MagIC Net 4.2

Manual

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Technical Communication
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1 Introduction

1.1 Welcome to MagIC Net

Introduction

MagIC Net

MagIC Net is the complete software solution for ion chromatography. It does not matter whether it is an ion chromatograph, dosing device or sample changer – all the required devices are automatically detected, monitored and addressed. The data produced is saved in a database, a reliable and retraceable procedure.

It's MagIC! MagIC Net is ready for any task – from "One-Button IC" in routine operation for one device to highly automated applications in FDA-regulated client/server environments. Appearance and available functions can always be adapted to the exact needs of the user.

With **MagIC Net**, Metrohm provides a uniform software product for all aspects of ion chromatography. Companies with international operations can use the same software platform in all sites around the globe to determine samples and exchange data and methods without loss.

Overview of the main program features

- *Easy-to-operate and easily configurable user interface*
- *Simple integration of devices and accessories*
- *Convenient method editor*

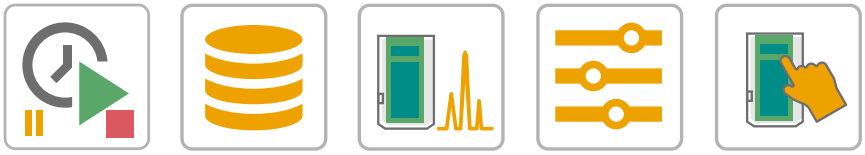
- *Database-based program with client/server functionality*
- *Wide range of import and export functions*
- *FDA compatibility in accordance with 21 CFR Part 11*
- *Comprehensive online help*
- *Program versions*

1.2 Operation

Introduction

Introduction

The modern **user interface** makes it easy for users to find their way around **MagIC Net**. All commands and control elements are located where you would expect. The bar on the left edge of the screen gives you access to the five basic elements of **MagIC Net**:



Workplace *Database* *Method* *Configura-tion* *Manual*

Depending on the access permissions, these buttons are either visible or hidden. The menu bar is in the upper part of the screen. It is also possible for the individual commands to be hidden, depending on the access permissions.

In the center of the screen, you can find the **information windows** with the settings, sample entry masks, live curves or results. This view can be set individually for each user with the aid of the new layout manager. As a result, users see only those windows or buttons they actually need for their work. This reduces the introductory period for routine users to a minimum. Incorrect operation as a result of overcrowded screens is also a thing of the past.

MagIC Net provides a wide range of **method and calculation templates**. These tried-and-tested templates allow any user to create new methods fast and easily and to use them immediately.

1.3 Device integration

Introduction

Introduction

MagIC Net and the Professional IC devices are ideally matched to one another. Together with the iColumns and Dosinos, they form an intelligent system of components, that are automatically recognized by **MagIC Net**. Software and devices communicate with each other. The devices provide the software with all the necessary data, which is optimized, monitored and, if required, documented to FDA standards by **MagIC Net**.

You can also profit from the strengths of **MagIC Net** with earlier Metrohm IC generation devices. These devices are operated in the usual manner with IC Net. IC Net can easily be remote controlled via **MagIC Net** and the measuring signal is transmitted to **MagIC Net** via the 771 IC Interface.

Third-party devices can be controlled via a Remote Box and their signals also recorded with the 771 IC Interface.

Devices that can be controlled with MagIC Net

- 948 Continuous IC Module
- 947 Professional UV/VIS Detector Vario
- 945 Professional Detector Vario
- 944 Professional UV/VIS Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 942 Extension Module Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 920 Absorber Module
- 919 IC Autosampler plus
- 896 Professional Detector
- 889 IC Sample Center
- 887 Professional UV/VIS Detector
- 886 Professional Thermostat / Reactor
- 883 Basic IC plus
- 882 Compact IC plus
- 881 Compact IC pro
- 872 Extension Module
- 863 Compact Autosampler
- 858 Professional Sample Processor
- 850 Professional IC
- 846 Dosing Interface
- 815 Robotic USB Sample Processor XL

- 814 USB Sample Processor
- 800 Dosino
- 771 IC Compact Interface
- Combustion Module
- Eco IC
- **Various**: 801 Stirrer, 803 Ti Stand, 804 Ti Stand, Remote Box MSB, barcode readers, RS-232 devices, 891 Professional Analog Out, etc.

For a description of the devices supported by the different versions of MagIC Net 4.2, see *Versions*.

1.4 Method editor

Introduction

The new **method editor** gets more out of your ion chromatography system. The method parameters are logically grouped in the **Devices**, **Time program** and **Evaluation** subwindows. Changes to the method can be visualized immediately in the fourth subwindow **Chromatograms** using the last chromatogram.

With the aid of the numerous templates, methods can be created quickly and easily. For routine and automated tasks, there are tried and tested methods available. Just a few clicks and they are adapted and ready to use.

The method has just one time program that controls all the devices involved, can request parallel or sequential sub programs, and can make logical decisions. Several chromatograms can be recorded and evaluated in different manners within one method: anions and cations from the same sample, for example, can be determined with one method – all the results of a sample are thus in one data set. Sample changers can be used in several methods at the same time. A sample can be prepared while the chromatogram of the previous sample is being recorded. This saves time and increases the sample throughput.

MagIC Net is flexible and adapts to your workflow and not vice versa.

Overview of functions

- Several chromatograms with one method.
- One time program for all devices.
- Method manager *(see chapter 5.4.1, page 388)*.
- Separate management of access permissions for each method group *(see chapter 5.5.2.3, page 402)*.
- Templates for method development *(see chapter 5.2.1, page 372)*.
- Plausibility tests for methods *(see chapter 5.2.5, page 376)*.
- Method-specific fixed values for sample data *(see chapter 5.3.1, page 383)*.

- Comments and application notes *(see chapter 5.3.3, page 384)* can be added to the methods *(see chapter 5.3.4, page 384)*.
- Parallel runs *(see chapter 5.7.4.2.2, page 427)*.
- Loop functions *(see chapter 5.7.4.2.4, page 428)*.

1.5 Database

Introduction

MagIC Net is based on an **object-oriented database** that has proven itself in practice. All program settings, the user administration, methods and templates are stored in the **configuration database** and the determination data is stored in the **determination databases** defined by the user. These databases can be installed locally on the computer reserved for measurements and represent a simple measurement system. **MagIC Net** is, however, scalable and grows with increasing operational requirements. As soon as data security and central data management make it necessary, **MagIC Net** is installed as a **client/server configuration**. The **MagIC Net** database is then installed on a server. All measurement and office computers work as clients. All results are stored centrally in this network and can be accessed and reprocessed by all client PCs. In addition, all clients use the same method pool.

The new database has all the major tools necessary for managing, searching for and grouping results. Quick filters allow the user to browse through thousands of determinations within seconds and to display the result clearly. Chart plots provide a quick overview of the chronological sequence of the results.

All options for **reprocessing** are available to the user.

Overview of functions

- Object-oriented client/server database *(see chapter 6.2.3.1, page 556)*.
- Layout manager for the database view *(see chapter 3.1.7, page 119)*.
- Quick filters *(see chapter 4.7.6.3, page 296)*
- Efficient search functions *(see chapter 4.7.4, page 290)*
- Access permissions control for every database *(see chapter 4.3.6.3, page 222)*
- Automatic database backup *(see chapter 4.3.6.4, page 222)*.
- Quick result overview or specially designed control charts *(see chapter 4.7.16, page 314)*
- Curve overlay *(see chapter 4.7.17, page 322)*.
- Reprocessing of determinations *(see chapter 4.7.18, page 328)*

1.6 Communication

Introduction

The decisive factor for the acceptance of PC-controlled analysis systems is being able to **integrate** it easily and economically in existing laboratory information systems, central databases and long-term archiving systems.

MagIC Net is communicative. **LIMS systems** can easily import work lists into the **MagIC Net** sample table and control them remotely, without extra modules. Data generated in **MagIC Net** can be exported in XML format. This therefore enables a simple connection to all customary LIMS. Export to long-term archiving systems such as NuGenesis SDMS or Scientific Software Cyberlab is also supported.

The new **Report generator** provides a simple and flexible solution for creating analysis reports. The report generator allows you to freely define the report templates. It is therefore possible to display one or more determinations in a layout of your choice as a PDF file or as a printout at any time.

A special feature is that **MagIC Net** can send messages, error messages or results from the method run to the user by **e-mail**.

Overview of functions

- Import of sample data *(see chapter 3.3.1.6, page 132)*.
- Various export formats, e.g. XML, CSV, SLK, CDF, measuring point list *(see chapter 4.6.2.1, page 277)*.
- Automatic data export, e.g. to NuGenesis SDMS, Scientific Software CyberLAB, etc. *(see chapter 5.8.6.3, page 477)*.
- Report designer *(see chapter 5.8.6.8, page 481)*.
- E-mail functions for status messages, error messages or results *(see chapter 2.7, page 111)*
- Send determinations by e-mail *(see chapter 4.7.8, page 308)*.
- Import of external determinations *(see chapter 4.7.10, page 309)*.

1.7 Conformity

Introduction

MagIC Net also sets new standards with respect to the fulfilling of **GMP, GLP and FDA requirements**. The latest quality standards and validation procedures were implemented already at the development and programming stage of the software. MagIC Net has been designed to fulfill the **FDA Guidance 21 CFR Part 11** and the customer-specific interpretations. This is evidenced by a Certificate of Conformity. The access permissions for program functions, methods and results are defined in a centralized user administration, and any number of users with freely definable access profiles are possible. The system administrator can conveniently access the user administration from any MagIC Net client. Access to the software is password-protected and the MagIC Net or Windows login can be selected.

The use of **digital signatures** makes it possible to sign methods and results. There are two signatures available with differing properties. With the first signature (Level 1, Review) the user confirms that he has programmed the method correctly or carried out the analysis correctly. With the second signature (Level 2, Release) the method or result is shared and protected against further modifications. It is thus possible to mirror customized workflows in **MagIC Net**.

Data management is **version-controlled**, and all data is protected against unauthorized access, modification or deletion in the database. The database itself controls access to the data in network operation and provides archiving and restore functions.

The **"Audit Trail"** protocols all actions by the user and all major system processes.

Conformity-relevant properties of MagIC Net

- Completely developed and validated with conformity in mind
- Central user administration *User administration*.
- Detailed access permissions *User administration - Access permissions*
- Password protection under MagIC Net or Windows *Login / password protection*
- Digital signature on two levels *Electronic signatures*.
- One signature each for methods and results.
- Documentation of all method and result modifications *Determinations - Displaying history*
- Traceability thanks to detailed Audit Trail *Audit Trail - Definition*.

1.8 Versions

Introduction

MagIC Net 4.2 is available in **four versions**, which differ regarding the scope of functions; MSB devices and barcode readers are supported by each version:

6.6059.423 MagIC Net Multi

Client/server version with all functions incl. 3 licenses.

Supported hardware:	***Ion chromatographs*** ▪ 940 Professional IC Vario ▪ 930 Compact IC Flex ▪ 883 Basic IC plus ▪ 882 Compact IC plus ▪ 881 Compact IC pro ▪ 850 Professional IC ▪ 771 IC Compact Interface ▪ Eco IC ***Sample changers*** ▪ 919 IC Autosampler plus ▪ 889 IC Sample Center ▪ 863 Compact Autosampler ▪ 858 Professional Sample Processor ▪ 815 Robotic USB Sample Processor XL ▪ 814 USB Sample Processor ***Detectors*** ▪ 947 Professional UV/VIS Detector Vario ▪ 945 Professional Detector Vario ▪ 944 Professional UV/VIS Detector Vario ▪ 896 Professional Detector ▪ 887 Professional UV/VIS Detector ▪ 850.9110 IC Amperometric Detector ▪ 850.9010 Professional IC Detector (Conductivity) ▪ 850.9020 Professional IC Detector MB (Microbore, Conductivity) ***Other*** ▪ 948 Continuous IC Module ▪ 943 Professional Thermostat / Reactor Vario ▪ 942 Extension Module Vario ▪ 941 Eluent Production Module ▪ 920 Absorber Module ▪ 891 Professional Analog Out ▪ 886 Professional Thermostat / Reactor ▪ 872 Extension Module ▪ 846 Dosing Interface ▪ 804 Ti Stand ▪ 803 Ti Stand ▪ 801 Stirrer ▪ 800 Dosino ▪ Combustion Module ▪ Remote Box MSB ▪ RS-232 device for TRANSFER command

Max. number of *ion chromatographs*:	unlimited
Max. number of *sample changers*:	unlimited
Max. number of *detectors*:	unlimited
Max. number of *Other*:	unlimited
Compatible with FDA 21 CFR Part 11:	✔
User administration:	✔
Security settings:	✔ All security settings are available: Settings according to 21 CFR Part 11, Login/Password protection, Signatures, Audit Trail/Modifications, Default reasons
Audit Trail:	✔ All options available: Audit Trail, Modifications, Reprocessing with history
Client/server support:	✔
Number of licenses:	3
Additional licenses as an option:	✔
XML data export to LIMS:	✔
Parallel runs:	✔
Upgrade possible:	

6.6059.422 MagIC Net Professional

Local server version with all functions, except client/server functionality.

Supported hardware:	***Ion chromatographs*** ▪ 940 Professional IC Vario ▪ 930 Compact IC Flex ▪ 850 Professional IC ▪ 883 Basic IC plus ▪ 882 Compact IC plus ▪ 881 Compact IC pro ▪ 771 IC Compact Interface ▪ Eco IC ***Sample changers*** ▪ 919 IC Autosampler plus ▪ 889 IC Sample Center ▪ 863 Compact Autosampler ▪ 858 Professional Sample Processor ▪ 815 Robotic USB Sample Processor XL ▪ 814 USB Sample Processor ***Detectors*** ▪ 947 Professional UV/VIS Detector Vario ▪ 945 Professional Detector Vario ▪ 944 Professional UV/VIS Detector Vario ▪ 896 Professional Detector ▪ 887 Professional UV/VIS Detector ▪ 850.9110 IC Amperometric Detector ▪ 850.9010 Professional IC Detector (Conductivity) ▪ 850.9020 Professional IC Detector MB (Microbore, Conductivity) ***Other*** ▪ 948 Continuous IC Module ▪ 943 Professional Thermostat / Reactor Vario ▪ 942 Extension Module Vario ▪ 941 Eluent Production Module ▪ 920 Absorber Module ▪ 891 Professional Analog Out ▪ 886 Professional Thermostat / Reactor ▪ 872 Extension Module ▪ 846 Dosing Interface ▪ 804 Ti Stand ▪ 803 Ti Stand ▪ 801 Stirrer ▪ 800 Dosino ▪ Combustion Module ▪ Remote Box MSB ▪ RS-232 device for TRANSFER command

Max. number of *ion chromatographs*:	unlimited
Max. number of *sample changers*:	unlimited
Max. number of *detectors*:	unlimited
Max. number of *Other*:	unlimited
Compatible with FDA 21 CFR Part 11:	✔
User administration:	✔
Security settings:	✔ All security settings are available: Settings according to 21 CFR Part 11, Login/Password protection, Signatures, Audit Trail/Modifications, Default reasons
Audit Trail:	✔ All options available: Audit Trail, Modifications, Reprocessing with history
Client/server support:	
Number of licenses:	1
Additional licenses as an option:	
XML data export to LIMS:	✔
Parallel runs:	✔
Upgrade possible:	✔

6.6059.421 MagIC Net Compact

Local server version with limited functionality and limited device support.

Supported hardware:	***Ion chromatographs*** ▪ 930 Compact IC Flex ▪ 882 Compact IC plus ▪ 881 Compact IC pro ▪ 771 IC Compact Interface ***Sample changers*** ▪ 919 IC Autosampler plus ▪ 889 IC Sample Center ▪ 863 Compact Autosampler ▪ 858 Professional Sample Processor ▪ 815 Robotic USB Sample Processor XL ▪ 814 USB Sample Processor ***Detectors*** ▪ 947 Professional UV/VIS Detector Vario ▪ 945 Professional Detector Vario[*] ▪ 944 Professional UV/VIS Detector Vario ▪ 896 Professional Detector[*] ▪ 887 Professional UV/VIS Detector ▪ 850.9110 IC Amperometric Detector [*] ▪ 850.9010 Professional IC Detector (Conductivity) [*] ▪ 850.9020 Professional IC Detector MB (Microbore, Conductivity) [*] ***Other*** ▪ 948 Continuous IC Module ▪ 943 Professional Thermostat / Reactor Vario ▪ 941 Eluent Production Module ▪ 920 Absorber Module ▪ 891 Professional Analog Out ▪ 886 Professional Thermostat / Reactor ▪ 846 Dosing Interface ▪ 804 Ti Stand ▪ 803 Ti Stand ▪ 801 Stirrer ▪ 800 Dosino ▪ Combustion Module ▪ Remote Box MSB ▪ RS-232 device for TRANSFER command [*] Depending on the version, the 896 Professional Detector, the 945 Professional Detector Vario or the 850 IC Detector contains one or two detector modules. The detector modules which are connected are counted at the time that the **Max. number of detectors** is checked.

Max. number of *ion chromatographs*:	1
Max. number of *sample changers*:	1
Max. number of *detectors*:	1
Max. number of *Other*:	unlimited
Compatible with FDA 21 CFR Part 11:	✔
User administration:	✔
Security settings:	✔ All security settings are available: Settings according to 21 CFR Part 11, Login/Password protection, Signatures, Audit Trail/Modifications, Default reasons
Audit Trail:	✔ All options available: Audit Trail, Modifications, Reprocessing with history
Client/server support:	
Number of licenses:	1
Additional licenses as an option:	
XML data export to LIMS:	✔
Parallel runs:	✔
Upgrade possible:	✔

6.6059.420 MagIC Net Basic

Local server version with limited functionality and limited device support.

Supported hardware:	***Ion chromatographs*:** ▪ 883 Basic IC plus ▪ Eco IC ***Sample changers*:** ▪ 863 Compact Autosampler ***Detectors*:** ▪ 850.9010 Professional IC Detector (Conductivity) ▪ 850.9020 Professional IC Detector MB (Microbore, Conductivity) ***Other*:** ▪ 948 Continuous IC Module
Max. number of *ion chromatographs*:	1
Max. number of *sample changers*:	1
Max. number of *detectors*:	1
Compatible with FDA 21 CFR Part 11:	
User administration:	✔
Security settings:	✔ Security settings for Login/Password protection and Audit Trail available
Audit Trail:	✔ Option **Audit Trail** available
Client/server support:	
Number of licenses:	1
Additional licenses as an option:	
XML data export to LIMS:	✔
Parallel runs:	✔
Upgrade possible:	

1.9 Online help

Introduction

Calling up the help

MagIC Net has a very extensive and detailed online help that can be accessed in two ways:

- **General call**

  With the **Help ▶ MagIC Net** menu item or the ? icon, the online help with the topic *Welcome to MagIC Net* is opened. From there you can jump to the desired topic via **Contents**, **Index**, **Search** or personal **Favorites**.
- **Context-sensitive call**
  You can jump directly to the topic which contains information on the active element in **MagIC Net** (dialog window, tab) with the **[F1]** function key on the keyboard.

Symbols and conventions

The following icons and formatting are used in this documentation:

(see chapter 6.1, page 529)	Link to another help topic that contains information about the marked term.
Database	**Dialog text** Designation for names of parameters, menu items, tabs and dialog windows in the software.
100	Designation for parameter values in input fields.
File ▶ New	Menu or menu item; path needed to reach a certain point in the program.
[Continue]	**Button**
Σ	**Formula editor** Formulas can be entered in fields with this icon. The formula editor opens when you click on the *(see chapter 2.4, page 30)* icon.
1	**Instruction step** Carry out these steps in the sequence shown.
	Caution This symbol draws attention to possible damage to devices or device parts.

	Note This symbol highlights additional information and tips.

Colors

In MagIC Net, color markings are used, e.g. in database management. The colors described refer to the **MagIC Net Light** display. In the visualization **MagIC Net Dark**, the colors may differ from the description.

1.10 Installation notes

The information on how to install the **MagIC Net** can be found in the separate installation instructions *(8.0102.8016)*. These include:

- PC and user rights requirements in the Windows system
- Steps for initial installation of the software
- Steps for modifying, repairing or removing an existing software installation
- Steps for updating an existing installation to the most current version
- Information on adding new licenses

Normally, the installation routine of the **MagIC Net** automatically installs all the components necessary for operation. On the operating system Windows 10, it may be necessary for the correct display of East Asian fonts (e.g. in reports) to install the required fonts by adding the corresponding language in the Windows settings. In case of an error, follow the installation instructions and contact your regional Metrohm representative if necessary.

1.11 What is new in MagIC Net?

Introduction

All the new features are described in the document *8.0102.8017 – Release Notes MagIC Net 4.2*.

The latest version of the Release Notes can be accessed on the *Metrohm website*. Enter the document number in the search field or open the Release Notes in **Support & Service ► Software Center ► MagIC Net**.

2 General program functions

2.1 Program parts

2.1.1 Program parts - Overview

General program functions

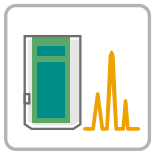
MagIC Net has five different program parts which can be opened by clicking on the corresponding icon in the vertical bar on the left. The icon for the opened program part is shown in color, the icons for the other program parts in black and white. The menus, toolbars and content of the main window depend on the program part currently opened.

Workplace program part

- Opening/closing workplaces
- Starting single determinations and determination series
- Sample tables

Database program part

- Opening/closing databases
- Managing databases
- Reprocessing
- Creating report templates



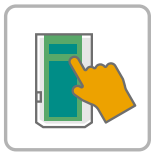
Method program part

- Opening/closing existing methods
- Creating new methods
- Managing methods

Configuration program part

- Configuration of devices, eluents, columns, common variables, rack data and accessories
- Security settings
- User administration
- Program administration
- Audit Trail

Manual program part



- Manual control of devices

NOTE

Access to the individual program parts can be deactivated in the user administration. In this case, the corresponding icons are hidden.

2.1.2 Workplace - User interface

Program part: **Workplace**

Workplace icon

Clicking on the workplace icon in the vertical bar on the left opens the **Workplace** program part while at the same time the workplace icon is shown in color. The upper left corner of the icon contains a black field displaying the number of workplaces currently opened *(see chapter 3.2.3.1, page 124)*.

Elements

The user interface of the **Workplace** program part comprises the following elements:

- Workplace-specific menu bar.
- Workplace-specific toolbar.
- Main window, in which up to six subwindows can be displayed.

2.1.3 Database - User interface

Program part: **Database**

Database icon

Clicking on the database icon in the vertical bar on the left opens the **Database** program part; the database icon is shown in color at the same

time. The upper left corner of the icon contains a black field displaying the number of databases currently opened *(see chapter 4.2.2, page 215)*.

Elements

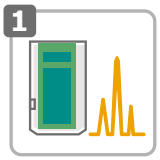
The user interface of the **Database** program part comprises the following elements:

- Database-specific menu bar.
- Database-specific toolbar.
- Main window, in which up to six subwindows can be displayed.

2.1.4 Method - User interface

Program part: **Method**

Method icon



Clicking on the method icon in the vertical bar on the left opens the **Method** program part; the method icon is shown in color at the same time. The upper left corner of the icon contains a black field displaying the number of methods currently opened *(see chapter 5.2.3, page 374)*.

Elements

The user interface of the **Method** program part comprises the following elements:

- Method-specific menu bar.
- Method-specific toolbar.
- Main window in which up to four subwindows can be displayed at the same time.

2.1.5 Configuration - User interface

Program part: **Configuration**

Configuration icon

Clicking on the configuration icon in the vertical bar at the left opens the **Configuration** program part; the configuration icon is shown in color at the same time.

Elements

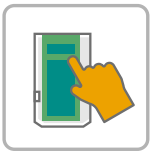
The user interface of the **Configuration** program part comprises the following elements:

- Configuration-specific menu bar.
- Configuration-specific toolbar.
- Main window, in which up to six subwindows can be displayed.

2.1.6 Manual control - User interface

Program part: **Manual control**

Manual control - Symbol



Clicking on the **manual** icon in the vertical bar on the left opens the **manual control** program part in a separate window; the **manual** icon is displayed in color at the same time.

Elements

The user interface of the **manual control** program part comprises the following elements:

- Device selection
- Device window

2.2 Login / password protection

2.2.1 General information on login / password protection

Program parts: **Workplace / Database / Method / Configuration**

Login into MagIC Net

MagIC Net can be configured so that all users have to log in with their **user name** and **password**, and this data is automatically checked. This requires a **User administration** to be set up and the corresponding **Security settings** to be made. This data is saved in the configuration database. In the case of client/server systems, this is on the server and applies globally for all clients (central user administration).

FDA-compliant settings

If you are to be in compliance with the FDA, the settings on the **Login/ Password protection** tab in dialog window **Security settings** must be activated according to 21 CFR Part 11 by activating the check box **Settings according to 21 CFR Part 11**. The following conditions will then be complied with:

- A **login with user name and password** is required each time the program is started.
- **User names** must be **unique**. Users cannot be deleted once they have been entered.
- **Passwords** must be **unique** for each user. None of the expired passwords already used once by the user may be reused.
- Passwords must be changed after a defined **validity period**.
- The **number of login attempts** is limited. If this number is exceeded, the user will automatically be set to **inactive** status.

Actions

If the login is activated, the following actions can be performed:

- *Logging in at program start*
- *Logging out manually*
- *Logging out automatically*
- *Changing password*

2.2.2 Logging in

Program parts: **Workplace / Database / Method / Configuration**

Program parts: **Configuration / Database**

If both of the options **Enforce login with user name** and **Enforce login with password** are activated in the **Security settings**, the **Login** dialog window will appear each time the program is started and after each time a user logs out.

User

Entry of the short name of the user.

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

NOTE

Users who log in for the first time or users whose status has been reset from **disabled** or **removed** back to **enabled**, must log in with the **Start password** *(see chapter 6.2.1.3.1, page 544)* assigned by the administrator. Afterwards, the **Change password** window, in which a new password needs to be entered, will open automatically.

[Change password]

Opens the **Change password** window, in which the new password needs to be entered and confirmed.

[Cancel]

The login is canceled and the program is terminated.

2.2.3 Logging out manually

Menu item: **Workplace / Database / Method / Configuration ▶ File ▶ Logout**

A logged-in user can log out at any time with the **File ▶ Logout...** menu item. The logout options defined in the **Security settings** apply. After the logout the **Login** window appears, allowing a new user to log in.

2.2.4 Logging out automatically

Program part: **Configuration**

If the automatic logout is activated in the **Security settings**, then the user will be logged out automatically after a defined waiting time no operating functions have been performed in the meantime via the keyboard or mouse. The **Login** window appears again afterwards, but only the same user or members of the same user group can use it to log back in again.

NOTE

Users with administrator rights can always log in; an emergency stop is also possible.

2.2.5 Changing the password

Dialog window: **Login ▶ [Change password] ▶ Change password**

NOTE

In **MagIC Net**, the password can only be changed if the option **Password monitoring by MagIC Net** is set in the **Security settings**.

[Change password]

This button in the **Login** dialog window opens the **Change password** window, in which the new password needs to be entered and confirmed.

NOTE

The password always needs to be changed before the **Passwords expire every** period of the password expires. For users who are logging in for the first time or users whose status has been reset from **disabled** or **removed** back to **enabled**, this window is automatically opened after logging in with the **Start password**. Here you also need to enter the **Start password** assigned by the administrator for **Old password**.

Old password

Entry of the previous password.

Entry	**24 characters**

New password

Entry of the new password. The password options are defined in the **Security settings** on the **Login/Password protection** tab.

Entry	**24 characters**

Confirm password

Confirmation of the new password.

Entry	**24 characters**

2.3 Electronic signatures

2.3.1 Rules for electronic signatures

Program parts: **Method / Database**

In MagIC Net, methods and determination can be **electronically signed** at two levels. The following rules apply for this:

- **Signature levels**
  Methods and determinations can be signed at two levels (Signature Level 1 and Signature Level 2) by entering the user name and password.
- **Multiple signing**
  Methods and determinations can be signed several times at each level. All signatures are saved and documented in the Audit Trail.
- **Signing at level 1**
  If level 2 has been signed, then no more signatures are possible at level 1.

- **Signing at level 2**
  Level 2 cannot be signed unless there are already signatures on level 1.
- **Different users**
  The same user may not sign on both level 1 and level 2.
- **Reason and comment**
  Each signature must be accompanied by a reason selected from predefined default reasons. An additional comment can also be entered.
- **Saved data**
  Signature date, user name, full name, reason and comment are saved for each signature.
- **Deleting signatures 1**
  Signatures at level 1 are automatically deleted when a new version is created.
- **Deleting signatures 2**
  Signatures at level 2 can be deleted by users who have the respective permission.
- **Signing methods**
  Methods can only be signed individually.
- **Signature options**
  The options for electronic signatures are set in the **Signatures** tab in the **Security settings** dialog window.

2.3.2 Procedure for electronic signatures

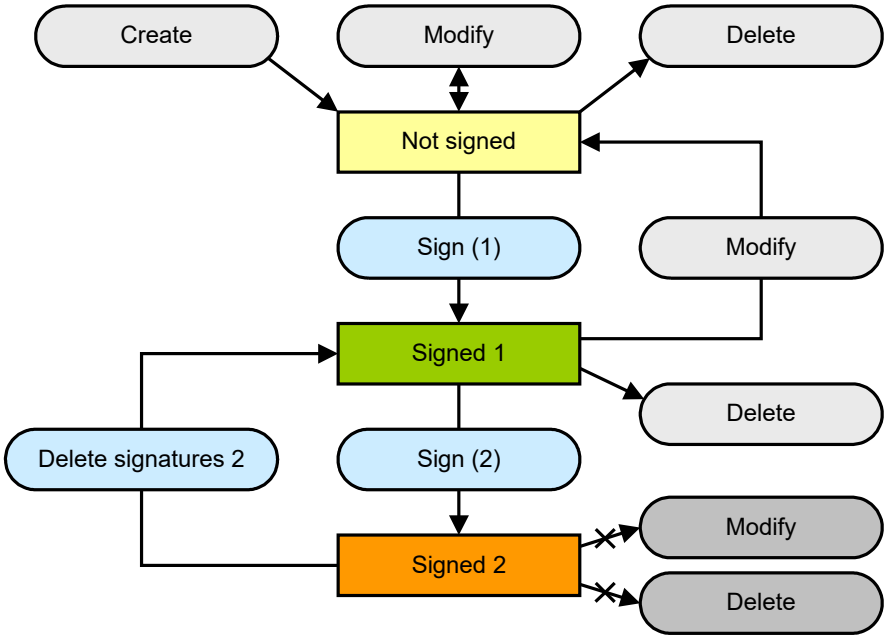
Program parts: **Database / Method**

Methods and determinations exhibit one of the following three statuses in relation to signatures (see flow chart):

Determinations exhibit one of the following three statuses with respect to signatures (see flow chart):

- **Not signed**
  Methods and determinations which are not signed can be deleted and changed, a new version being created at each change.
- **Signed (1)**
  When signing methods and determinations at level 1, no new versions are generated. If methods and determinations signed at Level 1 are changed, a new version is generated, which no longer contains any signatures. Methods and determinations signed at Level 1 can be deleted.
- **Signed (2)**
  When signing methods and determinations at level 2, no new versions are generated. Methods and determinations signed at Level 2 can neither be changed nor deleted. It is, however, possible to delete the signatures (2), although the signatures (1) will be retained.

- **Not signed**
  Determinations that are not signed can be deleted and changed, with a new version being created each time there is a change.
- **Signed (1)**
  When signing determinations at level 1, no new versions are generated. If determinations signed at level 1 are changed, a new version is generated, which no longer contains any signatures. Determinations signed at level 1 can be deleted.
- **Signed (2)**
  When signing determinations at level 2, no new versions are generated. Determinations signed at level 2 can neither be changed nor deleted. It is, however, possible to delete the signatures (2), although the signatures (1) will be retained.



2.3.3 Signature level 1

Dialog window: **Database ▶ Determinations ▶ Sign ▶ Signature 1... ▶ Signature Level 1**

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Signature 1... ▶ Signature Level 1**

Methods or determinations can be signed at level 1 in the **Signature Level 1** window.

NOTE

Methods or determinations which have been signed at level 1 can be modified and deleted. If the modified method or determination is saved as a new version, however, then all existing signatures will be deleted automatically, i.e. the method or determination must be signed once again.

Info

Display of information for signing and deleting signatures. The following messages are possible:

Selection	**Signature possible** | **Signature 1 not possible (signature 2 exists)** | **Signature not possible (accessed by other client)**

Signature possible
The selected method or determination can be signed.

Signature 1 not possible (signature 2 exists)
The selected method or determination can no longer be signed at level 1 as it has already been signed at level 2.

Signature not possible (accessed by other client)
The selected method or determination cannot be signed as it is already marked to be signed on a different client.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 1** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Sign]

Sign the method or determination. The window remains open.

NOTE

Methods or determinations can only be signed at level 1 if the user belongs to a user group with the corresponding permission.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

2.3.4 Signature level 2

Dialog window: **Database ▶ Determinations ▶ Sign ▶ Signature 2... ▶ Signature Level 2**

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Signature 2... ▶ Signature Level 2**

Methods or determinations can be signed at level 2 in the **Signature Level 2** window.

NOTE

Methods or determinations signed at level 2 are **locked**, i.e. they can neither be modified nor deleted. In order to be able to edit such methods or determinations again, the signatures on level 2 must first be deleted.

Info

Information for signing and deleting signatures is displayed in this box. The following messages are possible:

Selection	**Signature possible | Signature 2 not possible (signature 1 missing) | Signature not possible (accessed by other client)**

Signature possible
The selected method or determination can be signed.

Signature 2 not possible (signature 1 missing)
The selected method or determination cannot be signed at level 2 as it has not yet been signed at level 1.

Signature not possible (accessed by other client)
The selected method or determination cannot be signed as it is already marked to be signed on a different client.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 2** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Sign]

Sign the method or determination. The window remains open.

NOTE

Methods or determinations can only be signed at level 2 if the user belongs to a user group with the corresponding permission.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

2.3.5 Deleting signatures Level 2

Dialog window: **Database ▶ Determinations ▶ Sign ▶ Delete signatures 2... ▶ Delete Signatures Level 2**

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Delete signatures 2... ▶ Delete Signatures Level 2**

All signatures on level 2 for the selected method or determination can be deleted in the **Delete Signatures Level 2** window.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 2** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Delete]

Delete signatures 2.

NOTE

Signatures 2 can only be deleted if the user belongs to a user group with the respective permission.

2.4 Formula editor

2.4.1 General

Dialog window: **Formula editor**

The formula editor serves as a support when entering formulas for result calculation. It has an automatic **syntax check**, which is activated when the formula is applied. The general rules of priority apply for the calculation operations.

The **Formula editor** dialog window contains the following elements:

- **Input field**
  Entry of the calculation formula *(see chapter 2.4.2, page 31)*.

- **Buttons**
  Buttons for the quick entry of operators, parentheses and brackets *(see "Entry using the buttons", page 31)*.
- **Variables**
  Selection of the variables available for the calculation formula *(see chapter 2.4.4, page 34)*.
- **Operators/functions**
  Selection of the operators and functions available for the calculation formula *(see chapter 2.4.5, page 47)*.
- **Description**
  Description of the selected variables, operators or functions.

2.4.2 Input field

Dialog window: **Formula editor**

The calculation formula is entered in the input field of the formula editor. The following options are available for the entry:

Entry via keyboard

- **Numbers**
  Numbers as well as mathematical functions can be entered directly via the keyboard.
- **Text**
  Text must be enclosed in quotation marks **"** (e.g. **"my text"**).
- **Variables**
  Variables must be entered with an apostrophe **'** at the beginning and at the end (e.g. **'MV.my variable'**).
- **Time**
  Time indications must always be made with the aid of the **Time( )** function.

Entry using the buttons

Mathematical operators and parentheses or brackets can simply be inserted in the formula using the corresponding buttons. A space is automatically inserted before and after the character.

+	*Addition*	=	*Equal to*	AND	*Logical AND*
−	*Subtraction*	>	*Greater than*	OR	*Logical AND*
×	*Multiplication*	<	*Less than*	( )	Round parentheses

/	*Division*	<>	*Not equal to*	{ }	Curly brackets e.g. for endpoint definition (example **'DETpH 1.EP{1}.VOL'**) Curly brackets: request values of variables with index; the index is in curly brackets
^	*Potentiation*	<=	*Less than or equal to*		*Molar mass calculator*
		>=	*Greater than or equal to*		Undo last action
					Redo last action

Entry via selection

The element selected in the **Variables** or **Operators/Functions** fields can be added to the formula with a double-click or with **[Add]**.

2.4.3 Calculation algorithms

Dialog window: **Formula editor**

Numerical format

The standard IEEE 754 (1985) for binary floating-point arithmetic is implemented in "double precision" (64 bit) in the software.

Rounding-off process

Measured values and results are rounded off symmetrically (commercial rounding). I.e., **1, 2, 3, 4** are always rounded down whereas **5, 6, 7, 8, 9** are always rounded up.

Examples

2.33 yields **2.3**

2.35 yields **2.4**

2.47 yields **2.5**

–2.38 yields **–2.4**

–2.45 yields **–2.5**

Statistics

The mean value as well as the absolute and relative standard deviation of results *R* are calculated using the following formulas:

Mean value

$$\bar{x}_k = \frac{1}{n} \cdot \sum_{i=1}^{n} R_{k,i}$$

Absolute standard deviation

$$Sabs_k = + \sqrt{\frac{\sum_{i=1}^{n}(R_{k,i} - \overline{x}_k)^2}{n-1}}$$

Relative standard deviation (in %)

$$Srel_k = 100 \cdot \frac{Sabs_k}{\overline{x}_k}$$

The statistical calculations of the software have been implemented so that they can be checked to as great a degree as possible by the user. The individual values are therefore incorporated in the statistics with full accuracy.

It is not the number of decimal places which is decisive for the accuracy of the calculations, but rather the number of significant digits of the decimal numbers displayed. As a result of the binary 64-bit numerical format implemented on the basis of the IEEE 754 standard, the resulting decimal numbers have 15 reliable significant decimal places.

You can influence the number of significant digits by selecting the unit and the number of decimal places. As the result unit to be set sometimes contains the prefix "milli" as well as the actual physical unit, the number of significant places changes accordingly by three places during such a conversion.

Example

The displayed result of **mg/L** has 15 reliable digits. It should be rounded off to three decimal places according to the above rounding-off process:

1234.568 mg/L (7 significant places, 3 of them decimal places)

The unit "**g/L**" means that the same result **g/L** is also rounded off to three decimal places:

1.235 g/L (4 significant places, 3 of them decimal places)

The number of significant digits has now been reduced by three to four digits by omitting the prefix "milli".

NOTE

The above losses with respect to accuracy caused by rounding off in the range of the maximum reliable places are only theoretically relevant. Most of the time they are lower by several orders of magnitude than, for example, the uncertainties resulting from sample size.

2.4.4 Variables

2.4.4.1 Variables - Overview

Dialog window: **Formula editor ► Variables**

Variables are automatically generated by the program during or at the end of the determination. You can use the formula editor to access these and either use the values for further calculations or output them as a result.

Variable types

The following types of variables are differentiated:

Variable type	Syntax	Description
Sample data variables		Sample data variables contain all of the sample data of the determination.
▪ *Sample data variables*	▪ **'SD.Variable name'** These variables contain the sample data of a single determination and/or the sample data of the current determination of a determination series.	
▪ *Sample data variables of the next sample line*	▪ **'SD.NEXT.Variable name'** These variables contain the sample data of the *next* determination of a determination series.	

Variable type	Syntax	Description
Method variables		Method variables can contain parameters of a method or data which has been generated in the method run.
▪ *Evaluation parameter variables*	▪ **ED.'Variable name'** ▪ **ED.'Analysis name'.'Variable name'** ▪ **ED.Standard'x'.'Component name'.CONC** ▪ **ED.Check standard'x'.'Component name'.CONC** ▪ **ED.Spiking solution'x'.'Component name'.CONC**	
▪ *Time program variables*	▪ **'TP.Command number. Variable name'**	
▪ *Subprogram variables*	▪ **'SR.Subprogram name. Variable name'**	
▪ *Hardware variables*	▪ **'HW.Hardware class. Hardware name. Variable name'**	
▪ *Determination variables*	▪ **'DV.Variable name'**	
Result variables		Result variables are automatically generated during the evaluation either by the program or from the results defined by the user.
▪ Single result variable	▪ **RS.'Result name'**	
▪ Component result variable	▪ **RS.'Analysis name'.'Component name'. 'Result name'**	
▪ Calibration standard variables	▪ **RS.'Analysis name'.Standard'x'.'Component name'.AREA** ▪ **RS.'Analysis name'.Standard'x'.'Component name'.HGT**	
System variables	**'SV.Variable identification'**	System variables are general variables which are adopted in the determination at the start of the determination.
Common variables	**'CV.Variable name'**	Common variables are global variables which are adopted from the table of the **Configuration** program part at the start of the determination and assigned to the determination.

Entering variables

Variables must always be entered and ended with an apostrophe **'** (e.g. **'SD.myVariable'**).

You can select the variables directly in the formula editor to avoid syntax errors.

NOTE

When using variables, always observe their data type (**Number**, **Text** or **Date/Time**).

2.4.4.2 Sample data variables

Dialog window: **Formula editor ► Variables ► Variable types**

Syntax

'SD.Variable name'

These variables contain the sample data of a single determination and/or the sample data of the current determination of a determination series. They are automatically generated after a determination has been run. The data type (**Text**, **Number** or **Date/Time**) depends on the variable.

Available sample data variables

Variable name	Description	Data type
BATCH	Name of the batch to which a determination has been assigned The **SD.BATCH** variable contains the name of the original batch with which the determination was run, even though the determination was added to another batch retrospectively.	Text
METHOD	Method which has been used for sample determination	Text
IDENT	Identification of the sample	Text
TYPENAME	Name of the sample type	Text
TYPEVALUE	Numerical value of the sample type: '**Sample**' and '**Blank**' = **0** All other sample types = Sample type number (e.g. '**Standard 2**' = **2**)	Number
POSITION	Position of the sample If the **SD.POSITION** variable contains digits only, it is **automatically** converted into the Number data type. In this case, the *TextToNumber()* function does **not** need to be applied.	Text
INJECTIONS	Number of injections of the same sample (multiple determination)	Number
INJCOUNT	Injection number of a multiple determination	Number
VOLUME	Volume of the sample [µL]	Number
DILUTION	Dilution of the sample	Number
AMOUNT	Amount of the sample	Number
INFO1	Sample identification info 1	Text

Variable name	Description	Data type
INFO2	Sample identification info 2	Text
INFO3	Sample identification info 3	Text
INFO4	Sample identification info 4	Text
VALUE1	Sample identification value 1	Number
VALUE2	Sample identification value 2	Number
VALUE3	Sample identification value 3	Number
VALUE4	Sample identification value 4	Number

2.4.4.3 Sample data variables of the next sample line

Dialog window: **Formula editor ► Variables ► Variable types**

Syntax

'SD.NEXT.Variable name'

These variables contain the sample data of the *next line of the sample table* of a determination series. This also applies if the determination of the current sample line involves the running of a multiple injection. These variables are distinguished in the syntax from the sample data variables of the current sample data line by means of the word **NEXT**. The data type (**Text**, **Number** or **Date/Time**) depends on the variable.

NOTE

- The sample data variables of the next sample line are available **only in the time program**.
- The variable names in **'SD.NEXT.Variable name'** are the same as with the normal sample data variables *(see chapter 2.4.4.2, page 36)*, with the **exception** of **INJCOUNT**, which is not available here.
- In the case of a single determination or if the current determination is the last determination of a series, all of the **'SD.NEXT.Variable name'** variables contain the value **invalid**.

2.4.4.4 Evaluation parameter variables

Dialog window: **Formula editor ► Variables ► Variable types**

The evaluation parameter variables are method-specific and they are automatically generated after a determination has been run in which an evaluation was defined. The data type (**Text**, **Number** or **Date/Time**) depends on the variable.

Syntax

ED.'Variable name'

ED.'Analysis name'.'Variable name'

ED.Standard'x'.'Component name'.'CONC'

ED.Check standard'x'.'Component name'.'CONC'

ED.Spiking solution'x'.'Component name'.'CONC'

Available evaluation parameter variables

Variable name	Description	Data type
CONC	Concentration of a component in a standard, check standard or spiking solution	Number
CONCUNIT	Unit of the concentration	Text
DT	Void time of the analysis [min]	Number
DAT	Recording time of the analysis [min]	Number
RET	Specified retention time [min]	Number
RETWIN	Specified time slot for retention time [%]	Number

2.4.4.5 Time program variables

Dialog window: **Formula editor ► Variables ► Variable types**

The time program variables are method-specific and are automatically generated after certain time program commands have been run. The data type (**Text**, **Number** or **Date/Time**) depends on the variable.

Syntax

TP.'Command number'.'Variable name'

Available time program variables

Variable name	Description	Data type
ABSORBANCE	Measured absorbance [mAu] in the corresponding measuring channel	Number
AMOUNT	Amount of the sample	Number
ANALOGSIGNAL	Measured analog signal [mV]	Number
BAR	Measured pressure [bar]	Number
AVOL	Aspirated volume [mL]	Number
CONC	Concentration of the solution	Number
CONC1	Concentration of the solution	Number
CONC2	Concentration of the solution	Number
CTIME	Duration of the combustion [min]	Number
LOOPNO	Number of loop runs	Number
CONDUCTIVITY	Measured conductivity	Number

Variable name	Description	Data type
CURRENT	Current measured for the 948 Continuous IC Module	Number
DATA{x}	Data from RS-232 communication (command: **Transfer**). x = x-th data segment.	Text
DILUTION	Dilution of the sample	Number
DRIFT	Measured drift (conductivity detector)	Number
DRIFT_I	Measured drift in the **Current** channel of the amperometric detector.	Number
DRIFT_Q	Measured drift in the **Charge** channel of the amperometric detector.	Number
DVOL	Dosed volume [mL]	Number
GASFEED	Indication whether the gas supply in the method takes place via LPG or GSS.	Text
IDENT	Identification of the sample	Text
INFO1	Sample identification info 1	Text
INFO2	Sample identification info 2	Text
INFO3	Sample identification info 3	Text
INFO4	Sample identification info 4	Text
INJECTIONS	Number of injections of the same sample (multiple determination)	Number
LPO	Current, absolute lift position [mm]	Number
MEAS_I	Measured current for the amperometric detector	Number
METHOD	Method which has been used for sample determination	Text
MPA	Measured pressure [MPa]	Number
MWAIT	Time until the 'Wait' command has been manually terminated [s]	Number
NOISE	Measured noise (conductivity detector)	Number
NOISE_I	Measured noise in the **Current** channel of the amperometric detector.	Number
NOISE_Q	Measured noise in the **Charge** channel of the amperometric detector.	Number
POSITION	Position of the sample. If the TP.'Command number'.POSITION variable contains digits only, it is automatically converted into the Number data type in formulas. In this case, it is not necessary to use the TextToNumber() function.	Text
PRESS	GSS sample pressure in [bar] that is set manually on the device.	Number
PSI	Measured pressure [psi]	Number
RAN	Current, absolute rotation angle of the rack in relation to the axis of the selected tower [°]	Number
RPO	Current rack position when terminating the command **0** = Rack position when terminating the command not defined	Text
SAN	Current, absolute swing angle of the robotic arm [°]	Number

Variable name	Description	Data type
SDA	Start time of data acquisition	Date/ Time
SDAD	Drift of the chromatogram	Number
SDAN	Noise of the chromatogram	Number
SDAP	Pressure when starting data acquisition	Number
SDAT	Temperature when starting data acquisition [°C]	Number
SPO	**1 - 4** = Current external position when terminating the command **0** = Position when terminating the command not defined	Number
TEMP	Measured temperature [°C]	Number
TOU	**1** = max. waiting time expired **0** = max. waiting time not expired	Number
TSLS	Time elapsed [min] since the previous (manual or automatic) stepping to next position by the rotor of the affected module of the MSM, MSM-HC, SPM type. TSLS stands for **Time Since Last Step**.	Number
TYPE	Sample type that is entered	Text
VALUE1	Sample identification value 1	Number
VALUE2	Sample identification value 2	Number
VALUE3	Sample identification value 3	Number
VALUE4	Sample identification value 4	Number
VOLTAGE	Measured voltage for the 948 Continuous IC Module	Number
VOLUME	Volume of the sample [µL]	Number

Special cases

The device-independent **Calculation** time program command *(see chapter 5.7.4.2.8, page 430)* generates for each single result two variables of the form **TP.'Command number'.'Result name'.'Variable name'**:

Variable name	Description	Data type
VAL	Value of the 'Result name' result from the no. 'Command number' time program command.	(dependent on the formula used)
UNI	Unit of the 'Result name' result from the no. 'Command number' time program command.	Text

2.4.4.6 Subprogram variables

Dialog window: **Formula editor ▶ Variables ▶ Variable types**

The subprogram variables are method-specific and are generated when a subprogram is called up. The data type (**Text**, **Number** or **Date/Time**) depends on the variable.

Syntax

'SR.Subprogram name.Variable name'

Available subprogram variables

Variable name	Description	Data type
LCO	Loop counter. Number of completed loops of a call. Each new call sets the counter to **1**. This variable is also valid if the subprogram has not been called up as a loop, and it then has the value **1**.	Number
FIN	Status. **0** = Subprogram has been called up and has not yet been ended. **1** = Subprogram has been called up and ended at least once. **invalid** = Subprogram has never been called up.	Number

2.4.4.7 Hardware variables

Dialog window: **Formula editor ▶ Variables ▶ Variable types**

The hardware variables are method-specific and they are automatically generated. They contain certain parameters of the columns and modules which can be used in the method. The data type (**Text**, **Number** or **Date/Time**) depends on the variable.

Syntax

'HW.Hardware class.Hardware name.Variable name

Available hardware variables

Variable name	Description	Data type
HW.COL.'Column name'.ID	Inner diameter of the column [mm]	Number
HW.COL.'Column name'.LEN	Length of the column [mm]	Number
HW.COL.'Column name'.PS	Particle size of the column [µm]	Text
HW.COL.'Column name'.IDPRE	Inner diameter of the guard column [mm]	Number
HW.COL.'Column name'.LENPRE	Length of the guard column [mm]	Number

2.4.4.8 Determination variables

Dialog: **Formula editor ► Variables**

Determination variables are general variables that are generated in the method run. They are not assigned to individual commands. The **Variables** field of the formula editor lists the **Determination variables** which are available for the current method, sorted according to name.

Syntax

'DV.Variable name'

Examples: **'DV.DUR'**, **'DV.STT'**

You can select the determination variables directly in the formula editor under **Variables/Determination variables** in order to avoid syntax errors.

Available determination variables

Variable name	Description	Data type
DUR	Duration of the determination in s	Number
STT	Time point at which the determination was started	Date/ Time

2.4.4.9 Result variables

Dialog window: **Formula editor ► Variables ► Variable types**

Some result variables are automatically generated by the program. In addition, the user can also define the result variables (user-defined results) that can then also be used in the Formula editor for further calculations.

A basic distinction is made between **single results**, **component results** and **calibration standard results**.

A **single result** is an individual numerical value which is calculated according to a specified formula. Single results are never generated by the program; they are always user-defined.

In the case of a **component result**, a formula is specified with which a result is calculated in the same way for each component. Component results are generated both by the program as well as by the user.

A **calibration standard result** represents the area or height of a peak for a component in the respective standard. It is generated directly by MagIC Net and can be used by users for calculations, e.g. for the calculation of a dilution factor.

Syntax

Single result:

- **RS.'Result name'**

Component result:

- **'RS.Analysis name.AC.Result name'**, whereby **AC** stands for "all components" and represents all components as a wildcard.
- **'RS.Analysis name.SPEC.Result name'**, whereby **SPEC** means "Spectrum".
- **'RS.Analysis name.Component name.Result name'**, whereby the **component name** stands for one specific component.

Calibration standard result:

- **RS.'Analysis name'.Standard'x'.'Component name'.AREA**
- **RS.'Analysis name'.Standard'x'.'Component name'.HGT**

Available result variables

The following result variables are automatically generated by the program. They are already available at the time of the time program creation.

The variables marked with an asterisk (*****) are only generated if the corresponding option is activated in the evaluation.

Variable name	Description	Data type
NUM	Peak number	Number
COMP	Component name	Text
RET	Retention time [min]	Number
FWHM	Width at half peak height [min]	Number
HGT	Height of the peak (unit depends on the measuring signal)	Number
HGT%	Peak height ratio, for a standardization of the peak heights of all peaks to 100%.	Number
AREA	Area of the peak (unit: measuring signal unit x minutes)	Number
AREA%	Peak area ratio, for a standardization of the sum of all peak areas to 100%	Number
CAP	Retention factor: Ratio of the corrected retention time to the void time	Number
RES	Resolution for two adjoining peaks	Number
PLA	Theoretical plates: Effectiveness of the column for the peak	Number
PLAM	Theoretical plates per meter: Effectiveness of the column for the peak	Number
PGF	Gauss factor of the peak	Number
ASY	Peak asymmetry	Number
CONC	Concentration of the component	Number
CONC%	Concentration ratio, for a standardization of the sum of all concentrations to 100%	Number
CONCMEAN	Concentration mean value from a single or multiple determination	Number

Variable name	Description	Data type
CONCMEANSD	Standard deviation of the concentration mean value, including calibration errors	Number
CONCMEAN-CONF95	Half width of the confidence interval for the concentration mean value, at 95% confidence	Number
LDTCCONF95	Limit of detection from linear calibration function, at 95% confidence	Number
STDCONC	Standard concentration of the component	Number
TYPE	Peak type, designates several properties of the peak	Number
START	Peak start [min]	Number
END	Peak end [min]	Number
A044	Width of the peak between peak start and peak maximum at 4.4% of the peak height [min]	Number
B044	Width of the peak between peak maximum and peak end at 4.4% of the peak height [min]	Number
A05	Width of the peak between peak start and peak maximum at 5.0% of the peak height [min]	Number
B05	Width of the peak between peak maximum and peak end at 5.0% of the peak height [min]	Number
A10	Width of the peak between peak start and peak maximum at 10% of the peak height [min]	Number
B10	Width of the peak between peak maximum and peak end at 10% of the peak height [min]	Number
A134	Width of the peak between peak start and peak maximum at 13.4% of the peak height [min]	Number
B134	Width of the peak between peak maximum and peak end at 13.4% of the peak height [min]	Number
A324	Width of the peak between peak start and peak maximum at 32.4% of the peak height [min]	Number
B324	Width of the peak between peak maximum and peak end at 32.4% of the peak height [min]	Number
A50	Width of the peak between peak start and peak maximum at 50% of the peak height [min]	Number
B50	Width of the peak between peak maximum and peak end at 50% of the peak height [min]	Number
A61	Width of the peak between peak start and peak maximum at 61% of the peak height [min]	Number
B61	Width of the peak between peak maximum and peak end at 61% of the peak height [min]	Number
HVA	Height of the base point at peak start over the baseline of the chromatogram	Number

Variable name	Description	Data type
HVB	Height of the base point at peak end over the baseline of the chromatogram	Number
PVA	Peak-to-valley ratio of the peak height to the height of the base point at peak start over the baseline of the chromatogram	Number
PVB	Peak-to-valley ratio of the peak height to the height of the base point at peak end over the baseline of the chromatogram	Number
WIDTH	Base width of the peak [min].	Number
CALK0	Coefficient of zero order of the calibration curve	Number
CALK1	Coefficient of first order of the calibration curve	Number
CALK2	Coefficient of second order of the calibration curve	Number
CALK3	Coefficient of third order of the calibration curve	Number
CALCORR	Correlation coefficient of the calibration curve	Number
CALPSD	Percentage standard deviation of the calibration curve	Number
CALRSE	Percentage standard error of the calibration curve	Number
CALXMEAN	Arithmetic mean of the x value of the calibration points	Number
CALYMEAN	Arithmetic mean of the y value of the calibration points	Number
CALNUM	Number of calibration points	Number
CALTERM	Number of terms of the calibration curve	Number
CALXSD	Standard deviation of the x value of the calibration points	Number
CALYRSD	Residual standard deviation of the y values of the calibration points from the calculated calibration curve	Number
REC*	Recovery rate	Number
SREC*	Recovery rate (spiking)	Number
INJCOUNTFIN	Number of injections carried out for a single or multiple determination	Number
WVLMAX{x}	Wavelength maximum in the wavelength range x of the spectrum.	Number
CONCCALC	Concentration of a standard component calculated with the calibration used.	Number
CONCDEV%	Percentage deviation of the calculated concentration from the nominal concentration of a standard component.	Number

Results statistics

If results are evaluated statistically, the result variable of the statistical order is comprised of the variable of the result about which the statistic has been made and the attached name of the statistical order, e.g.

'RS'.'Analysis name'.'Component name'.'Result name'.MNV (component result)

'RS'.'Result name'.MNV (single result)

Variable name	Description	Data type
MNV	Mean value	Number
ASD	Absolute standard deviation	Number
RSD	Relative standard deviation	Number
MIN	Minimum value	Number
MAX	Maximum value	Number

Monitoring results

If results are monitored, the result variable of the monitoring comprises the variable of the monitored result and the attached abbreviation **OVF**:

'RS'.'Analysis name'.'Component name'.'Result name'.OVF (component result)

'RS'.'Result name'.OVF (single result)

Variable name	Description	Data type
OVF	Monitoring	Number

2.4.4.10 System variables

Dialog: **Formula editor ► Variables**

System variables are general variables which are adopted in the determination at the start of the determination. They are assigned neither to individual commands nor to determinations. The **Variables** field of the formula editor lists all the **System variables** that are available for the current method.

Syntax

'SV.Variable name'

Examples: **'SV.SIN'**, **'SV.SLI'**

You can select the system variables directly in the formula editor under **Variables/System variables** in order to avoid syntax errors.

Available system variables

Variable name	Description	Data type
DID	Determination ID	Text
FUN	Full name of the logged-in user	Text
REM	Remarks	Text
SEN	Indication whether the end of the sample table has been reached; **1 = yes**, **0 = no**	Number

Variable name	Description	Data type
SFL	Indication whether the sample table actual line is the first line after start ; **1 = yes**, **0 = no**	Number
SIN	Indication whether the determination has been started as a single determination or within a series; **1 = single determination**, **0 = series determination**	Number
SLI	Sample table actual line (**number**)	Number
STC	Start counter	Number
USN	Short name of the logged-in user	Text

2.4.4.11 Common variables

Dialog: **Formula editor ▶ Variables**

Common variables are global variables, which are adopted from the corresponding table of the program part **Configuration**, where the common variables can be defined, at the start of the determination and assigned to the determination. The **Variables** field of the formula editor lists all **Common variables** that are available, sorted according to variable name.

Syntax

'CV.Variable name.Variable name'

Examples: **'CV.TestDate'**, **'CV.TestTime.VAL'**, **'CV.AverageTemp.UNI'**

You can select the common variables directly in the formula editor under **Variables/Common Variables** in order to avoid syntax errors.

Available Common Variables

Variable name	Description	Data type
VAL	Value of the common variable (optional, i.e. **'CV.Test.VAL'** = **'CV.Test'**)	Text, Number or Date/ Time
UNI	Unit of the Common Variable	Text

2.4.5 Operators/functions

2.4.5.1 Operators/functions - Overview

Dialog window: **Formula editor ▶ Operators/functions**

Overview of the operators and functions

Operators	Functions
Arithmetic: ▪ *Addition* (+) ▪ *Subtraction* (-) ▪ *Multiplication* (*) ▪ *Division* (/) ▪ *Potentiation* (^)	**Arithmetic:** ▪ *Exponential function* (Exp) ▪ *Natural logarithm* (Ln) ▪ *Common logarithm* (Log) ▪ *Square root* (Sqrt) ▪ *Absolute value* (Abs) ▪ *Fraction* (Frac) ▪ *Integer* (Int) ▪ *Round integer* (Round) ▪ *Sign* (Sign) ▪ *Quantiles of the Student's t-distribution* (Tinv)
Logic: ▪ *AND* ▪ *OR*	**Date/Time:** ▪ *Time()* ▪ *Time(Date)* ▪ *Time(Date+Time)*
Comparison: ▪ *Equal to* (=) ▪ *Greater than* (>) ▪ *Greater than or equal to* (>=) ▪ *Less than* (<) ▪ *Less than or equal to* (<=) ▪ *Not equal to* (<>)	**Type conversion:** ▪ *NumberToText* ▪ *NumberToTime* ▪ *TextToNumber* ▪ *TextToTime* ▪ *TimeToNumber* ▪ *TimeToText*
	Text: ▪ *TextPosition* ▪ *SubText* ▪ *Trim*
	Miscellaneous: ▪ *Error* ▪ *Case*

Priority rules of the operators

The operators are evaluated in the order in which they are listed in the table below. In order to attain the required order, it may be necessary to place operands in parentheses.

	Operators
Arithmetic	^
	*, /
	+, -
Comparison	<, <=, >, >=
Logic	AND, OR

2.4.5.2 Arithmetical operators

2.4.5.2.1 Addition

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 + Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**.

Examples

Operand1	Operand2	Result	Example	Remark
both operands of the same type:				
Number	Number	Number	**1.2 + 3 = 4.2**	-
Text	Text	Text	**"Metrohm" + "AG" = "Metrohm AG"**	If the maximum permissible length (65 536 characters) of the character string is exceeded by addition of the operands, the surplus characters will be removed from the second operand.
Time	Time	Number	**Time(1998;04;06) + Time(1964;02;03) = 59300.875** (for UTC+1)	Result: Number of days calculated from December 1899, dependent on the system time
Operand of different type: The operand which does not correspond to the result type is converted to the relevant result type before the operation.				
Number	Text	Text	**1.2 + "Metrohm" = "1.2Metrohm"**	-
Text	Number	Text	**"Metrohm" + 1.2 = "Metrohm1.2"**	-
Number	Time	Number	**2.0 + Time(1999;11;7) = 36472.96** (for UTC+1)	Result: Number of days calculated from December 1899, dependent on the system time
Time	Number	Number	**Time(1999;10;7) + 2.0 = 36441.92** (for UTC+2)	Result: Number of days calculated from December 1899, dependent on the system time
Text	Time	Text	**"Metrohm" + Time(1999;10;7) = "Metrohm1999-10-07 00:00:00 UTC+2"**	Before the operation, the operand of the type **Date/Time** is converted to **Text**.
Time	Text	Text	**Time(1999;01;7) + "Metrohm" = "1999-01-07 00:00:00 UTC +1Metrohm"**	The same rules apply here as for the previous operation.

2.4.5.2.2 Subtraction

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 - Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**.

Examples

Operand1	Operand2	Result	Example	Remark
both operands of the same type:				
Number	Number	Number	**1.2 - 3 = -1.8**	-
Text	Text	Text	**"Metrohm" - "AG" = invalid**	This operation is not allowed.
Time	Time	Number	**Time(1998;01;06) - Time(1964;12;03) = 12'087.00** (for UTC+1)	Result: Number of days calculated from December 1899, dependent on the system time
Operand of different type: The operand which does not correspond to the result type is converted to the relevant result type before the operation.				
Number	Text	Text	**1.2 - "Metrohm" = invalid**	This operation is not allowed.
Text	Number	Text	**"Metrohm" - 1.2 = not valid**	This operation is not allowed.
Number	Time	Number	**2.0 - Time(1999;10;7) = -36'437.917** (for UTC+2)	Result: Number of days calculated from December 1899, dependent on the system time
Time	Number	Number	**Time(1999;10;7) - 2.5 = 36'437.917** (for UTC+2)	Result: Number of days calculated from December 1899, dependent on the system time
Text	Time	Text	**"Metrohm" - Time(1999;10;7) = invalid**	This operation is not allowed.
Time	Text	Text	**Time(1999;10;7) - "Metrohm" = invalid**	This operation is not allowed.

2.4.5.2.3 Multiplication

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 * Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**.

Examples

Operand1	Operand2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**1.2 * 3 = 3.6**	-
Text	Text	Text	**"Metrohm" * "AG" = invalid**	This operation is not allowed.
Time	Time	Number	**Time(1998;05;06) * Time(1902;02;03) = 27'478'004.545** (for UTC+1 or +2 for summer time)	Result: Number of days calculated from December 1899, dependent on the system time
Operand of different type: The operand which does not correspond to the result type is converted to the relevant result type before the operation.				
Number	Text	Text	**2 * "Metrohm" = "MetrohmMetrohm"**	-
Text	Number	Text	**"Metrohm" * 2 = "MetrohmMetrohm"**	-
Number	Time	Number	**2.0 * Time(1999;10;7) = 72'879.833** (for UTC+2)	Result: Number of days calculated from December 1899, dependent on the system time
Time	Number	Number	**Time(1999;10;7) * 2.0 = 72'879.833** (for UTC+2)	Result: Number of days calculated from December 1899, dependent on the system time
Text	Time	Text	**"Metrohm" * Time(1999;10;7) = invalid**	This operation is not allowed.
Time	Text	Text	**Time(1999;10;7) * "Metrohm" = invalid**	This operation is not allowed.

2.4.5.2.4 Division

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 / Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**.

Examples

Operand1	Operand2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**1.2 / 3 = 0.4**	Operand2 must not be zero!
Text	Text	Text	**"Metrohm" / "AG" = invalid**	This operation is not allowed.

Operand1	Operand2	Result	Example	Remark
Time	Time	Number	**Time(1998;04;06) / Time(1964;02;03) = 1.533** (for UTC+1 or +2 for summer time)	Result: Number of days calculated from December 1899, dependent on the system time
Operand of different type: The operand which does not correspond to the result type is converted to the relevant result type before the operation.				
Number	Text	Text	**1.2 / "Metrohm" = invalid**	This operation is not allowed.
Text	Number	Text	**"Metrohm" / 1.2 = invalid**	This operation is not allowed.
Number	Time	Number	**10'000 / Time(1999;10;7) = 274** (for UTC+2)	Result: Number of days calculated from December 1899, dependent on the system time
Time	Number	Number	**Time(1999;02;17) / 10'000 = 3.621** (for UTC+1)	Result: Number of days calculated from December 1899, dependent on the system time
Text	Time	Text	**"Metrohm" / Time(1999;10;7) = invalid**	This operation is not allowed.
Time	Text	Text	**Time(1999;10;7) / "Metrohm" = invalid**	This operation is not allowed.

2.4.5.2.5 Potentiation

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 ^ Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**.

Examples

Operand1	Operand2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**1.2 ^ 3 = 1.728**	Complex results (which comprise +b*i*, i.e. a real and an imaginary component) are displayed as an error.
Text	Text	Text	**"Metrohm" ^ "AG" = invalid**	This operation is not allowed.
Time	Time	Number	**Time(1900;01;05) ^ Time(1900;01;02) = 196.371** (for UTC+1)	Result: Number of days calculated from December 1899, dependent on the system time
Operand of different type: The operand which does not correspond to the result type is converted to the relevant result type before the operation.				
Number	Text	Text	**1.2 ^ "Metrohm" = invalid**	This operation is not allowed.

Operand1	Operand2	Result	Example	Remark
Text	Number	Text	**"Metrohm" ^ 1.2 = invalid**	This operation is not allowed.
Number	Time	Number	**1.2 ^ Time(1900;02;03) = 586.198** (for UTC+1)	-
Time	Number	Number	**Time(1999;10;7) ^ 2.5 = 253479847878.04** (for UTC+2)	-
Text	Time	Text	**"Metrohm" ^ Time(1999;10;7) = invalid**	This operation is not allowed.
Time	Text	Text	**Time(1999;10;7) ^ "Metrohm" = invalid**	This operation is not allowed.

2.4.5.3 Logical operators

2.4.5.3.1 AND

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 AND Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false). The following cases are possible:

Operand1	Operand2	Result
1	**1**	**1**
0	**1**	**0**
1	**0**	**0**
0	**0**	**0**

Examples

Oper-and1	Oper-and2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**5 AND 4 ➔ 1** **4 AND 0 ➔ 0**	Numbers greater than 0 are interpreted as **1** (true).
Text	Text	Number	**"Metrohm" AND "AG" ➔ 1** **"" AND "AG" ➔ 0**	An empty character string (**""**) is interpreted as **0** (false), everything else as **1** (true). The first operation therefore corresponds to **1 AND 1 ➔ 1.**
Time	Time	Number	**Time(1999;10;07) AND Time(1999;10;07) ➔ 1**	**Time()**: see *Time(Date)*
Operands of a different type:				

Oper-and1	Oper-and2	Result	Example	Remark
Number	Text	Number	**1.2 AND "1.2" ➔ 1** **0 AND "1" ➔ 1** **0 AND "0" ➔ 1** **0 AND "" ➔ 0**	Before the operation, the operand of the type **Number** is converted to the type **Text**, as a conversion from **Text** to **Number** is not advisable. During the second operation, the 0 is therefore converted to **"0"**, which corresponds to the logical value **1** (true), as every character string that is not empty is interpreted as 1.
Text	Number	Number	**"Metrohm" AND 1.2 ➔ 1**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 AND Time(1999;10;7) ➔ 1** **0 AND Time(1999;10;07) ➔ 0**	Before the operation, the operand of the type **Date/Time** is converted to **Number** and all data from December 30, 1899 are interpreted as **1** (true).
Time	Number	Number	**Time(1999;10;7) AND 2.5 ➔ 1**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" AND Time(1999;10;7) ➔ 1** **"" AND Time(1999;10;07) ➔ 0**	Before execution of the operation, the operand of the type **Date/Time** is converted to the type **Text** and every character string that is not empty is interpreted as **1** (true).
Time	Text	Number	**Time(1999;10;7) AND "Metrohm" ➔ 1**	The same rules apply here as for the previous operation.

2.4.5.3.2 OR

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 OR Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false). The following cases are possible:

Operand1	Operand2	Result
1	**1**	**1**
0	**1**	**1**
1	**0**	**1**
0	**0**	**0**

Examples

Operand1	Operand2	Result	Example	Remark
Operands of the same type:				

Operand1	Operand2	Result	Example	Remark
Number	Number	Number	**5 OR 4 ➔ 1** **4 OR 0 ➔ 1**	Numbers greater than 1 are automatically interpreted as 1 (true)
Text	Text	Number	**"Metrohm" OR "AG" ➔ 1** **"" OR "Metrohm" ➔ 1** **"" OR "" ➔ 0**	An empty character string ("") is interpreted as 0 (false), everything else as 1 (true). The first operation therefore corresponds to 1 OR 1 ➔ 1
Time	Time	Number	**Time(1999;10;07) OR Time(1964;02;03) ➔ 1**	**Time()**: see *Time(Date)*
Operand of different type: The operand which does not correspond to the result type is converted to the relevant result type before the operation.				
Number	Text	Number	**1.2 OR "1.2" ➔ 1** **0 OR "" ➔ 1**	Before the operation, the operand of the type **Number** is converted to the type **Text**, as a conversion from **Text** to **Number** is not advisable. During the second operation, the 0 is therefore converted to "0", which corresponds to the logical value 1 (true), as every character string that is not empty is interpreted as 1.
Text	Number	Number	**"Metrohm" OR 1.2 ➔ 1**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 OR Time(1999;10;7) ➔ 1** **0 OR Time(1964;02;03) ➔ 1**	Before the operation, the operand of the type **Date/Time** is converted to **Number** and all data from December 30, 1899 are interpreted as 1 (true).
Time	Number	Number	**Time(1999;10;7) OR 2.5 ➔ 1**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" OR Time(1999;10;7) ➔ 1**	Before execution of the operation, the operand of the type **Date/Time** is converted to the type **Text** and every character string that is not empty is interpreted as 1 (true).
Time	Text	Number	**Time(1999;10;7) OR "Metrohm" ➔ 1**	The same rules apply here as for the previous operation.

2.4.5.4 Relational operators

2.4.5.4.1 Equal to

Dialog window: **Formula editor ▶ Operators/Functions**

Syntax

Operand1 = Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false).

Examples

Oper-and1	Oper-and2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**5 = 5 ➔ 1** **4 = 5 ➔ 0**	-
Text	Text	Number	**"Metrohm" = "AG" ➔ 0** **"aG" = "AG" ➔ 0**	When making a comparison between two texts the **ASCII value** of the character sequence is compared *(see chapter 2.4.5.10, page 80)*. **Attention:** Uppercase and lowercase letters have different values!
Time	Time	Number	**Time(1998;04;06) = Time(1964;02;03) ➔ 0**	*(see chapter 2.4.5.6.2, page 68)*
Operands of a different type:				
Number	Text	Number	**1.2 = "1.2" ➔ 11.2 = "Metrohm" ➔ 0**	Before the relational operation, the **Number** is converted to **Text**, afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Text	Number	Number	**"Metrohm" = 1.2 ➔ 0**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 = Time(1999;10;07) ➔ 0**	Before the operation, the operand of the type **Date/Time** is converted to **Number**. During execution of the operation, the exact value is always used after this conversion, even if maximum 5 places after the comma can be displayed *(see chapter 2.4.5.7.5, page 73)*.
Time	Number	Number	**Time(1999;10;7) = 2.0 ➔ 0**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" = Time(1999;10;07) ➔ 0**	Before the operation, the operand is converted from the type **Date/Time** to **Text** (here thus: **"1999-10-07 00:00:00 UTC +2"**), afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Time	Text	Number	**Time(1999;10;07) = "Metrohm" ➔ 0**	The same rules apply here as for the previous operation.

2.4.5.4.2 Greater than

Dialog window: **Formula editor ▶ Operators/Functions**

Syntax

Operand1 > Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false).

Examples

Operand1	Operand2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**5 > 4 ➔ 1** **4 > 5 ➔ 0**	-
Text	Text	Number	**"Metrohm" > "AG" ➔ 1** **"Aarau" > "Zug" ➔ 0**	When making a comparison between two texts the **ASCII value** of the character sequence is compared *(see chapter 2.4.5.10, page 80)*. **Attention:** Uppercase and lowercase letters have different values!
Time	Time	Number	**Time(1998;04;06) > Time(1964;02;03) ➔ 1**	*(see chapter 2.4.5.6.2, page 68)*
Operands of a different type:				
Number	Text	Number	**1.2 > "Metrohm" ➔ 01.23 > "1.2" ➔ 1**	Before the relational operation, the **Number** is converted to **Text**, afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Text	Number	Number	**"Metrohm" > 1.2 ➔ 1**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 > Time(1999;10;07) ➔ 0**	Before the comparison, the operand is converted from the type **Date/Time** to a **Number**.
Time	Number	Number	**Time(1999;10;07) > 2.0 ➔ 1**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" > Time(1999;10;07) ➔ 1**	Before the operation, the operand is converted from the type **Date/Time** to **Text** (here thus: **"1999-10-07 00:00:00 UTC +2"**), afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Time	Text	Number	**Time(1999;10;7) > "Metrohm" ➔ 0**	The same rules apply here as for the previous operation.

2.4.5.4.3 Greater than or equal to

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 >= Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false).

Examples

Operand1	Operand2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**5 >= 4 ➔ 1** **4 >= 5 ➔ 0**	-
Text	Text	Number	**"Metrohm" >= "AG" ➔ 1**	When making a comparison between two texts the **ASCII value** of the character sequence is compared *(see chapter 2.4.5.10, page 80)*. **Attention:** Uppercase and lowercase letters have different values!
Time	Time	Number	**Time(1998;04;06) >= Time(1964;02;03) ➔ 1**	*(see chapter 2.4.5.6.2, page 68)*
Operands of a different type:				
Number	Text	Number	**1.2 >= "1.2" ➔ 11.2 >= "Metrohm" ➔ 0**	Before the relational operation, the **Number** is converted to **Text**, afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Text	Number	Number	**"Metrohm" >= 1.2 ➔ 1**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 >= Time(1999;10;07) ➔ 0**	Before the comparison, the operand is converted from the type **Date/Time** to a **Number**.
Time	Number	Number	**Time(1999;10;07) >= 2.0 ➔ 1**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" >= Time(1999;10;07) ➔ 1**	Before the operation, the operand is converted from the type **Date/Time** to **Text** (here thus: **"1999-10-07 00:00:00 UTC +2"**), afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Time	Text	Number	**Time(1999;10;7) >= "Metrohm" ➔ 0**	The same rules apply here as for the previous operation.

2.4.5.4.4 Less than

Dialog window: **Formula editor ▶ Operators/Functions**

Syntax

Operand1 < Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false).

Examples

Operand1	Operand2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**5 < 4 ➔ 0** **4 < 5 ➔ 1**	-
Text	Text	Number	**"Metrohm" < "AG" ➔ 0**	When making a comparison between two texts the **ASCII value** of the character sequence is compared *(see chapter 2.4.5.10, page 80)*. **Attention:** Uppercase and lowercase letters have different values!
Time	Time	Number	**Time(1998;04;06) < Time(1964;02;03) ➔ 0**	*(see chapter 2.4.5.6.2, page 68)*
Operands of a different type:				
Number	Text	Number	**1.2 < "Metrohm" ➔ 11.2 < "1" ➔ 0**	Before the relational operation, the **Number** is converted to **Text**, afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Text	Number	Number	**"Metrohm" < 1.2 ➔ 0**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 < Time(1999;10;07) ➔ 1**	Before the comparison, the operand is converted from the type **Date/Time** to a **Number**.
Time	Number	Number	**Time(1999;10;07) < 2.0 ➔ 0**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" < Time(1999;10;07) ➔ 0**	Before the operation, the operand is converted from the type **Date/Time** to **Text** (here thus: **"1999-10-07 00:00:00 UTC +2"**), afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Time	Text	Number	**Time(1999;10;7) < "Metrohm" ➔ 1**	The same rules apply here as for the previous operation.

2.4.5.4.5 Less than or equal to

Dialog window: **Formula editor ► Operators/Functions**

Syntax

Operand1 <= Operand2

The operands can be entered either directly or as variables and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false).

Examples

Oper-and1	Oper-and2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**5 <= 4 ➔ 0** **4 <= 5 ➔ 1**	-
Text	Text	Number	**"Metrohm" <= "AG" ➔ 0**	When making a comparison between two texts the **ASCII value** of the character sequence is compared *(see chapter 2.4.5.10, page 80)*. **Attention:** Uppercase and lowercase letters have different values!
Time	Time	Number	**Time(1998;04;06) <= Time(1964;02;03) ➔ 0**	*(see chapter 2.4.5.6.2, page 68)*
Operands of a different type:				
Number	Text	Number	**2 <= "1.2" ➔ 01.2 <= "Metrohm" ➔ 1**	Before the relational operation, the **Number** is converted to **Text**, afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Text	Number	Number	**"Metrohm" <= 1.2 ➔ 0**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 <= Time(1999;10;07) ➔ 1**	Before the comparison, the operand is converted from the type **Date/Time** to a **Number**.
Time	Number	Number	**Time(1999;10;07) <= 2.0 ➔ 0**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" <= Time(1999;10;07) ➔ 0**	Before the operation, the operand is converted from the type **Date/Time** to **Text** (here thus: **"1999.10.07"**), afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Time	Text	Number	**Time(1999;10;7) <= "Metrohm" ➔ 1**	The same rules apply here as for the previous operation.

2.4.5.4.6 Not equal to

Dialog window: **Formula editor ▶ Operators/Functions**

Syntax

Operand1 <> Operand2

The operands can be entered either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. The result type is always a number (**1** = true, **0** = false).

Examples

Oper-and1	Oper-and2	Result	Example	Remark
Operands of the same type:				
Number	Number	Number	**5 <> 4 ➔ 1** **5 <> 5 ➔ 0**	-
Text	Text	Number	**"Metrohm" <> "AG" ➔ 1**	When making a comparison between two texts the **ASCII value** of the character sequence is compared *(see chapter 2.4.5.10, page 80)*. **Attention:** Uppercase and lowercase letters have different values!
Time	Time	Number	**Time(1998;04;06) <> Time(1964;02;03) ➔ 1**	*(see chapter 2.4.5.6.2, page 68)*
Operands of a different type:				
Number	Text	Number	**1.2 <> "1.2" ➔ 01.2 <> "Metrohm" ➔ 1**	Before the relational operation, the **Number** is converted to **Text**, afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Text	Number	Number	**"Metrohm" <> 1.2 ➔ 1**	The same rules apply here as for the previous operation.
Number	Time	Number	**2.0 <> Time(1999;10;07) ➔ 1**	Before the comparison, the operand is converted from the type **Date/Time** to a **Number**.
Time	Number	Number	**Time(1999;10;07) <> 2.5 ➔ 1**	The same rules apply here as for the previous operation.
Text	Time	Number	**"Metrohm" <> Time(1999;10;07) ➔ 1**	Before the operation, the operand is converted from the type **Date/Time** to **Text** (here thus: **"1999-10-07 00:00:00 UTC +2"**), afterwards the texts are compared according to **ASCII value** *(see chapter 2.4.5.10, page 80)*.
Time	Text	Number	**Time(1999;10;7) <> "Metrohm" ➔ 1**	The same rules apply here as for the previous operation.

2.4.5.5 Arithmetical functions

2.4.5.5.1 Exponential function

Dialog: **Formula editor ► Operators/functions**

Syntax

y = Exp(number)

Calculates e ^ number. Other notation for $y = e^{(number)}$, where e is the Euler number (e = 2.71828…).

Parameters

Number Exponent

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Exp(1.5) = 4.48169

Exp('CV.AverageTemp') = Power of the exponent (common variable **CV.AverageTemp**) for base e

2.4.5.5.2 Natural logarithm

Dialog: **Formula editor ► Operators/functions**

Syntax

y = Ln(number)

Returns the logarithm of the entered number for base e. Alternative notation for $y = \log_e$ (number), where e is the Euler number (e = 2.71828…).

Parameters

Number > 0

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Ln(3) = 1.09861

Ln('CV.AverageTemp') = Natural logarithm of the value of the common variable **CV.AverageTemp** for base e

2.4.5.5.3 Decimal logarithm

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = Log(number)

Returns the logarithm of the entered number for base 10. Alternative notation for $y = \log_{10}$ (number).

Parameters

Number > 0

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Log(10) = 1

Log('CV.AverageTemp') = Common logarithm of the value of the common variable **CV.AverageTemp**

2.4.5.5.4 Square root

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = Sqrt(number)

Returns the square root of the entered number. Alternative notation for $y = \sqrt{}$ **number** or $y = \sqrt[2]{}$ **number**.

Parameters

Number ≥ 0

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Sqrt(33) = 5.745

Sqrt('CV.AverageTemp') = Square root of the value of the common variable **CV.AverageTemp**

2.4.5.5.5 Absolute value

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = Abs(number)

Returns the absolute value of the entered number, i.e. the value of the number irrespective of its sign.

Parameters

Number

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Abs(–55.3) = 55.3

Abs('CV.AverageTemp') = Value of the common variables **CV.AverageTemp** without signs

2.4.5.5.6 Fraction

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = Frac(number)

Returns the fraction of the entered number.

NOTE

In the results properties, the number of **Decimal places** of the result must always be given, as otherwise the fraction cannot be displayed.

Parameters

Number

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Frac(–55.325) = -0.325

Frac('CV.AverageTemp) = value of the common variable **CV.AverageTemp** without integer

2.4.5.5.7 Integer

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = Int(number)

Returns the integer of the entered number.

Parameters

Number

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Int(–55.325) = –55

Int('CV.AverageTemp') = Integer of the value of the common variable **CV.AverageTemp**

2.4.5.5.8 Rounding integer

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = Round(number)

Returns the rounded value of the entered number as a whole number.

NOTE

If the first decimal place is 5 or greater, the number is rounded up to the next whole number (commercial rounding).

Parameters

Number

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Round(–55.5259) = –56

Round('CV.AverageTemp') = Rounded value of the common variable **CV.AverageTemp**

2.4.5.5.9 Algebraic sign

Dialog: **Formula editor ► Operators/functions**

Syntax

y = Sign(number)

Returns the sign of the entered number: **1** for a positive number, **–1** for a negative number.

Parameters

Number

The parameter can be indicated either directly as a number or as a variable of the **Number** type. If the parameter does not correspond to the expected type, it will automatically be converted to it. If this is not possible, the result of this operation is returned as **invalid**.

Examples

Sign(–55.3) = –1

Sign(26.115) = 1

Sign('CV.AverageTemp') = Sign of the value of the common variable **CV.AverageTemp**

2.4.5.5.10 Quantiles of the Student's t-distribution

Dialog: **Formula editor ► Operators/functions**

Syntax

t_s **= Tinv(Probability, Degrees of freedom)**

Calculates the quantiles of the Student's t-distribution for two-sided intervals.

The result describes the half interval length as a multiple of the standard deviation of a sampling totality with given **degrees of freedom** within which, with the indicated **probability**, the mean value of the distribution lies, when the interval is centered on the mean value of the sampling totality.

Parameters

Probability

Number type, value range: 0 - 1. Direct entry as number or as formula providing a number. If the type of value is non-permitted, then the result will become **invalid**. This is to indicate the probability of the unknown mean value of the t-distributed result falling within the two-sided interval.

Degrees of freedom

Number type, value range: 1 - n. Direct entry as number or as formula providing a number. If the type of value is non-permitted, then the result will become **invalid**. The number of independent samplings for calculating the standard deviation, reduced by the number of adjusted parameters for the model to which the standard deviation refers, must be specified as degrees of freedom (Degrees of freedom = Number of samplings – Number of parameters).

Examples

Tinv(0.95; 9) = 2.26: With a 10-fold determination (e.g., of a titer) half the interval length corresponds to 2.26 times the standard deviation.

Calculation of the confidence interval for a mean value of sampling: A variance-homogenous sampling with a range n for a normally distributed quantity with an expected value μ has the mean value x_m, the standard deviation s and the degrees of freedom $v = n - 1$. The half interval length $t_s \cdot s/\sqrt{n}$ then indicates how high, within the given probability, the maximum absolute difference is between the mean value x_m and the expected value μ. Here the **confidence interval** is the full interval length, centered to the mean value: $\mu = x_m \pm t_s \cdot s/\sqrt{n}$.

Titer determination: 0.991, 1.021, 0.995, 1.003, 1.007, 0.993, 0.998, 1.015, 1.003, 0.985

Mean value = 1.001

Standard deviation = 0.0111

Student's t-quantiles for a probability of 95% = 2.26

Confidence interval of the titer = 1.001 ± 0.008

2.4.5.6 Date/time functions

2.4.5.6.1 Time()

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = Time()

Gives the current date and the current time.

Parameters

none

Return value

Current date and current time in the format **yyyy-mm-dd hh:mm:ss UTC ±xx**

NOTE

UTC = Universal Time , from which the times in the various time zones of the earth are derived. CET (Central European Time) is equal to UTC plus 1 hour, in the summer time UTC plus 2 hours.

2.4.5.6.2 Time(Date)

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = Time(year; month; day)

Gives the entered figures in the format **Date/Time**.

Parameters

year	**00…99** or **1000…9999**
month	**1…12**
day	**1…31**

A parameter can be indicated either directly as a number or as a variable of the type **Number**. If the parameter does not correspond to the expected type, it will automatically be converted to this. If this is not possible, the result of this operation is given as **invalid**.

NOTE

Only the integral part is used for all parameters.

A variable of the type **Date/Time** cannot be transferred as a parameter here.

Both for the automatic and explicit conversion of a **Time** to the type **Number**, the number of days are counted since **December 30, 1899** at **01 hours**.

Attention: December 30, 1899 01 hour = 0.00000 days, this number is **rounded** off to 5 decimal places, but a relational operation for example is carried out with the exact value!

Return value

Date/Time in the format **yyyy-mm-dd hh:mm:ss UTC ±xx**

NOTE

UTC = Universal Time , from which the times in the various time zones of the earth are derived. CET (Central European Time) is equal to UTC plus 1 hour, in the summer time UTC plus 2 hours.

Examples

Time(2004;02;02) = 2004-02-02 00:00:00 UTC +1 (dependent on the system time)

Time('CV.Test year';'CV.Test month';'CV.Test day') = Date comprised of the common variables

2.4.5.6.3 Time(Date + Time)

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = Time(year; month; day; hour; minute; second)

Gives the entered numbers in the format **Date/Time**.

Parameters

year	**00…99** or **1000…9999**
month	**1…12**
day	**1…31**
hour	**0…23**
minute	**0…59**
second	**0…59**

A parameter can be indicated either directly as a number or as a variable of the type **Number**. If the parameter does not correspond to the expected type, it will automatically be converted to this. If this is not possible, the result of this operation is given as **invalid**.

NOTE

Only the integral part is used for all parameters.

A variable of the type **Date/Time** cannot be transferred as a parameter here.

Both for the automatic and explicit conversion of a **Time** to the type **Number**, the number of days are counted since **December 30, 1899** at **01 hours**.

Attention: December 30, 1899 01 hour = 0.00000 days, this number is **rounded** off to 5 decimal places, but a relational operation for example is carried out with the exact value!

Return value

Date/Time in the format **yyyy-mm-dd hh:mm:ss UTC ±xx**

NOTE

UTC = Universal Time , from which the times in the various time zones of the earth are derived. CET (Central European Time) is equal to UTC plus 1 hour, in the summer time UTC plus 2 hours.

Examples

Time(2004;06;02;10;30;25) = 2004-06-02 10:30:25 UTC +2 (dependent on the system time)

Time('CV.TestYear';'CV.TestMonth';'CV.TestDay';'CV.TestHour';'CV.TestMin';'CV.TestSek') = Date comprised of the common variables

2.4.5.7 Type conversion functions

2.4.5.7.1 NumberToText

Dialog: **Formula editor ► Operators/functions**

Syntax

y = NumberToText(number)

Returns the entered number as **Text**.

Parameters

Number

The parameter can be indicated either directly as a number or as a variable of the **Number** type.

Operators are ignored.

Examples

NumberToText(55.3)+5 = **55.35**

NumberToText(55.3)+0.05 = **55.30.05**

NumberToText('CV.AverageTemp') = Value of the common variable (AverageTemp) as **Text**

2.4.5.7.2 NumberToTime

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = NumberToTime(number)

Returns the entered number as **Date/Time**, where the number is interpreted as the number of days since December 30, 1899 at 01 hours.

Parameters

Number

The parameter can be indicated either directly as a number or as a variable of the **Number** type.

Examples

NumberToTime(35545.526) = **1997-04-25 14:37:26 UTC+2** (dependent on the system time)

NumberToTime(35780.55) = **1997-12-16 14:12:00 UTC+1** (dependent on the system time)

NumberToTime('CV.TestDate') = Value of the common variable (TestDate) as **Date/Time**

2.4.5.7.3 TextToNumber

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = TextToNumber(Text)

Returns the entered text as a **number**.

Parameters

Text

The parameter may only contain **numerical characters** or variables of the **Text** type, as otherwise a type conversion is not possible. The result of this conversion or the calculation would then be **invalid**. In addition, text must be marked by **quotation marks**. Operators and the defined number of decimal places are observed.

Examples

TextToNumber("55.3")+5 = **60.300**

TextToNumber("55.3")+0.05 = **55.350**

TextToNumber('CV.AverageTemp') = Value of the variables (AverageTemp) as **Number**

TextToNumber('MV.ID1') = entered text of **ID 1** as **Number**

Special cases

If the sample data variable *SD.POSITION, page 36* (sample position) contains only digits, it will be **automatically** converted to the data type Number. In this case, it is **not** necessary to use the TextToNumber() function.

2.4.5.7.4 TextToTime

Dialog: **Formula editor ► Operators/functions**

Syntax

y = TextToTime(Text;Format)

Returns the entered text as **Date/Time**.

Parameters

Text

The parameter may only contain **numerical characters** or variables of the **Text** type, as otherwise a type conversion is not possible (Result = **invalid**). You can use the following characters as the **separator** between year, month, etc.: slash (**/**), period (**.**), minus (**-**), semicolon (**;**), colon (**:**), space and comma. You can determine the **sequence** of the individual data yourself, but you must specify this in the **Format** parameter.

Format

Indicates in which format or order the text has been entered. This parameter must be highlighted by **quotation marks** and can comprise the following code characters:

Character	Meaning
y	Year
M	Month
d	Day
H	Hour 0 - 23
h	Hour AM/PM
m	Minute

Character	Meaning
s	Second
a	AM/PM marking

NOTE

If you indicate the time in the **AM/PM** format, it is necessary (in addition to the formatting character **h**) to use the AM/PM marking **a** (see first example below).

Examples

TextToTime("2004-12-3 5:22:01 PM";"yMdhmsa") = **2004-12-03 17:22:01 UTC+1** (dependent on the system time)

TextToTime("12-15-01 2001:3:5";"HmsyMd") = **2001-03-05 12:15:01 UTC+1** (dependent on the system time)

TextToTime('CV.TestDate';'CV.TestFormat') = Values of the common variables in the time format indicated

TextToTime('MV.ID1';'CV.TestFormat') = entered text of ID1 in the time format indicated

2.4.5.7.5 TimeToNumber

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = TimeToNumber(Time)

Returns the entered time as a **Number**.

NOTE

Both for the automatic and explicit conversion of a **Time** to the **Number** type, the number of days are counted since **December 30, 1899 at 01 hours**.

Attention: December 30, 1899 01 hours = 0.00000 days, this number is **rounded off** to 5 decimal places, but a relational operation, for example, is carried out with the exact value.

Parameters

Time

This parameter can be indicated either in the form of a time function or as a variable of the **Time** type.

Examples

TimeToNumber(Time()) = current date and current time represented as **Number** (in days since December 1899)

TimeToNumber(Time(1999;12;31;23;59;59)) = 36525.95832

TimeToNumber(Time('TestYear';'TestMonth';'TestDay')) = Value of the common variables as number of days as a **Number**

2.4.5.7.6 TimeToText

Dialog: **Formula editor ▶ Operators/functions**

Syntax

y = TimeToText(Time)

Returns the time entered as **Text**.

y = TimeToText(Time;Format)

Returns the time entered as **Text** in the required format.

Parameters

Time

This parameter can be indicated either in the form of a time function or as a variable of the **Date/Time** type.

Format

Indicates in which format or order the time is to be output as text. This parameter can comprise the following code characters and must be marked by **quotation marks**:

Character	Meaning	Example
y	two-digit year number	**03**
yyyy	four-digit year number	**1,999**
M	one- or two-digit month number	**4, 12**
MM	two-digit month number	**04, 12**
MMM	month name short form	**Jul, Aug**
MMMM	month name	**July, August**
d	one- or two-digit day number	**2, 25**
dd	two-digit day number	**02, 25**
h	one- or two-digit hour number (1 - 12 AM/PM)	**5, 11**
hh	two-digit hour number (1 - 12 AM/PM)	**05, 11**

Character	Meaning	Example
H	one- or two-digit hour number (0 - 23)	**8, 17**
HH	two-digit hour number (0 - 23)	**08, 17**
m	one- or two-digit minute number	**2, 25**
mm	two-digit minute number	**02, 25**
s	one- or two-digit second number	**3, 55**
ss	two-digit second number	**03, 55**
E	weekday short form	**Mon, Tue, Wed**
EEEE	weekday	**Monday, Tuesday**
D	one-, two- or three-digit number of the day in the year	**2, 35, 142**
DD	two- or three-digit number of the day in the year	**02, 35, 142**
DDD	three-digit number of the day in the year	**002, 035, 142**
F	one-digit number of the weekday in the month, e.g., the **2**nd Monday in May	**2**
w	one- or two-digit number of the week in the year	**5, 25**
ww	two-digit number of the week in the year	**05, 25**
W	one-digit number of the week in the month	**3**
a	Format AM/PM	**AM, PM**
'	Quotation marks used for entering any text	
''	Entry of '	'

NOTE

If you wish to indicate the time in the **AM/PM** format, it is necessary, in addition to the formatting character **h**, to use the AM/PM marking **a** (see last example below).

Examples

TimeToText(Time()) = current date and current time (system) as **Text**

TimeToText(Time(2004;05;04)) = **2004-05-04 00:00:00 UTC+2** (dependent on the system time)

TimeToText('CV.TestTime') = Value of the common variable (type **Time**) as **Text**

TimeToText(Time(2000;12;31);"EEEE', 'dd'.'MMMM' 'yyyy") = **Sunday, December 31, 2000**

TimeToText(Time(1997;05;22);"M'/'d'/'yyyy', 'ha") = 5/22/1997, 12AM

2.4.5.8 Text functions

2.4.5.8.1 TextPosition

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = TextPosition(Text ; sample text)

Gives the **Index** which indicates at which point the **sample text** appears for the first time in the **Text**. The numbering of the index begins at **1**!

Parameters

Text

The parameter can be indicated either directly or as a variable of the type **Text**, **Number** or **Date/Time**.

Sample text

The parameter can be indicated either directly or as a variable of the type **Text**, **Number** or **Date/Time**. If the types of the two parameters do not coincide, the type is converted from **Sample text** to the type **Text**. If the **Sample text** is not included in the **Text**, the status **invalid** is given.

NOTE

Entries of the type **Number** are always provided with a decimal place.

Example: **TexPosition("12345";3)** = **invalid**, as the 3 is converted to 3.0 before the operation in 3.0 and this is not included in the text.

Examples

TextPosition("Citric acid";"acid") = 9, the word "**acid**" occurs in the text from index number 9 onwards

TextPosition("Citric acid";"Acid") = **invalid**, the word "**Acid**" (capitalized) does not occur in the text

TextPosition("Citirc acid";"salt") = **invalid**, the word "**salt**" does not occur in the text

TextPosition(Time(2004;05;05);"5") = **7**

TextPosition(3362.14;"6") = **3**

TextPosition('MV.ID2';"Carbonate") = Index in which the word part "**Carbonate**" begins for the first time in the ID2

2.4.5.8.2 SubText

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = SubText(Text ; Position ; Length)

Gives that part of the text from **Text** which begins at the index **Position** and which has the length **Length**.

Parameters

Text

The parameter can be indicated either directly as text or as a variable of the type **Text**. If the parameter does not correspond to the expected type, it will automatically be converted to this. If this type conversion is not possible, the result of this operation is given as **invalid**.

Position

The numbering of the **Position** begins at **1**. The parameter can be indicated either **directly as a number** or as a variable of the type **Number**. If the parameter does not correspond to the expected type, it will automatically be converted to this. If a type conversion is not possible or the position does not exist, the result of this operation is given as **invalid**.

Length

The parameter can be indicated either directly as a number or as a variable of the type **Number**. If the parameter does not correspond to the expected type, it will automatically be converted to this. It a type conversion is not possible or the length indicated here is greater than the length of the subtext, **invalid** is given

Examples

SubText("Citric acid";9;5) = **acid**

SubText("Citric acid";9;6) = **invalid**, only five characters exist from position 9 onwards

SubText('MV.ID2';1;3) = the first three chracters of the identification 2

2.4.5.8.3 Trim

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = Trim(Text)

Gives the **Text** without spaces before and after.

y = Trim(Text ; sample text)

Gives the **Text** without **Sample text**.

Parameters

Text

The parameter can be indicated either directly or as a variable of the type **Text**, **Number** or **Date/Time**.

Sample text

The parameter can be indicated either directly or as a variable of the type **Text**, **Number** or **Date/Time**. If the types of the two parameters do not coincide, the type is converted from **Sample text** to the type **Text**.

NOTE

Entries of the type **Number** are always provided with a decimal place.

Example: **Trim("12345";3)** = **12345**, as the 3 is converted to 3.0 before the operation and this is not included in the text.

Examples

Trim(" Citric acid ") = **"Citric acid"**

Trim("Citric acid";"acid") = **Lemons**

Trim("Citric acid";"salt") = **Citric acid**

2.4.5.9 Miscellaneous functions

2.4.5.9.1 Case

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = Case(Condition ; value_true ; value_false)

y = Case(Condition ; value_true ; value_false ; value_error)

Gives **value_true** if the condition is true. Otherwise **value_false** is given. If an error occurs in the condition (result **invalid**), **value_error** is given.

Parameters

Condition Number

Any variable (type **Number**) can be entered here, or a relational or logic operation can be performed whose operators can be transferred either directly or as a variable. These can be of the type **Text**, **Number** or **Date/Time**.

Value_true

If **condition <> 0**, this parameter is saved as a result of the function. This parameter can be transferred either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. Entire operations can also be transferred here.

Value_false

If **condition = 0**, this parameter is saved as a result of the function. This parameter can be transferred either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. Entire operations can also be transferred here.

Value_error

If **condition = invalid**, this parameter is saved as a result of the function. This parameter can be transferred either directly or as a variable and can be of the type **Text**, **Number** or **Date/Time**. Entire operations can also be transferred here.

Examples

Case('MV.ID1' = "";"ID1 empty";"ID1 not empty") = if no entry has been made for ID1 in the run window, the text **ID1 empty**, otherwise **ID1 not empty**will be saved in the result.

Case('RS.IntermediateRes' > 5.5;"Intermediate result too high";'RS.IntermediateRes' * 26.5;"Error occurred") = If the result "**IntermediateRes**" is greater than 5.5, the text "**Intermediate result too high**" will be written into the result, otherwise the intermediate result will be multiplied by 26.5. If an error occurs during the comparison (**'RS.IntermediateRes' > 5.5**), "**Error occurred**" will be saved as a result of this operation.

2.4.5.9.2 Error

Dialog window: **Formula editor ► Operators/Functions**

Syntax

y = Error(value)

Gives **+1** if the **value is invalid** (error) or **0** if the **value is valid**. This function can be used e.g. to check variables for their existence or validity.

Parameters

Value

The variable to be tested.

Examples

Error('RS.IntermediateRes') = 0: the intermediate result was able to be calculated.

Error('RS.ZwischenRes') = 1: the intermediate result is invalid.

2.4.5.10 ASCII table

Dialog window: **Formula editor**

To generate the ASCII code, press and hold the [ALT] key and enter the three-digit code for the required symbol using the numeric keypad.

Only printable characters are listed in the table below:

ASCII value (dec)	Character	ASCII value (dec)	Character	ASCII value (dec)	Character
32	Space	64	At sign (@)	96	Grave accent (`)
33	Exclamation mark (!)	65	A	97	a
34	Quotation mark (")	66	B	98	b
35	Hash mark (#)	67	C	99	c
36	Dollar ($)	68	D	100	d
37	Percent (%)	69	e	101	e
38	Ampersand "and" (&)	70	f	102	f
39	Apostrophe (')	71	G	103	g
40	Opening parentheses (()	72	H	104	h
41	Closing parentheses ())	73	i	105	i
42	Multiplication sign (*)	74	J	106	j
43	Addition sign (+)	75	C	107	k
44	Comma (,)	76	L	108	l
45	Minus sign (-)	77	M	109	m
46	Period (.)	78	N	110	n
47	Slash mark (/)	79	O	111	o

ASCII value (dec)	Character	ASCII value (dec)	Character	ASCII value (dec)	Character
48	0	80	P	112	p
49	1	81	Q	113	q
50	2	82	R	114	r
51	3	83	S	115	s
52	4	84	T	116	t
53	5	85	U	117	u
54	6	86	V	118	v
55	7	87	W	119	w
56	8	88	X	120	x
57	9	89	Y	121	y
58	Colon (:)	90	Z	122	z
59	Semicolon (;)	91	Square bracket ([)	123	Curly bracket ({)
60	Less than (<)	92	Backslash (\)	124	Vertical stroke (¦)
61	Equals (=)	93	Square bracket (])	125	Curly bracket (})
62	Greater than (>)	94	Circumflex (^)	126	Tilde (~)
63	Question mark (?)	95	Underscore (_)		

2.4.6 Molar mass calculator

Dialog: **Molar mass calculator**

The dialog **molar mass calculator** is used for the simple entry of molar masses into the formula editor and is opened with the button.

Mode of operation

The molecular formula of any given chemical compound can be entered into the **Molecular formula** field; if you click on **[OK]** the molar mass of the compound is calculated and directly entered into the formula editor.

The molecular formula can be entered either directly or by clicking on the symbols of the periodic table.

Examples

Molecular formula	Molar mass
H2SO4	**98.0734**

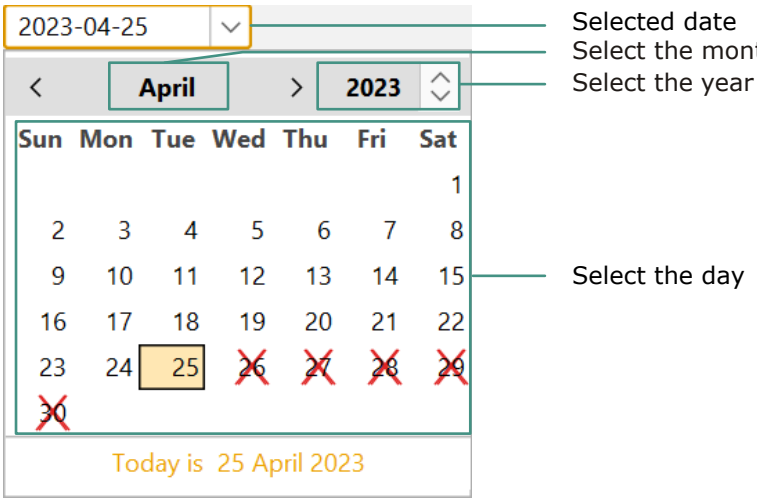
Molecular formula	Molar mass
Ca(OH)2	**74.09268**
AlCl3*6H2O	**238.43174**

2.5 Editing

2.5.1 Selecting the date

Dialog window: **Select date**

The **Select date** dialog window serves for entering a date in a field and is opened with the ⌄ button.



2.5.2 Text editor

Dialog window: **Text editor**

The text editor serves for entering formatted text in text fields and is opened with the T button.

The toolbar of the text editor includes the following functions:

Cut selected text and copy it to the clipboard.

Copy selected text to the clipboard.

Insert text from the clipboard.

Open editor for entering a hyperlink *(see chapter 2.5.3, page 83)*.

Σ

Open formula editor for entering calculation formulas *(see chapter 2.4, page 30)*.

NOTE

In order for results of formulas of the **Date** type to be output correctly, for text windows they must be converted to **Text** using the function **TimeToText** *(see chapter 2.4.5.7.6, page 74)*.

9

Font size in pt.

Select font color.

B

Bold.

I

Italic.

U

Underlined.

Left-justified.

Centered.

Right-justified.

2.5.3 Hyperlink

Dialog window: **Hyperlink**

The **Hyperlink** dialog window is used for entering a hyperlink in a field and is opened with the button.

Displayed text

Designation of the hyperlink that is displayed.

Link target

Address of the link target to which the hyperlink refers (Web site, e-mail address, file, …).

...

The button opens a selection dialog for linking a file as a link target.

2.6 Graphics window

Subwindow:Workplace ▶ Live display #

Subwindow:Database ▶ Curve #

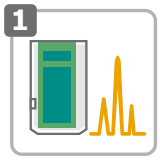
Subwindow:Database ▶ Determinations ▶ Reprocess ▶ Chromatograms - 'Ident' #

Subwindow:Method ▶ Chromatograms - 'Ident' #

The graphics window is used for displaying the recorded chromatograms, calibration curves, spectra and cyclic voltammograms. It is used in the following program parts:

Workplace

Live display of chromatograms, spectra and cyclic voltammograms during the recording of a determination *(see chapter 3.8, page 194)*.



Method

Assigning the peaks and visualizing the effects of parameter changes on chromatograms, spectra and calibration curves during method development *(see chapter 5.9, page 528)*.

Database

Viewing chromatograms, calibration curves, spectra and cyclic voltammograms of the recorded determinations *(see chapter 4.10, page 367)*.

Reprocessing determinations *(see chapter 4.7.18.4.4, page 335)*:

- Assigning the peaks and visualizing the effects of parameter changes on chromatograms and calibration curves during reprocessing.
- Manual integration.

NOTE

The graphics window does not have exactly the same properties in all program parts. Where there are deviations, this is specially indicated.

2.6.1 Elements

Subwindow:Workplace ▶ Live display #

Subwindow:Database ▶ Curve #

Subwindow:Database ▶ Determinations ▶ Reprocess ▶ Chromatograms - 'Ident' #

Subwindow:Method ▶ Chromatograms - 'Ident' #

Header

It contains the title of the subwindow and a button for minimizing/maximizing the subwindow.

NOTE

The **Ident** of the determination is additionally displayed in the database and in the method.

Tabs

Each analysis which has been assigned a data source has its own tab. Chromatograms of the determination and the associated calibration data set as well as the calibration curves of the components are displayed there.

Radio buttons

Switches back and forth between **Chromatogram view**, **Calibration curve view**, **Spectrum view** and **Cyclic voltammogram view**.

If an analysis has been selected which does not have an evaluation (auxiliary curve), the radio buttons will be inactive and the chromatogram view is set.

NOTE

Not available in **Workplace ▶ Live display #**. Only the current chromatogram or the cyclic voltammogram can be displayed during recording.

Selection	**Chromatogram** | **Calibration curve** | **Spectrum** | **Cyclic voltammogram**
Default value	**Chromatogram**

Chromatogram
This radio button activates the chromatogram view. If the radio button is active, the spin box will contain the chromatogram selection. The chromatogram of the last determination or of a determination which has been incorporated in the calibration can be displayed.

Calibration curve
This radio button activates the calibration curve view. If the radio button is active, the spin box is labeled with **Components** and contains the calibration curve selection for all components.

Spectrum
This radio button is only available for analyses which use the 887 Professional UV/VIS Detector. It activates the spectrum view. The selection list next to it contains the names of the spectra.

Cyclic voltammogram
This radio button is only available for analyses which use the 850.9110 IC Amperometric Detector. It activates the cyclic voltammogram view. The selection list next to it contains the designations of the cyclic voltammograms.

Current measuring value

Left field above the curve, shows the current measured value during the recording.

NOTE

Available only in **Workplace ► Live display #**.

Cursor

Right field above the curve, shows the coordinates of the cursor position.

NOTE

In **Database ► Curve #**, the cursor position is displayed in the header of the subwindow.

2.6.2 Chromatogram view

Subwindow:Workplace ► Live display #

Subwindow:Database ► Curve #

Subwindow:Database ► Determinations ► Reprocess ► Chromatograms - 'Ident' #

Subwindow:Method ► Chromatograms - 'Ident' #

The chromatogram view consists of the following elements:

- **Chromatogram** field for selecting the displayed curve.
- **Overview window** which displays the complete curve and the zoom range.
- **Curve window**, you can zoom and configure the display here.

Chromatogram

Chromatogram

Selection of the determination whose curve is displayed.

NOTE

Not available in **Workplace ► Live display #**. Only the current chromatogram can be displayed during recording.

Database

The chromatogram can be selected from the selected determination and from all determinations located in its calibration data set.

Selection	**Chromatogram** | **Blank** | **Standard 1 … n**
Default value	**Chromatogram**

Method

The chromatogram of the last determination or of the last sample which has been measured can be selected; the chromatograms of all the determinations which are incorporated in the current calibration data set are also available.

Selection	**Last chromatogram** | **Sample** | **Blank** | **Standard 1 … n**
Default value	**Last chromatogram**

Overview window

The overview window always displays the entire measurement curve. The zoom range is represented as a red square in the overview window and it can be moved with the mouse.

Curve window

The curve window is used for displaying and viewing the measurement curve. The curve can be zoomed in or out and its visualization (background, axes, peak label,...) can be completely configured.

If you click on the curve window with the right mouse button, a **context-sensitive menu** will appear with the following menu items:

Show all	Show the entire curve. This menu item is always active.

Default view	Show the default view. This menu item is inactive, if **Show all** is selected for both axes as the definition of the default view *(see chapter 2.6.11.1, page 98)*.
Zoom	Opens the dialog for entry of a zoom range *(see chapter 2.6.7, page 95)*.
Unzoom	Undo the last zoom action.
Properties...	Open the **Properties - 'Analysis name'** dialog window to define the properties of the curve display *(see chapter 2.6.11, page 98)*.
Copy	Copy the graph displayed in the graphics window.
Export graph...	Open the **Export graph** dialog window to export the graph displayed in the graphics window *(see chapter 2.6.12, page 105)*.

NOTE

The following menu items are only available in the **Reprocess** dialog window (**Subwindow: Database ► Determinations ► Reprocess ► Chromatograms - 'Ident' #**) *(see chapter 4.7.18.4.4, page 335)*.

Add peak	Add a peak. Only active if cursor is not placed on a peak.
Add rider	Add a rider. Only active if cursor is placed on a peak. It is not possible to insert a rider in peaks with a common baseline or in other riders.
Remove peak	Remove the highlighted peak. Only active if a peak is highlighted.
Split peak	Split the peak at cursor position into two peaks with a common baseline. Only active if a peak is highlighted.
Join peaks	Join peaks with a common baseline to one peak. Only active if two peaks with a common baseline are highlighted.

NOTE

The following menu items are only available in the **Method** program part and in the **Reprocess** dialog window (**Subwindow: Method ► Chromatograms - 'Ident' #** or **Subwindow: Database ► Determinations ► Reprocess ► Chromatograms - 'Ident' #**).

New component	Open the **Component** dialog window to define a new component. The cursor position is automatically applied as the retention time *(see chapter 5.8.3.2, page 449)*.
New event	Open the **Integration event** dialog window to define a new event. The cursor position is automatically applied as the event time *(see chapter 5.8.2.4, page 445)*.

2.6.3 Calibration curve view

Subwindow:Database ► Curve #

Subwindow:Database ► Determinations ► Reprocess ► Chromatograms - 'Ident' #

Subwindow:Method ► Chromatograms - 'Ident' #

The calibration curve view consists of the following elements:

- **Component** field for selecting the displayed calibration curve.
- Graph showing the calibration points and the **calibration curve**.
- The mathematical **properties** of the calibration curve.
- A table with the **calibration points**.

Component

Component

Selection of the component whose calibration curve is displayed. The selection comprises all components which are defined in the active analysis.

Calibration curve

Shows the calibration curve of the component which is selected in the **Component** field.

The graph of the calibration curve is synchronized with the calibration points table. A calibration point can be selected both in the curve and in the table. The point is then highlighted in **blue** and the corresponding line in the table in **yellow**. Points which have been removed manually from the calibration appear as a **red cross** in the graph and as a **red line** in the table.

The labels of the axes or the assignment in respect to which property is applied to the x/y axis is derived from the function type of the calibration which is defined in the method. For a calibration with an internal standard, the unit of the measured quantity is called **Ratio**.

If you click on the calibration curve with the right mouse button, a **context-sensitive menu** will appear with the following menu items:

Show all	Show the entire curve. This menu item is always active.
Default view	This menu item is inactive for the calibration curve.
Zoom	Opens the dialog for entry of a zoom range *(see chapter 2.6.7, page 95)*.
Unzoom	Undo the last zoom action.
Copy	Copy the calibration curve displayed in the graphics window.
Export graph...	Open the **Export graph** dialog window to export the graph displayed in the graphics window *(see chapter 2.6.12, page 105)*.

Properties

Display of several characteristics of the calibration curve.

Function

Function of the calibration curve.

Relative standard deviation

Relative standard deviation of the calibration curve.

Correlation coefficient

Correlation coefficient of the calibration curve.

Curve type

Curve type of the calibration curve. This is derived from the method used to record the determination *(see chapter 5.8.5.2, page 463)*.

Weighting

Weighting used to incorporate a calibration point in the calibration curve. This is derived from the method used to record the determination *(see chapter 5.8.5.2, page 463)*.

Retention time of the last standard or retention time of the last determination

Is only displayed if **Readjust retention times** is selected in the method *(see chapter 5.8.3.3, page 451)*.

Calibration points

Table with the calibration points used to calculate the calibration curve. The table contains the following columns:

Sample type

Type of the standard, from the sample data of the determination.

Index

The index indicates the numbering of the standard of the same type in the calibration data set. The numbering is in the same sequence as the standard determinations occurring in the calibration data set of the determination.

Concentration

Indicates the concentration of the component in the standard, from the standard table in the method.

Volume

Injected volume, from the sample data of the determination.

Dilution

Dilution, from the sample data of the determination.

Sample amount

Sample amount, from the sample data of the determination.

Conc.(calc.)

Indicates the concentration of the component calculated with the calibration used. The number of decimal places is identical with the number of decimal places set for the **Concentration** result.

The value for **Conc.(calc.)** corresponds to the variable **CONCCALC**.

Conc.(dev.,%)

Indicates the percentage deviation of the calculated concentration from the nominal concentration of the component. The number of decimal places is smaller by one compared to the number of decimal places set for the **Concentration** result, but it always must have at least 1 decimal place.

The value for **Conc.(dev.,%)** corresponds to the variable **CONCDEV%**.

Area / Height

Property of the component peak, measured quantity used to calculate the calibration curve. The method defines whether the area or height is used.

Ident

Ident, from the sample data of the determination.

Date

Recording date, from the determination data.

Used

Indicates whether a calibration point is used for calculating the calibration curve.

NOTE

Cannot be edited in the **Subwindow: Database ► Curve #**.

The setting can be edited via the context-sensitive menu item. If a change is made, the calibration curve is immediately recalculated and the updated curve is displayed in the graphics window. The calibration data set is also updated.

The graph of the calibration curve is synchronized with the calibration points table. A calibration point can be selected both in the curve and in the table. The point is then highlighted in **blue** and the corresponding line in the table in **yellow**. Points which have been removed manually from the calibration appear as a **red cross** in the graph and as a **red line** in the table.

If you click on the table for the calibration points with the right mouse button, a **context-sensitive menu** will appear with the following menu items:

On	Enable the **Used** check box for the highlighted calibration points.
Off	Disable the **Used** check box for the highlighted calibration points.
Invert selection	Inverts the **Used** setting for the highlighted calibration points.
Change calibration	Open the **Select calibration** dialog window *(see chapter 2.6.13, page 107)*.
Import calibration points	Open the **Import calibration points** dialog window. An ***.ical** file can be selected in this window to import it into an analysis of the currently selected determination *(see chapter 4.7.18.5.5, page 342)*.
Export calibration points	Open the **Export calibration points** dialog window. The calibration points of an analysis of the currently selected determination can be exported into an ***.ical** file in this window *(see chapter 4.7.18.5.6, page 343)*.
Column display...	Define the columns for the calibration points table *(see chapter 2.6.4, page 93)*.

2.6.4 Calibration curve view - Column display

Dialog window: **Database ► Curve # ► [Edit] ► Column display... ► Column display**

Dialog window: **Database ► Reprocess ► Chromatograms ► [Edit] ► Column display... ► Column display**

Dialog window: **Method ► Chromatograms ► [Edit] ► Column display… ► Column display**

With **[Edit] ► Column display…**, the **Column display** dialog window opens. Here you can define the columns that are to be shown in the table of calibration points.

Available columns

All fields that can be displayed as columns in the table of calibration points are shown.

Displayed columns

All fields that are displayed as columns in the table of calibration points are shown.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Moves the selected column upwards.

▼

Moves the selected column downwards.

NOTE

If the **Response** column is added to the displayed columns, the column **Area** or **Height** is displayed in the calibration points table depending on the settings for the calibration curve.

2.6.5 Spectrum view

Subwindow:Workplace ► Live display #

Subwindow:Database ► Curve #

Subwindow:Method ► Spectrum #

The spectra view consists of the following elements:

- **Spectrum** field for selecting the spectrum to be displayed.
- **Curve window**, you can zoom and configure the display here.

Spectrum

Spectrum

Selection of the spectrum to be displayed.

Curve window

The curve window is used for displaying and viewing the measurement curve. The curve can be zoomed in or out and its visualization (background, axes, peak label,...) can be completely configured.

If you click on the curve window with the right mouse button, a **context-sensitive menu** will appear with the following menu items:

Show all	Show the entire curve. This menu item is always active.
Default view	Show the default view. This menu item is inactive, if **Show all** is selected for both axes as the definition of the default view *(see chapter 2.6.11.1, page 98)*.
Zoom	Opens the dialog for entry of a zoom range *(see chapter 2.6.7, page 95)*.
Unzoom	Undo the last zoom action.
Properties...	Open the **Properties - 'Analysis name'** dialog window to define the properties of the curve display *(see chapter 2.6.11, page 98)*.
Copy	Copy the chromatogram displayed in the graphics window.
Export graph...	Open the **Export graph** dialog window to export the graph displayed in the graphics window *(see chapter 2.6.12, page 105)*.

2.6.6 Cyclic voltammogram view

Subwindow:Workplace ► Live display #

Subwindow:Database ► Curve #

Subwindow:Method ► CV #

The cyclic voltammogram view consists of the following elements:

- **CV** field for selecting the cyclic voltammogram to be displayed.
- **Curve window**, you can zoom and configure the display here.

Cyclic voltammograms

CV

Selection of the cyclic voltammogram to be displayed.

Curve window

The curve window is used for displaying and viewing the measurement curve. The curve can be zoomed in or out and its visualization (background, axes, peak label,...) can be completely configured.

If you click on the curve window with the right mouse button, a **context-sensitive menu** will appear with the following menu items:

Show all	Show the entire curve. This menu item is always active.
Default view	Show the default view. This menu item is inactive, if **Show all** is selected for both axes as the definition of the default view *(see chapter 2.6.11.1, page 98)*.
Zoom	Opens the dialog for entry of a zoom range *(see chapter 2.6.7, page 95)*.
Unzoom	Undo the last zoom action.
Properties...	Open the **Properties - 'Analysis name'** dialog window to define the properties of the curve display *(see chapter 2.6.11, page 98)*.
Copy	Copy the curve displayed in the graphics window.
Export graph...	Open the **Export graph** dialog window to export the graph displayed in the graphics window *(see chapter 2.6.12, page 105)*.

2.6.7 Zooming

Subwindow:Workplace ► Live display #

Subwindow:Database ► Curve #

Subwindow:Database ► Determinations ► Reprocess ► Chromatograms - 'Ident' #

Subwindow:Method ► Chromatograms - 'Ident' #

Zooming with the mouse

Curves can be zoomed as often as required by spanning a section of the curve display with the left-hand mouse button pressed down. The smallest range that can be zoomed is 10^{-6}.

Zooming with the dialog

Zooming can be undone by double-clicking on the section of the graph or with the context-sensitive **Show All** menu command.

The context-sensitive **Zoom** menu item opens the **Set Zoom** dialog window for entering the zoom range *(see chapter 2.6.7, page 95)*.

Zooming with the keyboard

The arrow keys only become active if the graphics window has the focus. It receives the focus by clicking on the graphics window, the focus being indicated by a red frame.

Zooming with the keyboard can make the zoom range bigger than in the overview window. In this case, the overview window does not change its size. Only a partial frame or even no red frame is outlined.

[↑]	Zoom in the view in the direction of the y-axis.
[↓]	Zoom out the view in the direction of the y-axis.
[←]	Zoom in the view in the direction of the x-axis.
[→]	Zoom out the view in the direction of the x axis.

2.6.8 Moving a curve

Subwindow:Workplace ► Live display #

Subwindow:Database ► Curve #

Subwindow:Database ► Determinations ► Reprocess ► Chromatograms - 'Ident' #

Subwindow:Method ► Chromatograms - 'Ident' #

NOTE

These actions are only possible in the **Chromatogram view**.

The arrow keys only become active if the graphics window has the focus. It receives the focus by clicking on the graphics window, the focus being indicated by a red frame around the graphics window.

[PageUp]	Move the chromatogram upwards by 10% of the graphics window.
[PageDown]	Move the chromatogram downwards by 10% of the graphics window.
[Shift][↑]	Increase the spacing of two chromatograms within the same graphics window by 10%.
[Shift][↓]	Reduce the spacing of two chromatograms within the same graphics window by 10%.
[0](Zero)	Move the lowest point of the chromatogram to zero. This function is not possible in the live display.

[Ctrl][←]	Move the zoomed section to the right by 10% of the graphics window, i.e. the chromatogram shifts to the left in the visible range.
[Ctrl][→]	Move the zoomed section to the left by 10% of the graphics window, i.e. the chromatogram shifts to the right in the visible range.

2.6.9 Working with the cursor

The curve window is synchronized with specific areas of the evaluation in the **Method** program part. Thus the time of the cursor position in the curve window can be directly adopted in the method evaluation.

Integration events

Tab: Method ► Evaluation ► Integration ► Events

If an event is selected in the table for the integration events, its starting time will be highlighted by a **blue** vertical cursor and its ending time by a **red** vertical cursor in the curve window. Events which have a time are highlighted by a red cursor. The cursors can be moved manually. The changed times are adopted in the evaluation with the **[Update event time]** button *(see chapter 5.8.2.4, page 445)*.

Retention times

Tab: Method ► Evaluation ► Components ► Component table

If a component has been selected in the component table, its retention time will be highlighted by a **blue** vertical cursor in the curve window. The cursor can be moved manually. The changed retention time is adopted in the evaluation with the **[Update retention time]** button *(see chapter 5.8.3.2, page 449)*.

2.6.10 Setting the zoom

Dialog window: **Graphics window ► Zoom... ► Zoom**

Specifies the displayed area that is always spanned over the whole size of the curve window.

NOTE

The zoom settings are retained in the **Database** program part and in the properties of the **Reprocessing** dialog window when scrolling in the curve display, provided that the same analyses are available in both determinations.

X Axis

Visible range in X direction.

from

Starting point in X direction.

Input range	**-10^{12} to 10^{12}**

to

Endpoint in X direction.

Input range	**-10^{12} to 10^{12}**

Y Axis

Visible range in Y direction.

from

Starting point in Y direction.

Input range	**-10^{12} to 10^{12}**

to

Endpoint in Y direction.

Input range	**-10^{12} to 10^{12}**

2.6.11 Properties

Subwindow:Workplace ▶ Live display #

Subwindow:Database ▶ Curve #

Subwindow:Database ▶ Determinations ▶ Reprocess ▶ Chromatograms - 'Ident' #

Subwindow:Method ▶ Chromatograms - 'Ident' #

The context-sensitive **Properties...** menu item in the curve window opens the **Properties - 'Analysis name'** dialog window. The visualization of the curve display can be configured here. The window consists of up to four tabs.

2.6.11.1 Properties - Axes

The label and scaling of the axes is defined on the **Properties - Axes** tab.

X Axis

Axis label

Freely definable label of the axis.

Selection	**auto** | **any text**
Default value	**auto**

auto
The axis is labeled with the unit of the applied size.

any text
Any text can be entered.

Default view

The default view includes option buttons for defining the standard visualization of the axes.

Selection	**Show all** | **Range**
Default value	**Show all**

Show all
The axis scaling is selected in such way that all points of the curve are displayed.

Range
Only the area indicated of the axis between **from** and **to** is displayed. These two fields can only be edited if the option **Range** is activated.

from

Initial value for scaling the axis. The displayed unit corresponds to the setting in the **Axis label** field.

Input range	**-10^{12} to 10^{12}**

to

Final value for scaling the axis. The displayed unit corresponds to the setting in the **Axis label** field.

Input range	**-10^{12} to 10^{12}**

Y Axis

Axis label

Freely definable label of the axis.

Selection	**auto** | **any text**
Default value	**auto**

auto
The axis is labeled with the unit of the applied size.

any text
Any text can be entered.

Default view

The default view includes option buttons for defining the standard visualization of the axes.

Selection	**Show all** | **Range**
Default value	**Show all**

Show all
The axis scaling is selected in such way that all points of the curve are displayed.

Range
Only the area indicated of the axis between **from** and **to** is displayed. These two fields can only be edited if the option **Range** is activated.

from

Initial value for scaling the axis. The displayed unit corresponds to the setting in the **Axis label** field.

Input range	**-10^{12} to 10^{12}**

to

Final value for scaling the axis. The displayed unit corresponds to the setting in the **Axis label** field.

Input range	**-10^{12} to 10^{12}**

Scaling

Selection whether the y axis is to be scaled absolutely or relatively.

Selection	**Absolute** | **Relative**
Default value	**Absolute**

Absolute
The values displayed correspond to the actual measured values. The y axis starts at y_0(abs) and ranges to y_{max}(abs).

Relative
Not selectable with auxiliary curves. The curve is represented in the same way as with absolute scaling. The y axis, however, starts at 0 and ranges to y_{max}(abs) – y_0(abs). This calculation applies for positive as well as for negative polarity. Example: A signal in the range of -600 to -500 is shown in the range of 0 to 100 with relative scaling.

2.6.11.2 Properties - Curve

The peak label, display of the baseline and curve visualization are defined in the **Properties - Curve** tab.

Peak label

Orientation

Specifies the orientation of the peak label.

Input range	**0° (horizontal) to 90° (vertical)**
Default value	**90° (vertical)**

Always visible

on | off (Default value: **on**)

> **NOTE**
>
> The peak label is always located on the tip of the peak, regardless of whether positive or negative peaks are involved.

Specifies where the peak label is located if the **peak tip is not visible** (e.g. due to zoom).

- If the option is **active**, the peak label is displayed on the upper or lower edge of the curve window.
- If the option is **inactive**, the peak label will always remain at the peak tip, i.e. it is also not visible.

The following properties can be activated/deactivated for the peak label:

Peak number

on | off (Default value: **off**)

Number of the peak. The recognized peaks are numbered consecutively. A peak which cannot be assigned to any component, is **always** provided with the peak number.

Component name

on | off (Default value: **on**)

Name of the component. The component name is displayed if the peak can be assigned to a component from the component table.

Retention time

on | off (Default value: **on**)

Retention time of the peak.

Concentration

on | off (Default value: **off**)

Concentration of the components. No concentration can be calculated and displayed for a peak which cannot be assigned to any component.

Area

on | off (Default value: **off**)

Area of the peak.

Height

on | off (Default value: **off**)

Height of the peak.

Tooltip

on | off (Default value: **on**)

The tooltip appears when the cursor rests on a peak and it shows the peak properties **Component name**, **Retention time** and **Concentration** if they are activated for the peak label.

Baseline

Show baseline

on | off (Default value: **on**)

Specifies whether the baseline is displayed.

Show base point

on | off (Default value: **on**)

Specifies whether the base points of the peaks are displayed.

Curve

Filter spikes

on | off (Default value: **on**)

Specifies whether the curve is smoothed for the display. The spike filter smoothes the first and last points of the curve and the points which are identified as spikes. The spike is replaced by the half sum of the two adjoining points.

2.6.11.3 Properties - Reference curve

The **Properties - Reference curve** tab allows you to define whether a chromatogram that was already recorded is displayed in the graphics window.

NOTE

Not possible in **Database ► Curve #** and **Database ► Determinations ► Reprocess ► Chromatograms - 'Ident' #**. The reference chromatogram can only be displayed in the method development and during the recording.

Radio buttons

Selection	**Off** | **Last standard** | **Last check standard** | **Last chromatogram**
Default value	**Off**

Off
No reference chromatogram is shown.

Last standard
The chromatogram of the most recently determined standard is shown.

Last check standard
The chromatogram of the most recently determined check standard is shown.

Last chromatogram
The chromatogram of the most recently recorded determination is shown, regardless of which sample type has been determined.

A reference chromatogram is only displayed if the reference chromatogram was determined with the same method. The analysis of the two chromatograms which are to be compared must also correspond.

As soon as a new **standard** (for **Last standard**), **Check standard** (for **Last check standard**) or any **sample type** (for **Last chromatogram**) has been determined, the associated chromatogram is displayed as a reference chromatogram. The latest available reference chromatogram is displayed.

2.6.11.4 Properties - Spectrum

The **Properties - Spectrum** tab allows you to define whether a spectrum that was already recorded is displayed in the graphics window.

Labeling of maxima

Orientation

The orientation of the label from 0° (horizontal) to 90° (vertical).

Input range	**0 to 90 °** (Increment: **1**)
Default value	**90 °**

Always visible

on | off (Default value: **on**)

Setting whether the label should always be visible.

With the option **activated**, the default position is at the top of the maximum, if this one is, however, not visible because of zooming or other viewing options, the label is shown on the upper edge of the graphics window.

With the option **deactivated**, the peak label is always at the top of the maximum, i.e. with corresponding zooming/viewing options the peak label may be located outside the range displayed.

Show number of maximum

on | off (Default value: **off**)

Calculated maxima are numbered consecutively.

Show wavelength

on | off (Default value: **on**)

The wavelength of the calculated maxima is shown.

Curve

Smoothing (Cubic Splines)

on | off (Default value: **off**)

Interpolation of the measuring points displayed by a spline of the third grade.

2.6.11.5 Properties - Display

The visual appearance of the graphics window is defined in the **Properties - Display** tab.

Overview

Show overview window

on | off (Default value: **on**)

Check box to show/hide the overview window. Not available with cyclic voltammograms.

Curve

Area for defining the color of the measurement curve.

Curve

List box for the color of the measurement curve.

Line thickness

Input range	**1 to 10 pPixels**
Default value	**1 pPixels**

Baseline

List box for the color of the baseline. Not available with cyclic voltammograms.

Reference curve

Area for defining the color of the reference curve.

Reference curve

List box for the color of the reference curve.

Line thickness

Input range	**1 to 10 pPixels**
Default value	**1 pPixels**

Graph

Area for defining the appearance of the graphics window.

Background

Clicking on the symbol … opens the dialog window **Select color**.

Axes

List box for the color of the axes.

Line thickness

Input range	**1 to 10 pPixels**
Default value	**1 pPixels**

Grid

on | off (Default value: **off**)

Check box for showing/hiding a grid in the background of the measurement curve.

List box for the color of the grid.

2.6.12 Export graph

The context-sensitive **Export graph...** menu item in the curve window opens the **Export graph** dialog window. Here, you can define how the current content of the graphics window is to be exported in a file (vector graph in the ***.eps** format).

File name

Display of the selected file name.

…

Opens the standard dialog of the operating system for selecting or entering a file name. The specification of the file type ***.eps** is fixed. After the selection or input of a valid file name, this will be displayed in the **File name** parameter.

Dimensions

on | off (Default value: **off**)

Option for the application of dimensions to the graph to be exported (**Width** and **Height**).

If this option is **activated**, then the graph will be exported in the size which is defined in the **Width** and **Height** parameters.

If this option is **switched off**, then the graph will be exported in the currently displayed size.

Width

Definition of the width of the graph to be exported. Only available if the **Dimensions** parameter is switched on.

Input range	**40 to 1,000 mm**
Default value	**100 mm**

Height

Definition of the height of the graph to be exported. Only available if the **Dimensions** parameter is switched on.

Input range	**40 to 1,000 mm**
Default value	**80 mm**

Font for text in the graph

on | off (Default value: **off**)

Option for the use of a font for texts which are located in the graph to be exported.

If this option is **activated**, then text which is located in the graph will be exported with the selected font and in the selected size.

If this option is **switched off**, then text which is located in the graph will be vectorized.

NOTE

If you switch on this option, then you should check whether the selected font is available on the computer where the exported graph may need to be edited further.

(Font type)

Selection of the font from the list of fonts which are installed on the computer. Only available if the **Font for text in the graph** parameter is switched on.

(Font size)

Selection of the size of the selected font. Only available if the **Font for text in the graph** parameter is switched on and a font has been selected.

2.6.13 Changing the calibration

Client

Selection list used for selecting the client whose calibration data set is to be loaded.

Selection	**all clients**

If the selection is confirmed with **[OK]**, the calibration data set of the client on which the action is to be executed is overwritten with the calibration data set of the selected client.

2.6.14 Select color

The dialog window contains radio buttons for setting the hue, saturation and brightness.

Color selection

Clicking in the left color field allows you to select a color; the settings for the color are automatically transferred to the fields for the color setting at the same time.

Scroll bar

The scroll bar in the center of the dialog window is synchronized with the activated field of the color setting. The **Hue**, **Saturation** and **Brightness** can thus be set very quickly.

Color setting

The hue, saturation and brightness of the color can be set independently of one another.

Selection	**Hue** | **Saturation** | **Brightness**
Default value	**Hue**

Hue

Hue entry.

Input range	**0 to 359**

Saturation

Saturation entry.

Input range	**0 to 100**

Brightness

Brightness entry.

Input range	**0 to 100**

RGB values display

The RGB values for the selected color are displayed.

Red

Display of the red component.

Input range	**0 to 255**

Green

Display of the green component.

Input range	**0 to 255**

Blue

Display of the blue component.

Input range	**0 to 255**

Color sample

A sample with the color set is displayed in the lower part of the dialog window.

2.6.15 Importing calibration points

Dialog window: **Method ► Chromatograms - ► Calibration curve ► [Edit...] ► Import calibration points ► Import calibration points**

With the **Import calibration points** function, you can import the content of an ***.ical** file that was created by MagIC Net into a selected analysis ("target analysis") of this method.

Select analysis

List of the analyses (sorted alphabetically) in the selected method. Select the analysis (target analysis) into which you wish to import calibration points from an ***.ical** file here.

Import file

Display of the name (including path) of the ***.ical** file selected for the import.

...

Opens a dialog for the selection of an ***.ical** file for import.

[OK]

Starts the import of the calibration points from the selected ***.ical** file into the selected analysis. The **Import calibration points** dialog will close after the import has been successfully completed.

[Cancel]

Discards any user inputs and closes the **Import calibration points** dialog.

What happens when calibration points are imported into an analysis?

- All calibration points of the target analysis are deleted.
- For every component for which calibration points are available in the ***.ical** file, these will be copied into the target analysis. The *names* of the components will be compared at this time.
- After the import of the calibration points into the target analysis, the display of their calibration will be updated in the **Chromatograms***(see chapter 4.7.18.4.4, page 335)* subwindow.
- The determination will *not* be automatically recalculated after the import.

2.6.16 Exporting calibration points

Dialog window: **Method ► Chromatograms - ► Calibration curve ► [Edit...] ► Export calibration points ► Export calibration points**

With the **Export calibration points** function, you can select an analysis of this method and export its calibration points (if any exist) into an ***.ical** file.

Select analysis

List of the analyses (sorted alphabetically) in the selected method. Select the analysis whose calibration points you wish to export into an ***.ical** file here. If the selected analysis contains no calibration points, then you will be prompted to select a different analysis when pressing **[OK]**.

Export file

Display of the name (including path) of the ***.ical** file determined for the export.

...

Opens a dialog for the definition of the ***.ical** file into which the calibration points are to be exported. You can select the target directory and an ***.ical** file or enter them manually.

[OK]

Starts the export of the calibration points from the selected analysis into the ***.ical** file. The **Export calibration points** dialog will close after the export has been successfully completed.

[Cancel]

Discards any user inputs and closes the **Export calibration points** dialog.

2.6.17 MagIC Net Multi - Calibration data set

NOTE

This chapter applies exclusively to client/server systems (MagIC Net Multi).

The calibration data set contains data that can change without changing the method. That is primarily calibration data that changes after each injected standard.

Calibration data sets are not part of the method. Calibration data sets are also saved in the determination. Calibration data sets are client-specific. Each client has exactly one calibration data set assigned per method. This makes it possible to use a method on several instruments. The calibration data set that corresponds to the instrument is used.

Application example - Changing the calibration in a method

On one client, e.g. the laboratory computer, a determination is carried out. A calibration data set is created. On another client, e.g. the office computer, the determination incl. calibration is reprocessed. The method with the modified calibration is saved. However, on the laboratory computer, the original calibration data set is used before the reprocessing. If you want to use the reprocessed calibration data set on the laboratory computer, change the calibration data set in the method editor *(see chapter 2.6.13, page 107)*.

Handling of calibration data sets

When saving a method, the calibration data set of the client on which the action is executed is saved as well. The calibration data sets of the other clients are retained *(see chapter 5.2.10, page 379)*.

When exporting a method, the calibration data set of the client on which the action is executed is exported as well *(see chapter 5.4.7, page 392)*.

When importing a method, the calibration data set that is part of the method is stored as calibration data set of the client on which the import is taking place *(see chapter 5.4.8, page 392)*.

If you do not want to use the calibration data set that is assigned to the client, change the calibration data set. The calibration data set of another client can be loaded in the method editor *(see chapter 2.6.13, page 107)*.

2.7 E-mail

2.7.1 Sending an e-mail

Dialog window: **[E-mail...] ► Send e-mail**

E-mail template

Selection of the template for sending e-mails.

Subject

Subject to describe the message.

Message

Text of the message which is sent to the address defined under **[E-mail...]**. Clicking on the T icon opens the dialog window of the text editor *(see chapter 2.5.2, page 82)*.

2.7.2 Managing e-mail templates

Dialog window: **Configuration ► Tools ► Templates ► E-mail templates... ► E-mail templates**

The saved e-mail templates are displayed in a table in the **E-mail templates** dialog window. The table cannot be edited, but with a click on the column title the table can be sorted according to the selected column in either ascending or descending order.

Name

Name of the e-mail template.

Recipient

E-mail address of the recipient.

The **[Edit]** menu below the list of e-mail templates or a right-click on the table opens a menu with the following menu items:

New...	Create a new template. The **Edit e-mail template** window opens, in which a new template can be defined *(see chapter 2.7.3, page 112)*.
Properties...	Edit the selected template. The **Edit e-mail template** window opens, in which the template can be edited *(see chapter 2.7.3, page 112)*.
Copy	Copy the selected template and save it under the name **'Template name'_#**.

Paste	Paste the selected e-mail template(s) after copying using the **Copy** menu item.
Delete	Deletes the selected template.
Send test E-mail	Sends test e-mail with the selected e-mail template.

2.7.3 Edit e-mail template

Dialog window: **Configuration ► Tools ► Templates ► E-mail templates... ► E-mail templates ► [New] / [Properties] ► Edit e-mail template**

With **[New]** or **[Edit]** in the dialog window **E-mail templates**, the dialog window **Edit e-mail template** opens for entering a new template or for editing an existing template.

E-mail template

Name of the e-mail template.

Entry	**1 - 16 characters**

Recipient

E-mail address(es)

E-mail address of the recipient. If there are several recipients, the addresses must be separated with a semicolon.

Entry	**1–1,024 characters**

Sender

E-mail address

E-mail address of the sender.

Entry	**1 - 200 characters**

SMTP server

Address of the SMTP mail server.

Entry	**1 - 200 characters**

Port

Port number of the SMTP mail server.

Input range	**1 to 65,536**
Default value	**25**

Encryption

Selection of the encryption type for data transmission to the SMTP mail server.

Selection	**None** | **SSL** | **StartTLS**
Default value	**None**

Authentication

on | off (Default value: **off**)

Check box for activating the authentication of the sender when sending the e-mail and selection of the authentication method.

Selection	**SMTP** | **SMTP after POP**
Default value	**SMTP**

POP server

Address of the POP mail server.

Entry	**3 - 200 characters**

Port

Port number of the POP mail server.

Input range	**1 to 65,536**
Default value	**110**

User

Name of the user for accessing the mail server. The name need not match the Windows user name.

Entry	**2 - 50 characters**

Password

Password for accessing the mail server. This password need not match the Windows password.

Entry	**0–50 characters**

3 Workplace

3.1 Workplace - General

3.1.1 Workplace - Definition

Program part: **Workplace**

Workplace is defined in **MagIC Net** as the program part in which up to 4 workplaces can be opened next to one another for the simultaneous, independent running of determinations.

3.1.2 Workplace - User interface

Program part: **Workplace**

Workplace icon

Clicking on the workplace icon in the vertical bar on the left opens the **Workplace** program part while at the same time the workplace icon is shown in color. The upper left corner of the icon contains a black field displaying the number of workplaces currently opened *(see chapter 3.2.3.1, page 124)*.

Elements

The user interface of the **Workplace** program part comprises the following elements:

- Workplace-specific menu bar.
- Workplace-specific toolbar.
- Main window, in which up to six subwindows can be displayed.

3.1.3 Workplace - Menu bar

3.1.3.1 Workplace - Main menus

Program part: **Workplace**

The menu bar in the **Workplace** program part contains the following main menu items:

- *File*
  Creating, editing, closing workplaces; saving methods; opening manual control.

- *View*
  Changing layout, loading views, saving views, editing properties of subwindows.
- *Tools*
  Manual control, run test, sample tables, sample assignment tables, text templates.
- *Help*
  Opening help, showing program info.

3.1.3.2 Workplace - File menu

Program part: **Workplace**

file	
Workplace ►	
New...	Opens a new workplace *(see chapter 3.2.1, page 123)*.
Properties...	Edit properties of the selected workplace *(see chapter 3.2.2, page 123)*.
Close	Closes the selected workplace *(see chapter 3.2.4, page 125)*.
Method ►	
Save	Save the method with the modified live parameters *(see chapter 3.8.3, page 196)*.
Save As...	Save the method with the modified live parameters under a new name *(see chapter 3.8.3, page 196)*.
Logout...	Logs out user *(see chapter 2.2.3, page 23)*.
Exit	Exits the program.

3.1.3.3 Workplace - View menu

Program part: **Workplace**

View	
Change layout...	Change the layout of the loaded workplace view *(see chapter 3.1.7.2, page 121)*.
Load view...	Load a saved workplace view *(see chapter 3.1.7.3, page 121)*.
Save view...	Saves the current workplace view *(see chapter 3.1.7.4, page 122)*.

Split vertically	Splits the workplace window vertically and displays two workplaces side by side *(see chapter 3.2.3.3, page 124)*.
Split horizontally	Splits the workplace window horizontally and displays two workplaces below each other *(see chapter 3.2.3.4, page 125)*.
Unsplit	Undoes the splitting of the workplace window *(see chapter 3.2.3.2, page 124)*.
Properties ►	
Properties Run window	Set the properties for the **Single determination** or **Determination series** tabs in the **Run** subwindow.
Properties Live display 1	Set the properties for the **Live display 1** subwindow *(see chapter 3.8, page 194)*.
Properties Live display 2	Set the properties for the **Live display 2** subwindow *(see chapter 3.8, page 194)*.
Properties Watch window	Set the properties for the **Watch window** subwindow *(see chapter 3.10, page 199)*.
Toolbar	Activates/deactivates the toolbar display.

View	
Toolbar	Activates/deactivates the toolbar display.

3.1.3.4 Workplace - Tools menu

Program part: **Workplace**

Tools	
Run test	Carries out start test for determination(s) *(see chapter 3.7.2, page 155)*.
Sample table ►	
New...	Opens a new, empty sample table *(see chapter 3.3.1.1, page 125)*.
Open...	Open a saved sample table *(see chapter 3.3.1.2, page 125)*.
Manager...	Manage saved sample tables *(see chapter 3.3.3.1, page 144)*.
Timer...	Define automatically executable actions *(see chapter 3.4.1, page 147)*.

Sample assignment table...	Define sample identifications which can be assigned a certain method *(see chapter 3.5.1, page 151)*.
Text templates...	Create text templates for the sample data *(see chapter 3.6, page 153)*.

3.1.3.5 Help menu

Program part: **Workplace / Database / Method / Configuration**

MagIC Net Help	Opens MagIC Net Help.
About	Displays information about the program and the installation.

3.1.4 Workplace - Toolbar

Program part: **Workplace**

Sample table/New...	Opens a new, empty sample table *(see chapter 3.3.1.1, page 125)*.
Sample table/Open...	Open a saved sample table *(see chapter 3.3.1.2, page 125)*.
Sample table/ Manager...	Manage saved sample tables *(see chapter 3.3.3.1, page 144)*.
Change layout	Change the layout of the loaded workplace view *(see chapter 3.1.7.2, page 121)*.
Load view	Load a saved workplace view *(see chapter 3.1.7.3, page 121)*.
Save view	Saves the current workplace view *(see chapter 3.1.7.4, page 122)*.
Run test	Carry out the run test for determination(s) *(see chapter 3.7.2, page 155)*.
Timer...	Define automatically executable actions *(see chapter 3.4, page 147)*.
Split vertically	Splits the workplace window vertically and displays two workplaces side by side *(see chapter 3.2.3.3, page 124)*.
Split horizontally	Splits the workplace window horizontally and displays two workplaces below each other *(see chapter 3.2.3.4, page 125)*.
Unsplit	Undoes the splitting of the workplace window *(see chapter 3.2.3.2, page 124)*.
Logout	Logs out user *(see chapter 2.2.3, page 23)*.
MagIC Net Help	Opens MagIC Net Help.

3.1.5 Workplace - Subwindows

Program part: **Workplace**

Selection

The following subwindows can be displayed in the main window:

- *Run*
  Window for controlling runs and entering sample data. This subwindow is permanently on display.
- *Live display 1*
  Displays live curves, measured values and messages for the ongoing determination.
- *Live display 2*
  Displays live curves, measured values and messages for the ongoing determination.
- *Report*
  Displays reports of recorded determinations.
- *Watch window*
  Shows important information concerning method and instruments.
- *Time program*
  Display of the time program of the method loaded.

Representation

The subwindows can be enlarged or made smaller to suit by dragging the separating bar between the windows.

By clicking on the ☐ button above at the right, the subwindows can be maximized so that only one subwindow is displayed in the main window. The original view of all subwindows is restored when the ☐ button is clicked again in the maximized subwindow.

3.1.6 Workplace - Functions

Program part: **Workplace**

The following functions can be carried out in the **Workplace** program part:

Views

- *Defining the workplace view layout*
- *Loading a workplace view*
- *Saving a workplace view*
- *Renaming a workplace view*
- *Deleting a workplace view*

Workplaces

- *Creating a workplace*
- *Editing a workplace*

- *Selecting a workplace*
- *Closing a workplace*

Sample tables

- *Creating a sample table*
- *Opening a sample table*
- *Editing a sample table*
- *Editing sample data*
- *Saving a sample table*
- *Printing the sample table*
- *Defining the sample table properties*
- *Managing sample tables*

Single determination

- *Starting/stopping a single determination*
- *Entering sample data*
- *Modifying sample data live*
- *Defining properties*

Determination series

- *Starting/stopping a series*
- *Loading a sample table*
- *Editing a sample table*
- *Modifying sample data live*
- *Defining properties*

Live display subwindow

- *Defining properties*

Report subwindow

- *Selecting a report*

Tools

- *Performing a run test*
- *Editing the sample assignment table*
- *Defining text templates*

3.1.7 Views

3.1.7.1 Views - General

Program part: **Workplace / Database / Configuration**

Definition

The contents and design of the main window in the **Workplace**, **Database** and **Configuration** program parts is called a **View**. The following elements belong to a view:

- Number, arrangement, sequence and size of the subwindows.

- Representation within the individual subwindows, i.e. column sequence, column width, sorting and filter.

Functions

The following functions are possible for views:

- *Changing the layout*
  Defining the number, arrangement and sequence of the subwindows for the current view.
- *Saving a view*
  Saving the current view.
- *Loading a view*
  Loading a saved view.
- *Renaming a view*
  Renaming a saved view.
- *Deleting a view*
  Deleting a saved view.

Saving automatically

The current view will be saved automatically when the program is closed if the corresponding option is activated under **Save on closing** in the **Configuration** program part under **Tools ► Options...** on the **Save** tab.

Loading automatically

By default, the view that is saved when the program is closed will be loaded automatically the next time that the program is opened. As an alternative, a default view that is loaded automatically the first time that the program part is opened can be defined for each user group.

By default, views are opened with the following subwindows with the very first program start:

- **Workplace**
  Run, **Live display 1**, **Report**, **Watch window**, **Time program**
- **Database**
  Determination overview, **Curves 1**, **Information**, **Results**
- **Configuration**
  Devices, **Columns**, **Eluents**, **Accessories**

Export/import

Views can also be exported and imported. In this way these views can be exchanged between different client/server systems.

3.1.7.2 Changing the layout

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Change layout... ▶ Change layout**

The **Change layout** dialog window is opened with the icon or the **View ▶ Change layout...** menu item.

Select layout

Selection of a graphical icon for the number and arrangement of the subwindows.

Selection	**'Selection of the possible combinations'**

Available subwindows

Display of the subwindows that are still available for being displayed in the view.

Selection	**'Selection of the subwindows'**

Displayed subwindows

Display of the subwindows that are shown in the view.

Selection	**'Subwindow'**

»

Adds the selected subwindow to the view.

«

Removes the selected subwindow from the view.

▲

Moves the selected subwindow upward (modifies sequence).

▼

Moves the selected subwindow downward (modifies sequence).

3.1.7.3 Loading a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Load view... ▶ Load view**

The **Load view** dialog window is opened with the icon or the **View ▶ Load view...** menu item.

Name

Name of the view to be loaded.

[Rename]

Rename the selected view.

[Delete]

Deletes the selected view.

[Load]

Loads the selected view.

3.1.7.4 Saving a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Save view... ▶ Save view**

The **Save view** dialog window is opened with the icon or the **View ▶ Save view...** menu item.

Name

Name under which the view is to be saved.

[Rename]

Rename the selected view.

[Delete]

Deletes the selected view.

[Save]

Saves the view under the given name. The saved views are globally valid and available for client/server systems.

3.1.7.5 Renaming a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Load view... ▶ Load view ▶ [Rename] ▶ Rename view**

To be able to rename a view, either open the **Load view** or the **Save view** dialog window and click on the **[Rename]** button. The **Rename view** window opens afterwards.

Rename view '%1' to

Entry of a new name for the view.

Entry	**50 characters**

3.1.7.6 Deleting a view

Function: **Workplace / Database / Configuration ▶ View ▶ Load/save view… ▶ [Delete]**

To delete a view, open either the **Load view** or **Save view** dialog window and press the **[Delete]** button. The delete procedure must then be confirmed.

3.2 Workplaces

3.2.1 Creating a new workplace

Dialog window: **Workplace ► File ► Workplace ► New… ► New workplace**

The properties of the new workplace can be defined in this dialog window.

Name

Entry of a name for the new workplace or selection from a list containing the 10 most recently used names.

Entry	**50 characters**

Color

Selection of the color for the title bar of the subwindows and the status icon for the new workplace in the status bar.

Selection	**yellow** | **blue** | **green** | **brown**
Default value	**yellow**

3.2.2 Editing a workplace

Dialog window: **Workplace ► File ► Workplace ► Properties… ► Workplace properties**

The properties of the selected workplace can be defined in this dialog window.

Name

Entry of a name for the selected workplace or selection from a list containing the 10 most recently used names.

Entry	**50 characters**

Color

Selection of the color for the title bar of the subwindows and the status icon for the selected workplace in the status bar.

Selection	**yellow** | **blue** | **green** | **brown**
Default value	**yellow**

3.2.3 Displaying the workplace

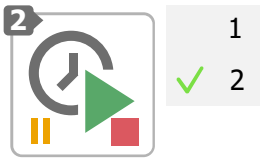
3.2.3.1 Selecting a workplace

Program part: **Workplace**

The number of currently opened workplaces is displayed in the upper left-hand corner of the workplace icon. If two or more workplaces are opened, then you can use the workplace icon to select the two workplaces that can be displayed either next to one another or one above the other in the main window.

One workplace is opened and is displayed in the main window.

Two workplaces are opened. Normally only one workplace is displayed in the main window, but the option exists of displaying two workplaces at once, either next to one another or one above the other.



A menu with the names of the currently opened workplaces is displayed by clicking with either the left or right mouse button on the workplace icon. The workplaces displayed in the main window are then marked with a checkmark. Clicking on the desired workplace will cause it to be displayed in the main window in place of the previously selected one.

3.2.3.2 Displaying an individual workplace

Menu item: **Workplace ► View ► Unsplit**

In the default settings, the most recently opened workplace is displayed by itself in the main window. If the display of two workplaces is activated, then the ⛌ icon or the **View ► Unsplit** menu item can be used to switch back to the display of just one single workplace.

3.2.3.3 Displaying workplaces next to one another

Menu item: **Workplace ► View ► Split vertically**

Two workplaces are displayed next to one another in the main window with the ◫ icon or the **View ► Split vertically** menu item.

3.2.3.4 Displaying workplaces one above the other

Menu item: **Workplace ▶ View ▶ Split horizontally**

Two workplaces are displayed one above the other in the main window with the ⊟ icon or the **View ▶ Split horizontally** menu item.

3.2.4 Closing a workplace

Menu item: **Workplace ▶ File ▶ Workplace ▶ Close**

The selected workplace is closed with this menu item.

3.3 Sample tables

3.3.1 Editing the sample table

3.3.1.1 Creating a new sample table

Dialog window: **Workplace ▶ Tools ▶ Sample table ▶ New... ▶ Sample table 'New sample table'**

A new sample table, which can subsequently be edited, is opened with the icon or the **Tools ▶ Sample table ▶ New...** menu item.

3.3.1.2 Opening the sample table

Dialog window: **Workplace ▶ Tools ▶ Sample table ▶ Open... ▶ Open sample table**

One of the globally available sample tables can be opened with the icon or the **Tools ▶ Sample table ▶ Open...** menu item.

List of sample tables

The list of sample tables contains information about all the saved sample tables. The table cannot be edited. Click on the column title to sort the table according to the selected column in either ascending or descending order.

Name

Name of the sample table.

Saved

Date and time when the sample table was saved.

Saved by

Short name of the user who saved the sample table.

Lines

Number of lines in the sample table.

Comment

Comment on the sample table that was entered on the **Comment** tab as a comment concerning the sample table *(see chapter 3.3.2.6, page 144)*.

Open sample table

Name

Name of the sample table that is to be opened. If a sample table from the table is selected, then the name will be entered automatically in this field. It can, however, also be entered manually.

Entry	**50 characters**

[Open]

Opens the selected sample table.

3.3.1.3 Editing the sample table

Dialog window: **Workplace ► Tools ► Sample table ► Open... ► [Open] ► Sample table 'Name'**

A newly created sample table or one that has been opened can be edited and saved in this dialog window.

Toolbar

Save sample table	Saves the sample table.
Output of PDF file	Outputs the sample table as a PDF file.
Reset sample table	Resets lines that have been processed, i.e., they can be edited again.
Duplicate	Duplicates the selected line(s). The new lines are inserted below the selected range.
Increment	Increments the selected cells automatically.
Filling	Fills the selected cells automatically.
Test sample table	Checks whether all sample data in the sample table is correct.

Sample data table

This table contains the sample data lines that have already been saved in the sample table and a line for entering new data that contains a star instead of a line number. The table cannot be edited or sorted directly.

For the meaning of the columns, see *(see "Sample data", page 137)*.

Window menus

[Edit] contains the following menu items:

Edit line	Edit the selected line.
Insert new line	Inserts a new, empty line above the selected line.
Cut lines	Cuts the selected lines and transfers them to the clipboard.
Copy lines	Copies the selected lines to the clipboard.
Paste lines	Pastes lines from the clipboard above the selected line.
Delete lines	Deletes the selected lines.
Increment	The range that is to be automatically incremented from a column in the table can be selected with the cursor, which takes on the form ✚. In this process, the number standing at the end of the expression will be automatically increased by 1 in the selected cells of a column, starting from the first selected cell. This works with pure numbers as well as with character strings ending with a number (e.g. **ABC10** → **ABC11** → **ABC12**…).
Filling	Fills the selected cells automatically.
Duplicate	Duplicates the selected line(s). The new lines are inserted below the selected range.
Mark lines	Marks the line number of the selected lines with a red background. Before the start of such a line, the corresponding actions defined under **Properties** on the **Process** tab *(see chapter 3.3.2.4, page 140)* will be triggered.
Unmark lines	Removes the line marking for the selected lines.
Set lines inexecutable	Sets the selected lines to "inexecutable", i.e., these lines will not be executed in the run. Such lines are struck through with a red line.
Set lines executable	Sets the selected lines to "executable", i.e., they will be executed in the run.

[Sample table] contains the following menu items:

Save	Saves the current sample table under the same name.
Save as...	Save the current sample table under a new name.
Sample table test...	Checks whether all sample data in the sample table is correct.

Print (PDF)...	Outputs the sample table as a PDF file.
Properties...	Edit the properties of the selected sample table.
Import data...	Import a sample table from a file with the format ***.csv**.
Export data...	Export a sample table to a file with the format ***.csv**.
Reset	Resets lines that have been processed, i.e., they can be edited again.

Moving lines with drag and drop

The lines selected in the sample table can be moved into the working sample table via drag and drop.

Copying lines with drag and drop

The lines selected in the sample table can be copied into the working sample table with drag and drop by pressing the **Ctrl key**.

3.3.1.4 Editing the sample data

Dialog window: **Workplace ► Tools ► Sample table ► Open... ► [Open] ► [Edit] ► Edit line ► Edit line - Sample table 'Name'**

Method

Entry or selection of the method from the current method group with which the determination is to be carried out. The method selection is continuously restricted as the first characters are entered; this allows a quick selection of the required method.

Entry	**50 characters**
Selection	**Method selection**

...

Opens the **Open method** dialog window for the extended method selection. If a method is selected in this window from a method group other than the current one, then this group will henceforth be the current method group for the quick selection of methods in the **Method** field. This button is active only if more than one method group is present.

NOTE

If a method is changed and saved in the method editor or during reprocessing, then the latest method version will be loaded when a new determination is started.

NOTE

The following sample data fields can no longer be edited if they were defined as **Fixed value** in the method *(see chapter 5.3.1, page 383)*.

Ident

Entry of an identification or selection of a defined text template to identify the chromatogram *(see chapter 3.6, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Sample type

Selection of the sample type. **Sample** and **Blank** can always be selected, the remaining types can only be selected if they are defined in the method.

Entry	**64 characters**
Selection	**'empty'** | **Sample** | **Standard 1…n** | **Spiking 1…n** | **Check standard 1…n** | **Blank**
Default value	**'empty'**

Position

Position of the sample on the rack. Input as character string. Enter numbers for sample changers with numerically designated positions. Enter a corresponding character string with letter(s) and number(s) for sample changers with alphanumerically designated positions. The value is used to move to the sample position with the corresponding sample changer command.

Entry	**100 characters**

Injections

Number of injections per sample line. The determinations of this kind of multiple injection are linked statistically with one another.

Input range	**1 to 99** (Increment: **1**)
Default value	**'empty'**

Volume

Volume of the sample in µL.

Input range	**0.01 to 1000000.00 µL**
Default value	**'empty' µL**

Dilution

Dilution factor for the sample.

Input range	**0.000001 to 100,000.000000**
Default value	**'empty'**

Sample amount

The parameter **Sample amount** is a correction factor for taking into account various initial weights for different samples. It indicates the ratio of the initial weight of the current sample to the normal initial weight or to the basic unit. The end result thus achieved is divided by this factor.

- *Example 1*
  Basic initial weight = 2.0 g
  Sample initial weight = 2.1 g
  Sample amount = 2.1 / 2.0 = 1.05
  The result is divided by 1.05 and indicates how high the content is in relation to the defined basic initial weight of 2 g.
- *Example 2*
  Basic unit = 1.0 mg
  Initial sample size = 2.1 mg
  Sample amount = 2.1 / 1.0 = 2.1
  The result is divided by 2.1 and indicates how high the content per mg of sample is.

Input range	**0.00001 to 1000000.00000**
Default value	**'empty'**

Info 1 to Info 4

Entry of additional information about the sample. Text templates can be selected here if they have been defined for this parameter *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Value 1 to Value 4

Input of additional values for the sample.

Input range	**-10^{99} to 10^{99}**
Default value	**'empty'**

Batch name

Selection of the batch to which the determination is to be appended after the run. Entering a name generates a new batch in the database that is specified in the method.

Info

Opens the **Batch info** dialog window *(see chapter 3.7.4, page 157)*.

Navigation

Shows the currently selected line in the sample table with the following functions:

|<

Jump to the first line in the sample table.

<

Jump to the previous line in the sample table.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

>

Jump to the next line in the sample table. If the end of the table has been reached, then a new line will be inserted automatically and the program will jump to it.

The same function can also be triggered by pressing the **[Enter]** key.

>|

Jump to the last line in the sample table.

>*

Jump to a new, empty line.

Display application note

on | off (Default value: **off**)

If this check box is activated, then the application note defined in the method will be displayed during the editing of the sample data.

Functions

[Apply]

Applies the sample data entered in the respective line of the sample table. If the end of the table has been reached, then a new line will be generated automatically. The same function can also be triggered by pressing the **[Enter]** key. The next line will, however, also be highlighted automatically when **[Enter]** is used.

[Close]

Closes the input window. The current sample data will not be applied in the sample table (this needs to be triggered beforehand with **[Apply]**).

3.3.1.5 Duplicating sample data

Dialog window: **Workplace ► Sample table / determination series ► [Edit] ► Duplicate ► Duplicate**

Number

Request to inquire how many times the selected lines are to be duplicated. The new lines are inserted below the selected range.

Input range	**1 to 999**
Default value	**1**

3.3.1.6 Importing sample data

Dialog window: **Workplace ► Sample table / determination series ► [Sample table] ► Import data… ► Select data for import**

You can select a ***.csv** file with the sample data to be imported in this dialog window.

File name

Input or selection of the file that is to be imported.

Selection	**File name**

File type

Selection of the import format for the import of data from a file (only ***.csv** possible).

NOTE

Select the same format for importing and exporting sample data.

If the export format is unknown and characters in the sample table are not displayed correctly, delete the file and re-import it using a different import format.

Selection	***.csv** | ***.csv UTF-16BE** | ***.csv UTF-16LE** | ***.csv UTF-8**
Default value	***.csv**

***.csv**
Format for the import of CSV files with Western European ASCII character sets.

***.csv UTF-16BE**
Format for the import of CSV files with Unicode character sets with UTF-16BE coding.

***.csv UTF-16LE**
Format for the import of CSV files with Unicode character sets with UTF-16LE coding.

***.csv UTF-8**
Format for the import of CSV files with Unicode character sets with UTF-8 coding.

[Open]

The sample data from the selected file is inserted at the end of the sample table.

NOTE

No matter the number of data fields defined on the **Display** tab, the import file must always contain for each line the entirety of the sample data in the format **Method name;Ident;Sample type;Position;Injections;Volume;Dilution;Sample amount**.

3.3.1.7 Exporting sample data

Dialog window: Workplace ► Tools ► Sample table ► Open... ► [Open] ► [Sample table] ► Export data... ► Save file as

Dialog window: Workplace ► Run ► Determination series ► [Sample table] ► Export data... ► Save file as

You can select the file to which the sample data is to be exported in this dialog window.

File name

Entry or selection of the file to which the export is made.

Selection	**File name**

File type

Selection of the export format for the export of data from a file (only ***.csv** possible).

NOTE

Select the same format for importing and exporting sample data.

Selection	***.csv** | ***.csv UTF-16BE** | ***.csv UTF-16LE** | ***.csv UTF-8**
Default value	***.csv**

***.csv**
Format for the export of CSV files with Western European ASCII character sets.

***.csv UTF-16BE**
Format for the export of CSV files with Unicode character sets with UTF-16BE coding.

***.csv UTF-16LE**
Format for the export of CSV files with Unicode character sets with UTF-16LE coding.

***.csv UTF-8**
Format for the export of CSV files with Unicode character sets with UTF-8 coding.

[Save]

The sample data is written to the export file.

3.3.1.8 Sample table test

Dialog window: **Workplace ► Sample table / determination series ► [Sample table] ► Sample table test... ► Sample table test - 'Sample table name'**

The sample table test is carried out with the **[Sample table] ► Sample table test...** menu item or the icon. This opens the **Sample table test - 'Sample table name'** dialog window, in which information pertaining to the test is displayed.

NOTE

The **Sample table test** only checks whether all sample data is correct (as opposed to the **Run test** *(see chapter 3.7.2, page 155)*, which also checks the required hardware).

Line

Display of the line number of the currently tested sample data line.

Status displays

One of the following status displays appears below the line number:

Selection	**Sample table running...** | **Sample table stopped manually** | **Sample table test finished without errors** | **Sample table test finished with errors**

Sample table running...
This display appears while the test is running. In addition, a progress bar appears. The test can be canceled by clicking on [x] next to the progress bar.

Sample table stopped manually
This display appears if the user has manually canceled the sample table test.

Sample table test finished without errors
This display appears at the end of a sample table test that has been completed without an error.

Sample table test finished with errors
This display appears if an error has occurred during the sample table test. The errors that have occurred are listed in the **Test report** field.

Test report

Shows the errors that have occurred during the sample table test together with the line number.

3.3.1.9 Saving a sample table

Dialog window: **Workplace ► Sample table / determination series ► [Sample table] ► Save as... ► Save sample table**

A name for the working sample table to be saved can be entered or selected in this dialog window.

List of sample tables

The list of sample tables contains information about all the saved sample tables.

Name

Name of the sample table.

Saved

Date and time when the sample table was saved.

Saved by

Short name of the user who saved the sample table.

Lines

Number of lines in the sample table.

Comment

Comment on the sample table that was entered on the **Comment** tab as a comment concerning the sample table *(see chapter 3.3.2.6, page 144)*.

Saving the sample table

Name

Entry of the name under which the sample table is to be saved.

NOTE

The name of the sample table must be unique throughout the entire client/server system.

Entry	**50 characters**

[Save]

Saves the sample table under the required name.

3.3.1.10 Print sample table (PDF)

Dialog window: **Workplace ► Sample table / determination series ► [Sample table] ► Print (PDF)... ► Print sample table (PDF)**

The output format for the PDF output can be selected in this dialog window.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Portrait
Output in portrait format.

Landscape
Output in landscape format.

3.3.2 Sample table - Properties

3.3.2.1 Properties - Overview

Dialog window: **Workplace ► Tools ► Sample table ► New... ► [Sample table ► Properties... ► Properties - Sample table 'Name'**

The properties for a sample table are set on the following tabs:

- *Properties - Display*
  Definition of the columns that are to be displayed in the sample table.
- *Properties - Edit*
  Options for editing the sample table in the **Sample table** and **Edit line** dialog windows.
- *Properties - Process*
  Options for processing the working sample table on the **Determination series** tab.

- *Properties - Data import*
  Activating/deactivating the import of external data for sample table fields.
- *Properties - Comment*
  Entry of a comment on the sample table.

3.3.2.2 Properties - Display

Tab: **Workplace ► Tools ► Sample table ► New... ► [Sample table] ► Properties... ► Display**

Tab: **Workplace ► Run ► Determination series ► [Sample table] ► Properties... ► Display**

Definition of the controls and columns that are to be displayed in the sample table.

Sample data

Ident

on | off (Default value: **on**)

Activating/deactivating the display of the **Ident** column in the sample table.

Sample type

on | off (Default value: **on**)

Activating/deactivating the display of the **Sample type** column in the sample table.

Position

on | off (Default value: **on**)

Activating/deactivating the display of the **Position** column in the sample table.

Injections

on | off (Default value: **on**)

Activating/deactivating the display of the **Injections** column in the sample table.

Volume

on | off (Default value: **on**)

Activating/deactivating the display of the **Volume** column in the sample table.

Dilution

on | off (Default value: **on**)

Activating/deactivating the display of the **Dilution** column in the sample table.

Sample amount

on | off (Default value: **on**)

Activating/deactivating the display of the **Sample amount** column in the sample table.

Info 1 to Info 4

on | off (Default value: **off**)

Activating/deactivating the display of the **Info 1** to **Info 4** columns in the sample table. **Info 1** to **Info 4** can be given individual names. These names are not dependent on the method.

Value 1 to Value 4

on | off (Default value: **off**)

Activating/deactivating the display of the **Value 1** to **Value 4** columns in the sample table. **Value 1** to **Value 4** can be given individual names. These names are not dependent on the method.

Batch name

on | off (Default value: **on**)

Activating/deactivating the display of the **Batch name** column in the sample table.

3.3.2.3 Properties - Edit

Tab: **Workplace ► Tools ► Sample table ► New... ► [Sample table] ► Properties... ► Edit**

Tab: **Workplace ► Run ► Determination series ► [Sample table] ► Properties... ► Edit**

Options for the editing of the sample table.

Accept data with

on | off (Default value: **off**)

Selection of the data field that must be filled for the automatic import of data via barcode reader or file in order for the data of the line to be applied to the sample data storage and to move on to the next line. If the relevant column is empty, then additional imported data will be written into the same line.

NOTE

This option has no relevance when data is entered manually.

Selection	**Method** | **Ident** | **Volume** | **Sample amount** | **Info 1** | **Info 2** | **Info 3** | **Info 4** | **Value 1** | **Value 2** | **Value 3** | **Value 4**
Default value	**Method**

Lock editing in working sample table

on | off (Default value: **off**)

If this check box is activated, then the editing of lines in the sample table loaded in the working sample table is locked.

Lock editing of the next line in the working sample table

If this check box is activated, then the editing of the sample data line following the current line is blocked in the working sample table.

Copy automatically into next line

Method

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Ident

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Sample type

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Sample position + 1

on | off (Default value: **on**)

If this check box is activated, then the content of this field will automatically be incremented by **+1** when a new sample data line is created.

Injections

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Volume

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Dilution

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Sample amount

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Info 1 to Info 4

on | off (Default value: **off**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Value 1 to Value 4

on | off (Default value: **off**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Batch name

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

3.3.2.4 Properties - Process

Dialog window: **Workplace ► Tools ► Sample table ► New… ► Sample table 'Name' ► [Sample table] ► Properties… ► Properties - Sample table 'Name'**

Dialog window: **Workplace ► Run ► Determination series ► Properties run window ► Properties - Determination series**

Options for processing the working sample table in the workplace window on the **Determination series** tab.

Delete processed lines

on | off (Default value: **off**)

If this option is activated, then lines in the working sample table which have already been processed completely will be deleted automatically.

Method selection with assignment ID

on | off (Default value: **off**)

If this option is activated, then the selected sample identification will be used for the method selection in the working sample table. This identification receives the designation **Assignment ID**, which can then no longer be changed; if this ID matches one of the Assignment IDs from the sample assignment table *(see chapter 3.5.1, page 151)*, then the respective method will be loaded.

Selection	**Ident** | **Info 1** | **Info 2** | **Info 3** | **Info 4** | **Value 1** | **Value 2** | **Value 3** | **Value 4**
Default value	**Ident**

Request assignment ID

on | off (Default value: **off**)

If this option is activated, the **Assignment ID** will be queried immediately after the start of the determination.

Actions for marked sample table lines

Selection	**Pause series ([Pause]) and show message** | **Stop series ([Stop])**
Default value	**Pause series ([Pause]) and show message**

Pause series ([Pause]) and show message
If this option is selected, then the series is interrupted before the start of the marked line (equivalent to [Pause]). At the same time a message will appear which also contains the text defined in the message box.

Stop series ([Stop])
If this option is selected, then the series is stopped before the start of the marked line (equivalent to [Stop]).

T

Starts the text editor, with which the message can be entered and edited.

3.3.2.5 Properties - Data import

Dialog window: Workplace ▶ Tools ▶ Sample table ▶ New… ▶ [Sample table] ▶ Properties… ▶ Properties - Sample table 'Name'

Dialog window: Workplace ▶ Run ▶ Determination series ▶ Properties Run window ▶ Properties - Determination series

Activating/deactivating the import of external data for sample table fields.

NOTE

The successful completion of the data import is indicated during the run by an acoustic signal (beep).

Import from a barcode reader

on | off (Default value: **off**)

If this option is activated, then external data from the selected barcode reading device will be imported into the opened sample table. The device properties of the barcode reader will define the field into which that data is imported *(see chapter 7.28.4, page 1619)*.

Barcode reader

Selection of the barcode reader from which data is to be imported.

Selection	**Device name**
Selection	**Always accept data** | **Accept data only for active window**
Default value	**Always accept data**

Always accept data
If this option is selected, then the data sent from the barcode reader is imported into the open sample table for which this barcode reader is defined as data source.

Accept data only for active window
If this option is selected, then the data sent from the barcode reader is only imported into the open sample table if this is actively selected (i.e. when the focus is on the window).

Import from a file

on | off (Default value: **off**)

If this option is activated, then external data from a file (e.g. via LIMS) will be imported into a sample table. When this is the case, a check is made to determine whether the specified import file is available when the sample

table is opened, when the sample table is loaded into the working sample table and also periodically (every 10 s) when the sample table is open (although not when the dialog window **Edit line** is open). If the import file is available, then the data from this file is automatically inserted at the end of the sample table. The import file is deleted after each import.

NOTE

No matter the number of data fields defined on the **Display** tab, the import file must always contain for each line the entirety of the sample data in the format **Method name;Ident;Sample type;Position;Injections;Volume;Dilution;Sample amount**.

Import file

File that is to be imported. With ... the file can be selected in the **Select files for import** dialog window.

Entry	**File name**

Import format

Selection of the import format for the import of data from a file.

NOTE

For an update of **MagIC Net 4.0 or earlier to MagIC Net 4.1 or higher**:

If the import format ***.csv (Unicode)** was defined, define a new default import format in the new MagIC Net version.

Select the same format for importing and exporting sample data.

If the export format is unknown and characters in the sample table are not displayed correctly, delete the file and re-import it using a different import format.

Selection	***.csv** | ***.csv UTF-16BE** | ***.csv UTF-16LE** | ***.csv UTF-8**
Default value	***.csv**

***.csv**
Format for the import of CSV files with Western European ASCII character sets.

***.csv UTF-16BE**
Format for the import of CSV files with Unicode character sets with UTF-16BE coding.

***.csv UTF-16LE**
Format for the import of CSV files with Unicode character sets with UTF-16LE coding.

***.csv UTF-8**
Format for the import of CSV files with Unicode character sets with UTF-8 coding.

3.3.2.6 Properties - Comment

Dialog window: **Workplace ► Tools ► Sample table ► New... ► [Sample table] ► Properties... ► Properties - Sample table 'Name'**

Dialog window: **Workplace ► Run ► Determination series ► Properties run window ► Properties - Determination series**

Entry of a comment on the sample table.

Comment on sample table

Entry of a comment on the sample table. This comment will be displayed in the column of the same name in the **Open sample table** and **Sample table manager** dialog windows.

Entry	**1,000 characters**

3.3.3 Sample table manager

3.3.3.1 Sample table manager

Dialog window: **Workplace ► Tools ► Sample table ► Manage... ► Manage sample tables**

The saved sample tables can be managed with the icon or the **Tools ► Sample table ► Manage...** menu item.

List of sample tables

The list of sample tables contains information about all the saved sample tables. The table cannot be edited. Click on the column title to sort the table according to the selected column in either ascending or descending order.

Name

Name of the sample table.

Saved

Date and time when the sample table was saved.

Saved by

Short name of the user who saved the sample table.

Lines

Number of lines in the sample table.

Comment

Comment on the sample table that was entered on the **Comment** tab as a comment concerning the sample table *(see chapter 3.3.2.6, page 144)*.

Window menus

The **[Edit]** menu below the list of sample tables contains the following menu items:

Rename…	Rename the selected sample table *(see chapter 3.3.3.2, page 145)*.
Copy	Copies the selected sample table(s) *(see chapter 3.3.3.3, page 145)*.
Delete…	Deletes the selected sample table(s) *(see chapter 3.3.3.4, page 146)*.
Export…	Exports the selected sample table(s) in the ***.mstab** file format *(see chapter 3.3.3.5, page 146)*.
Import…	Import sample table(s) from ***.mstab** file(s) *(see chapter 3.3.3.6, page 146)*.

3.3.3.2 Renaming sample table

Dialog window: **Workplace ▶ Tools ▶ Sample table ▶ Manage… ▶ [Edit] ▶ Rename… ▶ Rename sample table**

The selected sample table can be renamed in this dialog window.

Renaming sample table 'Name' to

Entry of the new name for the sample table.

NOTE

The name of the sample table must be unique throughout the entire client/server system.

Entry	**50 characters**

3.3.3.3 Copying sample table

Menu item: **Workplace ▶ Tools ▶ Sample table ▶ Manage… ▶ [Edit] ▶ Copy**

The selected sample tables are copied under the name **Copy of 'Name'** with the **[Edit] ▶ Copy** menu item in the **Manage sample tables** dialog window.

3.3.3.4 Deleting a sample table

Menu item: **Workplace ▶ Tools ▶ Sample table ▶ Manage… ▶ [Edit] ▶ Delete…**

The selected sample tables are deleted with the **[Edit] ▶ Delete...** menu item in the **Manage sample tables** dialog window.

3.3.3.5 Exporting a sample table

Dialog window: **Workplace ▶ Tools ▶ Sample table ▶ Manage… ▶ [Edit] ▶ Export… ▶ Select directory for export**

The **Select directory for export** dialog window, in which the directory for the export must be selected, is opened with the **[Edit] ▶ Export...** menu item. The selected sample table is exported into a file with the name **'Name'.mstab**.

3.3.3.6 Importing a sample table

Dialog window: **Workplace ▶ Tools ▶ Sample table ▶ Manage… ▶ [Edit] ▶ Import… ▶ Select files to import**

The **Select files to import** dialog window, in which the sample table (file format ***.mstab**) to be imported needs to be selected, is opened with the **[Edit] ▶ Import...** menu item.

3.3.3.7 Renaming imported sample table

Renaming imported sample table 'Name' to

Entry of the new name for the sample table.

NOTE

The name of the sample table must be unique throughout the entire client/server system.

Entry	**50 characters**

3.4 Timer

3.4.1 Timer - General

Dialog window: **Workplace ► Tools ► Timer... ► Timer**

With the **Tools ► Timer...** menu item or the icon ⏲, the window **Timer** opens, in which one-time or recurrent tasks can be defined which are to be carried out automatically at a particular time.

The ⏲ icon in the status bar indicates that a timer has been defined. The remaining run-time is given in the format **hh:mm**. This means that at **00:00** the next automatically executed action will start after a maximum of 59 s. The tooltip contains the date, the time and the action.

Timer table

The timer table shows all the defined tasks and cannot itself be edited directly. The first tasks to appear in the table are the recurrent ones, which are sorted according to day of the week and time of day. These are followed by one-time tasks sorted according to date/time.

Date/Day

Display of the date on which the action is to be performed.

Time

Display of the time at which the action is to be performed.

Action

Display of the action which is to be performed.

Parameters

Display of the parameters or method for the action.

Active

Displays whether the action is active or not.

Menu items

Activating the **[Edit]** button or clicking on the right-hand mouse button opens the following menu for editing the timer table:

New Task ►	
Single Task	Create a new single task *(see chapter 3.4, page 147)*.
Recurrent Task	Create a new recurrent task *(see chapter 3.4.3, page 149)*.

Edit	Edit the selected single task *(see chapter 3.4.2, page 148)* or recurrent task *(see chapter 3.4.3, page 149)*.
Active ►	
On	Sets the selected task to **Active**.
Off	Sets the selected task to **Not active**.
Invert selection	Sets all active tasks to **Not active** and all non-active tasks to **Active**.

3.4.2 Edit single task

Dialog window: **Workplace ► Tools ► Timer... ► Timer ► [Edit] ► Edit ► Edit single task**

Activating the **[Edit] ► New task ► Single task** or **[Edit] ► Edit** menu item opens the **Edit single task** window, in which a new single task or one selected from those in the table can be edited.

Active task

on | off (Default value: **on**)

If this option is activated, then the action is activated for the workplace.

Date

Date on which the task is to be carried out. This date can be selected by clicking on … in the **Select date** dialog window.

Time

Moment in hours and minutes at which the task is to be carried out.

Input range	**00:00 to 23:59**

Action

Action that is to be started automatically.

Selection	**Start equilibration** | **Start sample table** | **Stop devices** | **Option "Stop hardware when sample table is finished"**

Start equilibration
The equilibration for the active workplace is started with the method selected under **Parameters**.

Start sample table
The selected sample table is loaded and started on the active workplace.

Stop devices
The devices defined under **Parameters** are stopped.

Option "Stop hardware when sample table is finished"
The check box for stopping the hardware when the sample table is finished is enabled for the determination series in the workplace.

Parameters

Method

Selection of the method to be loaded for the equilibration. With ..., the **Select method** window opens for extended method selection. This parameter appears only for **Action** = **Start equilibration**.

Selection	**Methods from method groups**

Sample table

Selection of the sample table that is to be loaded. This parameter appear only for **Action** = **Start sample table**.

Selection	**Sample tables**

Devices

Selection of the devices that are to be stopped. This parameter appears only for **Action** = **Stop devices**.

Selection	**Devices of the method** | **All devices**

Devices of the method
Only the devices of the method loaded will be stopped.

All devices
All devices are stopped.

Option Stop hardware

Selection whether the option is activated or deactivated. This parameter appears only when **Action** = **Option "Stop hardware when sample table is finished"**.

Selection	**activate** | **disable**

3.4.3 Edit recurrent task

Dialog: **Workplace ► Tools ► Timer... ► Timer ► [Edit] ► Edit ► Edit recurrent task**

Activating the menu item **[Edit] ► New Task ► Recurrent Task** or **[Edit] ► Edit** opens the window **Edit recurrent task**, in which a new recurrent task or one selected from those in the table can be edited.

Active task

on | off (Default value: **on**)

If this option is activated, then the action is activated for the workplace.

Day

Selection of the day of the week on which the task is to be carried out.

Time

Moment in hours and minutes at which the task is to be carried out.

Input range	**00:00 to 23:59**

Action

Action that is to be started automatically.

Selection	**Start equilibration** | **Start sample table** | **Stop devices** | **Option "Stop hardware when sample table is finished"**

Start equilibration
The equilibration for the active workplace is started with the method selected under **Parameters**.

Start sample table
The selected sample table is loaded and started on the active workplace.

Stop devices
The devices defined under **Parameters** are stopped.

Option "Stop hardware when sample table is finished"
The check box for stopping the hardware when the sample table is finished is activated for the determination series in the workplace.

Parameters

Method

Selection of the method to be loaded for the equilibration. With ..., the **Select method** window opens for extended method selection. This parameter appears only for **Action** = **Start equilibration**.

Selection	**Methods from method groups**

Sample table

Selection of the sample table that is to be loaded. This parameter appear only for **Action** = **Start sample table**.

Selection	**Sample tables**

Devices

Selection of the devices that are to be stopped. This parameter appears only for **Action** = **Stop devices**.

Selection	**Devices of the method** | **All devices**

Devices of the method
Only the devices of the method loaded will be stopped.

All devices
All devices are stopped.

Option Stop hardware

Selection whether the option is activated or deactivated. This parameter appears only when **Action** = **Option "Stop hardware when sample table is finished"**.

Selection	**activate** | **deactivate**

3.5 Sample assignment table

3.5.1 Sample assignment table

Dialog window: **Workplace ► Tools ► Sample assignment table... ► Sample assignment table**

The **Sample assignment table** causes the samples to be processed automatically with the **correct method**. A particular method is assigned to a sample identification (**assignment ID**). In order for this to work, the **Method selection by assignment ID** option must be activated on the **Process** tab in the properties of the **Single determination** or **Determination series** and a sample identification must be selected as assignment ID. As soon as an **assignment ID** has been recognized during the processing of sample data, the respective method will be loaded automatically. The **Method** field can then no longer be edited and is grayed out.

NOTE

The sample assignment table is valid for all open workplaces and is saved per client.

The overview table shows all defined assignment IDs and cannot itself be directly edited. The table can be sorted according to the selected column in ascending or descending order by clicking on the column title **Assignment ID** or **Method**.

Assignment ID

Identification on the basis of which the method is assigned.

Method

Method that is loaded for the assignment ID.

[New]

Adds a new sample assignment.

[Properties]

Edit the selected sample assignment.

[Delete]

Deletes the selected sample assignment.

3.5.2 Sample assignment

Dialog window: **Workplace ► Tools ► Sample assignment table... ► [New] / [Properties] ► Sample assignment**

Assignment ID

Entry of an identification on the basis of which the method is assigned or selection of a defined text template *(see chapter 3.6.1, page 153)*. The assignment ID can contain any alphanumerical characters or wildcards (*****). No assignment ID can occur more than once; however, several different assignment IDs can assign the same method.

Entry	**50 characters**
Selection	**Selection of text templates**

NOTE

The ***** character itself must be generated with ******. It can represent any number of characters. No identical pattern may be used when entering patterns. If a character string matches several patterns, then the first matching pattern in the table will be used.

Method

Selection of the method in the current method group *(see chapter 5.5.2.2, page 401)*. If one remains in this field with the cursor, then the name of the current method group will appear as the **Group: 'Group name'** tooltip in the event that other groups exist besides the main group.

Selection	**Method selection**

...

Opens the **Open method** dialog window for the extended method selection. If a method is selected in this window from a method group other than the current one, then this group will henceforth be the current method group for the quick selection of methods in the **Method** field.

This button is active only if more than one method group is present.

3.5.3 Sample assignment request

Dialog window: Workplace ► Sample assignment

Assignment ID

Request of an assignment ID on the basis of which the method is assigned or selection of a defined text template *(see chapter 3.6.1, page 153)*.

Entry	**50 characters**
Selection	**Selection of text templates**

3.6 Text templates

3.6.1 List of text templates

Dialog window: **Workplace ► Tools ► Text templates... ► Text templates**

Text templates can be defined for the fields **Ident**, **Info 1 - 4** and **Remark**. These templates can then be applied on the **Single determination** tab, in the **Sample table** and in the **Working sample table** when these fields are entered. The text templates are saved for each client.

Text templates for

Selection of the field for which text templates are to be defined.

Selection	**Ident** | **Info 1** | **Info 2** | **Info 3** | **Info 4** | **Remarks**
Default value	**Ident**

List of text templates

All text templates defined for the selected field are shown in the list of text templates. The table cannot be edited. The table can be sorted in either ascending or descending order by clicking on the **Text** column title.

Text

Shows the text templates defined for the selected field.

[New]

Adds a new text template *(see chapter 3.6.2, page 154)*.

[Properties]

Edit the selected text template *(see chapter 3.6.2, page 154)*.

[Delete]

Deletes the selected text template.

3.6.2 Editing a text template

Dialog window: **Workplace ▶ Tools ▶ Text templates... ▶ Text templates ▶ [New] / [Properties] ▶ Text templates**

Text templates can be edited in the **Text templates** dialog window.

Text

Text template entry.

Entry	**100 characters**

3.7 Subwindow Run

3.7.1 Run - General

Subwindow: **Workplace**

Run subwindow

The **Run** subwindow contains the controls for controlling method runs and for administering sample data. It is always displayed in the **Workplace** program part, i.e., it cannot be removed from the workplace view. The subwindow can be enlarged and reduced as required; it can also be maximized.

Tabs

The **Run** subwindow consists of the following three tabs:

- *Equilibration*
  Control of equilibration.
- *Single determination*
  Control of single determinations.
- *Determination series*
  Control of determination series.

NOTE

If a run has been started on the **Single determination** tab (**Status** = **BUSY**), then the **Determination series** tab is no longer accessible (disabled). The same holds true for the **Single determination** tab in the event that a run has started on the **Determination series** tab.

3.7.2 Run test

Menu item: **Workplace ▶ Tools ▶ Run test**

NOTE

As opposed to the **Sample table test**, which checks only whether all sample data is correct, the **Run test** also checks the required hardware.

Single determination

With the **Tools ▶ Run test** menu item or the ✓ icon, the start test is carried out for the selected method. The workplace must have the status **READY** for this.

The **Run test - 'Workplace name' - Single determination** dialog window, in which information on the test is shown, opens during the run test.

Method

Display of the method for the single determination.

Determination series

The start test is carried out with the **Tools ▶ Run test** or **[Sample table] ▶ Run test…** menu items or the ✓ icon. The workplace must have the status **READY** for this.

The **Run test - 'Workplace name' - Determination series** dialog window, in which information on the test is shown, opens during the run test.

Line

Display of the line number of the currently tested sample data line for the determination series.

Status displays

One of the following status displays appears below the line number:

Selection	**Run test running… | Run test error | Run test finished without errors**

Run test running…
This display appears while the test is running. In addition, a progress bar appears. The test can be canceled by clicking on [x] next to the progress bar.

Run test error
This display appears if an error has occurred during the run test. In a determination series, the user can determine on the basis of the indicated line number to which line the error message appearing with the error and being displayed in the usual message window belongs.

Run test finished without errors
This display appears at the end of a run test that has been completed without an error.

3.7.3 Equilibration

Tab: **Workplace ► Run ► Equilibration**

NOTE

The **Equilibration** tab is enabled only when no determination is running in the **Single determination** or in the **Determination series**.

The following controls and parameters are located on the **Equilibration** tab:

Start HW

Start hardware (shortcut: **Ctrl G**)

Sends all basic parameters of the loaded **Method** to the hardware and starts it. If the start can be triggered, then the button is green, otherwise light gray.

Stop HW

Stop hardware (shortcut: **Ctrl S**)

Stops the hardware of the loaded method.

Method

Entry or selection of the method from the current method group with which the equilibration is to be carried out.

Entry	**50 characters**
Selection	**Method selection**

...

Opens the **Open method** dialog window for the extended method selection. If a method is selected in this window from a method group other than the current one, then this group will henceforth be the current method group for the quick selection of methods in the **Method** field. This button is active only if more than one method group is present.

NOTE

If a method is changed and saved in the method editor or during reprocessing, then the latest method version will be loaded when a new equilibration is started.

Working in parallel on several workplace

If work is done in parallel on two or more workplaces with different methods using the same sample changer, then the equilibration may be started on a different workplace on which determinations are already running. During equilibration, the sample changer and the devices connected to it that are used in a determination are ignored.

3.7.4 Single determination

3.7.4.1 Single determination - Overview

Tab: **Workplace ► Run ► Single determination**

Parameters and sample data for single determinations can be edited and run functions can be triggered on the **Single determination** tab. It contains the following elements and functions:

- *Single determination - Controls*
  Buttons for starting, stopping, interrupting and resuming determinations.
- *Single determination - Status display*
  Shows the current status of the workplace.
- *Single determination - Sample data*
  Entry of method and sample identification for the next determination.
- *Single determination - Properties*
  Definition of the properties for the **Single determination** tab.

3.7.4.2 Single determination - Controls

Tab: **Workplace ► Run ► Single determination**

The following controls are located on the **Single determination** tab:

Start

Start single determination (shortcut: **Ctrl G**)

The button is disabled as soon as the determination begins running. If the start can be triggered, it is green, otherwise light gray.

Stop

Stop single determination (shortcut: **Ctrl S**)

The button is enabled as soon as the determination begins running. If the stop can be triggered, it is red, otherwise light gray.

Combustion IC system

When **[Stop]** is triggered

- during preparation of a sample (e.g. the washing procedure), the determination is canceled.
- while a quartz boat is inserted or a sample is injected, the determination is canceled.
- during combustion, the determination is canceled. The combustion is completed.
- during post-combustion, the determination is canceled. The post-combustion is completed.
- during the cool-down period, the determination is canceled.

3.7.4.3 Single determination - Status display

Tab: **Workplace ► Run ► Single determination**

The current status of the workplace is displayed on the **Single determination** tab:

Status

Selection	**READY** | **BUSY** | **ERROR**

READY
Ready for the start of a determination.

BUSY
Determination is running.

ERROR
Error.

3.7.4.4 Single determination - Sample data

Tab: **Workplace ► Run ► Single determination**

Method

Entry or selection of the method from the current method group with which the determination is to be carried out. The method selection is continuously restricted as the first characters are entered; this allows a quick selection of the required method.

Entry	**50 characters**
Selection	**Method selection**

Opens the **Open method** dialog window for the extended method selection. If a method is selected in this window from a method group other than the current one, then this group will henceforth be the current

method group for the quick selection of methods in the **Method** field. This button is active only if more than one method group is present.

NOTE

If a method is changed and saved in the method editor or during reprocessing, then the latest method version will be loaded when a new determination is started.

NOTE

The following sample data fields can no longer be edited if they were defined as **Fixed value** in the method *(see chapter 5.3.1, page 383)*.

Remark

Freely definable remark on the determination, which is saved together with the determination. Predetermined text templates may also be selected instead of a manual entry *(see chapter 3.6.1, page 153)*.

NOTE

The **Remark** field can be changed live also when determinations are in progress. The **Live modification** dialog window is opened with the context-sensitive **Modify remark** menu item *(see chapter 3.7.4.6, page 162)*.

Entry	**100 characters**

Ident

Entry of an identification or selection of a defined text template to identify the chromatogram *(see chapter 3.6, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Sample type

Selection of the sample type. **Sample** and **Blank** can always be selected, the remaining types can only be selected if they are defined in the method.

Entry	**64 characters**
Selection	**'empty'** | **Sample** | **Standard 1…n** | **Spiking 1…n** | **Check standard 1…n** | **Blank**
Default value	**'empty'**

Position

Position of the sample on the rack. Input as character string. Enter numbers for sample changers with numerically designated positions. Enter a corresponding character string with letter(s) and number(s) for sample changers with alphanumerically designated positions. The value is used to move to the sample position with the corresponding sample changer command.

Entry	**100 characters**

Volume

Volume of the sample in µL.

Input range	**0.01 to 1000000.00 µL**
Default value	**'empty' µL**

Dilution

Dilution factor for the sample.

Input range	**0.000001 to 100,000.000000**
Default value	**'empty'**

Sample amount

The parameter **Sample amount** is a correction factor for taking into account various initial weights for different samples. It indicates the ratio of the initial weight of the current sample to the normal initial weight or to the basic unit. The end result thus achieved is divided by this factor.

- *Example 1*
  Basic initial weight = 2.0 g
  Sample initial weight = 2.1 g
  Sample amount = 2.1 / 2.0 = 1.05
  The result is divided by 1.05 and indicates how high the content is in relation to the defined basic initial weight of 2 g.
- *Example 2*
  Basic unit = 1.0 mg
  Initial sample size = 2.1 mg
  Sample amount = 2.1 / 1.0 = 2.1
  The result is divided by 2.1 and indicates how high the content per mg of sample is.

Input range	**0.00001 to 1000000.00000**
Default value	**'empty'**

Info 1 to Info 4

Entry of additional information about the sample. Text templates can be selected here if they have been defined for this parameter *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Value 1 to Value 4

Input of additional values for the sample.

Input range	**-10^{99} to 10^{99}**
Default value	**'empty'**

Batch name

Selection of the batch to which the determination is to be appended after the run. Entering a name generates a new batch in the database that is specified in the method.

Info

Opens the **Batch info** dialog window *(see chapter 3.7.4, page 157)*.

NOTE

Ident, **Volume**, **Dilution**, **Sample amount**, **Info 1** to **Info 4**, **Value 1** to **Value 4** and **Batch name** can be modified live for a running determination *(see chapter 3.7.4.7, page 162)*. Generally, no formula input is possible in these fields.

3.7.4.5 Batch info

Dialog window: **Workplace ▶ Run ▶ Single determination ▶ [About] ▶ Batch info**

The batch table contains information about the selected batch. The table cannot be edited. Click on the column title (database name, batch name) to sort the table according to the selected column in either ascending or descending order.

Batch table

Name database

Name of the database that contains the selected batch.

Batch name

Name of the batch.

Number of determinations

Indicates the number of determinations appended to the batch and the maximum possible number of determinations in a batch. A batch can include a maximum of 500 determinations.

NOTE

When determinations are deleted, the indication of the number of determinations appended to the batch will not be refreshed.

3.7.4.6 Changing a remark

Dialog window: **Workplace ▶ Run ▶ Single determination ▶ Modify remark ▶ Live modifications**

The **Live modifications** dialog window, in which the remark can be modified during an ongoing determination, opens with the context-sensitive **Modify remark** menu item.

Remark

Freely definable remark on the determination, which is saved together with the determination. Predetermined text templates may also be selected instead of a manual entry *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**

3.7.4.7 Live modification

Dialog window: **Workplace ▶ Run ▶ Single determination ▶ Live modifications ▶ Live modifications**

Certain sample data can be modified live in this dialog window while a determination is running.

Ident

Entry of an identification or selection of a defined text template to identify the chromatogram *(see chapter 3.6, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Volume

Volume of the sample in µL.

Input range	**0.01 to 1000000.00 µL**
Default value	**'empty' µL**

Dilution

Dilution factor for the sample.

Input range	**0.000001 to 100,000.000000**
Default value	**'empty'**

Sample amount

The parameter **Sample amount** is a correction factor for taking into account various initial weights for different samples. It indicates the ratio of the initial weight of the current sample to the normal initial weight or to the basic unit. The end result thus achieved is divided by this factor.

- *Example 1*
  Basic initial weight = 2.0 g
  Sample initial weight = 2.1 g
  Sample amount = 2.1 / 2.0 = 1.05
  The result is divided by 1.05 and indicates how high the content is in relation to the defined basic initial weight of 2 g.
- *Example 2*
  Basic unit = 1.0 mg
  Initial sample size = 2.1 mg
  Sample amount = 2.1 / 1.0 = 2.1
  The result is divided by 2.1 and indicates how high the content per mg of sample is.

Input range	**0.00001 to 1000000.00000**
Default value	**'empty'**

Info 1 to Info 4

Entry of additional information about the sample. Text templates can be selected here if they have been defined for this parameter *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Value 1 to Value 4

Input of additional values for the sample.

Input range	**-10^{99} to 10^{99}**
Default value	**'empty'**

Batch name

Selection of the batch to which the determination is to be appended after the run. Entering a name generates a new batch in the database that is specified in the method.

Info

Opens the **Batch info** dialog window *(see chapter 3.7.4, page 157)*.

NOTE

Generally, no formula input is possible in these fields.

If the **Comment on modification of sample data (live)** option is enabled in the security settings, then a reason and a comment must be entered for the modification before saving *(see chapter 6.2.2.4, page 552)*.

3.7.4.8 Single determination - Determination run

Tab: **Workplace ► Run ► Single determination**

A determination that is started on the **Single determination** tab in the **Run** subwindow proceeds as follows:

1 - Loading the sample data

The sample data entered for the determination is loaded.

2 - Method selection

The following actions are triggered during method selection:

- **Method selection without assignment ID**
  The method selected in the **Method** field is loaded.
- **Method selection with assignment ID**
  If the option **Method selection by assignment ID** is activated on the **Process** tab in the properties of the single determination *(see chapter 3.7.4.9, page 166)*, then the method defined in the sample assignment table will be loaded *(see chapter 3.5, page 151)*.

3 - Start test

The following checks and actions are triggered during the start test:

- **Permission to carry out the method?**
  Check whether the logged-in user has the permission to carry out the required method *(see chapter 5.5.2.3, page 402)*.
- **Method runnable?**
  Check whether the requested method is runnable. In the case of non-runnable methods, a prompt will appear asking to carry out the method check and to modify the method accordingly *(see chapter 5.2.5, page 376)*.
- **Hardware available?**
  Check whether the hardware defined in the device list of the loaded method (devices, modules, columns, solutions, etc.) is present and available.
- **Method settings OK?**
  Check whether the method settings (e.g. pump head-dependent parameters) are appropriate for the ready-for-use hardware.

NOTE

In the status **READY**, the start test can also be triggered manually with the ✓ icon or the **Tools ► Run test** or **[Sample table] ► Run test...** menu items. In addition, the sample data test will also be carried out afterwards.

4 - Sample data test

The following checks and actions are triggered during the sample data test:

- **Checking the fixed values**
  Check whether the sample data entered corresponds to the **fixed values** defined in the properties of the method *(see chapter 5.3.1, page 383)*.
- **Checking the sample data**
  Check whether the sample data is monitored in the method and whether the entered values lie within the defined limits.

5 - Determination run

The following actions are triggered when the loaded method is being processed:

- **Start determination**
  The start parameters defined in the method are sent to the devices (or their modules) and the devices are started.
- **Assigning determination ID**
  A unique determination ID is assigned for the determination.
- **Reserving instruments (or instrument modules)**
  The instruments or their functional units used in the method are reserved for the duration of the determination, i.e. they can neither be used on other workplaces nor operated manually outside the workplace.
- **Processing the time program**
  After the start of the determination the status changes to **BUSY**. The commands of the time program are processed consecutively. An ongoing determination can be canceled at any time with **[Stop]**. If an error occurs during an ongoing determination, then the determination will be ended.
- **Evaluating the determination**
  The determination is evaluated with the evaluation parameters of the method.
- **Finishing the determination**
  After the end of the determination, the status changes to **READY**. The reserved instruments (or their modules) are unlocked again.

3.7.4.9 Single determination - Properties

3.7.4.9.1 Properties - Overview

Dialog window: **Workplace ► Run ► Single determination ► Properties run window ► Properties - Single determination**

The properties for the **Single determination** tab are set on the following tabs:

- *Process*
  Options for the processing of single determinations.
- *Data import*
  Activating/deactivating the import of external data for fields on the **Single determination** tab.

3.7.4.9.2 Properties - Process

Tab: **Workplace ► Run ► Single determination ► Properties run window ► Properties - Single determination ► Process**

Options for the processing of single determinations.

Method selection with assignment ID

on | off (Default value: **off**)

If this option is activated, then the selected sample identification will be used for the method selection in the working sample table. This identification receives the designation **Assignment ID**, which can then no longer be changed; if this ID matches one of the Assignment IDs from the sample assignment table *(see chapter 3.5.1, page 151)*, then the respective method will be loaded.

Selection	**Ident** | **Info 1** | **Info 2** | **Info 3** | **Info 4** | **Value 1** | **Value 2** | **Value 3** | **Value 4**
Default value	**Ident**

Request assignment ID

on | off (Default value: **off**)

If this option is activated, the **Assignment ID** will be queried immediately after the start of the determination.

Autorepeat determination

on | off (Default value: **off**)

If this option is activated, then the next determination is automatically started with the same method after a determination has been finished. In order to stop the automatic repetition, the determination has to be stopped with **[Stop]**.

3.7.4.9.3 Properties - Data import

Tab: **Workplace ► Run ► Single determination ► Properties run window ► Properties - Single determination ► Data import**

Activating/deactivating the import of external data for fields on the **Single determination** tab.

NOTE

The successful completion of the data import is indicated during the run by an acoustic signal (beep).

Import from a barcode reader

on | off (Default value: **off**)

If this option is activated, then external data is imported from the selected barcode reader into the fields on the **Single determination** tab. The device properties of the barcode reader will define the field into which that data is imported *(see chapter 7.28.4, page 1619)*.

Barcode reader

Selection of the barcode reader from which data is to be imported.

Selection	**Device name**
Selection	**Always accept data** | **Accept data only for active window**
Default value	**Always accept data**

Always accept data
If this option is selected, then the data sent from the barcode reader is imported into all **Single determination** tabs of the open workplaces for which this barcode reader is defined as data source.

Accept data only for active window
If this option is selected, then the data sent from the barcode reader will be imported only into the **Single determination** tab of the workplace which is actively selected.

3.7.4.10 Modification comment on sample data

Dialog window: Workplace ► Run ► Single determination ► Live modifications ► Live modifications ► Modification comment sample data

Dialog window: Workplace ► Run ► Determination series ► [Edit] ► Edit line ► Edit line - Working sample table - Workplace 'Name' ► Modification comment sample data

If the **Comment on modification of sample data (live)** option is enabled in the security settings, then this dialog window is opened before saving. A reason and a comment for the modification must be entered here *(see chapter 6.2.2.4, page 552)*.

Reason

Selection from the default reasons defined in the security settings for the **Modification of sample data** category *(see chapter 6.2.2.6, page 554)*.

Selection	**Selection from default texts**

Comment

Entry of a comment on the modification of the sample data.

Entry	**1,000 characters**

3.7.5 Determination series

3.7.5.1 Determination series - Overview

Tab: **Workplace ► Run ► Determination series**

Parameters and sample data for determination series can be edited and run functions can be triggered on the **Determination series** tab in the **Run** subwindow. It contains the following elements and functions:

- *Controls*
  Buttons for starting, stopping, interrupting and resuming determinations and series.
- *Status display*
  Shows the current status of the workplace.
- *Sample data*
  Entry of sample data for the next determinations.
- *Properties*
  Definition of the properties for the **Determination series** tab.

3.7.5.2 Determination series - Controls

Tab: **Workplace ► Run ► Determination series**

The following controls are located on the **Determination series** tab:

Start series (shortcut: **Ctrl G**)

Start of the first determination of a sample series. The button is disabled as soon as the first determination begins running. If the start can be triggered, it is green, otherwise light gray.

Stop series (shortcut: **Ctrl S**)

Immediate stop of the ongoing determination of a sample series. The button is enabled as soon as the first determination begins running. If the stop can be triggered, it is red, otherwise light gray.

Pause

Interrupt series

With this button, the ongoing determination of a sample series will still be completed, but no new determination will be started. The button is enabled as soon as the first determination begins running. If the function can be triggered, it is yellow, otherwise light gray. When **[Pause]** is pressed, this button will be replaced in the display by **[Cont]**.

Cont

Continue series

Starts the next determination of the interrupted sample series. The button is only present in the status **PAUSE** (series interrupted). Pressing **[Cont]** will cause this button to be replaced again in the display by **[Pause]**.

Combustion IC system

When **[Stop]** is triggered

- during preparation of a sample (e.g. the washing procedure), the determination is canceled.
- while a quartz boat is inserted or a sample is injected, the determination is canceled.
- during combustion, the determination is canceled. The combustion is completed.
- during post-combustion, the determination is canceled. The post-combustion is completed.
- during the cool-down period, the determination is canceled.

3.7.5.3 Determination series - Status display

Tab: **Workplace ► Run ► Determination series**

The current status of the workplace is displayed on the **Determination series** tab:

Status

Selection	**READY** | **BUSY** | **PAUSE** | **ERROR**

READY
Ready for the start of a determination.

BUSY
Determination is running.

PAUSE
Series is interrupted.

ERROR
Error.

3.7.5.4 Determination series - Sample data

Tab: **Workplace ► Run ► Determination series**

Remark

Freely definable remark on the determination, which is saved together with the determination. Predetermined text templates may also be selected instead of a manual entry *(see chapter 3.6.1, page 153)*.

NOTE

The **Remark** field can be changed live also when determinations are in progress. The **Live modification** dialog window is opened with the context-sensitive **Modify remark** menu item *(see chapter 3.7.4.6, page 162)*.

Entry	**100 characters**

The current working sample table, which contains the sample data for determination series in tabular form, is displayed under **Sample data**. Each line corresponds to a single determination.

This table contains the sample data lines that have already been saved in the sample table and a line for entering new data that contains a star instead of a line number. The table cannot be edited or sorted directly.

For the meaning of the columns, *see (see chapter 3.7.4.4, page 158)*.

The lines in the working sample table can exhibit different **background colors**:

- **Light gray background**
  Processed line. Data in this line can no longer be modified. These lines only appear if the option **Delete processed lines** is disabled on the **Process** tab *(see chapter 3.3.2.4, page 140)*.
- **Dark gray background**
  Selected, already processed line.
- **Light orange background**
  Currently running line.
- **Dark orange background**
  Selected line currently running. If sample data is modified after the start of the determination (in the status **BUSY**), then this is considered a live modification.
- **White background**
  Lines that have not yet been processed. These lines can be edited.

- **Yellow background**
  Selected line not yet processed.

Loaded

Shows the sample table whose data has been loaded into the working sample table. If no sample table has been loaded or if all lines have been deleted, then this field is empty. If data for a loaded sample table is modified retroactively or expanded to include new lines, then the term **(modified)** will be added to the display of the name.

Stop hardware when sample table is finished

on | off (Default value: **on**)

If this check box is activated, then the hardware will be stopped automatically after the sample table has been run.

The default setting, **active**, only applies for a new workplace. If this setting is changed, then this will be saved when the workplace is closed.

Toolbar

Save sample table	Saves the sample table.
Output of PDF file	Outputs the sample table as a PDF file.
Reset sample table	Resets lines that have been processed, i.e., they can be edited again.
Duplicate	Duplicates the selected line(s). The new lines are inserted below the selected range.
Increment	Increments the selected cells automatically.
Filling	Fills the selected cells automatically.
Test sample table	Checks whether all sample data in the sample table is correct.

Window menus

[Edit] contains the following menu items:

Edit line	Edit the selected line.
Insert new line	Inserts a new, empty line above the selected line.
Cut lines	Cuts the selected lines and transfers them to the clipboard.

Copy lines	Copies the selected lines to the clipboard.
Paste lines	Pastes lines from the clipboard above the selected line.
Delete lines	Deletes the selected lines.
Increment	The range that is to be automatically incremented from a column in the table can be selected with the cursor, which takes on the form ✚. In this process, the number standing at the end of the expression will be automatically increased by 1 in the selected cells of a column, starting from the first selected cell. This works not only with pure numbers but also with text expressions ending with a number (e.g. **ABC10** → **ABC11** → **ABC12**…).
Filling	Fills the selected cells automatically.
Duplicate	Duplicates the selected line(s). The new lines are inserted below the selected range.
Mark lines	Marks the line number of the selected lines with a red background. Before the start of such a line, the corresponding actions defined under **Properties** on the **Process** *(see chapter 3.3.2.4, page 140)* tab will be triggered.
Unmark lines	Removes the line marking for the selected lines.
Set lines inexecutable	Sets the selected lines to "inexecutable", i.e., these lines will not be executed in the run. Such lines are struck through with a red line.
Set lines executable	Sets the selected lines to "executable", i.e., they will be executed in the run.

[Sample table] contains the following menu items:

New	Loads a new, empty sample table.
Load...	Loads the saved sample table into the working sample table.
Save	Saves the current sample table under the same name.
Save as...	Save the current sample table under a new name.
Sample table test...	Checks whether all sample data in the working sample table is correct.
Run test...	Carry out the run test for the lines in the working sample table *(see chapter 3.7.2, page 155)*.
Print (PDF)...	Outputs the working sample table as PDF file.

Properties...	Set the properties of the working sample table.
Import data...	Import a sample table from a file with the format ***.csv**.
Export data...	Export a sample table to a file with the format ***.csv**.
Reset	Resets lines that have been processed, i.e., they can be edited again.

Moving lines with drag and drop

The lines selected in the working sample table can be moved to an opened sample table via drag and drop.

Copying lines with drag and drop

The lines selected in the working sample table can be copied to an opened sample table with drag and drop by pressing the **Ctrl key**.

3.7.5.5 Changing a remark

Dialog window: **Workplace ► Run ► Single determination ► Modify remark ► Live modifications**

The **Live modifications** dialog window, in which the remark can be modified during an ongoing determination, opens with the context-sensitive **Modify remark** menu item.

Remark

Freely definable remark on the determination, which is saved together with the determination. Predetermined text templates may also be selected instead of a manual entry *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**

3.7.5.6 Determination series - Determination run

Tab: **Workplace ► Run ► Determination series**

In the case of a series of determinations that is started on the **Determination series** tab in the **Run** subwindow, each determination proceeds as follows:

1 - Loading the sample data

The sample data for the determination entered on the current line in the **working sample table** will be loaded.

2 - Method selection

The following actions are triggered during method selection:

- **Method selection without assignment ID**
  The method selected in the **Method** column is loaded.

- **Method selection with assignment ID**
  If the option **Method selection by assignment ID** is activated on the **Process** tab in the properties of the determination series *(see chapter 3.3.2.4, page 140)*, then the method defined in the sample assignment table will be loaded *(see chapter 3.5, page 151)*.

3 - Start test

The following checks and actions are triggered during the start test:

- **Permission to carry out the method?**
  Check whether the logged-in user has the permission to carry out the required method *(see chapter 5.5.2.3, page 402)*.
- **Method runnable?**
  Check whether the requested method is runnable. In the case of non-runnable methods, a prompt will appear asking to carry out the method check and to modify the method accordingly *(see chapter 5.2.5, page 376)*.
- **Hardware available?**
  Check whether the hardware defined in the device list of the loaded method (devices, modules, columns, solutions, etc.) is present and available.
- **Method settings OK?**
  Check whether the method settings (e.g. pump head-dependent parameters) are appropriate for the ready-for-use hardware.

NOTE

In the status **READY**, the start test can also be triggered manually with the ✓ icon or the **Tools ► Run test** or **[Sample table] ► Run test...** menu items. In addition, the sample data test will also be carried out afterwards.

4 - Starting the hardware

- **Reserve devices**
  The instruments or their functional units used in the method are reserved for the duration of the determination, i.e. they can neither be used on other workplaces nor operated manually.
- **Send start parameters to devices**
  The start parameters defined in the method are sent to the devices (or their modules) and the devices are started.

5 - Sample data test

The following checks and actions are triggered during the sample data test:

- **Checking the fixed values**
  Check whether the sample data entered corresponds to the **fixed values** defined in the properties of the method *(see chapter 5.3.1, page 383)*.
- **Checking the sample data**
  Check whether the sample data is monitored in the method and whether the entered values lie within the defined limits.

NOTE

In the status **READY**, the sample table can also be checked manually using the icon or the **[Sample table] ► Sample table test...** menu item.

6 - Determination run

The following actions are triggered when the loaded method is being processed:

- **Start determination**
  The determination is started and issued a unique determination ID. After the start of the determination, the status changes to **BUSY**.
- **Processing the time program**
  The commands of the time program are processed consecutively. An ongoing determination can be canceled at any time with **[Stop]**. If an error occurs during an ongoing determination, then the determination will be ended. If you click on **[Pause]**, the ongoing determination of a sample series will be completed but no new determination will be started. The next determination of the interrupted sample series can be started with **[Cont]**.
- **Evaluating the determination**
  The determination is evaluated with the evaluation parameters of the method.
- **Finishing the determination**
  After the end of the determination, the reserved instruments (or their modules) are unlocked again and the next determination is started. In this situation, two cases are distinguished:
  - The same sample line is processed again as part of a multiple determination, in which case the run starts at **Point 3**.
  - The next sample line is processed; the run starts at **Point 1** again.

  When the last determination has finished, the status changes to **READY**.

NOTE

If the option **Stop hardware when sample table is finished** is activated, then the hardware will be stopped automatically after the sample table run.

3.7.5.7 Working sample table

3.7.5.7.1 Loading a new sample table

Menu item: **Workplace ► Run ► Determination series ► [Sample table] ► New**

A new, empty sample table is loaded as working sample table with the **[Sample table] ► New** menu item on the **Determination series** tab, i.e. all existing sample table lines will be deleted.

3.7.5.7.2 Loading a sample table

Dialog window: **Workplace ► Run ► Determination series ► [Sample table] ► Loading... ► Load sample table**

One of the globally available sample tables can be selected in this dialog window for loading as a working sample table.

List of sample tables

The list of sample tables contains information about all the saved sample tables. The table cannot be edited. Click on the column title to sort the table according to the selected column in either ascending or descending order.

Name

Name of the sample table.

Saved

Date and time when the sample table was saved.

Saved by

Short name of the user who saved the sample table.

Lines

Number of lines in the sample table.

Comment

Comment on the sample table that was entered on the **Comment** tab as a comment concerning the sample table *(see chapter 3.3.2.6, page 144)*.

Load sample table

Name

Name of the sample table that is to be loaded. If a sample table from the table is selected, then the name will be entered automatically in this field. It can, however, also be entered manually.

Entry	**50 characters**

[Load]

Loads the data of the selected sample table into the working sample table. In addition, all properties of the sample table, with the exception of the settings for **Import form file** and **Import format**, are applied for the working sample table.

3.7.5.7.3 Editing sample data

Menu item: **Workplace ► Run ► Determination series ► [Edit] ► Edit line ► Edit line - Working sample table - Workplace 'Name'**

The fields in this dialog window exhibit the same background colors as the lines in the working sample table:

- **Light gray background**
  Line that is already processed and whose data can no longer be modified.
- **Orange background**
  Currently running line. If sample data is modified after the start of the determination (in the status **BUSY**), then this is considered a live modification.
- **White background**
  Line that has not yet been processed and that can still be edited.

NOTE

Generally, no formula input is possible in the fields of this dialog window.

Method

Entry or selection of the method from the current method group with which the determination is to be carried out. The method selection is continuously restricted as the first characters are entered; this allows a quick selection of the required method.

Entry	**50 characters**
Selection	**Method selection**

...

Opens the **Open method** dialog window for the extended method selection. If a method is selected in this window from a method group other than the current one, then this group will henceforth be the current method group for the quick selection of methods in the **Method** field. This button is active only if more than one method group is present.

NOTE

If a method is changed and saved in the method editor or during reprocessing, then the latest method version will be loaded when a new determination is started.

Ident

Entry of an identification or selection of a defined text template to identify the chromatogram *(see chapter 3.6, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Sample type

Selection of the sample type. **Sample** and **Blank** can always be selected, the remaining types can only be selected if they are defined in the method.

Entry	**64 characters**
Selection	**'empty'** | **Sample** | **Standard 1…n** | **Spiking 1…n** | **Check standard 1…n** | **Blank**
Default value	**'empty'**

Sample position

Position of the sample on the rack. This number is used to approach the sample position with the command **Move**. For this, the **Sample position** option must be set for the parameter **Move** under **Target**.

Input range	**1 to 999** (Increment: **1**)
Default value	**'empty'**

Injections

Number of injections per sample line. The determinations of this kind of multiple injection are linked statistically with one another.

Input range	**1 to 99** (Increment: **1**)
Default value	**'empty'**

Volume

Volume of the sample in µL.

Input range	**0.01 to 1000000.00 µL**
Default value	**'empty' µL**

Dilution

Dilution factor for the sample.

Input range	**0.000001 to 100,000.000000**
Default value	**'empty'**

Sample amount

The parameter **Sample amount** is a correction factor for taking into account various initial weights for different samples. It indicates the ratio of the initial weight of the current sample to the normal initial weight or to the basic unit. The end result thus achieved is divided by this factor.

- *Example 1*
  Basic initial weight = 2.0 g
  Sample initial weight = 2.1 g
  Sample amount = 2.1 / 2.0 = 1.05
  The result is divided by 1.05 and indicates how high the content is in relation to the defined basic initial weight of 2 g.
- *Example 2*
  Basic unit = 1.0 mg
  Initial sample size = 2.1 mg
  Sample amount = 2.1 / 1.0 = 2.1
  The result is divided by 2.1 and indicates how high the content per mg of sample is.

Input range	**0.00001 to 1000000.00000**
Default value	**'empty'**

Info 1 to Info 4

Entry of additional information about the sample. Text templates can be selected here if they have been defined for this parameter *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Value 1 to Value 4

Input of additional values for the sample.

Input range	**-10^{99} to 10^{99}**
Default value	**'empty'**

Batch name

Selection of the batch to which the determination is to be appended after the run. Entering a name generates a new batch in the database that is specified in the method.

Info

Opens the **Batch info** dialog window *(see chapter 3.7.4, page 157)*.

NOTE

If data from the current sample data line is modified for the ongoing determination, then this is regarded as a live modification. If the **Comment on modification of sample data (live)** option is enabled in the security settings, then a reason and a comment must be entered for the modification before saving *(see chapter 6.2.2.4, page 552)*.

Navigation

Shows the currently selected line in the working sample table with the following functions:

|<

Jump to the first line in the working sample table.

<

Jump to the previous line in the working sample table.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

>

Jump to the next line in the working sample table. If the end of the table has been reached, then a new line will be inserted automatically and the program will jump to it.

>|

Jump to the last line in the working sample table.

>*

Jump to a new, empty line.

Functions

[Apply]

Applies the sample data entered in the respective line of the working sample table. If the end of the table has been reached, then a new line will be generated automatically. The same function can also be triggered by pressing the **[Enter]** key. The next line will, however, also be highlighted automatically when **[Enter]** is used.

[Close]

Closes the input window. The current sample data will not be applied in the working sample table (this needs to be triggered beforehand with **[Apply]**).

3.7.5.7.4 Duplicating sample data

Dialog window: **Workplace ► Sample table / determination series ► [Edit] ► Duplicate ► Duplicate**

Number

Request to inquire how many times the selected lines are to be duplicated. The new lines are inserted below the selected range.

Input range	**1 to 999**
Default value	**1**

3.7.5.7.5 Importing sample data

Dialog window: **Workplace ► Sample table / determination series ► [Sample table] ► Import data… ► Select data for import**

You can select a ***.csv** file with the sample data to be imported in this dialog window.

File name

Input or selection of the file that is to be imported.

Selection	**File name**

File type

Selection of the import format for the import of data from a file (only ***.csv** possible).

NOTE

Select the same format for importing and exporting sample data.

If the export format is unknown and characters in the sample table are not displayed correctly, delete the file and re-import it using a different import format.

Selection	***.csv** | ***.csv UTF-16BE** | ***.csv UTF-16LE** | ***.csv UTF-8**
Default value	***.csv**

***.csv**
Format for the import of CSV files with Western European ASCII character sets.

***.csv UTF-16BE**
Format for the import of CSV files with Unicode character sets with UTF-16BE coding.

***.csv UTF-16LE**
Format for the import of CSV files with Unicode character sets with UTF-16LE coding.

***.csv UTF-8**
Format for the import of CSV files with Unicode character sets with UTF-8 coding.

[Open]

The sample data from the selected file is inserted at the end of the sample table.

NOTE

No matter the number of data fields defined on the **Display** tab, the import file must always contain for each line the entirety of the sample data in the format **Method name;Ident;Sample type;Position;Injections;Volume;Dilution;Sample amount**.

3.7.5.7.6 Sample table test

Dialog window: **Workplace ► Sample table / determination series ► [Sample table] ► Sample table test... ► Sample table test - 'Sample table name'**

The sample table test is carried out with the **[Sample table] ► Sample table test...** menu item or the icon. This opens the **Sample table test - 'Sample table name'** dialog window, in which information pertaining to the test is displayed.

NOTE

The **Sample table test** only checks whether all sample data is correct (as opposed to the **Run test** *(see chapter 3.7.2, page 155)*, which also checks the required hardware).

Line

Display of the line number of the currently tested sample data line.

Status displays

One of the following status displays appears below the line number:

Selection	**Sample table running... | Sample table stopped manually | Sample table test finished without errors | Sample table test finished with errors**

Sample table running...
This display appears while the test is running. In addition, a progress bar appears. The test can be canceled by clicking on [x] next to the progress bar.

Sample table stopped manually
This display appears if the user has manually canceled the sample table test.

Sample table test finished without errors
This display appears at the end of a sample table test that has been completed without an error.

Sample table test finished with errors
This display appears if an error has occurred during the sample table test. The errors that have occurred are listed in the **Test report** field.

Test report

Shows the errors that have occurred during the sample table test together with the line number.

3.7.5.7.7 Saving a sample table

Dialog window: **Workplace ► Sample table / determination series ► [Sample table] ► Save as… ► Save sample table**

A name for the working sample table to be saved can be entered or selected in this dialog window.

List of sample tables

The list of sample tables contains information about all the saved sample tables.

Name

Name of the sample table.

Saved

Date and time when the sample table was saved.

Saved by

Short name of the user who saved the sample table.

Lines

Number of lines in the sample table.

Comment

Comment on the sample table that was entered on the **Comment** tab as a comment concerning the sample table *(see chapter 3.3.2.6, page 144)*.

Saving the sample table

Name

Entry of the name under which the sample table is to be saved.

NOTE

The name of the sample table must be unique throughout the entire client/server system.

Entry	**50 characters**

[Save]

Saves the sample table under the required name.

3.7.5.7.8 Run test

Menu item: **Workplace ▶ Tools ▶ Run test**

NOTE

As opposed to the **Sample table test**, which checks only whether all sample data is correct, the **Run test** also checks the required hardware.

Single determination

With the **Tools ▶ Run test** menu item or the ✓ icon, the start test is carried out for the selected method. The workplace must have the status **READY** for this.

The **Run test - 'Workplace name' - Single determination** dialog window, in which information on the test is shown, opens during the run test.

Method

Display of the method for the single determination.

Determination series

The start test is carried out with the **Tools ▶ Run test** or **[Sample table] ▶ Run test…** menu items or the ✓ icon. The workplace must have the status **READY** for this.

The **Run test - 'Workplace name' - Determination series** dialog window, in which information on the test is shown, opens during the run test.

Line

Display of the line number of the currently tested sample data line for the determination series.

Status displays

One of the following status displays appears below the line number:

Selection	**Run test running… | Run test error | Run test finished without errors**

Run test running…
This display appears while the test is running. In addition, a progress bar appears. The test can be canceled by clicking on [x] next to the progress bar.

Run test error
This display appears if an error has occurred during the run test. In a determination series, the user can determine on the basis of the indicated line number to which line the error message appearing with the error and being displayed in the usual message window belongs.

Run test finished without errors
This display appears at the end of a run test that has been completed without an error.

3.7.5.7.9 Print sample table (PDF)

Dialog window: **Workplace ▶ Sample table / determination series ▶ [Sample table] ▶ Print (PDF)… ▶ Print sample table (PDF)**

The output format for the PDF output can be selected in this dialog window.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Portrait
Output in portrait format.

Landscape
Output in landscape format.

3.7.5.8 Determination series - Properties

3.7.5.8.1 Properties - Overview

Dialog window: **Workplace ▶ Run ▶ Determination series ▶ [Sample table] ▶ Properties... ▶ Properties - Determination series**

Dialog window: **Workplace ▶ View ▶ Properties ▶ Properties Run window ▶ Properties - Determination series**

The properties for the **Properties - Determination series** tab are set on the following tabs:

- *Display*
  Definition of the columns that are to be displayed in the working sample table.
- *Edit*
  Options for editing the working sample table on the **Determination series** tab and in the **Edit line** dialog window.
- *Process*
  Options for processing the working sample table on the **Determination series** tab.
- *Data import*
  Activating/deactivating the import of external data for working sample table fields.
- *Comment*
  Entry of a comment on the working sample table.

3.7.5.8.2 Properties - Display

Tab: **Workplace ▶ Tools ▶ Sample table ▶ New... ▶ [Sample table] ▶ Properties... ▶ Display**

Tab: **Workplace ▶ Run ▶ Determination series ▶ [Sample table] ▶ Properties... ▶ Display**

Definition of the controls and columns that are to be displayed in the sample table.

Sample data

Ident

on | off (Default value: **on**)

Activating/deactivating the display of the **Ident** column in the sample table.

Sample type

on | off (Default value: **on**)

Activating/deactivating the display of the **Sample type** column in the sample table.

Position

on | off (Default value: **on**)

Activating/deactivating the display of the **Position** column in the sample table.

Injections

on | off (Default value: **on**)

Activating/deactivating the display of the **Injections** column in the sample table.

Volume

on | off (Default value: **on**)

Activating/deactivating the display of the **Volume** column in the sample table.

Dilution

on | off (Default value: **on**)

Activating/deactivating the display of the **Dilution** column in the sample table.

Sample amount

on | off (Default value: **on**)

Activating/deactivating the display of the **Sample amount** column in the sample table.

Info 1 to Info 4

on | off (Default value: **off**)

Activating/deactivating the display of the **Info 1** to **Info 4** columns in the sample table. **Info 1** to **Info 4** can be given individual names. These names are not dependent on the method.

Value 1 to Value 4

on | off (Default value: **off**)

Activating/deactivating the display of the **Value 1** to **Value 4** columns in the sample table. **Value 1** to **Value 4** can be given individual names. These names are not dependent on the method.

Batch name

on | off (Default value: **on**)

Activating/deactivating the display of the **Batch name** column in the sample table.

3.7.5.8.3 Properties - Edit

Tab: **Workplace ▶ Tools ▶ Sample table ▶ New... ▶ [Sample table] ▶ Properties... ▶ Edit**

Tab: **Workplace ▶ Run ▶ Determination series ▶ [Sample table] ▶ Properties... ▶ Edit**

Options for the editing of the sample table.

Accept data with

on | off (Default value: **off**)

Selection of the data field that must be filled for the automatic import of data via barcode reader or file in order for the data of the line to be applied to the sample data storage and to move on to the next line. If the relevant column is empty, then additional imported data will be written into the same line.

NOTE

This option has no relevance when data is entered manually.

Selection	**Method** | **Ident** | **Volume** | **Sample amount** | **Info 1** | **Info 2** | **Info 3** | **Info 4** | **Value 1** | **Value 2** | **Value 3** | **Value 4**
Default value	**Method**

Lock editing in working sample table

on | off (Default value: **off**)

If this check box is activated, then the editing of lines in the sample table loaded in the working sample table is locked.

Lock editing of the next line in the working sample table

If this check box is activated, then the editing of the sample data line following the current line is blocked in the working sample table.

Copy automatically into next line

Method

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Ident

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Sample type

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Sample position + 1

on | off (Default value: **on**)

If this check box is activated, then the content of this field will automatically be incremented by **+1** when a new sample data line is created.

Injections

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Volume

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Dilution

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Sample amount

on | off (Default value: **on**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Info 1 to Info 4

on | off (Default value: **off**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Value 1 to Value 4

on | off (Default value: **off**)

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

Batch name

If this check box is activated, then this field will automatically be filled with the content of the previous line when a new sample data line is created.

3.7.5.8.4 Properties - Process

Dialog window: **Workplace ► Tools ► Sample table ► New... ► Sample table 'Name' ► [Sample table] ► Properties... ► Properties - Sample table 'Name'**

Dialog window: **Workplace ► Run ► Determination series ► Properties run window ► Properties - Determination series**

Options for processing the working sample table in the workplace window on the **Determination series** tab.

Delete processed lines

on | off (Default value: **off**)

If this option is activated, then lines in the working sample table which have already been processed completely will be deleted automatically.

Method selection with assignment ID

on | off (Default value: **off**)

If this option is activated, then the selected sample identification will be used for the method selection in the working sample table. This identification receives the designation **Assignment ID**, which can then no longer be changed; if this ID matches one of the Assignment IDs from the sample assignment table *(see chapter 3.5.1, page 151)*, then the respective method will be loaded.

Selection	**Ident** | **Info 1** | **Info 2** | **Info 3** | **Info 4** | **Value 1** | **Value 2** | **Value 3** | **Value 4**
Default value	**Ident**

Request assignment ID

on | off (Default value: **off**)

If this option is activated, the **Assignment ID** will be queried immediately after the start of the determination.

Actions for marked sample table lines

Selection	**Pause series ([Pause]) and show message** | **Stop series ([Stop])**
Default value	**Pause series ([Pause]) and show message**

Pause series ([Pause]) and show message
If this option is selected, then the series is interrupted before the start of the marked line (equivalent to [Pause]). At the same time a message will appear which also contains the text defined in the message box.

Stop series ([Stop])
If this option is selected, then the series is stopped before the start of the marked line (equivalent to [Stop]).

T

Starts the text editor, with which the message can be entered and edited.

3.7.5.8.5 Properties - Data import

Dialog window: Workplace ▶ Tools ▶ Sample table ▶ New… ▶ [Sample table] ▶ Properties… ▶ Properties - Sample table 'Name'

Dialog window: Workplace ▶ Run ▶ Determination series ▶ Properties Run window ▶ Properties - Determination series

Activating/deactivating the import of external data for sample table fields.

NOTE

The successful completion of the data import is indicated during the run by an acoustic signal (beep).

Import from a barcode reader

on | off (Default value: **off**)

If this option is activated, then external data from the selected barcode reading device will be imported into the opened sample table. The device

properties of the barcode reader will define the field into which that data is imported *(see chapter 7.28.4, page 1619)*.

Barcode reader

Selection of the barcode reader from which data is to be imported.

Selection	**Device name**

Selection	**Always accept data** | **Accept data only for active window**
Default value	**Always accept data**

Always accept data
If this option is selected, then the data sent from the barcode reader is imported into the open sample table for which this barcode reader is defined as data source.

Accept data only for active window
If this option is selected, then the data sent from the barcode reader is only imported into the open sample table if this is actively selected (i.e. when the focus is on the window).

Import from a file

on | off (Default value: **off**)

If this option is activated, then external data from a file (e.g. via LIMS) will be imported into a sample table. When this is the case, a check is made to determine whether the specified import file is available when the sample table is opened, when the sample table is loaded into the working sample table and also periodically (every 10 s) when the sample table is open (although not when the dialog window **Edit line** is open). If the import file is available, then the data from this file is automatically inserted at the end of the sample table. The import file is deleted after each import.

NOTE

No matter the number of data fields defined on the **Display** tab, the import file must always contain for each line the entirety of the sample data in the format **Method name;Ident;Sample type;Position;Injections;Volume;Dilution;Sample amount**.

Import file

File that is to be imported. With … the file can be selected in the **Select files for import** dialog window.

Entry	**File name**

Import format

Selection of the import format for the import of data from a file.

NOTE

For an update of **MagIC Net 4.0 or earlier to MagIC Net 4.1 or higher**:

If the import format ***.csv (Unicode)** was defined, define a new default import format in the new MagIC Net version.

Select the same format for importing and exporting sample data.

If the export format is unknown and characters in the sample table are not displayed correctly, delete the file and re-import it using a different import format.

Selection	***.csv** | ***.csv UTF-16BE** | ***.csv UTF-16LE** | ***.csv UTF-8**
Default value	***.csv**

***.csv**
Format for the import of CSV files with Western European ASCII character sets.

***.csv UTF-16BE**
Format for the import of CSV files with Unicode character sets with UTF-16BE coding.

***.csv UTF-16LE**
Format for the import of CSV files with Unicode character sets with UTF-16LE coding.

***.csv UTF-8**
Format for the import of CSV files with Unicode character sets with UTF-8 coding.

3.7.5.8.6 Properties - Comment

Dialog window: **Workplace ▶ Tools ▶ Sample table ▶ New… ▶ [Sample table] ▶ Properties… ▶ Properties - Sample table 'Name'**

Dialog window: **Workplace ▶ Run ▶ Determination series ▶ Properties run window ▶ Properties - Determination series**

Entry of a comment on the sample table.

Comment on sample table

Entry of a comment on the sample table. This comment will be displayed in the column of the same name in the **Open sample table** and **Sample table manager** dialog windows.

Entry	**1,000 characters**

3.7.5.9 Modification comment on sample data

Dialog window: Workplace ► Run ► Single determination ► Live modifications ► Live modifications ► Modification comment sample data

Dialog window: Workplace ► Run ► Determination series ► [Edit] ► Edit line ► Edit line - Working sample table - Workplace 'Name' ► Modification comment sample data

If the **Comment on modification of sample data (live)** option is enabled in the security settings, then this dialog window is opened before saving. A reason and a comment for the modification must be entered here *(see chapter 6.2.2.4, page 552)*.

Reason

Selection from the default reasons defined in the security settings for the **Modification of sample data** category *(see chapter 6.2.2.6, page 554)*.

Selection	**Selection from default texts**

Comment

Entry of a comment on the modification of the sample data.

Entry	**1,000 characters**

3.8 Live display subwindow

3.8.1 Live display - General

Subwindow: **Workplace ► Live display**

Live display subwindow

Chromatograms of analyses of the ongoing determination are displayed in the two subwindows **Live display 1** and **Live display 2**. The subwindows can be activated in the **Workplace** program part during the definition of the layout and thus made visible *(see chapter 3.1.7.2, page 121)*. They can be enlarged and reduced as required, and they can also be maximized.

Tabs

The subwindows **Live display 1** and **Live display 2** are comprised of the following tabs:

- *Analyses*
  A tab labeled with the name of the analysis is displayed for each analysis.

- *Application note*
  Shows the application note defined in the method properties.

3.8.2 Live display - Analyses

Tab: **Workplace ► Live display ► 'Analysis name'**

A tab labeled with the name of the analysis is displayed in the **Live display** subwindow for each analysis defined in the method. Here the measuring signal of this analysis is displayed live while the determination is running.

Current measured value

Shows the current measured value on the x axis (time) and the y axis (measured value).

Cursor

Shows the current position of the cursor on the x axis (time) and the y axis (measured value).

[Evaluate]

Triggers the evaluation of the ongoing chromatogram during recording. The measuring point list recorded at this time is evaluated with the current method parameters (including parameters that were modified live). This evaluation is temporary and serves only to visualize the initial results during recording. When recording is completed, it will be discarded and a final evaluation of the chromatogram will be made.

[Evaluation parameters]

Opens the **Live modifications - Evaluation** dialog window, in which the evaluation parameters of the method can be modified live *(see chapter 3.8.3, page 196)*.

[Recording time]

Opens the **Change recording time** dialog window, in which the recording time can be modified live *(see chapter 3.8.4, page 196)*.

The additional functions and properties of the subwindows **Live display 1** and **Live display 2** are described in the *Graphics window* chapter in the following subchapters:

- *Elements*
- *Chromatogram view*
- *Zooming*
- *Move curve*
- *Work with cursor*
- *Set Zoom*
- *Properties*
- *Change calibration*
- *Select color*

3.8.3 Live display - Modifying evaluation parameters

Dialog window: **Workplace ► Live display ► 'Analysis name' ► [Evaluation parameters] ► Live modifications – Evaluation**

The **[Evaluation parameters]** function opens the **Live modifications - Evaluation** dialog window, in which the evaluation parameters of the method can be modified live.

The dialog window is identical with the **Evaluation** window in the method *(see chapter 5.8, page 441)*; however, not all functions and parameters can be modified live.

NOTE

The modifications apply only to the current determination. If all subsequent determinations of this method are also to be carried out with the modified settings, then the method has to be saved again using the **File ► Method ► Save** menu item.

3.8.4 Live display - Changing the recording time

Dialog window: **Workplace ► Live display ► 'Analysis name' ► [Recording time] ►**

The **[Recording time]** function opens the **Change recording time** dialog window, in which the recording time for the chromatogram can be changed.

Time

Input range	**0.5 to 1,000.0 min**

NOTE

Only the recording time of the current analysis is prolonged. If the recording time is to be prolonged also for all subsequent recordings of the analysis, then the method has to be saved again using the **File ► Method ► Save** menu item.

3.8.5 Live display - Application note

Tab: **Workplace ► Live display ► Application note**

The application note of the loaded method is displayed on the **Application note** tab. This tab is displayed by default when the method is loaded. The application note is defined in the method properties *(see chapter 5.3.4, page 384)*.

3.9 Report subwindow

3.9.1 Report - General

Subwindow: **Workplace ► Report**

Report subwindow

The reports of determinations are displayed in the **Report** subwindow. The subwindow can be activated in the **Workplace** program part during the definition of the layout and thus made visible *(see chapter 3.1.7.2, page 121)*. It can be enlarged and reduced as required, and it can also be maximized.

Tabs

The **Report** subwindow consist of the following tabs:

- *Latest report*
  Display of the most recently automatically generated report.
- *Report overview*
  Display of the report selected in the report overview.
- *Properties report overview*
  Overview of the reports saved in the workplace.

3.9.2 Latest report

Tab: **Workplace ► Report ► Last report**

The report most recently generated in the method run is automatically displayed on the **Last report** tab. The content and format of the reports are determined by the report template selected.

3.9.3 Selected report

Tab: **Workplace ► Report ► Selected report**

The report selected in the report overview is shown on the **Selected report** tab. The content and format of the reports are determined by the report template selected.

3.9.4 Report overview

Tab: **Workplace ► Report ► Report overview**

The reports of the determinations since program start are shown in a table on the **Report overview** tab. The lines are arranged chronologically in ascending order. The table is automatically updated as new reports are received.

The table contains the following columns, which can be enlarged, reduced and moved with the mouse:

Date

Moment of the compilation of the report, together with date, time and time zone (UTC ± ##).

Report

Name of the report template that generated the report.

Method

Method name.

Ident

Identification of the chromatogram.

Sample type

Sample type

Position

Position of the sample on the rack.

Injections

Number of injections per sample.

Volume

Volume of the sample.

Dilution

Dilution factor for the sample.

Sample amount

Amount of the solid sample.

Info 1 - 4

Additional information about the sample.

Value 1 - 4

Additional values on the sample.

[View]

Shows the selected report on the **Selected report** tab.

[Delete]

Deletes the selected reports in the report overview.

[Properties]

Opens the **Properties - Report overview** dialog window.

3.9.5 Properties report overview

Dialog window: **Workplace ► Report ► Report overview ► [Properties] ► Properties - Report overview**

Maximum number of reports

Maximum number of reports that can be saved in the report overview table. If this number is exceeded, then the oldest report will be deleted automatically.

Input range	**1 to 100**
Default value	**20**

3.10 Subwindow Watch window

3.10.1 Watch window - Overview

Subwindow: **Workplace ► Watch window - 'Method name'**

The **Watch window** is a subwindow in the **Workplace** program part, which serves to provide the user clearly and quickly with the most important information about his method and the associated devices. It consists of the following parts:

- *Device information*
  Display of the selected, current device information.
- *Messages*
  Display of the messages that occurred during the method run.

3.10.2 Watch window - Device information

Subwindow: **Workplace ► Watch window - 'Method name'**

The upper part of the **Watch window** displays the device information. Which information is displayed is configurable by the user *(see chapter 3.10.4, page 200)*.

NOTE

The Watch window properties are method-specific and client-specific.

The device information of the method loaded in the workplace is displayed. Even with methods that are used company-wide in a client-server network, all individual users can design the Watch window on their computers according to their needs. The properties are preserved. The Watch window of a newly loaded method is always displayed with the last settings.

The display of the device information itself is not configurable. In general, the following applies:

- A simple state/status of the device/module is shown **black on gray** in a display field.
- Device values that are being monitored are displayed **black on gray** when the values are within the limit values and **white on red** when the values are outside the limits.

3.10.3 Watch window - Messages

Subwindow: **Workplace ► Watch window - 'Method name'**

A scrollable message field is located in the lower section of the **Watch window** which contains all messages concerning events occurring during the run of the current determination. Entries consist of messages that generate a database entry in the determination but which are not significant enough to result in the run being interrupted pending confirmation by the user.

Each message consists of **Date**, **Time** and **Message text**.

3.10.4 Watch window - Properties

Dialog: **Workplace ► View ► Properties ► Watch window properties ► Watch window - 'Method name'**

Use **View ► Properties ► Watch window properties** to open the **Watch window - 'Method name'** dialog. Here the instrument properties can be selected for the method which is to be displayed in the Watch window.

Available properties

The device properties available for display are shown in a tree-like manner for each device and can be selected with the cursor. Properties that are already displayed are inactive.

In the available properties, a **separator** is available at the end of the tree selection, which can be used to structure the displayed properties in the Watch window.

Displayed properties

Display of the device properties to be displayed in the **Watch window**.

»

Add the selected property to the table.

«

Remove the selected property from the table.

▲

Modifies the sequence of the properties displayed by moving the selected property up.

Modifies the sequence of the properties displayed by moving the selected property down.

[Decimal places]

Open the **Decimal places - 'Property'** dialog, where the number of decimal places displayed for the selected property can be selected.

3.11 Time program subwindow

Subwindow: **Workplace ► Time program**

The subwindow Time program is identical with the window of the same name in the method *(see chapter 5.7, page 419)*; it can however be edited.

The run of the time program is presented graphically by the colored marking of the command lines:

- When a command line is being carried out, it is marked in **red**. It will remain marked until the next command is executed.
- Command lines that have been processed are shown in **gray**.
- The tabs of (sub)programs in which commands are presently being executed, are marked with **red lettering**.
- The tabs of (sub)programs in which all commands have been executed, are marked with **gray lettering**.

4 Database

4.1 Database - General

4.1.1 Database - Definition

Program part: **Database**

Definition

The term **Database** is used in **MagIC Net** to refer to the program part in which the determinations saved in the databases can be displayed, managed, evaluated, reprocessed and printed out. The **determination databases** are also referred to as **databases**; they can, in contrast to the **configuration database**, be generated by the user and contain the determination data. Included among such determination data are the method data used for the determination, the measured data generated during the determination and the results calculated from it.

Organization

In **local server systems** (**MagIC Net Compact**, **MagIC Net Professional**) the databases are stored on the drives administered by the computer and are only available to those users registered on that computer who have the appropriate access rights.

In **client/server systems** (**MagIC Net Multi**) the databases are stored on the drives managed centrally by the server and are globally available throughout the entire client/server system, i.e., all users with the appropriate access rights can use these databases.

4.1.2 Database - User interface

Program part: **Database**

Database icon

Clicking on the database icon in the vertical bar on the left opens the **Database** program part; the database icon is shown in color at the same time. The upper left corner of the icon contains a black field displaying the number of databases currently opened *(see chapter 4.2.2, page 215)*.

Elements

The user interface of the **Database** program part comprises the following elements:

- Database-specific menu bar.
- Database-specific toolbar.
- Main window, in which up to six subwindows can be displayed.

4.1.3 Database - Menu bar

4.1.3.1 Database - Main menus

Program part: **Database**

The menu bar in the **Database** program part contains the following main menu items:

- *File*
  Opening and closing databases, database manager, printing.
- *Edit*
  Copying selected lines in the determination overview to the clipboard, marking all lines.
- *View*
  Changing the layout, loading a view, saving a view, modifying the sub-window properties.
-
  Search, filter, sign, delete determinations; overlay curves, calibration curves, reprocessing, etc.
- *Tools*
  Report templates, further templates.
- *Help*
  Open program help, display program information.

4.1.3.2 Database - File menu

Program part: **Database**

Open...	Open a database *(see chapter 4.2.1, page 213)*.
Close all	Closes all open databases *(see chapter 4.2.6, page 216)*.
Close	Close database *(see chapter 4.2.6, page 216)*.
Database manager...	Management of the determination databases *(see chapter 4.3.1, page 216)*.
Print ►	
Determination overview...	PDF file output of the determination overview *(see chapter 4.7.11, page 310)*.

Report...	PDF file output of the report *(see chapter 4.7.12, page 310)*.
Logout...	Logs out user *(see chapter 2.2.3, page 23)*.
Exit	Exits the program.
1 'File name'	Opens the selected database *(see chapter 4.2.1, page 213)*. The last five databases opened are displayed for selection.

4.1.3.3 Database - Edit menu

Program part: **Database**

Copy	Copies the selected lines in the determination overview to the clipboard.
Select all	Selects all lines in the current set of determinations in the determination overview.

4.1.3.4 Database - View menu

Program part: **Database**

Update	Updates the determination overview.
Previous determination	Scroll to the previous determination in the table.
Next determination	Scroll to the next determination in the table.
Change layout...	Modify the layout of the loaded database view *(see chapter 3.1.7.2, page 121)*.
Load view...	Load a saved database view *(see chapter 3.1.7.3, page 121)*.
Save view...	Saves the loaded database view *(see chapter 3.1.7.4, page 122)*.
Split vertically	Splits the database window vertically and displays two databases side by side *(see chapter 4.2.4, page 216)*.
Split horizontally	Splits the database window horizontally and displays two databases, one above the other *(see chapter 4.2.5, page 216)*.
Unsplit	Undoes the splitting of the database window *(see chapter 4.2.3, page 215)*.
Properties ►	
Column display...	Set the column display for the **Determination overview** subwindow *(see chapter 4.7.1.3, page 285)*.

Properties Results	Set the properties for the **Results** subwindow *(see chapter 4.9.1, page 364)*.
Toolbar	Activates/deactivates the toolbar display.

4.1.3.5 Database - Determinations menu

Program part: **Database**

Comment...	Enter a comment on the selected determination *(see chapter 4.7.3, page 289)*.
Search...	Opens the **Search** window for searching for determinations *(see chapter 4.7.4, page 290)*.
Filter ▶	
Last filter	Applies the most recently used quick or special filter *(see chapter 4.7.6.2, page 296)*.
Quick filter	Quick filtering of the database with the content of the selected table cell *(see chapter 4.7.6.3, page 296)*.
Special filter...	Opens the **Special filter** window for the definition of user-specific filters *(see chapter 4.7.6.4, page 296)*.
Remove filter	Removes the current filter *(see chapter 4.7.6.5, page 298)*.
Batch ▶	
New batch...	Creates a new batch *(see chapter 4.7.5.2, page 294)*.
Delete batch...	Deletes a batch *(see chapter 4.7.5.3, page 294)*.
Append to batch...	Attaches the selected determinations to the batch *(see chapter 4.7.5.4, page 295)*.
Remove from batch...	Removes the selected determinations from the current batch *(see chapter 4.7.5.5, page 295)*.
Sign ▶	
Signature 1...	Signs the selected determinations at level 1 *(see chapter 2.3.3, page 26)*.
Signature 2...	Signs the selected determinations at level 2 *(see chapter 2.3.4, page 28)*.
Show signatures...	Shows all signatures for the focused determination *(see chapter 4.7.7.4, page 307)*.

Delete signatures 2...	Deletes all signatures at level 2 of the focused determination *(see chapter 2.3.5, page 29)*.
Send to...	Send the selected determinations per e-mail *(see chapter 4.7.8, page 308)*.
Export...	Export the selected determinations *(see chapter 4.7.9, page 309)*.
Import...	Imports the selected determinations *(see chapter 4.7.10, page 309)*.
Show method...	Shows the method used for the focused determination *(see chapter 4.7.13, page 313)*.
Show history	Shows all versions of the focused determination in the determination table *(see chapter 4.7.14, page 313)*.
Make current	Makes the old version selected in the history view the current version once again *(see chapter 4.7.15, page 313)*.
Detail overview...	Shows the detail overview of results for the selected determinations *(see chapter 4.7.16.2, page 314)*.
Overlay curves...	Overlays the curves of the selected determinations *(see chapter 4.7.17, page 322)*.
Reprocess...	Reprocess the selected determinations *(see chapter 4.7.18.1, page 328)*.
Complete...	Complete the selected determinations *(see chapter 4.7.19, page 347)*.
Delete	Deletes the selected determinations *(see chapter 4.7.20, page 347)*.

4.1.3.6 Database - Tools menu

Program part: **Database**

Report templates ▶	
New ▶	
Form report...	Opens the **Report template** window with an empty form report *(see chapter 4.4.3, page 229)*. This menu item is disabled as long as the database is empty.
Tabular report...	Opens the **Report template** window with an empty tabular report *(see chapter 4.4.3, page 229)*.
Open...	Opens a report template for editing *(see chapter 4.4.3, page 229)*. This menu item is disabled as long as the database is empty.

Manager...	Manage report templates *(see chapter 4.4.1, page 227)*.
Templates ►	
Control chart templates...	Manage templates for control charts *(see chapter 4.5, page 271)*.
Export templates...	Manage export templates *(see chapter 4.6.1, page 276)*.

4.1.3.7 Help menu

Program part: **Workplace / Database / Method / Configuration**

MagIC Net Help	Opens MagIC Net Help.
About	Displays information about the program and the installation.

4.1.4 Database - Toolbar

Program part: **Database**

Open...	Open a database *(see chapter 4.2.1, page 213)*.
Close	Close database *(see chapter 4.2.6, page 216)*.
Database manager...	Management of the determination databases *(see chapter 4.3.1, page 216)*.
Logout...	Logs out user *(see chapter 2.2.3, page 23)*.
Copy	Copies the selected lines in the determination overview to the clipboard.
Update	Updates the determination overview.
Previous determination	Scroll to the previous determination in the table.
Next determination	Scroll to the next determination in the table.
Change layout...	Modify the layout of the loaded database view *(see chapter 3.1.7.2, page 121)*.
Load view...	Load a saved database view *(see chapter 3.1.7.3, page 121)*.
Save view...	Saves the loaded database view *(see chapter 3.1.7.4, page 122)*.

Split vertically	Splits the database window vertically and displays two databases side by side *(see chapter 4.2.4, page 216)*.
Split horizontally	Splits the database window horizontally and displays two databases, one above the other *(see chapter 4.2.5, page 216)*.
Unsplit	Undoes the splitting of the database window *(see chapter 4.2.3, page 215)*.
Comment	Enter a comment on the selected determination *(see chapter 4.7.3, page 289)*.
Search	Opens the **Search** window for searching for determinations *(see chapter 4.7.4, page 290)*.
Last filter	Applies the most recently used quick or special filter *(see chapter 4.7.6.2, page 296)*.
Quick filter	Quick filtering of the database with the content of the selected table cell *(see chapter 4.7.6.3, page 296)*.
Special filter...	Opens the **Special filter** window for the definition of user-specific filters *(see chapter 4.7.6.4, page 296)*.
Remove filter	Removes the current filter *(see chapter 4.7.6.5, page 298)*.
Signature 1...	Signs the selected determinations at level 1 *(see chapter 2.3.3, page 26)*.
Signature 2...	Signs the selected determinations at level 2 *(see chapter 2.3.4, page 28)*.
Show method...	Shows the method used for the focused determination *(see chapter 4.7.13, page 313)*.
Show history	Shows all versions of the focused determination in the determination table *(see chapter 4.7.14, page 313)*.
Make current	Makes the old version selected in the history view the current version once again *(see chapter 4.7.15, page 313)*.
Detail overview...	Shows the detail overview of results for the selected determinations *(see chapter 4.7.16.2, page 314)*.
Overlay curves...	Overlays the curves of the selected determinations *(see chapter 4.7.17, page 322)*.

Reprocess...	Reprocess the selected determinations *(see chapter 4.7.18.1, page 328)*.
Delete	Deletes the selected determinations *(see chapter 4.7.20, page 347)*.
Open...	Opens a report template for editing *(see chapter 4.4.3, page 229)*.
MagIC Net Help	Open MagIC Net help.

4.1.5 Database - Subwindow

Program part: **Database**

Selection

The following subwindows can be displayed in the main window:

- *Determination overview*
  Overview of the determinations saved in the database. This subwindow is permanently on display.
- *Information*
  Shows information on the focused determination.
- *Results*
  Display showing the results of the focused determination.
- *Curves 1 - 5*
  Shows curves for the focused determination.

Representation

The subwindows can be enlarged or made smaller to suit by dragging the separating bar between the windows.

By clicking on the ☐ button above at the right, the subwindows can be maximized so that only one subwindow is displayed in the main window. The original view of all subwindows is restored by clicking on the ☐ button in the maximized subwindow once again.

If you change the view of the subwindows, these changes will remain in effect when the database is closed and reopened.

4.1.6 Database - Functions

Program part: **Database**

The following functions can be carried out in the **Database** program part:

Views

- *Modifying the layout of the database view*
- *Loading a database view*
- *Saving a database view*
- *Renaming a database view*
- *Deleting a database view*

Database management

- *Creating a new database*
- *Renaming a database*
- *Editing database properties*
- *Backing up a database*
- *Restoring a database*
- *Deleting a database*

Determinations

- *Overview of functions*

Templates

- *Editing report templates*
- *Editing templates for control charts*
- *Editing export templates*

4.1.7 Views

4.1.7.1 Views - General

Program part: **Workplace / Database / Configuration**

Definition

The contents and design of the main window in the **Workplace**, **Database** and **Configuration** program parts is called a **View**. The following elements belong to a view:

- Number, arrangement, sequence and size of the subwindows.
- Representation within the individual subwindows, i.e. column sequence, column width, sorting and filter.

Functions

The following functions are possible for views:

- *Changing the layout*
  Defining the number, arrangement and sequence of the subwindows for the current view.
- *Saving a view*
  Saving the current view.
- *Loading a view*
  Loading a saved view.
- *Renaming a view*
  Renaming a saved view.
- *Deleting a view*
  Deleting a saved view.

Saving automatically

The current view will be saved automatically when the program is closed if the corresponding option is activated under **Save on closing** in the **Configuration** program part under **Tools ► Options...** on the **Save** tab.

Loading automatically

By default, the view that is saved when the program is closed will be loaded automatically the next time that the program is opened. As an alternative, a default view that is loaded automatically the first time that the program part is opened can be defined for each user group.

By default, views are opened with the following subwindows with the very first program start:

- **Workplace**
  Run, **Live display 1**, **Report**, **Watch window**, **Time program**
- **Database**
  Determination overview, **Curves 1**, **Information**, **Results**
- **Configuration**
  Devices, **Columns**, **Eluents**, **Accessories**

Export/import

Views can also be exported and imported. In this way these views can be exchanged between different client/server systems.

4.1.7.2 Changing the layout

Dialog window: **Workplace / Database / Configuration ► View ► Change layout... ► Change layout**

The **Change layout** dialog window is opened with the icon or the **View ► Change layout...** menu item.

Select layout

Selection of a graphical icon for the number and arrangement of the subwindows.

Selection	**'Selection of the possible combinations'**

Available subwindows

Display of the subwindows that are still available for being displayed in the view.

Selection	**'Selection of the subwindows'**

Displayed subwindows

Display of the subwindows that are shown in the view.

Selection	**'Subwindow'**

»

Adds the selected subwindow to the view.

«

Removes the selected subwindow from the view.

▲

Moves the selected subwindow upward (modifies sequence).

▼

Moves the selected subwindow downward (modifies sequence).

4.1.7.3 Loading a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Load view... ▶ Load view**

The **Load view** dialog window is opened with the icon or the **View ▶ Load view...** menu item.

Name

Name of the view to be loaded.

[Rename]

Rename the selected view.

[Delete]

Deletes the selected view.

[Load]

Loads the selected view.

4.1.7.4 Saving a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Save view... ▶ Save view**

The **Save view** dialog window is opened with the icon or the **View ▶ Save view...** menu item.

Name

Name under which the view is to be saved.

[Rename]

Rename the selected view.

[Delete]

Deletes the selected view.

[Save]

Saves the view under the given name. The saved views are globally valid and available for client/server systems.

4.1.7.5 Renaming a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Load view... ▶ Load view ▶ [Rename] ▶ Rename view**

To be able to rename a view, either open the **Load view** or the **Save view** dialog window and click on the **[Rename]** button. The **Rename view** window opens afterwards.

Rename view '%1' to

Entry of a new name for the view.

Entry	**50 characters**

4.1.7.6 Deleting a view

Function: **Workplace / Database / Configuration ▶ View ▶ Load/save view… ▶ [Delete]**

To delete a view, open either the **Load view** or **Save view** dialog window and press the **[Delete]** button. The delete procedure must then be confirmed.

4.2 Database display

4.2.1 Opening a database

Dialog window: **Database ▶ File ▶ Open… ▶ Open database**

The icon or the **File ▶ Open…** menu item opens the **Open database** window, in which one of the databases to be opened available on the server (or on the local server) can be selected. The names of all of the available databases are displayed in this window; the additional information is loaded afterwards. All of the databases are then displayed, even if the user does not have read permissions.

Database table

The database table contains information concerning all determination databases. The table cannot be edited. The table can be sorted according to the selected column (**Name**, **Number of records**, **Size**, **Last backup**, **Next backup**, **Comment**) in ascending or descending order by clicking on the column title.

Name

Name of the database.

Number of records

Shows the number of records in the database.

Size

Shows the size of the database in KB.

Readable

Shows whether or not the database can be read by the user currently logged in.

Editable

Shows whether or not the database can be edited by the user currently logged in.

Comment

Shows comments about the database.

Opening a database

Database name

Name of the database to be opened. If a database is selected from the table, the name of the database will be entered automatically in this field. It can, however, also be entered manually.

Entry	**50 characters**

[Open]

Opens the selected database and shows its datasets in the determination overview. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

NOTE

A maximum of 4 databases can be opened, but only 2 can be displayed at the same time. Databases that are open at the time the program is exited will be opened automatically the next time the program is started.

4.2.2 Selecting a database

Program part: **Database**

The number of currently opened databases is displayed in the upper left corner of the database icon. If 2 or more databases are opened, then these databases, which can be displayed either next to one another or one above the other in the main window, can be selected with the aid of the database icon.

No database is opened. **No database loaded** is displayed in the main window.

A database is opened and is displayed in the main window.

Two databases are opened. Normally only one database is displayed in the main window, but the option exists of displaying two databases at once, either next to one another or one above the other.

A menu with the names of all the currently opened databases is displayed by clicking on the database icon with either the left or right mouse button. The databases displayed in the main window are then marked with a checkmark. Clicking on the desired database displays it in the main window in the place of the previously selected one.

4.2.3 Displaying a single database

Menu item: **Database ▶ View ▶ Unsplit**

In the default settings, the most recently opened database is displayed by itself in the main window. If the display of two databases is enabled, then the ⤫ icon or the **View ▶ Unsplit** menu item can be used to switch back to the display of just one single database.

4.2.4 Displaying databases next to one another

Menu item: **Database ▶ View ▶ Split vertically**

Two databases are displayed next to one another in the main window with the symbol or the **View ▶ Split vertically** menu item.

4.2.5 Displaying databases one above the other

Menu item: **Database ▶ View ▶ Split horizontally**

Two databases can be displayed one below the other in the main window with the symbol or the **View ▶ Split horizontally** menu item.

4.2.6 Closing a database

Menu items: **Database ▶ File ▶ Close / Close all**

Closing a single database

The icon or the **File ▶ Close** menu item can be used to close the focused database.

Closing all databases

All the opened databases are closed with the **File ▶ Close all** menu item.

4.3 Managing databases

4.3.1 Managing databases

Dialog window: **Database ▶ File ▶ Database manager… ▶ Database manager**

The icon or the **File ▶ Database manager…** menu item is used to open the **Database manager** window, in which a user with corresponding access permission can administer databases.

Database table

The database table contains information concerning all determination databases. The table cannot be edited. The table can be sorted according to the selected column (**Name**, **Number of records**, **Size**, **Last backup**, **Next backup**, **Comment**) in ascending or descending order by clicking on the column title.

Name

Name of the database.

Number of records

Shows the number of records in the database.

Size

Shows the size of the database in KB.

Last backup

Shows the date and time of the last database backup.

Next backup

Shows the date and time at which the next backup is to be carried out.

Comment

Display showing comments about the database.

Markings in the database table

NOTE

Yellow marking and blue marking = For performance improvements, migrate the database with **Edit ► Migrating...**.

Orange marking = Status of the database backup unknown. Update the status with **[Updating]**.

Red marking = The limit value of the marked field has been exceeded.

Yellow and blue markings

If the line header is highlighted in yellow and the **Name** field in blue in the database table, then the database can be migrated into another data format for performance improvements *(see chapter 4.3.5, page 220)*.

Orange marking

If the line header of a database and the **Next backup** field are highlighted in orange in the database table, then it will be unknown whether a backup that was due has been performed successfully. This status is used, for example, when a backup is running.

Use **[Updating]** to update the status of the database backup.

If the backup was successful, the marking of the line header and the **Next backup** field is removed.

If the backup was not performed successfully, then the line header and the **Next backup** field are highlighted in red. The backup is attempted again every 30 minutes *(see chapter 4.3.6.4, page 222)*.

Red marking

If the line header of a database and a monitored field are highlighted in red in the database table, then the limit value of the highlighted field has been exceeded. The following limit values can be monitored:

- Number of datasets *(see chapter 4.3.6.5, page 224)*
- Size of the database *(see chapter 4.3.6.5, page 224)*

- Next backup *(see chapter 4.3.6.4, page 222)*

Window menus and functions

The **[Edit]** menu beneath the database table contains the following menu items:

New…	Create a new database *(see chapter 4.3.2, page 219)*.
Delete	Deletes the selected database *(see chapter 4.3.4, page 219)*.
Rename…	Rename the selected database *(see chapter 4.3.3, page 219)*.
Migrating…	Migrate selected database into the data format for optimized performance *(see chapter 4.3.5, page 220)*.

[Properties]

Opens the **Database manager** window for editing the database selected in the table *(see chapter 4.3.6, page 221)*.

[Updating]

Updates the status of the database backup *(see chapter 4.3.1, page 216)*.

[Backup]

Opens the **Backup database** window for backing up the database selected in the table *(see chapter 4.3.7, page 224)*.

[Restore]

Opens the **Restore databases** window for restoring backed-up databases *(see chapter 4.3.8, page 225)*.

[Open]

Opens the selected database and shows its datasets in the determination overview. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

NOTE

A maximum of 4 databases can be opened, but only 2 can be displayed at the same time. Databases that are open at the time the program is exited will be opened automatically the next time the program is started.

[Close]

Close the **Database management** window.

4.3.2 Creating a new database

Dialog window: **Database ▶ File ▶ Database manager… ▶ Database manager ▶ [Edit] ▶ New... ▶ New database**

The **[Edit] ▶ New...** menu item can be used to open the **New database** window, in which a name for the new database must be entered.

Name

Name of the new database.

Entry	**50 characters**
Default value	**New database #**

NOTE

The database name must be unique in the entire client/server system.

Click on **[OK]** to open the **Database properties** window for editing the database properties.

4.3.3 Renaming a database

Dialog window: **Database ▶ File ▶ Database manager… ▶ Database manager ▶ [Edit] ▶ Rename... ▶ Rename database**

The **[Edit] ▶ Rename...** menu item is used to open the **Rename database** window for renaming the selected database.

Rename database 'Name' to

Entry of the new database name.

Entry	**50 characters**

NOTE

The database name must be unique in the entire client/server system.

4.3.4 Deleting a database

Menu item: **Database ▶ File ▶ Database manager… ▶ Database manager ▶ [Edit] ▶ Delete**

The **[Edit] ▶ Delete** menu item is used to delete the selected database.

NOTE

Databases that are open cannot be deleted.

4.3.5 Migrating database

Menu item: **Database ▶ File ▶ Database management... ▶ Database management ▶ [Edit] ▶ Migrating...**

Performance improvements are available from MagIC Net 4.2. Existing databases must be migrated in another data format to improve performance. Each already existing database must be migrated once. If a database needs to be migrated, the line header of the affected database is highlighted in yellow in the database table. The name of the database is highlighted in blue.

NOTE

Depending on the size of the database, migration may take some time. A progress bar shows the status of the migration.

During migration, MagIC Net cannot be used elsewhere.

Each database must be migrated individually. Multiple databases cannot be migrated at the same time. Do not start the migration of a database until after any previous migrations have been completed.

Prerequisites for migration:

- The database may not be opened.
- To migrate a database, the user needs the permission to edit the affected database *(see chapter 4.3.6.3, page 222)*.

NOTE

Notes on migration in MagIC Net Multi

- Perform the migration on the server. Migration takes less time on the server than on clients.
- Do not open the affected database on any client during migration.
- During migration, do not run any determinations that use the affected database on any client.

Select the database to be migrated in the database table. Use the **[Edit] ▶ Migrating...** menu item to open the **Migration - Database 'database name'** window.

If the database migration for the affected database has not yet been performed, start the migration with **[Migrating]**.

If the database migration for the affected database has already been performed, the **[Migrating]** button is inactive.

4.3.6 Database properties

4.3.6.1 Database properties - Overview

Dialog window: **Database ► File ► Database manager… ► Database manager ► [Properties] ► Properties - Database - 'Database name'**

The properties for a database are set on the following tabs:

- *General*
  General information about the database.
- *Access rights*
  Database access rights for user groups.
- *Backup*
  Definition of backup monitoring and automatic backups.
- *Monitoring*
  Definition of database monitoring.

4.3.6.2 Database properties - General

Tab: **Database ► File ► Database manager… ► Database manager ► [Properties] ► Properties - Database - 'Database name' ► General**

General information about the database.

Comment

Freely definable comments about the database.

Entry	**250 characters**

Number of records

Shows the number of records in the database.

Size

Shows the size of the database in KB.

Created

Shows the date and time when the database was created.

Created by

Shows the user (user) who created the database.

Modified

Shows the date and time of the last modification of the database properties.

Modified by

Shows the name of the user (short name) who carried out the modifications.

4.3.6.3 Database properties - Access rights

Tab: **Database ▶ File ▶ Database manager… ▶ Database manager ▶ [Properties] ▶ Properties - Database - 'Database name' ▶ Access rights**

Database access rights for user groups.

User group

Shows the user groups defined in the user administration.

Read

on | off (Default value: **on**)

Activates/deactivates the permission to open the database. The database can only be displayed but not modified (records cannot be deleted or reprocessed).

Editing

on | off (Default value: **off**)

Activates/deactivates the permission to edit the database. Records can be modified or deleted.

NOTE

If access for editing is activated, then access rights for reading will also automatically be activated. If access for reading is deactivated, then access rights for editing will also automatically be deactivated.

4.3.6.4 Database properties - Backup

Tab: **Database ▶ File ▶ Database manager… ▶ Database manager ▶ [Properties] ▶ Properties - Database - 'Database name' ▶ Backup**

Definition of backup monitoring and automatic backups.

Backup monitoring

on | off (Default value: **off**)

Enables/disables the backup monitoring for the selected database. If the **Backup monitoring** check box is enabled, then the line header of the affected database and the **Next backup** field in the database table will be highlighted in **orange** when the date of the next backup is reached. The status of the database backup can be updated with **[Updating]**.

If it is not yet known whether the backup was successful, the line header and the **Next backup** field remain highlighted in orange. This status is used, for example, when a backup is running.

If the backup was successful, the marking of the line header and the **Next backup** field is removed.

If the backup was not performed successfully, then the line header and the **Next backup** field are highlighted in red.

Last backup

Shows the date and time of the last database backup.

Next backup

Date on which the next backup must take place. The date can be selected by clicking on … in the **Select date** dialog window.

Entry	**Date selection**
Default value	**Last backup + 1 month**

Interval

Entry of the interval for the backup monitoring. After each automatically or manually triggered backup, the interval entered here will be added automatically to the **Last backup** and the **Next backup** field will be automatically adjusted accordingly.

Input range	**1 to 999**
Default value	**1**
Selection	**Days** | **Weeks** | **Months** | **Years**
Default value	**Months**

Starting backup automatically

on | off (Default value: **off**)

Automatic start of the backup for the database in the defined **Backup directory**.

Backup directory

Selection of a directory predefined in the **Program administration** for the automatic backup.

Selection	**Selection of the backup directory** | **Default backup directory**
Default value	**Default backup directory**

NOTE

Make sure that you have read and write permission for the selected directory.

If a database is not backed up successfully, the system will try to back up the database again every 30 minutes.

4.3.6.5 Database properties - Monitoring

Tab: **Database ► File ► Database manager… ► Database manager ► [Properties] ► Properties - Database - 'Database name' ► Monitoring**

Definition of database monitoring.

Monitoring size

on | off (Default value: **off**)

Activates/deactivates size monitoring for the selected database. If this check box is activated, then the **Size** field in the database table will be highlighted in **red** when the limit value has been exceeded. At the same time, a corresponding message also appears when the database is opened.

Maximum size

Maximum permitted database size in MB.

Input range	**1 to 2147483647 MB**
Default value	**500 MB**

Monitoring number of records

on | off (Default value: **off**)

Activates/deactivates the monitoring of the number of records for the selected database. If this check box is activated, then the **Number** field in the database table will be highlighted in **red** when the limit value has been exceeded. At the same time, a corresponding message also appears when the database is opened.

Maximum number

Maximum permitted number of records for database.

Input range	**1 to 2147483647**
Default value	**1,000**

4.3.7 Backing up a database manually

Dialog window: **Database ► File ► Database manager… ► Database manager ► [Backup] ► Database backup**

[Backup] is used to open the **Backup database** dialog window:

Backup target

Backup directory

Selection of a directory predefined in the **Program administration** for the backup.

Selection	**Selection of the backup directory** | **Default backup directory**
Default value	**Default backup directory**

NOTE

Make sure that you have read and write permission for the selected directory.

Backup name

Selection of an already existing name or entry of a new name for the backup file. If an existing backup file is selected, it will be overwritten.

Entry	**50 characters**
Default value	**Backup ##**

NOTE

If the backup directory is on a network drive, the backup date should be added to the **Backup name** because the backup date information is not available when the data is restored.

[Starting]

Starts manual database backup.

4.3.8 Restoring a database

Dialog window: **Database ▶ File ▶ Database manager… ▶ Database manager ▶ [Restore] ▶ Restoring databases**

[Restore] is used to open the **Restore databases** dialog window:

Backup directory

Selection of a directory that is predefined in the **Program administration** and in which the backed-up databases are located.

Selection	**Selection of the backup directory** | **Default backup directory**
Default value	**Default backup directory**

Backup name

Selection of a backup file.

Selection	**Selection of backup files**

Backup date

Shows the time at which the database was backed up. This information is not available if the backup file is located on a network drive.

Database name

Shows the name of the database. This information is not available if the backup file is located on a network drive.

Number of records

Shows the number of records in the database. This information is not available if the backup file is located on a network drive.

Size

Shows the size of the database in KB.

Save As

Name under which the database is to be restored.

Entry	**50 characters**
Default value	**New database ##**

[Starting]

Starts database restoring. After the start, a progress bar appears in the window. The dialog window closes automatically once the backup has been completed.

NOTE

Existing databases cannot be overwritten, i.e., they must first be deleted so that the database can be restored under its old name.

4.4 Report templates

4.4.1 Managing report templates

4.4.1.1 Managing report templates

Dialog window: **Database ► Tools ► Report templates ► Manage… ► Manage report templates**

The **Tools ► Report templates ► Manage…** menu item opens the **Manage report templates** window.

List of report templates

The list of report templates contains information about all the saved report templates. The table cannot be edited. With a click on the column title (Column **Name**, **Saved**, **Saved by**, **Comment**) the table can be sorted according to the selected column in ascending or descending sequence.

Name

Name of the report template.

Saved

Date and time when the report template was saved.

Saved by

Short name of the user who saved the report template.

Comment

Comment on the report template.

Window menus

The **[Edit]** menu beneath the list of report templates contains the following menu items:

Rename…	Rename the selected report template *(see chapter 4.4.1.2, page 228)*.
Copy	Copies the selected report template(s) *(see chapter 4.4.1.3, page 228)*.
Delete…	Deletes the selected report template(s) *(see chapter 4.4.1.4, page 228)*.
Export…	Export the selected report template(s) *(see chapter 4.4.1.5, page 228)*.
Import…	Import report template(s) *(see chapter 4.4.1.6, page 228)*.

4.4.1.2 Renaming report templates

Dialog window: **Database ▶ Tools ▶ Report templates ▶ Manage… ▶ Manage report templates ▶ [Edit] ▶ Rename… ▶ Rename report template**

The **[Edit] ▶ Rename…** menu item in the **Manage report templates** window opens the **Rename report template** window for renaming the selected report template.

Rename report template 'Name' to

Entry of the new name for the report template.

Entry	**50 characters**

NOTE

The name of the report template must be unique throughout the entire client/server system.

4.4.1.3 Copying report templates

Menu item: **Database ▶ Tools ▶ Report templates ▶ Manage… ▶ Manage report templates ▶ [Edit] ▶ Copy**

The **[Edit] ▶ Copy** in the **Manage report templates** window copies the selected report templates under the name **Copy of 'Report template name**.

4.4.1.4 Deleting report templates

Menu item: **Database ▶ Tools ▶ Report templates ▶ Manage… ▶ Manage report templates ▶ [Edit] ▶ Delete…**

The **[Edit] ▶ Delete…** menu item in the **Manage report templates** window deletes the selected report templates.

4.4.1.5 Exporting report templates

Dialog window: **Database ▶ Tools ▶ Report templates ▶ Manage… ▶ Manage report templates ▶ [Edit] ▶ Export… ▶ Select directory for export**

The **[Edit] ▶ Export…** menu item in the **Manage report templates** window exports the selected report templates, each one into a file with the name **'Name'.mrep**. The **Select directory for export** dialog window opens, in which the directory for export must be selected.

4.4.1.6 Importing report templates

Dialog window: **Database ▶ Tools ▶ Report templates ▶ Manage… ▶ Manage report templates ▶ [Edit] ▶ Import… ▶ Select files for import**

The **[Edit] ▶ Import…** menu item in the **Manage report templates** window opens the **Select files for import** dialog window, in which the

report templates to be imported must be selected. These report templates are then imported.

4.4.2 Creating new report templates

Menu item: **Database ▶ Tools ▶ Report templates ▶ New**

New form report

With the menu item **Tools ▶ Report templates ▶ New ▶ Form report** the program window **Report template - New form report** is opened with an empty report template, which can then be edited.

In the **form report**, the report section always includes the whole area between the header and the footer. This means that at least one page will always be output for each determination.

New tabular report

With the menu item **Tools ▶ Report templates ▶ New ▶ Tabular report** the program window **Report template - New tabular report** is opened with an empty report template, which can then be edited.

In the **tabular report**, the report section can be set with the mouse. For each data set one such report section will be filled with data and placed on the page row by row. Tabular reports from several determinations can thus be created in this way.

4.4.3 Opening report templates

Dialog window: **Database ▶ Tools ▶ Report templates ▶ Open… ▶ Open report template**

The icon or the **Tools ▶ Report templates ▶ Open…** menu item opens the **Open report template** window, in which one of the globally available report templates can be selected and opened.

List of report templates

The list of report templates contains information about all the saved report templates. The table cannot be edited. With a click on the column title (Column **Name**, **Saved**, **Saved by**, **Comment**) the table can be sorted according to the selected column in ascending or descending sequence.

Name

Name of the report template.

Saved

Date and time when the report template was saved.

Saved by

Short name of the user who saved the report template.

Comment

Comment on the report template.

Opening a report template

Name

Name of the report template to be opened. If a report template is selected from the table, the name will be entered automatically in this field. It can, however, also be entered manually.

Entry	**50 characters**

[Open]

Opens the **Report template** program window, in which the selected report template is shown and can be edited.

4.4.4 Editing report templates

4.4.4.1 Report template - General

4.4.4.1.1 Report template - Overview

Program window: **Database ► Report template**

Which determination data and which other items (e.g. text fields, images, graphics elements) are to be output in a report is defined in report templates. The templates can be created or edited in their own program window and then saved globally under a unique name. They are used for the automatic output of reports in determinations or for manual report output from the database.

There are two basically different types of report templates:

- **Form report**
  In the form report, the report section always includes the whole area between the header and the footer. This means that at least one page will always be output for each determination.
- **Tabular report**
  In the tabular report, the report section can be set with the mouse. For each data set one such report section will be filled with data and placed on the page row by row. Tabular reports from several determinations can thus be created in this way.

4.4.4.1.2 Report template - User interface

Program window: **Database ► Report template**

Elements

The user interface of the **Report template** program window comprises the following elements:

- *Menu bar*
- *General toolbar*
- *Module-specific toolbar*
- *Module bar*

4.4.4.1.3 Report template - Menu bar

4.4.4.1.3.1 Report template - Main menu

Program window: **Database ► Report template**

The menu bar in the **Report template** program window contains the following main menu items:

- *File*
  Saving report templates, page setup, page preview, closing window.
- *Edit*
  Undoing, redoing, cutting, copying, pasting, deleting, entering comment.
- *View*
  Updating view, page navigation.
- *Insert*
  Inserting pages.
- *Tools*
  Options.
- *Help*
  Opens the program help.

4.4.4.1.3.2 Report template - File menu

Program window: **Database ► Report template**

Save	Saves the opened report template *(see chapter 4.4.4.2.11, page 244)*.
Save As	Save the opened report template under a new name *(see "Saving the report template", page 245)*.
Page setup...	Set up the page settings for the report template *(see chapter 4.4.4.2.2, page 235)*.
Page preview	Page preview of the report template with the data of the selected determination *(see chapter 4.4.4.2.8, page 242)*.
Close	Closes the **Report template** program window.

4.4.4.1.3.3 Report template - Edit menu

Program window: **Database ► Report template**

Undo:	Undoes the last action.
Restore:	Redoes the undone action.
Cut	Cuts the highlighted items and copies them to the clipboard.
Copy	Copies the selected items to the clipboard.
Paste	Pastes the highlighted items from the clipboard.
Delete	Deletes the highlighted items.
Comment	Enter a comment on the report template.

4.4.4.1.3.4 Report template - View menu

Program window: **Database ► Report template**

Update	Update view.
First page	Shows the first page of the report template.
Previous page	Shows the previous page of the report template.
Next page	Shows the next page of the report template.
Last page	Shows the last page of the report template.

4.4.4.1.3.5 Report template - Insert menu

Program window: **Database ► Report template**

Page before	Inserts a new page before the page shown.
Page after	Inserts a new page after the page shown.

4.4.4.1.3.6 Report template - Tools menu

Program window: **Database ► Report template**

Options...	Set options for the report template.

4.4.4.1.3.7 Report template - Help menu

Program window: **Database** ▶ **Report template**

MagIC Net Help	Opens MagIC Net Help.

4.4.4.1.4 Report template - General toolbar

Program window: **Database** ▶ **Report template**

Save	Saves the opened report template *(see chapter 4.4.4.2.11, page 244)*.
Page preview	Page preview of the report template with the data of the selected determination *(see chapter 4.4.4.2.8, page 242)*.
Print (PDF)...	PDF file output of the report template with the data of the selected determination.
Undo:	Undoes the last action.
Restore	Redoes the undone action.
Cut	Cuts the highlighted items and copies them to the clipboard.
Copy	Copies the selected items to the clipboard.
Paste	Pastes the highlighted items from the clipboard.
Delete	Deletes the highlighted items.
100 %	Selection of the zoom level *(see chapter 4.4.4.2.7, page 242)*.
Grid	Activates/deactivates the grid display *(see "Grid", page 244)*.
Snap to grid	Activates/deactivates snapping to grid.

4.4.4.1.5 Report template - Module-specific toolbar

Program window: **Database** ▶ **Report template**

Depending on the module selected in the report template, other icons and input fields, with which the properties of these modules can be directly edited, are shown below the general toolbar *(see chapter 4.4.4.1.6, page 234)*.

4.4.4.1.6 Report template - Module bar

Program window: **Database ► Report template**

Select modules	If this option is enabled, then modules in the report template can be selected, reduced/enlarged and moved *(see chapter 4.4.4.2.6, page 241)*.
Text field	If this option is enabled, then **text fields** can be inserted in the report template *(see chapter 4.4.4.3.1, page 245)*.
Data field	If this option is enabled, then **data fields** can be inserted in the report template *(see chapter 4.4.4.3.2, page 247)*.
Date field	If this option is enabled, then **date fields**, in which the actual date is entered, can be inserted in the report template *(see chapter 4.4.4.3.3, page 249)*.
Time field	If this option is enabled, then **time fields**, in which the actual time is entered, can be inserted in the report template *(see chapter 4.4.4.3.4, page 250)*.
Page number	If this option is enabled, then fields in which the **page number** is entered can be inserted in the report template *(see chapter 4.4.4.3.5, page 252)*.
Number of pages	If this option is enabled, then fields in which the **number of pages** is entered can be inserted in the report template *(see chapter 4.4.4.3.6, page 253)*.
Fixed report	If this option is enabled, then **fixed reports** can be inserted in the report template *(see chapter 4.4.4.3.7, page 255)*.
Group field	If this option is enabled, then **group fields** can be inserted in the report template *(see chapter 4.4.4.3.8, page 256)*.
Result table	If this option is enabled, then **result tables** can be inserted in the report template *(see chapter 4.4.4.3.9, page 257)*.
Single result	If this option is enabled, then **single results** can be inserted in the report template *(see chapter 4.4.4.3.10, page 259)*.
Curve and result table	If this option is enabled, then **curves and result tables** can be inserted in the report template *(see chapter 4.4.4.3.11, page 261)*.
Image	If this option is enabled, then **images** can be inserted in the report template *(see chapter 4.4.4.3.12, page 262)*.
Line	If this option is enabled, then **lines** can be inserted in the report template *(see chapter 4.4.4.3.13, page 263)*.

Rectangle	If this option is enabled, then **rectangles** can be inserted in the report template *(see chapter 4.4.4.3.14, page 264)*.
Curve	If this option is enabled, then **curves** can be inserted in the report template *(see chapter 4.4.4.3.15, page 265)*.
Calibration curve	If this option is enabled, then **calibration curves** can be inserted in the report template *(see chapter 4.4.4.3.16, page 266)*.
Spectrum and maxima table	If this option is enabled, then **Spectra and maxima tables** can be inserted in the report template *(see chapter 4.4.4.3.17, page 268)*.
Cyclic voltammograms	If this option is enabled, then **cyclic voltammograms** can be inserted in the report table *(see chapter 4.4.4.3.18, page 269)*.

4.4.4.2 Report template - Functions

4.4.4.2.1 Report template - Function overview

Program window: **Database ▶ Report template**

The following functions can be carried out in the **Report template** program window:

- *Page setup*
- *Defining sections in main window*
- *Inserting report pages*
- *Insert modules*
- *Edit modules*
- *Zooming*
- *Showing the page preview*
- *Entering comments on report templates*
- *Defining options for report templates*
- *Saving a report template*

4.4.4.2.2 Report template - Page setup

Dialog window: **Report template ▶ File ▶ Page setup… ▶ Page setup**

The **File ▶ Page setup…** menu item in the **Report template** window opens the **Page setup** dialog window, in which the report format settings can be made.

General

only for form report

Settings

Selection	**Apply to current page** | **Apply to all pages**
Default value	**Apply to current page**

Apply to current page
The page settings are applied only to the currently selected report page.

Apply to all pages
The page settings are applied to all report pages.

Paper size

Paper size

Selection of the paper size. The width and height of the paper can be defined with **User-defined**.

Selection	**A4** | **Letter** | **Legal** | **User-defined**
Default value	**A4**

Width

Width of the paper size. This parameter can be edited only if **Paper format** = **User-defined**.

Input range	**0.0 to 499.0 mm**
Default value	**210.0 mm**

Height

Height of the paper size. This parameter can be edited only if **Paper format** = **User-defined**.

Input range	**0.0 to 499.0 mm**
Default value	**297.0 mm**

Orientation

Selection of the page layout.

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Page margins

Top

Upper page margin.

Input range	**0.0 to 499.0 mm**
Default value	**15.0 mm**

Bottom

Lower page margin.

Input range	**0.0 to 499.0 mm**
Default value	**15.0 mm**

Left

Left-hand page margin.

Input range	**0.0 to 499.0 mm**
Default value	**20.0 mm**

Right

Right-hand page margin.

Input range	**0.0 to 499.0 mm**
Default value	**20.0 mm**

Layout

Header

Height of the header.

Input range	**0.0 to 499.0 mm**
Default value	**15.0 mm**

Footer

Height of the footer.

Input range	**0.0 to 499.0 mm**
Default value	**15.0 mm**

Determination height

Height of the section for a single determination on a tabular report.

only for tabular report

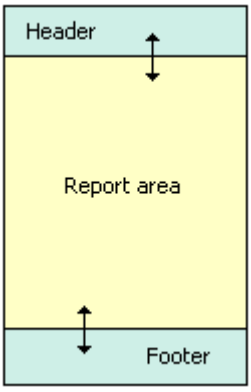
Input range	**0.0 to 499.0 mm**
Default value	**25.0 mm**

4.4.4.2.3 Report template - Defining sections

Program window: **Database ▶ Report template**

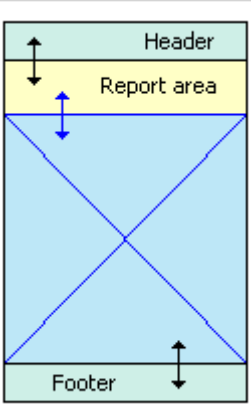
Defining sections for the form report

The header, footer and report sections can be enlarged or reduced with the left mouse button.



Defining sections for tabular report

The header, footer and report sections can be enlarged or reduced with the left mouse button.



4.4.4.2.4 Report template - Inserting pages

Menu item: **Report template ► Insert ► Page before / page after**

NOTE

It is not possible to insert pages in templates for tabular reports.

Inserting page before

The **Insert ► Page before** menu item in the **Report template** program window is used to insert a new, empty report page before the report page shown.

Inserting page after

The **Insert ► Page after** menu item in the **Report template** program window is used to insert a new, empty report page after the report page shown.

Navigating

In report templates with several pages, the navigation bar can be used to switch to the required page.

|<

Jump to first page.

<

Jump to previous page.

>

Jump to next page.

>|

Jump to last page.

4.4.4.2.5 Report template - Inserting modules

Program window: **Database ▶ Report template**

In order to insert a module into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button. The properties window for the corresponding module opens automatically afterwards.

Form report

The following modules can be inserted in a form report:

- **Header**
  Text field
  Data field
  Date field
  Time field
  Page number
  Number of pages
  Image
  Line
  Rectangle
  Curve
  Curve

- **Report section**
  Text field
  Data field
  Date field
  Time field
  Fixed report
  Group field
  Image
  Line
  Rectangle
  Curve
  Curve
- **Footer**
  Text field
  Data field
  Date field
  Time field
  Page number
  Number of pages
  Image
  Line
  Rectangle
  Curve
  Curve

Tabular report

The following modules can be inserted in a tabular report:

- **Header**
  Text field
  Date field
  Time field
  Page number
  Number of pages
  Image
  Line
  Rectangle
- **Report section**
  Text field
  Data field
  Date field
  Time field
  Group field
  Image
  Line
  Rectangle

- **Footer**
  Text field
  Date field
  Time field
  Page number
  Number of pages
  Image
  Line
  Rectangle

4.4.4.2.6 Report template - Editing modules

Program window: **Database ▶ Report template**

Activating the selection

This icon in the module bar must be activated in order to be able to select modules in a report template for editing.

Selecting a single module

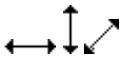
Single modules are selected with a left click. This automatically shows the corresponding properties of the module below the toolbar.

Selecting several modules

Several modules are selected by creating a frame around the required modules with the left mouse button.

Moving, reducing, enlarging modules

When this cursor icon appears, the selected modules can be moved about on the report template with the left mouse button pressed down.



When one of these cursor icons appears, the selected modules can be reduced or enlarged, respectively, on the report template with the left mouse button pressed down.

Cutting, copying, pasting, deleting modules

Cuts the selected modules and copies them to the clipboard.

Copies the selected modules to the clipboard.

Pastes modules from the clipboard.

Deletes selected modules.

Editing module properties

Opens the properties window for the selected module. Alternatively, the properties can also be edited directly below the toolbar.

4.4.4.2.7 Report template - Zooming

Program window: **Database ► Report template**

100 %

The required zoom factor for showing the report template can be selected in increments of **25%** from **25%** to **400%** with this list box on the toolbar.

4.4.4.2.8 Report template - Page preview

Preview window: **Report template ► File ► Page preview ► Report preview**

With the icon or the **File ► Page preview** menu item in the program window **Report template** the window **Report preview** opens, in which a page preview of the report template is shown with the data of the determinations selected in the determination overview.

Functions

PDF

Outputs the displayed report as a PDF file.

100 %

Select the required zoom factor for displaying the report preview; range **25%** to **400%** in increments of **25%**.

Selecting a report page

In reports with several pages, the **Page** navigation bar can be used to switch to the required page.

Jump to first page.

Jump to previous page.

>

Jump to next page.

>|

Jump to last page.

Selecting a determination

If several determinations have been selected for the report display, then the **Determination** navigation bar can be used to switch to the required determination.

|<

Jump to first determination.

<

Jump to previous determination.

>

Jump to next determination.

>|

Jump to last determination.

4.4.4.2.9 Report template - Comment

Dialog window: **Report template ► Edit ► Comment ► Comment**

With the **Edit ► Comment** menu item in the **Report template** program window, the **Comment on report template** window opens in which comments on the opened report template can be entered.

Comment

Comment on the report template shown in the list of report templates.

Entry	**1000 characters**

4.4.4.2.10 Report template - Options

Dialog window: **Report template ► Tools ► Options...**

With the menu item **Tools, Options** in the program window **Report templates** the window **Options for report templates** opens in which various settings for the report template can be defined.

Unit

Unit

Selection of the unit for the report templates.

Selection	**mm** | **cm** | **inch**
Default value	**mm**

Grid

X distance

Grid distance in x direction.

Input range	**1.0 to 100.0 mm**
Default value	**5.0 mm**

Y distance

Grid distance in y direction.

Input range	**1.0 to 100.0 mm**
Default value	**5.0 mm**

Display grid

on | off (Default value: **off**)

Activates/deactivates the grid display on the report template.

Snap to grid

on | off (Default value: **off**)

Enable/disable snapping to grid on the report template.

Default font

Font

Selection of the default font for the report templates.

Selection	**Arial** | **Windows fonts**
Default value	**Arial**

4.4.4.2.11 Report template - Saving

Dialog window: **Report template ► File ► Save / Save as ► Save report template**

With the icon or the **File ► Save** menu item an existing opened report template will be saved again under its own name without opening the window **Save report template**.

When saving a newly created report template with the **File ► Save** menu item or when saving an existing report template with the **File ► Save as** menu item, the **Save report template** window is opened, in which a name for the report template can be entered or selected.

List of report templates

The list of report templates contains information about all the saved report templates. The table cannot be edited. With a click on the column title (Column **Name**, **Saved**, **Saved by**, **Comment**) the table can be sorted according to the selected column in ascending or descending sequence.

Name

Name of the report template.

Saved

Date and time when the report template was saved.

Saved by

Short name of the user who saved the report template.

Comment

Comment on the report template.

Saving the report template

Name

Entry of the name under which the report template is to be saved.

Entry	**50 characters**

NOTE

The name of the report template must be unique throughout the entire client/server system.

[Save]

Saves the report template under the required name.

4.4.4.3 Report template - Modules

4.4.4.3.1 Report template - Text field

Program window: **Database ► Report template**

Text fields are used for outputting any texts in the report.

Inserting

Ab

In order to insert a text field into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of the text field.

Input range	**0.0000 to (max. page width) mm**

Height

Height of the text field.

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

Bold.

Italic.

Underlined.

Left-justified.

Centered.

Right-justified.

Activates/deactivates line break for multi-line text fields.

A...

Fills the field with dots.

Text

Text input for the text field.

4.4.4.3.2 Report template - Data field

Program window: **Database ► Report template**

Data fields are used for outputting determination data in a report.

Inserting

In order to insert a data field into a report template the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of data field.

Input range	**0.0000 to (max. page width) mm**

Height

Height of data field.

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

B

Bold.

I

Italic.

U

Underlined.

Left-justified.

Centered.

Right-justified.

Activates/deactivates line break for multi-line data fields.

A...

Fills the field with dots.

Prefix

Text placed before the contents of the data field.

Entry	**50 characters**

Data field

Shows path and name of selected data field (the field cannot be edited directly). ... opens a window for selecting the data field in which all the available fields for the determination overview are shown in tree-form. The path and name of the data field are entered with a double-click on the required field.

Suffix

Text placed after the contents of the data field.

Entry	**50 characters**

Preview

Shows a formatted example of text.

4.4.4.3.3 Report template - Date field

Program window: **Database ► Report template**

Date fields are used for outputting the current date in a report.

Inserting

In order to insert a date field into a report template the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of date field.

Input range	**0.0000 to (max. page width) mm**

Height

Height of date field.

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

Bold.

Italic.

Underlined.

Left-justified.

Centered.

Right-justified.

Fills the field with dots.

Prefix

Text placed before the contents of the date field.

Entry	**50 characters**

Suffix

Text placed after the contents of the date field.

Entry	**50 characters**

Preview

Shows the formatted date.

4.4.4.3.4 Report template - Time field

Program window: **Database ► Report template**

Time fields are used for outputting the actual time in the report.

Inserting

In order to insert a time field into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of the time field.

Input range	**0.0000 to (max. page width) mm**

Height

Height of time field.

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

Bold.

Italic.

Underlined.

Left-justified.

Centered.

Right-justified.

Fills the field with dots.

Prefix

Text placed before the contents of the time field.

Entry	**50 characters**

Suffix

Text placed after the contents of the time field.

Entry	**50 characters**

Preview

Shows the formatted time.

4.4.4.3.5 Report template - Page number

Program window: **Database ▶ Report template**

The actual page number in the report is output in a page number field.

Inserting

In order to insert a page number field into a report template, the corresponding icon must be selected on the module bar and then placed in the header or footer of the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of the page number field.

Input range	**0.0000 to (max. page width) mm**

Height

Height of the page number field.

Input range	**0.0000 to (max. page height) mm**

Arial

Selection of the available Windows fonts.

9

Font size in pt.

Color selection.

B

Bold.

I

Italic.

U

Underlined.

Left-justified.

Centered.

Right-justified.

A...

Fills the field with dots.

Prefix

Text placed before the contents of the page number field.

Entry	**50 characters**

Suffix

Text placed after the contents of the page number field.

Entry	**50 characters**

Preview

Shows the formatted page number.

4.4.4.3.6 Report template - Number of pages

Program window: **Database ► Report template**

This field shows the total number of pages in the report.

Inserting

In order to insert a number of pages field into a report template, the corresponding icon must be selected on the module bar and then placed in the header or footer of the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of the field.

Input range	**0.0000 to (max. page width) mm**

Height

Height of the field.

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

Bold.

Italic.

Underlined.

Left-justified.

Centered.

Right-justified.

A...

Fills the field with dots.

Prefix

Text placed before the contents of the field.

Entry	**50 characters**

Suffix

Text placed after the contents of the field.

Entry	**50 characters**

Preview

Shows the formatted number of pages.

4.4.4.3.7 Report template - Fixed report

Program window: **Database ► Report template**

Fixed reports are used for outputting predefined partial reports of the determination in the report.

Inserting

In order to insert a fixed report into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

Shows the predefined X position for the fixed report.

Y pos.

Shows the Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Shows the predefined width of the fixed report.

Height

Height of the fixed report.

Input range	**0.0000 to (max. page height) mm**

Fixed report

Selection of a predefined fixed report.

Selection	**Amperometric cells** | **Analyses** | **Integration parameters** | **Calibration parameters** | **Components** | **MSM** | **Messages** | **Method properties** | **Method parameters** | **Sample data** | **Result definitions** | **Standards** | **Start parameters** | **Statistical data (short)** | **Statistical data (full)** | **Columns** | **Signature list determination** | **Signature list method** | **Used common variables** | **Used devices** | **Time program** | **Monitoring report**

4.4.4.3.8 Report template - Group field

Program window: **Database ► Report template**

A group field is for the purpose of grouping together a variety of fields in the report template. All of the fields gathered together in a group field can be moved together as a group. The group field prevents a page break inside the group field.

The group field always extends across the entire width of a page; only the upper edge (Y value) and the height of the field can be configured.

NOTE

The following fields, which do not permit page break controls, cannot be inserted into a group field:

- Fixed report
- Result table
- Curve
- Calibration curve

Inserting

In order to insert a group field into a report template the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

Shows the predefined X position for the field.

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Shows the predefined width of the field.

Height

Height of the field

Input range	**0.0000 to (max. page height) mm**

4.4.4.3.9 Report template - Result table

Program window: **Database ► Report template**

Result tables are used to output determination results in table form in the report.

Inserting

In order to insert a result table in a report template the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

Shows the predefined X position for the field.

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Shows the predefined width of the field.

Height

Height of the field.

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

Analysis

Entry of the name of the analysis for which the results are to be output.

Entry	**40 characters**
Selection	**All**
Default value	**All**

All
Result tables are output for all analyses.

Available results

Shows all the results that can be shown as columns in the result table.

Results shown

Result

Shows all the results that can be displayed as columns in the result table.

Decimal places

Number of decimal places for displaying the results.

[Decimal places]

Opens the **Decimal places** dialog window, in which the number of decimal places for the result can be selected.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

Changes the sequence of displayed columns by moving the selected column up.

Changes the sequence of displayed columns by moving the selected column down.

Non-identified peaks

Shows non-identified peaks

on | off (Default value: **off**)

Selection whether non-identified peaks are to be displayed in the result table.

4.4.4.3.10 Report template - Single result

Program window: **Database ► Report template**

Single-result fields are used for the output of user-defined single results in the report.

Inserting

In order to insert a single-result field into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

Shows the predefined X position for the field.

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Shows the predefined width of the field.

Height

Height of the field.

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

Bold.

Italic.

Underlined.

Fills the field with dots.

Prefix

Text placed before the contents of the single-result field.

Entry	**50 characters**

Single result

Entry of the name of the user-defined single result that is to be output.

Entry	**50 characters**
Selection	**All**
Default value	**All**

All
All user-defined single results are output one below each other.

Suffix

Text placed after the contents of the single-result field.

Entry	**50 characters**

Preview

Shows a formatted example of text.

4.4.4.3.11 Report template - Curves + result table

Program window: **Database ▶ Report template**

Inserting

In order to insert a curve and result table field into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

General properties

X pos.

Shows the predefined X position for the field.

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Shows the predefined width of the field.

Height

Height of the field

Input range	**0.0000 to (max. page height) mm**

Selection of the available Windows fonts.

Font size in pt.

Color selection.

Analysis

Entry of the name of the analysis for which the curves and results are to be output.

Entry	**40 characters**
Selection	**All**
Default value	**All**

All
Curves and result tables are output for all analyses.

Properties for curve display

Curve

The properties for the curve display are selected with this icon (parameter description *see Report template - Curve field*).

Properties for result display

Result

The properties for the display of the result tables are selected with this icon (parameter description *see Report template - Result table*).

4.4.4.3.12 Report template - Image

Program window: **Database ► Report template**

An image field is used for entering any external graphics on the report template. The file formats ***.png**, ***.jpg** and ***.gif** are supported.

Inserting

In order to insert an image into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of the text field.

Input range	**0.0000 to (max. page width) mm**

Height

Height of the text field.

Input range	**0.0000 to (max. page height) mm**

Graphics file

Shows path and name of the selected graphics file (the field cannot be edited directly). … opens a window for selecting the graphics file. The path and name of the graphics file are then entered.

Size

Definition of how the graph is to be displayed.

Selection	**original** | **proportional** | **non-proportional**
Default value	**original**

original
Original size.

proportional
Proportional enlargement or reduction in size.

non-proportional
Non-proportional enlargement or reduction in size.

4.4.4.3.13 Report template - Line

Program window: **Database ► Report template**

Any line can be inserted in the report template.

Inserting

In order to insert a line into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Length

Length of the line.

Input range	**0.0 to (max. page width) mm**

Angle

Angle of the line.

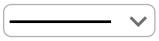
Input range	**0.000 to 360.000 °**

Line thickness

Thickness of the line.

Input range	**0.1 to 10.0 mm**
Default value	**0.5 mm**

Selection of the line color.



Selection of the type of line.

4.4.4.3.14 Report template - Rectangle

Program window: **Database ► Report template**

Any rectangle can be inserted in the report template.

Inserting

In order to insert a rectangle into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

X position within the permitted range.

Input range	**0.0000 to (max. page width) mm**

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Width of the rectangle.

Input range	**0.0000 to (max. page width) mm**

Height

Height of the rectangle.

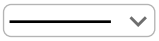
Input range	**0.0000 to (max. page height) mm**

Line thickness

Thickness of the line for the rectangle.

Input range	**0.1 to 10.0 mm**
Default value	**0.5 mm**

Selection of the line color.



Selection of the type of line for the rectangle.

Activates/deactivates the fill color.

Selection of the fill color.

4.4.4.3.15 Report template - Curve field

Program window: **Database ► Report template**

Inserting

In order to insert a curve into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

Properties

X pos.

Shows the predefined X-position for the curve field.

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Shows the predefined width of the curve field.

Height

Height of the curve field.

Input range	**0.0000 to (max. page height) mm**

Analysis

Entry of the name of the analysis for which curves are to be output.

Entry	**40 characters**
Selection	**All**
Default value	**All**

All
Curves are output for all analyses.

Curve display

Definition of the curve display.

Selection	**from database** | **user-defined**
Default value	**from database**

from database
The curve is displayed with the settings as stored in the database (with the exception of the background color, which is always white). The tabs for configuring the display are disabled.

user-defined
The display of the curve in the report can be configured by the user.

Axes

Parameter *see Properties - Axes*.

Chromatogram

Parameter *see Properties - Curve*.

Representation

Parameter *see Properties - Display*.

4.4.4.3.16 Report template - Calibration curve field

Program window: **Database ► Report template**

Inserting

In order to insert a calibration curve field into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

General properties

X pos.

Shows the predefined X position for the field.

Y pos.

Y position within the permitted range.

Input range	**0.0000 to (max. page height) mm**

Width

Shows the predefined width of the field.

Height

Height of the field

Input range	**0.0000 to (max. page height) mm**

Arial

Selection of the available Windows fonts.

9

Font size in pt.

Color selection.

Analysis

Entry of the name of the analysis for which the calibration curve is to be output.

Entry	**40 characters**
Selection	**All**
Default value	**All**

All
Calibration curves are output for all analyses.

Component

Entry of the name of the component for which the calibration curve is to be output.

Entry	**40 characters**
Selection	**All**
Default value	**All**

All
Calibration curves are output for all components.

Curve display

Parameter description *see Report template - Curve field*.

4.4.4.3.17 Report template - Spectra + Maxima table

Program window: **Database ► Report template**

4.4.4.3.17.1 General properties

Program window: **Database ► Report template**

Inserting

In order to insert a spectrum and maxima table field into a report template the corresponding icon must be selected on the module bar and placed on the report template by creating a field with the left mouse button.

General properties

The parameters **X pos.**, **Y pos.**, **Width** and **Height** as well as the parameters for font, font size and color are described in the report module *Report template - Curves + result table, p. 261*.

Analysis

Selection **All** or manual entry of the analysis name.

Entry	**40 characters** Out of all analyses of the determination which have the entered name, the spectra are to be put out.
Selection	**All**
Default value	**All**

All
Out of all analyses of the determination the spectra are to be put out.

Spectrum

Selection **All** or manual entry of a spectrum name.

Entry	**40 characters** Out of the selected analyses all spectra which have the entered name are put out.
Selection	**All**
Default value	**All**

All
Out of the selected analyses all spectra are put out.

The parameter **Curve view** is described in the report module *Report template - Curve field, p. 265*.

Properties for the display of spectra

Spectra

The properties for the display of spectra are selected with this icon (parameter description *see Properties for the display of spectra*).

Properties for the display of maxima

Maxima

The properties for the display of the maxima table are selected with this icon (parameter description *see Properties for the display of maxima tables*).

4.4.4.3.17.2 Properties for the display of spectra

Program window: **Database ► Report template**

Axes

Parameter *see Properties - Axes*.

Spectrum

Parameter *see Properties - Spectrum*.

Display

Parameter *see Properties - Display*.

4.4.4.3.17.3 Properties for the display of maxima tables

Program window: **Database ► Report template**

Available results

Display of all the results that can be shown as columns in the maxima table.

Displayed results

Parameter *see Results shown*.

4.4.4.3.18 Report template - Cyclovoltammograms

Program window: **Database ► Report template**

4.4.4.3.18.1 General properties

Program window: **Database ► Report template**

Inserting

In order to insert a cyclic voltammogram field into a report template, the corresponding icon must be selected on the module bar and then placed on the report template by creating a field with the left mouse button.

General properties

The parameters **X pos.**, **Y pos.**, **Width** and **Height** are described in the report module *Report template - Curve field, p. 265*.

Analysis

Selection **All** or manual entry of the analysis name.

Entry	**40 characters** Out of all analyses of the determination which have the entered name, the cyclovoltammograms are to be put out.
Selection	**All**
Default value	**All**

All
Out of all analyses of the determination the cyclovoltammograms are to be put out.

Cyclic voltammogram

Selection **All** or manual entry of the cyclic voltammogram name.

Entry	**40 characters** Out of the selected analyses all cyclovoltammograms which have the entered name are put out.
Selection	**All**
Default value	**All**

All
Out of the selected analyses all cyclovoltammograms are put out.

The parameter **Curve view** is described in the report module *Report template - Curve field, p. 265*.

4.4.4.3.18.2 Properties for the display of cyclovoltammograms

Program window: **Database ► Report template**

Axes

Parameter *see Properties - Axes*.

Display

Parameter *see Properties - Display*.

4.5 Control chart templates

4.5.1 Managing control chart templates

Menu item: **Database ▶ Tools ▶ Templates ▶ Control chart templates... ▶ Control chart templates**

The **Tools ▶ Templates ▶ Templates for control charts...** menu item opens the **Control chart templates** dialog window, in which globally available control chart templates can be managed.

Template table

The table with the defined templates cannot be edited, but it can be sorted according to the selected column in ascending or descending order by clicking on the column title.

Template name

Shows the name of the template.

Comment

Shows the comments about the template.

Functions

[New]

Creates a new template. The **Properties - Control chart template** dialog window opens, in which the properties for the new template can be defined.

[Properties]

Opens the **Properties - Control chart template** dialog window, in which the properties of the template selected in the table can be edited.

[Delete]

Delete template.

[Copy]

Copies the template and saves it under the name **Copy of...**.

4.5.2 Editing control chart templates

4.5.2.1 Control chart template - Properties

Dialog window: **Database ▶ Tools ▶ Templates ▶ Control chart templates... ▶ Control chart templates ▶ [Properties] ▶ Properties - Control chart templates**

Template name

Name under which the control chart template is saved per client in the configuration database.

Entry	**50 characters**

Result table

Table with the results for which a control chart is defined.

The most important properties of the control chart of the selected result are displayed next to the table on the right.

[Edit]

Opens the menu for editing the control charts of the individual results.

New	Adds a new result to the template.
Properties	Edit properties of the selected result.
Delete	Deletes the selected result.

Result properties overview

Displays the most important properties of the control chart of the selected result in the table.

Warning limits

Displays the defined warning limits.

Intervention limits

Displays the defined intervention limits.

Statistics

Displays the defined statistical data.

Comment

Entry of a comment on the control chart template.

Comment

Comment on the control chart.

Entry	**1,000 characters**

4.5.2.2 Control chart template - Result properties

Dialog window: **Database ▶ Tools ▶ Templates ▶ Control chart templates... ▶ Control chart templates ▶ [Properties] ▶ Properties - Control chart templates ▶ [Edit] ▶ Properties ▶ Control chart - Result properties**

Result

Display of the result variable whose control chart is being edited. … opens the dialog window **Select result**, in which all results of the determination which is in focus in the determination overview are available.

Label

Freely definable designation for the control chart of the result; the tab of the control chart in the **Detailed overview - Control chart** window is labeled with this *(see chapter 4.7.16.4, page 317)*.

Entry	**50 characters**
Default value	**empty**

4.5.2.3 Control chart template - Graphics parameters

Tab: **Database ▶ Tools ▶ Templates ▶ Control chart templates... ▶ Control chart templates ▶ [Properties] ▶ Properties - Control chart template ▶ [Edit] ▶ Properties ▶ Control chart - Result properties ▶ Graphics parameters**

Y axis

Scaling

Selection	**Automatic** | **Manual**
Default value	**Automatic**

Automatic
Automatic scaling of the Y axis.

Manual
Manual scaling of the Y axis with the values of **Minimum** and **Maximum.**

Minimum

Minimum value for manual scaling.

Input range	**$-1 \cdot 10^{99}$ to $1 \cdot 10^{99}$**
Default value	**0**

Maximum

Maximum value for manual scaling.

Input range	**$-1 \cdot 10^{99}$ to $1 \cdot 10^{99}$**
Default value	**1,000**

Background

Background color

Background color for the control chart. Clicking on the ... icon opens the **Select color** dialog window for the selection of the background color *(see chapter 2.6.14, page 107)*.

.

Measured values

Link measured values

on | off (Default value: **off**)

If this option is activated then the measured value points will be joined together with a black line.

4.5.2.4 Control chart template - Limit values

Tab: **Database ► Tools ► Templates ► Control chart templates... ► Control chart templates ► [Properties] ► Properties - Control chart template ► [Edit] ► Properties ► Control chart - Result properties ► Limit values**

Definition of warning and intervention limits to be shown on the control chart.

Warning limits

Warning limits are displayed in **orange** on the control chart.

Selection	**Fixed value** | **Mean value ± standard deviation** | **Mean value ± 2× standard deviation** | **Mean value ± 3× standard deviation**

Fixed value
Fixed value of the warning limit.

Mean value ± standard deviation
Mean value ± Standard deviation as a value of the warning limit.

Mean value ± 2× standard deviation
Mean value ± 2×Standard deviation as a value of the warning limit.

Mean value ± 3× standard deviation
Mean value ± 3×Standard deviation as a value of the warning limit.

Lower limit

Lower warning limit. Only editable for the value of the warning limit **fixed value**.

Input range	**$-1.0 \cdot 10^{99}$ to $1.0 \cdot 10^{99}$**
Default value	**0**

Upper limit

Upper warning limit. Only editable for the value of the warning limit **fixed value**.

Input range	**$-1.0 \cdot 10^{99}$ to $1.0 \cdot 10^{99}$**
Default value	**1**

Intervention limits

Intervention limits are displayed in **red** on the control chart.

Selection	**Fixed value** | **Mean value ± standard deviation** | **Mean value ± 2× standard deviation** | **Mean value ± 3× standard deviation**

Fixed value
Fixed value of the intervention limit.

Mean value ± standard deviation
Mean value± of the standard deviation as a value of the intervention limit.

Mean value ± 2× standard deviation
Mean value± 2×standard deviation as a value of the intervention limit.

Mean value ± 3× standard deviation
Mean value± 3×standard deviation as a value of the intervention limit.

Lower limit

Lower intervention limit. Only editable for the value of the intervention limit **fixed value**.

Input range	**$-1.0 \cdot 10^{99}$ to $1.0 \cdot 10^{99}$**
Default value	**0**

Upper limit

Upper intervention limit. Only editable for the value of the intervention limit **fixed value**.

Input range	**$-1.0 \cdot 10^{99}$ to $1.0 \cdot 10^{99}$**
Default value	**1**

4.5.2.5 Control chart template - Statistics

Tab: **Database ► Tools ► Templates ► Control chart templates... ► Control chart templates ► [Properties] ► Properties - Control chart template ► [Edit] ► Properties ► Control chart - Result properties ► Statistics**

Definition of the display of statistics data on the control chart.

Displaying statistics data

on | off (Default value: **on**)

If this option is enabled, then the statistics data for **Mean value**, **Standard deviation**, **Number of measuring points** and **Minimum and maximum value** will be shown beneath the graph display.

Draw in mean value

on | off (Default value: **on**)

If this option is enabled, then the **Mean value** will be shown on the control chart as a continuous line in the color of the measured value.

Draw in standard deviation

on | off (Default value: **on**)

If this option is enabled, then the two values **Mean value + Absolute standard deviation** and **Mean value - Absolute standard deviation** will be shown on the control chart as dotted lines in the color of the measured value.

4.6 Export templates

4.6.1 Managing export templates

Dialog window: **Database ► Tools ► Templates ► Export templates... ► Export templates**

With the menu item **Tools ► Templates ► Export templates**, the dialog window **Export templates** is opened in which the globally available templates for manual or automatic export of determination data can be managed.

Template table

The table with the defined templates cannot be edited, but it can be sorted according to the selected column in ascending or descending order by clicking on the column title.

Name

Shows the name of the export template.

File type

Shows the file format of the export template for data export.

Comment

Shows the comment on the export template.

Functions

[New]

Create a new export template. The dialog window **Export template** opens in which the properties for the new template can be defined.

[Properties]

Open the dialog window **Export template** in which the properties of the template selected in the table can be edited.

[Delete]

Deletes the selected export template.

[Copy]

Copies the selected export template and saves it under the name **Copy of…**.

4.6.2 Editing export templates

4.6.2.1 Export template - Properties

Dialog window: **Database ► Tools ► Templates ► Export templates... ► Export templates ► [Properties] ► Export template 'Name'**

[Properties] is used to open the dialog window **Export template 'Name'** in which the properties of the selected export template can be edited.

Name

Name of the export template.

Entry	**50 characters**

Comment

Freely definable comment on the export template.

Entry	**250 characters**

Target directory

Entry or selection (with …) of the path for the directory in which the export file is to be saved.

Entry	**1,000 characters**

File type

Selection of the file format for data export:

Selection	***.idet (MagIC Net format)** | ***.csv (comma separated)** | ***.slk (SLK format)** | ***.xml (XML format)** | ***.cdf (AIA format)** | ***.txt (measuring point list)**
Default value	***.idet (MagIC Net format)**

***.idet (MagIC Net format)**
Program-specific data exchange format that can only be imported into other MagIC Net databases.

***.csv (comma separated)**
Data exchange format with unformatted text that can be imported into other PC programs (e.g. Excel, Access).

***.slk (SLK format)**
Data exchange format with formatted text that can be imported into other PC programs (e.g. Excel).

***.xml (XML format)**
Data exchange format with XML code that can be imported into corresponding PC programs.

***.cdf (AIA format)**
Data exchange format for AIA chromatogram data that can be imported into corresponding PC programs.

***.txt (measuring point list)**
Data exchange format for the measuring point list that can be imported into corresponding PC programs. The text file contains a header with date/time of the determination, Ident and determination ID, then the measuring point lists of the analyses will be listed one after the other. For each measuring point list, the analysis name, the number of measuring points and the units of time and measured value will be listed at the head. If the determination contains analyses using the *(see chapter 7.14, page 1132)*, UV/VIS spectra may additionally be defined. In this case the spectrum data is output afterwards: the name of the spectrum has the format **Analysis name/Spectrum name**. The output of spectra is alphabetically sorted according to the spectrum name.

[Select fields]

Opens the dialog window **Select fields** in which the required fields for the export can be selected, arranged in the required sequence and renamed.

NOTE

Field selection is only possible for the file types ***.csv** and ***.slk**. With ***.idet** and ***.xml** always all fields will be exported.

[Options]

Opens the **Options** dialog window, in which the separators can be defined.

NOTE

The options can only be set for the file types ***.csv** and ***.txt**.

File name

One of the following options can be selected for the definition of the name of the export file:

Selection	**Determination ID** | **Sample identification** | **Request on each export** | **Fixed file name (append data)**
Default value	**Determination ID**

Determination ID
If this option is selected then the name of the export file will be formed from the unique **determination ID**, the **computer name**, the date stamp **-YYYYMMDD-HHMMSS** and the suffix for the format.

Sample identification
If this option is selected then the name of the export file will be formed from the selected sample identification (**Ident**, **Info 1 - 4** or **Value 1 - 4**), the **Computer name**, the date stamp **-YYYYMMDD-HHMMSS** and the suffix for the format. If the generated name already exists in the directory, then a version number will be additionally appended to the date.

Request on each export
If this option is selected, then the name of the export file will be requested at each export. In addition to the entered name, the **Computer name** and the date stamp **-YYYYMMDD-HHMMSS** will be added automatically.

Fixed file name (append data)
If this option is selected, then the name of the export file will be formed from the name entered here and the suffix for the format. If the file is already present in the directory, then the data will be appended to this file.

NOTE

The option **Fixed file name** can only be selected for the file type ***.csv (comma separated)** or ***.slk (SLK format)**.

4.6.2.2 Export template - Selecting fields

Dialog window: **Database ▶ Tools ▶ Templates ▶ Export templates... ▶ Export templates ▶ [Properties] ▶ Export template ▶ [Select fields] ▶ Select fields**

With **[Select fields]** in the Properties window for export templates the dialog window **Select fields** opens in which the fields for data export for the file types ***.csv** and ***.slk** can be selected.

Available fields

Shows all the fields that can be exported.

Selected fields

Shows all the fields that will be exported.

Default name

Non-editable name of the field to be exported.

Displayed name

Field name editable by the user for the exported field. The **Default name** is entered as default. If the field name is deleted, then the **Default name** will appear again.

»

Adds the selected field.

«

Removes the selected field.

▲

Changes the sequence of the exported fields by moving the selected field upwards.

▼

Changes the sequence of the exported fields by moving the selected field downwards.

4.6.2.3 Export template - Options for CSV format

Dialog window: **Database ▶ Tools ▶ Templates ▶ Export templates... ▶ Export templates ▶ [Properties] ▶ Export template ▶ [Options] ▶ Options for CSV format**

With **[Options]** in the properties window for export templates, the dialog window **Options for CSV format** opens in which the separators can be defined.

Field separator

Selection of the field separator.

Selection	**;** | **,** | **Tab**
Default value	**;**

Record separator

Selection of the data set separator (**CR** = Carriage return, **LF** = Line feed).

Selection	**CR/LF** | **CR** | **LF**
Default value	**CR/LF**

Header

on | off (Default value: **on**)

If this check box is activated, the column headers are output at the beginning of the export file.

4.6.2.4 Export template - Options for measuring point list

Dialog window: **Database ▶ Tools ▶ Templates ▶ Export templates... ▶ Export templates ▶ [Properties] ▶ Export template ▶ [Options] ▶ Options for measuring point list**

With **[Options]** in the properties window for export templates, the dialog window **Options for measuring point list** opens in which the separators can be defined.

Field separator

Selection of the field separator.

Selection	**;** | **,** | **Tab**
Default value	**;**

4.6.2.5 Export template - Request at file export

Dialog window: **Database ▶ Tools ▶ Templates ▶ Export templates... ▶ Export templates ▶ [Properties] ▶ Export template**

If in the properties of the export template under **File name** the option **Request on each export** has been selected *(see chapter 4.6.2.1, page 277)*, then before the export of a determination the **File export** dialog is displayed. If several determinations have been marked for export, then this dialog will be displayed for each individual determination.

Target directory

Shows the target directory for the export file, which has been defined in the properties of the export template used *(see chapter 4.6.2.1, page 277)*.

File name

Entry of the name under which the export file is to be saved in the **Target directory**. Both the user name and the current time stamp are automatically appended to the name entered when the file is created.

[OK]

The corresponding determination will be exported to the indicated file.

[Cancel]

The export of *the corresponding determination* is canceled. If several determinations have been marked for export, then the **File export** dialog will be displayed afterwards for the next determination.

[Cancel all]

The export of *all selected determinations* is canceled.

4.6.3 XML export

4.6.3.1 XML export - Overview

Dialog window: **Database ▶ Tools ▶ Templates ▶ Export templates... ▶ Export templates ▶ [Properties] ▶ Export template**

General

An XML export file with all determination data can be created by using an XML report template for the export of determinations.

Structure

An XML export file is constructed as follows:

<?xml version="1.0" encoding="ISO-8859-1" ?>	
–<DeterminationReport>	**Determination report**
<xmlCreator val=""/>	Program name
<xmlCreatorVersion val=""/>	Program version
<xmlCreatorBuildNo val=""/>	Build number
<subtype val=""/>	
+ <Determination>	Determination data
+ <Method>	Method data
+ <Sample>	Sample data
+ <Comvars dynamic="">	Common variables
+ <Analyses dynamic="">	Component results
+ <SingleResults>	Single results

+ <ResultMonitoring dynamic="">	Monitored results
+ <MethodParams>	Method parameters
+ <Statistics>	Statistics results
+ <Devices dynamic="">	Instrument data
+ <MethAnalyses dynamic="">	Analysis data
+ <Columns dynamic="">	Column data
–<System>	System data
<userName val="" />	User name (short name)
<userNameFull val="" />	User name (full name)
<clientName val="" />	Client name
<progVersion val="" />	Program version - Build number
<licenseRoot val="" />	License code
</System>	
</DeterminationReport>	

NOTE

dynamic= means that the following nodes can appear more than once.

4.7 Determination overview subwindow

4.7.1 Determination overview - General

4.7.1.1 Determination overview - Overview

Subwindow: **Database ► Determination overview**

General

The **Determination overview** subwindow shows selected data in tabular form for the determinations contained in the open database. It is always displayed in the **Database** program part, i.e., it cannot be removed from the database view. The subwindow can be enlarged and reduced as required; it can also be maximized.

Elements

The **Determination overview** subwindow includes the following tools:

- *Determination table*
- *Filter selection*

- *Navigation bar*

4.7.1.2 Determination overview - Table

Subwindow: **Database ► Determination overview**

Data display

The information defined in the **Column display** regarding the determinations is displayed in the determination table. If the content of a field is larger than the column width, then the entire content will be shown as a **tooltip** if the mouse cursor hovers over the field.

If a result value is monitored and lies within the limit values defined, then it will be shown in **green** text color. If it is outside these limits then the value will be shown in **red** text color.

NOTE

Lines that contain red entries will also show the line number highlighted with a red background.

Update

As long as the **Database** program part remains open, changes in the determination table that are caused by ongoing determinations or by other users (adding, changing or deleting records) are not displayed automatically. The table must either be updated with **View ► Update** or newly sorted or filtered. The determination table is automatically updated every time a switch is made from an other program part to the **Database** program part.

Table view

Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**
  Sets the column width.
- **Double-clicking on the margin between column titles**
  Sets the optimal column width.
- **Dragging the column title**
  Moves the column to the required location.

Dataset selection and table navigation

The determinations selected in the table are displayed in **yellow**; the focused determination, the data of which is displayed in the other subwindows, is marked with an arrow before the line number. There are various possibilities for record selection in the table.

It is not possible to show more than 200 determinations at once in the determination table. If more than 200 records are present in the database, then the Navigation bar must be used to switch to further sets of determinations.

4.7.1.3 Determination overview - Column display

Dialog window: **Database ► View ► Properties ► Column display… ► Column display**

View ► Properties ► Column display… opens the **Column display** dialog window. Here you can define the columns that are to be shown in the determination table.

Available columns

Shows all the fields that can be shown as columns in the determination table.

Displayed columns

Shows all the fields that will be shown as columns in the determination table.

Default name

Non-editable name of the field that is displayed as a column.

Displayed name

Editable name (by double-click) of the column displayed in the determination overview.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Moves the selected column upwards.

▼

Moves the selected column downwards.

4.7.1.4 Determination overview - Filter selection

Subwindow: **Database ► Determination overview**

Filter

Selection of the filter with which the determination table is to be filtered:

Selection	**All determinations** | **All determinations of a multiple injection** | **Quick filter** | **Temporary filter** | **Filter name**
Default value	**All determinations**

All determinations
The table is shown unfiltered.

All determinations of a multiple injection
The table is filtered so that all determinations are shown that are linked with the selected determination as part of a multiple injection.

Quick filter
The table is filtered according to the last defined **quick filter**.

Temporary filter
The table is filtered according to the last defined, not saved **special filter**.

Filter name
The table is filtered according to the selected and saved **special filter**.

4.7.1.5 Determination overview - Batch selection

Subwindow: **Database ► Determination overview**

Batch

Selection of the batch whose determinations are to appear in the determination table.

Selection	**No batch selected** | **Batch name**
Default value	**No batch selected**

No batch selected
The table is shown unfiltered.

Batch name
The table is filtered according to the selected and saved **Batch**.

4.7.1.6 Determination overview - Navigation bar

Subwindow: **Database ► Determination overview**

The navigation bar shown below the determination table is used for navigation in extensive tables in which all the determinations can no longer be displayed simultaneously. It contains the following elements:

|<

Jump to the first set of determinations in the table.

<

Jump back to the previous set of determinations in the table.

201 - 400 of 2098 (filtered)

Display of the selected set **#### - ####** of determinations in the table. If the table is not filtered, then the total number of all determinations will also be shown. If the table is filtered, then the total number of filtered determinations will appear with the additional information **(filtered)**.

>

Jump further to the next set of determinations in the table.

>|

Jump to the last set of determinations in the table.

4.7.1.7 Determination overview - Table navigation

Subwindow: **Database ► Determination overview**

The vertical and the horizontal scroll bars can be used to navigate in the determination table with the mouse. In addition, the following options are available with the keyboard:

[↑]

Moves the line cursor up by one field.

[↓]

Moves the line cursor down by one field.

[Ctrl] [End]

Jump to the last determination in the current set.

[Ctrl] [Home]

Jump to the first determination in the current set.

[Page Up]

Scrolls backward within the current set.

[Page Down]

Scrolls forward within the current set.

[Alt] [End]

Jump to last determination (of all).

[Alt] [Home]

Jump to first determination (of all).

[Alt] [↑]

Jump to first record of previous set.

[Alt] [↓]

Jump to first record of next set.

It is not possible to show more than 200 determinations at once in the determination table. If more than 200 determinations are present in the database then the navigation bar must be used to switch to further sets of determinations.

4.7.1.8 Determination overview - Data set selection

Subwindow: **Database ▶ Determination overview**

The determinations selected in the table are displayed in **yellow**; the focused determination, the data of which is displayed in the other subwindows, is marked with an arrow before the line number. The first determination is always selected and focused when a database is opened.

The following possibilities are available for the selection of determinations in the determination table:

- **Single determinations**
  Single determinations are selected by clicking on them with the mouse within the line (including line number). This determination, whose data is shown in the other opened subwindows, is now focused and marked with an arrow in front of the line number.
- **Several determinations in sequence**
  In order to select several determinations in sequence, the required range can be selected with the left mouse button pressed down. It is also possible to select a range by clicking on the first determination and **holding [Shift] while clicking** on the last determination. The last determination to be selected receives the focus.
- **Several determinations not in sequence**
  In order to select several determinations not in sequence, the individual determinations must be selected by left-clicking on them while holding down the **Ctrl key**. The last determination to be selected receives the focus.
- **All determinations**
  With **[Ctrl] [A]** or by clicking on the uppermost left-hand table cell, all the filtered determinations within the current set of determinations are selected. The focus is retained.

4.7.1.9 Determination overview - Functions

Subwindow: **Database ▶ Determination overview**

The following functions can be carried out with the determinations selected in the determination table:

Editing determinations

- *Entering a determination comment*
- *Signing determinations*

- *Exporting determinations*
- *Importing determinations*
- *Sending determinations to*
- *Reprocessing determinations*
- *Complete determinations*
- *Deleting determinations*

Searching and filtering determinations

- *Searching determinations*
- *Filtering determinations*
- *Create determination batch*

Other functions

- *Updating the determination overview*
- *Displaying a determination method*
- *Displaying the determination history*
- *Show detail overview*
- *Overlay curves*
- *Printing a determination overview*
- *Printing a determination report*

4.7.2 Updating the determination overview

Menu item: **Database ▶ View ▶ Update**

The **View ▶ Update** menu item or the icon is used to update the determination table.

NOTE

The determination table is refreshed automatically when the database is opened and when changing from another program part to the **Database** program part, but afterwards only when resorting or refiltering is carried out.

4.7.3 Determination comment

Dialog window: **Database ▶ Determinations ▶ Comment… ▶ Determination comment**

The **Determinations ▶ Comment…** menu item or the icon opens the **Determination comment** dialog window, in which new comments on the selected determination can be entered or an existing comment can be edited.

Comments entered in this way appear automatically as a tooltip text when the cursor hovers over the number field of a line in the determination

table for more than one second. It is additionally displayed in the **Information** subwindow.

4.7.4 Searching for determinations

Dialog window: **Database ► Determinations ► Search… ► Search - Database**

The **Determinations ► Search...** menu item or the icon opens the **Search - Database** dialog window for the search for determinations.

Search in

Selection of the data field in which the search is to be carried out.

Selection	**All fields** | **'Field name'**

All fields
A search is made in all fields of the database.

'Field name'
A search is made only in the selected field. The 10 most recently selected fields are always available for selection.

[Other…]

Open the **Search - Field selection** dialog window. All fields are listed in tree form. A field can be included in the search by highlighting it and closing the dialog window with **[OK]**.

Details

Analysis

Selects the analysis in which the search is to be carried out. This field is displayed only where **Search in** = **Component result**.

Entry	**64 characters**
Selection	**All** | **'Analysis name'**

All
A search is made in all analyses.

'Analysis name'
A search is made only in the selected analysis. The 10 most recently selected analyses are always available for selection.

Component

Selects the component in which the search is to be carried out. This field is displayed only where **Search in** = **Component result**.

Entry	**64 characters**
Selection	**All** | **'Component name'**

All
A search is made in all components.

'Component name'
A search is made only in the selected component. The 10 most recently selected components are always available for selection.

Result name

Selects the result field in which the search is to be carried out. This field is displayed only where **Search in** = **Component result** or where **Search in** = **Single result**.

Entry	**64 character** A search can be made in user-defined results by entering the result name.
Selection	**'Result name'**

'Result name'
A search is made only in the selected result field. The 10 most recently selected results are always available for selection, as are all component results calculated by default.

Search options

Type

Selection of the type of format for fields in which several types are possible. Only this type will be shown for fields with a fixed type.

Selection	**Text** | **Date** | **Number**
Default value	**Text**

Operator

Selection of the comparison operator for the search criterion.

for fields of the type = text

Selection	**=** | **<>** | **empty** | **not empty**
Default value	**=**

for fields of the type = date

Selection	**=** | **<>** | **<** | **<=** | **>** | **>=** | **empty** | **not empty** | **invalid** | **out of limits** | **Today**
Default value	**=**

invalid
Values with the entry **invalid** are searched for.

out of limits
Values that are outside of the defined limit values for the selected fields will be searched for (values shown in red).

Today
A search is made for the current date. A range in days can also be defined in the **Search term** field if the search should be carried out within to this range, starting from the current date.

for fields of the type = number

Selection	**=** | **<>** | **<** | **<=** | **>** | **>=** | **empty** | **not empty** | **invalid** | **out of limits**
Default value	**=**

invalid
Values with the entry **invalid** are searched for.

out of limits
Values that are outside of the defined limit values for the selected fields will be searched for (values shown in red).

Search term

Entry of the search term for the search in the selected data field. For **Type** = **Date** fields, the date can be selected by clicking on **[...]** in the **Select date** dialog window.

for fields of the type = text

Entry	**256 characters** Definition of a text expression as a search term. The last 10 search terms are saved and can be selected. The following wildcards can be used in the search term:
Selection	**^?** | **^#** | **^$** | **^***

^?
Wildcard for any character.

^#
Wildcard for any digit.

^$
Wildcard for any letter of the alphabet.

^*
Wildcard for any character string.

for fields of the type = date

Entry	**all possible date values** Definition of a date as search term. The last 10 search terms are saved and can be selected.

for fields of the type = date and operator = today

Input range	**-9,999 to 9,999**
Default value	**0**
	Definition of a numerical value as a range in days in which, starting from the current date, the search is to be carried out. The last 10 search terms are saved and can be selected.

for fields of the type = number

Entry	**all possible numerical values**
	Definition of a numerical value as search term. The last 10 search terms are saved and can be selected.

Search direction

Selection of the search direction.

Selection	**All** | **Down** | **Up**
Default value	**All**

All
A search is made down to the end of the database and then again from the top down to the selected record.

Down
A search is made to the end of the database.

Up
A search will be made to the beginning of the database.

Match case

on | off (Default value: **off**)

If this check box is activated, then the search in fields of the **Text** type is case-sensitive.

Search for whole word only

on | off (Default value: **off**)

If this check box is activated, then the field contents must be identical with the search term during searches in **Text** fields (no part-search).

[Find next]

Search until next occurrence of the search term.

4.7.5 Determinations - Batch

4.7.5.1 Batch - Overview

Subwindow: **Database ► Determination overview**

A **Batch** is a selection of determinations that can be combined to suit and that can be saved under a single name and also selected again under this name. A batch can include a maximum of 500 determinations.

The following possibilities exist for loading and managing batches in the determination table:

- *Select batch*
- *Create batch*
- *(see chapter 4.7.5.3, page 294)*
- *Attach determinations to batch*
- *Remove determinations from batch*

4.7.5.2 Creating a batch

Dialog window: **Database ► Determinations ► Batch ► New batch... ► New batch**

The **Determinations ► Batch ► New batch...** menu item opens the **New batch** dialog window for creating a new batch.

Batch name

Name of the batch.

Entry	**64 characters**

Batches can also be created in the **Method** program part during method creation.

4.7.5.3 Deleting a batch

Dialog window: **Database ► Determinations ► Batch ► Delete batch... ► Delete batch**

The **Determinations ► Batch ► Delete batch...** menu item opens the **Delete batch** dialog window for deleting a batch.

Batch name

Selection of the batch that is to be deleted.

Selection	**'Batch name'**

4.7.5.4 Attaching determinations to a batch

Dialog window: **Database ► Determinations ► Batch ► Append to batch... ► Append to batch**

The **Determinations ► Batch ► Append to batch...** menu item opens the **Append to batch** dialog window for adding determinations to an existing batch.

Batch name

Selection of the batch to which the selected determinations are to be attached.

Selection	**'Batch name'**

Selection

Selection of the determinations that are to be added to the batch.

Selection	**Selected determinations** | **All filtered determinations**

Selected determinations
The data sets selected in the determination overview are added to the batch.

All filtered determinations
All of the data sets filtered in the determination overview are added to the batch.

4.7.5.5 Deleting determinations from a batch

Dialog window: **Database ► Determinations ► Batch ► Remove from batch...**

The **Determinations ► Batch ► Remove from batch...** menu item is used to delete the determinations selected in the determination table from the loaded batch.

4.7.6 Filtering determinations

4.7.6.1 Filtering determinations - Overview

Subwindow: **Database ► Determination overview**

The following possibilities exist for filtering determinations in the determination table:

- *Filter selection in the filter bar*
- *Quick filter*
- *Special filter*
- *Last filter*
- *Remove filter*

4.7.6.2 Determinations - Last filter

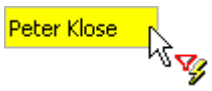
Menu item: **Database ▶ Determinations ▶ Filter ▶ Last filter**

The most recently applied filter is reactivated with the **Determinations ▶ Filter ▶ Last filter** menu item or with the icon.

4.7.6.3 Determinations - Quick filter

Menu item: **Database ▶ Determinations ▶ Filter ▶ Quick filter**

A quick filtration can be carried out in accordance with the content of the selected table field using the **Determinations ▶ Filter ▶ Quick filter** menu item or the icon. After this function has been selected, the field in the determination table in which the cursor is located will have a colored background during navigation. At the same time, the following special filter icon appears:



By double-clicking with the left mouse button you can set the content of the selected field as filter criterion and apply it directly to the table.

NOTE

The quick filter can be applied again within the filtered table, so that the number of entries can be limited step by step.

4.7.6.4 Determinations - Special filter

Dialog window: **Database ▶ Determinations ▶ Filter ▶ Special filter... ▶ Special filter - Database "Database name"**

The **Determinations ▶ Filter ▶ Special filter...** menu item or the icon is used to open the **Special filter - Database** dialog window for the definition of user-specific filters.

Filter

Selection of the filter to be loaded for editing.

Selection	**'Filter name'** | **New filter**
Default value	**New filter**

'Filter name'
The saved filter is loaded.

New filter
An empty table with the name **New filter** is loaded.

[Save filter]

Opens the **Save filter** dialog window, in which the filter conditions entered in the table can be saved as a special filter under the required name.

[Delete filter]

The currently loaded special filter is deleted.

Table view

The overview table shows all the defined filter criteria and cannot be directly edited. The filter criteria will be numbered automatically in sequence. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**
  Sets the column width
- **Double-clicking on the margin between column titles**
  Sets the optimal column width

If the content of a field is larger than the column width, then the entire content will be shown as a **tooltip** if the mouse cursor hovers over the field.

For the meaning of the columns *(see chapter 4.7.6.7, page 298)*.

Functions

The **[Edit]** menu beneath the filter table contains the following menu items:

Edit line	Opens the **Edit filter criterion 'New filter'** dialog window, in which the filter criterion of the line selected in the table can be edited.
Insert new line	Inserts a new, empty line above the line selected in the table. The **Edit filter criterion 'New filter'** dialog window will then open automatically.
Cut lines	Transfers the selected lines to the clipboard.
Copy lines	Copies the selected lines to the clipboard.
Paste lines	Pastes lines from the clipboard above the selected line.
Delete lines	Deletes the selected lines.

[Apply filter]

Applies filter criteria to the determination table.

4.7.6.5 Determinations - Deleting a filter

Menu item: **Database ▶ Determinations ▶ Filter ▶ Remove filter**

The **Determinations ▶ Filter ▶ Remove filter** menu item or the icon is used to delete the most recently used filter, and all determinations will be displayed.

4.7.6.6 Determinations - Saving a filter

Dialog window: **Database ▶ Determinations ▶ Filter ▶ Special filter... ▶ Special filter - Database "Database name" ▶ [Save filter] ▶ Save filter**

The **[Save filter]** button in the **Special filter - Database "Database name"** dialog window opens the **Save filter** dialog window for saving a special filter.

All the saved special filters are shown in the upper field.

Filter name

Name under which the special filter is to be saved.

Entry	**50 characters**

[Save]

Saves the filter under the given name.

NOTE

The filters are saved globally in the configuration database and are therefore available for all clients.

4.7.6.7 Determinations - Editing the filter criterion

Dialog window: **Database ▶ Determinations ▶ Filter ▶ Special filter... ▶ Special filter - Database "Database name" ▶ [Save filter] ▶ Edit line ▶ Edit filter criterion 'Filter name'**

The **Edit ▶ Edit line** command in the **Special filter - Database "Database name"** dialog window opens the **Edit filter criterion #** dialog window, in which the filter criterion selected in the filter table can be edited.

Link

Selection of the type of link (logical operator) with the preceding filter criterion.

Selection	**AND** | **OR**
Default value	**AND**

AND
Logical "AND" link.

OR
Logical "OR" link.

Field

Selection of the data field for which a criterion is to be formulated.

Selection	**'Field name'** Filtering is carried out only for the selected field. The 10 most recently selected fields are always available for selection.

[More...]

Opens the **Filter - Field selection** dialog window. In this window, all fields that can be used for filtering are listed in tree form. You can apply a field by highlighting it and closing the dialog window with **[OK]**.

Details

Analysis

Selection of the analysis to be used for filtering.

Only for field = component result

Entry	**64 characters**
Selection	**All** | **'Analysis name'**

All
All analyses are filtered for

'Analysis name'
Only the selected analysis is used for filtering. The 10 most recently selected analyses are always available for selection.

Component

Selection of the component to be used for filtering.

Only for field = component result

Entry	**64 characters**
Selection	**All** | **'Component name'**

All
All components are filtered for.

'Component name'
Only the selected component is used for filtering. The 10 most recently selected components are always available for selection.

Result name

Selection of the result field according to which the filtering is to be carried out.

Only for field = "Component result" or "Single result"

Entry	**64 characters** User-defined results can be filtered for by entering the result name.
Selection	**'Result name'**

'Result name'
Only the selected result field is filtered for. The 10 most recently selected results are always available for selection, as are all component results calculated by default.

Condition

Type

Selection of the type of format for fields in which several types are possible. Only this type will be shown for fields with a fixed type.

Selection	**Text** | **Number** | **Date**
Default value	**Text**

Operator

Selection of the comparison operator for the filter criterion.

For fields of the type = text

Selection	**=** | **<>**
Default value	**=**

For fields of the type = date

Selection	**=** | **<>** | **<** | **<=** | **>** | **>=** | **Today**
Default value	**=**

Today
A search is made for the current date. A range in days can also be defined in the **Comparative value** field, according to which filtration should be carried out, starting from the current date.

For fields of the type = number

Selection	**=** | **<>** | **<** | **<=** | **>** | **>=** | **empty** | **not empty** | **invalid** | **out of limits**
Default value	**=**

invalid
Values with the **invalid** entry are filtered for.

out of limits
Values that are outside of the limit values defined for the selected fields will be filtered for (values shown in red).

Comparative value

Selection or entry of the comparative value for the filter criterion. For **Type** = **Date** fields, you can select the date by clicking on **[...]** in the **Select date** dialog window.

For fields of the type = text

Entry	**256 characters** Definition of a text expression as comparative value. ***** can be used as a wildcard for any character string if the **Use asterisk (*) as wildcard** option is enabled.

For fields of the type = date

Entry	**all possible date values** Definition of a date as comparative value.

For fields of the type = date and operator = today

Input range	**-9,999 to 9,999**
Default value	**0** Definition of a numerical value as a range in days in which, starting from the current date, filtering is to be carried out.

For fields of the type = number

Entry	**all possible numerical values** Definition of a numerical value as comparative value.

Match case

on | off (Default value: **off**)

If this check box is activated, then the filtering of fields of the **Text** type is case-sensitive.

Use asterisk (*) as wildcard

on | off (Default value: **off**)

If this check box is activated then the asterisk ***** can be used as a wildcard for any character strings when filtering **Text**-type fields.

NOTE

The asterisk (*) can be used as a wildcard only for sample types that can be indexed (**Standard**, **Check standard**, **Spiking solution**). For sample types that cannot be indexed (**Sample**, **Blank**), the entire name must be entered.

The character string before the asterisk (*) must be unique for each sample type, otherwise no data set will be displayed in the determination overview after filtering.

Example:

Filter A					
Filter criterion	Link	Field	Type	Operator	Comparative value
1		Sample type	Text	=	Sta*
2	OR	Sample type	Text	=	Check*
Result A: all determinations with sample type = **Standard**, **Check standard**					
Filter B					
Filter criterion	Link	Field	Type	Operator	Comparative value
1		Sample type	Text	<>	Sta*
2	AND	Sample type	Text	<>	Spi*
Result B: all determinations with sample type ≠ **Standard**, **Spiking solution**					

4.7.7 Signing determinations

4.7.7.1 Rules for electronic signatures

Program parts: **Method / Database**

In MagIC Net, methods and determination can be **electronically signed** at two levels. The following rules apply for this:

- **Signature levels**
  Methods and determinations can be signed at two levels (Signature Level 1 and Signature Level 2) by entering the user name and password.
- **Multiple signing**
  Methods and determinations can be signed several times at each level. All signatures are saved and documented in the Audit Trail.
- **Signing at level 1**
  If level 2 has been signed, then no more signatures are possible at level 1.
- **Signing at level 2**
  Level 2 cannot be signed unless there are already signatures on level 1.
- **Different users**
  The same user may not sign on both level 1 and level 2.
- **Reason and comment**
  Each signature must be accompanied by a reason selected from predefined default reasons. An additional comment can also be entered.
- **Saved data**
  Signature date, user name, full name, reason and comment are saved for each signature.
- **Deleting signatures 1**
  Signatures at level 1 are automatically deleted when a new version is created.
- **Deleting signatures 2**
  Signatures at level 2 can be deleted by users who have the respective permission.
- **Signing methods**
  Methods can only be signed individually.
- **Signature options**
  The options for electronic signatures are set in the **Signatures** tab in the **Security settings** dialog window.

4.7.7.2 Signature level 1

Dialog window: **Database ► Determinations ► Sign ► Signature 1... ► Signature Level 1**

Dialog window: **Method ► File ► Method manager... ► Method manager ► [Sign] ► Signature 1... ► Signature Level 1**

Methods or determinations can be signed at level 1 in the **Signature Level 1** window.

NOTE

Methods or determinations which have been signed at level 1 can be modified and deleted. If the modified method or determination is saved as a new version, however, then all existing signatures will be deleted automatically, i.e. the method or determination must be signed once again.

Info

Display of information for signing and deleting signatures. The following messages are possible:

Selection	**Signature possible** | **Signature 1 not possible (signature 2 exists)** | **Signature not possible (accessed by other client)**

Signature possible
The selected method or determination can be signed.

Signature 1 not possible (signature 2 exists)
The selected method or determination can no longer be signed at level 1 as it has already been signed at level 2.

Signature not possible (accessed by other client)
The selected method or determination cannot be signed as it is already marked to be signed on a different client.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 1** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Sign]

Sign the method or determination. The window remains open.

NOTE

Methods or determinations can only be signed at level 1 if the user belongs to a user group with the corresponding permission.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

4.7.7.3 Signature level 2

Dialog window: **Database ▶ Determinations ▶ Sign ▶ Signature 2... ▶ Signature Level 2**

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Signature 2... ▶ Signature Level 2**

Methods or determinations can be signed at level 2 in the **Signature Level 2** window.

NOTE

Methods or determinations signed at level 2 are **locked**, i.e. they can neither be modified nor deleted. In order to be able to edit such methods or determinations again, the signatures on level 2 must first be deleted.

Info

Information for signing and deleting signatures is displayed in this box. The following messages are possible:

Selection	**Signature possible** | **Signature 2 not possible (signature 1 missing)** | **Signature not possible (accessed by other client)**

Signature possible
The selected method or determination can be signed.

Signature 2 not possible (signature 1 missing)
The selected method or determination cannot be signed at level 2 as it has not yet been signed at level 1.

Signature not possible (accessed by other client)
The selected method or determination cannot be signed as it is already marked to be signed on a different client.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 2** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Sign]

Sign the method or determination. The window remains open.

NOTE

Methods or determinations can only be signed at level 2 if the user belongs to a user group with the corresponding permission.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

4.7.7.4 Displaying determination signatures

Dialog window: **Database ► Determinations ► Sign ► Display signatures… ► Signatures - Determination 'Determination ID'**

The **Determinations ► Sign ► Show signatures…** menu item opens the **Signatures - Determination 'Determination ID'** window with a table in which the information for all of the signatures for the selected determinations is displayed.

Signature

Shows at which level the determination has been signed (**level 1** or **level 2**).

Signature date

Date and time at which the determination was signed.

User

Short name of the user who signed the determination.

Full name

Full name of the user who signed the determination.

Reason

Reason for signature.

Signature comment

Comment on the signature.

4.7.7.5 Deleting signatures Level 2

Dialog window: **Database ► Determinations ► Sign ► Delete signatures 2... ► Delete Signatures Level 2**

Dialog window: **Method ► File ► Method manager... ► Method manager ► [Sign] ► Delete signatures 2... ► Delete Signatures Level 2**

All signatures on level 2 for the selected method or determination can be deleted in the **Delete Signatures Level 2** window.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 2** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Delete]

Delete signatures 2.

NOTE

Signatures 2 can only be deleted if the user belongs to a user group with the respective permission.

4.7.8 Sending determinations to

Dialog window: **Database ► Determinations ► Send to...**

The **Determinations ► Send to…** menu item opens the **Send determinations per E-mail** dialog window.

Selection	**Determination ID** | **Sample identification** | **Name**
Default value	**Determination ID**

Determination ID
The name of the export file is formed out of the unique determination ID, the computer name, the date stamp **-YYYYMMDD-HHMMSS** and the suffix for the format.

Sample identification
Selection of the sample identification. The name of the export file is formed out of this ID, the computer name, the date stamp **YYYYMMDD-HHMMSS** and the suffix for the format. If the generated name already exists in the directory, a version number will additionally be appended to the date.

Name
Name under which the export file of a determination is to be saved as an attachment to the e-mail message. If more than one determination is selected, then a sequential number will be added to this name for each determination.

After confirmation of the file name with **[OK]**, the default Windows e-mail client opens with an empty message and the export files of the selected

determinations are automatically added as an attachment in the ***.idet** format.

4.7.9 Exporting determinations

Dialog window: **Database ▶ Determinations ▶ Export… ▶ Export determinations**

Click on the **Determinations ▶ Export…** menu item to open the **Export determinations** dialog window for exporting the selected determinations.

Selection

Selection of determinations for the export.

Selection	**All selected data records** | **All filtered data records**
Default value	**All selected data records**

All selected data records
All those determinations are exported that have been selected (highlighted) in the determination table.

All filtered data records
All the determinations from the determination table as a whole that correspond to the set filter are exported.

Export template

Selection of the export template for the data export.

Selection	**'Export template'**

4.7.10 Importing determinations

Dialog window: **Database ▶ Determinations ▶ Import… ▶ Import determinations**

The **Determinations ▶ Import…** menu item opens the **Import determinations** dialog window, in which the determinations to be imported must be selected. These determinations are then imported into the open database.

NOTE

Exported determinations can be imported in the ***.idet** and ***.cdf** file format.

4.7.11 Determination overview - Print

Dialog window: **Database ► File ► Print ► Determination overview… ► Print determination overview (PDF)**

The **File ► Print ► Determination overview…** menu item opens the **Print determination overview (PDF)** dialog window.

Selection

Selection	**Selected determinations** | **All filtered determinations**
Default value	**Selected determinations**

Selected determinations
If this option is selected, then a list will be produced with all of the determinations that are selected (highlighted) in the determination table.

All filtered determinations
If this option is selected, then a list will be produced with all the determinations in the determination table that meet the filter criterion.

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Portrait format**

Portrait format
If this option is selected, then the determination table will be produced in portrait format.

Landscape format
If this option is selected, then the determination table will be produced in landscape format.

[OK]

The determination table is produced in the required format as a PDF file and opened directly with Acrobat Reader; it can then be printed and/or saved.

4.7.12 Determinations - Print report

Dialog window: **Database ► File ► Print ► Report... ► Report output**

The **Report output** dialog window opens with the **File ► Print ► Report...** menu item.

Selection

Selection	**Selected determinations** | **All filtered determinations**
Default value	**Selected determinations**

Selected determinations
If this option is selected, then the reports will be produced for all determinations that are selected (highlighted) in the determination table.

All filtered determinations
If this option is selected, then the reports will be produced for all the determinations in the determination table that meet the filter criterion.

Report type

Selection	**Original report(s)** | **Report template**
Default value	**Original report(s)**

Original report(s)
If this option is selected, then the reports that are output during the determination will be output at the **Output target** defined below.

Report template
If this option is selected, then reports will be output according to the selected report template at the **Output target** defined below.

NOTE

Reports that were automatically generated when the **determination version** was created are referred to as original reports. If a determination is reprocessed, a new determination version and thus also a new original report will be generated.

For the report of the non-reprocessed determination to be printed, determination version 1 must be selected.

Output target

Printer

on | off (Default value: **on**)

If this check box is activated, the reports are printed on the selected printer.

PDF file

on | off (Default value: **off**)

If this check box is activated, then the reports are output as PDF files under the entered file name.

File name

One of the following options can be selected for the name of the PDF file:

Selection	**Fixed file name** | **Append time stamp** | **Append sequential number** | **Determination ID** | **Sample identification** | **Batch name**

Fixed file name
If this option is selected, then the name of the PDF file will be formed from the name entered here and the suffix for the format. If several reports are output at the same time as PDF files, then you can select whether a **Time stamp** or a **Sequential number** is to be added to the file name. The path name may not contain more than 231 characters.

Append time stamp
If this option is activated, then a time stamp **YYYYMMDD-hhmmss-SSS** (SSS = milliseconds, three digits) will be added to the file name.

Append sequential number
If this option is activated, then a sequential number will be added to the file name.

Determination ID
If this option is selected, then the name of the PDF file will be formed from the unique **Determination ID**, the **YYYYMMDD-hhmmss-SSS** time stamp (SSS = milliseconds, 3 digits) and the suffix for the format.

Sample identification
If this option is selected, then the name of the PDF file will be formed from the selected sample identification (**Ident**, **Info 1** to **Info 4** or **Value 1** to **Value 4**), the **YYYYMMDD-hhmmss-SSS** time stamp (SSS = milliseconds, 3 digits) and the suffix for the format.

Batch name
If this option is selected, then the name of the PDF file will be formed from the batch name, the time stamp **YYYYMMDD-hhmmss-SSS** (SSS = milliseconds, three digits) and the suffix for the format. This option is only active if a batch is selected in the determination overview.

Target directory

Entry or selection (with …) of the path for the directory in which the export file is to be saved.

Entry	**131 characters**

NOTE

In Windows, the path name is limited to a maximum of 255 characters. To make sure that the PDF export works for the option **Sample identification** + **Ident/Info/Value** + **Time stamp** + **File extension**, a maximum of 131 characters may be used.

4.7.13 Determinations - Showing method

Menu item: **Database ▶ Determinations ▶ Show method...**

The **Determinations ▶ Show method...** menu item or the icon opens the **Determination method 'Method name'** dialog window, in which the method used for the selected determination is displayed with the four subwindows **Devices**, **Time program**, **Evaluation** and **Chromatograms**. In contrast to the **Method** program part, there are no parameters available for editing here.

Saving the method

[Save as...]

With this button, the determination method can be saved in a method group. The **Save method** window is opened, in which the method group is selected and a method name can be entered or selected.

4.7.14 Determinations - Displaying history

Menu item: **Database ▶ Determinations ▶ Show history**

Switching history view on/off

With the menu item **Determinations ▶ Display history...** or the icon only the currently focused determination in the Determination table as well as all the previous versions of this determination will be shown.

If the history view with the menu item **Determinations ▶ Show history** or the icon is disabled again, then the original selection of determinations in the determination table will appear again.

4.7.15 Determinations - Making current

Menu item: **Database ▶ Determinations ▶ Make current**

Making an old version current

With the menu item **Determinations ▶ Make current...** or the icon the determination version selected in the determination table will again be made the current determination version. This creates a new determination whose version number is increased by **+1** compared with the last version to have been saved.

4.7.16 Determinations - Detail view

4.7.16.1 Detail overview - Selection

Dialog window: **Database ► Determinations ► Detail overview... ► Open detail overview**

The menu item **Determinations ► Detail overview...**, the dialog window **Open detail overview** opens for the selections of the determination that are to be displayed in the detail overview.

Selection

Selection of the determinations that are to be displayed in the detail overview.

Selection	**Selected determinations** | **All filtered determinations**
Default value	**Selected determinations**

Selected determinations
All those determinations are displayed that have been selected (highlighted) in the determination table.

All filtered determinations
All those determinations from the whole determination table are displayed in the detail overview that correspond to the set filter.

4.7.16.2 Detail view - General

Dialog window: **Database ► Determinations ► Detail overview… ► Open detail overview ► [OK] ► Detail overview**

After the determinations have been selected *(see chapter 4.7.16.1, page 314)*, the dialog window **Detail overview** opens in which the results and control charts for the selected determinations are displayed.

The **Detail view** dialog contains the following two areas, which can be selected with the respective symbol on the left-hand side:

- *Results*
- *Control chart*

4.7.16.3 Detail overview - Results

Dialog window: **Database ► Determinations ► Detail overview… ► Open detail overview ► [OK] ► [Results] ► Detail overview - Results**

The **Detail overview - Results** dialog window shows the results for the selected determinations in graphics and tabular form, along with the associated statistical evaluations.

Result

Selection of the result to be shown in the graph and in the table for all components.

Selection	**Concentration** | **Additional component results**
Default value	**Concentration**

Graph display

The selected result is graphically displayed across several determinations for each component. Each component has an own tab labeled with the component name.

The y axis is automatically scaled in the unit of the selected result; on the x axis, the selected determinations are numbered consecutively from **1** to **n** in accordance with their recording date and displayed at equal intervals. The statistical mean value is marked in the graph as a blue line.

The result values are presented with the following icons:

○

Result of a determination that is taken into account for the statistical calculations. A mouse click on the icon will also cause the associated determination to be highlighted in the table.

●

Result of a determination that is taken into account for the statistical calculations and which is also highlighted in the table.

×

Result of a determination that is not taken into account for the statistical calculations.

The following context-sensitive menu opens with a right-hand mouse click inside the graphics frame:

Show all	Shows the entire graph. This menu item is always enabled.
Default view	This menu item is inactive.
Zoom	Opens the dialog for entry of a zoom range *(see chapter 4.7.16.5, page 319)*.
Unzoom	Undo the last zoom action.
Copy	Copies the graph.

Table

Table with information concerning the selected determinations. It contains the following columns:

Date

Date the determination was recorded.

Number

Number of the determination (sorted chronologically).

Ident

Identification for the sample data of the determination.

Sample type

Type of standard that was used in the determination.

Method

Name of the method used for the determination.

Analysis

Name of the analysis with which the result was generated.

'Result name'

Result value for each result.

Statistics

Indicates whether a result was used for calculation of the statistics or not.

The graph of the results values is synchronized with the determination table. A point can be selected in either the graph or in the table. The point is then highlighted in **blue** and the corresponding line in the table in **yellow**. Points that were deleted manually from the statistics, appear as a **black cross** in the graph.

Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**
  Sets the column width.
- **Double-clicking on the margin between column titles**
  Sets the optimal column width.
- **Dragging the column title**
  Moves the column to the required location.

Clicking on the table of determinations with the right mouse button causes a context-sensitive menu to appear with the following menu items:

On	Activates the **Statistics** check box for the highlighted determinations.
Off	Deactivates the **Statistics** check box for the highlighted determinations.
Invert selection	Inverts the **Statistics** setting for the highlighted determinations.

NOTE

Highlighted lines in the table can be copied to other programs with CTRL+C and CTRL+V. The context menu for the table is not permitted to be open while this is carried out!

4.7.16.4 Detail view - Control chart

Dialog window: **Database ▶ Determinations ▶ Detail overview... ▶ Open detail overview ▶ [OK] ▶ [Control chart] ▶ Detail overview - Control chart**

The **Detail overview - Check box** dialog window shows a control chart of the results for the selected determinations in graphics and tabular form, along with the associated statistical evaluations.

Template

Selection of the saved template for displaying control charts. When the dialog window is opened, the last template to have been loaded will be loaded. If a new template is selected, then the display will be updated automatically.

Selection	**Saved templates**

[Templates]

Opens the **Templates for control charts** dialog window for creating and editing control chart templates *(see chapter 4.5.1, page 271)*.

Graph display

Each result has an own tab labeled with the result name.

The y axis is scaled in accordance with the template; on the x axis, the selected determinations are numbered sequentially from **1** to **n** in accordance with their recording date and displayed at identical intervals. The intervention limits are displayed in the graph with orange lines, the warning limits with red lines, the statistical mean value with a blue line and the standard deviation ranges with black lines.

The result values are presented with the following icons:

○

Result of a determination that is taken into account for the statistical calculations. A mouse click on the icon will also cause the associated determination to be highlighted in the table.

●

Result of a determination that is taken into account for the statistical calculations and which is also highlighted in the table.

Result of a determination that is taken into account for the statistical calculations and which lies outside the warning limits defined in the template.

Result of a determination that is taken into account for the statistical calculations and which lies outside the intervention limits defined in the template.

Result of a determination that is not taken into account for the statistical calculations.

The following context-sensitive menu opens with a right-hand mouse click inside the graphics frame:

Show all	Shows the entire graph. This menu item is always enabled.
Default view	This menu item is inactive.
Zoom	Opens the dialog for entry of a zoom range *(see chapter 2.6.10, page 97)*.
Unzoom	Undo the last zoom action.
Copy	Copies the graph.

Table

Table with information concerning the selected determinations. It contains the following columns:

Date

Date the determination was recorded.

Number

Number of the determination (sorted chronologically).

Ident

Identification for the sample data of the determination.

Sample type

Type of standard that was used in the determination.

Method

Name of the method used for the determination.

'Result name'

Result value. Values within the intervention limits are shown in **green**, values outside the intervention limits in **orange** and values outside the warning limits in **red**.

Statistics

Indicates whether a result was used for calculation of the statistics or not.

The graph of the results values is synchronized with the determination table. A point can be selected in either the graph or in the table. The point is then highlighted in **blue** and the corresponding line in the table in **yellow**. Points that were deleted manually from the statistics, appear as a **black cross** in the graph.

Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**
  Sets the column width.
- **Double-clicking on the margin between column titles**
  Sets the optimal column width.
- **Dragging the column title**
  Moves the column to the required location.

Clicking on the table of determinations with the right mouse button causes a context-sensitive menu to appear with the following menu items:

On	Activates the **Statistics** check box for the highlighted determinations.
Off	Deactivates the **Statistics** check box for the highlighted determinations.
Invert selection	Inverts the **Statistics** setting for the highlighted determinations.

NOTE

Highlighted lines in the table can be copied to other programs with CTRL+C and CTRL+V. The context menu for the table is not permitted to be open while this is carried out!

4.7.16.5 Detail view - Zooming

Dialog window: **Database ▶ Determinations ▶ Detail overview… ▶ Open detail overview ▶ [OK] ▶ [Results] / [Control chart] ▶ Detail overview - Results / Detail overview - Control chart ▶ Zoom… ▶ Zoom**

Specifies the displayed area; this is always stretched to fill the whole size of the graphics window.

X axis

Visible range in X direction.

from

Starting point in X direction.

Input range	**0 to 10^{12} Number**

to

Endpoint in X direction.

Input range	**0 to 10^{12} Number**

Y axis

Visible range in Y direction.

from

Starting point in Y direction.

Input range	**-10^{12} to 10^{12}**

to

Endpoint in Y direction.

Input range	**-10^{12} to 10^{12}**

4.7.16.6 Printing the result overview

Dialog window: **Database ► Determinations ► Detail overview… ► Open detail overview ► [OK] ► [Results] ► Detail overview - Results ► [Print (PDF)] ► Print result overview (PDF)**

[Print (PDF)] opens the **Print result overview (PDF)** dialog window.

Selection

Selection	**All components** | **Selected component**
Default value	**All components**

All components
Produces a result overview for all components.

Selected component
Produces a result overview only for the selected component.

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Portrait format**

Portrait format
Produces the result overview in portrait format.

Landscape format
Produces the result overview in landscape format.

Comment

Possibility of entering comments on the result overview which will be produced together with the result overview.

Entry	**1000 characters**

[OK]

The result overview is produced in the required format as a PDF file and can be opened directly with Acrobat Reader; it can then be printed and/or saved.

4.7.16.7 Printing a control chart

Dialog window: Database ► Determinations ► Detail overview… ► Open detail overview ► [OK] ► [Control chart] ► Detail overview - Control chart ► [Print (PDF)] ► Print control chart (PDF)

The format for the printout of the control chart is indicated in the **Print control chart (PDF)** dialog window.

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Landscape format**

Portrait format
Produces the control chart in portrait format.

Landscape format
Produces the control chart in landscape format.

Comment

Possibility of entering comments on the control chart; these comments will be output together with the control chart.

Entry	**1,000 characters**

[OK]

The control chart is output in the required format as a PDF file and opened directly with the Acrobat Reader. It can then be printed and/or saved.

4.7.17 Determinations - Overlay curves

4.7.17.1 Overlaying curves - Selection

Dialog window: **Database ► Determinations ► Overlay curves… ► Overlay curves**

The **Determinations ► Overlay curves…** menu item opens the **Overlay curves** dialog window for the selection of the determinations whose curves are to be overlaid.

Selection

Selection	**Selected determinations** | **All filtered determinations**
Default value	**Selected determinations**

Selected determinations
Displays curves from all of the determinations that have been selected (highlighted) in the determination table.

All filtered determinations
Displays curves from all of the determinations contained in the whole determination table that correspond to the filter that was set.

4.7.17.2 Overlaying curves - Display

Dialog window: **Database ► Determinations ► Overlay curves… ► Overlay curves ► [OK] ► Overlay of curves**

The dialog window **Overlay of curves** displays curves for the selected determinations in graphics and tabular form.

Graph display

The curves of the selected determinations are displayed graphically in different colors. The y axis is automatically scaled in the unit of the first selected determination and adjusted to the largest curve; the x axis is also scaled in such a way that the longest curve is displayed in its entirety.

You can use the cursor to determine the coordinates of curve points.

Clicking on a curve causes it to be depicted with a bolder line, and a frame is created around the entire curve that is scaled to the right-hand side.

The following context-sensitive menu opens with a right-hand mouse click inside the graphics frame:

Show all	Shows the entire graph. This menu item is always enabled.
Default view	This menu item is inactive.
Zoom	Opens the dialog for entry of a zoom range *(see chapter 4.7.17.3, page 325)*.

Unzoom	Undo the last zoom action.
Copy	Copies the graph.
Properties...	Defines the properties for the curve display *(see chapter 4.7.17.4, page 325)*.

Table

Table with information concerning the selected determinations.

NOTE

An analysis which is recorded with the amperometric detector can contain several cyclovoltammograms. In this case, the table contains the analysis of one separate line for each cyclic voltammogram. The cyclovoltammograms differ on the basis of the entry in the **Analysis** column.

The table contains the following columns:

Date

Date the determination was recorded.

Number

Number of the determination (sorted chronologically).

Ident

Identification for the sample data of the determination.

Sample type

Type of standard that was used in the determination.

Volume

Volume that was used in the determination.

Dilution

Dilution that was used in the determination.

Sample amount

Sample amount that was used in the determination.

Method

Name of the method used for the determination.

Analysis

Name of the analysis with which the result was generated.

In the even of an analysis with cyclic voltammograms, one "/" and the name of the respective cyclic voltammogram appear after the name of the analysis.

Legend

Color of the line in which the curve is displayed.

Display

Indicates whether a curve is displayed or not.

The graph is synchronized with the determination table. A curve can be selected in either the graph or in the table. The line is then shown in boldface.

Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**
  Sets the column width.
- **Double-clicking on the margin between column titles**
  Sets the optimal column width.
- **Dragging the column title**
  Moves the column to the required location.

Moves the curve upward (modifies sequence).

Moves the curve downward (modifies sequence).

Clicking on the table of determinations with the right mouse button causes a context-sensitive menu to appear with the following menu items:

On	Activates the **Display** check box for the highlighted curves.
Off	Deactivates the **Display** check box for the highlighted curves.
Invert selection	Inverts the **Display** setting for the highlighted curves.

4.7.17.3 Overlaying curves - Zoom

Dialog window: **Database ▶ Determinations ▶ Overlay curves… ▶ Overlay curves ▶ [OK] ▶ Overlay of curves ▶ Zoom… ▶ Zoom**

Specifies the displayed area; this is always stretched to fill the whole size of the graphics window.

X axis

Visible range in X direction.

from

Starting point in X direction.

Input range	**0.0 to 10^{12} min**

to

Endpoint in X direction.

Input range	**0.0 to 10^{12} min**

Y axis

Visible range in Y direction.

from

Starting point in Y direction.

Input range	**-10^{12} to 10^{12}**

to

Endpoint in Y direction.

Input range	**-10^{12} to 10^{12}**

4.7.17.4 Overlaying curves - Properties

Dialog window: **Database ▶ Determinations ▶ Overlay curves… ▶ Overlay curves ▶ [OK] ▶ Overlay of curves ▶ Properties… ▶ Overlay of curves - Properties**

4.7.17.4.1 Properties - General

Dialog window: **Database ▶ Determinations ▶ Overlay curves… ▶ Overlay curves ▶ [OK] ▶ Overlay of curves ▶ Properties… ▶ Overlay of curves - Properties ▶ General**

Reference point

Point of the X axis in which the Y value of all displayed curves lies above one another before the curve offset is applied. The unit for the reference point is determined by the *first* overlaid curve. If the first overlaid curve is time-based (e.g. a chromatogram), then the X axis has the dimension

Time with the unit **min**. If the first overlaid curve is a cyclic voltammogram, then the X axis has the dimension **Potential** with the unit **V**.

Time or Potential

Point on the X axis in which the Y value of all curves lies above one another.

If there is no measuring point at the selected reference point, then the nearest measuring point will be used.

Input range	**- 1,000.00 to 1,000.00 min or V**
Default value	**0.00 min or V**

Curve offset

The offset based on the reference point that is used to display the curves for clear comprehension.

X-Axis

Offset on the x axis. The curves are moved by the amount of the specified percentage of the length of the selected curve.

Input range	**0.0 to 100.0 %**
Default value	**0.0 %**

Y-Axis

Offset on the y axis (measurement value axis). The curves are moved by the amount of the specified percentage of the height of the selected curve.

Input range	**0.0 to 100.0 %**
Default value	**5.0 %**

4.7.17.4.2 Properties - Colors

Dialog window: **Database ► Determinations ► Overlay curves… ► Overlay curves ► [OK] ► Overlay of curves ► Properties… ► Overlay of curves - Properties ► Colors**

On this tab you can define and modify the colors which will be used for the display of the curves in the curve overlay. In the default settings, 10 colors are defined (standard colors).

Table "Colors"

The table permits the definition of 1 to 20 colors. The defined colors are applied in sequence to the curves that are selected in the curve overlay.

The following context-sensitive menu opens with a right-hand mouse click inside the table:

New	Adds another color. The **Choose color** dialog opens *(see chapter 2.6.14, page 107)*.
Edit	Edit the selected color. The **Choose color** dialog opens *(see chapter 2.6.14, page 107)*.
Delete	Deletes the selected color. This function is only available if more than one color is defined.

▲

Moves color upward (modifies sequence).

▼

Moves color downward (modifies sequence).

[Load default colors]

Pressing this button causes the table of the colors to be initialized with the 10 standard colors. Any changes you made yourself will be lost at this time. The changes will, however, be permanently applied by first pressing the **[OK]** button.

4.7.17.5 Printing the curve overlay

Dialog window: **Database ► Determinations ► Overlay curves… ► Overlay curves ► [OK] ► Overlay of curves ► [Print (PDF)] ► Print curve overview (PDF)**

[Print (PDF)] opens the **Print curves overview (PDF)** dialog window.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Portrait
Produces the curve overview in portrait format.

Landscape
Produces the curve overview in landscape format.

Comment

Possibility of entering comments on the curve overview that will be produced along with it.

Entry	**1,000 characters**

[OK]

The curve overview is output in the required format as a PDF file and opened directly with Acrobat Reader; it can then be printed and/or saved.

4.7.18 Determinations - Reprocessing

4.7.18.1 Reprocessing - General

Dialog window: **Reprocessing**

Reprocessing determinations

Completed determinations that are saved in the database can be reprocessed at any time. Sample data, integration, evaluation parameters, calibration and result definitions can all be modified and the determinations can be reevaluated when this is done. The reprocessed determination can then be saved in the database as a new version.

NOTE

Determinations signed at level 2 can no longer be reprocessed.

NOTE

Determinations that are not yet completed, e.g. because their calibration is not yet complete or because not all injections have been accomplished for a multiple determination, cannot be reprocessed.

NOTE

A determination that is **automatically** exported and imported into another database cannot be reprocessed. With certain settings, e.g. with the calibration modes Bracketing and Total, automatic reprocessing is carried out after the measurement series has been completed. The automatic export takes place before the automatic reprocessing. Therefore, the data set is incomplete at the time of export and cannot be reprocessed after the import.

A determination that is **manually** exported and imported into another database can be reprocessed. The manual export is carried out after the automatic reprocessing. Therefore, the data set is complete at the time of the manual export and can be reprocessed after the import.

Opening the reprocessing window

Determinations that have been selected in the **Determination overview** subwindow are reprocessed in the separate **Reprocessing** dialog window, which is opened with **Determinations ► Reprocess...** or the icon. It contains the button for closing in the Windows title bar. When the

window is opened, the first of the selected determinations is always shown by default.

Closing the reprocessing window

The **Reprocessing** dialog window is closed with **[OK]**, **[Cancel]** or the Close Window button.

NOTE

The reprocessing window cannot be closed while the recalculation process is still running.

4.7.18.2 Reprocessing - Rules

Dialog window: **Reprocessing**

Selecting determinations

The following rules apply for the selection of determinations that are reprocessed:

- **Completed determination**
  Only completed determinations can be reprocessed.
- **Signed determination**
  Determinations signed at level 1 can be reprocessed.
  Determinations signed at level 2 can no longer be reprocessed.
- **Multiple determinations**
  Multiple determinations can only be reprocessed as a group.
- **Number of determinations**
  Only a maximum of 200 determinations can be selected for reprocessing.

Reprocessing several determinations

In order for more than one determination to be reprocessed together at the same time, the analyses for these determinations must fulfill additional rules:

- **No determination contains an analysis with evaluation**
  There is no limitation.
- **Each determination contains only one analysis with evaluation**
  The **Data channel** of this analysis must be identical for all of the determinations; the analysis names need not match.
- **The determinations contain several analyses with evaluation**
  The number of analyses with evaluation must be identical in all of the determinations and **Name** and **Data channel** must match for each of these analyses.

Sequence

The following rules apply for reprocessing the selected and modified determinations:

- **Recalculate**
  All of the determinations are reprocessed that are located in the **Reprocessing table**. If one determination is not to be reprocessed, then the respective line must be deleted.
- **Sequence**
  The determinations are reprocessed in the same sequence in which they are to be found in the reprocessing table. Reprocessing proceeds in analogous fashion to a sample table. This is particularly important for the sequence of the standards when the calibration is recalculated.

4.7.18.3 Reprocessing window

Dialog window: **Reprocessing**

Subwindows

The **Reprocessing** dialog window contains the following subwindows, which can be enlarged and reduced by dragging the separating bar between them:

- *Reprocessing table*
  Selecting a determination, editing sample data and defining sequence in which the determinations are to be reprocessed.
- *Results*
  Displaying results.
- *Evaluation parameters*
  Editing evaluation parameters.
- *Chromatograms*
  Integrates chromatograms manually, displays measurement and calibration curves.

Method... menu

Save as...	Opens the dialog window **Save method**, in order to save the method of the selected determination *(see chapter 5.2.10, page 379)*.
Change column	Opens the dialog window **Modify column**. The columns which are assigned to analyses can be modified for all determinations during reprocessing in this window *(see chapter 4.7.18.5.1, page 339)*.
Change eluent	Opens the dialog window **Modify eluent**. The eluents which are assigned to analyses can be modified for all determinations during reprocessing in this window *(see chapter 4.7.18.5.3, page 341)*.

Import calibration points	Open the **Import calibration points** dialog window. An ***.ical** file can be selected in this window to import it into an analysis of the currently selected determination *(see chapter 4.7.18.5.5, page 342)*.
Export calibration points	Open the **Export calibration points** dialog window. The calibration points of an analysis of the currently selected determination can be exported into an ***.ical** file in this window *(see chapter 4.7.18.5.6, page 343)*.

Functions

If determinations have been modified, then the following functions can be triggered:

[Reprocessing]

Opens the **Reprocessing** dialog window. Calibration and integration options for reprocessing are set and reprocessing is triggered in this window *(see chapter 4.7.18.5.7, page 344)*.

[Update]

Applies the (modified) evaluation parameters to the selected determination.

NOTE

Reprocessing behaves as though only one determination were in the table and this were being reprocessed with the option **Apply calibration from selected determination to all determinations.**.

The function is used for optimization of the evaluation parameters. The effect of a modification of the parameters can be checked without having to reprocess the entire table.

NOTE

The determination itself is not reprocessed during this process!

Modifications of the determination that were generated by the **[Update]** function cannot be saved. If the dialog window **Reprocessing** is exited without reprocessing, then all modifications will be discarded.

[Reset]

This button causes all modifications that were carried out during reprocessing to be reset. The original data and results are once again available. This button is disabled for as long as reprocessing has not yet been triggered.

▲

Scroll to the previous determination in the table.

▼

Scroll to the next determination in the table.

[OK]

With this button each determination that has been modified by reprocessing will be saved as a new version with a version number increased by **+1** and the **Reprocessing** subwindow will be closed. This button is disabled for as long as reprocessing has not yet been triggered and if not all of the selected determinations were able to be reprocessed.

[Cancel]

The reprocessing is discarded with this button and the **Reprocessing** dialog window is closed.

4.7.18.4 Reprocessing - Subwindow

4.7.18.4.1 Reprocessing table subwindow

Subwindow: **Reprocessing ► Reprocessing table**

The **Reprocessing table** subwindow lists all determinations that are reprocessed. The sample data of the individual determinations can be modified here and the sequence in which the determinations are to be reprocessed is established here.

Table

The table contains all of the determinations that are to be reprocessed.

The table has a fixed number of columns; the **determination type**, **all sample data** and the type of **integration** are displayed in separate columns for each determination.

By default, the table is sorted in ascending order according to the determination start time. The sequence can, however, be modified with the arrow keys on the right-hand margin.

Clicking on a line will cause it to be marked with a **yellow background**; this determination is selected. This results in the following consequences:

- The subwindows **Results**, **Evaluation parameters** and **Chromatograms** display the properties of the selected determination.
- The selected determination can be moved upwards or downwards with the arrow keys in the reprocessing table.
- The selected determination can be edited or deleted from the reprocessing list.

Arrow keys

NOTE

The sequence of the determinations in the reprocessing table establishes the sequence in which the determinations will be reprocessed. This is particularly important when the calibration is recalculated according to standards to be found in reprocessing.

Moves the selected determination one line upwards.

Moves the selected determination one line downwards.

Edit menu

[Edit] contains the following menu items:

Edit line	Open the dialog window **Edit line - Reprocessing** to edit the sample date of the selected determination *(see chapter 4.7.18.4.5, page 337)*.
Delete line	The selected determination is removed from reprocessing.
Increment	The range that is to be automatically incremented from a column in the table can be selected with the cursor, which takes on the form ✚. In this process, the number standing at the end of the expression will be automatically increased by 1 in the selected cells of a column, starting from the first selected cell. This works not only with pure numbers but also with text expressions ending with a number (e.g. **ABC10** → **ABC11** → **ABC12**…).
Fill	Fills the selected cells automatically.

4.7.18.4.2 Results subwindow

Subwindow: **Reprocessing ► Results**

The results of the selected determination are shown in the **Results** subwindow.

Structure and properties correspond to the **Results** subwindow in the **Database** program area *(see chapter 4.9, page 364)*.

Tabs

The results of the determination are shown on the following tabs:

- *Results*
  Display of the automatically generated and user-defined results for determination.

- *Statistics*
  Display of the statistics data concerning the statistically evaluated results of multiple determinations.
- *Monitoring*
  Display of monitored results for determination.

4.7.18.4.3 Evaluation parameters subwindow

Subwindow: **Reprocessing ▶ Evaluation parameters**

The **Evaluation parameters** subwindow shows the evaluation parameters of the selected determination. The header of the subwindow indicates from which determination the evaluation parameters originate. The evaluation parameters can be edited in order to reprocess the determinations.

Structure and properties correspond to the **Evaluation parameters** subwindow in the **Method** program area *(see chapter 5.8, page 441)*.

NOTE

Even though the entire evaluation of the method is visible, not all of the sections can be edited in reprocessing. The sections that cannot be edited are not executed in reprocessing.

Overview evaluation parameters

Evaluation parameters that can be edited are incorporated into the calculations made during reprocessing. As a basic rule, all evaluation parameters behave the same way in **Reprocessing** and **Method**.

The evaluation ranges that behave differently during reprocessing than they do in the method are shown in **boldface**. Their behavior is described in detail in the space after the table.

Area		Can be edited
Evaluation - Integration		Yes
Evaluation - Components		Yes
Evaluation - Standards		Yes
Evaluation - Calibration		Yes
Evaluation - Results		
	Results - Report	Partially
	Results - Database	No
	Results - Statistics	Yes

Area		Can be edited
	Results - Monitoring	Yes
	Results - User-defined results	Yes
	Results - Common variable	**Yes**

Report

- **Report template**
  Cannot be edited, no new report will be generated after reprocessing.
- **Pharmacopoeia**
  Can be edited, is incorporated into reprocessing.
- **Decimal places of the results**
  Can be edited, the reprocessed results are displayed with the number of decimal places specified in the settings.

Database

- **Database**
  Cannot be edited, no new database entry is generated, the reprocessed determination is saved as a new version.
- **Automatic export**
  Cannot be edited, no export takes place after reprocessing.

Common variable

Can be edited; the common variables are used during reprocessing, however, their values will not be written into the configuration.

4.7.18.4.4 Chromatograms subwindow

Subwindow: **Reprocessing ▶ Chromatograms**

The **Chromatograms** subwindow shows the measuring and calibration curves of the selected determination. Chromatograms can also be integrated here manually.

Tabs

A tab is displayed for every analysis that is defined in a method; these tabs are lettered with the name of the analysis and they show the associated chromatograms and calibration curves.

Graphics window

The interface, functions and properties of the **Chromatograms** subwindow are described in the *Graphics window* chapter in the following subchapters:

- *Elements*
- *Chromatogram view*
- *Calibration curve view*
- *Zooming*
- *Move curve*
- *Work with cursor*
- *Set Zoom*
- *Properties*
- *Change calibration*
- *Select color*

Integrating manually

The chromatograms of the **selected** determination can be integrated manually during reprocessing. The only measurement curves that can be integrated manually are those that have an evaluation; auxiliary curves of analyses lacking evaluation cannot be integrated manually.

NOTE

Chromatograms belonging to the calibration data set of the selected determination cannot be integrated manually. The associated determination must be selected for this purpose.

Manual integration functions

The functions of manual integration can be called up with the **context-sensitive menu** of the Chromatogram view by using the right-hand mouse button (*Functions Manual Integration*).

The following functions are available:

- Add peak
- Add rider
- Remove peak
- Split peak
- Join peaks

NOTE

A manually integrated determination is marked with the entry **Manual** in the field **Integration**.

This field is displayed in **Reprocessing** in the subwindow **Reprocessing ► Reprocessing table** and in the **Database** on the tabs **Database ► Information ► Determination** and **Database ► Information ► Analyses**.

4.7.18.4.5 Editing line - Reprocessing

Dialog window: **Reprocessing ▶ Reprocessing table ▶ [Edit] ▶ Edit lines ▶ Edit lines - Reprocessing**

NOTE

Except for **Method** and **Injections**, all displayed sample data for a determination can be edited in reprocessing. It makes no difference in this context whether or not it had been used at all in the original method, or whether or not it was defined as **Fixed values**.

Sample data that was defined as fixed values at the start of the determination are presented in the dialog window **Editing lines - Reprocessing** in ***italics***.

Method

Display of the method with which the determination was recorded; no longer available for editing in reprocessing.

Ident

Entry of an identification or selection of a defined text template to identify the chromatogram *(see chapter 3.6, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Sample type

Selection of the sample type. **Sample** and **Blank** can always be selected, the remaining types can only be selected if they are defined in the method.

Entry	**64 characters**
Selection	**'empty'** | **Sample** | **Standard 1…n** | **Spiking 1…n** | **Check standard 1…n** | **Blank**
Default value	**'empty'**

Injections

The value **n/m** indicates whether or not the determination is part of a multiple determination. No longer available for editing in reprocessing.

- **n**: Injection number of the determination.
- **m**: Number of injections in the multiple determination.

The determinations of a multiple injection are linked statistically with one another.

Volume

Volume of the sample in µL.

Input range	**0.01 to 1000000.00 µL**
Default value	**'empty' µL**

Dilution

Dilution factor for the sample.

Input range	**0.000001 to 100,000.000000**
Default value	**'empty'**

Sample amount

The parameter **Sample amount** is a correction factor for taking into account various initial weights for different samples. It indicates the ratio of the initial weight of the current sample to the normal initial weight or to the basic unit. The end result thus achieved is divided by this factor.

- *Example 1*
  Basic initial weight = 2.0 g
  Sample initial weight = 2.1 g
  Sample amount = 2.1 / 2.0 = 1.05
  The result is divided by 1.05 and indicates how high the content is in relation to the defined basic initial weight of 2 g.
- *Example 2*
  Basic unit = 1.0 mg
  Initial sample size = 2.1 mg
  Sample amount = 2.1 / 1.0 = 2.1
  The result is divided by 2.1 and indicates how high the content per mg of sample is.

Input range	**0.00001 to 1000000.00000**
Default value	**'empty'**

Info 1 to Info 4

Entry of additional information about the sample. Text templates can be selected here if they have been defined for this parameter *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Value 1 to Value 4

Input of additional values for the sample.

Input range	**-10^{99} to 10^{99}**
Default value	**'empty'**

Navigation

Jump to the first line in the table.

Jump to the previous line in the table.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

Jump to the next line in the table. If the end of the table has been reached, then a new line will be inserted automatically and the program will jump to it.

The same function can also be triggered by pressing the **[Enter]** key.

Jump to the last line in the table.

Functions

[Apply]

Applies the sample data entered in the respective line of the table. If the end of the table has been reached, then a new line will be generated automatically.

[Close]

Closes the input window. The current sample data will not be applied in the table (this needs to be triggered beforehand with **[Apply]**).

4.7.18.5 Reprocessing - Functions

4.7.18.5.1 Change column

Dialog window: **Reprocessing ▶ [Method...] ▶ Change column ▶ Change column**

The columns of the selected determination are displayed and can be replaced by other columns from the configuration. The settings made in the **Change column** dialog can then be applied to all determinations in reprocessing.

Elements

'Analysis name'

NOTE

All analyses with evaluation that are present in the selected determination are each listed in their own section.

Column

Display of the column that is assigned to the analysis 'Analysis name'.

NOTE

The column is linked with the analysis in the instrument window of the method in the hardware assignment of the analysis.

If the analysis has had a gradient pump assigned to it, then up to four eluents (**Eluent A - B**) will be displayed.

[...]

Opens the dialog window **Select column from configuration**, in order to assign another column *(see chapter 4.7.18.5.2, page 341)*.

[OK]

The settings are applied to **all** determinations in the reprocessing table.

[Cancel]

The settings are discarded.

Assigning the columns

The assignment of the columns to the determinations depends on the type of determinations that are to be found in the reprocessing. The following rules apply:

- **Each determination contains only one analysis with evaluation**
  The columns are assigned with evaluations in all determinations of the analysis. It makes no difference whether the analysis names of the determinations match the analysis names of the selected determination.
- **The determinations contain several analyses with evaluation**
  The number of analyses with evaluation and their name is identical in all determinations, the columns are assigned in the other determinations according to the settings in the **Change column** dialog.
-

4.7.18.5.2 Selecting columns from configuration

Dialog window: **Reprocessing ▶ [Method...] ▶ Change column ▶ Change column ▶ Selecting columns from configuration**

Column

Selection	**Columns from column table**

4.7.18.5.3 Change eluent

Dialog window: **Reprocessing ▶ [Method...] ▶ Change eluent ▶ Change eluent**

The eluents of the selected determination are displayed and can be replaced by other eluents from the configuration. The settings made in the dialog **Change eluent** can then be applied to all determinations in reprocessing.

Elements

'Analysis name'

NOTE

All analyses that are present in the selected determination are each listed in their own section.

Eluent / Eluent #

Display of the eluent that is assigned to the analysis 'Analysis name'.

NOTE

The eluent is specified in the instrument window of the method in the start parameters of the high-pressure (gradient) pump; this pump — and with it the eluent — are linked with the analysis in the hardware assignment of the analysis.

If the analysis has had a gradient pump assigned to it, then up to four eluents (**Eluent A - B**) will be displayed.

...

Opens the **Select eluent from configuration** dialog window in order to assign another eluent *(see chapter 4.7.18.5.4, page 342)*.

[OK]

The settings are applied to **all** determinations in the reprocessing table.

[Cancel]

The settings are discarded.

Assigning the eluents

The assigning of the eluents to the determinations depends on the type of determinations that are to be found in the reprocessing. The following rules apply:

NOTE

The eluents that are defined in the dialog **Change eluent** are applied to the **respective** eluents of the determinations in reprocessing.

- **Change eluentcontains fewer eluents than the determination in reprocessing.**
  The eluents in the dialog **Change eluent**, which correspond to one eluent in the determination, are applied in the determination. Eluents in the determination that have no correspondence will not be modified.
- **Change eluent contains more eluents than one determination in reprocessing.**
  The eluents in the dialog **Change eluent**, which correspond to one eluent in the determination, are applied in the determination. Eluents in the dialog **Change eluent** that have no correspondence in the determination have no effect.
-

4.7.18.5.4 Selecting eluents from configuration

Dialog window: **Reprocessing ► [Method...] ► Change eluent ► Change eluent ► Selecting eluents from configuration**

Eluent

Selection	**Eluent from eluent table**

4.7.18.5.5 Importing calibration points

Dialog window: **Reprocessing ► [Method...] ► Import calibration points ► Import calibration points**

The **Import calibration points** function refers to the currently selected determination in the Reprocessing table *(see chapter 4.7.18.4.1, page 332)*. You can use this function as an aid to import the content of an ***.ical** file that was created by MagIC Net into a selected analysis ("target analysis") of this determination.

Select analysis

List of the analyses (sorted alphabetically) in the selected determination. Select the analysis (target analysis) into which you wish to import calibration points from an ***.ical** file here.

Import file

Display of the name (including path) of the ***.ical** file selected for the import.

...

Opens a dialog for the selection of an ***.ical** file for import.

[OK]

Starts the import of the calibration points from the selected ***.ical** file into the selected analysis. The **Import calibration points** dialog will close after the import has been successfully completed.

[Cancel]

Discards any user inputs and closes the **Import calibration points** dialog.

What happens when calibration points are imported into an analysis?

- All calibration points of the target analysis are deleted.
- For every component for which calibration points are available in the ***.ical** file, these will be copied into the target analysis. The *names* of the components will be compared at this time.
- After the import of the calibration points into the target analysis, the display of their calibration will be updated in the **Chromatograms***(see chapter 4.7.18.4.4, page 335)* subwindow.
- The determination will *not* be automatically recalculated after the import.

4.7.18.5.6 Exporting calibration points

Dialog window: **Reprocessing ► [Method...] ► Export calibration points ► Export calibration points**

The **Export calibration points** function refers to the currently selected determination in the Reprocessing table *(see chapter 4.7.18.4.1, page 332)*. This function can be used as an aid for selecting an analysis of this determination and to export its calibration points (if available) into an ***.ical** file.

Select analysis

List of the analyses (sorted alphabetically) in the selected determination. Select the analysis whose calibration points you wish to export into an ***.ical** file here. If the selected analysis contains no calibration points, then you will be prompted to select a different analysis when pressing **[OK]**.

Export file

Display of the name (including path) of the ***.ical** file determined for the export.

[...]

Opens a dialog for the definition of the ***.ical** file into which the calibration points are to be exported. You can select the target directory and an ***.ical** file or enter them manually.

[OK]

Starts the export of the calibration points from the selected analysis into the ***.ical** file. The **Export calibration points** dialog will close after the export has been successfully completed.

[Cancel]

Discards any user inputs and closes the **Export calibration points** dialog.

4.7.18.5.7 Reprocessing

Dialog window: **Reprocessing ▶ [Reprocessing] ▶ Reprocessing**

The actual reprocessing is triggered in this dialog window.

All modifications that were made in the subwindows **Reprocessing table**, **Evaluation parameters** and **Chromatograms** are incorporated in the reprocessing of the determinations.

Calibration

Defines whether a new calibration is generated during reprocessing or whether an existing calibration will be used.

Selection	**Apply calibration from selected determination to all determinations.** | **Create and apply new calibration from standards of reprocessing table.**
Default value	**Apply calibration from selected determination to all determinations.**

Apply calibration from selected determination to all determinations.
The calibration (standard chromatograms, calibration points and calibration curves) of the highlighted determination is used during reprocessing for the calibration of all determinations in the table.
Application example: Select this option to use a good calibration for all the determinations.

Create and apply new calibration from standards of reprocessing table.
During the reprocessing new calibrations are created from the standards. To do this, the evaluation parameters of the highlighted determination are used. The reprocessing table is run through from top to bottom. **Application example:** All the standards are now applied to the calibration. The calibration is only complete after the last standard has finished.

Keep manual integration

on | off (Default value: **on**)

Establishes whether manual integration is taken into account during reprocessing or whether new integrations are carried out.

- **on**: Manual integration taken into account during reprocessing.
- **off**: Manual integrations are discarded, all determinations are reintegrated with the current evaluation parameters.

[OK]

Triggers reprocessing. As long as the reprocessing is running, all subwindows and buttons are disabled; a progress bar is displayed in the lower area of the window.

NOTE

All determinations are reprocessed with the evaluation parameters of the **selected** determination.

It is not until this moment that all the modifications that were made in the reprocessing are incorporated into the determinations. The changed results and chromatograms are displayed in the **Results** and **Chromatograms** subwindows.

[Cancel]

The procedure will be canceled.

What happens during reprocessing?

- **Columns and eluents**
  Modified columns and eluents are written into **all** determinations and taken into account for the calculations (e.g. theoretical plates).
- **Sample data**
  All determinations are reprocessed one after the other with their sample data from the reprocessing table.

- **Evaluation parameters**
  All determinations are reprocessed one after the other with the evaluation parameters of the selected determination. The reprocessing table is run through from top to bottom during this process. The calculations and results behave the same way as when a determination series is being processed. The chromatograms of the determinations are reintegrated, the peaks of the components that are discovered are assigned and the results are calculated with the current calibration. Depending on the calibration mode, the calibration changes thereby with each standard, in a fashion analogous to a determination series.
  Exceptions:
  - If the **Keep manual integration** parameter is set to **on**, then manually integrated chromatograms will not be reintegrated. All other chromatograms will be integrated with the integration parameters of the selected determination.
  - If the **Calibration** parameter has the value **Apply calibration from selected determination to all determinations.**, then the evaluation parameters of the selected method will be used solely for integrating chromatograms and assigning the peaks to the components. No calibration curves will be recalculated, however.
    The calculation of the results is then accomplished with the calibration data set of the selected determination, i.e. the results of all determinations in reprocessing will each be calculated with the same calibration data set.

4.7.18.6 Modification comment for determinations

Dialog window: **Database ► Determinations ► Delete/Reprocess...**

If the **Comment on modification of determinations** option is activated in the security settings, then the **Modification comment determination** window appears, in which a **Reason** must be selected and a **Comment** on the modification must be entered before the modified sample data can be accepted.

Reason

Selection from the default reasons defined in the **Security settings** dialog window for the **Modification determination** category.

Selection	**Selection from default texts**

Comment

Entry of a comment on the modification of the determinations.

Entry	**1,000 characters**

4.7.19 Completing determinations

Menu item: **Database ▶ Determinations ▶ Complete...**

All incomplete determinations marked in the determination overview which are not complete due to an incident of global error (e.g. interrupted contact with the server, electrical power failure, program crash) or which were not finished after a reprocessing error will be made complete by means of the menu item **Determinations ▶ Complete...**.

NOTE

Incomplete determinations can only be made complete if they were generated by the same client as the one that is to complete them, and only if no determinations are running in any of that client's workplaces.

4.7.20 Deleting determinations

Menu item: **Database ▶ Determinations ▶ Delete**

The selected determinations are deleted after the confirmation request with the icon or the **Determinations ▶ Delete** menu item.

NOTE

If a database is opened simultaneously on several clients and if determinations are deleted on a client, then these will continue to be shown on the other clients in the determination table until the table is updated. All the fields of these determinations will then have the entry **deleted**.

NOTE

If the **Comment on modification of determinations** check box in the **Security settings** is activated, then the **Modification comment determination** window will appear before the modification is saved.

4.8 Information subwindow

4.8.1 Information - Overview

Subwindow: **Database ► Information**

General

General information about the focused determination in the determination table is shown in the **Information** subwindow. The subwindow can be activated in the **Database** program part during the definition of the layout and thus made visible. It can be enlarged and reduced as required; it can also be maximized.

Tabs

Information about the determination is shown on the following tabs:

- *Determination*
  Shows general information about the determination.
- *Method*
  Shows general information about the method used.
- *Sample*
  Shows general information about the sample used.
- *Devices*
  Display of general information about the devices used.
- *Analyses*
  Display of general information concerning the analyses present in the determination.
- *Messages*
  Shows messages about the determination.
- *Determination comment*
  Shows the comment on the determination.

4.8.2 Information - Determination

Tab: **Database ► Information ► Determination**

Shows general information about the determination.

Identification

Information about the identification of the determination.

Determination ID:

Unique and unmistakable identification for the determination.

Server name:

Computer name of the server to which the client was connected when the determination was recorded.

Computer name:

Name of the computer with which the determination was recorded.

Start counter:

Shows the start counter which is increased by +1 at the start of each determination. The start counter is saved for each client and cannot be reset.

Source format:

Display of the source format (e.g. ***.cdf**) for imported determinations.

Recording

Information about the recording of the determination.

Determination start:

Date and time at start of determination.

Determination duration [min]:

Duration of the determination from its start to its end or termination in min.

Determination run:

Way in which the determination was ended:

Selection	**regular without remarks** | **regular with remarks** | **stop** | **stop by error**

regular without remarks
The determination was finished automatically after the method was run normally and without any messages.

regular with remarks
The determination was finished automatically after the method was run normally but with messages.

stop
The determination was canceled manually with **[Stop]**.

stop by error
The determination was canceled automatically due to an error.

User (short name):

Short name of the user.

NOTE

Which user is entered depends on the **No editing of workplaces in 'BUSY' status** option in the security settings *(see chapter 6.2.2.2, page 547)*.

Active	User who started the determination.
Inactive	User logged in when finishing determination.

User (full name):

Full name of the user.

NOTE

Which user is entered depends on the **No editing of workplaces in 'BUSY' status** option in the security settings *(see chapter 6.2.2.2, page 547)*.

Active	User who started the determination.
Inactive	User logged in when finishing determination.

Remarks:

Shows the **Remarks** about the determination entered in the run window of the workplace.

Program version:

Shows the program version and build number of **MagIC Net** with which the determination was recorded.

License ID:

Shows the license serial number with which the determination was recorded.

Status/Version

Information about the determination version.

Determination status:

Selection	**original** | **modified**

original
Determination data unaltered.

modified
Determination data modified.

Determination version:

Version of the determination. The unaltered original determination has the version number **1**, reprocessed determinations have a version number **>1**.

Reprocessing date:

Date and time when the reprocessed determination version was saved.

Reprocessed by (short name):

Short name of the user logged in when the determination was reprocessed.

Reprocessed by (full name):

Full name of the user logged in when the determination was reprocessed.

Integration:

Information as to how the integration was accomplished.

Selection	**Automatically** | **Manual**

Automatically
Automatic integration.

Manual
Manual integration.

Modification reason determination:

Reason for the modification of the determination.

Modification comment determination:

User comment for the modification of the determination.

Signature Level #

Information about the signatures at level 1 or level 2 in chronological order.

Signature date:

Date and time at which the determination was signed.

Signed by (short name):

Short name of the user who signed the determination.

Signed by (full name):

Full name of the user who signed the determination.

Signature reason:

Reason for signature selected by the user.

Signature comment:

User comment at the time of signing the determination.

4.8.3 Information - Method

Tab: **Database ► Information ► Method**

Shows general information about the method used.

Identification

Information about the identification of the method.

Method name:

Name of the method.

Method group:

Name of the method group to which the method belonged at the moment of the determination.

Method ID:

Unambiguous and unmistakable identification for the method.

Method comment:

Comment on the method that was defined in the **Properties - Method** dialog window.

Status/Version

Information about the method version.

Method status:

Selection	**original** | **modified**

original
Determination method unaltered.

modified
Determination method was modified during **Reprocessing**.

Method version:

Version of the method with which the determination was generated.

Method saving date:

Date and time when the modified method version was saved.

Method saved by (short name):

Short name of the user logged in when the modified method was saved.

Method saved by (full name):

Full name of the user logged in when the modified method was saved.

Modification reason method:

Reason for the modification of the method.

Modification comment method:

User comment for the modification of the method.

Signature Level #

Information about the signatures at level 1 or level 2 in chronological order.

Signature date:

Date and time at which the method was signed.

Signed by (short name):

Short name of the user who signed the method.

Signed by (full name):

Full name of the user who signed the method.

Signature reason:

Reason for signature selected by the user.

Signature comment:

User comment at the time of signing the method.

4.8.4 Information - Sample

Tab: **Database ► Information ► Sample**

Shows general information about the sample used.

Sample data

Information about the sample. The only sample data shown is that for which a value is available.

Ident:

Identification of the sample.

Sample type:

Sample type of the sample.

Position:

Position of the sample.

Injection counter:

Specification of the injection counter **n/m** (**n** = Injection number of a multiple determination; **m** = Nominal number of injections of a multiple determination).

Volume:

Volume of the sample µL.

Dilution:

Dilution factor for the sample.

Sample amount:

Amount of the sample.

Identifications

Information about the sample identifications. This will only be shown when a value is present.

Info 1 to Info 4:

Display of the text information entered as identification for the sample.

Value 1 to Value 4:

Display of the numerical values entered as identification for the sample.

Live modifications

Information on the last live modification of sample data.

Modification reason sample data:

Reason for the sample data modification.

Modification comment sample data:

User comment for the modification of the sample data.

4.8.5 Information - Devices

Tab: **Database ▶ Information ▶ Devices**

Display of general information about the devices and common variables used.

Device 'Device name'

Information about the device used (only the existing device information will be shown). If a device has modules, then the respective module designation and module name will be displayed in boldface.

Device type:

Type of device.

Program version:

Device program version.

Device serial number:

Serial number of the device.

Leak sensor:

Status of the leak sensor.

High-pressure pump:

Name of the high-pressure pump.

Material:

Material of the pump head.

Device serial number:

Serial number of the pump head.

Maximum pressure:

Maximum pressure of the pump head.

Correction factor:

Correction factor of the pump head.

Eluent name:

Name of the eluent.

Order number:

Order number for the eluent.

Manufacturer:

Manufacturer of the eluent.

Batch number:

Batch number of the eluent.

Composition:

Composition of the eluent.

Set to work:

Date at which the eluent was used for the first time.

Expiry date:

Expiry date of the eluent.

Detector:

Name of the detector.

Detector type:

Type of detector

Connection:

Designation of the detector connector at the device.

Serial number:

Serial number of the detector.

Cell constant:

Cell constant of the detector.

Thermostat:

Thermostat setting of the detector.

Peristaltic Pump:

Name of the peristaltic pump.

Solution name:

Name of the solution conveyed with the pump.

Concentration:

Concentration of the solution.

Production date:

Production date of the solution.

Expiry date:

Expiry date of the solution.

Injector:

Name of the injection valve.

MSM:

Name of the suppressor.

Degasser:

Name of the degasser.

Column thermostat:

Name of the column thermostat.

MCS:

Name of the CO_2 suppressor.

10-port valve:

Name of the 10-port valve.

Analog Out:

Name of the 891 Professional Analog Out

Device type:

Device type of the 891 Professional Analog Out

Device serial number:

Device serial number of the 891 Professional Analog Out

Rack name:

Name of the rack on the sample changer.

Number of positions:

Number of sample positions on the rack.

Work position:

Work position of the rack.

Rinse position:

Rinse position of the rack.

Shift position:

Shift position of the rack.

Special position:

Special position of the rack.

Ext. Pump #:

Name of the external pump.

Solution name:

Name of the solution conveyed with the pump.

Production date:

Production date of the solution.

Expiry date:

Expiry date of the solution.

Device type:

Dosing device type.

Device serial number:

Serial number of the Dosino.

Connection:

Dosing connector at device.

Solution name:

Name of the solution.

Concentration:

Concentration value and unit of the solution.

Production date:

Date at which the solution was produced.

Expiry date:

Expiry date of the solution.

Exchange/Dosing unit:

Type of the exchange unit or dosing unit.

Name:

Designation of the exchange or dosing unit.

Order number:

Order number of exchange or dosing unit.

Serial number:

Serial number of exchange or dosing unit.

Cylinder volume:

Cylinder volume of the exchange or dosing unit.

Cylinder serial number:

Serial number of the cylinder.

Device type:

Type of stirrer.

Serial number:

Serial number of the stirrer.

Connection:

Stirrer connector at device.

Remote Box:

Connector at device.

Number of Eluents:

Number of eluents for the high-pressure gradient pump.

Analysis 'Analysis name'

Information concerning the hardware assigned to an analysis.

Data source:

Alias name of the detector.

Channel:

Data channel.

Injection valve:

Alias name of the injection valve.

Column:

Alias name of the column.

Pump:

Alias name of the pump.

Accessories:

Name of the accessories.

Manufacturer:

Manufacturer of the accessories.

Order number:

Order number of accessories.

Set to work:

Date at which the accessories was used for the first time.

Expiry date:

Expiry date of the accessories.

Column 'Column name'

Information about the separation column used.

Column type:

Type of column.

Order number:

Order number of the column.

Serial number:

Serial number of the column.

Batch number:

Batch number of the column.

Set to work:

Date at which the column was used for the first time.

Length:

Length of the column in mm.

Inner diameter:

Inner diameter of the column in mm.

Particle size:

Particle size of the column in µm.

Determinations:

Number of determinations of the column at the end of the determination.

Operating hours:

Number of operating hours of the column at the end of the determination.

Precolumn type:

Type of guard column used.

Order number precolumn:

Order number of the guard column.

Serial number precolumn:

Serial number of the guard column.

Batch number precolumn:

Batch number of the guard column.

Set to work precolumn:

Date at which the guard column was used for the first time.

Length precolumn:

Length of the guard column in mm.

Inner diameter precolumn:

Inner diameter of the guard column, in mm.

Determinations precolumn:

Number of guard column determinations at the end of the determination.

Operating hours precolumn:

Number of guard column operating hours at the end of the determination.

Common variable 'Name'

Information about the common variable used.

Value:

Value and unit of the common variables at the start of the determination.

Assignment date:

Date and time of last value assignment.

Assignment method:

Method with which the value was assigned.

4.8.6 Information - Analyses

Tab: Database ► Information ► Analyses

Display of the most important chromatographic information concerning the analyses.

'Analysis name'

Information concerning an analysis.

Data source:

Type of detector with which the analysis was recorded.

Channel:

Data channel.

Recording time:

Recording time of the analysis in min.

Integration:

Information as to how the integration was accomplished.

Column type:

Type of column.

Eluent composition:

Composition of the eluent.

Flow:

Flow at the pump that is assigned to the analysis at **Start data recording** (in mL/min).

Maximum flow monitored

Indication whether the maximum flow rate written on the column chip was monitored during the analysis.

Pressure:

Pressure at the pump that is assigned to the analysis at **Start data recording**.

Maximum pressure monitored

Indication whether the maximum pressure written on the column chip was monitored during the analysis.

Temperature:

Temperature at the pump that is assigned to the analysis at **Start data recording**.

4.8.7 Information - Messages

Tab: **Database ► Information ► Messages**

Display of messages generated during the determination run.

'Time'

Shows the time at which the message was generated in the run (date, time, UTC in the format **YYYY-MM-DD hh:mm:ss UTC……**).

Message title:

Shows the message title and number.

Message text:

Shows the message.

4.8.8 Information - Determination comment

Tab: **Database ► Information ► Determination comment**

Shows the comment on the determination.

Determination comment:

Shows the comment entered for the determination.

4.9 Results subwindow

4.9.1 Results - Overview

Subwindow: **Database ► Results**

General

The results calculated according to the method for the determination focused in the determination table are displayed in the **Results** subwindow. The subwindow can be switched on in the **Database** program part during the definition of the layout and thus be made visible. It can be enlarged and reduced as required; it can also be maximized.

Tabs

The results of the determination are shown on the following tabs:

- *Results*
  Display of the automatically generated and user-defined results for determination.
- *Statistics*
  Display of the statistics data concerning the statistically evaluated results of multiple determinations.
- *Monitoring*
  Display of monitored results for determination.

4.9.2 Results - Results

Tab: **Database ► Results ► Results**

Display of the automatically generated and user-defined results for determination.

'Analysis name'

For each analysis defined in the method, an individual peak table is displayed in which the automatically calculated as well as the user-defined component results are listed. The columns that are displayed can be defined by the user *(see chapter 4.9.5, page 366)*. Components that are not assigned to any peak are **not** listed in the result table.

Single results

User-defined single results are shown here. Each single result consists of **Result name**, **Result value** and **result unit**.

Result definitions

The definitions of all user-defined results (single and component results) are shown here. Result name, formula and the variables used in the formula with the variable name and variable value are shown for each user-defined result.

4.9.3 Results - Statistics

Tab: **Database ▶ Results ▶ Statistic**

NOTE

.This tab is only shown if a statistic for results was defined in the method and if the determination was a multiple injection

'Analysis name' - 'Result name'

For each statistically evaluated result of an analysis, the component result as well as corresponding results and statistical results defined in the method are shown per component.

Single results

For each statistically evaluated user-defined single result, the single result as well as the corresponding statistical results defined in the method are shown.

4.9.4 Results - Monitoring

Tab: **Database ▶ Results ▶ Monitoring**

NOTE

This tab is only displayed when results monitoring has been defined in the method.

'Analysis name' - 'Result name'

For each analysis that contains monitored component results, the component result and the corresponding limit values are shown per component. If the result falls within the limit values, it is displayed in **green**; if it lies outside, it is displayed in **red**. In this case, **Message** and **Action** defined for the monitoring are also shown.

Single results

For each monitored single result, the single result and the corresponding limit values are shown. If the result falls within the limit values, it is displayed in **green**; if it lies outside, it is displayed in **red**. In this case, **Message** and **Action** defined for the monitoring are also shown.

4.9.5 Results - Properties

Dialog window: **Database ► View ► Properties ► Results properties ► Result window properties**

The Result properties dialog window is opened with the **View ► Properties ► Result window properties** menu item and there, the elements can be selected which will be listed in the peak table of the result window.

Available columns

Display of all columns that can be shown in the peak table.

Displayed columns

Display of all columns that are shown in the peak table. The **Component name**, **Retention time**, **Height**, **Area** and **Concentration** columns are displayed by default.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

show unidentified peaks

on | off (Default value: **off**)

If this check box is activated, unidentified peaks will also be listed in the peak table.

Hide result definitions

If this check box is enabled, the definitions of the user-defined results will not be shown.

4.10 Curves subwindow

4.10.1 Curves - Overview

Subwindow: **Database ► Curves #**

General

The chromatograms and calibration curves of the determination focused in the determination table are displayed in the **Curves 1 - 5** subwindows. When navigating in the determination overview, these curves will be updated automatically (after a certain time delay).

The **Curves 1 - 5** subwindows can be activated in the **Database** program part and thus made visible when the layout is defined. They can be enlarged and reduced as required, and they can also be maximized.

Tabs

A tab is displayed for every analysis that is defined in a method; these tabs are lettered with the name of the analysis and they show the associated chromatograms and calibration curves.

Graphics window

The functions and properties of the **Curves #** subwindow are described in the *Graphics window* chapter in the following subchapters:

- *Elements*
- *Chromatogram view*
- *Calibration curve view*
- *Zooming*
- *Move curve*
- *Work with cursor*
- *Set Zoom*
- *Properties*
- *Change calibration*
- *Select color*

5 Method

5.1 Method - General

5.1.1 Method - Definition

Program part: **Method**

Definition

In **MagIC Net** a **method** is an instruction for processing a sample, which can be created in the program part **Method** and be started in the program part **Workplace**.

Structure

The main window of the program part **Method** is divided into four subwindows:

- *Devices*
- *Time program*
- *Evaluation*
- *Chromatograms*

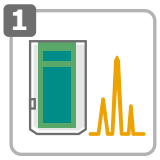
Management

Methods are organized in **method groups** and are always automatically assigned a new version, i.e. each time a method is stored a new **version** is created. Methods can also be **signed at two levels** and be blocked against further modifications. Methods are stored in the **configuration database** and are globally accessible for all clients.

5.1.2 Method - User interface

Program part: **Method**

Method icon



Clicking on the method icon in the vertical bar on the left opens the **Method** program part; the method icon is shown in color at the same time. The upper left corner of the icon contains a black field displaying the number of methods currently opened *(see chapter 5.2.3, page 374)*.

Elements

The user interface of the **Method** program part comprises the following elements:

- Method-specific menu bar.
- Method-specific toolbar.
- Main window in which up to four subwindows can be displayed at the same time.

5.1.3 Method - Menu bar

5.1.3.1 Method - Main menus

Program part: **Method**

The menu bar in the program part **Method** contains the following main items:

- *File*
  Creating, opening, saving, closing, checking, managing, printing methods; logging out.
- *Edit*
  Define method properties, recalculate calibration data, update calibration data and chromatograms.
- *View*
  Activate/deactivate the toolbar.
- *Help*
  Open MagIC Net help, display information on the program.

5.1.3.2 Method - File menu

Program part: **Method**

New...	Create a new method *(see chapter 5.2.1, page 372)*.
Open...	Open an existing method *(see chapter 5.2.2, page 373)*.
Save	Saves the selected method *(see chapter 5.2.10, page 379)*.
Save As...	Save the selected method under a new name *(see chapter 5.2.10, page 379)*.
Close all	Closes all opened methods *(see chapter 5.2.13, page 382)*.
Close	Closes the selected method *(see chapter 5.2.13, page 382)*.
Method check	Checks the selected method for plausibility *(see chapter 5.2.5, page 376)*.
Method manager...	Opens the method manager *(see chapter 5.4.1, page 388)*.
Method groups...	Opens the method groups manager *(see chapter 5.5.1, page 400)*.
Print (PDF)	Output of the method report as PDF file *(see chapter 5.2.12, page 381)*.

Logout...	Log out the user. The **Login** dialog window opens *(see chapter 2.2.3, page 23)*.
Exit	Exits the program.
1 'Method name'	Opens the selected method.

5.1.3.3 Method - Edit menu

Program part: **Method**

Properties...	Open the **Method properties** dialog window *(see chapter 5.3, page 383)*.
Calculate	Recalculate the calibration data *(see chapter 5.2.6, page 376)*.
Update	Update the calibration data and chromatograms *(see chapter 5.2.7, page 377)*.

5.1.3.4 Method - View menu

Program part: **Method**

Split vertically	Split method window vertically and display two methods side by side *(see chapter 5.2.3.2, page 375)*.
Split horizontally	Split method window horizontally and display two methods below each other *(see chapter 5.2.3.3, page 375)*.
Unsplit	Undoes the splitting of the method window *(see chapter 5.2.3.1, page 375)*.
Toolbar	Activates/deactivates the toolbar display.

5.1.3.5 Help menu

Program part: **Workplace / Database / Method / Configuration**

MagIC Net Help	Opens MagIC Net Help.
About	Displays information about the program and the installation.

5.1.4 Method - Toolbar

Program part: **Method**

New...	Create a new method *(see chapter 5.2.1, page 372)*.
Open...	Open an existing method *(see chapter 5.2.2, page 373)*.
Save	Saves the selected method *(see chapter 5.2.10, page 379)*.

Close	Closes the selected method *(see chapter 5.2.13, page 382)*.
Method manager...	Opens the method manager *(see chapter 5.4.1, page 388)*.
Method groups...	Opens the method groups manager *(see chapter 5.5.1, page 400)*.
Print (PDF)	Output of the method report as PDF file *(see chapter 5.2.12, page 381)*.
Properties...	Opens the parameter window of the command selected in the method *(see chapter 5.3, page 383)*.
Method check	Checks the selected method for plausibility *(see chapter 5.2.5, page 376)*.
Calculate	Recalculate the calibration data *(see chapter 5.2.6, page 376)*.
Update	Update the calibration data and chromatograms *(see chapter 5.2.7, page 377)*.
Split vertically	Split method window vertically and display two methods side by side *(see chapter 5.2.3.2, page 375)*.
Split horizontally	Split method window horizontally and display two methods below each other *(see chapter 5.2.3.3, page 375)*.
Unsplit	Undoes the splitting of the method window *(see chapter 5.2.3.1, page 375)*.
Logout...	Logs out user *(see chapter 2.2.3, page 23)*.
MagIC Net Help	Opens MagIC Net Help.

5.1.5 Method - Functions

Program part: **Method**

The following functions can be carried out in the **Method** program part:

Method editor

- *Creating a new method*
- *Opening a method*
- *Selecting a method*
- *Editing a method*
- *Checking a method*
- *Printing a method report*
- *Saving a method*
- *Closing a method*

Managing methods

- *Managing methods*
- *Renaming a method*
- *Copying a method*
- *Moving a method*
- *Deleting a method*
- *Exporting a method*
- *Importing a method*
- *Signing methods*
- *Displaying the method history*

Managing method groups

- *Managing method groups*
- *Editing method groups*

5.2 Method editor

5.2.1 Creating a new method

Menu item: **Method ▶ File ▶ New…**

The icon or the **File ▶ New...** menu item opens the **New method** window, in which a method template can be selected for the new method.

Templates

Selection of the template with which the new method is to be generated.

Selection	**Method templates** | **Empty method**
Default value	**Empty method**

Method templates
Selection of a method template as a basis for creating a new method.

Empty method
An empty template is loaded (the four subwindows of the method program part).

Description

Description of the selected method template.

[OK]

Opens the selected template for editing.

5.2.2 Opening a method

Menu item: **Method ► File ► Open...**

The icon or the **File ► Open** menu item opens the **Open method** window. One of the globally available methods can be selected and opened.

Method group

Method group

Selection of the method group whose methods are to be displayed in the method table *(see chapter 5.5.1, page 400)*.

Selection	**Method groups** | **Main group**
Default value	**Main group**

Method table

The method table contains information on all methods of the selected method group. The table cannot be edited. The table can be sorted according to the selected column (**Name**, **Saved**, **User**, **Full name**, **Version**, **Signed**, **Method comment** columns) in either ascending or descending order by clicking on the column title.

Name

Name of the method.

Saved

Date and time when the method was saved.

User

Short name of the user who saved the method.

Full name

Full name of the user who saved the method.

Version

Version number of the method.

Signed

Shows whether and at which level the method was signed.

Selection	**no** | **Level 1** | **Level 2**

no
The method has not been signed yet. It can be opened for editing and can be deleted.

Level 1
The method has been signed electronically at level 1. It can be opened for editing and can be deleted. If the method is modified and saved again, a new version is created and all the signatures will be deleted.

Level 2
The method has been signed electronically at level 2. The method is locked now and it can neither be opened for editing nor deleted.

Method comment

Comment on the method defined in the method properties *(see chapter 5.3.3, page 384)*.

Opening a method

Method name

Name of the method to be opened. If a method is selected from the table, the method name will be entered automatically in this field. It can, however, also be entered manually.

Entry	**50 characters**

[Open]

Opens the selected method in the main window in the place of the method that is already open. The method name is displayed in the title bar of the program; the number of currently opened methods is displayed in the left upper corner of the method symbol.

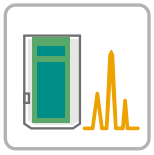
NOTE

A maximum of 9 methods can be opened, but only 2 can be displayed at the same time.

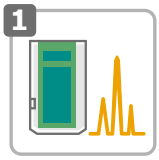
5.2.3 Selecting a method

Program part: **Method**

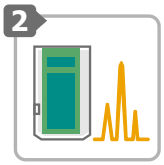
The number of currently opened methods is displayed in the left upper corner of the method symbol. The method to be displayed in the main window can be selected with the help of the method icon.



No method is opened. No method is displayed in the main window.



One method is opened and is displayed in the main window.



Two methods are opened. Only one method is displayed in the main window.

A menu with the currently opened methods is displayed by clicking with either the left or right mouse button on the method symbol. The method displayed in the main window is marked with a checkmark. Clicking on the desired method displays it in the place of the previously selected one.

5.2.3.1 Displaying a single method

Menu item: **Method ▶ View ▶ Unsplit**

In the default settings, the most recently opened method is displayed by itself in the main window. If the display of two methods is switched on, the display can be changed back to only one method with the icon ⛝ or the menu item **View ▶ Unsplit**.

5.2.3.2 Displaying methods next to each other

Menu item: **Method ▶ View ▶ Split vertically**

Two methods are displayed next to one another in the main window with the ◫ icon or the **View ▶ Split vertically** menu item.

5.2.3.3 Displaying methods below each other

Menu item: **Method ▶ View ▶ Split horizontally**

Two methods can be displayed one below the other in the main window with the ⊟ symbol or the **View ▶ Split horizontally** menu item.

5.2.4 Editing a method

Subwindow: **Method ▶ Devices / Time program / Evaluation**

Methods can only be edited if they are not signed at **Level 2**.

The method is edited directly via **[Edit]** in the subwindows **Devices**, **Time program** or **Evaluation**. General settings are edited under the menu item **Edit ▶ Properties...**.

5.2.5 Checking a method

Menu item: **Method ▶ File ▶ Method check**

With the ✓ icon or the **File ▶ Method check** menu item a method check for the method in focus is triggered. The following points are checked:

- **Variables**
  Are the variables used in formulas available?
- **Common variables**
  Are the common variables in the method also available in the configuration and are they valid?
- **E-mail templates**
  Are the e-mail templates used in the method also available in the configuration?
- **Database**
  Is a database named in the method?
- **Time program**
  Are all the devices, modules and analyses used in the time program available in the device list and are all the modules used active?
  Are the requested subprograms available and are all the times correct?
- **Data source**
  Has a data source been assigned to an analysis?
- **Devices**
  Are all devices and device modules used available and active?

A respective error message is displayed for each error found. The check has to be started again afterwards. When the method check has been completed successfully, this is confirmed with a message.

5.2.6 Recalculating calibration data

Menu item: **Method ▶ Edit ▶ Calculate**

The **Edit ▶ Calculate** menu item or the icon on the toolbar triggers the following actions:

NOTE

The calibration is recalculated with the **currently loaded determinations** of the calibration data set (standard chromatograms, blank) and the **latest method settings**.

Later determinations are not reloaded from the database.

- All standard chromatograms are reevaluated with the current settings of the method and the calibration points are redefined.
- The calibration curves are recalculated.

- If there is a sample chromatogram in the method view, it is also re-integrated and evaluated with new calibration curves.
- The display in the graphics window (settings, zoom) remains the same.

5.2.7 Updating calibration data and chromatograms

Menu item: **Method ▶ Edit ▶ Update**

The **Edit ▶ Update** menu item or the icon on the toolbar triggers the following actions:

NOTE

The calibration is recalculated with the **current determinations** of the calibration data set (standard chromatograms, blank) and the **latest method settings**.

The latest determinations for the method are reloaded from the database.

- The temporary calibration data set of the method is updated, i.e. determinations of standards and blanks that may have been added are loaded into the method and displayed. Outdated standards and blanks are removed.
- All standard chromatograms are reevaluated with the current settings of the method and the calibration points are redefined.
- The calibration curves are recalculated.
- If there is a sample chromatogram in the method view, it is also re-integrated and evaluated with new calibration curves.
- The display in the graphics window (settings, zoom) is reloaded. Changes that were not saved are discarded.

5.2.8 Exporting calibration points

Dialog window: **Reprocessing ▶ [Method...] ▶ Export calibration points ▶ Export calibration points**

The **Export calibration points** function refers to the currently selected determination in the Reprocessing table *(see chapter 4.7.18.4.1, page 332)*. This function can be used as an aid for selecting an analysis of this determination and to export its calibration points (if available) into an ***.ical** file.

Select analysis

List of the analyses (sorted alphabetically) in the selected determination. Select the analysis whose calibration points you wish to export into an ***.ical** file here. If the selected analysis contains no calibration points, then you will be prompted to select a different analysis when pressing **[OK]**.

Export file

Display of the name (including path) of the ***.ical** file determined for the export.

...

Opens a dialog for the definition of the ***.ical** file into which the calibration points are to be exported. You can select the target directory and an ***.ical** file or enter them manually.

[OK]

Starts the export of the calibration points from the selected analysis into the ***.ical** file. The **Export calibration points** dialog will close after the export has been successfully completed.

[Cancel]

Discards any user inputs and closes the **Export calibration points** dialog.

5.2.9 Importing calibration points

Dialog window: **Reprocessing ▶ [Method...] ▶ Import calibration points ▶ Import calibration points**

The **Import calibration points** function refers to the currently selected determination in the Reprocessing table *(see chapter 4.7.18.4.1, page 332)*. You can use this function as an aid to import the content of an ***.ical** file that was created by MagIC Net into a selected analysis ("target analysis") of this determination.

Select analysis

List of the analyses (sorted alphabetically) in the selected determination. Select the analysis (target analysis) into which you wish to import calibration points from an ***.ical** file here.

Import file

Display of the name (including path) of the ***.ical** file selected for the import.

...

Opens a dialog for the selection of an ***.ical** file for import.

[OK]

Starts the import of the calibration points from the selected ***.ical** file into the selected analysis. The **Import calibration points** dialog will close after the import has been successfully completed.

[Cancel]

Discards any user inputs and closes the **Import calibration points** dialog.

What happens when calibration points are imported into an analysis?

- All calibration points of the target analysis are deleted.
- For every component for which calibration points are available in the ***.ical** file, these will be copied into the target analysis. The *names* of the components will be compared at this time.
- After the import of the calibration points into the target analysis, the display of their calibration will be updated in the **Chromatograms***(see chapter 4.7.18.4.4, page 335)* subwindow.
- The determination will *not* be automatically recalculated after the import.

5.2.10 Saving a method

Menu item: **Method ► File ► Save / Save As…**

The icon or the **File ► Save** menu item is used to save an existing focused method again under its own name without opening the **Save method** window.

When saving a **newly** created method with the **File ► Save** menu item or when saving an existing method with the **File ► Save As…** menu item, the **Save method** window is opened, in which the method group can be selected and a method name can be entered or selected.

Method group

Method group

Selection of the method group where the method is to be stored *(see chapter 5.5.1, page 400)*.

Selection	**Method groups** | **Main group**
Default value	**Main group**

Method table

The method table contains information on all methods of the selected method group. The table cannot be edited. The table can be sorted according to the selected column (**Name**, **Saved**, **User**, **Full name**, **Version**, **Signed**, **Method comment** columns) in either ascending or descending order by clicking on the column title.

Name

Name of the method.

Saved

Date and time when the method was saved.

User

Short name of the user who saved the method.

Full name

Full name of the user who saved the method.

Version

Version number of the method.

Signed

Shows whether and at which level the method was signed.

Selection	**no** | **Level 1** | **Level 2**

no
The method has not been signed yet. It can be opened for editing and can be deleted.

Level 1
The method has been signed electronically at level 1. It can be opened for editing and can be deleted. If the method is modified and saved again, a new version is created and all the signatures will be deleted.

Level 2
The method has been signed electronically at level 2. The method is locked now and it can neither be opened for editing nor deleted.

Method comment

Comment on the method defined in the method properties *(see chapter 5.3.3, page 384)*.

Saving a method

Method name

Entry of the name under which the method is to be saved.

Entry	**50 characters**

NOTE

The method name must be unique in the entire client/server system.

[Save]

Save the focused method under the desired method name in the selected method group.

The **method check** is automatically carried out before saving the method; it can also be started manually at any time *(see chapter 5.2.5, page 376)*. The method is checked as thoroughly as possible. Checks for devices, columns and eluents are not carried out until the start of the method in order to ensure that methods can also be created for devices which are not yet configured in the system. If an error is detected during the method check, a message is displayed asking whether the method should be saved nevertheless. Faulty methods cannot be started.

A new method version with a new method identification is created each time a modified method is saved *(see chapter 5.4.12, page 399)*. If the **Comment on modification of methods** option is activated under **Security settings ► Audit Trail ► Modifications** in the **Configuration** program part *(see chapter 6.2.2.4, page 552)*, then the **Modification comment method** window *(see chapter 5.2.11, page 381)* is displayed before the method is saved.

5.2.11 Modification comment on method

Menu item: **Method ► File ► Save / Save As…**

If the **Comment on modification of methods** option is activated in the **Security settings ► Audit Trail ► Modifications** in the **Configuration** program part *(see chapter 6.2.2.4, page 552)* when saving a modified method or when deleting methods, the **Modification comment method** window is opened, in which a reason and a comment on the modification must be entered.

Reason

Selection from the **Default reasons** defined for the **Modification of methods** category in the **Security settings** dialog window *(see chapter 6.2.2.6, page 554)*.

Selection	**Selection from the default reasons**

Comment

Entry of a comment for modifying the method.

Entry	**1000 characters**

5.2.12 Printing a method report

Menu item: **Method ► File ► Print (PDF)…**

The **File ► Print (PDF)…** menu item or the PDF icon can be used to open the **Print method reports (PDF)** window, where the desired report for the focused method can be selected and output as a PDF file.

Report selection

Selection of the partial reports to be output for the method report.

Hardware

on | off (Default value: **on**)

Output of the device list including all start parameters of the devices used as well as the settings and links of the analysis. This partial report includes the **Start parameters** fixed report *(see chapter 4.4.4.3.7, page 255)*.

Time program

on | off (Default value: **on**)

Output of the complete time program including all subprograms. This partial report includes the **Time program** fixed report *(see chapter 4.4.4.3.7, page 255)*.

Evaluation parameters

on | off (Default value: **on**)

Output of all evaluation parameters including a table containing the components and the standards. This partial report includes the fixed reports **Integration**, **Components**, **Standards**, **Calibration parameters** and **Result definition** *(see chapter 4.4.4.3.7, page 255)*.

Properties

on | off (Default value: **on**)

Output of all settings of the **Settings** menu item. This partial report includes the **Method properties** fixed report *(see chapter 4.4.4.3.7, page 255)*.

5.2.13 Closing a method

Menu item: **Method ▶ File ▶ Close / Close all**

Closing a single method

The icon or the **File ▶ Close** menu item can be used to close the focused method. If the method has been modified, a prompt for confirmation to save the method as a new version will appear.

Closing all methods

All opened methods are closed with the **File ▶ Close all** menu item. A prompt for confirmation to save the method as a new version will appear for each method that has been modified.

5.3 Method - Properties

Dialog window: **Method ► Edit ► Properties... ► Properties - Method**

5.3.1 Properties - Sample data

Tab: **Method ► Edit ► Properties... ► Properties - Method ► Sample data**

On this tab, the sample data used and monitored in the method and their fixed values are displayed. The table contains the following columns:

Name

Designation of the sample data variable. **Info 1** to **Info 4** and **Value 1** to **Value 4** can be given individual names. These names are valid only within the same method.

Display name

Name of the sample data variable shown on the graphic user interface. The individually assigned names are displayed for **Info 1** to **Info 4** and **Value 1** to **Value 4**.

Type

Type of sample data variable (cannot be changed).

Fixed value

Fixed value for the sample data variable.

Used

Shows whether the sample data variable is used in the method or not.

Monitoring

Shows whether the sample data variable is monitored in the method or not.

[Edit]

Opens the **Configure sample data input** dialog window to edit the sample data variable selected in the table *(see chapter 5.3.5, page 385)*.

5.3.2 Properties - View

Tab: **Method ► Edit ► Properties... ► Properties - Method ► View**

You can configure the views of the method in this tab.

Workplace

Selection of the workplace view that is to be opened automatically when the method is started.

Selection	**Current view** | **View**
Default value	**Current view**

Current view
If this option is enabled, then the view currently selected on the workplace remains open.

View
Selection list with the saved workplace views.

Curve display

Live window 1

Selection of the analysis whose chromatogram is to be displayed in the **Live display 1** subwindow *(see chapter 3.8, page 194)*.

Selection	**'Analysis name'**

Live window 2

Selection of the analysis whose chromatogram is to be displayed in the **Live display 2** subwindow *(see chapter 3.8, page 194)*.

Selection	**'Analysis name'**

5.3.3 Properties - Method comment

Tab: **Method ► Edit ► Properties... ► Properties - Method ► Method comment**

Method comment

Comment on the method displayed in the method table.

Entry	**1,000 characters**

5.3.4 Properties - Application note

Tab: **Method ► Edit ► Properties... ► Properties - Method ► Application note**

An application note can be entered on this tab,

Application note

Application note for the method displayed in the **Workplace** program part in the subwindow **Live display** on its own tab *(see chapter 3.8, page 194)*. This tab opens automatically when the method is loaded.

With T or by double-clicking into the text field, start the text editor to enter or change the application note.

Selection	**Text (unlimited)**

5.3.5 Configuring sample data

Dialog window: **Method ▶ Edit ▶ Properties ▶ Sample data ▶ [Edit] ▶ Configure sample data input**

Used

on | off (Default value: **off**)

If this option is enabled, the sample data variable is used in the method.

NOTE

The sample data variables **Ident**, **Sample type**, **Position**, **Injections**, **Volume**, **Dilution** and **Sample amount** are always used in a method, i.e., their use cannot be disabled.

Display name

Name of the sample data variable shown on the graphic user interface. The individually assigned names are displayed for **Info 1** to **Info 4** and **Value 1** to **Value 4**.

Show in formula editor

Display showing which name is assigned to the **Display name** and displayed in the formula editor.

Fixed value

on | off (Default value: **off**)

If this option is enabled, a fixed value can be defined for the sample data variable. This value is displayed and used in the run for the sample data variable and can no longer be edited there.

The input of the fixed value (text, number, input range) depends on the sample data variable selected *(see chapter 3.7.4.4, page 158)*. If text templates are defined for the sample data variables **Ident** and **Info 1...4**, they can be selected in the input field *(see chapter 3.6.1, page 153)*.

Type

Displays the data type (**Number** or **Text**). The field cannot be edited.

Comment

Optional comment on sample data variable.

Monitoring

NOTE

For the sample data variable **Position** no monitoring is possible.

on | off (Default value: **off**)

If this option is enabled then sample data variable will be monitored at the start test. Monitoring cannot be enabled for sample data variables of **Text** type.

Lower limit

Lower limit value for the variable.

The input of the limit value depends on the sample data variable selected *(see chapter 3.7.4.4, page 158)*.

Upper limit

Upper limit value for the variable.

The input of the limit value depends on the sample data variable selected *(see chapter 3.7.4.4, page 158)*.

Message

The message options can only be edited if monitoring is switched on.

The text editor for entering or editing the message is opened with T or by double-clicking on the text field.

Selection	**Text (unlimited)**

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail]

[E-Mail] opens the **Send E-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If at the start test it is found that the limit values have been exceeded, then one of the following actions will be triggered automatically:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that a limit value has been exceeded will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the limit value has been exceeded will be saved automatically in the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

Navigation bar

Navigation bar for changing the displayed sample data with the following functions:

Jump to the first sample data variable. Altered data is adopted.

Jump to the previous sample data variable. Altered data is adopted.

Jump to the next sample data variable. Altered data is adopted.

Jump to the last sample data variable. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.4 Managing methods

5.4.1 Managing methods

Dialog window **Method ► File ► Method manager… ► Method manager**

With the icon or the **File ► Method manager...** menu item the **Method manager** dialog window is opened where a user with the corresponding access right is allowed to manage the methods.

Method group

Method group

Selection of the method group whose methods are to be displayed in the table.

Selection	**Method groups** | **Main group**
Default value	**Main group**

[Method groups]

Opens the dialog window **Method groups** for managing the method groups *(see chapter 5.5.1, page 400)*.

Method table

The method table contains information on all methods of the selected method group. The table cannot be edited. The table can be sorted according to the selected column (**Name**, **Saved**, **User**, **Full name**, **Version**, **Signed**, **Method comment** columns) in either ascending or descending order by clicking on the column title.

Name

Name of the method.

Saved

Date and time when the method was saved.

User

Short name of the user who saved the method.

Full name

Full name of the user who saved the method.

Version

Version number of the method.

Signed

Shows whether and at which level the method was signed.

Selection	**no** | **Level 1** | **Level 2**

no
The method has not been signed yet. It can be opened for editing and can be deleted.

Level 1
The method has been signed electronically at level 1. It can be opened for editing and can be deleted. If the method is modified and saved again, a new version is created and all the signatures will be deleted.

Level 2
The method has been signed electronically at level 2. The method is locked now and it can neither be opened for editing nor deleted.

Method comment

Comment on the method defined in the method properties *(see chapter 5.3.3, page 384)*.

Markings in the method table

If the line header is highlighted in yellow and the **Name** field in blue in the method table, the method can be migrated into another data format for performance improvements *(see chapter 5.4.10, page 393)*.

Window menus

The **[Edit]** menu below the method table contains the following menu items:

Rename…	Rename the selected method *(see chapter 5.4.2, page 390)*.
Copy	Copies the selected method(s) in the same method group *(see chapter 5.4.3, page 391)*.
Move…	Move the selected method(s) to a different method group *(see chapter 5.4.4, page 391)*.
Delete…	Deletes the selected method(s) *(see chapter 5.4.5, page 391)*.
Send to…	Export the selected method(s) and attach it (them) to an e-mail *(see chapter 5.4.6, page 392)*.
Export…	Export the selected method(s) *(see chapter 5.4.7, page 392)*.
Import…	Import method(s) *(see chapter 5.4.8, page 392)*.
Migrating…	Migrate selected method(s) into the data format for optimized performance *(see chapter 5.4.10, page 393)*.

The **[Sign]** menu below the method table contains the following menu items:

Signature 1…	Sign the selected method at level 1 *(see chapter 2.3.3, page 26)*.
Signature 2…	Sign the selected method at level 2 *(see chapter 2.3.4, page 28)*.
Show signatures…	Shows all signatures of the selected method *(see chapter 5.4.11.4, page 398)*.
Delete signatures 2…	Delete all signatures at level 2 of the selected method *(see chapter 2.3.5, page 29)*.

[History]

Open the **Method history** dialog for the selected method *(see chapter 5.4.12, page 399)*.

[Open]

Opens the selected method in the main window in the place of the method that is already open. The method name is displayed in the title bar of the program; the number of currently opened methods is displayed in the left upper corner of the method symbol.

NOTE

A maximum of 9 methods can be opened, but only 2 can be displayed at the same time.

[Close]

Closes the dialog window and saves the entries.

5.4.2 Renaming a method

Dialog window: **Method ► File ► Manage method… ► Method manager ► [Edit] ► Rename… ► Rename method**

The **Rename method** dialog window for renaming the selected method is opened with the menu item **[Edit] ► Rename…**.

Rename method 'Method name' to

Entry of the new method name.

Entry	**50 characters**

NOTE

The method name must be unique in the entire client/server system. Locked methods cannot be renamed. Renaming a method is not regarded as a modification, i.e. the method version does not change.

5.4.3 Copying a method

Menu item: **Method ▶ File ▶ Manage method… ▶ Method manager ▶ [Edit] ▶ Copy**

With the **[Edit] ▶ Copy** menu item, the selected methods are saved in the same method group under the name **Copy of 'Method name'**.

5.4.4 Moving a method

Dialog window: **Method ▶ File ▶ Manage method… ▶ Method manager ▶ [Edit] ▶ Move… ▶ Move method(s)**

With the menu item **Edit ▶ Move…**, the selected methods are moved to the desired method group. The method group can be selected in the window **Move method(s)**.

Method group

Selection of the method group to which the methods should be moved.

Selection	**Method groups**

NOTE

Locked methods (methods signed at **Level 2**) cannot be moved.

5.4.5 Deleting a method

Menu item: **Method ▶ File ▶ Method manager… ▶ Method manager ▶ [Edit] ▶ Delete**

The selected methods and all method versions are deleted with the **[Edit] ▶ Delete** menu item.

If the option **Comment on modification of methods** is activated in the **Security settings** *(see chapter 6.2.2.4, page 552)*, then the dialog window **Modification comment method** *(see chapter 5.2.11, page 381)* is displayed when methods are deleted.

NOTE

Locked methods (methods signed at **Level 2**) cannot be deleted.

5.4.6 Sending a method to

Menu item: **Method ▶ File ▶ Method manager… ▶ Method manager ▶ [Edit] ▶ Send to…**

With the menu item **Edit ▶ Send to…**, the selected methods are each exported as a file named **'Method name'imet**.

Afterwards, the Windows standard e-mail client will open with an empty message. The export files of the highlighted objects will automatically be added as an attachment. The user can complete the e-mail him- or herself and send it on. The exported methods are stored only temporarily on the computer and will be deleted automatically after the e-mail has been sent.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

5.4.7 Exporting a method

Menu item: **Method ▶ File ▶ Method manager… ▶ Method manager ▶ [Edit] ▶ Export…**

With the menu item **Edit ▶ Export…**, the selected methods can each be exported as a file named **'Method name'imet**. The **Select directory for export** dialog window opens, in which the directory for export must be selected.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

5.4.8 Importing a method

Menu item: **Method ▶ File ▶ Method manager… ▶ Method manager ▶ [Edit] ▶ Import…**

With the menu item **Edit ▶ Import…** the dialog window **Select files for import** opens. Here you must select the methods to be imported and the method group into which the methods are to be imported. These methods are then imported into the opened method table.

5.4.9 Renaming an imported method

Menu item: **Method ▶ File ▶ Method manager… ▶ Method manager ▶ [Edit] ▶ Import…**

Methods with the same name as already existing methods can only be imported under a new name. The window **Import method** opens for renaming the method.

Rename imported method 'Method name' to

Entry of the new method name.

Entry	**50 characters**

NOTE

The method name must be unique in the entire client/server system. Locked methods cannot be renamed. Renaming a method is not regarded as a modification, i.e. the method version does not change.

5.4.10 Migrating method

Menu item: **Method ▶ File ▶ Method manager… ▶ Method manager ▶ [Edit] ▶ Migrating...**

Performance improvements are available from MagIC Net 4.2. Existing methods must be migrated in another data format to improve performance. Each already existing method must be migrated once. If a method needs to be migrated, the line header of the affected method is highlighted in yellow in the method table. The name of the method is highlighted in blue.

NOTE

During migration, MagIC Net cannot be used elsewhere.

Prerequisites for migration:

- The method may not be opened.
- To migrate a method, the user needs the permission to edit the affected method group *(see chapter 5.5.2, page 401)*.

NOTE

Notes on migration in MagIC Net Multi

- Perform the migration on the server. Migration takes less time on the server than on clients.
- Do not open or start the affected methods on any client during migration.

Select the methods to be migrated in the method table. Multiple selections are possible. Use the **[Edit] ▶ Migrating...** menu item to open the **Migrating method(s)** window.

If the method migration for the affected method(s) has not yet been performed, start the migration with **[Migrating]**.

If the method migration for the affected method(s) has already been performed, the **[Migrating]** button is inactive.

5.4.11 Signing methods

5.4.11.1 Rules for electronic signatures

Program parts: **Method / Database**

In MagIC Net, methods and determination can be **electronically signed** at two levels. The following rules apply for this:

- **Signature levels**
  Methods and determinations can be signed at two levels (Signature Level 1 and Signature Level 2) by entering the user name and password.
- **Multiple signing**
  Methods and determinations can be signed several times at each level. All signatures are saved and documented in the Audit Trail.
- **Signing at level 1**
  If level 2 has been signed, then no more signatures are possible at level 1.
- **Signing at level 2**
  Level 2 cannot be signed unless there are already signatures on level 1.
- **Different users**
  The same user may not sign on both level 1 and level 2.
- **Reason and comment**
  Each signature must be accompanied by a reason selected from predefined default reasons. An additional comment can also be entered.
- **Saved data**
  Signature date, user name, full name, reason and comment are saved for each signature.

- **Deleting signatures 1**
  Signatures at level 1 are automatically deleted when a new version is created.
- **Deleting signatures 2**
  Signatures at level 2 can be deleted by users who have the respective permission.
- **Signing methods**
  Methods can only be signed individually.
- **Signature options**
  The options for electronic signatures are set in the **Signatures** tab in the **Security settings** dialog window.

5.4.11.2 Signature level 1

Dialog window: **Database ▶ Determinations ▶ Sign ▶ Signature 1... ▶ Signature Level 1**

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Signature 1... ▶ Signature Level 1**

Methods or determinations can be signed at level 1 in the **Signature Level 1** window.

NOTE

Methods or determinations which have been signed at level 1 can be modified and deleted. If the modified method or determination is saved as a new version, however, then all existing signatures will be deleted automatically, i.e. the method or determination must be signed once again.

Info

Display of information for signing and deleting signatures. The following messages are possible:

Selection	**Signature possible | Signature 1 not possible (signature 2 exists) | Signature not possible (accessed by other client)**

Signature possible
The selected method or determination can be signed.

Signature 1 not possible (signature 2 exists)
The selected method or determination can no longer be signed at level 1 as it has already been signed at level 2.

Signature not possible (accessed by other client)
The selected method or determination cannot be signed as it is already marked to be signed on a different client.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 1** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Sign]

Sign the method or determination. The window remains open.

NOTE

Methods or determinations can only be signed at level 1 if the user belongs to a user group with the corresponding permission.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

5.4.11.3 Signature level 2

Dialog window: **Database ▶ Determinations ▶ Sign ▶ Signature 2... ▶ Signature Level 2**

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Signature 2... ▶ Signature Level 2**

Methods or determinations can be signed at level 2 in the **Signature Level 2** window.

NOTE

Methods or determinations signed at level 2 are **locked**, i.e. they can neither be modified nor deleted. In order to be able to edit such methods or determinations again, the signatures on level 2 must first be deleted.

Info

Information for signing and deleting signatures is displayed in this box. The following messages are possible:

Selection	**Signature possible** | **Signature 2 not possible (signature 1 missing)** | **Signature not possible (accessed by other client)**

Signature possible
The selected method or determination can be signed.

Signature 2 not possible (signature 1 missing)
The selected method or determination cannot be signed at level 2 as it has not yet been signed at level 1.

Signature not possible (accessed by other client)
The selected method or determination cannot be signed as it is already marked to be signed on a different client.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 2** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Sign]

Sign the method or determination. The window remains open.

NOTE

Methods or determinations can only be signed at level 2 if the user belongs to a user group with the corresponding permission.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

5.4.11.4 Displaying method signatures

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Show signatures...**

The **[Sign] ▶ Show signatures…** menu item opens the **Signatures - Method 'Method name'** window with a table displaying information for all of the signatures for the selected method.

Signature

Shows at which level the method has been signed (**Level 1** or **Level 2**).

Signature date

Date and time at which the method was signed.

User

Short name of the user who has signed the method.

Full name

Full name of the user who has signed the method.

Reason

Reason for signature.

Signature comment

Comment on the signature.

5.4.11.5 Deleting signatures Level 2

Dialog window: **Database ▶ Determinations ▶ Sign ▶ Delete signatures 2... ▶ Delete Signatures Level 2**

Dialog window: **Method ▶ File ▶ Method manager... ▶ Method manager ▶ [Sign] ▶ Delete signatures 2... ▶ Delete Signatures Level 2**

All signatures on level 2 for the selected method or determination can be deleted in the **Delete Signatures Level 2** window.

User

Entry of the user name (short name).

Entry	**24 characters**

Password

Entry of the password.

Entry	**24 characters**

Reason

Selection from the **Default reasons** defined in the **Security settings** dialog window for the **Signature level 2** category.

Selection	**'Selection from the default reasons'**

Comment

Entry of a comment on the signature.

Entry	**1,000 characters**

[Delete]

Delete signatures 2.

NOTE

Signatures 2 can only be deleted if the user belongs to a user group with the respective permission.

5.4.12 Displaying the method history

Dialog window: **Method ► File ► Method manager… ► Method manager ► [History] ► Method history**

The **Method history** dialog window showing a table with all **versions** of the selected method is opened with the **[History]** button.

Name

Name of the method.

Version

Version number of the method.

Method ID

Unique method identification.

Saved

Date and time when the method was saved.

User

Short name of the user who saved the method.

Full name

Full name of the user who saved the method.

Modification reason

Reason entered when saving the modified method.

Modification comment

Comment entered when saving the modified method.

[Show method]

Opens the **Method 'Method name' - Version #** dialog window, in which the method for the selected method version is displayed.

[Make current]

Makes the selected method version the current method version again. This creates a new method whose version number is increased by **+1** compared with the last version to have been saved.

5.5 Method groups

5.5.1 Managing method groups

Dialog window: **Method ► File ► Method groups… ► Method groups**

The icon or the **File ► Method groups…** menu item is used to open the **Method groups** dialog window, in which a user with corresponding access permission can manage method groups. The information on the existing method groups is shown in a table. The table cannot be edited and is not automatically updated. Click on the column title to sort the table according to the selected column in either ascending or descending order.

Name

Name of the method group.

Number

Shows the number of methods in the method group.

Saved

Date and time when the method group was saved.

User

Short name of the user who saved the method group.

Full name

Full name of the user who saved the method group.

Comment

Comment on the method group.

[New]

Opens the **Properties - Method group - 'New Group'** dialog window for defining a new method group *(see chapter 5.5.2, page 401)*.

[Properties]

Opens the **Properties - Method group 'Name'** dialog window, in which the method group selected in the table can be edited *(see chapter 5.5.2.1, page 401)*.

[Delete]

Deletes the method group selected in the table.

5.5.2 Editing method groups

5.5.2.1 Method groups - Properties

Dialog window: **Method ► File ► Method groups... ► Method groups ► Properties - Method group 'Name'**

The **Properties - Method group 'Name'** properties window for the selected method group is opened with the **[Properties]** button or by double-clicking on a line in the table.

The parameters for method groups are configured on the following tabs:

- *General*
  General parameters.
- *Access permissions*
  Access rights for method groups and their methods.

5.5.2.2 Method groups - General

Tab: **Method ► File ► Method groups... ► Method groups ► [Properties] ► Properties - Method group 'Name' ► General**

Name

Name of the method group. The name has to be entered when a new method group is created.

Entry	**50 characters**

Number

Shows the number of methods in the method group.

Comment

Freely definable remarks about the method group.

Entry	**1,000 characters**

5.5.2.3 Method groups - Access rights

Tab: **Method ► File ► Method groups... ► Method groups ► [Properties] ► Properties - Method group 'Name' ► Access permission**

Access rights for method groups and their methods can be assigned per user group.

NOTE

The **Administrators** user group always has both access rights, i.e. these rights cannot be disabled.

User group

Names of the user groups

Execute

on | off (Default value: **on**)

Permission to start methods from a method group. Methods in this group can only be opened and started but cannot be edited or deleted.

Edit

on | off (Default value: **on**)

Permission to edit methods from a method group. Methods in this group can be opened, started, edited and deleted. New methods can be added as well.

5.6 Devices subwindow

5.6.1 Devices - General

Subwindow: **Method ▶ Devices**

Devices subwindow

The **Devices** subwindow shows the list of devices of the method. This is where devices and analyses are assigned to the method and their start parameters and/or properties are defined.

Surface

The assigned devices and analyses are displayed in the upper part of the **Devices** subwindow.

The start parameters *(see chapter 5.6.4, page 412)* for the devices and the properties *(see chapter 5.6.6, page 414)* for the analyses can be defined in the bottom part of the **Devices** subwindow.

NOTE

Both parts of the window are synchronized with each other. If a device, module or analysis is selected in the upper part, the corresponding start parameters/properties are displayed in the lower part.

5.6.2 Devices - Edit menu

Subwindow: **Method ▶ Devices ▶ [Edit]**

Add ▶	
Device	Add a device to the method *(see chapter 5.6.3.1, page 404)*.
Analysis	Add an analysis to the method *(see chapter 5.6.5.1, page 413)*.
Gradient pump	Add a gradient pump to the method *(see chapter 5.6.3.6, page 409)*.
Edit	Opens the editing window of the element (device, analysis or gradient pump) selected in the upper part of the **Devices** subwindow: ▪ **Edit device** *(see chapter 5.6.3.2, page 407)* ▪ **Edit analysis** *(see chapter 5.6.5.2, page 414)* ▪ **Edit gradient pump** *(see chapter 5.6.3.7, page 411)*
Remove	Removes the element (device, analysis or gradient pump) selected in the upper part of the **Devices** subwindow from the method.

5.6.3 Devices - Functions

5.6.3.1 Adding a device

Dialog window: **Method ► Devices ► [Edit] ► Add ► Device ► Add device**

Device selection

Selection of the device that is to be added.

Selection	**From device table** | **New device**
Default value	**From device table**

From device table
Add a known device from the device table to the device list of the method.

New device
Add a new device that is not connected and not configured in the device table to the device list of the method.

The rest of the dialog window modifies its appearance depending on the selection.

Adding a device from the device table

The **From device table** option must be selected in order to add a known device to the method from the device table.

Name

Device that is to be added.

Selection	**All devices from the device table that have not yet been assigned to this method**

Device type

Shows the device type of the device selected under **Name**.

NOTE

- If a device is added to which an MSB device is connected, then you are asked if you also want to add the MSB device to the method. If this is confirmed with **[Yes]**, then the **Define name for 'MSB device type' on MSB 'No.'** dialog window will appear *(see chapter 5.6.3.3, page 408)*.
- If a device with an amperometric detector is added to which an intelligent measuring cell is connected, then the measuring cell is added to the method without a prompt appearing *(see chapter 7.3.3.1.2.1, page 728)*.

Connections

The detector interfaces of the device and the detectors connected (cannot be edited) are shown. This area depends on the device selected. Only detectors connected to the main device at the time the method is created are added to the device list.

Detector 1

A standard name is assigned for the detectors; this name cannot be edited in the **Change device** dialog window. The default designation for the detector is made up of the detector type and the connector number of the main device. If the method is to be changed later and a second detector is to be connected to the IC instrument, it is plugged in and the device is added to the device list once again in the **Edit device** subwindow.

Detector 2

See **Detector 1**.

Adding a new device

Select the option **New device** in order to be able to add a device that has never been connected to this **MagIC Net** installation (and is therefore not listed in the device table) to a method.

Device type

Type of the new device that is to be added to the method.

Selection	**'Device type'**

Name

Name of the new device that is to be added to the method.

Entry	**40 characters**

NOTE

Which of the following parameters are displayed depends on the selected device type.

Connections

Detector 1

Indicates the detector to be used at **Detector 1** detector connector.

Only for devices with detector connector

Selection	**not defined** | **All detector types known to MagIC Net**
Default value	**not defined**

Detector 2

Indicates the second detector to be used at **Detector 2** detector connector.

Only for devices with detector connector

Selection	**not defined** | **All detector types known to MagIC Net**
Default value	**not defined**

Analog Out connected

on | off (Default value: **off**)

Selection whether an 891 Professional Analog Out is to be connected to the device.

Only with devices of the Professional IC and Compact IC type

MSB

Shows the MSB connector to which this device is connected.

Only for MSB devices

Selection	**not defined** | **Number of the MSB connector and name of the device (in parentheses)**
Default value	**not defined**

Opens the **'MSB device' - Select connection** window *(see chapter 5.6.3.4, page 409)*.

Use

Selection of the Dosino type connected to the newly added device.

Selection	**Dosino** | **Eluent Dosino** | **Suppressor Dosino**
Default value	**Dosino**

Eluent Dosino
The Eluent Dosino is labeled with an **E** in the graphical representation.

Suppressor Dosino
The Suppressor Dosino is labeled with an **S** in the graphical representation.

Towers

Number of towers

Number of towers of the sample changer to be added.

Only with the 814 USB Sample Processor or the 815 Robotic USB Sample Processor XL

Selection	**1** | **2**
Default value	**1**

Cooling

With cooling unit

on | off (Default value: **off**)

Selection whether the device is to be added with or without cooling unit.

Only with the 889 IC Sample Center

Sample addition

Options for the sample addition.

Only with the Combustion Oven with Auto Boat Driver or the Combustion Oven with LPG/GSS

Selection	**Auto Boat Driver** | **LPG/GSS**
Default value	**Auto Boat Driver**

Auto Boat Driver
Option for solid and liquid samples.

LPG/GSS
Option for gaseous samples.

Autosampler

on | off (Default value: **off**)

If this check box is activated, then an Auto Boat Driver with a connected Autosampler is used. The check box can be activated or deactivated only with the **Auto Boat Driver** option.

5.6.3.2 Editing a device

Dialog: **Method ► Devices ► [Edit] ► Edit ► Edit device**

If a device is selected in the device list, then the **[Edit] ► Edit** menu item opens the **Edit device** dialog window, in which a device can be replaced by a different one and the module designations of a device can be changed.

Replacing a device

A device can be replaced by another one of the same type from the device table. If the device is already used in the time program, the new name is entered automatically in the time program.

Device

Selection of the new device of the same device type as the device to be replaced.

Selection	**Devices of the same type from the device table**

Device type

Shows the device type of the device to be replaced.

Module designations

This section is structured dynamically depending on the device type and contains all the modules of the device. Each module can be given its own application-specific name.

'Module name'

Freely definable designation for the selected module. These alias names are only used within the method and are intended to allow the user to give "descriptive" names for a special application. They do not need to be unique.

Entry	**24 characters**
Default value	**Default designation proposed by MagIC Net**

5.6.3.3 Entering a name for an MSB device

Dialog window: **Method ▶ Devices ▶ [Edit] ▶ Add ▶ Device ▶ Add device**

If a device is added to which an MSB device is connected, then you are asked if you also want to add the MSB device to the method. If this is confirmed with **[Yes]**, then the **Enter name for 'MSB device type' on MSB 'No.'** dialog window will appear.

Name

Name of the MSB device connected to a newly added device. This name must be unique within the method.

Entry	**40 characters**

Use

Selection of the Dosino type connected to the newly added device.

Selection	**Dosino** | **Eluent Dosino** | **Suppressor Dosino**
Default value	**Dosino**

Eluent Dosino
The Eluent Dosino is labeled with an **E** in the graphical representation.

Suppressor Dosino
The Suppressor Dosino is labeled with an **S** in the graphical representation.

5.6.3.4 Selecting an MSB connector

Dialog window: **Method ▶ Devices ▶ [Edit] ▶ Add ▶ Device ▶ Add device ▶ 'MSB device' - Select connection**

In the **'MSB device' - Select connection** window, the devices added to the method are listed with their MSB connectors. Select the connector to which the MSB device is connected.

5.6.3.5 Editing the name for an MSB device

Dialog: **Method ▶ Devices ▶ [Edit] ▶ Edit ▶ Edit device**

If an MSB device is selected in the list of devices, the **[Edit] ▶ Edit** menu item opens the **Edit device** dialog window, in which its name can be changed.

Device

Name of the MSB device. This name must be unique within the method.

Entry	**40 characters**

Device type

Shows the device type of the MSB device for which the name is to be changed.

Connection

Shows the connector to which the MSB device is connected.

5.6.3.6 Adding a gradient pump

Dialog window: **Method ▶ Devices ▶ [Edit] ▶ Add ▶ Gradient pump ▶ Add gradient pump**

The **[Edit] ▶ Add ▶ Gradient pump** menu item opens the **Add gradient pump** dialog window, in which a gradient pump consisting of individual high-pressure pump modules can be defined.

Name

Name of the gradient pump.

Entry	**40 characters**

Number of pumps

Number of pump modules that are to be combined to form a gradient pump.

Selection	**2** | **3** | **4**
Default value	**2**

Pump selection

The pump modules for the gradient pump are selected in this section. Only as many fields can be edited as defined under **Number of pumps**.

NOTE

- A pump module can only be assigned once to the same gradient pump.
- Only pump modules controlled by the same IC instrument can be grouped together to a gradient pump, i.e., they must either be built into the same IC instrument or be in an Extension Module connected to the device.
- All pump heads of the gradient pump must have the same order number.

Pump A

Pump A for gradient pump.

Pump B

Pump B for gradient pump.

Pump C

Pump C for gradient pump.

Pump D

Pump D for gradient pump.

...

Opens the **Pump 'X' - Assign pump** dialog window, in which the pump modules for the gradient pump can be selected *(see chapter 5.6.3.8, page 412)*.

5.6.3.7 Editing a gradient pump

Dialog: **Method ▶ Devices ▶ [Edit] ▶ Edit ▶ Edit gradient pump**

If a gradient pump is selected in the device list, the **[Edit] ▶ Edit** menu item opens the **Edit gradient pump** dialog window, in which the gradient pump can be changed.

Name

Name of the gradient pump.

Entry	**40 characters**

NOTE

If a gradient pump already used in the time program is renamed, the new name is entered automatically there.

Number of pumps

Number of pump modules that are to be combined to form a gradient pump.

Selection	**2** | **3** | **4**
Default value	**2**

Pump selection

The pump modules for the gradient pump are selected in this section. Only as many fields can be edited as defined under **Number of pumps**.

NOTE

- A pump module can only be assigned once to the same gradient pump.
- Only pump modules controlled by the same IC instrument can be grouped together to a gradient pump, i.e., they must either be built into the same IC instrument or be in an Extension Module connected to the device.
- All pump heads of the gradient pump must have the same order number.

Pump A

Pump A for gradient pump.

Pump B

Pump B for gradient pump.

Pump C

Pump C for gradient pump.

Pump D

Pump D for gradient pump.

...

Opens the **Pump 'X' - Assign pump** dialog window, in which the pump modules for the gradient pump can be selected *(see chapter 5.6.3.8, page 412)*.

5.6.3.8 Assigning pumps for gradient pump

Dialog window: **Method ▶ Devices ▶ [Edit] ▶ Add ▶ Gradient pump ▶ Add gradient pump ▶ Pumpe 'X' - Assign pump**

The **Pump 'X' - Assign pump** dialog window is for selecting a high-pressure pump module for the gradient pump. The window is structured dynamically and contains only those high-pressure pumps for selection that are not already assigned to another gradient pump. Each pick tree is grouped according to devices. Extension Modules are shown as top level devices.

5.6.4 Devices - Start parameters

Subwindow: **Method ▶ Devices**

The start parameters for the devices can be defined in the bottom part of the **Devices** subwindow. If you click on a device in the top part of the window, the tabs of the modules contained the device appear in the bottom part of the subwindow. The start parameters for the various modules that are sent to the devices when the method is started can be defined on these tabs.

Device-dependent start parameters

- *948 Continuous IC Module - Start parameters*
- *947 Professional UV/VIS Detector Vario - Start parameters*
- *945 Professional Detector Vario - Start parameters*
- *944 Professional UV/VIS Detector Vario - Start parameters*
- *943 Professional Thermostat / Reactor Vario - Start parameters*
- *942 Extension Module Vario ONE/Deg - Start parameters*
- *942 Extension Module Vario HPG - Start parameters*
- *942 Extension Module Vario LQH - Start parameters*
- *942 Extension Module Vario Prep 2 - Start parameters*
- *942 Extension Module Vario ChS/PP - Start parameters*
- *942 Extension Module Vario SeS/PP - Start parameters*
- *941 Eluent Production Module - Start parameters*
- *940 Professional IC Vario - Start parameters*
- *930 Compact IC Flex - Start parameters*

- *920 Absorber Module - Start parameters*
- *919 IC Autosampler plus - Start parameters*
- *896 Professional Detector - Start parameters*
- *889 IC Sample Center - Start parameters*
- *887 Professional UV/VIS Detector - Start parameters*
- *886 Professional Thermostat / Reactor - Start parameters*
- *883 Basic IC plus - Start parameters*
- *882 Compact IC plus - Start parameters*
- *881 Compact IC pro - Start parameters*
- *872 Extension Module IC Module - Start parameters*
- *872 Extension Module IC Pump - Start parameters*
- *872 Extension Module Liquid Handling - Start parameters*
- *872 Extension Module Sample Prep - Start parameters*
- *872 Extension Module Suppression - Start parameters*
- *872 Extension Module Suppression – MCS - Start parameters*
- *863 Compact Autosampler - Start parameters*
- *858 Professional Sample Processor - Start parameters*
- *850 Professional IC - Start parameters*
- *814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Start parameters*
- *800 Dosino - Start parameters*
- *771 IC Compact Interface - Start parameters*
- *Combustion Module - Start parameters*
- *Eco IC - Start parameters*
- *High-pressure gradient pump - Start parameters*
- *Remote Box MSB - Start parameters*
- *Stirrer - Start parameters*
- *RS-232 device - Start parameters*

The start parameters of the **891 Professional Analog Out** *(see chapter 7.8.3.1.11, page 914)* are assigned to the main device to which it is connected.

5.6.5 Analyses - Functions

5.6.5.1 Adding an analysis

Dialog: **Method ▶ Devices ▶ [Edit] ▶ Add ▶ Analysis**

The **[Edit] ▶ Add ▶ Analysis** menu item opens the **Add analysis** dialog window, in which a name for the new analysis can be entered.

Analysis name

Name of the analysis.

Entry	**40 characters**
Default value	**New analysis**

5.6.5.2 Editing an analysis

Dialog: **Method ▶ Devices ▶ [Edit] ▶ Edit ▶ Edit analysis**

In this dialog window, you can change the name of the selected analysis and its modules.

Analysis name

Name of the analysis.

Entry	**40 characters**

Module designations

Hardware assignment

Name of the "Hardware assignment" module.

Entry	**25 characters**

Data acquisition

Name of the "Data acquisition" module.

Entry	**25 characters**

Accessories

Name of the "Accessories" module.

Entry	**25 characters**

NOTE

If an analysis already used in the time program is renamed, the new name is entered automatically there.

5.6.6 Analyses - Properties

Subwindow: **Method ▶ Devices**

The properties of the selected analysis are defined in the bottom part of the instrument window. They are grouped on the **Hardware assignment**, **Data acquisition** and **Accessories** tabs.

The analysis covers all the chromatographically relevant hardware components (data source, column, pump, etc.) that generate a measuring signal and links these with the evaluation parameters.

5.6.6.1 Analysis - Hardware assignment

Tab: **Method ▶ Devices ▶ Hardware assignment**

Modules from the device list of the method can be assigned to the analysis on this tab. This assignment makes it possible to see in the report which chromatograms were recorded with which device modules.

NOTE

For a method to be run, it is not necessary that modules are assigned to the analysis. However, for a useful analysis, at least the data source must be assigned.

Data source

Data source that provides the raw data.

The … icon opens the selection window for selecting the data source *(see chapter 5.6.6.4, page 417)*.

Channel

Channel of the data source assigned to the analysis. This optional selection list is only active if the data source selected has more than one data channel. The same channel can be assigned to more than one analysis, so that the same signal can be evaluated with different evaluation parameters (e.g. to determine the analytes and contaminations; content/purity).

Selection	**All channels of a module**

NOTE

Not all the data channels provide signals that can be evaluated. You will find more details on this with the individual devices.

- *940 Professional IC Vario - Method*
- *850 Professional IC - Data channels*
- *771 IC Compact Interface - Data channels*
- *High-pressure gradient pump - Data channels*

Injection valve

Injection valve assigned to the analysis.

The … icon opens the selection window for selecting the injection valve *(see chapter 5.6.6.5, page 418)*.

Pump

High-pressure pump assigned to the analysis.

The … icon opens the selection window for selecting the high-pressure pump *(see chapter 5.6.6.7, page 418)*.

Column

Column from the column table assigned to the analysis *(see chapter 6.6.2, page 611)*.

The … icon opens the selection window for selecting the separation column *(see chapter 5.6.6.6, page 418)*.

Monitor maximum values of the column

Maximum pressure

on | off (Default value: **on**)

If this check box is activated, then the maximum pressure written on the column chip will be monitored during the analysis.

Maximum flow

on | off (Default value: **on**)

If this check box is activated, then the maximum flow rate written on the column chip will be monitored during the analysis.

5.6.6.2 Analysis - Data acquisition

Tab: **Method ► Devices ► Recording time**

The recording time for a chromatogram is defined on this tab.

Recording time

Time during which the signal of the **Data source** defined under **Hardware assignment** is recorded. The value can be entered manually or defined with the formula editor (Σ). Recording starts with the **Start data acquisition** command in the time program.

Input range	**0.5 to 1,000.0 min**
Default value	**15.0 min**

5.6.6.3 Analysis - Accessories

Tab: **Method ► Devices ► Accessories**

Accessories can be assigned to the analysis on this tab. Monitoring and GLP data of the accessories are checked at method start by means of the assignment *(see chapter 6.10.3, page 654)*. These accessory parts are also indicated in the report.

Table

The accessories assigned to the analysis are shown in the table. The table is sorted in alphabetical order.

Name

Designation of the accessory part.

[Add]

Opens the **Add accessory** dialog window *(see chapter 5.6.6.8, page 418)*.

[Remove]

Removes the selected accessory parts from the accessories table of the analysis.

5.6.6.4 Assigning a data source

Dialog window: **Method ► Devices ► Hardware assignment ► 'Analysis name' - Assign data source**

The **'Analysis name' - Assign data source** dialog window serves for selecting the data source to be assigned to the analysis. The window is structured dynamically and contains only those data sources for selection that are already part of the method due to the main device. The pick tree is grouped according to devices. The modules of the device are sorted according to alias names.

Data sources

The following devices can provide data that can be recorded in **MagIC Net**:

- *948 Continuous IC Module - Data channels*
- *947 Professional UV/VIS Detector Vario - Data channels*
- *945 Professional Detector Vario - Data channels*
- *944 Professional UV/VIS Detector Vario - Data channels*
- *943 Professional Thermostat / Reactor Vario - Data channels*
- *942 Extension Module Vario ONE/Deg - Data channels*
- *942 Extension Module Vario HPG - Data channels*
- *940 Professional IC Vario - Data channels*
- *930 Compact IC Flex - Data channels*
- *896 Professional Detector - Data channels*
- *887 Professional UV/VIS Detector - Data channels*
- *886 Professional Thermostat / Reactor - Data channels*
- *883 Basic IC plus - Data channels*
- *882 Compact IC plus - Data channels*
- *881 Compact IC pro - Data channels*
- *872 Extension Module IC Pump - Data channels*
- *872 Extension Module IC Module - Data channels*

- *850 Professional IC - Data channels*
- *771 IC Compact Interface - Data channels*
- *Eco IC - Data channels*
- *High-pressure gradient pump - Data channels*

5.6.6.5 Assigning an injection valve

Dialog window: **Method ► Devices ► Hardware assignment ► 'Analysis name' - Assign injection valve**

The **'Analysis name' - Assign injection valve** dialog window serves for selecting the injection valves to be assigned to the analysis. The window is structured dynamically and contains only those injection valves for selection that are already part of the method due to the main device. Each pick tree is grouped according to devices. The modules of the device are sorted according to alias names.

5.6.6.6 Assigning a column

Dialog window: **Method ► Devices ► Hardware assignment ► 'Analysis name' - Assign column**

The **'Analysis name' - Assign column** dialog window serves for selecting the separation column to be assigned to the analysis. The window is structured dynamically and contains only those columns for selection that are already part of the method due to the main device. Each pick tree is grouped according to devices. The modules of the device are sorted according to alias names.

5.6.6.7 Assigning a pump

Dialog window: **Method ► Devices ► Hardware assignment ► 'Analysis name' - Assign pump**

The **'Analysis name' - Assign pump** dialog window serves for selecting the high-pressure pump to be assigned to the analysis. The window is structured dynamically and contains only those pumps for selection that are already part of the method due to the main device. Each pick tree is grouped according to devices. The modules of the device are sorted according to alias names.

5.6.6.8 Adding accessories

Dialog window: **Method ► Devices ► Accessories ► [Add] ► Add accessory**

The **[Add]** button opens the **Add accessory** dialog window, in which accessory parts defined in the accessories table can be added to the analysis *(see chapter 6.10.2, page 652)*.

Accessories

Accessory part to be assigned to the analysis.

Selection	**Accessory parts from the accessories table**

5.7 Subwindow Time program

5.7.1 Time program - General

Subwindow: **Method ▶ Time program**

Definition

- A **time program** is a run instruction for the automated processing of a sample and is part of a method. Each **method** has exactly one time program.
- Time programs consist of a **main program** and **subprograms**, which are themselves made up of **commands**.

Main program

- Each time program contains exactly one **main program** with the main run instruction. Subprograms can be called in the main program.

Subprogram

- A time program can contain 0 to 100 **subprograms**.
- The subprograms can be **called** in main programs or in other subprograms of the same time program. This call is done with the commands **Parallel** *(see chapter 5.7.4.2.2, page 427)*, **Sequence** *(see chapter 5.7.4.2.3, page 427)* or **Loop** *(see chapter 5.7.4.2.4, page 428)*.
- In the IC combustion system, the subprograms are integrated in the **Combustion** *(see chapter 7.29.3.2.1, page 1635)* command.
- A subprogram can only be **deleted** when no command exists in the entire time program that calls this subprogram.

Commands

- Main programs and subprograms consist of a sequence of **commands**. A distinction is made between **device-dependent commands** and **device-independent commands**.
- The time program permits a mixture of commands that are carried out at a point in time that can be specified (called **command without feedback**) and commands that are executed after the previous command has finished (called **command with feedback**).
- **Commands without feedback** are commands with a predictable and relatively short run time (e.g. switching of the injection valve).
- Commands with feedback are commands with a longer and often **unpredictable run time** (e.g. moving the robotic arm to a certain sample position).

NOTE

You can find further information on the commands under *5.7.4.1Commands - General*.

5.7.2 Time program - User interface

Subwindow: **Method ▶ Time program**

Structure of the time program table

- The **Main program** is displayed in its own tab, which is always present.
- Each **Subprogram** can be found on its own tab labeled with the name of the corresponding subprogram.
- One line corresponds to a **command**.

Columns of the time program table

Time

Moment when the command is executed in relation to the current time basis. A **command with feedback** contains no time indication.

NOTE

After a **command with feedback** has been carried out, the time basis is reset to **0**.

Device

Name of the device to which the command is sent.

NOTE

A **device-independent command** contains no device specification.

Module

Name of the module to which the command is sent.

NOTE

A **device-independent command** contains no module specification.

Command

Name of the command.

Parameter

Adjustable values of the command.

Comment

Comment on the command.

No.

Number of the command. This number is issued automatically when a new time program command is inserted.

Editing the time program table

The time program table can be edited in a variety of ways:

- Via the **[Edit]** menu *(see chapter 5.7.3, page 421)*.
- Via the context menu, which can be called up with the right mouse button.
- By double-clicking in a command line, which causes the dialog window for editing this command to open.
- Via copy/paste from other time programs.

5.7.3 Editing a Time program

5.7.3.1 Time program - Edit menu

Subwindow: **Method ► Time program**

The **[Edit]** menu, which can also be accessed by right-clicking on the time program table, contains the following menu items:

New	Inserts a new line above the selected line in the time program table and opens the **Insert new line** dialog window *(see chapter 5.7.3.2, page 422)*.
Edit	Opens the **'Device' - 'Command'** dialog window to edit the selected line *(see chapter 5.7.3.3, page 422)*.
Copy	Copies the selected lines from the time program table to the clipboard (the command numbers are retained).
Paste	Inserts all lines from the clipboard above the selected line in the time program table.
Cut	Copies the selected lines from the time program table to the clipboard and deletes them.
Delete	Deletes the selected lines from the time program table.

Change time	Opens the **Change time** dialog window *(see chapter 5.7.3.4, page 423)*. The time of the selected commands can be changed.
Insert subprogram	Opens the **Insert subprogram** dialog window *(see chapter 5.7.3.5, page 423)*. After a new name is entered, an empty subprogram is created, which can be selected via its own tab.
Rename subprogram	Opens the **Rename subprogram** dialog window *(see chapter 5.7.3.6, page 423)*. The subprogram selected via the tab can be renamed.
Delete subprogram	Deletes the subprogram selected via the tab. This menu item is only active if a subprogram is selected in the time program. The main program cannot be deleted.
Go to...	Open the **Go to** dialog for searching for a particular program command *(see chapter 5.7.3.7, page 423)*.

5.7.3.2 Insert new line

Dialog: **Method ► Time program ► [Edit] ► New ► Insert new line**

The **[Edit] ► New** menu item opens the **Insert new line** dialog window, which lists all commands that can be inserted in the form of a tree.

Commands

Selection of the new command. All device-independent commands as well as the device-dependent commands for the active modules of the devices that are in the list of devices for the loaded method are available.

Description

Description of the selected command.

The **[OK]** button opens the **'Device type - 'Module' - 'Command'** dialog window for device-dependent commands; for commands for an MSB device, it opens the **'MSB device name - 'Command'** dialog window; and for device-independent commands, it opens the **'Command'** dialog window.

5.7.3.3 Editing a line

Dialog window: **Method ► Time program ► [Edit] ► Edit ► 'Device' - 'Module' - 'Command'**

The **[Edit] ► Edit** menu item opens the **'Device' - 'Module' - 'Command'** dialog window, in which the command selected in the time program can be edited.

The parameters that can be edited in the dialog window depend on the command selected.

5.7.3.4 Change time

Dialog: **Method ► Time program ► [Edit] ► Change time ► Change time**

The **[Edit] ► Change time** menu item opens the **Change time** dialog.

Time offset

Time value by which the current time of the commands selected is corrected. The resulting time must be within the permitted range of **0 to 10,000 min**.

Input range	**-9,999.99 to 9,999.99 min**
Default value	**0 min**

5.7.3.5 Insert subprogram

Dialog: **Method ► Time program ► [Edit] ► Insert subprogram ► Insert subprogram**

The **[Edit] ► Insert subprogram** menu item opens the **Insert subprogram** dialog.

Name

Name of the subprogram that is to be inserted.

Entry	**50 characters**

5.7.3.6 Renaming a subprogram

Dialog window: **Method ► Time program ► [Edit] ► Insert subprogram ► Rename subprogram**

The **[Edit] ► Rename subprogram** menu item opens the **Rename subprogram** dialog window.

Name

Name of the subprogram that is to be renamed.

Entry	**50 characters**

5.7.3.7 Go to

Dialog: **Method ► Time program ► [Edit] ► Go to... ► Go to**

The **[Edit] ► Go to...** menu item opens the **Go to** dialog.

No. of command

Number of the command in the main program or subprogram to be jumped to.

Input range	**1 to 1,000**
Default value	**'empty'**

5.7.4 Time program - Commands

5.7.4.1 Commands - General

Subwindow: **Method ▶ Time program**

Definitions

- Main programs and subprograms consist of a sequence of **commands**. A distinction is made between **device-dependent commands** and **device-independent commands**.
- The time program permits a mixture of commands that are carried out at a point in time that can be specified (called **command without feedback**) and commands that are executed after the previous command has finished (called **command with feedback**).
- At the start of the main program, the time begins running with the starting time of **0**. The starting point of the time measurement is subsequently also designated the **time basis**. The times specified with the commands are in reference to this time basis. When carrying out a **command with feedback**, the time basis is automatically reset to **0**. The times specified with the subsequent commands are in reference to this time basis.

Device-dependent commands

- Device-dependent commands serve to trigger and control the functions of devices and device modules.
- The device-dependent commands that can be selected depend on the devices assigned to the method.
- Device-dependent commands lock access to the device or device module in the program sequence until the command has been completed.

Device-independent commands

- Device-independent commands serve to control the time program sequence.
- The device-independent commands that can be selected are always the same and do not depend on the devices assigned to the method.

Commands without feedback

- The command lines for commands without feedback are displayed in the time program table in **white**.
- Commands without feedback are commands with a relatively short and **predictable run time** (e.g. switching over the injection valve).
- Commands without feedback are executed at a defined moment.
- The chronological sequence in the time program is not interrupted when commands without feedback are executed; the time basis remains the same.
- Commands without feedback are processed in parallel with the same time indication in the program sequence.

NOTE

With a **command without feedback** that immediately follows a **command with feedback**, it is mandatory that **0** be defined as **time**. Other time indications are invalid and are displayed in the time program table in **red**.

Commands with feedback

- The command lines for commands with feedback are displayed in the time program table in **blue**.
- Commands with feedback are commands with a longer and often **unpredictable run time** (e.g. moving the robotic arm to a certain sample position).
- Commands with feedback are executed after the previous command has finished.
- The chronological sequence in the time program is interrupted by the execution of commands with feedback and the time is reset to **0**. The moment after the completion of the command is then the new time basis for the subsequent commands.
- Consecutive commands with feedback are processed sequentially in the program sequence.

Copying commands

- Commands can be copied to the clipboard and from there inserted anywhere in the time program, even in other methods.
- Copy/paste can be used to adopt complete sections of programs from other time programs.

5.7.4.2 Device-independent commands

Device-independent commands are instructions for controlling the time program sequence. These commands are carried out by the software and are available in every time program. The following commands are available:

5.7.4.2.1 Wait

Dialog window: **Method ► Time program ► [Edit] ► New / Edit ► Wait**

The device-independent **Wait** command serves to specifically interrupt a program sequence and to output messages.

Wait

Radio buttons for selecting how to stop the Wait function.

Selection	**Stop program and waiting for [Continue]** | **Waiting time**
Default value	**Waiting time**

Stop program and waiting for [Continue]
If this option is selected, then the run of the main program or subprogram containing the command is paused. A message window appears in which the run can be continued with [Next].

Waiting time
If this option is selected, then the run of the main program or subprogram containing the command is paused. After the time indicated has elapsed, the program run is continued automatically.

Waiting time

The waiting time can be defined manually or with the aid of the formula editor Σ *(see chapter 2.4, page 30)*.

Input range	**0 to 9,999 min | s**

Message

The text editor for entering or editing the message is opened with T or by double-clicking on the text field.

Record message

on | off (Default value: **off**)

If this option is activated, the message is saved in the determination.

Message by e-mail

on | off (Default value: **off**)

The message is sent to the e-mail address defined under **[E-mail]** if this option is activated. The message is sent in text format.

Acoustic signal

on | off (Default value: **off**)

If this option is activated, an acoustic signal will be emitted in addition to the message defined above.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** *(see chapter 2.7.1, page 111)* window, and the address can be entered.

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.2 Parallel

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Parallel**

The device-independent **Parallel** command serves to call a subprogram running in parallel to the program that is calling.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Subprogram

Name of the subprogram that is to be started.

Selection	**All the subprograms saved in the method**

Condition

on | off (Default value: **off**)

If this option is activated, then the subprogram is only started if the condition defined with the aid of the formula editor Σ *(see chapter 2.4, page 30)* is fulfilled.

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.3 Sequence

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Sequence**

The device-independent **Sequence** command serves to call a subprogram that has to be processed first before the program that is calling continues.

Subprogram

Name of the subprogram that is to be started.

Selection	**All the subprograms saved in the method**

Condition

on | off (Default value: **off**)

If this option is activated, then the subprogram is only started if the condition defined with the aid of the formula editor Σ *(see chapter 2.4, page 30)* is fulfilled.

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.4 Loop

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Loop**

The device-independent **Loop** command serves to call a subprogram several times. The loop is carried out until the number of runs is reached or the call condition is no longer fulfilled.

Subprogram

Name of the subprogram that is to be started more than once.

Selection	**All the subprograms saved in the method**

Number of runs

on | off (Default value: **on**)

If this option is activated, then the loop is canceled when the number of runs defined here is reached. The number can be entered as a fixed value or it can be entered as a variable with the aid of the formula editor *(see chapter 2.4, page 30)* that is opened with Σ.

Input range	**1 to 9,999**
Default value	**1**

Condition

on | off (Default value: **off**)

If this option is activated, then the loop is carried out for as long as the condition defined with the aid of the formula editor Σ *(see chapter 2.4, page 30)* for calling the subprogram is fulfilled.

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.5 Start IC Net

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Start IC Net**

The device-independent **Start IC Net** command serves to trigger the start of an **IC Net 2.3 system** in the time program of **MagIC Net**.

System

System file to be started in IC Net. The … icon opens the **Open file** dialog window to select the system file.

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.6 Wait for IC Net

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Wait for IC Net**

The device-independent **Wait for IC Net** command serves to make the time program of **MagIC Net** wait until an **IC Net 2.3** determination has been completed.

max. waiting time

on | off (Default value: **off**)

If this option is activated, then the time program will always be continued after expiry of the waiting time even if the IC Net 2.3 determination is not yet completed.

Waiting time

Input range	**0 to 9,999 min | s**
Default value	**10 min | s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.7 Start data acquisition

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Start data acquisition**

The device-independent **Start data acquisition** command serves to start data recording for an analysis.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.8 Calculation

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Calculation**

The device-independent **Calculation** command permits the calculation of results while determinations are running. Up to 25 single results can be calculated for each **Calculation** command. The single results are listed in a table and can be edited.

5.7.4.2.8.1 Table of single results

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Calculation**

Results

The **Results** table lists the single results defined for the calculation. It contains the following columns, which are described in detail in *Editing the result*:

Result

Name of the result.

Formula

Formula for the calculation of the result. The result value calculated with the formula is saved in the variable **TP.'#'.'Result name'.VAL**.

Unit

Unit of the result. The unit is saved in the variable **TP.'#'.'Result name'.UNI**.

Decimal places

Number of decimal places for the output of the result in the report and in the display of results in the database.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New	Add a new line to the result table and edit in a separate dialog *(see chapter 5.7.4.2.8.2, page 431)* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *(see chapter 5.7.4.2.8.2, page 431)* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected line to the clipboard.
Insert	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.

Delete	Deletes the selected line.

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.2.8.2 Editing the result

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Calculation ▶ [Edit] ▶ New / Edit ▶ Calculation - 'Result name'**

When selecting the function **[New]** or **[Edit]** for a **Calculation** command (see *Table of single results*), the **'Calculation - Result #'** dialog will open.

Name

Name of the result. The default value is **'Result #'**, where # is the number of the result in the command. A different name can be assigned. This has, however, to be unique within the same **Calculation** command of the same method.

Entry	**40 characters**

Formula

The formula used for the calculation of the result is entered and edited in the formula editor. This is called up by means of the Σ icon *(see chapter 2.4, page 30)*. The calculated result value is saved in the variable **TP.'#'.'Result name'.VAL**.

Unit

Unit of the result for the output (text only). The unit can be selected from the list or entered manually. The unit selected or entered is saved in the variable **TP.'#'.'Result name'.UNI**.

Entry	**60 characters**
Selection	**ppm** | **ppb** | **ppt** | **g/L** | **mg/L** | **µg/L** | **ng/L** | **g/kg** | **mg/kg** | **µg/kg** | **ng/kg**
Default value	**ppm**

Decimal places

Number of decimal places for the output of the calculated result. This parameter is ignored for results of the **Text** or **Date/Time** type.

Input range	**0 to 6**
Default value	**3**

Save result as common variable

If this check box is activated, then the result will be saved under the selected name as a common variable *(see chapter 6.12.1, page 666)*. In all cases, only the single value for this result will be saved as a common variable, even if the statistics are enabled for this result.

Common variable

Name of the common variable for which the result is to be saved as a new value.

Selection	**Selection from defined common variables**

NOTE

As long as no common variable has been defined, the list box will be empty. The creation of common variables is described in the configuration *(see chapter 6.12.2.2, page 668)*.

NOTE

It is not possible to enter data for common variables during a determination and to reuse the modified value in a different formula. Use single results for this *(see chapter 5.7.4.2.8, page 430)*.

Description

Optional description of the result.

Recalculating the value of a common variable

One workplace

The **Calculation** time program command can be used to assign a new value to a common variable defined in the configuration. As soon as the time program command has been executed in the time program run, the common variable is available for the ongoing determination with the new value. After completion of the determination, the new value is saved in the configuration. The common variable with the new value will then be used on all workplaces in subsequent determinations.

Several workplaces

The new common variable can be used on an additional workplace only after the first determination has been completed on workplace 1 and the result of the common variable has been saved in the configuration.

5.7.4.2.9 Request

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Insert new line**

The device-independent **Request** command serves to enter sample data while a determination is running. The data can either be entered manually or scanned with a barcode reader.

5.7.4.2.9.1 Request

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Insert new line**

Sample data request

The sample data variables that are to be entered only during the determination can be selected in the **Request** dialog window. The *Sample data request* dialog window, in which the sample parameters selected in the command are requested, appears in the method run during the processing of this command. The run continues to be stopped until the entry is confirmed.

NOTE

If the **run is not to be stopped**, the **Request** command has to be entered in a subprogram.

Ident

on | off (Default value: **off**)

If this check box is activated, then the Ident will be requested.

Volume

on | off (Default value: **off**)

If this check box is activated, then the volume of the sample will be requested.

Dilution

on | off (Default value: **off**)

If this check box is activated, then the dilution factor of the sample will be requested.

Sample amount

on | off (Default value: **off**)

If this check box is activated, then the sample amount correction factor will be requested.

Info 1

on | off (Default value: **off**)

If this check box is activated, then Info 1 will be requested.

Info 2

on | off (Default value: **off**)

If this check box is activated, then Info 2 will be requested.

Info 3

on | off (Default value: **off**)

If this check box is activated, then Info 3 will be requested.

Info 4

on | off (Default value: **off**)

If this check box is activated, then Info 4 will be requested.

Value 1

on | off (Default value: **off**)

If this check box is activated, then Value 1 will be requested.

Value 2

on | off (Default value: **off**)

If this check box is activated, then Value 2 will be requested.

Value 3

on | off (Default value: **off**)

If this check box is activated, then Value 3 will be requested.

Value 4

on | off (Default value: **off**)

If this check box is activated, then Value 4 will be requested.

Batch name

on | off (Default value: **off**)

If this check box is activated, then the name of the batch where the determination is to be saved will be requested.

Message

The text editor for entering or editing the message is opened with T or by double-clicking on the text field.

on | off (Default value: **off**)

If this check box is activated, then the message defined here appears in the **Sample data request** dialog window, in which the sample data is requested at the moment of the method run *(see chapter 5.7.4.2.9.2, page 435)*. The text editor for entering or changing the message is opened with T or by double-clicking on the text field *(see chapter 2.5.2, page 82)*.

Entry	**Text (unlimited)**

Comment

on | off (Default value: **off**)

Optional comment on the time program command.

Entry	**64 characters**

NOTE

If the option **Comment on modification of sample data (live)** is activated in the **Security settings**, then the dialog window **Modification comment sample data** will appear after data input, where you have to enter a **Reason** and a **Comment** for the modification.

5.7.4.2.9.2 Sample data request

Dialog window: **Workplace ▶ Start ▶ Sample data request**

Message

Shows the message defined in the **Request** command.

Ident

on | off (Default value: **off**)

If this check box is activated, then the Ident will be requested.

Volume

on | off (Default value: **off**)

If this check box is activated, then the volume of the sample will be requested.

Dilution

on | off (Default value: **off**)

If this check box is activated, then the dilution factor of the sample will be requested.

Sample amount

on | off (Default value: **off**)

If this check box is activated, then the sample amount correction factor will be requested.

Info 1

on | off (Default value: **off**)

If this check box is activated, then Info 1 will be requested.

Info 2

on | off (Default value: **off**)

If this check box is activated, then Info 2 will be requested.

Info 3

on | off (Default value: **off**)

If this check box is activated, then Info 3 will be requested.

Info 4

on | off (Default value: **off**)

If this check box is activated, then Info 4 will be requested.

Value 1

on | off (Default value: **off**)

If this check box is activated, then Value 1 will be requested.

Value 2

on | off (Default value: **off**)

If this check box is activated, then Value 2 will be requested.

Value 3

on | off (Default value: **off**)

If this check box is activated, then Value 3 will be requested.

Value 4

on | off (Default value: **off**)

If this check box is activated, then Value 4 will be requested.

Batch name

on | off (Default value: **off**)

If this check box is activated, then the name of the batch where the determination is to be saved will be requested.

NOTE

Sample data can also be loaded directly from a barcode reader. To accomplish this, the data import *(see chapter 3.7.4.9.3, page 167)* must be enabled and the respective device must be defined in the run window in which the determination is started (single determination or determination series). If **Active input field** is selected as the input target *(see chapter 7.28.4, page 1619)*, then the dialog window **Sample data request** must be manually closed after data has been received from this device. If a particular field is selected as input target (e.g. **Ident**), then the **Sample data request** dialog window will be automatically closed as soon as the data has been loaded in the **Ident** field.

5.7.4.2.10 Insert new line

Dialog window: **Method ► Time program ► [Edit] ► New / Edit ► Insert new line**

The device-independent **Insert new line** command serves to insert another line into the sample table during the run of a determination.

Method

Entry or selection of the method from the current method group with which the determination is to be carried out. The method selection is continuously restricted as the first characters are entered; this allows a quick selection of the required method.

Entry	**50 characters**
Selection	**Method selection**

Opens the **Open method** dialog window for the extended method selection. If a method is selected in this window from a method group other than the current one, then this group will henceforth be the current method group for the quick selection of methods in the **Method** field. This button is active only if more than one method group is present.

NOTE

If a method is changed and saved in the method editor or during reprocessing, then the latest method version will be loaded when a new determination is started.

Ident

Entry of an identification or selection of a defined text template to identify the chromatogram *(see chapter 3.6, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Sample type

Selection of the sample type. **Sample** and **Blank** can always be selected, the remaining types can only be selected if they are defined in the method.

Entry	**64 characters**
Selection	**'empty'** | **Sample** | **Standard 1…n** | **Spiking 1…n** | **Check standard 1…n** | **Blank**
Default value	**'empty'**

Position

Position of the sample on the rack. Input as character string. Enter numbers for sample changers with numerically designated positions. Enter a corresponding character string with letter(s) and number(s) for sample changers with alphanumerically designated positions. The value is used to move to the sample position with the corresponding sample changer command.

Entry	**100 characters**

Injections

Number of injections per sample line. The determinations of this kind of multiple injection are linked statistically with one another.

Input range	**1 to 99** (Increment: **1**)
Default value	**'empty'**

Volume

Volume of the sample in µL.

Input range	**0.01 to 1000000.00 µL**
Default value	**'empty' µL**

Dilution

Dilution factor for the sample.

Input range	**0.000001 to 100,000.000000**
Default value	**'empty'**

Sample amount

The parameter **Sample amount** is a correction factor for taking into account various initial weights for different samples. It indicates the ratio of the initial weight of the current sample to the normal initial weight or to the basic unit. The end result thus achieved is divided by this factor.

- *Example 1*
  Basic initial weight = 2.0 g
  Sample initial weight = 2.1 g
  Sample amount = 2.1 / 2.0 = 1.05
  The result is divided by 1.05 and indicates how high the content is in relation to the defined basic initial weight of 2 g.
- *Example 2*
  Basic unit = 1.0 mg
  Initial sample size = 2.1 mg
  Sample amount = 2.1 / 1.0 = 2.1
  The result is divided by 2.1 and indicates how high the content per mg of sample is.

Input range	**0.00001 to 1000000.00000**
Default value	**'empty'**

Info 1 to Info 4

Entry of additional information about the sample. Text templates can be selected here if they have been defined for this parameter *(see chapter 3.6.1, page 153)*.

Entry	**100 characters**
Selection	**Selection of text templates**

Value 1 to Value 4

Input of additional values for the sample.

Input range	**-10^{99} to 10^{99}**
Default value	**'empty'**

Batch name

Selection of the batch to which the determination is to be appended after the run. Entering a name generates a new batch in the database that is specified in the method.

Info

Opens the **Batch info** dialog window *(see chapter 3.7.4, page 157)*.

Select the position for insertion

Options to select where the new line should be inserted into the sample table.

Selection	**Next sample line** | **Next sample line but one** | **Last sample line**

Next sample line
Inserts the new line after the specified sample line.

Next sample line but one
Inserts the new line two lines after the specified sample line.

Last sample line
Inserts the new line as the last line in the table.

Comment

Optional comment on the time program command.

Entry	**64 characters**

5.7.4.3 Device-dependent commands

Subwindow: **Method ▶ Time program**

Device-dependent commands serve to trigger and control the functions of devices and device modules. The following commands are available:

- *948 Continuous IC Module - Commands*
- *947 Professional UV/VIS Detector Vario - Commands*
- *945 Professional Detector Vario - Commands*
- *944 Professional UV/VIS Detector Vario - Commands*
- *943 Professional Thermostat / Reactor Vario - Commands*
- *942 Extension Module Vario ONE/Deg - Commands*
- *942 Extension Module Vario HPG - Commands*
- *942 Extension Module Vario LQH - Commands*
- *942 Extension Module Vario Prep 2 - Commands*
- *942 Extension Module Vario ChS/PP - Commands*
- *942 Extension Module Vario SeS/PP - Commands*
- *941 Eluent Production Module - Commands*
- *940 Professional IC Vario - Commands*
- *930 Compact IC Flex - Commands*
- *919 IC Autosampler plus - Commands*
- *896 Professional Detector - Commands*
- *889 IC Sample Center - Commands*
- *887 Professional UV/VIS Detector - Commands*
- *886 Professional Thermostat / Reactor - Commands*
- *883 Basic IC plus - Commands*

- *882 Compact IC plus - Commands*
- *881 Compact IC pro - Commands*
- *872 Extension Module IC Module - Commands*
- *872 Extension Module IC Pump - Commands*
- *872 Extension Module Liquid Handling - Commands*
- *872 Extension Module Sample Prep - Commands*
- *872 Extension Module Suppression - Commands*
- *872 Extension Module Suppression – MCS - Commands*
- *863 Compact Autosampler - Commands*
- *858 Professional Sample Processor - Commands*
- *850 Professional IC - Commands*
- *814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Commands*
- *771 IC Compact Interface - Commands*
- *800 Dosino - Commands*
- *Combustion Module - Commands*
- *Eco IC - Commands*
- *High-pressure gradient pump - Commands*
- *Remote Box MSB - Commands*
- *Stirrer - Commands*
- *RS-232 device - Commands*

The commands of the **891 Professional Analog Out** *(see chapter 7.8.3.3.11, page 946)* are assigned to the main device to which it is connected.

5.8 Evaluation subwindow

5.8.1 Evaluation - General

Evaluation subwindow

In the **Evaluation** subwindow, you can define how the retention times, concentrations and other parameters of the individual ions are to be calculated from the measured raw data. The procedure can be subdivided into **Integration** and **Calibration**. Every analysis with a detector as data source has its own evaluation.

Evaluation sections

The **Evaluation** subwindow is comprised of five sections that can be selected with the following symbols on the left-hand toolbar:

$\int^{\times}$ The **Integration** section contains the parameters for the integration of the measuring point list and determination of the peak data. It also contains criteria as to which signals of the measuring point list are recognized as peaks *(see chapter 5.8.2.1, page 442)*.

The components to be determined are defined in the **Components** section. The criteria defined here are used for assigning to the recognized and integrated peaks *(see chapter 5.8.3.1, page 449)*.

In the **Standards** section, the standard solutions for calibrating the sample and the check standards and spiking solutions for calculating the recovery are defined *(see chapter 5.8.4.1, page 453)*.

The calibration methods and the calibration parameters for calculating the calibration curves are defined in the **Calibration** section *(see chapter 5.8.5.1, page 463)*.

The output and the export of the results are defined in the **Results** section. Additional results can also be defined by the user and results can be evaluated statistically and can be monitored *(see chapter 5.8.6.1, page 476)*.

The **UV / VIS** section is only available in UV/VIS analyses. Here you can define whether and at which time points UV/VIS spectra should be recorded; for every spectrum, the evaluation of absorbance maximums can be defined *(see chapter 5.8.8, page 524)*.

5.8.2 Evaluation - Integration

5.8.2.1 Integration - General

Subwindow section: **Method ► Evaluation ► Integration**

Application

The **Integration** section contains the parameters for the integration of the measuring point list and determination of the peak data. It also contains criteria as to which signals of the measuring point list are recognized as peaks.

Selection of the analysis

Analysis

Selecting the analysis. Only analyses with data sources that can be evaluated can be selected. Details can be found with the individual devices *(see chapter 7, page 691)*.

Selection	**Analyses of the method**

Tabs

- *Settings*
- *Peak detection*
- *Events*

5.8.2.2 Integration - Settings

Tab: **Method ▶ Evaluation ▶ Integration ▶ Settings**

Smoothing

Smoothing value. The greater the value, the more the data are smoothed before integration.

Input range	**1 to 100**
Default value	**30**

Sensitivity

Sensitivity value. The higher the value, the better smaller peaks are detected.

Input range	**1 to 100**
Default value	**50**

[Basic setting]

Resets **Smoothing** and **Sensitivity** to the default values.

5.8.2.3 Integration - Peak detection

Tab: **Method ▶ Evaluation ▶ Integration ▶ Peak detection**

Minimum height

Minimum height which is still detected as a peak.

Input range	**0.0000 to 10,000.0000 µS/cm**
Default value	**0.01 µS/cm**

Minimum area

Minimum area which is still detected as a peak.

Input range	**0.00000 to 100,000.00000 (µS/cm) x min**
Default value	**0.001 (µS/cm) x min**

Integration start

Time from the start of a determination to the start of integration.

Input range	**0.00 to 1,000.00 min**
Default value	**1.00 min**

Polarity

Polarity for representing the measuring signal. The measured conductivity is always positive. Peaks from cation chromatograms point downward and those of anion chromatograms upward. The polarity makes it possible to display the cation chromatograms with the peaks pointing upward.

Selection	**+ | −**

[Filter]

Opens the **Filter** dialog to define the filtering of the measuring point list of an analysis *(see chapter 5.8.2.5, page 446)*.

Negative peaks

on | off (Default value: **off**)

If this option is enabled, negative peaks are evaluated. Otherwise they are ignored.

Subtract blank

on | off (Default value: **off**)

If this option is enabled, all the determinations of the same method measured in a run after a blank are corrected with this blank. The measuring point list of the blank is subtracted from the measuring point list of the determination (regardless of whether it is a sample, standard, check standard or spiking solution). This subtraction is a continuous process whenever a chromatogram is recorded.

NOTE

- The chromatogram of the blank is saved with the corrected curve so that the correction can be undone during reprocessing.
- Only curves of analyses with an evaluation are corrected (i.e. not pump pressure, etc.).
- A determination of sample type **Blank** is not evaluated. The determination includes only the chromatogram and the sample data, but no results.

Drift compensation

on | off (Default value: **off**)

If this option is enabled, the drift is compensated, i.e. a drift curve is calculated for the baseline, which is subtracted from the measuring point list. It is this measuring point list that is integrated and evaluated.

NOTE

In the **Live display** subwindow, the drift is not displayed and the chromatogram is displayed without correction. If you click on **[Evaluate]**, the drift compensation is included in the evaluation and the corrected chromatogram is displayed with the determined peaks. The chromatogram is always displayed in its corrected version in the **database**.

Ignore overflow

on | off (Default value: **off**)

If this option is enabled, peaks that are higher than the overflow value are evaluated. Otherwise there is no evaluation.

5.8.2.4 Integration - Events

Tab: **Method ▶ Evaluation ▶ Integration ▶ Events**

Definition

Integration events are time-controlled integration parameters. The time indication refers to the time axis of the chromatogram.

Table

The event table contains an overview of the programmed integration events. It is always displayed sorted according to times and cannot be edited directly. When selecting an integration event, the graphics window is switched to the chromatogram view and the corresponding analysis. A vertical mouse pointer appears in the displayed chromatogram of the graphics window. One or two lines of the mouse pointer appear, depending on whether the integration event has a start and end or only a start time. The cursor can be moved but the end time cannot be moved ahead of the start time.

Edit menu

New	Inserts a new empty line above the selected line in the event table and opens the **Integration event** dialog window.
Edit	Edit the selected line.
Copy	Copies the highlighted lines to the clipboard.
Insert	Inserts lines from the clipboard above the selected line in the event table.
Cut	Copies the highlighted lines to the clipboard and deletes them.
Delete	Deletes the highlighted lines.

Activate events

on | off (Default value: **on**)

If this option is enabled, the integration events are applied.

[Update event time]

The cursor position(s) for a selected event of the event table are adopted. One or two lines of the cursor appear, depending on whether the selected peak event has a start and end or only a start time. The cursor can be

moved. The end time cannot, however, be shifted ahead of the start time. The cursor lines for the start and end time are differentiated with different colors.

5.8.2.5 Editing filter

Dialog window: **Method ► Evaluation ► Integration ► Peak detection ► [Filter] ► Filter**

The measuring point list (chromatogram) is displayed with these settings and passed on to the evaluation algorithm in the same state.

The chromatogram is displayed with filtering.

Savitzky-Golay

on | off (Default value: **off**)

If this option is enabled, the noise of the signal is filtered with a Savitzky-Golay filter.

Filter length

Range of measuring points in which filtering is to be carried out. The input refers to half the filter length. Since the filter must have an odd number of points over which filtering takes place, the overall filter length is **2 x input +1**.

Input range	**1 to 30**
Default value	**1**

5.8.2.6 Editing integration event

Dialog window: **Method ► Evaluation ► Integration ► Events ► [Edit] ► New/Edit ► Events**

Start

Start time for the integration event.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

End

End time for the integration event.

Input range	**0.00 to 1,000.00 min**
Default value	**1.00 min**

NOTE

Absolute times must always be entered for **Start** and **End**. The time of the **Start data acquisition** command of the analysis in the time program is the time basis.

Event

Integration event to be executed.

Selection	**Deactivate peak detection** | **Peak start** | **Peak end** | **Valley-Valley** | **Common baseline** | **Rider peak** | **Horizontal baseline** | **Horizontal baseline back** | **Smoothing** | **Minimum height** | **Minimum area**

Deactivate peak detection
The peak detection is deactivated in this interval.

Peak start
The start point of the peak is set to this value. The **Peak start** event is ignored if the set value is before the end of the previous peak or after the first turning point of the peak in question.

Peak end
The endpoint of the peak is set to this value. The event **Peak end** is ignored if the set value is after the start of the following peak or before the second inflection point of the peak in question.

Valley-Valley
Peaks that are not separated by the baseline are each given their own baseline.

Common baseline
Peaks that are not separated by the baseline are given a common baseline.

Rider peak
Peaks that are not separated by the baseline are interpreted such that the smaller peaks are evaluated as riders on the highest peak.

Horizontal baseline
The baseline is drawn horizontally from left to right from the start point of the peak. The intersection point with the curve or the end of the event is the endpoint.

Horizontal baseline back
The baseline is drawn horizontally from left to right from the endpoint of the peak. The intersection point with the curve or the start value of the event is the start point.

Smoothing
New value for the smoothing.

Minimum height
New value for the minimum height.

Minimum area
New value for minimum area.

Parameter

Extra parameter for **Event** = **Smoothing**.

Smoothing value. The greater the value, the more the data are smoothed before integration.

Input range	**1 to 100**
Default value	**30**

Parameter

Extra parameter for **Event** = **Minimum height**.

Minimum height which is still detected as a peak.

Input range	**0.0000 to 10,000.0000 µS/cm**
Default value	**0.01 µS/cm**

Parameter

Extra parameter for **Event** = **Minimum area**.

Minimum area which is still detected as a peak.

Input range	**0.00000 to 100,000.00000 (µS/cm) x min**
Default value	**0.001 (µS/cm) x min**

Navigation bar

Navigation bar for changing the displayed integration events with the following functions:

|<

Jump to the first integration event. Altered data is adopted.

<

Jump to previous integration event. Altered data is adopted.

>

Jump to the next integration event. Altered data is adopted.

>|

Jump to the last integration event. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.3 Evaluation - Components

5.8.3.1 Components - General

Subwindow section: **Method ▶ Evaluation ▶ Components**

Application

The components to be determined are defined in the **Components** section. The criteria defined here are used for assigning the components to the detected and integrated peaks.

Selection of the analysis

Analysis

Selecting the analysis. Only analyses with data sources that can be evaluated can be selected. Details can be found with the individual devices *(see chapter 7, page 691)*.

Selection	**Analyses of the method**

Tabs

- *Component table*
- *Identification*

5.8.3.2 Components - Component table

Tab: **Method ▶ Evaluation ▶ Components ▶ Component table**

Table

The component table contains the components of an analysis and the criteria for how to assign this to the peaks of a chromatogram. The table cannot be edited and contains the following columns:

Name

Name of the component.

Time [min]

Expected retention time of the component.

Window [%]

Identification window of the peak.

Reference

Reference peak with which the expected retention time is defined.

Edit menu

New	Inserts a new empty line above the selected line in the component table and opens the **Component** dialog *(see chapter 5.8.3.4, page 452)*.
Edit	Edits the selected line *(see chapter 5.8.3.4, page 452)*.
Copy	Copies the highlighted lines to the clipboard.
Insert	Insert all lines from the clipboard above the selected line.
Cut	Copies the highlighted lines to the clipboard and deletes them.
Delete	Deletes the highlighted lines.

Functions and parameters

[Update retention time]

Adopts the time of the cursor position in the graph frame as the retention time for a selected component. Any existing retention time is overwritten.

Void time

Time required by a component of the sample not retained by the column to reach the detector. The void time is required to calculate the net retention time of a component and its retention factor.

Selection	**Manual** | **1. Peak**

Manual
With this setting, the void time can be entered manually in the adjacent field.

1. Peak
With this setting, the retention time found for the first detected peak (regardless of whether it is detected as a peak or not) is used as void time.

Time indication

Time indication given for the void time if the option **Manual** was selected.

Input range	**0.01 to 1,000.00 min**

5.8.3.3 Components - Identification

Tab: **Method ▶ Evaluation ▶ Components ▶ Identification**

Reference components

Criterion for assigning of a peak to a reference component if multiple peaks are within the time slot of the reference component.

Selection	**Height** | **Area** | **Time**
Default value	**Height**

Height
The peak with the greatest height is assigned to the reference component.

Area
The peak with the greatest area is assigned to the reference component.

Time
The peak with the closest retention time is assigned to the reference component.

Other components

Criterion for assigning a peak to a component if there is more than one peak in the time slot of the component.

Selection	**Height** | **Area** | **Time**
Default value	**Time**

Height
The peak with the greatest height is assigned to the component.

Area
The peak with the greatest area is assigned to the component.

Time
The peak with the closest retention time is assigned to the component.

Track retention times

Settings for tracking the retention time.

Selection	**off** | **Standard** | **everytime**
Default value	**off**

off
The latest retention times are not tracked. Instead, they are always taken from the component table.

Standard
The latest retention times are tracked by using the retention times of the last standard in the calibration data set and displaying them in the calibration curve.

everytime
The latest retention times are tracked by using the retention times of the last determination in the calibration data set and displaying them in the calibration curve.

5.8.3.4 Editing a component

Dialog window: **Method ► Evaluation ► Components ► Component table ► [Edit] ► New/ Edit ► Component**

Name

Name of the component. The name must be unique within the component table of an analysis.

Entry	**64 characters**

Retention time

Expected retention time of the component with which the component is identified. The retention time is the time span from the injection of the component until the detector is reached. This time is specific for one component, whereby the properties of the separation column and the eluents also have an effect.

Input range	**0.000 to Recording time min**

Window

Identification window for assigning a peak to the component. The window size is given as a percentage of the expected retention time.

Input range	**1 to 50 %**
Default value	**5 %**

Reference component

Reference components with which the retention time is corrected. The expected retention time of a component is corrected with the factor $t_{reference}(found)/t_{reference}(expected)$. A reference component may not have any reference components itself.

Selection	**none** | **Components of the analysis**
Default value	**none**

Navigation bar

Navigation bar for changing the displayed component with the following functions:

|<

Jump to the first component. Altered data is adopted.

<

Jump to the previous component. Altered data is adopted.

>

Jump to the next component. Altered data is adopted.

>|

Jump to the last component. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.4 Evaluation - Standards

5.8.4.1 Standards - General

Subwindow section: **Method ▶ Evaluation ▶ Standards**

Application

In the **Standards** section, the standard solutions for calibrating the sample and the check standards and spiking solutions for calculating the recovery are defined. The solutions defined here are defined globally for the entire method. They are not specific to a particular analysis.

Selecting the unit of concentration

Concentration unit

Unit of concentration used for calculations in the method. It applies for **Standards**, **Check standards**, **Spiking solutions** and the **Internal standard**. The result concentrations are also output in this unit.

Entry	**60 characters**
Selection	**ppm** | **ppb** | **ppt** | **g/L** | **mg/mL** | **µg/L** | **ng/L** | **g/kg** | **mg/kg** | **µg/kg** | **ng/kg**
Default value	**ppm**

Generated variables (standard)

If determinations of a method are run with the sample type **Standard**, then these generate the following analysis-specific variables of the type **RS.'Analysis name'.Standard'x'.'Component name'.'Variable name'**:

Variable name	Description	Data type
AREA	Peak area of a standard's component.	Number
HGT	Peak height of a standard's component.	Number
CONCCALC	Concentration of a standard component calculated with the calibration used.	Number
CONCDEV%	Percentage deviation of the calculated concentration from the nominal concentration of a standard component.	Number

Generated variables (standard / check standard / spiking solution)

If determinations of a method are running with the sample type **Standard**, **Check standard** or **Spiking solution**, then these generate the variables of the type **ED.'Standard'x'.'Component name'.'CONC'**, **ED.'Check standard'x'.'Component name'.'CONC'** or **ED.Spiking solution'x'.'Component name'.CONC'**:

Variable name	Description	Data type
CONC	Concentration of a component of a standard, check standard or spiking solution.	Number

Use

The variables **AREA**, **CONC**, **HGT**, **CONCCALC** and **CONCDEV%** can be used for calculations in automated sequences.

Example:

A component's peak area value in a sample lies outside the calibration curve's range. The required dilution factor can, for example, be calculated using the peak area of the standard.

Tabs

- *Standards*
- *Check standards*
- *Spiking solutions*

5.8.4.2 Standards - Standards

Tab: **Method ▶ Evaluation ▶ Standards ▶ Standards**

Table

The table of standard solutions contains the standards defined for the method with the corresponding concentrations for the components. If a component is defined in more than one analysis, it is only listed once.

The table cannot be edited and contains the following columns:

Name

Name of the component.

Standard

Concentrations of the components for the corresponding standard.

Edit menu

New	Opens the **New Standard** dialog window to create a new standard *(see chapter 5.8.4.5, page 457)*.
Edit	Edits selected standard *(see chapter 5.8.4.6, page 458)*.
Copy	Copies selected standard to the clipboard.
Insert	Inserts new standard from the clipboard. Opens the **New Standard** dialog window to create a new standard. The dialog window will be completed automatically and needs to be closed with **[OK]**.
Cut	Cuts selected standard and copy it to the clipboard.
Delete	Deletes the selected standard.

5.8.4.3 Standards - Check standards

Tab: **Method ▶ Evaluation ▶ Standards ▶ Check standards**

Table

The table of check standards contains the check standards defined for the methods with the corresponding concentrations for the components. If a component is defined in more than one analysis, it is only listed once.

The table cannot be edited and contains the following columns:

Name

Name of the component.

Check standard

Concentrations of the components for the corresponding check standard.

Edit menu

New	Opens the **New check standard** dialog window to create a new check standard *(see chapter 5.8.4.7, page 459)*.
Edit	Edits selected check standard *(see chapter 5.8.4.8, page 460)*.
Copy	Copies selected check standard to the clipboard.

Insert	Inserts new check standard from the clipboard. Opens the **New check standard** dialog window to create a new check standard. The dialog window will be completed automatically and needs to be closed with **[OK]**.
Cut	Cuts selected check standard and copies it to the clipboard.
Delete	Deletes the selected check standard.

5.8.4.4 Standards - Spiking solutions

Tab: **Method ▶ Evaluation ▶ Standards ▶ Spiking solutions**

Table

The table of spiking solutions contains the spiking solutions defined for the methods with the corresponding concentrations for the components. If a component is defined in more than one analysis, it is only listed once.

The table cannot be edited and contains the following columns:

Name

Name of the component.

Spiking solution #

Concentrations of the components for the corresponding spiking solution

Edit menu

New	Opens the **New spiking solution** dialog window to create a new spiking solution *(see chapter 5.8.4.9, page 461)*.
Edit	Edits selected spiking solution *(see chapter 5.8.4.10, page 462)*.
Copy	Copies selected spiking solution to the clipboard.
Insert	Inserts a new spiking solution from the clipboard. Opens the **New spiking solution** dialog window to create a new spiking solution. The dialog window will be completed automatically and needs to be closed with **[OK]**.
Cut	Cuts selected spiking solution and copy it to the clipboard.
Delete	Deletes the selected spiking solution.

Spiking

This is the section where the volumes are specified for the sample and spiking solutions which define the mixing ratio in the spiking.

Sample

Percentage of volume of the sample in the spiking.

Input range	**0.000 to 100.000 mL**
Default value	**1.000 mL**

Spiking solution

Percentage of volume of the spiking solution in the spiking.

Input range	**0.000 to 100.000 mL**
Default value	**9.000 mL**

5.8.4.5 Creating a new standard

Dialog window: **Method ► Evaluation ► Standards ► Standards ► [Edit] ► New ► New Standard**

A new standard is defined in the **New Standard** dialog window and is inserted in the standard table according to its name.

Standard

Number of the standard.

Input range	**1 to 1,000**
Default value	**Smallest number not assigned**

'Component'

Concentration of the components in the selected standard.

Input range	**0.0 to 1,000,000.0 'Concentration unit'** (Increment: **0.000001**)
Default value	**0.0 'Concentration unit'**

[Filling]

Apply concentration for the selected components for all components.

Navigation bar

Navigation bar for changing the newly created standards with the following functions:

|<

Jump to the first standard solution. Altered data is adopted.

<

Jump to the previous standard solution. Altered data is adopted.

>

Jump to the next standard solution. Altered data is adopted.

>|

Jump to the last standard solution. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.4.6 Edit Standard

Dialog window: **Method ► Evaluation ► Standards ► Standards ► [Edit] ► Edit ► Edit Standard**

The standard selected in the table can be edited in the **Edit Standard** dialog window.

Standard

Number of the standard. The number can be changed later.

Input range	**1 to 1,000**
Default value	**Smallest number not assigned**

'Component'

Concentration of the components in the selected standard.

Input range	**0.0 to 1,000,000.0 'Concentration unit'** (Increment: **0.000001**)
Default value	**0.0 'Concentration unit'**

[Filling]

Apply concentration for the selected components for all components.

Navigation bar

Navigation bar for changing the displayed standard with the following functions:

|<

Jump to the first standard solution. Altered data is adopted.

<

Jump to the previous standard solution. Altered data is adopted.

>

Jump to the next standard solution. Altered data is adopted.

>|

Jump to the last standard solution. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.4.7 Creating a new check standard

Dialog window: **Method ► Evaluation ► Standards ► Check standards ► [Edit] ► New ► New check standard**

A new check standard is defined in the **New check standard** dialog window and is inserted in the check standard table in accordance with its name.

Check standard

Number of the check standard

Input range	**1 to 1,000**
Default value	**Smallest number not assigned**

'Component'

Concentration of the components in the selected check standard.

Input range	**0.0 to 1,000,000.0 'Concentration unit'** (Increment: **0.000001**)
Default value	**0.0 'Concentration unit'**

[Filling]

Apply concentration for the selected components for all components.

Navigation bar

Navigation bar for changing the newly created check standards with the following functions:

|<

Jump to the first check standard. Altered data is adopted.

<

Jump to the previous check standard. Altered data is adopted.

Jump to the next check standard. Altered data is adopted.

Jump to the last check standard. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.4.8 Edit check standard

Dialog window: **Method ► Evaluation ► Standards ► Check standards ► [Edit] ► Edit ► Edit check standard**

The check standard selected in the table can be edited in the **Edit check standard** dialog window.

Check standard

Number of the check standard

Input range	**1 to 1,000**
Default value	**Smallest number not assigned**

'Component'

Concentration of the components in the selected check standard

Input range	**0.0 to 1,000,000.0 'Concentration unit'** (Increment: **0.000001**)
Default value	**0.0 'Concentration unit'**

[Filling]

Apply concentration for the selected components for all components.

Navigation bar

Navigation bar for changing the displayed check standards with the following functions:

Jump to the first check standard. Altered data is adopted.

Jump to the previous check standard. Altered data is adopted.

Jump to the next check standard. Altered data is adopted.

Jump to the last check standard. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.4.9 Creating a new spiking solution

Dialog window: **Method ► Evaluation ► Standards ► Spiking solutions ► [Edit] ► New ► New spiking solution**

A new spiking solution is defined in the **New spiking solution** dialog window and is inserted in the table in accordance with its name.

Spiking solution

Number of the spiking solution.

Input range	**1 to 1,000**
Default value	**Smallest number not assigned**

'Component'

Concentration of the components in the selected spiking solution.

Input range	**0.0 to 1,000,000.0 'Concentration unit'** (Increment: **0.000001**)
Default value	**0.0 'Concentration unit'**

[Filling]

Apply concentration for the selected components for all components.

Navigation bar

Navigation bar for changing the newly created spiking solutions with the following functions:

Jump to the first spiking solution. Altered data is adopted.

Jump to the previous spiking solution. Altered data is adopted.

>

Jump to the next spiking solution. Altered data is adopted.

>|

Jump to the last spiking solution. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.4.10 Edit spiking solution

Dialog window: **Method ► Evaluation ► Standards ► Spiking solutions ► [Edit] ► Edit ► Edit spiking solution**

The spiking solution selected in the table can be edited in the **Edit spiking solution** dialog window.

Spiking solution

Number of the spiking solution.

Input range	**1 to 1,000**
Default value	**Smallest number not assigned**

'Component'

Concentration of the components in the selected spiking solution.

Input range	**0.0 to 1,000,000.0 'Concentration unit'** (Increment: **0.000001**)
Default value	**0.0 'Concentration unit'**

[Filling]

Apply concentration for the selected components for all components.

Navigation bar

Line |< < 1 > >| >* of 5

Navigation bar for changing the displayed spiking solutions with the following functions:

|<

Jump to the first spiking solution. Altered data is adopted.

<

Jump to the previous spiking solution. Altered data is adopted.

>

Jump to the next spiking solution. Altered data is adopted.

>|

Jump to the last spiking solution. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.5 Evaluation - Calibration

5.8.5.1 Calibration - General

Subwindow section: **Method ▶ Evaluation ▶ Calibration**

Application

In the **Calibration** area, the calibration method and the calibration parameters for calculating the calibration curves are defined for the components.

Tabs

- *Calibration curves*
- *Properties Calibration*
- *Monitoring*

Additional information

- *Select calibration data set*

5.8.5.2 Calibration - Calibration curves

Tab: **Method ▶ Evaluation ▶ Calibration ▶ Calibration curves**

Selection of the analysis

Analysis

Selecting the analysis. Only analyses with data sources that can be evaluated can be selected. Details can be found with the individual devices *(see chapter 7, page 691)*.

Selection	**Analyses of the method**

Table

The type of calibration curve is defined in the table of calibration curves for each component. The table cannot be edited and contains the following columns:

Component

Name of the component. Components can neither be added nor deleted here; this must be done in the component table*(see chapter 5.8.3.2, page 449)*.

Response

Measured quantity for the evaluation of the calibration curve.

Curve type

Curve type for the evaluation of the calibration curve.

Weighting

Information as to how the points of the calibration curve are to be weighted.

Edit menu

Edit	Opens the **Calibration curve 'component name'** dialog window to edit the data of the highlighted line.
Copy	Copies all selected lines to the clipboard.
Insert	Inserts lines from the clipboard into the lines above the selected line. The copied lines cannot be inserted into the same method.
Apply settings for all components	Settings of the selected line will be set for all components.

5.8.5.3 Calibration - Properties Calibration

Tab: **Method ► Evaluation ► Calibration ► Properties calibration**

Calibration method

Selection of the method with which calibration is to take place.

Selection	**External standard** | **Internal standard**
Default value	**External standard**

External standard
When calibrating with an external standard, calibration curves are recorded for all components to be determined. The concentrations of the components in the sample are calculated with the aid of these calibration curves *(see chapter 5.8.7.3.1, page 504)*.

Internal standard
When calibrating with an internal standard, an internal standard is injected along with each sample and each standard. The signal ratios and volume ratios of component and internal standard are taken into account for calculating the calibration curves and the concentrations of the components in the sample *(see chapter 5.8.7.3.2, page 507)*.

[Internal standard…]

Opens the **Internal standard** dialog window in which each analysis can be assigned an internal standard and its concentration *(see chapter 5.8.5.6, page 472)*.

Calibration mode

The calibration mode determines which standard measurements are used for determining the calibration curve.

NOTE

The exact behavior of the calibration modes is described under *5.8.5.7 Calibration mode*.

Selection	**Replace** | **Average** | **Moving average** | **Bracketing** | **Total**
Default value	**Replace**

Replace
In this calibration mode, only the last determination is included in the calibration of the sample for each standard.

Average
In this calibration mode, the average of the selected number of determinations is included in the calibration of the sample for each standard. All standards are weighted equally.

Moving average
In this calibration mode, the average of the selected number of standard determinations is included in the calibration of the sample for each standard. The standards are weighted differently. If this mode is selected, only one weighting **1** is allowed.

Bracketing
In this calibration mode, all standards around a sample are used for calibrating it. The calibration curves can only be calculated after the second sequence of standards. This mode is only possible within a sample table. Methods with this calibration mode cannot be executed in a single determination.

Total
In this calibration mode, every sample of a sample table is calibrated with all the standards in this table. This mode is only possible within a sample table. Methods with this calibration mode cannot be executed in a single determination.

Average / Moving average

Number of determinations for calculating the average or moving average.

Input range	**1 to 10**
Default value	**3**

Function type

The function type determines the independent variable when fitting the calibration curve. This also defines how the calibration curve is displayed.

Selection	**Response = f(concentration)** | **Concentration = f(response)**
Default value	**Response = f(concentration)**

Add point in origin to calibration curve

on | off (Default value: **off**)

If this option is enabled, a point with the coordinates 0;0 is added to the calibration data set. This point is taken into account in the calculation of the calibration curve. It is not listed in the table of calibration points and not depicted in the graph of the calibration points. It can therefore also not be removed manually from the calibration. To do so, this option, and thus also the method as well, must be changed.

Blank value correction for inline calibration

on | off (Default value: **off**)

If this option is activated, the blank value calculated from the calibration curve is automatically subtracted from the result.

Calculation of calibration curve off

Selection as to how the single calibration points of the same standard contribute to the calculation of the calibration curve.

NOTE

This setting is only visible for the calibration modes **Bracketing** and **Total**. For the other calibration modes always one calibration point per standard is created.

Selection	**Single calibration points** | **Mean values for every standard**
Default value	**Single calibration points**

Single calibration points
Each measurement with the same standard contributes equally to the calibration curve; the curve will be adjusted to all calibration points. If standard 3 is measured 5 times, for example, then 5 calibration points of standard 3 will contribute to the calibration curve.

Mean values for every standard
For all standards, the mean value is derived from the calibration points of the same standard. Then the calibration curve is adjusted to the mean values of the standards. If standard 3 is measured 5-times, for example, then the mean value of the 5 measurements of standard 3 will contribute to the calibration curve.

5.8.5.4 Calibration - Monitoring

Tab: **Method ▶ Evaluation ▶ Calibration ▶ Monitoring**

Validity of calibration

Selection	**Unlimited** | **Same day** | **x days**
Default value	**Unlimited**

Unlimited
The calibration data set is valid indefinitely, i.e., an unknown sample will be calibrated with this calibration data set no matter how old it is.

Same day
All standards that are included in the calculation of the calibration data set need to have been determined on the same day.

x days
All standards that are included in the calculation of the calibration data set need to have been determined within the specified number of days (**1– 999**) to have been determined.

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on. Regardless of which action is selected, the particular message is also displayed in the message window of the **Watch Window**.

If it has been discovered while monitoring that the time interval for the validity of the calibration has expired, then one of the following actions will be triggered automatically with the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the time interval for the validity of the calibration has expired will be saved automatically with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued then the message that the calibration is no longer valid will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

5.8.5.5 Editing calibration curves

Dialog window: **Method ► Evaluation ► Calibration ► Calibration curves ► [Edit] ► Edit ► Calibration curve 'Component'**

The calibration curve parameters for the components selected in the table can be edited in the **Calibration curve 'Component'** dialog window.

Response

Measured quantity for the evaluation of the calibration curve.

Selection	**Area** | **Height**
Default value	**Area**

Curve type

Curve type for the evaluation of the calibration curve. Determines the type according to which the calibration curve is to be fitted. A minimum number **p** of different calibration points must exist for the different curve types

(the number of calibration points corresponds to the number of different standards) for the fit of the calibration curve to make sense. The minimum number **p** corresponds to the number of terms in the calibration equation.

Selection	**Linear through 0** | **Linear** | **Quadratic through 0** | **Quadratic** | **Cubic through 0** | **Cubic** | **Point to Point**
Default value	**Linear**

Linear through 0
Linear calibration curve that crosses the zero point.

Linear
Linear calibration curve.

Quadratic through 0
Quadratic calibration curve that crosses the zero point.

Quadratic
Quadratic calibration curve.

Cubic through 0
Cubic calibration curve that crosses the zero point.

Cubic
Cubic calibration curve.

Point to Point
The individual calibration points are linked together in a linear form.

NOTE

If the minimum number of calibration points for the selected curve type in the calibration data set is not reached, a different curve type will be selected to fit the curve during the calculation of the calibration curve .

Selected curve type	p	Curve type used
Linear through 0	≥1	Linear through 0
Linear	≥2	Linear
	1	Linear through 0
Quadratic through 0	≥2	Quadratic through 0
	1	Linear through 0
Quadratic	≥3	Quadratic
	2	Linear
	1	Linear through 0
Cubic through 0	≥3	Cubic through 0

Selected curve type	p	Curve type used
	2	Linear
	1	Linear through 0
Cubic	≥4	Cubic
	3	Quadratic
	2	Linear
	1	Linear through 0
Point to Point	≥3	Point to Point
	2	Linear
	1	Linear through 0

Weighting

Information as to how the points of the calibration curve are to be weighted.

Selection	**1** | **1/Concentration** | **1/Concentration²** | **1/Area** | **1/Area²** | **1/Height** | **1/Height²**
Default value	**1**

1/Area
Available for selection only if the **Area** was selected as **Response** *(see page 468)*.

1/Area²
Available for selection only if the **Area** was selected as **Response** *(see page 468)*.

1/Height
Only available for selection if the **Height** was selected as **Response***(see page 468)*.

1/Height²
Only available for selection if the **Height** was selected as **Response***(see page 468)*.

NOTE

If **Moving average** is selected on the **Properties calibration** tab for the **Calibration mode**, then only weighting **1** is permitted.

Why are calibration points weighted?

The calibration points are composed of the combination of concentration and peak area or peak height of the measured standards. There is one calibration point per standard.

The calibration curve is determined from the calibration points using the least squares method. The least squares method looks for the calibration curve where the sum of squared residuals (absolute error) is minimal.

With weighting 1, the relative error of the calibration curve is thus much larger for calibration points with low concentration than for calibration points with high concentration *(see table 1, page 471)*.

Table 1 E.g.: Error with weighting 1

Concentration	Absolute error	Relative error
5 ppm	1 ppm	20%
1200 ppm	1 ppm	0.083%

To compensate for this effect, the calibration points are weighted before the calibration curve is determined.

Navigation bar

Navigation bar for changing the displayed calibration curves with the following functions:

Jump to the first calibration curve. Altered data is adopted.

Jump to the previous calibration curve. Altered data is adopted.

Jump to the next calibration curve. Altered data is adopted.

Jump to the last calibration curve. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.5.6 Editing internal standard

Dialog window: **Method ► Evaluation ► Calibration ► Properties calibration ► [Internal standard] ► Internal standard**

The **Internal standard** dialog contains a line for each analysis, in which the internal standard and its concentration can be entered. No calibration points are generated if the peak of the internal standard is not found in a determination.

'Analysis'

Selecting the components to be defined as internal standard for the selected analysis.

Selection	**not defined** | **Components from the component table of the analysis**
Default value	**not defined**

Concentration

Input range	**0.000 to 1,000,000.000 'Concentration unit'**
Default value	**not defined 'Concentration unit'**
Selection	**Value 1 - 4**

Value 1 - 4
Value 1 - 4 can be selected from the **sample data** of the determination as concentration value of the internal standard.

5.8.5.7 Calibration mode

The calibration mode determines which standard measurements are used for calculating the calibration curve. It is specified in the evaluation dialog **Calibration** on the tab **Properties calibration**.

In the calibration modes **Replace**, **Average** and **Moving average** only standards that were measured **before the sample** are included in the calibration of the sample. A sample determined with these calibration modes can therefore immediately be calibrated, evaluated and fully completed.

In contrast to this, with **Bracketing** and **Total**, standards that were measured **after the sample** are also included in the calibration of the sample. In these calibration modes, a sample is first provisionally evaluated with the available standards and saved as an incomplete determination. When all the relevant standards have been measured, the sample is automatically evaluated with the full calibration and completed. These calibration modes are therefore only possible in a sample table.

5.8.5.7.1 Calibration mode - Replace

If **Replace** is selected, only the **last determination** of each **standard m** is included in the calibration of the sample.

- In the case of the multiple determination of a standard, only the result of the last determination is included in the calibration, since the calibration points are always replaced immediately.
- Only standards measured **before the sample** are used for calibration. A sample can immediately be evaluated and fully completed.

5.8.5.7.2 Calibration mode - Average

With **Average**, the average from the **last n determinations** from **Standard m** is included in the calibration of the sample. All the determinations of standard m are **weighted equally**.

- In this mode, a full calibration is always generated. It merely indicates the maximum no. of determinations of a **Standard m** that are included in the calibration.
- Only standards measured **before the sample** are used for calibration. A sample can immediately be evaluated and fully completed.

5.8.5.7.3 Calibration mode - Moving average

With **Moving average**, the average from the **last n determinations** from **Standard m** is included in the calibration of the sample. All the determinations of a standard m are **weighted differently**. A standard always carries double the weight of the next older and half the weight of the next younger standard.

- In this mode, a full calibration is always generated. It merely indicates the maximum no. of determinations of a **Standard m** that are included in the calibration.
- Only standards measured **before the sample** are used for calibration. A sample can immediately be evaluated and fully completed.

5.8.5.7.4 Calibration mode - Bracketing

In the case of **Bracketing**, **all standards surrounding a sample** in the sample table are included in the calibration of the sample.

NOTE

This mode is only possible within a sample table. Methods with this calibration mode cannot be executed in a single determination.

- If a **Standard m** is subjected to multiple determinations, all the measurement points are included in the calculation of the calibration curve without averaging. It makes no difference whether the multiple determination results from a multiple injection of a sample or from several samples from the sample table.
- A sequence of samples is always surrounded by two sequences of standards before and after that must be taken into account. Final calculation of the calibration curves is therefore not possible until after the second sequence of standards.
- Samples with the standards measured so far (Standard sequence before the sample) are determined in a sample table, marked as incomplete and stored in the database. After the last standard of the standard sequence following the samples has been determined, the incomplete determination is reprocessed automatically. The valid calibration data set is calculated and final determination of the sample is made. It is not until now that the data sets of the sample can be marked as complete.

5.8.5.7.5 Calibration mode - Total

With **Total**, every sample of a sample table is completely calibrated with **all the standards** in this **sample table**.

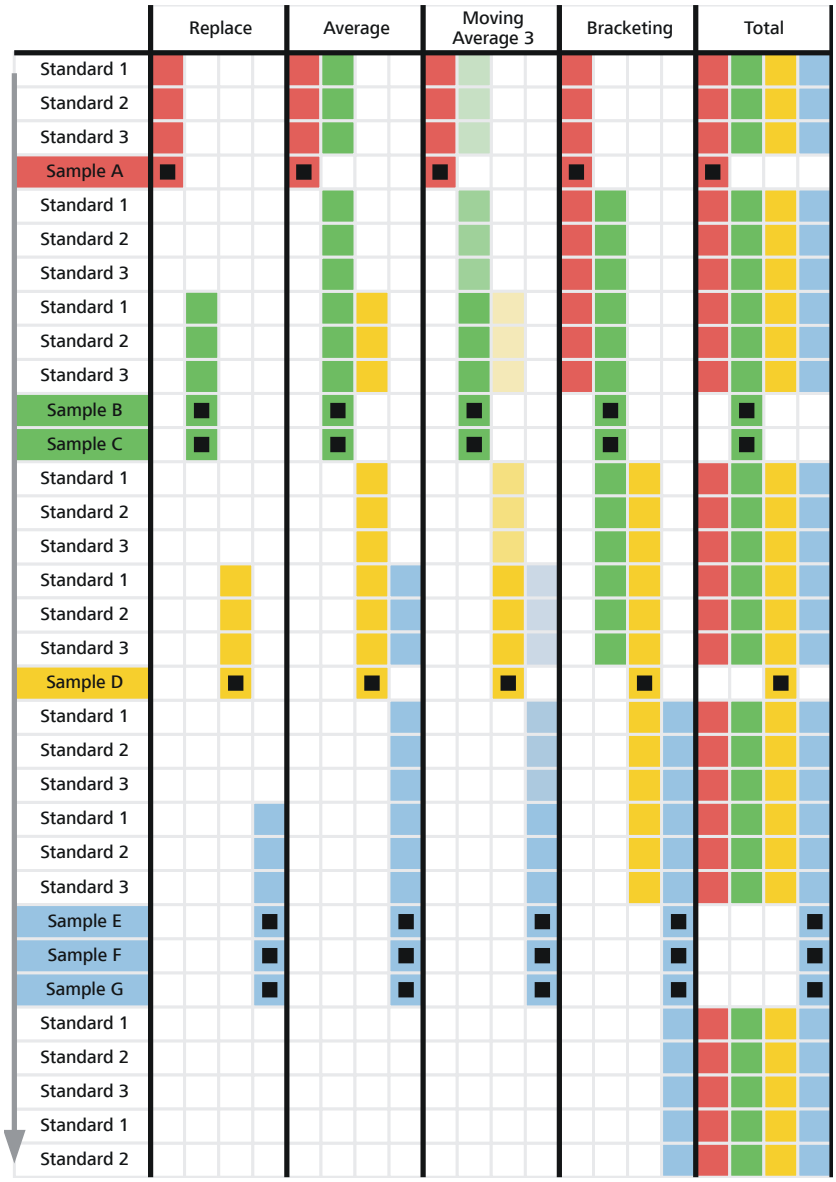
NOTE

This mode is only possible within a sample table. Methods with this calibration mode cannot be executed in a single determination.

- To calculate the calibration curve, all standards are include for all samples within a sample table. If a **Standard m** is subjected to multiple injections, all the measurement points are included in the calculation of the calibration curve without averaging.
- Before the sample table is completely processed, samples with the standards measured so far are determined, marked as incomplete and stored in the database. After the entire table has been processed, the incomplete determinations are automatically reprocessed. It is not until now that the data sets of the sample can be marked as complete.

5.8.5.7.6 Calibration mode - Overview

Schematic overview of the behavior of the calibration in the various calibration modes:



First column Example of a sample table with standards and samples.

Further columns Each column shows a calibration mode. All the standards that belong to the calibration of a sample are visualized according to the calibration mode.

Black square Marks a sample.

Colored background A different color is assigned to each sample. The samples and the standards that generate the associated calibration curve are marked with the same color.

5.8.6 Evaluation - Results

5.8.6.1 Results - General

Subwindow section: **Method ▶ Evaluation ▶ Results**

Application

The output and export of results are defined in the **Results** section. Additional results can also be defined by the user and results can be evaluated statistically and can be monitored.

Tabs

- *Report*
- *Database*
- *Statistics*
- *Monitoring*
- *User-defined results*
- *Common variable*

5.8.6.2 Results - Report

Tab: **Method ▶ Evaluation ▶ Results ▶ Report**

Table

Definition is made in the report table as to which report template is used to generate the reports for the determinations in this method and whether they are to be saved as PDF file or printed. The report is output as soon as the determination is complete (in the case of multiple determinations, for example, all single determinations need to have been carried out and the common statistics needs to have been calculated). The table cannot be edited and it contains the following columns:

Report template

Displays the names of the report templates for the reports.

Output

Displays the output target for the reports.

Edit menu

New	Inserts a new empty line above the selected line and opens the **Define report** dialog window *(see chapter 5.8.6.8, page 481)*.
Edit	Edits the selected line *(see chapter 5.8.6.8, page 481)*.
Copy	Copies the highlighted lines to the clipboard.
Insert	Inserts all lines from the clipboard above the highlighted line in the report table.

Cut	Copies the highlighted lines to the clipboard and deletes them.
Delete	Deletes the highlighted lines.

Pharmacopoeia

Selection of the calculation regulation for certain peak parameters that are calculated differently, depending on the country/region.

Selection	**USP, latest ed.** | **EP, latest ed.** | **JP, latest ed.** | **USP** | **EP** | **JP**
Default value	**USP, latest ed.**

USP, latest ed.
Current edition of the US pharmacopoeia (in accordance with the valid version at the time of the software release).

EP, latest ed.
Current edition of the European pharmacopoeia (in accordance with the valid version at the time of the software release).

JP, latest ed.
Current edition of the Japanese pharmacopoeia (in accordance with the valid version at the time of the software release).

USP
US pharmacopoeia.

EP
European pharmacopoeia.

JP
Japanese pharmacopoeia.

Decimal places of the results

[Edit]

Opens the **Define decimal places** window in which you can define with which level of accuracy the results are to be output *(see chapter 5.8.6.9, page 483)*.

5.8.6.3 Results - Database

Tab: **Method** ▶ **Evaluation** ▶ **Results** ▶ **Database**

Database

This table defines which database the determination data is to be saved in.

Database name

Name of the database in which the determination is to be stored.

Edit menu

New	Opens the **Select database** dialog window *(see chapter 5.8.6.10, page 484)*.
Edit	Opens the **Select database** dialog window *(see chapter 5.8.6.10, page 484)*.
Delete	Deletes the highlighted lines.

Automatic export

This table defines whether and how an automatic export of the determination data should take place.

Export settings

Name of the export template with which the determination is to be exported.

Edit menu

New	Opens the **Select export settings** dialog window *(see chapter 5.8.6.11, page 484)*.
Edit	Opens the **Select export settings** dialog window *(see chapter 5.8.6.11, page 484)*.
Delete	Deletes the highlighted lines.

5.8.6.4 Results - Statistics

Tab: **Method ▶ Evaluation ▶ Results ▶ Statistics**

Statistically covered results

This table defines which results of multiple determinations are to automatically be evaluated statistically. The table cannot be edited and it contains the following columns:

Result name

Name of the result being evaluated statistically.

Statistics function

Statistics function with which the result is evaluated.

Edit menu

New	Opens **Define statistics** dialog window *(see chapter 5.8.6.12, page 486)*.
Edit	Opens **Define statistics** dialog window *(see chapter 5.8.6.12, page 486)*.

Delete	Deletes the highlighted lines.

5.8.6.5 Results - Monitoring

Tab: **Method ▶ Evaluation ▶ Results ▶ Monitoring**

Rules for monitoring results

- Each result can only be monitored once.
- Only results of the **number** type can be monitored.
- The results are always monitored after evaluation. The determination does not need to be complete. As soon as the results of a determination are recalculated in a run (e.g. due to modified calibration), the newly calculated results are monitored.

Table

This table defines which results are to be monitored. The monitoring settings of a highlighted result are displayed in the right-hand part of the tab.

Edit menu

New	Opens **Define monitoring** dialog window *(see chapter 5.8.6.14, page 487)*.
Edit	Opens **Define monitoring** dialog window *(see chapter 5.8.6.14, page 487)*.
Copy	Copies the highlighted lines to the clipboard.
Insert	Inserts all lines from the clipboard above the highlighted line in the table.
Cut	Copies the highlighted lines to the clipboard and deletes them.
Delete	Deletes the highlighted lines.

Limit

Lower limit

Displays the lower limit value for the selected result.

Upper limit

Displays the upper limit value for the selected result.

Message

Displays the message to be sent when the limit values for the selected result are exceeded.

Action

Displays the action to be triggered automatically when the limit values for the selected result are exceeded.

5.8.6.6 Results - User-defined results

Tab: **Method ▶ Evaluation ▶ Results ▶ User-defined results**

Table

Additional user-defined results can be defined in this table which are automatically included in the calculation. The main properties of a highlighted result are displayed in the right-hand part of the tab. The results are calculated in the order in which they appear in the table. They can be moved with the arrow keys in order to change the sequence in which they appear.

The table cannot be edited and it contains the following columns:

Result name

Name of the user-defined result.

Edit menu

New	Opens the **Define result** dialog window *(see chapter 5.8.6.15, page 490)*.
Edit	Opens the **Define result** dialog window *(see chapter 5.8.6.15, page 490)*.
Copy	Copies the highlighted lines to the clipboard.
Insert	Inserts all lines from the clipboard above the highlighted line in the table.
Cut	Copies the highlighted lines to the clipboard and deletes them.
Delete	Deletes the highlighted lines.

Result type

Displays the result type for the selected result.

Formula

Displays the formula for the selected result.

Description

Displays the description for the selected result.

▲

Modifies the sequence of displayed lines by moving the selected line upward.

▼

Modifies the sequence of displayed lines by moving the selected line downward.

5.8.6.7 Results - Common variable

Tab: **Method ▶ Evaluation ▶ Results ▶ Common variable**

Table

You can assign **Common variables** in this table to use them in the following determinations. Assigned result and description of a highlighted result are displayed in the right-hand part of the tab. The common variables are calculated in the order in which they appear in the table. The common variables are saved in the data set of the determination and can be output in a report but will not be displayed in the result overview.

The table cannot be edited and it contains the following columns:

Name

Name of the common variable.

Edit menu

New	Opens **Assign common variable** dialog window *(see chapter 5.8.6.16, page 492)*.
Edit	Opens **Assign common variable** dialog window *(see chapter 5.8.6.16, page 492)*.
Delete	Deletes the highlighted lines.

Assigned result

Displays the result assigned to the common variable.

Description

Displays the description for the common variable.

5.8.6.8 Defining reports

Dialog window: **Method ▶ Evaluation ▶ Results ▶ Report ▶ [Edit] ▶ New / Edit**

Report template

Report template

Selection of the report template with which the report is to be generated.

Selection	**Report templates**

Report output

Definition of targets for the report output.

Printer

on | off (Default value: **off**)

The report is printed on the selected printer when this option is activated.

Selection	**Standard printer** | **All of the printers configured in Windows**
Default value	**Standard printer**

Standard printer
Printout on the printer defined as standard printer in Windows.

PDF file

on | off (Default value: **off**)

The report is stored as a PDF file when this option is activated.

The desired directory can be selected and a name for the PDF file can be entered by means of the ... icon.

Send e-mail

on | off (Default value: **off**)

If this option is enabled, then the report is output not only as a PDF file but also as an attachment to the address defined under **[E-mail]**.

[E-mail]

[E-Mail] opens the **Send E-mail** window *(see chapter 2.7.1, page 111)*.

File name

One of the following options can be selected for the name of the PDF file:

Selection	**Fixed file name** | **Determination ID** | **Sample identification** | **Batch name**

Fixed file name
If this option is selected, then the name of the PDF file will be formed from the name entered here and from the suffix for the format.

Determination ID
If this option is selected, then the name of the PDF file will be formed from the unique **Determination ID**, the **YYYYMMDD-hhmmss-SSS** time stamp (SSS = milliseconds, 3 digits) and the suffix for the format.

Sample identification
If this option is selected, then the name of the PDF file will be formed from the selected sample identification (**Ident**, **Info 1** to **Info 4** or **Value 1** to Value 4), the **YYYYMMDD-hhmmss-SSS** time stamp (SSS = milliseconds, 3 digits) and the suffix for the format.

Batch name
If this option is selected, then the name of the PDF file will be formed from the batch name, the **YYYYMMDD-hhmmss-SSS** time stamp (SSS = milliseconds, 3 digits) and the suffix for the format.

Target directory

Entry or selection (with ...) of the path for the directory in which the export file is to be saved.

Entry	**1000 characters**

Navigation bar

Navigation bar for changing the displayed result templates with the following functions:

Jump to the first result template. Altered data is adopted.

Jump to the previous result template. Altered data is adopted.

Jump to the next result template. Altered data is adopted.

Jump to the last result template. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.6.9 Defining decimal places

Dialog window: **Method ► Evaluation ► Results ► Report ► [Edit] ► Define decimal places**

The dialog window contains all results calculated by default in **MagIC Net** which are not whole numbers. The fields can be edited directly.

[OK]

Apply new entries for decimal places.

[Basic setting]

Restore default values for decimal places.

5.8.6.10 Selecting a database

Dialog window: **Method ► Evaluation ► Results ► Database ► [Edit] ► New / Edit ► Select database**

Database

Name of the database in which the determination is to be stored.

Selection	**All databases in MagIC Net**

Navigation bar

Navigation bar for changing the displayed databases with the following functions:

Jump to the first database. Altered data is adopted.

Jump to the previous database. Altered data is adopted.

Jump to the next database. Altered data is adopted.

Jump to the last database. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.6.11 Selecting export settings

Dialog window: **Method ► Evaluation ► Results ► Database ► [Edit] ► New / Edit ► Select export settings**

Export settings

Name of the export template with which the determination is to be exported.

Selection	**Export templates**

NOTE

A determination that is **automatically** exported and imported into another database cannot be reprocessed. With certain settings, e.g. with the calibration modes Bracketing and Total, automatic reprocessing is carried out after the measurement series has been completed. The automatic export takes place before the automatic reprocessing. Therefore, the data set is incomplete at the time of export and cannot be reprocessed after the import.

A determination that is **manually** exported and imported into another database can be reprocessed. The manual export is carried out after the automatic reprocessing. Therefore, the data set is complete at the time of the manual export and can be reprocessed after the import.

Navigation bar

Navigation bar for changing the displayed export templates with the following functions:

Jump to the first export template. Altered data is adopted.

Jump to the previous export template. Altered data is adopted.

Jump to the next export template. Altered data is adopted.

Jump to the last export template. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.6.12 Defining statistics

Dialog window: **Method ▶ Evaluation ▶ Results ▶ Statistics ▶ [Edit] ▶ New / Edit ▶ Define statistics**

Result

Name of the result to be statistically evaluated.

With the … icon you open the **Select result** dialog window, in which the desired result can be selected *(see chapter 5.8.6.13, page 487)*.

Statistics

List of statistical variables to be calculated.

Mean value

on | off (Default value: **on**)

Absolute standard deviation

on | off (Default value: **off**)

Relative standard deviation

on | off (Default value: **off**)

Minimum

on | off (Default value: **off**)

The **Minimum** variable is not calculated. Only the smallest defined result of the statistical group is output together with the statistical variables.

Maximum

on | off (Default value: **off**)

The **Maximum** variable is not calculated. Only the biggest defined variable of the statistical group is output together with the statistical variables.

Navigation bar

Navigation bar for changing the displayed results with the following functions:

|<

Jump to the first result. Altered data is adopted.

<

Jump to previous result. Altered data is adopted.

>

Jump to the next result. Altered data is adopted.

>|

Jump to the last result. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.6.13 Selecting a result

Dialog window: **Method ► Evaluation ► Results ► Statistics ► [Edit] ► New / Edit ► Define statistics ► Select result**

The result variables can be selected in the **Select result** dialog window.

Variables

Selects the desired result variables from all of the automatically calculated results and from the user-defined single and component results.

Description

Description of the result variables selected under **Variables**.

5.8.6.14 Defining monitoring

Dialog window: **Method ► Evaluation ► Results ► Monitoring ► [Edit] ► New / Edit ► Define monitoring**

Result

Name of the result to be monitored.

With the ... icon you open the **Select result** dialog window, in which the desired result can be selected *(see chapter 5.8.6.13, page 487)*.

Validity

In this section, the type of determinations to be monitored is defined and how the monitoring should react if a result to be monitored is not at all present.

Sample

on | off (Default value: **on**)

If this option is enabled, all the determinations with sample type **Sample** are monitored.

Check standard

on | off (Default value: **off**)

If this option is enabled, all the determinations with sample type **Check standard** are monitored.

Standard

on | off (Default value: **off**)

If this option is enabled, all the determinations with sample type **Standard** are monitored.

Monitor unavailable results

on | off (Default value: **off**)

If this option is enabled, the result is always monitored even if it is not available (it is then automatically outside the limits). If this option is disabled, an unavailable result will be ignored by the monitoring.

NOTE

Monitoring only affects unavailable results which have been generated but which are without content (e.g. no peak was found for a component). It does not affect results that have not been generated (e.g. no analysis has been started). These are never monitored.

Limit

Lower limit

Lower limit value for the result. It is possible to enter a formula with Σ.

Input range	**-1.000E99 to 1.000E99**

Upper limit

Upper limit value for the result. It is possible to enter a formula with Σ.

Input range	**-1.000E99 to 1.000E99**

Message

The text editor for entering or editing the message is opened with T or by double-clicking on the text field. The message defined here is output in the message window of the **Watch Window** in the **Workplace** program part if the lower limit value is not reached or if the upper limit value is exceeded.

Selection	**Text (unlimited)**

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

If the lower limit value is not reached or if the upper limit value is exceeded for the monitored result, then one of the following actions will be executed automatically:

Selection	**Document message** | **Display message** | **End the determination and stop instruments**
Default value	**Display message**

Document message
The message that the result is outside the limit values is saved automatically in the determination.

Display message
After the determination is ended, a message is displayed and you can select whether you want to continue the determination or cancel it. The message that the result is outside the limit values is saved automatically in the determination.

End the determination and stop instruments
After the determination is finished, a message is displayed and the used instruments will be stopped. The message that the result is outside the limit values is saved automatically in the determination.

Navigation bar

Navigation bar for changing the monitored results with the following functions:

Jump to the first result. Altered data is adopted.

<

Jump to previous result. Altered data is adopted.

>

Jump to the next result. Altered data is adopted.

>|

Jump to the last result. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.6.15 Defining result

Dialog window: **Method ▶ Evaluation ▶ Results ▶ User-defined results ▶ [Edit] ▶ New / Edit ▶ Define result**

Result type

Result type

Selecting the type of user-defined result.

Selection	**Single result** | **Component result**
Default value	**Single result**

Single result
User-defined single result that is automatically calculated.

Component result
User-defined component result that is calculated from an automatically generated result with the help of the specified formula for all components of the selected analysis.

for

selecting the analysis for user-defined component results.

Selection	**Analyses**

Result name

Name of the calculated result, which can be reused under the designation **RS.'Analysis name'.'Component name'.'Result name'[.VAL]** (single result) or **RS.AC. 'Result name'[.VAL]** (**AC**=all components; component result).

Entry	**40 characters**

Properties

Formula

Field for the calculation formula that can either be edited directly or be created with the formula editor by clicking on the Σ icon. The formula defines the type (**Number**, **Text** or **Date/Time**) of the result.

Unit

Unit of the calculated result for output (only text) that can continue to be used under the designation **RS. 'Analysis name'.'Component name'.'Result name'.UNI** (single result) or **RS.AC. 'Result name'.UNI** (**AC** =all components; component result).

Entry	**60 characters**
Selection	**ppm** | **ppb** | **ppt** | **g/L** | **mg/L** | **µg/L** | **ng/L** | **g/kg** | **mg/kg** | **µg/kg** | **ng/kg** | **µS/cm·min**
Default value	**ppm**

Decimal places

Number of decimal places for the output of the calculated result. This parameter is ignored for results of the **Text** or **Date/Time** type.

Input range	**0 to 6**
Default value	**3**

Description

Optional description of the result.

Entry	**1000 characters**

Navigation bar

Navigation bar for changing the user-defined results with the following functions:

|<

Jump to the first result. Altered data is adopted.

<

Jump to previous result. Altered data is adopted.

>

Jump to the next result. Altered data is adopted.

>|

Jump to the last result. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.6.16 Assigning common variable

Dialog window: **Method ▶ Evaluation ▶ Results ▶ Common variable ▶ [Edit] ▶ New / Edit ▶ Assign common variable**

Name

Selecting the common variables to which a result can be assigned.

Selection	**Common variables that are not already assigned**

Assigned result

Name of the result to be assigned to the common variables.

With the … icon you open the **Select result** dialog window, in which the desired result can be selected *(see chapter 5.8.6.13, page 487)*.

Description

Optional description of the common variables.

Entry	**1000 characters**

Navigation bar

Navigation bar for changing the assigned common variables with the following functions:

Jump to the first common variable. Altered data is adopted.

Jump to the previous common variable. Altered data is adopted.

Jump to the next common variable. Altered data is adopted.

Jump to the last common variable. Altered data is adopted.

>*

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

5

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.7 Evaluation - Calculations

5.8.7.1 Peak results

The following peak results are automatically calculated/defined for each component and are available as variables:

5.8.7.1.1 Peak number

Variable name: RS.'Analysis name'.'Component name'.NUM

Number of the peak. The peaks found at integration are numbered consecutively. It is of no importance whether they can be assigned to a component or not.

5.8.7.1.2 Component name

Variable name: RS.'Analysis name'.'Component name'.COMP

Name of the component contained in the sample or standard.

5.8.7.1.3 Retention time

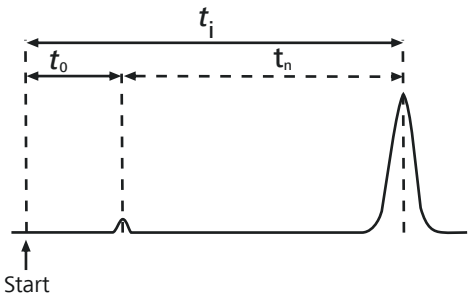
Variable name: RS.'Analysis name'.'Component name'.RET

The dwell time of a component in the column is referred to as the overall retention time or **gross retention time** t_i. The gross retention time is defined as **net retention time** t_n plus **void time** t_0.

$$t_i = t_n + t_0$$

The time during which a component does not move is referred to as **net retention time** (corrected retention time).

The time required by a component to travel through the column without interacting with the stationary phase is referred to as **void time**.



5.8.7.1.4 Full width at half maximum

Variable name: RS.'Analysis name'.'Component name'.FWHM

Width of a peak at half height.

5.8.7.1.5 Height

Variable name: RS.'Analysis name'.'Component name'.HGT

Height of a peak.

5.8.7.1.6 Height ratio

Variable name: RS.'Analysis name'.'Component name'.HGT%

Standardization of the peak height for all peaks to 100%.

The formula for standardization is:

$$H_i\% = \frac{100 \cdot H_i}{\sum |H_i|}$$

5.8.7.1.7 Area

Variable name: RS.'Analysis name'.'Component name'.AREA

Area of a peak.

5.8.7.1.8 Area ratio

Variable name: RS.'Analysis name'.'Component name'.AREA%

Standardization of the peak area for all peaks to 100%.

$$A_i\% = \frac{100 \cdot A_i}{\sum |A_i|}$$

5.8.7.1.9 Capacity factor

Variable name: RS.'Analysis name'.'Component name'.CAP

The capacity factor is a parameter for evaluating the quality of a chromatographic separation. The **capacity factor** k_i' (also referred to as retention factor) indicates how much longer a component remains at or in the stationary phase compared to the mobile phase. The capacity factor is equal to the quotient of the **corrected retention time** $t_i - t_0$ and the **void time** t_0.

$$k_i' = \frac{(t_i - t_0)}{t_0}$$

5.8.7.1.10 Resolution

Variable name: RS.'Analysis name'.'Component name'.RES

The aim of an analysis is to separate the component into individual signals. The resolution R between two neighboring peaks is a parameter for evaluating the quality of a chromatographic separation. It is defined as the quotient of the distance of two peak maxima (difference of the two gross retention times) and the arithmetic mean of the two associated base widths.

EP, latest ed.

(European pharmacopoeia)

applies in
Ph. Eur. 2.2.46, edition 11.0, January 2023

$$R = 1.18 \frac{(t_{i+1} - t_i)}{W_{0.5i} + W_{0.5i+1}}$$

USP, latest ed.

(US pharmacopoeia)

applies from
USP <621>, December 1, 2022

$$R = 1.18 \frac{(t_{i+1} - t_i)}{W_{0.5i} + W_{0.5i+1}}$$

JP, latest ed.

(Japanese pharmacopoeia)

applies in
JP 2.01, 18th edition, June 7, 2021

$$R = 1.18 \frac{(t_{i+1} - t_i)}{W_{0.5i} + W_{0.5i+1}}$$

EP

(European pharmacopoeia)

$$R = 1.18 \frac{(t_{i+1} - t_i)}{W_{0.5i} + W_{0.5i+1}}$$

USP

(US pharmacopoeia)

applies up to USP <621>, August 1, 2017

$$R = 2 \frac{(t_{i+1} - t_i)}{W_{bi} + W_{bi+1}}$$

JP

(Japanese pharmacopoeia)

$$R = 1.18 \frac{(t_{i+1} - t_i)}{W_{0.5i} + W_{0.5i+1}}$$

Variable symbol	Variable name	Unit	Description
R	Resolution	—	Resolution of two neighboring peaks
t_i	Gross retention time	min	Gross retention time of signal *i*
t_{i+1}	Gross retention time	min	Gross retention time of signal *i+1*
$W_{0.5i}$	Peak width	min	Width of the peak *i* at half height
$W_{0.5i+1}$	Peak width	min	Width of the peak *i+1* at half height
W_{bi}	Peak base width	min	Width of the peak *i* between the inflection tangents as a section on the baseline.

5.8.7.1.11 Theoretical plates

Variable name: RS.'Analysis name'.'Component name'.PLA

The theoretical plates (number of theoretical plates) describe the separating efficiency of a column. They are calculated from the peak width and the associated retention time.

EP, latest ed.

(European pharmacopoeia)

applies in Ph. Eur. 2.2.46, edition 11.0, January 2023

$$N_i = 5.54\left(\frac{t_i}{W_{0.5i}}\right)^2$$

USP, latest ed.

(US pharmacopoeia)

applies from USP <621>, December 1, 2022

$$N_i = 5.54\left(\frac{t_i}{W_{0.5i}}\right)^2$$

JP, latest ed.

(Japanese pharmacopoeia)

applies from JP 2.01, 15th edition

$$N_i = 5.54\left(\frac{t_i}{W_{0.5i}}\right)^2$$

EP

(European pharmacopoeia)

$$N_i = 5.54\left(\frac{t_i}{W_{0.5i}}\right)^2$$

USP

(US pharmacopoeia)

applies up to USP <621>, August 1, 2017

$$N_i = 16\left(\frac{t_i}{W_{bi}}\right)^2$$

JP

(Japanese pharmacopoeia)

applies up to JP 2.01, 14th Edition

$$N_i = 5.55\left(\frac{t_i}{W_{0.5i}}\right)^2$$

Variable symbol	Variable name	Unit	Description
N_i	Theoretical plates	—	The theoretical plates describe the separating capacity of a column
t_i	Gross retention time	min	Gross retention time of signal *i*
$W_{0.5i}$	Peak width	min	Width of the peak *i* at half height
W_{bi}	Peak base width	min	Width of the peak *i* between the inflection tangents as a section on the baseline.

5.8.7.1.12 Theoretical plates per meter

Variable name: RS.'Analysis name'.'Component name'.PLAM

Theoretical plates per meter of the column for the corresponding peak (theoretical plates divided by the length of the separation column).

$$N_i' = \frac{N_i \cdot 1000}{(L_{column} + L_{precolumn})}$$

Variable symbol	Variable name	Unit	Description
N_i'	Theoretical plates per meter	1/m	The theoretical plates per meter describe the separating capacity of a column
N_i	Theoretical plates	—	The theoretical plates describe the separating capacity of a column
L_{Column}	Length	mm	Length of the column

5.8.7.1.13 Gauss factor

Variable name: RS.'Analysis name'.'Component name'.PGF

The peak Gauss factor PGF is the ratio of the peak width at half signal height $W_{0.5i}$ to the peak width at a tenth of the signal height $W_{0.1i}$ multiplied by a reciprocal value of the ratio for a peak with ideal Gauss profile. The formula in accordance with EPA is:

$$PGF = 1.83 \frac{W_{0.5i}}{W_{0.1i}}$$

Variable symbol	Variable name	Unit	Description
PGF	Peak Gauss factor	—	
$W_{0.5i}$	Peak width	min	Width of the peak *i* at half height
$W_{0.1i}$	Peak width	min	Width of the peak *i* at a tenth of the signal height

5.8.7.1.14 Asymmetry

Variable name: RS.'Analysis name'.'Component name'.ASY

The form of a peak is described in an initial approximation as a Gauss curve. In practice, this ideal form is seldom reached. The peaks generally have a certain asymmetry defined by the following formulas:

EP, latest ed.

(European pharmacopoeia)

applies in Ph. Eur. 2.2.46, edition 11.0, January 2023

$$A_s = \frac{W_{0.05i}}{2a_{0.05i}}$$

USP, latest ed.

(US pharmacopoeia)

applies in USP <621>, December 1, 2022

$$A_s = \frac{W_{0.05i}}{2a_{0.05i}}$$

JP, latest ed.

(Japanese pharmacopoeia)

applies in JP 2.01, 18th edition, June 7, 2021

$$A_s = \frac{W_{0.05i}}{2a_{0.05i}}$$

EP

(European pharmacopoeia)

$$A_s = \frac{b_{0.05i}}{a_{0.05i}}$$

USP

(US pharmacopoeia)

$$A_s = \frac{W_{0.05i}}{2a_{0.05i}}$$

JP

(Japanese pharmacopoeia)

$$A_s = \frac{b_{0.05i}}{a_{0.05i}}$$

Variable symbol	Variable name	Unit	Description
A_s	Peak asymmetry	—	
$b_{0.05i}$	Peak width	min	Width of the peak *i* between the top and the end of the peak at 5% peak height
$a_{0.05i}$	Peak width	min	Width of the peak *i* between the start and the top of the peak at 5% peak height
$W_{0.05i}$	Peak width	min	Width of the entire peak *i* at 5% peak height

A peak asymmetry with a A_s - value > 1 is referred to as **Tailing**. The front inclination is steeper than the drop of the peak. The tailing effect is mainly due to adsorption forces.

A peak asymmetry with a A_s - value < 1 is referred to as **Fronting**. The front inclination is gentler than the drop of the peak.

A good separation column has an asymmetry factor A_s between 0.9 and 1.2.

5.8.7.2 Further peak results

The following further peak results are automatically calculated/defined for each component and they are available as variables:

5.8.7.2.1 Peak start

Variable name: RS.'Analysis name'.'Component name'.START

Moment of the peak start.

5.8.7.2.2 Peak end

Variable name: RS.'Analysis name'.'Component name'.END

Moment of the peak end.

5.8.7.2.3 a(0.x)

Variable name	Variable	Description
RS.'Analysis name'.'Component name'.A044	$a_{0.044}$	Width of the peak between peak start and peak maximum at 4.4% peak height.
RS.'Analysis name'.'Component name'.A05	$a_{0.05}$	Width of the peak between peak start and peak maximum at 5% peak height.
RS.'Analysis name'.'Component name'.A10	$a_{0.10}$	Width of the peak between peak start and peak maximum at 10% peak height.
RS.'Analysis name'.'Component name'.A134	$a_{0.134}$	Width of the peak between peak start and peak maximum at 13.4% peak height.
RS.'Analysis name'.'Component name'.A324	$a_{0.324}$	Width of the peak between peak start and peak maximum at 32.4% peak height.
RS.'Analysis name'.'Component name'.A50	$a_{0.5}$	Width of the peak between peak start and peak maximum at 50% peak height.

RS.'Analysis name'.'Component name'.A61	$a_{0.61}$	Width of the peak between peak start and peak maximum at 61% peak height.

5.8.7.2.4 b(0.x)

Variable name	Variable	Description
RS.'Analysis name'.'Component name'.B044	$b_{0.044}$	Width of the peak between peak maximum and peak end at 4.4% peak height.
RS.'Analysis name'.'Component name'.B05	$b_{0.05}$	Width of the peak between peak maximum and peak end at 5% peak height.
RS.'Analysis name'.'Component name'.B10	$b_{0.10}$	Width of the peak between peak maximum and peak end at 10% peak height.
RS.'Analysis name'.'Component name'.B134	$b_{0.134}$	Width of the peak between peak maximum and peak end at 13.4% peak height.
RS.'Analysis name'.'Component name'.B324	$b_{0.324}$	Width of the peak between peak maximum and peak end at 32.4% peak height.
RS.'Analysis name'.'Component name'.B50	$b_{0.5}$	Width of the peak between peak maximum and peak end at 50% peak height.
RS.'Analysis name'.'Component name'.B61	$b_{0.61}$	Width of the peak between peak maximum and peak end at 61% peak height.

5.8.7.2.5 Base width

Variable name: RS.'Analysis name'.'Component name'.WIDTH

Base width of the peak.

5.8.7.2.6 Hva

Variable name: RS.'Analysis name'.'Component name'.HVA

Height of the base point at peak start over the baseline of the chromatogram.

5.8.7.2.7 Hvb

Variable name: RS.'Analysis name'.'Component name'.HVB

Height of the base point at peak end over the baseline of the chromatogram.

5.8.7.2.8 P/V ratio A

Variable name: RS.'Analysis name'.'Component name'.PVA

Peak-to-valley ratio of the peak height of the base point at peak start over the baseline of the chromatogram.

This ratio serves for quality assessment if two peaks are not divided by a baseline. If a peak is divided by a baseline, this variable is invalid (division by zero).

$$R_{PVa} = \frac{H_P}{H_{Va}}$$

Variable symbol	Description
R_{PVa}	Ratio of the peak height to the height of the base point over the baseline at peak start.
H_P	Peak height.
H_{Va}	Height of the base point over the baseline at peak start.

5.8.7.2.9 P/V ratio B

Variable name: RS.'Analysis name'.'Component name'.PVB

Peak-to-valley ratio of the peak height to the height of the base point at peak end over the baseline of the chromatogram.

This ratio serves for quality assessment if two peaks are not divided by a baseline. If a peak is divided by a baseline, this variable is invalid (division by zero).

$$R_{PVb} = \frac{H_P}{H_{Vb}}$$

Variable symbol	Description
R_{PVb}	Ratio of the peak height to the height of the base point over the baseline at peak end.
H_P	Peak height.

Variable symbol	Description
H_{Vb}	Height of the base point over the baseline at peak end.

5.8.7.2.10 Type

Variable name: RS.'Analysis name'.'Component name'.TYPE

The **Type** parameter designates some of the properties of a peak with the aid of a letter code. This variable can be shown under **Database ► Results ► Results**.

Table 2 Letter code

	Description
1st position	
B	The peak starts at the baseline.
D	The peak starts on the drop line.
T	The peak is a rider. It starts at a tangent of the main peak.
2nd position	
B	The peak ends at the baseline.
D	The peak ends on the drop line.
T	The peak is a rider. It ends at a tangent of the main peak.
Following positions	
H	The peak is a main peak on which there is a rider.
I	The peak has a shoulder (impurity).
M	The peak was integrated manually.
N	Negative peak (the conductance for the peak sinks).
R	A reference component was used for peak identification.

?	The points of the corresponding peak are outside of the detector's measuring range.

The **first position** of the code always describes the type of **peak start**.

The **second position** of the code always describes the type of **peak end**.

The **following positions** are optional and describe other **peak properties**.

5.8.7.3 Concentration results

The following concentration results are automatically calculated/defined for each component and they are available as variables:

5.8.7.3.1 Concentration when calibrating with external standards

Variable name: RS.'Analysis name'.'Component name'.CONC

Concentration calculation when calibrating with external standard

With external calibration, calibration curves are recorded for all ions to be determined. A calibration curve is applied to calculate the concentration of a sample. The signal of the detector correlates to the injected amount of an ion and not to its concentration. Since the injected volume can vary, it is necessary to calculate with the amount of substance.

Calculation of the amount of substance for standards

The quantity of substances Q_i is calculated for all components for all standards used in the calibration:

$$Q_i = C_i \cdot V'$$

with

$$V' = \frac{V}{D} A$$

Variable symbol	Variable name	Unit	Description
Q_i	Amount of substance	mg	Amount of substance in the component *i* used for calculating the calibration curve.
C_i	Concentration	mg/L	Concentration of the component *i* in the standard.

Variable symbol	Variable name	Unit	Description
V'	Volume, corrected	µL	Corrected volume of injected standard. The injected volume is corrected by the dilution coefficient D.
V	Volume	µL	Injected volume of the standard. **Volume** from the sample data.
D	Dilution coefficient		The dilution coefficient indicates by what factor the standard was diluted before injection. **Dilution** from the sample data.
A	Sample amount		Correction factor to account for any differences in sample sizes. **Sample amount** from the sample data.

Calculation of the calibration curve

The calculation of the calibration curve depends on the function type:

Function type (1):

The amount of substance Q_i of the nth ion as a function of the response R_i (surface or height) of the nth ion.

$$Q_i = f(R_i)$$

Function type (2):

The response R_i (surface or height) of the nth ion as a function of the amount of substance Q_i of the nth ion.

$$R_i = f(Q_i)$$

The calibration parameters **Response**, **Curve type** and **Weighting** are taken into account.

If **Blank value correction for inline calibration** is enabled, the blank value Q_{bi} is calculated from the calibration curve. The blank value is the negative value on the x axis (x axis = amount of substance).

Function type (1):

$$Q_i = f(R_i) + Q_{bi}$$

Function type (2):

$$Q_i = \frac{1}{f}(R_i) + Q_{bi}$$

The **correlation coefficient** *(see chapter 5.8.7.4.2, page 520)* and the **percentage standard deviation** *(see chapter 5.8.7.4.3, page 520)* are calculated for each calibration curve:

Calculation of the amount of substance for samples

Function type (1):

The amount of substance can be calculated directly from the calibration curve.

$$Q_i = f(R_i)$$

Function type (2):

The amount of substance must be calculated using the inverse function.

$$Q_i = \frac{1}{f}(R_i)$$

If **Blank value correction for Inline calibration** is enabled, then the blank value Q_{bi} is added.

Function type (1):

$$Q_i = f(R_i) + Q_{bi}$$

Function type (2):

$$Q_i = \frac{1}{f}(R_i) + Q_{bi}$$

Calculation of the concentration for samples

Variable name: RS.'Analysis name'.'Component name'.CONC

For the concentration calculation, the amount of substance must be divided by the corrected volume V':

$$C_i = \frac{Q_i}{V'} = Q_i \frac{D}{V \cdot A}$$

with

$$V' = \frac{V}{D} A$$

Variable symbol	Variable name	Unit	Description
c_i	Concentration	mg/L	Calculated concentration of component *i* in the sample
Q_i	Amount of substance	mg	Amount of substance of the component *i* in the sample.
V'	Volume, corrected	µL	Corrected volume of the injected sample. The injected sample volume is corrected by the dilution coefficient D.
V	Volume	µL	Injected sample volume. **Volume** from the sample data.
D	Dilution coefficient		The dilution coefficient indicates by what factor the sample was diluted before injection. **Dilution** from the sample data.
A	Sample amount		Correction factor to account for any differences in sample sizes. **Sample amount** from the sample data.

5.8.7.3.2 Concentration when calibrating with internal standard

Variable name: RS.'Analysis name'.'Component name'.CONC

Concentration calculation when calibrating with internal standard

With internal calibration, a standard substance of known concentration is injected with every sample and every standard. The standard substance does not show in the analysis sample. To calculate the calibration curve

and the concentration of samples, the signal and quantity ratios of the sample ion and of the standard are compared.

Calculation of the amount of substance for standards

In a similar manner as the external calibration, the quantities of substances of the standards are calculated for every component Q_i and for the internal standard ion Q_s.

$$Q_i = C_i \cdot V'$$

with

$$V' = \frac{V}{D} A$$

$$Q_S = C_S \cdot V'$$

with

$$V' = \frac{V}{D} A$$

Variable symbol	Variable name	Unit	Description
Q_i	Amount of substance	mg	Amount of substance in the component *i* used for calculating the calibration curve.
c_i	Concentration	mg/L	Concentration of the component *i* in the standard.
Q_s	Amount of substance, internal standard	mg	Amount of substance of the internal standard.
C_S	Concentration, internal standard	mg/L	Concentration of the internal standard.
V'	Volume, corrected	µL	Corrected volume of injected standard. The injected volume is corrected by the dilution coefficient D.
V	Volume	µL	Injected volume of the standard. **Volume** from the sample data.

Variable symbol	Variable name	Unit	Description
D	Dilution coefficient		The dilution coefficient indicates by what factor the standard was diluted before injection. **Dilution** from the sample data.
A	Sample amount		Correction factor to account for any differences in sample sizes. **Sample amount** from the sample data.

Calculation of the calibration curve

Function type (1):

$$Q_i = f\left(Q_s \frac{R_i}{R_s}\right)$$

Function type (2):

$$Q_s \frac{R_i}{R_s} = f(Q_i)$$

Variable symbol	Description
Q_i	Amount of substance of the i-th ion used to formulate the calibration function.
$Q_S = C_S \cdot V$	Amount of substance of the standard ion
R_i	Response of the i-th ion
R_s	Response of the standard ion

The calibration parameters **Response**, **Curve type** and **Weighting** are taken into account when calculating the calibration curves.

If **Blank value correction for inline calibration** is enabled, the blank value is calculated from the calibration curve Q_{bi} in a similar manner to the external calibration.

Calculation of the amount of substance for samples

Function type (1):

$$Q_i = f\left(Q_s \frac{R_i}{R_s}\right)$$

The amount of substance can be calculated directly from the calibration curve.

Function type (2):

The amount of substance must be calculated using the inverse function.

$$Q_i = \frac{1}{f}\left(Q_s \frac{R_i}{R_s}\right)$$

If **Blank value correction for Inline calibration** is enabled, then the blank value Q_{bi} is added.

Function type (1):

$$Q_i = f\left(Q_s \frac{R_i}{R_s}\right) + Q_{bi}$$

Function type (2):

$$Q_i = \frac{1}{f}\left(Q_s \frac{R_i}{R_s}\right) + Q_{bi}$$

Calculation of the concentration for samples

Variable name: RS.'Analysis name'.'Component name'.CONC

For the concentration calculation, the amount of substance must be divided by the corrected volume V':

$$C_i = \frac{Q_i}{V'} = Q_i \frac{D}{V \cdot A}$$

with

$$V' = \frac{V}{D} A$$

Variable symbol	Variable name	Unit	Description
C_i	Concentration	mg/L	Calculated concentration of component *i* in the sample
Q_i	Amount of substance	mg	Amount of substance of the component *i* in the sample.

Variable symbol	Variable name	Unit	Description
V'	Volume, corrected	µL	Corrected volume of the injected sample. The injected sample volume is corrected by the dilution coefficient D.
V	Volume	µL	Injected sample volume. **Volume** from the sample data.
D	Dilution coefficient		The dilution coefficient indicates by what factor the sample was diluted before injection. **Dilution** from the sample data.
A	Sample amount		Correction factor to account for any differences in sample sizes. **Sample amount** from the sample data.

5.8.7.3.3 Concentration ratio

Variable name: RS.'Analysis name'.'Component name'.CONC%

Standardization of the concentrations for all peaks to 100%.

$$C_i = \frac{100 \cdot C_i}{\sum C_i}$$

NOTE

For standardization, only those peaks are used which were assigned to a component.

5.8.7.3.4 Standard concentration

Variable name: RS.'Analysis name'.'Component name'.STDCONC

Concentration of the component in acc. with the standard table. It is not a calculated result and it is only output for standards.

5.8.7.3.5 Mean value of the concentrations

Variable name: RS.'Analysis name'.'Component name'.CONCMEAN

Concentration mean value from a single or multiple determination.

$$\overline{C}_{sa} = \sum C_{sa,i} / m$$

Variable symbol	Description
$\overline{C}_{sa}$	Concentration mean value from a single or multiple determination, **RS.'Analysis name'.'Component name'.CONCMEAN**.
$C_{sa,i}$	Concentration of the i-th sample.
m	Number of injections carried out for a single or multiple determination, **RS.'Analysis name'.'Component name'.INJCOUNTFIN**.

5.8.7.3.6 Standard deviation of the concentration mean value

Variable name: RS.'Analysis name'.'Component name'.CONCMEANSD

Standard deviation of the concentration mean value, including calibration errors. The calculation is in accordance with DIN 38402 Part 51 (1986).

NOTE

The standard deviation **RS.'Analysis name'.'Component name'.CONC.ASA** (if the statistic for concentration is activated) does not take into account the additional uncertainty of the calibration function. Therefore, it is *smaller* than **RS.'Analysis name'.'Component name'.CONCMEANSD**.

Calculation of the mean value standard deviation of the amount of substance, using function type (1)

The calculation of the mean value standard deviation of the amount of substance proceeds as follows if the **Concentration = f(response)** function type was selected *(see chapter 5.8.5.3, page 464)* in the properties of the calibration.

For this, it is assumed that:

- Only the *amounts of substance* Q_i are affected by normal-distribution errors.
- These variances are *homogenous* in the area of the calibration points used (i.e. they are also the same for standards and samples).

$$\bar{x}_{sa} = \left(\overline{C}_{sa} \times \frac{V \times A}{D} - k_0 \right) \Big/ k_1$$

$$s_{\overline{Q}_{sa}} = s_y \times \sqrt{\frac{1}{n} + \frac{1}{m} + \frac{(\bar{x}_{sa} - \bar{x})^2}{(n-1) \times s_x^2}}$$

Variable symbol	Description
$\bar{x}_{sa}$	Mean value of the x values of the sample measurements.
$\overline{C}_{sa}$	Mean value of the sample concentration found, **RS.'Analysis name'.'Component name'.CONCMEAN**.
V	Injection volume from the sample data, **SD.VOLUME**
A	Sample amount from the sample data, **SD.AMOUNT**.
D	Dilution according to the sample table, **SD.DILUTION**.
k_0	Axis intercept of the calibration lines, **RS.'Analysis name'.'Component name'.CALK0**
k_1	Slope of the calibration lines, **RS.'Analysis name'.'Component name'.CALK1**.
$s_{\overline{Q}_{sa}}$	Mean value standard deviation of the amounts of substance found.
s_y	Residual standard deviation of the y values of the calibration points used, **RS.'Analysis name'.'Component name'.CALYRSD** *(see chapter 5.8.7.4.10, page 522)*.
n	Number of standards used, **RS.'Analysis name'.'Component name'.CALNUM**.
m	Number of injections carried out for a single or multiple determination, **RS.'Analysis name'.'Component name'.INJCOUNTFIN**.
$\bar{x}$	Mean value of the x values of the calibration points **RS.'Analysis name'.'Component name'.CALXMEAN**.
s_x	Standard deviation of the x values of the calibration points used. **RS.'Analysis name'.'Component name'.CALXSD**.

Calculation of the mean value standard deviation of the amount of substance, using function type (2)

The calculation of the mean value standard deviation of the amount of substance proceeds as follows if the **Response= f(concentration)** function type was selected *(see chapter 5.8.5.3, page 464)* in the properties of the calibration.

For this, it is assumed that:

- Only the *Response values* R_i are affected by normal-distribution errors.
- These variances are *homogenous* in the area of the calibration points used (i.e. they are also the same for standards and samples).

$$\bar{y}_{sa} = k_0 + \overline{C}_{sa} \times \frac{V \times A}{D} \times k_1$$

$$s_{\overline{Q}_{sa}} = \frac{s_y}{k_1} \times \sqrt{\frac{1}{n} + \frac{1}{m} + \frac{(\bar{y}_{sa} - \bar{y})^2}{(n-1) \times k_1^2 \times s_x^2}}$$

Variable symbol	Description
$\bar{y}_{sa}$	Mean value of the y values of the sample measurements.
k_0	Axis intercept of the calibration lines, **RS.'Analysis name'.'Component name'.CALK0**.
$\overline{C}_{sa}$	Mean value of the sample concentration found, **RS.'Analysis name'.'Component name'.CONCMEAN**.
V	Injection volume from the sample data, **SD.VOLUME**
A	Sample amount from the sample data, **SD.AMOUNT**.
D	Dilution according to the sample table, **SD.DILUTION**.
k_1	Slope of the calibration lines, **RS.'Analysis name'.'Component name'.CALK1**.
$s_{\overline{Q}_{sa}}$	Mean value standard deviation of the amounts of substance found.
s_y	Residual standard deviation of the y values of the calibration points used, **RS.'Analysis name'.'Component name'.CALYRSD** *(see chapter 5.8.7.4.10, page 522)*.
n	Number of standards used, **RS.'Analysis name'.'Component name'.CALNUM**.

Variable symbol	Description
m	Number of injections carried out for a single or multiple determination, **RS.'Analysis name'.'Component name'.INJCOUNTFIN**.
$\bar{y}_{sa}$	Mean value of the y values of the sample measurements.
$\bar{y}$	Mean value of the y values of the calibration points
s_x	Standard deviation of the x values of the calibration points used. **RS.'Analysis name'.'Component name'.CALXSD**.

Calculation of the result

$$s_{\bar{C}_{sa}} = s_{\bar{Q}_{sa}} \times \frac{1}{V'} = s_{\bar{Q}_{sa}} \times \frac{D}{V \times A}$$

Variable symbol	Description
$s_{\bar{C}_{sa}}$	Mean value standard deviation of the sample concentration with calibration error, **RS.'Analysis name'.'Component name'.CONCMEANSD**.
$s_{\bar{Q}_{sa}}$	Mean value standard deviation of the amounts of substance found.
V'	Standardized volume
D	Dilution according to the sample table, **SD.DILUTION**.
V	Injection volume from the sample data, **SD.VOLUME**
A	Sample amount from the sample data, **SD.AMOUNT**.

NOTE

The calculation takes place only when the following conditions have been fulfilled:

1. The **Linear** calibration function is used.
2. At least 3 valid (used) calibration points exist.
3. The weighting is **unweighted**.
4. The calibration mode is **Replace**.
5. The blank value correction is *not* activated.
6. The determinations have been recorded with MagIC Net 2.0 or newer.

5.8.7.3.7 Confidence interval for the concentration mean value

Variable name: RS.'Analysis name'.'Component name'.CONCMEANCONF95

Half width of the confidence interval for the concentration mean value, at 95% confidence.

Calculation

$$\Delta\overline{C}_{sa}(95\%) = s_{\overline{C}_{sa}} \times \text{tquantile}(0.95, p = n-2)$$

where $\text{tquantile}(0.95, p = n-2)$ is the inverse function of the *Student's t-distribution (see chapter 2.4.5.5, page 62)*.

Variable symbol	Description
$\Delta\overline{C}_{sa}(95\%)$	Half width of the confidence interval for the concentration mean value, at 95% confidence, **RS.'Analysis name'.'Component name'.CONCMEANCONF95**.
$s_{\overline{C}_{sa}}$	Standard deviation of the concentration mean value, including calibration errors, **RS.'Analysis name'.'Component name'.CONCMEANSD**.
p	Number of degrees of freedom
n	Number of independent standards used, **RS.'Analysis name'.'Component name'.CALNUM**.

5.8.7.3.8 Limit of detection from linear calibration function

Variable name: RS.'Analysis name'.'Component name'.LDTCCONF95

Limit of detection from linear calibration function, at 95% confidence.

Calculation using function type (1)

The calculation proceeds as follows if the **Concentration = f(response)** function type was selected *(see chapter 5.8.5.3, page 464)* in the properties of the calibration.

For this, it is assumed that:

- Only the *amounts of substance* Q_i are affected by normal-distribution errors.
- These variances are *homogenous* in the area of the calibration points used (i.e. they are also the same for standards and samples).

Expected response from regression with sample concentration 0:

$$x_0 = -k_0 / k_1$$

$$s_{Q=0} = s_y \times \sqrt{\frac{1}{n} + \frac{1}{m} + \frac{(x_0 - \bar{x})^2}{(n-1) \times s_x^2}}$$

Variable symbol	Description
x_0	Expected response from regression with sample concentration 0
k_0	Axis intercept of the calibration lines, **RS.'Analysis name'.'Component name'.CALK0**
k_1	Slope of the calibration lines, **RS.'Analysis name'.'Component name'.CALK1**.
$s_{Q=0}$	Standard deviation at amount of substance 0
s_y	Standard deviation of the y values of the calibration points used, **RS.'Analysis name'.'Component name'.CALYRSD**
n	Number of standards used, **RS.'Analysis name'.'Component name'.CALNUM**.
m	Number of injections carried out for a single or multiple determination, **RS.'Analysis name'.'Component name'.INJCOUNTFIN**.
$\bar{x}$	Mean value of the x values of the calibration points **RS.'Analysis name'.'Component name'.CALXMEAN**.
s_x	Standard deviation of the x values of the calibration points used. **RS.'Analysis name'.'Component name'.CALXSD**.

Calculation using function type (2)

The calculation proceeds as follows if the **Response = f(concentration)** function type was selected *(see chapter 5.8.5.3, page 464)* in the properties of the calibration.

For this, it is assumed that:

- Only the *Response values* R_i are affected by normal-distribution errors.
- These variances are *homogenous* in the area of the calibration points used (i.e. they are also the same for standards and samples).

Expected response from regression with sample concentration 0:

$$y_0 = k_0$$

$$s_{Q=0} = \frac{s_y}{k_1} \times \sqrt{\frac{1}{n} + \frac{1}{m} + \frac{(y_0 - \bar{y})^2}{(n-1) \times k_1^2 \times s_x^2}}$$

where

$$\frac{(\bar{y}_0 - \bar{y})^2}{k_1^2} = (x_0 - \bar{x})^2$$

Variable symbol	Description
y_0	Expected response from regression with sample concentration 0
k_0	Axis intercept of the calibration lines, **RS.'Analysis name'.'Component name'.CALK0**
$s_{Q=0}$	Standard deviation at amount of substance 0
k_1	Slope of the calibration lines, **RS.'Analysis name'.'Component name'.CALK1**.
s_y	Standard deviation of the y values of the calibration points used, **RS.'Analysis name'.'Component name'.CALYRSD**
n	Number of standards used, **RS.'Analysis name'.'Component name'.CALNUM**.
m	Number of injections carried out for a single or multiple determination, **RS.'Analysis name'.'Component name'.INJCOUNTFIN**.
$\bar{y}$	Mean value of the y values of the calibration points
s_x	Standard deviation of the x values of the calibration points used. **RS.'Analysis name'.'Component name'.CALXSD**.

Calculation of the result

$$s_{C=0} = s_{Q=0} \times \frac{1}{V'} = s_{Q=0} \times \frac{D}{V \times A}$$

$$NG(95\%) = s_{C=0} \times \text{tquantile}(0.90,\ p = n - 2)$$

where: $t_{oneside}(0.95, p) = t_{twoside}(0.90, p)$.

Variable symbol	Description
$s_{C=0}$	Standard deviation at sample concentration 0

Variable symbol	Description
$NG(95\%)$	Limit of detection from linear calibration function, at 95% confidence, **RS.'Analysis name'.'Component name'.LDTCCONF95**.
V'	Standardized volume
D	Dilution according to the sample table, **SD.DILUTION**.
V	Injection volume from the sample data, **SD.VOLUME**
A	Sample amount from the sample data, **SD.AMOUNT**.

5.8.7.3.9 Calculated concentration of standards

Variable name: RS.'Analysis name'.Standard'x'.'Component name'.CONCCALC

The variable is automatically generated for components of calibration standards.

Indicates the concentration of the component calculated with the calibration used.

5.8.7.3.10 Deviation CONCCALC from CONC

Variable name: RS.'Analysis name'.Standard'x'.'Component name'.CONCDEV%

The variable is automatically generated for components of calibration standards.

Indicates the percentage deviation of the calculated concentration from the nominal concentration of the component. (Deviation of the variable **CONCCALC** from the variable **CONC**).

5.8.7.4 Calibration curves results

The following calibration curve results are automatically calculated/defined for each component and they are available as variables:

5.8.7.4.1 k(0) - k(3)

Variable name: RS.'Analysis name'.'Component name'.CALK# (**#= 0 - 3**)

Variable symbol	Description
k_0	Coefficient of zero order of the calibration curve
k_1	Coefficient of first order of the calibration curve
k_2	Coefficient of second order of the calibration curve
k_3	Coefficient of third order of the calibration curve

5.8.7.4.2 Correlation coefficient

Variable name: RS.'Analysis name'.'Component name'.CALCORR

$$r = \sqrt{\frac{\sum_{i=1}^{n}(y_i - \bar{y})^2 - \sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{\sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

Variable symbol	Description
r	Correlation coefficient
y_i	y value of calibration point i
$\bar{y}$	Mean value of all y values of the calibration points
$\hat{y}_i$	The y value of calibration point i calculated with the calibration curve

5.8.7.4.3 Percentage standard deviation

Variable name: RS.'Analysis name'.'Component name'.CALPSD

$$\%RSD = 100 \times \frac{1}{\bar{y}} \times \sqrt{\frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{n - p}}$$

Variable symbol	Description
$\%RSD$	Percentage standard deviation
y_i	y value of calibration point i
$\bar{y}$	Mean value of all y values of the calibration points
$\hat{y}_i$	The y value of calibration point i calculated with the calibration curve
n	Number of calibration points of the calibration curve
p	Number of terms of the calibration equation that are not equal to zero

5.8.7.4.4 Percentage standard error

Variable name: RS.'Analysis name'.'Component name'.CALRSE

$$\%RSE = 100 \times \sqrt{\frac{\sum_{i=1}^{n}\left(\frac{x_i' - x_i}{x_i}\right)^2}{n-p}}$$

Variable symbol	Description
%RSE	Percentage standard error
x'_i	Calculated concentration of calibration point *i*
x_i	Current concentration of calibration point *i*
n	Number of calibration points of the calibration curve
p	Number of terms of the calibration equation that are not equal to zero

5.8.7.4.5 Mean X

Variable name: RS.'Analysis name'.'Component name'.CALX-MEAN

$\bar{x}$ is the mean value of all x values of the calibration points.

5.8.7.4.6 Mean Y

Variable name: RS.'Analysis name'.'Component name'.CALY-MEAN

$\bar{y}$ is the mean value of all y values of the calibration points.

5.8.7.4.7 Number of calibration points

Variable name: RS.'Analysis name'.'Component name'.CALNUM

Number of measured values of the calibration curve.

5.8.7.4.8 Calibration terms

Variable name: RS.'Analysis name'.'Component name'.CALTERM

Number of terms of the calibration curve.

5.8.7.4.9 Standard deviation X

Variable name: RS.'Analysis name'.'Component name'.CALXSD

$$s_x = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$$

Variable symbol	Description
s_x	Standard deviation of the x values of the calibration points.
x_i	x value of calibration point i
$\bar{x}$	Mean value of the x values of all calibration points
n	Number of calibration points of the calibration curve

5.8.7.4.10 Residual standard deviation Y

Variable name: RS.'Analysis name'.'Component name'.CALYRSD

$$s_y = \sqrt{\frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{n-p}}$$

Variable symbol	Description
s_y	Residual standard deviation of the y values of the calibration points from the y values of the corresponding calibration point which were calculated with the calibration curve.
y_i	y value of calibration point i
$\hat{y}_i$	The y value of calibration point i calculated with the calibration curve
n	Number of calibration points of the calibration curve
p	Number of terms of the calibration equation that are not equal to zero

5.8.7.5 Recovery results

The following recovery results are automatically calculated/defined for each component and they are available as variables:

5.8.7.5.1 Recovery rate (check standard)

Variable name: RS.'Analysis name'.'Component name'.REC

For the calculation of the recovery rate $W_{CS_n i}$ via a check standard, a check standard (with known concentration) is determined like a sample. The recovery rate is calculated by dividing the determined concentration by the actual concentration of the check standard.

$$W_{CS_n i} = \frac{C_{CS_n i}}{C'_{CS_n i}}$$

Variable symbol	Description
$W_{CS_n i}$	Recovery rate of the ion i, calculated with the check standard n.
$C_{CS_n i}$	Measured concentration of ion i in check standard n.
$C'_{CS_n i}$	Defined concentration of ion i in the check standard n.

5.8.7.5.2 Recovery rate (spiking)

Variable name: RS.'Analysis name'.'Component name'.SREC

To calculate the recovery rate W_{Ai} by spiking, the sample is spiked with a spiking solution. The concentrations of the sample and of the spiked sample are calculated by means of external and internal calibration. The recovery rate is calculated for each component with these two values.

This peak parameter is calculated if a sample of the **Spiking** sample type is determined. The recovery rate is always calculated only for one spiking solution. A further automatic calculation with the recovery rates of various spiking solutions does not take place. The calculation always affects the last sample measured.

$$W_{A_n i} = \frac{C_{A_n Pi} \cdot \left(V_{A_{nInject}} + V_{P_{nInject}}\right) - C_{Pi} \cdot V_{P_{nInject}}}{C_{A_n i} \cdot V_{A_{nInject}}}$$

$$V_{A_{nInject}} = \frac{V_{A_n}}{\left(V_{A_n} + V_{P_n}\right)} \cdot V$$

$$V_{P_{nInject}} = \frac{V_{P_n}}{\left(V_{A_n} + V_{P_n}\right)} \cdot V$$

Variable symbol	Description
$W_{A_n i}$	Recovery of ion i, calculated with the spiking solution A_n
$C_{A_n Pi}$	Measured concentration of ion i in the sample, which was spiked with A_n.
C_{Pi}	Measured concentration of ion i in the sample, without spiking.
$C_{A_n i}$	Defined concentration of ion i in the spiking solution A_n.

Variable symbol	Description
$V_{A_{nInject}}$	Injected volume of the spiking solution A_n in the spiked sample.
$V_{P_{nInject}}$	Injected volume of the sample in the spiked sample.
V_{A_n}	Volume of the spiking solution in the spiked sample.
V_{P_n}	Volume of the sample in the spiked sample.
V	Volume from the sample data.

5.8.8 Evaluation - UV/VIS

5.8.8.1 UV/VIS - General

Subwindow section: **Method ► Evaluation ► UV/VIS**

Application

In the section **UV/VIS**, the special evaluation parameters for UV/VIS analyses are defined.

Tabs

- *Spectra*

5.8.8.2 UV/VIS - Spectra

Tab: **Method ► Evaluation ► UV/VIS ► Spectra**

For each analysis using the 887 Professional UV/VIS detector ("UV/VIS analysis"), spectra can be defined.

Analysis

Selection list of UV/VIS analyses. The *Table of spectra p. 524* below corresponds to the selected analysis.

Table of spectra

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit in separate dialog *(see chapter 5.8.8.3, page 525)* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *(see chapter 5.8.8.3, page 525)* (is also triggered by a double-click on a non-empty line).
Copy [CTRL-C]	Copies the selected line to the clipboard.

Paste [CTRL-V]	Inserts the line from the clipboard into the table.
Cut [CTRL-X]	Cuts the selected line and copies it to the clipboard.
Delete [Delete]	Deletes the selected line.

5.8.8.3 Editing spectrum

Tab: **Method ▶ Evaluation ▶ UV/VIS ▶ Spectrum**

Here the properties of a spectrum defined before can be edited or the properties of a new spectrum can be defined.

For each spectrum you can define the wavelength ranges in which maxima are to be evaluated *(see "Evaluation of maxima", page 525)*.

Spectrum

Time

Time when the spectrum is to be recorded in accordance to the timeline of the corresponding analysis.

Input range	**0.00 to 10,000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Name

Name for the spectrum. Must be unique within the corresponding analysis.

Entry	**1– 40 characters**

Start wavelength

Lower limit of the wavelength range in which the spectrum is to be measured.

Input range	**190 to 900 nm** (Increment: **1**)
Default value	**190 nm**

End wavelength

Upper limit of the wavelength range in which the spectrum is to be measured.

Input range	**190 to 900 nm** (Increment: **1**)
Default value	**900 nm**

Evaluation of maxima

Up to 10 wavelength ranges in which the wavelength at the absorbance maximum is to be evaluated can be defined per spectrum.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit in separate dialog *(see chapter 5.8.8.4, page 526)* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *(see chapter 5.8.8.4, page 526)* (is also triggered by a double-click on a non-empty line).
Delete [Delete]	Deletes the selected line.

Navigation bar

Navigation bar for changing the displayed spectra with the following functions:

Jump to the first spectrum. Altered data is adopted.

Jump to the previous spectrum. Altered data is adopted.

Jump to the next spectrum. Altered data is adopted.

Jump to the last spectrum. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

5.8.8.4 Evaluation of the wavelength at the absorbance maximum

Tab: **Method ► Evaluation ► UV/VIS ► Spectrum ► Maximum evaluation**

Here a wavelength range can be defined in which MagIC Net automatically detects the wavelength at the maximum measured absorbance for the corresponding spectrum. The wavelength range must have a width of at least 10 nm.

Start wavelength

Lower limit of the wavelength range in which the wavelength at the absorbance maximum is to be detected.

Input range	**190 to 900 nm** (Increment: **1**)
Default value	**900 nm**

End wavelength

Upper limit of the wavelength range in which the wavelength at the absorbance maximum is to be detected.

Input range	**190 to 900 nm** (Increment: **1**)
Default value	**900 nm**

Navigation bar

Navigation bar for changing the displayed spectra with the following functions:

Jump to the first spectrum. Altered data is adopted.

Jump to the previous spectrum. Altered data is adopted.

Jump to the next spectrum. Altered data is adopted.

Jump to the last spectrum. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

In the case that several *equal* maxima are found in the wavelength range, the one located on the most "right" will be given (the one at the highest wavelength).

A result variable is generated for each maximum evaluation:

RS.'Analysis name'.SPEC.'Spectrum name'.WVLMAX{x}

5.9 Chromatograms subwindow

5.9.1 Chromatograms - General

Subwindow: **Method ▶ Chromatograms**

Chromatograms subwindow

The last chromatogram and the associated calibration curves are displayed in the subwindow **Chromatograms** for every analysis which was recorded with this method and saved in the database. The blanks with which the chromatograms have been corrected and the standards (or spiking solutions) which were used to calibrate the sample can also be displayed. The subwindow also supports data import from the chromatogram to the method parameters.

When a method is opened, the evaluation parameters of the method are immediately applied to the chromatograms and calibration curves shown.

Graphics window

The interface, functions and properties of the **Chromatograms** subwindow are described in the *Graphics window* chapter in the following subchapters:

- *Elements*
- *Chromatogram view*
- *Zooming*
- *Move curve*
- *Work with cursor*
- *Set Zoom*
- *Properties*
- *Change calibration*
- *Select color*
- *Select calibration data set*

5.9.2 Chromatograms - Update

Menu item: **Method ▶ Edit ▶ Update**

With the icon or the **Edit ▶ Update** menu item, the latest chromatograms are reloaded from the database and evaluated with the modified method parameters, and the calibration data is recalculated.

5.9.3 Chromatograms - Calculating

Menu item: **Method ▶ Edit ▶ Calculate**

With the symbol or the **Edit ▶ Calculate** menu item, the existing chromatograms are evaluated with the modified method parameters and the calibration data is recalculated.

6 Configuration

6.1 Configuration - General

6.1.1 Configuration - Definition

Program part: **Configuration**

Definition

The term **Configuration** is used in **MagIC Net** to refer to all comprehensive settings for devices, columns, eluents, accessories, common variables, rack data, solutions and EPC solutions. Included in the configuration are also methods, security settings, user administration, program administration, templates and Audit Trail.

Organization

All configuration data is saved in the **configuration database**. In the case of local server systems (**MagIC Net Professional**), this is to be found in the program directory of the computer on which the program was installed. In the case of client/server systems (**MagIC Net Multi**), the configuration database is saved centrally on the server and contains all of the configuration data of all computers (clients) which are connected to this server.

6.1.2 Configuration - User interface

Program part: **Configuration**

Configuration icon

Clicking on the configuration icon in the vertical bar at the left opens the **Configuration** program part; the configuration icon is shown in color at the same time.

Elements

The user interface of the **Configuration** program part comprises the following elements:

- Configuration-specific menu bar.
- Configuration-specific toolbar.
- Main window, in which up to six subwindows can be displayed.

6.1.3 Configuration - Menu bar

6.1.3.1 Configuration - Main menus

Program part: **Configuration**

The menu bar in the **Configuration** program part contains the following main menu items:

- *File*
  Exporting, importing, backing up and restoring configuration data.
- *View*
  Changing layout, loading views, saving views, quick access to subwindows.
- *Tools*
  User administration, security settings, program administration, Audit Trail, templates, options.
- *Help*
  Open program help, display program information.

6.1.3.2 Configuration - File menu

Program part: **Configuration**

Export...	Export configuration data *(see chapter 6.3.1.1, page 561)*.
Import...	Import configuration data *(see chapter 6.3.1.2, page 563)*.
Backup ▶	
Automatically	Back up configuration data automatically *(see chapter 6.3.2.1, page 566)*.
Manually	Back up configuration data manually *(see chapter 6.3.2.2, page 567)*.
Print (PDF)... ▶	
User administration	Outputs the user administration data as PDF file *(see chapter 6.2.1.1, page 537)*.
Security settings	Outputs the security settings as PDF file *(see chapter 6.2.2.1, page 546)*.
Logout...	Logs out user *(see chapter 2.2.3, page 23)*
Exit	Exits the program.

6.1.3.3 Configuration - View menu

Program part: **Configuration**

Change layout...	Modify layout of loaded configuration view *(see chapter 3.1.7.2, page 121)*.
Load view...	Load a saved configuration view *(see chapter 3.1.7.3, page 121)*.
Save view...	Save current configuration view *(see chapter 3.1.7.4, page 122)*.
Quick access	Open a subwindow not contained in the current configuration view.
Toolbar	Activates/deactivates the toolbar display.

6.1.3.4 Configuration - Tools menu

Program part: **Configuration**

User administration...	Manage users and groups of users with access permissions, signature permissions and options *(see chapter 6.2.1.1, page 537)*.
Security settings...	Options for login, password protection, Audit Trail and electronic signature *(see chapter 6.2.2.1, page 546)*.
Program administration...	General settings for local server and client/server settings *(see chapter 6.2.3.1, page 556)*.
Audit Trail...	Open the Audit Trail *(see chapter 6.4, page 578)*.
Templates ►	
Input lines...	Generate templates for scanning remote lines *(see chapter 6.3.3.1.1, page 568)*.
Output lines...	Generate templates for setting remote lines *(see chapter 6.3.3.2.1, page 570)*.
E-mail templates...	Create templates for sending e-mails *(see chapter 6.3.3.3, page 572)*.
Options...	Set program options *(see chapter 6.3.4.1, page 574)*.

6.1.3.5 Help menu

Program part: **Workplace / Database / Method / Configuration**

MagIC Net Help	Opens MagIC Net Help.
About	Displays information about the program and the installation.

6.1.4 Configuration - Toolbar

Program part: **Configuration**

Change layout…	Modify layout of loaded configuration view *(see chapter 3.1.7.2, page 121)*.
Load view…	Load a saved configuration view *(see chapter 3.1.7.3, page 121)*.
Save view	Save current configuration view *(see chapter 3.1.7.4, page 122)*.
User administration…	Manage users and groups of users with access permissions, signature permissions and options *(see chapter 6.2.1.1, page 537)*.
Security settings…	Options for login, password protection, Audit Trail and electronic signature *(see chapter 6.2.2.1, page 546)*.
Audit Trail…	Open the Audit Trail *(see chapter 6.4, page 578)*.
Logout…	Logs out user *(see chapter 2.2.3, page 23)*.
MagIC Net Help	Opens MagIC Net Help.

6.1.5 Configuration - Subwindows

Program part: **Configuration**

Selection

The following subwindows can be displayed in the main window:

- *Devices*
  Display of the automatically recognized and manually added devices.
- *Columns*
  Display of the automatically recognized and manually added separation columns.
- *Eluents*
  Display of the manually added eluents.
- *Accessories*
  Display of the data for all defined accessory parts.
- *Common variables*
  Shows the data for all defined common variables.
- *Rack data*
  Shows the data for all Metrohm sample racks.
- *Solutions*
  Display of the manually added solutions.

- *EPC solutions*
  Display of the manually added EPC solutions.
- *Amperometric cells*
  Display of the automatically recognized and manually added amperometric cells.
- *Rotors*
  Display of the manually added rotors.

Representation

The subwindows can be enlarged or made smaller to suit by dragging the separating bar between the windows.

By clicking on the ❑ button above at the right, the subwindows can be maximized so that only one subwindow is displayed in the main window. The original view of all subwindows is restored by clicking on the ❑ button in the maximized subwindow once again.

Via the menu item **View ► Quick access...** subwindows that are not in the current configuration view can be shown as a single window.

6.1.6 Configuration - Functions

Program part: **Configuration**

The following functions can be carried out in the **Configuration** program part:

Views

- *Changing the layout of the configuration view*
- *Loading configuration view*
- *Saving configuration view*
- *Renaming configuration view*
- *Deleting configuration view*

User administration

- *Manage user groups*
- *Access permissions*
- *Signatures*
- *Options*
- *Users*

Security settings

- *Login / password protection*
- *Audit Trail/Changes*
- *Electronic signature*
- *Default reasons*

Program administration

- *Backup directories*
- *Clients*

- *Licenses*

Export/import of configuration data

- *Exporting configuration data*
- *Importing configuration data*

Backing up / restoring configuration data

- *Backing up configuration data automatically*
- *Backing up configuration data manually*
- *Restoring configuration data*

Templates

- *Input lines*
- *Output lines*
- *E-mail templates*

Options

- *General program properties*

6.1.7 Views

6.1.7.1 Views - General

Program part: **Workplace / Database / Configuration**

Definition

The contents and design of the main window in the **Workplace**, **Database** and **Configuration** program parts is called a **View**. The following elements belong to a view:

- Number, arrangement, sequence and size of the subwindows.
- Representation within the individual subwindows, i.e. column sequence, column width, sorting and filter.

Functions

The following functions are possible for views:

- *Changing the layout*
  Defining the number, arrangement and sequence of the subwindows for the current view.
- *Saving a view*
  Saving the current view.
- *Loading a view*
  Loading a saved view.
- *Renaming a view*
  Renaming a saved view.
- *Deleting a view*
  Deleting a saved view.

Saving automatically

The current view will be saved automatically when the program is closed if the corresponding option is activated under **Save on closing** in the **Configuration** program part under **Tools ► Options...** on the **Save** tab.

Loading automatically

By default, the view that is saved when the program is closed will be loaded automatically the next time that the program is opened. As an alternative, a default view that is loaded automatically the first time that the program part is opened can be defined for each user group.

By default, views are opened with the following subwindows with the very first program start:

- **Workplace**
  Run, **Live display 1**, **Report**, **Watch window**, **Time program**
- **Database**
  Determination overview, **Curves 1**, **Information**, **Results**
- **Configuration**
  Devices, **Columns**, **Eluents**, **Accessories**

Export/import

Views can also be exported and imported. In this way these views can be exchanged between different client/server systems.

6.1.7.2 Changing the layout

Dialog window: **Workplace / Database / Configuration ► View ► Change layout... ► Change layout**

The **Change layout** dialog window is opened with the icon or the **View ► Change layout...** menu item.

Select layout

Selection of a graphical icon for the number and arrangement of the subwindows.

Selection	**'Selection of the possible combinations'**

Available subwindows

Display of the subwindows that are still available for being displayed in the view.

Selection	**'Selection of the subwindows'**

Displayed subwindows

Display of the subwindows that are shown in the view.

Selection	**'Subwindow'**

»

Adds the selected subwindow to the view.

«

Removes the selected subwindow from the view.

▲

Moves the selected subwindow upward (modifies sequence).

▼

Moves the selected subwindow downward (modifies sequence).

6.1.7.3 Loading a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Load view... ▶ Load view**

The **Load view** dialog window is opened with the icon or the **View ▶ Load view...** menu item.

Name

Name of the view to be loaded.

[Rename]

Rename the selected view.

[Delete]

Deletes the selected view.

[Load]

Loads the selected view.

6.1.7.4 Saving a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Save view... ▶ Save view**

The **Save view** dialog window is opened with the icon or the **View ▶ Save view...** menu item.

Name

Name under which the view is to be saved.

[Rename]

Rename the selected view.

[Delete]

Deletes the selected view.

[Save]

Saves the view under the given name. The saved views are globally valid and available for client/server systems.

6.1.7.5 Renaming a view

Dialog window: **Workplace / Database / Configuration ▶ View ▶ Load view... ▶ Load view ▶ [Rename] ▶ Rename view**

To be able to rename a view, either open the **Load view** or the **Save view** dialog window and click on the **[Rename]** button. The **Rename view** window opens afterwards.

Rename view '%1' to

Entry of a new name for the view.

Entry	**50 characters**

6.1.7.6 Deleting a view

Function: **Workplace / Database / Configuration ▶ View ▶ Load/save view… ▶ [Delete]**

To delete a view, open either the **Load view** or **Save view** dialog window and press the **[Delete]** button. The delete procedure must then be confirmed.

6.2 Administration

6.2.1 User administration

6.2.1.1 User administration

Dialog window: **Configuration ▶ Tools ▶ User administration...**

Overview

User groups and their members can be managed in the **User administration** dialog window. Access rights for menu items and functions, signature permissions and default views can be defined for the individual program parts for each user group. In the case of client/server systems, the user administration is globally valid for all connected clients (central user administration).

During installation, the three user groups **Administrators** (with the user **Admin1**), **Users** and **Removed users** (each without any users) are automatically created. All groups can be renamed; the **Administrators** group is the only group that cannot be deleted.

The user administration data can be exported and imported. In this way this data can be exchanged between different client/server systems.

The user administration data can be output as a PDF file with the **File ▶ Print (PDF)... ▶ User administration** menu item.

Structure

The **User administration** dialog window is divided into two parts, the size of which can be modified with the mouse. The user groups with their assigned users are listed in a tree in the left-hand part; the right-hand side shows details of the selected items.

Each user group, with the exception of the **Removed users** group, contains the following items:

- *Access rights*
  Assignment of access permissions to the four program parts and their menu bars.
- *(see chapter 6.2.1.2.3, page 540)*
  Assignment of signature permissions for methods and determinations.
- *Options*
  Definition of the view for the individual program parts.
- *Users*
  Details regarding the user.

Functions

The following functions can be carried out in the **User administration** dialog window:

- *Adding user groups*
- *Copying user groups*
- *Renaming user groups*
- *Deleting user groups*
- *Defining access permissions for user groups*
- *Define signature permissions for user groups*
- *Defining options for user groups*
- *Adding users*
- *Setting start password for new user*
- *Deactivating users*
- *Activating users*
- *Removing users*

6.2.1.2 User groups

6.2.1.2.1 User groups - Details

Dialog window: **Configuration ▶ Tools ▶ User administration...**

If a user group is selected in the left-hand side of the **User administration** dialog window, then details on this user group will be shown on the right-hand side together with a table containing all its members.

Group data

Group name

Shows the name of the user group.

Description

Description of the user group.

Entry	**256 characters**

[Rename group]

Rename the selected user group.

[Delete group]

Deletes the selected user group.

[Copy group]

Copy the selected user group.

[Add group]

Add a new user group.

Group members

The table showing the group members contains information about all members of the selected user group. The table can neither be edited nor sorted.

User

Short name of the user.

Full name

Full name of the user.

Status

Current user status.

Selection	**enabled** | **disabled**

enabled
The user can log in as usual.

disabled
The user can no longer log in. The administrator must first assign him or her the status **enabled** and provide him or her with a new start password.

[Add user]

Add a new user to the user group.

6.2.1.2.2 User administration - Access permissions

Dialog window: **Configuration ▶ Tools ▶ User administration...**

If the **Access rights** item is highlighted for a user group in the left-hand part of the **User administration** dialog window, then the access permissions of this group for program parts, menu items and functions will be shown as a tree in the right-hand side of the window and can be modified there. If one item is deactivated, then all the subitems belonging to it will also be automatically deactivated. If a subitem, e.g. the **Tools** menu, is deactivated in the configuration, then the box for the configuration is colored gray. Blocked functions are deactivated for the particular users, i.e. shown in gray.

Meaning of the icons:

›	Expand view	P	Program part
⌄	Collapse view	M	Menu item
☑	Full access to function(s)	F	Function
▬	Limited access to function(s)		
☐	No access to function(s)		

NOTE

All access permissions are switched on by default for the **Administrators** group and cannot be modified.

6.2.1.2.3 User administration - Signatures

Dialog window: **Configuration ▶ Tools ▶ User administration...**

If the **Signatures** item is highlighted for a user group in the left-hand part of the **User administration** dialog window, then the rights of this group will be shown in the right-hand part and can be modified there.

Permissions for methods

Signature level 1

If this check box is activated, then users in this user group can sign methods electronically at level 1.

Selection	**off** | **on**
Default value	**off**

Signature level 2 (Lock)

If this check box is activated, then users in this user group can sign methods electronically at level 2 and at the same time lock them against further modifications.

Selection	**off** | **on**
Default value	**off**

Delete signatures level 2

If this check box is activated, then users in this user group can delete all signatures at level 2. This means that the method can be edited again.

Selection	**off** | **on**
Default value	**off**

Permissions for determinations

Signature level 1

If this check box is activated, then users in this user group can sign determinations electronically at level 1.

Selection	**off** | **on**
Default value	**off**

Signature level 2 (Lock)

If this check box is activated, then users in this user group can sign determinations electronically at level 2 and at the same time lock them against further modifications.

Selection	**off** | **on**
Default value	**off**

Delete signatures level 2

If this check box is activated, then users in this user group can delete all signatures at level 2. This enables the determination to be edited again.

Selection	**off** | **on**
Default value	**off**

Permissions for Audit Trail

Delete records

If this check box is activated, then users in this user group can confirm the deletion of Audit Trail entries with their signature.

Selection	**off** | **on**
Default value	**off**

NOTE

All signature permissions are switched on as default settings in the **Administrators** group, but they can also be switched off.

Executable methods

Only methods with signature level 2

If this check box is activated, then only methods with signature level 2 can be started at the workplace by users in this user group.

Selection	**off** | **on**
Default value	**off**

6.2.1.2.4 User administration - Options

Dialog window: **Configuration ► Tools ► User administration...**

If the **Options** item is highlighted for a user group in the left-hand part of the **User administration** dialog window, then options for this group will be shown in the right-hand part and can be modified there.

Default workplace view

Selection of the view that will open in the program part **Workplace** as default when the user logs in.

Selection	**Selection of the defined workplace views**

Default database view

Selection of the view that will open in the **Database** program part as the default setting when the user logs in.

Selection	**Selection of the defined database views**

Default configuration view

Selection of the view that will open in the **Configuration** program part as default setting when the user logs in.

Selection	**Selection of the defined configuration views**

Default method group

Selection of the method group to be opened as the default setting for opening and saving methods.

Selection	**Selection of the defined method groups**

6.2.1.2.5 Adding a user group

Dialog window: **Configuration ▶ Tools ▶ User administration... ▶ [Add group] ▶ Add group**

In order to add a new user group with default settings, select an existing group and click on either the context-sensitive **Add group** menu item or the **[Add group]** button. Afterwards, the **Add group** dialog window opens.

Group name

Name of the new group.

Entry	**24 characters**

A new group with default settings containing no users is created under this name with **[OK]**. The **Description** field and the table of group members are empty.

6.2.1.2.6 Copying a user group

Dialog window: **Configuration ▶ Tools ▶ User administration... ▶ [Copy group] ▶ Copy group**

Dialog window:

In order to copy a user group and save it under a new name, select an existing group and click on either the context-sensitive menu item **Copy group** or the **[Copy group]** button. Afterwards, the **Copy group** dialog window opens.

Group name

Name of the new group.

Entry	**24 characters**

Pressing **[OK]** creates a new group under this name that has the same properties (access permissions, signature permissions, etc.) as the selected group; it does not contain any users. The **Description** field and the table of group members are empty.

6.2.1.2.7 Renaming a user group

Dialog window: **Configuration ▶ Tools ▶ User administration... ▶ [Rename group] ▶ Rename group**

In order to rename a selected user group, click on either the context-sensitive **Rename group** menu item or the **[Rename group]** button. Afterwards, the **Rename group** dialog window opens.

Group name

Entry of the new group name.

Entry	**24 characters**

6.2.1.2.8 Deleting a user group

Function: **Configuration ▶ Tools ▶ User administration... ▶ [Delete group]**

In order to delete a selected user group, click on either the context-sensitive **Delete group** menu item or the **[Delete group]** button. The group is then deleted.

NOTE

Deleting user groups is only possible if the group no longer contains any users.

6.2.1.3 User

6.2.1.3.1 User - Details

Dialog window: **Configuration ▶ Tools ▶ User administration...**

If a user in a user group is selected in the left-hand side of the **User administration** dialog window, then details on this user will be shown on the right-hand side.

User

Shows the short name of the user that must be entered in the **User** field at the time of login. This name is defined when a new user is created and cannot be subsequently modified.

Entry	**24 characters**

Full name

Full name of the user.

Entry	**256 characters**

Status

Shows the current status of the user. Only users of the **Administrators** group can modify the status.

Selection	**enabled** | **disabled** | **removed**

enabled
Users with the **enabled** status can log in as usual. An exception is the first login after the change in status from **disabled** or **removed** to **enabled**. If this is the case, then a **Start password** must be assigned with which this user can log in again.

disabled
Users with the **disabled** status can no longer log in. They will be automatically set to this status as soon as the number of login attempts defined in the **Security settings** has been exceeded.

removed
Users with the **removed** status can no longer log in. If the set status of a user is changed from **enabled** or **disabled** to **removed**, then the user will automatically be moved to the **Removed users** group. If the status of a removed user is changed back to **enabled** or **disabled**, then a dialog window will appear for selecting the group to which the user is to be assigned.

Start password

The invisible start password is displayed with six ***** characters which must be entered by a new user the first time that new user logs in or after a change in status from **disabled** or **removed** to **enabled**. The administrator must assign a new start password when adding a new user or when changing the status to **enabled**. If the user has logged in with the start password and then entered a new password afterwards, then the start password will be deleted again.

Entry	**50 characters**

[Set start password]

Opens the **Start password** dialog window. This button is active only for users with **enabled** status. If a user has forgotten his or her password, then the administrator can assign a new start password here.

User group

Current user group. The administrator can modify the group assignment of the user. The user is automatically moved to the new group. A user can also be moved to a new group with drag and drop.

Selection	**Selection of the defined user groups**

Remarks

Possibility of entering additional user information (e.g. function, address).

Entry	**1,000 characters**

6.2.1.3.2 Adding a user

Dialog window: **Configuration ▶ Tools ▶ User administration... ▶ [Add user] ▶ Add user**

There are two possible ways to add a new user:

- Select a user group and then the context-sensitive **Add user** menu item.
- Select a user group and click on the **[Add user]** button.

The **Add user** dialog window is then opened in both cases.

User

Short name of the new user that must be used to log in at program start. After the name has been entered, a **Start password** must be issued for the user to be entered in the user list.

Entry	**24 characters**

6.2.1.3.3 Setting a start password

Dialog window: **Configuration ► Tools ► User administration... ► [Set start password] ► Start password**

A start password can be assigned for the selected user with the **[Set start password]** button in the **User administration** dialog window. It is active only for newly created users or for those who have had their status set to **enabled** again. The **Start password** dialog window opens.

Start password

Entry of a new start password. Password options are not used for the start password.

Entry	**50 characters**

Confirm password

Confirmation of the start password.

Entry	**50 characters**

6.2.2 Security settings

6.2.2.1 Security settings

Dialog window: **Configuration ► Tools ► Security settings**

Overview

Parameters for login, password protection, Audit Trail and electronic signatures can be configured in the **Security settings** dialog window. They are used primarily to ensure that work is performed in accordance with the safety requirements contained in FDA Guidance 21 CFR Part 11.

With client/server systems, the security settings are globally valid for all connected clients.

Security settings can be exported and imported. This means that these settings can be exchanged between different client/server systems.

The security settings can be output as a PDF file with the **File ► Print (PDF)... ► Security settings** menu item.

Settings according to 21 CFR Part 11

Settings according to 21 CFR Part 11

on | off (Default value: **off**)

If this check box is activated, then the default settings pursuant to 21 CFR Part 11 will be activated on all tabs. At the same time, those check boxes which are required to be activated pursuant to 21 CFR Part 11 will be displayed against a gray background, i.e. they can no longer be edited.

NOTE

If the **Settings according to 21 CFR Part 11** check box is enabled, the **Modifying the document allowed** permission in the **Options** dialog under **Configuration ► Tools ► Options...** cannot be enabled.

Tabs

The security settings are configured on the following tabs:

- *Login / password protection*
  Settings for login and password protection
- *Audit Trail / Changes*
  Activation/deactivation of the Audit Trail and comments when methods, determinations or sample data are modified
- *Signatures*
  Options for electronic signatures
- *Default reasons*
  Definition of reasons for signing and modifying methods, determinations and sample data.

6.2.2.2 Login / password protection

Tab: **Configuration ► Tools ► Security settings ► Login/Password protection**

On the **Login/Password protection** tab, it is defined whether the user must log in with name only or with name and password and how the password must be monitored and constructed.

Login policies

Enforce login with user name

If this check box is **activated**, then each time the program starts the login window will appear, in which the user must enter his or her user name. If this check box is **deactivated**, no login is necessary and the user logged in under Windows will be adopted as the user name. If this is the case, then all subsequent parameters are deactivated.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Enforce login with password

If this check box is **activated**, then each time the program starts the login window will appear, in which the user must enter not only his or her user name but also a password. If this option is **disabled**, then all of the subsequent parameters will be deactivated.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Password monitoring by MagIC Net

If this option is **enabled**, then the password will be monitored by **MagIC Net** in accordance with the subsequent parameters.

Selection	**on** | **off**
Default value	**on**

Password monitoring by Windows

If this option is **enabled**, then the password will be monitored in accordance with the parameters defined in Windows. The parameters for password protection are deactivated in this case.

Selection	**on** | **off**
Default value	**off**

CAUTION

In order to prevent an unwanted login by means of the **Guest** user category that is defined by default in Windows when performing password monitoring with Windows, it is imperative that this user also be assigned a password or (even better) be deactivated.

CAUTION

If this option is enabled, then the user names in **Windows** and **MagIC Net** must necessarily match, because otherwise the user will no longer be able to log in to **MagIC Net**. In order to ensure this, once this selection has been made, the **Test login** dialog window *(see chapter 6.2.2.3, page 551)* appears in which the logged-in user must log in with his or her Windows password. If this test login fails, then the **Security settings** dialog will remain open.

Maximum number of login attempts

If this check box is **enabled**, then a user will be set to the **disabled** status as soon as the number of login attempts defined here has been exceeded. A user with the status **disabled** can no longer start the program. The counter for login attempts is reset to zero for all users with each restart.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Input range	**2 to 5**
Default value	**3**

Message by e-mail

If this check box is **activated**, then an e-mail will be sent to the address defined under **[E-mail...]** as soon as the defined number of login attempts has been exceeded.

Selection	**on** | **off**
Default value	**off**

[E-mail...]

This button opens the **Send e-mail** window *(see chapter 6.2.2.7, page 555)* for defining the e-mail parameters.

Logout policies

New login only for same user

If this check box is **activated**, then only the same user can log in again after a manual logout. Users with administrator rights can always log in. If this option is enabled, then the following option is automatically enabled and inactive.

Selection	**on** | **off**
Default value	**off**

NOTE

If the automatic logout is enabled (see below), then only the same user or a user with administrator rights can log on again, no matter what the setting for this option is.

No editing of workplaces in 'BUSY' status

If this check box is **activated**, then, after a user has logged out manually, a newly logged-in user can neither edit data nor trigger actions on the workplaces still open with running determinations. These workplaces will

only be available again when all determinations are finished. For running determinations, the old user name still applies (Audit Trail entries, Save, Export, etc.). Exceptions are the cancellation of a determination with **[Stop]** and **[Emergency stop MagIC Net]**, which are always possible for all running determinations and series.

If this check box is **deactivated**, then the newly logged-in user has all of the rights for the opened workplaces which he or she has on the basis of his or her group membership. The new user name is valid, effective immediately, for the ongoing determinations (Audit Trail entries, Save, Export, etc.).

Selection	**on** | **off**
Default value	**off**

Automatic logout after

If this check box is **activated**, then the user will be logged out automatically when no operating functions have been carried out with the keyboard or the mouse within this time. After this automatic logout, only a user belonging to the same user group as the previously logged-out user or a user with administrator rights can log in again.

Selection	**on** | **off**
Default value	**off**

Input range	**1 to 60 min**
Default value	**10 min**

NOTE

The immediate stop of all ongoing determinations at all active workplaces with the **[Emergency stop MagIC Net]** button remains possible even after an automatic logout.

Password policies

NOTE

If the **Password monitoring by Windows** option is enabled, then the parameters for password protection are deactivated. Compliance with the directives pursuant to 21 CFR Part 11 must then be ensured by the administrator in Windows.

Enforce unique password

Activating this check box ensures that a user can use a given password only once.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Enforce use of special characters

Activating this check box ensures that the password must contain at least one special character (@, #, ~, etc.).

Selection	**on** | **off**
Default value	**off**

Minimum password length

Activating this check box ensures that the password must contain at least the indicated number of characters.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Input range	**1 to 10 characters**
Default value	**6 characters**

Passwords expire every

Activating this check box ensures that the user must enter a new password before the validity period expires. When a user logs in whose password will expire within the next 10 days, a corresponding message will appear. If the validity period has expired, the user can only log in if he or she changes the password.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Input range	**1 to 999 Days**
Default value	**365 Days**

6.2.2.3 Test login for password monitoring by Windows

Tab: **Configuration ► Tools ► Security settings ► Login/Password protection ► Test login**

If the **Password monitoring by Windows** option *(see chapter 6.2.2.2, page 547)* is activated, then the Windows password of the user must be entered in this dialog window. The test login is used to check whether the user name matches the Windows user name.

User

Shows the current user name.

Password

Entry of the Windows password.

Password monitoring by Windows can be used only when the test login is successful.

6.2.2.4 Audit Trail / Modifications

Tab: **Configuration ► Tools ► Security settings ► Audit Trail/Modifications**

The recording of the Audit Trail is switched on and off on the **Audit Trail/ Modifications** tab. When a method, a determination or sample data is modified, it can also be defined whether or not a reason and a comment must be given for the modification.

Audit Trail

Enable Audit Trail

If this check box is **activated** then all program actions will be automatically recorded; these are defined as Audit Trail actions.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Modifications

This option is not available in MagIC Net Basic.

Comment on modification of methods

If this check box is **enabled**, then each time that a method is modified a modification reason and a modification comment must be entered; these are saved in the method and shown in the method history. The reason and comments are also recorded in the Audit Trail.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Comment on modification of determinations

If this check box is **activated**, then each time that a determination is modified a modification reason and a modification comment must be entered; these are saved in the determination and shown in the database in the **Information** subwindow on the **Determination** tab. The reason and comments are also recorded in the Audit Trail.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Comment on modification of sample data (live)

If this check box is **activated** then each time that a determination is modified a modification reason and a modification comment must be entered; these are saved in the determination and shown in the database in the **Information** subwindow on the **Sample** tab. The reason and comments are also recorded in the Audit Trail.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Reprocessing with history

This option is not available in MagIC Net Basic.

on | off (Default value: **on**)

The behavior during reprocessing is set with this parameter for the complete MagIC Net installation (server and all clients). In the case of **on**, a new version of the determination will be generated and saved in the database each time a determination is reprocessed. In the case of **off**, *no* new determination version will be generated (unless only the original version exists).

Selection	**on** | **off**
Default value	**off** FDA default: **on**

6.2.2.5 Signatures

Tab: **Configuration ► Tools ► Security settings ► Signatures**

The parameters for the electronic signature can be configured on the **Signatures** tab.

Inactivity delay

If this check box is **activated**, then the dialog window for signing will be automatically closed when the entered time limit has expired.

Selection	**on** | **off**
Default value	**off**

Input range	**1 to 60 min**
Default value	**10 min**

Remove password after signature

If this check box is **activated**, then the password must be entered again after each signature.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

Sign each determination separately

If this check box is **activated**, then each determination selected in the determination overview must be signed individually.

Selection	**on** | **off**
Default value	**off** FDA default: **on** (can no longer be edited)

6.2.2.6 Default reasons

Tab: **Configuration ► Tools ► Security settings ► Default reasons**

The reasons which must be entered when signing methods and determinations or when modifying methods, determinations and sample data are defined on the **Default reasons** tab.

Category

Selection of the category for which the reasons are to be defined.

Selection	**Signature level 1** | **Signature level 2** | **Modification of methods** | **Modification of determinations** | **Modification of sample data**
Default value	**Signature level 1**

Reasons

Shows the reasons defined for the selected category.

Entry	**50 characters**

▲

Moves the text upward (modifies sequence).

▼

Moves the text downward (modifies sequence).

[New]

Add a new reason.

[Edit]

Edit the selected reason.

[Delete]

Deletes the selected reason.

6.2.2.7 Sending e-mail

Dialog window: **Configuration ▶ Tools ▶ Security settings ▶ Login/Password protection ▶ [E-mail...] ▶ Send e-mail**

Mail to

E-mail address of the recipient.

Entry	**200 characters**

Subject

Title for describing the message.

Entry	**200 characters**

Message

The message defined here is sent as an e-mail when the maximum permitted number of login attempts has been exceeded.

The text editor for entering or editing the message is opened with T or by double-clicking on the text field.

Selection	**Text (unlimited)**

Sender

Mail from

E-mail address of the sender.

Entry	**200 characters**

SMTP Server

Address of the SMTP mail server.

Entry	**200 characters**

Port

Port number of the SMTP mail server.

Input range	**1 to 65,536**
Default value	**25**

Encryption

Selection of the encryption type for data transmission to the SMTP mail server.

Selection	**None** | **SSL** | **StartTLS**
Default value	**None**

Authentication

on | off (Default value: **off**)

Check box for activation the authentication of the sender when sending the e-mail and for selecting the authentication method.

Selection	**SMTP** | **SMTP after POP**
Default value	**SMTP**

POP server

Address of the POP mail server.

Entry	**200 characters**

Port

Port number of the POP mail server.

Input range	**1 to 65,536**
Default value	**110**

User

Name of the user for accessing the mail server. The name need not match the Windows user name.

Entry	**200 characters**

Password

Password for accessing the mail server. This password need not match the Windows password.

Entry	**200 characters**

6.2.3 Program administration

6.2.3.1 Program administration

Dialog window: **Configuration ▶ Tools ▶ Program administration**

Overview

Backup directories and licenses can be managed in the **Program administration** dialog window.

Tabs

The parameters for program administration are defined on the following tabs:

- *Backup directories*
  List of the defined backup directories.
- *Clients*
  List of computers on which **MagIC Net** is installed.

- *Licenses*
  List of installed licenses with number of clients. This tab is only shown on the server of a client/server installation.

6.2.3.2 Backup directories

6.2.3.2.1 Backup directories

Tab: **Configuration ► Tools ► Program administration ► Backup directories**

Table with the defined backup directories. Click on the column title to sort the table according to the selected column in either ascending or descending order. The **Default backup directory** directory is created during installation.

NOTE

The following buttons are active only on the server in client/server systems. They are inactive for the individual clients.

[New]

Add a new backup directory *(see chapter 6.2.3.2.2, page 557)*.

[Edit]

Edit the selected backup directory *(see chapter 6.2.3.2.3, page 558)*.

[Delete]

Delete the selected backup directory.

NOTE

The **Default backup directory** cannot be deleted.

6.2.3.2.2 Creating a new backup directory

Dialog window: **Configuration ► Tools ► Program administration ► Backup directories ► [New] ► New backup directory**

Name

Name for the backup directory.

Entry	**50 characters**

Directory

Entry or selection (with …) of the path for the backup directory.

Entry	**1000 characters**

NOTE

If the backup directory is on a network drive, the backup date should be added manually to the **Backup name** when backing up because the backup date information is not available when the data is restored.

NOTE

Make sure that you have read and write permission for the selected directory.

6.2.3.2.3 Editing the backup directory

Dialog window: **Configuration ▶ Tools ▶ Program administration ▶ Backup directories ▶ [Edit] ▶ Edit backup directory**

Name

Name for the backup directory.

Entry	**50 characters**

NOTE

The **Default backup directory** created during installation cannot be renamed.

Directory

Entry or selection (with ...) of the path for the backup directory.

Entry	**1000 characters**

NOTE

If the backup directory is on a network drive, the backup date should be added manually to the **Backup name** when backing up because the backup date information is not available when the data is restored.

NOTE

Make sure that you have read and write permission for the selected directory.

6.2.3.3 Clients

Tab: **Configuration ▶ Tools ▶ Program administration ▶ Clients**

Table with information about the computers on which **MagIC Net** is installed. The table cannot be edited. Click on the column title to sort the table according to the selected column in either ascending or descending order.

Client ID

Shows the ID for the client that was entered during the client/server installation.

Computer name

Shows the name of the computer on which the client is installed.

Status

Shows whether **MagIC Net** has been started on the client (**active**) or not (**inactive**).

NOTE

The content of the tab **Clients** can also be displayed via the shortcut

in the directory **..\Metrohm\magic\bin** (available only on the server) if **MagIC Net** is not running.

6.2.3.4 Licenses

Tab: **Configuration ▶ Tools ▶ Program administration ▶ Licenses**

Table with the licenses that are installed on the server (for **MagIC Net Multi**) or on the local server (for **MagIC Net Professional**). The table cannot be edited.

NOTE

In client/server systems, this tab is visible only on the server and only for members of the **Administrators** user group.

License code

Shows the entered license code.

Number of clients

Shows the number of clients that have been enabled with the license code.

[Add licenses]

Add new, additional licenses *(see chapter 6.2.3.5, page 560)*.

NOTE

The supported Windows versions have a UAC (User Account Control), which permits running tasks either as non-administrator or as administrator (without changes of user, switching off or similar). For more information about this function, see *https://docs.microsoft.com/en-us/windows/security/identity-protection/user-account-control/how-user-account-control-works*.

This function can cause difficulties with client/server installations of **MagIC Net**. Therefore, to add additional licenses, proceed as follows:

- **For new installations**
  - Start the program as an administrator.
  - Add the license code for additional licenses as usual. The **license.mlic** file in the **C:\Program Files (x86)\Metrohm\MagIC Net\bin** directory contains both license codes.
- **For existing installations**
  - In the **C:\Users\'Username'\AppData\Local\VirtualStore\Program Files (x86)\Metrohm\MagIC Net\bin** directory, check whether there is a file present named **license.mlic** and delete it if necessary.
  - Start the program as an administrator.
    Add the license code for additional licenses as usual. The **license.mlic** file in the **C:\Program Files (x86)\Metrohm\MagIC Net\bin** directory contains both license codes.

Additional information on this topic can be found in the installation manual, which is saved in the **C:\Program Files (x86)\Metrohm\MagIC Net\doc** directory.

6.2.3.5 Adding licenses

Dialog window: **Configuration ▶ Tools ▶ Program administration ▶ Licenses ▶ [Add licenses] ▶ Add licenses**

The **Tools ▶ Program administration ▶ Licenses ▶ [Add licenses]** menu in the **Configuration** program part opens the **Add licenses** dialog window, in which the new license code can be entered.

License code

Entry of the license code.

6.3 Configuration data

6.3.1 Export/import

6.3.1.1 Exporting configuration data

Dialog: **Configuration ► File ► Export... ► Export configuration data**

File ► Export... opens the **Export configuration data** dialog window, in which the following parts of the configuration database can be selected for export:

Devices

on | off (Default value: **on**)

Exporting configuration data for devices *(see chapter 6.5.1, page 604)*.

Solutions

on | off (Default value: **on**)

Exporting configuration data for solutions *(see chapter 6.8.1, page 630)*.

EPC solutions

on | off (Default value: **on**)

Exporting configuration data for EPC solutions *(see chapter 6.9, page 643)*.

Common variables

on | off (Default value: **on**)

Exporting configuration data for common variables *(see chapter 6.12.1, page 666)*.

Rack data

on | off (Default value: **on**)

Exporting configuration data for sample changer racks *(see chapter 6.11.1, page 659)*.

Columns

on | off (Default value: **on**)

Exporting configuration data for separation columns *(see chapter 6.6.1, page 610)*.

Eluents

on | off (Default value: **on**)

Exporting configuration data for eluents *(see chapter 6.7.1, page 623)*.

Rotors

Exporting configuration data for rotors *(see chapter 6.14.1, page 683)*.

Accessories

on | off (Default value: **on**)

Exporting configuration data for accessories *(see chapter 6.10.1, page 651)*.

Configuration views

on | off (Default value: **on**)

Exporting saved configuration views *(see chapter 3.1.7.1, page 119)*.

Workplace views

on | off (Default value: **on**)

Exporting saved workplace views *(see chapter 3.1.7.1, page 119)*.

Database views

on | off (Default value: **on**)

Exporting saved database views *(see chapter 3.1.7.1, page 119)*.

Export templates

on | off (Default value: **on**)

Exporting saved export templates *(see chapter 4.6.1, page 276)*.

Control chart templates

on | off (Default value: **on**)

Exporting saved control chart templates *(see chapter 4.5.1, page 271)*.

E-mail templates

on | off (Default value: **on**)

Exporting saved e-mail templates *(see chapter 6.3.3.3, page 572)*.

Sample assignment table

on | off (Default value: **on**)

Exporting the saved sample assignment table *(see chapter 3.5, page 151)*.

Security settings

on | off (Default value: **on**)

Exporting security settings *(see chapter 6.2.2.1, page 546)*.

User administration

on | off (Default value: **on**)

Exporting user administration *(see chapter 6.2.1.1, page 537)*.

[OK]

The **Save** dialog window for saving data, in which the name and directory for the export file must be entered, opens. The selected configuration data is then saved in a file with the extension **.mcfg**.

6.3.1.2 Importing configuration data

Dialog: **Configuration ► File ► Import… ► Import configuration data**

NOTE

Data that is not present in the export file cannot be selected.

Devices

on | off (Default value: **on**)

Importing configuration data for devices *(see chapter 6.5.1, page 604)*.

Solutions

on | off (Default value: **on**)

Importing configuration data for solutions *(see chapter 6.8.1, page 630)*.

EPC solutions

on | off (Default value: **on**)

Importing configuration data for EPC solutions *(see chapter 6.9, page 643)*.

Common variables

on | off (Default value: **on**)

Importing configuration data for common variables *(see chapter 6.12.1, page 666)*.

Rack data

on | off (Default value: **on**)

Importing configuration data for sample changer racks *(see chapter 6.11.1, page 659)*.

Columns

on | off (Default value: **on**)

Importing configuration data for separation columns *(see chapter 6.6.1, page 610)*.

Eluents

on | off (Default value: **on**)

Importing configuration data for eluents *(see chapter 6.7.1, page 623)*.

Rotors

Importing configuration data for rotors *(see chapter 6.14.1, page 683)*.

Accessories

on | off (Default value: **on**)

Importing configuration data for accessories *(see chapter 6.10.1, page 651)*.

Configuration views

on | off (Default value: **on**)

Importing saved configuration views *(see chapter 3.1.7.1, page 119)*.

Workplace views

on | off (Default value: **on**)

Importing saved workplace views *(see chapter 3.1.7.1, page 119)*.

Database views

on | off (Default value: **on**)

Importing saved database views *(see chapter 3.1.7.1, page 119)*.

Export templates

on | off (Default value: **on**)

Importing saved export templates *(see chapter 4.6.1, page 276)*.

Control chart templates

on | off (Default value: **on**)

Importing saved control chart templates *(see chapter 4.5.1, page 271)*.

E-mail templates

on | off (Default value: **on**)

Importing saved e-mail templates *(see chapter 6.3.3.3, page 572)*.

Text templates

on | off (Default value: **on**)

Importing saved text templates *(see chapter 3.6, page 153)*.

Sample assignment table

on | off (Default value: **on**)

Importing a saved sample assignment table *(see chapter 3.5, page 151)*.

Security settings

on | off (Default value: **on**)

Importing security settings *(see chapter 6.2.2.1, page 546)*.

User administration

on | off (Default value: **on**)

Importing user administration *(see chapter 6.2.1.1, page 537)*.

NOTE

If a configuration database with security settings or user administration is imported, the settings of the imported configuration database are not applied immediately.

Do not print the configuration report directly after importing a configuration database. The printed settings do not correspond to the actual settings.

Check the security settings and user administration after importing a configuration database. Otherwise there is a risk of being excluded from the application. After the settings have been checked, restart the computer. In a client/server system, restart all clients after importing a configuration database on a client.

Print the configuration report only after restarting the clients, if desired.

[OK]

The selected data is imported.

6.3.2 Backing up/restoring

6.3.2.1 Backing up configuration data automatically

Dialog window: **Configuration ► File ► Backup ► Automatically ► Backup configuration data automatically**

Automatic backup

on | off (Default value: **off**)

If this check box is **activated**, then the configuration database is saved automatically to the defined backup directory at the desired time interval. The entire configuration database (including method groups and methods) is saved at this time.

If this check box is **deactivated**, then the following parameters cannot be edited.

Last backup

Shows date and time of the last configuration data backup.

Next backup

Date and time at which the next backup is to be carried out. … opens the **Next backup** window to select the date *(see chapter 2.5.1, page 82)*.

Default value	**Last backup + 1 month**

Interval

Entry of the time interval after which an automatic backup will take place. With each automatic or manual backup, the interval entered here will be added to the date of the **Last backup** and shown in the **Next backup** field.

Input range	**1 to 999**
Default value	**1**
Selection	**day(s)** | **week(s)** | **month(s)** | **year(s)**
Default value	**month(s)**

Backup directory

Selection of a predefined backup directory *(see chapter 6.2.3.2.1, page 557)*.

NOTE

Make sure that you have read and write permission for the selected directory.

6.3.2.2 Backing up configuration data manually

Dialog window: **Configuration ▶ File ▶ Backup ▶ Manually ▶ Backup configuration data manually**

Backup target

Backup directory

Selection of a predefined backup directory *(see chapter 6.2.3.2.1, page 557)*.

NOTE

Make sure that you have read and write permission for the selected directory.

Backup name

Selection of an already existing name or entry of a new name for the backup file. If an existing backup file is selected, it will be overwritten.

Entry	**50 characters**
Selection	**'Backup name'**

NOTE

If the backup directory is on a network drive, then the date of the backup should be added to the **Backup name**, because the backup date information is not available when the data is restored.

[Start]

Starts the manual backup of the complete configuration database (including method groups and methods).

Starts the manual backup of the complete configuration database.

6.3.2.3 Restoring configuration data

Dialog window: **Restore configuration data**

Dialog window "Restore configuration data"

Backup directory

Selection of a directory predefined in the program administration that contains the backed-up configuration database.

Selection	**'Backup directories'**

Backup name

Selection of a backup file.

Selection	**'Backup files'**

Backup date

Shows the time at which the configuration database was backed up. This information is not available if the backup file is located on a network drive.

Database name

Shows the name of the configuration database. This information is not available if the backup file is located on a network drive.

Size

Shows the size of the configuration database in KB.

Save as

Shows the name under which the configuration database will be restored.

[Start]

Starts restoration of the configuration database. After the start, a progress bar appears in the window. The dialog window closes automatically once the backup has been completed.

6.3.3 Templates

6.3.3.1 Templates - Input lines

6.3.3.1.1 Managing templates for input lines

Dialog window: **Configuration ► Tools ► Templates ► Input lines ► Templates for input lines**

In the **Templates for input lines** dialog window, client-specific bit patterns for scanning remote input signals can be defined which can be selected with the **SCAN** command and in Manual Control. The table with the defined templates cannot be edited, but it can be sorted according to

the selected column in ascending or descending order by clicking on the column title.

In the **Templates for input lines** dialog window, client-specific bit patterns for scanning remote input signals can be defined which can be selected with the **Scan lines** time program command and in Manual Control. The table with the defined templates cannot be edited, but it can be sorted according to the selected column in ascending or descending order by clicking on the column title.

[New]

Create a new template *(see chapter 6.3.3.1.2, page 569)*.

[Edit]

Edit the selected template *(see chapter 6.3.3.1.2, page 569)*.

[Delete]

Deletes the selected template.

6.3.3.1.2 Editing templates for input lines

Dialog window: **Configuration ▶ Tools ▶ Templates ▶ Input lines ▶ Templates for input lines ▶ [New] / [Edit] ▶ New template / Edit template**

With **[New]** or **[Edit]** the dialog window **New template** or **Edit template** opens for entering a new template or for editing an existing template.

Signal name

Name of the template for the input signal.

Entry	**25 characters**

Input signal

Entry of the bit pattern for the input signal with exactly 8 characters. It is possible to enter the characters

0 = Line inactive,

1 = Line active and

***** = Any line status.

Selection	**Bit pattern with 8 characters (0, 1, *) | **********
Default value	************

The input lines and bits are numbered from right to left:

Input	7 6 5 4 3 2 1 0
Bit	7 6 5 4 3 2 1 0

Example: *******1 expects an active input line 0 (**1** = set). For example, this line is set by a Titrino after a titration has been completed and the Titrino can accept a start signal again.

NOTE

Input lines that are of no interest or for which no defined condition can be predicted should be masked with an asterisk *****.

6.3.3.2 Templates - Output lines

6.3.3.2.1 Managing templates for output lines

Dialog window: **Configuration ▶ Tools ▶ Templates ▶ Output lines... ▶ Templates for output lines**

Client-specific bit patterns for setting remote output signals can be defined in the dialog window **Templates for output lines**; these can be selected with the **CTRL** command and in Manual Control. The table with the defined templates cannot be edited, but it can be sorted according to the selected column in ascending or descending order by clicking on the column title.

Client-specific bit patterns for setting remote output signals can be defined in the **Templates for output lines** dialog window; these can be selected with the **Set lines** time program command and in manual control. The table with the defined templates cannot be edited, but it can be sorted according to the selected column in ascending or descending order by clicking on the column title.

[New]

Create a new template *(see chapter 6.3.3.2.2, page 570)*.

[Edit]

Edit the selected template *(see chapter 6.3.3.2.2, page 570)*.

[Delete]

Deletes the selected template.

6.3.3.2.2 Editing templates for output lines

Dialog window: **Configuration ▶ Tools ▶ Templates ▶ Output lines ▶ Templates for output lines ▶ [New] / [Edit] ▶ New template / Edit template**

With **[New]** or **[Edit]** the dialog window **New template** or **Edit template** opens for entering a new template or for editing an existing template.

Creating new template or editing template

With **[New]** or **[Edit]** the dialog window **New template** or **Edit template** opens for entering a new template or for editing an existing template.

Signal name

Name of the template for the output signal.

Entry	**25 characters**

Output signal

Entry of the bit pattern for the output signal with exactly 14 characters.

It is possible to enter the characters

0 = Line inactive,

1 = Line active,

***** = Any line status and

p = Set pulse

Selection	**Bit pattern with exactly 14 characters (0, 1, *, p) | ****************
Default value	******************

The output lines and bits are numbered from right to left:

Output	13 12 11 10 9 8 7 6 5 4 3 2 1 0
Bit	13 12 11 10 9 8 7 6 5 4 3 2 1 0

Example: **********1*** sets the output line 1 to active (= set), which would result in a Stop command for a connected Titrino, for example. **************0*** sets the line to inactive.

NOTE

We recommend masking the irrelevant output lines with an asterisk ***** so as not to modify these line statuses.

Pulse duration

Duration of the transmitted pulse.

Input range	**100 to 1,000 ms**
Default value	**200 ms**

Examples for 765 Dosimat

Parameters	Bit pattern	Function
Start Dos1	*********p********	Starts Dosimat 1 (Titrino via "activate")
Start Dos2	*******p**********	Starts Dosimat 2 (Titrino via "activate")
Start Dos*	*******p*p********	Starts Dosimat 1 and 2 (Titrino via "activate")

6.3.3.3 Templates - E-mail

6.3.3.3.1 Managing e-mail templates

Dialog window: **Configuration ► Tools ► Templates ► E-mail templates... ► E-mail templates**

The saved e-mail templates are displayed in a table in the **E-mail templates** dialog window. The table cannot be edited, but with a click on the column title the table can be sorted according to the selected column in either ascending or descending order.

Name

Name of the e-mail template.

Recipient

E-mail address of the recipient.

The **[Edit]** menu below the list of e-mail templates or a right-click on the table opens a menu with the following menu items:

New...	Create a new template. The **Edit e-mail template** window opens, in which a new template can be defined *(see chapter 2.7.3, page 112)*.
Properties...	Edit the selected template. The **Edit e-mail template** window opens, in which the template can be edited *(see chapter 2.7.3, page 112)*.
Copy	Copy the selected template and save it under the name **'Template name'_#**.
Paste	Paste the selected e-mail template(s) after copying using the **Copy** menu item.
Delete	Deletes the selected template.
Send test E-mail	Sends test e-mail with the selected e-mail template.

6.3.3.3.2 Edit e-mail template

Dialog window: **Configuration ▶ Tools ▶ Templates ▶ E-mail templates... ▶ E-mail templates ▶ [New] / [Properties] ▶ Edit e-mail template**

With **[New]** or **[Edit]** in the dialog window **E-mail templates**, the dialog window **Edit e-mail template** opens for entering a new template or for editing an existing template.

E-mail template

Name of the e-mail template.

Entry	**1 - 16 characters**

Recipient

E-mail address(es)

E-mail address of the recipient. If there are several recipients, the addresses must be separated with a semicolon.

Entry	**1–1,024 characters**

Sender

E-mail address

E-mail address of the sender.

Entry	**1 - 200 characters**

SMTP server

Address of the SMTP mail server.

Entry	**1 - 200 characters**

Port

Port number of the SMTP mail server.

Input range	**1 to 65,536**
Default value	**25**

Encryption

Selection of the encryption type for data transmission to the SMTP mail server.

Selection	**None** | **SSL** | **StartTLS**
Default value	**None**

Authentication

on | off (Default value: **off**)

Check box for activating the authentication of the sender when sending the e-mail and selection of the authentication method.

Selection	**SMTP** | **SMTP after POP**
Default value	**SMTP**

POP server

Address of the POP mail server.

Entry	**3 - 200 characters**

Port

Port number of the POP mail server.

Input range	**1 to 65,536**
Default value	**110**

User

Name of the user for accessing the mail server. The name need not match the Windows user name.

Entry	**2 - 50 characters**

Password

Password for accessing the mail server. This password need not match the Windows password.

Entry	**0–50 characters**

6.3.4 Options

6.3.4.1 Options - Overview

Dialog window: **Configuration ▶ Tools ▶ Options... ▶ Options**

General program properties can be set on the following tabs under **Tools ▶ Options...**:

- *General*
  Selection of the dialog language and pressure unit.
- *Error handling*
  Settings for the emergency stop button and safety shutdown.
- *Save*
  Settings for saving on exiting the program.
- *PDF*
  Settings for PDF files.

6.3.4.2 Options - General

Tab: **Configuration ▶ Tools ▶ Options... ▶ Options ▶ General**

Dialog language

Selection of the dialog language.

NOTE

The program must be restarted for the modified setting to become effective.

Selection	**German** | **English** | **Additional languages (dependent on installed language patches)**
Default value	**English**

Unit

Pressure

Selection of the unit for the pressure.

Selection	**MPa** | **bar** | **psi**
Default value	**MPa**

Appearance

Selection of the color theme.

Selection	**MagIC Net Light** | **MagIC Net Dark**
Default value	**MagIC Net Light**

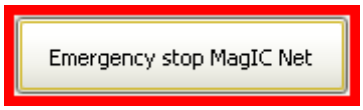
6.3.4.3 Options - Error handling

Tab: **Configuration ▶ Tools ▶ Options... ▶ Options ▶ Error handling**

Emergency stop button

If this option is activated, then the Emergency stop button will be shown in all program parts.

Selection	**On** | **Off**
Default value	**Off**



This emergency stop button can be moved to any position with the left mouse button pressed down and is always shown at the very top of the screen both in the program window and outside it on the Windows desktop. A mouse click on this button immediately stops all running determi-

nations on all active workplaces and stops all running devices. The emergency stop is effective even if no user is logged in, e.g. when the user has been logged out automatically.

Emergency shut-down at hardware errors

on | off (Default value: **on**)

If this option is activated, the devices are automatically shut down in the event of device malfunctions.

Shut-down hardware if messages are not acknowledged:

Choice of the moment when the devices should be shut down.

Selection	**immediately** | **after x hours**
Default value	**immediately**

after x hours

Time delay until the devices are shut down.

Input range	**0.1 to 100.0 Hours**
Default value	**0.1 Hours**

6.3.4.4 Options - Save

Tab: **Configuration ► Tools ► Options... ► Options ► Save**

Save on closing

It can be defined here which settings are to be saved when the program is exited. If the option is **enabled**, the current view with its settings will be saved automatically when the program is exited. If the option is **disabled**, then any modifications that may have been made to the view will not be saved and the original, manually saved view will be loaded the next time that the program is started.

Workplace settings

on | off (Default value: **off**)

Activates/deactivates the saving of the workplace view when exiting.

Database settings

on | off (Default value: **off**)

Activates/deactivates the saving of the database view when exiting.

Configuration settings

on | off (Default value: **off**)

Activates/deactivates the saving of the configuration view when exiting.

6.3.4.5 Options - PDF

Tab: **Configuration ▶ Tools ▶ Options... ▶ Options ▶ PDF**

Security permissions for PDF files

Content copying or extraction allowed

on | off (Default value: **on**)

If this check box is **deactivated**, then content cannot be either copied or taken from the PDF file.

Printing allowed

on | off (Default value: **on**)

If this check box is **deactivated**, then the PDF file cannot be printed.

Adding or changing comments allowed

on | off (Default value: **on**)

If this check box is **deactivated**, then comments and form fields can neither be added nor changed.

Modifying the document allowed

on | off (Default value: **on**)

If this check box is **deactivated**, then no changes can be made to the PDF file. The check box can only be activated if the **Adding or changing comments allowed** is also activated. If the check box is activated, then all other safety permissions for PDF files will also be activated.

In order to merge several PDF files into one PDF file, this permission must be activated.

NOTE

The **Modifying the document allowed** permission can be enabled only if the **Settings according to 21 CFR Part 11** check box in the **Security settings** dialog under **Configuration ▶ Tools ▶ Security settings...** is not enabled.

NOTE

Changing this option affects all PDF files, except when printing the Audit Trail.

6.4 Audit Trail

6.4.1 Audit Trail - General

6.4.1.1 Audit Trail - Definition

Program window: **Configuration ► Tools ► Audit Trail... ► Audit Trail**

Definition

The term **Audit Trail** means the FDA-compliant protocolling of all user actions with which data is generated, modified or deleted in **MagIC Net**. Each of these actions is saved as a line in the Audit Trail table together with the date, time and name of the logged-in user.

Organization

All Audit Trail data is saved in the configuration database and can be backed up and restored together with this database. In the **local server systems** (**MagIC Net Professional**) this is stored in the program directory of the computer on which the program has been installed. In the **client/server systems** (**MagIC Net multi**) the Audit Trail data is stored centrally on the server and contains all the actions taking place on all the computers (clients) that are connected to this server.

Configuration

Recording the Audit Trail actions can be switched on and off in the Security settings *(see chapter 6.2.2.4, page 552)*.

6.4.1.2 Audit Trail - User interface

Program window: **Configuration ► Tools ► Audit Trail... ► Audit Trail**

Elements

The user interface of the **Audit Trail** program window comprises the following elements:

- *Menu bar*
- *Toolbar*
- *Filter selection*
- *Audit Trail table*
- *Navigation bar*

6.4.1.3 Audit Trail - Menu bar

6.4.1.3.1 Audit Trail - Main menus

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

The menu bar in the **Audit Trail** program window contains the following main menu items:

- *File*
  Print, export, archive, delete Audit Trail.
- *View*
  Update table, define column display.
- *Filter*
  Define and use special filters and quick filters.
- *Tools*
  Monitor Audit Trail. Open installation log. Verify exported and archived Audit Trail files.
- *Help*
  Open program help, display program information.

6.4.1.3.2 Audit Trail - File menu

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

Print (PDF)...	Output Audit Trail data sets as PDF file *(see chapter 6.4.2.8, page 592)*.
Export...	Export Audit Trail data sets *(see chapter 6.4.2.5, page 590)*.
Archive...	Archive Audit Trail data sets *(see chapter 6.4.2.6, page 591)*.
Delete	Delete archived Audit Trail data sets *(see chapter 6.4.2.7, page 591)*.
Close	Close the Audit Trail window.

6.4.1.3.3 Audit Trail - View menu

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

Update	Update Audit Trail table *(see chapter 6.4.2.4, page 590)*.
Column display...	Define columns for the Audit Trail table *(see chapter 6.4.2.2, page 584)*.

6.4.1.3.4 Audit Trail - Filter menu

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

Last filter	Apply the last quick or special filter again *(see chapter 6.4.2.3.2, page 585)*.
Quick filter	Apply the quick filter *(see chapter 6.4.2.3.3, page 585)*.

Special filter...	Define and apply a special filter *(see chapter 6.4.2.3.4, page 586)*.
Remove filter	Removes the current filter *(see chapter 6.4.2.3.5, page 589)*.

6.4.1.3.5 Audit Trail - Tools menu

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

Monitoring	Define Audit Trail table monitoring *(see chapter 6.4.2.9, page 593)*.
Installation Log	Open the folder with the log files of the installation.
Verify export / archive	Check the checksum of an exported or archived Audit Trail file *(see chapter 6.4.2.10, page 594)*.

6.4.1.3.6 Audit Trail - Help menu

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

MagIC Net Help	Opens MagIC Net Help.
About	Displays information about the program and the installation.

6.4.1.4 Audit Trail - Toolbar

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

Print (PDF)...	Output Audit Trail data sets as PDF file *(see chapter 6.4.1.3.2, page 579)*.
Last filter	Apply the last quick or special filter again *(see chapter 6.4.2.3.2, page 585)*.
Quick filter	Apply the quick filter *(see chapter 6.4.2.3.3, page 585)*.
Special filter...	Define and apply a special filter *(see chapter 6.4.2.3.4, page 586)*.
Remove filter	Removes the current filter *(see chapter 6.4.2.3.5, page 589)*.
Update	Update Audit Trail table *(see chapter 6.4.2.4, page 590)*.
MagIC Net Help	Opens the program help.

6.4.1.5 Audit Trail - Filter selection

Program window: **Configuration ► Tools ► Audit Trail... ► Audit Trail**

Filter

Selection of the filter with which the Audit Trail table is to be filtered.

Selection	**All entries** | **Quick filter** | **Temporary filter** | **Filter name**
Default value	**All entries**

All entries
The table is shown unfiltered.

Quick filter
The table is filtered according to the last defined quick filter *(see chapter 6.4.2.3.4, page 586)*.

Temporary filter
The table is filtered according to the last defined, not saved special filter *(see chapter 6.4.2.3.2, page 585)*.

Filter name
The table is filtered according to the selected and saved special filter *(see chapter 6.4.2.3.4.1, page 586)*.

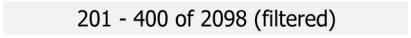
6.4.1.6 Audit Trail - Navigation bar

Program window: **Configuration ► Tools ► Audit Trail... ► Audit Trail**

The navigation bar shown beneath the Audit Trail table is used for navigating through extensive tables in which not all the entries can be shown at the same time. It contains the following elements:

Jumps to first set of entries in the Audit Trail table.

Returns to previous set of entries in the Audit Trail table.



Display of the selected set of **#### - ####** entries in the Audit Trail table. If the table has not been filtered, then the total number of entries will also appear. If the table has been filtered then the total number of filtered entries will appear with the info **(filtered)**.

Moves to next set of entries in the Audit Trail table.

>|

Jumps to last set of entries in the Audit Trail table.

6.4.1.7 Audit Trail - Functions

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

In the **Audit Trail** program window the following functions can be carried out:

- *Filter Audit Trail*
- *Update Audit Trail*
- *Export Audit Trail*
- *Archiving the Audit Trail*
- *Delete Audit Trail*
- *Print Audit Trail*

6.4.2 Audit Trail table

6.4.2.1 Audit-Trail - Table

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

Open

The Audit-Trail table is opened with **Tools ▶ Audit Trail...** or with the icon in the **Configuration** program part.

NOTE

The table can be opened only if the **Enable Audit Trail** option is switched on in the security settings *(see chapter 6.2.2.4, page 552)*.

Content

In the Audit Trail table, the following information regarding user actions is displayed in the default settings:

Type

Icon for characterizing the action:

Information about the action, which is neither relevant to the security nor has modified any data.

Information about the action that is either relevant to the security or was modified with the data.

Information about errors or incorrect actions. The line numbers of these actions are shown in addition against a red background.

Date

Date, time and time zone of the action.

User

Short name of the logged-in user.

Full name

Full name of the logged-in user.

Client

Name of the client on which the action was carried out or which is affected by the action.

Category

Program part to which the action belongs.

Action

Brief description of the action.

Details

Detailed information about the action.

Archived

Shows whether the action has already been archived or not (only archived actions can be deleted).

Unwanted columns can be removed with the menu item **View ▶ Column display...**.

Table view

The Audit Trail table cannot be edited. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width
- **Dragging the column title**:
  Moves the column to the required location

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

Functions

The following functions can be carried out:

- *Filter Audit Trail*
- *Update Audit Trail*
- *Export Audit Trail*
- *Archiving the Audit Trail*
- *Delete Audit Trail*
- *Print Audit Trail*
- *Monitor Audit Trail*
- *Verify Audit Trail*

6.4.2.2 Audit Trail - Column display

Dialog window: **Audit Trail ► View ► Column display... ► Column display**

The **Column display** dialog window is opened with **View ► Column display...**. Here the columns can be defined which are to be displayed in the Audit Trail table.

Columns available

Shows all the fields that can be displayed as columns in the Audit Trail table.

Columns displayed

Shows all the fields that are displayed as columns in the Audit Trail table. All available columns are shown as the default.

Add the selected column to the table.

Removes the selected column from the table.

Changes the sequence of displayed columns by moving the selected column up.

Changes the sequence of displayed columns by moving the selected column down.

6.4.2.3 Filtering the Audit Trail

6.4.2.3.1 Filter Audit Trail

Program window: **Configuration ► Tools ► Audit Trail... ► Audit Trail**

The following possibilities exist for filtering entries in the Audit Trail table:

- *Filter selection in filter bar*
- *Quick filter*
- *Special filter*
- *Last filter*
- *Remove filter*

6.4.2.3.2 Audit Trail - Last filter

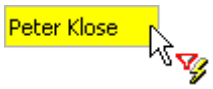
Menu item: **Audit Trail ► Filter ► Last filter**

The most recently applied filter is reactivated with the **Filter ► Last filter** menu item or with the icon in the **Audit Trail** program window.

6.4.2.3.3 Audit Trail - Quick filter

Menu item: **Audit Trail ► Filter ► Quick filter**

A quick filtration can be carried out in accordance with the content of the selected table field using the **Filter ► Quick filter** menu item or the icon in the **Audit Trail** program window. After this function has been selected, the field in which the cursor is located will have a colored background when navigating within the Audit Trail table. At the same time, the following special filter icon appears:



Double-clicking with the left mouse button on the field selected in the table will cause its contents to be set as the filter criterion, and this filter will be applied directly to the table.

NOTE

The quick filter can be applied again within the filtered table, so that the number of entries can be limited step by step.

6.4.2.3.4 Audit Trail - Special filter

6.4.2.3.4.1 Special filter table

Dialog window: **Audit Trail ► Filter ► Special filter... ► Special filter - Database 'ConfigDB'**

The **Filter ► Special filter...** menu item or the icon in the **Audit Trail** program window is used to open the **Special filter - Database 'ConfigDB'** dialog window for the definition of user-specific filters.

Filter

Selection of the filter to be loaded for editing. An empty table with the name **New filter** is loaded per default.

Selection	**'Filter name'** | **New filter**
Default value	**New filter**

[Save filter]

Opens the **Save filter** dialog window in which the filter criteria entered in the table can be saved as a special filter under the required name *(see chapter 6.4.2.3.4.3, page 589)*.

[Delete filter]

The currently loaded special filter is deleted.

Table view

The overview table shows all the defined filter criteria and cannot be directly edited. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

For the meaning of the columns, see *(see chapter 6.4.2.3.4.2, page 587)*.

Functions

The **[Edit]** menu beneath the filter table contains the following menu items:

Edit line	Open the **Edit filter criterion %1** dialog window, in which the filter conditions of the line selected in the table can be edited *(see chapter 6.4.2.3.4.2, page 587)*.
Insert new line	Inserts a new, empty line above the line selected in the table. The **Edit filter criterion** dialog window then opens automatically *(see chapter 6.4.2.3.4.2, page 587)*.
Cut lines	Transfers the selected lines to the clipboard.
Copy lines	Copies the selected lines to the clipboard.
Paste lines	Pastes lines from the clipboard above the selected line.
Delete lines	Deletes the selected lines.

[Apply filter]

Apply the filter conditions to the Audit Trail table.

6.4.2.3.4.2 Special filter - Editing filter criterion

Dialog window: **Audit Trail ► Filter ► Special filter... ► Special filter - Database 'ConfigDB' ► [Edit] ► Edit line ► Edit filter criterion %1**

[Edit] ► Edit line is used to open the dialog window **Edit filter criterion %1** in which the filter condition selected in the filter table can be edited.

Link

Selection of the type of link (logical operator) with the preceding filter criterion.

Selection	**AND** | **OR**
Default value	**AND**

Field

Selection of the field according to which the filtering is to be carried out.

Selection	**Last 10 selected fields**

[More...]

Opens the **Filter - Field selection** dialog window in which all fields according to which filtration can be performed are listed in the form of a tree. A field can be applied in the filter condition by highlighting it and closing the dialog window with **[OK]**.

Condition

Type

Selection of the type of format for columns in which several types are possible. In the case of columns with a fixed type, this will only be indicated.

Selection	**Text** | **Number** | **Date**
Default value	**Text**

Operator

Selection of the comparison operator for the filter criterion.

for fields of the 'Text' type

Selection	**=** | **<>** | **empty** | **not empty**
Default value	**=**

for fields of the 'Number' type

Selection	**=** | **<>** | **<** | **>** | **<=** | **>=** | **invalid** | **out of limits**
Default value	**=**

for fields of the 'Date' type

Selection	**=** | **<>** | **<** | **>** | **<=** | **>=** | **Today**
Default value	**=**

NOTE

If selection is made for the **Date** column of the **Operator Today**, then filtration will be carried out in accordance with the current date. A range in days (**-9999 - 9999**) can also be defined in the **Comparative value** field, according to which filtration should be carried out starting from the current date.

Comparative value

Selection or entry of the comparative value for the filter criterion.

for fields of the 'Text' type

Entry	**250 characters** **^*** can be used as a wildcard for any strings.

for fields of the 'Number' type

Entry	**Numerical value**

for fields of the 'Date' type

… opens the **Select date** window to select the date *(see chapter 2.5.1, page 82)*.

for fields of type 'Date' and 'Operator = Today'	
Input range	**-9,999 to 9,999**
Default value	**0**

Match case

on | off (Default value: **off**)

If this option is activated, then upper/lower case will be differentiated when filtering fields where **Type** = **Text**.

Use asterisk (*) as wildcard

on | off (Default value: **off**)

If this option is activated, then the asterisk ***** is used as a wildcard for any strings when filtering fields for which **Type** = **Text**.

6.4.2.3.4.3 Special filter - Saving a filter

Dialog window: **Audit Trail ► Filter ► Special filter... ► Special filter - Database 'ConfigDB' ► [Save filter] ► Save filter**

The **[Save filter]** button is used to open the **Save filter** dialog window for saving a special filter.

Filter name

Name under which the special filter is to be saved.

Entry	**50 characters**

[Save]

Saves the filter under the given name.

NOTE

The filters are saved globally in the configuration database and are therefore available for all clients.

6.4.2.3.5 Audit Trail - Removing a filter

Menu item: **Audit Trail ► Filter ► Remove filter**

The most recently applied filter is removed again with the **Filter ► Remove filter** menu item or with the icon in the **Audit Trail** program window and all entries are displayed.

6.4.2.4 Updating the Audit Trail

Menu item: **Audit Trail ▶ View ▶ Update**

The Audit Trail table is updated with the **View ▶ Update** menu item or with the icon.

NOTE

The Audit Trail table is automatically updated when it is opened, but not afterwards.

6.4.2.5 Exporting the Audit Trail

Dialog window: **Audit Trail ▶ File ▶ Export... ▶ Export Audit Trail**

The **Export Audit Trail** dialog window opens with the **File ▶ Export...** menu item.

Save file as

Entry or selection (with ...) of the complete path and the file name for saving the export file.

Entry	**1000 characters**

Selection

Selection	**All records** | **Selected records**
Default value	**All records**

All records
All the entries from the filtered Audit Trail table are exported.

Selected records
Only the entries selected in the Audit Trail table will be exported.

NOTE

Audit Trail entries are exported in text format and cannot be imported back into the Audit Trail table. The export file contains a checksum which makes it possible to verify whether the file has been modified later on.

6.4.2.6 Archiving the Audit Trail

Dialog window: **Audit Trail ► File ► Archive... ► Archive Audit Trail**

The **Archive Audit Trail** dialog window opens with the **File ► Archive...** menu item.

Target directory

Entry or selection (with ...) of the directory in which the Audit Trail entries are to be archived.

Entry	**1000 characters**

Selection

Selection	**All records** | **Records until**
Default value	**All records**

All records
All entries from the filtered Audit Trail table will be archived.

Records until
Only data sets from the Audit Trail table up to the selected date will be archived.

NOTE

Archiving Audit Trail entries is identical to exporting them, i.e. the Audit Trail entries are stored in text format and cannot be imported back into the Audit Trail Table. The difference between this and exporting is that the archived entries can be highlighted in the **Archived** column and then deleted. The archive file contains a checksum which makes it possible to verify whether the file has been modified later on.

6.4.2.7 Deleting the Audit Trail

Dialog window: **Audit Trail ► File ► Delete ► Delete Audit Trail**

The **Delete Audit Trail** dialog window opens with the **File ► Delete** menu item.

Selection

Selection	**All archived records** | **Archived records until**
Default value	**All archived records**

All archived records
All of the entries that are already archived will be deleted from the Audit Trail table.

Archived records until
Only the archived entries that were created by the selected date entry will be deleted from the Audit Trail table.

User 1

User

Short name of the first user who has the permission to delete Audit Trail entries.

Entry	**24 characters**

Password

Password of the first user who has the permission to delete Audit Trail entries.

Entry	**24 characters**

User 2

User

Short name of the second user who has the permission to delete Audit Trail entries.

Entry	**24 characters**

Password

Password of the second user who has the permission to delete Audit Trail entries.

Entry	**24 characters**

6.4.2.8 Printing the Audit Trail

Dialog window: **Audit Trail ▶ File ▶ Print (PDF)... ▶ Print Audit Trail (PDF)**

The **Print Audit Trail (PDF)** dialog window opens with the **File ▶ Print (PDF)...** menu item or the PDF icon in the **Audit Trail** program window.

Selection

Selection	**All records** | **Selected records**
Default value	**Selected records**

All records
All the entries from the filtered Audit Trail table will be printed.

Selected records
Only the entries selected in the Audit Trail table will be printed.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Portrait
Output of the Audit Trail table in portrait format.

Landscape
Output of the Audit Trail table in landscape format.

[OK]

The Audit Trail table is output in the chosen format as a PDF file that is opened directly in Acrobat Reader, from where it can then be printed or saved.

NOTE

The Audit Trail table is automatically updated when it is opened, but not afterwards.

The Audit Trail PDF remains read-only, even if the **Modifying the document allowed** check box under **Security permissions for PDF files** has been activated.

6.4.2.9 Monitoring the Audit Trail

Dialog window: **Audit Trail ▶ Tools ▶ Monitoring ▶ Audit Trail monitoring**

The **Audit Trail monitoring** dialog window opens with the **Tools ▶ Monitoring** menu item.

Monitor number of entries

on | off (Default value: **on**)

If this option is **switched on**, then the number of entries in the Audit Trail table will be monitored.

NOTE

Metrohm recommends enabling the **Monitor number of entries** option.

Maximum number

Maximum number of entries allowed in the Audit Trail table. An error message appears if this number is exceeded.

Input range	**10 to 500,000**
Default value	**100,000**

6.4.2.10 Verifying the Audit Trail

Dialog window: **Audit Trail ▶ Tools ▶ Verify export / archive ▶ Verify audit trail export / archive**

The **Tools ▶ Verify export / archive** menu item is used to open the **Verify audit trail export / archive** dialog window in which the checksum of a file that is exported from the Audit Trail or archived can be checked.

Select file

Entry or selection (with …) of the file that is to be verified.

[Verify]

Trigger the verification of the selected file.

Result

The result of the checksum verification is displayed.

6.4.3 Audit Trail - Actions

Program window: **Configuration ▶ Tools ▶ Audit Trail... ▶ Audit Trail**

The actions that are recorded in the Audit Trail are listed below by categories.

Icons for characterizing the action:

Information about the action, which is neither relevant to the security nor has modified any data.

Information about the action that is either relevant to the security or was modified with the data.

Information about errors or incorrect actions. The line numbers of these actions are shown in addition against a red background.

The Audit Trail contains entries on the following topics:

- *Program*
- *Security settings*
- *User administration*
- *Login*
- *Audit Trail*
- *Configuration*
- *Method*
- *Workplace*
- *Manual control*
- *Database*

6.4.3.1 Program

Category	Type	Action	Details
Program	ℹ	Program started	Program: "text"; build: "number"
Program	ℹ	Program finished	Program: "text"; build: "number"

6.4.3.2 Security settings

Category	Type	Action	Details
Security settings	⚠	Login option modified	Modified parameter: "parameter"; old value: "old value"; new value: "new value"
Security settings	⚠	Password option modified	Modified parameter: "parameter"; old value: "old value"; new value: "new value"
Security settings	⚠	Audit Trail option modified	Modified parameter: "parameter"; old value: "old value"; new value: "new value"
Security settings	⚠	Signature option modified	Modified parameter: "parameter"; old value: "old value"; new value: "new value"
Security settings	⚠	Default reason added	Category: "category"; text: "default text"
Security settings	⚠	Default reason deleted	Category: "category"; text: "default text"
Security settings	⚠	Security settings imported	

6.4.3.3 User administration

Category	Type	Action	Details
User administration	⚠	Group copied	Old group: "group name"; new group: "group name"
User administration	⚠	Group added	Group: "group name"
User administration	⚠	Group renamed	Old name: "old group name"; new name: "new group name"
User administration	⚠	Group deleted	Group: "group name"
User administration	⚠	Access right modified	Group: "group name"; access right: "functionality (tree)"; old value: "on/off"; new value: "on/off"
User administration	⚠	Signature permission modified	Group: "group name"; signature permission: "parameter"; old value: "on/off"; new value: "on/off"
User administration	⚠	Group option modified	Group: "group name"; option: "parameter"; old value: "value"; new value: "value"

User administration		User added	Group: "group name"; user: "user name"
User administration		User imported	Group: "group name"; user: "user"
User administration		User properties modified	Group: "group name"; user: "user name"; parameter: "parameter"; old value: "value"; new value: "value"
User administration		User moved	User: "user name"; old group: "group name"; new group: "group name"
User administration		User group imported	Group: "group name"

6.4.3.4 Login

Category	Type	Action	Details
Login		Logged in	User: "user name"
Login		Logged out manually	User: "user name"
Login		Logged out automatically	User: "user name"
Login		Password modified	User: "user name"
Login		Invalid login attempt	User: "user name"; error: "error message"

6.4.3.5 Audit Trail

Category	Type	Action	Details
Audit Trail		Audit Trail exported	Number of entries: "number"; file name: "*.txt"; directory: "archive directory"
Audit Trail		Audit Trail archived	Number of entries: "number"; start: "date of first entry"; end: "date of last entry"; file name: "*.txt"; directory: "archive directory"
Audit Trail		Audit Trail deleted	Number of entries: "number"; start: "date of first entry"; end: "date of last entry"; signature 1 by: "user name"; signature 2 by: "user name"
Audit Trail		Audit Trail monitoring modified	Modified parameter: "parameter"; old value: "old value"; new value: "new value"
Audit Trail		Invalid login attempt in Audit Trail	User: "user name"; error: "error message"

6.4.3.6 Configuration

Category	Type	Action	Details
Configuration	ℹ	Configuration exported	Configuration data: "designation"; "designation"
Configuration	⚠	Configuration imported	Configuration data: "designation"; "designation"
Configuration	ℹ	Device added	Device name: "device name"; device type: "device type"; serial number: "serial number"
Configuration	ℹ	Device imported	Device name: "device name"; device type: "device type"; serial number: "serial number"
Configuration	⚠	Device modified	Device name: "device name"; device type: "device type"; serial number: "serial number"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Device modified automatically	Device name: "name"; modified by method: "method name"; method group: "group name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Device deleted	Device name: "device name"; device type: "device type"; serial number: "serial number"
Configuration	ℹ	Column added	Column: "name"; column type: "column type"; serial number: "serial number"; creation: "manually" or "automatically"
Configuration	ℹ	Column imported	Column: "name"; column type: "column type"; serial number: "serial number"
Configuration	ℹ	Column chip repaired	Column: "name"; column type: "column type"; serial number: "serial number"
Configuration	⚠	Column modified manually	Column: "name"; serial number: "serial number"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Column deleted	Column: "name"; serial number: "serial number"
Configuration	ℹ	Eluent added	Eluent: "name"
Configuration	ℹ	Eluent imported	Eluent: "name"
Configuration	⚠	Eluent modified	Eluent: "name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Eluent deleted	Eluent: "name"
Configuration	ℹ	Solution added	Solution: "name"; creation: "manually" or "automatically"
Configuration	ℹ	Solution imported	Solution: "name"
Configuration	⚠	Solution modified	Solution: "name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"

Configuration	⚠	Solution modified automatically	Solution: "name"; modified by method: "method name"; method group: "group name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Solution deleted	Solution: "name"
Configuration	ℹ	Accessory added	Accessory: "name"
Configuration	ℹ	Accessory imported	Accessory: "name"
Configuration	⚠	Accessory modified	Accessory: "name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Accessory deleted	Accessory: "name"
Configuration	ℹ	Common variable added	Common variable: "name"; creation: "manually" or "automatically"
Configuration	ℹ	Common variable imported	Common variable: "name"
Configuration	⚠	Common variable modified manually	Common variable: "name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Common variable modified automatically	Common variable: "name"; modified by method: "method name"; method group: "group name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Common variable deleted	Common variable: "name"
Configuration	ℹ	Rack added	Rack name: "device name"; rack code: "rack code"; devices: "device names"
Configuration	ℹ	Rack imported	Rack name: "device name"
Configuration	⚠	Rack modified	Rack name: "device name"; rack code: "rack code"; devices: "device names"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Configuration	⚠	Rack deleted	Rack name: "device name"; rack code: "rack code"; devices: "device names"

6.4.3.7 Method

Category	Type	Action	Details
Method	ℹ	Method group created	Name: "group name"
Method	⚠	Method group deleted	Name: "group name"
Method	⚠	Method group renamed	Old name: "old group name"; new name: "new group name"
Method	⚠	Properties of method group modified	Name: "group name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Method	ℹ	Method created	Name: "method name"; version: "version number"; group: "group name"

Method		Method modified	Name: "method name"; version: "version number"; group: "group name"; modification comment: "modification comment"
Method		Method renamed	Old name: "method name"; new name: "method name"; version: "version number"; group: "group name"
Method		Method copied	Old name: "method name"; version: "version number"; new name: "method name"; version: "version number"
Method		Method exported	Name: "method name"; version: "version number"; group: "group name"
Method		Method moved	Name: "method name"; version: "version number"; old group: "group name"; new group: "group name"
Method		Method imported	Name: "method name"; version: "version number"; group: "group name"
Method		Method migrating	Name: "method name"; version: "version number"; group: "group name"
Method		Method updated	Name: "method name"; old version: "version number"; new version: "version number"
Method		Invalid login attempt when signing methods	Name: "method name"; version: "version number"; user: "user name"; error: "error message"
Method		Method signed (1)	Name: "method name"; version: "version number"; signed (1) by: "user name"; reason: "reason"; comment: "signature comment"
Method		Method signed (2)	Name: "Method name"; version: "version number"; signed (2) by: "user name"; reason: "reason"; comment: "signature comment"
Method		Signatures (2) for method deleted	Name: "method name"; version: "version number"; signatures (2) deleted by: "user name"; reason: "reason"; comment: "signature comment"
Method		Method deleted	Name: "method name"; version: "version number"; group: "group name"
Method		Calibration modified automatically	Name: "method name"; version: "version number"; group: "group name"; determination ID: "determination ID"; database "database name"; directory: "database directory"; Ident: "Ident"
Method		Calibration modified manually	Name: "method name"; version: "version number"; group: "group name"

6.4.3.8 Workplace

Category	Type	Action	Details
Workplace		Hardware started	Method: "method name"; method version: "version number"; method group: "group name"
Workplace		Hardware stopped	Method: "method name"; method version: "version number"; method group: "group name"

Workplace		Determination series started	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Determination started	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Determination series interrupted	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Determination series continued	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Recording time live modified	Method: "method name"; method version: "version number"; method group: "group name"; analysis: "analysis name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"; Ident: "Ident"; determination ID: "determination ID"; reason: "reason"; modification comment: "modification comment" The determination ID is not entered if the determination has not yet been started.
Workplace		Evaluation parameter live modified	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"; reason: "reason"; modification comment: "modification comment"; evaluation: "section of evaluation"; analysis: "analysis name"; modified parameter: "parameter"; old value: "old value"; new value: "new value" The determination ID is not entered if the determination has not yet been started. For evaluation parameters that are not analysis-specific, "**-**" is entered for analysis. For evaluation parameters that were modified in a table, the title of the tab of the table and all values from the table line strung together are entered as parameter values (e.g. **evaluation: Components; analysis: Analysis1; parameter: Component table; old value: Fluoride, 1, 4.9, 5, chloride; new value: Fluoride, 1, 4.7, 5, chloride**). If a line is deleted in a table, an entry is made at **New value: Deleted**. If a line is added, **old value: not available** is entered. Otherwise the structure of the Audit Trail entry is the same as for a modification.
Workplace		Sample data live modified (manually)	Method: "method name"; method version: "version number"; method group: "group name"; modified parameter: "parameter"; old value: "old value"; new value: "new value"; Ident: "Ident"; determination ID: "determination ID"; reason: "reason"; modification comment: "modification comment" The determination ID is not entered if the determination has not yet been started.

Workplace		Error in determination	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"; error: "error message"
Workplace		Error during start test	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; error: "error message"
Workplace		Limit value infringed	Method: "method name"; method version: "version number"; method group: "group name"; variable name: "variable name"; variable value: "value"; upper limit value: "upper limit value"; lower limit value: "lower limit value"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Action triggered	Method: "method name"; method version: "version number"; method group: "group name"; action: "record message" or "display message" or "cancel determination" or "hold determination" or "cancel determination and shutdown devices" or "hold after determination" or "cancel after determination and shutdown devices"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Determination stopped	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Determination series stopped	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Determination finished	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Determination series finished	Method: "method name"; method version: "version number"; method group: "group name"; Ident: "Ident"; determination ID: "determination ID"
Workplace		Timer task started	Action: "start equilibration" or "start sample table" or "stop devices"; parameter: "method name" or "name sample table" or "devices of the method" or "all devices"
Workplace		Error on timer task	Action: "start equilibration" or "start sample table" or "stop devices"; parameter: "method name" or "name sample table" or "devices of the method" or "all devices"
Workplace		Hardware error	Error: "error message"; Reason: "reason"

6.4.3.9 Manual control

Category	Type	Action	Details

Manual control	⚠	Device parameter modified live	Determination ID: "determination ID"; device: "device"; module: "assembly"; Ident: "Ident"; reason: "reason"; modification comment: "modification comment"; modified parameter: "parameter"; old value: "old value"; new value: "new value" The determination ID is not entered if the determination has not yet been started. For devices without assemblies, "-" is entered for module.
Manual control	❗	Error in manual control	Determination ID: "determination ID"; device: "device"; module: "assembly"; Ident: "Ident"; error: "error message"

6.4.3.10 Database

Category	Type	Action	Details
Database	ℹ	Database created	Name: "database name"; directory: "database directory"
Database	⚠	Database renamed	Old name: "database name"; new name: "database name"; directory: "database directory"
Database	⚠	Database backed up	Name: "database name"; directory: "database directory"; backup name: "backup name"; backup directory: "backup directory"
Database	⚠	Database restored	Name: "database name"; directory: "database directory"; backup name: "backup name"; backup directory: "backup directory"
Database	⚠	Configuration database restored	Name: "database name"; directory: "database directory"
Database	⚠	Database deleted	Name: "database name"; directory: "database directory"
Database	⚠	Database migrates	Name: "Database name"
Database	⚠	Database properties modified	Name: "database name"; directory: "database directory"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Database	⚠	Access right for database modified	Name: "database name"; directory: "database directory"; user group: "user group"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Database	⚠	Backup options for database modified	Name: "database name"; directory: "database directory"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Database	⚠	Monitoring option for database modified	Name: "database name"; directory: "database directory"; modified parameter: "parameter"; old value: "old value"; new value: "new value"
Database	ℹ	Determination imported manually	Determination ID: "determination ID"; determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"

Database		Determination exported manually	Determination ID: "determination ID"; determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"; format: "export format"; target directory: "directory"; file name: "file name"
Database		Determination exported automatically	Determination ID: "determination ID"; determination version: "version number"; ID1: "ID1"; method: "method name"; method version: "version number"; method group: "group name"; format: "export format"; target directory: "directory"; file name: "file name"
Database		Determination completed	Determination ID: "determination ID"; determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"
Database		Determination reprocessed	Old determination ID: "determination ID"; old determination version: "version number"; new determination ID: "determination ID"; new determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"; modification comment: "modification comment"
Database		Determination updated	Old determination ID: "determination ID"; old determination version: "version number"; new determination ID: "determination ID"; new determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"; modification comment: "modification comment"
Database		Invalid login attempt when signing determinations	User: "user name"; error: "error message"
Database		Determination signed (1)	Determination ID: "determination ID"; determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"; signed (1) by: "user name"; reason: "reason"; comment: "signature comment"
Database		Determination signed (2)	Determination ID: "determination ID"; determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"; signed (2) by: "user name"; reason: "reason"; comment: "signature comment"

Database	⚠	Signatures (2) for determination deleted	Determination ID: "determination ID"; determination version: "version number"; database: "database name"; directory: "database directory"; Ident: "Ident"; method: "method name"; method version: "version number"; method group: "group name"; signatures (2) deleted by: "user name"; reason: "reason"; comment: "signature comment"
Database	⚠	Determination deleted	Determination ID: "determination ID"; determination version: "version number"; database: "database name"; directory: "database directory"; ID1: "ID1"; method: "method name"; method version: "version number"; method group: "group name"; reason: "determination deleted automatically by system" (only for remote control option)

6.5 Devices subwindow

6.5.1 Configuration - Devices

Subwindow: **Configuration ► Devices**

Devices subwindow

The **Devices** subwindow contains the device table with all automatically recognized and manually added devices and is always shown in the **Configuration** program part, i.e., it cannot be removed from the configuration view. The subwindow can be enlarged and reduced as required; it can also be maximized.

USB devices

Devices connected to the PC via USB are automatically recognized when the program starts and are entered in the device table. If the connection between the PC and the device or the power supply is interrupted, then the device will remain in the device table with the status **not ok**. If it is reconnected, then it will be recognized automatically by its serial number and assigned to the existing device entry again. This causes the status to change to **ok**.

Peripheral devices of USB devices

Peripheral devices connected to USB devices (dosing device, stirrer, etc.) are also recognized automatically, but they are not listed in the device table as separate devices. If they are connected or removed while a program is running, a corresponding message must be confirmed and then either the USB device must be reinitialized, the USB connection must be interrupted and then re-established, or the program must be restarted.

RS-232 devices

Devices that are connected to the PC via an RS-232 interface will not be recognized automatically. They must be added manually to the device table as new devices. If the connection between the PC and device is interrupted or the device is switched off, the device will nevertheless

remain in the device table with **ok**. In order to update the status to **not ok**, the properties window of the device must be opened and closed again. The same applies when the device is connected again or switched on.

6.5.2 Device table

6.5.2.1 Device table - User interface

Subwindow: **Configuration ▶ Devices**

Content

In the device table the following information about automatically recognized or manually added devices is shown by default:

Device name

Designation of the device.

Device type

Type of device.

Device serial number

Serial number of the device.

Status

Device status. A device that is ready has the status **ok** shown in green, a device that is not ready has the **not ok** status shown in red.

NOTE

The device status is permanently monitored and updated for USB devices only. For Metrohm devices with RS-232 connection, the current status at the last access to the device is shown. For barcode readers, the status cannot be monitored. It will be set to **ok** after confirmation of the connection test.

Set to work

Date on which the device was added to the device table.

Next GLP test

Date on which the next GLP test is due. If GLP monitoring is switched on and the set date is before the current date (i.e., the GLP test has not yet been carried out), then the date will be shown in red.

Remarks

Remarks about the device.

NOTE

Lines that contain red entries will also show the line number highlighted with a red background.

As soon as a determination is started all the instruments or instrument modules used in the method will be reserved. Generally speaking, they can then neither be used at a different workplace nor used or configured in manual control until the determination has been finished. The line for a reserved device is shown in gray letters. However, various instruments and instrument modules support the **Release** time program command, with which they can be released again before the end of the determination.

Table view

The device table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

Functions

The **[Edit]** menu beneath the device table contains the following menu items:

New...	Add manually a new device connected to the PC via an RS-232 interface *(see chapter 6.5.2.2, page 607)*.
Delete	Deletes the selected device. Only devices that are not connected can be deleted *(see chapter 6.5.2.3, page 607)*.
Properties...	Edit the selected device *(see chapter 6.5.3, page 609)*.
Column display...	Define columns for the device table *(see chapter 6.5.2.4, page 607)*.
Print (PDF)...	Output of the device table as a PDF file *(see chapter 6.5.2.6, page 609)*.

Ignored devices	Opens the list of ignored devices *(see chapter 6.5.2.5, page 608)*.
Initialize	Initializes the selected device. Only possible for the following devices: 814 USB Sample Processor, 815 Robotic USB Sample Processor XL, 846 Dosing Interface, 858 Professional Sample Processor, 919 IC Autosampler plus. Has the same effect as connecting the device with a USB port once again; the (newly) connected MSB devices will also be recognized at this time.

6.5.2.2 Adding a new device

Menu item: **Configuration ► Devices ► [Edit] ► New...**

Devices that are connected to the PC via an RS-232 interface must be added manually to the device table with **[Edit] ► New...**. This opens the **Device selection** dialog window.

The required new device must be selected from the list that is shown, which contains all the devices known to the program. When the dialog has been closed with **[OK]**, the properties window opens automatically for entering additional device data.

After the properties window has been closed, the new device with its set parameters is entered in the device table and the connection is tested. If the connection is **OK**, then the further available device information is read out of the device.

6.5.2.3 Deleting a device

Menu item: **Configuration ► Devices ► [Edit] ► Delete**

The device selected in the device table is deleted with **[Edit] ► Delete**.

NOTE

Only devices that are not connected can be deleted.

6.5.2.4 Devices - Column display

Dialog: **Configuration ► Devices ► [Edit] ► Column display... ► Column display**

The **Column display** dialog window is opened with **[Edit] ► Column display...**. Here you can define the columns that are to be shown in the device table.

Columns available

Shows all the fields that can be shown as columns in the device table.

Columns displayed

Shows all the fields that will be shown as columns in the device table. The **Device name**, **Device type**, **Device serial number**, **Status**, **Set to work**, **Next GLP test** and **Remarks** columns are displayed by default.

The **Device name** and **Device type** columns are always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.5.2.5 Editing ignored devices

Dialog: **Configuration ► Devices ► [Edit] ► Ignored devices ► Ignored devices**

The **Ignored devices** dialog window is opened with **[Edit] ► Ignored devices**. Here the list of ignored devices can be edited.

Ignored devices are devices which are recognized automatically upon connection but which the user wants to exclude permanently from being displayed in the device table. Ignored devices will no longer be recognized automatically at the time of the next program start.

Table contents

The following information concerning the ignored devices is shown in the table:

Device type

Type of device.

Device serial number

Serial number of the device.

[Delete]

The highlighted device is removed from the list. It will be recognized automatically again at the time of the next program start and can be included in the list of devices.

6.5.2.6 Printing the list of devices

Dialog: **Configuration ▶ Devices ▶ [Edit] ▶ Print (PDF)... ▶ Print list of devices (PDF)**

The **Print list of devices (PDF)** dialog window is opened with **[Edit] ▶ Print (PDF)...**.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Portrait
Output of the device table in portrait format.

Landscape
Output of the device table in landscape format.

[OK]

The device table is output in the required format as a PDF file and opened directly in Acrobat Reader, where it can then be printed and/or saved.

6.5.3 Device properties

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties… ▶ Properties - 'Device type' - 'Device name'**

The properties window for the device selected in the device table, in which the parameters of the device can be edited, is opened with the **[Edit] ▶ Properties...** menu item in the **Devices** subwindow. It consists of several tabs. The tabs **General** and **GLP** are always present, the remaining tabs depend on the selected device. Properties can be set for the following devices:

- *948 Continuous IC Module*
- *947 Professional UV/VIS Detector Vario*
- *945 Professional Detector Vario*
- *944 Professional UV/VIS Detector Vario*
- *943 Professional Thermostat / Reactor Vario*
- *942 Extension Module Vario ONE/Deg*
- *942 Extension Module Vario HPG*
- *942 Extension Module Vario LQH*
- *942 Extension Module Vario Prep 2*
- *942 Extension Module Vario ChS/PP*
- *942 Extension Module Vario SeS/PP*
- *941 Eluent Production Module*
- *940 Professional IC Vario*
- *930 Compact IC Flex*
- *919 IC Autosampler plus*
- *896 Professional Detector*
- *889 IC Sample Center*

- *887 Professional UV/VIS Detector*
- *886 Professional Thermostat / Reactor*
- *883 Basic IC plus*
- *882 Compact IC plus*
- *881 Compact IC pro*
- *872 Extension Module IC Pump*
- *872 Extension Module IC Module*
- *872 Extension Module Liquid Handling*
- *872 Extension Module Sample Prep*
- *872 Extension Module Suppression*
- *872 Extension Module Suppression – MCS*
- *863 Compact Autosampler*
- *858 Professional Sample Processor*
- *850 Professional IC*
- *846 Dosing Interface*
- *814 USB Sample Processor and 815 Robotic USB Sample Processor XL*
- *771 IC Interface*
- *Combustion Module*
- *Eco IC*
- *RS-232 device*

The device properties of the **891 Professional Analog Out** *(see chapter 7.8.2.7, page 882)* are assigned to the main device it is connected to.

6.6 Columns subwindow

6.6.1 Configuration - Columns

Subwindow: **Configuration ► Columns**

Columns subwindow

The subwindow **Columns** contains the column table with automatically recognized and manually added separation columns. It can be shown in the **Configuration** program part as a part of the configuration view or (if not present on the user interface) in a separate window with **View ► Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Automatically recognized columns

Intelligent Metrohm separation columns, which have a data chip with the stored column data, are automatically recognized when connected to an **IC instrument** and are saved in the column table.

Manually added columns

Nonintelligent Metrohm separation columns without data chip must be added manually to the column table.

6.6.2 Column table

6.6.2.1 Column table - User interface

Content

The following information about automatically recognized or manually added separation columns is shown in the column table by default:

Column name

Name of the separation column.

Column type

Type of the separation column. For automatically recognized columns, the type is shown in green.

Connection

Name of the device to which the separation column is connected (only for automatically recognized columns).

Maximum pressure

Maximum permitted pressure for the separation column.

Guard column type

Type of guard column used for the separation column.

Determinations

Number of determinations that were carried out with this separation column.

Operating hours

Number of operating hours for the separation column.

Next GLP test

Shows the date on which the next GLP test is due for the separation column. If GLP monitoring is switched on and the set date is before the current date (i.e., the GLP test has not yet been carried out), then the date will be shown in red.

Table view

The column table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

If a column is reserved for an ongoing determination or for manual control, then the line will be shown in gray and the column cannot be edited until the determination has been finished.

Functions

The menu **[Edit]** beneath the column table contains the following menu items:

New…	Manually add a new column *(see chapter 6.6.2.2, page 612)*.
Delete	Deletes the selected column *(see chapter 6.6.2.3, page 613)*.
Properties…	Edit the selected column *(see chapter 6.6.3.1, page 614)*.
Column display…	Define the columns for the column table *(see chapter 6.6.2.4, page 613)*.
Print (PDF)…	Output of the column table as a PDF file *(see chapter 6.6.2.5, page 613)*.

6.6.2.2 Adding a new column

Menu item: **Configuration ► Columns ► [Edit] ► New…**

A new, non-intelligent separation column is added to the column table with **[Edit] ► New…**. A selection window opens first for selecting the column type.

Add new column

Selection of the column types available from Metrohm.

Selection	**unknown** | **Selection of column types**
Default value	**unknown**

The properties window then opens for editing the column. After the properties window has been closed, the column is entered in the column table. The parameters can be modified at any time with **[Edit] ► Properties…**.

6.6.2.3 Deleting a column

Menu item: **Configuration ► Columns ► [Edit] ► Delete**

With **[Edit] ► Delete**, the column selected in the table is deleted.

6.6.2.4 Columns - Column display

Dialog window: **Configuration ► Columns ► [Edit] ► Column display… ► Column display**

With **[Edit] ► Column display…**, the **Column display** window opens. Here you can define the columns that are to be shown in the column table.

Available columns

Shows all fields that can be displayed as columns in the column table.

Displayed columns

Shows all fields that are displayed as columns in the column table. The columns **Column name**, **Column type**, **Connection**, **Maximum pressure**, **Precolumn type**, **Determinations**, **Operating hours** and **Next GLP test** are displayed by default. The **Column name** column is always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.6.2.5 Printing a column list

Menu item: **Configuration ► Columns ► [Edit] ► Print (PDF)…**

[Edit] ► Print (PDF)… opens the **Print list of columns (PDF)** dialog window.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Landscape**

Portrait
Output of the column table in portrait format.

Landscape
Output of the column table in landscape format.

[OK]

The column table is output in the required format as a PDF file and opened directly with Acrobat Reader; it can then be printed and/or saved.

6.6.3 Column properties

6.6.3.1 Editing column properties

Dialog window: **Configuration ▶ Columns ▶ [Edit] ▶ Properties... ▶ Column - 'Name'**

The parameters for the selected column are defined on the following tabs:

- *Column*
  Parameters of the separation column.
- *Properties*
  Operating characteristics and technical specifications of the separation column.
- *Guard column*
  Parameters of the guard column used.
- *Monitoring*
  Parameters for monitoring the separation column.
- *GLP*

6.6.3.2 Properties - Column

Tab: **Configuration ▶ Columns ▶ [Edit] ▶ Properties... ▶ Column - 'Name' ▶ Column**

Column name

Name of the separation column.

Entry	**24 characters**

Column type

Type of the separation column (entry only possible for **Column type** = **unknown**).

Entry	**40 characters**

Order number

Order number of the separation column (entry only possible for **Column type** = **unknown**).

Entry	**10 characters**

Serial number

Serial number of the separation column (entry only possible for manually added columns).

Entry	**16 characters**

Batch number

Batch number of the separation column (entry only possible for manually added columns).

Entry	**16 characters**

Set to work

Date on which the column was first used for a determination. This date can be edited for manually added columns only by pressing ....

Comment

Comments on the separation column.

Entry	**24 characters**

6.6.3.3 Properties - Properties

Tab: **Configuration ▶ Columns ▶ [Edit] ▶ Properties... ▶ Column - 'Name' ▶ Properties**

Maximum working values

Pressure

Maximum value

Maximum permitted pressure for this type of column (entry only possible for **Column type** = **unknown**).

Input range	**0.0 to 50.0 MPa**

Highest measured value

Display of the highest pressure measured with this separation column.

Flow

Maximum value

Maximum permitted flow for this type of column (entry only possible for **Column type** = **unknown**).

Input range	**0.00 to 5.00 mL/min**

Highest measured value

Display of the highest flow value measured with this separation column.

Recommended working values

Standard flow

Recommended flow for the separation column (entry only possible for **Column type** = **unknown**).

Input range	**0.00 to 5.00 mL/min**

Standard start-up time

Recommended duration for a column-gently starting-up of the high-pressure pump in [min].

Input range	**0.00 to 99 min** (Increment: **1**)
Default value	**0 min**

Standard injection volume

Recommended injection volume for the separation column (entry only possible for **Column type** = **unknown**).

Input range	**0.1 to 999.9 µL**
Default value	**20.0 µL**

Standard temperature

Recommended temperature for operating the separation column (entry only possible for **Column type** = **unknown**).

Input range	**0 to 30 °C**
Default value	**100 °C**

Standard eluent

Recommended eluent for operating the separation column (entry only possible for **Column type** = **unknown**).

Entry	**100 characters**

pH range

Recommended pH range for operating the separation column (entry only possible for **Column type** = **unknown**).

Input range	**0.0 to 14.0**

Technical Data

Inner diameter

Inner diameter of the separation column (entry only possible for **Column type** = **unknown**).

Input range	**0.0 to 999.9 mm**

Length

Length of the separation column (entry only possible for **Column type** = **unknown**).

Input range	**0.1 to 9,999.9 mm**

Particle size

Particle size of the separation column (entry only possible for **Column type** = **unknown**). Either a numerical value (in µm) or a text (e.g. **monolithic**) can be entered here.

Entry	**10 characters**

6.6.3.4 Properties - Guard column

Tab: **Configuration ► Columns ► [Edit] ► Properties... ► Column - 'Name' ► Precolumn**

Use precolumn

on | off (Default value: **off**)

If this option is activated, use of the selected guard column is activated. This means that the data of the guard column can be saved both on the column chip and in every determination. The use of a guard column also influences certain calculations.

Precolumn type

Type of the guard column.

Entry	**40 characters**
Selection	**unknown** | **Selection of the guard columns** | **none**

Order number precolumn

Order number of the guard column.

Entry	**10 characters**

Serial number precolumn

Serial number of the guard column.

Entry	**16 characters**

Batch number

Batch number of the guard column.

Entry	**16 characters**

Set to work

Date on which the guard column was first used for a determination. This date can be edited by pressing ....

Technical Data

Inner diameter precolumn

Inner diameter of the guard column.

Input range	**0.0 to 999.9 mm**

Length precolumn

Length of the guard column.

Input range	**0.1 to 9,999.9 mm**

6.6.3.5 Properties - Monitoring

Tab: **Configuration ► Columns ► [Edit] ► Properties... ► Column - 'Name' ► Monitoring**

NOTE

This tab is only available for intelligent columns.

Column

Determinations

Limit

Maximum number of determinations permitted with this separation column. If this value is exceeded, the message or action defined below will be triggered.

Input range	**1 to 99,999**

Current value

Display of the number of determinations carried out with this separation column. If the **Limit** is exceeded, the **Current value** is displayed in **red**.

Monitor

on | off (Default value: **off**)

This check box activates monitoring.

Operating hours

Limit

Maximum permitted operating hours with this separation column. If this value is exceeded, the message or action defined below will be triggered.

Input range	**1 to 99,999**

Current value

Display of the current number of operating hours with this separation column. If the **Limit** is exceeded, the **Current value** is displayed in **red**.

Monitor

on | off (Default value: **off**)

This check box activates monitoring.

Precolumn

Determinations

Limit

Maximum permitted number of determinations with this guard column. If this value is exceeded, the message or action defined below will be triggered.

Input range	**1 to 99,999**

Current value

Display of the number of determinations carried out with this guard column. If the **Limit** is exceeded, the **Current value** is displayed in **red**.

Monitor

on | off (Default value: **off**)

This check box activates monitoring.

Operating hours

Limit

Maximum permitted operating hours with this guard column. If this value is exceeded, the message or action defined below will be triggered.

Input range	**1 to 99,999**

Current value

Display of the current number of operating hours with this guard column. If the **Limit** is exceeded, the **Current value** is displayed in **red**.

Monitor

on | off (Default value: **off**)

This check box activates monitoring.

[Reset]

Reset the current values for the guard column to 0.

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

The message is sent to the e-mail address defined under **[E-mail]** if this option is activated. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window.

Acoustic signal

on | off (Default value: **off**)

If this option is activated, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If during monitoring it is found that a limit value has been exceeded then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that a limit value has been exceeded will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued then the message that the limit value has been exceeded will be saved automatically with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.6.3.6 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.7 Eluents subwindow

6.7.1 Configuration - Eluents

Subwindow: **Configuration ► Eluents**

Eluents subwindow

The **Eluents** subwindow contains the table with the eluents defined by the user. It can be shown in a separate window in the program part **Configuration** as a part of the configuration view or (if not present on the desktop) with **View ► Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Using eluents

The eluents defined in the eluent table can be assigned to each high-pressure pump in the method in the devices subwindow. The eluent data is saved in the determination in this case. The working life of the eluents can also be monitored.

6.7.2 Eluent table

6.7.2.1 Eluent table - Surface

Content

In the eluent table the following information about manually added eluents is shown as standard:

Eluent name

Name of the eluent.

Composition

Composition of the eluent.

Manufacturing date

Date on which the eluent was added to the table.

Expiry date

Expiry date of the eluent. If eluent monitoring is switched on and the set date is before the current date (i.e., the working life has expired), then the date will be shown in red.

Next GLP test

Display of the date on which the next GLP test is due for the eluent. If GLP monitoring is switched on and the set date is before the current date (i.e., the GLP test has not yet been carried out), then the date will be shown in red.

Table view

The eluent table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

If an eluent is reserved for a running determination then the line will be shown in gray and the eluent cannot be edited until the determination has been finished.

Functions

The **[Edit]** menu beneath the eluent table contains the following menu items:

New…	Add manually a new eluent *(see chapter 6.7.2.2, page 624)*.
Delete	Delete the selected eluent *(see chapter 6.7.2.3, page 625)*.
Properties…	Edit the selected eluent *(see chapter 6.7.3.1, page 626)*.
Column display…	Defines columns for the eluent table *(see chapter 6.7.2.4, page 625)*.
Print (PDF)…	Outputs the eluent table as a PDF file *(see chapter 6.7.2.5, page 625)*.

6.7.2.2 Adding a new eluent

Menu item: **Configuration ► Eluents ► [Edit] ► New…**

A new eluent is manually added in the eluent table with **[Edit] ► New…**. The properties window then opens automatically for editing the eluent. After closing the properties window, the eluent is entered in the eluent table. The parameters can be modified at any time with **[Edit] ► Properties…**.

6.7.2.3 Deleting an eluent

Menu item: **Configuration ▶ Eluents ▶ [Edit] ▶ Delete**

With **[Edit] ▶ Delete**, the eluent selected in the table is deleted.

6.7.2.4 Eluent - Column display

Dialog: **Configuration ▶ Eluents ▶ [Edit] ▶ Column display… ▶ Column display**

With **[Edit] ▶ Column display…**, the **Column display** window opens. Here you can define the columns that are to be shown in the eluent table.

Available columns

Display of all the fields that can be shown as columns in the eluent table.

Displayed columns

Display of all the fields that will be shown as columns in the eluent table. The columns **Eluent name**, **Composition**, **Manufacturing date**, **Expiry date** and **Next GLP test** are displayed by default. The **Eluent name** column is always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.7.2.5 Printing the eluent list

Menu item: **Configuration ▶ Eluents ▶ [Edit] ▶ Print (PDF)…**

The **Print eluent list (PDF)** dialog is opened with **[Edit] ▶ Print (PDF) …**.

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Portrait format**

Portrait format
Output of the eluent table in portrait format.

Landscape format
prints the eluent table in landscape format.

[OK]

The eluent table is shown in the required format as a PDF file and can be opened directly with the Acrobat Reader; it can then be printed out and/or saved.

6.7.3 Eluent properties

6.7.3.1 Editing eluent properties

Dialog window: **Configuration ► Eluents ► [Edit] ► Properties… ► Eluent - 'Name'**

The parameters for the selected eluent are defined on the following tabs:

- *Eluent*
  Parameters of the accessories part.
- *Monitoring*
  Parameters for monitoring the accessories part.
- *GLP*

6.7.3.2 Properties - Eluent

Tab: **Configuration ► Eluents ► [Edit] ► Properties... ► Eluent - 'Name' ► Eluent**

Eluent name

Name of the eluent.

Entry	**40 characters**

Order number

Order number of the eluent.

Entry	**25 characters**

Manufacturer

Manufacturer of the eluent.

Entry	**25 characters**

Batch number

Batch number of the eluent.

Entry	**25 characters**

Composition

Composition of the eluent.

Entry	**250 characters**

Comment

Comment on the eluent.

Entry	**250 characters**

6.7.3.3 Properties - Monitoring

Tab: **Configuration ▶ Eluents ▶ [Edit] ▶ Properties... ▶ Eluent - 'Name' ▶ Monitoring**

Manufacturing date

Shows the date and time when the eluent was produced. This date can be edited by pressing ....

Eluent monitoring

on | off (Default value: **off**)

If this option is activated, then the working life of the eluent will be monitored.

Working life

Working life of the eluent in days. If a value is entered here, then the field **Expiry date** will be automatically adapted.

Input range	**0 to 999 Days**
Default value	**999 Days**

Expiry date

Expiry date of the eluent. The date can be selected by clicking on ... in the **Select date** dialog window. After a date has been entered the **Working life** will be automatically adapted.

Selection	**Date selection**

Message

The message options can only be edited if monitoring of eluent is enabled.

Message by e-mail

on | off (Default value: **off**)

The message is sent to the e-mail address defined under **[E-mail]** if this option is activated. The message is sent in text format.

[E-mail]

[E-mail] opens the **Send E-mail** window.

Acoustic signal

on | off (Default value: **off**)

If this option is activated, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring of eluent is switched on.

If during eluent monitoring it is found that the working life has expired then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the working life of the eluent has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, the message that the working life of the eluent has expired will be saved automatically with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.7.3.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.8 Solutions subwindow

6.8.1 Configuration - Solutions

Subwindow: **Configuration ► Solutions**

Solutions subwindow

The subwindow **Solutions** contains the solution table with all automatically recognized and manually added solutions. It can be shown in a separate window in the program part **Configuration** as a part of the configuration view or (if not present on the desktop) with **View ► Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Solutions for dosing units

Solutions can be dosed in **MagIC Net** dosing units of the **800 Dosino** type with **807 Dosing Unit** fitted. These intelligent dosing units have a data chip with stored solution data. When connected to Metrohm devices (e.g. 850 Professional IC, 858 Sample Processor), they are automatically recognized and saved in the solution table.

Solutions for pumps

Solutions that are dosed using, for example, **peristaltic pumps** (850 Professional IC, 858 Sample Processor) or **external pumps** (858 Sample Processor) instead of dosing devices, must be added to the solution table manually.

6.8.2 Solution table

6.8.2.1 Solution table

Subwindow: **Configuration ▶ Solutions**

Content

The following information on the automatically recognized or manually added solutions is shown by default in the solution table:

Solution name

Name of the solution.

Concentration

Concentration (value and unit) of the solution.

Cylinder volume

Cylinder volume of the dosing unit in mL.

Type

Type of solution (**manual** = manually added solution, **IDU** = solution in intelligent dosing unit).

Dosing device

Device name and connection of the dosing device on which the dosing unit is placed.

Expiry date

Expiry date of the solution. If solution monitoring is enabled and the set date is before the current date (i.e., the working life has expired), then the date will be shown in red.

With the **[Edit] ▶ Column display...** menu item further columns from the solution properties can be shown.

NOTE

Lines that contain red entries will also show the line number highlighted with a red background.

Table view

The solution table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width
- **Dragging the column title**:
  Moves the column to the required location

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

Functions

The **[Edit]** menu beneath the solution table contains the following menu items:

New…	Add manually a new solution *(see chapter 6.8.2.2, page 632)*.
Delete	Deletes the selected solution *(see chapter 6.8.2.3, page 632)*.
Properties…	Edits the selected solution *(see chapter 6.8.3.1, page 634)*.
Column display…	Defines columns for the solution table *(see chapter 6.8.2.4, page 632)*.
Print (PDF)	Outputs the solution table as PDF file *(see chapter 6.8.2.5, page 633)*.

6.8.2.2 Adding a new solution

Menu item: **Configuration ► Solutions ► [Edit] ► New…**

A new solution that is not supplied by dosing devices is manually added to solution table with **[Edit] ► New…**. The properties window opens automatically for editing the solution. After the properties window has been closed, the solution is entered in the solution table. The parameters can be modified at any time with **[Edit] ► Properties…**.

6.8.2.3 Deleting a solution

Menu item: **Configuration ► Solutions ► [Edit] ► Delete**

The solution selected in the solution table is deleted with **[Edit] ► Delete**.

6.8.2.4 Solutions - Column display

Dialog window: **Configuration ► Solutions ► [Edit] ► Column display… ► Column display**

With **[Edit] ► Column display…**, the **Column display** dialog window opens. Here you can define the columns that are to be shown in the solution table.

Available columns

Shows all fields that can be displayed as columns in the solution table.

Displayed columns

Shows all fields that are displayed as columns in the solution table. By default, the columns **Solution name**, **Concentration**, **Cylinder volume**, **Type**, **Dosing device** and **Expiry date** are shown. The **Solution name** column is always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.8.2.5 Printing solution list

Dialog window: **Configuration ► Solutions ► [Edit] ► Print (PDF)… ► Print solution list (PDF)**

[Edit] ► Print (PDF)… opens the dialog window **Print list of solutions (PDF)**.

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Portrait format**

Portrait format
Output of the solution table in portrait format.

Landscape format
Output of the solution table in landscape format.

[OK]

The solution table is output in the required format as a PDF file and opened directly in Acrobat Reader; it can then be printed and/or saved.

6.8.3 Solution properties

6.8.3.1 Editing solution properties

Dialog window: **Configuration ► Solutions ► [Edit] ► Properties... ► Solution - 'Name'**

The parameters for the selected solution are defined on the following tabs:

- *Solution*
  Properties of the solution and solution monitoring.
- *Dosing unit*
  Properties of the dosing unit containing the solution.
- *GLP*
  Properties of GLP test and GLP monitoring.

6.8.3.2 Properties - Solution

Tab: **Configuration ► Solutions ► [Edit] ► Properties... ► Solution - 'Name' ► Solution**

Solution name

Name of the solution.

Entry	**24 characters**

Concentration (value)

Concentration value of the solution. The concentration value of a solution used in a time program by the corresponding commands, is available as a variable (**'TP.command number.CONC'**, **'TP.command number.CONC1'** or **'TP.command number.CONC2'**) for calculations.

Input range	**0.0 to 1E+13**
Default value	**1.000**

Concentration (unit)

Concentration unit of solution.

Entry	**10 characters**
Selection	**mol/L** | **g/L** | **µg/mL** | **µmol/L** | **µmol/mL** | **mEq/L** | **mg/L** | **mg/mL** | **mmol/L** | **%** | **ppb** | **ppm** | **ppt**
Default value	**mol/L**

Comment

Remarks about the solution (e.g. batch number).

Entry	**24 characters**

Production date

Date on which the solution was produced. This date can be edited only for manually added solutions by pressing ....

Selection	**Date selection**

Monitoring the solution

on | off (Default value: **off**)

If this option is activated, then the working life of the solution will be monitored.

Working life

Working life of the solution in days. If a value is entered here, then the **Expiry date** will be automatically adapted.

Input range	**0 to 999 Days**
Default value	**999 Days**

Expiry date

Expiry date of the solution. The date can be selected by clicking on ... in the **Select date** dialog window. After a date has been entered the **Working life** will be automatically adapted.

Selection	**Date selection**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail]

[E-Mail] opens the **Send E-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If during monitoring it is found that the working life has expired then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the working life has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, the message that the working life has expired is automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.8.3.3 Properties - Dosing unit

Tab: **Configuration ▶ Solutions ▶ [Edit] ▶ Properties… ▶ Dosing unit**

Hardware

Name

Freely definable designation for the dosing unit.

Entry	**24 characters**
Default value	**'empty'**

Type

Shows the type of dosing unit:

Selection	**IDU**

IDU
Intelligent dosing unit 807 with data chip.

Order number

Shows the order number of the dosing unit.

Serial number

Shows the serial number of the dosing unit.

Cylinder volume

Shows the cylinder volume for the dosing unit.

Cylinder serial number

Shows the serial number of the cylinder, which is read out automatically. It is printed on new cylinders and can be modified at any time, e.g. if the cylinder has been replaced.

Entry	**8 characters**

Parameters for preparation

Configuration of the parameters which are to be used for the **Prepare** and **Empty** commands.

Prepare/empty dosing port

Dosing port through which the cylinder content is to be ejected during preparation and emptying.

Selection	**Dosing port 1** | **Dosing port 2** | **Fill port** | **Special port**
Default value	**Dosing port 1**

Dosing rate Dos. port 1

Rate at which dosing should take place via **dosing port 1**. The maximum dosing rate depends on the cylinder volume of the dosing unit used (see below). When the function is carried out, the rate will automatically be reduced to the highest possible value.

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Dosing rate Dos. port 2

Rate at which dosing should take place via **dosing port 2**. The maximum dosing rate depends on the cylinder volume of the dosing unit used (see below). When the function is carried out, the rate will automatically be reduced to the highest possible value.

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Dosing rate Fill port

Rate at which dosing or filling should take place via **Fill port**. The maximum dosing rate depends on the cylinder volume of the dosing unit used (see below). When the function is carried out, the rate will automatically be reduced to the highest possible value.

Input range	**0.01 to 166.00 mL/min**

Selection	**maximum**
Default value	**maximum**

Dosing rate Spec.port

Rate at which dosing should take place via the **Special port**. The maximum dosing rate depends on the cylinder volume of the dosing unit used (see below). When the function is carried out, the rate will automatically be reduced to the highest possible value.

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Maximum dosing rate for the dosing unit in relation to the cylinder volume:

Cylinder volume	Maximum rate
2 mL	6.67 mL/min
5 mL	16.67 mL/min
10 mL	33.3 mL/min
20 mL	66.6 mL/min
50 mL	166.0 mL/min

NOTE

Enter lower rates for solutions of higher viscosity.

Tubing parameters

Definition of length and diameter of the tubing connected to the dosing unit. In addition, the port assignment can be modified. These parameters are important for the correct execution of the commands **Prepare** and **Empty** with the dosing unit, because the volumes of the tubing connections are taken into account.

NOTE

Default values have already been entered for the tubing parameters; these correspond to the dimensions of the standard tubing supplied. If you do not make any modifications to the tubing connections then you do not need to modify the tubing parameters. Please visit the *Metrohm website* for information on the length and diameter of other tubings.

Dosing port 1

Port

Port to be used as dosing port 1.

Selection	**Port 1** | **Port 2** | **Port 3** | **Port 4**
Default value	**Port 1**

Length

Length of the tubing on dosing port 1.

Input range	**0.0 to 999.9 cm**
Default value	**40.0 cm**

Diameter

Diameter of the tubing on dosing port 1.

Input range	**0.0 to 9.9 mm**
Default value	**2.0 mm**

Dosing port 2

Port

Port to be used as dosing port 2.

Selection	**Port 1** | **Port 2** | **Port 3** | **Port 4**
Default value	**Port 3**

Length

Length of the tubing on dosing port 2.

Input range	**0.0 to 999.9 cm**
Default value	**0.0 cm**

Diameter

Diameter of the tubing on dosing port 2.

Input range	**0.0 to 9.9 mm**
Default value	**2.0 mm**

Fill port

Port

Port to be used as a fill port for aspirating solution.

Selection	**Port 1** | **Port 2** | **Port 3** | **Port 4**
Default value	**Port 2**

Length

Length of the tubing on the fill port.

Input range	**0.0 to 999.9**
Default value	**25.0**

Diameter

Diameter of the tubing on the fill port.

Input range	**0.0 to 9.9 mm**
Default value	**2.0 mm**

Special port

Port

Port to be used as the special port.

Selection	**Port 1** | **Port 2** | **Port 3** | **Port 4**
Default value	**Port 4**

Length

Length of the tubing on the special port.

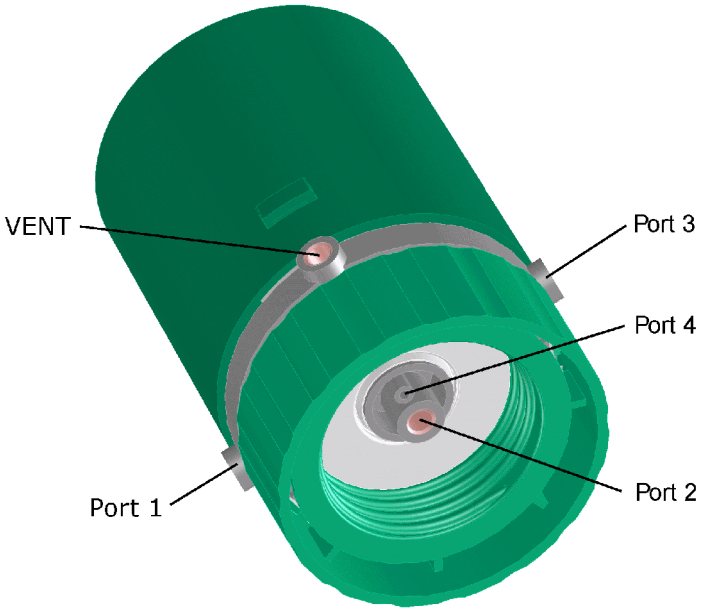
Input range	**0.0 to 999.9 cm**
Default value	**0.0 cm**

Diameter

Diameter of the tubing on the special port.

Input range	**0.0 to 9.9 mm**
Default value	**2.0 mm**

Port assignment of the dosing unit:



Valve disk

Rotation direction

Indication of the shift direction of the valve disk. **automatic** is the shift direction with the shortest path.

Selection	**ascending** | **descending** | **automatic** | **not over**
Default value	**automatic**

Not over

Selection of a protected port that is not crossed during rotation.

Selection	**Port 1** | **Port 2** | **Port 3** | **Port 4**
Default value	**Port 4**

6.8.3.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.9 Subwindow EPC solutions

6.9.1 Configuration - EPC solutions

Subwindow: **Configuration ► EPC solutions**

Subwindow EPC solutions

The EPC solutions are used for eluent production with the 948 Continuous IC Module. The **EPC solutions** subwindow contains the solution table with all EPC solutions. All EPC solutions must be added manually. The **EPC solutions** subwindow can be shown in a separate window in the **Configuration** program part as a part of the configuration view or (if not present on the user interface) with **View ► Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

6.9.2 Solution table

6.9.2.1 Solution table

Subwindow: **Configuration ► EPC solutions**

Content

The following information about the EPC solutions is displayed in the solution table by default:

Solution name

Name of the EPC solution.

Concentration

Concentration of the EPC solution at the time the EPC solution was added to the solution table.

Unit: mol/L

Expiry date

Expiry date of the EPC solution. If solution monitoring is enabled and the set date is before the current date (i.e., the working life has expired), then the date will be shown in red.

Current concentration

Remaining concentration of the EPC solution.

Unit: mol/L

Additional columns from the solution properties can be shown with the **[Edit] ► Column display...** menu item.

NOTE

Lines that contain red entries will also show the line number highlighted with a red background.

Table view

The solution table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width
- **Dragging the column title**:
  Moves the column to the required location

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

Functions

The **[Edit]** menu beneath the solution table contains the following menu items:

New...	Add new EPC solution manually *(see chapter 6.8.2.2, page 632)*.
Delete	Delete selected EPC solution *(see chapter 6.8.2.3, page 632)*.
Properties...	Edit selected EPC solution *(see chapter 6.8.3.1, page 634)*.
Column display...	Defines columns for the solution table *(see chapter 6.8.2.4, page 632)*.

Print (PDF)	Outputs the solution table as PDF file *(see chapter 6.8.2.5, page 633)*.

6.9.2.2 Adding a new EPC solution

Menu item: **Configuration ► EPC solutions ► [Edit] ► New…**

A new EPC solution is manually added to the solution table with **[Edit] ► New…**. The properties window then opens automatically for editing the EPC solution. After the properties window has been closed, the EPC solution is entered in the solution table. The parameters can be modified at any time with **[Edit] ► Properties…**.

6.9.2.3 EPC solution delete

Menu item: **Configuration ► EPC solutions ► [Edit] ► Delete**

The EPC solution selected in the solution table is deleted with **[Edit] ► Delete**.

6.9.2.4 EPC solutions - Column display

Dialog: **Configuration ► EPC solutions ► [Edit] ► Column display… ► Column display**

With **[Edit] ► Column display…**, the **Column display** dialog is opened. Here you can define the columns that are to be shown in the solution table.

Available columns

Shows all fields that can be displayed as columns in the solution table.

Displayed columns

Display showing all fields that are displayed as columns in the solution table. By default, the columns **Solution name**, **Concentration**, **Expiry date** and **Current concentration** are shown. The **Solution name** column is always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.9.2.5 Print solution list

Dialog: **Configuration ► EPC solutions ► [Edit] ► Print (PDF)… ► Print solution list (PDF)**

[Edit] ► Print (PDF)… opens the **Print solution list (PDF)** dialog.

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Portrait format**

Portrait format
Output of the solution table in portrait format.

Landscape format
Output of the solution table in landscape format.

[OK]

The solution table is output in the required format as a PDF file and opened directly in Acrobat Reader; it can then be printed and/or saved.

6.9.3 Solution properties

6.9.3.1 Editing solution properties

Dialog: **Configuration ► EPC solutions ► [Edit] ► Properties… ► EPC solution - 'Name'**

The parameters for the selected solution are defined on the following tabs:

- *EPC solution*
  Properties of the solution and solution monitoring.
- *Monitoring*
  Monitoring the concentration.
- *GLP*
  Properties of GLP test and GLP monitoring.

6.9.3.2 Properties - Solution

Tab: **Configuration ► EPC solutions ► [Edit] ► Properties... ► EPC solution - 'Name' ► Solution**

Solution name

Name of the EPC solution.

Entry	**24 characters**

Concentration (value)

Concentration value of the EPC solution.

Input range	**0.0 to 1E+13 mol/L**
Default value	**1.000 mol/L**

Comment

Remarks about the EPC solution (e.g. batch number).

Entry	**24 characters**

Manufacturing date

Date on which the EPC solution was produced.

Selection	**Date selection**

Monitoring the solution

on | off (Default value: **off**)

If this option is enabled, then the working life of the EPC solution will be monitored.

Working life

Working life of the EPC solution in days. If a value is entered here, then the **Expiry date** will be automatically adapted.

Input range	**0 to 999 Days**
Default value	**999 Days**

Expiry date

Expiry date of the EPC solution. The date can be selected by clicking on … in the **Select date** dialog. After a date has been entered the **Working life** will be automatically adapted.

Selection	**Date selection**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail]

[E-Mail] opens the **Send E-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If during monitoring it is found that the working life has expired then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the working life has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, the message that the working life has expired is automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.9.3.3 Properties - Monitoring

Tab: **Configuration ► EPC solutions ► [Edit] ► Properties... ► EPC solution - 'Name' ► Monitoring**

Current concentration

Current concentration of the EPC solution.

Input range	**0.0 to Concentration mol/L**
Default value	**4.0 mol/L**

The value of the Concentration is visible on the Solution tab.

Reset

With **[Reset]**, the value for the **Current concentration** is set equal to the value for the **Concentration** on the **Solution** tab.

Monitor the concentration

on | off (Default value: **off**)

If this option is enabled, then the concentration of the EPC solution will be monitored.

Concentration limit

Lower Concentration limit of the EPC solution.

Input range	**0.0 to Value entered for the Current concentration. mol/L**
Default value	**0.4 mol/L**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail]

[E-Mail] opens the **Send E-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can be edited only if monitoring is switched on.

If during monitoring it is found that the Concentration limit was not reached, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the Concentration limit was not reached will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, the message that the Concentration limit was not reached will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.9.3.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.10 Accessories subwindow

6.10.1 Configuration - Accessories

Subwindow: **Configuration ► Accessories**

Accessories subwindow

The subwindow **Accessories** contains the table with the accessories defined by the user. It can be shown in the **Configuration** program part as a part of the configuration view or (if not present on the user interface) in a separate window with **View ► Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Use of accessories

The accessories defined in the accessories table can be assigned to each analysis in the method in the devices subwindow. The accessories data is saved in the determination in this case. The working life of the accessories can also be monitored.

6.10.2 Accessories table

6.10.2.1 Accessories table - Desktop

Content

In the accessories table the following information about automatically recognized or manually added accessories parts is shown by default:

Accessory name

Name of the accessories part.

Set to work

Date on which the accessories part was added to the table.

Expiry date

Expiry date of the accessories part. If accessories monitoring is switched on and the set date is before the current date (i.e., the working life has expired), then the set date will be shown in red lettering.

Next GLP test

Shows the date on which the next GLP test is due for the accessories part. If GLP monitoring is switched on and the set date is before the current date (i.e., the GLP test has not yet been carried out), then the date will be shown in red.

Table view

The accessories table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width
- **Dragging the column title**:
  Moves the column to the required location

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

If the accessories part is reserved for an ongoing determination then the line will be shown in gray and the accessories part cannot be edited until the determination has been finished.

Functions

The menu **[Edit]** beneath the accessories table contains the following menu items:

New...	Add manually a new accessory part *(see chapter 6.10.2.2, page 653)*.
Delete	Delete the selected accessories *(see chapter 6.10.2.3, page 653)*.
Properties...	Edit the selected accessories *(see chapter 6.10.3.1, page 654)*.
Column display...	Define the columns for the accessories table *(see chapter 6.10.2.4, page 653)*.
Print (PDF)...	PDF file output of the accessories table *(see chapter 6.10.2.5, page 654)*.

6.10.2.2 Adding new accessories

Menu item: **Configuration ► Accessories ► [Edit] ► New...**

A new accessories part is added manually with **[Edit] ► New...** to the accessories table. The properties window then opens automatically for editing the accessories part. After the properties window has been closed, the accessories part is entered in the accessories table. The parameters can be modified at any time with **[Edit] ► Properties...**.

6.10.2.3 Deleting accessories

Menu item: **Configuration ► Accessories ► [Edit] ► Delete**

With **[Edit] ► Delete**, the accessories part selected in the table is deleted.

6.10.2.4 Accessories - Column display

Dialog: **Configuration ► Accessories ► [Edit] ► Column display... ► Column display**

The **Column display** window is opened with **[Edit] ► Column display...**. Here you can define the columns that are to be shown in the accessories table.

Columns available

Shows all the fields that can be shown as columns in the accessories table.

Columns displayed

Shows all the fields that will be shown as columns in the accessories table. Per default, the columns **Accessory name**, **Set to work**, **Expiry date**

and **Next GLP test** are displayed. The **Accessory name** column is always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.10.2.5 Printing the accessories list

Menu item: **Configuration ► Accessories ► [Edit] ► Print (PDF)... ► Print list of accessories (PDF)**

The **Print list of accessories (PDF)** dialog window is opened with **[Edit] ► Print (PDF)...**.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Portrait
Output of the accessories table in portrait format.

Landscape
Output of the accessories table in landscape format.

[OK]

The accessories table is output in the required format as a PDF file and opened directly with Acrobat Reader; it can then be printed and/or saved.

6.10.3 Accessories properties

6.10.3.1 Editing accessories properties

Dialog window: **Configuration ► Accessories ► [Edit] ► Properties... ► Accessories - 'Name'**

The parameters for the selected accessories part are defined in the following tabs:

- *Accessories*
- *Monitoring*
- *GLP*

6.10.3.2 Properties - Accessories

Tab: **Configuration ▶ Accessories ▶ [Edit] ▶ Properties... ▶ Accessories - 'Name' ▶ Accessory**

Accessory name

Name of the accessories part.

Entry	**40 characters**

Order number

Order number of the accessories part.

Entry	**25 characters**

Manufacturer

Manufacturer of the accessories part.

Entry	**25 characters**

Comment

Comment on the accessories part.

Entry	**250 characters**

6.10.3.3 Properties - Monitoring

Tab: **Configuration ▶ Accessories ▶ [Edit] ▶ Properties... ▶ Accessories - 'Name' ▶ Monitoring**

Set to work

Displays the date and time when the accessory part was used for the first time. This date can be edited by pressing ….

Accessory monitoring

on | off (Default value: **off**)

If this option is activated, then the working life of the accessories part will be monitored.

Working life

Working life of the accessories part in days. If a value is entered here, then the **Expiry date** field will be adjusted automatically.

Input range	**0 to 999 days**
Default value	**999 days**

Expiry date

Expiry date of the accessories part. This date can be selected by clicking on ... in the **Select date** dialog window. After a date has been entered, the value for the **Working life** will be automatically adjusted.

Selection	**Date selection**

Message

The message options can only be edited if monitoring of accessories parts is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is activated, then the message is sent to the e-mail address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window.

Acoustic signal

on | off (Default value: **off**)

If this option is activated, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring of accessories parts is switched on.

If during accessories part monitoring it is found that the working life has expired then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the working life of the accessories part has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued then the message that the working life of the accessories part has expired will be saved automatically with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.10.3.4 Properties - GLP

Tab: **Configuration ▶ 'Subwindow' ▶ [Edit] ▶ Properties... ▶ 'Properties' ▶ GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.11 Rack data subwindow

6.11.1 Configuration - Rack data

Subwindow: **Configuration ▶ Rack data**

Rack data subwindow

The **Rack data** subwindow contains the rack table with all sample racks for Metrohm sample changers defined for the client. It can be shown in a separate window in the **Configuration** program part as a part of the configuration view or (if not present on the user interface) with **View ▶ Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Display of sample racks

The rack table is empty by default. Sample racks that are placed on sample processors are recognized automatically and included in the rack table. Additional racks can be imported manually.

6.11.2 Rack table

6.11.2.1 Rack table

Subwindow: **Configuration ▶ Rack data**

Contents

The rack data table shows the following information about the configured racks as the default setting:

Rack name

Name of the rack.

Rack code

Rack code of the rack.

Number of positions

Number of sample positions on the rack.

Beaker radius samples

Radius of the beakers on the rack.

Beaker sensor

Defines the beaker sensors for the rack.

Device

Shows the devices to which the rack is attached.

Table view

The rack table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width
- **Dragging the column title**:
  Moves the column to the required location

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

For sample racks that are placed on a Sample Processor and that are automatically recognized, the corresponding device name will be displayed in the **Device** column. In addition the line number will be shown with a green background.

If a rack is reserved for an ongoing determination or for manual control, then the line will be shown in gray and the rack cannot be edited until the determination has been finished.

Functions

The **[Edit]** menu beneath the rack table contains the following menu items:

New…	Add manually a new rack *(see chapter 6.11.2.2, page 660)*.
Delete	Deletes the selected rack *(see chapter 6.11.2.3, page 661)*.
Properties…	Edit the selected rack *(see chapter 6.11.3.1, page 661)*.
Print (PDF)…	Output of the rack table as a PDF file .*(see chapter 6.11.2.4, page 661)*

6.11.2.2 Adding a new rack

Dialog window: **Configuration ▶ Rack data ▶ [Edit] ▶ New… ▶ New rack**

A new rack can only be generated as a copy of an already existing rack under a new rack name and with a new rack code. **[Edit] ▶ New…** opens the **New rack** dialog window.

Template

Selection of the rack to be used as a template for the new rack.

Selection	**All existing racks**

Rack name

Name for the new rack. The selected name must not already exist.

Entry	**25 characters**

Rack code

Code of the new rack. The selected rack code must not already exist.

Entry	**6-digit bit pattern consisting of 0 and 1**

6.11.2.3 Deleting a rack

Menu item: **Configuration ► Rack data ► [Edit] ► Delete**

The rack selected in the rack list is deleted with **[Edit] ► Delete**.

6.11.2.4 Printing the rack list

Dialog window: **Configuration ► Rack data ► [Edit] ► Print (PDF)… ► Print rack list (PDF)**

The **Print rack list (PDF)** dialog window is opened with **[Edit] ► Print (PDF)…**.

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Portrait format**

Portrait format
Output of the rack table in portrait format.

Landscape format
Output of the rack table in landscape format.

[OK]

The rack table is output in the required format as a PDF file and opened directly with Acrobat Reader; it can then be printed and/or saved.

6.11.3 Rack properties

6.11.3.1 Editing rack properties

Dialog window: **Configuration ► Rack data ► [Edit] ► Properties… ► Rack data**

Rack name

Shows the name of the attached rack. If no rack is attached, then "**-----**" will be shown.

Rack code

Shows the rack code of the attached rack. The rack code corresponds to the arrangement of magnets on the base of the rack and is read in by the Sample Processor in order to recognize the rack. If no rack is in position, then the display will be empty.

Number of positions

Shows the number of positions on the attached rack. If no rack is in position, then the display will be empty.

The parameters for the attached rack are defined on the following tabs:

- *Rack parameters*
  Defines the parameters that are valid for all rack positions.
- *Lift positions*
  Defines the work, rinse, shift and special positions for Tower 1 and Tower 2 (if present).
- *Special beakers*
  Settings for all special beakers on the attached rack.

6.11.3.2 Properties - Rack parameters

Tab **Configuration ► Rack data ► [Edit] ► Properties… ► Rack data ► Rack parameters**

Beaker radius samples

Radius of the sample beakers on the rack. If the lift is moved to this work position, then this value will be compared with the **Min. beaker radius** parameter *(see chapter 7.11.2.2, page 1044)*, which can be specifically defined for each tower. If **Beaker radius samples << min. beaker radius**, then a corresponding error message will appear. With **off**, the beaker radius will not be checked.

Input range	**1.0 to 100.0 mm**
Selection	**off**

Beaker sensor

If a sample position is approached with the **MOVE** command, then the beaker sensor (**Tower**, **Robotic arm**) checks whether a sample beaker is present or not. With **off**, no check takes place. For the **Robotic arm** option, a Swing Head with beaker sensor must be installed and a suitable work position with beaker contact must be defined for the lift, as this position is approached for beaker recognition.

With the **Beaker test** parameter in the **MOVE** command, you can determine whether the determination is to be canceled if a beaker is missing with or without the display of a corresponding message and whether the series is to be continued or canceled as well.

Selection	**Tower** | **Robotic arm** | **off**

Rack offset

The rack offset is a production-dependent tolerance value between the upper part of the rack and the lower part. The rack offset value is deter-

mined when the rack is adjusted and displayed here. If necessary, it can be edited.

Input range	**-5.00 to 5.00 °**

6.11.3.3 Properties - Lift positions

Tab: **Configuration ▶ Rack data ▶ [Edit] ▶ Properties... ▶ Rack data ▶ Lift positions**

Tower 1

Defines the lift positions for tower 1. These apply for all rack positions except those that are defined as **Special beakers**.

Work position

Work position for lift 1. At this lift position the electrodes, stirrers and buret tips are optimally positioned for work.

Input range	**0 to 235 mm**

Rinse position

Rinse position for lift 1. This lift position is used for rinsing the electrodes.

Input range	**0 to 235 mm**

Shift position

Shift position for Lift 1. Each time that the rack shifts, the lift will move to this position if it is located at a lower lift position. If the lift is located at a higher lift position than that defined here, then it will shift at the current lift position. This means that the shift position must be selected so that a safe movement across the entire rack is possible at any time.

Input range	**0 to 235 mm**

Special position

Special position for lift 1. This position, which can be additionally defined, can be used, e.g., for pipetting, when the tip is to be immersed only a little in the sample solution.

Input range	**0 to 235 mm**

Tower 2

Defines the lift positions for tower 2. These apply for all rack positions except those that are defined as **Special beakers**.

Work position

Work position for lift 2. At this lift position the electrodes, stirrers and buret tips are optimally positioned for work.

Input range	**0 to 235 mm**

Rinse position

Rinse position for lift 2. This lift position is used for rinsing the electrodes.

Input range	**0 to 235 mm**

Shift position

Shift position for Lift 2. Each time that the rack shifts, the lift will move to this position if it is located at a lower lift position. If the lift is located at a higher lift position than that defined here, then it will shift at the current lift position. This means that the shift position must be selected so that a safe movement across the entire rack is possible at any time.

Input range	**0 to 235 mm**

Special position

Special position for lift 2. This position, which can be additionally defined, can be used, e.g., for pipetting, when the tip is to be immersed only a little in the sample solution.

Input range	**0 to 235 mm**

6.11.3.4 Properties - Special beaker

Tab: **Configuration ▶ Rack data ▶ [Edit] ▶ Properties… ▶ Rack data ▶ Special beakers**

The table shows the data of all special beakers of the attached rack in tabular form. Any position on the rack can be assigned to each special beaker. The table cannot be edited directly.

NOTE

Special beakers should preferably be set at high rack positions in order to be able to begin sample series at rack position 1. Rack positions defined as special beakers are no longer available as sample positions. A specific work position can be defined for each special beaker at tower 1 and tower 2 (if present). The shift, rinse and special positions of the corresponding tower are applied from the general rack positions.

The following columns are displayed in the table:

Special beaker

Number of the special beaker for the selected rack.

Rack position

Number of the rack position for the special beaker.

Work position tower 1

Work position for the special beaker at tower 1.

Work position tower 2

Work position for the special beaker at tower 2.

Beaker radius

Radius of the special beaker.

Beaker sensor

Defines whether a beaker sensor is to be used for the special beaker, and if so, which.

[Edit]

Opens the **Special beaker #** *(see chapter 6.11.3.5, page 665)* dialog window for editing the data of the selected special beaker.

6.11.3.5 Special beaker

Dialog window: **Configuration ▶ Rack data ▶ [Edit] ▶ Properties… ▶ Rack data ▶ Special beakers ▶ [Edit] ▶ Special beaker #**

The parameters for the special beaker selected in the table of special beakers can be defined in the **Special beaker #** dialog window.

Rack position

Number of the rack position for the selected special beaker.

Input range	**0 to n (n is rack-dependent)**

NOTE

Special beakers should preferably be set at high rack positions in order to be able to begin sample series at rack position 1. Rack positions defined as special beakers are no longer available as sample positions. They will be skipped when a sample position is automatically approached.

Work position tower 1

Work position of the selected special beaker at tower 1.

Input range	**0 to 235 mm**

Work position tower 2

Work position of the selected special beaker at tower 2.

Input range	**0 to 235 mm**

Beaker radius

Radius of the selected special beaker on the rack. If the lift is moved to this work position, then this value will be compared with the **Min. beaker radius** parameter *(see chapter 7.11.2.2, page 1044)*, which can be specifically defined for each tower. If **Beaker radius samples << min. beaker radius**, then a corresponding error message will appear. With **off**, the beaker radius will not be checked.

Input range	**1.0 to 100.0 mm**
Selection	**off**

Beaker sensor

If the **Move** command is used for moving to the selected special beaker, then the beaker sensor (**Tower**, **Robotic arm**) will check whether the special beaker is present or not. With **off**, no check takes place. For the **Robotic arm** option, a Swing Head with beaker sensor must be installed and a suitable work position with beaker contact must be defined for the lift, as this position is approached for beaker recognition.

With the **Beaker test** parameter in the **Move** command, you can determine whether the determination is to be canceled if a beaker is missing with or without the display of a corresponding message and whether the series is to be continued or canceled as well.

Selection	**Tower** | **Robotic arm** | **off**

6.12 Common variables subwindow

6.12.1 Configuration - Common variables

Subwindow: **Configuration ► Common variables**

Common variables subwindow

The subwindow **Common variables** contains the table with the configured common variables. It can be shown in a separate window in the program part **Configuration** as a part of the configuration view or (if not present on the desktop) with **View ► Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Using common variables

Common variables are variables that apply to all methods and that are stored per client; they can be used in formulas under the designation **'CV.Name'**. They are either entered manually in the configuration or assigned in the method run under **Evaluation - Results - Common variables**.

6.12.2 Table of common variables

6.12.2.1 Table of common variables

Subwindow: **Configuration ► Common variables**

Content

The table of common variables shows the following information about the global variables by default:

Name

Name of common variables.

Type

Type of common variables (**Number**, **Text** or **Date/Time**).

Value

Value of common variables.

Unit

Unit of common variables.

Assignment date

Date of the last value assignment for the common variable.

Assignment method

Name of the method used for value assignment.

User

Short name of the user who was logged in during value assignment.

Next assignment

Date on which the next value assignment is to be carried out. If monitoring of the common variable is enabled and the set date is before the current date (i.e., the value assignment has not yet been carried out), then the date will be shown in red.

With the **[Edit] ► Column display** menu item, further columns can be shown from the properties of the common variables.

NOTE

Lines that contain red entries will also show the line number highlighted with a red background.

Table view

The table of common variables cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width
- **Dragging the column title**:
  Moves the column to the required location

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

Functions

The **[Edit]** menu beneath the table of common variables contains the following menu items:

New…	Add manually a new common variable *(see chapter 6.12.2.2, page 668)*.
Delete	Deletes the selected common variable *(see chapter 6.12.2.3, page 669)*.
Properties…	Edit the selected common variable *(see chapter 6.12.3.1, page 670)*.
Column display…	Define the columns of the table of common variables *(see chapter 6.12.2.4, page 669)*.
Print (PDF)…	Output the table of common variables as PDF file *(see chapter 6.12.2.5, page 669)*.

6.12.2.2 Adding a new common variable

Menu item: **Configuration ► Common variables ► [Edit] ► New…**

A new common variable is manually added to the table of common variables with **[Edit] ► New…**. The properties window for editing the common variables then opens automatically. After the properties window has been closed the common variable will be entered in the table of common variables. The parameters can be modified at any time with **[Edit] ► Properties…**.

6.12.2.3 Deleting a common variable

Menu item: **Configuration ▶ Common variables ▶ [Edit] ▶ Delete**

With **[Edit] ▶ Delete**, the common variable selected in the table is deleted.

6.12.2.4 Common variables - Column display

Dialog window: **Configuration ▶ Common variables ▶ [Edit] ▶ Column display… ▶ Column display**

With **[Edit] ▶ Column display…**, the **Column display** window opens. Here you can define the columns that are to be shown in the table of common variables.

Available columns

Shows all fields that can be displayed as columns in the table of common variables.

Displayed columns

Shows all fields that are displayed as columns in the table of common variables. The default situation shows the columns **Name**, **Type**, **Value**, **Unit**, **Assignment date**, **Assignment method**, **User** and **Next assignment**. The three columns **Name**, **Type** and **Value** are always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.12.2.5 Printing the list of common variables

Dialog window: **Configuration ▶ Common Variables ▶ [Edit] ▶ Print (PDF) … ▶ Print list of common variables (PDF)**

Orientation

Selection	**Portrait format** | **Landscape format**
Default value	**Portrait format**

Portrait format
Outputs the table of common variables in portrait format.

Landscape format
Outputs the table of common variables in landscape format.

[OK]

The table of common variables is output in the desired format as a PDF file and opened directly with Acrobat Reader; it can then be printed out and/or saved.

6.12.3 Properties of common variables

6.12.3.1 Editing properties of common variables

Dialog window: **Configuration ► Common variables ► [Edit] ► Properties… ► Common variable 'Name'**

With menu item **[Edit] ► Properties…** in the subwindow **Common variables** the properties window for the common variable selected in the table opens, in which the parameters of the common variables can be edited. It consists of the following tabs:

- *Common variable*
  Information about common variables, such as name, type, value, etc.

6.12.3.2 Properties - Common variable

Tab: **Configuration ► Common variables ► [Edit] ► Properties... ► Common variable - 'Name' ► Common variable**

Name

Name of common variables.

Entry	**50 characters**

Type

Selection of the type for a new common variable. For existing common variables, the type will only be shown; it cannot be edited.

Selection	**Number** | **Text** | **Date/Time**
Default value	**Number**

Value

Value of common variables. This value can be assigned in a method or entered manually. For methods that use the common variable it is available as the variable **'CV.Name.VAL'** or **'CV.Name'** (short form) for calculations.

For type **Date/Time** variables, the date can be selected by clicking on … in the **Select date** dialog window.

Type = Number	
Input range	**-1E+99 to 1E+99 (max. 15 places)**

Type = Text	
Entry	**256 characters**

Type = Date/Time	
Selection	**Date selection**

Value (unit)

Designation of the unit. If a value is assigned automatically, then the unit will be automatically entered here. It is available for methods that use the common variable as variable **'CV.Name.UNI'** for calculations.

Entry	**20 characters**
Selection	**'empty'** | **mol/L** | **mmol/L** | **µmol/mL** | **g/L** | **mg/L** | **µg/L** | **mg/mL** | **ppm** | **%** | **mEq/L** | **mL** | **µg** | **µS/cm**
Default value	**mol/L**

Comment

Possibility of entering remarks about the common variable.

Entry	**256 characters**

Assignment date

Date and time at of last value assignment; this is entered automatically each time that a value is assigned automatically or entered manually.

NOTE

In contrast to automatic value assignment, no new date is entered when the value is assigned manually if the value remains unchanged.

Assignment method

Name of the method with which the last value assignment was carried out. If the value has been entered manually then **manual** will be shown here.

User

Short name of the user who was logged in during value assignment or who entered the value manually. If the login function is not used, then the user logged in under Windows will be entered automatically.

Common variable monitoring

on | off (Default value: **off**)

If this option is enabled then the validity of the common variables will be monitored.

Validity

Validity period of the common variable in days. If a value is entered here, then the field **Next assignment** will be adapted automatically.

Input range	**0 to 999 Days**
Default value	**999 Days**

Next assignment

Date on which the next value assignment must take place. The date can be selected by clicking on … in the dialog window **Select date** *(see chapter 2.5.1, page 82)*. After a date has been entered, the value for the **Validity** will be automatically adapted.

Selection	**Date selection**

Message

The message options can only be edited if monitoring of common variables is enabled.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail]

[E-mail] opens the **Send E-mail** window.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring for common variables is enabled.

If during common variable monitoring it is found that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period of the common variable has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.13 Subwindow Amperometric cells

6.13.1 Configuration - Amperometric cells

Subwindow: **Configuration ► Amperometric cells**

Subwindow Amperometric cells

The subwindow **Amperometric cells** contains the table of the amperometric cells with all of the automatically recognized and manually added cells of the amperometric detector. It can be shown in a separate window in the program part **Configuration** as a part of the configuration view or (if not present on the desktop) with **View ► Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Automatically recognized amperometric cells

Intelligent amperometric cells from Metrohm have a data chip with the stored cell data. These kinds of cells are recognized automatically when they are connected to an amperometric detector which is connected to a device such as the **850 Professional IC**. A newly recognized cell is saved in the table of the amperometric cells.

Manually added amperometric cells

Nonintelligent amperometric cells have no data chip and must be added manually to the table of the amperometric cells.

6.13.2 Table of amperometric cells

6.13.2.1 Table of amperometric cells - Desktop

Content

The following information about automatically recognized or manually added amperometric cells is shown per default in the table of the amperometric cells:

Cell name

Name of the amperometric cell.

Cell type

Type of the amperometric cell. For automatically recognized cells, the type is shown in green.

Connection

Name of the device to which the amperometric cell is connected (only for automatically recognized cells).

Working electrode (WE)

Name of the working electrode of the amperometric cell.

Reference electrode (RE)

Name of the reference electrode of the amperometric cell.

Operating hours WE

Number of operating hours of the working electrode of the amperometric cell.

Next GLP test

Shows the date on which the next GLP test is due for the amperometric cell. If GLP monitoring is switched on and the set date is before the current date (i.e., the GLP test has not yet been carried out), then the date will be shown in red.

Table view

The table of the amperometric cells cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width

- **Double-clicking on the margin between column titles**:
  Sets the optimal column width
- **Dragging the column title**:
  Moves the column to the required location

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

If an amperometric cell is reserved for an ongoing determination or for manual operation then the line will be shown in gray and the cell cannot be edited until the determination has been finished.

Functions

The menu **[Edit]** beneath the table of the amperometric cells contains the following menu items:

New…	Add manually a new amperometric cell *(see chapter 6.13.2.2, page 675)*.
Delete	Delete the selected amperometric cell *(see chapter 6.13.2.3, page 675)*.
Properties…	Edit the selected amperometric cell *(see chapter 6.13.3.2, page 677)*.
Column display…	Define the columns for the table of amperometric cells *(see chapter 6.13.2.4, page 676)*.
Print (PDF)…	Output of the table of amperometric cells as a PDF file *(see chapter 6.13.2.5, page 676)*.

6.13.2.2 Adding a new amperometric cell

Menu item: **Configuration ► Amperometric cells ► [Edit] ► New…**

To add a new, nonintelligent amperometric cell manually, select **[Edit] ► New…**. The *Properties window (p. 677)* opens for editing the cell. Once the fields have been filled out and the Properties window has been closed, the cell is entered in the table of the amperometric cells.

The parameters can be modified at any time with **[Edit] ► Properties…**.

6.13.2.3 Deleting an amperometric cell

Menu item: **Configuration ► Amperometric cells ► [Edit] ► Delete**

With **[Edit] ► Delete**, the amperometric cell selected in the table is deleted.

6.13.2.4 Amperometric cells - Column display

Dialog window: **Configuration ► Amperometric cells ► [Edit] ► Column display… ► Column display**

With **[Edit] ► Column display…**, the **Column display** window opens. Here you can define the columns that are to be shown in the table of the amperometric cells.

Available columns

Shows all the fields that can be displayed as columns in the table of amperometric cells.

Displayed columns

Display of all the fields that will be shown as columns in the table of amperometric cells. The **Cell name** column is always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.13.2.5 Printing the list of amperometric cells

Menu item: **Configuration ► Amperometric cells ► [Edit] ► Print (PDF)…**

With **[Edit] ► Print (PDF)…**, the dialog window **Print list of amp. cells (PDF)** opens.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Landscape**

Portrait
Output of the table of amperometric cells in portrait format.

Landscape
Output of the table of amperometric cells in landscape format.

[OK]

The table of amperometric cells is output in the required format as a PDF file and opened directly with Acrobat Reader; it can then be printed out and/or saved.

6.13.3 Properties of the amperometric cell

6.13.3.1 Editing the properties of the amperometric cell

Dialog window: **Configuration ► Amperometric cells ► [Edit] ► Properties... ► Cell - 'Name'**

The parameters for the selected amperometric cell are defined on the following tabs:

- *Cell*
  Parameters of the amperometric cell.
- *Electrodes*
  Parameters of the electrodes used in the amperometric cell.
- *Monitoring*
  Monitoring the amperometric cell.
- *GLP*
  GLP parameters.

6.13.3.2 Properties - amperometric cell

Tab: **Configuration ► Amperometric cells ► [Edit] ► Properties... ► Cell - 'Name' ► Cell**

Cell name

Name of the amperometric cell.

Entry	**24 characters**

Cell type

Type of the amperometric cell.

Entry	**40 characters**

Order number

Order number of the amperometric cell.

Entry	**10 characters**

Serial number

Serial number of the amperometric cell (entry only possible for manually added cells).

Entry	**16 characters**

Set to work

Date on which the amperometric cell was first used for a determination. This date can be edited for manually added cells only by pressing ...

Comment

Comment on the amperometric cell.

Entry	**24 characters**

6.13.3.3 Properties - Electrodes

Tab: **Configuration ► Amperometric cells ► [Edit] ► Properties... ► Cell - 'Name' ► Properties**

Working electrode (WE)

Type WE

Type of the working electrode.

Entry	**40 characters**

Order number WE

Order number of the working electrode.

Entry	**10 characters**

Serial number WE

Serial number of the working electrode.

Entry	**16 characters**

Set to work WE

Date on which the working electrode was first used for a determination. This date can be edited for manually added amperometric cells only by pressing ...

Comment WE

Comment on the working electrode.

Entry	**24 characters**

Reference electrode (RE)

Type RE

Type of the reference electrode.

Entry	**40 characters**

Order number RE

Order number of the reference electrode.

Entry	**10 characters**

Serial number RE

Serial number of the reference electrode.

Entry	**16 characters**

Set to work RE

Date on which the reference electrode was first used for a determination. This date can be edited for manually added amperometric cells only by pressing ...

Comment RE

Comment on the reference electrode.

Entry	**24 characters**

Spacer

Type Spacer

Type of the spacer.

Entry	**40 characters**

Order number Spacer

Order number of the spacer.

Entry	**10 characters**

6.13.3.4 Properties - Monitoring

Tab: **Configuration ► Amperometric cells ► [Edit] ► Properties… ► Cell - 'Name' ► Monitoring**

Working electrode (WE)

Operating hours

Limit value

Maximum permitted operating hours with this working electrode. If this value is exceeded, the message or action defined below will be triggered.

Input range	**1 to 999**

Current value

Display of the current number of operating hours with this working electrode. If the **Limit value** is exceeded, the **Current value** is displayed **in red**.

Monitoring

on | off (Default value: **off**)

This check box activates monitoring.

Reference electrode (RE)

Operating hours

Limit value

Maximum permitted operating hours with this reference electrode. If this value is exceeded, the message or action defined below will be triggered.

Input range	**1 to 999**

Current value

Display of the current number of operating hours with this reference electrode. If the **Limit value** is exceeded, the **Current value** is displayed **in red**.

Monitoring

on | off (Default value: **off**)

This check box activates monitoring.

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail]**. The message is sent in text format.

[E-mail]

[E-mail] opens the **Send E-mail** window.

Acoustic signal

on | off (Default value: **off**)

If this option is activated, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If during monitoring it is found that a limit value has been exceeded then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that a limit value has been exceeded will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued then the message that the limit value has been exceeded will be saved automatically with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.13.3.5 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.14 Subwindow Rotors

6.14.1 Configuration - Rotors

Subwindow: **Configuration ▶ Rotors**

Subwindow Rotors

The **Rotors** subwindow contains a table with the rotors defined by the user. It can be shown in the **Configuration** program part as a part of the configuration view or (if not present on the user interface) in a separate window with **View ▶ Quick access**. The subwindow can be enlarged and reduced as required; it can also be maximized.

Using Rotors

In the **Devices** subwindow in the method, the rotors defined in the rotor table can be assigned to the module MSM. The rotor data is saved in the determination in this case. The working life of the rotors can also be monitored.

6.14.2 Rotor table

6.14.2.1 Rotor table - User interface

Subwindow: **Configuration ▶ Rotors**

Content

In the rotor table, the following information about manually added rotors is shown by default:

Rotor name

Name of the rotor.

Rotor type

Type of the rotor.

Set to work

Date on which the rotor was added to the table.

Expiry date

Expiry date of the rotor. If **Monitor rotor** is activated and the date set is before the current date (i.e., the working life has expired), then the date will be shown in red.

Next GLP test

Shows the date on which the next GLP test is due for the rotor. If GLP monitoring is switched on and the set date is before the current date (i.e., the GLP test has not yet been carried out), then the date will be shown in red.

Table view

The rotor table cannot be edited directly. Click on the column title to sort the table according to the selected column in either ascending or descending order. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

If the content of a field is larger than the column width, then the entire content will be shown as a tooltip if the mouse cursor hovers over the field.

If a rotor is reserved for an ongoing determination, then this line will be shown in gray and the rotor cannot be edited until the determination has been finished.

Functions

The **[Edit]** menu beneath the rotor table contains the following menu items:

New...	Manually add a new rotor *(see chapter 6.14.2.2, page 684)*.
Delete	Deletes the selected rotor *(see chapter 6.14.2.3, page 685)*.
Properties...	Edit the selected rotor *(see chapter 6.14.3.1, page 686)*.
Column display...	Define columns for the rotor table *(see chapter 6.14.2.4, page 685)*.
Print (PDF)...	Outputs the rotor table as PDF file *(see chapter 6.14.2.5, page 685)*.

6.14.2.2 Add new rotor

Subwindow: **Configuration ► Rotors ► [Edit] ► New...**

A new rotor is manually added to the rotor table with **[Edit] ► New...**. The properties window opens automatically for editing the rotor. After the properties window has been closed, the rotor is entered in the rotor table. The parameters can be modified at any time with **[Edit] ► Properties...**.

6.14.2.3 Deleting a rotor

Menu item: **Configuration ▶ Rotors ▶ [Edit] ▶ Delete**

The rotor selected in the table is deleted with **[Edit] ▶ Delete**.

6.14.2.4 Rotors - Column display

Dialog: **Configuration ▶ Rotors ▶ [Edit] ▶ Column display... ▶ Column display**

The **Column display** window is opened with **[Edit] ▶ Column display...**. Here you can define the columns that are to be shown in the rotor table.

Columns available

Shows all fields that can be displayed as columns in the rotor table.

Columns displayed

Shows all fields that can be displayed as columns in the rotor table. The **Rotor name**, **Rotor type**, **Set to work**, **Expiry date** and **Next GLP test** columns are displayed by default. The **Rotor name** column is always present and cannot be removed.

»

Adds the selected column to the table.

«

Removes the selected column from the table.

▲

Changes the sequence of the displayed columns by moving the selected column upwards.

▼

Changes the sequence of the displayed columns by moving the selected column downwards.

6.14.2.5 Print rotor list (PDF)

Menu item: **Configuration ▶ Rotors ▶ [Edit] ▶ Print (PDF)...**

The **Print rotor list (PDF)** dialog window is opened with **[Edit] ▶ Print (PDF)...**.

Orientation

Selection	**Portrait** | **Landscape**
Default value	**Portrait**

Portrait
Output of the rotor table in portrait format.

Landscape
Output of the rotor table in landscape format.

[OK]

The rotor table is output in the desired format as a PDF file and opened directly with Acrobat Reader; it can then be printed and/or saved.

6.14.3 Rotor properties

6.14.3.1 Editing rotor properties

Dialog window: **Configuration ▶ Rotors ▶ [Edit] ▶ Properties... ▶ Rotor - 'Name'**

The parameters for the selected rotor are defined on the following tabs:

- *Rotor*
  Parameters of the rotor.
- *Monitoring*
  Parameters for monitoring the rotor.
- *GLP*
  GLP parameters.

6.14.3.2 Properties - Rotor

Tab: **Configuration ▶ Rotors ▶ [Edit] ▶ Properties... ▶ Rotor - 'Name' ▶ Rotor**

Rotor name

Name of the rotor.

Entry	**40 characters**

Rotor type

Type of the rotor.

Order number

Order number of the rotor.

Entry	**25 characters**

Serial number

Serial number of the rotor.

Entry	**16 characters**

Comment

Comment on the rotor.

Entry	**250 characters**

6.14.3.3 Properties - Monitor rotor

Tab: **Configuration ▶ Rotors ▶ [Edit] ▶ Properties... ▶ Rotor - 'Name' ▶ Monitor rotor**

Set to work

Date on which the rotor was first used for a determination. This date can be edited for manually added rotors only by pressing ....

Monitor rotor

on | off (Default value: **off**)

If this option is enabled, then the working life of the rotor will be monitored.

Working life

Working life of the rotor in days. If a value is entered here, then the **Expiry date** field will be adjusted automatically.

Input range	**0 to 999 Days**
Default value	**999 Days**

Expiry date

Expiry date of the rotor. This date can be selected by clicking on ... in the **Select date** dialog window. After a date has been entered, the value for the **Working life** will be automatically adjusted.

Selection	**Date selection**

Message

The message options can only be edited if monitoring of the rotor is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is activated, then the message is sent to the e-mail address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the Send e-mail window.

Acoustic signal

on | off (Default value: **off**)

If this option is activated, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring of the rotor is switched on.

If during rotor monitoring it is found that the working life has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the working life of the rotor has expired is automatically saved in the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the working life of the rotor has expired will be saved automatically with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

6.14.3.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7 Devices

7.1 948 Continuous IC Module

7.1.1 948 Continuous IC Module - Overview

The **948 Continuous IC Module** device is available in 1 model version:

- **2.948.0010 948 Continuous IC Module, CEP**
  The 948 Continuous IC Module, CEP (Continuous Eluent Producer) is a device for the automated production of hydroxide eluents.

7.1.2 948 Continuous IC Module - Configuration

Dialog: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a type **948 Continuous IC Module** device is selected in the device table, the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog with the device-specific tabs.

7.1.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Name of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device name #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**Empty**

7.1.2.2 Properties - GLP

Tab: **Configuration ▶ 'Subwindow' ▶ [Edit] ▶ Properties... ▶ 'Properties' ▶ GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.1.3 948 Continuous IC Module - Method

Start parameters and program commands can be defined for the **948 Continuous IC Module** in the **Method** program part.

NOTE

The 948 Continuous IC Module has a leak detector.

If a leak is detected, the following actions are triggered automatically:

- All ongoing determinations that are using this device are canceled.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

7.1.3.1 948 Continuous IC Module - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the symbol for the **948 Continuous IC Module** in the top part of the window, then the tabs of the modules contained in the device appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.1.3.1.1 Start parameters - Continuous Eluent Producer (CEP)

Tab: **Method ▶ Devices ▶ Continuous Eluent Producer (CEP)**

Concentration

Concentration of potassium hydroxide in the eluent.

If a concentration is selected that cannot be achieved with the set pump flow, a message appears in the plausibility check of the method *(see chapter 5.2.5, page 376)*.

Input range	**0.1 to 100.0 mmol/L**
Default value	**10.0 mmol/L**

The possible concentration depends on the flow of the assigned pump.

Table 3 Flow – concentration ratio

Flow [mL/min]	Min. concentration [mmol/L]	Max. concentration [mmol/L]
0.100–0.200	4.5	100.0

Flow [mL/min]	Min. concentration [mmol/L]	Max. concentration [mmol/L]
0.201–0.500	2.5	100.0
0.501–1.000	1.0	100.0
1.001–2.000	0.5	50.0
2.001–2.999	0.3	33.0
3.000	0.1	33.0

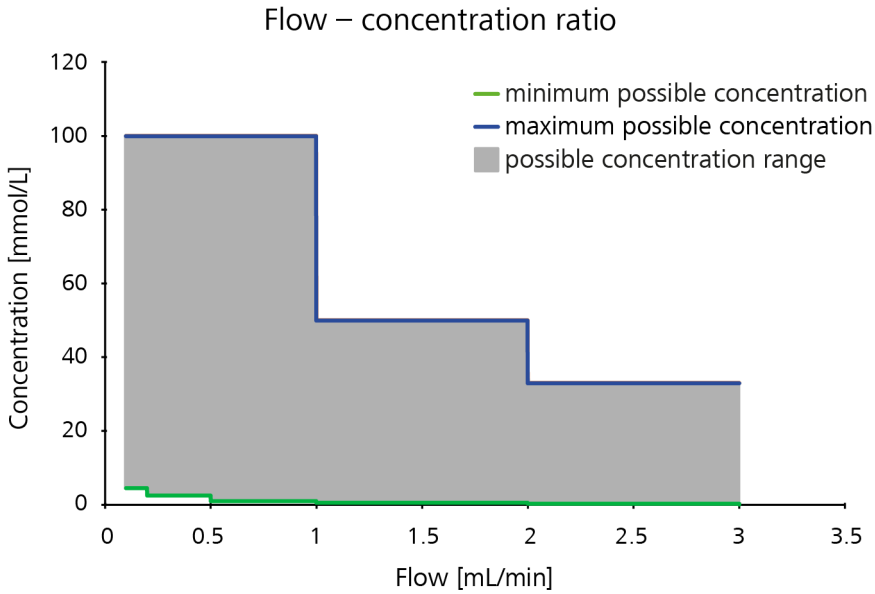


Figure 1 Flow – concentration ratio

Pump

Display of the assigned pump.

The **[...]** button opens the **'Device name - Assign pump** dialog.

The **'Device name' - Assign pump** dialog is used to select a high-pressure pump module for the gradient.

NOTE

If the pump assigned to the Continuous Eluent Producer is switched off or the pressure is less than 1.0 MPa, the following actions are automatically triggered:

- All ongoing determinations that are using this device are canceled.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

7.1.3.1.2 Start parameters - Eluent Producer Cartridge (EPC)

Tab: **Method ▶ Devices ▶ Eluent Producer Cartridge (EPC)**

EPC solution

Selection of the EPC solution from which the eluent is generated. To start the 948 Continuous IC Module, it is mandatory to select a EPC solution.

Selection	**not defined** | **Solutions from the solution table**
Default value	**not defined**

The EPC solutions are added in the **Configuration** program part in the **EPC solutions** subwindow *(see chapter 6.9, page 643)*.

7.1.3.1.3 Start parameters - Continuous Trap (CT)

Tab: **Method ▶ Devices ▶ Continuous Trap (CT)**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.1.3.2 948 Continuous IC Module - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.1.3.2.1 Eluent Producer Cartridge (EPC) - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of y-axis	Unit	Evaluation
Voltage	V	V	No
Current	mA	mA	No

7.1.3.2.2 Continuous Trap (CT) - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of y-axis	Unit	Evaluation
Voltage	V	V	No
Current	mA	mA	No

7.1.3.3 948 Continuous IC Module - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the **948 Continuous IC Module**:

7.1.3.3.1 Commands - Continuous Eluent Producer (CEP)

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the Continuous Eluent Producer:

7.1.3.3.1.1 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a gradient program for the **948 Continuous IC Module**.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Table

The sequence of the gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least from the first line with the start settings of the gradient. A maximum of 20 gradient steps are possible. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** window *(see chapter 7.1.3.3.1.2, page 698)*.
Edit	Edit the selected line in the table in the **Edit gradient** window *(see chapter 7.1.3.3.1.2, page 698)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The graph **Concentration** shows the gradient steps entered in the table.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.1.3.3.1.2 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Concentration

Concentration of potassium hydroxide in the eluent.

If a concentration is selected that cannot be achieved with the set pump flow, a message appears in the plausibility check of the method *(see chapter 5.2.5, page 376)*.

Input range	**0.1 to 100.0 mmol/L**
Default value	**'empty' mmol/L**

The possible concentration depends on the flow of the assigned pump.

Table 4 Flow – concentration ratio

Flow [mL/min]	Min. concentration [mmol/L]	Max. concentration [mmol/L]
0.100–0.200	4.5	100.0
0.201–0.500	2.5	100.0
0.501–1.000	1.0	100.0
1.001–2.000	0.5	50.0
2.001–2.999	0.3	33.0
3.000	0.1	33.0

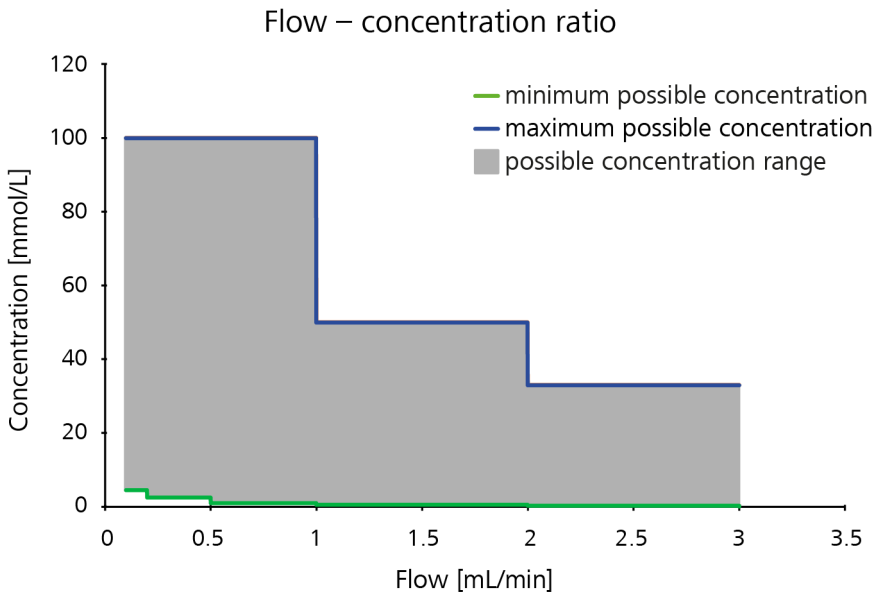


Figure 2 Flow – concentration ratio

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Convex 1–4** | **Linear** | **Concave 1–4**

Convex 1–4
The concentration changes along the selected curve from the entry of the previous command line to the entry of the current command line.

Linear
The concentration changes linearly from the entry of the previous command line to the entry of the current command line.

Concave 1–4
The concentration changes along the selected curve from the entry of the previous command line to the entry of the current command line.

7.1.3.3.1.3 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the Continuous Eluent Producer on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Continuous Eluent Producer (CEP)

Selection	**On** | **Off**
Default value	**On**

On
Switches the Continuous Eluent Producer on. The start parameters are used.

Off
Switches the Continuous Eluent Producer off. The Eluent Producer Cartridge and the Continuous Trap are also switched off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.1.3.3.2 Commands - Eluent Producer Cartridge (EPC)

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the Eluent Producer Cartridge:

7.1.3.3.2.1 Measure EPC voltage

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Measure EPC voltage**

The device-dependent **Measure EPC voltage** time program command (command with feedback) measures the voltage of the Eluent Producer Cartridge.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
VOLTAGE	Measured voltage [V]	Number

7.1.3.3.2.2 Measure EPC current

Dialog: **Method ► Time program ► Edit ► 'Device' - Measure EPC current**

The device-dependent **Measure EPC current** time program command (command with feedback) measures the current of the Continuous Eluent Producer.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CURRENT	Current measured [mA]	Number

7.1.3.3.3 Commands - Continuous Trap (CT)

Subwindow: **Method ► Time program**

Overview of the time program commands available for the Continuous Trap:

7.1.3.3.3.1 Measure CT voltage

Dialog: **Method ► Time program ► Edit ► 'Device' - Measure CT voltage**

The device-dependent **Measure CT voltage** time program command (command with feedback) measures the voltage of the Continuous Trap.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
VOLTAGE	Measured voltage [V]	Number

7.1.3.3.3.2 Measure CT current

Dialog: **Method ► Time program ► Edit ► 'Device' - Measure CT current**

The device-dependent **Measure CT current** time program command (command with feedback) measures the current of the Continuous Trap.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CURRENT	Current measured [mA]	Number

7.2 947 Professional UV/VIS Detector Vario

7.2.1 947 Professional UV/VIS Detector Vario - Overview

The **947 Professional UV/VIS Detector Vario** is an alternative to the proven conductivity detector and extends the family of intelligent Metrohm detectors. It permits a secure and reliable quantification of substances active in the ultraviolet or visible range.

The **947 Professional UV/VIS Detector Vario** device is available in two versions:

- **2.947.0010 Professional UV/VIS Detector Vario SW**
  UV/VIS detector with 1 wavelength, variable
- **2.947.0020 Professional UV/VIS Detector Vario MW**
  UV/VIS detector with 1-8 wavelengths, variable

7.2.2 947 Professional UV/VIS Detector Vario - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the type **947 Professional UV/VIS Detector Vario** is selected in the device table, the **[Edit] ► Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.2.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.2.2.2 Properties - UV lamp

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ UV lamp**

Lamp

Shows whether a UV lamp is connected.

[Monitoring]

Opens the **Monitoring - 'UV lamp'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.2.2.3 Properties - VIS lamp

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► VIS lamp**

Lamp

Shows whether a VIS lamp is connected.

Intensity level

Shows the current intensity level of the lamp.

[Monitoring]

Opens the **Monitoring - 'VIS lamp'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.2.2.4 Properties - Detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Detector**

Integration duration

Shows the integration duration of the diode array (time until the next reading of each diode). The value is set in the **Settings** dialog *(see chapter 7.2.2.7, page 707)*.

Input range	**8.000 to 247.000 ms**

[Properties...]

If the device is connected, the **Settings** dialog *(see chapter 7.2.2.7, page 707)* is opened.

CAUTION

The lamp settings may not be changed except under very particular conditions. Before you change the settings, read and follow the corresponding instructions in the chapter **Adjusting the lamp settings** of the device manual.

7.2.2.5 Properties - Analog Out

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Analog Out**

The 947 Professional UV/VIS Detector Vario supports the output of data via an analog channel.

Range/Volt

Entry of the absorption value in [mAU] which is to be output as 1 volt.

Input range	**10.0 to 2,000.0 mAU** (Increment: **10.0**)

7.2.2.6 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter*

2.5.1, page 82). After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.2.2.7 Settings

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Detector ▶ Properties...**

Here the detector settings can be adjusted. Please observe the following information beforehand:

CAUTION

The lamp settings may be adjusted **only in the following cases**:

- After first start-up, if the check of the intensity spectrum shows a cut-off.
- After the replacement of the UV lamp or of the VIS lamp, if the check of the intensity spectrum shows a cut-off.

Before each adjustment of the lamp values, it is **mandatory** to check the intensity spectrum. The lamp settings may only be adjusted if the intensity spectrum is cut off at the top.

Adjusting the lamp settings

Before you can adjust the lamp settings, all the following preconditions must be met:

- The UV lamp and the VIS lamp are connected.
- The UV lamp has been burning for at least 30 minutes.
- The flow-through cell is clean.
- The flow-through cell is rinsed with ultrapure water.
- The flow-through cell is free of air bubbles.
- The intensity spectrum has been checked and shows a cut-off.

In the top part of the dialog window the current intensity spectrum is shown. Note that the UV or VIS part of the spectrum is only displayed when the corresponding lamps are connected and switched on. The spectrum indicates whether your settings are optimal. The settings can be adjusted manually *(see "Manually adjusting the settings", page 1137)* or automatically *(see "Automatically adjusting the settings", page 1138)*.

Adjusting the UV lamp

1. Manually set the intensity level of the VIS lamp to 1.
2. Turn the adjustment ring to move the UV lamp in its vertical axis. This allows for adjusting the intensity in the range of 400 - 900 nm. Turn the adjustment ring until the maximum intensity has been reached.
3. Click on **[Adjust automatically]**.

Optimized values for the integration duration and the VIS intensity level are calculated and set.

4 Click **[OK]**.

The parameters are written to the device. The properties window closes. The adjustment is finished.

Manually adjusting the settings

Integration duration

Entry of the integration duration.

Input range	**8.000 to 247.000 ms** (Increment: **0.001**)

VIS intensity level

Entry of the intensity level of the lamp.

Input range	**1.000 to 12.000** (Increment: **0.001**)

[Apply]

The values of **Integration duration** and **VIS intensity level** are written to the device. Afterwards, a new intensity spectrum is displayed.

Automatically adjusting the settings

As an alternative to the manual adjustment, the settings can also be adjusted automatically.

[Adjust automatically]

With this function, the adjustment is carried out by a built-in algorithm of the device. This algorithm calculates and sets the optimized values for the parameters **Integration duration** and **VIS intensity level**. A new intensity spectrum is displayed after the adjustment.

[OK]

The parameter values are written to the device and the dialog is closed.

[Cancel]

The dialog is closed and those values that were set in the device *before* opening this dialog apply.

7.2.3 947 Professional UV/VIS Detector Vario - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the **947 Professional UV/VIS Detector Vario**.

The recording of spectra is defined in the evaluation of the method *(see chapter 5.8.8, page 524)*.

7.2.3.1 947 Professional UV/VIS Detector Vario - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **947 Professional UV/VIS Detector Vario** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.2.3.1.1 Start parameters - UV lamp

Tab: **Method ▶ Devices ▶ UV lamp**

On/Off

Selection	**On** | **Off**
Default value	**Off**

On
The UV lamp is switched on when the hardware is started with **[Start HW]**.

Off
The UV lamp is switched off when the hardware is started with **[Start HW]**.

7.2.3.1.2 Start parameters - VIS lamp

Tab: **Method ▶ Devices ▶ VIS lamp**

On/Off

Selection	**On** | **Off**
Default value	**Off**

On
The VIS lamp is switched on when the hardware is started with **[Start HW]**.

Off
The VIS lamp is switched off when the hardware is started with **[Start HW]**.

7.2.3.1.3 Start parameters - Detector

Tab: **Method ▶ Devices ▶ Detector**

A measuring channel is a wavelength range in which a chromatogram can be recorded via the change of absorbance. For the **Professional UV/VIS Detector Vario SW**, one measuring channel can be defined. For the **Professional UV/VIS Detector Vario MW**, up to eight measuring channels can be defined. For this, the channel must assigned as a data source to an analysis *(see chapter 5.6.6.1, page 415)*.

Channels

Table of the measuring channels defined for the 947 Professional UV/VIS Detector Vario. The table cannot be edited directly. Use the **[Edit]** menu below the table. This contains the following menu items:

New	Add a new line to the table and edit in separate dialog *(see chapter 7.2.3.1, page 709)* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *(see chapter 7.2.3.1, page 709)* (is also triggered by a double-click on a non-empty line).
Delete	Deletes the selected line.

Reference channel

The reference channel is optional. It can be used to compensate lamp effects (drift, flicker) out of the intensities.

Use reference channel

on | off (Default value: **off**)

If this option is enabled, the properties of the reference channel can be edited with the button **[...]** and the reference channel will be used in the determination. If this option is disabled, no reference channel will be used in the determination. However, the properties previously defined for a reference channel will be retained.

[...]

Opens the dialog for entering/editing the properties of the reference channel *(see chapter 7.2.3.1, page 709)*.

Measuring duration

Entry of the measurement duration per data point.

NOTE

This value is used as an approximate value only. The *actual* measurement duration is that integral multiple of the configuration parameter **Integration duration** *(see chapter 7.2.2.4, page 704)* that is closest to the this approximate value.

Input range	**50 to 2,000 ms**

7.2.3.1.4 Start parameters - Analog Out

Tab: **Method ▶ Devices ▶ Analog Out**

The 947 Professional UV/VIS Detector Vario supports the output of measured values in an analog output **Out**. The measuring channels can be defined in the start parameters of the detector *(see chapter 7.2.3, page 708)*. For the **Professional UV/VIS Detector Vario SW**, one measuring channel **Channel 1** can be defined. For the **Professional UV/VIS Detector Vario MW**, up to eight measuring channels **Channel #** (#=1 - 8) can be defined. Measuring channels can be assigned to analog output channels.

Out

Assignment of a measuring channel to the analog output.

Selection	**'not defined'** | **Channel #**
Default value	**'not defined'**

'not defined'
If this entry is selected, no measuring channel is assigned to the analog channel.

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list. If a measuring channel is selected, then it will be assigned to the analog channel.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.2.3.1.5 Editing the channel

Tab: **Method ▶ Devices ▶ Detector ▶ Channel**

Channel

Number of the channel. Only available for measuring channels, not for the reference channel.

For the **Professional UV/VIS Detector Vario SW**, only one measuring channel can be defined. For the **Professional UV/VIS Detector Vario MW**, up to eight measuring channels can be defined.

Selection	**1** | **2** | **3** | **4** | **5** | **6** | **7** | **8**

Wavelength

Entry of the wavelength of the channel.

Input range	**191 to 899 nm** (Increment: **1**)
Default value	**254 nm**

Bandwidth ±

Input of the wavelength which is subtracted from or added to, respectively, the wavelength of the measuring channel.

Example: if the wavelength of the channel is 390 nm and for **Bandwidth ±** the value 5 nm has been entered, then the channel comprises the interval 385…395 nm.

Input range	**1 to 50 nm** (Increment: **1**)
Default value	**5 nm**

7.2.3.1.6 Editing the reference channel

Tab: **Method ► Devices ► Detector ► Reference channel**

In this dialog the properties for the reference channel can be edited.

7.2.3.1.7 Calculation of the absorbance

Here you can find the formulas for calculating the absorbance A. The following abbreviations are used in the formulas:

A	Absorbance	
I	Intensity	Sum of the intensities of wavelengths in the channel.
Mc	Measuring channel	Normally a wavelength range in which the sample of interest absorbs light.
M	(Index: m)	Number of bundled points in the measuring channel.
Rc	Reference channel	Normally another wavelength range, in which the sample of interest *does not* absorb light. Optional!
R	(Index: r)	Number of bundled points in the reference channel.
Bls	Baseline spectrum	Spectrum without sample substance. This spectrum is always present. The detector itself creates one when switching on. The user can have it recorded again in the manual control or in the time program. It is stored in the detector.

Msp	Measured spectrum	Spectrum, recorded during run-time.

Calculation of the absorbance (without reference channel)

$$A = \frac{1}{M} \cdot \sum_{m=1}^{M} \log \frac{I_m^{Mc,Bls}}{I_m^{Mc,Msp}}$$

Calculation of the absorbance (with reference channel)

The first term corresponds to the formula above for the absorbance without reference channel. The second term subtracts the absorbance of the reference channel.

$$A = \frac{1}{M} \cdot \sum_{m=1}^{M} \log \frac{I_m^{Mc,Bls}}{I_m^{Mc,Msp}} - \frac{1}{R} \cdot \sum_{r=1}^{R} \log \frac{I_r^{Rc,Bls}}{I_r^{Rc,Msp}}$$

7.2.3.2 947 Professional UV/VIS Detector Vario - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Each of the measuring channels of the detector can be selected as **Channel** for the analysis *(see chapter 5.6.6.1, page 415)*.

Property	Label of y-axis	Unit	Evaluation
Absorbance	none	mAU	Yes

7.2.3.3 947 Professional UV/VIS Detector Vario - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 947 Professional UV/VIS Detector Vario:

7.2.3.3.1 Commands - Detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the detector:

7.2.3.3.1.1 Reset baseline

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Reset baseline**

The device-dependent **Reset baseline** time program command (command without feedback) measures a complete spectrum (190 to 900 nm). This is then taken into account as background spectrum with immediate effect.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.2.3.3.1.2 Modify channel

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Modify channel**

The device-dependent **Modify channel** time program command (command without feedback) redefines the parameters of the corresponding channel. The modifications apply until the end of the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Channel

Selection of the measuring channel whose parameters are to be modified.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

Wavelength

Entry of the wavelength of the channel.

Input range	**191 to 899 nm** (Increment: **1**)
Default value	**254 nm**

Bandwidth ±

Input of the wavelength which is subtracted from or added to, respectively, the wavelength of the measuring channel.

Example: if the wavelength of the channel is 390 nm and for **Bandwidth ±** the value 5 nm has been entered, then the channel comprises the interval 385…395 nm.

Input range	**1 to 50 nm** (Increment: **1**)
Default value	**5 nm**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.2.3.3.1.3 Measure absorbance

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure absorbance**

The device-dependent **Measure absorbance** time program command (command without feedback) measures the absorbance in the corresponding channel.

Channel

Selection of the measuring channel in which the absorbance is to be measured.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
ABSORBANCE	Measured absorbance [mAu] in the selected measuring channel.	Number

7.2.3.3.1.4 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.2.3.3.1.5 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.2.4 947 Professional UV/VIS Detector Vario - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.2.4.1 Manual control - UV lamp

Tab: **Manual control ► Manual control - All devices - 'Device name' ► UV lamp**

The UV lamp can be switched on and off in the manual control.

[On]

Switches the UV lamp on.

[Off]

Switches the UV lamp off.

7.2.4.2 Manual control - VIS lamp

Tab: **Manual control ► Manual control - All devices - 'Device name' ► VIS lamp**

The VIS lamp can be switched on and off in the manual control.

[On]

Switches the VIS lamp on.

[Off]

Switches the VIS lamp off.

7.2.4.3 Manual control - Detector

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Detector**

The measuring channels of the detector can be edited in the manual control. In addition, the current absorbance, intensity or baseline spectrum can be displayed. It is also possible to record a new baseline spectrum here.

Channel

Selection of the channel that is to be edited when the **[Edit]** button is clicked.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

[Edit]

Opens the dialog for editing the selected channel *(see chapter 7.2.3.1, page 709)*.

Spectrum

Selection of the type of spectrum that is to be displayed when the **[View]** button is clicked.

Selection	**Absorbance spectrum** | **Intensity spectrum** | **Baseline spectrum**

Absorbance spectrum
Current absorbance spectrum (complete wavelength range).

Intensity spectrum
Current intensity spectrum (complete wavelength range).

Baseline spectrum
The last baseline spectrum that has been recorded in the time program or by the **[Reset baseline]** function.

[Edit]

Opens the dialog for editing the selected channel *(see chapter 7.2.3.1, page 709)*.

[View]

Shows the spectrum selected in the **Spectrum** parameter *(see chapter 7.2.4, page 718)*.

NOTE

A baseline spectrum needs to be recorded with **[Reset baseline]** before a spectrum can be displayed.

If an intensity spectrum or absorbance spectrum was selected for displaying, a method with UV/VIS detector that was started with **[Start HW]** must be loaded. This way, a baseline is set automatically.

[Reset baseline]

If no determination is running with the same method, a new baseline spectrum is being recorded.

7.2.4.4 Displaying spectra

Tab: **Manual control ▶ Manual control - All devices - 'Device name' ▶ Detector ▶ View**

The spectrum selected in the manual control of the detector *(see chapter 7.2.4, page 718)* is displayed here. By right-clicking on the graphics window, a context menu is opened *(see "Curve window", page 94)*.

[Close]

Closes the dialog.

7.3 945 Professional Detector Vario

7.3.1 945 Professional Detector Vario - Overview

The **945 Professional Detector Vario** is available in three versions.

- **2.945.0010 Professional Detector Vario - Conductometry**
- **2.945.0020 Professional Detector Vario - Amperometry**
- **2.945.0030 Professional Detector Vario - Conductometry & Amperometry**

7.3.2 945 Professional Detector Vario - Configuration

If a device of the type **945 Professional Detector Vario** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ▶ Properties...** menu item.

Which detector or which detectors are contained in the 945 Professional Detector Vario depends on the detector version.

7.3.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.3.2.2 Properties - Conductivity detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name' ► LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.3.2.3 Properties - Amperometric detector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Amp. detector**

NOTE

The amperometric detector can only be used with the following instruments: 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus, 896 Professional Detector, 930 Compact IC Flex, 940 Professional IC Vario, 945 Professional Detector Vario.

Detector type

Shows the detector type, is read out automatically from the detector.

Connection

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

7.3.2.4 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.3.2.5 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.3.3 945 Professional Detector Vario - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the **945 Professional Detector Vario**.

Which detector or which detectors are contained in the 945 Professional Detector Vario depends on the detector version.

7.3.3.1 945 Professional Detector Vario - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **945 Professional Detector Vario** in the top part of the window, then the tabs of the modules contained in the device will be displayed in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.3.3.1.1 Start parameters - Conductivity detector

Tab: **Method ▶ Devices ▶ Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.3.3.1.2 Start parameters - Amperometric detector

7.3.3.1.2.1 Amperometric detector

Tab: **Method ▶ Devices ▶ Amp. detector**

Mode

Selection of the measuring mode of the amperometric detector.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potential steps.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector.

Temperature

Temperature that is set in the detector when the hardware is started with **[Start HW]**.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to

achieve the temperature and to maintain it, but the determination will begin in any case.

Cell

Selection of a cell which is defined in the configuration table of the amperometric cells *(see chapter 6.13.2, page 674)*. If no cell has been selected yet, then **not defined** is displayed. Otherwise, the selected cell will be displayed with its user-defined name.

Selection	**not defined** | **Selection of amperometric cells**
Default value	**not defined**

not defined
You can also start the method when this option is selected. The cell connected to the detector is then used. In the report, the amperometric cell is then called "**not defined**", but the properties of the cell that is *actually* used will be output. **Important note:** If an intelligent cell for which the operating hours monitoring has been activated is connected to the amperometric detector, then the operating hours will be counted.

Start delay

on | off (Default value: **off**)

If this option is **enabled**, the amperometric cell is only switched on once this waiting time has elapsed.

Waiting time

Waiting time until the amperometric cell is switched on.

Input range	**0 to 99 min**
Default value	**15 min**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.3.3.1.2.2 DC mode settings

Tab: **Method ► Devices ► Amp. detector ► DC ► Settings**

In this dialog, you can set the properties of the **DC** measuring mode.

The properties are also available in the manual control *(see chapter 7.3.4.1, page 750)*.

DC potential

Potential of the working electrode in comparison to the reference electrode.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

Range

Selection of the measuring range.

Selection	**auto** | **2 nA** | **20 nA** | **200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**

auto
Automatic setting of the measuring range. This selection is not allowed with damping activated.

Damping

on | off (Default value: **off**)

Activates or deactivates the additional damping.

7.3.3.1.2.3 PAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, you can set the properties of the **PAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the PAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Potential [V]

Potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define PAD step* (is also triggered by a double-click on an empty line).

Edit	Edit the selected line in a separate dialog *Define PAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Duration

Duration of the measurement.

Input range	**1 to 2000 ms** (Increment: **1**)
Default value	**100 ms**

Range

Selection of the measuring range.

Selection	**200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**
Default value	**2 µA**

The defined potential progression is displayed in the form of a graph.

7.3.3.1.2.4 Define PAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, a new PAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**300 ms**

Potential

Potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.05 V**

7.3.3.1.2.5 flexIPAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ flexIPAD ▶ Settings**

In this dialog, you can set the properties of the **flexIPAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the flexIPAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Start potential [V]

Start potential of the step in volts.

End potential [V]

End potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define flexIPAD step* (is also triggered by a double-click on an empty line).

Edit	Edit the selected line in a separate dialog *Define flexIPAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The affected lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Start

Start time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**50 ms**

End

Ending time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**150 ms**

Range

Selection of the measuring range.

Selection	**20 µA** | **200 µA** | **2 mA**
Default value	**200 µA**

NOTE

The selection of the measuring channel (**Current** or **Charge**) takes place in the hardware assignment of the analysis *(see chapter 7.3.3.2.1, page 736)*.

The defined potential progression is displayed in the form of a graph.

7.3.3.1.2.6 Define flexIPAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ Settings ▶ flexIPAD mode settings**

In this dialog, a new flexIPAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**100 ms**

Start potential

Start potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

End potential

End potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

7.3.3.1.2.7 CV mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ CV ▶ Settings**

In this dialog, you can set the properties of the **CV** measuring mode.

Number of cycles for cyclic voltammograms

Preparing cycles

Number of cyclic voltammograms which are to be measured in the time program after **Start data acquisition** and then discarded. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Measuring cycles

Number of cyclic voltammograms which are to be measured and saved in the time program after **Start data acquisition**. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1,000 s**

7.3.3.2 945 Professional Detector Vario - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.3.3.2.1 Amperometric detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Current	Current	nA	Yes
Charge	Charge	nC	Yes
Current vs. Potential	Current	nA	No

NOTE

The only channels available for the output of the measured values by means of the *891 Professional Analog Out (see Chap. 7.8.3.1.11.1, p. 914)* are **Current** and **Charge**. The output of the measured values of these channels is then **time-based**.

7.3.3.2.2 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!

- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column	Metrosep A Supp 5 - 100/4.0
Injection volume	20 µL
Duration of recording	12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.3.3.3 945 Professional Detector Vario - Commands

Subwindow: **Method ▶ Time program**

Depending on the device version, the 945 Professional Detector Vario contains a conductivity detector, an amperometric detector or both. The available time program commands depend on the device version.

7.3.3.3.1 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.3.3.3.1.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.3.3.3.1.2 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.3.3.3.1.3 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.3.3.3.2 Commands - Amperometric detector

Subwindow: **Method ▶ Time program**

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then the following commands may **not** be used. This is checked by the start test of the method.

Overview of the time program commands available for the amperometric detector:

7.3.3.3.2.1 Measure current

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure current**

The device-dependent **Measure current** time program command (command with feedback) measures the current.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_I	TP.'Command number.MEAS_I Measured current [nA].	Number

7.3.3.3.2.2 Measure charge

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure charge**

The device-dependent **Measure charge** time program command (command with feedback) measures the charge.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_Q	TP.'Command number.MEAS_Q Measured charge [nC].	Number

7.3.3.3.2.3 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are

available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.3.3.3.2.4 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.3.3.3.2.5 Modify mode

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Modify mode**

The device-dependent **Modify mode** time program command (command without feedback) permits a change of measuring mode: You can change the parameterization of the current measuring mode or select a different measuring mode and set its parameters.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

When the command is opened, the mode parameters which are set in the start parameters are displayed by default.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Mode

Selection of the measuring mode of the amperometric detector. The CV mode mode is not available here.

Selection	**DC** | **PAD** | **flexIPAD**

DC
Measurement with constant potential.

PAD
Measurement with several potential levels.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector. The same settings can be set as in the *start parameters, see Chap. 7.3.3.1.2, p. 728*.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.3.3.3.2.6 CV treatment

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - CV treatment**

The device-dependent CV treatment time program command (command without feedback) allows the performance of cyclovoltammetric treatments.

Settings

Opens the settings for the cyclovoltammetric treatment.

Comment

Optional comment on the time program command.

Entry	**64 characters.**

Settings

In this dialog, you can set the properties for the cyclovoltammetric treatments.

Number of cycles for cyclovoltammetric treatment

Cycles

Number of cyclovoltammetric treatments that are to be performed in the time program. The parameterization defined in the Sweep parameters section is used for the treatment.

Input range	**1 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1000 s**

7.3.3.3.2.7 On/Off

Dialog: **Method ▶ Time program ▶ [Edit] ▶ New ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the amperometric cell on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Cell

Selection	**On** | **Off**
Default value	**On**

On
Switches the cell of the amperometric detector on.

Off
Switches the cell of the amperometric detector off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.3.4 945 Professional Detector Vario - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manually** icon at the left of the program bar.

No manual control is available with the conductivity detector.

7.3.4.1 Manual control - Amperometric detector

7.3.4.1.1 General settings

Tab: **Manual ► 'Amp. detector'**

Mode

Generally speaking, the measuring mode and its settings can be changed only in the manual control of the workplace, not in the Global manual control.

Selection of the measuring mode of the amperometric detector which is set in the device when **[Apply]** is pressed. The following rules apply for the changeability of the mode when a determination is running:

- When a determination is running in the mode DC, PAD or flexIPAD, it is **not** possible to change to the mode CV.
- When a determination is running in the mode CV it is **not** possible to change to the modes DC, PAD or flexIPAD.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potentials.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric *(see chapter 7.3.4.1.2, page 752)*. Not available in the manual control of the CV mode.

[Apply]

The parameterization of the selected measuring mode is sent to the device. The device and the measuring cell are switched on. Not available in the manual control of the CV mode.

Cell

[Cell On]

The measuring cell is switched on. If it had been switched off beforehand, then it will continue to run with the settings which were active prior to being switched off. Not available in the manual control of the CV mode.

[Cell Off]

The measuring cell is switched off. Not available in the manual control of the CV mode.

Temperature

Current Value

Display of the current temperature in the detector.

Input

Input of a new temperature which is to be set in the device when **[Apply]** is pressed.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

[Apply]

Sets the new temperature value in the device.

7.3.4.1.2 Dialog window «Settings»

In this dialog window, the selected measuring mode can be parameterized in the manual control of the workplace.

7.3.4.1.2.1 Settings DC mode

The parameterization of the DC mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.2, page 729)*.

7.3.4.1.2.2 Settings PAD mode

The parameterization of the PAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.3, page 730)*.

7.3.4.1.2.3 Settings flexIPAD mode

The parameterization of the flexIPAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.5, page 732)*.

7.3.4.1.2.4 Settings CV mode

The parameterization of the CV mode can **not** be changed in the manual control.

7.4 944 Professional UV/VIS Detector Vario

7.4.1 944 Professional UV/VIS Detector Vario - Overview

The **944 Professional UV/VIS Detector Vario** is available in one version:

- **2.944.0010 Professional UV/VIS Detector Vario**
  The 944 Professional UV/VIS Detector Vario is an alternative to the proven conductivity detector and extends the family of intelligent Metrohm detectors. It permits a secure and reliable quantification of substances active in the ultraviolet or visible range.

7.4.2 944 Professional UV/VIS Detector Vario - Configuration

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If an instrument of the type **944 Professional UV/VIS Detector Vario** is selected in the device table, the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.4.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.4.2.2 Properties - UV lamp

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► UV lamp**

[Monitoring]

Opens the **Monitoring - 'UV lamp'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.4.2.3 Properties - VIS lamp

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► VIS lamp**

Intensity level

Shows the current intensity level of the lamp.

[Monitoring]

Opens the **Monitoring - 'VIS lamp'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.4.2.4 Properties - Detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Detector**

Integration duration

Shows the integration duration of the diode array (time until the next reading of each diode). The value is set in the **Settings** dialog *(see chapter 7.14.2.7, page 1136)*.

Input range	**10 to 247 ms**

[Properties...]

If the device is connected, the **Settings** dialog *(see chapter 7.14.2.7, page 1136)* is opened.

CAUTION

The lamp settings may not be changed except under very particular conditions. Before you change the settings, read and follow the corresponding instructions in the chapter **Adjusting the lamp settings** of the device manual.

7.4.2.5 Properties - Analog Out

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Analog Out**

The 944 Professional UV/VIS Detector Vario supports the output of data via a maximum of four analog channels.

Range/Volt

Entry of the absorption value in [mAU] which is to be output as 1 volt. This value applies for all four analog channels.

Input range	**10.0 to 2,000.0 mAU** (Increment: **10.0**)

7.4.2.6 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.4.2.7 Settings

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Detector ▶ Properties...**

Here the detector settings can be adjusted. Please observe the following information beforehand:

CAUTION

The lamp settings may be adjusted **only in the following cases**:

- After first start-up, if the check of the intensity spectrum shows a cut-off.
- After the replacement of the UV lamp or of the VIS lamp, if the check of the intensity spectrum shows a cut-off.

Before each adjustment of the lamp values, it is **mandatory** to check the intensity spectrum. The lamp settings may only be adjusted if the intensity spectrum is cut off at the top.

Adjusting the lamp settings

Before you can adjust the lamp settings, all the following preconditions must be met:

- The UV lamp has been burning for at least 30 minutes.
- The flow-through cell is clean.
- The flow-through cell is rinsed with ultrapure water.
- The flow-through cell is free of air bubbles.
- The intensity spectrum has been checked and shows a cut-off.

In the top part of the dialog window the current intensity spectrum is shown. Note that the UV or VIS part of the spectrum is only displayed when the corresponding lamps are switched on. The spectrum indicates whether your settings are optimal. The settings can be adjusted manually *(see "Manually adjusting the settings", page 1137)* or automatically *(see "Automatically adjusting the settings", page 1138)*.

Manually adjusting the settings

Integration duration

Entry of the integration duration.

Input range	**10 to 247 ms** (Increment: **1**)

VIS intensity level

Entry of the intensity level of the lamp.

Input range	**1 to 8** (Increment: **1**)

[Apply]

The values of **Integration duration** and **VIS intensity level** are written to the device. Afterwards, a new intensity spectrum is displayed.

Automatically adjusting the settings

As an alternative to the manual adjustment, the settings can also be adjusted automatically.

[Adjust automatically]

With this function, the adjustment is carried out by a built-in algorithm of the device. This algorithm calculates and sets the optimized values for the parameters **Integration duration** and **VIS intensity level**. A new intensity spectrum is displayed after the adjustment.

[OK]

The parameter values are written to the device and the dialog is closed.

[Cancel]

The dialog is closed and those values that were set in the device *before* opening this dialog apply.

7.4.3 944 Professional UV/VIS Detector Vario - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the **944 Professional UV/VIS Detector Vario**.

The recording of spectra is defined in the evaluation of the method *(see chapter 5.8.8, page 524)*.

7.4.3.1 944 Professional UV/VIS Detector Vario - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **944 Professional UV/VIS Detector Vario** in the top part of the window, then the tabs of the modules con-

tained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.4.3.1.1 Start parameters - UV lamp

Tab: **Method ▶ Devices ▶ UV lamp**

On/Off

Selection	**On** | **Off**
Default value	**Off**

On
The UV lamp is switched on when the hardware is started with **[Start HW]**.

Off
The UV lamp is switched off when the hardware is started with **[Start HW]**.

7.4.3.1.2 Start parameters - VIS lamp

Tab: **Method ▶ Devices ▶ VIS lamp**

On/Off

Selection	**On** | **Off**
Default value	**Off**

On
The VIS lamp is switched on when the hardware is started with **[Start HW]**.

Off
The VIS lamp is switched off when the hardware is started with **[Start HW]**.

7.4.3.1.3 Start parameters - Detector

Tab: **Method ▶ Devices ▶ Detector**

Up to eight measuring channels can be defined:

A measuring channel is a wavelength range in which a chromatogram can be recorded via the change of absorbance. For this, the channel must assigned as a data source to an analysis *(see chapter 5.6.6.1, page 415)*.

Channels

Table of the measuring channels defined for the 944 Professional UV/VIS Detector Vario. The table cannot be edited directly. Use the **[Edit]** menu below the table. This contains the following menu items:

New	Add a new line to the table and edit in separate dialog *(see chapter 7.4.3.1, page 758)* (is also triggered by a double-click on an empty line).

Edit	Edit the selected line in a separate dialog *(see chapter 7.4.3.1, page 758)* (is also triggered by a double-click on a non-empty line).
Delete	Deletes the selected line.

Reference channel

The reference channel is optional. It can be used to compensate lamp effects (drift, flicker) out of the intensities.

Use reference channel

on | off (Default value: **off**)

If this option is enabled, the properties of the reference channel can be edited with the button **[...]** and the reference channel will be used in the determination. If this option is disabled, no reference channel will be used in the determination. However, the properties previously defined for a reference channel will be retained.

[...]

Opens the dialog for entering/editing the properties of the reference channel *(see chapter 7.4.3.1, page 758)*.

Measuring duration

Entry of the measurement duration per data point.

NOTE

This value is used as an approximate value only. The *actual* measurement duration is that integral multiple of the configuration parameter **Integration duration** *(see chapter 7.4.2.4, page 754)* that is closest to the this approximate value.

Input range	**50 to 2,000 ms**

7.4.3.1.4 Start parameters - Analog Out

Tab: **Method ▶ Devices ▶ Analog Out**

The 944 Professional UV/VIS Detector Vario supports the output of measured values in four analog outputs **Out #** (# = 1 to 4). Up to eight measuring channels **Channel #** (# = 1 - 8) can be defined in the start parameters of the detector *(see chapter 7.4.3, page 758)*. Here the measuring channels can be assigned to analog output channels.

Out #

Assignment of a measuring channel to the corresponding analog output.

Selection	**'not defined'** | **Channel #**
Default value	**'not defined'**

'not defined'
If this entry is selected, no measuring channel is assigned to the corresponding analog channel.

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list. If a measuring channel is selected, then it will be assigned to the corresponding output channel.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.4.3.1.5 Editing the channel

Tab: **Method ▶ Devices ▶ Detector ▶ Channel**

Channel

Number of the channel. Only available for measuring channels, not for the reference channel.

Selection	**1** | **2** | **3** | **4** | **5** | **6** | **7** | **8**

Wavelength

Entry of the wavelength of the channel.

Input range	**191 to 899 nm** (Increment: **1**)
Default value	**254 nm**

Bandwidth ±

Input of the wavelength which is subtracted from or added to, respectively, the wavelength of the measuring channel.

Example: if the wavelength of the channel is 390 nm and for **Bandwidth ±** the value 5 nm has been entered, then the channel comprises the interval 385…395 nm.

Input range	**1 to 50 nm** (Increment: **1**)
Default value	**5 nm**

7.4.3.1.6 Editing the reference channel

Tab: **Method ▶ Devices ▶ Detector ▶ Reference channel**

In this dialog the properties for the reference channel can be edited.

7.4.3.1.7 Calculation of the absorbance

Here you can find the formulas for calculating the absorbance A. The following abbreviations are used in the formulas:

A	Absorbance	
I	Intensity	Sum of the intensities of wavelengths in the channel.
Mc	Measuring channel	Normally a wavelength range in which the sample of interest absorbs light.
M	(Index: m)	Number of bundled points in the measuring channel.
Rc	Reference channel	Normally another wavelength range, in which the sample of interest *does not* absorb light. Optional!
R	(Index: r)	Number of bundled points in the reference channel.
Bls	Baseline spectrum	Spectrum without sample substance. This spectrum is always present. The detector itself creates one when switching on. The user can have it recorded again in the manual control or in the time program. It is stored in the detector.
Msp	Measured spectrum	Spectrum, recorded during run-time.

Calculation of the absorbance (without reference channel)

$$A = \frac{1}{M} \cdot \sum_{m=1}^{M} \log \frac{I_m^{Mc,Bls}}{I_m^{Mc,Msp}}$$

Calculation of the absorbance (with reference channel)

The first term corresponds to the formula above for the absorbance without reference channel. The second term subtracts the absorbance of the reference channel.

$$A = \frac{1}{M} \cdot \sum_{m=1}^{M} \log \frac{I_m^{Mc,Bls}}{I_m^{Mc,Msp}} - \frac{1}{R} \cdot \sum_{r=1}^{R} \log \frac{I_r^{Rc,Bls}}{I_r^{Rc,Msp}}$$

7.4.3.2 944 Professional UV/VIS Detector Vario - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Each of the (up to eight) measuring channels of the detector *(see chapter 7.14.3.1.3, page 1139)* can be selected as **channel** for the analysis *(see chapter 5.6.6.1, page 415)*.

Property	Label of y-axis	Unit	Evaluation
Absorbance	none	mAU	Yes

7.4.3.3 944 Professional UV/VIS Detector Vario - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 944 Professional UV/VIS Detector Vario:

7.4.3.3.1 Commands - Detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the detector:

7.4.3.3.1.1 Reset baseline

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Reset baseline**

The device-dependent **Reset baseline** time program command (command without feedback) measures a complete spectrum (190 to 900 nm). This is then taken into account as background spectrum with immediate effect.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.4.3.3.1.2 Modify channel

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Modify channel**

The device-dependent **Modify channel** time program command (command without feedback) redefines the parameters of the corresponding channel. The modifications apply until the end of the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Channel

Selection of the measuring channel whose parameters are to be modified.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

Wavelength

Entry of the wavelength of the channel.

Input range	**191 to 899 nm** (Increment: **1**)
Default value	**254 nm**

Bandwidth ±

Input of the wavelength which is subtracted from or added to, respectively, the wavelength of the measuring channel.

Example: if the wavelength of the channel is 390 nm and for **Bandwidth ±** the value 5 nm has been entered, then the channel comprises the interval 385…395 nm.

Input range	**1 to 50 nm** (Increment: **1**)
Default value	**5 nm**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.4.3.3.1.3 Measure absorbance

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure absorbance**

The device-dependent **Measure absorbance** time program command (command without feedback) measures the absorbance in the corresponding channel.

Channel

Selection of the measuring channel in which the absorbance is to be measured.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
ABSORBANCE	Measured absorbance [mAu] in the selected measuring channel.	Number

7.4.3.3.1.4 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.4.3.3.1.5 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Pro-

fessional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.4.4 944 Professional UV/VIS Detector Vario - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.4.4.1 Manual control - UV lamp

Tab: **Manual control ► Manual control - All devices - 'Device name' ► UV lamp**

The UV lamp can be switched on and off in the manual control.

[On]

Switches the UV lamp on.

[Off]

Switches the UV lamp off.

7.4.4.2 Manual control - VIS lamp

Tab: **Manual control ► Manual control - All devices - 'Device name' ► VIS lamp**

The VIS lamp can be switched on and off in the manual control.

[On]

Switches the VIS lamp on.

[Off]

Switches the VIS lamp off.

7.4.4.3 Manual control - Detector

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Detector**

The measuring channels of the detector can be edited in the manual control. In addition, the current absorbance, intensity or baseline spectrum can be displayed. It is also possible to record a new baseline spectrum here.

Channel

Selection of the channel that is to be edited when the **[Edit]** button is clicked.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

[Edit]

Opens the dialog for editing the selected channel *(see chapter 7.4.3.1, page 758)*.

Spectrum

Selection of the type of spectrum that is to be displayed when the **[View]** button is clicked.

Selection	**Absorbance spectrum** | **Intensity spectrum** | **Baseline spectrum**

Absorbance spectrum
Current absorbance spectrum (complete wavelength range).

Intensity spectrum
Current intensity spectrum (complete wavelength range).

Baseline spectrum
The last baseline spectrum that has been recorded in the time program or by the **[Reset baseline]** function.

[Edit]

Opens the dialog for editing the selected channel *(see chapter 7.4.3.1, page 758)*.

[View]

Shows the spectrum selected in the **Spectrum** parameter *(see chapter 7.4.4, page 768)*.

NOTE

To display a spectrum, a baseline spectrum must first be recorded using **[Reset baseline]**.

If an intensity spectrum or extinction spectrum has been selected, a method using an UV/VIS detector that has been started with **[Start HW]** must be loaded. This automatically sets a baseline.

[Reset baseline]

If no determination is running with the same method, a new baseline spectrum is being recorded.

7.4.4.4 Displaying spectra

Tab: **Manual control ▶ Manual control - All devices - 'Device name' ▶ Detector ▶ View**

The spectrum selected in the manual control of the detector *(see chapter 7.4.4, page 768)* is displayed here. By right-clicking on the graphics window, a context menu is opened *(see "Curve window", page 94)*.

[Close]

Closes the dialog.

7.5 943 Professional Thermostat / Reactor Vario

7.5.1 943 Professional Thermostat / Reactor Vario - Overview

NOTE

The device **943 Professional Thermostat / Reactor Vario** is available in 2 model versions. The device is described in the online help with all possible modules.

The following versions are available for different fields of application:

- **2.943.0110 Professional Reactor Vario**
  The 943 Professional Reactor Vario is a heatable reactor, especially developed for pre- and post-column derivatization. It stands out with its robustness, the fast heating rate and the possibility to carry out reactions at up to 120 °C.

- **2.943.0210 Professional Thermostat Vario**
  The 943 Professional Thermostat Vario is a stand-alone column oven for up to two columns with a maximum length of 150 mm. It captivates by its fast heating rate and the possibility to operate two separation columns at up to 80 °C.

7.5.2 943 Professional Thermostat / Reactor Vario - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a type **943 Professional Thermostat / Reactor Vario** instrument is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item.

7.5.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.5.2.2 Properties - Reactor unit

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Reactor unit**

NOTE

This tab is only available when there is a reactor unit in the device.

The properties of the reactor unit and the monitoring of the reactor plate can be defined here. In addition, up to four reactors can be defined.

Properties of the reactor unit

Name

Name of the reactor unit (must not be empty).

Entry	**1 - 24 characters**

Set to work

Display of the set-to-work date of the reactor unit.

Comment

Field for optional and additional information.

Entry	**0 - 50 characters**

[Monitoring]

Opens the **Monitoring – 'Reactor unit name'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

Reactors

Table of reactors of the reactor unit. Up to four reactors can be defined. The most important properties are displayed in the table. The table cannot be edited directly. Use the **[Edit]** menu below the table. This contains the following menu items:

New	Add a new line to the table and edit in separate dialog *(see chapter 7.15.2.5, page 1156)* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *(see chapter 7.15.2.5, page 1156)* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected line to the clipboard.
Insert [CTRL-V]	Inserts the line from the clipboard into the table.
Cut [CTRL-X]	Cuts the selected line and copies it to the clipboard.
Delete [Delete]	Deletes the selected line.

The properties of the reactors are described in *7.15.2.5 Editing a reactor, p. 1156*.

7.5.2.3 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector

- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB #

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.5.2.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.5.2.5 Editing a reactor

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Reactor unit ► Reactors**

In this dialog, a new reactor can be registered or a previously defined reactor can be edited.

Order number

Optional entry of the order number of the reactor.

Entry	**0–10**

Material

Optional entry of the material of the reactor capillary.

Entry	**0–16**

Length

Optional entry of the length of the reactor capillary.

Input range	**0.01 to 10.0 m** (Increment: **0.01**)
Default value	**2.00 m**

Inner diameter

Optional entry of the inner diameter [mm] of the reactor capillary.

Input range	**0.01 to 10.0 mm** (Increment: **0.01**)
Default value	**0.5 mm**

Volume

This field shows the total volume of the reactor capillary in [µL] calculated from **Inner diameter** and **Length**.

calculated volume in [µL], without decimal places

Comment

Optional comment on the reactor.

Entry	**0–24**

7.5.3 943 Professional Thermostat / Reactor Vario - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the **943 Professional Thermostat / Reactor Vario**.

7.5.3.1 943 Professional Thermostat / Reactor Vario - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **943 Professional Thermostat / Reactor Vario** in the top part of the window, then the tabs of the modules contained in the instrument will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.5.3.1.1 Start parameters - Thermostat

Tab: **Method ▶ Devices ▶ Thermostat**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The thermostat is switched on when the hardware is started with **[Start HW]**.

Off
The thermostat is switched off when the hardware is started with **[Start HW]**.

Temperature

Temperature that is set for the thermostat when the hardware is started with **[Start HW]**.

CAUTION

Maximum temperatures allowed

The checking does not take place until the start test of the method.

- Intelligent column (iColumn): 80 °C.
- Intelligent Reactor unit: 120 °C.
- Otherwise: 150 °C.

Input range	**0.0 to 150.0 °C** (Increment: **0.1**)
Default value	**25.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.5.3.2 943 Professional Thermostat / Reactor Vario - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of y-axis	Unit	Evaluation
Temperature	Temperature	°C	No

7.5.3.3 943 Professional Thermostat / Reactor Vario - Commands

Subwindow: **Method ► Time program**

Overview of the time program commands available for the 943 Professional Thermostat / Reactor Vario:

7.5.3.3.1 Commands - Thermostat

Subwindow: **Method ► Time program**

Overview of the time program commands available for the thermostat:

7.5.3.3.1.1 Measuring temperature

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure temperature**

The device-dependent time program command **Measure temperature** (command with feedback) measures the temperature in the thermostat.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following type **'TP.command number.Variable name'** variables are generated by the command:

Variable name	Description	Data type
TEMP	Measured temperature [°C]	Number

7.5.4 943 Professional Thermostat / Reactor Vario - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.5.4.1 Manual control - Thermostat

Tab: **Manual ► Manual control - 'Device name' ► 'Thermostat'**

Temperature

Current Value

Current temperature of the thermostat.

Input

Entering a new value for the temperature of the thermostat.

940

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

943

Input range	**0.0 to 150.0 °C**
Default value	**30.0 °C**

[On]

Switches the thermostat on. This is inactive if it is running.

[Off]

Switches the thermostat off. This is inactive if it is not running.

[Apply]

Sending the parameters set to the thermostat.

7.6 942 Extension Module Vario

The **942 Extension Module Vario** can be connected to a **940 Professional IC Vario** and thus expand the available functional range in order to allow even very elaborate applications to be performed.

Different versions are available for different fields of application:

- **2.942.0040 Extension Module Vario HPG**
  Extension module with high-pressure pump.
- **2.942.1060 Extension Module Vario ONE/Deg**
  Extension module with high-pressure pump, injection valve and degasser.
- **2.942.0020 Extension Module Vario Prep 2**
  Extension module with peristaltic pump and injection valve.
- **2.942.0070 Extension Module Vario LQH**
  Extension module with peristaltic pump, 10-port valve and injection valve.
- **2.942.0300 Extension Module Vario ChS/PP**
  Extension module with suppressor and peristaltic pump.
- **2.942.0500 Extension Module Vario SeS/PP**
  Extension module with suppressor, peristaltic pump and Metrohm CO_2 Suppressor (MCS).

7.6.1 942 Extension Module Vario HPG

7.6.1.1 942 Extension Module Vario HPG - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the type **942 Extension Module Vario HPG** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item.

7.6.1.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.6.1.1.2 Properties - High-pressure pump

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.6.1.1.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.6.1.2 942 Extension Module Vario HPG - Method

Program part: **Method**

Start parameters, data channels and program commands can be defined for the 942 Extension Module Vario HPG in the **Method** program part.

7.6.1.2.1 942 Extension Module Vario HPG - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the 942 Extension Module Vario HPG in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.6.1.2.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.1.2.2 942 Extension Module Vario HPG - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.6.1.2.2.1 High-pressure pump - Data channels

Tab: **Method ► Devices ► Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.6.1.2.3 942 Extension Module Vario HPG - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 942 Extension Module Vario HPG:

7.6.1.2.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.6.1.2.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.1.2.3.1.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.1.2.3.1.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.

Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.1.2.3.1.4 Editing gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient ▶ [Edit] ▶ New / Edit ▶ Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.6.1.2.3.1.5 Measure pressure

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.6.1.2.3.1.6 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.1.3 942 Extension Module Vario HPG - Manual control

7.6.1.3.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.6.2 942 Extension Module Vario ONE/Deg

7.6.2.1 942 Extension Module Vario ONE/Deg - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the type **942 Extension Module Vario ONE/Deg** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item.

7.6.2.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.6.2.1.2 Properties - High-pressure pump

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.6.2.1.3 Properties - Degasser

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Degasser**

The degasser has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - Degasser** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.6.2.1.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter*

2.5.1, page 82). After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.6.2.2 942 Extension Module Vario ONE/Deg - Method

Program part: **Method**

Start parameters and program commands can be defined for the 942 Extension Module Vario ONE/Deg in the **Method** program part.

7.6.2.2.1 942 Extension Module Vario ONE/Deg - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the 942 Extension Module Vario ONE/Deg in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.6.2.2.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.2.2.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.2.2.1.3 Start parameters - Degasser

Tab: **Method ▶ Devices ▶ Degasser**

Status

Selection	**On** | **Off**

On
The degasser is switched on when the hardware is started with **[Start HW]**.

Off
The degasser is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.2.2.2 942 Extension Module Vario ONE/Deg - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.6.2.2.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.6.2.2.3 942 Extension Module Vario ONE/Deg - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 942 Extension Module Vario ONE/Deg:

7.6.2.2.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.6.2.2.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.2.2.3.1.2 Flow

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.2.2.3.1.3 Gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.2.2.3.1.4 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.6.2.2.3.1.5 Measure pressure

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.6.2.2.3.1.6 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.2.2.3.2 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.6.2.2.3.2.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.2.2.3.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.2.2.3.2.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.2.2.3.3 Commands - Degasser

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the degasser:

7.6.2.2.3.3.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the degasser on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Degasser

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.2.3 942 Extension Module Vario ONE/Deg - Manual control

7.6.2.3.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.6.2.3.2 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.6.2.3.3 Manual control - Degasser

Tab: **Manual ► Manual control - 'Device name' ► 'Degasser'**

[On]

Start degasser. This is inactive if the degasser is already running.

[Off]

Stop degasser. This is inactive if the degasser is not running.

7.6.3 942 Extension Module Vario Prep 2

7.6.3.1 942 Extension Module Vario Prep 2 - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the type **942 Extension Module Vario Prep 2** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item.

7.6.3.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.6.3.1.2 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.6.3.2 942 Extension Module Vario Prep 2 - Method

Program part: **Method**

Start parameters and program commands can be defined for the 942 Extension Module Vario Prep 2 in the **Method** program part.

7.6.3.2.1 942 Extension Module Vario Prep 2 - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the 942 Extension Module Vario Prep 2 in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.6.3.2.1.1 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.3.2.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.3.2.2 942 Extension Module Vario Prep 2 - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 942 Extension Module Vario Prep 2:

7.6.3.2.2.1 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.6.3.2.2.1.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.3.2.2.1.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.3.2.2.2 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.6.3.2.2.2.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.3.2.2.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.3.2.2.2.3 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.3.3 942 Extension Module Vario Prep 2 - Manual control

7.6.3.3.1 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.6.3.3.2 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.6.4 942 Extension Module Vario LQH

7.6.4.1 942 Extension Module Vario LQH - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the type **942 Extension Module Vario LQH** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item.

7.6.4.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.6.4.1.2 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.6.4.2 942 Extension Module Vario LQH - Method

Program part: **Method**

The start parameters and program commands can be defined for the 942 Extension Module Vario Liquid Handling in the **Method** program part.

7.6.4.2.1 942 Extension Module Vario LQH - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the 942 Extension Module Vario LQH in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.6.4.2.1.1 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.4.2.1.2 Start parameters - 10-port valve

7.6.4.2.1.2.1 Start parameters

Method: **Devices ► 10-port valve**

Here the parameter values are defined which are sent to the 10-port valve at the start of the method.

Valve position selection

Selecting the corresponding option determines whether the valve remains in its current position when the method starts or whether a particular port is moved to.

Selection	**Maintain current port** | **Port**
Default value	**Maintain current port**

Maintain current port
If this option is selected, then the valve remains in its current position at the start of the method.

Port
If this option is selected, then at the start of the method the port which is selected in the parameter **Port** will be set.

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

[Port configuration]

Opens the dialog window **Port configuration** in which a user-defined name can be assigned for each port and a solution can be allocated from the solution table *(see chapter 7.6.4.2.1.2.2.1, page 819)*.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.4.2.1.2.2 Port configuration

Method **Devices ► 10-port valve ► Port configuration**

The dialog **Port configuration** displays in tabular fashion the names and optionally assigned solutions of the individual ports, and permits the editing of these port properties.

7.6.4.2.1.2.2.1 Port table

The dialog **Port configuration** shows the table of the ports.

Name

Name of the port. The default name is **Port #**, where # stands for the number of the port. A user-defined port name must be unique in the context of the respective method.

Entry	**24 characters**

Solution

Optional allocation of a ("non-intelligent") solution from the solution table.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

[Edit]

Opens the dialog window **Edit port**, in which the name for the selected port can be defined and a solution from the solution table can be allocated *(see chapter 7.6.4.2.1.2.2.2, page 819)*.

7.6.4.2.1.2.2.2 Editing port

Method **Devices ► 10-port valve ► Port configuration ► Edit port**

A user-defined name can be assigned in the dialog **Port configuration** for each port and a solution can be allocated from the solution table .

Port

Display of the number of the selected port.

Name

Name of the port. The default name is **Port #**, where # stands for the number of the port. A user-defined port name must be unique in the context of the respective method.

Entry	**24 characters**

Solution

Optional allocation of a ("non-intelligent") solution from the solution table.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

[OK]

Save the port properties.

[Cancel]

Cancel the editing of the port properties.

7.6.4.2.1.3 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.4.2.2 942 Extension Module Vario LQH - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 942 Extension Module Vario LQH:

7.6.4.2.2.1 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.6.4.2.2.1.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.4.2.2.1.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.4.2.2.2 Commands - 10-port valve

Method **Method ► Time program**

Overview of the time program commands available for the 10-port valve:

7.6.4.2.2.2.1 Change port

Method **Time program ► Edit ► 'Device' - 'Module' - Change port**

The device-dependent time program command **Change port** (command with feedback) switches the 10-port valve over to the desired port. The parameters described in the following can be used as aids for a precise definition of how the switching of the ports is to be carried out.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Changing port

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

Shift direction

List of the shift modes of the 10-port valve.

Selection	**ascending** | **descending** | **automatic** | **not over**
Default value	**automatic**

ascending
The valve moves towards the target port in ascending direction. Example: if the current position is *Port 9*, and the target port is to be *Port 2*, then the valve in this mode will select the path 9 – 10 – 1 – 2.

descending
The valve moves towards the target port in descending direction. Example: if the current position is *Port 1*, and the target port is to be *Port 7*, then the valve in this mode will select the path 1 – 10 – 9 – 8 – 7.

automatic
The valve determines the shortest path to the target port on its own.

not over
The valve moves towards the target port in such a way that the port specified in the parameter "Not over" will not be traversed.

Not over

Combobox for selecting the port which is not to be traversed when the port is changed; will have no effect here if the port selected is the same as the target port. Only active when the parameter's "Not over" option is selected for the shift direction. The user-defined name, if available, is used as the 'Port name', otherwise the default name.

Selection	**'Port name' of Port 1** | **'Port name' of Port 2** | **...** | **'Port name' of Port 10**
Default value	**'Port name' of Port 10**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.4.2.2.2.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.4.2.2.3 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.6.4.2.2.3.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.4.2.2.3.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.4.2.2.3.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.4.3 942 Extension Module Vario LQH - Manual control

7.6.4.3.1 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.6.4.3.2 Manual control - 10-port valve

Tab: **Manual control - 'Device name' ► '10-port valve'**

Current port

Shows the current port.

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

Shift direction

List of the shift modes of the 10-port valve.

Selection	**ascending** | **descending** | **automatic** | **not over**
Default value	**automatic**

ascending
The valve moves towards the target port in ascending direction. Example: if the current position is *Port 9*, and the target port is to be *Port 2*, then the valve in this mode will select the path 9 – 10 – 1 – 2.

descending
The valve moves towards the target port in descending direction. Example: if the current position is *Port 1*, and the target port is to be *Port 7*, then the valve in this mode will select the path 1 – 10 – 9 – 8 – 7.

automatic
The valve determines the shortest path to the target port on its own.

not over
The valve moves towards the target port in such a way that the port specified in the parameter "Not over" will not be traversed.

Not over

Combobox for selecting the port which is not to be traversed when the port is changed; will have no effect here if the port selected is the same as the target port. Only active when the parameter's "Not over" option is selected for the shift direction. The user-defined name, if available, is used as the 'Port name', otherwise the default name.

Selection	**'Port name' of Port 1** | **'Port name' of Port 2** | **...** | **'Port name' of Port 10**
Default value	**'Port name' of Port 10**

[Apply]

Move to the target port in the specified manner.

7.6.4.3.3 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.6.5 942 Extension Module Vario ChS/PP

7.6.5.1 942 Extension Module Vario ChS/PP - Configuration

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a device of the type **942 Extension Module Vario ChS/PP** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ▶ Properties...** menu item.

7.6.5.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.6.5.1.2 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.6.5.2 942 Extension Module Vario ChS/PP - Method

Program part: **Method**

Start parameters and program commands can be defined for the 942 Extension Module Vario ChS/PP in the **Method** program part.

7.6.5.2.1 942 Extension Module Vario ChS/PP - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the 942 Extension Module Vario ChS/PP in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.6.5.2.1.1 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.6.5.2.1.1.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.6.5.2.1.1.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.6.5.2.1.1.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.6.5.2.1.1.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		

Step	Action	Description
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.6.5.2.1.2 Start parameters - Peristaltic pump

Tab: **Method** ▶ **Devices** ▶ **Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.5.2.2 942 Extension Module Vario ChS/PP - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 942 Extension Module Vario ChS/PP:

7.6.5.2.2.1 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.6.5.2.2.1.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.6.5.2.2.1.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.5.2.2.2 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.6.5.2.2.2.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.5.2.2.2.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.5.3 942 Extension Module Vario ChS/PP - Manual control

7.6.5.3.1 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.6.5.3.1.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.6.5.3.2 Manual control - Peristaltic pump

Tab: **Manual control ▶ Manual control - All devices - 'Device name' ▶ 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.6.6 942 Extension Module Vario SeS/PP

7.6.6.1 942 Extension Module Vario SeS/PP - Configuration

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a device of the type **942 Extension Module Vario SeS/PP** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ▶ Properties...** menu item.

7.6.6.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.6.6.1.2 Properties - MCS

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ MCS**

The MCS (Metrohm CO_2 Suppressor) has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - MCS** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.6.6.1.3 Properties - GLP

Tab: **Configuration ▶ 'Subwindow' ▶ [Edit] ▶ Properties... ▶ 'Properties' ▶ GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.6.6.2 942 Extension Module Vario SeS/PP - Method

Program part: **Method**

Start parameters and program commands can be defined for the 942 Extension Module Vario SeS/PP in the **Method** program part.

7.6.6.2.1 942 Extension Module Vario SeS/PP - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the 942 Extension Module Vario SeS/PP in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.6.6.2.1.1 Start parameters - MCS

Tab: **Method ▶ Devices ▶ MCS**

Status

Selection	**On** | **Off**
Default value	**On**

On
The MCS (Metrohm CO2 Suppressor) is switched on when the hardware is started with **[Start HW]**.

Off
The MCS (Metrohm CO_2 Suppressor) is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.6.2.1.2 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.6.6.2.1.2.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.6.6.2.1.2.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.6.6.2.1.2.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)

- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.6.6.2.1.2.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino

Step	Action	Description
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**
- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.6.6.2.1.3 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.6.6.2.2 942 Extension Module Vario SeS/PP - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 942 Extension Module Vario SeS/PP:

7.6.6.2.2.1 Commands - MCS

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MCS (Metrohm CO_2 Suppressor):

7.6.6.2.2.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the MCS (Metrohm CO_2 Suppressor) on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

MCS

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.6.2.2.2 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.6.6.2.2.2.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.6.6.2.2.2.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.6.2.2.3 Commands - Peristaltic pump

Subwindow: **Method ► Time program**

Overview of the time program commands available for the peristaltic pump:

7.6.6.2.2.3.1 On/Off

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.6.6.2.2.3.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.6.6.3 942 Extension Module Vario SeS/PP - Manual control

7.6.6.3.1 Manual control - MCS

Tab: **Manual ► Manual control - 'Device name' ► 'MCS'**

[On]

Start MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is already running.

[Off]

Stop MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is not running.

7.6.6.3.2 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.6.6.3.2.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.6.6.3.3 Manual control - Peristaltic pump

Tab: **Manual control ▶ Manual control - All devices - 'Device name' ▶ 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

	-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.7 941 Eluent Production Module

7.7.1 941 Eluent Production Module - General

The 941 Eluent Production Module is used for the automated production of eluent from concentrate and water.

With up to three connected Dosinos and up to four level sensors, eluents can be produced in an automated fashion on the one hand, and the fill levels in storage and waste vessels can be monitored on the other hand.

7.7.2 941 Eluent Production Module - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the type **941 Eluent Production Module** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item. The properties for the various modules, the connections of the modules to the main device and the GLP data can all be defined on these tabs.

7.7.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Start-up

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.7.2.2 Properties - Connections

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

MSB #

NOTE

One **MSB #** (# = number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.7.2.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.7.3 941 Eluent Production Module - Method

Start parameters and time program commands can be defined for the **941 Eluent Production Module** in the **Method** program part.

7.7.3.1 941 Eluent Production Module - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **941 Eluent Production Module** instrument in the top part of the window, then the tabs for the level sensors 1 to 4 will appear. The level sensors can be assigned to the eluent Dosinos used and additional start parameters can be defined in the bottom part of the window.

7.7.3.1.1 Start parameters - Level sensor

Tab: **Method ▶ Devices ▶ Level sensor #**

If level sensors are defined in a method for the fill level monitoring of supply and waste vessels and for eluent production, then the following must be observed:

NOTE

Level sensors for fill level monitoring **before** eluent production in the **full** mode **before** eluent production in the **empty** mode.

The reason for this is that the tabs with the start parameters of the level sensors are processed from left to right, i.e. from level sensor 1 to level sensor 4, when a method is run.

The level sensors that monitor the fill level in supply and waste vessels should be checked before eluent production begins.

Eluent production takes place in the batch process in the **empty** mode. If it is discovered during an ongoing determination that the vessel with eluent is empty, then eluent production begins and the determination is interrupted. Eluent production takes place continuously in the **full** mode. In order to avoid delays while determination sequences are being run, a tab with the **full** mode should be defined before a tab with the **empty** mode.

Conditions for eluent production:

1. If the mode **empty** and the mode **full** are used together in a method, then **full** before **empty** applies. This means that the tab with **full** comes before a tab with **empty**.
2. In the mode **empty**, the **Eluent volume** and a **Waiting time** must be entered.
3. For determinations with suppression, level sensors with short rods are used (corresponds to mode **full**).
4. For determinations without suppression, level sensors with long rods are used (corresponds to mode **empty**).
5. Level sensor monitoring is only possible for the selection **Dosing device** = **not defined**.

Mode

Shows the current mode of the level sensor.

Selection	**full** | **empty**
Default value	**full**

full
Sensor (with short rods) indicates when the monitored vessel is filled. This sensor is used for producing eluent continuously.

empty
Sensor (with long rods) indicates when the monitored vessel is nearly empty. This sensor is used for the batch production of eluent.

Dosing device

Eluent Dosino (labeled with **E**) assigned to a level sensor. Only Dosinos that are connected to an MSB connector of the 941 Eluent Production Module and that were defined as eluent Dosino when the 941 Eluent Production Module was included in a method can be selected in this list.

Selection	**not defined** | **'Name of Dosino'**
Default value	**not defined**

Eluent volume

Indication how many mL of an eluent are to be produced.

only editable in the mode empty

Input range	**100 to 10,000 mL**
Default value	**2,000 mL**

Waiting time

Time that must elapse before data for a determination is recorded again with the newly produced eluent. Slight concentration differences may occur between the old and the new eluent, resulting in an unstable base-

line. Once the waiting time has elapsed, the chromatogram will be recorded again at a constant eluent concentration.

only editable in the mode empty

Input range	**0 to 1,000 min**
Default value	**10 min**

Monitoring

Level sensor monitoring can be activated only for a dosing device that has no specific function. **not defined** must be selected in the **Dosing device** list box.

[Settings]

The **Monitoring - 'Name level sensor'** dialog window opens *(see chapter 7.7.3.1, page 864)*.

Active

on | off (Default value: **on**)

If this check box is activated, then the level sensor will be used in the method. This means that the eluent concerned is produced with **[Start HW]** for the method in the workplace, provided an eluent Dosino is assigned and the sensor status allows for this.

The check box is enabled by default only for level sensor 1. For level sensors 2 to 4, it is disabled by default.

Component concentrations

The table **Component concentrations** lists the parameters for eluent production.

Name

Name of the respective component in the concentrate or in the eluent.

Concentration

Concentration of the respective component in the concentrate.

Unit

Unit of the component concentration.

Target concentration

Target concentration of the respective component in the finished eluent.

Unit

Unit of the target concentration of the eluent.

It is edited via the *Edit menu*.

Edit menu

New	Inserts a new line at the end of the table **Component concentrations** and opens the **Component concentrations** dialog window *(see chapter 7.7.3.1.3, page 868)*.
Edit	Edit the selected line *(see chapter 7.7.3.1.3, page 868)*.
Delete	Deletes the highlighted lines. The first line can only be deleted if it is the only line in the table or together with all lines.

7.7.3.1.2 Monitoring - Level sensor

Dialog window: **Method ► Devices ► Level sensor # ► Monitoring ► Settings**

Level sensor monitoring is only possible if **Dosing device** = **not defined**.

Monitoring enabled

on | off (Default value: **on**)

If this check box is activated, then the fill level (in **empty** mode = vessel empty, in **full** mode = vessel full) will be monitored by the level sensor # connected to the 941 Eluent Production Module.

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

The message is sent to the e-mail address defined under **[E-mail]** if this option is activated. The message is sent in text format.

[E-mail...]

[E-mail...] opens the Send e-mail window.

Acoustic signal

on | off (Default value: **off**)

If this option is activated, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can be edited only if fill level monitoring by the level sensor is activated.

If during fill level monitoring it is found that a level sensor has the status **not ok** (**empty** mode = level sensor has no contact, **full** mode = level sensor has contact), then one of the following actions will be triggered automatically:

Selection	**Record message** | **Display message** | **Cancel determination and stop devices** | **Finish determination and shutdown devices**
Default value	**Display message**

Record message
The message that a level sensor has the status **not ok** will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, the message that the working life of the eluent has expired will be saved automatically with the determination.

Cancel determination and stop devices
The ongoing determination will be canceled automatically and all devices immediately stopped. The following message must be confirmed with **[OK]**.

Finish determination and shutdown devices
The ongoing determination is finished and then the instruments will be stopped. The following message must be confirmed with **[OK]**.

7.7.3.1.3 Component concentrations

Dialog window: **Method ► Devices ► Level sensor ► New...**

Component name

Name of the respective component in the concentrate or in the eluent.

Entry	**1 - 24 characters**
Default value	**'empty'**

Component concentrations

Concentration of the respective component in the concentrate.

Input range	**1.0E–6 to 1.0E+6**
Default value	**1.000**
Selection	**mol/L** | **g/L** | **µg/L** | **µmol/L** | **µmol/mL** | **mEq/L** | **mg/L** | **mg/mL** | **mmol/L** | **%** | **ppb** | **ppm** | **Custom**

Target concentration

Target concentration of the respective component in the finished eluent.

The input range applies to the first component in the table. The target concentrations of the additional components are calculated by applying the dilution factor required for the first component and displayed with an accuracy of at least three decimal places. These target concentrations cannot be edited.

The range for the dilution factor for eluent production must lie between 1:1.25 and 1:50.

Input range	**1.0E–6 to 1.0E+6**
Default value	**1.000**
Selection	**Unit is adopted from component concentrations**

Navigation bar

Navigation bar for changing the displayed components with the following functions:

Jump to the first component. Altered data is adopted.

Jump to the previous component. Altered data is adopted.

Jump to the next component. Altered data is adopted.

Jump to the last component. Altered data is adopted.

Jump to a new, empty line. The number of lines is increased by +1 at this time. Altered data is adopted.

Option of entering the desired line number to which the program jumps when pressing **[Enter]**.

7.7.3.1.4 Procedure of the eluent production (mode full)

The eluent production can be started as follows:

- **[Start HW]** in the workplace (equilibration)
- **[Start]** in the workplace (single determination or determination series)
- **[Start]** in manual control

As a prerequisite for eluent production, the concentrate must be defined as a solution of the **IDU** type in the configuration, i.e., the concentrate is in an intelligent dosing unit.

Port assignment, dosing rate, etc. are fixed. They cannot be defined in the **Configuration** program part.

Port assignment

Port 1	Concentrate
Port 2	H_2O / UPW (ultrapure water)
Port 3	Eluent
Port 4	Waste

Table 5 Procedure of the eluent production using a 50 mL cylinder unit as an example

Mode = full **Sensor status = 0: start of eluent production in accordance with the specifications in table Component concentrations** **Sensor status = 1: eluent production is not started**			
Step	Port	Action	Description
Start HW / Start			
1	4	ejecting	Remaining eluent in the cylinder is discarded
2	3	aspirating 0.2 mL of eluent	For compensating a change of direction *(see chapter 7.26.3.2, page 1586)*
3		waiting 2 s	
4	2	aspirating 5 mL H_2O	Adding H_2O in order to improve the subsequent mixing of concentrate and H_2O
5		waiting 5 s	
6	1	aspirating concentrate	The volume of the concentrate is calculated on the basis of the data in the component table and aspirated
7		waiting 5 s	Mixing concentrate and H_2O

Mode = full **Sensor status = 0: start of eluent production in accordance with the specifications in table Component concentrations** **Sensor status = 1: eluent production is not started**				
8	2	aspirating H_2O	The volume is calculated on the basis of the data in the component table; the eluent has a defined target concentration	
9		waiting 5 s	Mixing the eluent	
10	3	ejecting	The eluent is transferred to the the eluent bottle	
11		Repeating steps 1 to 10 or interrupting or stopping	**Repeating** in the workplace, if	Sensor = 0
			Interrupting in the workplace, if	Sensor = 1
			Stopping in manual control, if	Sensor = 1 or Eluent volume achieved

7.7.3.1.5 Procedure of the eluent production (mode empty)

The eluent production can be started as follows:

- **[Start HW]** in the workplace (equilibration)
- **[Start]** in the workplace (single determination und determination series)
- **[Start]** in manual control

Eluent production cannot take place while a determination is running. If the sensor status *(see page 875)* changes while a determination is running from **1** to **0**, then eluent production is not started until the determination is finished. Conversely, a determination cannot proceed as long as the eluent production is still ongoing.

NOTE

After the production of the eluent, the set waiting time is observed in the **empty** mode. The time program of the next determination will not start until afterwards.

NOTE

If, at the start of a determination in the **empty** mode, the sensor status = **0** (i.e. the supply vessel is empty), then the IC system will not start until after the production of the eluent volume that has been set, including the waiting time that has been entered. We recommend that the system be put into operation via **[Start HW]** prior to the start of the determination.

The port assignment is fixed. It cannot be defined in the **Configuration** program part.

Port 1 Concentrate

Port 2 H_2O / UPW (ultrapure water)

Port 3 Eluent

Port 4 Waste

Table 6 Procedure of the eluent production using a 50 mL cylinder unit as an example

Mode = empty **Sensor status = 0: start of eluent production in accordance with the specifications in table Component concentrations** **Sensor status = 1: eluent production is not started**			
Step	Port	Action	Description
Start HW / Start			
1	4	ejecting	Remaining eluent in the cylinder is discarded
2	3	aspirating 0.2 mL of eluent	For compensating a change of direction *(see chapter 7.26.3.2, page 1586)*
3		waiting 2 s	

Mode = empty **Sensor status = 0: start of eluent production in accordance with the specifications in table Component concentrations** **Sensor status = 1: eluent production is not started**			
4	2	aspirating 5 mL H_2O	Adding H_2O in order to improve the subsequent mixing of concentrate and H_2O
5		waiting 5 s	
6	1	aspirating concentrate	The volume of the concentrate is calculated on the basis of the data in the component table and aspirated
7		waiting 5 s	Mixing concentrate and H_2O
8	2	aspirating H_2O	The volume is calculated on the basis of the data in the component table; the eluent has a defined target concentration
9		waiting 5 s	Mixing the eluent
10	3	ejecting	The eluent is transferred to the the eluent bottle

Mode = empty **Sensor status = 0: start of eluent production in accordance with the specifications in table Component concentrations** **Sensor status = 1: eluent production is not started**				
11		Repeating steps 1 to 10 or interrupting or stopping	**Repeating** in the workplace, if	Eluent volume not achieved
			Interrupting in the workplace, if	Eluent volume achieved. The waiting time until the next determination is observed.
			Stopping in manual control, if	Eluent volume achieved

7.7.3.2 941 Eluent Production Module - Commands

No time program commands exist for the 941 Eluent Production Module.

7.7.4 941 Eluent Production Module - Manual control

7.7.4.1 Manual control - Level sensor

Tab: **Manual ► Manual control - 'Device name' ► Level sensor**

Component concentrations

The table **Component concentrations** lists the parameters for eluent production.

Name

Name of the respective component in the concentrate for the production of eluent.

Concentration

Concentration of the respective component in the concentrate.

Unit

Unit of the component concentration.

Target concentration

Target concentration of the respective component in the finished eluent.

Unit

Unit of the target concentration of the eluent.

Edit menu

New	Inserts an empty line above the highlighted line in the table **Component concentrations** and opens the **Component concentrations** dialog window *(see chapter 7.7.3.1.3, page 868)*.
Edit	Edit the selected line *(see chapter 7.7.3.1.3, page 868)*.
Delete	Deletes the highlighted lines. The first line can only be deleted if it is the only line in the table or together with all lines.

Eluent volume

Current Value

Shows the current volume of the eluent.

Input

Volume of the eluent to be produced.

Input range	**100 to 10,000 mL** (Increment: **100**)
Default value	**2,000 mL**

Sensor status

Displays the current fill level.

Selection	**1** | **0**

1
The level sensor has contact with the liquid in the eluent bottle.

0
The level sensor has no contact with the liquid in the eluent bottle.

Mode

Shows the current mode of the level sensor.

Selection	**full** | **empty**
Default value	**full**

full
Sensor (with short rods) indicates when the monitored vessel is filled. This sensor is used for producing eluent continuously.

empty
Sensor (with long rods) indicates when the monitored vessel is nearly empty. This sensor is used for the batch production of eluent.

Dosing device

Dosing device assigned to a level sensor.

Selection	**not defined** | **Dosino 2** | **Dosino 3** | **Dosino 4**
Default value	**not defined**

not defined
If no Dosino is assigned to a level sensor or if the level sensor is deactivated, then the eluent specified in the **Component concentrations** table of this level sensor cannot be produced.

[Start]

Starts eluent production in accordance with the component concentration displayed. Only possible if the corresponding level sensor is activated and if a dosing device is assigned to it.

[Stop]

Stops eluent production. The dilution cycle that has been started is, however, run to completion.

[Apply]

7.8 940 Professional IC Vario

7.8.1 940 Professional IC Vario - Overview

The 940 Professional IC Vario is available in numerous versions that differ in the combination of integrated modules. The basic unit of the device is equipped with a column thermostat with two column holders and a third column holder outside the column thermostat.

On the basis of the 940 Professional IC Vario basic unit, the versions are individually combined in accordance with the intended field of application.

The device is described in the online help with all possible modules.

The following versions are available:

- **940.1100 Professional IC Vario ONE**
- **940.1110 Professional IC Vario ONE/Prep 1**
- **940.1120 Professional IC Vario ONE/Prep 2**
- **940.1140 Professional IC Vario ONE/HPG**
- **940.1150 Professional IC Vario ONE/LPG**
- **940.1200 Professional IC Vario ONE/ChS**
- **940.1240 Professional IC Vario ONE/ChS/HPG**
- **940.1250 Professional IC Vario ONE/ChS/LPG**
- **940.1300 Professional IC Vario ONE/ChS/PP**

- **940.1340 Professional IC Vario ONE/ChS/PP/HPG**
- **940.1350 Professional IC Vario ONE/ChS/PP/LPG**
- **940.1400 Professional IC Vario ONE/SeS**
- **940.1410 Professional IC Vario ONE/SeS/Prep 1**
- **940.1420 Professional IC Vario ONE/SeS/Prep 2**
- **940.1430 Professional IC Vario ONE/SeS/Prep 3**
- **940.1440 Professional IC Vario ONE/SeS/HPG**
- **940.1450 Professional IC Vario ONE/SeS/LPG**
- **940.1500 Professional IC Vario ONE/SeS/PP**
- **940.1510 Professional IC Vario ONE/SeS/PP/Prep 1**
- **940.1520 Professional IC Vario ONE/SeS/PP/Prep 2**
- **940.1530 Professional IC Vario ONE/SeS/PP/Prep 3**
- **940.1540 Professional IC Vario ONE/SeS/PP/HPG**
- **940.1550 Professional IC Vario ONE/SeS/PP/LPG**
- **940.2100 Professional IC Vario TWO**
- **940.2200 Professional IC Vario TWO/ChS**
- **940.2300 Professional IC Vario TWO/ChS/PP**
- **940.2400 Professional IC Vario TWO/SeS**
- **940.2500 Professional IC Vario TWO/SeS/PP**
- **940.1580 Professional IC Vario ONE/SeS/PP/MB**
- **940.2580 Professional IC Vario TWO/SeS/PP/MB**

ONE = high-pressure pump + injector + degasser

TWO = 2 high-pressure pumps + 2 injectors + 2 degassers

ChS = chemical suppression

Deg = eluent and sample degasser

HPG = high-pressure gradient

LPG = low-pressure gradient

Prep 1 = sample preparation (peristaltic pump + dialysis/filtration)

Prep 2 = sample preparation (peristaltic pump + 6-port valve)

Prep 3 = sample preparation (peristaltic pump + SMP)

PP = peristaltic pump

SeS = sequential suppression

MB = Microbore, system optimized for 2 mm columns

7.8.2 940 Professional IC Vario - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the type **940 Professional IC Vario** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item. The properties for the various mod-

ules, the connections of the modules to the main device and the GLP data can all be defined on these tabs.

7.8.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.8.2.2 Properties - High-pressure pump

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.8.2.3 Properties - Conductivity detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name' ► LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.8.2.4 Properties - Amperometric detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Amp. detector**

NOTE

The amperometric detector can only be used with the following instruments: 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus, 896 Professional Detector, 930 Compact IC Flex, 940 Professional IC Vario, 945 Professional Detector Vario.

Detector type

Shows the detector type, is read out automatically from the detector.

Connection

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

7.8.2.5 Properties - MCS

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► MCS**

The MCS (Metrohm CO_2 Suppressor) has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - MCS** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.8.2.6 Properties - Degasser

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Degasser**

The degasser has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - Degasser** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.8.2.7 Properties - Analog Out

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Analog Out**

NOTE

This tab is only available when an **891 Professional Analog Out** is connected.

Device type

Display of the device type.

Device serial number

Display of the serial number of the connected 891 Professional Analog Out.

7.8.2.8 Properties - Connections

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC

- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB #

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.8.2.9 Properties - GLP

Tab: **Configuration ▶ 'Subwindow' ▶ [Edit] ▶ Properties... ▶ 'Properties' ▶ GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.8.2.10 Load new program version

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ General ▶ [Update] ▶ Load new program version**

If it is discovered that the device to be connected has an old program version not supported by **MagIC Net**, then it must be updated. Select the device from the device table. Open the properties window with **[Edit] ▶ Properties...**. On the **General** tab, click on **[Update]** to open the **Load new program version** dialog window.

Old version

Shows the old device program version.

New version

Shows the new device program version to be loaded.

[Load]

Loads the new device program version.

NOTE

Make sure that the device is not manipulated or switched off during the loading process, and follow the instructions shown.

7.8.2.11 Monitoring

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module'**

The dialog window comprises the tabs **Date** and **Operating hours**, on which you can define the parameters for module monitoring.

7.8.2.11.1 Monitoring - Date

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring- 'Module' ▶ Date**

Monitor date

Current value

Shows the current date.

Last service

Date of the last service. This date can be selected by clicking on ... in the **Select date** dialog window and is used for monitoring (**last service + service interval = next service**).

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor date

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the date.

NOTE

Monitoring cannot be enabled until after a date has been entered in the **Last service** field.

Service interval

Interval in days after which the service for the module should be repeated. If a value is entered here, then the date in the **Next Service** field will be adjusted automatically.

Next Service

Date on which the next service is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window. After the

date has been entered, the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate which action is to be triggered automatically during start check if the time interval for the service has expired.

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.8.2.11.2 Monitoring - Operating hours

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module' ▶ Operating hours**

Operating hours

Current value

Shows the operating hours to date.

[Reset]

NOTE

This function is only available in the monitoring of the 887 Professional UV/VIS Detector.

Use this function after having replaced the corresponding lamp of the 887 Professional UV/VIS Detector. This resets the values of the parameters **Current value** and **Last service**.

Last service

Operating hours at last service. This value is used for monitoring (**last service + service interval = next service**).

Input range	**0 to 99,999 Hours**

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor operating hours

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the operating hours.

NOTE

Monitoring cannot be enabled until after a value has been entered in the **Last service** field.

Service interval

Interval in hours after which the service for the module should be repeated. If a value is entered here, then the value in the **Next Service** field will be adjusted automatically.

Next Service

Operating hours after which the next service is to be carried out. If a value is entered here, then the value in the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate what action is to be triggered automatically during start check if the time interval for the service has expired:

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.8.3 940 Professional IC Vario - Method

Program part: **Method**

In the **Method** program part, you can define start parameters, data channels and program commands for the **940 Professional IC Vario**.

7.8.3.1 940 Professional IC Vario - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **940 Professional IC Vario** in the top part of the window, then the tabs of the modules contained in the device appear in the lower part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.8.3.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.2 Start parameters - Low pressure gradient pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent A

Selecting the eluent A that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

% Eluent A

Displays the proportion of eluent A in the mixing ratio. The proportion is calculated automatically from the proportions for the other eluents using the formula **100 - (% Eluent B + % Eluent C)**.

Eluent B

Selecting the eluent B that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

% Eluent B

Enter the proportion of eluent B in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent C) % %**

Eluent C

Selecting the eluent C that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

% Eluent C

Enter the proportion of eluent C in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent B) % %**

When there is a change from one dialog/tab to another, the percentages are checked ($\sum$ **= 100%**).

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.3 Start parameter - Injection valve

Tab: **Method ► Devices ► Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.4 Start parameters - Peristaltic pump

Tab: **Method** ▶ **Devices** ▶ **Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.5 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.8.3.1.5.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.8.3.1.5.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.8.3.1.5.3 Dosino Regeneration

Dialog window: **Method ▶ Devices - 'Name' ▶ MSM ▶ [Edit] ▶ Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.8.3.1.5.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		

Step	Action	Description
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.8.3.1.6 Start parameters - MCS

Tab: **Method** ▶ **Devices** ▶ **MCS**

Status

Selection	**On** | **Off**
Default value	**On**

On
The MCS (Metrohm CO2 Suppressor) is switched on when the hardware is started with **[Start HW]**.

Off
The MCS (Metrohm CO_2 Suppressor) is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.7 Start parameters - Degasser

Tab: **Method** ▶ **Devices** ▶ **Degasser**

Status

Selection	**On** | **Off**

On
The degasser is switched on when the hardware is started with **[Start HW]**.

Off
The degasser is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.8 Start parameters - Thermostat

Tab: **Method ► Devices ► 'Thermostat'**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The thermostat is switched on when the hardware is started with **[Start HW]**.

Off
The thermostat is switched off when the hardware is started with **[Start HW]**.

Temperature

Temperature that is set for the thermostat when the hardware is started with **[Start HW]**.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.9 Start parameters - Conductivity detector

Tab: **Method ▶ Devices ▶ Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.10 Start parameters - Amperometric detector

7.8.3.1.10.1 Amperometric detector

Tab: **Method ▶ Devices ▶ Amp. detector**

Mode

Selection of the measuring mode of the amperometric detector.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potential steps.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector.

Temperature

Temperature that is set in the detector when the hardware is started with **[Start HW]**.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Cell

Selection of a cell which is defined in the configuration table of the amperometric cells *(see chapter 6.13.2, page 674)*. If no cell has been selected yet, then **not defined** is displayed. Otherwise, the selected cell will be displayed with its user-defined name.

Selection	**not defined** | **Selection of amperometric cells**
Default value	**not defined**

not defined
You can also start the method when this option is selected. The cell connected to the detector is then used. In the report, the amperometric cell is then called "**not defined**", but the properties of the cell that is *actually* used will be output. **Important note:** If an intelligent cell for which the operating hours monitoring has been activated is connected to the amperometric detector, then the operating hours will be counted.

Start delay

on | off (Default value: **off**)

If this option is **enabled**, the amperometric cell is only switched on once this waiting time has elapsed.

Waiting time

Waiting time until the amperometric cell is switched on.

Input range	**0 to 99 min**
Default value	**15 min**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.10.2 DC mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ DC ▶ Settings**

In this dialog, you can set the properties of the **DC** measuring mode.

The properties are also available in the manual control *(see chapter 7.3.4.1, page 750)*.

DC potential

Potential of the working electrode in comparison to the reference electrode.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

Range

Selection of the measuring range.

Selection	**auto** | **2 nA** | **20 nA** | **200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**

auto
Automatic setting of the measuring range. This selection is not allowed with damping activated.

Damping

on | off (Default value: **off**)

Activates or deactivates the additional damping.

7.8.3.1.10.3 PAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, you can set the properties of the **PAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the PAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Potential [V]

Potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define PAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define PAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Duration

Duration of the measurement.

Input range	**1 to 2000 ms** (Increment: **1**)
Default value	**100 ms**

Range

Selection of the measuring range.

Selection	**200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**
Default value	**2 µA**

The defined potential progression is displayed in the form of a graph.

7.8.3.1.10.4 Define PAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, a new PAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**300 ms**

Potential

Potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.05 V**

7.8.3.1.10.5 flexIPAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ flexIPAD ▶ Settings**

In this dialog, you can set the properties of the **flexIPAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the flexIPAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Start potential [V]

Start potential of the step in volts.

End potential [V]

End potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define flexIPAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define flexIPAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The affected lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Start

Start time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**50 ms**

End

Ending time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**150 ms**

Range

Selection of the measuring range.

Selection	**20 µA** | **200 µA** | **2 mA**
Default value	**200 µA**

NOTE

The selection of the measuring channel (**Current** or **Charge**) takes place in the hardware assignment of the analysis *(see chapter 7.3.3.2.1, page 736)*.

The defined potential progression is displayed in the form of a graph.

7.8.3.1.10.6 Define flexIPAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ Settings ▶ flexIPAD mode settings**

In this dialog, a new flexIPAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**100 ms**

Start potential

Start potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

End potential

End potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

7.8.3.1.10.7 CV mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ CV ▶ Settings**

In this dialog, you can set the properties of the **CV** measuring mode.

Number of cycles for cyclic voltammograms

Preparing cycles

Number of cyclic voltammograms which are to be measured in the time program after **Start data acquisition** and then discarded. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Measuring cycles

Number of cyclic voltammograms which are to be measured and saved in the time program after **Start data acquisition**. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1,000 s**

7.8.3.1.11 Start parameters - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are present only if an **891 Professional Analog Out** is connected.

7.8.3.1.11.1 Data source, Polarity, Range/Volt

Tab: **Method ▶ Devices ▶ Analog Out**

Channels Out1, Out2, Aux1, Aux2

The 891 Professional Analog Out includes 4 output channels for analog voltage in the range of -1...+1 volt:

- 2 main channels **Out1**, **Out2** with high resolution, for the digital/ analog converting of chromatograms or cyclovoltammograms.
- 2 auxiliary channels **Aux1**, **Aux2** with low resolution for the digital/ analog converting of measured values such as pressure, flow, temperature, ratio eluent.

The technical specifications can be found in the device manual of the 891 Professional Analog Out.

Each channel has the following set of start parameters. These are on one tab each in the start parameters of the main device. The parameter values are sent to the 891 Professional Analog Out when starting the method.

Data source

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data source** is displayed here.

Channel

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data channel** is displayed here.

Polarity

Indicates the sign of the output voltage of the channel.

Selection	**+** | **–**
Default value	**+**

Range/Volt

Indicates a measured value which is – after using a possible **Measured value offset** – to be converted to 1 volt output voltage *(see chapter 7.8.3.1.11.3, page 916)*.

Input range	**0.001 to 4000000**
Default value	**1.000** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

[Offset..]

This button opens the dialog for defining the measured value offset and the voltage offset *(see chapter 7.8.3.1.11.2, page 915)*.

Active

on | off (Default value: **off**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.8.3.1.11.2 Offset

Tab: **Method ► Devices ► Analog Out ► Offset**

Measured value offset

Indicates a positive or negative amount (in the units of the data channel selected) every measured value is to be corrected by *(see chapter 7.8.3.1.11.3, page 916)*.

Selection	**Current value** | **Value**
Default value	**Current value**

Current value
Select this option if the offset value *currently* set in the Analog Out is to be used. This value can be found in the manual control *(see chapter 7.8.4.10, page 956)*.

Value
Select this option, if you want to enter a new measured value offset in the **Value** field.

Value

Enter a new measured value offset.

Input range	**-4000000 to +4000000**
Default value	**0.0**
	Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful input field for the channel **Conductivity**: **±15000** µS/cm; for the channel **Current**: **±2000000** nA; for the channel **Charge**: **±4000000** nC.

Voltage offset

Value

Offset in mV, to be used on the output signal after the digital/analog conversion.

Input range	**-1000 to +1000 mV** (Increment: **1**)
Default value	**0 mV**

7.8.3.1.11.3 Using range/volt and offsets

With **Range/Volt**, you can indicate the measured value amount to be converted to 1000 mV output voltage.

If you want to correct every measured value by a certain amount, then define a corresponding **Measured value offset**. If you enter a *positive* measured value offset, it will be *added* to every measured value, if you enter a *negative* measured value offset, it will be *subtracted* from every measured value. This happens **before** the digital/analog conversion.

With **Voltage offset** you can indicate a value in mV to be used on the output signal **after** the digital/analog conversion.

The **polarity** will be applied to the resulting output signal.

Example for the channel "Conductivity" of the data source "Detector"

If the required measured values are e.g. between 15 and 35 µS/cm, you could define a measured value of **–15** (µS/cm). The measured values corrected by this offset then are between 0 and 20 µS/cm. The output voltage these offset-corrected values are converted to, depends on **Range/Volt**. Examples:

With a **Range/Volt** of 20 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

With a **Range/Volt** of 40 (µS/cm-V), 20 µS/cm are output as 0.5 V (500 mV).

With a **Range/Volt** of 10 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

You can correct the output signal by a **Voltage offset**. Example: You find out that the output voltage sometimes is slightly negative, whereas you would like to have positive output signals only. If the lowest output voltage is e.g. at –12 mV, you could consistently achieve only positive voltage values with the aid of a **Voltage offset** of 15 mV.

7.8.3.2 940 Professional IC Vario - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.8.3.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.8.3.2.2 Low-pressure gradient pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No
Proportion eluent A	Eluent name	%	No
Proportion eluent B	Eluent name	%	No
Proportion eluent C	Eluent name	%	No

7.8.3.2.3 Thermostat - Data channels

Tab: **Method ▶ Devices ▶ 'Hardware assignment'**

Property	Label of y axis	Unit	Evaluation
Temperature	Temperature	°C	No

7.8.3.2.4 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!
- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column Metrosep A Supp 5 - 100/4.0

Injection volume 20 µL

Duration of recording 12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.8.3.2.5 Amperometric detector - Data channels

Tab:Method ► Devices ► Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Current	Current	nA	Yes
Charge	Charge	nC	Yes
Current vs. Potential	Current	nA	No

NOTE

The only channels available for the output of the measured values by means of the *891 Professional Analog Out (see Chap. 7.8.3.1.11.1, p. 914)* are **Current** and **Charge**. The output of the measured values of these channels is then **time-based**.

7.8.3.3 940 Professional IC Vario - Commands

Subwindow: **Method ► Time program**

Overview of the time program commands available for the 940 Professional IC Vario:

7.8.3.3.1 Commands - High-pressure pump

Subwindow: **Method ► Time program**

Overview of the time program commands available for the high-pressure pump:

7.8.3.3.1.1 On/Off

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.1.2 Flow

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.1.3 Gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.1.4 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.8.3.3.1.5 Measure pressure

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.8.3.3.1.6 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.8.3.3.2 Commands - Low-pressure gradient pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the low-pressure gradient pump:

7.8.3.3.2.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the low-pressure gradient pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.2.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the low-pressure gradient pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.2.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent time program command **Gradient** (command without feedback) starts a mixing gradient program for the low-pressure gradient pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.

- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.8.3.3.2.4, page 927)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.8.3.3.2.4, page 927)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The mixing ratio and the flow rate of the programmed gradient are displayed below the gradient table as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.2.4 Editing gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient ▶ [Edit] ▶ New / Edit ▶ Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Eluent A

Display of the proportion of eluent A in the mixing ratio in %. The proportion is calculated automatically from the proportions for the other eluents using the formula **100 - (% Eluent B + % EluentC)**.

Eluent B

Entry of the proportion of eluent B in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent C) %**
Default value	**0 %**

Eluent C

Entry of the proportion of eluent C in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent B) %**
Default value	**0 %**

When there is a change from one dialog/tab to another, the percentages are checked (∑ **100%**).

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Convex 1 - 4** | **Linear** | **Concave 1 - 4** | **Step**

Convex 1 - 4
If the flow is not changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Linear
If the flow is not changed: The proportion of the eluents changes in a linear fashion from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump change in a linear fashion from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Concave 1 - 4
If the flow is not changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump change along the selected curve from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Step

If the flow is not changed: The proportion of the eluents remains at the value of the previous command line up to the point in time of the current command line. Then the proportion is changed to the entry of the current command line immediately. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump remain at the value of the previous command line up to the point in time of the current command line. Then both are changed to the entry of the current command line immediately. The mixing ratio changes in the same way.

Flow

Set the flow of the low-pressure gradient pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

7.8.3.3.2.5 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.8.3.3.3 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.8.3.3.3.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.3.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.3.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.8.3.3.4 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.8.3.3.4.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.4.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.8.3.3.5 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.8.3.3.5.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.8.3.3.5.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.8.3.3.6 Commands - MCS

Subwindow: **Method ► Time program**

Overview of the time program commands available for the MCS (Metrohm CO_2 Suppressor):

7.8.3.3.6.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the MCS (Metrohm CO_2 Suppressor) on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

MCS

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.7 Commands - Degasser

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the degasser:

7.8.3.3.7.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the degasser on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Degasser

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.8 Commands - Thermostat

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the thermostat:

7.8.3.3.8.1 Measuring temperature

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure temperature**

The device-dependent time program command **Measure temperature** (command with feedback) measures the temperature in the thermostat.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following type **'TP.command number.Variable name'** variables are generated by the command:

Variable name	Description	Data type
TEMP	Measured temperature [°C]	Number

7.8.3.3.9 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.8.3.3.9.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.8.3.3.9.2 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.8.3.3.9.3 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.8.3.3.10 Commands - Amperometric detector

Subwindow: **Method ▶ Time program**

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then the following commands may **not** be used. This is checked by the start test of the method.

Overview of the time program commands available for the amperometric detector:

7.8.3.3.10.1 Measure current

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure current**

The device-dependent **Measure current** time program command (command with feedback) measures the current.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_I	TP.'Command number.MEAS_I Measured current [nA].	Number

7.8.3.3.10.2 Measure charge

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure charge**

The device-dependent **Measure charge** time program command (command with feedback) measures the charge.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_Q	TP.'Command number.MEAS_Q Measured charge [nC].	Number

7.8.3.3.10.3 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are

available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.8.3.3.10.4 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.8.3.3.10.5 Modify mode

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Modify mode**

The device-dependent **Modify mode** time program command (command without feedback) permits a change of measuring mode: You can change the parameterization of the current measuring mode or select a different measuring mode and set its parameters.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

When the command is opened, the mode parameters which are set in the start parameters are displayed by default.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Mode

Selection of the measuring mode of the amperometric detector. The CV mode mode is not available here.

Selection	**DC** | **PAD** | **flexIPAD**

DC
Measurement with constant potential.

PAD
Measurement with several potential levels.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector. The same settings can be set as in the *start parameters, see Chap. 7.3.3.1.2, p. 728*.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.10.6 CV treatment

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - CV treatment**

The device-dependent CV treatment time program command (command without feedback) allows the performance of cyclovoltammetric treatments.

Settings

Opens the settings for the cyclovoltammetric treatment.

Comment

Optional comment on the time program command.

Entry	**64 characters.**

Settings

In this dialog, you can set the properties for the cyclovoltammetric treatments.

Number of cycles for cyclovoltammetric treatment

Cycles

Number of cyclovoltammetric treatments that are to be performed in the time program. The parameterization defined in the Sweep parameters section is used for the treatment.

Input range	**1 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1000 s**

7.8.3.3.10.7 On/Off

Dialog: **Method ▶ Time program ▶ [Edit] ▶ New ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the amperometric cell on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Cell

Selection	**On** | **Off**
Default value	**On**

On
Switches the cell of the amperometric detector on.

Off
Switches the cell of the amperometric detector off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.11 Commands - Analog Out

Subwindow: **Method ▶ Time program**

NOTE

The commands under **Analog Out** are only available if an **891 Professional Analog Out** is connected.

7.8.3.3.11.1 Change range

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change range**

The device-dependent time program command **Change range** (command without feedback) of the 891 Professional Analog Out redefines the measured value range per volt in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Range/Volt

Indicates the measured value amount to be output as 1 Volt (1000 mV). The value is transferred to the device.

Input range	**0.001 to 4000000**
Default value	**(empty)** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.11.2 Change polarity

Dialog window: **Method ► Time program ► Edit ► 'Device' - Analog Out - Change polarity**

The device-dependent time program command **Change polarity** (command without feedback) of the 891 Professional Analog Out redefines the sign of the output voltage in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Polarity

Indicates the new sign of the output voltage.

Selection	**+ | –**
Default value	**+**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.11.3 Reset baseline

Dialog window: **Method ► Time program ► Edit ► 'Device' - Analog Out - Reset baseline**

The device-dependent time program command **Reset baseline** (command without feedback) of the 891 Professional Analog Out redefines the baseline of the output voltage in the method run. If the default value **0 mV** is applied for the parameter **Voltage offset**, then the current value of the output voltage is defined as new baseline (0 mV). If you enter a dif-

ferent value for the **Voltage offset**, the baseline will be moved additionally by this value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Voltage offset

Optional offset in mV, which is *additionally* used after resetting the baseline to 0 mV.

Input range	**-1000 to +1000 mV**
Default value	**0 mV**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.8.3.3.11.4 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.8.4 940 Professional IC Vario - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.8.4.1 Manual control - High-pressure pump

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.8.4.2 Manual control - Low-pressure gradient pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

Mixing ratio

Eluent A

Current value

Current percentage of the proportion of eluent A in the mixing ratio

Input

Enter the new proportion of eluent A in the mixing ratio

Input range	**0 to 100 - (% Eluent B + % Eluent C)**
Default value	**100**

Eluent B

Current value

Current percentage of the proportion of eluent B in the mixing ratio

Input

Enter the new proportion of eluent B in the mixing ratio

Input range	**0 to 100 - (% Eluent A + % Eluent C) %**
Default value	**100**

Eluent C

Current value

Current percentage of the proportion of eluent C in the mixing ratio

Input

Enter the new proportion of eluent C in the mixing ratio

Input range	**0 to 100 - (% Eluent A + % Eluent B) %**
Default value	**100**

[]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.8.4.3 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.8.4.4 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.8.4.5 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.8.4.5.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.8.4.6 Manual control - MCS

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'MCS'**

[On]

Start MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is already running.

[Off]

Stop MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is not running.

7.8.4.7 Manual control - Degasser

Tab: **Manual ► Manual control - 'Device name' ► 'Degasser'**

[On]

Start degasser. This is inactive if the degasser is already running.

[Off]

Stop degasser. This is inactive if the degasser is not running.

7.8.4.8 Manual control - Thermostat

Tab: **Manual ► Manual control - 'Device name' ► 'Thermostat'**

Temperature

Current Value

Current temperature of the thermostat.

Input

Entering a new value for the temperature of the thermostat.

940

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

943

Input range	**0.0 to 150.0 °C**
Default value	**30.0 °C**

[On]

Switches the thermostat on. This is inactive if it is running.

[Off]

Switches the thermostat off. This is inactive if it is not running.

[Apply]

Sending the parameters set to the thermostat.

7.8.4.9 Manual control - Amperometric detector

7.8.4.9.1 General settings

Tab: **Manual ► 'Amp. detector'**

Mode

Generally speaking, the measuring mode and its settings can be changed only in the manual control of the workplace, not in the Global manual control.

Selection of the measuring mode of the amperometric detector which is set in the device when **[Apply]** is pressed. The following rules apply for the changeability of the mode when a determination is running:

- When a determination is running in the mode DC, PAD or flexIPAD, it is **not** possible to change to the mode CV.
- When a determination is running in the mode CV it is **not** possible to change to the modes DC, PAD or flexIPAD.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potentials.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric *(see chapter 7.3.4.1.2, page 752)*. Not available in the manual control of the CV mode.

[Apply]

The parameterization of the selected measuring mode is sent to the device. The device and the measuring cell are switched on. Not available in the manual control of the CV mode.

Cell

[Cell On]

The measuring cell is switched on. If it had been switched off beforehand, then it will continue to run with the settings which were active prior to being switched off. Not available in the manual control of the CV mode.

[Cell Off]

The measuring cell is switched off. Not available in the manual control of the CV mode.

Temperature

Current Value

Display of the current temperature in the detector.

Input

Input of a new temperature which is to be set in the device when **[Apply]** is pressed.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

[Apply]

Sets the new temperature value in the device.

7.8.4.9.2 Dialog window «Settings»

In this dialog window, the selected measuring mode can be parameterized in the manual control of the workplace.

7.8.4.9.2.1 Settings DC mode

The parameterization of the DC mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.2, page 729)*.

7.8.4.9.2.2 Settings PAD mode

The parameterization of the PAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.3, page 730)*.

7.8.4.9.2.3 Settings flexIPAD mode

The parameterization of the flexIPAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.5, page 732)*.

7.8.4.9.2.4 Settings CV mode

The parameterization of the CV mode can **not** be changed in the manual control.

7.8.4.10 Manual control - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are only available when an **891 Professional Analog Out** is connected.

7.8.4.10.1 Channels Out1, Out2, Aux1, Aux2

Tab: **Manual ► Manual control - 'Device name' ► 'Channel'**

NOTE

In the Manual control of the Workplace the tabs of those channels of a connected **891 Professional Analog Out** are displayed which have been activated in the start parameters of the method.

[Resetting baseline]

Sets the current measured value as new baseline.

[Properties...]

Via this button the dialog window *Properties* opens, in which you can modify the properties of the channels.

7.8.4.10.2 Properties

Tab: **Manual ► Manual control - 'Device name' ► 'Channel' ► Properties**

Data source

Current value

Displays the name of the data source currently assigned.

Input

Displays the name of the newly assigned data source, which has been selected with the button **[...]**.

[...]

Opens the dialog for selecting a different data source and a channel *(see chapter 5.6.6.4, page 417)*.

Channel

Current value

Displays the name of the channel of the **data source** currently assigned.

Input

Displays the name of the channel of the new data source which has been selected with the button **[...]**. If a new channel has been selected, then its unit (e.g. µS/cm in case of conductivity) will be displayed on the right to the input fields of the parameters **Range/Volt** and **Measured value offset**.

Range/Volt

Current value

Displays the measured value amount currently defined in the device and which is converted to 1 volt output signal.

Input

Input of a new measured value amount to be converted to 1 volt output signal.

Input range	**0.001 to 4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Polarity

Current value

Displays the polarity of the output voltage currently set in the device.

Input

Selection of the new sign for the output voltage.

Selection	**+ | –**
Default value	**+**

Measured value offset

Current value

Displays the measured value offset currently set in the device, put out in the unit of the current channel.

Input

Optional input of a new measured value offset, put out in the units of the channel selected in the parameter Channel (Input).

Input range	**-4000000 to +4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Voltage offset

Current value

Displays the voltage offset currently set in the device in [mV].

Input

Optional input of a new voltage offset in [mV].

Input range	**-1'000 to +1'000 mV** (Increment: **1**)
Default value	**0 mV**

[OK]

The values in the column **Input** are applied for the device and the dialog is closed.

[Cancel]

The values in the column **Input** are rejected and the dialog is closed.

[OK]

The values in the column **Input** are applied for the device. The dialog remains open.

7.9 930 Compact IC Flex

7.9.1 930 Compact IC Flex - Overview

The 930 Compact IC Flex is available in numerous versions that differ in the combination of integrated modules. The basic unit of the device can be supplied either with or without a column oven with column holder.

On the basis of the 930 Compact IC Flex basic unit, the versions are individually combined in accordance with the intended field of application.

The device is described in the online help with all possible modules.

The following versions are available:

- **930.1100 Compact IC Flex**
- **930.1160 Compact IC Flex Deg**
- **930.1200 Compact IC Flex ChS**
- **930.1260 Compact IC Flex ChS/Deg**
- **930.1300 Compact IC Flex ChS/PP**
- **930.1360 Compact IC Flex ChS/PP/Deg**
- **930.1400 Compact IC Flex SeS**
- **930.1460 Compact IC Flex SeS/Deg**
- **930.1500 Compact IC Flex SeS/PP**
- **930.1560 Compact IC Flex SeS/PP/Deg**
- **930.2100 Compact IC Flex Oven**
- **930.2160 Compact IC Flex Oven/Deg**
- **930.2200 Compact IC Flex Oven/ChS**
- **930.2260 Compact IC Flex Oven/ChS/Deg**
- **930.2300 Compact IC Flex Oven/ChS/PP**
- **930.2360 Compact IC Flex Oven/ChS/PP/Deg**
- **930.2400 Compact IC Flex Oven/SeS**

- **930.2460 Compact IC Flex Oven/SeS/Deg**
- **930.2500 Compact IC Flex Oven/SeS/PP**
- **930.2560 Compact IC Flex Oven/SeS/PP/Deg**
- **930.2180 Compact IC Flex Oven/Deg/MB**
- **930.2580 Compact IC Flex Oven/SeS/PP/Deg/MB**

Deg = eluent and sample degasser

ChS = chemical suppression

PP = peristaltic pump

SeS = sequential suppression

Oven = column oven

MB = Microbore, system optimized for 2 mm columns

7.9.2 930 Compact IC Flex - Configuration

If a device of the type **930 Compact IC Flex** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item. The properties for the various modules, the connections of the modules to the main device and the GLP data can all be defined on these tabs.

7.9.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected | not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.9.2.2 Properties - High-pressure pump

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.9.2.3 Properties - Conductivity detector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Instrument type' - 'Device name' ▶ LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.9.2.4 Properties - Amperometric detector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Amp. detector**

NOTE

The amperometric detector can only be used with the following instruments: 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus, 896 Professional Detector, 930 Compact IC Flex, 940 Professional IC Vario, 945 Professional Detector Vario.

Detector type

Shows the detector type, is read out automatically from the detector.

Connection

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

7.9.2.5 Properties - MCS

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► MCS**

The MCS (Metrohm CO_2 Suppressor) has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - MCS** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.9.2.6 Properties - Degasser

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Degasser**

The degasser has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - Degasser** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.9.2.7 Properties - Analog Out

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Analog Out**

NOTE

This tab is only available when an **891 Professional Analog Out** is connected.

Device type

Display of the device type.

Device serial number

Display of the serial number of the connected 891 Professional Analog Out.

7.9.2.8 Properties - Connections

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.9.2.9 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.9.2.10 Load new program version

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ General ▶ [Update] ▶ Load new program version**

If it is discovered that the device to be connected has an old program version not supported by **MagIC Net**, then it must be updated. Select the device from the device table. Open the properties window with **[Edit] ▶ Properties...**. On the **General** tab, click on **[Update]** to open the **Load new program version** dialog window.

Old version

Shows the old device program version.

New version

Shows the new device program version to be loaded.

[Load]

Loads the new device program version.

NOTE

Make sure that the device is not manipulated or switched off during the loading process, and follow the instructions shown.

7.9.2.11 Monitoring

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module'**

The dialog window comprises the tabs **Date** and **Operating hours**, on which you can define the parameters for module monitoring.

7.9.2.11.1 Monitoring - Date

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring- 'Module' ▶ Date**

Monitor date

Current value

Shows the current date.

Last service

Date of the last service. This date can be selected by clicking on ... in the **Select date** dialog window and is used for monitoring (**last service + service interval = next service**).

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor date

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the date.

NOTE

Monitoring cannot be enabled until after a date has been entered in the **Last service** field.

Service interval

Interval in days after which the service for the module should be repeated. If a value is entered here, then the date in the **Next Service** field will be adjusted automatically.

Next Service

Date on which the next service is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window. After the date has been entered, the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate which action is to be triggered automatically during start check if the time interval for the service has expired.

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.9.2.11.2 Monitoring - Operating hours

Tab: **Configuration ► Devices ► [Edit] ► Properties… ► 'Module' ► [Monitoring] ► Monitoring - 'Module' ► Operating hours**

Operating hours

Current value

Shows the operating hours to date.

[Reset]

NOTE

This function is only available in the monitoring of the 887 Professional UV/VIS Detector.

Use this function after having replaced the corresponding lamp of the 887 Professional UV/VIS Detector. This resets the values of the parameters **Current value** and **Last service**.

Last service

Operating hours at last service. This value is used for monitoring (**last service + service interval = next service**).

Input range	**0 to 99,999 Hours**

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor operating hours

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the operating hours.

NOTE

Monitoring cannot be enabled until after a value has been entered in the **Last service** field.

Service interval

Interval in hours after which the service for the module should be repeated. If a value is entered here, then the value in the **Next Service** field will be adjusted automatically.

Next Service

Operating hours after which the next service is to be carried out. If a value is entered here, then the value in the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate what action is to be triggered automatically during start check if the time interval for the service has expired:

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.9.3 930 Compact IC Flex - Method

Program part: **Method**

Start parameters, data channels and program commands can be defined for the **930 Compact IC Flex** in the **Method** program part.

7.9.3.1 930 Compact IC Flex - Start parameters

Subwindow: **Method ► Devices**

If you click on the icon for the 930 Compact IC Flex in the top part of the window, then the tabs of the modules contained in the device appear in the lower part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.9.3.1.1 Start parameters - High pressure pump

Tab: **Method ► Devices ► Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.2 Start parameter - Injection valve

Tab: **Method ► Devices ► Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.3 Start parameters - Peristaltic pump

Tab: **Method** ▶ **Devices** ▶ **Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.4 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.9.3.1.4.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.9.3.1.4.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.9.3.1.4.3 Dosino Regeneration

Dialog window: **Method ▶ Devices - 'Name' ▶ MSM ▶ [Edit] ▶ Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.9.3.1.4.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		

Step	Action	Description
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.9.3.1.5 Start parameters - MCS

Tab: **Method** ▶ **Devices** ▶ **MCS**

Status

Selection	**On** | **Off**
Default value	**On**

On
The MCS (Metrohm CO2 Suppressor) is switched on when the hardware is started with **[Start HW]**.

Off
The MCS (Metrohm CO_2 Suppressor) is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.6 Start parameters - Degasser

Tab: **Method** ▶ **Devices** ▶ **Degasser**

Status

Selection	**On** | **Off**

On
The degasser is switched on when the hardware is started with **[Start HW]**.

Off
The degasser is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.7 Start parameters - Oven

Tab: **Method ▶ Devices ▶ 'Oven'**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The oven is switched on when the hardware is started with **[Start HW]**.

Off
The oven is switched off when the hardware is started with **[Start HW]**.

Temperature

Temperature that is set for the oven when the hardware is started with **[Start HW]**.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.8 Start parameters - Conductivity detector

Tab: **Method ▶ Devices ▶ Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.9 Start parameters - Amperometric detector

7.9.3.1.9.1 Amperometric detector

Tab: **Method ▶ Devices ▶ Amp. detector**

Mode

Selection of the measuring mode of the amperometric detector.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potential steps.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector.

Temperature

Temperature that is set in the detector when the hardware is started with **[Start HW]**.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Cell

Selection of a cell which is defined in the configuration table of the amperometric cells *(see chapter 6.13.2, page 674)*. If no cell has been selected yet, then **not defined** is displayed. Otherwise, the selected cell will be displayed with its user-defined name.

Selection	**not defined** | **Selection of amperometric cells**
Default value	**not defined**

not defined
You can also start the method when this option is selected. The cell connected to the detector is then used. In the report, the amperometric cell is then called "**not defined**", but the properties of the cell that is *actually* used will be output. **Important note:** If an intelligent cell for which the operating hours monitoring has been activated is connected to the amperometric detector, then the operating hours will be counted.

Start delay

on | off (Default value: **off**)

If this option is **enabled**, the amperometric cell is only switched on once this waiting time has elapsed.

Waiting time

Waiting time until the amperometric cell is switched on.

Input range	**0 to 99 min**
Default value	**15 min**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.9.2 DC mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ DC ▶ Settings**

In this dialog, you can set the properties of the **DC** measuring mode.

The properties are also available in the manual control *(see chapter 7.3.4.1, page 750)*.

DC potential

Potential of the working electrode in comparison to the reference electrode.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

Range

Selection of the measuring range.

Selection	**auto** | **2 nA** | **20 nA** | **200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**

auto
Automatic setting of the measuring range. This selection is not allowed with damping activated.

Damping

on | off (Default value: **off**)

Activates or deactivates the additional damping.

7.9.3.1.9.3 PAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, you can set the properties of the **PAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the PAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Potential [V]

Potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define PAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define PAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Duration

Duration of the measurement.

Input range	**1 to 2000 ms** (Increment: **1**)
Default value	**100 ms**

Range

Selection of the measuring range.

Selection	**200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**
Default value	**2 µA**

The defined potential progression is displayed in the form of a graph.

7.9.3.1.9.4 Define PAD step

Tab: **Method** ▶ **Devices** ▶ **Amp. detector** ▶ **PAD** ▶ **Settings**

In this dialog, a new PAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**300 ms**

Potential

Potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.05 V**

7.9.3.1.9.5 flexIPAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ flexIPAD ▶ Settings**

In this dialog, you can set the properties of the **flexIPAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the flexIPAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Start potential [V]

Start potential of the step in volts.

End potential [V]

End potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define flexIPAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define flexIPAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The affected lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Start

Start time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**50 ms**

End

Ending time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**150 ms**

Range

Selection of the measuring range.

Selection	**20 µA** | **200 µA** | **2 mA**
Default value	**200 µA**

NOTE

The selection of the measuring channel (**Current** or **Charge**) takes place in the hardware assignment of the analysis *(see chapter 7.3.3.2.1, page 736)*.

The defined potential progression is displayed in the form of a graph.

7.9.3.1.9.6 Define flexIPAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ Settings ▶ flexIPAD mode settings**

In this dialog, a new flexIPAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**100 ms**

Start potential

Start potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

End potential

End potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

7.9.3.1.9.7 CV mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ CV ▶ Settings**

In this dialog, you can set the properties of the **CV** measuring mode.

Number of cycles for cyclic voltammograms

Preparing cycles

Number of cyclic voltammograms which are to be measured in the time program after **Start data acquisition** and then discarded. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Measuring cycles

Number of cyclic voltammograms which are to be measured and saved in the time program after **Start data acquisition**. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1,000 s**

7.9.3.1.10 Start parameters - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are present only if an **891 Professional Analog Out** is connected.

7.9.3.1.10.1 Data source, Polarity, Range/Volt

Tab: **Method ▶ Devices ▶ Analog Out**

Channels Out1, Out2, Aux1, Aux2

The 891 Professional Analog Out includes 4 output channels for analog voltage in the range of -1...+1 volt:

- 2 main channels **Out1**, **Out2** with high resolution, for the digital/ analog converting of chromatograms or cyclovoltammograms.
- 2 auxiliary channels **Aux1**, **Aux2** with low resolution for the digital/ analog converting of measured values such as pressure, flow, temperature, ratio eluent.

The technical specifications can be found in the device manual of the 891 Professional Analog Out.

Each channel has the following set of start parameters. These are on one tab each in the start parameters of the main device. The parameter values are sent to the 891 Professional Analog Out when starting the method.

Data source

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data source** is displayed here.

Channel

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data channel** is displayed here.

Polarity

Indicates the sign of the output voltage of the channel.

Selection	**+** | **–**
Default value	**+**

Range/Volt

Indicates a measured value which is – after using a possible **Measured value offset** – to be converted to 1 volt output voltage *(see chapter 7.8.3.1.11.3, page 916)*.

Input range	**0.001 to 4000000**
Default value	**1.000** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

[Offset..]

This button opens the dialog for defining the measured value offset and the voltage offset *(see chapter 7.8.3.1.11.2, page 915)*.

Active

on | off (Default value: **off**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.9.3.1.10.2 Offset

Tab: **Method ► Devices ► Analog Out ► Offset**

Measured value offset

Indicates a positive or negative amount (in the units of the data channel selected) every measured value is to be corrected by *(see chapter 7.8.3.1.11.3, page 916)*.

Selection	**Current value** | **Value**
Default value	**Current value**

Current value
Select this option if the offset value *currently* set in the Analog Out is to be used. This value can be found in the manual control *(see chapter 7.8.4.10, page 956)*.

Value
Select this option, if you want to enter a new measured value offset in the **Value** field.

Value

Enter a new measured value offset.

Input range	**-4000000 to +4000000**
Default value	**0.0**
	Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful input field for the channel **Conductivity**: **±15000** µS/cm; for the channel **Current**: **±2000000** nA; for the channel **Charge**: **±4000000** nC.

Voltage offset

Value

Offset in mV, to be used on the output signal after the digital/analog conversion.

Input range	**-1000 to +1000 mV** (Increment: **1**)
Default value	**0 mV**

7.9.3.1.10.3 Using range/volt and offsets

With **Range/Volt**, you can indicate the measured value amount to be converted to 1000 mV output voltage.

If you want to correct every measured value by a certain amount, then define a corresponding **Measured value offset**. If you enter a *positive* measured value offset, it will be *added* to every measured value, if you enter a *negative* measured value offset, it will be *subtracted* from every measured value. This happens **before** the digital/analog conversion.

With **Voltage offset** you can indicate a value in mV to be used on the output signal **after** the digital/analog conversion.

The **polarity** will be applied to the resulting output signal.

Example for the channel "Conductivity" of the data source "Detector"

If the required measured values are e.g. between 15 and 35 µS/cm, you could define a measured value of **–15** (µS/cm). The measured values corrected by this offset then are between 0 and 20 µS/cm. The output voltage these offset-corrected values are converted to, depends on **Range/Volt**. Examples:

With a **Range/Volt** of 20 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

With a **Range/Volt** of 40 (µS/cm-V), 20 µS/cm are output as 0.5 V (500 mV).

With a **Range/Volt** of 10 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

You can correct the output signal by a **Voltage offset**. Example: You find out that the output voltage sometimes is slightly negative, whereas you would like to have positive output signals only. If the lowest output voltage is e.g. at –12 mV, you could consistently achieve only positive voltage values with the aid of a **Voltage offset** of 15 mV.

7.9.3.2 930 Compact IC Flex - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.9.3.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.9.3.2.2 Oven - Data channels

Tab: **Method ▶ Devices ▶ 'Hardware assignment'**

Property	Label of y axis	Unit	Evaluation
Temperature	Temperature	°C	No

7.9.3.2.3 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated

with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!
- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.

- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column Metrosep A Supp 5 - 100/4.0

Injection volume 20 µL

Duration of recording 12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.9.3.2.4 Amperometric detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Current	Current	nA	Yes
Charge	Charge	nC	Yes
Current vs. Potential	Current	nA	No

NOTE

The only channels available for the output of the measured values by means of the *891 Professional Analog Out (see Chap. 7.8.3.1.11.1, p. 914)* are **Current** and **Charge**. The output of the measured values of these channels is then **time-based**.

7.9.3.3 930 Compact IC Flex - Commands

Overview of the time program commands available for the 930 Compact IC Flex:

7.9.3.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.9.3.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.1.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.1.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.1.4 Editing gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient ▶ [Edit] ▶ New / Edit ▶ Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.9.3.3.1.5 Measure pressure

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.9.3.3.1.6 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.9.3.3.2 Commands - Injection valve

Subwindow: **Method ► Time program**

Overview of the time program commands available for the injection valve:

7.9.3.3.2.1 Fill

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.2.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.9.3.3.3 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.9.3.3.3.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.3.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.9.3.3.4 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.9.3.3.4.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.9.3.3.4.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.9.3.3.5 Commands - MCS

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MCS (Metrohm CO_2 Suppressor):

7.9.3.3.5.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the MCS (Metrohm CO_2 Suppressor) on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

MCS

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.6 Commands - Degasser

Subwindow: **Method ► Time program**

Overview of the time program commands available for the degasser:

7.9.3.3.6.1 On/Off

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the degasser on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Degasser

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.7 Commands - Oven

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the oven:

7.9.3.3.7.1 Measure temperature

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure temperature**

The device-dependent **Measure temperature** time program command (command with feedback) measures the temperature in the oven.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the type **'TP.command number.Variable name'** are generated by the command:

Variable name	Description	Data type
TEMP	Measured temperature [°C]	Number

7.9.3.3.8 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.9.3.3.8.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.9.3.3.8.2 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.9.3.3.8.3 Measure drift

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.9.3.3.9 Commands - Amperometric detector

Subwindow: **Method ► Time program**

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then the following commands may **not** be used. This is checked by the start test of the method.

Overview of the time program commands available for the amperometric detector:

7.9.3.3.9.1 Measure current

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure current**

The device-dependent **Measure current** time program command (command with feedback) measures the current.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_I	TP.'Command number.MEAS_I Measured current [nA].	Number

7.9.3.3.9.2 Measure charge

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure charge**

The device-dependent **Measure charge** time program command (command with feedback) measures the charge.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_Q	TP.'Command number.MEAS_Q Measured charge [nC].	Number

7.9.3.3.9.3 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are

available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.9.3.3.9.4 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.9.3.3.9.5 Modify mode

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Modify mode**

The device-dependent **Modify mode** time program command (command without feedback) permits a change of measuring mode: You can change the parameterization of the current measuring mode or select a different measuring mode and set its parameters.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

When the command is opened, the mode parameters which are set in the start parameters are displayed by default.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Mode

Selection of the measuring mode of the amperometric detector. The CV mode mode is not available here.

Selection	**DC** | **PAD** | **flexIPAD**

DC
Measurement with constant potential.

PAD
Measurement with several potential levels.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector. The same settings can be set as in the *start parameters, see Chap. 7.3.3.1.2, p. 728*.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.9.6 CV treatment

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - CV treatment**

The device-dependent CV treatment time program command (command without feedback) allows the performance of cyclovoltammetric treatments.

Settings

Opens the settings for the cyclovoltammetric treatment.

Comment

Optional comment on the time program command.

Entry	**64 characters.**

Settings

In this dialog, you can set the properties for the cyclovoltammetric treatments.

Number of cycles for cyclovoltammetric treatment

Cycles

Number of cyclovoltammetric treatments that are to be performed in the time program. The parameterization defined in the Sweep parameters section is used for the treatment.

Input range	**1 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1000 s**

7.9.3.3.9.7 On/Off

Dialog: **Method ▶ Time program ▶ [Edit] ▶ New ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the amperometric cell on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Cell

Selection	**On** | **Off**
Default value	**On**

On
Switches the cell of the amperometric detector on.

Off
Switches the cell of the amperometric detector off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.10 Commands - Analog Out

Subwindow: **Method ▶ Time program**

NOTE

The commands under **Analog Out** are only available if an **891 Professional Analog Out** is connected.

7.9.3.3.10.1 Change range

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change range**

The device-dependent time program command **Change range** (command without feedback) of the 891 Professional Analog Out redefines the measured value range per volt in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Range/Volt

Indicates the measured value amount to be output as 1 Volt (1000 mV). The value is transferred to the device.

Input range	**0.001 to 4000000**
Default value	**(empty)** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.10.2 Change polarity

Dialog window: **Method ► Time program ► Edit ► 'Device' - Analog Out - Change polarity**

The device-dependent time program command **Change polarity** (command without feedback) of the 891 Professional Analog Out redefines the sign of the output voltage in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Polarity

Indicates the new sign of the output voltage.

Selection	**+ | –**
Default value	**+**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.10.3 Reset baseline

Dialog window: **Method ► Time program ► Edit ► 'Device' - Analog Out - Reset baseline**

The device-dependent time program command **Reset baseline** (command without feedback) of the 891 Professional Analog Out redefines the baseline of the output voltage in the method run. If the default value **0 mV** is applied for the parameter **Voltage offset**, then the current value of the output voltage is defined as new baseline (0 mV). If you enter a dif-

ferent value for the **Voltage offset**, the baseline will be moved additionally by this value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Voltage offset

Optional offset in mV, which is *additionally* used after resetting the baseline to 0 mV.

Input range	**-1000 to +1000 mV**
Default value	**0 mV**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.9.3.3.10.4 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.9.4 930 Compact IC Flex - Manual control

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.9.4.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.9.4.2 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.9.4.3 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.9.4.4 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.9.4.4.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.9.4.5 Manual control - MCS

Tab: **Manual ► Manual control - 'Device name' ► 'MCS'**

[On]

Start MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is already running.

[Off]

Stop MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is not running.

7.9.4.6 Manual control - Degasser

Tab: **Manual ► Manual control - 'Device name' ► 'Degasser'**

[On]

Start degasser. This is inactive if the degasser is already running.

[Off]

Stop degasser. This is inactive if the degasser is not running.

7.9.4.7 Manual control - Oven

Tab: **Manual ► Manual control - 'Device name' ► 'Oven'**

Temperature

Current Value

Current temperature of the oven.

Input

Entry of a new value for the temperature of the oven.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

[On]

Switches the oven on. This is inactive if it is running.

[Off]

Switches the oven off. This is inactive if it is not running.

[Apply]

Sends the set parameters to the oven.

7.9.4.8 Manual control - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are only available when an **891 Professional Analog Out** is connected.

7.9.4.8.1 Channels Out1, Out2, Aux1, Aux2

Tab: **Manual ► Manual control - 'Device name' ► 'Channel'**

NOTE

In the Manual control of the Workplace the tabs of those channels of a connected **891 Professional Analog Out** are displayed which have been activated in the start parameters of the method.

[Resetting baseline]

Sets the current measured value as new baseline.

[Properties...]

Via this button the dialog window *Properties* opens, in which you can modify the properties of the channels.

7.9.4.8.2 Properties

Tab: **Manual ► Manual control - 'Device name' ► 'Channel' ► Properties**

Data source

Current value

Displays the name of the data source currently assigned.

Input

Displays the name of the newly assigned data source, which has been selected with the button **[...]**.

[...]

Opens the dialog for selecting a different data source and a channel *(see chapter 5.6.6.4, page 417)*.

Channel

Current value

Displays the name of the channel of the **data source** currently assigned.

Input

Displays the name of the channel of the new data source which has been selected with the button **[...]**. If a new channel has been selected, then its unit (e.g. µS/cm in case of conductivity) will be displayed on the right to the input fields of the parameters **Range/Volt** and **Measured value offset**.

Range/Volt

Current value

Displays the measured value amount currently defined in the device and which is converted to 1 volt output signal.

Input

Input of a new measured value amount to be converted to 1 volt output signal.

Input range	**0.001 to 4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Polarity

Current value

Displays the polarity of the output voltage currently set in the device.

Input

Selection of the new sign for the output voltage.

Selection	**+** | **–**
Default value	**+**

Measured value offset

Current value

Displays the measured value offset currently set in the device, put out in the unit of the current channel.

Input

Optional input of a new measured value offset, put out in the units of the channel selected in the parameter Channel (Input).

Input range	**-4000000 to +4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Voltage offset

Current value

Displays the voltage offset currently set in the device in [mV].

Input

Optional input of a new voltage offset in [mV].

Input range	**-1'000 to +1'000 mV** (Increment: **1**)
Default value	**0 mV**

[OK]

The values in the column **Input** are applied for the device and the dialog is closed.

[Cancel]

The values in the column **Input** are rejected and the dialog is closed.

[OK]

The values in the column **Input** are applied for the device. The dialog remains open.

7.10 920 Absorber Module

The 920.0010 Absorber Module absorbs the combustion gases in a aqueous medium and transfers the solution with the dissolved ions into the ion chromatography system.

7.10.1 920 Absorber Module - Overview

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

NOTE

The 920 absorber module is available in the 920.0010 absorber module version.

7.10.2 920 Absorber Module - Configuration

7.10.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.10.2.2 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.10.2.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.10.3 920 Absorber Module - Method

7.10.3.1 920 Absorber Module - Start parameters

7.10.3.1.1 Start parameter - Injection valve

Tab: **Method ► Devices ► Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.10.3.1.2 Start parameters - 10-port valve

7.10.3.1.2.1 Start parameters

Method: **Devices ► 10-port valve**

Here the parameter values are defined which are sent to the 10-port valve at the start of the method.

Valve position selection

Selecting the corresponding option determines whether the valve remains in its current position when the method starts or whether a particular port is moved to.

Selection	**Maintain current port** | **Port**
Default value	**Maintain current port**

Maintain current port
If this option is selected, then the valve remains in its current position at the start of the method.

Port
If this option is selected, then at the start of the method the port which is selected in the parameter **Port** will be set.

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

[Port configuration]

Opens the dialog window **Port configuration** in which a user-defined name can be assigned for each port and a solution can be allocated from the solution table *(see chapter 7.6.4.2.1.2.2.1, page 819)*.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.10.3.1.2.2 Port configuration

Method **Devices ► 10-port valve ► Port configuration**

The dialog **Port configuration** displays in tabular fashion the names and optionally assigned solutions of the individual ports, and permits the editing of these port properties.

7.10.3.1.2.2.1 Port table

The dialog **Port configuration** shows the table of the ports.

Name

Name of the port. The default name is **Port #**, where # stands for the number of the port. A user-defined port name must be unique in the context of the respective method.

Entry	**24 characters**

Solution

Optional allocation of a ("non-intelligent") solution from the solution table.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

[Edit]

Opens the dialog window **Edit port**, in which the name for the selected port can be defined and a solution from the solution table can be allocated *(see chapter 7.6.4.2.1.2.2.2, page 819)*.

7.10.3.1.2.2.2 Editing port

Method **Devices ▶ 10-port valve ▶ Port configuration ▶ Edit port**

A user-defined name can be assigned in the dialog **Port configuration** for each port and a solution can be allocated from the solution table .

Port

Display of the number of the selected port.

Name

Name of the port. The default name is **Port #**, where # stands for the number of the port. A user-defined port name must be unique in the context of the respective method.

Entry	**24 characters**

Solution

Optional allocation of a ("non-intelligent") solution from the solution table.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

[OK]

Save the port properties.

[Cancel]

Cancel the editing of the port properties.

7.10.3.2 920 Absorber Module - Commands

Overview of the time program commands available for the 920 Absorber Module:

7.10.3.2.1 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.10.3.2.1.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.10.3.2.1.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.10.3.2.1.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.10.3.2.2 Commands - 10-port valve

Method **Method ▶ Time program**

Overview of the time program commands available for the 10-port valve:

7.10.3.2.2.1 Change port

Method **Time program ▶ Edit ▶ 'Device' - 'Module' - Change port**

The device-dependent time program command **Change port** (command with feedback) switches the 10-port valve over to the desired port. The parameters described in the following can be used as aids for a precise definition of how the switching of the ports is to be carried out.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Changing port

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

Shift direction

List of the shift modes of the 10-port valve.

Selection	**ascending** | **descending** | **automatic** | **not over**
Default value	**automatic**

ascending
The valve moves towards the target port in ascending direction. Example: if the current position is *Port 9*, and the target port is to be *Port 2*, then the valve in this mode will select the path 9 – 10 – 1 – 2.

descending
The valve moves towards the target port in descending direction. Example: if the current position is *Port 1*, and the target port is to be *Port 7*, then the valve in this mode will select the path 1 – 10 – 9 – 8 – 7.

automatic
The valve determines the shortest path to the target port on its own.

not over
The valve moves towards the target port in such a way that the port specified in the parameter "Not over" will not be traversed.

Not over

Combobox for selecting the port which is not to be traversed when the port is changed; will have no effect here if the port selected is the same as the target port. Only active when the parameter's "Not over" option is selected for the shift direction. The user-defined name, if available, is used as the 'Port name', otherwise the default name.

Selection	**'Port name' of Port 1** | **'Port name' of Port 2** | **...** | **'Port name' of Port 10**
Default value	**'Port name' of Port 10**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.10.3.2.2.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.10.4 920 Absorber Module - Manual control

7.10.4.1 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.10.4.2 Manual control - 10-port valve

Tab: **Manual control - 'Device name' ► '10-port valve'**

Current port

Shows the current port.

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

Shift direction

List of the shift modes of the 10-port valve.

Selection	**ascending** | **descending** | **automatic** | **not over**
Default value	**automatic**

ascending
The valve moves towards the target port in ascending direction. Example: if the current position is *Port 9*, and the target port is to be *Port 2*, then the valve in this mode will select the path 9 – 10 – 1 – 2.

descending
The valve moves towards the target port in descending direction. Example: if the current position is *Port 1*, and the target port is to be *Port 7*, then the valve in this mode will select the path 1 – 10 – 9 – 8 – 7.

automatic
The valve determines the shortest path to the target port on its own.

not over
The valve moves towards the target port in such a way that the port specified in the parameter "Not over" will not be traversed.

Not over

Combobox for selecting the port which is not to be traversed when the port is changed; will have no effect here if the port selected is the same as the target port. Only active when the parameter's "Not over" option is selected for the shift direction. The user-defined name, if available, is used as the 'Port name', otherwise the default name.

Selection	**'Port name' of Port 1** | **'Port name' of Port 2** | **...** | **'Port name' of Port 10**
Default value	**'Port name' of Port 10**

[Apply]

Move to the target port in the specified manner.

7.11 919 IC Autosampler plus

7.11.1 919 IC Autosampler plus - Overview

NOTE

The **919 IC Autosampler plus** is available in 1 model version:

- **2.919.0020 919 IC Autosampler plus**
  Sample changer for ion chromatography with 1 removable rack for more than 50 samples with a vessel volume of up to 11 mL.

7.11.2 919 IC Autosampler plus - Configuration

Dialog: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name'**

If a type **919 IC Autosampler plus** device is selected in the device table, the menu item **[Edit] ► Properties...** can be used to open the dialog window **Properties - 'Device name' - 'Device type'** with the device-specific tabs.

The device can be initialized if necessary by means of the **[Initialize]** menu item in the device table *(see chapter 6.5.2.1, page 605)*.

7.11.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.11.2.2 Properties - Tower

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Tower**

NOTE

With the 858 Professional Sample Processor and the 919 IC Autosampler plus, the properties of the tower, including the Swing Head attached to it, are displayed on the **Tower** tab. In the case of the 814 USB Sample Processor and the 815 Robotic USB Sample Processor XL, the device versions with 1 tower have 1 tab **Tower 1**; device versions with 2 towers have 2 tabs **Tower 1** and **Tower 2**.

Tower parameters

Max. stroke path

Entry of the lowest permitted lift position. A lift height of **0 mm** corresponds to the "home position", i.e. the lift is moved all the way to the top.

Input range	**0 to 235 mm**
Default value	**235 mm**

Min. beaker radius

Definition of the minimum radius which the beakers used on the rack must have. If the lift is moved to the work position, the beaker radiuses defined in the **Rack table***(see chapter 6.11.2.1, page 659)* for general **Sample positions** *(see chapter 6.11.3.2, page 662)* and **Special beakers** *(see chapter 6.11.3.4, page 664)* will be compared with the **Min. beaker radius**. If this minimum beaker radius is not achieved, the run is stopped and an error message is output. No check will be made if **off** is enabled.

Selection	**1.0 - 100.0 mm** | **off**
Default value	**off**

Lift rate

Lift rate for the manual control of the tower.

Input range	**3 to 25 mm/s**
Default value	**25 mm/s**

Axial distance

Distance between the axis of rotation of the sample rack and the swing axis of the robotic arm.

Input range	**100.0 to 300.0 mm**

814 USB Sample Processor

Selection	**166.0 mm**
Default value	**166.0 mm**

815 Robotic USB Sample Processor XL

Selection	**196.0 mm**
Default value	**196.0 mm**

858 Professional Sample Processor

Selection	**166.0 mm**
Default value	**166.0 mm**

919 IC Autosampler plus

Selection	**196.0 mm**
Default value	**196.0 mm**

Swing Head

This parameter is only shown only if a Swing Head is mounted on the tower.

Serial number

Shows the serial number of the Swing Head.

Swing position

Lift position that is valid for all four external positions and at which the robotic arm turns to the external positions.

Input range	**0 to 235 mm**
Default value	**0 mm**

Rinse position

Rinse position valid for all 4 external positions.

Input range	**0 to 235 mm**
Default value	**0 mm**

[Configuration]

Opens the **Robotic arm configuration** dialog window *(see chapter 7.21.2.7, page 1427)*, in which the properties of the robotic arm can be edited.

Table for external positions

The properties for the four possible external positions for the robotic arm mounted on the Swing Head are shown in the table. The table cannot be edited directly.

External position

Number of the external position.

Angle [°]

Swing angle for external position.

Work position [mm]

Work position for external position.

[Edit]

Opens the **External position #** dialog window *(see chapter 7.21.2.8, page 1428)*, in which the parameters for the external position selected from the table can be edited.

7.11.2.3 Properties - Rack

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Rack**

The **Rack** tab shows the specific data of the attached rack.

Rack name

Shows the name of the rack attached. If no rack is attached, then "**-----**" is shown.

Rack code

Shows the rack code of the attached rack. The rack code corresponds to the arrangement of magnets on the base of the rack and is read out by the sample changer in order to recognize the rack. If no rack is in position, then the display will be empty.

Number of positions

Shows the number of positions on the rack. If no rack is in position, then the display will be empty.

Shift rate

Sample rack shift rate for manual control.

Input range	**3 to 20 °/s**
Default value	**20 °/s**

[Rack data]

Opens the **Rack data** dialog window *(see chapter 6.11.3.1, page 661)*, in which the data of the attached rack can be viewed and edited.

[Initialize rack]

Initializes the attached rack. This means that the rack, the lift and the robotic arm are reset, the rack code is read out and the respective rack data is transferred to the sample changer.

7.11.2.4 Properties - Starting position

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Starting position**

On the **Starting position** tab, a position can be defined which is automatically approached when the sample changer is initialized.

Move to starting position

on | off (Default value: **off**)

If this option is enabled, the position defined here is moved to when initializing the device. To do this, the lift either moves to the Shift position or remains in its current position if that is higher than the Shift position *(see page 663)*.

Tower

Selection of the tower on the sample changer for moving to the desired position.

Only editable for **Move to starting position** = **on** and if the corresponding sample changer has two towers, otherwise inactive.

Selection	**1** | **2**
Default value	**1**

Move

Selection of the target position which is to be approached:

Editable only for **Move to starting position** = **on**, otherwise inactive.

Selection	**Rack position** | **Special beaker** | **External position**
Default value	**Rack position**

Rack position
Predefined position on the rack. The lift is lowered at this time to the work position defined for that position.

Special beaker
Special position on the rack defined in the rack properties. The lift is lowered at this time to the work position defined for that position.

External position
External position which is defined for the Swing Head mounted to the tower. The lift is lowered to the work position defined for that position. This option is only available if a Swing Head is mounted to the tower.

Number

Specification of the number of the rack position, special beaker or external position.

Editable only for **Move to starting position** = **on**, otherwise inactive.

for Rotate = Rack position

Input range	**1 to 999**
Default value	**1**

for Move = Special beaker

Input range	**1 to 16**
Default value	**1**

for Move = External position

Input range	**1 to 4**
Default value	**1**

7.11.2.5 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario

- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.11.2.6 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.11.3 919 IC Autosampler plus - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the **919 IC Autosampler plus**.

7.11.3.1 919 IC Autosampler plus - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **919 IC Autosampler plus** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.11.3.1.1 Start parameters - Rack

Tab: **Method ▶ Devices ▶ Rack**

Rack name

Name of the rack which must be initialized on the sample changer when the hardware is started **[Start HW]**. If no rack is initialized, the method is not carried out.

Selection	**not defined** | **Rack names from the rack table**
Default value	**not defined**

not defined
The method is always carried out.

Rack names from the rack table
If a rack is selected, the method is only carried out if it is initialized in the sample changer. There is no automatic check to ensure that the rack is in position and that it is the correct rack. In order to check this during the run, the command **Initialize** must be inserted in the time program for the module **Rack**.

7.11.3.1.2 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.11.3.1.3 Start parameters - Peripherals Tower

Tab: **Method ► Devices ► Peripherals Tower**

Pump 1

Status

Selection	**on** | **off**
Default value	**off**

on
Pump 1 is switched on when the hardware is started with **[Start HW]**.

off
Pump 1 is switched off when the hardware is started with **[Start HW]**.

Solution

Selection list for the solution to be transported by Pump 1 when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Pump 2

Status

Selection	**on** | **off**
Default value	**off**

on
Pump 2 is switched on when the hardware is started with **[Start HW]**.

off
Pump 2 is switched off when the hardware is started with **[Start HW]**.

Solution

Selection list for the solution to be transported by Pump 2 when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Tower stirrer

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The settings have no effect.

Status

Selection	**on** | **off**
Default value	**off**

on
The tower stirrer is switched on when the hardware is started with **[Start HW]**.

off
The tower stirrer is switched off when the hardware is started with **[Start HW]**.

Rate

Enter the stirring rate

Input range	**-15 to 15**
Default value	**8**

7.11.3.2 919 IC Autosampler plus - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 919 IC Autosampler plus:

7.11.3.2.1 Commands - Tower

Subwindow: **Method ▶ Time program**

Overview of the time program commands assigned to the tower of the sample changer:

7.11.3.2.1.1 Rotate (Rack)

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Rotate (rack)**

The device-dependent **Rotate (rack)** time program command (command with feedback) rotates the rack until the desired position in relation to the tower is reached.

Purpose

Rotate

Selection of the target position on the rack.

Selection	**Sample position** | **Rack position** | **Special beaker** | **Relative angle**

Sample position
Position defined for the current determination in the Run window as the parameter **Position**.

Rack position
Predefined position on the rack.

Special beaker
Special position on the rack defined in the rack properties.

Relative angle
Rotate the rack relative to the current position by the specified rotation angle. This function can be used, for example, to remove vial caps automatically.

Number

Specification of the number of the rack position. This parameter is visible only for **Rotate** = **Rack position** or **Rotate** = **Special beaker**. The number can also be defined with the aid of the formula editor (Σ).

Input range	**1 to 999**
Default value	**1**

Rotation angle

Specification of the relative rotation angle. This parameter is displayed only for **Rotate** = **Relative angle**.

Input range	**–359.90 to 359.90 °**
Default value	**5.00 °**

Beaker test

on | off (Default value: **off**)

If this option is enabled, a beaker test is carried out. In this case, the action to be carried out can be selected if the beaker sensor defined for the rack does not detect a beaker at the target position. If the robotic arm is selected as beaker sensor, then a Swing Head must be installed and a work position also defined in the rack data must be defined in such a way that contact exists between the beaker sensor and the beaker. This work position will be automatically moved to for beaker recognition after the command **Move**.

Selection	**Display message** | **Cancel determination** | **Cancel determination and series**

Display message
A message is displayed and the determination is canceled.

Cancel determination
The determination is canceled and the next determination of the series is started.

Cancel determination and series
Both the determination and the series will be canceled.

Parameters

Rotation speed

Selection of the rate at which the rack rotates.

Input range	**3 to 20 °/s**
Default value	**20 °/s**

Rotation direction

Selection of the shift direction.

Selection	**auto** | **+** | **–**
Default value	**auto**

auto
The rotation direction with the smaller rotation angle is selected automatically.

+
It is rotated in the direction of **ascending** rack positions. Whether this requires clockwise or counterclockwise rotation depends on the rack.

–
It is rotated in the direction of **descending** rack positions. Whether this requires clockwise or counterclockwise rotation depends on the rack.

Swing rate speed

Selects the rate of the robotic arm when moving to a rack position or a special beaker (only with multiple row racks).

Input range	**10 to 55 °/s**
Default value	**55 °/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.11.3.2.1.2 Lift

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Lift**

With the device-dependent time program command **Lift** (command with feedback), the lift on the tower of the sample changer moves to the desired position.

Purpose

Lift position

Entering the desired lift position in mm or selection of one of the lift positions predefined for the rack. A lift height of **0 mm** corresponds to the home position. Here the lift is moved to the uppermost stop.

Input range	**0.0 to 235.0 mm**
Selection	**Work position** | **Shift position** | **Rinse position** | **Special position** | **Home position**
Default value	**Work position**

NOTE

Please take care that no lift positions exceed the maximum stroke path specified in the tower properties of the device.

Parameters

Lift rate

Selection of the speed for moving the lift.

Input range	**3 to 25 mm/s**
Default value	**25 mm/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.11.3.2.1.3 Swing

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Swing**

The device-dependent **Swing** time program command (command with feedback) is used to swing the robotic arm until the desired position is reached.

Purpose

Swing

Selection of the target position for the robotic arm.

Selection	**External position** | **Maximum angle** | **Relative angle**

External position
Swing to one of the 4 external positions defined per tower, which are defined in the tower properties of the Sample Processor.

Maximum angle
Swing the robotic arm to the maximum permissible angle value in the robotic arm properties.

Relative angle
Swing by the specified swing angle relative to the current position. This function can be used, for example, to automatically remove vial caps.

Number

Indicates the number of the external position which is to be swung to. This parameter is displayed only for **Swing** = **External position**. The number can also be defined with the aid of the formula editor (Σ).

Input range	**1 to 4 (depending on target position)**
Default value	**1**

Swing angle

Angle by which the robotic arm is to be swung relative to the current position. This parameter is visible only for **Swing** = **Relative angle**.

Input range	**–180 to 180 °**
Default value	**10 °**

Parameters

Swing rate speed

Rate of the robotic arm when swinging to an external position or a particular angle.

Input range	**10 to 55 °/s**
Default value	**55 °/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.11.3.2.2 Commands - Rack

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the rack:

7.11.3.2.2.1 Initialize

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Initialize**

The device-independent time program command **Initialize** (command with feedback) initializes the rack positioned on the sample changer.

Rack test

on | off (Default value: **on**)

If this option is enabled, the rack attached will be checked.

Test rack

Select the rack to be positioned on the sample changer. The rack attached will be checked to ensure it is the one specified.

Selection	**Racks from the rack table**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.11.3.2.3 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.11.3.2.3.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.11.3.2.3.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.11.3.2.4 Commands - Peripherals Tower

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peripheral devices assigned to the tower:

7.11.3.2.4.1 Pump # On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Pump # On/Off**

The device-dependent time program command **Pump # On/Off** (command without feedback) switches the respective pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.11.3.2.4.2 Tower stirrer On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Tower stirrer On/Off**

The device-dependent time program command **Tower stirrer On/Off** (command without feedback) switches the tower stirrer on/off and sets the value for the stirring rate.

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The command is ignored in the run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Stirrer

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Rate

Rate of the stirrer.

Input range	**-15 to 15 (without 0)**
Default value	**3**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.11.3.2.5 Commands - General

Subwindow: **Method ▶ Time program**

Overview of the general time program commands available for the 858 Professional Sample Processor:

7.11.3.2.5.1 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.11.3.2.5.2 Reserve

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - General ▶ Reserve**

The device-dependent time program command **Reserve** (command without feedback) reserves the sample changer including all connected MSB devices (Dosino, stirrer, Remote Box, etc.), after it has been released, during an ongoing determination for a given workplace again.

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.11.4 919 IC Autosampler plus - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.11.4.1 Manual control - Tower

Tab: **Manual ▶ Manual control - 'Device name' ▶ Tower**

Rack position

Current value

Shows the current rack position.

Input

Enter or select the rack position to be moved to.

Input range	**1 to n (depending on rack)**
Default value	**1**
Selection	**Special beaker 1 ... 16**

[Start]

Start moving to the specified position. After the start, the button changes to **[Stop]** and the two arrow keys become inactive (gray).

[Stop]

Stop moving to current rack immediately.

Move to current rack position -1.

Move to current rack position +1.

Lift position

Current value

Current lift position.

Input

Enter or select the lift position that is to be moved to for the current rack position (normal beaker, special beaker, external position).

Input range	**0 to Max. stroke path mm**
Default value	**0 mm**
Selection	**Work position** | **Shift position** | **Rinse position** | **Special position** | **Home position**

[Start]

Move lift to the desired position.

[Stop]

Stop moving to lift position immediately.

The lift continues moving up as long as this button is pressed.

The lift continues moving down as long as this button is pressed.

Robotic arm position

Current value

Current position (angle) of the robotic arm on the tower.

Input

Enter or select the robotic arm position to be moved to.

Input range	**0.0 to 330.0 °**
Default value	**0.0 °**
Selection	**External 1** | **External 2** | **External 3** | **External 4**

[Start]

Move robotic arm to the desired position.

[Stop]

Immediately stop the action which was triggered with **[Start]**.

The robotic arm continues moving to the left as long as this button is pressed.

The robotic arm continues moving to the right long as this button is pressed.

[Configure rack]

Open dialog window **Rack configure 'Rack name'** *(see chapter 7.11.4.5, page 1067)*.

7.11.4.2 Manual control - Rack

Tab: **Manual ► Manual control - 'Device name' ► Rack**

[Initialize rack]

Initialize rack that is in position.

7.11.4.3 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.11.4.4 Manual control - Peripheral devices

Tab: **Manual control ► Manual control - All Devices - 'Device name' ► Peripherals Tower**

Tower stirrer - Rate

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The settings have no effect.

Current value

Current rate of the tower stirrer.

Input

Enter the rate of the tower stirrer.

Input range	**-15 to 15 (without 0)**
Default value	**Current value**

[Apply]

Send the set parameters to the stirrer.

[On]

Start the stirrer with the set parameters. This is inactive if the stirrer is running.

[Off]

Stop the stirrer. This is inactive if the stirrer is not running.

Pump 1

[On]

Start pump 1 with the set parameters. This is inactive if the pump is running.

[Off]

Stop pump 1. This is inactive if the pump is not running.

Pump 2

[On]

Start pump 2 with the set parameters. This is inactive if the pump is running.

[Off]

Stop pump 2. This is inactive if the pump is not running.

7.11.4.5 Configuring the rack

Dialog window: **Manual control ► Manual control - All instruments - 'Instrument name' ► Rack ► [Configure rack] ► Configure 'rack name' rack**

Rack position

Current position

Shows the current rack position.

Special beaker

Selection of the special beaker to which the current rack position is to be assigned.

Input range	**1 to 16**

[Assign]

Assigns the current rack position to the selected special beaker.

NOTE

If an external position is selected as current position, it cannot be assigned to a special beaker.

Lift position

Current position

Shows the current lift position in mm.

Work position for

If this option is selected, the current lift position is assigned to the work position of the tower, of a special beaker or of an external position of the robotic arm.

Selection	**Tower** | **Special beaker 1 - 16** | **External 1 - 4**
Default value	**Tower**

Rinse position for

If this option is selected, the current lift position is assigned to the rinse position of the tower or of the external position of the robotic arm.

Selection	**Tower** | **External positions**
Default value	**Tower**

Shift position for

If this option is selected, the current lift position is assigned to the shift position of the tower.

Selection	**Tower**

Special position for

If this option is selected, the current lift position is assigned to the special position of the tower.

Selection	**Tower**

Robotic arm position

If this option is selected, the current lift position is assigned to the swing position of the robotic arm.

Selection	**External positions**

[Assign]

Assigns current lift position to selected position

Robotic arm position

Current position

Shows the current position of the robotic arm in °.

External position

Selection of the external position to which the current robotic arm position is to be assigned.

Selection	**External 1** | **External 2** | **External 3** | **External 4**

[Assign]

Assigns the current robotic arm position to the selected external position.

7.12 896 Professional Detector

7.12.1 896 Professional Detector - Overview

The device **896 Professional Detector** is available in 3 model versions.

- **2.896.0010 Professional Detector - Conductometry**
- **2.896.0020 Professional Detector - Amperometry**
- **2.896.0030 Professional Detector - Conductometry & Amperometry**

7.12.2 896 Professional Detector - Configuration

If a device of the type **896 Professional Detector** is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ▶ Properties...** menu item.

Which detector or which detectors are contained in the 896 Professional Detector depends on the detector version.

7.12.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected | not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.12.2.2 Properties - Conductivity detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name' ► LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.12.2.3 Properties - Amperometric detector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Amp. detector**

NOTE

The amperometric detector can only be used with the following instruments: 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus, 896 Professional Detector, 930 Compact IC Flex, 940 Professional IC Vario, 945 Professional Detector Vario.

Detector type

Shows the detector type, is read out automatically from the detector.

Connection

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

7.12.2.4 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.12.2.5 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.12.3 896 Professional Detector - Method

Program part: **Method**

Start parameters and program commands can be defined for the **896 Professional Detector** in the **Method** program part.

Which detector or which detectors are contained in the 896 Professional Detector depends on the detector version.

7.12.3.1 896 Professional Detector - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **896 Professional Detector** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.12.3.1.1 Start parameters - Conductivity detector

Tab: **Method ▶ Devices ▶ Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.12.3.1.2 Start parameters - Amperometric detector

7.12.3.1.2.1 Amperometric detector

Tab: **Method ► Devices ► Amp. detector**

Mode

Selection of the measuring mode of the amperometric detector.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potential steps.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector.

Temperature

Temperature that is set in the detector when the hardware is started with **[Start HW]**.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to

achieve the temperature and to maintain it, but the determination will begin in any case.

Cell

Selection of a cell which is defined in the configuration table of the amperometric cells *(see chapter 6.13.2, page 674)*. If no cell has been selected yet, then **not defined** is displayed. Otherwise, the selected cell will be displayed with its user-defined name.

Selection	**not defined** | **Selection of amperometric cells**
Default value	**not defined**

not defined
You can also start the method when this option is selected. The cell connected to the detector is then used. In the report, the amperometric cell is then called "**not defined**", but the properties of the cell that is *actually* used will be output. **Important note:** If an intelligent cell for which the operating hours monitoring has been activated is connected to the amperometric detector, then the operating hours will be counted.

Start delay

on | off (Default value: **off**)

If this option is **enabled**, the amperometric cell is only switched on once this waiting time has elapsed.

Waiting time

Waiting time until the amperometric cell is switched on.

Input range	**0 to 99 min**
Default value	**15 min**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.12.3.1.2.2 DC mode settings

Tab: **Method ► Devices ► Amp. detector ► DC ► Settings**

In this dialog, you can set the properties of the **DC** measuring mode.

The properties are also available in the manual control *(see chapter 7.3.4.1, page 750)*.

DC potential

Potential of the working electrode in comparison to the reference electrode.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

Range

Selection of the measuring range.

Selection	**auto** | **2 nA** | **20 nA** | **200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**

auto
Automatic setting of the measuring range. This selection is not allowed with damping activated.

Damping

on | off (Default value: **off**)

Activates or deactivates the additional damping.

7.12.3.1.2.3 PAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, you can set the properties of the **PAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the PAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Potential [V]

Potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define PAD step* (is also triggered by a double-click on an empty line).

Edit	Edit the selected line in a separate dialog *Define PAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Duration

Duration of the measurement.

Input range	**1 to 2000 ms** (Increment: **1**)
Default value	**100 ms**

Range

Selection of the measuring range.

Selection	**200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**
Default value	**2 µA**

The defined potential progression is displayed in the form of a graph.

7.12.3.1.2.4 Define PAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, a new PAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**300 ms**

Potential

Potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.05 V**

7.12.3.1.2.5 flexIPAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ flexIPAD ▶ Settings**

In this dialog, you can set the properties of the **flexIPAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the flexIPAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Start potential [V]

Start potential of the step in volts.

End potential [V]

End potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define flexIPAD step* (is also triggered by a double-click on an empty line).

Edit	Edit the selected line in a separate dialog *Define flexIPAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The affected lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Start

Start time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**50 ms**

End

Ending time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**150 ms**

Range

Selection of the measuring range.

Selection	**20 µA** | **200 µA** | **2 mA**
Default value	**200 µA**

NOTE

The selection of the measuring channel (**Current** or **Charge**) takes place in the hardware assignment of the analysis *(see chapter 7.3.3.2.1, page 736)*.

The defined potential progression is displayed in the form of a graph.

7.12.3.1.2.6 Define flexIPAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ Settings ▶ flexIPAD mode settings**

In this dialog, a new flexIPAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**100 ms**

Start potential

Start potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

End potential

End potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

7.12.3.1.2.7 CV mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ CV ▶ Settings**

In this dialog, you can set the properties of the **CV** measuring mode.

Number of cycles for cyclic voltammograms

Preparing cycles

Number of cyclic voltammograms which are to be measured in the time program after **Start data acquisition** and then discarded. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Measuring cycles

Number of cyclic voltammograms which are to be measured and saved in the time program after **Start data acquisition**. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1,000 s**

7.12.3.2 896 Professional Detector - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.12.3.2.1 Amperometric detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Current	Current	nA	Yes
Charge	Charge	nC	Yes
Current vs. Potential	Current	nA	No

NOTE

The only channels available for the output of the measured values by means of the *891 Professional Analog Out (see Chap. 7.8.3.1.11.1, p. 914)* are **Current** and **Charge**. The output of the measured values of these channels is then **time-based**.

7.12.3.2.2 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!

- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column	Metrosep A Supp 5 - 100/4.0
Injection volume	20 µL
Duration of recording	12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.12.3.3 896 Professional Detector - Commands

Subwindow: **Method ▶ Devices**

Subwindow: **Method ▶ Time program**

Depending on the device version, the 896 Professional Detector contains a conductivity detector, an amperometric detector or both. The available time program commands depend on the device version.

7.12.3.3.1 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.12.3.3.1.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.12.3.3.1.2 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.12.3.3.1.3 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.12.3.3.2 Commands - Amperometric detector

Subwindow: **Method ▶ Time program**

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then the following commands may **not** be used. This is checked by the start test of the method.

Overview of the time program commands available for the amperometric detector:

7.12.3.3.2.1 Measure current

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure current**

The device-dependent **Measure current** time program command (command with feedback) measures the current.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_I	TP.'Command number.MEAS_I Measured current [nA].	Number

7.12.3.3.2.2 Measure charge

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure charge**

The device-dependent **Measure charge** time program command (command with feedback) measures the charge.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_Q	TP.'Command number.MEAS_Q Measured charge [nC].	Number

7.12.3.3.2.3 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are

available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.12.3.3.2.4 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.12.3.3.2.5 Modify mode

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Modify mode**

The device-dependent **Modify mode** time program command (command without feedback) permits a change of measuring mode: You can change the parameterization of the current measuring mode or select a different measuring mode and set its parameters.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

When the command is opened, the mode parameters which are set in the start parameters are displayed by default.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Mode

Selection of the measuring mode of the amperometric detector. The CV mode mode is not available here.

Selection	**DC** | **PAD** | **flexIPAD**

DC
Measurement with constant potential.

PAD
Measurement with several potential levels.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector. The same settings can be set as in the *start parameters, see Chap. 7.3.3.1.2, p. 728*.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.12.3.3.2.6 CV treatment

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - CV treatment**

The device-dependent CV treatment time program command (command without feedback) allows the performance of cyclovoltammetric treatments.

Settings

Opens the settings for the cyclovoltammetric treatment.

Comment

Optional comment on the time program command.

Entry	**64 characters.**

Settings

In this dialog, you can set the properties for the cyclovoltammetric treatments.

Number of cycles for cyclovoltammetric treatment

Cycles

Number of cyclovoltammetric treatments that are to be performed in the time program. The parameterization defined in the Sweep parameters section is used for the treatment.

Input range	**1 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1000 s**

7.12.3.3.2.7 On/Off

Dialog: **Method ▶ Time program ▶ [Edit] ▶ New ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the amperometric cell on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Cell

Selection	**On** | **Off**
Default value	**On**

On
Switches the cell of the amperometric detector on.

Off
Switches the cell of the amperometric detector off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.12.4 896 Professional Detector - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manually** icon at the left of the program bar.

No manual control is available with the conductivity detector.

7.12.4.1 Manual control - Amperometric detector

7.12.4.1.1 General settings

Tab: **Manual ► 'Amp. detector'**

Mode

Generally speaking, the measuring mode and its settings can be changed only in the manual control of the workplace, not in the Global manual control.

Selection of the measuring mode of the amperometric detector which is set in the device when **[Apply]** is pressed. The following rules apply for the changeability of the mode when a determination is running:

- When a determination is running in the mode DC, PAD or flexIPAD, it is **not** possible to change to the mode CV.
- When a determination is running in the mode CV it is **not** possible to change to the modes DC, PAD or flexIPAD.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potentials.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric *(see chapter 7.3.4.1.2, page 752)*. Not available in the manual control of the CV mode.

[Apply]

The parameterization of the selected measuring mode is sent to the device. The device and the measuring cell are switched on. Not available in the manual control of the CV mode.

Cell

[Cell On]

The measuring cell is switched on. If it had been switched off beforehand, then it will continue to run with the settings which were active prior to being switched off. Not available in the manual control of the CV mode.

[Cell Off]

The measuring cell is switched off. Not available in the manual control of the CV mode.

Temperature

Current Value

Display of the current temperature in the detector.

Input

Input of a new temperature which is to be set in the device when **[Apply]** is pressed.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

[Apply]

Sets the new temperature value in the device.

7.12.4.1.2 Dialog window «Settings»

In this dialog window, the selected measuring mode can be parameterized in the manual control of the workplace.

7.12.4.1.2.1 Settings DC mode

The parameterization of the DC mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.2, page 729)*.

7.12.4.1.2.2 Settings PAD mode

The parameterization of the PAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.3, page 730)*.

7.12.4.1.2.3 Settings flexIPAD mode

The parameterization of the flexIPAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.5, page 732)*.

7.12.4.1.2.4 Settings CV mode

The parameterization of the CV mode can **not** be changed in the manual control.

7.13 889 IC Sample Center

7.13.1 889 IC Sample Center - Overview

NOTE

The **889 IC Sample Center** device is available in four versions which differ in the combination of integrated modules. This sample changer is described in the online help with all modules.

The following versions are available for different fields of application:

- **2.889.0010 889 IC Sample Center**
  IC Autosampler for small sample volumes, without sample cooling, with syringe and injector
- **2.889.0020 889 IC Sample Center - cool**
  IC Autosampler for small sample volumes, with sample cooling, with syringe and injector
- **2.889.0030 889 IC Sample Center Basic**
  IC Autosampler for small sample volumes, without sample cooling, without syringe and injector

- **2.889.0040 889 IC Sample Center Basic - cool**
  IC Autosampler for small sample volumes, with sample cooling, without syringe and injector

7.13.2 889 IC Sample Center - Configuration

If a device of the type **889 IC Sample Center** device is selected in the device table, then the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Instrument type'** dialog with the device-specific tabs.

In the case of automatically detected devices, it is also recognized whether the version is with or without syringe and injector or with or without cooling.

7.13.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Name of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device name #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.13.2.2 Properties - Syringe

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Syringe**

The tab is available for the **2.889.0010** and **2.889.0020** versions.

Syringe volume

Display of the volume of the syringe in µL.

Buffer loop volume

Volume of the buffer loop in µL.

Input range	**1 to 50,000 µL**
Default value	**1,000 µL**

7.13.2.3 Properties - Needle

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Needle**

The tab is available for the **2.889.0010** and **2.889.0020** versions.

Volume Needle to Valve

Whole volume, from the needle tip to the injection valve, in µL.

NOTE

The needle is supplied together with the necessary capillary. The capillary is labeled with the volume in µL; put this value in here.

Input range	**1 to 999 µL**
Default value	**15 µL**

7.13.2.4 Properties - Injector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Injector**

The tab is available for the **2.889.0010** and **2.889.0020** versions.

Sample loop volume

Volume of the sample loop of the injection valve, in µL.

Input range	**1 to 5,000 µL** (Increment: **1**)
Default value	**100 µL**

7.13.2.5 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.13.3 889 IC Sample Center - Method

Program part: **Method**

In the **Method** program part, the start parameters and program commands can be defined for the **889 IC Sample Center**.

If you assign the 889 IC Sample Center to a list of devices of a method *Adding a device from the device table, see p. 404*, it will be recognized *automatically* whether it is a device version with or without syringe and injector, or with or without cooling.

If you assign the 889 IC Sample Center to a list of devices of a method with *Adding a new device, see p. 405*, you will have to *explicitly indicate* whether the device version with or without syringe and injector, or with or without cooling is to be added.

7.13.3.1 889 IC Sample Center - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **889 IC Sample Center** in the top part of the window, then the tabs of the modules in the device appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.13.3.1.1 Start parameters - Rack

Tab: **Method ▶ Devices ▶ Rack**

Left rack/Right rack

Type

Selection of an **ANSI/SBS 1-4 / 2004 Microplates**-compatible rack type. Different rack types can be used on both rack holders. Default value is the 6.2041.200 Metrohm sample rack for 48 vials.

Selection	**12 vials** | **48 vials** | **96 low** | **96 high** | **384 low**
Default value	**48 vials**

12 vials
Holder for 12 Vials

48 vials
Holder for 48 Vials

96 low
Microtiter plate low, with 96 cavities

96 high
Microtiter plate high, with 96 cavities

384 low
Microtiter plate low, with 384 cavities

Needle height

Vertical distance of the needle tip from the bottom of the vial (with a sample rack) or the cavity (with a microtiter plate).

Input range	**2.0 to 6.0 mm** (Increment: **0.5**)
Default value	**6.0 mm**

7.13.3.1.2 Start parameters - Injector

Tab: **Method ▶ Devices ▶ Injector**

The tab is available for the **2.889.0010** and **2.889.0020** versions.

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

7.13.3.1.3 Start parameters - Cooling

Tab: **Method ▶ Devices ▶ Cooling**

The tab is available for the **2.889.0020** and **2.889.0040** versions.

Status

Selection	**On** | **Off**
Default value	**Off**

On
The cooling is switched on when the hardware is started with **[Start HW]**.

Off
The cooling is switched off when the hardware is started with **[Start HW]**.

Temperature

Temperature that is set for the cooling when the hardware is started with **[Start HW]**.

Input range	**4 to 22 °C**
Default value	**20 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

7.13.3.1.4 Start parameters - Compressor

Tab: **Method ▶ Devices ▶ Compressor**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The compressor is switched on when the hardware is started with **[Start HW]**.

Off
The compressor is switched off when the hardware is started with **[Start HW]**.

NOTE

The compressor can also be switched on or off with an option in the 3 time program commands *Full Loop Injection, p. 1116*, *Partial Loop Injection, p. 1117* and *Pickup Injection, p. 1119*.

7.13.3.2 889 IC Sample Center - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

The data channel is available for the **2.889.0020** and **2.889.0040** versions.

Property	Label of y-axis	Unit	Evaluation
Temperature	Temperature	°C	No

7.13.3.3 889 IC Sample Center - Commands

Subwindow: **Method ▶ Devices**

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 889 Sample Center:

7.13.3.3.1 Commands - Rack

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the rack:

7.13.3.3.1.1 Moving to a position

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Move to position**

The device-dependent time program command **Move to position** (command with feedback) of the 889 IC Sample Center, the rack can be positioned in the way that the needle is located above a sample position. Additionally the rack can be moved forward in order to remove it.

Purpose

Position

Selecting the kind of target position.

Selection	**Sample position** | **Rack position** | **Exchange position**
Default value	**Sample position**

Sample position
Position, defined as value of the parameter **Position** in the sample data of the single determination (or of the determination series).

Rack position
Predefined position on the corresponding rack. The position is defined in the parameter **Number**.

Exchange position
Position which permits the rack to be exchanged.

Number

If in the parameter **Position** the value **Rack position** is selected, an actual rack position can be indicated here. Note the label of the rack with letters and numbers. To distinguish between the left and the right rack, there is a preceding L or R, respectively.

NOTE

The following examples show how to define rack positions. Hold the 6.2041.200 standard rack (48 vials) the way the A1 coordinate is at the bottom left. In this orientation the rack has 6 columns (A...F) and 8 rows (1...8). In order to indicate the position A1 on the *left* rack, enter the value **LA1** in **Number**. In order to indicate the position in the 3rd column and 7th row on the *right* rack, enter the value **RC7** in **Number**.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command **Move to position** generates the command variable **TP.'Command number'.PRO**.

Identification	Description	Data type
RPO	Rack position after command execution. **0** = not defined.	Text

7.13.3.3.2 Commands - Needle

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the needle:

7.13.3.3.2.1 Move

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Move**

With the device-dependent time program command **Move** (command with feedback) of the 889 IC Sample Center, vertical and horizontal movements of the needle can be carried out.

NOTE

Use the time program command **Move to position** of the rack in order to position the rack in the way that the needle is located above the rack position required.

Purpose

Position

Selection of the horizontal or vertical position the needle is to be moved to.

Selection	**top** | **bottom** | **Wash position** | **Waste position**

top
Vertical movement of the needle to the top.

bottom
Vertical movement of the needle to the bottom. If the needle is located above a rack position, it will be moved to the bottom so far that the distance between the needle tip and the bottom of the vial specified in the parameter **Needle height** is reached.

Wash position
Movement of the needle to the wash position and to the bottom.

Waste position
Movement of the needle to the waste position and to the bottom.

Needle height

Distance of the needle tip from the bottom of the vial or the cavity of the microtiter plate. Only available if the parameter **Position** has the value **bottom**. The default value is the needle height defined in the start parameters of the rack *(see chapter 7.13.3.1.1, page 1105)*.

Input range	**2.0 to 6.0 mm** (Increment: **0.5**)

Vial test

Vial test

on | off (Default value: **off**)

Only available if the value **bottom** is selected for **Position**. Selection whether the needle is to be checked for the availability of a vial and what happens, if there is no vial.

Selection	**Display message** | **Cancel determination** | **Cancel determination and series**

Display message
The determination is stopped and an error message is displayed.

Cancel determination
The determination is canceled and the next determination of the series is started.

Cancel determination and series
Both the determination and the series will be canceled.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.3 Commands - Injection valve

Subwindow: **Method ▶ Time program**

The commands for the injection valve are available for the **2.889.0010** and **2.889.0020** versions.

Overview of the time program commands available for the injection valve:

7.13.3.3.3.1 Filling

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command with feedback) switches the injection valve to the **Fill** position.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.3.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command with feedback) switches the injection valve to **Inject** position.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.4 Commands - Syringe

Subwindow: **Method ▶ Time program**

The commands for the syringe are available for the **2.889.0010** and **2.889.0020** versions.

Overview of the time program commands available for the syringe:

7.13.3.3.4.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

With the device-dependent time program command **Fill** (command with feedback) of the 889 IC Sample Center the syringe is completely filled.

Port

Selection of the syringe valve port the syringe is filled at.

Selection	**Needle** | **Wash** | **Waste**
Default value	**Wash**

Needle
Port to the needle.

Wash
Port to the wash container.

Waste
Port to the waste container.

Speed

Selection of the speed level at which the syringe plunger is to be moved. Has an effect only if the value **Needle** is selected for **Port**.

Selection	**fast** | **normal** | **slow**
Default value	**normal**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.4.2 Eject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Eject**

With the device-dependent time program command **Eject** (command with feedback) of the 889 IC Sample Center the syringe is emptied.

Port

Selection of the syringe valve port the current syringe volume is to be ejected at.

Selection	**Needle** | **Wash** | **Waste**
Default value	**Waste**

Needle
Port to the needle.

Wash
Port to the wash container.

Waste
Port to the waste container.

Speed

Selection of the speed level at which the syringe plunger is to be moved. Has an effect only if the value **Needle** is selected for **Port**.

Selection	**fast** | **normal** | **slow**
Default value	**normal**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.4.3 Aspirate

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Aspirate**

With the device-dependent time program command **Aspirate** (command with feedback) of the 889 IC Sample Center the syringe aspirates a certain volume. The maximum volume that can be aspirated depends on the current position of the syringe plunger.

Port

Selection of the syringe valve port through which the **Volume** is to be aspirated.

Selection	**Needle** | **Wash** | **Waste**
Default value	**Needle**

Needle
Port to the needle.

Wash
Port to the wash container.

Waste
Port to the waste container.

Volume

Volume to be aspirated in µL. Can also be described as formula. If a volume is indicated that cannot be aspirated because of the current position of the syringe plunger, an error message is displayed.

Input range	**1 to 500 µL** (Increment: **1**)

Speed

Selection of the speed level at which the syringe plunger is to be moved. Has an effect only if the value **Needle** is selected for **Port**.

Selection	**fast** | **normal** | **slow**
Default value	**normal**

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command **Aspirate** generates the command variable **TP.'Command number'.AVOL** with the volume actually aspirated.

Identification	Description	Data type
AVOL	Aspirated volume [µL].	Number

7.13.3.3.4.4 Dispense

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Dispense**

With the device-dependent time program command **Dispense** (command with feedback) of the 889 IC Sample Center the syringe dispenses a certain volume. The maximum volume that can be dispensed depends on the current position of the syringe plunger.

Port

Selection of the syringe valve port the **Volume** is to be ejected at.

Selection	**Needle** | **Wash** | **Waste**
Default value	**Needle**

Needle
Port to the needle.

Wash
Port to the wash container.

Waste
Port to the waste container.

Volume

Volume to be ejected in µL. Can also be described as formula. If a volume is indicated that cannot be dispensed because of the current position of the syringe plunger, an error message is displayed.

Input range	**1 to 500 µL** (Increment: **1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command **Aspirate** generates the command variable **TP.'Command number'.DVOL** with the volume actually dispensed.

Identification	Description	Data type
DVOL	Dispensed volume [µL].	Number

7.13.3.3.4.5 Changing the port

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Change port**

With the device-dependent time program command **Change port** (command with feedback) of the 889 IC Sample Center, the syringe valve can be switched to a different port.

Port

Selection of the syringe valve port to be switched to.

Selection	**Needle** | **Wash** | **Waste**
Default value	**Needle**

Needle
Port to the needle.

Wash
Port to the wash container.

Waste
Port to the waste container.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.5 Commands - Cooling

Subwindow: **Method ▶ Time program**

The commands for cooling are available for the **2.889.0020** and **2.889.0040** versions.

Overview of the time program commands available for the cooling:

7.13.3.3.5.1 Measure temperature

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure temperature**

With the device-dependent time program command **Measure temperature** (command with feedback) of the 889 IC Sample Center, the actual temperature in the sample compartment is measured.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command **Measure temperature** generates the command variable **TP.'Command number'.TEMP**.

Identification	Description	Data type
TEMP	Measured temperature [°C]	Number

7.13.3.3.6 Commands - Compressor

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the compressor:

7.13.3.3.6.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

With the device-dependent time program command **On/Off** (command with feedback) of the 889 IC Sample Center, the compressor can be switched on or off.

Compressor

Selection	**On** | **Off**
Default value	**On**

On
Switches the compressor on.

Off
Switches the compressor off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.7 Commands - General

Subwindow: **Method ▶ Time program**

Overview of further time program commands made available by the 889 Sample Center:

7.13.3.3.7.1 Full Loop Injection

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - General - Full Loop Injection**

The command is available for the **2.889.0010** and **2.889.0020** versions.

With the device-dependent time program command **Full loop injection** (command with feedback), an automatic injection sequence is carried out by the 889 IC Sample Center. The sample loop is **completely** filled thereby.

Rinsing volume

Enter the volume to be used for rinsing.

Input range	**0 to 9999 µL** (Increment: **1**)
Default value	**30 µL**

Needle height

Distance of the needle tip from the bottom of the vial or the cavity of the micro titer plate. The default value is the needle height defined in the start parameters of the rack *(see chapter 7.13.3.1.1, page 1105)*.

Input range	**2.0 to 6.0 mm** (Increment: **0.5**)

Syringe rate

Selection of the rate level the plunger of the syringe is to be moved at.

Selection	**fast** | **normal** | **slow**
Default value	**normal**

Air segment

on | off (Default value: **off**)

Selection whether the sample is separated by an air segment.

Headspace pressure

on | off (Default value: **off**)

Selection whether pressure is to be applied to the liquid level in the vial while aspirating sample. This option is only useful when vials with septa are used.

Wash after injection

on | off (Default value: **off**)

Selection whether the washing procedure of the injection sequence is to be carried out after the injection.

Vial test

Selection of what is to happen if no vial is present when moving the needle downwards.

Selection	**Display message** | **Stop determination** | **Stop determination and series**

Display message
The determination is stopped and an error message is displayed.

Stop determination
The determination is stopped and the next determination of the series is started.

Stop determination and series
Both the determination and the series are stopped.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.7.2 Partial Loop Injection

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - General - Partial Loop Injection**

The command is available for the **2.889.0010** and **2.889.0020** versions.

With the device-dependent time program command **Partial loop injection** (command with feedback), an automatic injection sequence is carried out by the 889 IC Sample Center. The sample loop is thereby filled **to 50% maximum**.

Injection volume

Definition of the volume to be injected. The volume can be applied from the sample data. You can alternatively define it manually our by a formula.

Selection	**From sample data** | **(empty)**
Default value	**From sample data**

If the empty entry has been selected, the injection volume must be defined manually or by a formula.

Input range	**1 to 500 µL** (Increment: **1**)
Default value	**10 µL**

Rinsing volume

Enter the volume to be used for rinsing.

Input range	**0 to 9999 µL** (Increment: **1**)
Default value	**30 µL**

Needle height

Distance of the needle tip from the bottom of the vial or the cavity of the micro titer plate. The default value is the needle height defined in the start parameters of the rack *(see chapter 7.13.3.1.1, page 1105)*.

Input range	**2.0 to 6.0 mm** (Increment: **0.5**)

Syringe rate

Selection of the rate level the plunger of the syringe is to be moved at.

Selection	**fast** | **normal** | **slow**
Default value	**normal**

Air segment

on | off (Default value: **off**)

Selection whether the sample is separated by an air segment.

Headspace pressure

on | off (Default value: **off**)

Selection whether pressure is to be applied to the liquid level in the vial while aspirating sample. This option is only useful when vials with septa are used.

Wash after injection

on | off (Default value: **off**)

Selection whether the washing procedure of the injection sequence is to be carried out after the injection.

Vial test

Selection of what is to happen if no vial is present when moving the needle downwards.

Selection	**Display message** | **Stop determination** | **Stop determination and series**

Display message
The determination is stopped and an error message is displayed.

Stop determination
The determination is stopped and the next determination of the series is started.

Stop determination and series
Both the determination and the series are stopped.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.7.3 Pickup Injection

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - General - Pickup Injection**

The command is available for the **2.889.0010** and **2.889.0020** versions.

With the device-dependent time program command **Pickup injection** (command with feedback), an automatic injection sequence is carried out by the 889 IC Sample Center. The sample volume is thereby filled **partially** (to a maximum of **0.5 * (volume of the sample loop - 3 * volume of the needle)**).

Injection volume

Definition of the volume to be injected. The volume can be applied from the sample data. You can alternatively define it manually our by a formula.

Selection	**From sample data** | **(empty)**
Default value	**From sample data**

If the empty entry has been selected, the injection volume must be defined manually or by a formula.

Input range	**1 to 500 µL** (Increment: **1**)
Default value	**10 µL**

Transport volume

Definition of the transport volume in units of the syringe volume.

Input range	**1 to 9** (Increment: **1**)
Default value	**1**

Needle height

Distance of the needle tip from the bottom of the vial or the cavity of the micro titer plate. The default value is the needle height defined in the start parameters of the rack *(see chapter 7.13.3.1.1, page 1105)*.

Input range	**2.0 to 6.0 mm** (Increment: **0.5**)

Syringe rate

Selection of the rate level the plunger of the syringe is to be moved at.

Selection	**fast** | **normal** | **slow**
Default value	**normal**

Air segment

on | off (Default value: **off**)

Selection whether the sample is separated by an air segment.

Headspace pressure

on | off (Default value: **off**)

Selection whether pressure is to be applied to the liquid level in the vial while aspirating sample. This option is only useful when vials with septa are used.

Wash after injection

on | off (Default value: **off**)

Selection whether the washing procedure of the injection sequence is to be carried out after the injection.

Vial test

Selection of what is to happen if no vial is present when moving the needle downwards.

Selection	**Display message** | **Stop determination** | **Stop determination and series**

Display message
The determination is stopped and an error message is displayed.

Stop determination
The determination is stopped and the next determination of the series is started.

Stop determination and series
Both the determination and the series are stopped.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.7.4 Wait for injection

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - General - Wait for injection**

The command is available for the **2.889.0010** and **2.889.0020** versions.

With the device-dependent time program command **Wait for injection** (command with feedback) of the 889 IC Sample Center, MagIC Net waits until the injection valve of the 889 IC Sample Center switches to **INJECT**.

Max. waiting time

on | off (Default value: **off**)

If this option is activated, the time program is continued as soon as either the requested status has been read or the waiting time has expired.

Time

Enter the maximum waiting time.

Input range	**0 to 9,999** (Increment: **1**)
Default value	**10**

Unit

Selection of the unit for the max. waiting time.

Selection	**s** | **min**
Default value	**min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.7.5 Wash

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - General - Wash**

The command is available for the **2.889.0010** and **2.889.0020** versions.

With the device-dependent time program command **Wash** (command with feedback) of the 889 IC Sample Center, the standard washing procedure is carried out.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.13.3.3.7.6 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.13.4 889 IC Sample Center - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.13.4.1 Manual control - Rack

Tab: **Manual control ▶ Manual control - All devices - 'Device name' ▶ Rack**

Left rack/Right rack

Type

Current value

Display of the rack type currently set.

Input

Selection of a (different) rack type. Different rack types can be used on both rack holders. Analogous to the parameter **Type** in the start parameters of the rack *(see chapter 7.13.3.1.1, page 1105)*.

Selection	**12 vials** | **48 vials** | **96 low** | **96 high** | **384 low**
Default value	**48 vials**

12 vials
Holder for 12 Vials

48 vials
Holder for 48 Vials

96 low
Microtiter plate low, with 96 cavities

96 high
Microtiter plate high, with 96 cavities

384 low
Microtiter plate low, with 384 cavities

[Apply]

By this function, the rack types selected in the parameter **Input** are set.

Position

Current value

Display of the current position of the rack. If the position is undefined, **-----** is displayed.

Input

Select or enter a (different) rack position.

Selection	**(empty)** | **Exchange position**

(empty)
If the empty entry is selected, manually entering a rack position is expected *(see page 1108)*. The moving to the position is triggered with **[Start]**.

Exchange position
When selecting this value the rack is moved with **[Start]** to the exchange position (front position) in which the rack can be removed.

[Start]

By this function, the position selected in the parameter **Position (Input)** is moved to. The moving cannot be stopped.

7.13.4.2 Manual control - Needle

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Needle**

Position

Current value

Display of the current needle position.

Input

Selection of a (different) needle position.

Selection	**top** | **bottom** | **Wash position** | **Waste position** | **Exchange position**

top
Vertical movement of the needle to the top.

bottom
Vertical movement of the needle to the bottom. If the needle is located above a rack position, it will be moved to the bottom so far that the distance between the needle tip and the bottom of the vial specified in the parameter **Needle height** is reached.

Wash position
Horizontal movement of the needle to the wash position.

Waste position
Horizontal movement of the needle to the waste position.

Exchange position
Movement of the needle to the exchange position.

Needle height

Current value

Display of the current value of the needle height.

Input

Input of a (different) needle height.

Input range	**2.0 to 6.0 mm** (Increment: **0.5**)
Default value	**6.0 mm**

[Start]

By this function, the selected position in the parameter **Input** is moved to.

7.13.4.3 Manual control - Injector

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Injector**

The tab is available for the **2.889.0010** and **2.889.0020** versions.

[Inject]

By this function, the valve is switched to the position **Inject**.

[Fill]

By this function, the valve is switched to the position **Fill**.

7.13.4.4 Manual control - Syringe

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Syringe**

The tab is available for the **2.889.0010** and **2.889.0020** versions.

Command

Selection of the required action of the syringe.

Selection	**Fill** | **Eject** | **Aspirate** | **Dispense**
Default value	**Fill**

Volume

Input

If the **Command Aspirate** or **Dispense** has been selected, the volume in µL has to be entered here.

Port

Current value

Display of the current position of the syringe valve.

Input

Selection of a (different) position of the syringe valve.

Selection	**Needle** | **Wash** | **Waste**
Default value	**Needle**

Needle
Port to the needle.

Wash
Port to the wash container.

Waste
Port to the waste container.

Speed

Input

Selection of the syringe speed when carrying out the selected **Command**.

NOTE

The effect of the selected speed depends on the **Command** and on the **Port**, as is described with the corresponding Time program commands.

[Start]

Starts the required action.

7.13.4.5 Manual control - Cooling

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Cooling**

The tab is available for the **2.889.0020** and **2.889.0040** versions.

Temperature

Current value

Display of the current temperature in the sample compartment.

Input

Input of a (different) cooling temperature.

Input range	**4 to 22 °C** (Increment: **1**)
Default value	**20 °C**

[On]

Switch on cooling.

[Off]

Switch off cooling.

[Apply]

By this function, the value in **Input** is written to the device as new cooling temperature.

7.13.4.6 Manual control - Compressor

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Compressor**

[On]

Switch on compressor.

[Off]

Switch off compressor.

7.13.4.7 Manual control - General

Tab: **Manual control ► Manual control - All devices - 'Device name' ► General**

Wash

With the corresponding button **[Start]** the standard washing procedure is started. During washing, the label of the button changes to **[Stop]**.

The command is available for the **2.889.0010** and **2.889.0020** versions.

[Start]

Starts the washing procedure.

[Stopping]

Stops the washing procedure.

Reset device

With the corresponding button **[Start]** the device is reset. With this function the device can be reset from an error status to the ready status.

7.13.5 889 IC Sample Center - Troubleshooting

If MagIC Net reports a problem during working with the 889 IC Sample Center, information on causes and possibilities for troubleshooting can be found in the following error list.

7.13.5.1 Error list

7.13.5.1.1 Rack unit

Problem	Cause	Remedy
Error 294	*The home sensor of the rack holder has not been activated.*	1. Switch off sample changer. 2. Carefully slide the rack holder back and forth and remove any obstacles that may be present. 3. If possible, push the rack holder all the way back. 4. Switch on sample changer. If the error occurs again, call your regional Metrohm service representative.
Error 295	*The current position of the rack holder deviates more than 2 mm from the home position.*	1. Switch off sample changer. 2. Carefully slide the rack holder back and forth and remove any obstacles that may be present. 3. If possible, push the rack holder all the way back. 4. Switch on sample changer. If the error occurs again, call your regional Metrohm service representative.
Error 296	*The home sensor of the rack holder has not been deactivated.*	▪ If the following steps require moving the rack holder, first switch off the sample changer. ▪ Ensure that the transport lock (foam) has been removed from the sample compartment. ▪ Remove any other obstacles that may be present in the area of the rack holder. If the error occurs again, call your regional Metrohm service representative.
Error 297	*The home sensor of the rack holder has been activated unexpectedly.*	Call the Metrohm Service.

Problem	Cause	Remedy
Error 298	*The rack is in an undefined position.*	Perform the **[Reset device]** function in the manual control mode of the sample changer. If the error occurs again, call your regional Metrohm service representative.

7.13.5.1.2 Needle unit

Problem	Cause	Remedy
Error 303	*The needle is in an undefined horizontal position.*	Perform the **[Reset device]** function in the manual control mode of the sample changer. If the error occurs again, call your regional Metrohm service representative.
Error 304	*The home sensor for the horizontal movement of the needle has not been activated.*	1. Check whether the horizontal movement of the needle unit is obstructed. 2. If possible, remove any obstacles that may be present. If the error occurs again, call your regional Metrohm service representative.
Error 306	*The home sensor for the horizontal movement of the needle has not been deactivated.*	1. Check whether the horizontal movement of the needle unit is obstructed. 2. If possible, remove any obstacles that may be present. If the error occurs again, call your regional Metrohm service representative.
Error 307	*The home sensor for the horizontal movement of the needle has been activated unexpectedly.*	Call the Metrohm Service.
Error 308	*The expected number of steps was not taken to reach the horizontal home position of the needle.*	1. Check whether the horizontal movement of the needle unit is obstructed. 2. If possible, remove any obstacles that may be present. If the error occurs again, call your regional Metrohm service representative.
Error 312	*The needle is in an undefined vertical position.*	Perform the **[Reset device]** function in the manual control mode of the sample changer. If the error occurs again, call your regional Metrohm service representative.

Problem	Cause	Remedy
Error 313	*The home sensor for the vertical movement of the needle has not been activated.*	1. Check whether the vertical movement of the needle unit is obstructed. 2. If possible, remove any obstacles that may be present. If the error occurs again, call your regional Metrohm service representative.
Error 315	*The home sensor for the vertical movement of the needle has not been deactivated.*	1. Check whether the vertical movement of the needle unit is obstructed. 2. If possible, remove any obstacles that may be present. If the error occurs again, call your regional Metrohm service representative.
Error 316	*The home sensor for the vertical movement of the needle has been activated unexpectedly.*	Call the Metrohm Service.
Error 317	*When the needle unit is moving vertically, the needle scraper has not detected a rack or the wash or waste position.*	If the error occurred when moving to a rack position: Make sure that there is either a rack with vials or a microtiter plate on the rack holder. If the error occurs again, call your regional Metrohm service representative.
Error 318	*The needle scraper is blocked when the needle unit is in vertical motion.*	1. Check whether the movement of the needle scraper is obstructed. 2. If possible, remove any obstacles that may be present. If the error occurs again, call your regional Metrohm service representative.
Error 319	*The sample needle arm is in an undefined vertical position.*	Call the Metrohm Service.

7.13.5.1.3 Syringe unit

Problem	Cause	Remedy
Error 324	*The syringe valve has not reached the desired port.*	Call the Metrohm Service.

Problem	Cause	Remedy
Error 330	*The home sensor of the syringe has not been activated.*	1. Check if the flow path is pinched off or clogged in one or more places. 2. If possible, reestablish the flow path. If the error occurs again, call your regional Metrohm service representative.
Error 331	*The home sensor of the syringe has been activated unexpectedly.*	Call the Metrohm Service.
Error 332	*The desired loading volume for the syringe is too large.*	The permitted loading volume is limited by the maximum syringe volume. Which loading volume is possible at the moment depends furthermore on the current position of the injection plunger. ▪ Ensure that the desired loading volume of the syringe is less than or equal to the maximum syringe volume. ▪ Check whether the desired loading volume can be achieved, starting from the current position of the syringe plunger. ▪ Before loading the syringe, first dispense a sufficient volume, or enter a smaller loading volume.
Error 333	*The desired discharge volume for the syringe is too large.*	The permitted discharge volume is limited by the maximum syringe volume. Which discharge volume is possible at the moment depends furthermore on the current position of the injection plunger. ▪ Ensure that the desired discharge volume of the syringe is less than or equal to the maximum syringe volume. ▪ Check whether the desired discharge volume is possible when starting from the current position of the syringe plunger. ▪ Before discharging the syringe, first aspirate sufficient volume, or enter a smaller discharge volume.
Error 334	*The injection plunger is at an undefined position.*	Perform the **[Reset device]** function in the manual control mode of the sample changer.

Problem	Cause	Remedy
		If the error occurs again, call your regional Metrohm service representative.
Error 335	*The spindle of the syringe could not be turned correctly.*	1. Check if the flow path is pinched off or clogged in one or more places. 2. If possible, reestablish the flow path. If the error occurs again, call your regional Metrohm service representative.
Error 500–505	*The syringe and/or the injector is/are not available.*	Check whether the version used contains a syringe and an injector. Use a version with syringe and injector (2.889.0010 or 2.889.0020) to execute the command.

7.13.5.1.4 Cooling unit

Problem	Cause	Remedy
Error 347	*A temperature of over 48 °C was measured at the time the cooling was switched on.*	Refer to the device manual of the sample changer for technical specifications and ensure that the range of permissible operating temperatures is observed.

7.13.5.1.5 Electronics

Problem	Cause	Remedy
Error 280, 282, 283, 284	*An electronic error has occurred in the EEPROM.*	1. Switch off sample changer. 2. Wait a few seconds. 3. Switch on sample changer. If the error occurs again, call your regional Metrohm service representative.
Error 290	*At least one critical functional disruption was detected when initializing the sample changer. No injections can be performed.*	1. Exit MagIC Net. 2. Switch off sample changer. 3. Ensure that the cables between the sample changer and the computer are correctly connected. 4. Switch on sample changer. 5. Start MagIC Net. If the error occurs again, call your regional Metrohm service representative.

7.14 887 Professional UV/VIS Detector

7.14.1 887 Professional UV/VIS Detector - Overview

The device **887 Professional UV/VIS Detector** is available in 1 model version:

- **2.887.0010 Professional UV/VIS Detector**
  The 887 Professional UV/VIS Detector is an alternative to the proven conductivity detector and extends the family of the intelligent detectors by Metrohm. It permits a secure and reliable quantification of substances active in the ultraviolet or visible range.

7.14.2 887 Professional UV/VIS Detector - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a device of the **887 Professional UV/VIS Detector** type is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item.

7.14.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected | not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.14.2.2 Properties - UV lamp

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► UV lamp**

[Monitoring]

Opens the **Monitoring - 'UV lamp'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.14.2.3 Properties - VIS lamp

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► VIS lamp**

Intensity level

Shows the current intensity level of the lamp.

[Monitoring]

Opens the **Monitoring - 'VIS lamp'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.14.2.4 Properties - Detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Detector**

Integration duration

Shows the integration duration of the diode array (time until the next reading of each diode). The value is set in the **Settings** dialog *(see chapter 7.14.2.7, page 1136)*.

Input range	**10 to 247 ms**

[Settings..]

If the device is connected, the **Settings** dialog *(see chapter 7.14.2.7, page 1136)* is opened.

CAUTION

The lamp settings may not be changed except under very particular conditions. Before you change the settings, read and follow the corresponding instructions in the chapter **Adjusting the lamp settings** of the device manual.

7.14.2.5 Properties - Analog Out

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Analog Out**

The 887 Professional UV/VIS Detector supports the output of data via a maximum of four analog channels.

Range/Volt

Entry of the absorption value in [mAU] which is to be output as 1 volt. This value applies for all four analog channels.

Input range	**10.0 to 2,000.0 mAU** (Increment: **10.0**)

7.14.2.6 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.14.2.7 Settings

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Detector ► Properties...**

Here the detector settings can be adjusted. Please observe the following information beforehand:

CAUTION

The lamp settings may be adjusted **only in the following cases**:

- After first start-up, if the check of the intensity spectrum shows a cut-off.
- After the replacement of the UV lamp or of the VIS lamp, if the check of the intensity spectrum shows a cut-off.

Before each adjustment of the lamp values, it is **mandatory** to check the intensity spectrum. The lamp settings may only be adjusted if the intensity spectrum is cut off at the top.

Adjusting the lamp settings

Before you can adjust the lamp settings, all the following preconditions must be met:

- The UV lamp has been burning for at least 30 minutes.
- The flow-through cell is clean.
- The flow-through cell is rinsed with ultrapure water.
- The flow-through cell is free of air bubbles.
- The intensity spectrum has been checked and shows a cut-off.

In the top part of the dialog window the current intensity spectrum is shown. Note that the UV or VIS part of the spectrum is only displayed when the corresponding lamps are switched on. The spectrum indicates whether your settings are optimal. The settings can be adjusted manually *(see "Manually adjusting the settings", page 1137)* or automatically *(see "Automatically adjusting the settings", page 1138)*.

Manually adjusting the settings

Integration duration

Entry of the integration duration.

Input range	**10 to 247 ms** (Increment: **1**)

VIS intensity level

Entry of the intensity level of the lamp.

Input range	**1 to 8** (Increment: **1**)

[Apply]

The values of **Integration duration** and **VIS intensity level** are written to the device. Afterwards, a new intensity spectrum is displayed.

Automatically adjusting the settings

As an alternative to the manual adjustment, the settings can also be adjusted automatically.

[Adjust automatically]

With this function, the adjustment is carried out by a built-in algorithm of the device. This calculates and sets optimized values for the **Integration duration** and **VIS intensity level** parameters. A new intensity spectrum is displayed after the adjustment.

[OK]

The parameter values are written to the device and the dialog is closed.

[Cancel]

The dialog is closed and those values that were set in the device *before* opening this dialog apply.

7.14.3 887 Professional UV/VIS Detector - Method

Program part: **Method**

Start parameters and program commands can be defined for the **887 Professional UV/VIS Detector** in the **Method** program part.

The recording of spectra is defined in the evaluation of the method *(see chapter 5.8.8, page 524)*.

7.14.3.1 887 Professional UV/VIS Detector - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **887 Professional UV/VIS Detector** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.14.3.1.1 Start parameters - UV lamp

Tab: **Method ▶ Devices ▶ UV lamp**

On/Off

Selection	**On** | **Off**
Default value	**Off**

On
The UV lamp is switched on when the hardware is started with **[Start HW]**.

Off
The UV lamp is switched off when the hardware is started with **[Start HW]**.

7.14.3.1.2 Start parameters - VIS lamp

Tab: **Method ▶ Devices ▶ VIS lamp**

On/Off

Selection	**On** | **Off**
Default value	**Off**

On
The VIS lamp is switched on when the hardware is started with **[Start HW]**.

Off
The VIS lamp is switched off when the hardware is started with **[Start HW]**.

7.14.3.1.3 Start parameters - Detector

Tab: **Method ▶ Devices ▶ Detector**

Up to eight measuring channels can be defined:

A measuring channel is a wavelength range in which a chromatogram can be recorded via the change of absorbance. For this, the channel must assigned as a data source to an analysis *(see chapter 5.6.6.1, page 415)*.

Channels

Table of the measuring channels defined for the 887 Professional UV/VIS Detector. The table cannot be edited directly. Use the **[Edit]** menu below the table. This contains the following menu items:

New	Add a new line to the table and edit in separate dialog *(see chapter 7.14.3.1.5, page 1141)* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *(see chapter 7.14.3.1.5, page 1141)* (is also triggered by a double-click on a non-empty line).
Cut [CTRL-X]	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

Reference channel

The reference channel is optional. It can be used to compensate lamp effects (drift, flicker) out of the intensities.

Use reference channel

on | off (Default value: **off**)

If this option is enabled, the properties of the reference channel can be edited with the button **[...]** and the reference channel will be used in the determination. If this option is disabled, no reference channel will be used

in the determination. However, the properties previously defined for a reference channel will be retained.

[...]

Opens the dialog for entering/editing the properties of the reference channel *(see chapter 7.14.3.1.6, page 1141)*.

Measuring duration

Entry of the measurement duration per data point.

NOTE

This value is used as an approximate value only. The *actual* measurement duration is that integral multiple of the configuration parameter **Integration duration** *(see page 1134)* that is closest to the this approximate value.

Input range	**50 to 2,000 ms**

7.14.3.1.4 Start parameters - Analog Out

Tab: **Method ▶ Devices ▶ Analog Out**

The 887 Professional UV/VIS Detector supports the output of measured values in four analog outputs **Out #** (#=1 - 4). Up to eight measuring channels **Channel #** (# = 1 - 8) can be defined in the start parameters of the detector *(see chapter 7.14.3.1, page 1138)*. Here the measuring channels can be assigned to analog output channels.

Out #

Assignment of a measuring channel to the corresponding analog output.

Selection	**'not defined'** | **Channel #**
Default value	**'not defined'**

'not defined'
If this entry is selected, no measuring channel is assigned to the corresponding analog channel.

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list. If a measuring channel is selected, then it will be assigned to the corresponding output channel.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.14.3.1.5 Editing the channel

Tab: **Method ▶ Devices ▶ Detector ▶ Channel**

Channel

Number of the channel. Only available for measuring channels, not for the reference channel.

Selection	**1** | **2** | **3** | **4** | **5** | **6** | **7** | **8**

Wavelength

Entry of the wavelength of the channel.

Input range	**191 to 899 nm** (Increment: **1**)
Default value	**254 nm**

Bandwidth ±

Input of the wavelength which is subtracted from or added to, respectively, the wavelength of the measuring channel.

Example: if the wavelength of the channel is 390 nm and for **Bandwidth ±** the value 5 nm has been entered, then the channel comprises the interval 385…395 nm.

Input range	**1 to 50 nm** (Increment: **1**)
Default value	**5 nm**

7.14.3.1.6 Editing the reference channel

Tab: **Method ▶ Devices ▶ Detector ▶ Reference channel**

In this dialog the properties for the reference channel can be edited.

7.14.3.1.7 Calculation of the absorbance

Here you can find the formulas for calculating the absorbance A. The following abbreviations are used in the formulas:

A	Absorbance	
I	Intensity	Sum of the intensities of wavelengths in the channel.
Mc	Measuring channel	Normally a wavelength range in which the sample of interest absorbs light.
M	(Index: m)	Number of bundled points in the measuring channel.

Rc	Reference channel	Normally another wavelength range, in which the sample of interest *does not* absorb light. Optional!
R	(Index: r)	Number of bundled points in the reference channel.
Bls	Baseline spectrum	Spectrum without sample substance. This spectrum is always present. The detector itself creates one when switching on. The user can have it recorded again in the manual control or in the time program. It is stored in the detector.
Msp	Measured spectrum	Spectrum, recorded during run-time.

Calculation of the absorbance (without reference channel)

$$A = \frac{1}{M} \cdot \sum_{m=1}^{M} \log \frac{I_m^{Mc,Bls}}{I_m^{Mc,Msp}}$$

Calculation of the absorbance (with reference channel)

The first term corresponds to the formula above for the absorbance without reference channel. The second term subtracts the absorbance of the reference channel.

$$A = \frac{1}{M} \cdot \sum_{m=1}^{M} \log \frac{I_m^{Mc,Bls}}{I_m^{Mc,Msp}} - \frac{1}{R} \cdot \sum_{r=1}^{R} \log \frac{I_r^{Rc,Bls}}{I_r^{Rc,Msp}}$$

7.14.3.2 887 Professional UV/VIS Detector - Data channels

Tab: **Method ► Devices ► Hardware assignment**

Each of the (up to eight) measuring channels of the detector *(see chapter 7.14.3.1.3, page 1139)* can be selected as **channel** for the analysis *(see chapter 5.6.6.1, page 415)*.

Property	Label of y-axis	Unit	Evaluation
Absorbance	none	mAU	Yes

7.14.3.3 887 Professional UV/VIS Detector - Commands

Subwindow: **Method ► Devices**

Subwindow: **Method ► Time program**

Overview of the time program commands available for the 887 Professional UV/VIS Detector:

7.14.3.3.1 Commands - Detector

Subwindow: **Method ► Time program**

Overview of the time program commands available for the detector:

7.14.3.3.1.1 Reset baseline

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Reset baseline**

The device-dependent **Reset baseline** time program command (command without feedback) measures a complete spectrum (190 to 900 nm). This is then taken into account as background spectrum with immediate effect.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.14.3.3.1.2 Modify channel

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Modify channel**

The device-dependent **Modify channel** time program command (command without feedback) redefines the parameters of the corresponding channel. The modifications apply until the end of the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Channel

Selection of the measuring channel whose parameters are to be modified.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

Wavelength

Entry of the wavelength of the channel.

Input range	**191 to 899 nm** (Increment: **1**)
Default value	**254 nm**

Bandwidth ±

Input of the wavelength which is subtracted from or added to, respectively, the wavelength of the measuring channel.

Example: if the wavelength of the channel is 390 nm and for **Bandwidth ±** the value 5 nm has been entered, then the channel comprises the interval 385…395 nm.

Input range	**1 to 50 nm** (Increment: **1**)
Default value	**5 nm**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.14.3.3.1.3 Measure absorbance

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure absorbance**

The device-dependent time program command **Measure absorbance** (command without feedback) measures the absorbance in the corresponding measuring channel.

Channel

Selection of the measuring channel in which the absorbance is to be measured.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
ABSORBANCE	Measured absorbance [mAu] in the selected measuring channel.	Number

7.14.3.3.1.4 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.14.3.3.1.5 Measure drift

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.14.4 887 Professional UV/VIS Detector - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.14.4.1 Manual control - UV lamp

Tab: **Manual control ► Manual control - All devices - 'Device name' ► UV lamp**

The UV lamp can be switched on and off in the manual control.

[On]

Switches the UV lamp on.

[Off]

Switches the UV lamp off.

7.14.4.2 Manual control - VIS lamp

Tab: **Manual control ► Manual control - All devices - 'Device name' ► VIS lamp**

The VIS lamp can be switched on and off in the manual control.

[On]

Switches the VIS lamp on.

[Off]

Switches the VIS lamp off.

7.14.4.3 Manual control - Detector

Tab: **Manual control ► Manual control - All devices - 'Device name' ► Detector**

The measuring channels of the detector can be edited in the manual control. In addition, the current absorbance, intensity or baseline spectrum can be displayed. It is also possible to record a new baseline spectrum here.

Channel

Selection of the channel that is to be edited when the **[Edit]** button is clicked.

Selection	**Channel #**

Channel #
For each measuring channel defined in the start parameters of the detector there will be an entry in the selection list.

[Edit]

Opens the dialog for editing the selected channel *(see chapter 7.14.3.1.5, page 1141)*.

Spectrum

Selection of the type of spectrum that is to be displayed when the **[View]** button is clicked.

Selection	**Absorbance spectrum** | **Intensity spectrum** | **Baseline spectrum**

Absorbance spectrum
Current absorbance spectrum (complete wavelength range).

Intensity spectrum
Current intensity spectrum (complete wavelength range).

Baseline spectrum
The last baseline spectrum that has been recorded in the time program or by the **[Reset baseline]** function.

[Edit]

Opens the dialog for editing the selected channel *(see chapter 7.14.3.1.5, page 1141)*.

[View]

Shows the spectrum selected in the **Spectrum** parameter *(see chapter 7.14.4.4, page 1149)*.

NOTE

To display a spectrum, a baseline spectrum must first be recorded using **[Reset baseline]**.

If an intensity spectrum or extinction spectrum has been selected, a method using an UV/VIS detector that has been started with **[Start HW]** must be loaded. This automatically sets a baseline.

[Reset baseline]

If no determination is running with the same method, a new baseline spectrum is being recorded.

7.14.4.4 Displaying spectra

Tab: **Manual control ▶ Manual control - All devices - 'Device name' ▶ Detector ▶ View**

The spectrum selected in the manual control of the detector *(see chapter 7.14.4.3, page 1148)* is displayed here. By right-clicking on the graphics window, a context menu is opened *(see "Curve window", page 94)*.

[Close]

Closes the dialog.

7.15 886 Professional Thermostat / Reactor

7.15.1 886 Professional Thermostat / Reactor - Overview

NOTE

The device **886 Professional Thermostat / Reactor** is available in 2 model versions. The device is described in the online help with all possible modules.

The following versions are available for different fields of application:

- **2.886.0110 Professional Reactor**
  The 886 Professional Reactor is a heatable reactor, especially developed for pre- and post-column derivatization. It stands out with its robustness, the fast heating rate and the possibility to carry out reactions at up to 120 °C.
- **2.886.0210 Professional Thermostat**
  The 886 Professional Thermostat is a stand-alone column oven for up to two columns with a maximum length of 150 mm. It captivates by its fast heating rate and the possibility to operate two separation columns at up to 80 °C.

7.15.2 886 Professional Thermostat / Reactor - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a type **886 Professional Thermostat / Reactor** instrument is selected in the device table, then the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs can be opened with the **[Edit] ► Properties...** menu item.

7.15.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected | not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.15.2.2 Properties - Reactor unit

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Reactor unit**

NOTE

This tab is only available when there is a reactor unit in the device.

The properties of the reactor unit and the monitoring of the reactor plate can be defined here. In addition, up to 4 reactors can be defined.

Properties of the reactor unit

Name

Name of the reactor unit (must not be empty).

Entry	**1 - 24 characters**

Set to work

Display of the set-to-work date of the reactor unit.

Comment

Field for optional and additional information.

Entry	**0 - 50 characters**

[Monitoring]

Opens the **Monitoring – 'Reactor unit name'** dialog window, in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

Reactors

Table of reactors of the reactor unit. Up to 4 reactors can be defined. The most important properties are displayed in the table. The table cannot be edited directly. Use the **[Edit]** menu below the table. This contains the following menu items:

New	Add a new line to the table and edit in separate dialog *(see chapter 7.15.2.5, page 1156)* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *(see chapter 7.15.2.5, page 1156)* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected line to the clipboard.

Insert [CTRL-V]	Inserts the line from the clipboard into the table.
Cut [CTRL-X]	Cuts the selected line and copies it to the clipboard.
Delete [Delete]	Deletes the selected line.

The properties of the reactors are described in *7.15.2.5 Editing a reactor, p. 1156*.

7.15.2.3 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.15.2.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.15.2.5 Editing a reactor

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Reactor unit ► Reactors**

In this dialog, a new reactor can be registered or a previously defined reactor can be edited.

Order number

Optional entry of the order number of the reactor.

Entry	**0–10**

Material

Optional entry of the material of the reactor capillary.

Entry	**0–16**

Length

Optional entry of the length of the reactor capillary.

Input range	**0.01 to 10.0 m** (Increment: **0.01**)
Default value	**2.00 m**

Inner diameter

Optional entry of the inner diameter [mm] of the reactor capillary.

Input range	**0.01 to 10.0 mm** (Increment: **0.01**)
Default value	**0.5 mm**

Volume

This field shows the total volume of the reactor capillary in [µL] calculated from **Inner diameter** and **Length**.

calculated volume in [µL], without decimal places

Comment

Optional comment on the reactor.

Entry	**0–24**

7.15.3 886 Professional Thermostat / Reactor - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the **886 Professional Thermostat / Reactor**.

7.15.3.1 886 Professional Thermostat / Reactor - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **886 Professional Thermostat / Reactor** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.15.3.1.1 Start parameters - Thermostat

Tab: **Method ▶ Devices ▶ Thermostat**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The thermostat is switched on when the hardware is started with **[Start HW]**.

Off
The thermostat is switched off when the hardware is started with **[Start HW]**.

Temperature

Temperature that is set for the thermostat when the hardware is started with **Start HW**.

CAUTION

Maximum temperatures allowed

The checking does not take place until the start test of the method.

- Intelligent column (iColumn): 80°C.
- Intelligent Reactor unit: 120°C.
- Otherwise: 150°C.

Input range	**0.0 to 150.0 °C** (Increment: **0.1**)
Default value	**25.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.15.3.2 886 Professional Thermostat / Reactor - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of y-axis	Unit	Evaluation
Temperature	Temperature	°C	No

7.15.3.3 886 Professional Thermostat / Reactor - Commands

Subwindow: **Method ▶ Devices**

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 886 Professional Thermostat / Reactor:

7.15.3.3.1 Commands - Thermostat

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the thermostat:

7.15.3.3.1.1 Measuring temperature

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure temperature**

The device-dependent time program command **Measure temperature** (command with feedback) measures the temperature in the thermostat.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following type **'TP.command number.Variable name'** variables are generated by the command:

Variable name	Description	Data type
TEMP	Measured temperature [°C]	Number

7.15.4 886 Professional Thermostat / Reactor - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.15.4.1 Manual control - Column thermostat

Tab: **Manual ► Manual control - 'Device name' ► 'Thermostat'**

Temperature

Current value

Current temperature of the thermostat.

Input

Entering a new value for the temperature of the thermostat.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

[On]

Switching on the thermostat. This is inactive if it is running.

[Off]

Switching off the thermostat. This is inactive if it is not running.

[Apply]

Sending the parameters set to the thermostat.

7.16 883 Basic IC plus

7.16.1 883 Basic IC plus - Overview

The device **883 Basic IC plus** is available in 1 model version:

- **2.883.0020 883 Basic IC plus**
  Intelligent, very compact ion chromatograph for education and routine analysis. For determining cations and anions with and without chemical suppression.

7.16.2 883 Basic IC plus - Configuration

Dialog: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name'**

If a type **883 Compact IC plus** device is selected in the device table, then the **[Edit] ► Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs. The properties for the various modules, the connections of the modules to the main device and the GLP data can all be defined on these tabs.

7.16.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected | not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.16.2.2 Properties - High-pressure pump

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.16.2.3 Properties - Conductivity detector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Instrument type' - 'Device name' ▶ LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.16.2.4 Properties - GLP

Tab: **Configuration ▶ 'Subwindow' ▶ [Edit] ▶ Properties... ▶ 'Properties' ▶ GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.16.3 883 Basic IC plus - Method

Program part: **Method**

In the **Method** program part, start parameters, data channels and program commands can be defined for the **883 Basic IC plus**.

7.16.3.1 883 Basic IC plus - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **883 Compact IC plus** device in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.16.3.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.16.3.1.2 Start parameter - Injection valve

Tab: **Method ► Devices ► Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.16.3.1.3 Start parameters - Peristaltic pump

Tab: **Method ► Devices ► Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.16.3.1.4 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.16.3.1.4.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception:

If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.16.3.1.5 Start parameters - Conductivity detector

Tab: **Method ▶ Devices ▶ Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.16.3.2 883 Basic IC plus - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.16.3.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.16.3.2.2 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!
- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column Metrosep A Supp 5 - 100/4.0

Injection volume 20 µL

Duration of recording 12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.16.3.3 883 Basic IC plus - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 883 Basic IC plus:

7.16.3.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.16.3.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.16.3.3.1.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.16.3.3.1.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.

Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.16.3.3.1.4 Editing gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient ▶ [Edit] ▶ New / Edit ▶ Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.16.3.3.1.5 Measure pressure

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.16.3.3.1.6 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.16.3.3.2 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.16.3.3.2.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.16.3.3.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.16.3.3.2.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.16.3.3.3 Commands - Peristaltic pump

Subwindow: **Method ► Time program**

Overview of the time program commands available for the peristaltic pump:

7.16.3.3.3.1 On/Off

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.16.3.3.3.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.16.3.3.4 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.16.3.3.4.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.16.3.3.4.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.16.3.3.5 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.16.3.3.5.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.16.3.3.5.2 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.16.3.3.5.3 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.16.4 883 Basic IC plus - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.16.4.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.16.4.2 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.16.4.3 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.16.4.4 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.16.4.4.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.17 882 Compact IC plus

7.17.1 882 Compact IC plus - Overview

NOTE

The **882 Compact IC plus** is available in various versions which differ with respect to the combination of integrated modules. The **882 Compact IC plus** is described in the online help with all possible modules.

- **2.882.0010 Compact IC plus - Cation**
  Compact ion chromatography system for determining anions or cations with electronic suppression.
- **2.882.0020 Compact IC plus - Anion**
  Compact ion chromatography system for determining anions with chemical suppression.
- **2.882.0030 Compact IC plus - Anion MCS**
  Compact ion chromatography system for determining anions with sequential suppression.

7.17.2 882 Compact IC plus - Configuration

Dialog: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Instrument type' - 'Device name'**

If a device of the type **882 Compact IC plus** is selected in the device table, then the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs. The properties for the various modules, the connections of the modules to the main device and the GLP data can all be defined on these tabs.

7.17.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.17.2.2 Properties - High-pressure pump

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.17.2.3 Properties - Conductivity detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name' ► LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.17.2.4 Properties - Amperometric detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Amp. detector**

NOTE

The amperometric detector can only be used with the following instruments: 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus, 896 Professional Detector, 930 Compact IC Flex, 940 Professional IC Vario, 945 Professional Detector Vario.

Detector type

Shows the detector type, is read out automatically from the detector.

Connection

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

7.17.2.5 Properties - MCS

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ MCS**

The MCS (Metrohm CO_2 Suppressor) has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - MCS** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.17.2.6 Properties - Analog Out

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Analog Out**

NOTE

This tab is only available when an **891 Professional Analog Out** is connected.

Device type

Display of the device type.

Device serial number

Display of the serial number of the connected 891 Professional Analog Out.

7.17.2.7 Properties - Connections

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL

- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB #

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.17.2.8 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.17.2.9 Load new program version

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► General ► [Update] ► Load new program version**

If it is discovered that the device to be connected has an old program version not supported by **MagIC Net**, then it must be updated. Select the device from the device table. Open the properties window with **[Edit] ► Properties...**. On the **General** tab, click on **[Update]** to open the **Load new program version** dialog window.

Old version

Shows the old device program version.

New version

Shows the new device program version to be loaded.

[Load]

Loads the new device program version.

NOTE

Make sure that the device is not manipulated or switched off during the loading process, and follow the instructions shown.

7.17.2.10 Monitoring

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module'**

The dialog window comprises the tabs **Date** and **Operating hours**, on which you can define the parameters for module monitoring.

7.17.2.10.1 Monitoring - Date

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring- 'Module' ▶ Date**

Monitor date

Current value

Shows the current date.

Last service

Date of the last service. This date can be selected by clicking on … in the **Select date** dialog window and is used for monitoring (**last service + service interval = next service**).

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor date

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the date.

NOTE

Monitoring cannot be enabled until after a date has been entered in the **Last service** field.

Service interval

Interval in days after which the service for the module should be repeated. If a value is entered here, then the date in the **Next Service** field will be adjusted automatically.

Next Service

Date on which the next service is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window. After the

date has been entered, the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate which action is to be triggered automatically during start check if the time interval for the service has expired.

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.17.2.10.2 Monitoring - Operating hours

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module' ▶ Operating hours**

Operating hours

Current value

Shows the operating hours to date.

[Reset]

NOTE

This function is only available in the monitoring of the 887 Professional UV/VIS Detector.

Use this function after having replaced the corresponding lamp of the 887 Professional UV/VIS Detector. This resets the values of the parameters **Current value** and **Last service**.

Last service

Operating hours at last service. This value is used for monitoring (**last service + service interval = next service**).

Input range	**0 to 99,999 Hours**

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor operating hours

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the operating hours.

NOTE

Monitoring cannot be enabled until after a value has been entered in the **Last service** field.

Service interval

Interval in hours after which the service for the module should be repeated. If a value is entered here, then the value in the **Next Service** field will be adjusted automatically.

Next Service

Operating hours after which the next service is to be carried out. If a value is entered here, then the value in the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate what action is to be triggered automatically during start check if the time interval for the service has expired:

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ▶ Information ▶ Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.17.3 882 Compact IC plus - Method

Program part: **Method**

In the **Method** program part, start parameters, data channels and program commands can be defined for the **882 Compact IC plus**.

7.17.3.1 882 Compact IC plus - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **882 Compact IC plus** in the top part of the window, the tabs of the modules contained in the device appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.17.3.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.17.3.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.17.3.1.3 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.17.3.1.4 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.17.3.1.4.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.17.3.1.4.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.17.3.1.4.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.17.3.1.4.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)

- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume

Step	Action	Description
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**
- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.17.3.1.5 Start parameters - MCS

Tab: **Method ► Devices ► MCS**

Status

Selection	**On** | **Off**
Default value	**On**

On
The MCS (Metrohm CO2 Suppressor) is switched on when the hardware is started with **[Start HW]**.

Off
The MCS (Metrohm CO_2 Suppressor) is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.17.3.1.6 Start parameters - Conductivity detector

Tab: **Method ▶ Devices ▶ Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.17.3.1.7 Start parameters - Amperometric detector

7.17.3.1.7.1 Amperometric detector

Tab: **Method ▶ Devices ▶ Amp. detector**

Mode

Selection of the measuring mode of the amperometric detector.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potential steps.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector.

Temperature

Temperature that is set in the detector when the hardware is started with **[Start HW]**.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Cell

Selection of a cell which is defined in the configuration table of the amperometric cells *(see chapter 6.13.2, page 674)*. If no cell has been selected yet, then **not defined** is displayed. Otherwise, the selected cell will be displayed with its user-defined name.

Selection	**not defined** | **Selection of amperometric cells**
Default value	**not defined**

not defined
You can also start the method when this option is selected. The cell connected to the detector is then used. In the report, the amperometric cell is then called "**not defined**", but the properties of the cell that is *actually* used will be output. **Important note:** If an intelligent cell for which the operating hours monitoring has been activated is connected to the amperometric detector, then the operating hours will be counted.

Start delay

on | off (Default value: **off**)

If this option is **enabled**, the amperometric cell is only switched on once this waiting time has elapsed.

Waiting time

Waiting time until the amperometric cell is switched on.

Input range	**0 to 99 min**
Default value	**15 min**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.17.3.1.7.2 DC mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ DC ▶ Settings**

In this dialog, you can set the properties of the **DC** measuring mode.

The properties are also available in the manual control *(see chapter 7.3.4.1, page 750)*.

DC potential

Potential of the working electrode in comparison to the reference electrode.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

Range

Selection of the measuring range.

Selection	**auto** | **2 nA** | **20 nA** | **200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**

auto
Automatic setting of the measuring range. This selection is not allowed with damping activated.

Damping

on | off (Default value: **off**)

Activates or deactivates the additional damping.

7.17.3.1.7.3 PAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, you can set the properties of the **PAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the PAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Potential [V]

Potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define PAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define PAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Duration

Duration of the measurement.

Input range	**1 to 2000 ms** (Increment: **1**)
Default value	**100 ms**

Range

Selection of the measuring range.

Selection	**200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**
Default value	**2 µA**

The defined potential progression is displayed in the form of a graph.

7.17.3.1.7.4 Define PAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, a new PAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**300 ms**

Potential

Potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.05 V**

7.17.3.1.7.5 flexIPAD mode settings

Tab: **Method ► Devices ► Amp. detector ► flexIPAD ► Settings**

In this dialog, you can set the properties of the **flexIPAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the flexIPAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Start potential [V]

Start potential of the step in volts.

End potential [V]

End potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define flexIPAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define flexIPAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The affected lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Start

Start time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**50 ms**

End

Ending time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**150 ms**

Range

Selection of the measuring range.

Selection	**20 µA** | **200 µA** | **2 mA**
Default value	**200 µA**

NOTE

The selection of the measuring channel (**Current** or **Charge**) takes place in the hardware assignment of the analysis *(see chapter 7.3.3.2.1, page 736)*.

The defined potential progression is displayed in the form of a graph.

7.17.3.1.7.6 Define flexIPAD step

Tab: **Method ► Devices ► Amp. detector ► Settings ► flexIPAD mode settings**

In this dialog, a new flexIPAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**100 ms**

Start potential

Start potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

End potential

End potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

7.17.3.1.7.7 CV mode settings

Tab: **Method ► Devices ► Amp. detector ► CV ► Settings**

In this dialog, you can set the properties of the **CV** measuring mode.

Number of cycles for cyclic voltammograms

Preparing cycles

Number of cyclic voltammograms which are to be measured in the time program after **Start data acquisition** and then discarded. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Measuring cycles

Number of cyclic voltammograms which are to be measured and saved in the time program after **Start data acquisition**. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1,000 s**

7.17.3.1.8 Start parameters - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are present only if an **891 Professional Analog Out** is connected.

7.17.3.1.8.1 Data source, Polarity, Range/Volt

Tab: **Method** ▶ **Devices** ▶ **Analog Out**

Channels Out1, Out2, Aux1, Aux2

The 891 Professional Analog Out includes 4 output channels for analog voltage in the range of -1…+1 volt:

- 2 main channels **Out1**, **Out2** with high resolution, for the digital/ analog converting of chromatograms or cyclovoltammograms.
- 2 auxiliary channels **Aux1**, **Aux2** with low resolution for the digital/ analog converting of measured values such as pressure, flow, temperature, ratio eluent.

The technical specifications can be found in the device manual of the 891 Professional Analog Out.

Each channel has the following set of start parameters. These are on one tab each in the start parameters of the main device. The parameter values are sent to the 891 Professional Analog Out when starting the method.

Data source

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data source** is displayed here.

Channel

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data channel** is displayed here.

Polarity

Indicates the sign of the output voltage of the channel.

Selection	**+** | **–**
Default value	**+**

Range/Volt

Indicates a measured value which is – after using a possible **Measured value offset** – to be converted to 1 volt output voltage *(see chapter 7.8.3.1.11.3, page 916)*.

Input range	**0.001 to 4000000**
Default value	**1.000** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

[Offset..]

This button opens the dialog for defining the measured value offset and the voltage offset *(see chapter 7.8.3.1.11.2, page 915)*.

Active

on | off (Default value: **off**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.17.3.1.8.2 Offset

Tab: **Method ▶ Devices ▶ Analog Out ▶ Offset**

Measured value offset

Indicates a positive or negative amount (in the units of the data channel selected) every measured value is to be corrected by *(see chapter 7.8.3.1.11.3, page 916)*.

Selection	**Current value** | **Value**
Default value	**Current value**

Current value
Select this option if the offset value *currently* set in the Analog Out is to be used. This value can be found in the manual control *(see chapter 7.8.4.10, page 956)*.

Value
Select this option, if you want to enter a new measured value offset in the **Value** field.

Value

Enter a new measured value offset.

Input range	**-4000000 to +4000000**
Default value	**0.0** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful input field for the channel **Conductivity**: **±15000** µS/cm; for the channel **Current**: **±2000000** nA; for the channel **Charge**: **±4000000** nC.

Voltage offset

Value

Offset in mV, to be used on the output signal after the digital/analog conversion.

Input range	**-1000 to +1000 mV** (Increment: **1**)
Default value	**0 mV**

7.17.3.1.8.3 Using range/volt and offsets

With **Range/Volt**, you can indicate the measured value amount to be converted to 1000 mV output voltage.

If you want to correct every measured value by a certain amount, then define a corresponding **Measured value offset**. If you enter a *positive* measured value offset, it will be *added* to every measured value, if you enter a *negative* measured value offset, it will be *subtracted* from every measured value. This happens **before** the digital/analog conversion.

With **Voltage offset** you can indicate a value in mV to be used on the output signal **after** the digital/analog conversion.

The **polarity** will be applied to the resulting output signal.

Example for the channel "Conductivity" of the data source "Detector"

If the required measured values are e.g. between 15 and 35 µS/cm, you could define a measured value of **–15** (µS/cm). The measured values corrected by this offset then are between 0 and 20 µS/cm. The output voltage these offset-corrected values are converted to, depends on **Range/Volt**. Examples:

With a **Range/Volt** of 20 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

With a **Range/Volt** of 40 (µS/cm-V), 20 µS/cm are output as 0.5 V (500 mV).

With a **Range/Volt** of 10 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

You can correct the output signal by a **Voltage offset**. Example: You find out that the output voltage sometimes is slightly negative, whereas you would like to have positive output signals only. If the lowest output voltage is e.g. at –12 mV, you could consistently achieve only positive voltage values with the aid of a **Voltage offset** of 15 mV.

7.17.3.2 882 Compact IC plus - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.17.3.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.17.3.2.2 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!
- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column Metrosep A Supp 5 - 100/4.0

Injection volume 20 µL

Duration of recording 12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.17.3.2.3 Amperometric detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Current	Current	nA	Yes
Charge	Charge	nC	Yes
Current vs. Potential	Current	nA	No

NOTE

The only channels available for the output of the measured values by means of the *891 Professional Analog Out (see Chap. 7.8.3.1.11.1, p. 914)* are **Current** and **Charge**. The output of the measured values of these channels is then **time-based**.

7.17.3.3 882 Compact IC plus - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 882 Compact IC plus:

7.17.3.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.17.3.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.1.2 Flow

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.1.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.1.4 Editing gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient ▶ [Edit] ▶ New / Edit ▶ Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.17.3.3.1.5 Measure pressure

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.17.3.3.1.6 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.17.3.3.2 Commands - Injection valve

Subwindow: **Method ► Time program**

Overview of the time program commands available for the injection valve:

7.17.3.3.2.1 Fill

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.2.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.17.3.3.3 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.17.3.3.3.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.3.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.17.3.3.4 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.17.3.3.4.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.17.3.3.4.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.17.3.3.5 Commands - MCS

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MCS (Metrohm CO_2 Suppressor):

7.17.3.3.5.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the MCS (Metrohm CO_2 Suppressor) on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

MCS

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.6 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.17.3.3.6.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.17.3.3.6.2 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.17.3.3.6.3 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.17.3.3.7 Commands - Amperometric detector

Subwindow: **Method ▶ Time program**

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then the following commands may **not** be used. This is checked by the start test of the method.

Overview of the time program commands available for the amperometric detector:

7.17.3.3.7.1 Measure current

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure current**

The device-dependent **Measure current** time program command (command with feedback) measures the current.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_I	TP.'Command number.MEAS_I Measured current [nA].	Number

7.17.3.3.7.2 Measure charge

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure charge**

The device-dependent **Measure charge** time program command (command with feedback) measures the charge.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_Q	TP.'Command number.MEAS_Q Measured charge [nC].	Number

7.17.3.3.7.3 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.17.3.3.7.4 Measure drift

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.17.3.3.7.5 Modify mode

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Modify mode**

The device-dependent **Modify mode** time program command (command without feedback) permits a change of measuring mode: You can change the parameterization of the current measuring mode or select a different measuring mode and set its parameters.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

When the command is opened, the mode parameters which are set in the start parameters are displayed by default.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Mode

Selection of the measuring mode of the amperometric detector. The CV mode mode is not available here.

Selection	**DC** | **PAD** | **flexIPAD**

DC
Measurement with constant potential.

PAD
Measurement with several potential levels.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector. The same settings can be set as in the *start parameters, see Chap. 7.3.3.1.2, p. 728*.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.7.6 CV treatment

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - CV treatment**

The device-dependent CV treatment time program command (command without feedback) allows the performance of cyclovoltammetric treatments.

Settings

Opens the settings for the cyclovoltammetric treatment.

Comment

Optional comment on the time program command.

Entry	**64 characters.**

Settings

In this dialog, you can set the properties for the cyclovoltammetric treatments.

Number of cycles for cyclovoltammetric treatment

Cycles

Number of cyclovoltammetric treatments that are to be performed in the time program. The parameterization defined in the Sweep parameters section is used for the treatment.

Input range	**1 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1000 s**

7.17.3.3.7.7 On/Off

Dialog: **Method ► Time program ► [Edit] ► New ► 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the amperometric cell on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Cell

Selection	**On** | **Off**
Default value	**On**

On
Switches the cell of the amperometric detector on.

Off
Switches the cell of the amperometric detector off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.8 Commands - Analog Out

Subwindow: **Method ▶ Time program**

NOTE

The commands under **Analog Out** are only available if an **891 Professional Analog Out** is connected.

7.17.3.3.8.1 Change range

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change range**

The device-dependent time program command **Change range** (command without feedback) of the 891 Professional Analog Out redefines the measured value range per volt in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Range/Volt

Indicates the measured value amount to be output as 1 Volt (1000 mV). The value is transferred to the device.

Input range	**0.001 to 4000000**
Default value	**(empty)** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.8.2 Change polarity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change polarity**

The device-dependent time program command **Change polarity** (command without feedback) of the 891 Professional Analog Out redefines the sign of the output voltage in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Polarity

Indicates the new sign of the output voltage.

Selection	**+ | –**
Default value	**+**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.8.3 Reset baseline

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Reset baseline**

The device-dependent time program command **Reset baseline** (command without feedback) of the 891 Professional Analog Out redefines the baseline of the output voltage in the method run. If the default value **0 mV** is applied for the parameter **Voltage offset**, then the current value of the output voltage is defined as new baseline (0 mV). If you enter a different value for the **Voltage offset**, the baseline will be moved additionally by this value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Voltage offset

Optional offset in mV, which is *additionally* used after resetting the baseline to 0 mV.

Input range	**-1000 to +1000 mV**
Default value	**0 mV**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.17.3.3.8.4 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.17.4 882 Compact IC plus - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.17.4.1 Manual control - High-pressure pump

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.17.4.2 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.17.4.3 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.17.4.4 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.17.4.4.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.17.4.5 Manual control - MCS

Tab: **Manual ► Manual control - 'Device name' ► 'MCS'**

[On]

Start MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is already running.

[Off]

Stop MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is not running.

7.17.4.6 Manual control - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are only available when an **891 Professional Analog Out** is connected.

7.17.4.6.1 Channels Out1, Out2, Aux1, Aux2

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Channel'**

NOTE

In the Manual control of the Workplace the tabs of those channels of a connected **891 Professional Analog Out** are displayed which have been activated in the start parameters of the method.

[Resetting baseline]

Sets the current measured value as new baseline.

[Properties...]

Via this button the dialog window *Properties* opens, in which you can modify the properties of the channels.

7.17.4.6.2 Properties

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Channel' ▶ Properties**

Data source

Current value

Displays the name of the data source currently assigned.

Input

Displays the name of the newly assigned data source, which has been selected with the button **[...]**.

[...]

Opens the dialog for selecting a different data source and a channel *(see chapter 5.6.6.4, page 417)*.

Channel

Current value

Displays the name of the channel of the **data source** currently assigned.

Input

Displays the name of the channel of the new data source which has been selected with the button **[...]**. If a new channel has been selected, then its unit (e.g. µS/cm in case of conductivity) will be displayed on the right to the input fields of the parameters **Range/Volt** and **Measured value offset**.

Range/Volt

Current value

Displays the measured value amount currently defined in the device and which is converted to 1 volt output signal.

Input

Input of a new measured value amount to be converted to 1 volt output signal.

Input range	**0.001 to 4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Polarity

Current value

Displays the polarity of the output voltage currently set in the device.

Input

Selection of the new sign for the output voltage.

Selection	**+ | –**
Default value	**+**

Measured value offset

Current value

Displays the measured value offset currently set in the device, put out in the unit of the current channel.

Input

Optional input of a new measured value offset, put out in the units of the channel selected in the parameter Channel (Input).

Input range	**-4000000 to +4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Voltage offset

Current value

Displays the voltage offset currently set in the device in [mV].

Input

Optional input of a new voltage offset in [mV].

Input range	**-1'000 to +1'000 mV** (Increment: **1**)
Default value	**0 mV**

[OK]

The values in the column **Input** are applied for the device and the dialog is closed.

[Cancel]

The values in the column **Input** are rejected and the dialog is closed.

[OK]

The values in the column **Input** are applied for the device. The dialog remains open.

7.18 881 Compact IC pro

7.18.1 881 Compact IC pro - Overview

NOTE

The **881 Compact IC pro** is available in various versions which differ with respect to the combination of integrated modules. The **881 Compact IC pro** is described in the online help with all possible modules.

Different versions are available for different fields of application:

- **2.881.0010 Compact IC pro - Cation**
  Compact ion chromatography system for determining anions or cations with electronic suppression.
- **2.881.0020 Compact IC pro - Anion**
  Compact ion chromatography system for determining anions with chemical suppression.
- **2.881.0030 Compact IC pro - Anion MCS**
  Compact ion chromatography system for determining anions with sequential suppression.

7.18.2 881 Compact IC pro - Configuration

Dialog: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Instrument type' - 'Device name'**

If a device of the type **881 Compact IC pro** is selected in the device table, then the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs. The properties for the various modules, the con-

nections of the modules to the main device and the GLP data can all be defined on these tabs.

7.18.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.18.2.2 Properties - High-pressure pump

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.18.2.3 Properties - Conductivity detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name' ► LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.18.2.4 Properties - Amperometric detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Amp. detector**

NOTE

The amperometric detector can only be used with the following instruments: 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus, 896 Professional Detector, 930 Compact IC Flex, 940 Professional IC Vario, 945 Professional Detector Vario.

Detector type

Shows the detector type, is read out automatically from the detector.

Connection

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

7.18.2.5 Properties - MCS

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► MCS**

The MCS (Metrohm CO_2 Suppressor) has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - MCS** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.18.2.6 Properties - Degasser

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Degasser**

The degasser has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - Degasser** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.18.2.7 Properties - Analog Out

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Analog Out**

NOTE

This tab is only available when an **891 Professional Analog Out** is connected.

Device type

Display of the device type.

Device serial number

Display of the serial number of the connected 891 Professional Analog Out.

7.18.2.8 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC

- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB #

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.18.2.9 Properties - GLP

Tab: **Configuration ▶ 'Subwindow' ▶ [Edit] ▶ Properties... ▶ 'Properties' ▶ GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.18.2.10 Load new program version

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ General ▶ [Update] ▶ Load new program version**

If it is discovered that the device to be connected has an old program version not supported by **MagIC Net**, then it must be updated. Select the device from the device table. Open the properties window with **[Edit] ▶ Properties...**. On the **General** tab, click on **[Update]** to open the **Load new program version** dialog window.

Old version

Shows the old device program version.

New version

Shows the new device program version to be loaded.

[Load]

Loads the new device program version.

NOTE

Make sure that the device is not manipulated or switched off during the loading process, and follow the instructions shown.

7.18.2.11 Monitoring

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module'**

The dialog window comprises the tabs **Date** and **Operating hours**, on which you can define the parameters for module monitoring.

7.18.2.11.1 Monitoring - Date

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring- 'Module' ▶ Date**

Monitor date

Current value

Shows the current date.

Last service

Date of the last service. This date can be selected by clicking on ... in the **Select date** dialog window and is used for monitoring (**last service + service interval = next service**).

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor date

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the date.

NOTE

Monitoring cannot be enabled until after a date has been entered in the **Last service** field.

Service interval

Interval in days after which the service for the module should be repeated. If a value is entered here, then the date in the **Next Service** field will be adjusted automatically.

Next Service

Date on which the next service is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window. After the

date has been entered, the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate which action is to be triggered automatically during start check if the time interval for the service has expired.

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.18.2.11.2 Monitoring - Operating hours

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module' ▶ Operating hours**

Operating hours

Current value

Shows the operating hours to date.

[Reset]

NOTE

This function is only available in the monitoring of the 887 Professional UV/VIS Detector.

Use this function after having replaced the corresponding lamp of the 887 Professional UV/VIS Detector. This resets the values of the parameters **Current value** and **Last service**.

Last service

Operating hours at last service. This value is used for monitoring (**last service + service interval = next service**).

Input range	**0 to 99,999 Hours**

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor operating hours

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the operating hours.

NOTE

Monitoring cannot be enabled until after a value has been entered in the **Last service** field.

Service interval

Interval in hours after which the service for the module should be repeated. If a value is entered here, then the value in the **Next Service** field will be adjusted automatically.

Next Service

Operating hours after which the next service is to be carried out. If a value is entered here, then the value in the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate what action is to be triggered automatically during start check if the time interval for the service has expired:

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.18.3 881 Compact IC pro - Method

Program part: **Method**

Start parameters, data channels and program commands can be defined for the **881 Compact IC pro** in the **Method** program part.

7.18.3.1 881 Compact IC pro - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **881 Compact IC pro** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.18.3.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.3 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.4 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.18.3.1.4.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.18.3.1.4.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.18.3.1.4.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.18.3.1.4.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)

- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume

Step	Action	Description
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**
- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.18.3.1.5 Start parameters - MCS

Tab: **Method ► Devices ► MCS**

Status

Selection	**On** | **Off**
Default value	**On**

On
The MCS (Metrohm CO2 Suppressor) is switched on when the hardware is started with **[Start HW]**.

Off
The MCS (Metrohm CO_2 Suppressor) is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.6 Start parameters - Degasser

Tab: **Method ▶ Devices ▶ Degasser**

Status

Selection	**On** | **Off**

On
The degasser is switched on when the hardware is started with **[Start HW]**.

Off
The degasser is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.7 Start parameters - Column heater

Tab: **Method ▶ Devices ▶ Column heater**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The column heater is switched on when the hardware is started with **[Start HW]**.

Off
The column heater is switched off when the hardware is started with **[Start HW]**.

Temperature

Temperature that is set for the column heater when the hardware is started with **[Start HW]**.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.8 Start parameters - Conductivity detector

Tab: **Method ► Devices ► Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.9 Start parameters - Amperometric detector

7.18.3.1.9.1 Amperometric detector

Tab: **Method ▶ Devices ▶ Amp. detector**

Mode

Selection of the measuring mode of the amperometric detector.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potential steps.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector.

Temperature

Temperature that is set in the detector when the hardware is started with **[Start HW]**.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Cell

Selection of a cell which is defined in the configuration table of the amperometric cells *(see chapter 6.13.2, page 674)*. If no cell has been selected yet, then **not defined** is displayed. Otherwise, the selected cell will be displayed with its user-defined name.

Selection	**not defined** | **Selection of amperometric cells**
Default value	**not defined**

not defined
You can also start the method when this option is selected. The cell connected to the detector is then used. In the report, the amperometric cell is then called "**not defined**", but the properties of the cell that is *actually* used will be output. **Important note:** If an intelligent cell for which the operating hours monitoring has been activated is connected to the amperometric detector, then the operating hours will be counted.

Start delay

on | off (Default value: **off**)

If this option is **enabled**, the amperometric cell is only switched on once this waiting time has elapsed.

Waiting time

Waiting time until the amperometric cell is switched on.

Input range	**0 to 99 min**
Default value	**15 min**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.9.2 DC mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ DC ▶ Settings**

In this dialog, you can set the properties of the **DC** measuring mode.

The properties are also available in the manual control *(see chapter 7.3.4.1, page 750)*.

DC potential

Potential of the working electrode in comparison to the reference electrode.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

Range

Selection of the measuring range.

Selection	**auto** | **2 nA** | **20 nA** | **200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**

auto
Automatic setting of the measuring range. This selection is not allowed with damping activated.

Damping

on | off (Default value: **off**)

Activates or deactivates the additional damping.

7.18.3.1.9.3 PAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, you can set the properties of the **PAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the PAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Potential [V]

Potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define PAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define PAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Duration

Duration of the measurement.

Input range	**1 to 2000 ms** (Increment: **1**)
Default value	**100 ms**

Range

Selection of the measuring range.

Selection	**200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**
Default value	**2 µA**

The defined potential progression is displayed in the form of a graph.

7.18.3.1.9.4 Define PAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, a new PAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**300 ms**

Potential

Potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.05 V**

7.18.3.1.9.5 flexIPAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ flexIPAD ▶ Settings**

In this dialog, you can set the properties of the **flexIPAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the flexIPAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Start potential [V]

Start potential of the step in volts.

End potential [V]

End potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define flexIPAD step* (is also triggered by a double-click on an empty line).

Edit	Edit the selected line in a separate dialog *Define flexIPAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The affected lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Start

Start time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**50 ms**

End

Ending time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**150 ms**

Range

Selection of the measuring range.

Selection	**20 µA** | **200 µA** | **2 mA**
Default value	**200 µA**

NOTE

The selection of the measuring channel (**Current** or **Charge**) takes place in the hardware assignment of the analysis *(see chapter 7.3.3.2.1, page 736)*.

The defined potential progression is displayed in the form of a graph.

7.18.3.1.9.6 Define flexIPAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ Settings ▶ flexIPAD mode settings**

In this dialog, a new flexIPAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**100 ms**

Start potential

Start potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

End potential

End potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

7.18.3.1.9.7 CV mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ CV ▶ Settings**

In this dialog, you can set the properties of the **CV** measuring mode.

Number of cycles for cyclic voltammograms

Preparing cycles

Number of cyclic voltammograms which are to be measured in the time program after **Start data acquisition** and then discarded. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Measuring cycles

Number of cyclic voltammograms which are to be measured and saved in the time program after **Start data acquisition**. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1,000 s**

7.18.3.1.10 Start parameters - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are present only if an **891 Professional Analog Out** is connected.

7.18.3.1.10.1 Data source, Polarity, Range/Volt

Tab: **Method ▶ Devices ▶ Analog Out**

Channels Out1, Out2, Aux1, Aux2

The 891 Professional Analog Out includes 4 output channels for analog voltage in the range of -1...+1 volt:

- 2 main channels **Out1**, **Out2** with high resolution, for the digital/ analog converting of chromatograms or cyclovoltammograms.
- 2 auxiliary channels **Aux1**, **Aux2** with low resolution for the digital/ analog converting of measured values such as pressure, flow, temperature, ratio eluent.

The technical specifications can be found in the device manual of the 891 Professional Analog Out.

Each channel has the following set of start parameters. These are on one tab each in the start parameters of the main device. The parameter values are sent to the 891 Professional Analog Out when starting the method.

Data source

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data source** is displayed here.

Channel

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data channel** is displayed here.

Polarity

Indicates the sign of the output voltage of the channel.

Selection	**+** | **–**
Default value	**+**

Range/Volt

Indicates a measured value which is – after using a possible **Measured value offset** – to be converted to 1 volt output voltage *(see chapter 7.8.3.1.11.3, page 916)*.

Input range	**0.001 to 4000000**
Default value	**1.000** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

[Offset..]

This button opens the dialog for defining the measured value offset and the voltage offset *(see chapter 7.8.3.1.11.2, page 915)*.

Active

on | off (Default value: **off**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.18.3.1.10.2 Offset

Tab: **Method ► Devices ► Analog Out ► Offset**

Measured value offset

Indicates a positive or negative amount (in the units of the data channel selected) every measured value is to be corrected by *(see chapter 7.8.3.1.11.3, page 916)*.

Selection	**Current value** | **Value**
Default value	**Current value**

Current value
Select this option if the offset value *currently* set in the Analog Out is to be used. This value can be found in the manual control *(see chapter 7.8.4.10, page 956)*.

Value
Select this option, if you want to enter a new measured value offset in the **Value** field.

Value

Enter a new measured value offset.

Input range	**-4000000 to +4000000**
Default value	**0.0** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful input field for the channel **Conductivity**: **±15000** µS/cm; for the channel **Current**: **±2000000** nA; for the channel **Charge**: **±4000000** nC.

Voltage offset

Value

Offset in mV, to be used on the output signal after the digital/analog conversion.

Input range	**-1000 to +1000 mV** (Increment: **1**)
Default value	**0 mV**

7.18.3.1.10.3 Using range/volt and offsets

With **Range/Volt**, you can indicate the measured value amount to be converted to 1000 mV output voltage.

If you want to correct every measured value by a certain amount, then define a corresponding **Measured value offset**. If you enter a *positive* measured value offset, it will be *added* to every measured value, if you enter a *negative* measured value offset, it will be *subtracted* from every measured value. This happens **before** the digital/analog conversion.

With **Voltage offset** you can indicate a value in mV to be used on the output signal **after** the digital/analog conversion.

The **polarity** will be applied to the resulting output signal.

Example for the channel "Conductivity" of the data source "Detector"

If the required measured values are e.g. between 15 and 35 µS/cm, you could define a measured value of **–15** (µS/cm). The measured values corrected by this offset then are between 0 and 20 µS/cm. The output voltage these offset-corrected values are converted to, depends on **Range/Volt**. Examples:

With a **Range/Volt** of 20 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

With a **Range/Volt** of 40 (µS/cm-V), 20 µS/cm are output as 0.5 V (500 mV).

With a **Range/Volt** of 10 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

You can correct the output signal by a **Voltage offset**. Example: You find out that the output voltage sometimes is slightly negative, whereas you would like to have positive output signals only. If the lowest output voltage is e.g. at –12 mV, you could consistently achieve only positive voltage values with the aid of a **Voltage offset** of 15 mV.

7.18.3.2 881 Compact IC pro - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.18.3.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.18.3.2.2 Column heater - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
Temperature	Temperature	°C	No

7.18.3.2.3 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!
- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column Metrosep A Supp 5 - 100/4.0

Injection volume 20 µL

Duration of recording 12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.18.3.2.4 Amperometric detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Current	Current	nA	Yes
Charge	Charge	nC	Yes
Current vs. Potential	Current	nA	No

NOTE

The only channels available for the output of the measured values by means of the *891 Professional Analog Out (see Chap. 7.8.3.1.11.1, p. 914)* are **Current** and **Charge**. The output of the measured values of these channels is then **time-based**.

7.18.3.3 881 Compact IC pro - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 881 Compact IC pro:

7.18.3.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.18.3.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.1.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.1.3 Gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.

Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.1.4 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.18.3.3.1.5 Measure pressure

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.18.3.3.1.6 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.18.3.3.2 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.18.3.3.2.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.2.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.18.3.3.3 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.18.3.3.3.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.3.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.18.3.3.4 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.18.3.3.4.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.18.3.3.4.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.18.3.3.5 Commands - MCS

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MCS (Metrohm CO_2 Suppressor):

7.18.3.3.5.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the MCS (Metrohm CO_2 Suppressor) on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

MCS

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.6 Commands - Degasser

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the degasser:

7.18.3.3.6.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the degasser on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Degasser

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.7 Commands - Column heater

Subwindow: **Method ► Time program**

Overview of the time program commands available for the column heater:

7.18.3.3.7.1 Measuring temperature

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure temperature**

The device-dependent time program command **Measure temperature** (command with feedback) measures the temperature in the column heater.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following type **'TP.command number.Variable name'** variables are generated by the command:

Variable name	Description	Data type
TEMP	Measured temperature [°C]	Number

7.18.3.3.8 Commands - Conductivity detector

Subwindow: **Method ► Time program**

Overview of the time program commands available for the conductivity detector:

7.18.3.3.8.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.18.3.3.8.2 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points

are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.18.3.3.8.3 Measure drift

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.18.3.3.9 Commands - Amperometric detector

Subwindow: **Method ▶ Time program**

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then the following commands may **not** be used. This is checked by the start test of the method.

Overview of the time program commands available for the amperometric detector:

7.18.3.3.9.1 Measure current

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure current**

The device-dependent **Measure current** time program command (command with feedback) measures the current.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_I	TP.'Command number.MEAS_I Measured current [nA].	Number

7.18.3.3.9.2 Measure charge

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure charge**

The device-dependent **Measure charge** time program command (command with feedback) measures the charge.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_Q	TP.'Command number.MEAS_Q Measured charge [nC].	Number

7.18.3.3.9.3 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.18.3.3.9.4 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.18.3.3.9.5 Modify mode

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Modify mode**

The device-dependent **Modify mode** time program command (command without feedback) permits a change of measuring mode: You can change the parameterization of the current measuring mode or select a different measuring mode and set its parameters.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

When the command is opened, the mode parameters which are set in the start parameters are displayed by default.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Mode

Selection of the measuring mode of the amperometric detector. The CV mode mode is not available here.

Selection	**DC** | **PAD** | **flexIPAD**

DC
Measurement with constant potential.

PAD
Measurement with several potential levels.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector. The same settings can be set as in the *start parameters, see Chap. 7.3.3.1.2, p. 728*.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.9.6 CV treatment

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - CV treatment**

The device-dependent CV treatment time program command (command without feedback) allows the performance of cyclovoltammetric treatments.

Settings

Opens the settings for the cyclovoltammetric treatment.

Comment

Optional comment on the time program command.

Entry	**64 characters.**

Settings

In this dialog, you can set the properties for the cyclovoltammetric treatments.

Number of cycles for cyclovoltammetric treatment

Cycles

Number of cyclovoltammetric treatments that are to be performed in the time program. The parameterization defined in the Sweep parameters section is used for the treatment.

Input range	**1 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1000 s**

7.18.3.3.9.7 On/Off

Dialog: **Method ▶ Time program ▶ [Edit] ▶ New ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the amperometric cell on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Cell

Selection	**On** | **Off**
Default value	**On**

On
Switches the cell of the amperometric detector on.

Off
Switches the cell of the amperometric detector off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.10 Commands - Analog Out

Subwindow: **Method ▶ Time program**

NOTE

The commands under **Analog Out** are only available if an **891 Professional Analog Out** is connected.

7.18.3.3.10.1 Change range

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change range**

The device-dependent time program command **Change range** (command without feedback) of the 891 Professional Analog Out redefines the measured value range per volt in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Range/Volt

Indicates the measured value amount to be output as 1 Volt (1000 mV). The value is transferred to the device.

Input range	**0.001 to 4000000**
Default value	**(empty)** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.10.2 Change polarity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change polarity**

The device-dependent time program command **Change polarity** (command without feedback) of the 891 Professional Analog Out redefines the sign of the output voltage in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Polarity

Indicates the new sign of the output voltage.

Selection	**+** | **–**
Default value	**+**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.10.3 Reset baseline

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Reset baseline**

The device-dependent time program command **Reset baseline** (command without feedback) of the 891 Professional Analog Out redefines the baseline of the output voltage in the method run. If the default value **0 mV** is applied for the parameter **Voltage offset**, then the current value of the output voltage is defined as new baseline (0 mV). If you enter a different value for the **Voltage offset**, the baseline will be moved additionally by this value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Voltage offset

Optional offset in mV, which is *additionally* used after resetting the baseline to 0 mV.

Input range	**-1000 to +1000 mV**
Default value	**0 mV**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.18.3.3.10.4 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.18.4 881 Compact IC pro - Manual control

Program part: Manual control

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.18.4.1 Manual control - High-pressure pump

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.18.4.2 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.18.4.3 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.18.4.4 Manual control - MSM

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'MSM'**

7.18.4.4.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.18.4.5 Manual control - MCS

Tab: **Manual ► Manual control - 'Device name' ► 'MCS'**

[On]

Start MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is already running.

[Off]

Stop MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is not running.

7.18.4.6 Manual control - Degasser

Tab: **Manual ► Manual control - 'Device name' ► 'Degasser'**

[On]

Start degasser. This is inactive if the degasser is already running.

[Off]

Stop degasser. This is inactive if the degasser is not running.

7.18.4.7 Manual control - Column heater

Tab: **Manual ► Manual control - 'Device name' ► Column heater'**

Temperature

Current value

Current column heater temperature

Input

Input of a new value for the column heater temperature.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

[On]

Switch on column heater. This is inactive if it is running.

[Off]

Switch off column heater. This is inactive if it is not running.

[Apply]

Send the parameters to the column heater.

7.18.4.8 Manual control - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are only available when an **891 Professional Analog Out** is connected.

7.18.4.8.1 Channels Out1, Out2, Aux1, Aux2

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Channel'**

NOTE

In the Manual control of the Workplace the tabs of those channels of a connected **891 Professional Analog Out** are displayed which have been activated in the start parameters of the method.

[Resetting baseline]

Sets the current measured value as new baseline.

[Properties...]

Via this button the dialog window *Properties* opens, in which you can modify the properties of the channels.

7.18.4.8.2 Properties

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Channel' ▶ Properties**

Data source

Current value

Displays the name of the data source currently assigned.

Input

Displays the name of the newly assigned data source, which has been selected with the button **[...]**.

[...]

Opens the dialog for selecting a different data source and a channel *(see chapter 5.6.6.4, page 417)*.

Channel

Current value

Displays the name of the channel of the **data source** currently assigned.

Input

Displays the name of the channel of the new data source which has been selected with the button **[...]**. If a new channel has been selected, then its unit (e.g. µS/cm in case of conductivity) will be displayed on the right to the input fields of the parameters **Range/Volt** and **Measured value offset**.

Range/Volt

Current value

Displays the measured value amount currently defined in the device and which is converted to 1 volt output signal.

Input

Input of a new measured value amount to be converted to 1 volt output signal.

Input range	**0.001 to 4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Polarity

Current value

Displays the polarity of the output voltage currently set in the device.

Input

Selection of the new sign for the output voltage.

Selection	**+** | **–**
Default value	**+**

Measured value offset

Current value

Displays the measured value offset currently set in the device, put out in the unit of the current channel.

Input

Optional input of a new measured value offset, put out in the units of the channel selected in the parameter Channel (Input).

Input range	**-4000000 to +4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Voltage offset

Current value

Displays the voltage offset currently set in the device in [mV].

Input

Optional input of a new voltage offset in [mV].

Input range	**-1'000 to +1'000 mV** (Increment: **1**)
Default value	**0 mV**

[OK]

The values in the column **Input** are applied for the device and the dialog is closed.

[Cancel]

The values in the column **Input** are rejected and the dialog is closed.

[OK]

The values in the column **Input** are applied for the device. The dialog remains open.

7.19 872 Extension Module

The **872 Extension Module** can be connected to an **850 Professional IC** and thus expand the available functional range in order to allow even very elaborate applications to be performed.

Different versions are available for different fields of application:

- **2.872.0010 Extension Module IC Pump**
  Extension module with high-pressure pump.
- **2.872.0030 Extension Module IC Module**
  Extension module with high-pressure pump, injection valve and degasser.
- **2.872.0050 Extension Module Sample Prep**
  Extension module with peristaltic pump and injection valve.

- **2.872.0060 Extension Module Liquid Handling**
  Extension module with peristaltic pump, 10-port valve and injection valve.
- **2.872.0110 Extension Module Suppression**
  Extension module with suppressor and peristaltic pump.
- **2.872.0120 Extension Module Suppression – MCS**
  Extension module with suppressor, peristaltic pump and Metrohm CO_2 Suppressor (MCS).

7.19.1 872 Extension Module IC Pump

7.19.1.1 872 Extension Module IC Pump - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a type **872 Extension Module IC Pump** device is selected in the device table, the **[Edit] ► Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.19.1.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.19.1.1.2 Properties - High-pressure pump

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.19.1.1.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.19.1.2 872 Extension Module IC Pump - Method

Program part: **Method**

The start parameters, data channels and program commands can be defined for the 872 Extension Module IC Pump in the **Method** program part.

7.19.1.2.1 872 Extension Module IC Pump - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **872 Extension Module IC Pump** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.19.1.2.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.1.2.2 872 Extension Module IC Pump - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.19.1.2.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.19.1.2.3 872 Extension Module IC Pump - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 872 Extension Module IC Pump:

7.19.1.2.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.19.1.2.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.1.2.3.1.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.1.2.3.1.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.1.2.3.1.4 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.19.1.2.3.1.5 Measure pressure

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.19.1.2.3.1.6 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.1.3 872 Extension Module IC Pump - Manual control

7.19.1.3.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.19.2 872 Extension Module IC Module

7.19.2.1 872 Extension Module IC Module - Configuration

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a type **872 Extension Module IC Module** device is selected in the device table, the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.19.2.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.19.2.1.2 Properties - High-pressure pump

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.19.2.1.3 Properties - Degasser

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Degasser**

The degasser has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - Degasser** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.19.2.1.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.19.2.2 872 Extension Module IC Module - Method

Program part: **Method**

The start parameters and program commands can be defined for the 872 Extension Module IC Module in the **Method** program part.

7.19.2.2.1 872 Extension Module IC Module - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **872 Extension Module IC Module** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.19.2.2.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.2.2.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.2.2.1.3 Start parameters - Degasser

Tab: **Method ▶ Devices ▶ Degasser**

Status

Selection	**On** | **Off**

On
The degasser is switched on when the hardware is started with **[Start HW]**.

Off
The degasser is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.2.2.2 872 Extension Module IC Module - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.19.2.2.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.19.2.2.3 872 Extension Module IC Module - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 872 Extension Module IC Module:

7.19.2.2.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.19.2.2.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.2.2.3.1.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.2.2.3.1.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.2.2.3.1.4 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.19.2.2.3.1.5 Measure pressure

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.19.2.2.3.1.6 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.2.2.3.2 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.19.2.2.3.2.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.2.2.3.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.2.2.3.2.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.2.2.3.3 Commands - Degasser

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the degasser:

7.19.2.2.3.3.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the degasser on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Degasser

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.2.3 872 Extension Module IC Module - Manual control

7.19.2.3.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.19.2.3.2 Manual control - Injection valve

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.19.2.3.3 Manual control - Degasser

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Degasser'**

[On]

Start degasser. This is inactive if the degasser is already running.

[Off]

Stop degasser. This is inactive if the degasser is not running.

7.19.3 872 Extension Module Sample Prep

7.19.3.1 872 Extension Module Sample Prep - Configuration

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a type **872 Extension Module Sample Prep** device is selected in the device table, the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.19.3.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.19.3.1.2 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.19.3.2 872 Extension Module Sample Prep - Method

Program part: **Method**

The start parameters and program commands can be defined for the 872 Extension Module Sample Prep in the **Method** program part.

7.19.3.2.1 872 Extension Module Sample Prep - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **872 Extension Module Sample Prep** in the top part of the window, then the tabs of the modules in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.19.3.2.1.1 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.3.2.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.3.2.2 872 Extension Module Sample Prep - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 872 Extension Module Sample Prep:

7.19.3.2.2.1 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.19.3.2.2.1.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.3.2.2.1.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.3.2.2.2 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.19.3.2.2.2.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.3.2.2.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.3.2.2.2.3 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.3.3 872 Extension Module Sample Prep - Manual control

7.19.3.3.1 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.19.3.3.2 Manual control - Injection valve

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.19.4 872 Extension Module Liquid Handling

7.19.4.1 872 Extension Module Liquid Handling - Configuration

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a type **872 Extension Module Liquid Handling** device is selected in the device table, the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.19.4.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.19.4.1.2 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.19.4.2 872 Extension Module Liquid Handling - Method

Program part: **Method**

The start parameters and program commands can be defined for the 872 Extension Module Liquid Handling in the **Method** program part.

7.19.4.2.1 872 Extension Module Liquid Handling - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **872 Extension Module Liquid Handling** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.19.4.2.1.1 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.4.2.1.2 Start parameters - 10-port valve

7.19.4.2.1.2.1 Start parameters

Method: **Devices ► 10-port valve**

Here the parameter values are defined which are sent to the 10-port valve at the start of the method.

Valve position selection

Selecting the corresponding option determines whether the valve remains in its current position when the method starts or whether a particular port is moved to.

Selection	**Maintain current port** | **Port**
Default value	**Maintain current port**

Maintain current port
If this option is selected, then the valve remains in its current position at the start of the method.

Port
If this option is selected, then at the start of the method the port which is selected in the parameter **Port** will be set.

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

[Port configuration]

Opens the dialog window **Port configuration** in which a user-defined name can be assigned for each port and a solution can be allocated from the solution table *(see chapter 7.6.4.2.1.2.2.1, page 819)*.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.4.2.1.2.2 Port configuration

Method **Devices ► 10-port valve ► Port configuration**

The dialog **Port configuration** displays in tabular fashion the names and optionally assigned solutions of the individual ports, and permits the editing of these port properties.

7.19.4.2.1.2.2.1 Port table

The dialog **Port configuration** shows the table of the ports.

Name

Name of the port. The default name is **Port #**, where # stands for the number of the port. A user-defined port name must be unique in the context of the respective method.

Entry	**24 characters**

Solution

Optional allocation of a ("non-intelligent") solution from the solution table.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

[Edit]

Opens the dialog window **Edit port**, in which the name for the selected port can be defined and a solution from the solution table can be allocated *(see chapter 7.6.4.2.1.2.2.2, page 819)*.

7.19.4.2.1.2.2.2 Editing port

Method **Devices ► 10-port valve ► Port configuration ► Edit port**

A user-defined name can be assigned in the dialog **Port configuration** for each port and a solution can be allocated from the solution table .

Port

Display of the number of the selected port.

Name

Name of the port. The default name is **Port #**, where # stands for the number of the port. A user-defined port name must be unique in the context of the respective method.

Entry	**24 characters**

Solution

Optional allocation of a ("non-intelligent") solution from the solution table.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

[OK]

Save the port properties.

[Cancel]

Cancel the editing of the port properties.

7.19.4.2.1.3 Start parameter - Injection valve

Tab: **Method** ▶ **Devices** ▶ **Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.4.2.2 872 Extension Module Liquid Handling - Commands

Subwindow: **Method** ▶ **Time program**

7.19.4.2.2.1 Commands - Peristaltic pump

Subwindow: **Method** ▶ **Time program**

Overview of the time program commands available for the peristaltic pump:

7.19.4.2.2.1.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.4.2.2.1.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.4.2.2.2 Commands - 10-port valve

Method **Method ▶ Time program**

Overview of the time program commands available for the 10-port valve:

7.19.4.2.2.2.1 Change port

Method **Time program ▶ Edit ▶ 'Device' - 'Module' - Change port**

The device-dependent time program command **Change port** (command with feedback) switches the 10-port valve over to the desired port. The parameters described in the following can be used as aids for a precise definition of how the switching of the ports is to be carried out.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Changing port

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

Shift direction

List of the shift modes of the 10-port valve.

Selection	**ascending** | **descending** | **automatic** | **not over**
Default value	**automatic**

ascending
The valve moves towards the target port in ascending direction. Example: if the current position is *Port 9*, and the target port is to be *Port 2*, then the valve in this mode will select the path 9 – 10 – 1 – 2.

descending
The valve moves towards the target port in descending direction. Example: if the current position is *Port 1*, and the target port is to be *Port 7*, then the valve in this mode will select the path 1 – 10 – 9 – 8 – 7.

automatic
The valve determines the shortest path to the target port on its own.

not over
The valve moves towards the target port in such a way that the port specified in the parameter "Not over" will not be traversed.

Not over

Combobox for selecting the port which is not to be traversed when the port is changed; will have no effect here if the port selected is the same as the target port. Only active when the parameter's "Not over" option is selected for the shift direction. The user-defined name, if available, is used as the 'Port name', otherwise the default name.

Selection	**'Port name' of Port 1** | **'Port name' of Port 2** | **...** | **'Port name' of Port 10**
Default value	**'Port name' of Port 10**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.4.2.2.2.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.4.2.2.3 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.19.4.2.2.3.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.4.2.2.3.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.4.2.2.3.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.4.3 872 Extension Module Liquid Handling - Manual control

7.19.4.3.1 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.19.4.3.2 Manual control - 10-port valve

Tab: **Manual control - 'Device name' ► '10-port valve'**

Current port

Shows the current port.

Port

List of the port names for selecting the target port.

Selection	**'Name Port 1'** | **'Name Port 2'** | **'Name Port 3'** | **'Name Port 4'** | **'Name Port 5'** | **'Name Port 6'** | **'Name Port 7'** | **'Name Port 8'** | **'Name Port 9'** | **'Name Port 10'**
Default value	**'Name Port 1'**

Shift direction

List of the shift modes of the 10-port valve.

Selection	**ascending** | **descending** | **automatic** | **not over**
Default value	**automatic**

ascending
The valve moves towards the target port in ascending direction. Example: if the current position is *Port 9*, and the target port is to be *Port 2*, then the valve in this mode will select the path 9 – 10 – 1 – 2.

descending
The valve moves towards the target port in descending direction. Example: if the current position is *Port 1*, and the target port is to be *Port 7*, then the valve in this mode will select the path 1 – 10 – 9 – 8 – 7.

automatic
The valve determines the shortest path to the target port on its own.

not over
The valve moves towards the target port in such a way that the port specified in the parameter "Not over" will not be traversed.

Not over

Combobox for selecting the port which is not to be traversed when the port is changed; will have no effect here if the port selected is the same as the target port. Only active when the parameter's "Not over" option is selected for the shift direction. The user-defined name, if available, is used as the 'Port name', otherwise the default name.

Selection	**'Port name' of Port 1** | **'Port name' of Port 2** | **...** | **'Port name' of Port 10**
Default value	**'Port name' of Port 10**

[Apply]

Move to the target port in the specified manner.

7.19.4.3.3 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.19.5 872 Extension Module Suppression

7.19.5.1 872 Extension Module Suppression - Configuration

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name'**

If a type **872 Extension Module Suppression** device is selected in the device table, the **[Edit] ► Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.19.5.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.19.5.1.2 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.19.5.2 872 Extension Module Suppression - Method

Program part: **Method**

The start parameters and program commands can be defined for the 872 Extension Module Suppression in the **Method** program part.

7.19.5.2.1 872 Extension Module Suppression - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **872 Extension Module Suppression** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.19.5.2.1.1 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.19.5.2.1.1.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.19.5.2.1.1.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.19.5.2.1.1.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.19.5.2.1.1.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		

Step	Action	Description
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.19.5.2.1.2 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.5.2.2 872 Extension Module Suppression - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 872 Extension Module Suppression:

7.19.5.2.2.1 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.19.5.2.2.1.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.19.5.2.2.1.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.5.2.2.2 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.19.5.2.2.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.5.2.2.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.5.3 872 Extension Module Suppression - Manual control

7.19.5.3.1 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.19.5.3.1.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.19.5.3.2 Manual control - Peristaltic pump

Tab: **Manual control ▶ Manual control - All devices - 'Device name' ▶ 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.19.6 872 Extension Module Suppression – MCS

7.19.6.1 872 Extension Module Suppression – MCS - Configuration

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a type **872 Extension Module Suppression – MCS** device is selected in the device table, the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.19.6.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.19.6.1.2 Properties - MCS

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► MCS**

The MCS (Metrohm CO_2 Suppressor) has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - MCS** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.19.6.1.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.19.6.2 872 Extension Module Suppression – MCS - Method

Program part: **Method**

The start parameters and program commands can be defined for the 872 Extension Module Suppression – MCS in the **Method** program part.

7.19.6.2.1 872 Extension Module Suppression – MCS - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **872 Extension Module Suppression – MCS** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.19.6.2.1.1 Start parameters - MCS

Tab: **Method ▶ Devices ▶ MCS**

Status

Selection	**On** | **Off**
Default value	**On**

On
The MCS (Metrohm CO2 Suppressor) is switched on when the hardware is started with **[Start HW]**.

Off
The MCS (Metrohm CO_2 Suppressor) is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.6.2.1.2 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.19.6.2.1.2.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.19.6.2.1.2.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.19.6.2.1.2.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)

- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.19.6.2.1.2.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino

Step	Action	Description
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**
- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.19.6.2.1.3 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

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Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.19.6.2.2 872 Extension Module Suppression – MCS - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 872 Extension Module Suppression – MCS:

7.19.6.2.2.1 Commands - MCS

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MCS (Metrohm CO_2 Suppressor):

7.19.6.2.2.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the MCS (Metrohm CO_2 Suppressor) on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

MCS

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.6.2.2 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.19.6.2.2.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.19.6.2.2.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.6.2.2.3 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.19.6.2.2.3.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.19.6.2.2.3.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.19.6.3 872 Extension Module Suppression - Manual control

7.19.6.3.1 Manual control - MCS

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'MCS'**

[On]

Start MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is already running.

[Off]

Stop MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is not running.

7.19.6.3.2 Manual control - MSM

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'MSM'**

7.19.6.3.2.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.19.6.3.3 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

	-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.20 863 Compact Autosampler

Compact sample changer with fixed sample rack for simple automation tasks.

7.20.1 863 Compact Autosampler - Configuration

Dialog: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Instrument type' - 'Device name'**

If a type **863 Compact Autosampler** device is selected in the device table, the menu item **[Edit] ▶ Properties...** can be used to open the dialog window **Properties - 'Device name' - 'Device type'** with the device-specific tabs.

7.20.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.20.1.2 Properties - Tower

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Tower**

Here the tower properties are displayed.

Tower parameters

Maximum stroke path

Entry of the lowest permitted lift position. A lift height of **0 mm** corresponds to the home position, i.e. the lift is moved right to the top.

Input range	**0 to 120 mm**
Default value	**120 mm**

Work position

Work position for the tower.

Input range	**0 to Maximum stroke path mm**
Default value	**0 mm**

7.20.1.3 Properties - Rack

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Rack**

Here the sample rack-specific data is displayed.

Number of positions

Display showing the number of positions on the rack.

7.20.1.4 Properties - Starting position

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Starting position**

On the **Starting position** tab, a position can be defined which is automatically approached when the sample changer is initialized.

Move to starting position

on | off (Default value: **off**)

If this option is enabled, the position defined here is moved to when initializing the device. To do this, the lift either moves to the Shift position or remains in its current position if that is higher than the Shift position *(see page 663)*.

Tower

Selection of the tower on the sample changer for moving to the desired position.

Only editable for **Move to starting position** = **on** and if the corresponding sample changer has two towers, otherwise inactive.

Selection	**1** | **2**
Default value	**1**

Move

Selection of the target position which is to be approached:

Editable only for **Move to starting position** = **on**, otherwise inactive.

Selection	**Rack position** | **Special beaker** | **External position**
Default value	**Rack position**

Rack position
Predefined position on the rack. The lift is lowered at this time to the work position defined for that position.

Special beaker
Special position on the rack defined in the rack properties. The lift is lowered at this time to the work position defined for that position.

External position
External position which is defined for the Swing Head mounted to the tower. The lift is lowered to the work position defined for that position. This option is only available if a Swing Head is mounted to the tower.

Number

Specification of the number of the rack position, special beaker or external position.

Editable only for **Move to starting position** = **on**, otherwise inactive.

for Rotate = Rack position

Input range	**1 to 999**
Default value	**1**

for Move = Special beaker

Input range	**1 to 16**
Default value	**1**

for Move = External position

Input range	**1 to 4**
Default value	**1**

7.20.1.5 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.20.2 863 Compact Autosampler - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the 863 Compact Autosampler.

7.20.2.1 863 Compact Autosampler - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **863 Compact Autosampler** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.20.2.1.1 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.20.2.2 863 Compact Autosampler - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 863 Compact Autosampler:

7.20.2.2.1 Commands - Tower

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the tower of the sample changer:

7.20.2.2.1.1 Move (Rack)

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Move**

The device-dependent time program command **Move** (command with feedback) turns the rack until the desired position is reached on the sample changer.

Purpose

Rotate

Selecting the target position on the rack:

Selection	**Sample position** | **Rack position**
Default value	**Sample position**

Sample position
Position defined for the current determination in the Run window as the parameter **Position**.

Rack position
Predefined position on the rack.

Number

Specification of the number of the rack position. This parameter is visible only for **Move** = **Rack position** or **Move** = **Special beaker**.

Input range	**1 to 36**
Default value	**1**

Parameters

Rotation direction

Selection of the shift direction.

Selection	**auto** | **+** | **–**
Default value	**auto**

auto
The shift direction with the smaller rotation angle is selected automatically.

+
It turns counterclockwise.

–
It turns clockwise.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.20.2.2.1.2 Lift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Lift**

With the device-dependent time program command **Lift** (command with feedback), the lift on the tower of the sample changer moves to the desired position.

Purpose

Lift position

Entering the desired lift position in mm or selection of one of the lift positions predefined for the rack. A lift height of **0 mm** corresponds to the home position. Here the lift is moved to the uppermost stop.

Input range	**0.0 to 126.0 mm**
Selection	**Work position** | **Shift position**
Default value	**Work position**

NOTE

Please take care that no lift positions exceed the maximum stroke path specified in the tower properties of the device.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.20.2.2.2 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.20.2.2.2.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.20.2.2.2.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.20.2.2.3 Commands - General

Subwindow: **Method ▶ Time program**

Overview of the general time program commands available for the 858 Professional Sample Processor:

7.20.2.2.3.1 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.20.2.2.3.2 Reserve

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - General ▶ Reserve**

The device-dependent time program command **Reserve** (command without feedback) reserves the sample changer including all connected MSB devices (Dosino, stirrer, Remote Box, etc.), after it has been released, during an ongoing determination for a given workplace again.

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.20.3 863 Compact Autosampler - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.20.3.1 Manual control - Tower

Tab: **Manual ► Manual control - 'Device name' ► Tower**

Rack position

Current value

Shows the current rack position.

Input

Entry or selection of the rack position to be approached.

Input range	**1 to 36**
Default value	**1**

[Start]

Starts approaching the entered position. After the start, the button changes to **[Stop]** and the two arrow keys become disabled (gray).

[Stopping]

Stops moving to the rack position immediately.

Moves to current rack position –1.

Moves to current rack position +1.

Lift position

Current value

Current lift position.

Input

Entry or selection of the lift position that is to be approached for the current rack position (regular beaker, special beaker, external position).

Input range	**0 to Max. stroke path mm**
Default value	**0 mm**
Selection	**Work position** | **Shift position**

[Start]

Moves the lift to the desired position.

The lift moves upwards for as long as this button is pressed.

Moves the lift downwards for as long as this button is pressed.

7.20.3.2 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 ... +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 ... +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.21 858 Professional Sample Processor

7.21.1 858 Professional Sample Processor - Overview

NOTE

The **858 Professional Sample Processor** is available in various versions that differ in the combination of integrated modules. The **858 Professional Sample Processor** is described in the online help with all possible modules.

Different versions are available for different fields of application:

- **2.858.0010 Professional Sample Processor**
  Sample changer for ion chromatography without peristaltic pump.
- **2.858.0020 Professional Sample Processor**
  Sample changer for ion chromatography with integrated two-channel peristaltic pump.
- **2.858.0030 Professional Sample Processor**
  Sample changer for ion chromatography with integrated two-channel peristaltic pump and injection valve.

7.21.2 858 Professional Sample Processor - Configuration

Dialog: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name'**

If a device of type **858 Professional Sample Processor** is selected in the device table, the the menu item **[Edit] ► Properties...** opens the dialog window **Properties - 'Device name' - 'Device type'** with the device-specific tabs.

The device can be initialized if necessary by means of the **[Initialize]** menu item in the device table *(see chapter 6.5.2.1, page 605)*.

7.21.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.21.2.2 Properties - Tower

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Tower**

NOTE

With the 858 Professional Sample Processor and the 919 IC Autosampler plus, the properties of the tower, including the Swing Head attached to it, are displayed on the **Tower** tab. In the case of the 814 USB Sample Processor and the 815 Robotic USB Sample Processor XL, the device versions with 1 tower have 1 tab **Tower 1**; device versions with 2 towers have 2 tabs **Tower 1** and **Tower 2**.

Tower parameters

Max. stroke path

Entry of the lowest permitted lift position. A lift height of **0 mm** corresponds to the "home position", i.e. the lift is moved all the way to the top.

Input range	**0 to 235 mm**
Default value	**235 mm**

Min. beaker radius

Definition of the minimum radius which the beakers used on the rack must have. If the lift is moved to the work position, the beaker radiuses defined in the **Rack table***(see chapter 6.11.2.1, page 659)* for general **Sample positions** *(see chapter 6.11.3.2, page 662)* and **Special beakers** *(see chapter 6.11.3.4, page 664)* will be compared with the **Min. beaker radius**. If this minimum beaker radius is not achieved, the run is stopped and an error message is output. No check will be made if **off** is enabled.

Selection	**1.0 - 100.0 mm** | **off**
Default value	**off**

Lift rate

Lift rate for the manual control of the tower.

Input range	**3 to 25 mm/s**
Default value	**25 mm/s**

Axial distance

Distance between the axis of rotation of the sample rack and the swing axis of the robotic arm.

Input range	**100.0 to 300.0 mm**

814 USB Sample Processor

Selection	**166.0 mm**
Default value	**166.0 mm**

815 Robotic USB Sample Processor XL

Selection	**196.0 mm**
Default value	**196.0 mm**

858 Professional Sample Processor

Selection	**166.0 mm**
Default value	**166.0 mm**

919 IC Autosampler plus

Selection	**196.0 mm**
Default value	**196.0 mm**

Swing Head

This parameter is only shown only if a Swing Head is mounted on the tower.

Serial number

Shows the serial number of the Swing Head.

Swing position

Lift position that is valid for all four external positions and at which the robotic arm turns to the external positions.

Input range	**0 to 235 mm**
Default value	**0 mm**

Rinse position

Rinse position valid for all 4 external positions.

Input range	**0 to 235 mm**
Default value	**0 mm**

[Configuration]

Opens the **Robotic arm configuration** dialog window *(see chapter 7.21.2.7, page 1427)*, in which the properties of the robotic arm can be edited.

Table for external positions

The properties for the four possible external positions for the robotic arm mounted on the Swing Head are shown in the table. The table cannot be edited directly.

External position

Number of the external position.

Angle [°]

Swing angle for external position.

Work position [mm]

Work position for external position.

[Edit]

Opens the **External position #** dialog window *(see chapter 7.21.2.8, page 1428)*, in which the parameters for the external position selected from the table can be edited.

7.21.2.3 Properties - Rack

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Rack**

The **Rack** tab shows the specific data of the attached rack.

Rack name

Shows the name of the rack attached. If no rack is attached, then "**-----**" is shown.

Rack code

Shows the rack code of the attached rack. The rack code corresponds to the arrangement of magnets on the base of the rack and is read out by the sample changer in order to recognize the rack. If no rack is in position, then the display will be empty.

Number of positions

Shows the number of positions on the rack. If no rack is in position, then the display will be empty.

Shift rate

Sample rack shift rate for manual control.

Input range	**3 to 20 °/s**
Default value	**20 °/s**

[Rack data]

Opens the **Rack data** dialog window *(see chapter 6.11.3.1, page 661)*, in which the data of the attached rack can be viewed and edited.

[Initialize rack]

Initializes the attached rack. This means that the rack, the lift and the robotic arm are reset, the rack code is read out and the respective rack data is transferred to the sample changer.

7.21.2.4 Properties - Starting position

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Starting position**

On the **Starting position** tab, a position can be defined which is automatically approached when the sample changer is initialized.

Move to starting position

on | off (Default value: **off**)

If this option is enabled, the position defined here is moved to when initializing the device. To do this, the lift either moves to the Shift position or remains in its current position if that is higher than the Shift position *(see page 663)*.

Tower

Selection of the tower on the sample changer for moving to the desired position.

Only editable for **Move to starting position** = **on** and if the corresponding sample changer has two towers, otherwise inactive.

Selection	**1** | **2**
Default value	**1**

Move

Selection of the target position which is to be approached:

Editable only for **Move to starting position** = **on**, otherwise inactive.

Selection	**Rack position** | **Special beaker** | **External position**
Default value	**Rack position**

Rack position
Predefined position on the rack. The lift is lowered at this time to the work position defined for that position.

Special beaker
Special position on the rack defined in the rack properties. The lift is lowered at this time to the work position defined for that position.

External position
External position which is defined for the Swing Head mounted to the tower. The lift is lowered to the work position defined for that position. This option is only available if a Swing Head is mounted to the tower.

Number

Specification of the number of the rack position, special beaker or external position.

Editable only for **Move to starting position** = **on**, otherwise inactive.

for Rotate = Rack position

Input range	**1 to 999**
Default value	**1**

for Move = Special beaker

Input range	**1 to 16**
Default value	**1**

for Move = External position

Input range	**1 to 4**
Default value	**1**

7.21.2.5 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB #

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.21.2.6 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.21.2.7 Configuration robotic arm

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Tower ► [Configuration] ► Configuration robotic arm**

The specific settings for each robotic arm mounted on a Swing Head can be made in the **Configuration robotic arm** dialog window.

Swing offset

Swing angle offset for specific robotic arm model. This value must be set according to the leaflet supplied with the robotic arm.

Input range	**-270.0 to 270.0 °**
Default value	**0.0 °**

Maximum swing range

Maximum usable swing range for specific robotic arm model. Each robotic arm model displays a different value on the basis of its construction. This value must be set according to the leaflet supplied with the robotic arm and can also be reduced as required.

Input range	**0.0 to 330.0 °**
Default value	**60.0 °**

Swing radius

The swing radius depends on the length of the robotic arm and, together with the axial distance, is the most important parameter for exact movement to a rack position. This value must be set according to the leaflet supplied with the robotic arm.

Input range	**30.0 to 300.0 mm**
Default value	**110.0 mm**

Rotation offset

Offset from the middle of the tower to the middle of the robotic arm; normally, this value does not have to be changed. If a robotic arm must be mounted on the tower so that it is offset to one side, then this value can be determined by the service technician during rack adjustment.

Input range	**-270.0 to 270.0 °**
Default value	**0.0 °**

Swing direction

The swing direction of the robotic arm depends on the type of robotic arm.

Selection	**+ | –**
Default value	**+**

+
Clockwise rotation.

–
Counterclockwise rotation.

7.21.2.8 External position

Dialog window: **Configuration ► Devices ► [Edit] ► Properties… ► Properties - 'Device type' - 'Device name' ► Tower ► [Edit] ► External position #**

A **Swing angle** and a specific **Work position** can be defined for each external position in the **External position #** dialog window. **Shift position** and **Rinse position** can only be commonly defined for all four external positions. No **Special position** can be defined for external positions.

Angle

Definition of the swing angle for the selected external position. The offset is comprised of a design-specific angle (approx. 8 - 9°) and the robotic arm offset from the robotic arm properties *(see chapter 7.21.2.7, page 1427)*. The maximum swing range is also defined in the robotic arm properties.

Input range	**(Offset) to (Offset + max. swing range) °**
Default value	**60.0 °**

Work position

Definition of the work position for the selected external position.

Input range	**0 to 235 mm**
Default value	**0 mm**

7.21.3 858 Professional Sample Processor - Method

Program part: **Method**

In the **Method** program part, start parameters and program commands can be defined for the **858 Professional Sample Processor**.

7.21.3.1 858 Professional Sample Processor - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **858 Professional Sample Processor** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.21.3.1.1 Start parameters - Rack

Tab: **Method ▶ Devices ▶ Rack**

Rack name

Name of the rack which must be initialized on the sample changer when the hardware is started **[Start HW]**. If no rack is initialized, the method is not carried out.

Selection	**not defined** | **Rack names from the rack table**
Default value	**not defined**

not defined
The method is always carried out.

Rack names from the rack table
If a rack is selected, the method is only carried out if it is initialized in the sample changer. There is no automatic check to ensure that the rack is in position and that it is the correct rack. In order to check this during the run, the command **Initialize** must be inserted in the time program for the module **Rack**.

7.21.3.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.21.3.1.3 Start parameters - Peristaltic pump

Tab: **Method ► Devices ► Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.21.3.1.4 Start parameters - Peripherals Tower

Tab: **Method ► Devices ► Peripherals Tower**

Pump 1

Status

Selection	**on** | **off**
Default value	**off**

on
Pump 1 is switched on when the hardware is started with **[Start HW]**.

off
Pump 1 is switched off when the hardware is started with **[Start HW]**.

Solution

Selection list for the solution to be transported by Pump 1 when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Pump 2

Status

Selection	**on** | **off**
Default value	**off**

on
Pump 2 is switched on when the hardware is started with **[Start HW]**.

off
Pump 2 is switched off when the hardware is started with **[Start HW]**.

Solution

Selection list for the solution to be transported by Pump 2 when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Tower stirrer

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The settings have no effect.

Status

Selection	**on** | **off**
Default value	**off**

on
The tower stirrer is switched on when the hardware is started with **[Start HW]**.

off
The tower stirrer is switched off when the hardware is started with **[Start HW]**.

Rate

Enter the stirring rate

Input range	**-15 to 15**
Default value	**8**

7.21.3.2 858 Professional Sample Processor - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 858 Professional Sample Processor:

7.21.3.2.1 Commands - Tower

Subwindow: **Method ▶ Time program**

Overview of the time program commands assigned to the tower of the sample changer:

7.21.3.2.1.1 Rotate (Rack)

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Rotate (rack)**

The device-dependent **Rotate (rack)** time program command (command with feedback) rotates the rack until the desired position in relation to the tower is reached.

Purpose

Rotate

Selection of the target position on the rack.

Selection	**Sample position** | **Rack position** | **Special beaker** | **Relative angle**

Sample position
Position defined for the current determination in the Run window as the parameter **Position**.

Rack position
Predefined position on the rack.

Special beaker
Special position on the rack defined in the rack properties.

Relative angle
Rotate the rack relative to the current position by the specified rotation angle. This function can be used, for example, to remove vial caps automatically.

Number

Specification of the number of the rack position. This parameter is visible only for **Rotate** = **Rack position** or **Rotate** = **Special beaker**. The number can also be defined with the aid of the formula editor (Σ).

Input range	**1 to 999**
Default value	**1**

Rotation angle

Specification of the relative rotation angle. This parameter is displayed only for **Rotate** = **Relative angle**.

Input range	**–359.90 to 359.90 °**
Default value	**5.00 °**

Beaker test

on | off (Default value: **off**)

If this option is enabled, a beaker test is carried out. In this case, the action to be carried out can be selected if the beaker sensor defined for the rack does not detect a beaker at the target position. If the robotic arm is selected as beaker sensor, then a Swing Head must be installed and a work position also defined in the rack data must be defined in such a way that contact exists between the beaker sensor and the beaker. This work position will be automatically moved to for beaker recognition after the command **Move**.

Selection	**Display message | Cancel determination | Cancel determination and series**

Display message
A message is displayed and the determination is canceled.

Cancel determination
The determination is canceled and the next determination of the series is started.

Cancel determination and series
Both the determination and the series will be canceled.

Parameters

Rotation speed

Selection of the rate at which the rack rotates.

Input range	**3 to 20 °/s**
Default value	**20 °/s**

Rotation direction

Selection of the shift direction.

Selection	**auto | + | –**
Default value	**auto**

auto
The rotation direction with the smaller rotation angle is selected automatically.

+
It is rotated in the direction of **ascending** rack positions. Whether this requires clockwise or counterclockwise rotation depends on the rack.

–
It is rotated in the direction of **descending** rack positions. Whether this requires clockwise or counterclockwise rotation depends on the rack.

Swing rate speed

Selects the rate of the robotic arm when moving to a rack position or a special beaker (only with multiple row racks).

Input range	**10 to 55 °/s**
Default value	**55 °/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.1.2 Lift

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Lift**

With the device-dependent time program command **Lift** (command with feedback), the lift on the tower of the sample changer moves to the desired position.

Purpose

Lift position

Entering the desired lift position in mm or selection of one of the lift positions predefined for the rack. A lift height of **0 mm** corresponds to the home position. Here the lift is moved to the uppermost stop.

Input range	**0.0 to 235.0 mm**
Selection	**Work position** | **Shift position** | **Rinse position** | **Special position** | **Home position**
Default value	**Work position**

NOTE

Please take care that no lift positions exceed the maximum stroke path specified in the tower properties of the device.

Parameters

Lift rate

Selection of the speed for moving the lift.

Input range	**3 to 25 mm/s**
Default value	**25 mm/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.1.3 Swing

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Swing**

The device-dependent **Swing** time program command (command with feedback) is used to swing the robotic arm until the desired position is reached.

Purpose

Swing

Selection of the target position for the robotic arm.

Selection	**External position** | **Maximum angle** | **Relative angle**

External position
Swing to one of the 4 external positions defined per tower, which are defined in the tower properties of the Sample Processor.

Maximum angle
Swing the robotic arm to the maximum permissible angle value in the robotic arm properties.

Relative angle
Swing by the specified swing angle relative to the current position. This function can be used, for example, to automatically remove vial caps.

Number

Indicates the number of the external position which is to be swung to. This parameter is displayed only for **Swing** = **External position**. The number can also be defined with the aid of the formula editor (Σ).

Input range	**1 to 4 (depending on target position)**
Default value	**1**

Swing angle

Angle by which the robotic arm is to be swung relative to the current position. This parameter is visible only for **Swing** = **Relative angle**.

Input range	**–180 to 180 °**
Default value	**10 °**

Parameters

Swing rate speed

Rate of the robotic arm when swinging to an external position or a particular angle.

Input range	**10 to 55 °/s**
Default value	**55 °/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.2 Commands - Rack

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the rack:

7.21.3.2.2.1 Initialize

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Initialize**

The device-independent time program command **Initialize** (command with feedback) initializes the rack positioned on the sample changer.

Rack test

on | off (Default value: **on**)

If this option is enabled, the rack attached will be checked.

Test rack

Select the rack to be positioned on the sample changer. The rack attached will be checked to ensure it is the one specified.

Selection	**Racks from the rack table**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.3 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.21.3.2.3.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.3.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.3.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.21.3.2.4 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.21.3.2.4.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.4.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 … 64 characters**

7.21.3.2.5 Commands - Peripherals Tower

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peripheral devices assigned to the tower:

7.21.3.2.5.1 Pump # On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Pump # On/Off**

The device-dependent time program command **Pump # On/Off** (command without feedback) switches the respective pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.5.2 Tower stirrer On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Tower stirrer On/Off**

The device-dependent time program command **Tower stirrer On/Off** (command without feedback) switches the tower stirrer on/off and sets the value for the stirring rate.

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The command is ignored in the run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Stirrer

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Rate

Rate of the stirrer.

Input range	**-15 to 15 (without 0)**
Default value	**3**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.21.3.2.6 Commands - General

Subwindow: **Method ▶ Time program**

Overview of the general time program commands available for the 858 Professional Sample Processor:

7.21.3.2.6.1 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.21.3.2.6.2 Reserve

Dialog window: **Method ► Time program ► Edit ► 'Device' - General ► Reserve**

The device-dependent time program command **Reserve** (command without feedback) reserves the sample changer including all connected MSB devices (Dosino, stirrer, Remote Box, etc.), after it has been released, during an ongoing determination for a given workplace again.

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.21.4 858 Professional Sample Processor - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.21.4.1 Manual control - Tower

Tab: **Manual ► Manual control - 'Device name' ► Tower**

Rack position

Current value

Shows the current rack position.

Input

Enter or select the rack position to be moved to.

Input range	**1 to n (depending on rack)**
Default value	**1**
Selection	**Special beaker 1 ... 16**

[Start]

Start moving to the specified position. After the start, the button changes to **[Stop]** and the two arrow keys become inactive (gray).

[Stop]

Stop moving to current rack immediately.

Move to current rack position -1.

Move to current rack position +1.

Lift position

Current value

Current lift position.

Input

Enter or select the lift position that is to be moved to for the current rack position (normal beaker, special beaker, external position).

Input range	**0 to Max. stroke path mm**
Default value	**0 mm**
Selection	**Work position** | **Shift position** | **Rinse position** | **Special position** | **Home position**

[Start]

Move lift to the desired position.

[Stop]

Stop moving to lift position immediately.

The lift continues moving up as long as this button is pressed.

The lift continues moving down as long as this button is pressed.

Robotic arm position

Current value

Current position (angle) of the robotic arm on the tower.

Input

Enter or select the robotic arm position to be moved to.

Input range	**0.0 to 330.0 °**
Default value	**0.0 °**
Selection	**External 1** | **External 2** | **External 3** | **External 4**

[Start]

Move robotic arm to the desired position.

[Stop]

Immediately stop the action which was triggered with **[Start]**.

The robotic arm continues moving to the left as long as this button is pressed.

The robotic arm continues moving to the right long as this button is pressed.

[Configure rack]

Open dialog window **Rack configure 'Rack name'** *(see chapter 7.11.4.5, page 1067)*.

7.21.4.2 Manual control - Rack

Tab: **Manual ► Manual control - 'Device name' ► Rack**

[Initialize rack]

Initialize rack that is in position.

7.21.4.3 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.21.4.4 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.21.4.5 Manual control - Peripheral devices

Tab: **Manual control ► Manual control - All Devices - 'Device name' ► Peripherals Tower**

Tower stirrer - Rate

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The settings have no effect.

Current value

Current rate of the tower stirrer.

Input

Enter the rate of the tower stirrer.

Input range	**-15 to 15 (without 0)**
Default value	**Current value**

[Apply]

Send the set parameters to the stirrer.

[On]

Start the stirrer with the set parameters. This is inactive if the stirrer is running.

[Off]

Stop the stirrer. This is inactive if the stirrer is not running.

Pump 1

[On]

Start pump 1 with the set parameters. This is inactive if the pump is running.

[Off]

Stop pump 1. This is inactive if the pump is not running.

Pump 2

[On]

Start pump 2 with the set parameters. This is inactive if the pump is running.

[Off]

Stop pump 2. This is inactive if the pump is not running.

7.21.4.6 Configuring the rack

Dialog window: **Manual control ► Manual control - All instruments - 'Instrument name' ► Rack ► [Configure rack] ► Configure 'rack name' rack**

Rack position

Current position

Shows the current rack position.

Special beaker

Selection of the special beaker to which the current rack position is to be assigned.

Input range	**1 to 16**

[Assign]

Assigns the current rack position to the selected special beaker.

NOTE

If an external position is selected as current position, it cannot be assigned to a special beaker.

Lift position

Current position

Shows the current lift position in mm.

Work position for

If this option is selected, the current lift position is assigned to the work position of the tower, of a special beaker or of an external position of the robotic arm.

Selection	**Tower** | **Special beaker 1 - 16** | **External 1 - 4**
Default value	**Tower**

Rinse position for

If this option is selected, the current lift position is assigned to the rinse position of the tower or of the external position of the robotic arm.

Selection	**Tower** | **External positions**
Default value	**Tower**

Shift position for

If this option is selected, the current lift position is assigned to the shift position of the tower.

Selection	**Tower**

Special position for

If this option is selected, the current lift position is assigned to the special position of the tower.

Selection	**Tower**

Robotic arm position

If this option is selected, the current lift position is assigned to the swing position of the robotic arm.

Selection	**External positions**

[Assign]

Assigns current lift position to selected position

Robotic arm position

Current position

Shows the current position of the robotic arm in °.

External position

Selection of the external position to which the current robotic arm position is to be assigned.

Selection	**External 1** | **External 2** | **External 3** | **External 4**

[Assign]

Assigns the current robotic arm position to the selected external position.

7.22 850 Professional IC

7.22.1 850 Professional IC - Overview

NOTE

The **850 Professional IC** is available in numerous versions that differ in the combination of integrated modules. The **850 Professional IC** is described in the online help with all possible modules.

Different versions are available for different fields of application:

- **850.1010 Professional IC Cation**
  Ion chromatography system for determining anions or cations without suppression.
- **850.1030 Professional IC Cation Prep 1**
  Ion chromatography system for determining anions or cations without suppression in combination with sample preparation such as ultrafiltration and dialysis.
- **850.1050 Professional IC Cation Prep 2**
  Ion chromatography system for determining anions or cations without suppression after sample preparation. The system is suitable for integrating the Metrohm inline sample preconcentration, inline matrix elimination or inline calibration.
- **850.1210 Professional IC Cation LP-Gradient**
  Ion chromatography system with low-pressure gradient but without suppression. The device may be combined with any types of separation and detection for which no suppression is necessary.
- **850.1220 Professional IC Cation HPG**
  Ion chromatography system for high-pressure gradients without suppression. The device may be combined with any types of separation and detection for which no suppression is necessary.
- **850.2010 Professional IC Anion**
  Ion chromatography system for determining anions with chemical suppression.
- **850.2030 Professional IC Anion MCS**
  Ion chromatography system for determining anions or cations with sequential suppression.
- **850.2050 Professional IC Anion MSM-HC**
  Ion chromatography system for determining anions or cations with *high-capacity* chemical suppression.
- **850.2070 Professional IC Anion MSM-HC MCS**
  Ion chromatography system for determining anions with *high-capacity* sequential suppression.

- **850.2110 Professional IC Anion MCS Prep 1**
  Ion chromatography system for determining anions with sequential suppression in combination with inline sample preparation techniques such as ultrafiltration or dialysis.
- **850.2120 Professional IC Anion MSM-HC MCS Prep1**
  Ion chromatography system for determining anions with *high-capacity* sequential suppression in combination with inline sample preparation techniques such as ultrafiltration or dialysis.
- **850.2140 Professional IC Anion MSM-HC MCS Prep 2**
  Ion chromatography system for determining anions with *high-capacity* sequential suppression. At the same time, it allows fully automatic sample preparation when inline sample preconcentration, inline matrix elimination or inline calibration is necessary.
- **850.2150 Professional IC Anion MCS Prep 2**
  Ion chromatography system for determining anions or cations with sequential suppression. At the same time, it allows fully automatic sample preparation when inline sample preconcentration, inline matrix elimination or inline calibration is necessary.
- **850.2180 Professional IC Anion MSM-HC MCS Prep 3**
  Ion chromatography system for determining anions with *high-capacity* sequential suppression with simultaneous inline neutralization or inline cation removal.
- **850.2190 Professional IC Anion MCS Prep 3**
  Ion chromatography system for determining anions with sequential suppression with simultaneous inline neutralization elimination or inline cation removal.
- **850.2210 Professional IC Anion MCS LPG**
  Ion chromatography system for determining anions with sequential suppression and low-pressure gradient.
- **850.2220 Professional IC Anion MCS HPG**
  Ion chromatography system for determining anions with sequential suppression and binary high-pressure gradient.
- **850.2230 Professional IC Anion MSM-HC MCS LPG**
  Ion chromatography system for determining anions with *high-capacity* sequential suppression and low-pressure gradient.
- **850.2240 Professional IC Anion MSM-HC MCS HPG**
  Ion chromatography system for determining anions with *high-capacity* sequential suppression and binary high-pressure gradient.
- **850.2250 Professional IC Anion MSM-HC LP-Gradient**
  Ion chromatography system for determining anions with high-capacity chemical suppression and low-pressure gradient. It can be operated with various types of detection.
- **850.2260 Professional IC Anion MSM-HC HPG**
  Ion chromatography system for determining anions with high-capacity chemical suppression and binary high-pressure gradient. It can be operated with various types of detection.

- **850.3000 Professional IC AnCat Nonsuppressed**
  Ion chromatography system for determining anions and cations without suppression.
- **850.3010 Professional IC AnCat**
  Ion chromatography system for the determination of cations without suppression and of anions optionally with or without chemical suppression.
- **850.3030 Professional IC AnCat MCS**
  Ion chromatography system for the determination of cations without suppression and of anions optionally with or without sequential suppression.
- **850.3040 Professional IC AnCat MSM-HC MCS**
  Ion chromatography system for the determination of cations without suppression and of anions optionally with or without *high-capacity* sequential suppression.

7.22.2 850 Professional IC - Configuration

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name'**

If a device of the type **850 Professional IC** is selected in the device table, then the **[Edit] ▶ Properties…** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs. The properties for the various modules, the connections of the modules to the main device and the GLP data can all be defined on these tabs.

7.22.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.22.2.2 Properties - High-pressure pump

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.22.2.3 Properties - Conductivity detector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Instrument type' - 'Device name' ▶ LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.22.2.4 Properties - Amperometric detector

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Amp. detector**

NOTE

The amperometric detector can only be used with the following instruments: 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus, 896 Professional Detector, 930 Compact IC Flex, 940 Professional IC Vario, 945 Professional Detector Vario.

Detector type

Shows the detector type, is read out automatically from the detector.

Connection

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

7.22.2.5 Properties - MCS

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ MCS**

The MCS (Metrohm CO_2 Suppressor) has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - MCS** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.22.2.6 Properties - Degasser

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Degasser**

The degasser has no configurable properties apart from the monitoring parameters.

[Monitoring]

Opens the dialog window **Monitoring - Degasser** in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.22.2.7 Properties - Analog Out

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Analog Out**

NOTE

This tab is only available when an **891 Professional Analog Out** is connected.

Device type

Display of the device type.

Device serial number

Display of the serial number of the connected 891 Professional Analog Out.

7.22.2.8 Properties - Connections

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devi-

ces are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.22.2.9 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.22.2.10 Load new program version

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ General ▶ [Update] ▶ Load new program version**

If it is discovered that the device to be connected has an old program version not supported by **MagIC Net**, then it must be updated. Select the device from the device table. Open the properties window with **[Edit] ▶ Properties...**. On the **General** tab, click on **[Update]** to open the **Load new program version** dialog window.

Old version

Shows the old device program version.

New version

Shows the new device program version to be loaded.

[Load]

Loads the new device program version.

NOTE

Make sure that the device is not manipulated or switched off during the loading process, and follow the instructions shown.

7.22.2.11 Monitoring

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring - 'Module'**

The dialog window comprises the tabs **Date** and **Operating hours**, on which you can define the parameters for module monitoring.

7.22.2.11.1 Monitoring - Date

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ 'Module' ▶ [Monitoring] ▶ Monitoring- 'Module' ▶ Date**

Monitor date

Current value

Shows the current date.

Last service

Date of the last service. This date can be selected by clicking on ... in the **Select date** dialog window and is used for monitoring (**last service + service interval = next service**).

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor date

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the date.

NOTE

Monitoring cannot be enabled until after a date has been entered in the **Last service** field.

Service interval

Interval in days after which the service for the module should be repeated. If a value is entered here, then the date in the **Next Service** field will be adjusted automatically.

Next Service

Date on which the next service is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window. After the date has been entered, the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate which action is to be triggered automatically during start check if the time interval for the service has expired.

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.22.2.11.2 Monitoring - Operating hours

Tab: **Configuration ► Devices ► [Edit] ► Properties… ► 'Module' ► [Monitoring] ► Monitoring - 'Module' ► Operating hours**

Operating hours

Current value

Shows the operating hours to date.

[Reset]

NOTE

This function is only available in the monitoring of the 887 Professional UV/VIS Detector.

Use this function after having replaced the corresponding lamp of the 887 Professional UV/VIS Detector. This resets the values of the parameters **Current value** and **Last service**.

Last service

Operating hours at last service. This value is used for monitoring (**last service + service interval = next service**).

Input range	**0 to 99,999 Hours**

Comment

Optional comment on service.

Entry	**1,000 characters**

Monitor operating hours

on | off (Default value: **off**)

If this option is enabled, then the service interval is monitored for the operating hours.

NOTE

Monitoring cannot be enabled until after a value has been entered in the **Last service** field.

Service interval

Interval in hours after which the service for the module should be repeated. If a value is entered here, then the value in the **Next Service** field will be adjusted automatically.

Next Service

Operating hours after which the next service is to be carried out. If a value is entered here, then the value in the **Service interval** field will be adjusted automatically.

Message

This area is for you to indicate how you wish to be informed about the time of the next service.

Message by E-mail

on | off (Default value: **off**)

If this option is enalbed and a limit value is exceeded, the message defined in the field **Message** is sent to the address given in **[E-mail]**.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted additionally to the message defined above if a limit exceeded.

[E-mail]

The **[E-mail]** button opens the **Send e-mail** window, and the address can be entered *(see chapter 2.7.1, page 111)*.

Action

This area is for you to indicate what action is to be triggered automatically during start check if the time interval for the service has expired:

Selection	**Record message** | **Display message** | **Stop determination**
Default value	**Record message**

Record message
If this option is enabled a message is sent when a limit is exceeded to inform you that the service interval has been exceeded. You will find this message in **Database ► Information ► Messages**. The run will not be stopped.

Display message
If this option is enabled a message is displayed on the screen when a limit is exceeded to inform you that the service interval has been exceeded. The determination is continued with **[Yes]** and the message recorded. The determination is terminated with **[No]**.

Stop determination
The running determination will be terminated.

7.22.3 850 Professional IC - Method

Program part: **Method**

In the **Method** program part, start parameters, data channels and program commands can be defined for the **850 Professional IC**.

7.22.3.1 850 Professional IC - Start parameters

Subwindow: **Method ► Devices**

If you click on the icon for the **850 Professional IC** in the top part of the window, the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.22.3.1.1 Start parameters - High pressure pump

Tab: **Method ► Devices ► Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.2 Start parameters - Low pressure gradient pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent A

Selecting the eluent A that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

% Eluent A

Displays the proportion of eluent A in the mixing ratio. The proportion is calculated automatically from the proportions for the other eluents using the formula **100 - (% Eluent B + % Eluent C)**.

Eluent B

Selecting the eluent B that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

% Eluent B

Enter the proportion of eluent B in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent C) % %**

Eluent C

Selecting the eluent C that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

% Eluent C

Enter the proportion of eluent C in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent B) % %**

When there is a change from one dialog/tab to another, the percentages are checked ($\sum$ **= 100%**).

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.3 Start parameter - Injection valve

Tab: **Method ► Devices ► Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.4 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.5 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.22.3.1.5.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

We recommend the use of a 2 mL dosing unit (pressure stability) for regenerating the suppressor with a suppressor Dosino (labeled with **S**). Using larger dosing units could result in overpressure. The distributor of the dosing unit might develop leaks as a consequence of this and chemical contamination could occur.

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino (labeled with **S**) has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.22.3.1.5.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.22.3.1.5.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.22.3.1.5.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		

Step	Action	Description
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.22.3.1.6 Start parameters - MSM-HC

Tab: **Method ▶ Devices ▶ MSM-HC**

7.22.3.1.6.1 Start parameters - MSM-HC

Tab: **Method ▶ Devices ▶ MSM-HC**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

For regenerating the suppressor with a suppressor Dosino, we recommend using a 2 mL dosing unit (pressure stability).

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1 with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.22.3.1.6.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.22.3.1.6.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.22.3.1.6.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		

Step	Action	Description
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.22.3.1.7 Start parameters - SPM

Tab: **Method ▶ Devices ▶ SPM**

7.22.3.1.7.1 Start parameters - SPM

Tab: **Method ▶ Devices ▶ SPM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Dosino Regeneration

If the suppressor is regenerated with a dosing device, then regenerating and rinsing with the dosing device takes places automatically after each step of the rotor. The **[Edit]** button opens the **Dosino Regeneration** dialog window, in which the parameters for the regeneration of the suppressor can be defined *(see chapter 7.6.5.2.1.1.3, page 833)*.

Regeneration with a Dosino is no longer functional after MagIC Net is closed, even if the devices are still operating.

Dosing device

Selection of the Dosino that regenerates the suppressor.

NOTE

For regenerating the suppressor with a suppressor Dosino, we recommend using a 2 mL dosing unit (pressure stability).

A suppressor Dosino may be assigned to only one MSM module.

Selection	**not defined** | **'Name of the suppressor Dosino'**

not defined
If no suppressor Dosino has been selected, then suppressor regeneration will be performed with a peristaltic pump *(see chapter 7.6.5.2.1.1.2, page 833)*.

Connection

Shows the device and the MSB connection to which the suppressor Dosino is connected.

Solution 1

Name of the regeneration solution 1 with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 1 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 1 will not be used in the method.

Solution 2

Name of the regeneration solution 2, with which the suppressor is regenerated. The solution has to have been entered in the solution table in the configuration.

Selection	**not defined**

[Edit]

Opens the **Dosino Regeneration** dialog window for editing the suppressor Dosino *(see chapter 7.6.5.2.1.1.3, page 833)*.

Active

on | off (Default value: **on**)

If this check box is **activated**, then Solution 2 will be used in the method to regenerate the suppressor.

If this check box is **deactivated**, then Solution 2 will not be used in the method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.22.3.1.7.2 Peristaltic pump regeneration

If no dosing device is defined in the start parameters of the MSM, then the suppressor can be regenerated with the peristaltic pump. The settings for a peristaltic pump are made separately *(see chapter 7.6.3.2.1.1, page 809)*.

Please refer to the manual of your IC instrument for instructions regarding the tubing configuration for the regenerant and the rinsing solution.

7.22.3.1.7.3 Dosino Regeneration

Dialog window: **Method ► Devices - 'Name' ► MSM ► [Edit] ► Dosino Regeneration**

The parameters for the regeneration of the suppressor with the suppressor Dosino is defined in this dialog window.

NOTE

Regeneration with Dosino will not continue to run if MagIC Net is closed.

We recommend the following ports for connecting the tubings:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

Dosing

Port

Port for dosing regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**1**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**3**

Volume

Volume of Solution 1 or Solution 2 for the regeneration of the suppressor.

Input range	**0.0000 to 50.0000 mL**
Default value	**0.9000 mL**

Time

The parameter defines for how long the suppressor is regenerated with Solution 1 or Solution 2.

Input range	**1.0 to 999.9 min**
Default value	**9.0 min**

Dosing rate

Dosing rate at which the suppressor is regenerated or rinsed. It is automatically calculated from the values of **Volume** and **Time**. The maximum dosing rate must be ≦ 2 mL/min.

Fill

Port

Port for filling regeneration solution.

Solution 1

Selection	**1** | **2** | **3** | **4**
Default value	**2**

Solution 2

Selection	**1** | **2** | **3** | **4**
Default value	**4**

Comment

Optional comment on the regeneration of the suppressor by the Dosino.

Entry	**64**

7.22.3.1.7.4 Sequence of the suppressor regeneration with a Dosino

Suppressor regeneration with a Dosino is carried out automatically each time a rotor step has been prompted. This applies for:

- Stepping in the workplace [Start HW] (equilibration)
- Stepping in the time program during a determination (single determination or determination series)
- Stepping in the manual control

If a stepping process takes place during regeneration, then the current regeneration will be canceled. After stepping, regeneration of the next suppressor channel commences.

The required parameters are defined in the start parameters. The sequence is fixed. In order for the fixed sequence to work, the tubing connections between the Dosino and the suppressor rotor have to correspond to the following allocation:

- Port 1: regenerating the rotor with Solution 1
- Port 2: aspirating Solution 1 (e.g. H_2SO_4)
- Port 3: rinsing the rotor with Solution 2
- Port 4: aspirating Solution 2 (e.g. ultrapure water)

NOTE

For regenerating the suppressor with a suppressor Dosino (labeled with **S**), we recommend using a 2 mL dosing unit (pressure stability). Using larger dosing units may result in overpressure. As a consequence, the distributor of the dosing unit may become leaky and contamination with chemicals may occur.

A suppressor Dosino may be assigned to only one MSM module.

Step	Action	Description
Regenerating the suppressor with Solution 1 (e.g. sulfuric acid), if Solution 1 = active		
1	Discharging to end volume via Port 1 Dosing rate (fixed) = 1 mL/min	Emptying the Dosino
2	Aspirating Solution 1	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
3	Discharging of Solution 1 to suppressor	Regenerating the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters
Rinsing the suppressor with Solution 2 (e.g. ultrapure water), if Solution 2 = active		

Step	Action	Description
4	Aspirating Solution 2	Filling the Dosino ▪ Port according to start parameters ▪ Filling rate = maximum ▪ Filling volume = volume
5	Discharging of Solution 2 to suppressor	Rinsing the suppressor ▪ Port according to start parameters ▪ Dosing rate according to start parameters ▪ Volume according to start parameters ▪ Time according to start parameters

Preparing the suppressor Dosino

If the system is restarted or if new solutions are connected to the Dosino, we recommend preparing the Dosino in manual control (workplace). For this purpose, the following parameters have to be set in the configuration of the linked, intelligent solution on the **Dosing unit** tab:

Parameters for preparation

- **Dosing port Prep/Empty** = **Dosing port 1**
- **Dosing port 1** = **1.0 mL/min**
- **Dosing port 2** = **1.0 mL/min**

Tubing parameters

- **Dosing port 1**
  - **Port** = **Port 1**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Dosing port 2**
  - **Port** = **Port 3**
  - **Length** = **150 cm**
  - **Diameter** = **0.5 mm**
- **Fill port**
  - **Port** = **Port 2**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

- **Special port**
  - **Port** = **Port 4**
  - **Length** = **65 cm**
  - **Diameter** = **2.0 mm**

The tubing lengths and diameters have to be adjusted, if necessary.

7.22.3.1.8 Start parameters - MCS

Tab: **Method** ▶ **Devices** ▶ **MCS**

Status

Selection	**On** | **Off**
Default value	**On**

On
The MCS (Metrohm CO2 Suppressor) is switched on when the hardware is started with **[Start HW]**.

Off
The MCS (Metrohm CO_2 Suppressor) is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.9 Start parameters - Degasser

Tab: **Method** ▶ **Devices** ▶ **Degasser**

Status

Selection	**On** | **Off**

On
The degasser is switched on when the hardware is started with **[Start HW]**.

Off
The degasser is switched off when the hardware is started with **[Start HW]**.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.10 Start parameters - Column thermostat

Tab: **Method ▶ Devices ▶ Column thermostat**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The thermostat is switched on when the hardware is started with **[Start HW]**.

Off
The thermostat is switched off when the hardware is started with **[Start HW]**.

Temperature

Temperature that is set for the column thermostat when the hardware is started with **[Start HW]**.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.11 Start parameters - Conductivity detector

Tab: **Method ▶ Devices ▶ Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.12 Start parameters - Amperometric detector

7.22.3.1.12.1 Amperometric detector

Tab: **Method ▶ Devices ▶ Amp. detector**

Mode

Selection of the measuring mode of the amperometric detector.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potential steps.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector.

Temperature

Temperature that is set in the detector when the hardware is started with **[Start HW]**.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

Monitor temperature stability

on | off (Default value: **on**)

If this option is **switched on**, then a determination will not start until the set temperature has been reached and is stable.

If this option is **switched off**, then the sequence of a determination will not be influenced by the temperature. An attempt will indeed be made to achieve the temperature and to maintain it, but the determination will begin in any case.

Cell

Selection of a cell which is defined in the configuration table of the amperometric cells *(see chapter 6.13.2, page 674)*. If no cell has been selected yet, then **not defined** is displayed. Otherwise, the selected cell will be displayed with its user-defined name.

Selection	**not defined** | **Selection of amperometric cells**
Default value	**not defined**

not defined
You can also start the method when this option is selected. The cell connected to the detector is then used. In the report, the amperometric cell is then called "**not defined**", but the properties of the cell that is *actually* used will be output. **Important note:** If an intelligent cell for which the operating hours monitoring has been activated is connected to the amperometric detector, then the operating hours will be counted.

Start delay

on | off (Default value: **off**)

If this option is **enabled**, the amperometric cell is only switched on once this waiting time has elapsed.

Waiting time

Waiting time until the amperometric cell is switched on.

Input range	**0 to 99 min**
Default value	**15 min**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.12.2 DC mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ DC ▶ Settings**

In this dialog, you can set the properties of the **DC** measuring mode.

The properties are also available in the manual control *(see chapter 7.3.4.1, page 750)*.

DC potential

Potential of the working electrode in comparison to the reference electrode.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

Range

Selection of the measuring range.

Selection	**auto** | **2 nA** | **20 nA** | **200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**

auto
Automatic setting of the measuring range. This selection is not allowed with damping activated.

Damping

on | off (Default value: **off**)

Activates or deactivates the additional damping.

7.22.3.1.12.3 PAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ PAD ▶ Settings**

In this dialog, you can set the properties of the **PAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the PAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Potential [V]

Potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define PAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define PAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Duration

Duration of the measurement.

Input range	**1 to 2000 ms** (Increment: **1**)
Default value	**100 ms**

Range

Selection of the measuring range.

Selection	**200 nA** | **2 µA** | **20 µA** | **200 µA** | **2 mA**
Default value	**2 µA**

The defined potential progression is displayed in the form of a graph.

7.22.3.1.12.4 Define PAD step

Tab: **Method** ▶ **Devices** ▶ **Amp. detector** ▶ **PAD** ▶ **Settings**

In this dialog, a new PAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**300 ms**

Potential

Potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.05 V**

7.22.3.1.12.5 flexIPAD mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ flexIPAD ▶ Settings**

In this dialog, you can set the properties of the **flexIPAD** measuring mode. The same properties are also available in the manual control.

Potential profile

The table lists the potential steps of the flexIPAD profile. Up to 40 steps are possible. The table contains the following columns:

Duration [ms]

Duration of the potential step in milliseconds.

Sum Duration [ms]

Cumulative duration of potential steps 1 - n in milliseconds (n = number of the potential step).

Start potential [V]

Start potential of the step in volts.

End potential [V]

End potential of the step in volts.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New...	Add a new line to the table and edit in separate dialog *Define flexIPAD step* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Define flexIPAD step* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected lines to the clipboard.
Cut	Cuts the selected lines and copies them to the clipboard.
Insert	Pastes lines from the clipboard. After pasting, check the sequence of the potential steps.
Delete	Deletes the selected lines.

NOTE

You can also use the copying/cutting and pasting of lines to transfer potential steps from one method to another (opened) method.

The affected lines of the source method need not be contiguous with one another.

The lines will be inserted in the target method only if the maximum number of lines is not exceeded as a result.

Cycle duration

Display of the total duration of the potential profile in milliseconds (sum of the durations of the individual steps).

Measurement

Start

Start time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**50 ms**

End

Ending time of the measurement.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**150 ms**

Range

Selection of the measuring range.

Selection	**20 µA** | **200 µA** | **2 mA**
Default value	**200 µA**

NOTE

The selection of the measuring channel (**Current** or **Charge**) takes place in the hardware assignment of the analysis *(see chapter 7.3.3.2.1, page 736)*.

The defined potential progression is displayed in the form of a graph.

7.22.3.1.12.6 Define flexIPAD step

Tab: **Method ▶ Devices ▶ Amp. detector ▶ Settings ▶ flexIPAD mode settings**

In this dialog, a new flexIPAD potential step can be defined or an existing one can be edited.

Duration

Duration of the potential step in milliseconds.

Input range	**1 to 2,000 ms** (Increment: **1**)
Default value	**100 ms**

Start potential

Start potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

End potential

End potential of the step in volts.

Input range	**–5.000 to +5.000 V** (Increment: **0.001**)
Default value	**0.0 V**

7.22.3.1.12.7 CV mode settings

Tab: **Method ▶ Devices ▶ Amp. detector ▶ CV ▶ Settings**

In this dialog, you can set the properties of the **CV** measuring mode.

Number of cycles for cyclic voltammograms

Preparing cycles

Number of cyclic voltammograms which are to be measured in the time program after **Start data acquisition** and then discarded. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Measuring cycles

Number of cyclic voltammograms which are to be measured and saved in the time program after **Start data acquisition**. The parameterization defined in the Sweep parameters section is used for the measurement.

Input range	**0 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1,000 s**

7.22.3.1.13 Start parameters - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are present only if an **891 Professional Analog Out** is connected.

7.22.3.1.13.1 Data source, Polarity, Range/Volt

Tab: **Method ▶ Devices ▶ Analog Out**

Channels Out1, Out2, Aux1, Aux2

The 891 Professional Analog Out includes 4 output channels for analog voltage in the range of -1...+1 volt:

- 2 main channels **Out1**, **Out2** with high resolution, for the digital/ analog converting of chromatograms or cyclovoltammograms.
- 2 auxiliary channels **Aux1**, **Aux2** with low resolution for the digital/ analog converting of measured values such as pressure, flow, temperature, ratio eluent.

The technical specifications can be found in the device manual of the 891 Professional Analog Out.

Each channel has the following set of start parameters. These are on one tab each in the start parameters of the main device. The parameter values are sent to the 891 Professional Analog Out when starting the method.

Data source

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data source** is displayed here.

Channel

If a data source and a data channel have been selected with the button **[...]** *(see chapter 5.6.6.4, page 417)*, the **Name of the data channel** is displayed here.

Polarity

Indicates the sign of the output voltage of the channel.

Selection	**+** | **−**
Default value	**+**

Range/Volt

Indicates a measured value which is – after using a possible **Measured value offset** – to be converted to 1 volt output voltage *(see chapter 7.8.3.1.11.3, page 916)*.

Input range	**0.001 to 4000000**
Default value	**1.000** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

[Offset..]

This button opens the dialog for defining the measured value offset and the voltage offset *(see chapter 7.8.3.1.11.2, page 915)*.

Active

on | off (Default value: **off**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.22.3.1.13.2 Offset

Tab: **Method ► Devices ► Analog Out ► Offset**

Measured value offset

Indicates a positive or negative amount (in the units of the data channel selected) every measured value is to be corrected by *(see chapter 7.8.3.1.11.3, page 916)*.

Selection	**Current value** | **Value**
Default value	**Current value**

Current value
Select this option if the offset value *currently* set in the Analog Out is to be used. This value can be found in the manual control *(see chapter 7.8.4.10, page 956)*.

Value
Select this option, if you want to enter a new measured value offset in the **Value** field.

Value

Enter a new measured value offset.

Input range	**-4000000 to +4000000**
Default value	**0.0**
	Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful input field for the channel **Conductivity**: **±15000** µS/cm; for the channel **Current**: **±2000000** nA; for the channel **Charge**: **±4000000** nC.

Voltage offset

Value

Offset in mV, to be used on the output signal after the digital/analog conversion.

Input range	**-1000 to +1000 mV** (Increment: **1**)
Default value	**0 mV**

7.22.3.1.13.3 Using range/volt and offsets

With **Range/Volt**, you can indicate the measured value amount to be converted to 1000 mV output voltage.

If you want to correct every measured value by a certain amount, then define a corresponding **Measured value offset**. If you enter a *positive* measured value offset, it will be *added* to every measured value, if you enter a *negative* measured value offset, it will be *subtracted* from every measured value. This happens **before** the digital/analog conversion.

With **Voltage offset** you can indicate a value in mV to be used on the output signal **after** the digital/analog conversion.

The **polarity** will be applied to the resulting output signal.

Example for the channel "Conductivity" of the data source "Detector"

If the required measured values are e.g. between 15 and 35 µS/cm, you could define a measured value of **–15** (µS/cm). The measured values corrected by this offset then are between 0 and 20 µS/cm. The output voltage these offset-corrected values are converted to, depends on **Range/Volt**. Examples:

With a **Range/Volt** of 20 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

With a **Range/Volt** of 40 (µS/cm-V), 20 µS/cm are output as 0.5 V (500 mV).

With a **Range/Volt** of 10 (µS/cm-V), 20 µS/cm are output as 1.0 V (1000 mV).

You can correct the output signal by a **Voltage offset**. Example: You find out that the output voltage sometimes is slightly negative, whereas you would like to have positive output signals only. If the lowest output voltage is e.g. at –12 mV, you could consistently achieve only positive voltage values with the aid of a **Voltage offset** of 15 mV.

7.22.3.2 850 Professional IC - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.22.3.2.1 High-pressure pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.22.3.2.2 Low-pressure gradient pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No
Proportion eluent A	Eluent name	%	No
Proportion eluent B	Eluent name	%	No
Proportion eluent C	Eluent name	%	No

7.22.3.2.3 Column thermostat - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
Temperature	Temperature	°C	No

7.22.3.2.4 Conductivity detector - Data channels

Tab:Method ▶ Devices ▶ Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!
- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column Metrosep A Supp 5 - 100/4.0

Injection volume 20 µL

Duration of recording 12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.22.3.2.5 Amperometric detector - Data channels

Tab:Method ► Devices ► Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Current	Current	nA	Yes
Charge	Charge	nC	Yes
Current vs. Potential	Current	nA	No

NOTE

The only channels available for the output of the measured values by means of the *891 Professional Analog Out (see Chap. 7.8.3.1.11.1, p. 914)* are **Current** and **Charge**. The output of the measured values of these channels is then **time-based**.

7.22.3.3 850 Professional IC - Commands

Subwindow: **Method ► Time program**

Overview of the time program commands available for the 850 Professional IC:

7.22.3.3.1 Commands - High-pressure pump

Subwindow: **Method ► Time program**

Overview of the time program commands available for the high-pressure pump:

7.22.3.3.1.1 On/Off

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.1.2 Flow

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.1.3 Gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.1.4 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.22.3.3.1.5 Measure pressure

Dialog: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.22.3.3.1.6 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.3.3.2 Commands - Low-pressure gradient pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the low-pressure gradient pump:

7.22.3.3.2.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the low-pressure gradient pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.2.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the low-pressure gradient pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.2.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent time program command **Gradient** (command without feedback) starts a mixing gradient program for the low-pressure gradient pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.

- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.8.3.3.2.4, page 927)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.8.3.3.2.4, page 927)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The mixing ratio and the flow rate of the programmed gradient are displayed below the gradient table as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.2.4 Editing gradient

Dialog: **Method ► Time program ► Edit ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Eluent A

Display of the proportion of eluent A in the mixing ratio in %. The proportion is calculated automatically from the proportions for the other eluents using the formula **100 - (% Eluent B + % EluentC)**.

Eluent B

Entry of the proportion of eluent B in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent C) %**
Default value	**0 %**

Eluent C

Entry of the proportion of eluent C in the mixing ratio.

Input range	**0 to 100 - (% Eluent A + % Eluent B) %**
Default value	**0 %**

When there is a change from one dialog/tab to another, the percentages are checked (∑ **100%**).

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Convex 1 - 4** | **Linear** | **Concave 1 - 4** | **Step**

Convex 1 - 4
If the flow is not changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Linear
If the flow is not changed: The proportion of the eluents changes in a linear fashion from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump change in a linear fashion from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Concave 1 - 4
If the flow is not changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump change along the selected curve from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Step

If the flow is not changed: The proportion of the eluents remains at the value of the previous command line up to the point in time of the current command line. Then the proportion is changed to the entry of the current command line immediately. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump remain at the value of the previous command line up to the point in time of the current command line. Then both are changed to the entry of the current command line immediately. The mixing ratio changes in the same way.

Flow

Set the flow of the low-pressure gradient pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

7.22.3.3.2.5 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.3.3 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.22.3.3.3.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.3.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.3.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.3.3.4 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.22.3.3.4.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.4.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.3.3.5 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.22.3.3.5.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.22.3.3.5.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.3.3.6 Commands - MSM-HC

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM-HC (Metrohm Suppressor Module - High Capacity):

7.22.3.3.6.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.22.3.3.6.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.3.3.7 Commands - SPM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the SPM (Sample Preparation Module):

7.22.3.3.7.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.22.3.3.7.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.3.3.8 Commands - MCS

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MCS (Metrohm CO_2 Suppressor):

7.22.3.3.8.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the MCS (Metrohm CO_2 Suppressor) on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

MCS

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.9 Commands - Degasser

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the degasser:

7.22.3.3.9.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the pump for the degasser on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Degasser

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.10 Commands - Column thermostat

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the column thermostat:

7.22.3.3.10.1 Measuring temperature

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure temperature**

The device-dependent time program command **Measure temperature** (command with feedback) measures the temperature in the thermostat.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following type **'TP.command number.Variable name'** variables are generated by the command:

Variable name	Description	Data type
TEMP	Measured temperature [°C]	Number

7.22.3.3.11 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.22.3.3.11.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.22.3.3.11.2 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.22.3.3.11.3 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.22.3.3.12 Commands - Amperometric detector

Subwindow: **Method ▶ Time program**

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then the following commands may **not** be used. This is checked by the start test of the method.

Overview of the time program commands available for the amperometric detector:

7.22.3.3.12.1 Measure current

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure current**

The device-dependent **Measure current** time program command (command with feedback) measures the current.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_I	TP.'Command number.MEAS_I Measured current [nA].	Number

7.22.3.3.12.2 Measure charge

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure charge**

The device-dependent **Measure charge** time program command (command with feedback) measures the charge.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MEAS_Q	TP.'Command number.MEAS_Q Measured charge [nC].	Number

7.22.3.3.12.3 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.22.3.3.12.4 Measure drift

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.22.3.3.12.5 Modify mode

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Modify mode**

The device-dependent **Modify mode** time program command (command without feedback) permits a change of measuring mode: You can change the parameterization of the current measuring mode or select a different measuring mode and set its parameters.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

When the command is opened, the mode parameters which are set in the start parameters are displayed by default.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Mode

Selection of the measuring mode of the amperometric detector. The CV mode mode is not available here.

Selection	**DC** | **PAD** | **flexIPAD**

DC
Measurement with constant potential.

PAD
Measurement with several potential levels.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric detector. The same settings can be set as in the *start parameters, see Chap. 7.3.3.1.2, p. 728*.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.12.6 CV treatment

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - CV treatment**

The device-dependent CV treatment time program command (command without feedback) allows the performance of cyclovoltammetric treatments.

Settings

Opens the settings for the cyclovoltammetric treatment.

Comment

Optional comment on the time program command.

Entry	**64 characters.**

Settings

In this dialog, you can set the properties for the cyclovoltammetric treatments.

Number of cycles for cyclovoltammetric treatment

Cycles

Number of cyclovoltammetric treatments that are to be performed in the time program. The parameterization defined in the Sweep parameters section is used for the treatment.

Input range	**1 to 100** (Increment: **1**)
Default value	**1**

Sweep parameters

Start potential

Start potential of the triangular profile, also corresponds to the 2nd vertex potential.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**–0.5 V**

End potential

End potential of the triangular profile, also corresponds to the 1st vertex potential with CV mode **Full cycle**.

Input range	**–5.000 to 5.000 V** (Increment: **0.001**)
Default value	**0.5 V**

Sweep rate

Potential sweep rate for the sweep in V/s.

Input range	**0.001 to 1.000 V/s** (Increment: **0.001**)
Default value	**0.01 V/s**

CV mode

Setting of the type of potential profile.

With each sweep, the potential begins with the **Start potential** and changes at first until the **End potential** is reached.

In the **Half cycle** mode, the sweep is thus ended. A sawtooth potential is the result.

In the **Full cycle** mode, the current potential changes back to the **Start potential**. A triangular potential ramp is the result.

Selection	**Full cycle** | **Half cycle**
Default value	**Full cycle**

Range

Selection of the measuring range.

Selection	**2 µA** | **20 µA** | **200 µA** | **2 mA** | **20 mA**
Default value	**2 mA**

Cycle duration

Shows the duration of a measuring cycle in [s]. The duration is derived from the values of the parameters Start potential, End potential, CV mode and Sweep rate.

Input range	**2 to 1000 s**

7.22.3.3.12.7 On/Off

Dialog: **Method ► Time program ► [Edit] ► New ► 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the amperometric cell on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Cell

Selection	**On** | **Off**
Default value	**On**

On
Switches the cell of the amperometric detector on.

Off
Switches the cell of the amperometric detector off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.13 Commands - Analog Out

Subwindow: **Method ► Time program**

NOTE

The commands under **Analog Out** are only available if an **891 Professional Analog Out** is connected.

7.22.3.3.13.1 Change range

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change range**

The device-dependent time program command **Change range** (command without feedback) of the 891 Professional Analog Out redefines the measured value range per volt in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Range/Volt

Indicates the measured value amount to be output as 1 Volt (1000 mV). The value is transferred to the device.

Input range	**0.001 to 4000000**
Default value	**(empty)** Next to the input field, the unit of the corresponding data channel is displayed. Maximum useful value for the channel **Conductivity**: **15000** µS/cm; for the channel **Current**: **2000000** nA; for the channel **Charge**: **4000000** nC.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.13.2 Change polarity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Analog Out - Change polarity**

The device-dependent time program command **Change polarity** (command without feedback) of the 891 Professional Analog Out redefines the sign of the output voltage in the method run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Polarity

Indicates the new sign of the output voltage.

Selection	**+ | –**
Default value	**+**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.13.3 Reset baseline

Dialog window: **Method ► Time program ► Edit ► 'Device' - Analog Out - Reset baseline**

The device-dependent time program command **Reset baseline** (command without feedback) of the 891 Professional Analog Out redefines the baseline of the output voltage in the method run. If the default value **0 mV** is applied for the parameter **Voltage offset**, then the current value of the output voltage is defined as new baseline (0 mV). If you enter a different value for the **Voltage offset**, the baseline will be moved additionally by this value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Voltage offset

Optional offset in mV, which is *additionally* used after resetting the baseline to 0 mV.

Input range	**-1000 to +1000 mV**
Default value	**0 mV**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.22.3.3.13.4 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.22.4 850 Professional IC - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.22.4.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.22.4.2 Manual control - Low-pressure gradient pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

Mixing ratio

Eluent A

Current value

Current percentage of the proportion of eluent A in the mixing ratio

Input

Enter the new proportion of eluent A in the mixing ratio

Input range	**0 to 100 - (% Eluent B + % Eluent C)**
Default value	**100**

Eluent B

Current value

Current percentage of the proportion of eluent B in the mixing ratio

Input

Enter the new proportion of eluent B in the mixing ratio

Input range	**0 to 100 - (% Eluent A + % Eluent C) %**
Default value	**100**

Eluent C

Current value

Current percentage of the proportion of eluent C in the mixing ratio

Input

Enter the new proportion of eluent C in the mixing ratio

Input range	**0 to 100 - (% Eluent A + % Eluent B) %**
Default value	**100**

[]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.22.4.3 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.22.4.4 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.22.4.5 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.22.4.5.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.22.4.6 Manual control - MSM-HC

Tab: **Manual ► Manual control - 'Device name' ► 'MSM-HC'**

7.22.4.6.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.22.4.7 Manual control - SPM

Tab: **Manual ► Manual control - 'Device name' ► 'SPM'**

7.22.4.7.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.22.4.8 Manual control - MCS

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'MCS'**

[On]

Start MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is already running.

[Off]

Stop MCS (Metrohm CO_2 suppressor). This is inactive if the suppressor is not running.

7.22.4.9 Manual control - Degasser

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Degasser'**

[On]

Start degasser. This is inactive if the degasser is already running.

[Off]

Stop degasser. This is inactive if the degasser is not running.

7.22.4.10 Manual control - Column thermostat

Tab: **Manual ▶ Manual control - 'Device name' ▶ 'Thermostat'**

Temperature

Current value

Current temperature of the thermostat.

Input

Entering a new value for the temperature of the thermostat.

Input range	**0.0 to 80.0 °C**
Default value	**30.0 °C**

[On]

Switching on the thermostat. This is inactive if it is running.

[Off]

Switching off the thermostat. This is inactive if it is not running.

[Apply]

Sending the parameters set to the thermostat.

7.22.4.11 Manual control - Amperometric detector

7.22.4.11.1 General settings

Tab: **Manual ► 'Amp. detector'**

Mode

Generally speaking, the measuring mode and its settings can be changed only in the manual control of the workplace, not in the Global manual control.

Selection of the measuring mode of the amperometric detector which is set in the device when **[Apply]** is pressed. The following rules apply for the changeability of the mode when a determination is running:

- When a determination is running in the mode DC, PAD or flexIPAD, it is **not** possible to change to the mode CV.
- When a determination is running in the mode CV it is **not** possible to change to the modes DC, PAD or flexIPAD.

Selection	**DC** | **PAD** | **flexIPAD** | **CV**

DC
Measurement with constant potential.

PAD
Measurement with several potentials.

flexIPAD
Measurement with flexible potential steps (levels, ramps) and integration.

CV
Measurement of cyclovoltammograms.

[Settings]

Opens the dialog for setting the parameters of the selected measuring mode of the amperometric *(see chapter 7.3.4.1.2, page 752)*. Not available in the manual control of the CV mode.

[Apply]

The parameterization of the selected measuring mode is sent to the device. The device and the measuring cell are switched on. Not available in the manual control of the CV mode.

Cell

[Cell On]

The measuring cell is switched on. If it had been switched off beforehand, then it will continue to run with the settings which were active prior to being switched off. Not available in the manual control of the CV mode.

[Cell Off]

The measuring cell is switched off. Not available in the manual control of the CV mode.

Temperature

Current Value

Display of the current temperature in the detector.

Input

Input of a new temperature which is to be set in the device when **[Apply]** is pressed.

Input range	**10.0 to 80.0 °C** (Increment: **0.1**)
Default value	**35.0 °C**

[Apply]

Sets the new temperature value in the device.

7.22.4.11.2 Dialog window «Settings»

In this dialog window, the selected measuring mode can be parameterized in the manual control of the workplace.

7.22.4.11.2.1 Settings DC mode

The parameterization of the DC mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.2, page 729)*.

7.22.4.11.2.2 Settings PAD mode

The parameterization of the PAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.3, page 730)*.

7.22.4.11.2.3 Settings flexIPAD mode

The parameterization of the flexIPAD mode in the manual control offers the same options as in the Start parameters *(see chapter 7.3.3.1.2.5, page 732)*.

7.22.4.11.2.4 Settings CV mode

The parameterization of the CV mode can **not** be changed in the manual control.

7.22.4.12 Manual control - Analog Out

NOTE

The tabs **Out1**, **Out2**, **Aux1** and **Aux2** are only available when an **891 Professional Analog Out** is connected.

7.22.4.12.1 Channels Out1, Out2, Aux1, Aux2

Tab: **Manual ► Manual control - 'Device name' ► 'Channel'**

NOTE

In the Manual control of the Workplace the tabs of those channels of a connected **891 Professional Analog Out** are displayed which have been activated in the start parameters of the method.

[Resetting baseline]

Sets the current measured value as new baseline.

[Properties...]

Via this button the dialog window *Properties* opens, in which you can modify the properties of the channels.

7.22.4.12.2 Properties

Tab: **Manual ► Manual control - 'Device name' ► 'Channel' ► Properties**

Data source

Current value

Displays the name of the data source currently assigned.

Input

Displays the name of the newly assigned data source, which has been selected with the button **[...]**.

[...]

Opens the dialog for selecting a different data source and a channel *(see chapter 5.6.6.4, page 417)*.

Channel

Current value

Displays the name of the channel of the **data source** currently assigned.

Input

Displays the name of the channel of the new data source which has been selected with the button **[...]**. If a new channel has been selected, then its unit (e.g. µS/cm in case of conductivity) will be displayed on the right to the input fields of the parameters **Range/Volt** and **Measured value offset**.

Range/Volt

Current value

Displays the measured value amount currently defined in the device and which is converted to 1 volt output signal.

Input

Input of a new measured value amount to be converted to 1 volt output signal.

Input range	**0.001 to 4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Polarity

Current value

Displays the polarity of the output voltage currently set in the device.

Input

Selection of the new sign for the output voltage.

Selection	**+** | **–**
Default value	**+**

Measured value offset

Current value

Displays the measured value offset currently set in the device, put out in the unit of the current channel.

Input

Optional input of a new measured value offset, put out in the units of the channel selected in the parameter Channel (Input).

Input range	**-4000000 to +4000000** (Increment: **0.001**)
Default value	**(empty)** Next to the input field the unit of the data channel is displayed.

Voltage offset

Current value

Displays the voltage offset currently set in the device in [mV].

Input

Optional input of a new voltage offset in [mV].

Input range	**-1'000 to +1'000 mV** (Increment: **1**)
Default value	**0 mV**

[OK]

The values in the column **Input** are applied for the device and the dialog is closed.

[Cancel]

The values in the column **Input** are rejected and the dialog is closed.

[OK]

The values in the column **Input** are applied for the device. The dialog remains open.

7.23 846 Dosing Interface

Program part: Configuration

The **846 Dosing Interface** is a USB-capable control unit for connecting 1 - 4 MSB devices.

7.23.1 846 Dosing Interface - Configuration

If a device of the type **846 Dosing Interface** is selected in the device table, then the **[Edit] ► Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

The device can be initialized if necessary by means of the **[Initialize]** menu item in the device table *(see chapter 6.5.2.1, page 605)*.

7.23.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.23.1.2 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario
- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.23.1.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.23.2 846 Dosing Interface - Method

The **846 Dosing Interface** itself has no start parameters and no method commands.

In order to be able to use MSB devices connected to an 846 Dosing Interface, the latter must be added to the list of devices in the method *(see chapter 5.6.3.1, page 404)*.

In the same way, the MSB devices connected to the 846 Dosing Interface must be added to the method. The MSB connector must be selected for each MSB device *(see chapter 5.6.3.5, page 409)*.

7.23.3 846 Dosing Interface - Manual control

The **846 Dosing Interface** has no functions that can be performed manually.

7.24 814 USB Sample Processor and 815 Robotic USB Sample Processor XL

NOTE

The devices **814 USB Sample Processor** and **815 Robotic USB Sample Processor XL** are available in various versions which differ from one another in their total number of towers and in the combinations of modules installed. These sample changers, together with all of the possible towers and/or modules are described in the online help.

7.24.1 814 USB Sample Processor - Overview

The 814 USB Sample Processor is suitable for sample racks with diameters of up to 42 cm. Different versions are available for different fields of application:

- **2.814.0010 814 USB Sample Processor**
  Sample changer with 1 tower, 1 integrated membrane pump and 1 connector for an external pump.

- **2.814.0020 814 USB Sample Processor**
  Sample changer with 1 tower and 2 integrated membrane pumps.
- **2.814.0030 814 USB Sample Processor**
  Sample changer with 1 tower and 2 connectors for external pumps.
- **2.814.0110 814 USB Sample Processor**
  Sample changer with 2 towers, 2 integrated membrane pumps and 2 connectors for external pumps.
- **2.814.0120 814 USB Sample Processor**
  Sample changer with 2 towers and 4 integrated membrane pumps.
- **2.814.0130 814 USB Sample Processor**
  Sample changer with 2 towers, and 4 connectors for external pumps.

For all variants, 1 Swing Head and 1 tower stirrer can be connected for each tower.

7.24.2 815 Robotic USB Sample Processor XL - Overview

The 815 Robotic USB Sample Processor XL is suitable for sample racks with diameters of up to 48 cm. Different versions are available for different fields of application:

- **2.815.0010 815 Robotic USB Sample Processor XL**
  Sample changer with 1 tower, 1 integrated membrane pump and 1 connector for an external pump.
- **2.815.0020 815 Robotic USB Sample Processor XL**
  Sample changer with 1 tower and 2 integrated membrane pumps.
- **2.815.0030 815 Robotic USB Sample Processor XL**
  Sample changer with 1 tower and 2 connectors for external pumps.
- **2.815.0110 815 Robotic USB Sample Processor XL**
  Sample changer with 2 towers, 2 integrated membrane pumps and 2 connectors for external pumps.
- **2.815.0120 815 Robotic USB Sample Processor XL**
  Sample changer with 2 towers and 4 integrated membrane pumps.
- **2.815.0130 815 Robotic USB Sample Processor XL**
  Sample changer with 2 towers, and 4 connectors for external pumps.

For all variants, 1 Swing Head and 1 tower stirrer can be connected for each tower.

7.24.3 814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Configuration

Dialog: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name'**

If a device of type **814 USB Sample Processor** or **815 Robotic USB Sample Processor XL** is selected in the device table, then the menu item **[Edit] ► Properties...** opens the dialog window **Properties - 'Device name' - 'Device type'** with the device-specific tabs.

The devices can be initialized if necessary by means of the **[Initialize]** menu item in the device table *(see chapter 6.5.2.1, page 605)*.

7.24.3.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.24.3.2 Properties - Tower

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Tower**

NOTE

With the 858 Professional Sample Processor and the 919 IC Autosampler plus, the properties of the tower, including the Swing Head attached to it, are displayed on the **Tower** tab. In the case of the 814 USB Sample Processor and the 815 Robotic USB Sample Processor XL, the device versions with 1 tower have 1 tab **Tower 1**; device versions with 2 towers have 2 tabs **Tower 1** and **Tower 2**.

Tower parameters

Max. stroke path

Entry of the lowest permitted lift position. A lift height of **0 mm** corresponds to the "home position", i.e. the lift is moved all the way to the top.

Input range	**0 to 235 mm**
Default value	**235 mm**

Min. beaker radius

Definition of the minimum radius which the beakers used on the rack must have. If the lift is moved to the work position, the beaker radiuses defined in the **Rack table***(see chapter 6.11.2.1, page 659)* for general **Sample positions** *(see chapter 6.11.3.2, page 662)* and **Special beakers** *(see chapter 6.11.3.4, page 664)* will be compared with the **Min. beaker radius**. If this minimum beaker radius is not achieved, the run is stopped and an error message is output. No check will be made if **off** is enabled.

Selection	**1.0 - 100.0 mm** | **off**
Default value	**off**

Lift rate

Lift rate for the manual control of the tower.

Input range	**3 to 25 mm/s**
Default value	**25 mm/s**

Axial distance

Distance between the axis of rotation of the sample rack and the swing axis of the robotic arm.

Input range	**100.0 to 300.0 mm**

814 USB Sample Processor

Selection	**166.0 mm**
Default value	**166.0 mm**

815 Robotic USB Sample Processor XL

Selection	**196.0 mm**
Default value	**196.0 mm**

858 Professional Sample Processor

Selection	**166.0 mm**
Default value	**166.0 mm**

919 IC Autosampler plus

Selection	**196.0 mm**
Default value	**196.0 mm**

Swing Head

This parameter is only shown only if a Swing Head is mounted on the tower.

Serial number

Shows the serial number of the Swing Head.

Swing position

Lift position that is valid for all four external positions and at which the robotic arm turns to the external positions.

Input range	**0 to 235 mm**
Default value	**0 mm**

Rinse position

Rinse position valid for all 4 external positions.

Input range	**0 to 235 mm**
Default value	**0 mm**

[Configuration]

Opens the **Robotic arm configuration** dialog window *(see chapter 7.21.2.7, page 1427)*, in which the properties of the robotic arm can be edited.

Table for external positions

The properties for the four possible external positions for the robotic arm mounted on the Swing Head are shown in the table. The table cannot be edited directly.

External position

Number of the external position.

Angle [°]

Swing angle for external position.

Work position [mm]

Work position for external position.

[Edit]

Opens the **External position #** dialog window *(see chapter 7.21.2.8, page 1428)*, in which the parameters for the external position selected from the table can be edited.

7.24.3.3 Properties - Rack

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Rack**

The **Rack** tab shows the specific data of the attached rack.

Rack name

Shows the name of the rack attached. If no rack is attached, then "**-----**" is shown.

Rack code

Shows the rack code of the attached rack. The rack code corresponds to the arrangement of magnets on the base of the rack and is read out by the sample changer in order to recognize the rack. If no rack is in position, then the display will be empty.

Number of positions

Shows the number of positions on the rack. If no rack is in position, then the display will be empty.

Shift rate

Sample rack shift rate for manual control.

Input range	**3 to 20 °/s**
Default value	**20 °/s**

[Rack data]

Opens the **Rack data** dialog window *(see chapter 6.11.3.1, page 661)*, in which the data of the attached rack can be viewed and edited.

[Initialize rack]

Initializes the attached rack. This means that the rack, the lift and the robotic arm are reset, the rack code is read out and the respective rack data is transferred to the sample changer.

7.24.3.4 Properties - Starting position

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Starting position**

On the **Starting position** tab, a position can be defined which is automatically approached when the sample changer is initialized.

Move to starting position

on | off (Default value: **off**)

If this option is enabled, the position defined here is moved to when initializing the device. To do this, the lift either moves to the Shift position or remains in its current position if that is higher than the Shift position *(see page 663)*.

Tower

Selection of the tower on the sample changer for moving to the desired position.

Only editable for **Move to starting position** = **on** and if the corresponding sample changer has two towers, otherwise inactive.

Selection	**1** | **2**
Default value	**1**

Move

Selection of the target position which is to be approached:

Editable only for **Move to starting position** = **on**, otherwise inactive.

Selection	**Rack position** | **Special beaker** | **External position**
Default value	**Rack position**

Rack position
Predefined position on the rack. The lift is lowered at this time to the work position defined for that position.

Special beaker
Special position on the rack defined in the rack properties. The lift is lowered at this time to the work position defined for that position.

External position
External position which is defined for the Swing Head mounted to the tower. The lift is lowered to the work position defined for that position. This option is only available if a Swing Head is mounted to the tower.

Number

Specification of the number of the rack position, special beaker or external position.

Editable only for **Move to starting position** = **on**, otherwise inactive.

for Rotate = Rack position

Input range	**1 to 999**
Default value	**1**

for Move = Special beaker

Input range	**1 to 16**
Default value	**1**

for Move = External position

Input range	**1 to 4**
Default value	**1**

7.24.3.5 Properties - Connections

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Connections**

All devices/modules that are connected to the interfaces of the main device are displayed on this tab, e.g.:

- 945 Professional Detector Vario
- 943 Professional Thermostat / Reactor Vario
- 941 Eluent Production Module
- 940 Professional IC Vario

- 930 Compact IC Flex
- 896 Professional Detector
- 886 Professional Thermostat / Reactor
- 882 Compact IC plus
- 881 Compact IC pro
- 858 Professional Sample Processor
- 850 Professional IC
- 815 Robotic USB Sample Processor XL
- 814 USB Sample Processor

Extension module

Shows the extension modules connected to the main device. These devices are managed separately and have their own entry in the device table and are configured under their own name.

Name

Shows the name of the extension module.

Type

Shows the type of extension module.

MSB

NOTE

One **MSB #** (#=number of the connector) section exists for each MSB connector of the main device.

Shows the devices connected to the MSB # of the main device. They are listed in the order in which they are connected in series. These MSB devices are not managed separately and do not have their own entry in the device table.

Name

The display is made up of the name of the MSB device and the number of the MSB connector.

Type

Shows the type of MSB device.

7.24.3.6 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.24.3.7 Configuration robotic arm

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Tower ▶ [Configuration] ▶ Configuration robotic arm**

The specific settings for each robotic arm mounted on a Swing Head can be made in the **Configuration robotic arm** dialog window.

Swing offset

Swing angle offset for specific robotic arm model. This value must be set according to the leaflet supplied with the robotic arm.

Input range	**-270.0 to 270.0 °**
Default value	**0.0 °**

Maximum swing range

Maximum usable swing range for specific robotic arm model. Each robotic arm model displays a different value on the basis of its construction. This value must be set according to the leaflet supplied with the robotic arm and can also be reduced as required.

Input range	**0.0 to 330.0 °**
Default value	**60.0 °**

Swing radius

The swing radius depends on the length of the robotic arm and, together with the axial distance, is the most important parameter for exact movement to a rack position. This value must be set according to the leaflet supplied with the robotic arm.

Input range	**30.0 to 300.0 mm**
Default value	**110.0 mm**

Rotation offset

Offset from the middle of the tower to the middle of the robotic arm; normally, this value does not have to be changed. If a robotic arm must be mounted on the tower so that it is offset to one side, then this value can be determined by the service technician during rack adjustment.

Input range	**-270.0 to 270.0 °**
Default value	**0.0 °**

Swing direction

The swing direction of the robotic arm depends on the type of robotic arm.

Selection	**+ | –**
Default value	**+**

+
Clockwise rotation.

–
Counterclockwise rotation.

7.24.3.8 External position

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties… ▶ Properties - 'Device type' - 'Device name' ▶ Tower ▶ [Edit] ▶ External position #**

A **Swing angle** and a specific **Work position** can be defined for each external position in the **External position #** dialog window. **Shift position** and **Rinse position** can only be commonly defined for all four external positions. No **Special position** can be defined for external positions.

Angle

Definition of the swing angle for the selected external position. The offset is comprised of a design-specific angle (approx. 8 - 9°) and the robotic arm offset from the robotic arm properties *(see chapter 7.21.2.7, page 1427)*. The maximum swing range is also defined in the robotic arm properties.

Input range	**(Offset) to (Offset + max. swing range) °**
Default value	**60.0 °**

Work position

Definition of the work position for the selected external position.

Input range	**0 to 235 mm**
Default value	**0 mm**

7.24.4 814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Method

Program part: **Method**

In the program part **Method**, start parameters and program commands can be defined for the **814 USB Sample Processor** or for the **815 Robotic USB Sample Processor XL**.

7.24.4.1 814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Start parameters

Subwindow: **Method ▶ Devices**

Clicking on the icon for the **814 USB Sample Processor** or the **815 Robotic USB Sample Processor XL** in the top part of the window causes the tabs of the modules contained in the device to appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.24.4.1.1 Start parameters - Rack

Tab: **Method ▶ Devices ▶ Rack**

Rack name

Name of the rack which must be initialized on the sample changer when the hardware is started **[Start HW]**. If no rack is initialized, the method is not carried out.

Selection	**not defined** | **Rack names from the rack table**
Default value	**not defined**

not defined
The method is always carried out.

Rack names from the rack table
If a rack is selected, the method is only carried out if it is initialized in the sample changer. There is no automatic check to ensure that the rack is in position and that it is the correct rack. In order to check this during the run, the command **Initialize** must be inserted in the time program for the module **Rack**.

7.24.4.1.2 Start parameters - Peripherals Tower

Tab: **Method ▶ Devices ▶ Peripherals Tower**

Pump 1

Status

Selection	**on** | **off**
Default value	**off**

on
Pump 1 is switched on when the hardware is started with **[Start HW]**.

off
Pump 1 is switched off when the hardware is started with **[Start HW]**.

Solution

Selection list for the solution to be transported by Pump 1 when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Pump 2

Status

Selection	**on** | **off**
Default value	**off**

on
Pump 2 is switched on when the hardware is started with **[Start HW]**.

off
Pump 2 is switched off when the hardware is started with **[Start HW]**.

Solution

Selection list for the solution to be transported by Pump 2 when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Tower stirrer

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The settings have no effect.

Status

Selection	**on** | **off**
Default value	**off**

on
The tower stirrer is switched on when the hardware is started with **[Start HW]**.

off
The tower stirrer is switched off when the hardware is started with **[Start HW]**.

Rate

Enter the stirring rate

Input range	**-15 to 15**
Default value	**8**

7.24.4.2 814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the **814 USB Sample Processor** or the **815 Robotic USB Sample Processor XL**:

7.24.4.2.1 Commands - Tower

Subwindow: **Method ▶ Time program**

Overview of the time program commands assigned to the tower of the sample changer:

7.24.4.2.1.1 Rotate (Rack)

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Rotate (rack)**

The device-dependent **Rotate (rack)** time program command (command with feedback) rotates the rack until the desired position in relation to the tower is reached.

Purpose

Rotate

Selection of the target position on the rack.

Selection	**Sample position** | **Rack position** | **Special beaker** | **Relative angle**

Sample position
Position defined for the current determination in the Run window as the parameter **Position**.

Rack position
Predefined position on the rack.

Special beaker
Special position on the rack defined in the rack properties.

Relative angle
Rotate the rack relative to the current position by the specified rotation angle. This function can be used, for example, to remove vial caps automatically.

Number

Specification of the number of the rack position. This parameter is visible only for **Rotate** = **Rack position** or **Rotate** = **Special beaker**. The number can also be defined with the aid of the formula editor (Σ).

Input range	**1 to 999**
Default value	**1**

Rotation angle

Specification of the relative rotation angle. This parameter is displayed only for **Rotate** = **Relative angle**.

Input range	**–359.90 to 359.90 °**
Default value	**5.00 °**

Beaker test

on | off (Default value: **off**)

If this option is enabled, a beaker test is carried out. In this case, the action to be carried out can be selected if the beaker sensor defined for the rack does not detect a beaker at the target position. If the robotic arm is selected as beaker sensor, then a Swing Head must be installed and a work position also defined in the rack data must be defined in such a way that contact exists between the beaker sensor and the beaker. This work position will be automatically moved to for beaker recognition after the command **Move**.

Selection	**Display message** | **Cancel determination** | **Cancel determination and series**

Display message
A message is displayed and the determination is canceled.

Cancel determination
The determination is canceled and the next determination of the series is started.

Cancel determination and series
Both the determination and the series will be canceled.

Parameters

Rotation speed

Selection of the rate at which the rack rotates.

Input range	**3 to 20 °/s**
Default value	**20 °/s**

Rotation direction

Selection of the shift direction.

Selection	**auto** | **+** | **–**
Default value	**auto**

auto
The rotation direction with the smaller rotation angle is selected automatically.

+
It is rotated in the direction of **ascending** rack positions. Whether this requires clockwise or counterclockwise rotation depends on the rack.

–
It is rotated in the direction of **descending** rack positions. Whether this requires clockwise or counterclockwise rotation depends on the rack.

Swing rate speed

Selects the rate of the robotic arm when moving to a rack position or a special beaker (only with multiple row racks).

Input range	**10 to 55 °/s**
Default value	**55 °/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.24.4.2.1.2 Lift

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Lift**

With the device-dependent time program command **Lift** (command with feedback), the lift on the tower of the sample changer moves to the desired position.

Purpose

Lift position

Entering the desired lift position in mm or selection of one of the lift positions predefined for the rack. A lift height of **0 mm** corresponds to the home position. Here the lift is moved to the uppermost stop.

Input range	**0.0 to 235.0 mm**
Selection	**Work position** | **Shift position** | **Rinse position** | **Special position** | **Home position**
Default value	**Work position**

NOTE

Please take care that no lift positions exceed the maximum stroke path specified in the tower properties of the device.

Parameters

Lift rate

Selection of the speed for moving the lift.

Input range	**3 to 25 mm/s**
Default value	**25 mm/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.24.4.2.1.3 Swing

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Swing**

The device-dependent **Swing** time program command (command with feedback) is used to swing the robotic arm until the desired position is reached.

Purpose

Swing

Selection of the target position for the robotic arm.

Selection	**External position** | **Maximum angle** | **Relative angle**

External position
Swing to one of the 4 external positions defined per tower, which are defined in the tower properties of the Sample Processor.

Maximum angle
Swing the robotic arm to the maximum permissible angle value in the robotic arm properties.

Relative angle
Swing by the specified swing angle relative to the current position. This function can be used, for example, to automatically remove vial caps.

Number

Indicates the number of the external position which is to be swung to. This parameter is displayed only for **Swing** = **External position**. The number can also be defined with the aid of the formula editor (Σ).

Input range	**1 to 4 (depending on target position)**
Default value	**1**

Swing angle

Angle by which the robotic arm is to be swung relative to the current position. This parameter is visible only for **Swing** = **Relative angle**.

Input range	**–180 to 180 °**
Default value	**10 °**

Parameters

Swing rate speed

Rate of the robotic arm when swinging to an external position or a particular angle.

Input range	**10 to 55 °/s**
Default value	**55 °/s**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.24.4.2.2 Commands - Rack

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the rack:

7.24.4.2.2.1 Initialize

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Initialize**

The device-independent time program command **Initialize** (command with feedback) initializes the rack positioned on the sample changer.

Rack test

on | off (Default value: **on**)

If this option is enabled, the rack attached will be checked.

Test rack

Select the rack to be positioned on the sample changer. The rack attached will be checked to ensure it is the one specified.

Selection	**Racks from the rack table**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.24.4.2.3 Commands - Peripherals Tower

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peripheral devices assigned to the tower:

7.24.4.2.3.1 Pump # On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Pump # On/Off**

The device-dependent time program command **Pump # On/Off** (command without feedback) switches the respective pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.24.4.2.3.2 Tower stirrer On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Tower stirrer On/Off**

The device-dependent time program command **Tower stirrer On/Off** (command without feedback) switches the tower stirrer on/off and sets the value for the stirring rate.

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The command is ignored in the run.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Stirrer

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Rate

Rate of the stirrer.

Input range	**-15 to 15 (without 0)**
Default value	**3**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.24.4.2.4 Commands - General

Subwindow: **Method ▶ Time program**

Overview of the general time program commands available for the 858 Professional Sample Processor:

7.24.4.2.4.1 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.24.4.2.4.2 Reserve

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - General ▶ Reserve**

The device-dependent time program command **Reserve** (command without feedback) reserves the sample changer including all connected MSB devices (Dosino, stirrer, Remote Box, etc.), after it has been released, during an ongoing determination for a given workplace again.

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.24.5 814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.24.5.1 Manual control - Tower

Tab: **Manual ▶ Manual control - 'Device name' ▶ Tower**

Rack position

Current value

Shows the current rack position.

Input

Enter or select the rack position to be moved to.

Input range	**1 to n (depending on rack)**
Default value	**1**
Selection	**Special beaker 1 ... 16**

[Start]

Start moving to the specified position. After the start, the button changes to **[Stop]** and the two arrow keys become inactive (gray).

[Stop]

Stop moving to current rack immediately.

Move to current rack position -1.

Move to current rack position +1.

Lift position

Current value

Current lift position.

Input

Enter or select the lift position that is to be moved to for the current rack position (normal beaker, special beaker, external position).

Input range	**0 to Max. stroke path mm**
Default value	**0 mm**
Selection	**Work position** | **Shift position** | **Rinse position** | **Special position** | **Home position**

[Start]

Move lift to the desired position.

[Stop]

Stop moving to lift position immediately.

The lift continues moving up as long as this button is pressed.

The lift continues moving down as long as this button is pressed.

Robotic arm position

Current value

Current position (angle) of the robotic arm on the tower.

Input

Enter or select the robotic arm position to be moved to.

Input range	**0.0 to 330.0 °**
Default value	**0.0 °**
Selection	**External 1** | **External 2** | **External 3** | **External 4**

[Start]

Move robotic arm to the desired position.

[Stop]

Immediately stop the action which was triggered with **[Start]**.

The robotic arm continues moving to the left as long as this button is pressed.

The robotic arm continues moving to the right long as this button is pressed.

[Configure rack]

Open dialog window **Rack configure 'Rack name'** *(see chapter 7.11.4.5, page 1067)*.

7.24.5.2 Manual control - Rack

Tab: **Manual ▶ Manual control - 'Device name' ▶ Rack**

[Initialize rack]

Initialize rack that is in position.

7.24.5.3 Manual control - Peripheral devices

Tab: **Manual control ▶ Manual control - All Devices - 'Device name' ▶ Peripherals Tower**

Tower stirrer - Rate

NOTE

The tower stirrer will be deactivated if a **stirrer** is connected to the **MSB 1** of the sample changer. The settings have no effect.

Current value

Current rate of the tower stirrer.

Input

Enter the rate of the tower stirrer.

Input range	**-15 to 15 (without 0)**
Default value	**Current value**

[Apply]

Send the set parameters to the stirrer.

[On]

Start the stirrer with the set parameters. This is inactive if the stirrer is running.

[Off]

Stop the stirrer. This is inactive if the stirrer is not running.

Pump 1

[On]

Start pump 1 with the set parameters. This is inactive if the pump is running.

[Off]

Stop pump 1. This is inactive if the pump is not running.

Pump 2

[On]

Start pump 2 with the set parameters. This is inactive if the pump is running.

[Off]

Stop pump 2. This is inactive if the pump is not running.

7.24.5.4 Configuring the rack

Dialog window: **Manual control ► Manual control - All instruments - 'Instrument name' ► Rack ► [Configure rack] ► Configure 'rack name' rack**

Rack position

Current position

Shows the current rack position.

Special beaker

Selection of the special beaker to which the current rack position is to be assigned.

Input range	**1 to 16**

[Assign]

Assigns the current rack position to the selected special beaker.

NOTE

If an external position is selected as current position, it cannot be assigned to a special beaker.

Lift position

Current position

Shows the current lift position in mm.

Work position for

If this option is selected, the current lift position is assigned to the work position of the tower, of a special beaker or of an external position of the robotic arm.

Selection	**Tower** | **Special beaker 1 - 16** | **External 1 - 4**
Default value	**Tower**

Rinse position for

If this option is selected, the current lift position is assigned to the rinse position of the tower or of the external position of the robotic arm.

Selection	**Tower** | **External positions**
Default value	**Tower**

Shift position for

If this option is selected, the current lift position is assigned to the shift position of the tower.

Selection	**Tower**

Special position for

If this option is selected, the current lift position is assigned to the special position of the tower.

Selection	**Tower**

Robotic arm position

If this option is selected, the current lift position is assigned to the swing position of the robotic arm.

Selection	**External positions**

[Assign]

Assigns current lift position to selected position

Robotic arm position

Current position

Shows the current position of the robotic arm in °.

External position

Selection of the external position to which the current robotic arm position is to be assigned.

Selection	**External 1** | **External 2** | **External 3** | **External 4**

[Assign]

Assigns the current robotic arm position to the selected external position.

7.25 801 Stirrer, 803 Ti Stand, 804 Ti Stand

7.25.1 Stirrer - General

The devices **801 Stirrer**, **803 Ti Stand** and **804 Ti Stand** are MSB devices and can be operated with a host of Metrohm main devices. They are referred to and described here together as **stirrers**.

Devices with which the stirrers can be used

- *945 Professional Detector Vario*
- *943 Professional Thermostat / Reactor Vario*
- *941 Eluent Production Module*
- *940 Professional IC Vario*
- *930 Compact IC Flex*
- *919 IC Autosampler plus*
- *896 Professional Detector*
- *886 Professional Thermostat / Reactor*
- *882 Compact IC plus*
- *881 Compact IC pro*
- *858 Professional Sample Processor*
- *850 Professional IC*
- *846 Dosing Interface*
- *814 USB Sample Processor and 815 Robotic USB Sample Processor XL*

7.25.2 Configuration MSB Device

An MSB device is not entered in the device table. In the configuration it is only listed under the MSB connections of the main device to which it is connected (e.g. **850 Professional IC** or **858 Professional Sample Processor**).

7.25.3 Stirrer - Method

Subwindow: **Method ▶ Devices**

A stirrer (as is the case with all MSB devices) cannot be added separately to a method. It is added to the list of devices by adding the main device to which it is connected to the method.

If the method is created without connected devices, the MSB device can be added separately. The MSB connector on the main device must be entered manually in such cases.

In the device list, a stirrer behaves like a stand-alone device. It can be selected and graphically displayed in the upper part of the instrument window.

7.25.3.1 Stirrer - Start parameters

Tab: **Method ▶ Devices ▶ Stirrer**

Status

Selection	**On** | **Off**

On
The stirrer is switched on when the hardware is started with **[Start HW]**.

Off
The stirrer is switched off when the hardware is started with **[Start HW]**.

Rate

Stirring rate when the hardware is started with **[Start HW]**.

Input range	**–15 to 15 (without 0)**
Default value	**8**

Connection

Shows the connector on the device to which the stirrer is connected.

7.25.3.2 Stirrer - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the stirrers **801 Stirrer**, **803 Ti Stand** and **804 Ti Stand**:

7.25.3.2.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the stirrer on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Stirrer

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Rate

Input field for the stirring rate.

Input range	**–15 to 15 (without 0)**
Default value	**8**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.25.3.2.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.25.4 Stirrer - Manual control

Tab: **Manual ► Manual control- 'Device name' ► 'Stirrer name'**

Rate

Current Value

Current value of the rate.

Input

Entry of a new value for the rate.

Input range	**–15 to 15 (without 0)**
Default value	**8**

[On]

The button starts the stirrer with the set parameters. This is inactive if it is already running.

[Off]

The button stops the stirrer. This is inactive if it is not running.

[Apply]

The button sends the set parameters to the stirrer.

7.26 800 Dosino

7.26.1 800 Dosino - General

The **800 Dosino** is a flexible dosing drive which, as an MSB device, can be used with a host of Metrohm main devices. Together with the intelligent **807 Dosing Unit**, it is well suited for both simple dosing and for complex automation and liquid handling tasks, such as sample transfer or pipetting.

NOTE

MagIC Net only supports the use of intelligent **807 Dosing Units**!

Devices with which the 800 Dosino can be used

- *945 Professional Detector Vario*
- *943 Professional Thermostat / Reactor Vario*
- *941 Eluent Production Module*
- *940 Professional IC Vario*
- *930 Compact IC Flex*
- *920 Absorber Module*
- *919 IC Autosampler plus*
- *896 Professional Detector*
- *886 Professional Thermostat / Reactor*
- *882 Compact IC plus*
- *881 Compact IC pro*
- *858 Professional Sample Processor*
- *850 Professional IC*
- *846 Dosing Interface*
- *814 USB Sample Processor and 815 Robotic USB Sample Processor XL*

7.26.2 Configuration MSB Device

An MSB device is not entered in the device table. In the configuration it is only listed under the MSB connections of the main device to which it is connected (e.g. **850 Professional IC** or **858 Professional Sample Processor**).

7.26.3 800 Dosino - Method

Subwindow: **Method ▶ Devices**

An 800 Dosino (as is the case with all MSB devices) cannot be added separately to a method. It is added to the device list by adding the main device to which it is connected to the method.

If the method is created without any connected devices, the MSB device can be added separately. The MSB connector on the main device must be entered manually in such cases.

In the device list, the 800 Dosino behaves like a stand-alone device. It can be selected and graphically displayed in the top part of the instrument window.

7.26.3.1 800 Dosino - Start parameters

Tab: **Method ▶ Devices ▶ Dosino**

Solution

Selection of the solution for the Dosino that is to be available when the hardware is started with **[Start HW]**. A check is carried out in the method run to ensure that the correct solution has been put on the dosing device. When the method is started, the working life and GLP test interval are checked for the selected solution.

Selection	**not defined** | **Solutions from the solution table**
Default value	**not defined**

not defined
The solution is not checked.

Solutions from the solution table
Only "intelligent" solutions, i.e. solutions that are assigned to an 807 Dosing Unit, can be selected.

Connection

Shows the main device and the MSB connector which the **800 Dosino** is on.

7.26.3.2 800 Dosino - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 800 Dosino:

7.26.3.2.1 Dosing

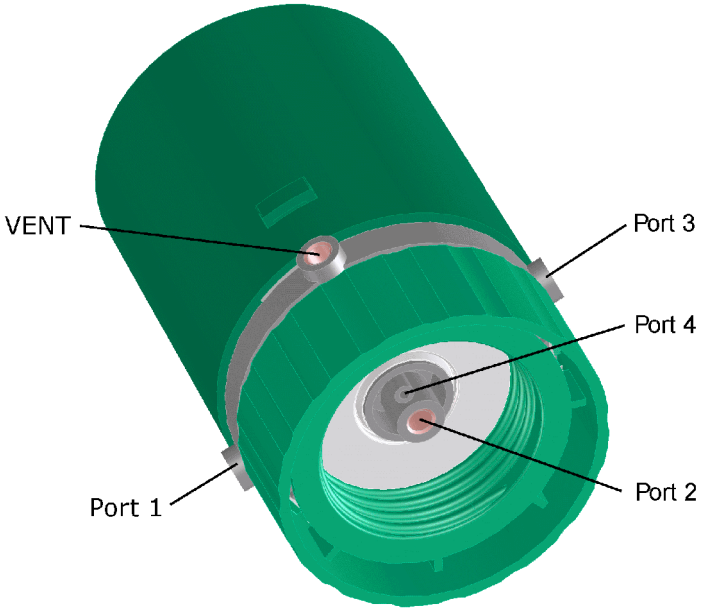
Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Dosing**

The device-dependent **Dosing** time program command (command with feedback) doses the specified volume via the defined port. There is no automatic filling beforehand or afterwards.

Parameter

Port

Port via which dosing takes place. Formula input possible.



Input range	**1 to 4**
Default value	**1**

Volume

Volume to be transported. Formula input possible.

Input range	**0.0000 to 99999.9000 mL**
Default value	**1.0000 mL**

Dosing rate

Rate of ejection. The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Filling rate

Rate of filling. The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Default value	**1.00 mL/min**
Selection	**maximum**

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONC	Concentration of the dosed solution, if one has been assigned to the Dosino.	Number
DVOL	Dosed volume [mL]	Number

7.26.3.2.2 Aspirate

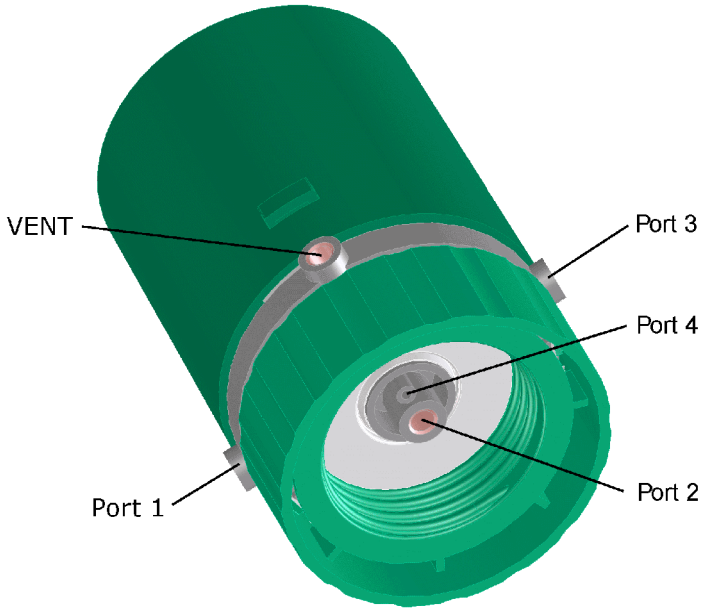
Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Aspirate**

The device-dependent **Aspirate** time program command (command with feedback) draws in the specified volume via the defined port. As with the **Dosing** command, the cylinder is not filled automatically beforehand or afterwards. It should be possible to reach the volume to be aspirated with a single piston stroke.

Parameter

Port

Port via which aspiration takes place. Formula input possible.



Input range	**1 to 4**
Default value	**1**

Volume

Volume to be transported. Formula input possible.

Input range	**0.0000 to 50.0000 mL**
Default value	**1.0000 mL**

Rate

The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
AVOL	Aspirated volume [mL]	Number

7.26.3.2.3 Fill

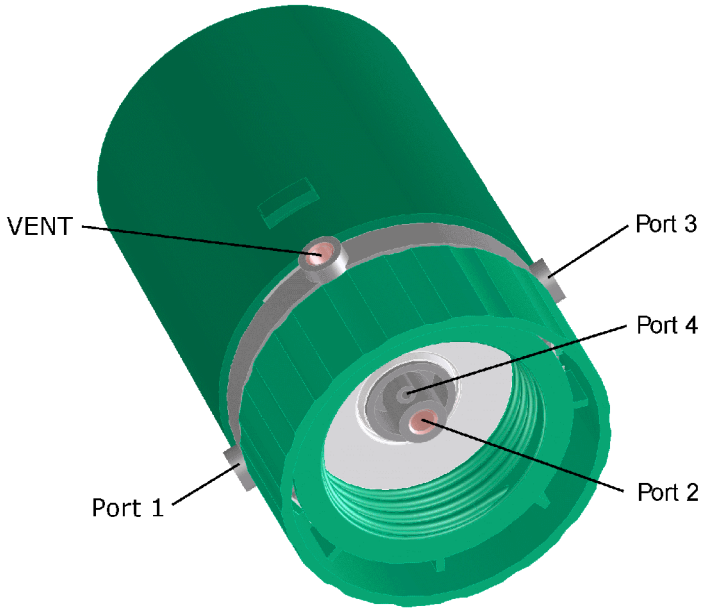
Dialog window: **Method ► Time program ► Edit ► 'Device' - Fill**

The device-dependent **Fill** time program command (command with feedback) fills the cylinder via the specified port. The valve disk stops afterwards on the selected port.

Parameter

Port

Port via which filling takes place. Formula input possible.



Input range	**1 to 4**
Default value	**2**

Rate

The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**

Selection	**maximum**
Default value	**maximum**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.4 Eject to end volume

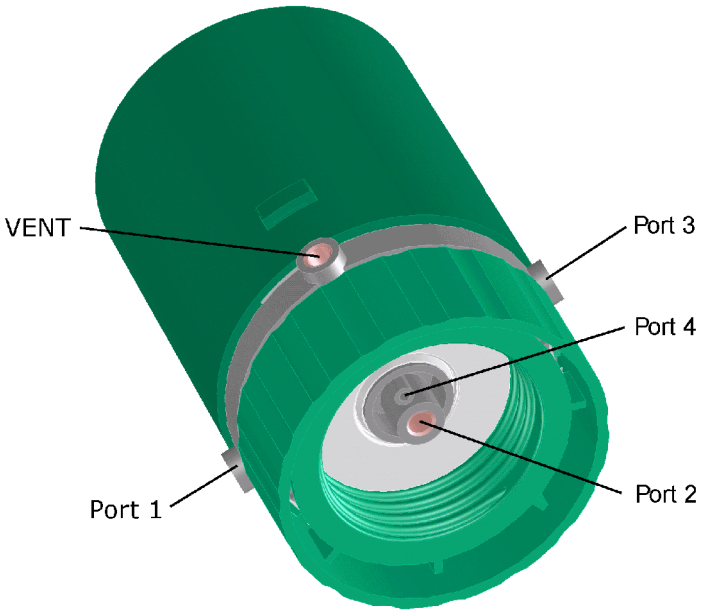
Dialog window: **Method ► Time program ► Edit ► 'Device' - Eject to end volume**

The device-dependent **Eject to end volume** time program command (command with feedback) ejects the entire content of the cylinder via the specified port. In contrast to the **Eject to stop** command, the piston moves to the maximum volume mark, i.e. until it has executed 10,000 pulses. This command should be used for pipetting functions for emptying the cylinder.

Parameter

Port

Port via which ejection takes place. Formula input possible.



Input range	**1 to 4**
Default value	**4**

Rate

The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.5 Eject to stop

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Eject to stop**

The device-dependent **Eject to stop** time program command (command with feedback) ejects the entire content of the cylinder via the specified port. The piston is pressed all the way down to the stop, i.e. beyond the maximum volume mark.

NOTE

This function should only be carried out to eject any air bubbles present.

CAUTION

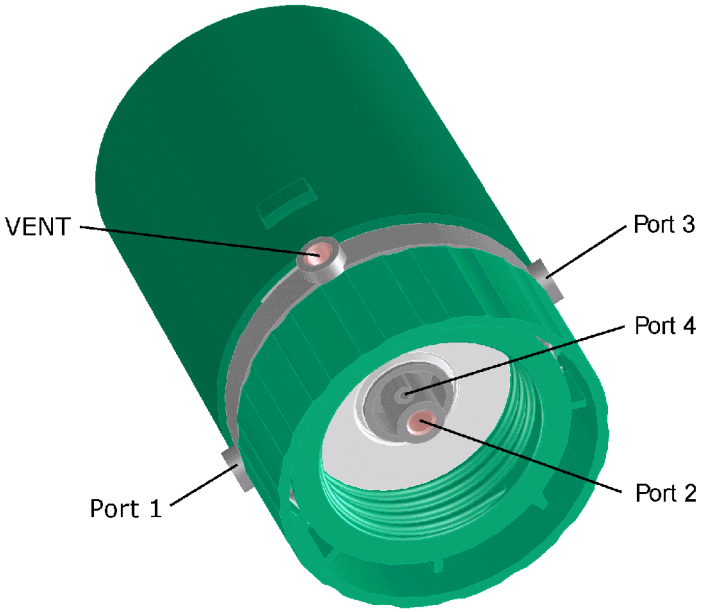
The **Aspirate** command does not work directly after **Eject to stop**.

If aspiration is to take place after **Eject to stop**, then **Eject to end volume** must first be carried out. In this command, the port via which aspiration is to take place must already be selected.

Parameter

Port

Port via which ejection takes place. Formula input possible.



Input range	**1 to 4**
Default value	**4**

Rate

The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**

Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.6 Exchange position

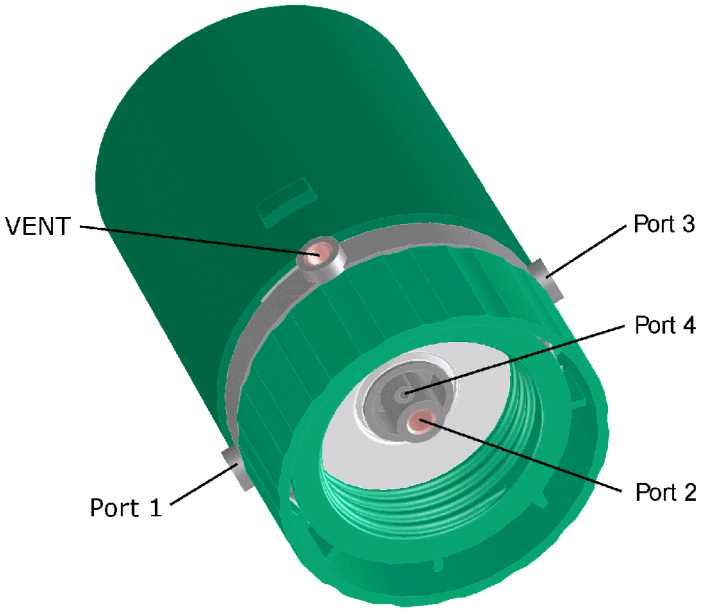
Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Exchange position**

With the device-dependent **Exchange position** time program command (command with feedback), the cylinder is first filled via the specified port. The valve disk is then rotated to **Port 2** and the dosing drive can be removed from the dosing unit.

Parameter

Fill port

Port via which filling takes place. Formula input possible.



Input range	**1 to 4**
Default value	**2**

Rate

The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**

Selection	**maximum**
Default value	**maximum**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.7 Change port

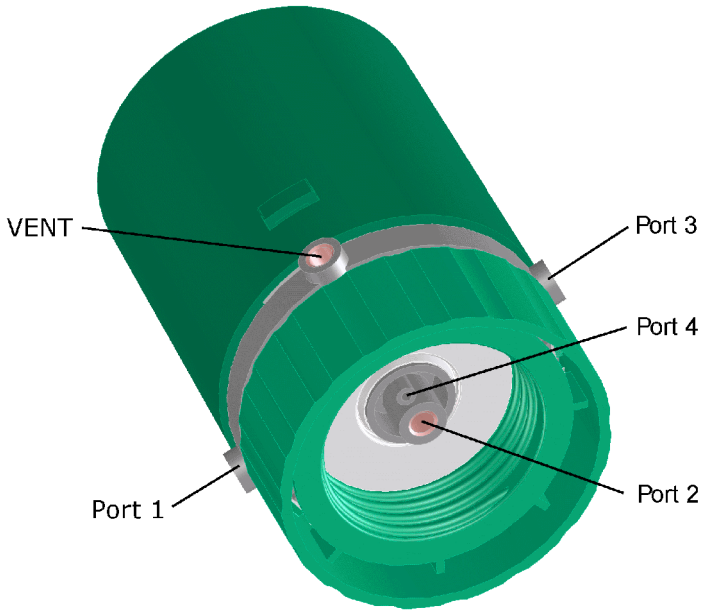
Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Change port**

The device-dependent **Change port** time program command (command with feedback) results only in a rotation of the valve to the specified port and not in any piston movement.

Parameter

Port

The flat stopcock is moved to the specified port. Formula input possible.



Input range	**1 to 4**
Default value	**2**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.8 Compensate

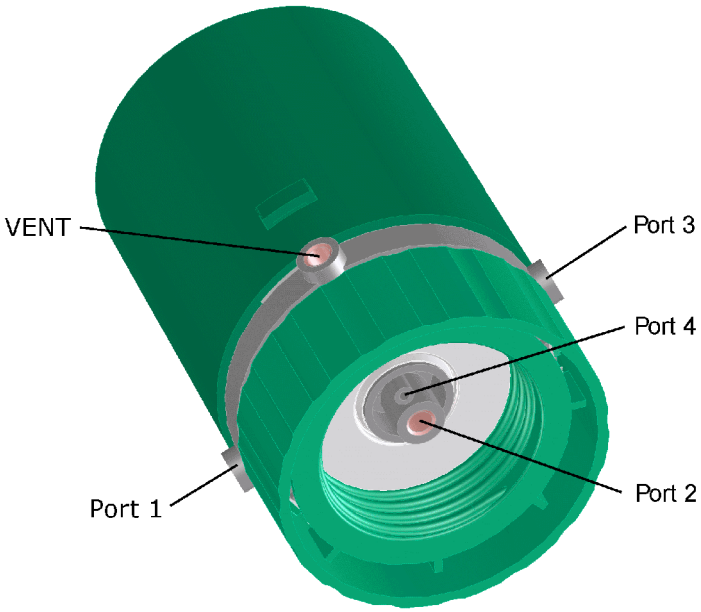
Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Compensate**

Because the dosing units are interchangeable, the coupling of the Dosino piston rod (spindle) exhibits a slight mechanical tolerance, which is noticeable when the piston changes its direction of movement. This tolerance can be compensated for with the device-dependent **Compensate** time program command (command with feedback). A short piston movement is first made in the same direction as the previous movement, which is then followed by a piston movement in the reverse direction.

Parameter

Port

Port via which the piston motions run. Formula input possible.



Input range	**1 to 4**
Default value	**4**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.9 Prepare

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Prepare**

The device-dependent **Prepare** time program command (command with feedback) is used to prepare a dosing unit.

The cylinder and all tubings of a dosing unit are rinsed in an extensive cleaning sequence. The parameters required for this process are stored in the configuration of the solution.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.10 Dosino gradient

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Dosino gradient**

The device-dependent **Dosino gradient** time program command (command without feedback) starts a flow gradient program for the Dosino. The dosing unit port via which the Dosino doses a solution is specified in the configuration and is read out while the time program runs *(see page 638)*.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Dosino gradient

Flow

High-pressure pump flow (see pump start parameter).

Table

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Edit	Edit the selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

Total volume

Total volume that is needed for the Dose-in Gradient.

The graph represents the ratio of the programmed gradient as a function of time. It is updated automatically after the gradient table has been edited.

Tandem dosing

If the **Tandem dosing** check box is activated, then a second dosing unit can be defined in order to enable continuous dosing. Dosing is carried out with a combination of two dosing units so that the second dosing unit is dosing while the first one is being filled and vice versa *(see chapter 7.26.3.2.14, page 1603)*.

Dosing device

Selection of the second dosing device for tandem dosing.

Filling rate

The maximum cylinder filling rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.11 Edit Dosino gradient

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient ▶ [Edit] ▶ New / Edit ▶ Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Ratio

Proportion of flow from the Dosino to the flow of the high-pressure pump.

Input range	**0.001 to 20.000 %**
Default value	**(Start parameter for flow in the method) %**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.26.3.2.12 Empty

Dialog window: **Method ► Time program ► Edit ► 'Device' - Empty**

The device-dependent **Empty** time program command (command with feedback) is used to empty the cylinder and the tubings of a dosing unit.

The cylinder and all the tubings of a dosing unit are emptied in an extensive sequence. The parameters required for this process are stored in the configuration of the solution.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.26.3.2.13 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.26.3.2.14 Tandem dosing

A second dosing device can be defined with **Tandem dosing** activated in order to enable uninterrupted dosing. Dosing is carried out with a combination of two dosing devices so that the second dosing device is dosing while the first one is being filled and vice versa.

However, in order to ensure uninterrupted dosing, the following points must be taken into account:

- **Keeping filling times short**
  Use the highest possible filling rate in order to keep the filling times as short as possible. Take the viscosity and density of the liquid into account.
- **Filling rate with different cylinders**
  When you use two dosing devices with different cylinder volumes (dosing cylinder 2 > dosing cylinder 1), then the minimum filling rate of the larger cylinder 2 must be:
  Filling rate 2 ≧ filling rate 1 • ($V_{dosing\ cylinder\ 2}$/$V_{dosing\ cylinder\ 1}$)
- **Rule for dosing rate**
  The dosing rate must not exceed 75% of the filling rate of the smaller cylinder. This corresponds to the following values (at maximum filling rate):

Cylinder volume	max. dosing rate		Max. flow rate	
	Exchange unit	Dosing unit	Exchange unit	Dosing unit
1 mL	2.25 mL/min	---	approx. 130 mL/h	---
2 mL	---	5.00 mL/min	---	approx. 300 mL/h
5 mL	11.25 mL/min	12.50 mL/min	approx. 670 mL/h	approx. 750 mL/h
10 mL	22.50 mL/min	25.00 mL/min	approx. 1.3 L/h	approx. 1.5 L/h
20 mL	45.00 mL/min	50.00 mL/min	approx. 2.7 L/h	approx. 3.0 L/h
50 mL	112.50 mL/min	124.50 mL/min	approx. 6.7 L/h	approx. 7.5 L/h

7.26.4 800 Dosino - Manual control

Tab: **Manual ► Manual control - 'Device name' ► 'Dosino'**

Command

Selection of the Dosino command that is to be triggered manually.

Selection	**Dosing** | **Aspirate** | **Fill** | **Prepare** | **Empty**
Default value	**Dosing**

Dosing
Doses the specified volume via the defined port. There is no automatic filling beforehand or afterwards.

Aspirate
Draws in the specified volume via the defined port. There is no automatic filling beforehand or afterwards.

Fill
The cylinder is filled in a fixed sequence. The parameters required for this process are stored in the configuration of the solution.

Prepare
The cylinder and all tubings of a dosing unit are rinsed in an extensive cleaning sequence. The parameters required for this process are stored in the configuration of the solution.

Empty
The cylinder and all the tubings of a dosing unit are emptied in an extensive sequence. The parameters required for this process are stored in the configuration of the solution.

Solution

Shows the solution assigned to the Dosino.

Volume

Current Value

Shows the currently dosed volume.

Input

Entry of the volume that is to be dosed/moved.

Input range	**0.0000 to 99999.9000 (exception: with command "Aspirate" 50.0000) mL**
Default value	**1.0000 mL**

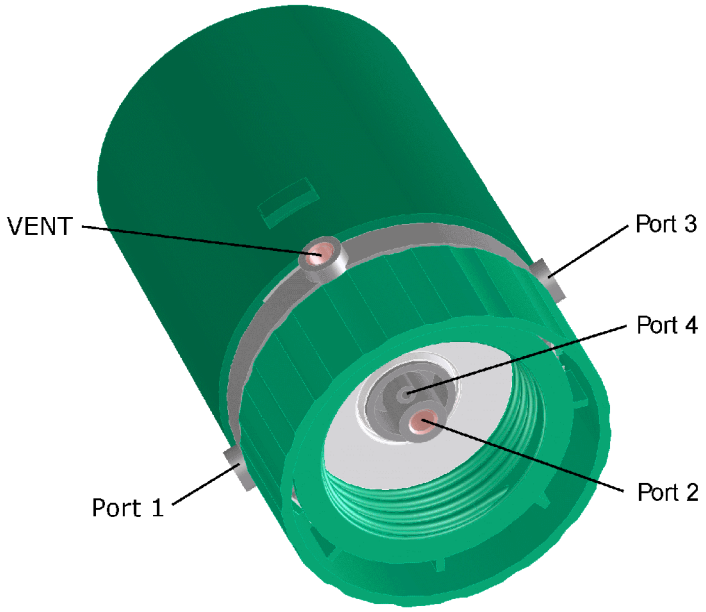
Port

Current Value

Shows the current port.

Input

Selection of a port for the action selected in the **Command** parameter.



Input range	**1 to 4**
Default value	**1**

Dosing rate

Input

Entry of the dosing rate. The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Filling rate

Input

Entry of the filling rate. The maximum rate depends on the cylinder volume of the dosing unit used. Formula input possible.

Cylinder volume 2 mL

Input range	**0.01 to 6.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 5 mL

Input range	**0.01 to 16.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 10 mL

Input range	**0.01 to 33.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 20 mL

Input range	**0.01 to 66.00 mL/min**
Selection	**maximum**
Default value	**maximum**

Cylinder volume 50 mL

Input range	**0.01 to 166.00 mL/min**
Selection	**maximum**
Default value	**maximum**

[Start]

Start Dosino command.

[Stop]

Stop Dosino command.

7.27 771 IC Compact Interface

The 771 IC Compact Interface serves to record and evaluate the analog signal of existing Metrohm IC devices of the Compact, Modular and Advanced series with MagIC Net.

7.27.1 771 IC Compact Interface - Configuration

Dialog: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Instrument type' - 'Device name'**

If a device of the type **771 IC Compact Interface** is selected in the device table, then the **[Edit] ▶ Properties...** menu item can be used to open the **Properties - 'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.27.1.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected | not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.27.1.2 Properties - RS 232

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ RS 232**

The connection to 771 IC Compact Interface is configured on this tab.

COM port

Selection of the serial port to which the 771 IC Compact Interface is connected.

NOTE

Make sure that the following settings have been made for the FIFO buffer of the selected interface:

Receive buffers	maximum
Transmit buffer	minimum

Input range	**COM 1 to COM n**
Default value	**first COM port found**

[Connect]

Establishes a connection to the device.

[Disconnect]

Disconnects the connection to the device (only then the device can be deleted from the configuration).

7.27.1.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.27.2 771 IC Compact Interface - Method

Program part: **Method**

Start parameters, data channels and program commands can be defined for the 771 IC Compact Interface in the **Method** program part.

7.27.2.1 771 IC Compact Interface - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **771 IC Compact Interface** in the top part of the window, then the tabs of the modules contained in the device will appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.27.2.1.1 Channel

Tab: **Method ▶ Devices ▶ Channel #**

Warning limit

The warning limit for the signal from **Channel #** is defined. If it is exceeded, the display in the Watch Window turns **red**. No messages are displayed or documented and no action is triggered.

Input range	**1 to 2,499 mV**
Default value	**2,499 mV**

7.27.2.2 771 IC Compact Interface - Data channels

Tab: **Method ▶ Devices ▶ Analysis ▶ Hardware assignment**

In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

The 771 IC Compact Interface has **two data channels**, both of which have the same properties:

Label of y-axis	Unit	Evaluation
Analog signal	mV	Yes

7.27.2.3 771 IC Compact Interface - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the 771 IC Compact Interface:

7.27.2.3.1 Waiting for injection IC Net

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Wait for injection IC Net**

With this device-dependent time program command **Wait for Injection IC Net** (command with feedback) **MagIC Net** waits until the signal is set for the completed injection at the remote input of the 771 IC Compact Interface.

Max. waiting time

on | off (Default value: **off**)

If this option is activated, then the time program is continued as soon as either the requested input signal has been received or the waiting time has expired.

Time

Input range	**0 to 9,999**
Default value	**10**

Unit

Selection	**s** | **min**
Default value	**min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.27.2.3.2 Measure analog signal

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure analog signal**

The device-dependent time program command **Measure analog signal** (command with feedback) measures the voltage and makes it available as a variable **TP.'command number'.analog signal**. If this command is carried out several times in a time program, the resulting variable will be overwritten each time.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.27.2.3.3 Measure noise

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.27.2.3.4 Measure drift

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.27.3 771 IC Compact Interface - Manual control

The **771 IC Compact Interface** has no functions that can be performed manually.

7.28 Barcode reader

7.28.1 Barcode reader - General

A barcode reader is used to enter sample data and other data in **MagIC Net**.

NOTE

A barcode reader only has to be configured as a **device** in **MagIC Net** when the functions for automatic data import into sample tables are to be used. If a USB barcode reader not configured as a device is connected to the PC, it will be recognized (in the same way as a keyboard) as being an **HID** (Human Interface Device) that can be used for data entries in all fields.

Barcode reader as a device

NOTE

If the functions for automatic data import into sample tables are to be used, the barcode reader must be added as a device in **MagIC Net** and configured so that during each data transfer the following preamble and postamble control characters are also transmitted:

Preamble #1: **02hex** (^B, STX)

Preamble #2: **02hex - 09hex** (different identification code **02hex - 09hex** for each barcode reader connected)

Postamble #1: **04hex** (^D, EOT)

Finish: **<CR><LF>**

Refer to the barcode reader manual regarding its configuration.

Barcode reader as an HID

NOTE

If a barcode reader is to be used as an HID it must be configured in such a way that it does not transmit any preamble control characters.

Refer to the barcode reader manual regarding its configuration.

7.28.2 Barcode reader - Overview

Dialog: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name'**

The parameters for a **barcode reader** are set on the following tabs:

- *General*
  General device information such as device name, device type, serial number, etc.
- *Settings*
  Settings for the barcode reader.
- *GLP*
  Information on GLP tests and GLP monitoring.

7.28.3 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.28.4 Properties - Settings

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Settings**

Barcode reader ID

Shows the identification of the barcode reader.

Input target

Selection of the field into which the barcode reader input is to be entered.

Selection	**Active input field** | **Method** | **Ident** | **Sample type** | **Position** | **Injections** | **Volume** | **Dilution** | **Sample amount** | **Info 1 to Info 4** | **Value 1 to Value 4** | **Batch name**
Default value	**Active input field**

[Connect]

Establishes a connection with the barcode reader. The dialog window **Establish connection** appears *(see chapter 7.28.6, page 1622)*.

[Disconnect]

Disconnects the connection with the barcode reader (only then can the device be deleted from the configuration).

7.28.5 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.28.6 Establishing a connection with the barcode reader

Dialog window: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Settings ▶ [Connect] ▶ Establish connection**

In order to test the connection with a barcode reader, click on the **[Connect]** button on the **Settings** tab.

If a barcode is then scanned with the barcode reader, the data received will be entered in the following fields:

Barcode reader ID

Identification of the barcode reader.

Data

Read-in data.

7.29 Combustion Module

7.29.1 Combustion Module - Overview

The Combustion Module can comprise the following components:

- Combustion oven for combusting solid, liquid or gaseous samples.
- Auto Boat Driver including flame sensor that moves the quartz boat with a liquid or solid sample into the combustion tube in the oven. Gaseous samples can also be fed into the combustion oven via the sample port.
- Autosampler (MMS 5000) with a rack for solid or liquid samples.
- LPG/GSS (Liquefied Petroleum Gas / Gas Sampling System) for feeding gaseous samples.
- LPG (Liquefied Petroleum Gas) for feeding gaseous samples under high pressure.

The Combustion Oven controls Autosampler, Auto Boat Driver, LPG/GSS and LPG.

NOTE

The hardware configuration of a combustion system may not be changed while a **determination series** is running.

7.29.2 Combustion Module - Configuration

If a device of type Combustion Module is selected, then menu item **Edit ▶ Properties...** can be used to open the dialog window **Properties -'Device name' - 'Device type'** . There, the properties for the various components and the GLP data can be defined.

7.29.2.1 Properties - General

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ General**

General properties of the device are displayed on the **General** tab.

Device name

Name of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device name #**

Device type

Shows the device type.

Program version

Shows the program version of the device.

Only visible with devices that have their own firmware.

Device serial number

Shows the serial number of the device.

Set to work

Shows the date on which the device was automatically added to the device table.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

[Basic initialization]

Starts the basic initialization of a combustion system.

Basic initialization

A basic initialization has to be performed with all components used in a combustion system (Auto Boat Driver, Autosampler, LPG/GSS or LPG) prior to the first use. If an additional component (Auto Boat Driver, Autosampler, LPG/GSS or LPG) is integrated into the combustion system, then basic

initialization needs to be performed once again with all components. All components must be connected to the Combustion Module and switched on for the basic initialization.

Only one component is permitted to be switched on during work, either an Auto Boat Driver or an LPG/GSS or an LPG. If a gaseous sample is fed via the sample port of the Auto Boat Driver rather than via a separate adapter, then it is mandatory that the Auto Boat Driver be switched off. This prevents the gases from condensing in the cooled sample port.

7.29.2.2 Properties - Combustion Oven

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Combustion Oven**

Combustion Oven after [Stop HW]

Standby

When **[Stop HW]** is triggered, the Combustion Module with all components goes into Standby mode. The cooling of the combustion gases with a Peltier element is switched off. If **[Stop HW]** is triggered again, it can take a few minutes for the cooling to again reach its operating point.

Temperature

Definition of the temperature of the combustion oven in Standby mode.

Switch off

When **[Stop HW]** is triggered, the Combustion Module with all components is switched off.

Connected device

Either an Auto Boat Driver, an LPG/GSS or an LPG can be connected to the Combustion Oven.

7.29.2.3 Properties - Auto Boat Driver

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Auto Boat Driver**

End position

End position of the sample boat in the glass tube while combusting a sample. How far the boat is moved into the glass tube is determined by the glass tube used and the application.

Input range	**277 to 307 mm**
Default value	**277 mm**

7.29.2.4 Properties - Autosampler

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ Autosampler**

The properties of the Autosampler MMS 5000, a component of the combustion module, are defined on this tab.

Sampler

Display of which sampler is used.

Selection	**Gripper** | **Dosing syringe 50 µL** | **Dosing syringe 100 µL**

Rack type

Display of which rack type is used.

Selection	**Solid rack** | **Liquid rack**

[Initialize]

If a different rack is used, the Combustion Module has to be reinitialized. Only then is the new rack recognized by MagIC Net.

[Align]

Open the dialog window *(see chapter 7.29.2.8, page 1628)* in which the adjustment coordinates for the sampler can be input.

Adjustment

In this table, the x, y, and z coordinates of the dosing syringe (liquid rack) and the gripper (solid rack) for position 1 on the rack and for the Auto Boat Driver sample port are shown.

NOTE

An adjustment of the sampler is required:

- before initial startup
- for every sample rack
- after changing the dosing syringe and Gripper
- during every recommissioning after modification, transport or storage

Selection	**Position 1** | **Sample port**

Position 1
Coordinates of the sampler for position 1 on the rack.

Sample port
Coordinates of the sampler for the sample port on the Auto Boat Driver.

NOTE

Upon use of a new dosing syringe, always check that the settings for the piston height are correct!

7.29.2.5 Properties - LPG/GSS

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ LPG/GSS**

The properties of the LPG/GSS, a component of the Combustion Module, are defined on this tab.

LPG Sample loop volume

Volume of the sample loop for LPG, in µL.

GSS Sample loop volume

Volume of the sample loop for GSS, in µL.

7.29.2.6 Properties - LPG

Tab: **Configuration ▶ Devices ▶ [Edit] ▶ Properties... ▶ Properties - 'Device type' - 'Device name' ▶ LPG**

The properties of the LPG, a component of the Combustion Module, are defined on this tab.

LPG Sample loop volume

Volume of the sample loop for LPG, in µL.

7.29.2.7 Properties - GLP

Tab: **Configuration ▶ 'Subwindow' ▶ [Edit] ▶ Properties... ▶ 'Properties' ▶ GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.29.2.8 Adjustment

Dialog window: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Autosampler ► ► Adjustment**

Sampler

Display of which sampler is used.

Rack type

Display of which rack type is used.

Adjustment

Position 1

Input of the x, y, and z values for the first position on the liquid or solid rack.

Liquid rack

Input range	**0 (x), 0 (y), 0 (z) to 200 (x), 200 (y), 80 (z) mm** (Increment: **0.1 (x, y z)**)
Default value	**4 (x), 145 (y), 10 (z) mm**

Solid rack	
Input range	**0 (x), 140 (y), 30 (z) to 20 (x), 170 (y), 60 (z) mm** (Increment: **0.1 (x, y z)**)
Default value	**3 (x), 161 (y), 30 (z) mm**

Sample port

Input of the x, y, and z values for the sample port on the Auto Boat Driver in which the quartz boat with the sample is set and subsequently is moved into the oven.

Liquid rack	
Input range	**0.1 (x), 0 (y), 1 (z) to 200 (x), 350 (y), 200 (z) mm** (Increment: **0.1 (x, y z)**)
Default value	**110 (x), 11.5 (y), 75 (z) mm**

Solid rack	
Input range	**90 (x), 30 (y), 80 (z) to 100 (x), 50 (y), 105 (z) mm** (Increment: **0.1 (x, y z)**)
Default value	**94 (x), 43 (y), 85 (z) mm**

[Move to position]

It moves to the position with the input x, y, and z coordinates. The values are not yet saved.

[Apply]

The button is only activated after a position has been moved to. With it, the adjustment parameters are saved in the device.

Sampler

Adjust piston height

The distance of the piston to the syringe body is set. The input values are corrections to the last respective distance of the piston from the syringe body.

Liquid rack	
Input range	**0.1 to 5.0 mm** (Increment: **0.1**)
Default value	**0.1 mm**

Corrects the piston height upward by the input value.

Corrects the piston height downward by the input value.

Adjust gripper width

The gripper must be aligned in the home position so that both gripper arms are almost together.

Solid rack

Input range	**0.1 to 5.0 mm** (Increment: **0.1**)
Default value	**0.1 mm**

Opens the gripper arms by the input value.

Closes the gripper arms by the input value.

[Close]

The adjustment parameters are saved in the device and the dialog window is closed. The Autosampler moves back to the starting position and the lock closes.

NOTE

The default values defined in MagIC Net are only shown if no values are saved in the Autosampler or if no values are sent to the combustion module because it is not connected or is defective.

7.29.3 Combustion Module - Method

In the **Method** program part the start parameters and program commands can be defined for the **combustion module**.

Whether the combustion module is used in a method with or without the auto sampler (MMS 5000) depends on the configuration. In the device table in the program part **Configuration**, the combustion module can be entered alone or with a connected auto sampler (MMS 5000).

If the combustion module is entered in the program part **Method** with the **New device** function, then you can select with or without auto sampler (MMS 5000).

7.29.3.1 Combustion Module - Start parameters

If you click on the icon for the combustion module in the top part of the **Devices** subwindow, the tabs of the combustion module components appear in the bottom part of the subwindow. The start parameters for the individual components can be defined on these.

7.29.3.1.1 Start parameters - Combustion Oven

Tab: **Method ▶ Devices ▶ Combustion Oven**

The parameters defined for the combustion oven apply to liquid and solid samples. During a determination, the current values for temperature, Main flow O_2 (MFC 1), oxygen flow for post combustion (MFC2) and gas flow of the pyrolysis gas argon (MFC3) are displayed in the Watch Window.

Temperature

Oven temperature at which decomposition happens through pyrolysis.

Input range	**50 to 1,100 °C**
Default value	**1,050 °C**

Ar gas flow for pyrolysis

Pyrolysis gas. Argon current in which the sample components are pyrolyzed in the first step of the digestion.

Input range	**50 to 200 mL/min**
Default value	**100 mL/min**

Post-combustion time

Second phase of combustion, in which the remaining pyrolysis gas is combusted in the oxygen stream. The oxygen gas flow corresponds to the gas flow of argon during pyrolysis.

Input range	**30 to 32,400 s**
Default value	**120 s**

Post-cooling time

This parameter is only relevant if a liquid rack is used. With manual sample addition, the next sample may only be applied if the quartz glass boat is cooled in the lock.

Input range	**300 to 900 s**
Default value	**420 s**

NOTE

When applying a highly volatile substance in a hot quartz glass boat, there is a RISK OF DEFLAGRATION.

If a determination is canceled, then the progress of the post-cooling time is no longer monitored by MagIC Net, as the post-cooling time is controlled by the combustion oven. The time allotted for cooling therefore has to be taken into account before starting the next determination.

7.29.3.1.2 Start parameters - Autosampler

Tab: **Method ▶ Devices ▶ Autosampler**

The start parameters for the auto sampler MMS 5000, a component of the combustion module, are defined on this tab. The parameters are only relevant for a auto sampler with a liquid rack.

Syringe

Aspiration rate

The rate at which the syringe aspirates the solution during sample taking. The rate does not apply to the rinsing steps.

Input range	**1 to 15 µL/s**
Default value	**2 µL/s**

Dispensing rate

The rate at which the syringe discharges the solution during sample input. The rate does not apply to the rinsing steps.

Input range	**1 to 20 µL/s**
Default value	**4 µL/s**

Number of rinsing steps

with sample

Specification of how often the syringe is to be rinsed with the sample solution. The sample solution is disposed of in the waste container. Rinsing with the sample solution is sufficient in most cases.

Input range	**0 to 5**
Default value	**3**

with rinsing solution

Specification of how often the syringe is to be rinsed with the rinsing solution from the external solvent container. The rinsing solution is disposed of in the waste container. Rinsing with rinsing solution is only necessary in exceptional cases, for example samples with special extracts.

Input range	**0 to 5**
Default value	**0**

Rinsing procedure

The rinsing process can be defined only for an Autosampler with attached liquid rack.

1 Start a determination.

2 The Autosampler moves to the sample.

3 **Rinsing with sample solution (number of rinsing steps with sample > 0)**

- Fit sample.
- Dispose of injection unit in waste container.

The number of both rinsing steps is read out from the start parameters and the volume from the combustion quantity. Aspiration rate and dispensing rate are likewise fixed.

4 **Conditioning the syringe**

The following two steps are always executed and cannot be configured.

- Fix the syringe in the sample solution.
- Eject the syringe unit in the sample vessel again.

These two steps are repeated three times. Volume is fixed (approx. 30 µL). Aspiration rate and dispensing rate are likewise permanently fixed.

5 Fit sample.

Volumes are read out from combustion quantities and the aspiration rate is read out from the start parameters.

6 Auto sampler moves to the lock.

7

NOTE

When using syringes, a quartz glass boat must always be in the sample port.

Samples are ejected through the injection port in the sample port into the quartz glass boat.

The dispensing rate is read out from the start parameters.

8 **Rinsing with rinsing solution (number of rinsing steps with sample > 0)**

- The auto sampler moves to the external solvent container.
- Pull up syringe with rinsing solution.
- Dispose of injection unit in waste container.

The number of rinsing steps is read out from the start parameters and the volume from the combustion quantity. Aspiration rate and dispensing rate are likewise fixed.

9 Combustion starts.

7.29.3.1.3 Start parameters - LPG/GSS

Tab: **Method ▶ Devices ▶ LPG/GSS**

The start parameters for the LPG/GSS, a component of the combustion module, are defined on this tab.

Gas supply

Selection whether an LPG or GSS measurement is to be carried out. The gas supply is available in the method variables as the variable **GASFEED** under the time program variable **TP** in the formula editor *(see chapter 2.4, page 30)*.

Selection	**LPG** | **GSS**
Default value	**LPG**

LPG
Measurement of a liquid gas. This option specifies that the method was created specifically for an LPG measurement. A calibration carried out with the IC instrument is only valid for the LPG measurement. A gaseous sample is fed to the combustion oven via the LPG sample cylinder connection.

GSS
Measurement of a pressurized gas. This selection specifies that the method was specifically created for a GSS measurement. A calibration carried out with the IC instrument is only valid for the GSS measurement. A gaseous sample is fed to the combustion oven via the GSS sample cylinder connection.

Sample pressure on the GSS

Gas pressure set manually at the LPG/GSS.

Input range	**0.7 to 1.7 bar**
Default value	**1.0 bar**

NOTE

A pressure controller is installed in the LPG/GSS to reduce an existing input pressure to between 0.7 and 1.7 bar. Pressure fluctuations are compensated for and can be stably adjusted within the specified range of 0.7 to 1.7 bar.

Calculating the end result

The sample pressure entered for the manometer can be used for calculating user-defined results. The value of the sample pressure can be read out in the formula editor and used for the calculation formula:

1. **Open the formula editor**
   Evaluation ▶ Results ▶ User-defined results ▶ [Edit] ▶ New ▶ Σ
2. **Select the GSS sample pressure**
   Method variables ▶ Time program variable TP ▶ Number of the 'Combust' time program command ▶ PRESS.
3. **Enter a formula**
   You can insert the variable into the input field for the composition of the calculation formula by double-clicking on **PRESS**.

7.29.3.2 Combustion Module - Commands

Overview of the time program commands available for the Combustion Module:

7.29.3.2.1 Combust

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ New / Edit ▶ Combust**

In the **Combustion Oven + Auto Boat Driver** system, the device-dependent **Combust** time program command (command without feedback) drives a quartz boat containing a solid or a liquid sample into the oven and combusts the sample.

In the **Combustion Oven + LPG/GSS** system, a gaseous sample is introduced into the combustion oven via a coupling between the LPG/GSS and the combustion oven or via the injection port of the sample port of an Auto Boat Driver.

In the **Combustion Oven + LPG** system, a gaseous sample is introduced into the Combustion Oven via a coupling between the LPG and the Combustion Oven or via the injection port of the sample port of an Auto Boat Driver.

NOTE

When working with the LPG/GSS or with the LPG, an Auto Boat Drive connected to the Combustion Oven must be switched off at the same time. Otherwise the sample port is cooled and the gases that are fed in will condense in the sample port.

The command contains a sequence of multiple steps *(see chapter 7.29.3.2.3, page 1641)*.

In contrast to other time program commands in MagIC Net, the subprograms are integrated into the **Combust** command. This ensures that the combustion and the processes that run before, during or after the combustion are synchronized and are defined in the subprograms.

Sample addition

You can select how a solid or liquid sample is fed to the combustion oven in the **Combustion Oven + Auto Boat Driver** system. No selection is possible in the **Combustion Oven + LPG/GSS** system. Here the **Manually** option is set by default.

Selection	**Manual** | **Autosampler**
Default value	**Autosampler**

Manual
If this option is activated, a sample can be manually added. It is recommended that you turn off the auto sampler. This will prevent error messages from being shown that are caused by an invalid configuration of the auto sampler (for example, the solid material rack with syringe mounted).

Autosampler
The sample is added with an Autosampler (MMS 5000) if this option is enabled. This option cannot be selected in the **Combustion Oven + LPG/GSS** and **Combustion Oven + LPG** systems.

Sample condition

When manually adding the sample, you must indicate whether it is a solid, liquid or gaseous sample.

Combustion Oven and Auto Boat Driver

Selection	**solid** | **liquid**
Default value	**liquid**

solid
The quartz glass boat with the fixed sample can be set in the sample port.

liquid
A defined sample volume can be manually injected via the injection port in the sample port into the quartz glass boat.

Combustion Oven and LPG/GSS

Selection	**gaseous**

gaseous
A defined gas volume is supplied via a coupling between LPG/GSS and combustion oven or via the injection port in the sample port.

Combustion Oven and LPG

Selection	**gaseous**

gaseous
A defined volume of gas is introduced via a coupling between the LPG and the combustion oven or via the injection port in the sample port.

Target

Selection of the target position on the rack. When manually adding a sample, the field is inactive.

Combustion Oven and Auto Boat Driver

Selection	**Sample position** | **Rack position**
Default value	**Sample position**

Sample position
Position defined for the current determination in the Run window as parameter **Position**.

Rack position
The selection **Rack position** activates the **Number** field in order to enter the number for a rack position.

Number

Specification of the number of the rack position. The number can also be defined with the aid of the formula editor Σ *(see chapter 2.4, page 30)*.

Combustion Oven and Auto Boat Driver

Input range	**1 to 112 (solid rack, however, has only 35 positions)**
Default value	**1**

Combustion amount

NOTE

A volume entered for the combustion quantity does not correspond to the volumes in the sample data in the Run window in the program part **Workplace**. The volume in the Run window is the volume of a sample loop during the ion chromatography.

Input

Selection	**From the sample amount** | **Manual**
Default value	**From the sample amount**

From the sample amount
The sample amount is read out from the **Sample amount** field in the sample table when the determination is started.

Manual
The sample amount can be entered manually. Selecting this option activates the **Value** field.

Value

Manual entry of the sample amount. The value can also be defined with the aid of the formula editor Σ *(see chapter 2.4, page 30)*.

The value of gaseous sample volumes ranges from 1 to 250 µL for LPG measurements and is given in 1-µL increments; for GSS measurements, it ranges from 1 to 65 mL and is given in 0.25-mL increments.

The unit for a liquid sample is **µL**. For a solid sample it is **mg**.

The unit for a gaseous sample is **µL** for LPG measurements and **mL** for GSS measurements.

Combustion

You can select how a solid or liquid sample is fed to the combustion oven in the **Combustion Oven + Auto Boat Driver** system. No selection is possible in the **Combustion Oven + LPG/GSS** and **Combustion Oven + LPG** systems.

Selection	**Flame sensor** | **Programmable feed**
Default value	**Flame sensor**

Flame sensor
If this option is selected, then the sample is fed to the oven using the flame sensor.

Programmable feed
If this option is selected, the sample is fed to the oven in the defined feed steps.

Feed steps

If the **Programmable feed** option is selected, a maximum of 8 feed steps can be programmed.

Speed [mm/s]

Rate at which the sample is moved.

Position [mm]

Position to which the sample is moved.

Waiting time [s]

Waiting time until the next feed step is carried out.

The **[Edit]** menu, which can also be accessed by right-clicking on the subprogram table, contains the following menu items:

New	Opens the **Feed step** dialog to create a new line *(see chapter 7.29.3.2.4, page 1646)*.
Edit	Opens the **Feed step** dialog to edit the selected line *(see chapter 7.29.3.2.4, page 1646)*.
Copy	Copies the selected line to the clipboard (the number is retained).
Paste	Insert the line from the clipboard above the selected line.
Cut	Copies the selected line to the clipboard and deletes it.
Delete	Deletes the selected line.

Subprogram(s) for the combustion

The tabs **before**, **during** and **after** show the subprograms that run before, during or after the combustion.

Subprograms before combustion run parallel to the preparation of a sample. Only after these subprograms end and the sample preparation is concluded (preparation of the Autosampler and/or after manual injection of the sample) does the combustion begin.

Subprograms during combustion run while a sample is being combusted. These subprograms are canceled after the combustion time has elapsed.

Subprograms after combustion run after a sample has been combusted.

The main program continues to run when all subprograms have been completed and the post-cooling time has finished.

Subprograms are applied and defined in the subwindow Time program via the **Method ► Time program ► [Edit] ► New / Edit ► Insert subprogram** menu.

Subprogram

Name of the subprogram running before, after or during the combustion.

Condition

If this check box is activated, then a condition defined with the formula editor Σ has to be fulfilled for the subprogram to run.

Formula

Formula for a condition for the start of the subprogram.

The **[Edit]** menu, which can also be accessed by right-clicking on the subprogram table, contains the following menu items:

New	Opens the **Subprogram** dialog.
Edit	Opens the **'Device' - 'Command'** dialog window to edit the selected line *(see chapter 5.7.3.3, page 422)*.
Copy	Copies the selected lines from the time program table to the clipboard (the command numbers are retained).
Paste	Inserts all lines from the clipboard above the selected line in the time program table.
Cut	Copies the selected lines from the time program table to the clipboard and deletes them.
Delete	Deletes the selected lines from the time program table.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.29.3.2.2 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.29.3.2.3 Combustion sequence

Combustion of a solid sample with Autosampler

The **O_2** main flow is constantly **300 mL/min** during the whole combustion.

Step	Action	Parallel action	Pyrolysis Ar (mL/min)	Post combustion O_2 (mL/min)
Start of the combustion command				
Preparing the sample				
1	Device is initialized, i.e. temperature and gas flow are set		50 - 200 mL/min according to start parameters	0
2	Adjust flame sensor			
3	If the flame sensor adjustment was not successful, wait 60 seconds. If the system does not get stable, repeat step 2.			
4	Move to sample position	Subprogram(s) before combustion		
5	Open sample port			
6	Add quartz boat			
7	Move to sample port and place quartz boat in it			
8	Close sample port			
Moving the sample into the combustion oven and combusting it				
9	ABD feed starts and the combustion begins. It is either controlled with the flame sensor or it is carried out according to the defined feed steps. During combustion, the feed can be interrupted or the quartz boat can be retracted. ABD moves the quartz boat for annealing to the specified end position *(see page 1624)*.	Subprogram(s) during the combustion (e.g. water infeed and transfer solution infeed). If the post-combustion time is finished, the subprogram is canceled.		
Post-combustion				
10	The remaining pyrolysis gases are burned in the O_2 stream. The duration of post-combustion is specified in the start parameters *(see page 1631)*.		0	50 - 200 mL/min according to start parameters

Step	Action	Parallel action	Pyrolysis Ar (mL/min)	Post combustion O_2 (mL/min)
11	Quartz boat moves back into the sample port	Subprogram(s) after the combustion	50 - 200 mL/min according to start parameters	0
End of the combustion command				
12	Sample port is opened	Main program runs on		
13	The gripper takes the quartz boat from the sample port, deposits it on the original position on the rack and stays in this position.			
14	The sample port is closed			
15	After the last line of a sample table has been processed, the Autosampler moves back to the basic position.			
End of the determination				

Combustion of a liquid sample with Autosampler

The **O_2** main flow is constantly **300 mL/min** during the whole combustion.

Step	Action	Parallel action	Pyrolysis Ar (mL/min)	Post combustion O_2 (mL/min)
Start of the combustion command				
Preparing the sample				
1	Device is initialized, i.e. temperature and gas flow are set		50 - 200 mL/min according to start parameters	0
2	Adjust flame sensor			
3	If the flame sensor adjustment was not successful, wait 60 seconds. If the system does not get stable, repeat step 2.			
4	Rinse *(see chapter 7.29.3.1.2, page 1632)*	Subprogram(s) before combustion		
5	Fit sample			
6	Move to sample port (x, y positions)			
7	Move to sample port (z position)			
8	The sample is injected through the septum of the closed sample port onto the quartz boat.			
9	Rinse with rinsing solution (optional)			
10	Autosampler moves to basic position			
Moving the sample into the combustion oven and combusting it				
11	ABD feed starts and the combustion begins. It is controlled by a flame sensor. During combustion, the feed can be interrupted or the quartz boat can be retracted. ABD moves the quartz boat for annealing to the specified end position *(see page 1624)*.	Subprogram(s) during the combustion (e.g. water infeed and transfer solution infeed). If the post-combustion time is finished, the subprogram is canceled.		
Post-combustion				
12	The remaining pyrolysis gases are burned in the O_2 stream. The duration of post-combustion is specified in the start parameters *(see page 1631)*.		0	50 - 200 mL/min according to start parameters

Step	Action	Parallel action	Pyrolysis Ar (mL/min)	Post combustion O_2 (mL/min)
13	Quartz boat moves back into the sample port	Subprogram(s) after the combustion	50 - 200 mL/min according to start parameters	0
14	Cooling. The quartz boat cools down so that the next sample can be injected without danger.			
End of the combustion command				
15	A post-cooling time that has possibly not completely expired is completed.	Main program runs on		
End of the determination				

Combustion of a gaseous sample with LPG/GSS

The **O_2** main flow is constantly **300 mL/min** during the whole combustion.

Step	Action	Parallel action	Pyrolysis Ar (mL/min)	Post combustion O_2 (mL/min)
Start of the combustion command				
Preparing the sample				
1	Device is initialized, i.e. temperature and gas flow are set		50 - 200 mL/min according to start parameters	0
2		Subprogram(s) before combustion		
Dosing and combusting the gas sample				
3	The dosing valve of the LPG/GSS is switched repeatedly until the defined sample amount has been reached. The sample is transferred to the combustion tube with an argon stream and it is continuously combusted. The post-combustion starts 45 s after the last switch of the dosing valve.	Subprogram(s) during the combustion (e.g. water infeed and transfer solution infeed). If the post-combustion time is finished, the subprogram is canceled.		
Post-combustion				
4	The remaining pyrolysis gases are burned in the O_2 stream. The duration of post-combustion is specified in the start parameters *(see page 1631)*.		0	50 - 200 mL/min according to start parameters
		Subprogram(s) after the combustion		

Step	Action	Parallel action	Pyrolysis Ar (mL/min)	Post combustion O_2 (mL/min)
End of the combustion command			50 - 200 mL/min according to start parameters	0
		Main program runs on		
End of the determination				

7.29.3.2.4 Feed step

Dialog window: **Method ► Time program ► ► [Edit] ► Combust ► Combustion ► New / Edit**

In this dialog window, a maximum of 8 feed steps can be defined for the programmable combustion of a sample.

Speed [mm/s]

Rate at which the sample is moved.

Position [mm]

Position to which the sample is moved.

Waiting time [s]

Waiting time until the next feed step is carried out.

7.29.3.2.5 Subprogram

Dialog: **Method ► Time program ► [Edit] ► New / Edit ► Combust ► New / Edit ► Subprogram**

A subprogram can be selected in this dialog window that runs simultaneously with sample preparation or is to be run during a combustion. Additionally, a condition for running the subprogram with the help of a formula can be defined.

Subprogram

Selection list with the subprograms available in the subwindow Time program.

Condition

Condition for the subprogram to run. The condition defined with a formula can be activated/deactivated.

7.29.4 Combustion Module - Manual control

7.29.4.1 Manual control - Combustion Oven

Tab: **Manual ► Manual control - 'Device name' ► Combustion Oven**

Oven temperature

Current Value

Current temperature of the combustion oven.

Input

Entering a new value for the temperature of the combustion oven.

Input range	**50 to 1,100 °C**
Default value	**1,050 °C**

Ar gas flow for pyrolysis

Current Value

Current gas flow of Argon (pyrolysis gas).

Input

Input of a new value for the gas flow of Argon.

Input range	**50 to 200 mL/min**
Default value	**100 mL/min**

Main flow O_2

Current Value

Fixed value (300 mL/min) of the main oxygen flow.

[On]

Switch on combustion module; in other words, the oven temperature and the gas flow. This is inactive if the combustion module is already running.

[Off]

Switch off combustion module; in other words, the oven temperature and the gas flow. This is inactive if the combustion module is not running.

[Apply]

Send the set parameters to the combustion module.

Gas flows

[On]

Switch on gas flow. If the combustion module is switched on, the gas flows can be switched on separately. This is inactive if the combustion module is switched off.

[Off]

Switch off gas flow. If the combustion module is switched on, the gas flows can be switched off separately. This is inactive if they are not running.

Auto Boat Driver

Sample port

Open and close the sample port manually.

[Open]

The sample port is opened. The sample port is closed with **[Continue]** in the message.

Initialize Combustion Module

After a gas pressure error, the Combustion Module with all components used in the combustion system (Auto Boat Driver, Autosampler or LPG/GSS or LPG) goes back to the normal status and is again ready for use.

7.30 Eco IC

7.30.1 Eco IC - Overview

The device **Eco IC** is available in 1 model version:

- **Eco IC**
  Intelligent, very compact ion chromatograph for education and routine analysis. For determining cations and anions with and without chemical suppression.

7.30.2 Eco IC - Configuration

Dialog: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name'**

If a device of the type **Eco IC** is selected in the device table, then the **[Edit] ► Properties...** menu item can be used to open the **Properties - 'Device name' - 'Instrument type'** dialog with the device-specific tabs. The properties for the various modules, the connections of the modules to the main device and the GLP data can all be defined on these tabs.

7.30.2.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the device are displayed on the **General** tab.

Device name

Designation of the device, can be freely defined by the user.

Entry	**50 characters**
Default value	**Device designation #**

Device type

Shows the device type.

Program version

Program version of the device. Only editable with the 771 IC Compact Interface and the RS-232 device.

[Update]

Opens the **Load new program version** dialog window *(see chapter 7.8.2.10, page 885)*.

This button is displayed only with devices that have their own firmware. It is only enabled if the device has an old program version that is not supported by **MagIC Net** and that can be updated by **MagIC Net** itself.

Device serial number

Serial number of the device. The field is only editable when adding a 771 IC Compact Interface or an RS-232 device for the first time.

Set to work

Shows the date on which the device was automatically added to the device table.

Leak sensor

on | off (Default value: **on**)

Shows whether the leak sensor is connected. This parameter is only available for devices with a leak sensor.

Selection	**connected** | **not connected**

active

on | off (Default value: **on**)

With this check box, monitoring with the connected leak sensor can be activated or deactivated. This parameter is only available for devices with a leak sensor.

NOTE

If a leak is detected when monitoring is on, the following actions are triggered automatically:

- All ongoing determinations that are using this device are interrupted.
- For all ongoing methods that are using this device, **[Stop HW]** is triggered.

Remarks

Remarks about the device.

Entry	**1,000 characters**
Default value	**empty**

7.30.2.2 Properties - High-pressure pump

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► Pump**

Pump type

Shows the type of pump.

Pump head

Type

Designation of pump head, is read out from the chip on the pump head.

Order number

Shows the order number of pump head, is read out from the chip on the pump head.

Material

Shows the material of pump head, is read out from the chip on the pump head.

Serial number

Shows the serial number of pump head, is read out from the chip on the pump head.

Flow range

Shows the flow range of pump head, is read out from the chip on the pump head.

P_{max}

Shows the maximum pressure, is read out from the chip on the pump head.

Correction factor

Factor with which any deviations in the flow of the pump as compared with the flow set (in the method) are corrected. Is read out from the chip on the pump head, can be edited and is then written back to the pump head automatically.

Input range	**0.90 to 1.10**
Default value	**1.00**

[Monitoring]

Opens the **Monitoring – 'Pump name'** dialog window in which the criteria for monitoring this module can be defined *(see chapter 7.8.2.11, page 886)*.

7.30.2.3 Properties - Conductivity detector

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Instrument type' - 'Device name' ► LF detector**

Detector type

Shows the detector type, is read out automatically from the detector.

Conductivity detector; Conductivity detector MB (microbore)

Connector

Shows the connector on the device to which the detector is connected.

Serial number

Shows the serial number of detector, is read out from the detector.

Measuring cell

Cell constant

Cell constant of the measuring cell.

Input range	**13 to 21 /cm** (Increment: **0.1**)

Thermostat

Selection of the thermostat temperature of the detector block.

NOTE

The temperature should be at least 5°C higher than the room temperature in order to ensure stable measuring conditions.

Input range	**20 to 50 °C** (Increment: **5**)
Default value	**40 °C**

7.30.2.4 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.30.3 Eco IC - Method

Program part: **Method**

In the **Method** program part, start parameters, data channels and program commands can be defined for the **Eco IC** device.

7.30.3.1 Eco IC - Start parameters

Subwindow: **Method ▶ Devices**

If you click on the icon for the **Eco IC** device in the top part of the window, the tabs of the modules contained in the device appear in the bottom part of the subwindow. The start parameters for the various modules can be defined on these tabs.

7.30.3.1.1 Start parameters - High pressure pump

Tab: **Method ▶ Devices ▶ Pump**

Flow

Flow of the high pressure pump when the hardware is started with **[Start HW]**.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the flow of the high pressure pump can be set automatically to the standard flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure level is not reached.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. The high pressure pump automatically switches off if this pressure is exceeded.

NOTE

If a separation column or a high pressure pump is re-assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be set automatically to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Start-up time

on | off (Default value: **off**)

Selection whether the start-up time defined for the column is to be considered when starting the pump with **[Start HW]**.

NOTE

- This option is **not** being considered when starting the pump in the manual control.
- If in a method more than one column is assigned to the same pump via hardware assignment, the last value applied for the starting-up time is valid.

Start-up time [min]. Only active when the option described above is deactivated. When linking a column to the pump *(see chapter 5.6.6.1, page 415)* the value from the properties of the column *(see "Recommended working values", page 616)* can be applied. If the value cannot be read from the column, the default value is 0. The user cannot modify this value.

Input range	**0 to 99 min** (Increment: **1**)

Eluent

Selecting the eluent that is to be transported with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the Eluent table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.30.3.1.2 Start parameter - Injection valve

Tab: **Method ▶ Devices ▶ Injector**

Position

Position of the injection valve when the hardware is started with **[Start HW]**.

Selection	**Maintain current position** | **Fill** | **Inject**
Default value	**Maintain current position**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.30.3.1.3 Start parameters - Peristaltic pump

Tab: **Method ▶ Devices ▶ Peristaltic**

Status

Selection	**On** | **Off**
Default value	**Off**

On
The peristaltic pump is switched on when the hardware is started with **[Start HW]**.

Off
The peristaltic pump is switched off when the hardware is started with **[Start HW]**.

Speed

Rate of the peristaltic pump when the hardware is started with **[Start HW]**.

942, 940, 930, 883, 882, 881, 872, 863, 850, Eco IC

Input range	**-7 to +7 (without 0)** (Increment: **1**)
Default value	**+1**

919, 858

Input range	**-15 to +15 (without 0)** (Increment: **1**)
Default value	**+3**

Solution #

Selecting the solution to be transported in channel # of the peristaltic pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Non-intelligent solutions from the solution table**
Default value	**not defined**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.30.3.1.4 Start parameters - MSM

Subwindow: **Method ▶ Devices**

7.30.3.1.4.1 Start parameters - MSM

Tab: **Method ▶ Devices ▶ MSM**

Automatic stepping to next position

Automatic stepping to next position means that the rotor is periodically switched to the next position when a defined time interval has expired. If automatic stepping to next position was required in the method, it is initiated at **[StartHW]**. It can be stopped with **[StopHW]**. A possibly occurring automatic stepping to next position is stopped at the beginning of a time program and restarted after the end of the time program. Exception: If the module has been released in the time program, then the automatic stepping to next position will *not* be resumed.

Automatic stepping to next position during equilibration

on | off (Default value: **on**)

This parameter can only be used if the **Active** check box has been activated.

If this parameter is **enabled**, then, after the method has been loaded, the automatic stepping to next position of the rotor is initiated at **[Start HW]**. The time interval defined in the **Interval** parameter is used.

If this parameter is **disabled**, then no automatic stepping of the rotor is initiated at **[Start HW]**.

Interval

Time interval between two consecutive, automatic stepping processes of the rotor. This parameter is only available if **Automatic stepping to next position during equilibration** has been activated.

Input range	**1.0 to 10,000.0 min**
Default value	**10.0 min**

Active

on | off (Default value: **on**)

If this check box is **activated**, then the instrument module will be used in the method. The module is reserved when a determination is started with this method.

If this check box is **deactivated**, then the instrument module will not be used in the method. The module is then not reserved during the run and can be used at the same time by another method.

Rotor

Selection of a rotor listed in the rotor table.

NOTE

A rotor may be assigned to only one MSM module.

Selection	**not defined** | **'Rotor name'**

7.30.3.1.5 Start parameters - Conductivity detector

Tab: **Method ► Devices ► Conductivity detector**

Temperature coefficient

Temperature coefficient that is set when the hardware is started with **[Start HW]**. The temperature coefficient corrects the measured conductivity of the detector at the operating temperature to the conductivity at the **reference temperature** 20 °C.

Input range	**0.0 to 5.0 %/°C**
Default value	**2.3 %/°C**

NOTE

The temperature coefficient of the conductivity is dependent upon the type of ions in the solution, among other things.

- Default value anions **2.3%/°C**
- Default value cations **1.5%/°C**

Warning limit

Warning limit for the conductivity that is set when the hardware is started with **[Start HW]**. If it is exceeded, the conductivity display in the Watch Window turns red.

Input range	**1 to 14999 µS/cm**
Default value	**9999 µS/cm**

Active

on | off (Default value: **on**)

If this option is **enabled**, then the device module is used in the method. The module is reserved when a determination is started with this method.

If this option is **disabled**, then the device module is not used in the method. The module is then not reserved during the run and can be used at the same time by another method.

7.30.3.2 Eco IC - Data channels

List of data channels offered by the device. In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

7.30.3.2.1 High-pressure pump - Data channels

Tab: **Method ► Devices ► Hardware assignment**

Property	Label of Y axis	Unit	Evaluation
System pressure	Pressure	MPa; bar; psi	No
Flow	Flow	mL/min	No

7.30.3.2.2 Conductivity detector - Data channels

Tab:Method ► Devices ► Hardware assignment

Property	Label of Y axis	Unit	Evaluation
Conductivity	Conductivity	µS/cm	Yes
Demo anion	Demo anion	µS/cm	Yes
Demo cation	Demo cation	µS/cm	Yes

NOTE

With the aid of data channels **Demo anion** and **Demo cation** measurement curves saved in the detector can be output.

Demo curves

There are 6 measurement curves stored in the detector that can be output for demonstration purposes. These are real curves that were generated with an 850 Professional IC and **MagIC Net**. The anion curves are recorded with Column A Supp 5 100, the cation curves with Column C 3 250. . Three standards and one sample are available from the anion curves and one sample and one standard each from the cation curves. Drinking water from Herisau (Switzerland) was used as the sample.

Data channel	Sample type
Demo anion	Standard 1
	Standard 2
	Standard 3
	Sample
Demo cation	Standard 1
	Sample

Output of demo curves

NOTE

The demo curves cannot be output directly. Methods and sample data must fulfill certain requirements in order to generate a determination contained in the demo curves.

The combination of **data channel** in the method and **sample type** in the sample data determines which curve is output.

1 Method

The method used must fulfill the following conditions:

- It must include a conductivity detector.
- It must include an analysis that uses the data channel **Demo anion** or **Demo cation** as data source.
- The duration of recording the analysis must not exceed **12.0 min** (anions) or **13.0 min** (cations)!
- 3 standards (anions) or 1 standard (cation) must be defined.
- There must be the command **Start data recording** in the time program for the analysis.

2 Sample data

It is of no importance whether a **single determination** or a **determination series** is to be recorded: the sample data must merely fulfill the following conditions:

- The method described must be used.
- The **sample type** must be **Standard 1...3** (anions) or **Standard 1** (cations) or **sample**.

3 Recording a determination

It is of no importance whether a **single determination** or a **determination series** is to be recorded.

- Start determination
- Instead of the conductivity value, the conductivity detector outputs in realtime one of the saved measurement curves. The determination behaves as if a real chromatogram is being recorded.

After completing the determination, it is saved in the database and has exactly the same properties as a real determination, i.e. it can be displayed, reprocessed and output in exactly the same way.

NOTE

The demo curves are output with the settings described and saved in a determination, but not evaluated.

If the demo curves are to be evaluated, the retention times and standard concentrations must also be given.

Demo anion

Overview of the main characteristics of the anion curves:

Separation column Metrosep A Supp 5 - 100/4.0

Injection volume 20 µL

Duration of recording 12.0 min

Component	Retention time [min]	Standard 1 [ppm]	Standard 2 [ppm]	Standard 3 [ppm]
Chloride	4.15	5	10	20
Nitrate	6.55	5	10	20
Sulfate	9.85	2	5	10

Demo cation

Overview of the main characteristics of the cation curves:

Separation column Metrosep C 2 - 250/4.0

Injection volume 10 µL

Duration of recording 13.0 min

Component	Retention time [min]	Standard 1 [ppm]
Sodium	3.57	2
Potassium	4.85	0.5
Magnesium	8.82	8
Calcium	10.72	30

7.30.3.3 Eco IC - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the **Eco IC** device:

7.30.3.3.1 Commands - High-pressure pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure pump:

7.30.3.3.1.1 On/Off

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the high-pressure pump on/off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.30.3.3.1.2 Flow

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.30.3.3.1.3 Gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the high-pressure pump.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.
- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.6.1.2.3.1.4, page 789)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.6.1.2.3.1.4, page 789)*.
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The flow of the programmed gradient is displayed below the gradient table in a graph as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.30.3.3.1.4 Editing gradient

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - Gradient ▶ [Edit] ▶ New / Edit ▶ Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Flow

Set the flow of the high-pressure pump to the specified value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Linear** | **Step**

Linear
The flow of the pump is modified linearly from the setting of the previous command line to the value of the current command line.

Step
The flow of the pump remains at the value of the previous command line up to the point in time of the current command line and then changes to the value of the current command line.

7.30.3.3.1.5 Measure pressure

Dialog: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
MPA	Measured pressure [MPa]	Number
BAR	Measured pressure [bar]	Number
PSI	Measured pressure [psi]	Number

7.30.3.3.1.6 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.30.3.3.2 Commands - Injection valve

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the injection valve:

7.30.3.3.2.1 Fill

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Fill**

The device-dependent time program command **Fill** (command without feedback) switches the injection valve to **Fill**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.30.3.3.2.2 Inject

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Inject**

The device-dependent time program command **Inject** (command without feedback) switches the injection valve to **Inject**.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.30.3.3.2.3 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.30.3.3.3 Commands - Peristaltic pump

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the peristaltic pump:

7.30.3.3.3.1 On/Off

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - On/Off**

The device-dependent time program command **On/Off** (command without feedback) switches the peristaltic pump on/off and sets the value for the pump rate.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Peristaltic

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Speed

Speed of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.30.3.3.3.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 … 64 characters**

7.30.3.3.4 Commands - MSM

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the MSM (Metrohm Suppressor Module):

7.30.3.3.4.1 Stepping

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Step**

The device-dependent **Step** time program command (command without feedback) causes the rotor to switch one step. This can be made dependent on a condition.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Run condition

on | off (Default value: **off**)

If you select this option, then the command is only run if the minimum regeneration time specified has been reached or exceeded.

Minimum regeneration time

Entry of the time that has to be reached or have elapsed since the last stepping.

Input range	**0.1 to 10,000.0 min** (Increment: **0.1**)

Comment

Optional comment on the time program command.

Entry	**64 characters**

NOTE

The time since the last stepping is available for the corresponding **Step** command in the **TP.'Command number'.TSLS** *(see chapter 2.4.4.5, page 38)* time program variable, even if the condition has not been used.

NOTE

If the suppressor is regenerated by means of a Dosino, then the regeneration of the suppressor is started with the **Step** command. In the process, the parameters defined for the regeneration with the Dosino will be used *(see "Dosino Regeneration", page 831)*.

This function is not available for the instruments 883 Basic IC plus and Eco IC!

7.30.3.3.4.2 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.30.3.3.5 Commands - Conductivity detector

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the conductivity detector:

7.30.3.3.5.1 Measuring the conductivity

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Measure conductivity**

The device-dependent **Measure conductivity** time program command (command with feedback) measures the conductivity.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The following variables of the **'TP.Command number.Variable name'** type are generated by the command:

Variable name	Description	Data type
CONDUCTIVITY	Measured conductivity [µS/cm]	Number

7.30.3.3.5.2 Measure noise

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure noise**

The device-dependent **Measure noise** time program command (command with feedback) measures the noise of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

Not all data points are always considered when calculating noise. At a measurement frequency of 10 Hz, the data is evaluated in intervals of 60 data points each. The number of data points depends on the measurement duration. If, for example, 120 data points are available, all data points are included in the evaluation. If, for example, 200 data points are available, 180 data points are included in the evaluation. 20 data points are ignored. Therefore, it is possible that the noise does not change even though the measurement duration is changed.

NOTE

Metrohm recommends selecting a measurement duration of at least 1 minute.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
NOISE	TP.'Command number'.NOISE Measured noise. **Units:** ▪ Conductivity detector: µS/cm ▪ 947 Professional UV/VIS Detector Vario: mAU ▪ 944 Professional UV/VIS Detector Vario: mAU ▪ 887 Professional UV/VIS Detector: mAU ▪ 771 IC Compact Interface: mV	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
NOISE_Q	TP.'Command number'.NOISE_Q Measured noise of charge [nC]. Unit: nC.	Number
NOISE_I	TP.'Command number'.NOISE_I Measured noise of current [nA]. Unit: nA.	Number

7.30.3.3.5.3 Measure drift

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Measure drift**

The device-dependent **Measure drift** time program command (command with feedback) measures the drift of the detector during the defined **Measuring time**.

NOTE

If a method uses the amperometric detector in the **CV** mode *(see chapter 7.3.3.1.2, page 728)*, then this command may **not** be used. This is checked by the start test of the method.

Measuring time

The value can be entered manually or defined with the formula editor (Σ).

Input range	**0.2 to 999.0 min** (Increment: **0.1**)
Default value	**1.0 min**

NOTE

Metrohm recommends selecting a measurement duration of at least 5 minutes.

Ideally, the measurement duration of the drift corresponds to the recording time of the chromatogram.

Comment

Optional comment on the time program command.

Entry	**64 characters**

Generated variables

The command generates variables of the type **'TP.Command number.Variable name'**.

In the case of the conductivity detector, the 947 Professional UV/VIS Detector Vario, the 944 Professional UV/VIS Detector Vario, the 887 Professional UV/VIS Detector and the 771 IC Compact Interface, one variable is generated:

Variable name	Description	Data type
DRIFT	TP.'Command number'.DRIFT Measured drift. **Units:** ▪ Conductivity detector: (µS/cm)/h ▪ 947 Professional UV/VIS Detector Vario: mAU/h ▪ 944 Professional UV/VIS Detector Vario: mAU/h ▪ 887 Professional UV/VIS Detector: mAU/h ▪ 771 IC Compact Interface: mV/h	Number

Two variables are generated with the amperometric detector:

Variable name	Description	Data type
DRIFT_Q	TP.'Command number'.DRIFT_Q Measured drift of charge [nC/h]. Unit: nC/h.	Number
DRIFT_I	TP.'Command number'.DRIFT_I Measured drift of current [nA/h]. Unit: nA/h.	Number

7.30.4 Eco IC - Manual control

Program part: **Manual control**

The manual control of devices takes place in the separate **Manual control** dialog window, which can be called up at all times from any program part (even during ongoing determinations) via the **Manual** icon at the left of the program bar.

7.30.4.1 Manual control - High-pressure pump

Tab: **Manual ► Manual control - 'Device name' ► 'Pump name'**

Flow

Current value

Currently set value of the flow of the pump.

Input

Entering a new value for the flow.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Current value

Current value for the minimum permitted pressure in the system.

Input

Entering a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Current value

Current value for the maximum permitted pressure in the system.

Input

Entering a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Pressure

Current value

Shows the current pressure in the system.

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop the pump with the set parameters. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.30.4.2 Manual control - Injection valve

Tab: **Manual ► Manual control - 'Device name' ► 'Injection valve'**

[Fill]

Switch the valve to **Fill**. Only active when the valve is set to **Inject**.

[Inject]

Switch the valve to **Inject**. Only active when the valve is set to **Fill**.

7.30.4.3 Manual control - Peristaltic pump

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Peristaltic pump'**

Rate

Current value

Display of the currently set rate of the peristaltic pump.

Input

Entering a new value for the rate of the peristaltic pump.

-7 … +7 (without 0); with the 858 Professional Sample Processor and 919 IC Autosampler plus: **-15 … +15** (without 0)

[Start]

Start the pump with the set parameters. This is inactive if the pump is already running.

[Stop]

Stop pump. This is inactive if the pump is not running.

[Apply]

Send the parameters to the pump.

7.30.4.4 Manual control - MSM

Tab: **Manual ► Manual control - 'Device name' ► 'MSM'**

7.30.4.4.1 Manual control - Stepping to next position

The settings for the automatic stepping of the rotor to the next position can be changed in the manual control of this module. In addition, the time since the last stepping to the next position can be called up and a manual stepping to the next position can be triggered.

Automatic stepping to next position

Interval – Current value

Display of the current time interval between 2 sequential rotor stepping operations. If no automatic stepping to next position is currently active, then **-----** will be displayed.

Interval – Input

Input of the time interval between 2 sequential automatic rotor stepping operations.

Input range	**1.0 to 10000.0 min**
Default value	**10.0 min**

[Apply]

If automatic stepping to the next position is already active, then the value entered for the parameter **Interval** can be applied with the button **[Apply]**.

NOTE

If the new value for **Interval** is less than the **time since the last stepping to the next position**, then the rotor will be moved one step to the next position **immediately**.

[On]

If automatic stepping to the next position is not yet active, then it can be started with this button.

[Off]

If automatic stepping to the next position is already active, then it can be stopped with this button.

Time since last stepping to next position

Current value

Display of the time since the last (manual or automatic) stepping to the next position, in minutes.

[Step]

Moves the rotor of the module to the next position.

7.31 High-pressure gradient pump

The high-pressure gradient pump is a "virtual" device, i.e., it is not physically present as **one** device.

It therefore has no properties that can be configured in the device table.

Within a method, it can be created by combining several existing high-pressure pump modules in the **subwindow:Method ► Devices**. These will then behave as one device in the software with different properties than the separate modules that constitute the device.

NOTE

You cannot combine pump modules to a gradient pump arbitrarily. The pumps must fulfill the following conditions:

- The pump modules must all be on the same **IC instrument**. It does not matter whether they are permanently installed or connected via an **Extension Module**.
- The pump modules must all be equipped with the same pump head type.
- A low-pressure gradient pump cannot be part of a high-pressure gradient pump.

7.31.1 High-pressure gradient pump - Configuration

The high-pressure gradient pump does not have an own entry in the device table. It is a "virtual" device that exists only within the method.

7.31.2 High-pressure gradient pump - Method

Program part: **Method**

The high-pressure gradient pump is a "virtual" device that exists only within the method.

Start parameters, data channels and program commands can be defined for the high-pressure gradient pump in the **Method** program part.

7.31.2.1 High-pressure gradient pump - Start parameters

Tab: **Method ▶ Devices ▶ 'Name of the high-pressure gradient pump'**

Flow

Flow rate of the high-pressure pump when the hardware is started with **[Start HW]**.

NOTE

If either a separation column or a high-pressure pump is newly assigned to an analysis under **Hardware assignment**, then the flow rate of the high-pressure pump can be automatically set to the default flow of the column.

Input range	**0.000 to 20.000 mL/min**
Default value	**0.500 mL/min**

P_{min}

Minimum permitted pressure in the system when the hardware is started with **[Start HW]**. If the pressure falls below this value, then the high-pressure pump switches off automatically.

Input range	**0.00 to P_{max} MPa**
Default value	**0.00 MPa**

P_{max}

Maximum permitted pressure in the system when the hardware is started with **[Start HW]**. If the pressure exceeds this value, then the high-pressure pump switches off automatically.

NOTE

If either a separation column or a high-pressure pump is newly assigned to an analysis under **Hardware assignment**, then the maximum permitted pressure can be automatically set to the default value of the column.

Input range	**P_{min} to 50.00 MPa**
Default value	**35.00 MPa**

Eluent A

Selection of eluent A, which is to be pumped with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the eluent table**
Default value	**not defined**

% eluent A

Display of the proportion of eluent A in the mixing ratio. The proportion is calculated automatically from the proportions for the other eluents using the formula **100 - (% eluent B + % eluent C + % eluent D)**.

Eluent B

Selection of eluent B, which is to be pumped with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the eluent table**
Default value	**not defined**

% eluent B

Entry of the proportion of eluent B in the mixing ratio.

Input range	**0 to 100 - % eluent C - % eluent D % %**

Eluent C

Selection of eluent C, which is to be pumped with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the eluent table**
Default value	**not defined**

% eluent C

Entry of the proportion of eluent C in the mixing ratio.

Input range	**0 to 100 - % eluent B - % eluent D % %**

Eluent D

Selection of eluent D, which is to be pumped with the pump when the hardware is started with **[Start HW]**.

Selection	**not defined** | **Eluents from the eluent table**
Default value	**not defined**

% eluent D

Entry of the proportion of eluent D in the mixing ratio.

Input range	**0 to 100 - % eluent B - % eluent C % %**

When there is a change from one dialog/tab to another, the percentages are checked ($\sum$ **= 100%**).

7.31.2.2 High-pressure gradient pump - Data channels

Tab: **Method ▶ Devices ▶ Hardware assignment**

In the method, a data channel is assigned to the analysis as a data source. The signal of this channel can then be recorded and evaluated.

Property	Label of y-axis	Unit	Evaluation
Flow	Flow	mL/min	No
System pressure	Pressure	MPa; bar; psi	No
Ratio eluent A	Eluent name	%	No
Ratio eluent B	Eluent name	%	No
Ratio eluent C	Eluent name	%	No
Ratio eluent D	Eluent name	%	No

7.31.2.3 High-pressure gradient pump - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the high-pressure gradient pump:

7.31.2.3.1 On/Off

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ 'Device' - On/Off**

The device-dependent **On/Off** time program command (command without feedback) switches the high-pressure gradient pump on and off.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Pump

Selection	**On** | **Off**
Default value	**On**

On
Switches the module on.

Off
Switches the module off.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.31.2.3.2 Flow

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ 'Device' - 'Module' - Flow**

The device-dependent **Flow** time program command (command without feedback) sets the flow rate of the high-pressure gradient pump to the defined value.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Flow

Input range	**0.000 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.31.2.3.3 Gradient

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ 'Device' - Gradient**

The device-dependent **Gradient** time program command (command without feedback) starts a flow gradient program for the virtual high-pressure gradient pump consisting of several high-pressure pumps.

Time

Start of the gradient program.

Input range	**0.00 to 10,000.00 min**
Default value	**0.00 min**

Gradient

The sequence of the flow gradient program is defined in a table. It consists of as many lines as gradient steps are entered, or at least the first line with the start settings of the gradient. The lines are chronologically sorted according to the **Time** column. The table view can be adapted with the left mouse button as follows:

- **Dragging the margin between column titles**:
  Sets the column width.
- **Double-clicking on the margin between column titles**:
  Sets the optimal column width.

- **Dragging the column title**:
  Moves the column to the required location.

The table cannot be edited directly. Use the **[Edit]** menu below the table. It contains the following menu items:

New	Add a new line to the table and edit it in the **Edit gradient** *(see chapter 7.31.2.3.4, page 1682)* window.
Edit	Edit selected line in the table in the **Edit gradient** window *(see chapter 7.31.2.3.4, page 1682)*.
Copy	Copies the selected line to the clipboard.
Insert	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

The mixing ratio and the flow rate of the programmed gradient are displayed below the gradient table as a function of time. The graph is updated automatically after the gradient table has been edited.

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.31.2.3.4 Editing gradient

Dialog window: **Method ► Time program ► [Edit] ► 'Device' - Gradient ► [Edit] ► New / Edit ► Edit gradient**

Time

Start of the single gradient step in relation to the start of the gradient program.

Input range	**0.00 to 1,000.00 min**
Default value	**0.00 min**

Eluent A

Display of the proportion of eluent A in the mixing ratio in %. The proportion is calculated automatically from the proportions for the other eluents using the formula **100 - (% eluent B + % eluent C + % eluent D)**.

Eluent B

Entry of the proportion of eluent B in the mixing ratio.

Input range	**0 to 100 - (% eluent A + % eluent C + % eluent D) %**
Default value	**0 %**

Eluent C

Entry of the proportion of eluent C in the mixing ratio.

Input range	**0 to 100 - (% eluent A + % eluent B + % eluent D) %**
Default value	**0 %**

Eluent D

Entry of the proportion of eluent D in the mixing ratio.

Input range	**0 to 100 - (% eluent A + % eluent B + % eluent C) %**
Default value	**0 %**

When there is a change from one dialog/tab to another, the percentages are checked ($\sum$ = 100%).

Curve

Selection of the curve shape with which you intend to move from the previous entry in the gradient table to the current entry.

Selection	**Convex 1 - 4** | **Linear** | **Concave 1 - 4** | **Step**

Convex 1 - 4
If the flow is not changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Linear
If the flow is not changed: The proportion of the eluents changes in a linear fashion from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump change in a linear fashion from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Concave 1 - 4
If the flow is not changed: The proportion of the eluents changes along the selected curve from the entry of the previous command line to the entry of the current command line. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump change along the selected curve from the entry of the previous command line to the entry of the current command line. The mixing ratio changes in a nonlinear fashion.

Step
If the flow is not changed: The proportion of the eluents remains at the value of the previous command line up to the point in time of the current command line. Then the proportion is changed to the entry of the current command line immediately. If the flow and the proportion of the eluents are changed: The proportion of the eluents and the flow of the pump remain at the value of the previous command line up to the point in time of the current command line. Then both are changed to the entry of the current command line immediately. The mixing ratio changes in the same way.

Flow

Set the flow of the high-pressure gradient pump to the given value.

Input range	**0.001 to 20.000 mL/min**
Default value	**(Start parameter for flow in the method) mL/min**

7.31.2.3.5 Measuring the pressure

Dialog window: **Method ▶ Time program ▶ [Edit] ▶ 'Device' - 'Module' - Measure pressure**

The device-dependent **Measure pressure** time program command (command with feedback) measures the pressure in the system and provides the pressure in the form of the variables **TP.'Command number'.MPA** (in MPa), **TP.'Command number'.BAR** (in bar) and **TP.'Command number'.PSI** (in psi).

Comment

Optional comment on the time program command.

Entry	**64 characters**

7.31.2.3.6 Release

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.31.3 High-pressure gradient pump - Manual control

Tab: **Manual control ► Manual control - All devices - 'Device name' ► 'Pump name'**

Flow

Current Value

Currently set value of the pump flow.

Input

Entry of a new value for the flow.

Input range	**0 to 20 mL/min** (Increment: **0.001**)
Default value	**0.50 mL/min**

P_{min}

Current Value

Current value for the minimum permitted pressure in the system.

Input

Entry of a new value for the minimum permitted pressure in the system.

Input range	**0.00 to P_{max} MPa** (Increment: **0.01**)
Default value	**0.00 MPa**

P_{max}

Current Value

Current value for the maximum permitted pressure in the system.

Input

Entry of a new value for the maximum permitted pressure in the system.

Input range	**P_{min} to 50.00 MPa** (Increment: **0.01**)
Default value	**35.00 MPa**

Pressure

Current Value

Shows the current pressure in the system.

Mixing ratio

Eluent A

Current Value

Current percentage of the proportion of eluent A in the mixing ratio.

Input

Entry of the new proportion of eluent A in the mixing ratio.

Input range	**0 to 100 - (% eluent B + % eluent C + % eluent D)**
Default value	**100**

Eluent B

Current Value

Current percentage of the proportion of eluent B in the mixing ratio.

Input

Entry of the new proportion of eluent B in the mixing ratio.

Input range	**0 to 100 - % eluent C - % eluent D %**
Default value	**100**

Eluent C

Current Value

Current percentage of the proportion of eluent C in the mixing ratio.

Input

Entry of the new proportion of eluent C in the mixing ratio.

Input range	**0 to 100 - % eluent B - % eluent D %**
Default value	**100**

Eluent D

Current Value

Current percentage of the proportion of eluent D in the mixing ratio.

Input

Entry of the new proportion of eluent D in the mixing ratio.

Input range	**0 to 100 - % eluent B - % eluent C %**
Default value	**100**

[Start]

The button starts the pump with the set parameters. It is disabled if the pump is already running.

[Stop]

The button stops the pump with the set parameters. It is disabled if the pump is not running.

[Apply]

This button transmits the set parameters to the pump.

[Close]

This button closes the **Manual control** dialog window and you will return to the last active program part.

7.32 Remote Box MSB

7.32.1 Remote Box MSB - General

The **6.2148.010 Remote Box MSB** is an MSB device and can be operated with a wide range of Metrohm main devices. It makes it possible to control third-party devices, and MagIC Net can receive external control signals.

Devices with which the Remote Box MSB can be used

- *945 Professional Detector Vario*
- *943 Professional Thermostat / Reactor Vario*
- *941 Eluent Production Module*
- *940 Professional IC Vario*
- *930 Compact IC Flex*
- *919 IC Autosampler plus*
- *896 Professional Detector*
- *886 Professional Thermostat / Reactor*
- *882 Compact IC plus*
- *881 Compact IC pro*
- *858 Professional Sample Processor*
- *850 Professional IC*
- *846 Dosing Interface*
- *814 USB Sample Processor and 815 Robotic USB Sample Processor XL*

7.32.2 Configuration MSB Device

An MSB device is not entered in the device table. In the configuration it is only listed under the MSB connections of the main device to which it is connected (e.g. **850 Professional IC** or **858 Professional Sample Processor**).

7.32.3 Remote Box MSB - Method

Subwindow: **Method ▶ Devices**

A Remote Box MSB (as is the case with all MSB devices) cannot be added separately to a method. It is added to the list of devices by adding the main device to which it connected to the method.

If the method is created without connected devices, the MSB device can be added separately. The MSB connector on the main device must be entered manually in such cases.

In the device list, a Remote Box MSB behaves like a stand-alone device. It can be selected and graphically displayed in the upper part of the instrument window.

7.32.3.1 Remote Box MSB - Start parameters

Tab: **Method ▶ Devices ▶ Remote Box MSB**

Output signal

Input of the binary pattern for the output signal of exactly 14 characters or selecting a predefined signal pattern.

0 = line inaktiv

1 = line active

***** = retain line status

p = set pulse (pulse length = 200 ms). If an impulse with a different length is to be emitted, a corresponding template must be defined.

The outputs are always numbered from right to left: 13 12 11 10 9 8 7 6 5 4 3 2 1 0.

Example: **********1*** sets the output line 1 to active (= set), **************0*** sets the line to inactive.

NOTE

We recommend masking the irrelevant output lines with an asterisk ***** so as not to alter these line conditions.

Entry	**0, 1, *, p (14 characters)**
Default value	******************

Selection	**Select a predefined signal template**

Connector

Shows the main device and the MSB connector at which the Remote Box MSB is located.

7.32.3.2 Remote Box MSB - Commands

Subwindow: **Method ▶ Time program**

Overview of the time program commands available for the Remote Box MSB:

7.32.3.2.1 Scan lines

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' - Scan lines**

The device-dependent **Scan lines** time program command (command with feedback) serves to request remote input signals. The time program does not continue before the lines exhibit the required status.

7.32.3.2.1.1 Scanning lines - Parameters

Input signal

Input of the binary pattern for the input signal of exactly 8 characters or selecting a predefined signal pattern.

0 = line inaktiv

1 = line active

***** = retain line status

The input lines are always numbered from right to left: 7 6 5 4 3 2 1 0.

Example: *******1 expects an active input line 0 (**1** = set).

NOTE

Input lines that are of no interest or for which no defined condition can be predicted should also be masked with an asterisk *****.

Entry	**0, 1, * (8 characters)**
Default value	********
Selection	**Select a predefined signal template**

Max. waiting time

on | off (Default value: **off**)

If this option is activated, then the time program is continued as soon as either the requested input signal has been received or the waiting time has expired.

NOTE

The **Max. waiting time** is rounded to a whole number by MagIC Net. A **Max. waiting time** less than 1.0 second will be rounded down to 0.

A **Max. waiting time** of 0 causes MagIC Net to wait "endlessly long".

Therefore, make sure when making a manual entry or when using a formula that the **Max. waiting time** is at least 1.0 second.

Time

Input range	**0.0 to 9,999.9**
Default value	**10.0**

Unit

Selection	**s** | **min**
Default value	**min**

Generated variables

The following variables of the type **'TP.command number.Variable name'** are generated by the command:

Variable name	Description	Data type
TOU	**1** = max. waiting time expired **0** = max. waiting time not expired	Number

7.32.3.2.1.2 Scan lines - 849 Level Control / Mitsubishi GA-100 for Combustion IC

Here you will find the list of signals with which the **849 Level Control** / the **Mitsubishi GA-100** (for Combustion IC) device can be actuated via Remote Box MSB in **MagIC Net**. These signals can be saved for the purpose of convenient reuse as templates.

NOTE

Preconditions for correct scanning of the 849 Level Control:

- The 6.2148.010 Remote Box MSB is connected to the MSB connector of a device *(see "Devices with which the Remote Box MSB can be used", page 1687)*, and this is, in turn, connected to the PC.
- The Remote Box MSB is connected to the 849 Level Control with the cable 6.2125.090.

Table 7 Remote signals for scanning the 849 Level Control

Sensor	Function	Input signal	Canister
Overall status ok	No sensor signal active	*****0**	
Overall status "active"	At least one sensor signal active	*****1**	
Full level 1 ok	Overflow monitoring 1: everything ok	***0****	
Full level 1 "active"	Overflow warning at sensor 1	***1****	full
	Overflow warning at sensor 1	***1*1**	full
Full level 2 ok	Overflow monitoring 2: everything ok	**0*****	
Full level 2 "active"	Overflow warning at sensor 2	**1*****	full
	Overflow warning at sensor 2	**1**1**	full
Empty level 1 ok	Empty level monitoring 1: everything ok	*0******	
Empty level 1 "active"	Empty level warning at sensor 1	*1******	empty
	Empty level warning at sensor 1	*1***1**	empty
Empty level 2 ok	Empty level monitoring 2: everything ok	0*******	
Empty level 2 "active"	Empty level warning at sensor 2	1*******	empty
	Empty level warning at sensor 2	1****1**	empty

NOTE

Preconditions for correct scanning of the Mitsubishi GA-100:

- The 6.2148.010 Remote Box MSB is connected to the MSB connector of a device *(see "Devices with which the Remote Box MSB can be used", page 1687)*, and this is, in turn, connected to the PC.
- The MSB Remote Box is connected to the Mitsubishi GA-100 with the 6.2141.140 cable. The two cable ends are correctly connected to the connector strip of the GA-100.

Table 8 Remote signal for scanning the Mitsubishi GA-100

Function	Input signal
Inject signal of the GA-100 to the IC device (synchronization)	*****1**

7.32.3.2.2 Set lines

Dialog window: **Method ▶ Time program ▶ Edit ▶ 'Device' - 'Module' -Set lines**

The device-dependent **Set lines** time program command (command with feedback) is used to control third-party devices during a run. It sets the remote lines to the defined values.

7.32.3.2.2.1 Set lines - Parameters

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min**
Default value	**0.00 min**

Output signal

Input of the binary pattern for the output signal of exactly 14 characters or selecting a predefined signal pattern.

0 = line inaktiv

1 = line active

***** = retain line status

p = set pulse (pulse length = 200 ms). If an impulse with a different length is to be emitted, a corresponding template must be defined.

The outputs are always numbered from right to left: 13 12 11 10 9 8 7 6 5 4 3 2 1 0.

Example: **********1*** sets the output line 1 to active (= set), **************0*** sets the line to inactive.

NOTE

We recommend masking the irrelevant output lines with an asterisk ***** so as not to alter these line conditions.

Entry	**0, 1, *, p (14 characters)**
Default value	******************
Selection	**Select a predefined signal template**

7.32.3.2.2.2 Set lines - Output signals for controlling devices

Here you will find lists of signals with which older-generation Metrohm IC instruments and instruments from other manufacturers can be actuated in **MagIC Net** via Remote Box MSB. These output signals can be saved for the purpose of convenient reuse as templates.

NOTE

Preconditions for the correct control:

- The 6.2148.010 Remote Box MSB is connected to the MSB connector of a device *(see "Devices with which the Remote Box MSB can be used", page 1687)*, and this is, in turn, connected to the PC.
- The Remote Box MSB is connected to the IC device with a corresponding remote cable.

Table 9 Remote signals for controlling Metrohm IC devices

Device	Function	Output signal	Cable (Remote Box MSB - Device)
833 IC Liquid Handling Unit	Starting the peristaltic pump	**********1*	6.2143.200 6.2143.210 6.2143.220 (connection B)
833 IC Liquid Handling Unit	Stopping the peristaltic pump	**********0*	6.2143.200 6.2143.210 6.2143.220 (connection B)
833 IC Liquid Handling Unit	Switching the actuator forward, e.g. switch MSM suppressor	**********P**	6.2143.210 6.2143.220 (connection C)
833 IC Liquid Handling Unit	Starting a second peristaltic pump, e.g. dialysis pump	*******1******	6.2143.220 (connection D)
833 IC Liquid Handling Unit	Stopping a second peristaltic pump	*******0******	6.2143.220 (connection D)
813 Compact Autosampler 838 Advanced IC Sample Processor	Starting the sample changer, reply to "Wait 1"	*********P****	6.2141.190
812 Valve Unit	Filling valve A	******P*******	6.2141.160
812 Valve Unit	Injecting valve A	********P******	6.2141.160
812 Valve Unit	Filling valve B	**********P***	6.9921.189

Device	Function	Output signal	Cable (Remote Box MSB - Device)
812 Valve Unit	Injecting valve B	**********P	6.9921.189
853 MCS CO_2 Suppressor	Starting the CO_2 Suppressor	******1*******	6.2143.230
853 MCS CO_2 Suppressor	Stopping the CO_2 Suppressor	******0*******	6.2143.230

Table 10 Remote signals for controlling other devices

Device	Function	Output signal	Cable (Remote Box MSB - Device)
Agilent 61X0 Quadrupole MSD	Starting data acquisition MS	**********p	6.2141.310

7.32.3.2.3 Release

Dialog window: **Method ► Time program ► Edit ► 'Device' - 'Module' - Release**

The device-dependent time program command **Release** (command without feedback) releases the module/device for use by other methods running at the same time. It removes the reservation made by the current method.

Time

Time at which the command is to be executed.

Input range	**0.00 to 10000.00 min** (Increment: **0.01**)
Default value	**0.00 min**

Comment

Optional comment on the time program command.

Entry	**0 ... 64 characters**

7.32.4 Remote Box MSB - Manual control

Tab: **Manual ► Manual control - 'Device name' ► 'Remote Box MSB'**

Current status

Input signal

Shows the current status of the eight input lines.

Output signal

Shows the current status of the 14 output lines.

Templates/Entry

Input signal

If the current status corresponds to one of the defined templates for the inputs, the corresponding name is shown here.

NOTE

Only templates without asterisks ***** are recognized.

Output signal

Input of the binary pattern for the output signal of exactly 14 characters or selecting a predefined signal pattern.

0 = line inaktiv

1 = line active

***** = retain line status

p = set pulse (pulse length = 200 ms). If an impulse with a different length is to be emitted, a corresponding template must be defined.

The outputs are always numbered from right to left: 13 12 11 10 9 8 7 6 5 4 3 2 1 0.

Example: **********1*** sets the output line 1 to active (= set), **************0*** sets the line to inactive.

NOTE

We recommend masking the irrelevant output lines with an asterisk ***** so as not to alter these line conditions.

Entry	**0, 1, *, p (14 characters)**
Default value	******************
Selection	**Select a predefined signal template**

[Apply]

Sets the bit pattern defined under **Output signal**.

7.33 RS-232 device

The generic device **RS-232 device** allows any RS-232-conforming device to be used with MagIC Net. The time program command **Transfer** *(see chapter 7.33.2.2, page 1703)* is used for communicating with the device.

NOTE

Overview of which MagIC Net version support the RS-232 device: *Versions*

7.33.1 RS-232 device - Configuration

NOTE

Devices which are to be integrated in MagIC Net as generic RS-232 devices, will **not** be recognized automatically. They must be added **manually** to the table of devices *(see chapter 6.5.2.2, page 607)*.

If a type **RS-232 device** device is selected in the device table, then the **[Edit] ► Properties...** menu item can be used to open the **Properties -'Device name' - 'Device type'** dialog window with the device-specific tabs.

7.33.1.1 Properties - General

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► General**

General properties of the RS-232 device are displayed on the **General** tab.

Device name

Designation of the device (can be freely defined by user).

Entry	**50 characters**
Default value	**RS-232 device #**

Device type

Display of the device type.

Program version

Optional text input.

Entry	**50 characters**
Default value	**empty**

Device serial number

The device serial number to be entered by the user when registering the device. A **unique** device serial number must be entered for each device of the type **RS-232 device**.

Entry	**50 characters**

Start-up

Shows the date on which the RS-232 device was manually added to the device table.

Remarks

Remarks about the RS-232 device

Entry	**1000 characters**
Default value	**empty**

7.33.1.2 Properties - RS-232

Tab: **Configuration ► Devices ► [Edit] ► Properties... ► Properties - 'Device type' - 'Device name' ► RS-232**

The properties of the RS-232 interface are defined on this tab.

COM Port

Selection of the serial interface on the PC to which the device is connected.

Selection	**COM1** | **COM2** | **...** | **COMn**
Default value	**COMn**

COMn
First free COM port.

Baud rate

Transmission rate. The baud rate selected here must also be set on the device itself.

Selection	**300** | **600** | **1200** | **2400** | **4800** | **9600** | **19200** | **38400** | **57600** | **115200**
Default value	**9600**

Data bit

Number of data bits.

Selection	**7** | **8**
Default value	**8**

Parity

Type of parity testing.

Selection	**None** | **Odd** | **Even**
Default value	**None**

Stop bit

Number of stop bits.

Selection	**1** | **2**
Default value	**1**

Handshake

Type of data transmission protocol.

Selection	**None** | **HW** | **SW**
Default value	**None**

Timeout

Maximum waiting time for receiving characters. If this time is exceeded, receiving will be stopped.

Input range	**1000 to 9000 ms**
Default value	**2000 ms**

Terminator for send

Terminator for send in hexadecimal code.

Selection	**\0D** | **\0D\0A** | **\0D\0A\0A** | **\0D\0D\0A**
Default value	**\0D\0A** (**\0D** = CR, **\0A** = LF)

Terminator for receiving

Final character for receiving in hexadecimal code.

Selection	**\0D** | **\0D\0A** | **\0D\0A\0A** | **\0D\0D\0A**
Default value	**\0D\0A** (**\0D** = CR, **\0A** = LF)

Code page

Code page used for the data transfer.

Selection	**Cp437** | **Cp850** | **Cp852** | **ASCII**
Default value	**Cp437**

Sending characters separately

on | off (Default value: **off**)

If this option is enabled each character is sent separately. The delay time is allowed to run before sending the next character.

Delay time

Delay time until the sending of the next character.

Input range	**0 to 9999 ms**
Default value	**0 ms**

[Connect]

Establishes the connection to the RS-232 device. The dialog window **Establish connection** appears *(see chapter 7.33.1.4, page 1701)*.

[Disconnect]

Disconnects the connection to the RS-232 device (only then the device can be deleted out of the configuration).

7.33.1.3 Properties - GLP

Tab: **Configuration ► 'Subwindow' ► [Edit] ► Properties... ► 'Properties' ► GLP**

GLP test date

Date of the last GLP test. This date can be selected by clicking on ... in the **Select date** dialog window *(see chapter 2.5.1, page 82)*.

Comment on GLP test

Comment regarding the GLP test.

Entry	**1,000 characters**

Monitoring of GLP validity

Monitoring of GLP validity

on | off (Default value: **off**)

If this option is enabled, then the time interval for the GLP test is monitored.

Monitoring cannot be switched on until after a date has been entered in the "GLP test date" field.

GLP test interval

Time interval to next GLP test. If a value is entered here, then the date in the **Next GLP test** field will be adjusted automatically.

Only editable if monitoring is switched on.

Input range	**1 to 999 days**
Default value	**999 days**

Next GLP test

Date on which the next GLP test is to be carried out. The date can be selected by clicking on … in the **Select date** dialog window *(see chapter 2.5.1, page 82)*. After the date has been entered, the **GLP test interval** field will be adjusted automatically.

Only editable if monitoring is switched on.

Default value	**GLP test date + 999 days**

Message

The message options can only be edited if monitoring is switched on.

Message by e-mail

on | off (Default value: **off**)

If this option is enabled, the message is sent to the address defined under **[E-mail...]**. The message is sent in text format.

[E-mail...]

[E-mail...] opens the **Send e-mail** window *(see chapter 2.7.1, page 111)*.

Acoustic signal

on | off (Default value: **off**)

If this option is enabled, an acoustic signal will be emitted in addition to the message defined above.

Action

The actions can only be edited if monitoring is switched on.

If it is found during monitoring that the validity period has expired, then one of the following actions will be triggered automatically during the start test:

Selection	**Record message** | **Display message** | **Cancel determination**
Default value	**Display message**

Record message
The message that the validity period has expired will be automatically saved with the determination.

Display message
A message is displayed and you can select whether you want to continue the run or cancel it. If the run is continued, then the message that the validity period has expired will be automatically saved with the determination.

Cancel determination
The ongoing determination will be canceled automatically. The following message must be confirmed with **[OK]**.

7.33.1.4 Establish a connection to the RS-232 device

Dialog window: **Configuration ▶ Devices ▶ Properties ▶ RS-232 ▶ Connect**

In order to establish a connection to a RS-232 device the button **[Connect]** has to be pressed on the tab **RS-232**.

If then a message is entered in the field besides the button **[Send]** and is sent, the message received by the device appears in the large text field.

Text field

The messages sent to and received by the device are shown in the large text field.

Input field

Input field for a message to be sent to the device.

[Send]

Sends the message shown in the input field to the device.

7.33.2 RS-232 device - Method

Subwindow: **Method ▶ Devices**

Start parameters can be defined for the **RS-232 device** in the **Method** program part. The **Transfer** command of the RS-232 device can be used in time programs.

7.33.2.1 RS-232 device - Start parameters

A sequence of up to 10 device-specific instructions can be defined as the start parameter(s) of the RS-232 device. These will be sent to the connected RS-232 device by pressing **[Start HW]**. This way, the RS-232 device is able to react to instructions when the IC hardware begins the equilibration.

NOTE

Only instructions of the type **Write** are possible in the start parameters of the RS-232 device.

7.33.2.1.1 Table of Single Instructions

Tab: **Method ▶ Devices ▶ RS-232**

The table lists the single instructions which are sent to the respective RS-232 device with **[Start HW]**. Up to 10 single instructions are possible. The table contains the following columns, which are described in detail in *Edit Instruction*:

Name

Optional name of the instruction.

Instruction

Literal instruction text or formula, which is evaluated as being an instruction.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New	Add a new line to the table and edit in separate dialog *Edit Instruction* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Edit Instruction* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

7.33.2.1.2 Edit Instruction

Dialog window: **Method ▶ Devices ▶ RS-232 ▶ Edit ▶ 'Instruction #'**

In this dialog, an instruction is being newly recorded or an existing instruction is being edited.

NOTE

Please consult the documentation of the respective RS-232 device in order to determine which instructions are permitted and how they must be formulated.

Name

Optional name of the instruction, for the purpose of improved comprehensibility of the entries in the instruction table.

Entry	**50 characters**

Instruction

Text to be sent to the device. The text can be entered literally or be defined as a formula Σ *(see chapter 2.4, page 30)*.

Entry	**1– 250 characters**

7.33.2.2 RS-232 device - Commands

Method **Method ► Time program**

7.33.2.2.1 Transfer

Method **Time program ► Edit ► 'Device' - 'Module' - Transfer**

The instrument-dependent time program command **Transfer** (command with feedback) is used for communications between MagIC Net and an RS-232 device.

Variables generated by the Transfer command

The **Transfer** command creates, independent of the number of single transfer instructions, 3 variables in the form **'TP.Command number.Variable name'**:

Variable name	Description	Data type
BSY	Command status; **1 = BUSY**, **HOLD** or **ERROR**; **0 = READY**; **invalid** (variable not available) **=** Command has never been started	Number
FIN	Command status; **1 = Command has ended at least once**, **0**, **invalid** (variable not available) **= Command has never ended**	Number
TOU	Timeout status: **1 = Max. waiting time expired**; **0 = Max. waiting time not expired**	Number

Single instructions of a **Transfer** command can for their own part generate additional variables *(see chapter 7.33.2.2.1.2, page 1704)*.

7.33.2.2.1.1 Table of Single Instructions

Method **Time program ► Edit ► 'Device' - 'Module' - Transfer**

The table lists the single instructions which are sent to the respective RS-232 device in the **Transfer** command. Up to 10 single instructions are possible. The table contains the following columns, which are described in detail in *Table of Single Instructions*:

Name

The name of the instruction to be entered by the user.

Action

One of 4 predefined actions which more closely define the behavior of the instruction.

Instruction

Literal instruction text or formula, which is evaluated as being an instruction.

Comparison

Comparison pattern for the answer sent back by the device.

The **[Edit]** menu is available for editing the table. It contains the following menu items:

New	Add a new line to the table and edit in separate dialog *Table of Single Instructions* (is also triggered by a double-click on an empty line).
Edit	Edit the selected line in a separate dialog *Table of Single Instructions* (is also triggered by a double-click on a non-empty line).
Copy	Copies the selected line to the clipboard.
Paste	Inserts the line from the clipboard into the table.
Cut	Cuts the selected line and copies it to the clipboard.
Delete	Deletes the selected line.

Max. waiting time

on | off (Default value: **off**)

If this option is activated, then a maximum waiting time can be entered. If not all transfer commands have finished after this time period, the command is canceled and the next command is started.

Input range	**0 to 9,999**
Default value	**1**

Selection	**min** | **s**
Default value	**s**

7.33.2.2.1.2 Edit Instruction

Method **Time program ► Edit ► 'Device' - 'Module' - Transfer ► Transfer - 'Instruction #'**

NOTE

Please consult the documentation of the respective RS-232 device in order to determine which instructions are permitted and how they must be formulated.

If the function **[New]** or **[Edit]** is selected in the table of the **Transfer** instructions (see *Table of Single Instructions*), then the dialog **Transfer - 'Instruction #'** will open.

Name

The name of the instruction to be entered by the user. This name must be unique within the same **Transfer** command.

Entry	**1– 50 characters**
Default value	**Instruction #**

Action

Selection from 4 predefined actions. The action describes the behavior after the instruction has been sent to the device.

Selection	**Read** | **Write** | **Wait for** | **Poll**
Default value	**Read**

Read
An answer from the device will be expected and evaluated within the "Max. waiting time" defined in the *Configuration(see chapter 7.33.1.2, page 1697)*.

Write
No answer will be waited for.

Wait for
Waiting will take place within the "Max. waiting time" defined in the *Command* until a character string is received which corresponds to the regular expression in the "Comparison" parameter. If this answer is not received within the "Max. waiting time" defined in the *Command*, then the command will be canceled.

Poll
An answer from the device will be expected and evaluated within the "Max. waiting time" defined in the *Configuration(see chapter 7.33.1.2, page 1697)*. This action will be repeated until a character string received corresponds to the regular expression in the parameter "Comparison". If this answer is not received within the "Max. waiting time" defined in the *Command*, then the command will be canceled.

Instruction

Instruction which is sent to the device. The instruction can be entered literally here. As an alternative, the instruction can be defined with the help of the formula editor Σ *(see chapter 2.4, page 30)*. If this is the case, then the effective instruction that is sent to the device will be determined during the method run.

0– 250 characters

NOTE

All ASCII characters can be entered with their two-digit hex code after backslash (e.g. **\1B** = **Escape**).

Comparison

Optional comparison pattern for the answer sent back by the device. Can be entered only in connection with instructions with the action **Read**, **Wait for** and **Request**. The comparison pattern can be either a literal text or a *Regular Expression (see chapter 7.33.2.2.1.3, page 1706)*.

Variables created by an instruction of a Transfer command

Each single instruction with the action **Read**, **Wait for** or **Scan** generates one or more variables of the form **TP.'Command number'.'Name of the instruction'.'DATA{x}'** (x=1, 2, etc.). These variables contain the data and/or the data segments in accordance with the regular expression defined in the parameter **Comparison**.

The **Transfer** command itself creates, independent of the number of single transfer instructions, 3 variables *(see "Variables generated by the Transfer command", page 1703)*.

7.33.2.2.1.3 Regular Expressions

NOTE

If external devices are actuated via RS-232 with the aid of Metrohm PC software such as **MagIC Net** and **tiamo**, then Regular Expressions can be used in order to examine and process the text data read by the RS-232 device.

Regular Expressions are used for browsing texts. A Regular Expression is a pattern. The text is investigated to determine whether or not and at which points the pattern matches. Sometimes it is sufficient to have the information as to whether or not and at which points the pattern matches the

text being investigated; sometimes the user wishes to "extract" the matches found in the text in order to use them for a particular purpose. Both is possible with Regular Expressions.

In the simplest case, a literal text can be used as a Regular Expression. For example, a text can be searched through using the sample "hello". The pattern will match 0, 1 or n times.

"Real" Regular Expressions, which are much more expressive than literal patterns such as "hello", are written in standardized form and manner (syntax). Metrohm PC software such as **MagIC Net** and **tiamo** support Regular Expressions in accordance with **Java™ Platform Standard Edition**.

In order to familiarize yourself more with Regular Expressions, we recommend that you look up **Regular Expression** at *http://www.wikipedia.org/*.

Simple Examples for Regular Expressions

The following table shows several (very simple) examples of Regular Expressions.

NOTE

Certain characters such as ****, **.** or ***** have special meanings in Regular Expressions (see table). If such characters are to be understood literally, i.e. if their special meanings are to be canceled, then a backslash **** must be placed before them.

Expression	Significance	Example
hello	Literal text	Matches every incidence of **hello**, but not, for example, **Hello** (large H)
[hH]	Every specified character	Matches every incidence of **h** or **H**
[hH]ello	Literal text with small or large initial letter	Matches **hello** and **Hello**
[a-z0-9]	All characters in the specified range	Matches every small letter of the alphabet **a**, **b**, …, **z**, as well as every digit **0**, **1**, …, **9**
^hello	Text at the beginning of the line	Matches **hello** at the beginning of the line
hello$	Text at the end of the line	Matches **hello** at the end of the line
.	Any single character	Matches, for example, **c** or **4** or **!** etc.
.*	Any number of characters	**abcd** or **41** or **-$=$**, etc.

\.	Word period	Matches the character **.** (period)
\d	One digit	Matches, for example, **3**, **47** (also contains one digit!), but not **X**
\d+	At least 1 digit	**324567**
\d{4}	Sequence of four digits	Matches not only **3143**, but also **12345** (also contains 4 digits!), but not **123**.
\D	A character that is not a digit	Matches, for example, **A** or **,** or **%**
\w	A digit or a letter of the alphabet, including _; same meaning as **[a-zA-Z_0-9]**	Matches, for example, **a** or **3**, but not **$**
\W	A character that is not a digit and not a letter of the alphabet.	Matches, for example, **$** or **+**
\s	An empty space, a tab, a line break	
\S	Every single character except empty space, tab, line break	

Regular Expressions with which something useful can be accomplished are in practice longer and "more complicated" than these simple examples. A more practice-oriented example can be found in the next Section.

Match extraction

When a Regular Expression is used, matches can not only be *found*, they can also be *extracted*. This functions with the use of **parentheses** in the Regular Expression.

The following Regular Expression contains no parentheses: **\w+@\w+\.[a-zA-Z]{2,}**. It can be used to *find* E-mail addresses in a text. This means that this pattern matches, for example, the E-mail address **info@metrohm.com**.

If parentheses are used in the expression, e.g. **(\w+)@(\w+)\.([a-zA-Z]{2,})**, then the fragments which match the pattern in the parentheses can be "extracted". 4 (!) individual matches are obtained when this version of the Regular Expression is applied to the text **info@metrohm.com**:

- 1st match: the *entire* matching text = **info@metrohm.com**
- 2nd match: matching fragment in accordance with the 1st pair of brackets = **info**
- 3rd match: matching fragment in accordance with the 2nd pair of brackets = **metrohm**
- 4th match: matching fragment in accordance with the 3rd pair of brackets = **com**

The characters **@** and **.** (period) were not extracted, they are only contained in the full match.

This extraction technique is useful, for example, when it is necessary to analyze and break down the "feedback" from a device (a character string) in order to reuse data in the context of communicating with an RS-232 device.

7.33.3 RS-232 device - Manual control

The generic RS-232 device has no functions that can be performed manually.

8 Manual control

8.1 Manual control - General

Program part: **Manual control**

Definition

The term **Manual control** is used in **MagIC Net** to refer to the program part in which the connected devices can be directly controlled, i.e. without a predefined run instruction. The precondition for this is that the devices are switched on and detected by **MagIC Net**. Manual control is also possible live during a method run.

Organization

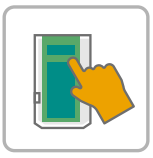
A distinction is made between the **manual control of the workplace** and the **global manual control**. They differ in respect to selection of the devices and in the rights concerning when manual control is allowed.

- **Manual control of the workplace**
  Only devices which are used in the method of the selected workplace are available. These devices can be operated manually at any time, also live during the run. Such live changes are, of course, noted in the relevant determination.
- **Global Manual control**
  All the devices which have been recognized by the software and which are not reserved by a workplace are available. This prevents an unintentional manipulation of devices which are used in the run of a method.

8.2 Manual control - User interface

Program part: **Manual control**

Manual control - Symbol



Clicking on the **manual** icon in the vertical bar on the left opens the **manual control** program part in a separate window; the **manual** icon is displayed in color at the same time.

Elements

The user interface of the **manual control** program part comprises the following elements:

- Device selection
- Device window

8.3 Device selection

Program part: **Manual control**

The device selection is located in the left area of the manual control; this can be used to specify which devices are operated.

Device selection

Selection of the devices which are to be operated manually. Depending on the selection the **device list** and the **instrument window** are updated.

Selection	**Workplace** | **All devices**
Default value	**Workplace**

Workplace
Manual control for devices which are used in the method of the selected workplace. All workplaces which are currently opened can be selected on the basis of their color.

All devices
Global manual control for all devices which are recognized by the software and which are not reserved by a workplace.

Device list

Depending on the setting in the **device selection** field, the devices which can be operated manually are shown in tree-form.

The currently selected device is shown with a colored background. Devices which are currently occupied because they are being used in a method run or in which manually initiated actions are running are shown with **red** lettering.

[Stop devices]

Stops all devices of the global manual control, active only if **All devices** has been selected.

NOTE

In order to stop the devices of a workplace, you need to change to the **workplace program part** and activate **[Stop HW]**.

8.4 Instrument window

Program part: **Manual control**

The instrument window is located in the right area of the manual control.

Depending on the setting in the **device selection** field, the devices which can be operated manually are shown graphically:

- For **device selection** = **workplace**:
  Manual control of the workplace: The instrument window is surrounded by a frame in the color of the workplace selected. Only those devices are displayed which are used in the method of the selected workplace.
- For **device selection** = **All devices**:
  Global manual control: The instrument window has a **gray** frame. The device that is selected in the device list is displayed.

The functions of the manual control are shown in the lower area of the window. The functions of a module are summarized in each tab. The required device/module can be selected using the tab or by clicking on the graph.

Devices with manual control

- *947 Professional UV/VIS Detector Vario - Manual control*
- *945 Professional Detector Vario*
- *944 Professional UV/VIS Detector Vario*
- *943 Professional Thermostat / Reactor Vario*
- *942 Extension Module Vario ONE/Deg - Manual control*
- *942 Extension Module Vario HPG - Manual control*
- *942 Extension Module Vario LQH - Manual control*
- *942 Extension Module Vario Prep 2 - Manual control*
- *942 Extension Module Vario ChS/PP - Manual control*
- *942 Extension Module Vario SeS/PP - Manual control*
- *941 Eluent Production Module - Manual control*
- *940 Professional IC Vario - Manual control*
- *930 Compact IC Flex - Manual control*
- *919 IC Autosampler plus - Manual control*
- *896 Professional Detector - Manual control*
- *889 IC Sample Center - Manual control*
- *887 Professional UV/VIS Detector - Manual control*
- *886 Professional Thermostat / Reactor - Manual control*
- *883 Basic IC plus - Manual control*
- *882 Compact IC plus - Manual control*
- *881 Compact IC pro - Manual control*
- *872 Extension Module IC Module - Manual control*
- *872 Extension Module IC Pump - Manual control*

- *872 Extension Module Liquid Handling - Manual control*
- *872 Extension Module Sample Prep - Manual control*
- *872 Extension Module Suppression - Manual control*
- *872 Extension Module Suppression - Manual control*
- *863 Compact Autosampler - Manual control*
- *858 Professional Sample Processor - Manual control*
- *850 Professional IC - Manual control*
- *814 USB Sample Processor and 815 Robotic USB Sample Processor XL - Manual control*
- *800 Dosino - Manual control*
- *771 IC Compact Interface - Manual control*
- *Eco IC - Manual control*
- *High-pressure gradient pump - Manual control*
- *Remote Box MSB - Manual control*
- *Stirrer - Manual control*

The manual control of the **891 Professional Analog Out** *(see chapter 7.8.4.10, page 956)* is assigned to the main device to which it is connected.

9 How to proceed?

9.1 Audit Trail

9.1.1 Opening the Audit Trail

How to proceed?

NOTE

The Audit Trail table can be opened only if the **Audit Trail active** option is switched on in the **Security settings** under **Audit Trail/ Modifications**.

1 Select the **Configuration** program part.

2 Click on the icon or the **Tools ► Audit Trail…** menu item.

The **Audit Trail** dialog window opens.

3 If required, adjust the column display.

9.1.2 Filtering the Audit Trail

How to proceed?

Opening the "Audit Trail" dialog

1 Select the **Configuration** program part.

2 Click on the icon or the **Tools ► Audit Trail…** menu item.

The **Audit Trail** dialog window opens.

Filtering can now be done via quick filter or special filter in the **Audit Trail** dialog window:

Quick filter

1 Click on the icon or the **Filter ► Quick filter** menu item.

After this function has been selected, the field in which the cursor is located will have a yellow background when navigating in the Audit Trail table.

2 Double-click on the desired field with the left mouse button.

The contents of the field selected in the table will be set as a filter criterion and this filter will be applied directly to the table.

NOTE

The quick filter can be applied again within the filtered table, so that the number of entries can be limited step by step.

Defining and using special filters

1 Click on the icon or the **Filter ► Special filter** menu item.

The **Special filter** dialog window for the definition of user-specific filters opens.

2 Use the **Edit ► Edit line** menu item to open the **Edit 'New filter' filter criterion** dialog window.

3 Enter the filter criteria and confirm with **OK**.

4 Click on **[Apply filter]** in the **Special filter** dialog window.

The table is then filtered.

Using special filters

1 In the **Special filter** dialog window, select the desired special filter in the **Filter** selection list.

The table is then filtered.

9.1.3 Exporting the Audit Trail

How to proceed?

1 Select the **Configuration** program part.

2 Click on the symbol or the **Tools ► Audit Trail…** menu item.

The **Audit Trail** dialog window opens.

3 If desired, filter the Audit Trail table.

4 If desired, select the Audit Trail entries to be exported.

5 Click on the **File ► Export…** menu item.

The **Export Audit Trail** dialog window opens.

6 Enter or select a directory and file name for saving the export file under **Save file as**.

7 In the **Selection** field, select the desired option (**All records** or **Selected records**).

8 Click on **[OK]**.

The selected Audit Trail data sets are then exported.

NOTE

Audit Trail entries are archived in text format. They cannot be imported back into the Audit Trail table.

9.1.4 Archiving the Audit Trail

How to proceed?

NOTE

Audit Trail entries can be backed up and restored together with the configuration data.

1 Select the **Configuration** program part.

2 Click on the icon or the **Tools ► Audit Trail…** menu item.

The **Audit Trail** dialog window opens.

3 Open the **Archive Audit Trail** dialog window with the **File ► Archive…** menu item.

4 Enter or select a directory and file name for saving the archive file under **Save file as**.

5 In the **Selection** field, select the desired option (**All records** or **Records until** including date selection).

6 Click on **[OK]**.

The selected Audit Trail data sets will be archived in text format.

NOTE

Archiving Audit Trail entries is identical to exporting, i.e. the Audit Trail entries are saved in text format. They cannot be imported back into the Audit Trail table. The difference between this and exporting is that the archived entries can be marked in the column **Archive** and then deleted.

NOTE

The text files generated by archiving are no longer protected and can be tampered with. If it is necessary to ensure that these files are archived in an unaltered condition, then a suitable external backup or archiving program must be used.

9.1.5 Deleting the Audit Trail

How to proceed?

NOTE

Audit Trail entries can only be deleted if they have previously been archived.

1 Select the **Configuration** program part.

2 Click on the icon or the **Tools ▶ Audit Trail...** menu item.

The **Audit Trail** dialog window opens.

3 Archive desired Audit Trail entries.

4 Open the **Delete Audit Trail** dialog window with the **File ▶ Delete** menu item.

5 In the **Selection** field, select the desired option (**All archived records** or **Archived records until** including date selection).

6 User 1: Enter **User name** and **Password**.

7 User 2: Enter **User name** and **Password**.

8 Click on **[OK]**.

The selected, archived Audit Trail data sets are then deleted.

9.2 Backup

9.2.1 Backing up a database

How to proceed?

General

The **determination databases** that, in contrast to the **configuration database**, can be generated by the user and contain the determination data, are referred to as databases in **MagIC Net**. Included among such determination data are the method data used for the determination, the measured data generated during the determination and the results calculated from it.

In local server systems (**MagIC Net Professional**), the databases are stored on the drives administered by the computer and are only available to those users registered on that computer who have the appropriate access permission. In client/server systems (**MagIC Net Multi**), the databases are stored on drives administered centrally by the server and are globally available throughout the entire client/server system, i.e., all users with the appropriate access permission can use these databases.

NOTE

Each determination database has to be backed up separately. Afterwards, it is recommended that all backed-up files also be copied to an external directory or to a CD/DVD.

Backing up a database manually

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Database manager…** menu item.

The **Database manager** dialog window opens.

3 Select the database.

4 Click on **[Backup]** in the **Database manager** dialog window.

The **Backup database 'Database name'** dialog window opens.

5 Select the directory for the backup in the **Backup directory** field.

6 Select or enter the name for the **Backup file**. If an existing backup file is selected, it will be overwritten.

NOTE

If the backup directory is on a network drive, the backup date should be added manually to the **Backup name** field because the backup date information is not available when the data is restored.

7 Click on **[Start]**.

The manual backup of the database is started and the database is backed up to the selected directory.

Backing up a database automatically

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Database manager…** menu item.

The **Database manager** dialog window opens.

3 Select desired database and click on **[Properties]**.

The **Properties - Database - 'Database name'** dialog window opens for editing the database properties.

4 On the **General** tab, enter a comment on the database in the **Comment** field.

5 On the **Backup** tab, enable the **Backup monitoring** check box.

6 Enter an **Interval** for backup monitoring or a date for the next backup in the **Next backup** field.

7 Activate the **Start backup automatically** check box.

8 Select the directory for the backup in the **Backup directory** field.

9 Click on **[OK]**.

The **Properties - Database** dialog window closes and the database will be backed up automatically to the selected directory at the desired moment.

9.2.2 Restoring a database

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ► Database manager…** menu item.

The **Database manager** dialog window opens.

3 Click on **[Restore]** in the **Database manager** dialog window.

The **Restore databases** dialog window opens.

4 Select the directory in the **Backup directory** in which the desired database was backed up.

5 Select or enter the name for the desired **Backup file**.

6 Enter the name under **Save As** under which the database is to be restored.

7 Click on **[Start]**.

The database restoring is started.

NOTE

Existing databases cannot be overwritten, i.e., they must first be deleted so that the database can be restored under its old name.

9.2.3 Backing up configuration data

How to proceed?

General

The configuration data is saved in **MagIC Net** in the **Configuration database**. Configuration data includes all method settings that apply to all settings, i.e. settings for devices, columns, eluents, solutions, EPC solutions, accessories, common variables and rack data, as well as **Methods**, **Security settings** *(see chapter 6.2.2.1, page 546)*, **User administration** *(see chapter 6.2.1.1, page 537)*, **Program administration** *(see chapter 6.2.3.1, page 556)*, templates and **Audit Trail** *(see chapter 6.4, page 578)*.

In local server systems (**MagIC Net Professional**), the configuration database is located in the program directory of the computer on which the program has been installed. In client/server systems (**MagIC Net Multi**), the configuration database is stored centrally on the server and contains all the configuration data of all computers (clients) that are connected to this server.

NOTE

It is strongly recommended that the configuration database be backed up periodically.

Backing up configuration data manually

1. Select the **Configuration** program part.
2. Click on the **File ► Backup ► Manually** menu item.

   The **Backup configuration data manually** dialog window opens.
3. Select the directory for the backup in the **Backup directory** field.

4 Select or enter a new name for the backup file in the **Backup name** list box. If an existing backup file is selected, it will be overwritten.

> **NOTE**
>
> If the backup directory is on a network drive, the backup date should be added to the **Backup name** because the backup date information is not available when the data is restored.

5 Click on **[Start]**.

The manual backup is started and the configuration database is backed up to the selected directory.

Backing up configuration data automatically

1 Select the **Configuration** program part.

2 Click on the **File ► Backup ► Automatically** menu item.

The **Backup configuration data automatically** dialog window opens.

3 Activate the **Automatic backup** check box.

4 Enter an **Interval** for backup monitoring or a date for the next backup in the **Next backup** field.

5 Select the directory for the backup in the **Backup directory** field.

6 Click on **[OK]**.

The **Backup configuration data automatically** dialog window closes and the configuration database will be backed up automatically to the selected directory at the desired moment.

9.2.4 Restoring configuration data

How to proceed?

MagIC Net Professional

1. Exit **MagIC Net**.
2. Start the **ConfigRestore.exe** file in the program directory **… \MagIC Net\bin**.

   The dialog window **Restore configuration data** opens *(see chapter 6.3.2.3, page 568)*.
3. Select the directory in the **Backup directory** field in which the configuration database was backed up.
4. Select or enter the name for the desired **Backup file**.
5. Click on **[Start]**.

   The restoring of the configuration database is started.

MagIC Net Multi

1. Make sure that **MagIC Net** is closed on all clients connected to the server and on the server itself.
2. Start the **ConfigRestore.exe** file in the **…\MagIC Net\bin** program directory on the server.

   The **Restore configuration data** dialog window opens.
3. Select the directory in the **Backup directory** field in which the configuration database was backed up.
4. Select or enter the name for the desired **Backup file**.
5. Click on **[Start]**.

   The restoring of the configuration database is started.

9.2.5 Backing up methods

How to proceed?

General

Methods are stored in the configuration database and are globally accessible for all clients. This means that in order to back up methods the configuration data must be backed up manually or automatically. Another possible way is to export the methods and then to store these files outside of **MagIC Net**.

Backing up configuration data manually

1. Select the **Configuration** program part.
2. Click on the **File ► Backup ► Manually** menu item.

   The **Backup configuration data manually** dialog window opens.
3. Select the directory for the backup in the **Backup directory** field.
4. Select or enter the name for the desired backup file in the **Backup name** list box. If an existing backup file is selected, it will be overwritten.

   .

   NOTE

   If the backup directory is on a network drive, the backup date should be added to the **Backup name** because the backup date information is not available when the data is restored.
5. Click on **[Start]**.

   The manual backup of the configuration database is started.

Backing up configuration data automatically

1. Select the **Configuration** program part.
2. Click on the **File ► Backup ► Automatically** menu item.

The **Backup configuration data automatically** dialog window opens.

3 Enable the **Automatic backup** check box.

4 Enter an **Interval** for backup monitoring or a date for the **Next backup**.

5 Select the directory for the backup in the **Backup directory** field.

6 Click on **[OK]**.

The **Backup configuration data automatically** dialog window closes.

Exporting methods

1 Select the **Method** program part.

2 Click on the icon or the **File ▶ Method manager…** menu item.

The **Method manager** dialog window opens.

3 Select the desired **Method group**.

4 Select the desired methods.

5 Click on the **File ▶ Export…** menu item.

The **Select directory for export** dialog opens.

6 Select the desired directory for the export files and click on **[OK]**.

The selected methods are each exported as files named **'Method name'.mmet**.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

7 Select the desired directory for the export files and click on **[OK]**.

The selected methods are each exported as files named **'Method name'.imet**.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

9.2.6 Archiving the Audit Trail

How to proceed?

NOTE

Audit Trail entries can be backed up and restored together with the configuration data.

1. Select the **Configuration** program part.
2. Click on the icon or the **Tools ► Audit Trail…** menu item.

   The **Audit Trail** dialog window opens.
3. Click on the **File ► Archive…** menu item.

   The **Archive Audit Trail** dialog window opens.
4. Enter or select a directory and file name for saving the archive file under **Save file as**.
5. In the **Selection** field, select the desired option (**All records** or **Records until** including date selection).
6. Click on **[OK]**.

   The selected Audit Trail data sets will be archived in text format.

NOTE

Archiving Audit Trail entries is identical to exporting, i.e. the Audit Trail entries are saved in text format. They cannot be imported back into the Audit Trail table. The difference between this and exporting is that the archived entries can be marked in the column **Archive** and then deleted.

NOTE

The text files generated by archiving are no longer protected and can be tampered with. If it is necessary to ensure that these files are archived in an unaltered condition, then a suitable external backup or archiving program must be used.

9.3 Determinations

9.3.1 Starting a single determination

How to proceed?

1. Select **Workplace** program part *(see chapter 3.1, page 114)*.
2. In the **Run** subwindow, click on the **Single determination** tab.
3. Select the **Method** from the desired method group that is to be used for carrying out the determination.

   The time program of the loaded method is shown in the **Time program** subwindow *(see chapter 3.11, page 201)*.
4. Enter **sample data**.
5. Click on **[Start]**.

   The single determination is started. The run is displayed in the **Time program** subwindow; live curves, measured values and messages are shown in the **Live display** subwindow.

9.3.2 Starting a determination series

How to proceed?

Determination series without statistics

1. Select **Workplace** program part.
2. Use the **Run** subwindow to select the **Determination series** tab.
3. If desired, enter **Determination parameters**.
4. Load existing sample table or enter sample data directly into the working sample table.

   The method loaded in the first line is displayed in the **Method** subwindow.
5. If a method was loaded in which the **Statistics** option is enabled in the **START** command, disable the **Statistics** check box on the **Determination series** tab.
6. Click on **[Start]**.

   The first determination of the sample series will be started. The **Method** subwindow shows active tracks and commands; the **Live display** subwindow shows live curves, measured values and messages.

Determination series with statistics

1. Select **Workplace** program part.
2. Use the **Run** subwindow to select the **Determination series** tab.
3. If desired, enter **Determination parameters**.
4. Load existing sample table or enter sample data directly into the working sample table.

   The method loaded in the first line is displayed in the **Method** subwindow.

NOTE

In order to carry out statistics calculations for results, the **Statistics** check box has to be enabled in the **START** command of the method. In addition, the **Statistics** check box has to be enabled for every desired result in the **CALC** command.

5 On the **Determination series** tab, enable the **Statistics** check box.

6 If desired, modify number of single determinations.

7 Click on **[Start]**.

The first determination of the sample series will be started. The **Method** subwindow shows active tracks and commands; the **Live display** subwindow shows live curves, measured values and messages.

NOTE

If the method contains a **DATABASE** command, then it is mandatory that this command be executed in all statistically linked determinations. If this is not done, then the statistical results will be displayed incorrectly and the determinations cannot be reprocessed.

Starting the determination series

1 Select **Workplace** program part *(see chapter 3.1, page 114)*.

2 In the **Run** subwindow, click on the **Determination series** tab.

3 Load existing sample table or enter sample data directly into the working sample table.

The time program of the method loaded in the first line is displayed in the **Time program** subwindow *(see chapter 3.11, page 201)*.

4 Click on **[Start]**.

The first determination of the sample series will be started. The run is displayed in the **Time program** subwindow; live curves, measured values and messages are shown in the **Live display** subwindow.

NOTE

If several injections have been defined for a sample line, then a multiple determination will be carried out. If defined in the method, the statistical results will be calculated by means of the determinations that are part of the multiple determination.

9.3.3 Searching for determinations

How to proceed?

1. Select the **Database** program part.
2. Click on the icon or the **File ► Open…** menu item.

   The **Open database** dialog window opens.
3. Select desired database or enter name in the **Database name** field.
4. Click on **[Open]**.

   The data sets of the selected database are displayed in the **Determination overview**.
5. Click on the symbol or the **Determinations ► Find...** menu item.

   The **Search - Database 'Database name'** dialog window opens.
6. Enter or select desired search terms and search options.
7. Click on **[Find next]**.

   The next determination containing the search term is highlighted in the **Determination overview**.

9.3.4 Filtering determinations

How to proceed?

Opening a database

1. Select the **Database** program part.
2. Click on the icon or the **File ► Open…** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The datasets of the selected database are displayed in the **Determination overview**.

Filtering can now be done via quick filter or special filter in the **Determination overview** window.

Quick filter

1 Click on the icon or on **Filter ▶ Quick filter** in the context menu.

After this function has been selected, the field in which the cursor is located will have a yellow background when navigating in the determination table.

2 Double-click on the desired field with the left mouse button.

The contents of the field selected in the table will be set as a filter criterion and this filter will be applied directly to the table.

NOTE

The quick filter can be applied again within the filtered table, so that the number of entries can be limited step by step.

Defining and using special filters

1 Click on the icon or on **Filter ▶ Special filter...** in the context menu.

The **Special filter** dialog window for the definition of user-specific filters opens.

2 Use the **Edit ▶ Edit line** menu item to open the **Edit filter criterion New filter** dialog window.

3 Define filter criteria.

4 Click on **[Save filter]**.

5 Click on **[Apply filter]**.

The table is then filtered.

Using special filters

1 In the **Filter** selection list, select the desired special filter.

The table is then filtered.

9.3.5 Displaying determinations of a batch

How to proceed?

1 Select the **Database** program part.

2 Open the desired **database**.

The selected database opens and its data sets are displayed in the **Determination overview**.

3 Select the desired batch in the **Batch** field.

The table shows the determination series of the batch.

9.3.6 Signing a determination

How to proceed?

Selecting a determination

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Open…** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**.

5 Select the desired determination.

Signature 1

NOTE

Determinations can only be signed at level 1 if the user belongs to a user group with the corresponding permission *(see chapter 6.2.1.2.3, page 540)*.

1 Click on the icon or **Determinations ▶ Sign ▶ Signature 1…** menu item.

The **Signature Level 1** window opens. If the selected determination can be signed, **Signature possible** is displayed in the **Info** field.

2 Enter or select **User**, **Password**, **Reason** and **Comment**.

3 Click on **[Sign]**.

The selected determination will be signed at level 1.

NOTE

Determinations that have been signed at level 1 can be reprocessed and deleted. If the modified determination is saved as a new determination version, then all existing signatures will be deleted automatically, i.e. the determination must be signed again.

Signature 2

NOTE

Determinations can only be signed at level 2 if the user belongs to a user group with the corresponding permission *(see chapter 6.2.1.2.3, page 540)*.

1 Click on the icon or the **Determinations ▶ Sign ▶ Signature 2…** menu item.

The **Signature Level 2** window opens; if a signature is possible for the selected determination, then **Signature possible** will appear in the **Info** field.

2 Enter or select **User**, **Password**, **Reason** and **Comment** and click on **[Sign]**.

The selected determination will be signed at level 2.

NOTE

Determinations signed at level 2 are **locked**, i.e. they can neither be reprocessed nor deleted. In order to be able to edit such determinations again, the signatures on level 2 must first be deleted.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

9.3.7 Exporting determinations

How to proceed?

Defining an export template

1 Select the **Database** program part.

2 Click on the **Tools ► Templates ► Export templates…** menu item.

The **Export templates** window opens.

3 Click on **[New]**.

The **Export templates – 'New file'** window opens.

4 Define the properties of the new export template.

5 Click on **[OK]**.

The dialog window closes.

6 Click on **[Close]**.

The **Export templates** dialog window closes.

Selecting determinations

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Open…** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**.

5 Select the desired determinations.

Exporting determinations

1 Click on the **Determinations ▶ Export…** menu item.

The **Export determinations** window opens.

2 In the **Selection** field, select the desired option (**All records** or **Selected records**).

3 In the **Export template** selection list, select an export template.

4 Click on **[OK]**.

The selected determinations are exported into the directory defined in the export template.

9.3.8 Importing determinations

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Open…** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**.

5 Click on the **Determinations ► Import...** menu item.

The **Import determinations** window opens.

6 Select the desired determinations.

7 Click on **[Open]**.

The selected determinations are imported into the open database.

NOTE

Exported determinations can only be imported in the ***.mdet** file format.

NOTE

Exported determinations can be imported in the ***.idet** and ***.cdf** file format.

9.3.9 Deleting determinations

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ► Open...** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**.

5 Select the desired determinations.

6 Click on the icon or the **Determinations ▶ Delete** menu item.

7 Confirm deleting.

The selected determinations are deleted along with all **Determination versions**.

NOTE

If the **Comment on modification of determinations** option in the **Security settings** is enabled, then the **Modification comment determination** window will appear before the modification is saved.

9.3.10 Making a determination version current

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Open…** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**.

5 Select the desired determination.

6 Click on the icon or the **Determinations ▶ Show history…** menu item.

Only the currently selected determination as well as all the previous versions of this determination will be shown in the **determination table**.

7 Select the desired determination that is once again to be made the current determination version.

8 Click on the icon or the **Determinations ▶ Make current** menu item.

The determination version selected in the table will again be made the current determination version. This creates a new determination, the version number of which is increased by **+1** compared with the last version that was saved.

9.3.11 Reprocessing determinations

9.3.11.1 Reprocessing determinations - General

How to proceed?

NOTE

Determinations signed at level 2 can no longer be reprocessed.

NOTE

Determinations that are not yet completed, e.g. because their calibration is not yet complete or because not all injections have been accomplished for a multiple determination, cannot be reprocessed.

NOTE

A determination that is **automatically** exported and imported into another database cannot be reprocessed. With certain settings, e.g. with the calibration modes Bracketing and Total, automatic reprocessing is carried out after the measurement series has been completed. The automatic export takes place before the automatic reprocessing. Therefore, the data set is incomplete at the time of export and cannot be reprocessed after the import.

A determination that is **manually** exported and imported into another database can be reprocessed. The manual export is carried out after the automatic reprocessing. Therefore, the data set is complete at the time of the manual export and can be reprocessed after the import.

1 Select the **Database** program part.

2 Open the desired database.

The selected database opens and its data sets are displayed in the **Determination overview**.

3 Select the desired determinations.

4 Click on the symbol or menu item **Determinations ► Reprocess**.

The **Reprocessing** dialog opens and the first of the selected determinations is displayed.

5 Change desired properties.

- Sample data can be edited in the **Reprocessing table** subwindow.
- Other columns and eluents are assigned with **[Method...] ► Change column** or **[Method...] ► Change eluent**.
- The properties of the evaluation are changed in the subwindow **Evaluation parameters**.
- Chromatograms are edited manually in the subwindow **Chromatograms**.

6 Click on **[Reprocess]**. The **Reprocessing** dialog opens; it is here that calibration in reprocessing is determined.

Click on **[OK]** to reprocess the determinations. The result of the reprocessing will be displayed in the subwindows **Results** and **Chromatograms**.

7 In the **Reprocessing** window, click on **[OK]**.

Each determination that has been modified by reprocessing will be saved as a new version with a version number increased by **+1** and the **Reprocessing** subwindow will be closed. This button is disabled for as long as reprocessing has not yet been triggered and if not all of the selected determinations were able to be recalculated.

9.3.11.2 Reprocessing - Application instances

9.3.11.2.1 Incorrect sample data

9.3.11.2.1.1 Samples or standards have an incorrect Ident

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. Correct **Ident** in the sample data.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.1.2 Samples or standards have incorrect volume

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. Correct the **Volume** in the sample data.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.1.3 Samples or standards have incorrect dilution factor

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. Correct the **Dilution** in the sample data.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.1.4 Samples or standards have incorrect sample amount

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. Correct the **Sample amount** in the sample data.

3 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.2 Incorrect integration

9.3.11.2.2.1 Samples are incorrectly integrated - Standards are OK

How to proceed?

1 Open samples in reprocessing.

2 Set new integration parameters, or integrate them manually.

3 Mark the determination of which the calibration is to be used.

4 Start reprocessing with the calibration option **Apply calibration from selected determination to all determinations.**.

9.3.11.2.2.2 Samples and standards are incorrectly integrated

How to proceed?

1 Open samples with the associated standards in reprocessing.

2 Set new integration parameters, or integrate them manually.

3 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.2.3 Standards are incorrectly integrated - Samples are OK

How to proceed?

1 Open samples with the associated standards in reprocessing.

2 Set the correct integration parameters for the standards.

3 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

The standards are now correctly integrated and generate a correct calibration curve. The samples now have a correct calibration, although they are now incorrectly integrated.

4 Open only the incorrectly integrated samples in reprocessing.

5 Set the correct integration parameters for the samples.

6 Mark the determination of which the calibration is to be used.

7 Start reprocessing with the calibration option **Apply calibration from selected determination to all determinations.**.

9.3.11.2.2.4 No reasonable integration parameters can be found

How to proceed?

1 Open samples with the associated standards in reprocessing.

2 Integrate manually all determinations with poor integration.

3 Start reprocessing with the calibration options **Create and apply new calibration from standards of reprocessing table.** and **Keep manual integration**.

9.3.11.2.2.5 A blank is to be taken into account

How to proceed?

1 Determine blank.

2 Open blank and samples with the associated standards in reprocessing.

3 Slide the newly recorded blank in the reprocessing table to the correct position.

4 In the method of the marked determination, under **Evaluation ► Integration ► Peak detection**, **activate** the check box **Subtract blank**.

5 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.2.6 No blank is to be taken into account

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. In the method of the marked determination, under **Evaluation ► Integration ► Peak detection**, **disable** the check box **Subtract blank**.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3 Incorrect calibration

9.3.11.2.3.1 A single point in the calibration curve is not correct

How to proceed?

1. Open the incorrectly calibrated determinations in reprocessing.
2. Delete the incorrect point from the calibration curve in one determination. Leave this determination highlighted.
3. Start reprocessing with the calibration option **Apply calibration from selected determination to all determinations.**.

9.3.11.2.3.2 None of the calibration points of a particular standard are correct

How to proceed?

1. Record the standard once more
2. Open the newly recorded standard, the old correct standards and the samples that are to be calibrated with them in reprocessing.
3. Move the newly recorded standard in the reprocessing table to the position at which the incorrect standard used to be located.
4. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.3 One standard has the wrong concentration

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. Change the concentration in the standard table.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.4 The calibration curve should be placed through the origin

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. Change the type of the calibration curve to **Linear through 0**, **Quadratic through 0** or **Cubic through 0**.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.5 One component should be evaluated in terms of height instead of area

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. In **Evaluation ► Calibration ► Calibration curves**, change the measured quantity of the affected component from **Area** to **Height**.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.6 One standard has the wrong sample type

How to proceed?

1. Open samples with the associated standards in reprocessing.
2. Correct the **Sample type** for the affected standard in the sample data.

3 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.7 One standard was not measured correctly

How to proceed?

1 Record the standard once more

2 Open the newly recorded standard, the old correct standards and the samples that are to be calibrated with them in reprocessing.

3 Move the newly recorded standard in the reprocessing table to the position at which the incorrect standard used to be located.

4 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.8 Samples should be calibrated with standards that were recorded according to the samples

How to proceed?

NOTE

Relevant only with the calibration modes **Replace**, **Average** and **Moving average**.

1 Open samples with the standards in reprocessing which are to be used for calibration.

2 Move the standards in the reprocessing table ahead of the samples.

3 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.9 Samples should be calibrated with existing calibration

How to proceed?

1 Open samples in reprocessing with one determination that contains the desired calibration.

2 Mark the determination with the desired calibration.

3 Start reprocessing with the calibration option **Apply calibration from selected determination to all determinations.**.

9.3.11.2.3.10 The concentrations of the sample are outside the calibration range

How to proceed?

1 Define in the method additional standards in the required concentration range.

2 Determine the additional standards.

3 Open samples with the associated standards and with the additionally measured standards in reprocessing.

4 **NOTE**

Relevant only with the calibration modes **Replace**, **Average** and **Moving average**.

Move the additionally measured standards ahead of the samples.

5 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.11 The wrong calibration mode was used

How to proceed?

1 Open samples with the associated standards in reprocessing.

2 Change the calibration mode.

3 Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.3.12 Applying calibration to standards

How to proceed?

1. Open all standards in reprocessing that have contributed to a calibration.
2. Mark the determination with the desired calibration.

> **NOTE**
>
> As a rule, that is the last determination.

3. Start reprocessing with the calibration option **Apply calibration from selected determination to all determinations.**.

9.3.11.2.4 Incorrect recovery rates

9.3.11.2.4.1 One check standard has the wrong sample type

How to proceed?

1. Open check standard with the associated standards in reprocessing.
2. Correct the **Sample type** for the check standard in the sample data.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.5 Incorrect recovery rates (spiking)

9.3.11.2.5.1 Spiking has the wrong sample type

How to proceed?

1. Open sample, spiking and the the associated standards in reprocessing.
2. Correct the **Sample type** for the spiking solution in the sample data.
3. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.11.2.5.2 Spiking was not measured correctly

How to proceed?

1. Record the spiking once again
2. Open in reprocessing the newly recorded spiking solution, the sample and the associated standards.
3. Slide the newly recorded spiking solution in the reprocessing table to the correct position.
4. Start reprocessing with the calibration option **Create and apply new calibration from standards of reprocessing table.**.

9.3.12 Completing determinations

How to proceed?

1. Select the **Database** program part.
2. Open the desired database.

   The selected database opens and its data sets are displayed in the **Determination overview**.
3. Select incomplete determinations.
4. Click on the **Determinations ▶ Complete…** menu item.

   The incomplete determinations will be completed.

9.3.13 Printing a determination report

How to proceed?

1. Select the **Database** program part.
2. Click on the icon or the **File ▶ Open…** menu item.

   The **Open database** dialog window opens.
3. Select desired database or enter name in the **Database name** field.
4. Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

NOTE

A maximum of 4 databases can be opened, but only 2 can be displayed at the same time. Databases that are open at the time the program is exited will be opened automatically the next time the program is started.

5 Select the desired determinations.

6 Click on the **File ▶ Print ▶ Report...** menu item.

The **Report output** dialog window opens.

7 Under **Selection**, select desired determinations for report output.

8 Under **Report type** select the option **Original report** or **Report template**.

9 Under **Output target**, activate the **Printer** and/or **PDF file** check box.

NOTE

If several reports are output simultaneously as a PDF file, then an index will be automatically appended to the file name.

10 In the **Report output** dialog window, click **[OK]**.

The reports of the selected determinations will be output.

9.3.14 Printing a determination overview

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Open...** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

NOTE

A maximum of 4 databases can be opened, but only 2 can be displayed at the same time. Databases that are open at the time the program is exited will be opened automatically the next time the program is started.

5 Select the desired determinations.

6 Click on the **File ► Print ► Determination overview…** menu item.

The **Print determination overview (PDF)** dialog window opens.

7 Under **Selection**, select desired determinations for report output.

8 Under **Orientation**, select the **Portrait format** or **Landscape format** option.

9 Click on **[OK]**.

The determination overview opens as a PDF file.

9.4 Databases

9.4.1 Database in general

The **determination databases** that, in contrast to the **configuration database**, can be generated by the user and contain the determination data, are referred to as databases in **MagIC Net**. Included among such determination data are the method data used for the determination, the measured data generated during the determination and the results calculated from it.

In local server systems (**MagIC Net Professional**), the databases are stored on the drives administered by the computer and are only available to those users registered on that computer who have the appropriate access permission. In client/server systems (**MagIC Net Multi**), the databases are stored on drives administered centrally by the server and are globally available throughout the entire client/server system, i.e., all users with the appropriate access permission can use these databases.

NOTE

Each determination database has to be backed up separately. Afterwards, it is recommended that all backed-up files also be copied to an external directory or to a CD/DVD.

9.4.2 Opening a database

How to proceed?

1. Select the **Database** program part.
2. Click on the icon or the **File ▶ Open…** menu item.

   The **Open database** dialog window opens.
3. Select desired database or enter name in the **Database name** field.
4. Click on **[Open]**.

   The data sets of the selected database are displayed in the **Determination overview**. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

NOTE

A maximum of 4 databases can be opened, but only 2 can be displayed at the same time. Databases that are open at the time the program is exited will be opened automatically the next time the program is started.

9.4.3 Closing a database

How to proceed?

Closing a single database

1. Select the **Database** program part.
2. Click on the icon or the **File ► Close…** menu item.

   The focused database will be closed.

Closing all databases

1. Select the **Database** program part.
2. Click on the **File ► Close all…** menu item.

   All opened databases will be closed.

9.4.4 Creating a database

How to proceed?

1. Select the **Database** program part.
2. Click on the icon or the **File ► Database manager…** menu item.

   The **Database manager** dialog window opens.
3. Click on the **Edit ► New…** menu item.

   The **New database** dialog window opens.
4. Enter a name for the new database.

5 Click on **[OK]**.

The **Properties - Database - 'Database name'** dialog opens for editing the database properties.

NOTE

The database name must be unique in the entire client/server system.

6 On the **General** tab, enter a comment on the database in the **Comment** field.

7 On the **Access rights** tab, define access rights for reading and editing the new database for the different user groups.

8 On the **Backup** tab, define backup monitoring and automatic backup for the newly created database.

9 On the **Monitoring** tab, define the monitoring of the size and number of data sets.

9.4.5 Backing up a database

How to proceed?

Backing up a database manually

1 Select the **Database** program part.

2 Click on the icon or **File ► Database manager…** menu item.

The **Database manager** window opens.

3 Click on **[Backup]**.

The **Backup database** window opens.

4 Select the directory for the backup in the **Backup directory** field.

5 Select or enter the name for the **Backup file**. If an existing backup file is selected, it will be overwritten.

NOTE

If the backup directory is on a network drive, the backup date should be added to the **Backup name** because the backup date information is not available when the data is restored.

6 Click on **[Start]**.

The manual backup is started and the database is backed up to the selected directory.

Backing up a database automatically

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Database manager…** menu item.

The **Database manager** dialog window opens.

3 Select the desired database.

4 Click on **[Properties]**.

The **Properties - Database** dialog window opens for editing the database properties.

5 On the **General** tab, enter a comment on the database in the **Comment** field.

6 On the **Backup** tab, enable the **Backup monitoring** check box.

7 Enter an **Interval** for backup monitoring or a date for the **Next backup**.

8 Activate the **Start backup automatically** check box.

9 Select the directory for the backup in the **Backup directory** field.

10 Click on **[OK]**.

11 The **Properties - Database** dialog window closes.

The database is automatically saved in the selected directory at the desired moment.

9.4.6 Restoring a database

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Database manager…** menu item.

The **Database manager** dialog window opens.

3 Click on **[Restore]** in the **Database manager** dialog window.

The **Restore databases** dialog window opens.

4 Select the directory in the **Backup directory** in which the desired database was backed up.

5 Select or enter the name for the desired **Backup file**.

6 Enter the name under **Save As** under which the database is to be restored.

7 Click on **[Start]**.

The database restoring is started.

NOTE

Existing databases cannot be overwritten, i.e., they must first be deleted so that the database can be restored under its old name.

9.4.7 Deleting a database

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Database manager…** menu item.

The **Database manager** dialog window opens.

3 Select the desired database.

4 Click on the **Edit ► Delete...** menu item.

The selected database is deleted.

NOTE

Databases that are open cannot be deleted.

9.5 Configuration data

9.5.1 Configuration data in general

The configuration data is saved in **MagIC Net** in the **Configuration database**. Configuration data includes all method settings that apply to all settings, i.e. settings for devices, columns, eluents, solutions, EPC solutions, accessories, common variables and rack data, as well as **Methods**, **Security settings** *(see chapter 6.2.2.1, page 546)*, **User administration** *(see chapter 6.2.1.1, page 537)*, **Program administration** *(see chapter 6.2.3.1, page 556)*, templates and **Audit Trail** *(see chapter 6.4, page 578)*.

In local server systems (**MagIC Net Professional**), the configuration database is located in the program directory of the computer on which the program has been installed. In client/server systems (**MagIC Net Multi**), the configuration database is stored centrally on the server and contains all the configuration data of all computers (clients) that are connected to this server.

9.5.2 Exporting configuration data

How to proceed?

1 Select the **Configuration** program part.

2 Click on the **File ► Export...** menu item.

The **Export configuration data** dialog opens.

3 Select the desired configuration data.

4 Click on **[OK]**.

The **Export configuration data** dialog window closes and the **Save** dialog window opens.

5 Select or enter a name and directory for the export file. If an existing export file is selected, it will be overwritten.

6 Click on **[Save]**.

The export of the configuration data is started.

The selected configuration data is then saved in a file with the extension **.mcfg**.

9.5.3 Importing configuration data

How to proceed?

1 Select the **Configuration** program part.

2 Click on the **Import ► file...** menu item.

The **Open** dialog window opens.

3 Select or enter a new name and directory for the ***.mcfg** import file.

4 Click on **[Open]**.

The **Import configuration data** dialog window opens.

5 Select the desired configuration data.

NOTE

Data that is not present in the export file cannot be selected.

6 Click on **[OK]**.

The import is started and the selected configuration data is imported.

7 If the configuration data contains security settings or user administration, then check the settings. Otherwise there is a risk of being excluded from the application.

8 Restart the computer. Restart all clients in a client/server system.

9.5.4 Backing up configuration data

How to proceed?

NOTE

It is strongly recommended that the configuration database be backed up periodically.

Backing up configuration data manually

1 Select the **Configuration** program part.

2 Click on the **File ► Backup ► Manually** menu item.

The **Backup configuration data manually** dialog window opens.

3 Select the directory for the backup in the **Backup directory** field.

4 Select or enter the name for the **Backup file**. If an existing backup file is selected, it will be overwritten.

NOTE

If the backup directory is on a network drive, the backup date should be added to the **Backup name** because the backup date information is not available when the data is restored.

5 Click on **[Start]**.

The manual backup is started and the configuration database is backed up to the selected directory.

Backing up configuration data automatically

1 Select the **Configuration** program part.

2 Click on the **File ► Backup ► Automatically** menu item.

The **Backup configuration data automatically** dialog window opens.

3 Enable the **Automatic backup** check box.

4 Enter an **Interval** for backup monitoring or a date for the **Next backup**.

5 Select a directory for the backup in the **Backup directory** field.

6 Click on **[OK]**.

The **Backup configuration data automatically** dialog window closes.

The configuration database is automatically saved in the selected directory at the desired moment.

9.5.5 Restoring configuration data

How to proceed?

MagIC Net Professional

1 Exit **MagIC Net**.

2 Start the **ConfigRestore.exe** file in the program directory **... \MagIC Net\bin**.

The dialog window **Restore configuration data** opens *(see chapter 6.3.2.3, page 568)*.

3 Select the directory in the **Backup directory** field in which the configuration database was backed up.

4 Select or enter the name for the desired **Backup file**.

5 Click on **[Start]**.

The restoring of the configuration database is started.

MagIC Net Multi

1 Make sure that **MagIC Net** is closed on all clients connected to the server and on the server itself.

2 Start the **ConfigRestore.exe** file in the **...\MagIC Net\bin** program directory on the server.

The **Restore configuration data** dialog window opens.

3 Select the directory in the **Backup directory** field in which the configuration database was backed up.

4 Select or enter the name for the desired **Backup file**.

5 Click on **[Start]**.

The restoring of the configuration database is started.

9.6 Methods

9.6.1 Opening a method

How to proceed?

1 Select the **Method** program part.

2 Click on the icon or the **File ▶ Open...** menu item.

The **Open method** dialog window opens.

3 In the list box **Method group** select the desired method group.

4 Select the desired method from the table or enter a name in the field **Method name**.

5 Click on **[Open]**.

The selected method is opened in the main window in the place of a method that is already opened. The method name is displayed in the title bar of the program; the number of currently opened methods is displayed in the left upper corner of the method symbol.

NOTE

A maximum of 9 methods can be opened, but only 2 can be displayed at the same time.

9.6.2 Closing a method

How to proceed?

Closing a single method

1 Select the **Method** program part.

2 Click on the icon or the **File ▶ Close** menu item.

The focused method will be closed. If the method has been modified, a prompt for confirmation to save the method as a new version will appear.

Closing all methods

1 Select the **Method** program part.

2 Click on menu item **File ▶ Close all…**.

All opened methods will be closed. A prompt for confirmation to save the method as a new version will appear for each method that has been modified.

9.6.3 Creating a method

How to proceed?

1 Select the **Method** program part.

2 Click on the icon or the menu item **File ▶ New…**.

The **New method** dialog window opens.

3 Select **Empty method** or a fixed **Method template**.

4 Click on **[OK]**.

The selected method template is opened for editing.

9.6.4 Saving a method

How to proceed?

Saving a method under the same name

1 Click on the icon or the menu item **File ► Save**.

The existing, focused method is newly saved under its name. A new **Method version** with a new method identification is created.

If the check box **Comment on modification of methods** is activated in the **Security settings**, the window **Modification comment method** is displayed before the method is saved.

Saving a method under a new name

1 Click on the menu item **File ► Save As...**.

The dialog window **Save method** opens.

2 In the list box **Method group** select the desired method group.

3 Select the desired method from the table or enter a name in the field **Method name**.

4 Click on **[Save]**.

The focused method is saved under the desired method name in the selected method group as method version **1**.

If the check box **Comment on modification of methods** is activated in the **Security settings**, the window **Modification comment method** is displayed before the method is saved.

9.6.5 Deleting a method

How to proceed?

1 Select the **Method** program part.

2 Click on the icon or the **File ► Method manager...** menu item.

The **Method manager** dialog window opens.

3 In the list box **Method group** select the desired method group.

4 Select the desired method from the table or enter a name in the field **Method name**.

5 Click on the menu item **Edit ► Delete…**.

The selected methods with all their **Method versions** are deleted.

If the check box **Comment on modification of methods** is activated in the **Security settings***(see chapter 6.2.2.4, page 552)*, the window **Modification comment method** is displayed before the method is saved. In this window, a reason and a comment on deleting can be entered, which is logged in the **Audit Trail**.

NOTE

Locked methods cannot be deleted.

9.6.6 Exporting a method

How to proceed?

1 Select the **Method** program part.

2 Click on the icon or the **File ► Method manager…** menu item.

The **Method manager** dialog window opens.

3 In the list box **Method group** select the desired method group.

4 Select the desired method from the table or enter a name in the field **Method name**.

5 Click on the **File ► Export…** menu item.

The **Select directory for export** dialog window opens.

6 Select the directory for the export files.

7 Click on **[OK]**.

The selected methods are each exported as files named **'Method name'.mmet**.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

8 Select the desired directory for the export files and click on **[OK]**.

The selected methods are each exported as files named **'Method name'.imet**.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

9.6.7 Importing a method

How to proceed?

1 Select the **Method** program part.

2 Click on the icon or the **File ► Method manager…** menu item.

The **Method manager** dialog window opens.

3 In the list box **Method group** select the desired method group.

4 Click on the menu item **Edit ► Import…**.

The dialog window **Select files to import** opens.

5 Select desired import files named as **'Method name'.imet** in the desired directory and click on **[OK]**.

The selected methods are imported into the currently opened method group.

6 Select desired import files named as **'Method name'.mmet** in the desired directory.

7 Click on **[OK]**.

The selected methods are imported into the currently opened method group.

9.6.8 Signing a method

How to proceed?

Selecting the method

1 Select the **Method** program part.

2 Click on the icon or the **File ► Method manager…** menu item.

The window **Method manager** opens.

3 Select the desired **Method group**.

4 Select the desired method.

Signature 1

NOTE

Methods can only be signed at level 1 if the user belongs to a user group with the corresponding permission *(see chapter 6.2.1.2.3, page 540)*.

1 Click on the menu item **Sign ► Signature 1…**.

The dialog window **Signature Level 1** opens. If the selected method can be signed, **Signature possible** is displayed in the field **Info**.

2 Enter or select **User**, **Password**, **Reason** and **Comment**.

3 Click on **[Sign]**.

The selected method will be signed at level 1.

NOTE

Methods can be signed more than once at level 1 and can also be edited and deleted. If the edited method is saved as a new method version, all the signatures will be automatically deleted, i.e. the method must be signed again.

Signature 2

NOTE

Methods can only be signed at level 2 if the user belongs to a user group with the corresponding permission *(see chapter 6.2.1.2.3, page 540)*.

1 Click on the menu item **Sign ► Signature 2…**.

The dialog window **Signature Level 2** opens. If the selected method can be signed, **Signature possible** is displayed in the field **Info**.

2 Enter or select **User**, **Password**, **Reason** and **Comment**.

3 Click on **[Sign]**.

The selected method will be signed at level 2.

NOTE

Methods signed at level 2 are **locked**, i.e. they can neither be edited nor deleted. In order to be able to edit such methods again, the signatures at level 2 must first be deleted *(see chapter 2.3.5, page 29)*.

NOTE

If a user enters an incorrect password 3 times, the user will be set to inactive. A user with the status disabled can no longer start the program.

9.6.9 Making a method version current

How to proceed?

1. Select the **Method** program part.
2. Click on the icon or the **File ▶ Method manager…** menu item.

   The **Method manager** dialog window opens.
3. In the list box **Method group** select the desired method group.
4. Select the desired method.
5. Click on **[History]**.

   The dialog window **Method history** showing a table with all **versions** of the selected method is opened.
6. Select the desired method that is to be made the current method version again.
7. Click on Make **[current]**.

   The selected method version is set once again as the current method version. At the same time, the method is saved with a version number that is increased by **+1** compared with the last method version to have been saved.

9.6.10 Printing a method report

How to proceed?

1. Select the **Method** program part.
2. Click on the icon or the **File ▶ Open…** menu item.

   The **Open method** dialog window opens.
3. In the list box **Method group** select the desired method group.
4. Select desired method or enter name in the **Method name** field.
5. Click on **[Open]**.

   The selected method is opened in the main window in the place of a method that is already opened. The method name is displayed in the

title bar of the program; the number of currently opened methods is displayed in the left upper corner of the method symbol.

6 Click on menu item **File ► Print (PDF)…**.

The dialog window **Print method reports (PDF)** *(see chapter 5.2.12, page 381)* opens.

7 Click on the menu item **File ► Print (PDF)…**.

The dialog window **Print method reports (PDF)** opens.

8 Select desired report and orientation and click on **[OK]**.

The desired report is opened as a PDF file.

9.6.11 Backing up methods

How to proceed?

General

Methods are stored in the configuration database and are globally accessible for all clients. This means that in order to back up methods the configuration data must be backed up manually or automatically. Another possible way is to export the methods and then to store these files outside of **MagIC Net**.

Backing up configuration data manually

1 Select the **Configuration** program part.

2 Click on the **File ► Backup ► Manually** menu item.

The **Backup configuration data manually** dialog window opens.

3 Select a directory for the backup in the **Backup directory** field.

4 Select or enter the name for the **Backup file**. If an existing backup file is selected, it will be overwritten.

NOTE

If the backup directory is on a network drive, the backup date should be added to the **Backup name** because the backup date information is not available when the data is restored.

5 Click on **[Start]**.

6 The manual backup of the configuration database is started.

Backing up configuration data automatically

1 Select the **Configuration** program part.

2 Click on the **File ► Backup ► Automatically** menu item.

The **Backup configuration data automatically** dialog window opens.

3 Activate the **Automatic backup** check box.

4 Enter an interval for backup monitoring in the field **Interval** or a date for the next backup in the field **Next backup**.

5 Select a directory for the backup in the **Backup directory** field.

6 Click on **[OK]**.

The **Backup configuration data automatically** dialog window closes.

Exporting methods

1 Select the **Method** program part.

2 Click on the icon or the **File ► Method manager…** menu item.

The **Method manager** dialog window opens.

3 Select the desired **Method group**.

4 Select the desired methods.

5 Click on the **File ► Export…** menu item.

The **Select directory for export** dialog window opens.

6 Select the directory for the export files.

7 Click on **[OK]**.

The selected methods are each exported as files named **'Method name'.mmet**.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

8 Select the desired directory for the export files and click on **[OK]**.

The selected methods are each exported as files named **'Method name'.imet**.

NOTE

The exported methods are stored uncoded but with a checksum. If a file stored in this manner is tampered with, then it cannot be imported again.

9.7 Method groups

9.7.1 Creating a method group

How to proceed?

1 Select the **Method** program part.

2 Click on the icon or the **File ► Method groups...** menu item.

The **Method groups** dialog window is opened.

3 Click on **[New]**.

The **Properties - Method group - New Group** dialog window opens.

4 On the **General** tab, enter a new name for the method group in the **Name** field and a comment in the **Comment** field.

5 On the **Access permissions** tab, assign access permissions for method groups and their methods per **User group**.

NOTE

The **Administrators** user group always has both access rights, i.e. these rights cannot be disabled.

6 Click on **[OK]**.

The **Properties - Method group - New Group** dialog window is closed.

9.7.2 Deleting a method group

How to proceed?

1 Select the **Method** program part.

2 Click on the icon or the **File ▶ Method groups...** menu item.

The **Method groups** dialog window is opened.

3 Select the desired method group.

4 Click on **[Delete]**.

The selected method group is deleted.

5 Confirm deleting with **[OK]**.

9.8 Sample tables

9.8.1 Creating a sample table

How to proceed?

1 Select **Workplace** program part.

2 Click on the icon or the **Tools ▶ Sample table ▶ New...** menu item.

The **Sample table 'New sample table'** dialog window is opened with an empty sample table.

3 Click on the **Sample table ▶ Properties...** menu item.

The **Properties - Sample table 'New sample table'** dialog window opens.

4 Edit the properties of the new sample table.

5 Click on **[OK]**.

The **Properties - Sample table 'New sample table'** dialog window closes.

6 Click on the **Edit ► Edit line** menu item in the **Sample table 'New sample table'** dialog window.

The **Edit line - Sample table 'New sample table'** dialog window opens.

7 Select the desired method in the **Method** selection list and enter the sample data.

8 Click on **[Apply]**.

The sample data entered is applied to the respective line in the sample table.

9 Repeat step **6** for each required determination.

10 Click on **[Close]**.

The **Edit line - Sample table 'New sample table'** dialog window closes.

11 Click on the **Sample table ► Save as…** menu item in the **Sample table 'New sample table'** dialog window.

The **Save sample table** dialog window opens.

12 Enter the desired name in the **Name** field.

13 Click on **[Save]**.

The sample table is saved under the name that has been entered.

9.8.2 Editing a sample table

How to proceed?

1 Select **Workplace** program part.

2 Click on the icon or the **Tools ► Sample table ► Open…** menu item.

The **Open sample table** dialog window opens.

3 Select the desired sample table.

4 Click on **[Open]**.

The dialog window with the selected sample table opens.

5 Click on the **Sample table ► Properties…** menu item in the **Sample table** dialog window.

The **Properties - Sample table** dialog window opens.

6 Define the properties for the sample table.

7 Click on **[OK]**.

8 Select the line to be modified in the **Sample table** dialog window.

9 Click on the **Edit ► Edit line** menu item in the **Sample table** dialog window.

The **Edit line** dialog window opens.

10 Select the **Method** from the desired method group, enter **Sample data** and click on **[Apply]**.

The sample data entered is applied to the respective line in the sample table.

11 Repeat step **8** for each required determination.

12 Close the **Edit line** dialog window with **[Close]**.

13 Click on the **Sample table ► Save as…** menu item in the **Sample table** dialog window.

The **Save sample table** dialog window opens.

14 Enter a new name for the sample table or overwrite the existing name in the **Name** field.

15 Click on **[Save]**.

The edited sample table is saved.

9.8.3 Loading a working sample table

How to proceed?

1 Select **Workplace** program part.

2 In the **Run** subwindow, click on the **Determination series** tab.

3 Click on the **Sample table ► Load…** menu item.

The **Load sample table** dialog window opens.

4 Select the desired sample table.

5 Click on **[Load]**.

The data of the selected sample table is loaded into the working sample table.

9.8.4 Editing a working sample table

How to proceed?

1 Select **Workplace** program part.

2 In the **Run** subwindow, click on the **Determination series** tab.

3 If desired, load the existing sample table into the working sample table.

4 If desired, click on the **Sample table ► Properties…** menu item in the **Run** subwindow.

The **Properties - Determination series** dialog window opens.

5 Define the properties for the determination series.

6 Click on **[OK]**.

The **Properties - Determination series** dialog window closes.

7 Select the line to be modified in the **Run** subwindow.

8 Click on the **Edit ▶ Edit line** menu item.

The **Edit line** dialog opens.

9 Select the desired method in the **Method** selection list and enter the sample data.

10 Click on **[Apply]**.

The sample data entered is applied to the respective line in the working sample table.

11 Repeat step **8** for each required determination.

12 Click on **[Close]**.

The **Edit line** dialog window closes.

13 If desired, click on the **Sample table ▶ Save as…** menu item in the **Run** subwindow.

The **Save sample table** dialog window opens.

14 Enter a name in the **Name** field.

15 Click on **[Save]**.

The working sample table is saved as sample table under the name that has been entered.

9.9 Reports

9.9.1 Creating a report template

How to proceed?

1 Select the **Database** program part.

2

NOTE

A database must be open in order to carry out the subsequent steps.

Click on the **Tools ▶ Report templates ▶ New ▶ Form report** menu item.

The **Report template** program window opens with an empty report template.

3 Click on the **File ► Page setup…** menu item in the **Report template** program window.

The **Page setup** dialog window opens.

4 Define the desired settings for the report format.

5 Click on **[OK]**.

The **Page setup** dialog window closes.

6 In the **Report template** program window, click on the **Tools ► Options...** menu item.

The **Options for report templates** dialog window opens.

7 Define the desired settings for the report template.

8 Close the dialog window with **[OK]**.

9 Select the desired module icon on the module bar and place it on the report template by creating a field with the left mouse button.

The properties window for the corresponding module opens automatically.

10 Enter the desired properties for the module.

11 Click on **[OK]**.

The properties window closes.

12 Repeat steps **7** and **8** for each desired module.

13 Click on the icon or the **File ► Save as…** menu item.

The **Save report template** dialog window opens.

14 Enter a name in the **Name** field.

15 Click on **[Save]**.

The report template is saved under the name entered.

9.9.2 Editing a report template

How to proceed?

1. Select the **Database** program part.
2. Click on the icon or on the **Tools ► Report templates ► Open…** menu item.

   The **Open report template** program window opens.
3. Select the desired report template.
4. Click on **[Open]**.

   The program window with the selected report template opens.
5. Click on the **File ► Page setup…** menu item.

   The **Page setup** dialog window opens.
6. Define the desired settings for the report format.
7. Close the dialog with **[OK]**.
8. In the **Report template** program window, click on the **Tools ► Options…** menu item.

   The **Options for report templates** dialog window opens.
9. Define the desired settings for the report template.
10. Close the window with **[OK]**.

Editing existing modules

1. Select the icon on the module bar and double-click on the desired module in the report template.

   The properties window of the selected module opens automatically.
2. Enter the desired properties for the module.
3. Close the properties window with **[OK]**.

4 Repeat steps **1** and **2** for each desired module.

Creating new modules

1 Select the desired module icon on the module bar and place it on the report template by creating a field with the left mouse button.

The properties window for the corresponding module opens automatically.

2 Define the desired properties for the module.

3 Close the properties window with **[OK]**.

4 Repeat steps **1** and **2** for each desired new module.

5 Click on the icon or the menu item **File ► Save**.

The report template is saved.

9.9.3 Printing a determination report

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ► Open…** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

NOTE

A maximum of 4 databases can be opened, but only 2 can be displayed at the same time. Databases that are open at the time the program is exited will be opened automatically the next time the program is started.

5 Select the desired determinations.

6 Click on the **File ▶ Print ▶ Report...** menu item.

The **Report output** dialog window opens.

7 Under **Selection**, select desired determinations for report output.

8 Under **Report type** select the option **Original report** or **Report template**.

9 Under **Output target**, activate the **Printer** and/or **PDF file** check box.

NOTE

If several reports are output simultaneously as a PDF file, then an index will be automatically appended to the file name.

10 In the **Report output** dialog window, click **[OK]**.

The reports of the selected determinations will be output.

9.9.4 Printing a determination overview

How to proceed?

1 Select the **Database** program part.

2 Click on the icon or the **File ▶ Open...** menu item.

The **Open database** dialog window opens.

3 Select desired database or enter name in the **Database name** field.

4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

NOTE

A maximum of 4 databases can be opened, but only 2 can be displayed at the same time. Databases that are open at the time the program is exited will be opened automatically the next time the program is started.

5 Select the desired determinations.

6 Click on the **File ▶ Print ▶ Determination overview…** menu item.

The **Print determination overview (PDF)** dialog window opens.

7 Under **Selection**, select desired determinations for report output.

8 Under **Orientation**, select the **Portrait format** or **Landscape format** option.

9 Click on **[OK]**.

The determination overview opens as a PDF file.

9.10 Devices

9.10.1 Adjusting the Autosampler

How to proceed?

It is required that you always adjust position 1 and the sample port together.

Adjustment of the dosing syringe for position 1

For the adjustment, the rack for liquids and a syringe must be mounted. The Combustion Module may have to be initialized.

To adjust position **1** on the rack for liquids, do the following:

1 Place a sample vessel at position **1** of the rack.

2 Select the **Configuration** program part.

3 In the **Devices** subwindow, select the Combustion Module with the rack for liquids attached and double-click.

The **Properties - Combustion Module - 'Name'** dialog opens.

4 On the **Autosampler** tab click **[Adjust]** and confirm the message with **[Yes]**.

The **Adjustment** dialog opens.

5 Enter values for the x and y coordinates of position **1**.

NOTE

The value for the z coordinate is only entered if the dosing syringe is positioned in the x and y direction. In the event of a faulty x-y position, the needle can become damaged.

6 Click on **[Move to position]**.

The auto sampler control arm moves to the specified position. Repeat steps 5 and 6 until the injection cannula is exactly at the center of the sample vessel.

7 Click on **[Apply]**.

The x and y coordinates are saved in the auto sampler.

8 Incrementally enter the value for the z coordinate of position 1 to carefully lower the needle.

9 As soon as the injection cannula is just above the floor of the sample vessel, click **[Apply]**.

The z coordinate is saved in the auto sampler.

The dosing syringe is adjusted for position **1**.

Adjustment of the dosing syringe for position Sample port

To adjust the position **Sample port** on the Auto Boat Driver, do the following:

1. Select the **Configuration** program part.

2. In the **Devices** subwindow, select the Combustion Module with the rack for liquids attached and double-click.

   The **Properties - Combustion Module - 'Name'** dialog opens.

3. On the **Autosampler** tab click **[Adjust]** and confirm the message with **[Yes]**.

   The **Adjustment** dialog opens.

4. Enter values for the x and y coordinates of the sample port.

   NOTE

   The value for the z coordinate is only entered if the dosing syringe is positioned in the x and y direction. In the event of a faulty x-y position, the needle can become damaged.

5. Click **[Move to position]**.

   The auto sampler control arm moves to the specified position. Repeat steps 5 and 6 until the dosing syringe is exactly at the center of the injection port septum of the lock.

6. Click on **[Apply]**.

   The x and y coordinates are saved in the auto sampler.

7. Incrementally enter the value for the z coordinate of the sample port to carefully lower the needle.

8. As soon as the injection cannula is just above the floor of the quartz boat, click **[Apply]**.

   The z coordinate is saved in the auto sampler.

   The dosing syringe is adjusted for position **Sample port**.

NOTE

Clicking on **[Apply]** always saves all coordinates in the auto sampler, in other words from position 1 and Sample port.

Adjusting the piston height

An adjustment to the piston height is required if a gap can be seen between the piston and the syringe body or if the piston hits the syringe body hard and audibly. Adjust the pistons as follows:

1. Select the **Configuration** program part.
2. In the **Devices** subwindow, select the Combustion Module with the rack for liquids attached and double-click.

   The **Properties - Combustion Module - 'Name'** dialog opens.
3. On the **Autosampler** tab click **[Align]** and confirm the message with **[Yes]**.

   The **Adjustment** dialog opens.
4. In the **Adjust piston height** field, enter values in small increments to those that the current distance of the piston from the syringe body are to be changed to.
5. Click ▲ or ▼.

   The piston height is corrected up or down by the value entered.

Adjusting the gripper for position 1

For the adjustment, the rack for solids and the gripper must be mounted. The Combustion Module may have to be initialized.

To adjust position **1** on the rack for solids, do the following:

1. Set a quartz boat on position **1** of the rack for solids.
2. Select the **Configuration** program part.

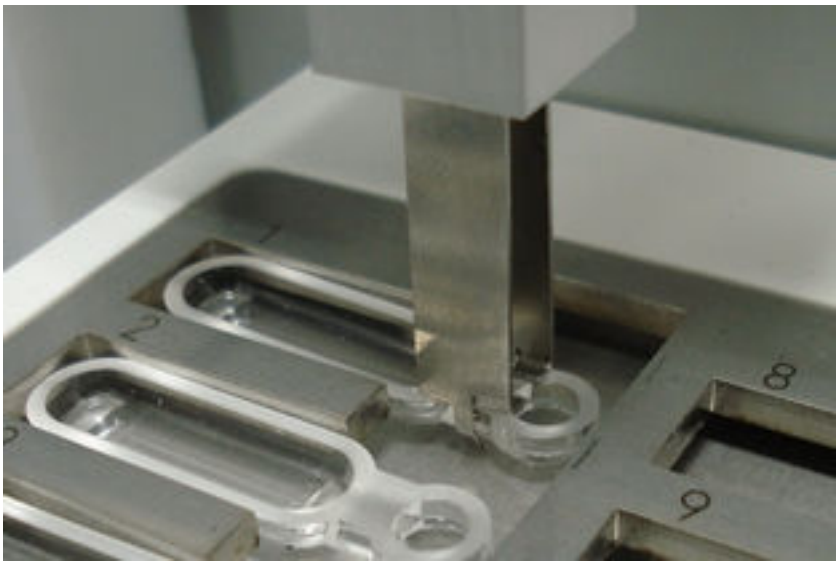
3 In the **Devices** subwindow, select the Combustion Module with the rack for solids attached and double-click.

The **Properties - Combustion Module - 'Name'** dialog opens.

4 On the **Autosampler** tab click **[Adjust]** and confirm the message with **[Yes]**.

The **Adjustment** dialog opens.

5 For position **1** change the preset values of the x and y direction in small increments until the gripper is exactly in the center of the base of the quartz boat.



6 Change the preset value of the z direction in small increments until the gripper plate is at the rack height.

7 Click on **[Apply]**.

The z coordinate is saved in the auto sampler.

The gripper is adjusted for position **1**.

Adjusting the gripper for position Sample port

To adjust the position **Sample port** on the Auto Boat Driver, do the following:

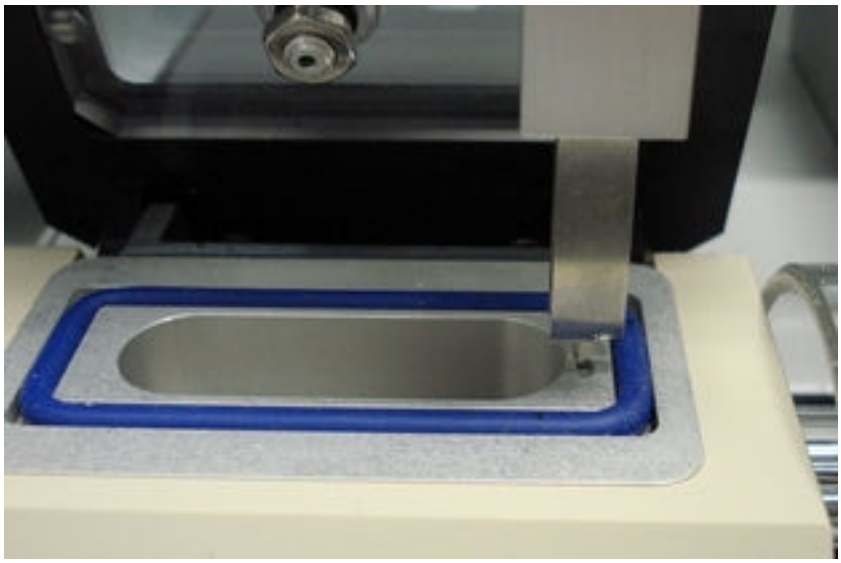
1 Select the **Configuration** program part.

2 In the **Devices** subwindow, select the Combustion Module with the rack for solids attached and double-click.

The **Properties - Combustion Module - 'Name'** dialog opens.

3 Change the preset values of the x and y direction for the sample port in small increments until the gripper is exactly in the center of the adjustment mark.

4 Change the preset value of the z direction in small increments until the gripper is submerged approx. 1 mm in the adjustment mark. The gripper may not rest on the mark.



5 Click on **[Apply]**.

The z coordinate is saved in the auto sampler.

The gripper is adjusted for position **Sample port**.

Adjustment of the gripper width

Adjust the gripper width as follows:

1 Select the **Configuration** program part.

2 In the **Devices** subwindow, select the Combustion Module with the rack for solids attached and double-click.

The **Properties - Combustion Module - 'Name'** dialog opens.

3 On the **Autosampler** tab click **[Align]** and confirm the message with **[Yes]**.

The **Adjustment** dialog opens.

4 In the **Adjust gripper width** field enter a value by which the gripper should be more or less closed.

5 Click ◂▸ or ▸◂.

The gripper arms are moved together or apart by the value entered.

9.10.2 Eluent production

How to proceed?

Conditions for eluent production:

1. If the mode **empty** and the mode **full** are used together in a method, then **full** before **empty** applies. This means that the tab with **full** comes before a tab with **empty**.
2. In the mode **empty**, the **Eluent volume** and a **Waiting time** must be entered.
3. For determinations with suppression, level sensors with short rods are used (corresponds to mode **full**).
4. For determinations without suppression, level sensors with long rods are used (corresponds to mode **empty**).
5. Level sensor monitoring is only possible for the selection **Dosing device** = **not defined**.

A 941 Eluent Production Module with connected Dosinos and intelligent dosing units is required for eluent production.

Creating a method

NOTE

Level sensors for fill level monitoring **before** eluent production in the **full** mode **before** eluent production in the **empty** mode.

(see chapter 7.7.3.1.1, page 864)

1 Select the **Method** program part.

2 Click on the icon or the menu item **File ► New…**.

The **New method** dialog window opens.

3 Select **Empty method** or a fixed **Method template**.

4 Click on **[OK]**.

The selected method template is opened for editing.

5 In the **Devices** subwindow, click on the menu **Edit ► Add ► Device**.

6 In the **Add device** dialog, select the **From device table** option.

7 Select the 941 Eluent Production Module in the **Name** field and click on **[OK]**.

8 Confirm the message **035-570 MSB device detected** with **[Yes]**.

9 Enter a name for the Dosino.

10 Under **Use**, select the **Eluent Dosino** entry.

11 Repeat steps **8** to **10** for the second Dosino.

Editing Level sensor 1 tab

Example for eluent production for determinations **with** suppression on level sensor 1. Proceed as follows to define the start parameters:

1 Click on the image of the 941 Eluent Production Module.

2 Select the **Level sensor 1** tab.

3 Select **Mode full** in the selection list.

4 Select the name of the eluent dosing device in the **Dosing device** selection list.

5 Select the first line of the **Component concentrations** table.

6 Open the **Component concentrations** dialog window with a double-click or via the **Edit ► New** menu.

7 Enter the name of the component in the concentrate in the **Component name** field.

8 Enter the concentration of the component in the concentrate in the **Component concentrations** field and select the concentration unit.

9 Enter the concentration of the component in the eluent in the **Target concentration** field.

The concentration unit for the Target concentration is adopted from the component concentration.

10 Confirm with **[OK]**.

11 Select additional lines in the **Component concentrations** table.

12 Repeat steps **4** to **6** each time.

13 Confirm with **[OK]**.

The target concentrations of the additional components are automatically entered in the table. They have the same dilution as the one of the first component.

Editing Level sensor 2 tab

Example for eluent production for determinations **without** suppression on level sensor 2. Proceed as follows to define the start parameters:

1 Click on the image of the 941 Eluent Production Module.

2 Select the **Level sensor 2** tab.

3 Select **Mode empty** in the selection list.

4 Select the name of the eluent dosing device in the **Dosing device** selection list.

5 Enter the volume for the eluent in the **Eluent volume** field.

6 In the **Delay time** field, enter a time during which the produced eluent can mix by way of diffusion.

7 Select the first line of the **Component concentrations** table.

8 Open the **Component concentrations** dialog window with a double-click or via the **Edit ▶ New** menu.

9 Enter the name of the component in the concentrate in the **Component name** field.

10 Enter the concentration of the component in the concentrate in the **Component concentrations** field and select the concentration unit.

11 Enter the concentration of the component in the eluent in the **Target concentration** field.

The concentration unit for the Target concentration is adopted from the component concentration.

12 Confirm with **[OK]**.

13 Select additional lines in the **Component concentrations** table.

14 Repeat steps **4** to **6** each time.

15 Confirm with **[OK]**.

The target concentrations of the additional components are automatically entered in the table. They have the same dilution as the one of the first component.

Monitoring in the mode full

Monitoring in **full** mode is enabled for level sensors that are installed in a waste canister, for example.

1 Click on the figure of the 941 Eluent Production Module.

2 Select the **Level sensor 3** tab.

3 Select **Mode full** in the selection list.

4 Select **Dosing device not defined** in the selection list.

5 Click on the **Settings** button.

The **Monitoring - 'Name level sensor'** dialog window is opened.

6 Define the parameters for the **Monitoring**.

Monitoring in the mode empty

Monitoring in **empty** mode is enabled for level sensors that are installed in a supply vessel (e.g. with water for dilution).

1 Click on the figure of the 941 Eluent Production Module.

2 Select the **Level sensor 4** tab.

3 Select **Mode empty** in the selection list.

4 Select **Dosing device not defined** in the selection list.

5 Click on the **Settings** button.

The **Monitoring - 'Name level sensor'** dialog window is opened.

6 Define the parameters for the **Monitoring**.

9.11 No help available

NOTE

There is unfortunately no help available for this topic.

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