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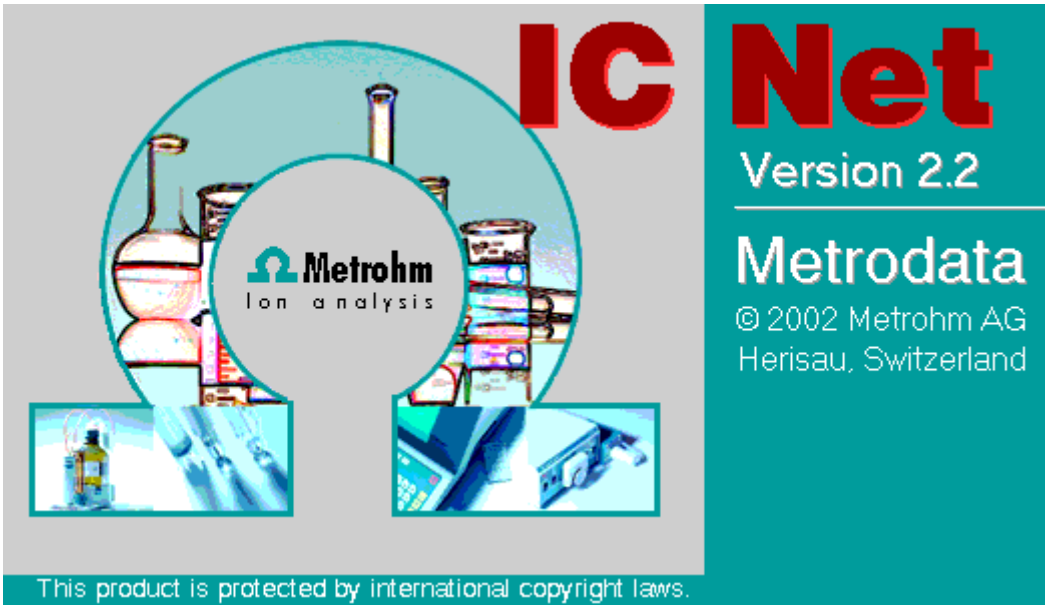
Metrodata IC Net 2.2



8.110.8263 Software Manual

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1 Introduction

1.1 Purpose of program

«IC Net 2.2» is the name of the data acquisition and control software for PC-controlled ion chromatographic systems consisting of Metrohm and Bischoff instruments. The current version is a true **32-bit application**. It was designed specially to operate under Windows 2000 and Windows XP and uses all its benefits.

The **«IC Net 2.2»** program can be used to create systems for recording and evaluating chromatograms. Time programs can also be created in which a large number of instrument functions can be triggered for each program step. It is also possible to use programmable signals to control external instruments.

The operating software meets all the requirements you could place today on a modern integration software: single or multipoint calibration, internal or external standard, selectable algorithms for non-linear calibration, various integration modes with integration parameters and integration events, different methods for peak recognition, peak editor, free scaling, superimposing several chromatograms, use of sample tables and batch reprocessing; a powerful and GLP-conform report generator with output interfaces for monitor, printer and external databases.

The **«IC Net 2.2»** software can be configured and used in order to comply with the Electronic Records and Signatures Rule, known as **21 CFR Part 11**, established by the U.S. Food and Drug Administration (**FDA**). For this purpose, the program contains password protection, user administration, electronic signatures, audit trail and administration of methods and results in databases. To use the 21 CFR Part 11 features of **«IC Net 2.2»** the operating system **Windows 2000** or **Windows XP** with **NTFS** file system is required.

1.2 Information about the software manual

This **8.110.8263 Software Manual** provides a comprehensive overview of the operation of the «IC Net» program. The manual is organized as follows:

Section 1 **Introduction**
Installation

Section 2 **Fundamentals of the operation**
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Section 3 **Software settings**
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Installation, control and parameter settings of devices

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Section 8 **Chromatograms**
Chromatogram appearance, peak editor

Section 9 **Sample queue**
Sample queue control and editor

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Reprocessing of chromatograms

Section 11 **Appendix**
Software license, declaration of conformity, ordering designations, index

To find the required information, you will find it an advantage to use either the **Table of contents** or the **Index** at the back.

This Software Manual describes only the installation and operation of **Metrohm instruments**. For details concerning the Bischoff instruments, please refer to the on-line help in the program and to the Bischoff instruction manuals.

Additional publications about ion chromatographic analyses are available on request free of charge from your Metrohm agency. The **8.732.2003 Metrohm Monograph «Ion chromatography»** provides an introduction to the theoretical fundamentals and general information on separating columns and sample pretreatment.

The **8.732.2013 IC Applications Collection** contains all the **Application Notes** on the subject of ion chromatography and

can be updated at any time by downloading the latest applications from the Internet under «www.metrohm.com». Last, but not least, you will find detailed information on the separating columns available from Metrohm and on special IC applications in the relevant "**Application Bulletins**".

1.3 Notation and pictograms

The following notations are used in this software manual:

Range	**Menu item, parameter or entry value**
SYSTEM STATE	**Program window**
<OK>	**Button**
[Ctrl]	**Key**
	**Danger/Warning** This symbol indicates a possible risk of death or injury to the user and possible damage to the instrument or its components by electricity.
	**Danger/Warning** This symbol indicates a possible risk of death or injury to the user and possible damage to the instrument or its components.
	**Caution** This symbol marks important information. First read the associated directions before you continue.
	**Comment** This symbol marks additional information and tips.

1.4 Installation

1.4.1 Hardware requirements for the PC

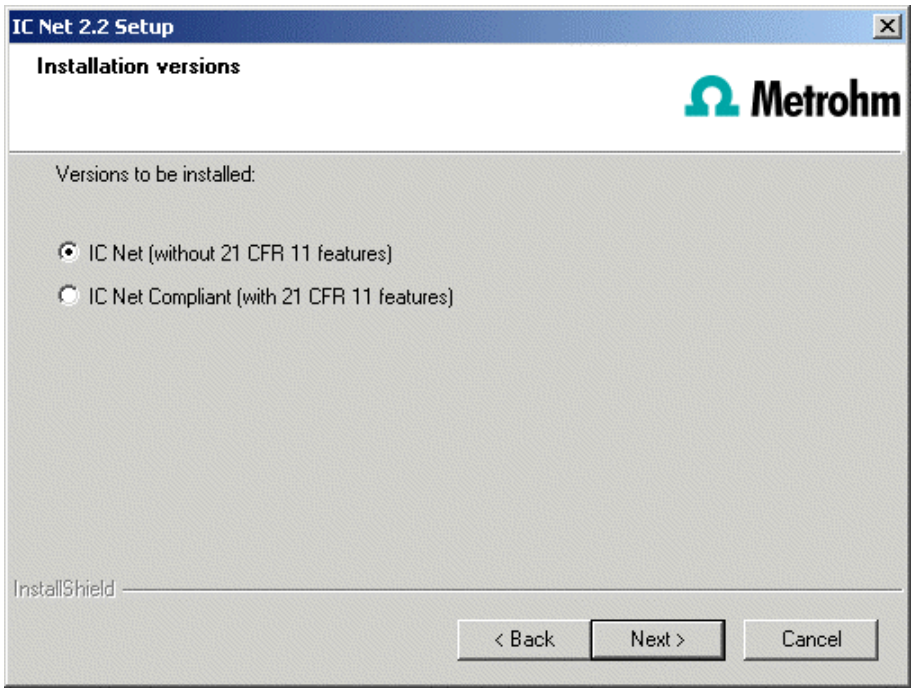
Computer	Pentium III with 450 MHz or higher
Operating system	Windows® 2000 or Windows® XP
Free space on hard disk	12 MB for program files 50 MB recommended for data files
Working memory RAM	128 MB for Windows® 2000 256 MB for Windows® XP
Graphics resolution	800×600, better 1024×768 or more
Printer	Any printer supported by the operating system

1.4.2 Software Installation

To use the 21 CFR Part 11 features of «ICNet 2.2» the operating system **Windows 2000** or **Windows XP** with **NTFS** file system is required.

If you want to update from IC Net 2.1 to IC Net 2.2, proceed as described in section 1.4.3.

Insert installation CD into CD drive. Select **<Start>** and **Run**. Find the file **setup.exe** on the CD and click on **<OK>**. Click on **IC Net** in the selection menu and follow the setup program instructions.



*To change from an **IC Net** installation (without 21 CFR part 11 features) to an **IC Net Compliant** (with 21 CFR part 11 features) installation (and back) you have to **remove** the previous installation! Pay attention to the corresponding dialog in the setup program.*

The two software packages «**IC Net 2.2**» and «**Autodatabase 1.0**» will be installed in the desired directory. Icons are created in the program folder, in the startup folder, and on the desktop. In addition to the program files of the «IC Net» program, the following folders are installed:

Accounts	Folder for user data, access is closed.
Data	Folder for storage of chromatogram files (***.chw**) and batch reprocessing files (***.bar**) with several examples.
Devices	Folder for storage of device files.(***.dev**).
Flog	Folder for Audit Trail files, access is closed.
Log	Folder for storage of exception files (***.exc**), History files (***.hst**) und Log files (***.log**).
Methods	Folder for storage of data acquisition method files (***.mtw**) and sample queue files (***.que**) with several examples.
Reports	Folder for storage of report files (*****) and graphic files (***.wmf**).
Services	Folder for user administration.
Systems	Folder for storage of system files (***.smt**).

1.4.3 Software update

For software update from IC Net 2.1 to IC Net 2.2, proceed as follows:

1. Switch on PC and start operating system.
2. If you want to save chromatograms, methods and system files created by IC Net 2.1, backup the folders **Data**, **Methods**, and **Systems** in another directory on the hard disk.
3. If you want to save data created by Autodatabase 1.0, backup the folders **Filters**, **Report templates**, and **User database** in another directory on the hard disk.
4. Deinstall the IC Net 2.1 software by selecting **<Start>** / **Settings** / **Control panel**, double-clicking the **Software** icon, selecting

Metrohm IC Net 2.1 in the list and clicking on **<Add/remove>**. All program files and icons should be removed.

5. Delete the folder **IC Net 2.1** in the program folder.
6. Install the IC Net 2.2 software (see *section 1.4.2*).
7. Copy the IC Net 2.1 backup files of the folders **Data**, **Methods**, and **Systems** into the folders **..\IC Net 2.2\IC Net\Data**, **..\IC Net 2.2\IC Net\Methods**, and **..\IC Net 2.2\IC Net\Systems**.
8. Copy the Autodatabase backup files of the folders **Filters**, **Report templates**, and **User database** into the folders **..\IC Net 2.2\Autodatabase\Filters**, **..\IC Net 2.2\Autodatabase\Report templates**, and **..\IC Net 2.2\Autodatabase\User database**.

*The folder **..\IC Net 2.2\IC Net\Data** is protected against unauthorized access and manipulation, if the **21 CFR Part 11** compliance is enabled. To copy the chromatograms from the backup **Data** folder into the **..\IC Net 2.2\IC Net\Data** folder start IC Net 2.2 and open the **Chromatogram open** window (see section 8.2.1), select the backup **Data** folder, mark the chromatograms and copy them into the **..\IC Net 2.2\IC Net\Data** folder.*

1.4.4 Software deinstallation

Select **<Start>** / **Settings** / **Control panel.** Double-click the **Software** icon. Select **Metrohm IC Net 2.2** in the list and click on **<Add/remove>**. All program files and icons should be removed.

1.4.5 Demo version

If the **«IC Net Software 2.2»** is installed on a PC without installation of IC system components, this software can be used as a **demo version** which is restricted to the **display** and **recalculation** of already recorded chromatograms.

1.4.6 Registration

Please send us your **8.110.8207 Registration card** as soon as possible. Only registered users will get updated program versions at a special price.

2 Fundamentals of the operation

2.1 Starting/closing the program

2.1.1 Start the «IC Net» program


ICNet.exe

Start the program
Double-click this icon or the **ICNet.exe** file to start the **«IC Net 2.2»** program. The **IC Net** login window appears:

Enter your User name and your Password and click on **<Log In>**.

*After software installation at the first start of the software, the **Add User** window opens (see section 3.2.1)and a user with **Administrator** access level is created. It is recommended to create users as a first action after the installation. For the definition of users, see section 3.2.*

2.1.2 Close the «IC Net» program

IC NET / File / Exit (Alt+F4)
Exit the «IC Net 2.2» program.

The program is also quit by clicking on ✕ in the upper right part of the main window.

2.2 Glossary

Batch reprocessing

Batch reprocessing is understood to be the subsequent reprocessing of a series of chromatograms which have been loaded in a batch reprocessing queue. During reprocessing with a selected method the settings for calibration, integration, passport, appearance and report can be altered at will (for details, see *section 10*).

Calibration

Calibration is used to describe the method of determining the relationship between the peak height or peak area found for one component and its concentration in the sample. The result of the calibration is a **calibration function** (calibration curve), which shows the relationship between the amount of sample and the evaluated quantity.

The determination of the calibration function with reference solutions can be carried out as a **one-point** or as a **multiple-point calibration**. The calibration method which is mainly used in ion chromatography is the **external standard calibration** (absolute calibration); calibration with an **internal standard** (relative calibration) or **tabulated calibration** are also possible (for details, see *section 7.5*).

Chromatogram

A chromatogram is a graphic plot of the elution curve (signal vs. time) recorded following a chromatographic separation on a separating column.

Chromatograms are stored as **chromatogram files** (***.chw**) in the **Data** directory. As well as the measuring data the chromatogram files also contain the method parameters and system settings which have been used for data recording, data processing and remote control (for details, see *section 8*).

Determination

In order to carry out a determination a suitable **system** must be selected for the separating problem. The result of the determination is a **chromatogram**, in which the measuring data and results of the determination are stored (for details, see *section 8*).

Device

The «IC Net» program supports remote control for Metrohm and Bischoff instruments. Each instrument within a system is a **device**. Devices are stored as device files (***.dev**) in the **Devices** directory. All **Metrohm devices** start with **Me*.dev** and all **Bischoff devices** start with **Bi*.dev** (for details, see *section 6*).

Integration

Integration is to be understood as being the method for determining the peak area and peak height with the aid of approximate baselines. The integration algorithm included in the program is in-

fluenced by the **integration parameters** and the optionally programmable **integration events** which are defined in the method. In addition, the integration can be manually corrected later with the aid of the **peak editor** (see *section 8.4*), for details see *section 7*.

Interface

The «IC Net» program supports remote control for **interfaces** available from Metrohm and Bischoff. Interfaces generally convert analog signals to digital form, which can be handled by the computer. Interfaces are stored as device files (***.dev**) in the **Devices** directory. All **Metrohm interfaces** and **Metrohm devices** start with **Me*.dev**; all **Bischoff interfaces** and **Bischoff devices** start with **Bi*.dev** (for details, see *section 5*).

Method

A method contains all information necessary for **data acquisition**, **integration**, **peak evaluation** and **quantification**. It can be considered as the chromatogram template, i.e. chromatogram without raw data. Methods are stored as **method files** (***.mtw**) in the **Methods** directory.

Each system is linked to a method. This method is called **processing method** and is opened automatically at the start of a new determination (for details, see *section 7*).

Sample queue

A sample queue is used for the automated processing of series of samples, particularly in combination with a sample changer (for details, see *section 9*).

System

The combination of Metrohm and Bischoff devices connected to an interface is called a **system**. The system includes all the settings of the devices, their time program, the data acquisition parameters and the processing method which have been optimized for the specific separating column and the determination to be carried out with it. A system is used to start single determinations or determinations with the help of a sample queue.

Systems are stored as **system files** (***.smt**) in the **Systems** directory (for details, see *section 4*).

Workplace

The **workplace** contains all interfaces and systems connected to the PC COM. The icons of all these active interfaces and systems are shown on the toolbar. They can also be displayed in the **Workplace** window opened by selecting the **Options** / **Devices setup** menu item.

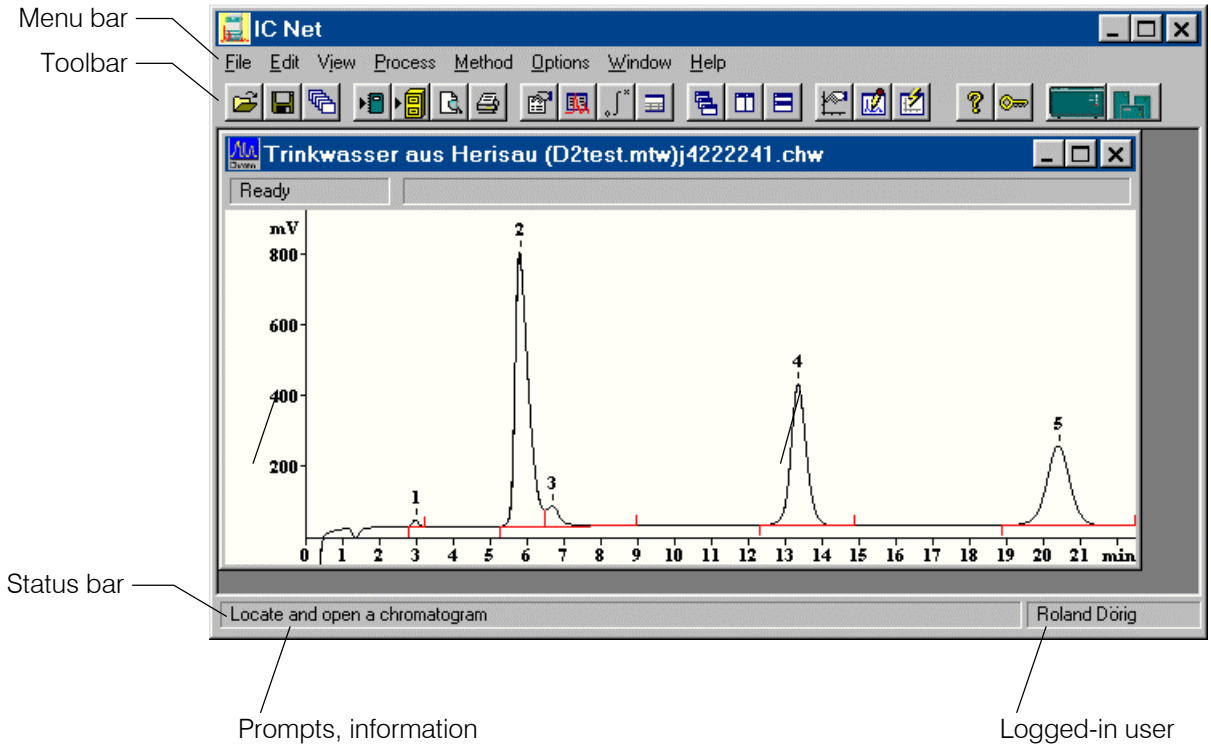
2.3 Overview of program windows

«IC Net 2.2» consists of different windows whose functionality is linked together. The different windows are:

IC NET	Main program window with menus for file administration, printing, method modification, options, login and user rights, window handling.
CHROMATOGRAM	Chromatogram window for graphic plot of running or recorded chromatograms.
SYSTEM	System window for control of interfaces and devices.
SYSTEM STATE	System state window for status messages.
WATCH WINDOW	Watch window for live display of instrument values.
QUEUE EDITOR	Queue editor window for edition of sample queue tables and batch reprocessing tables.

2.4 Main window elements

The elements of the **IC NET** main window are the menu bar, the toolbar and the status bar, indicating prompts and logged-in user.



2.5 Icons of the main window

The following icons are displayed in the **IC NET** main window:


Open chromatogram


Save chromatogram


Open last batch reprocessing file


Make report


Print preview


Send chromatograms to Autodatabase


Print chromatogram


Passport


Method setup


Integration


Components


Cascade all opened chromatogram windows


Vertical tiling of open chromatogram windows


Horizontal tiling of open chromatogram windows


Appearance


Enable/disable peak editor mode. If the Peak editor mode is enabled, the peak editor icons appear.


View all


Help


Lock system


762 IC Interface


771 Compact Interface


Connected system


Global timer

2.6 Overview of file types

The following file types are produced by the «IC Net» software:

***.adb** **Autodatabase file**
Contains chromatogram and method data of all determinations.

***.bar** **Batch reprocessing file** (binary file)
Contains batch reprocessing data. The ***.bar** file is stored automatically in the **Data** folder.

***.cal** **Calibration file** (binary file)
Contains calibration data, which can be exported with **IC Net** / **Method** / **Calibration** / **Export calibration**.
The ***.cal** file is stored automatically in the **Methods** folder.

***.chw** **Chromatogram file** (binary file)
Contains chromatogram, system and method data of a determination.
The ***.chw** file is stored automatically in the **Data** folder.

***.exc** **Exception file** (ASCII file)
Contains exceptions from normal running and error messages.
The ***.exc** file is stored automatically in one of the day subfolders of the **Log** folder.

***.hst** **History file** (ASCII file)
Contains history of commands and program actions.
The ***.hst** file is stored automatically in one of the day subfolders of the **Log** folder.

***.log** **Log file** (ASCII file)
Contains log file of data communication between PC and instruments.
The ***.log** file is stored automatically in one of the day subfolders of the **Log** folder.

***.mtw** **Method file** (binary file)
Contains the data acquisition method, which can be linked to a system.
The ***.mtw** file is stored automatically in the **Methods** folder.

***.que** **Sample queue file** (binary file)
Contains a sample data table.
The ***.que** file is stored automatically in the **Systems** folder.

***.rtt** **Report file** (ASCII file)
Contains a report template.
The ***.rtt** file is stored in the program folder.

***.smt** **System file** (ASCII file)
Contains the system settings.
The ***.smt** file is stored automatically in the **Systems** folder.

***.dev** **Device file** (ASCII file)
Contains drivers for devices.
The ***.dev** file is stored in the **Devices** folder.

2.7 Context-sensitive menus

Some of the menu functions of the program windows are also accessible by clicking on the desired window or item and pressing the **right mouse button**. The pop up windows have different contents and functions depending on the selected active window or item type.

2.8 Keyboard and mouse functions

The **mouse** can be used to carry out the normal program operating functions such as the selection of menu items and fields. It can additionally be used for magnifying a section of a chromatogram (**zooming**). To **zoom** a portion of the plot it is necessary to place the mouse cursor to the upper left corner of the square to zoom, press the left mouse button and drag the cursor to the lower right corner of the rectangle. After releasing of the left mouse button the selected region will be zoomed full-screen. If the cursor is active in the peak editor mode then it can be moved by pressing down the right-hand mouse key.

The **keyboard** can also be used to scale a chromatogram in the window, as described below.

Keyboard quick reference

Cursor is inactive:

[up]	Increases sensitivity on the Y axis.
[down]	Reduces sensitivity on the Y axis.
[right]	Expands a chromatogram on the X axis.
[left]	Shrinks a chromatogram on the X axis.
[Ctrl] + [Home]	Autoscale procedure on the X axis (shows all on X).
[Ctrl] + [End]	Autoscale procedure on the Y axis (shows all on Y).
[PageUp]	Shifts a chromatogram on $^1/_{10}$ part of a screen upwards.

[PageDown]	Shifts a chromatogram on $^1/_{10}$ part of a screen downwards.
[Shift] + [up]	Increases a distance between channels of a chromatogram.
[Shift] + [down]	Reduces a distance between channels of a chromatogram.
[0 (Zero)]	Adjusts a zero on the last point of a chromatogram (running chromatogram) or its lowest level (finished run).

Only part of the chromatogram is on screen:

[Ctrl] + [right]	Moves one window right (without change of scale on X and Y axes).
[Ctrl] + [left]	Moves one window left (without change of scale on X and Y axes).
[Home]	Shows the beginning of a chromatogram (without change of scale on X and Y).
[End]	Shows the end of a chromatogram (without change of scale on X and Y).
[0 (Zero)]	Adjusts a zero on the lowest level in the window.

Cursor is active:

[0 (Zero)]	Adjust a zero in site of the cursor.
[right]	Moves cursor left to right.
[Shift] + [right]	Quickly moves cursor left to right.
[left]	Moves cursor to the left.
[Shift] + [left]	Quickly moves cursor to the left.
[Home]	Moves cursor to beginning of a window.
[End]	Moves the cursor to end of a window.
[Shift] + [End]	Sets the beginning of a window in site of the cursor.
[Shift] + [Home]	Sets the end of a window in site of the cursor.

2.9 Help

By clicking on  , by clicking on 

, by selecting the **Help** / **Contents** menu item, or by pressing the [F1] key you can get on-line help on the current topic anywhere in the program.

Green texts	can be clicked to jump to a different Help topic.
Violet texts	identify the dialog item, parameter or button in the corresponding window.
Blue texts	identify important information.

3 Software settings

3.1 Fonts

IC NET / **Options** / **Fonts**

This option allows the selection of fonts used by the system.

Font for dialogs... Selection of font used for dialog boxes.
Default setting: **MS Sans Serif** / **Standard** / **8 pt.**

Font for reports... Selection of font used for report output to the screen or printer.
Default setting: **Courier New** / **Standard** / **10 pt.**

Font for tables... Selection of font used for data presentation in tables on the screen. It is not used for presentation of tables in the report.
Default setting: **MS Sans Serif** / **Bold** / **8 pt.**

Font for plots... Selection of font used for labels on chromatogram plots and calibration curves.
Default setting: **Times New Roman** / **Bold** / **10 pt.**

Save fonts configuration

Save chosen font configuration.

If you want to reset the modified font settings to the initial default settings, delete the **fonts.cfg** *file in the program path.*

3.2 Security system

In accordance with **GLP** and **21 CFR Part 11** requirements the «IC Net» software supports security with password protection of the system. Every user has his own **User Name**, **Password** and **Access Level** that restricts the set of possible actions.

IC Net / **Options** / **Security** opens the user administration of IC Net. When this menu item is chosen, the System log in window is called up first (see *section 2.1.1*).

The access to the **user administration** is restricted according to the **Access level** of the user, therefore different windows are called.

User	*Window*	*Possible actions*
Novice, Master	**New Password**	This window allows the user to change his **Password**.
Administrator	**Security options**	This window allows editing the **User List** and the **Password Options**, it is also possible for an administrator user to change his **Password**.

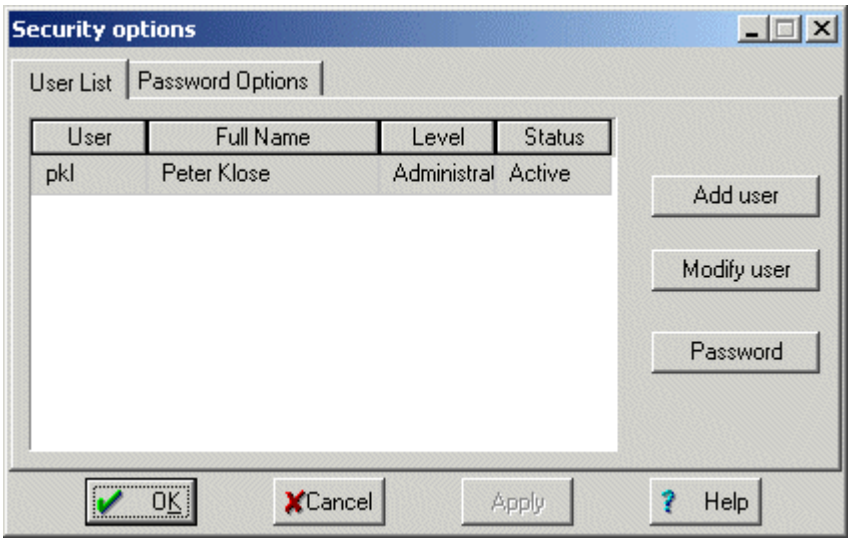
3.2.1 Security Options window

IC NET / Options / Security

This window contains the user administration and password options. Only a user with Administrator access level can open it. It consists of the two tabs **User List** and **Password Options**.

*The **Security Options window** is accessible only to **Administrator** users. If there is no **Active** Administrator, e.g. because he has forgotten his password, you have to reinstall the «IC Net» software to gain access. Therefore it is highly recommended to **create a second Administrator** user as a backup. Store his password in a safe place.*

User List

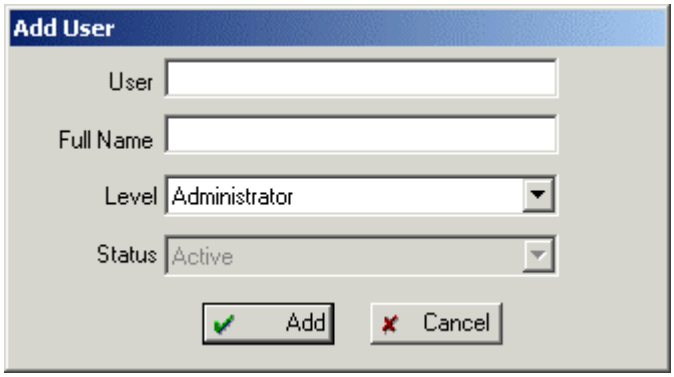


The **User List** displays the **User** name, **Full Name**, access **Level** and user **Status** of each user created. The list can be sorted alphabetically according to one of the four columns by clicking the title. A star (*) at the end of the title indicates the sorting criterion.

<Add user>	Add new user to the User's List, opens the **Add User** window.

<Modify user>	Edit current user's settings (username, full name, access level, status), opens the **Modify User** window.
<Password>	Change the password of the administrator logged in. Opens the **New Password** window.

Add/Modify User



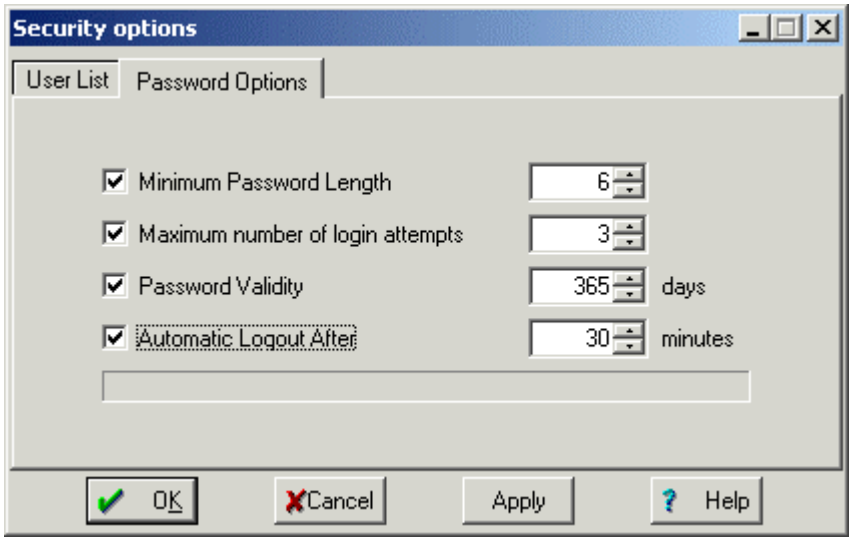
User	User name of the user.
Full Name	Full name of the user, this name is displayed in the status bar of the main window throughout an IC Net session.
Level	Access level of the user.
Novice	Restricted access to program functions. Allows only start and stop of determinations using existing system and method files and manual control of the devices. Modifications of system, method and data files are not allowed.
Master	Access to all program functions with few exceptions: the user cannot set **Global preferences**, open the **Workplace** window, change hardware settings of interfaces and devices, change **Security** options.
Administrator	Access to all program functions. This level should be switched on only while installing the system or in the case of configuration change. The administrator user is authorized to change name, access level and status of other users.
Status	Status of the user.
Active	The User is able to work with «IC Net» within the limitations of the access **Level** assigned to him by the **Administrator**.
Inactive	The User is not able to work with «IC Net». The user **Status** is also set **Inactive** if the number of

failed Login attempts exceeds the limit set in the **Password Options**.
The user can be set **Active** again by the **Administrator**.

Removed The User is not able to work with «IC Net», he is removed from the system but he is still listed in the **User List**.
The user can be set **Active** again by the **Administrator**.

Password Options

This tab allows to specify **Password** and **Login** related security settings.



Minimum Password Length

Minimum number of characters for the **Password**.
Range: **2...10, default 6**.

Maximum number of login attempts

If the number of failed Login's exceeds this value, the **User** is set **Inactive**.
Range: **2...10, default 3**.

Password Validity

Number of days the **Password** of a **User** remains valid. If the password is expired, the user is prompted at the system log in to change his password.
Range: **1...999, default 365**.

Automatic Logout After

After the specified period of inactivity (in minutes) the system is locked, to protect it against unauthorized access.
Range: **1,...999, default 30**.

The program prompts for username and password every time the system starts. This username stamps methods, chromatograms and reports, created during the working session. During the work it is possible to change the current user with the menu item **IC NET** / **Options** / **Lock system**.

3.3 Audit Trail

IC NET / Options / Audit Trail

The Audit Trail is a part of the Security system. IC Net automatically tracks all user logins and actions that create, modify or delete electronic records. The Audit Trail records every event with time, date and the user who performed it.

*The **Audit Trail window** is accessible only to **Administrator** users.*

This option displays the Audit Trail records in the Audit Trail window.

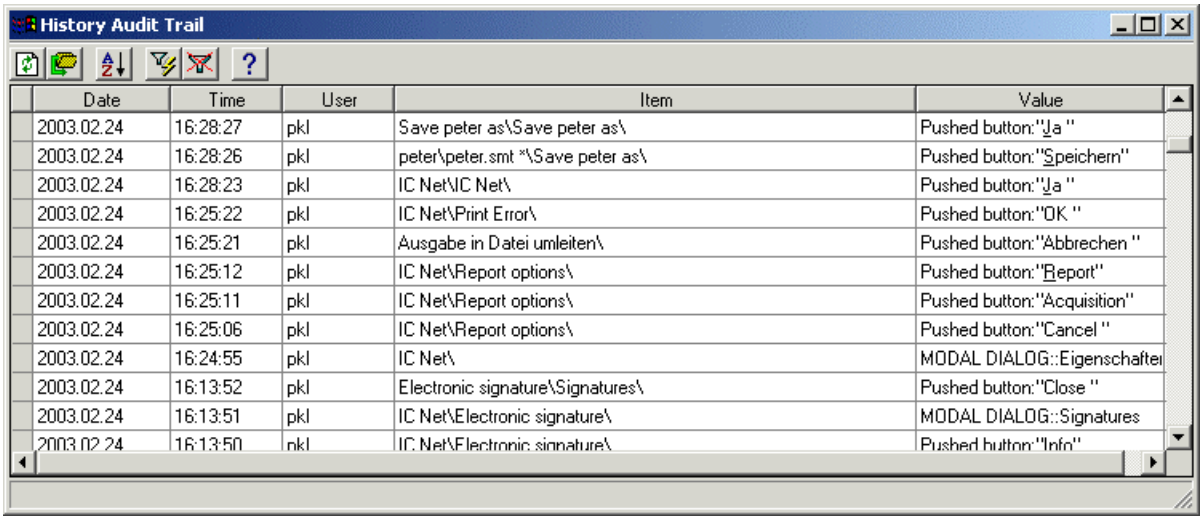
Chromatogram Open the Audit Trail window that displays all changes made to the **chromatogram**. Displays **Date**, **Time**, **User**, **Item** changed in the chromatogram, **Old Value** and **New Value**.
This option is only available if the interesting chromatogram is open and the active window of IC Net.

Changes to the Audit Trail of a chromatogram are made when the chromatogram is saved.

History Open the Audit Trail window that displays all actions performed in the **IC Net window**.
Displays **Date**, **Time**, **User**, **Item** worked on and **Value** of every action logged.
Tool to track the login and user administration history.

Audit Trail window

The Audit Trail window displays the Audit Trail records of the **IC Net** or **Chromatogram History** in a table. Easy access to specific information is enabled by several sort and filter options of the log window. The Log Window can be sorted according to one of the six columns by clicking the title. A star (*) at the end of the title indicates the sorting criterion.



Refresh window, not available for Chromatogram History.

Open **Save Audit Trail As** window to export Audit Trail records.

Sort, open the **Sort** window.

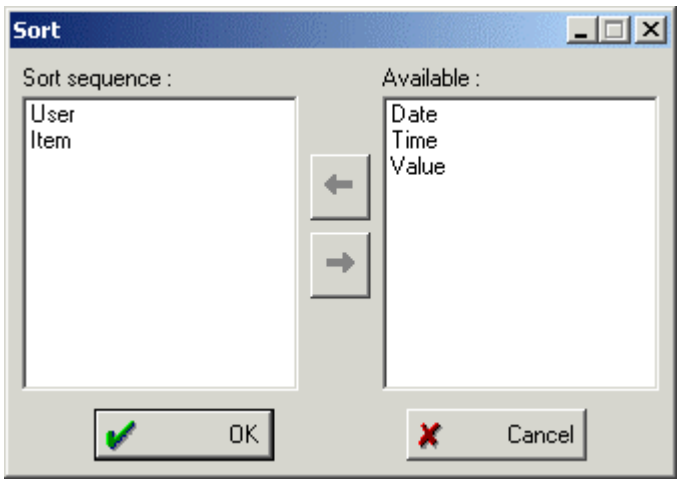
Filter the table according to the content and column of a selected field. This filter option can be applied sequentially to reduce the displayed data.

Reset filter.

Open **Help**.

Sort window

This window offers a more refined possibility to arrange log data by combining the **column titles** of the **Audit Trail window** to a **Sort Sequence** where the **Audit Trail** records are sorted.



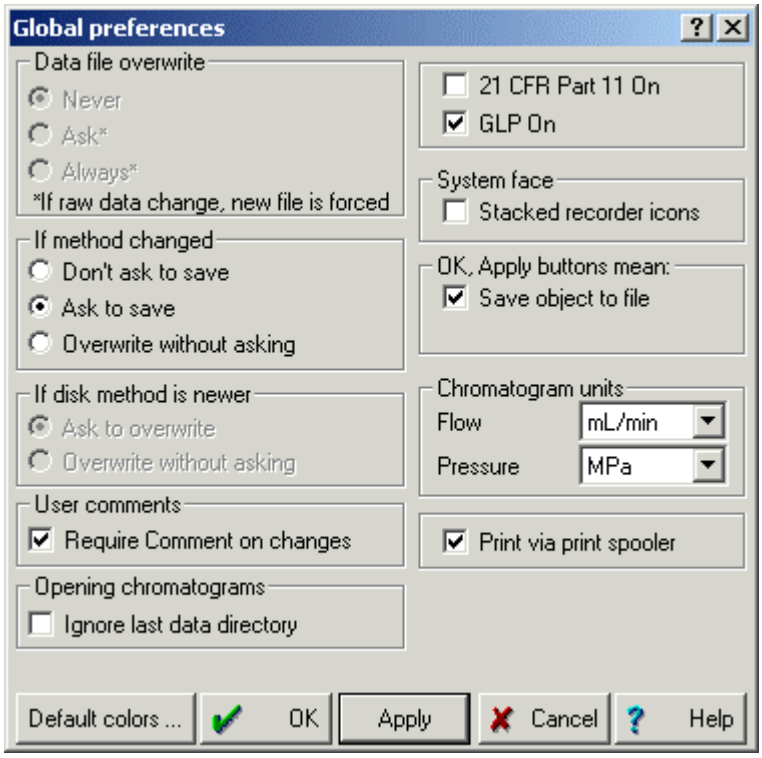
Sort Sequence	Sort criteria of the Sort Sequence, the sort criteria are applied in the order of their entry in the list.
Available	Unused sort criteria.
←	**Select** marked sort criterion.
→	**Deselect** marked sort criterion.

3.4 Global settings

IC NET / Options / Global preferences

This window is used for **global program settings**. It can be opened only by the user with **Administrator** access level.

Data file overwrite	Global settings for overwriting of chromatogram files:
Never	Chromatogram files cannot be overwritten. A modified chromatogram is saved as new file with the file name number raised by 1.
Ask	The user is asked if the chromatogram should be overwritten.
Always	Chromatogram files are always overwritten without confirmation.



If method changed Global settings for saving of method files:

Don't ask to save The method file is not saved automatically. It can be saved only with **File** / **Save** / **Method**.

Ask to save The user is asked if the method should be saved.

Overwrite without asking Method files are overwritten without confirmation.

If disk method is newer Global settings for overwriting of method files:

Ask to overwrite The user is asked if the method should be overwritten.

Overwrite without asking Method files are overwritten without confirmation.

User comments Changes on methods, systems, chromatograms,… :

Require Comment on changes The user has to comment a change.

Opening chromatograms Global settings for opening chromatograms:

Ignore last data directory If this option is **enabled**, the directory is opened where the current selected chroma-

	togram is saved. If this option is **disabled**, the directory is opened where the last opened chromatogram is saved.
21 CFR Part 11 On	Switch on/off global 21 CFR Part 11 settings. Is automatically activated and cannot be altered, if **IC Net Compliant** is installed. The following parameter settings are automatically set: **Data file overwrite = Never** **If method changed = Ask to save** **If disk method is newer = Ask to overwrite** **User comments = Require Comment on changes enabled** **GLP On = enabled**
GLP On	Switch on/off global GLP settings. The following parameter settings are automatically set: **Data file overwrite = Never** **If method changed = Ask to save** **If disk method is newer = Ask to overwrite**
System face	
Stacked recorder icons	If this option is **enabled**, only one recorder icon with different tabs appears in the system window if several data recorders are installed.
OK, Apply buttons mean	
Save object to file	If this option is **enabled**, the **<Apply>** button in system settings windows is replaced by the **<Save>** button. The system settings are saved if the **<Save>** or **<OK>** button is clicked.
Chromatogram units	Units for chromatograms:
Flow	Unit for flow rate: **µL/min**, **mL/min**
Pressure	Unit for pressure: **MPa**, **psi**, **bar**, **atm**
Print via print spooler	Switch on/off printing via print spooler. Switch off this option if problems with printing occur.
<Default colors>	Default colors for chromatographic windows (details see *section 8.3.1*).

4 Systems

The combination of Metrohm and Bischoff devices connected to an interface is called a **system**. The system includes all the settings of the devices, their time program, the data acquisition parameters and the processing method which have been optimized for the specific separating column and the determination to be carried out with it. A system is used to start single determinations or determinations with the help of a sample queue. Systems are stored as **system files** (***.smt**) in the **Systems** directory.

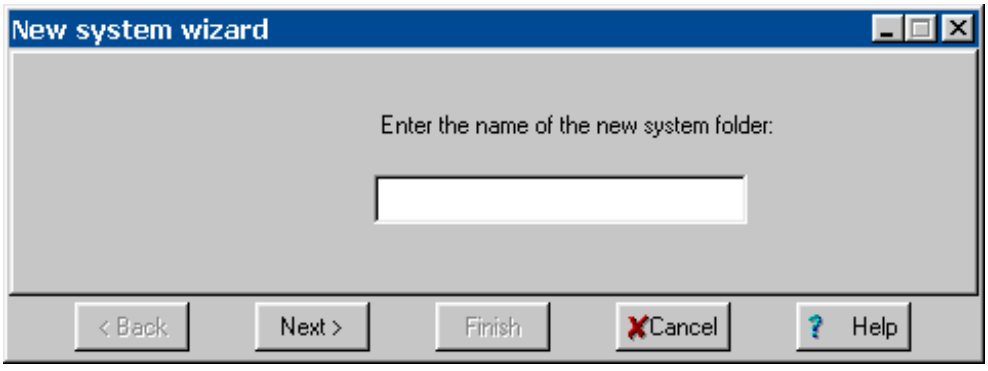
4.1 System creation

4.1.1 System wizard

IC NET / File / New / System

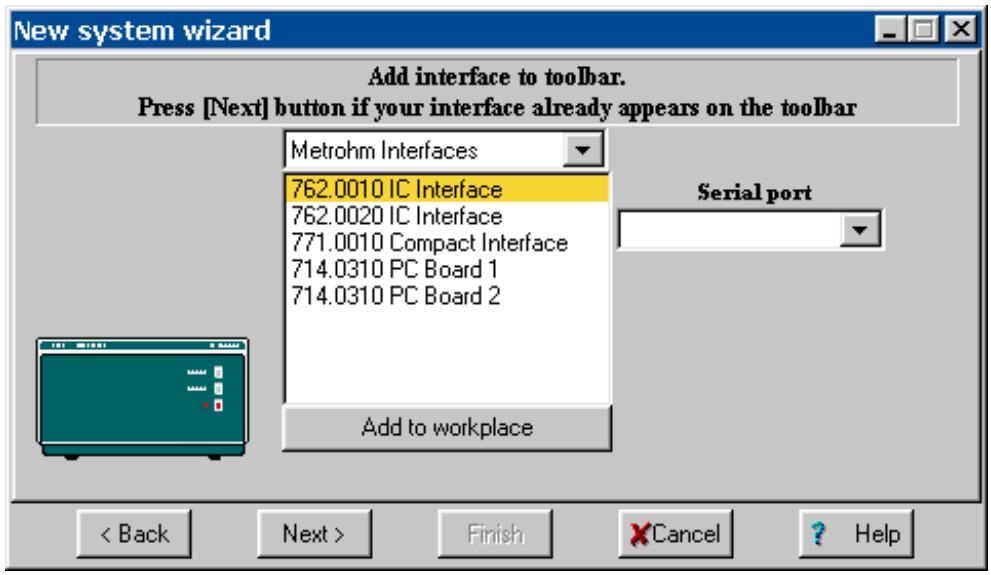
The **New system wizard** window and a new **SYSTEM** window are opened. The **New system wizard** guides you trough the installation routine step-by-step to build a new system. The next step of the system installation is reached with **<Next>**, the previous step with **<Back>** and the installation is completed with **<Finish>**.

The first step of the system installation is to enter a name for a new system folder within the «IC Net» program path **...\ICNet\Systems**. For every instrument combination, a new folder should be created.

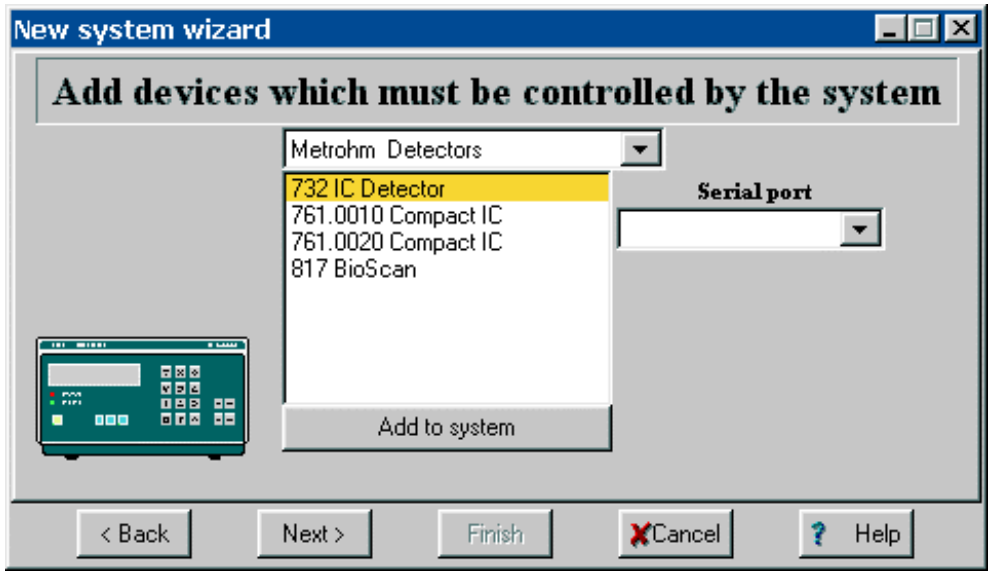


After clicking on **<Next>**, the window for addition of interfaces to the toolbar appears. This step can be skipped if the desired interface has been already added to the toolbar (see *section 5.1.2*). If this is not the case, the interface has to be selected from the **Metrohm Interfaces** or **Bischoff Interfaces** groups. After selecting the serial port where the interface is connected to and clicking on

<Add to workplace>, the interface icon will appear on the toolbar (PC Boards will not appear on toolbar).

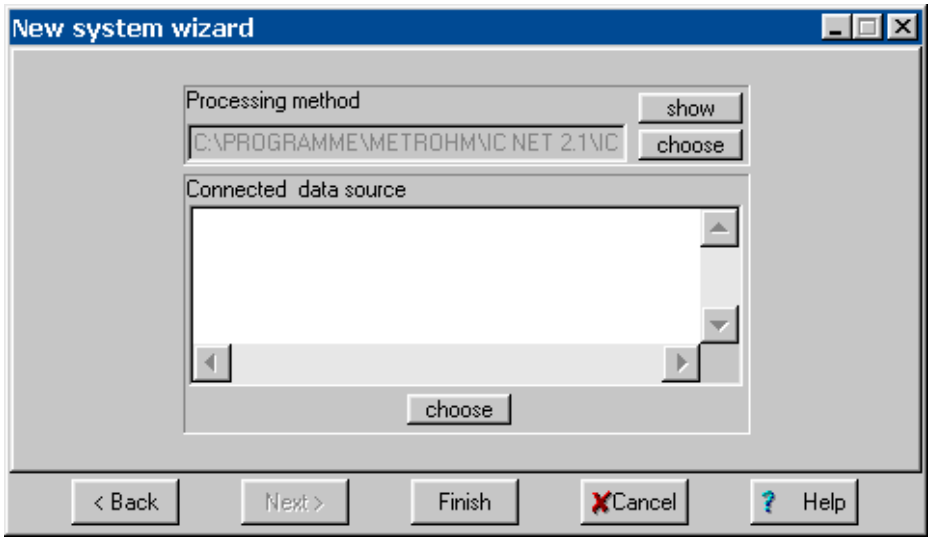


After clicking on **<Next>**, the window for addition of devices (see *6.1.1*) to the system window appears.



For every device to be controlled with «IC Net», open the group which contains this device, select the device and the **Serial port** of the interface where the device is connected to. After clicking on **<Add to system>**, the device is added to the **SYSTEM** window. If desired, an additional data recorder and a timer of the **More modules** group can be added to the system.

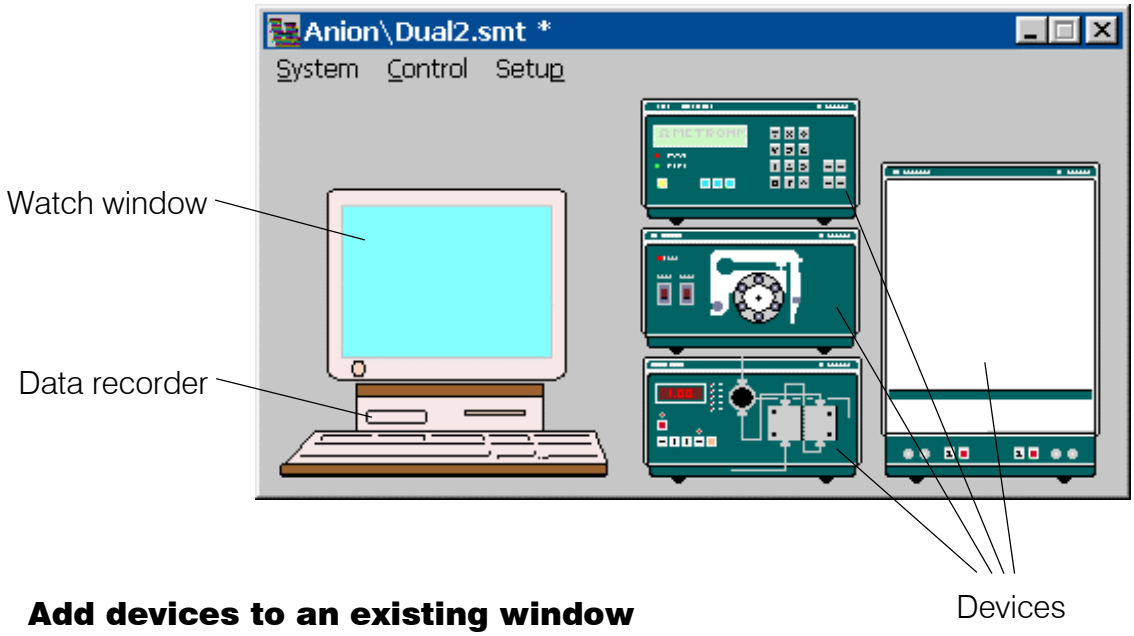
After clicking on **<Next>**, the window for selection of processing method linked to the system and data source appears (details see *section 6.1, 6.2*).



After clicking on **<Finish>**, the user is asked to save the new system as a system file (***.smt**) in the new system folder. The new system is now ready to start a determination (see *section 4.3.3*).

4.1.2 System window

A system window is opened with **IC NET** / **File** / **Open** / **System** and the selection of the desired system file. It contains icons for **Data recorder**, **Watch window** (screen) and all the **devices** installed with the system wizard.



4.1.3 Add devices to an existing window

SYSTEM / Setup / New devices/ Install new device

Add new devices to the open **SYSTEM** window. For every device to be added to the system, open the group which contains this device and select the device and the serial port of the interface where the device is connected to. After clicking on **<Add to system>**, the device is added to the **SYSTEM** window. If desired, an additional data recorder and a timer of the **More modules** group can be added to the system.

4.2 System file handling

The following menu items are used for opening, changing, saving and closing of systems:

IC NET / File / Open / System

Load an existing system file (***.smt**) from the **Systems** directory and open the corresponding **SYSTEM** window. The **name** of the folder and of the system file are displayed in the title bar of the **SYSTEM** window. A **star** (*****) at the end of the name indicates that the system settings have been changed since the last saving.

SYSTEM / System / Open other

Load an existing system file (***.smt**) from the desired system folder in the **Systems** directory and open a new **SYSTEM** window for parameter settings. The old system remains connected.

SYSTEM / System / Change

Open the selected new system in the desired system folder. The current system is disconnected and closed, and the new system is connected.

SYSTEM / System / Save

Save the current **system file** (***.smt**) in the desired folder of the **Systems** directory.

SYSTEM / System / Close

Close the selected system.

Delete a system

To delete an existing system, delete the ***.smt** file in the **Systems** folder.

4.3 System functions

4.3.1 Connect and disconnect system

To make possible manual control of the system devices and start of determinations, the selected system must be connected to the workplace. Systems are connected and disconnected as follows:

SYSTEM / Control / Connect to workplace

Connect selected system to the workplace. Only one system from the same system folder can be connected at the same time.

The  icon appears on the toolbar. If this icon is clicked, the **SYSTEM** window is always displayed in front of all other windows.

SYSTEM / Control / Disconnect from workplace

Disconnect selected system from the workplace. If a system is disconnected, manual control is not available for this system, but all other system settings can be modified and saved. **Start determination** and **Startup hardware** is only possible if no other system from the same system folder is connected. In this case, the system is automatically connected.

4.3.2 Start/stop hardware and record baseline

SYSTEM / Control / Startup hardware (Measure Baseline)

With this menu item the following actions are executed automatically:

- Send **System startup values** to the devices.
- Start Metrohm solvent delivery systems and Bischoff solvent delivery systems.
- Start Metrohm additional modules and Bischoff additional modules.
- Start Bischoff detectors.
- Switch Metrohm Autosamplers and Bischoff Autosamplers to remote control.
- Start recording of the measurement signal using the method of the connected system. Independently of the set chromatogram **Duration**, the measurement signal is recorded until the data acquisition is stopped if a new determination is started with **Start determination** or by clicking the  icon of the chromatogram window. In this case the user is asked if the recorded baseline should be saved or not.

SYSTEM / Control / Shutdown hardware

With this menu item the devices are stopped as follows:

- Stop Metrohm solvent delivery systems and Bischoff solvent delivery systems.
- Stop Metrohm additional modules and Bischoff additional modulesVariotherm.
- Stop Bischoff detectors.
- Switch Metrohm Autosamplers and Bischoff Autosamplers to local control.
- Stop running **determination**.
- Stop active **sample queue**.

SYSTEM / Control / Stop data acquisition

Stop recording of the baseline.

4.3.3 Start/stop determinations

SYSTEM / Control / Start determination

Start determination using the settings of the selected system. At this start command, the **System startup values** are set at the devices. The time programs of the different devices and the data recording are started either immediately (**Start with determination**) or after switching the injection valve to the "Inject" position (**Start with inject**) as set in the **Start mode** window.

SYSTEM / Control / Stop determination

Stop running determination. Data acquisition and time programs are terminated immediately. The recorded chromatogram is saved automatically if the **Save chromatogram after the run** option on the **Passport / Processing** tab is enabled.

Alternatively the determination can be stopped by clicking the icon of the chromatogram window. In this case the user is asked always if the determination should be saved or not.

If the **Auto restart** *option is enabled or if a sample queue is active, a new determination is started immediately after the running determination is stopped. If you want to avoid this, disable the* **Auto restart** *option or* **Pause** *the sample queue.*

SYSTEM / Control / Stop data acquisition

Stop data acquisition of the running determination immediately and save the recorded chromatogram automatically if the **Save chromatogram after the run** option on the **Passport / Processing** tab is enabled. The time programs of the running determination are continued normally.

4.3.4 Options for determinations

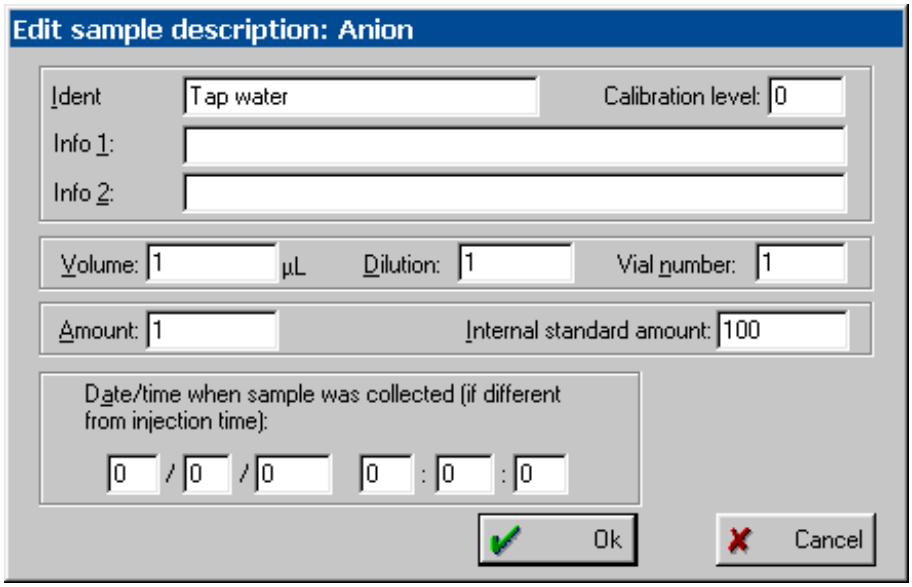
SYSTEM / Control / Auto restart

If this option is enabled, a new determination is started automatically using the current system after the preceding determination has been finished normally or stopped manually.

The Auto restart option is disabled if determinations are made with an active sample queue. This option allows to make an infinite batch cycle with the current system

SYSTEM / Control / Verify sample

If this option is enabled, the **Edit sample description** window is opened automatically at the start of each determination for entry of the following sample information:



Ident — User defined identifier (title) for the chromatogram to be displayed in the title bar of the chromatogram window and in the **Chromatogram open** window.

Calibration level — Calibration level (0 = sample; 1…n = calibration solutions).

Info 1 / **Info 2** — Sample description.

Volume — Injected volume in µL.

Dilution — Dilution of the sample.

Vial number — Autosampler vial position to take sample from.

Amount — Sample amount. If this value is different for the calibration run (**c**) and the sample run (**s**), the component concentrations of the sample are calculated as follows:

$$C_s = C_c \cdot \text{Amount}_s / \text{Amount}_c$$

Internal standard amount — Concentration of the internal standard component for relative concentration calculations.

Date/time when... — Date and time of sample collection (the default values are equal to the date and time when the chromatogram starts).

The **Verify sample** option is disabled if determinations are made with an active sample queue.

4.4 System settings

4.4.1 Modify system window

SYSTEM / Setup / Drag icons

If this option is enabled, the device icons can be resized and moved in the **SYSTEM** window and the **SYSTEM** window itself can be resized.

To **resize** an icon or the window, move the cursor to the desired object until ⤡ appears. Press the left mouse button and resize the object to the desired size.

To **move** an icon, move the cursor to the desired object until ✛ appears. Press the left mouse button and move the object to the desired place.

4.4.2 Watch window display

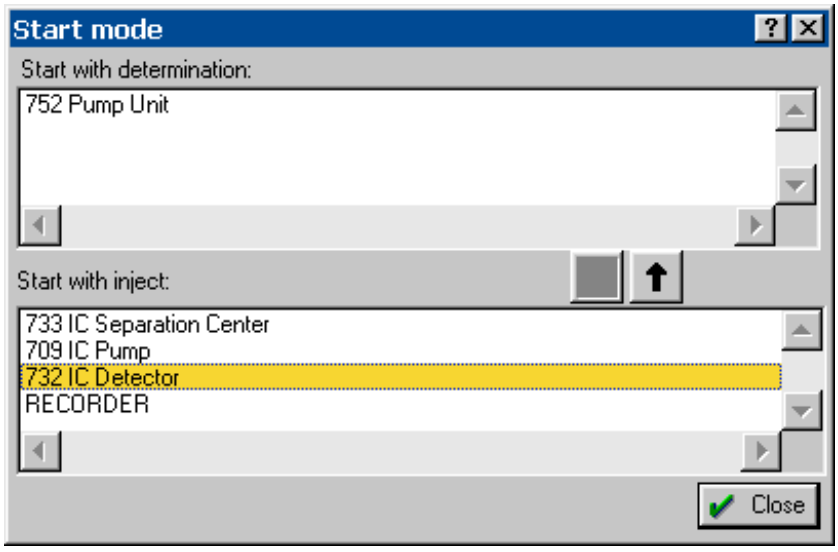
SYSTEM / Setup / Watch window

If this option is enabled, the **WATCH WINDOW** is automatically opened if a determination or measure baseline is started (see *section 6.2*).

4.4.3 Set start mode

SYSTEM / Setup / Start mode

This menu item opens the **Start mode** window for definition of start mode for time programs and data acquisition.



This window contains the following two fields:

Start with determination

The time program of the loaded object or the data acquisition (**RECORDER**) is started at the moment the **determination is started**.

Start with inject The time program of the loaded object or the data acquisition (**RECORDER**) is started at the moment the **sample is injected**.

The objects can be moved from one field to the other using the  or  buttons.

4.4.4 Install new devices

SYSTEM / Setup / New devices/ Install new device

Add new devices to the open **SYSTEM** window. For every device to be added to the system, open the group which contains this device and select the device and the serial port of the interface where the device is connected to. After clicking on **<Add to system>**, the device is added to the **SYSTEM** window. If desired, an additional data recorder and a timer of the **More modules** group can be added to the system.

4.4.5 Install existing devices

SYSTEM / Setup / New devices/ Link to existing device

Add devices to the open **SYSTEM** window which are already present on the toolbar. This is mostly used to add the **762 IC Interface events**. For every device to be added to the system, select the device and click on **<OK>**.

4.4.6 Print system parameters

SYSTEM / Setup / Parameters / Print

A report of the system parameters including the time program is created and opened using the «Microsoft Word» program. The ***.rtf** file opened can be printed, saved and exported into other programs. The system report includes the following elements:

STARTUP HARDWARE

Name of the method linked to the system
Main measurement channel
Configuration settings for the devices
System startup values

START WITH DETERMINATION

Objects defined in the **Start mode** window. The time programs are printed if the programs are enabled.

START WITH INJECT Objects defined in the **Start mode** window. The time programs are printed if the programs are enabled.

4.4.7 Show system parameters

SYSTEM / Setup / Parameters / Startup hardware

Display of the name of the method linked to the system, the main measurement channel, the configuration settings for the devices, and the system startup values.

SYSTEM / Setup / Parameters / Start with determination

Display of the objects defined in the **Start mode** window. The time programs are displayed if the programs are enabled.

SYSTEM / Setup / Parameters / Start with inject

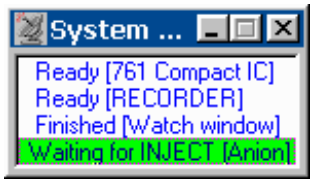
Display of the objects defined in the **Start mode** window. The time programs are displayed if the programs are enabled.

4.4.8 Links

SYSTEM / Setup / Links

Display of all devices of the system (including watch window and data recorder).

4.5 System state window



The **SYSTEM STATE** window is automatically opened if a system is connected. It shows status and error messages for this system. Messages concerning a device are followed by **["device name"]**, messages concerning the loaded system are followed by **["folder name"]** (name of the folder who contains the system file). The following messages can appear:

4.5.1 Status messages

Checking on-line	Checking connection between PC and device.
On-line	Connection between PC and device ok.
UploadStartupValues	Hardware or system startup values have been loaded to the device.
Initialisation	Hardware or system initialization.
Ready	Device is ready.
Starting	Starting program or chromatogram data acquisition.

Running	Running program or chromatogram data acquisition.
Running program (xxx min left)	Running time program with time display.
Waiting for INJECT	Waiting for "INJECT" to start program and/or chromatogram data acquisition as defined in the Start mode.
INJECT done	Injection valve has been switched to the "INJECT" position.
Stopping	Determination has been stopped.
Finished	Program or chromatogram data acquisition has been finished.
SHUTDOWN	System is shutdown.

4.5.2 General error messages

Detection of hardware failed	Bad connection between PC and device or device switched off (check connecting cable or switch on instrument).

4.5.3 Error messages for 761 Compact IC

LEAK DETECTED	The leak detector has detected a leak (check IC system and connections).
E1	Program checksum wrong (call Metrohm service).
E2	RAM faulty (call Metrohm service).
E200	Invalid instrument adjustment (call Metrohm service).
E237	Storage of configuration values failed (repeat last action; if error reappears, call Metrohm service).
E238	Storage of instrument number failed (repeat last action; if error reappears, call Metrohm service).
E240	EEPROM faulty (call Metrohm service).
E258	Storage of setup values failed (repeat last action; if error reappears, call Metrohm service).

E295	Storage of memory values failed (repeat last action; if error reappears, call Metrohm service).
E296	Instrument stopped (restart instrument; if error reappears, call Metrohm service).
E297	Storage of remote line values failed (repeat last action; if error reappears, call Metrohm service).
E298	Storage of flow correction value failed (repeat last action; if error reappears, call Metrohm service).
E299	Storage of break time values failed (repeat last action; if error reappears, call Metrohm service).
E300	High-pressure pump faulty (restart pump; if error reappears, call Metrohm service).
E301	Injection valve blocked (check injection valve; if error reappears, call Metrohm service).
E302	Suppressor module blocked (check suppressor; if error reappears, call Metrohm service).
E303	Storage of maintenance information failed (repeat last action; if error reappears, call Metrohm service).

5 Interfaces

The «IC Net» program supports remote control for **interfaces** available from Metrohm and Bischoff. Interfaces generally convert analog signals to digital form, which can be handled by the computer. Interfaces are stored as device files (***.dev**) in the **Devices** directory. All **Metrohm interfaces** and **Metrohm devices** start with **Me*.dev**; all **Bischoff interfaces** and **Bischoff devices** start with **Bi*.dev**.

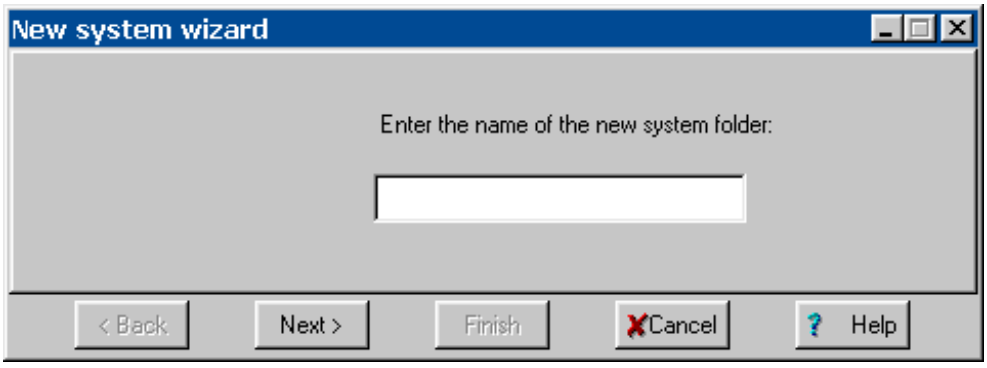
5.1 Interface installation

5.1.1 Add interfaces with system wizard

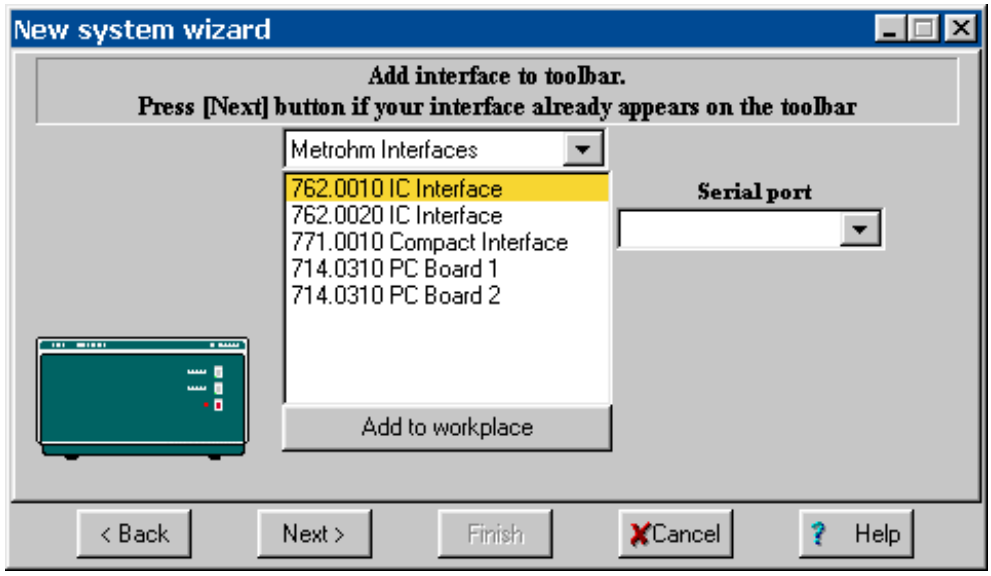
IC NET / File / New / System

The **New system wizard** window and a new **SYSTEM** window are opened. The **New system wizard** guides you trough the installation routine step-by-step to build a new system. The next step of the system installation is reached with **<Next>,** the previous step with **<Back>** and the installation is completed with **<Finish>**.

The first step of the system installation is to enter a name for a new system folder within the «IC Net» program path **...\ICNet\Systems**. For every instrument combination, a new folder should be created.



After clicking on **<Next>**, the window for addition of interfaces to the toolbar appears. The interface has to be selected from the **Metrohm Interfaces** or **Bischoff Interfaces** groups. After selecting the serial port where the interface is connected to and clicking on **<Add to workplace>**, the interface icon will appear on the toolbar (PC Boards will not appear on toolbar).

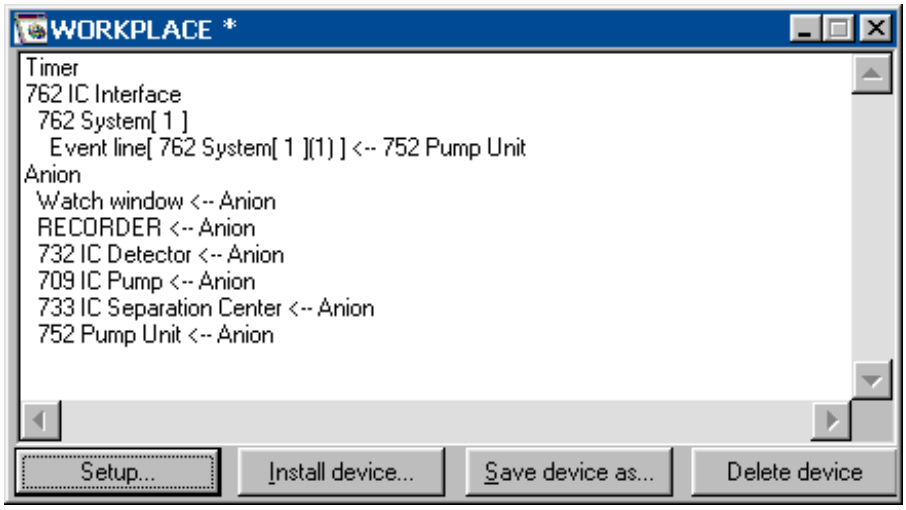


Details to the other steps of the system wizard procedure (installation of devices, processing method, and data source) see *section 4.1.1*.

5.1.2 Add interfaces in workplace window

IC NET / Options / Devices setup

Open the **WORKPLACE** window which shows all interfaces and devices installed. This window can be opened only by the user with **Administrator** access level.



Click on **<Install device>** to open the **Adding interfaces to your workplace** window and proceed as described in *section 5.1.1*.

5.1.3 Delete interfaces

IC NET / Options / Devices setup

Open the **WORKPLACE** window which shows all interfaces and devices installed. This window can be opened only by the user with **Administrator** access level. Select the desired interface and click on **<Delete device>** to delete the interface from the workplace.

5.2 762 IC Interface

5.2.1 762 IC Interface features

The Metrohm **762 IC Interface** is available as a one system version (2.762.0010) or a two system version (2.762.0020). Each system can control a complete ion chromatography or HPLC equipment and contains the following parts:

- Two 24-bit **Analog-to-Digital Converters** (often abbreviated as **ADC**) to acquire two analog signals from two different detectors simultaneously (for example conductivity detection and UV detection).
- One **external start input**.
- One **start button** at the interface front panel.
- **RS232 communication ports** to control up to eight devices of a complete ion chromatography equipment.
- Seven **Event output lines**.

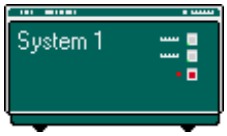
The 762 IC Interface is normally connected to a PC COM port using the 6.2134.100 connecting cable.

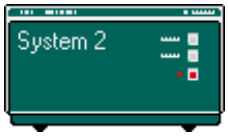
For detailed information about the 762 IC Interface see **762 Instructions for Use**.

5.2.2 762 icon on the toolbar

The **762 icon** is available on the toolbar if a **762 IC Interface** has been installed with the new system wizard or by using the **<Install device>** option of the **WORKPLACE** window (see *section 5.1.2*). By clicking this icon the **762 IC Interface** window for parameter settings opens.

5.2.3 762 icons in the system window





The **762 System 1** and **762 System 2 icons** are available in the **SYSTEM** window if the **762 System [1]** or **762 System [2]** have been installed with the **Install existing devices** option (see *section 6.1.3*).

By clicking this icon using the right mouse button, the following menu items can be selected:

Open Open the **762 System [#] window** for programming the event output lines (this window can also be opened by double-clicking the icon).

Unlink Delete the **762 icon** from the system.

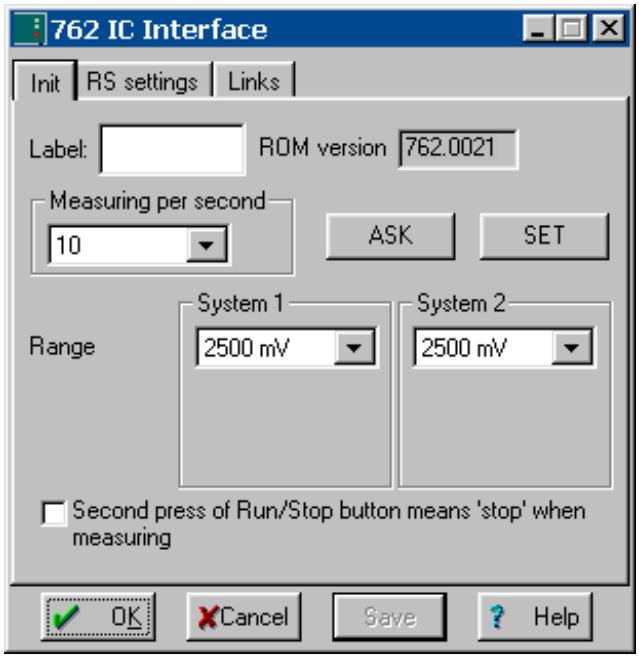
5.2.4 762 IC Interface window

762 icon / Open

The **762 IC Interface** window for parameter settings is opened by selecting this menu option with the right mouse button or by clicking the **762 icon** on the toolbar. It consists of three tabs **Init**, **RS settings**, and **Links**.

Init

The **Init** tab of the **762 IC Interface** window contains data acquisition parameters for the 762 IC Interface.



Label	Optional label to **name** the interface with maximum 8 characters.
ROM version	Instrument program version number.
Measuring per second	Number of data points measured per s. Entry range: **10, 20, 30, 50, 60 points/s**
Range	Range for AD converter. Example: converts ± 2500 mV to 2^{24} bits Entry range: **2500, 1250, 625, 312.5, 156.25, 78.125, 39.062 mV**

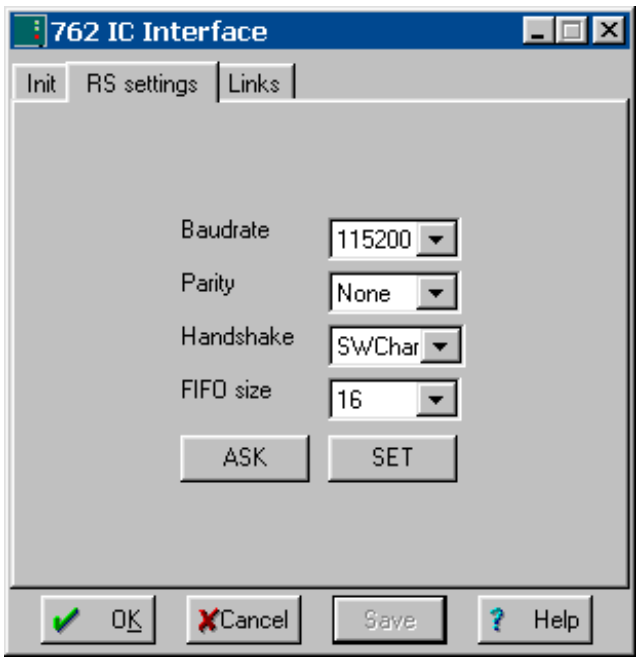
Second press on RUN/STOP means 'stop' when measuring

If this option is **enabled**, the running data acquisition will be stopped if the RUN/STOP button on the 762 IC Interface front panel is pressed. This is equal to **Stop determination**.
If this option is **disabled**, the running data acquisition will not be stopped if the RUN/STOP button on the 762 IC Interface front panel is pressed.

<ASK>	Read current parameters from 762 IC Interface.
<SET>	Send current parameters to 762 IC Interface.

RS settings

The **RS settings** tab of the **762 IC Interface** window contains RS232 parameters for the 762 IC Interface.

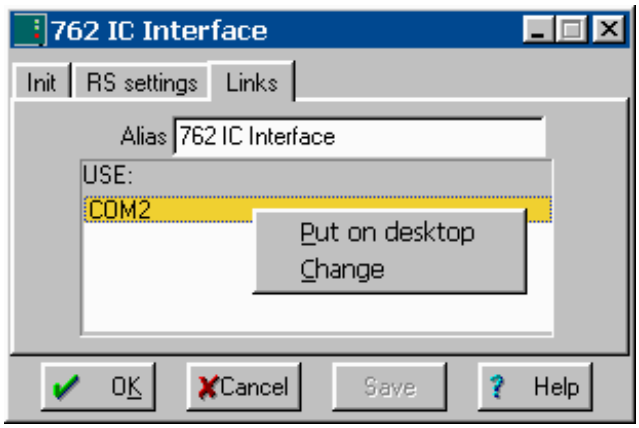


Baud Rate	Baud rate of the device. Selection: **1200...115200** Default value: **115200**
Parity	Parity check. Selection: **None**, **Even**, **Odd** Default value: **None**
Handshake	Enable/disable software handshake mode. Selection: **Swchar**, **none** Default value: **SWchar**
FIFO size	Intermediate memory in byte. Selection: **1...16** Default value: **16**

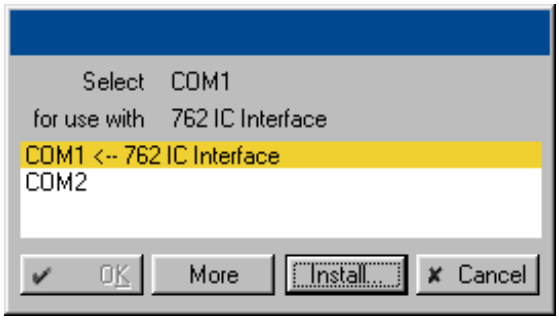
<ASK>	Read current parameters from 762 IC Interface.
<SET>	Send current parameters to 762 IC Interface.

Links

The **Links** tab of the **762 IC Interface** is used for COM port selection and settings.



Alias	Name of the interface or device.
COM #	If this entry is clicked with the right mouse button, the following menu appears:
Put on desktop	Possibility for setting COM port parameters (details see on-line help).
Change	Possibility for changing the COM port. The following window is opened, where the COM port can be changed by clicking on the desired entry.



5.2.5 762 Event output lines

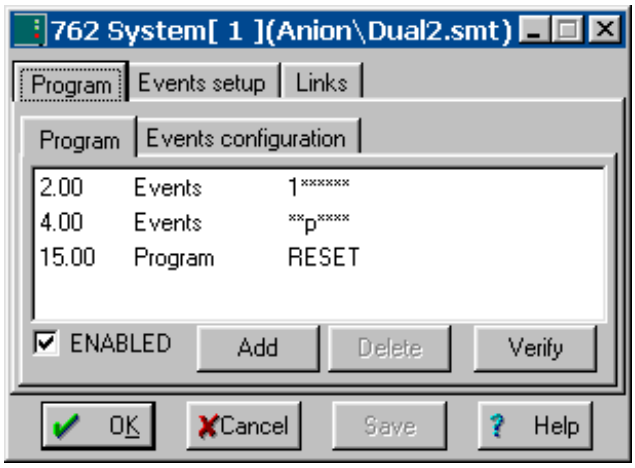
762 System [#] icon / Open

The **762 System [#]** window with programs and settings for the seven event output lines is opened by selecting this menu option with the right mouse button or by double-clicking the **762 icon** in the **SYSTEM** window. It consists of the tabs **Program** and **Events setup**.

Time program

On the **Program** tab of the **762 System [#]** window a user-defined time program for the event output lines of the 762 IC Interface can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment

the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



The **Program** tab contains the two following subpages:

Program	Main time program with all program steps.
Events configuration	Possibility for creation of user-defined remote commands.

Program

On the **Program** subpage, program steps including time, program instruction and parameter can be entered.

First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below). In addition to these predefined instructions, user-defined remote commands can be entered if activated on the **Events configuration** tab.
Third column	**Parameter** for program instruction (see below).

ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

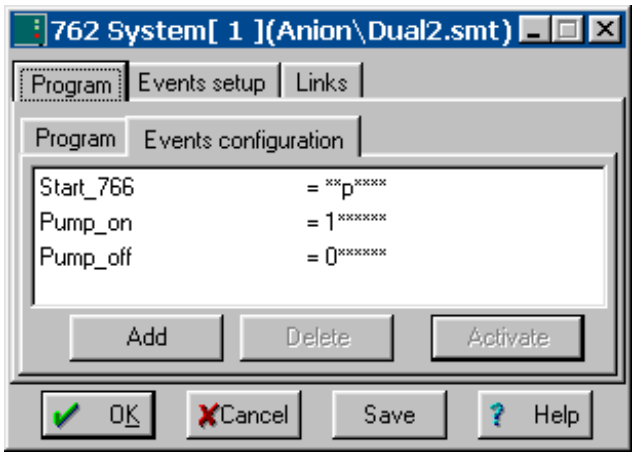
List of program instructions

The following program instructions can be added to the time program on the **Program** subpage:

Instruction	*Parameter entry*	*Meaning*
Events	**0, 1, p, ***	Set **event output lines** 1...7 to the desired values. For entry of the first value, enter **1**, **0**, **p** or ***. For entry of the other values, move the cursor in front of the value to be changed and enter **1**, **0**, **p** or ***.
Program	**END, RESET**	The **END** flag can be used to end a program, especially if the program time should be longer than the chromatogram duration. Additional steps after this flag are not allowed. The **RESET** flag is used to reset the parameters to the system startup values.

Events configuration

On the **Events configuration** subtab user-defined event commands can be defined, which can be inserted into a time program after being activated with **<Activate>**.



Name (1st column) User-definable name of the event command (e.g. **Start_766**).

Event command (2nd column)

Setting the event output lines 1…7.
Selection:

0	(line off, inactive, open)
1	(line on, active, 0 V)
p	(pulse, pulse length 150 ms)
*****	(leave line in current status)

For entry of the first value, enter **1**, **0**, **p** or *****.
For entry of the other values, move the cursor in front of the value to be changed and enter **1**, **0**, **p** or *****.

<Add>	Add new remote command.
<Delete>	Delete selected remote command.
<Activate>	Activate the defined remote commands for insertion into the time program.

Events setup

The **Events setup** tab of the **762 System [#]** window contains the **startup values** for the seven event output lines of system 1 or system 2 of the 762 IC Interface. These startup values are sent each time the system is connected or a determination is started.

Each event output line can be set to the following values:

0 Line off, inactive (open)

1 Line on, active (0 V)

For technical information see **762 Instructions for Use**.

5.3 771 Compact Interface

5.3.1 771 Compact Interface features

The Metrohm **771 Compact Interface** is a two channel Analog-to-Digital Converter to acquire two analog signals from two different detectors simultaneously or time independent. It contains the following parts:

- Two 24-bit **Analog-to-Digital Converters** (often abbreviated as **ADC**) to acquire two analog signals from two different detectors simultaneously (for example conductivity detection and UV detection).
- Two **external start inputs**.

The 771 Compact Interface is normally connected to a PC COM port using the 6.2134.100 connecting cable. The 6.2128.170 cable is used to acquire the analog signal from the 732 IC Detector (or another detector) and to start the data acquisition with contact closure from the 733 IC Separation Center.

For detailed information about the 771 Compact Interface see **771 Instructions for Use**.

5.3.2 771 icon on the toolbar

The **771 icon** is available on the toolbar if a **771 Compact Interface** has been installed with the **New system wizard** or by using the **<Install device>** option of the **WORKPLACE** window (see *section 5.1.2*). By clicking this icon the **771 Compact Interface** window for parameter settings opens.

5.3.3 771 Compact Interface window

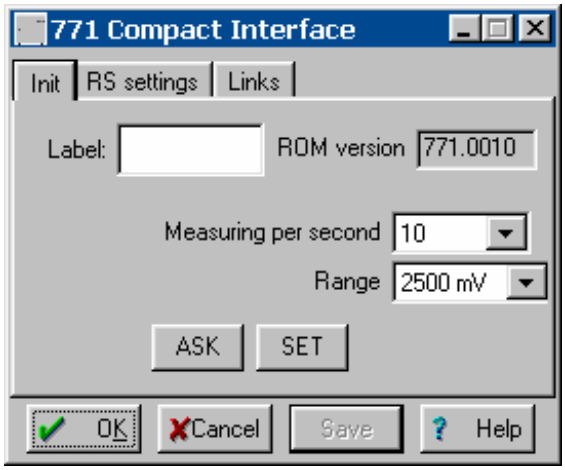
771 icon / Open

The **771 Compact Interface** window for parameter settings is opened by selecting this menu option with the right mouse button or by clicking the **771 icon** on the toolbar. It consists of three tabs **Init**, **RS settings**, and **Links**.

Init

The **Init** tab of the **771 Compact Interface** window contains data acquisition parameters for the 771 Compact Interface.

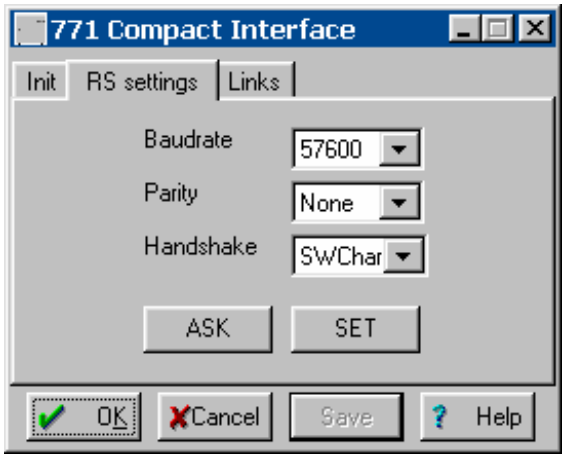
Label	Optional label to **name** the interface with maximum 8 characters.
ROM version	Instrument program version number.
Measuring per second	Number of data points measured per s. Entry range: **10, 20, 30, 50, 60 points/s**



Range	Range for AD converter. Example: converts ± 2500 mV to 2^{24} bits Entry range: **2500, 1250, 625, 312.5, 156.25, 78.125, 39.062 mV**
<ASK>	Read current parameters from 771 Compact Interface.
<SET>	Send current parameters to 771 Compact Interface.

RS settings

The **RS settings** tab of the **771 Compact Interface** window contains RS232 parameters for the 771 Compact Interface.



Baudrate	Baud rate of the device. Selection: **1200...115200** Default value: **57600**
Parity	Parity check. Selection: **None**, **Even**, **Odd** Default value: **None**
Handshake	Enable/disable software handshake mode. Selection: **Swchar**, **none** Default value: **SWchar**

<ASK>	Read current parameters from 771 Compact Interface.
<SET>	Send current parameters to 771 Compact Interface.

Links

The **Links** tab of the **771 IC Interface** is used for COM port selection and settings (details see *section 5.2.4 Links*).

5.4 Metrohm PC Board

The **2.714.0310 Metrohm PC Board** Interface is a two channel **Analog-to-Digital Converter** (often abbreviated as **ADC**) to acquire two analog signals from two different detectors simultaneously or time independent (e.g. conductivity detection and UV detection).

One or two PC Boards can be installed in the same PC: **PC Board 1** is the first interface, **PC Board 2** is the second interface installed in the PC. They differ in different jumper settings on the board. The «IC Net» program is the successor for the former «IC Metrodata for Windows» program used to work with the PC Boards.

The 6.2128.140 cable is used to connect the analog output of the 732 IC Detector (or another detector) and the contact closure output of the 733 IC Separation Center to the Metrohm PC Board.

The **Metrohm PC Board** must be installed with the new system wizard or by using the **<Install device>** option of the **Workplace** window (see *section 5.1.2*). However, there is no PC Board icon on the toolbar after installation. The PC Board can only be seen in the **Workplace** window opened with **Options** / **Devices setup**. By double-clicking the **MeBoard1** or **MeBoard2** item, the **MeBoard#** window opens with the following tabs:

Device settings	Manual control and startup values for PC Board (it is recommended not to change any of these parameters!).
Links	Window for COM port selection and settings (it is recommended not to change any of these parameters!).

For detailed information about the Metrohm PC Board see on-line help and **Instructions for Use** for «**IC Metrodata for Windows**».

5.5 Global timer

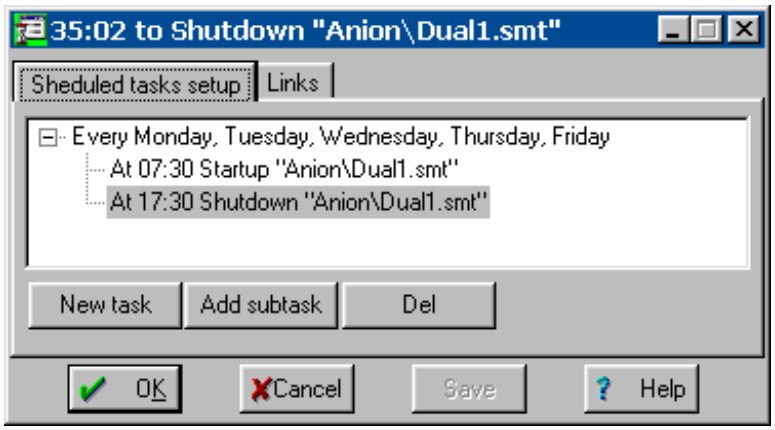
5.5.1 Timer icon

The global timer is used for programming system tasks which are started automatically daily or once at the desired time. The **Global timer icon** is available on the toolbar if the **Timer** has been installed with the new system wizard or by using the **<Install device>** option of the **Workplace** window (see *section 5.1.2*). By clicking this icon the **Timer** window for parameter settings opens.

5.5.2 Timer program

The **Timer** window contains the user-defined **program for system tasks** on the **Scheduled tasks setup** tab. These tasks are started automatically at the day and time defined in the program. On the **Links** tab of this window, a user-defined name can be entered under **Alias** for the timer.

The title line of the **Timer** window shows the current time left in **days:hours:minutes:seconds** until the next task is automatically started.



<New task> Add a new task to the timer program.

<Daily> Selecting this option opens a subwindow for selection of the days at which the task should be started.

<Once> Selecting this option opens a subwindow for selection of time and day at which the task should be started. After the selection of the desired program instruction the system file for which this instruction should be applied must be selected in the **Systems** folder.

<Add subtask>	Add a new subtask for the selected daily task. The **time** and program instruction for this subtask has to be entered in the opened subwindow and the system file to which this instruction should be applied must be selected in the **Systems** folder.
<Del>	Delete the selected task from the timer program.

The following **program instructions** can be used for user-defined **event program tasks** in the **Timer program** window:

Open	Open the selected system.
Close	Close the selected system and disconnect it from the workplace.
Startup	**Startup hardware** of the selected system.
Start	**Start determination** using the selected system.
Stop	**Stop determination** using the selected system.
Shutdown	**Shutdown hardware** of the selected system.

6 Devices

The «IC Net» program supports remote control for Metrohm and Bischoff instruments. Each instrument within a system is a **device**. Devices are stored as device files (***.dev**) in the **Devices** directory. All **Metrohm devices** start with **Me*.dev** and all **Bischoff devices** start with **Bi*.dev**.

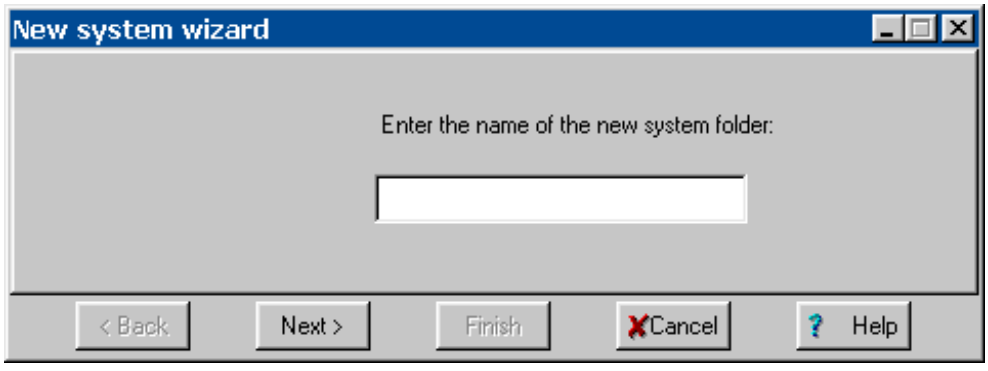
6.1 Device installation

6.1.1 Install devices at system creation

IC NET / File / New / System

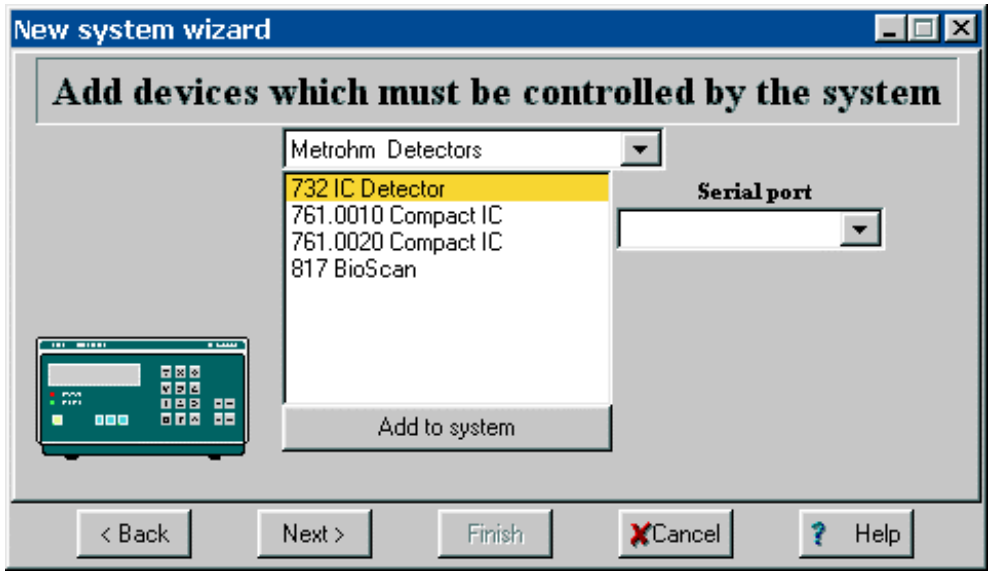
The **New system wizard** window and a new **SYSTEM** window are opened. The **New system wizard** guides you trough the installation routine step-by-step to build a new system. The next step of the system installation is reached with **<Next>**, the previous step with **<Back>** and the installation is completed with **<Finish>**.

The first step of the system installation is to enter a name for a new system folder within the «IC Net» program path **...\ICNet\Systems**. For every instrument combination, a new folder should be created.



After clicking on **<Next>**, the window for addition of interfaces to the toolbar appears (details see *section 4.1.1*).

After clicking on **<Next>**, the window for addition of devices to the system window appears.



For every device to be controlled with «IC Net», open the group which contains this device, select the device and the **Serial port** of the interface where the device is connected to. After clicking on **<Add to system>**, the device is added to the **SYSTEM** window. If desired, an additional data recorder and a timer of the **More modules** group can be added to the system.

Details to the other steps of the system wizard procedure (processing method, data source) see *section 4.1.1*.

6.1.2 Install new devices in system window

SYSTEM / Setup / New devices/ Install new device

Add new devices to the open **SYSTEM** window using the **New system wizard** window (see above). For every device to be added to the system, open the group which contains this device and select the device and the serial port of the interface where the device is connected to. After clicking on **<Add to system>**, the device is added to the **SYSTEM** window. If desired, an additional data recorder and a timer of the **More modules** group can be added to the system.

6.1.3 Install existing devices in system window

SYSTEM / Setup / New devices/ Link to existing device

Add devices to the open **SYSTEM** window which are already present on the toolbar. This is mostly used to add the **762 IC Interface events**. For every device to be added to the system, select the device and click on **<OK>**.

6.1.4 Delete devices

Icon / Unlink

Devices in a **SYSTEM** window can be deleted by clicking on the device icon using the right mouse button an select the **Unlink** menu item.

6.2 Watch window

6.2.1 Watch window icon

The **watch window icon** is one of the components always present in a new **SYSTEM** window. If the system is connected and this icon is clicked with the right mouse button, the following menu item appears:

Open Open the **WATCH WINDOW** for live display of instrument values (this window can also be opened by double-clicking the watch window icon).

Unlink Delete the **WATCH WINDOW** from the **SYSTEM** window (not recommended).

6.2.2 Watch window settings

Watch window icon / Open

The **WATCH WINDOW** displays all live parameters of the interfaces and devices included in the connected system. It can be set to be opened automatically if a determination or measure baseline is started with **SYSTEM / Setup / Watch window** (see *section 4.4.2*).

The **WATCH WINDOW** can be configured manually by clicking the frame titles inside the window with the right mouse button. This opens the following menu:

Manual arrange Possibility to select the parameters which should be shown or to rearrange the sequence of the displayed parameters. This option opens the **Data source** window for selection of the parameters to be displayed in the watch window. The **Connected** field shows the parameters to be displayed, the **Available** field shows the parameters not to be displayed. The parameters can be moved from one field to the other using the → or ← button.

Auto arrange Automatic arrangement of all important parameters.

The **colors** of the watch window fields and of the **SYSTEM STATE** window can be changed by clicking the fields with the right mouse button. This offers the following possibilities:

Choose color / **Foreground** / **Out of range**
Set display color for field numbers if the measurement value is out of range (overflow or out of limits).

Choose color / **Foreground** / **In range**
Set display color for field numbers if the measurement value is inside the normal range.

Choose color / **Foreground** / **Active**
Set display color for field characters in the **SYSTEM STATE** window for running tasks.

Choose color / **Foreground** / **Passive**
Set display color for field characters in the **SYSTEM STATE** window for finished tasks.

Choose color / **Background** / **Out of range**
Set display color for field background if the measurement value is out of range (overflow or out of limits).

Choose color / **Background** / **In range**
Set display color for field background if the measurement value is inside the normal range.

Choose color / **Background** / **Active**
Set display color for field background in the **SYSTEM STATE** window for running tasks.

Choose color / **Background** / **Passive**
Set display color for field background in the **SYSTEM STATE** window for finished tasks.

The colors set for this fields are also applied to the measurement display fields in the control tabs of some interfaces and devices.

6.3 732 IC Detector

6.3.1 732 IC Detector features

The Metrohm **732 IC Detector** is a conductivity detector for ion chromatography. The associated thermostatable detector block can be used for recording of chromatograms with and without chemical suppression and is normally installed in the 733 IC Separation Center. The two following versions are available:

- **2.732.0010 IC Detector with standard detector block**
- **2.732.0110 IC Detector with metal-free detector block**

The 732 IC Detector, which is normally operated using the keypad of the instrument, can be fully operated using the «IC Net» program. The 732 IC Detector is normally connected to the 762 IC Interface using the 6.2134.080 or 6.2134.090 cable. Examples for interconnections with the 732 IC Detector can be found in the **762 Instructions for Use**.

In order to operate the 732 IC Detector with «IC Net», the following RS settings have to be made using the **[CONFIG]** *key on the 732 IC Detector panel:*

```
>CONFIG/RS settings/handshake:      Swchar
>CONFIG/RS settings/RS control:     on
```

For detailed information about the 732 IC Detector see **732/733 Instructions for Use**.

6.3.2 732 IC Detector icon

The **732 icon** is available in the **SYSTEM** window if a **732 IC Detector** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **732 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **732 IC Detector** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **732 icon** from the system.

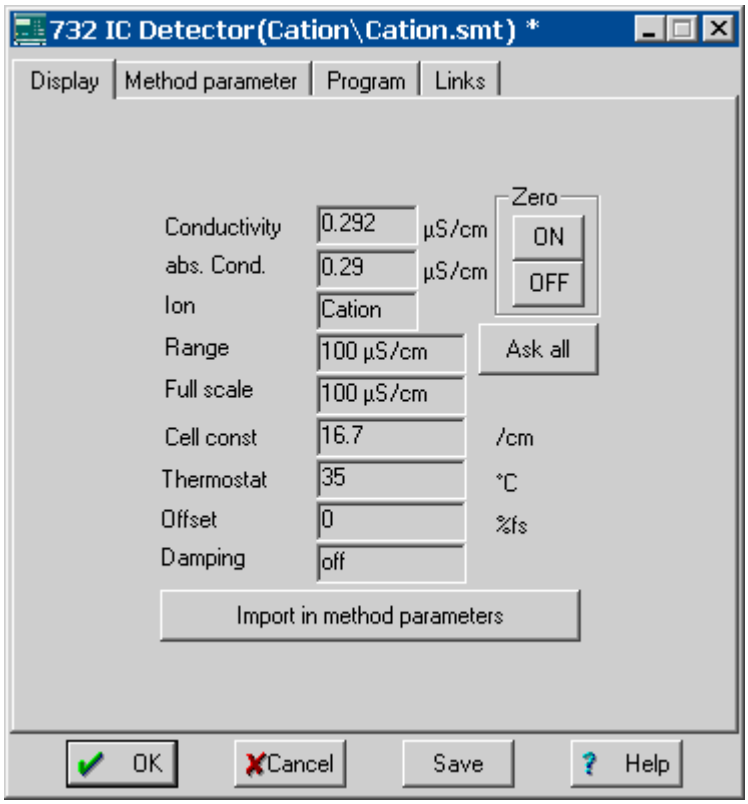
6.3.3 732 IC Detector window

732 icon / Open

The **732 IC Detector** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **732 icon** in the **SYSTEM** window. It consists of the four tabs **Display**, **Method parameter**, **Program**, and **Links**.

Display

The **Display** tab of the **732 IC Detector** window is only available for a **connected system**. It displays the current measurement values and parameters settings of the 732 IC Detector.



Conductivity — Live display of measured conductivity (auto-zero value) in µS/cm. This field is available for the **WATCH WINDOW**. The watch window color is changed to the **Out of range** color if the measured value is more than 80% outside the **Full Scale** range.

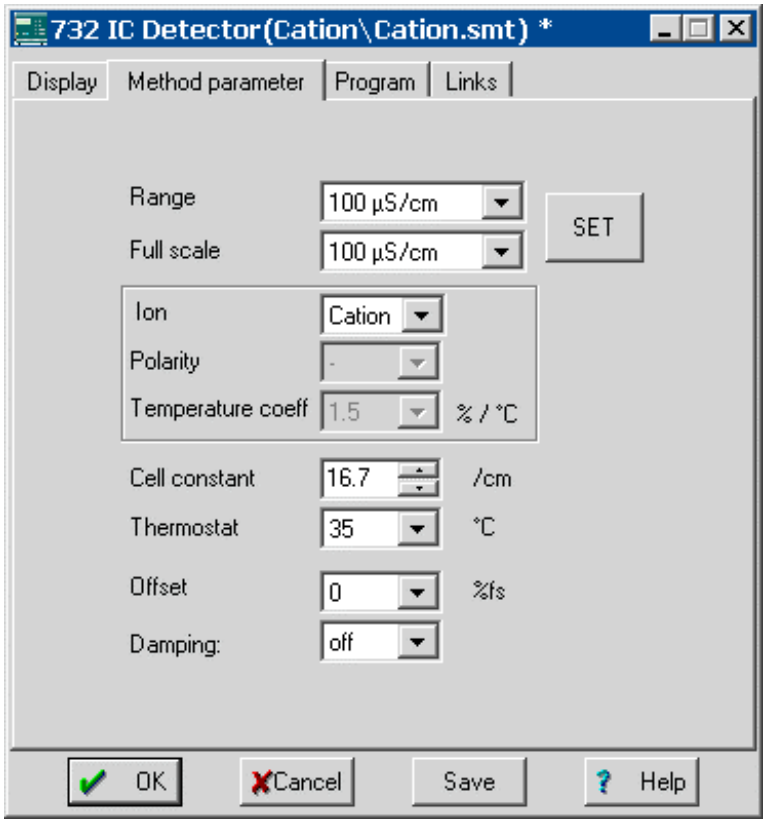
abs. Cond. — Live display of absolute conductivity value in µS/cm. This field is available for the **WATCH WINDOW**. The watch window color is changed to the **Out of range** color if the measured value is bigger or equal to 110% of **Range**.

Ion — Display of ion settings:
Anion: **polarity = +, temperature coeff. = 2.5**
Cation: **polarity = –, temperature coeff. = 1.5**

Range	Display of measuring range in µS/cm.
Full scale	Display of full scale range in µS/cm.
Cell const.	Display of cell constant of the conductivity cell in /cm.
Thermostat	Display of temperature within in the detector block.
Offset	Display of offset of the zero point.
Damping	Display of electronic damping of the analog output.
Zero <ON>	Triggers the auto-zero function.
Zero <OFF>	Switch off the auto-zero function.
<Ask all>	Update all display values.
<Import in method parameters>	Copy displayed parameters into the **Method parameter** tab.

Method parameter

The **Method parameter** tab of the **732 IC Detector** window contains the method startup values for the instrument. These values are sent and applied to the 732 IC Detector by **Start determination** and **Startup hardware**, or if the values are sent manually with **<SET>**.

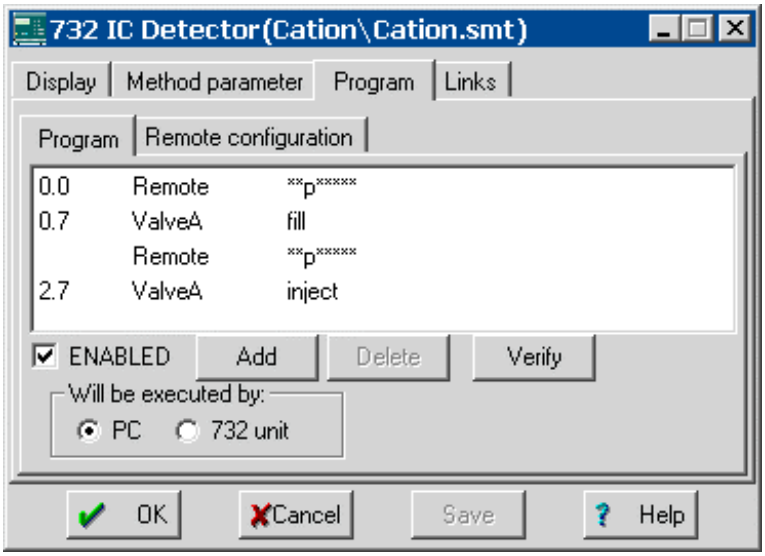


Range	Measuring range in µS/cm Selection: **100, 200, 500 µS/cm** and **1, 2, 5, 10 mS/cm**
Full scale	The full scale range (operating range) sets the desired sensitivity for the analog output. The possible values of the full scale range in µS/cm depend on the preset measuring **Range**.
Ion	Combination of polarity and temperature coefficient:
Anion	**polarity = +, temperature coeff. = 2.5**
Cation	**polarity = –, temperature coeff. = 1.5**
Custom	independent selection of **polarity** and **temperature coeff.**
Polarity	Polarity of the analog output signal: **+** positive polarity (e.g. for **anions**) **–** negative polarity (e.g. for **cations**)
Temperature coeff.	Converts automatically the conductivity from the operating temperature of the measuring cell to the reference temperature of 20°C. Selection: **1.5, 2.5 %/°C**
Cell constant	Cell constant of the conductivity cell in /cm. Entry range: **13 ... 21 /cm**
Thermostat	Operating temperature of the conductivity cell within in the detector block. Selection: **25, 30, 35, 40, 45 °C** and **off**
Offset	Offset of the zero point of the conductivity. Selection: **0, 10, 50 %fs**
Damping	Electronic damping of the analog output Selection: **on, off**
<SET>	Send current parameters immediately to the 732 IC Detector. Parameters are not stored in the system file (***.smt**) as long as the file is not saved.

For detailed information about the parameters of the 732 IC Detector see **732/733 Instructions for Use**.

Time program

On the **Program** tab of the **732 IC Detector** window a user-defined time program for the remote output lines of the 732 IC Detector can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



The **Program** tab contains the two following subpages:

Program	Main time program with all program steps.
Remote configuration	Possibility for creation of user-defined remote commands.

Program

On the **Program** subpage, program steps including time, program instruction and parameter can be entered.

First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below). In addition to these predefined instructions, user-defined remote commands can be entered if activated on the **Remote configuration** tab.
Third column	**Parameter** for program instruction (see below).

ENABLED	Enable program start (a disabled program is not started).
Will be executed by	Selection if the time program will be executed by the **PC** or the **732 unit**.

<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

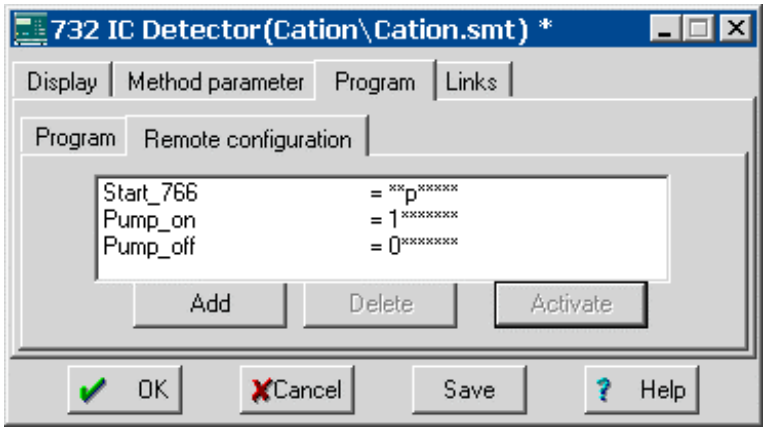
The following program instructions can be added to the time program on the **Program** subpage:

Instruction	*Parameter entry*	*Meaning*
Remote	**0, 1, ***	Set remote output lines 1...8 to the desired values. For entry of the first value, enter **1**, **0** or *****. For entry of the other values, move the cursor in front of the value to be changed and enter **1**, **0** or *****.
Flag	**reset, end**	Set program flag. The **end** flag can be used to end a program, especially if the program time should be longer than the chromatogram **duration**. Additional steps after this flag are not allowed. The **reset** flag is used to reset the parameters to the system startup values.
Range	**100, 200, 5000 µS/cm 1, 2, 5, 10 mS/cm**	Set measuring range to the selected value.
FS	**0.05 µS/cm ... 10 mS/cm**	Set full scale range to the selected value (depends on **Range** setting).
Zero	**on, off**	Switch on or off the auto-zero function.
Polarity	**+, –**	Reset the polarity of the output signal.
Mark		Trigger marking signal.
ValveA	**fill, inject**	Switch injection valve A to "**inject**" or "**fill**" position.
ValveB	**fill, inject**	Switch injection valve B to "**inject**" or "**fill**" position.
Suppressor		Switch suppressor module to the next position.
PumpRS	**on, off**	Switch on or off the high-pressure pump connected to the 732 IC Detector.
Flow	**0.01 ... 5 mL/min**	Set flow rate of the high-pressure pump to the desired value.

Pmax	**0.0 ... 25.0 MPa**	Set maximum pressure limit for the high-pressure pump connected to the 732 IC Detector to the desired value.
Pmin	**0.0 ... 25.0 MPa**	Set minimum pressure limit for the high-pressure pump connected to the 732 IC Detector to the desired value.

Remote configuration

On the **Remote configuration** subtab user-defined remote commands can be defined, which can be inserted into a time program after being activated with **<Activate>**.



Name (1st column) User-definable name of the remote command (e.g. **Start_766**).

Remote command (2nd column)

Setting the remote output lines 1…8.

- **0** (line off, inactive, open)
- **1** (line on, active, 0 V)
- ***** (leave line in current status)

For entry of the first value, enter **1**, **0** or *****. For entry of the other values, move the cursor in front of the value to be changed and enter **1**, **0** or *****.

<Add>	Add new remote command.
<Delete>	Delete selected remote command.
<Activate>	Activate the defined remote commands for insertion into the time program.

Links

The **Links** tab of the **732 IC Detector** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.4 761 Compact IC

6.4.1 761 Compact IC features

The Metrohm **761 Compact IC** is a PC-controlled system for ion chromatographic analyses. The two following versions are available:

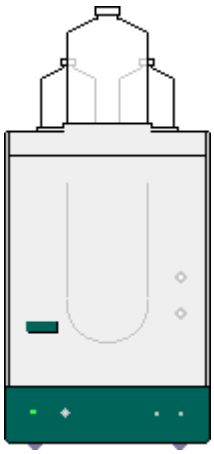
- **2.761.0010 Compact IC without suppressor module**
- **2.761.0020 Compact IC with suppressor module**

All the parts of the 761 Compact IC like injection valve, high-pressure pump, conductivity detector, suppressor module and peristaltic pump, are normally fully controlled by the «**761 Compact IC**» program. However, the 761 Compact IC can also be operated using the «**IC Net**» program. This program also enables the operation of more than one 761 Compact IC with one PC.

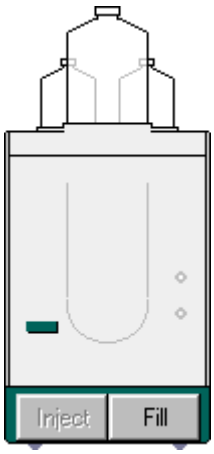
The 761 Compact IC is normally connected to a PC COM port using the 6.2134.100 connecting cable.

For detailed information about the 761 Compact IC see **761 Instructions for Use**.

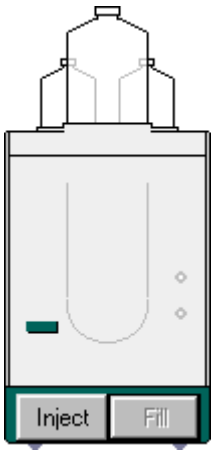
6.4.2 761 Compact IC icon



System disconnected



System connected
Injection valve in "**INJECT**" position



System connected
Injection valve in "**FILL**" position

The **761 icon** is available in the system window if a **761 Compact IC** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.3*). If the system is connected, the **761 icon** contains two buttons for manual control of the **injection valve** at the 761 Compact IC:

<Inject>	Switch the injection valve to the "Inject" position.
<Fill>	Switch the injection valve to the "Fill" position.

If the system is connected and the **761 icon** is clicked with the right mouse button, the following menu appears:

Open	Open the **761 Compact IC** window for parameter settings (this window can also be opened by double-clicking the icon).
Hardware	Open the hardware settings window.
Diagnostics	Open the diagnostics window (for service personal only).
Unlink	Delete the **761 icon** from the system.

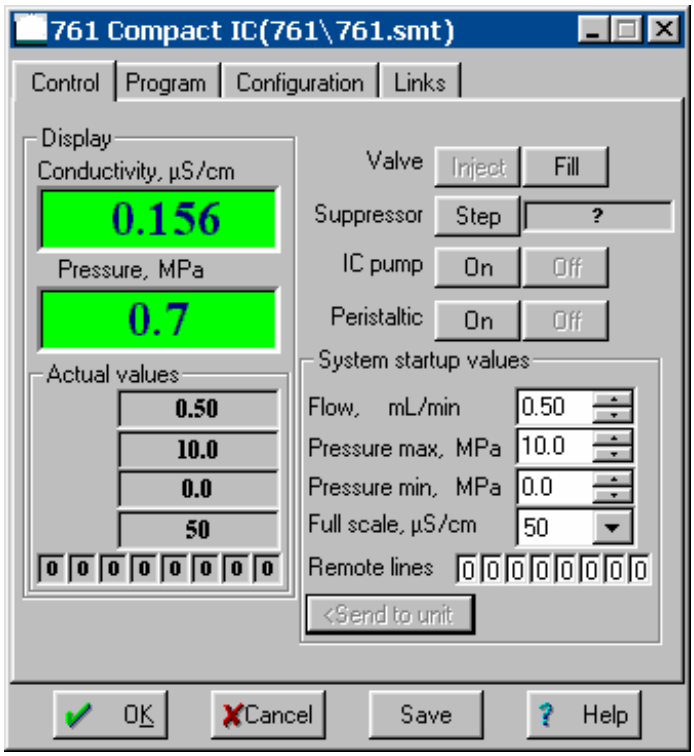
6.4.3 761 Compact IC window

761 icon / Open

The **761 Compact IC** window for parameter settings is opened by selecting this menu option with the right mouse button or by clicking the **761 icon** on the toolbar. It consists of the five tabs **Control**, **Initial**, **Program**, **Configuration**, and **Links**.

Control

The **Control** tab of the **761 Compact IC** window is only available for a **connected system**. It allows **manual control** of the 761 Compact IC functions and setting of startup values to be sent to the instrument.



Conductivity, µS/cm	Live display of measured conductivity.
Pressure, MPa	Live display of measured pressure. The color settings for this two fields can be changed by clicking the fields with the right mouse button (see *section 6.2.2*).
Actual values	Display of actual values.
Flow, mL/min	Display of current flow rate of the high-pressure pump.
Pressure max, MPa	Display of current maximum pressure limit for high-pressure pump.
Pressure min, MPa	Display of current minimum pressure limit for high-pressure pump.
Full scale, µS/cm	Display of current full scale range.
Remote lines	Display of current remote line settings.
Valve	Injection valve.
<Inject>	Switch injection valve to "INJECT" position.
<Fill>	Switch injection valve to "FILL" position
Suppressor	Suppressor module.
<Step>	Switch the suppressor module to the next position. The time since the last switching of the suppressor module is displayed in the field beside the **<Step>** button.
IC pump	High-pressure pump.
<On>	Start high-pressure pump.
<Off>	Stop high-pressure pump.
Peristaltic	Peristaltic pump.
<On>	Start peristaltic pump.
<Off>	Stop peristaltic pump.
System startup values	The system startup values are sent and applied to the 761 Compact IC each time the system is connected, a determination is started, or the values are sent manually with **<Send to unit>**.
Flow, mL/min	Startup value for flow rate of the high-pressure pump. Entry range: **0.20** ... **2.50 mL/min**
Pressure max, MPa	Startup value for maximum pressure limit for high-pressure pump. This limit is controlled even without connection to the PC. Entry range: **0.0** ... **25.0 MPa**
Pressure min, MPa	Startup value for minimum pressure limit for high-pressure pump. This limit is controlled

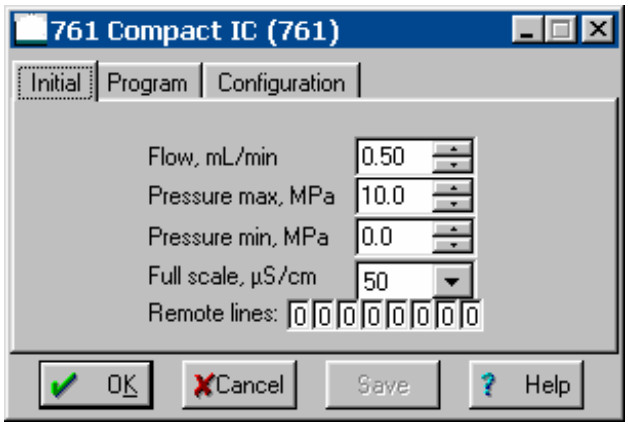
even without connection to the PC.
Entry range: **0.0** ... **25.0 MPa**

Full scale, µS/cm Startup value for full scale range.
Selection: **50**, **250**, **1000 µS/cm**

Remote lines Startup value for remote line settings 1…8.
Selection: **0**, **1**

Initial

The **Initial** tab of the **761 Compact IC** window for settings of system startup values is only available for a **disconnected system**.



Flow, mL/min Startup value for flow rate of the high-pressure pump.
Entry range: **0.20** ... **2.50 mL/min**

Pressure max, MPa Startup value for maximum pressure limit for high-pressure pump.
Entry range: **0.0** ... **25.0 MPa**

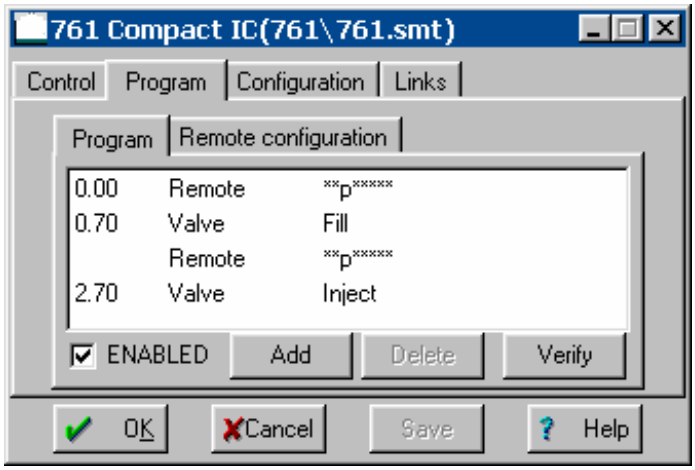
Pressure min, MPa Startup value for minimum pressure limit for high-pressure pump.
Entry range: **0.0** ... **25.0 MPa**

Full scale, µS/cm Startup value for full scale range.
Selection: **50**, **250**, **1000 µS/cm**

Remote lines Startup value for remote line settings 1…8.
Selection: **0**, **1**

Time program

On the **Program** tab of the **761 Compact IC** window a user-defined time program for the remote output lines of the 761 Compact IC can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



The **Program** tab contains the two following subpages:

Program	Main time program with all program steps.
Remote configuration	Possibility for creation of user-defined remote commands.

Program

On the **Program** subpage, program steps including time, program instruction and parameter can be entered.

First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below). In addition to these predefined instructions, user-defined remote commands can be entered if activated on the **Remote configuration** tab.
Third column	**Parameter** for program instruction (see below).
ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

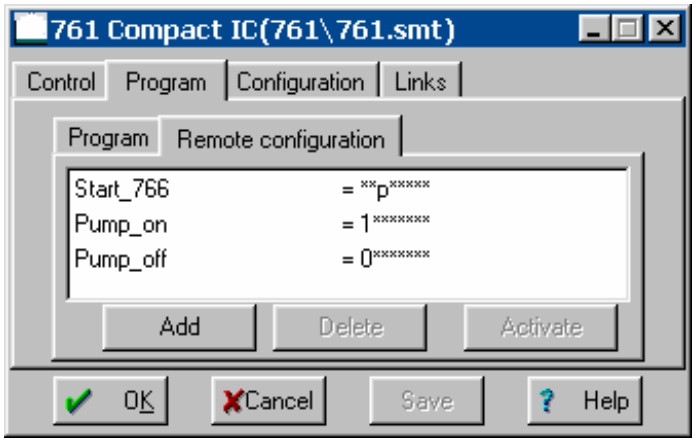
List of program instructions

The following program instructions can be added to the time program on the **Program** subpage:

Instruction	*Parameter entry*	*Meaning*
Valve	**Inject, Fill**	Switch **injection valve** to "INJECT" or "FILL" position.
FullScale	**50, 250, 1000 µS/cm**	Set **full scale range** to the selected value.
ICPump	**on, off**	Switch on or off the **high-pressure pump**.
Flow	**0.2 ... 2.5 mL/min**	Set **flow rate** of the high-pressure pump to the desired value.
Pmax	**0.0 ... 25.0 MPa**	Set **maximum pressure limit** for the high-pressure pump to the desired value.
Pmin	**0.0 ... 25.0 MPa**	Set **minimum pressure limit** for the high-pressure pump to the desired value.
Remote	**0, 1, *, p**	Set **remote output lines** 1...8 to the desired values. For entry of the first value, enter **1**, **0**, **p** or *****. For entry of the other values, move the cursor in front of the value to be changed and enter **1**, **0**, **p** or *****.
Program	**END, RESET**	The **END** flag can be used to end a program, especially if the program time should be longer than the chromatogram duration. Additional steps after this flag are not allowed. The **RESET** flag is used to reset the parameters to the system startup values.
Suppressor		Switch **suppressor module** to the next position.
Peristaltic	**on, off**	Switch on or off the **peristaltic pump**.

Remote configuration

On the **Remote configuration** subtab user-defined remote commands can be defined, which can be inserted into a time program after being activated with **<Activate>**.



Name (1st column) User-definable name of the remote command (e.g. **Start_766**).

Remote command (2nd column)

Setting the remote output lines 1…8.

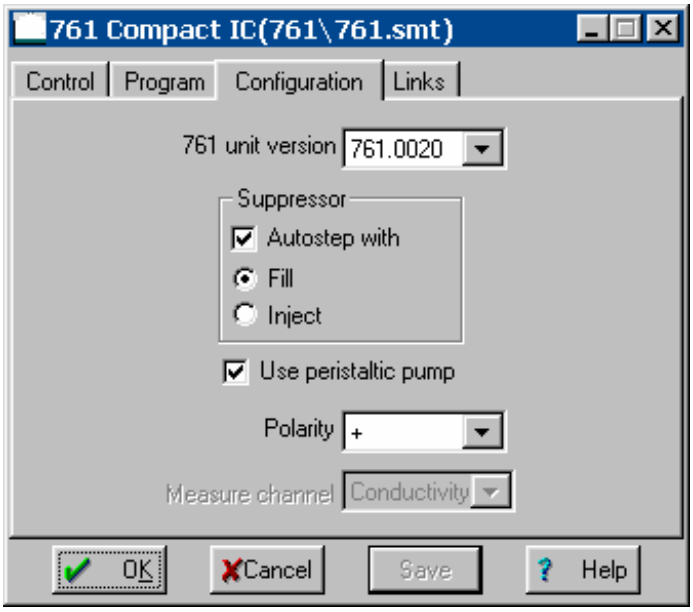
- **0** (line off, inactive, open)
- **1** (line on, active, 0 V)
- **p** (pulse)
- ***** (leave line in current status)

For entry of the first value, enter **1**, **0**, **p** or *****. For entry of the other values, move the cursor in front of the value to be changed and enter **1**, **0**, **p** or *****.

<Add>	Add new remote command.
<Delete>	Delete selected remote command.
<Activate>	Activate the defined remote commands for insertion into the time program.

Configuration

The **Configuration** tab in the system settings window contains configuration settings for the 761 Compact IC.



761 unit version	Selection of instrument version: **761.0010** = 761 Compact IC without suppressor **761.0020** = 761 Compact IC with suppressor
Suppressor	Suppressor module:
Autostep with	Automatic switching to the next position each time the injection valve is switched either to the **Fill** or to the **Inject** position.
Use peristaltic pump	If this option is disabled, the peristaltic pump is not switched on automatically at the start of a determination or with **Startup hardware**.
Polarity	Selection of the output signal polarity: **+** positive polarity (for anions) **–** negative polarity (for cations)
Measure channel	Display of the data source selected in the **Data source** window (see *section 6.19.2*).

Links

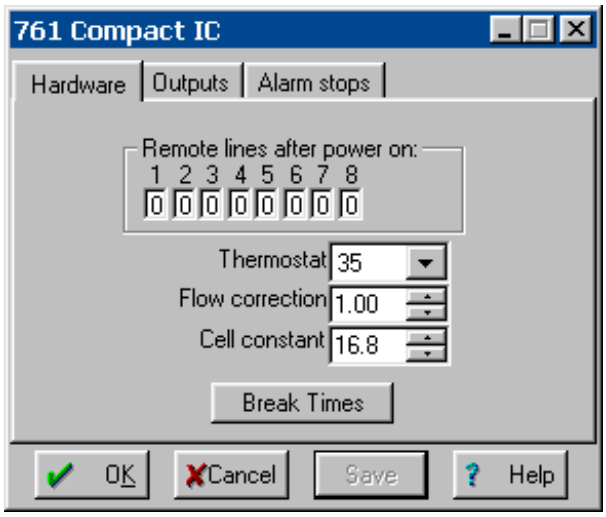
The **Links** tab of the **761 Compact IC** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.4.4 Hardware settings

Selection of the **Hardware** menu item of the **761 icon** using the right mouse button opens the hardware settings window consisting of the three tabs **Hardware**, **Outputs** and **Alarm stops**.

Hardware

The **Hardware** tab of the hardware settings window defines general parameters which are set automatically at power on of the 761 Compact IC.



Remote lines after power on

The remote output lines 1…8 are set to this values after power on or a manual stop with **Shutdown hardware**.
Selection: **0**, **1**

Thermostat

Operating temperature of the conductivity cell.
Selection: **25**, **30**, **35**, **40**, **45 °C**, **off**

Thermostatting functions only if the ambient temperature is at least 5 °C lower than the operating temperature. It normally takes 30…60 min after power on until a temperature stability of ±0.01 °C is attained.

Flow correction

Factor for correction of the difference between displayed and actual flow rate of the high-pressure pump.
Range: **0.9** ... **1.09**

The flow correction is determined by measurement of the actual flow rate with the aid of a measuring cylinder as follows:

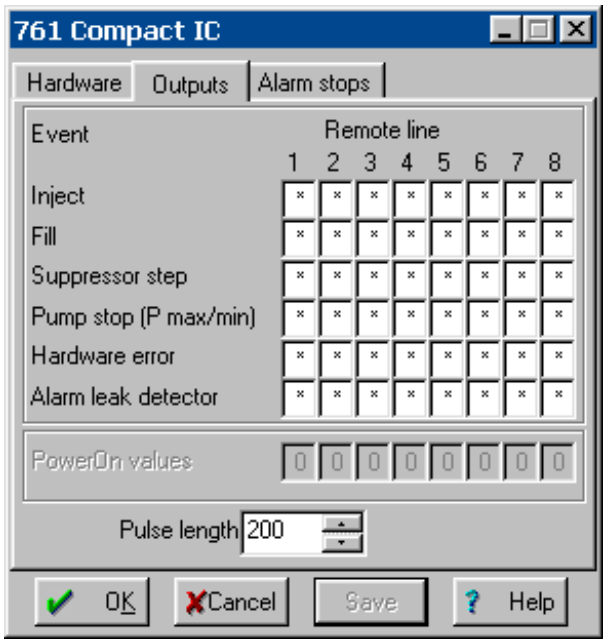
$$\textbf{Flow correction} = \frac{\textit{Displayed flow rate}}{\textit{Measured flow rate}}$$

Cell constant	Cell constant of the conductivity cell for correct display of the absolute conductivity. Enter the cell constant printed on the detector block into this field. Range: **0.1** ... **99.9** /**cm** For a precise determination of the cell constant, pump a calibration solution of known conductivity through the IC system, observe the displayed conductivity and change the cell constant until the correct conductivity value is displayed.
<Break times>	Possibility for changing the break times for injection valve **Valve** and suppressor module **Suppressor**.

These values should only be changed after consulting the Metrohm Service.

Outputs

The **Outputs** tab of the hardware settings window defines remote output signals to be set automatically if specific events occur.

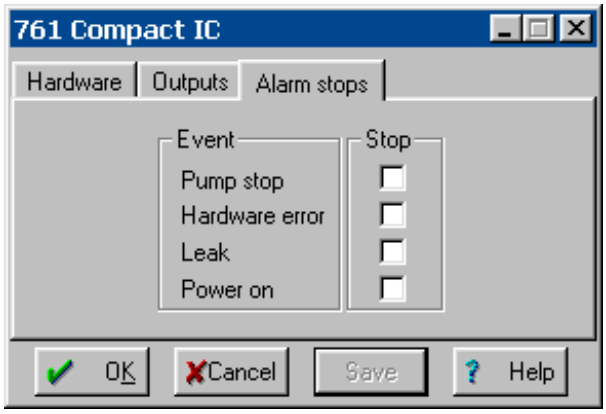


Event	Events for automatic remote signal output:
Inject	Switching of the injection valve to the "INJECT" position.
Fill	Switching of the injection valve to the "FILL" position.
Suppressor step	Switching of the suppressor module to the next position.

Pump stop (P max/min)	Pump stopped because pressure limits are exceeded.
Hardware error	Hardware error detected at the 761 Compact IC (high-pressure pump, injection valve, or suppressor not working correctly).
Alarm leak detector	Leak detector has detected solvent in the instruments interior.
Remote line	Set remote output lines 1…8. Selection: **0** (line off, inactive, open) **1** (line on, active, 0 V) **p** (pulse output) ***** (leave line in current status)
PowerOn values	Display of the power on startup values for remote output lines set on the **Hardware** tab.
Pulse length	Length of a pulse in ms.

Alarm stops

The **Alarm stops** tab of the hardware settings window defines the events for which the 761 Compact IC is stopped immediately. At an alarm stop, high-pressure pump and peristaltic pump are stopped immediately, the running determination and the active sample queue are also stopped.



Event	Events for alarm stop:
Pump stop	Pump stopped because pressure limits are exceeded.
Hardware error	Hardware error detected at the 761 Compact IC (high-pressure pump, injection valve, or suppressor not working correctly).

Leak	Leak detector has detected solvent in the instruments interior. This information is also stored in the instrument itself, so that it is stopped automatically even without connection to the PC.
Power on	Temporary power failure at the 761 Compact IC hardware.

6.5 817 Bioscan

6.5.1 817 Bioscan features

The Metrohm **817 Bioscan** is a pulsed amperometric detector for use with a modular IC system. The instrument is designed to carry out determination of carbohydrates but is also capable of analyzing alcohols (polyalcohols), sugar alcohols, as well as other oxidizable substances.

The 817 Bioscan is fully operated using the «IC Net» program. It is normally connected directly to a PC COM port using the 6.2134.080 or 6.2134.090 cable and the 6.2125.150 Adaptor.

For detailed information about the 817 Bioscan see **817 Instructions for Use**.

6.5.2 817 Bioscan icon

The **817 icon** is available in the system window if a **817 Bioscan** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **817 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **817 Bioscan** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **817 icon** from the system.

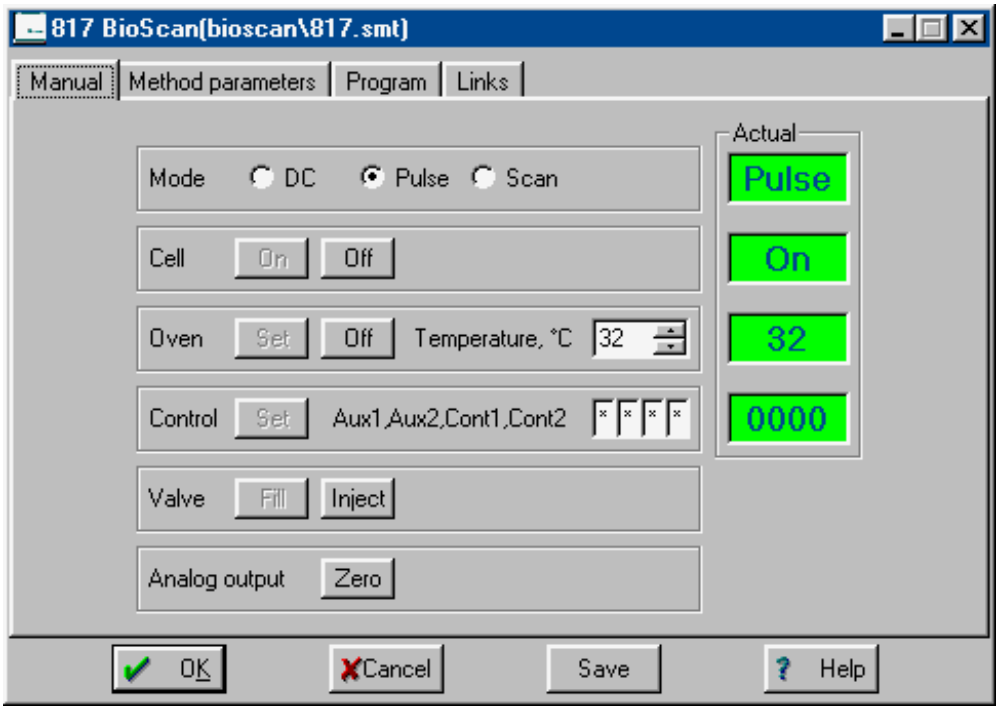
6.5.3 817 Bioscan window

817 icon / Open

The **817 Bioscan** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **817 icon** in the **SYSTEM** window. It consists of the four tabs **Manual**, **Method parameters**, **Program**, and **Links**.

Manual

The **Manual** tab of the **817 Bioscan** window is only available for a **connected system**.



Mode — Selection of detector mode:

- **DC** — In **DC** mode, a constant potential is applied to the working electrode, the analytes are oxidized or reduced in accordance with their electrochemical properties.
- **Pulse** — The **Pulse** mode works with three different working potentials, which are applied cyclically. This frees the electrode surface from any adhering reaction products after each sweep and an activated surface is produced for the next measurement.
- **Scan** — The **Scan** mode allows potential/current curves to be recorded.

Cell — Manual control of amperometric detector cell:

- **<On>** — Switch on detector cell.
- **<Off>** — Switch off detector cell.

Oven — Manual control of column oven (heater):

- **<On>** — Switch on oven.
- **<Off>** — Switch off oven.
- **Temperature** — Temperature of column oven.
  Range: **15 ... 60 °C**

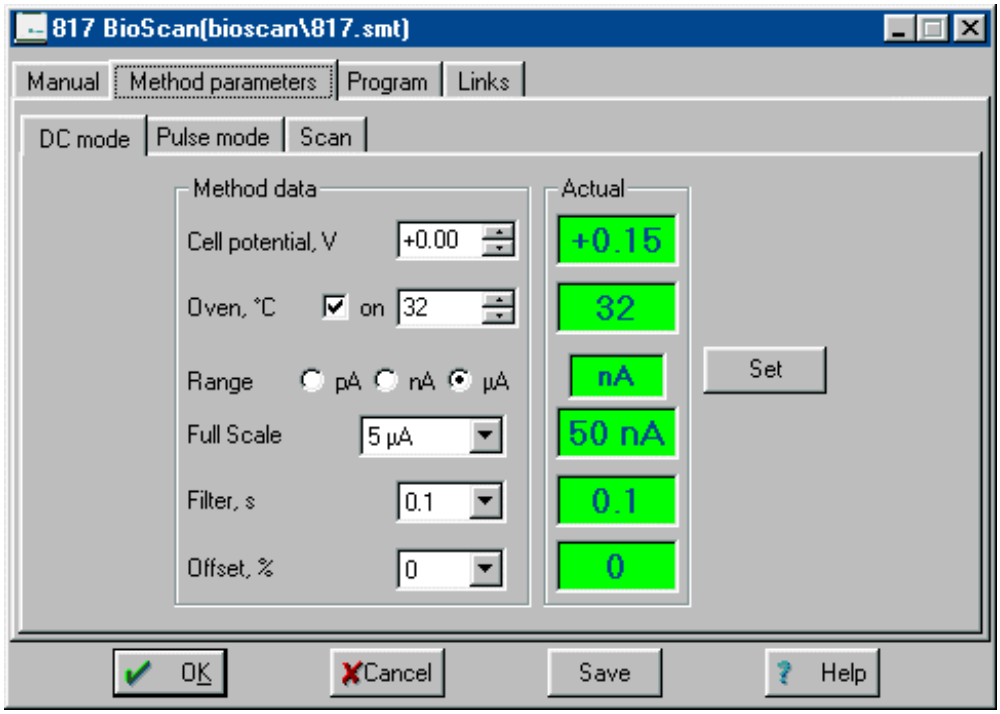
Control — Manual setting of 4 control lines.

- **<Set>** — Set control lines to selected states.
- **Aux1**, **Aux2**, **Cont1**, **Cont2**
  Setting of 4 control lines.
  Selection: **0**, **1**, *****

Valve	Manual switching of the injection valve at the 812 Valve Unit:
<Fill>	Switch injection valve to "Fill" position (control line **Cont1** is set to 0).
<Inject>	Switch injection valve to "Inject" position (control line **Cont1** is set to 1).
Analog output	Manual setting of the analog output signal to zero.
<Zero>	Trigger the autozero function.
Actual	Display of actual values.
Mode	Display of current detector mode.
Cell	Display of current cell state.
Oven	Display of current ovent state.
Control	Display of current control line settings.

DC mode

The **DC mode** subtab of the **Method parameters** tab on the **817 Bioscan** window is used to set the parameters for the DC mode. This window is only available if **Mode** has been set to **DC** on the **Manual** tab.



Method data

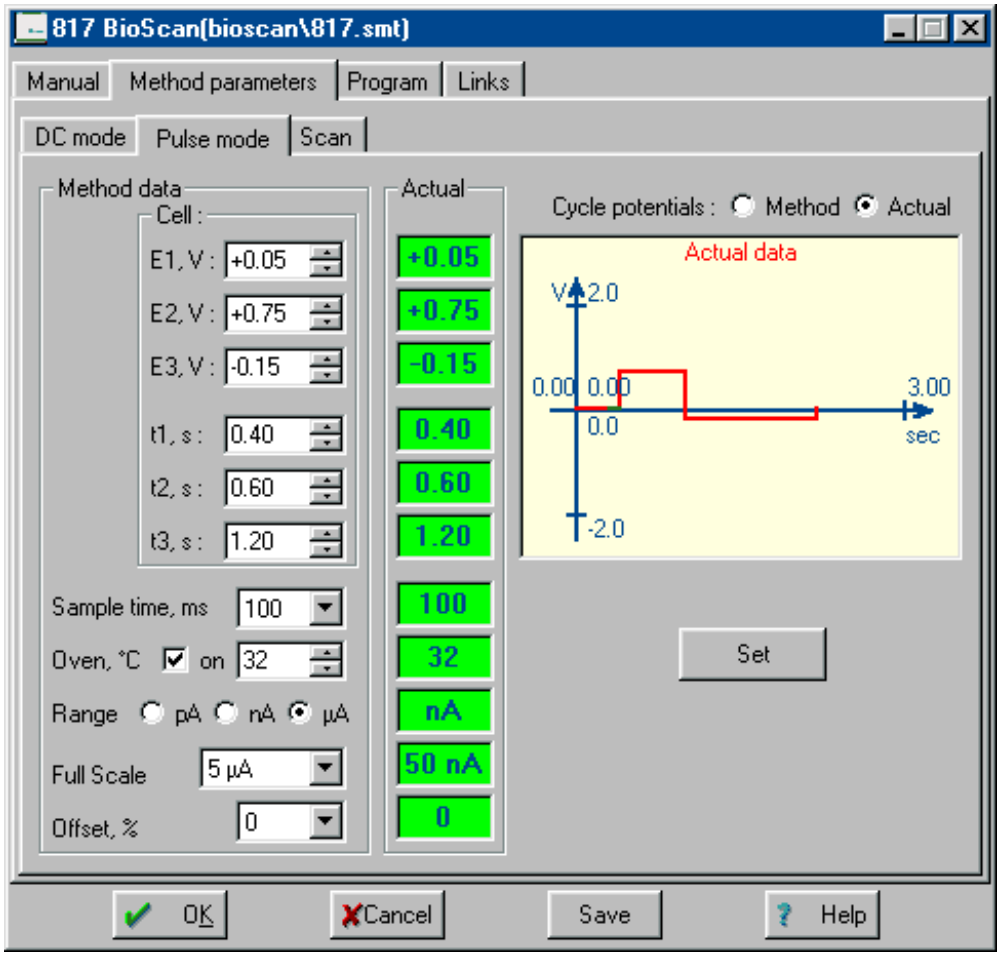
Cell potential	Electric potential applied to the amperometric detector cell in V Range: **-2 ... +2 V**.

Oven	Switching on/off column oven and setting operating temperature. Range: **15 ... 60 °C**
Range	Selection of measuring range: **pA** **10 ... 5000 pA**. **nA** **0.1 ... 50 nA**. **µA** **0.01 ... 5 µA**.
Full scale	The full scale range (operating range) sets the desired sensitivity for the analog output. The possible values of the full scale range depend on the preset measuring **Range**.
Filter	Electronic damping of the analog output signal. Selection: **0.1, 0.2, 0.5, 1, 2, 5 s**
Offset	Offset of the zero point for the analog output signal. Selection: **-50 ... +50 %** (in steps of 10 %)
Actual	
Cell potential	Display of current cell potential in V
Oven	Display of current oven state.
Range	Display of current measuring range.
Full scale	Display of current full scale range.
Filter	Display of current damping constant.
Offset	Display of current offset.
<Set>	Send current parameters immediately to the 817 Bioscan. Parameters are not stored in the system file (***.smt**) as long as the file is not saved.

Pulse mode

The **Pulse mode** subtab of the **Method parameters** tab on the **817 Bioscan** window is used to set the parameters for the pulse mode. This window is only available if **Mode** has been set to **Pulse** on the **Manual** tab.

Method data	
Cell	Definition of three different working potentials, which are applied to the amperometric detector cell cyclically. The set potentials are graphically displayed if the **Method** option is enabled above the graphic window.
E1, E2, E3	Working potentials. Range: **-2 ... +2 V**.
t1, t2, t3	Time duration to apply the working potential. Range: **0.01 ... 2 s**



Sample time — Measuring time at the end of working potential **E1**.
Selection: **20, 40, 60, 80, 100 ms**

Oven — Switching on/off column oven and setting operating temperature.
Range: **15 ... 60 °C**

Range — Selection of measuring range:
pA **10 ... 5000 pA**.
nA **0.1 ... 50 nA**.
µA **0.01 ... 5 *µA***.

Full scale — The full scale range (operating range) sets the desired sensitivity for the analog output. The possible values of the full scale range depend on the preset measuring **Range**.

Offset — Offset of the zero point for the analog output signal.
Selection: **-50 ... +50 %** (in steps of 10 %)

Actual

E1, E2, E3 — Display of current working potentials in V.

t1, t2, t3 — Display of current time durations for working potentials in s.

Sample time — Display of current sample time in ms.

Oven	Display of current oven state.
Range	Display of current measuring range.
Full scale	Display of current full scale range.
Offset	Display of current offset.
Cycle potentials	Graphical display of cycle potentials.
Method	Display of working potentials set in the Method data frame.
Actual	Display of current working potentials.
<Set>	Send current parameters immediately to the 817 Bioscan. Parameters are not stored in the system file (***.smt**) as long as the file is not saved.

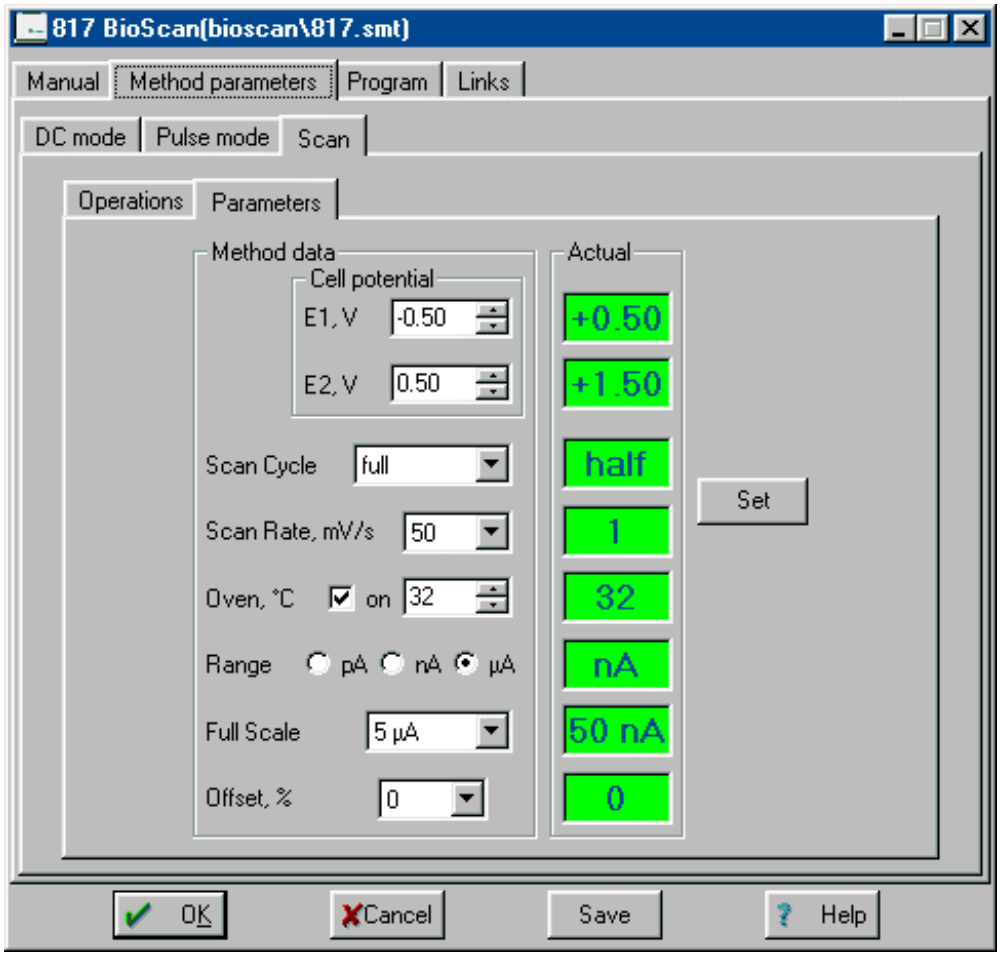
Scan mode

The **Scan mode** subtab of the **Method parameters** tab on the **817 Bioscan** window is used for parameter setting and curve display for the scan mode. This window is only available if **Mode** has been set to **Scan** on the **Manual** tab.

Parameters

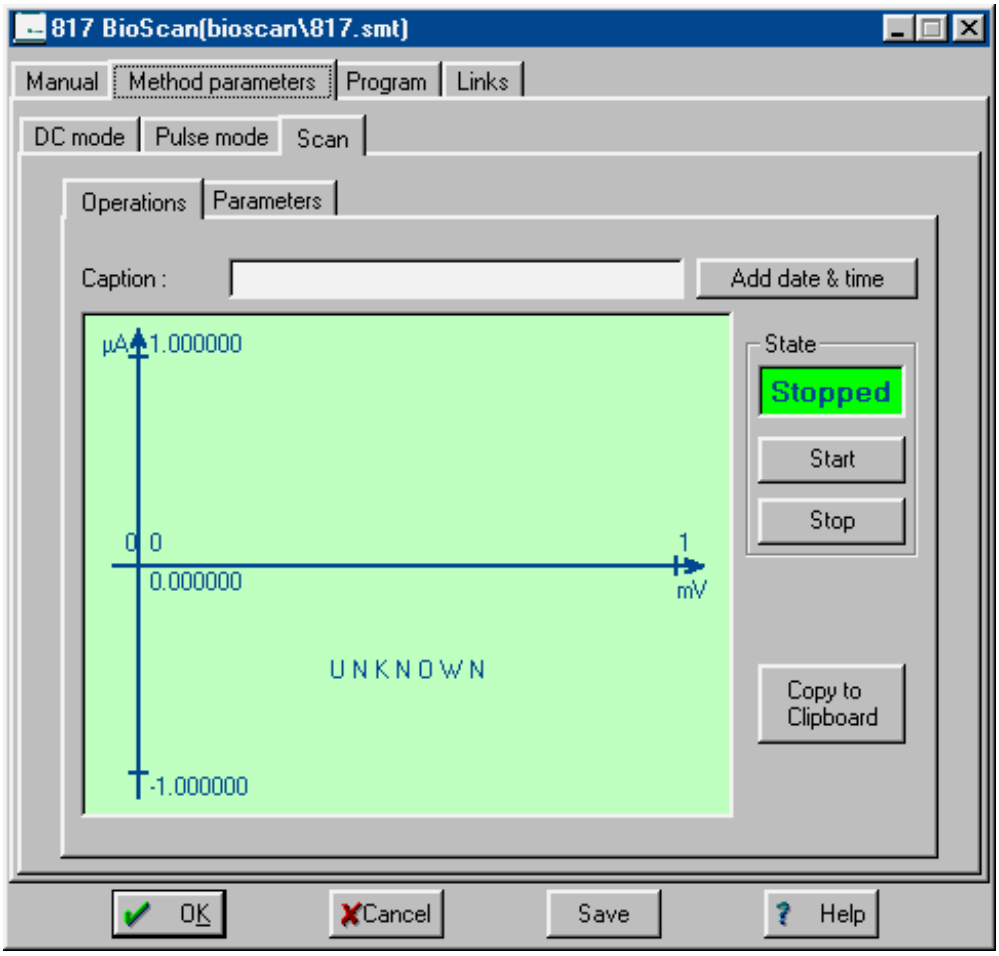
Method data

Cell potential	Definition of start and end potential for a user-defined potential sweep, which is applied to the amperometric detector cell.
E1	Start potential for sweep. Range: **-2 ... +2 V**.
E2	End potential for sweep. Range: **-2 ... +2 V**.
Scan cycle	Definition of scan cycle: **full** double scan **E1 ... E2 ... E1** **half** single scan **E1 ... E2** Selection: **full, half**
Scan rate	Definition of scan rate in mV/s. Selection: **1, 2, 5, 10, 20, 50 mV/s**
Oven	Switching on/off column oven and setting operating temperature. Range: **15 ... 60 °C**
Range	Selection of measuring range: **pA** **10 ... 5000 pA**. **nA** **0.1 ... 50 nA**. ***µ*A** **0.01 ... 5 *µ*A**.



Full scale	The full scale range (operating range) sets the desired sensitivity for the analog output. The possible values of the full scale range depend on the preset measuring **Range**.
Offset	Offset of the zero point for the analog output signal. Selection: **-50 ... +50 %** (in steps of 10 %)
Actual	
E1, E2	Display of current start and end potentials in V.
Scan cycle	Display of current scan cycle mode.
Scan rate	Display of current scan rate in mV/s.
Oven	Display of current oven state.
Range	Display of current measuring range.
Full scale	Display of current full scale range.
Offset	Display of current offset.
<Set>	Send current parameters immediately to the 817 Bioscan. Parameters are not stored in the system file (***.smt**) as long as the file is not saved.

Operations



Caption	Possibility to enter a title which is written on top of the scan mode graphics window**.**
<Add date & time>	The current date and time are added to the title defined in the **Caption** field.
State	Display of current state.
<Start>	Start scan mode sweep.
<Stop>	Stop scan mode sweep.
<Copy to clipboard>	Copy the content of the scan mode graphics window to the clipboard.

Links

The **Links** tab of the **817 Bioscan** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.6 733 IC Separation Center

6.6.1 733 IC Separation Center features

The Metrohm **733 IC Separation Center** is a thermally and electronically isolated wet part which accommodates injectors, columns, detectors, suppressor module and pulsation dampener and is controlled by and connected to the 732 IC Detector. The following versions are available:

- **2.733.0010 IC Separation Center** with 1 injector
- **2.733.0120 IC Separation Center** with 2 injectors, metal-free
- **2.733.0130 IC Separation Center** with 1 injector and 1 suppressor module, metal-free

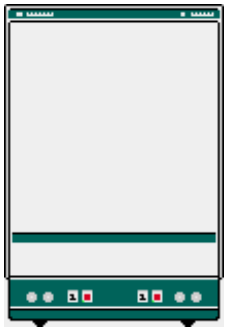
The 733 IC Separation Center, which is normally operated by the 732 IC Detector, can be fully operated using the «IC Net» program.

The 733 IC Separation Center with **one injection valve** is normally connected to the 732 IC Detector using the 6.2125.090 cable. For the operation of a 733 IC Separation Center with two independent columns and **two injection valves**, two individual 732 IC Detectors are needed. Each of this detectors is connected to the 733 IC Separation Center using a 6.2125.090 cable. For operation of a two-valve system with «IC Net», two **732 icons** and two **733 icons** (one for valve A and one for valve B) have to be installed in the **SYSTEM** window. To install the 733 IC Separation Center in a system the **733 IC Separation Center** device must be selected, the type of Separation Center is detected automatically.

If the Separation Center is connected to the **762 IC Interface**, one 6.2115.070 cable for every event line is needed. The number depends on the type of Separation Center, i.e. for the 733.0130 IC Separation Center three event lines are necessary to control the valve (fill, inject) and the suppressor (step). In this case the appropriate **733.0XX0 Separation Center** device must be selected to install the 733 IC Separation Center in a system.

For detailed information about the 733 IC Separation Center see **732/733 Instructions for Use**. Examples for interconnections with the 733 IC Separation Center, the 732 IC Detector and the 762 IC Interface can be found in the **762 Instructions for Use**.

6.6.2 733 IC Separation Center icon



The **733 icon** is available in the **SYSTEM** window if a **733 IC Separation Center** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **733 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **733 IC Separation Center** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **733 icon** from the system.

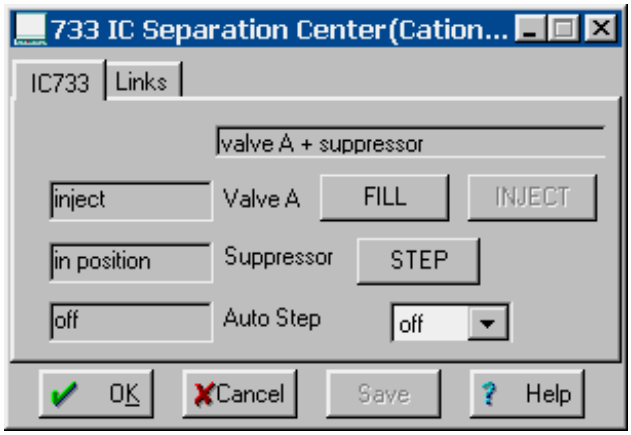
6.6.3 733 IC Separation Center window

733 icon / Open

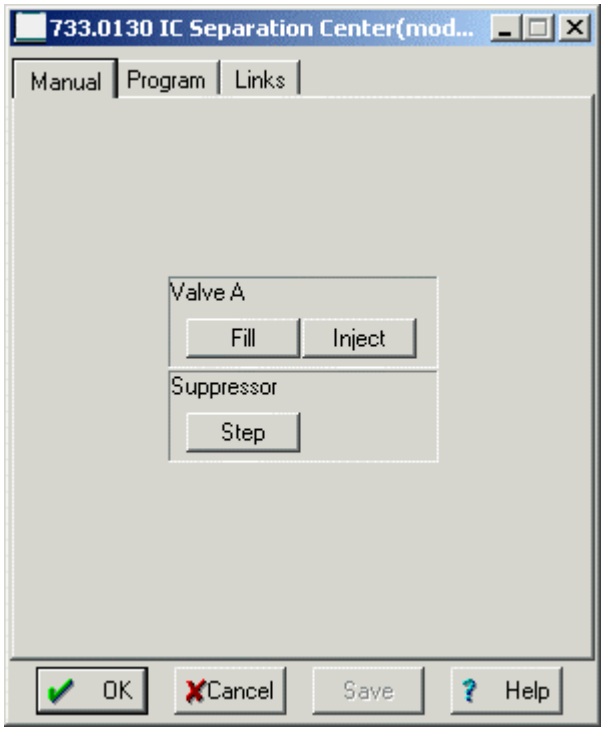
The **733 IC Separation Center** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **733 icon** in the **SYSTEM** window. It consists of the three tabs **Manual**, **Program** and **Links**.

Manual

The **Manual** tab of the **733 IC Separation Center** window is only available for a **connected system**. The parameters and buttons for manual operation depend on the type of instrument connected.



733 IC Separation Center connected to **732**



733.0130 Separation Center connected to **762**

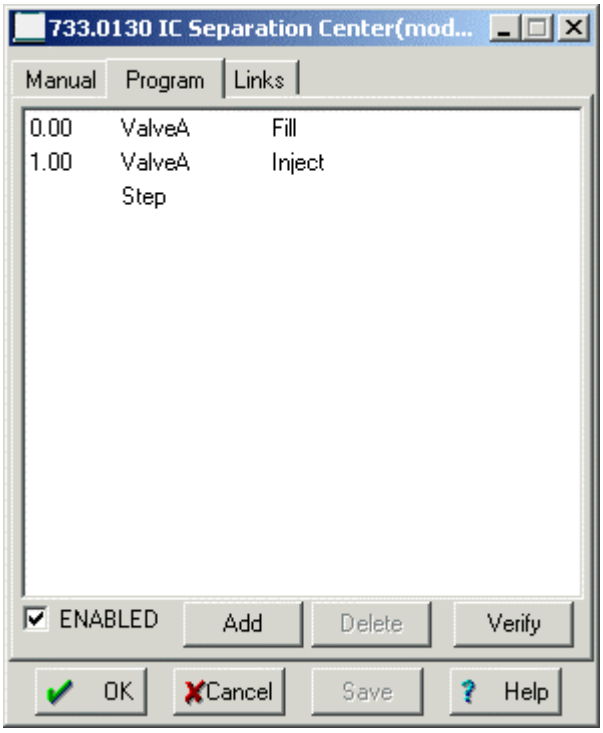
Configuration	Display of current instrument configuration.
valve A	733 IC Separation Center with 1 injector.
valve A + valve B	733 IC Separation Center with 2 injectors.
valve A + suppressor	733 IC Separation Center with 1 injector and 1 suppressor module.
Valve A	
fill/inject	Display of current valve position.*
<FILL>	Switch valve A to "fill" position.
<INJECT>	Switch valve A to "inject" position.
Valve B	
fill/inject	Display of current valve position.*
<FILL>	Switch valve B to "fill" position.
<INJECT>	Switch valve B to "inject" position.
Suppressor	
in position	Display of current suppressor status.*
<STEP>	Switch suppressor module to next position.
Auto Step	*
fill, inject, off	Display of current auto step status.
Entry field	Set automatic switching of the suppressor module after each "fill" or "inject" of valve A. Selection: **fill, inject, off**

* only available for **733 IC Separation Center** connected to 732

Time program

The **Program** tab is only available for a **733.0XX0 Separation Center** **connected to a 762 IC Interface**. The **733 IC Separation Center** that is **connected to a 732 IC Detector** is controlled by the time program of the detector.

On the **Program** tab of the **733.0XX0 Separation Center** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below).
Third column	**Parameter** for program instruction (see below).
ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.

<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
ValveA	**fill, inject**	Switch injection valve A to "**fill**" or "**inject**" position.
ValveB	**fill, inject**	Switch injection valve B to "**fill**" or "**inject**" position.
Step		Rotate suppressor to the next position.

Links

The **Links** tab of the **733 IC Separation Center** is used for COM port selection and settings (details see *section 5.2.4 Links*), resp. for Event line selection.

6.7 709 IC Pump

6.7.1 709 IC Pump features

The Metrohm **709 IC Pump** is a serial dual piston high pressure pump for ion chromatography. The two following versions are available:

- **2.709.0010 IC Pump (standard version)**
- **2.709.0110 IC Pump (metal-free version)**

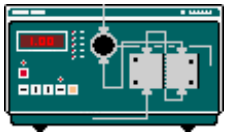
The 709 IC Pump, which is normally operated using the keypad of the instrument or via 732 IC Detector, can be fully operated using the «IC Net» program. It can be connected either to the 732 IC Detector using the 6.2125.060 cable, to the 762 IC Interface using the 6.2134.080 or 6.2134.090 cable, or to a PC COM port using the 6.2134.040 or 6.2134.100 cable. If it is connected to the 732 IC Detector, the **Isocratic pump 709 for 732** device must be selected for the installation of the 709 IC Pump in a system. If it is connected to the 762 IC Interface, the **Isocratic pump 709** device must be selected for the installation of the 709 IC Pump in a system.

Examples for interconnections with the 709 IC Pump can be found in the **762 Instructions for Use**.

The cable connection between 709 IC Pump and 732 IC Detector, 762 IC Interface or PC must be made before switching on the instrument. In order to operate the 709 IC Pump with «IC Net», the external control must be switched on using the **[Ext.]** *key.*

For detailed information about the 709 IC Pump see **709 Instructions for Use**.

6.7.2 709 IC Pump icon



The **709 icon** is available in the **SYSTEM** window if an **Isocratic pump 709** or an **Isocratic pump 709 for 732** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **709 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **709 IC Pump** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **709 icon** from the system.

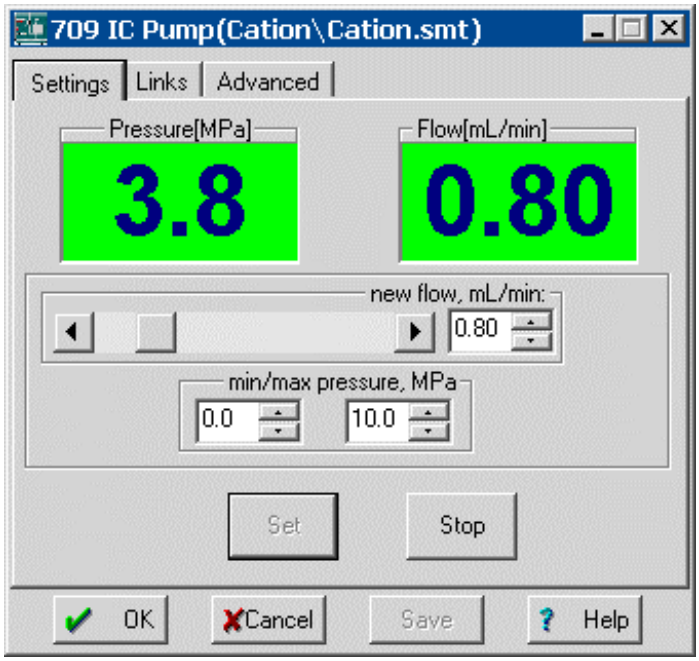
6.7.3 709 IC Pump window

709 icon / **Open**

The **709 IC Pump** window for parameter settings and manual control is opened by selecting this menu option with the right mouse button or by double-clicking the **709 icon** in the **SYSTEM** window. It consists of the three tabs **Settings**, **Links** and **Advanced**.

Settings

The **Settings** tab of the **709 IC Pump** window is only available for a **connected system**.



Pressure — Live display of current pressure in MPa. This field is also available for the **WATCH WINDOW**.

Flow — Live display of current flow in mL/min. This field is also available for the **WATCH WINDOW**.

New flow — A new flow can be set by moving the scroll bar, by entering a value or by changing the value using the up and down arrows.
Entry range: **0.01 ... 5.00 mL/min**

Min/Max pressure — The minimum and maximum pressure limit for the 709 IC Pump can be set in steps of 0.1 MPa.
Entry range: **0.0 ... 50.0 MPa**.

The set **maximum** limit value should lie between **5 to 10 MPa** above the particular operating pressure or the maximum admissible operating pressure of the column used. If the pump exceeds the preset limit value during operation, it is switched off immediately. At the same time, the **Pressure** field color in the 709 settings window and in the **WATCH WINDOW** is changed to the value set for **Out of range**.

The set **minimum** limit value should lie **far enough below** the particular operating pressure. If the pump pressure falls below this preset lower limit during operation and this pressure drop persist for several revolutions of the pump cam due to leaks or interrupted inflow of the eluent, the pump is

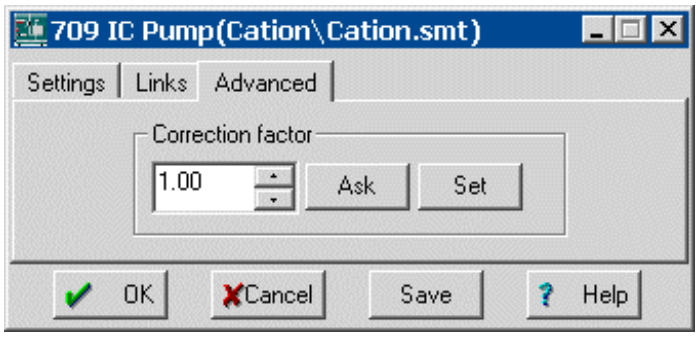
	automatically switched off. At the same time, the **Pressure** field color in the 709 settings window and in the **WATCH WINDOW** is changed to the value set for **Out of range**.
<Set>	Send current parameters immediately to the 709 IC Pump (only available if pump is running). Parameters are not stored in the system file (***.smt**) as long as the file is not saved.
<Start>	Set current parameters and start 709 IC Pump drive.
<Stop>	Stop 709 IC Pump drive.

Links

The **Links** tab of the **709 IC Pump** is used for COM port selection and settings (details see *section 5.2.4 Links*).

Advanced

The **Advanced** tab of the **709 IC Pump** window is only available for a **connected system**.



Correction factor	Flow correction factor to adjust the displayed flow to the actual flow measured with the aid of a measuring cylinder. Entry range: **0.90 ... 1.10**
<Ask>	Read current **Correction factor** value.
<Set>	Send current **Correction factor** value to the 709 IC Pump. This parameter is not stored in the system file (***.smt**) as long as the file is not saved.

6.8 Metrohm solvent delivery unit

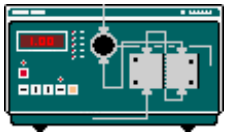
6.8.1 Metrohm SDU features

A **Metrohm SDU** (Solvent Delivery Unit) system can be used for high-pressure gradient mixture of one to four eluents. For each eluent, a 709 IC Pump is used. Each 709 IC Pump must be connected to the 762 IC Interface using a 6.2134.080 or 6.2134.090 cable. Examples for interconnections with the 709 IC Pump can be found in the **762 Instructions for Use**.

The outlet capillaries of the 709 IC Pumps must be connected to a mixing chamber from where one inlet capillary leads to the injection valve of the 733 IC Separation Center.

For detailed information about the 709 IC Pump see **709 Instructions for Use**.

6.8.2 Metrohm SDU icon



The **SDU icon** is available in the **SYSTEM** window if an **SDU** (Solvent Delivery Unit) has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*). The **SDU** icon consists of one to four 709 IC Pump icons one above the other depending on the SDU type installed.

If the system is connected and the **SDU icon** is clicked with the right mouse button, the following menu appears:

Open Open the **SDU** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **SDU icon** from the system.

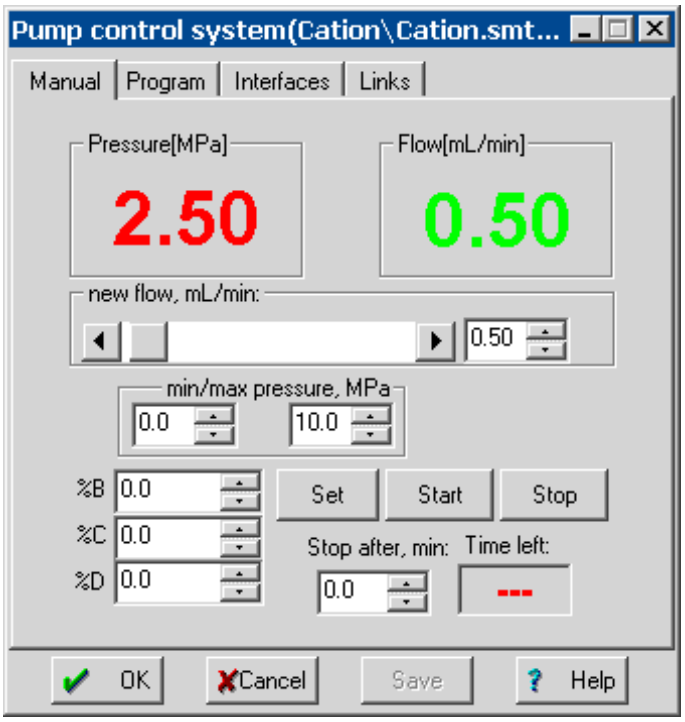
6.8.3 Metrohm SDU window

SDU icon / Open

The **Pump control system** window for parameter settings and manual control is opened by selecting this menu option with the right mouse button or by double-clicking the **SDU icon** in the **SYSTEM** window. It consists of the four tabs **Manual**, **Program**, **Interfaces**, and **Links**.

Manual

The **Manual** tab of the **Metrohm SDU** window is only available for a **connected system**.

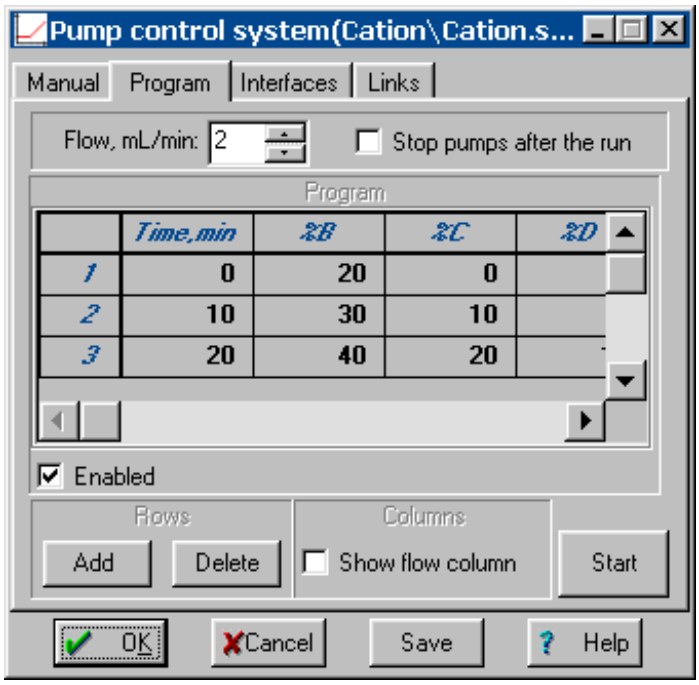


Pressure	Live display of current pressure in MPa. This field is also available for the **WATCH WINDOW**.
Flow	Live display of current flow in mL/min. This field is also available for the **WATCH WINDOW**.
New flow	A new flow can be set by moving the scroll bar, by entering a value or by changing the value using the up and down arrows. Entry range: **0.01 ... 20.00 mL/min** (depending on number of pumps)
Min/Max pressure	The minimum and maximum pressure limit for the individual pump units can be set in steps of 0.1 MPa. Entry range: **0.0 ... 50.0 MPa**.
%B	Individual flow rate for pump B in percent of total flow. Entry range: **0 ... 100 %**
%C	Individual flow rate for pump C in percent of total flow. Entry range: **0 ... 100 %**
%D	Individual flow rate for pump D in percent of total flow. Entry range: **0 ... 100 %**

Stop after	Stop time for all pump drives. Entry range: **0 ... 99999 min**
Time left	Display of time left before pumps are stopped.
<Set>	Send current parameters immediately to the pump control system. Parameters are not stored in the system file (***.smt**) as long as the file is not saved.
<Start>	Start all pump drives.
<Stop>	Stop all pump drives.

Program

The **Program** tab of the **SDU** window contains a time program for the pump control system to define eluent gradients.

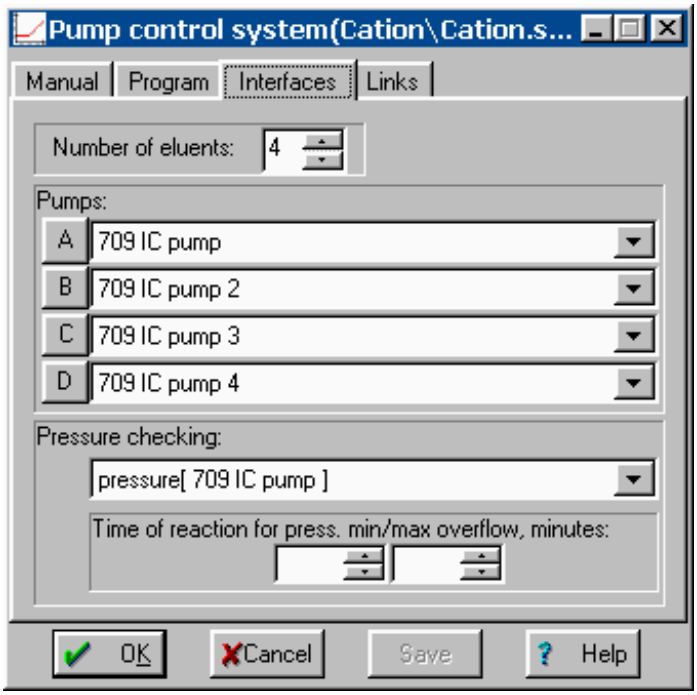


Flow	Overall flow of pump control system in mL/min. This value is also available for the **WATCH WINDOW**. This field is only available if the **Show flow column** option is disabled. Entry range: **0.01 ... 20.00 mL/min** (depending on number of pumps)
Stop pumps after the run	Stop pumps after the determination.
Program table	
Number	Row number in the program table (read-only).
Time	Time at which the flow and/or gradient is changed. Entry range: **0.0 ... 99999 min**

Flow	Overall flow of pump control system in mL/min. Entry range: **0.01 ... 20.00 mL/min** (depending on number of pumps)
%B	Individual flow rate for pump B in percent of total flow. Entry range: **0 ... 100 %**
%C	Individual flow rate for pump C in percent of total flow. Entry range: **0 ... 100 %**
%D	Individual flow rate for pump D in percent of total flow. Entry range: **0 ... 100 %**
Enabled	Enable time program start (a disabled program is not started).
Show flow column	Show **Flow** column in the program table.
<Add>	Add a new line to the time program.
<Delete>	Delete the selected line from the time program.
<Start>	Start all pump drives.

Interfaces

The **Interfaces** tab of the **SDU** window is only available for a **connected system**.



Number of eluents	Number of eluents used for gradient mixing.
Pumps	List of used pumps for gradient mixing. Clicking on **<A>**, **<B>**, **<C>**, or **<D>** opens the

	709 IC Pump window for parameter settings and manual control of the selected pump.
Pressure checking	Selection of the pump whose pressure is checked using the **Min**/**Max pressure** limits.

Time reaction for press. min/max overflow

Time delay for pump stopping at **Min**/**Max pressure** limits.

Links

The **Links** tab of the **Metrohm SDU** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.9 752 Pump Unit

6.9.1 752 Pump Unit features

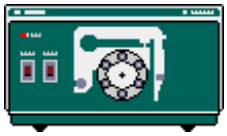
The Metrohm **752 Pump Unit** is a 2-channel peristaltic pump which is normally used for operating the suppressor module in the 733 IC Separation Center by supplying regeneration and rinsing solutions.

The 752 Pump Unit, which is normally operated manually using the keypad of the instrument or automatically via 732 IC Detector via remote interface, can be fully operated using the «IC Net» program. The 752 Pump Unit is normally connected to one of the event line connections of the 762 IC Interface using the optional 6.2128.180 cable. Examples for interconnections with the 752 Pump Unit can be found in the **762 Instructions for Use**.

*In order to operate the 752 Pump Unit with «IC Net», the external control must be switched on using the **[Remote]** key.*

For detailed information about the 752 Pump Unit see **752 Instructions for Use**.

6.9.2 752 Pump Unit icon



The **752 icon** is available in the **SYSTEM** window if a **752 Pump Unit** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **752 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **752 Pump Unit** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **752 icon** from the system.

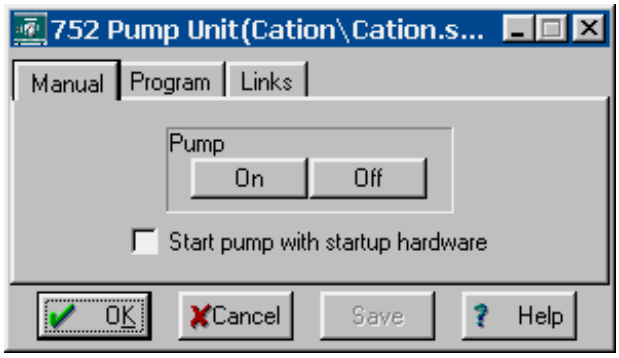
6.9.3 752 Pump Unit window

752 icon / Open

The **752 Pump Unit** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **752 icon** in the **SYSTEM** window. It consists of the three tabs **Manual**, **Program**, and **Links**.

Manual

The **Manual** tab of the **752 Pump Unit** window for manual operation is only available for a **connected system**.



Pump

<On> Start pump drive.

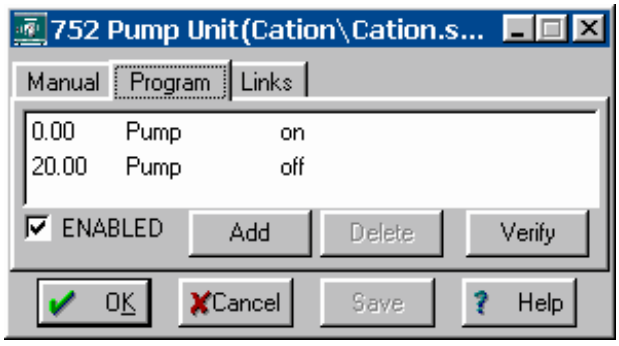
<Off> Stop pump drive.

Start pump with startup hardware

Automatic start of pump drive with **Startup hardware**.

Time program

On the **Program** tab of the **752 Pump Unit** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column **Time** at which program instruction is applied.
Entry range: **0.0 ... 999.9 min**
If no time is entered, the program instruction is applied together with the last instruction with time entry.

Second column **Program instruction** (see below).

Third column **Parameter** for program instruction (see below).

ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
Program	**RESET, END**	Set program flag. The **END** flag can be used to **end a program**, especially if the program time should be longer than the chromatogram **duration**. Additional steps after this flag are not allowed. The **RESET** flag is used to **reset** the parameters to the system startup values.
Pump	**on, off**	Switch on or off the pump drive.

Links

The **Links** tab of the **752 Pump Unit** is used for Event line selection.

6.10 753 Suppressor Module

6.10.1 753 Suppressor Module features

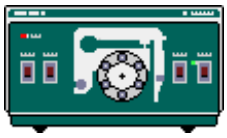
The Metrohm **753 Suppressor Module** consists of a control unit with a 2-channel peristaltic pump and a block containing a suppressor module.

The 753 Suppressor Module, which is normally operated manually using the keypad of the instrument or automatically via 732 IC Detector via remote interface, can be fully operated using the «IC Net» program. The 753 Suppressor Module is normally connected to two of the event line connections of the 762 IC Interface using two optional 6.2128.180 cables. Examples for interconnections with the 753 Suppressor Module can be found in the **762 Instructions for Use**.

*In order to operate the 753 Suppressor Module with «IC Net», the external control must be switched on using the **[Remote]** key.*

For detailed information about the 753 Suppressor Module see **753 Instructions for Use**.

6.10.2 753 Suppressor Module icon



The **753 icon** is available in the **SYSTEM** window if a **753 Suppressor Module** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *6.1.2*).

If the system is connected and the **753 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **753 Suppressor Module** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **753 icon** from the system.

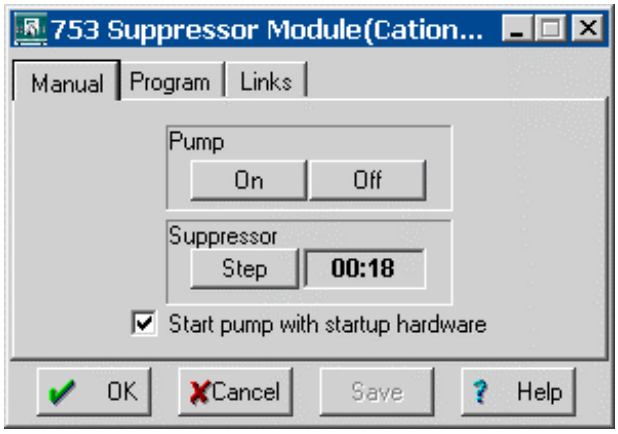
6.10.3 753 Suppressor Module window

753 icon / Open

The **753 Suppressor Module** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **753 icon** in the **SYSTEM** window. It consists of the three tabs **Manual**, **Program**, and **Links**.

Manual

The **Manual** tab of the **753 Suppressor Module** window for manual operation is only available for a **connected system**.



Pump

<On> Start pump drive.

<Off> Stop pump drive.

Suppressor

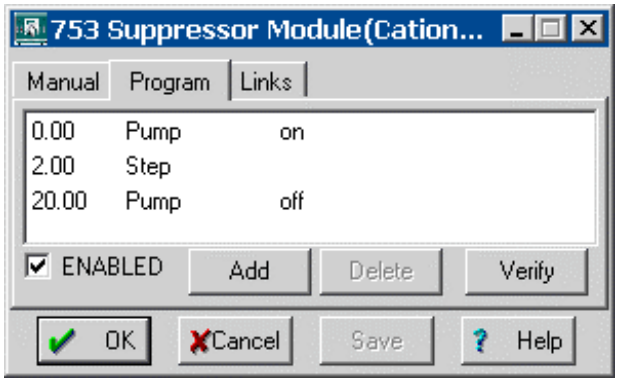
<Step> Rotate suppressor to the next position. The time since the last step action is displayed in the field beside the **<Step>** button.

Start pump with startup hardware

Automatic start of pump drive with **Startup hardware**.

Time program

On the **Program** tab of the **753 Suppressor Module** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below).
Third column	**Parameter** for program instruction (see below).
ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
Program	**RESET, END**	Set program flag. The **END** flag can be used to **end a program**, especially if the program time should be longer than the chromatogram **duration**. Additional steps after this flag are not allowed. The **RESET** flag is used to **reset** the parameters to the system startup values.
Pump	**on, off**	Switch on or off the pump drive.
Step		Rotate suppressor to the next position.

Links

The **Links** tab of the **753 Suppressor Module** is used for Event line selection.

6.11 754 Dialysis Unit

6.11.1 754 Dialysis Unit features

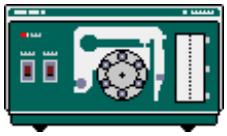
The Metrohm **754 Dialysis Unit** is a unit for on-line sample dialysis before sample injection. It consists of a 2-channel peristaltic pump and a dialysis cell.

The 754 Dialysis Unit, which is normally operated manually using the keypad of the instrument or automatically via 732 IC Detector via remote interface, can be fully operated using the «IC Net» program. The 754 Dialysis Unit is normally connected to one of the event line connections of the 762 IC Interface using the optional 6.2128.180 cable. Examples for interconnections with the 754 Dialysis Unit can be found in the **762 Instructions for Use**.

*In order to operate the 754 Dialysis Unit with «IC Net», the external control must be switched on using the **[Remote]** key.*

For detailed information about the 754 Dialysis Unit see **754 Instructions for Use**.

6.11.2 754 Dialysis Unit icon



The **754 icon** is available in the **SYSTEM** window if a **754 Dialysis Unit** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **754 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **754 Dialysis Unit** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **754 icon** from the system.

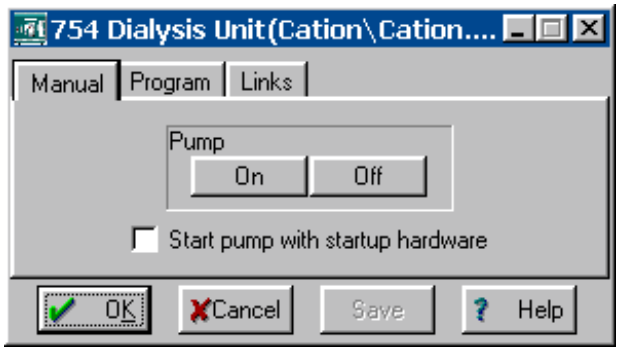
6.11.3 754 Dialysis Unit window

754 icon / Open

The **754 Dialysis Unit** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **754 icon** in **SYSTEM** window. It consists of the three tabs **Manual**, **Program**, and **Links**.

Manual

The **Manual** tab of the **754 Dialysis Unit** window for manual operation is only available for a **connected system**.



Pump

<On> Start pump drive.

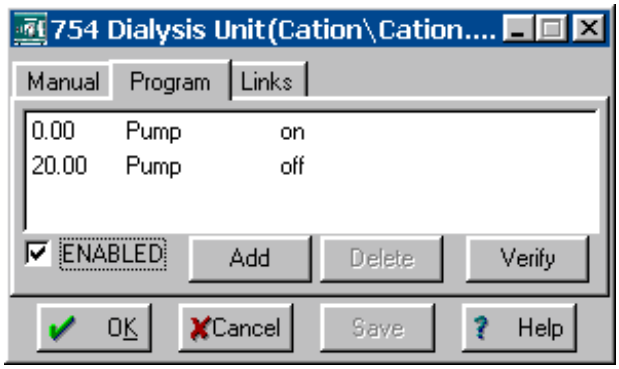
<Off> Stop pump drive.

Start pump with startup hardware

Automatic start of pump drive with **Startup hardware**.

Time program

On the **Program** tab of the **754 Dialysis Unit** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column **Time** at which program instruction is applied.
Entry range: **0.0 ... 999.9 min**
If no time is entered, the program instruction is applied together with the last instruction with time entry.

Second column **Program instruction** (see below).

Third column	**Parameter** for program instruction (see below).
ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
Program	**RESET, END**	Set program flag. The **END** flag can be used to **end a program**, especially if the program time should be longer than the chromatogram **duration**. Additional steps after this flag are not allowed. The **RESET** flag is used to **reset** the parameters to the system startup values.
Pump	**on, off**	Switch on or off the pump drive.

Links

The **Links** tab of the **754 Dialysis Unit** is used for Event line selection.

6.12 793 Sample Prep Module

6.12.1 793 Sample Prep Module features

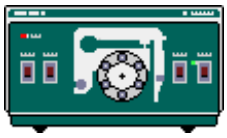
The Metrohm **793 Sample Prep Module** consists of a control unit with a 2-channel peristaltic pump and a block containing the sample preparation module.

The 793 Sample Prep Module, which is normally operated manually using the keypad of the instrument or automatically via 732 IC Detector via remote interface, can be fully operated using the «IC Net» program. The 793 Sample Prep Module is normally connected to two of the event line connections of the 762 IC Interface using two optional 6.2128.180 cables. Examples for interconnections with the 793 Sample Prep Module can be found in the **762 Instructions for Use**.

*In order to operate the 793 Sample Prep Module with «IC Net», the external control must be switched on using the **[Remote]** key.*

For detailed information about the 793 Sample Prep Module see **793 Instructions for Use**.

6.12.2 793 Sample Prep Module icon



The **793 icon** is available in the **SYSTEM** window if a **793 Sample Prep Module** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *6.1.2*).

If the system is connected and the **793 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **793 Sample Prep Module** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **793 icon** from the system.

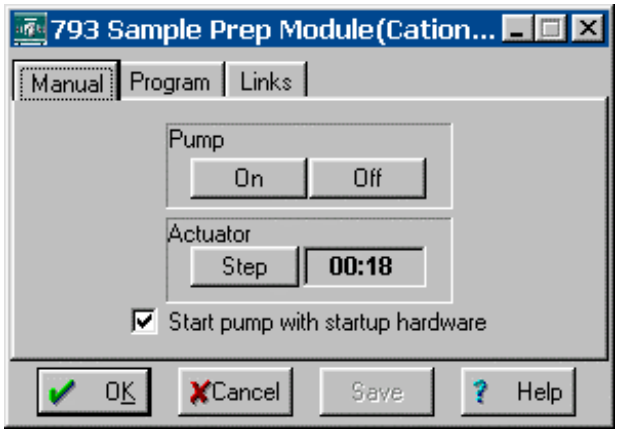
6.12.3 793 Sample Prep Module window

793 icon / Open

The **793 Sample Prep Module** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **793 icon** in the **SYSTEM** window. It consists of the three tabs **Manual**, **Program**, and **Links**.

Manual

The **Manual** tab of the **793 Sample Prep Module** window for manual operation is only available for a **connected system**.



Pump

<On>	Start pump drive.
<Off>	Stop pump drive.

Actuator

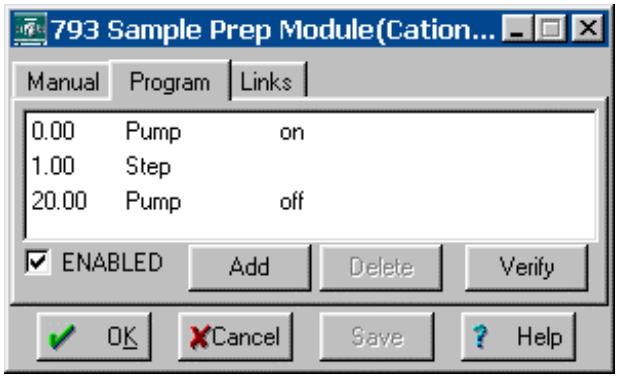
<Step>	Rotate sample preparation module to the next position. The time since the last step action is displayed in the field beside the **<Step>** button.

Start pump with startup hardware

Automatic start of pump drive with **Startup hardware**.

Time program

On the **Program** tab of the **793 Sample Prep Module** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below).
Third column	**Parameter** for program instruction (see below).
ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
Program	**RESET, END**	Set program flag. The **END** flag can be used to **end a program**, especially if the program time should be longer than the chromatogram **duration**. Additional steps after this flag are not allowed. The **RESET** flag is used to **reset** the parameters to the system startup values.
Pump	**on, off**	Switch on or off the pump drive.
Step		Rotate sample preparation module to the next position.

Links

The **Links** tab of the **793 Sample Prep Module** is used for Event line selection.

6.13 812 Valve Unit

6.13.1 812 Valve Unit features

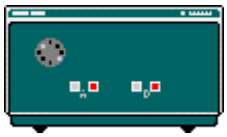
The Metrohm **812 Valve Unit** is a control unit with one or two built-in injection valves. The following versions are available:

- **2.812.0010 IC Valve Unit** with 1 injector
- **2.812.0020 IC Valve Unit** with 2 injectors

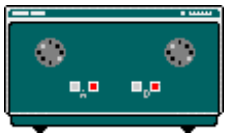
The 812 Valve Unit, which is normally operated manually using the keypad of the instrument or automatically via 732 IC Detector via remote interface, can be fully operated using the «IC Net» program. The 812 Valve Unit is normally connected to two or four of the event line connections of the 762 IC Interface using one or two optional 6.2128.100 cables. Examples for interconnections with the 812 Valve Unit can be found in the **762 Instructions for Use**.

For detailed information about the 812 Valve Unit see **812 Instructions for Use**.

6.13.2 812 Valve Unit icon



2.812.0010 Valve Unit with 1 injector



2.812.0020 Valve Unit with 2 injectors

The **812 icon** is available in the **SYSTEM** window if a **812 Valve Unit** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *6.1.2*).

If the system is connected and the **812 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **812 Valve Unit** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **812 icon** from the system.

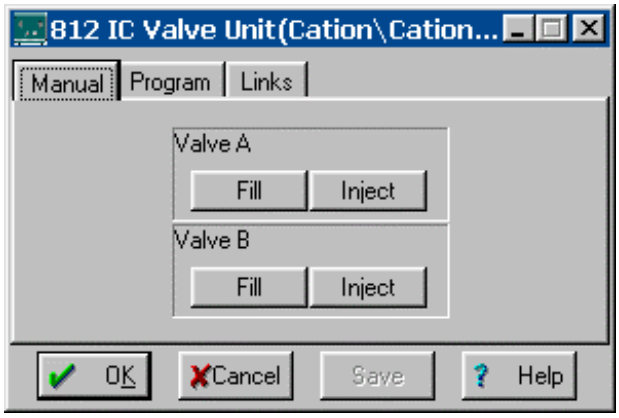
6.13.3 812 Valve Unit window

812 icon / Open

The **812 Valve Unit** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **812 icon** in the **SYSTEM** window. It consists of the three tabs **Manual**, **Program**, and **Links**.

Manual

The **Manual** tab of the **812 Valve Unit** window for manual operation is only available for a **connected system**.



Valve A

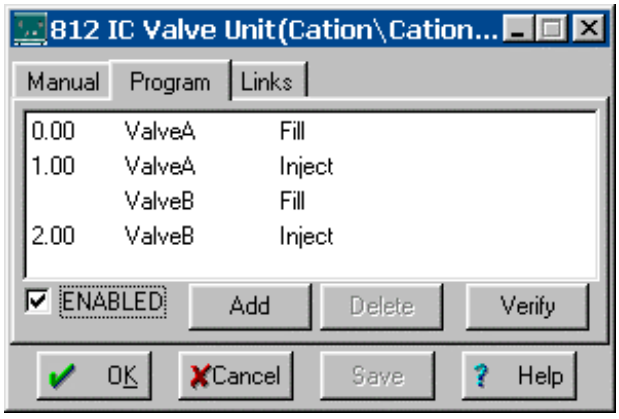
<Fill>	Switch valve A to "FILL" position.
<Inject>	Switch valve A to "INJECT" position.

Valve B

<Fill>	Switch valve B to "FILL" position.
<Inject>	Switch valve B to "INJECT" position.

Time program

On the **Program** tab of the **812 Valve Unit** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below).
Third column	**Parameter** for program instruction (see below).
ENABLED	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
ValveA	**fill, inject**	Switch injection valve A to "**inject**" or "**fill**" position.
ValveB	**fill, inject**	Switch injection valve B to "**inject**" or "**fill**" position.

Links

The **Links** tab of the **812 Valve Unit** is used for Event line(s) selection.

6.14 816 IC Eluent Selector

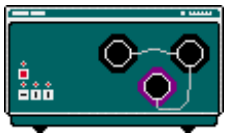
6.14.1 816 IC Eluent Selector features

The Metrohm **816 IC Eluent Selector** is a step-gradient 3-port selector, which can select one of three solutions (eluents).

The 816 IC Eluent Selector, which is normally operated manually using the keypad of the instrument, can be fully operated using the «IC Net» program. The 816 IC Eluent Selector is normally connected to the 762 IC Interface using the 6.2134.080 or 6.2134.090 cable and the 6.2125.150 Adapter. Examples for interconnections with the 816 IC Eluent Selector can be found in the **762 Instructions for Use**.

For detailed information about the 816 IC Eluent Selector see **816 Instructions for Use**.

6.14.2 816 IC Eluent Selector icon



The **816 icon** is available in the **SYSTEM** window if a **816 IC Eluent Selector** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *6.1.2*).

If the system is connected and the **816 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **816 IC Eluent Selector** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **816 icon** from the system.

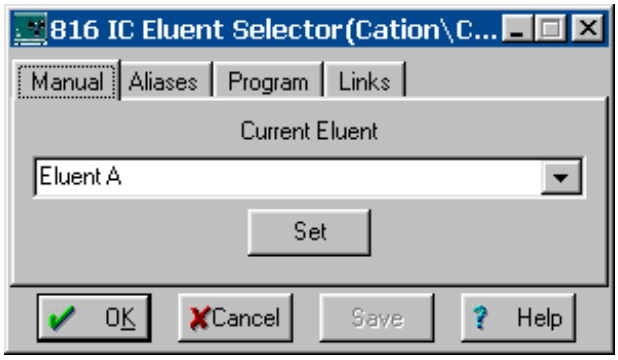
6.14.3 816 IC Eluent Selector window

816 icon / Open

The **816 IC Eluent Selector** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **816 icon** in the **SYSTEM** window. It consists of the four tabs **Manual**, **Aliases**, **Program**, and **Links**.

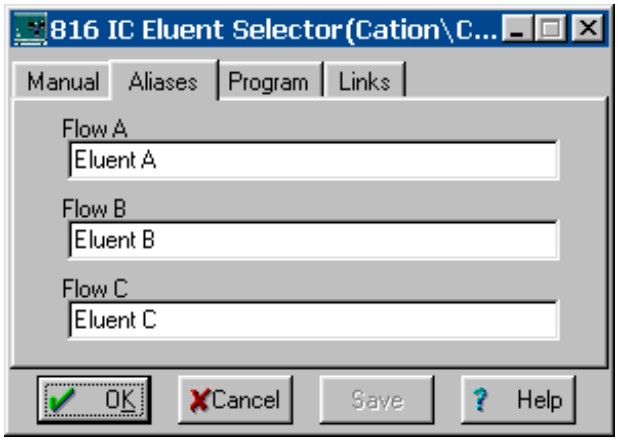
Manual

The **Manual** tab of the **816 IC Eluent Selector** window for manual operation is only available for a **connected system**.



Current eluent	Selection of **Eluent A**, **Eluent B**, or **Eluent C**.
<Set>	Switch valves to feed the selected eluent.

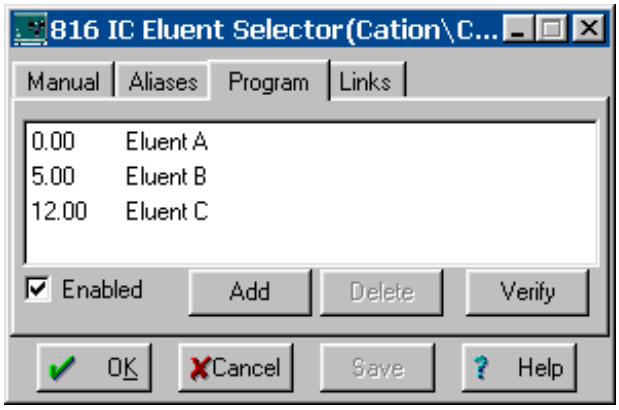
Aliases



Flow A	Possibility to rename **Eluent A**.
Flow B	Possibility to rename **Eluent B**.
Flow C	Possibility to rename **Eluent C**.

Time program

On the **Program** tab of the **816 IC Eluent Selector** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below).
Third column	**Parameter** for program instruction (see below).
Enabled	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
Eluent A		Switch valves to feed Eluent A.
Eluent B		Switch valves to feed Eluent B.
Eluent C		Switch valves to feed Eluent C.

Links

The **Links** tab of the **816 IC Eluent Selector** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.15 828 IC Dual Suppressor

6.15.1 828 IC Dual Suppressor features

The **828 IC Dual Suppressor** is a continuous, regeneration-free solid phase suppressor which is used to increase the sensitivity of the detection of anions in ion chromatography.

The 828 IC Dual Suppressor, which is normally operated manually using the switches of the instrument, can be fully operated using the «IC Net» program. The 828 IC Dual Suppressor is normally connected to the 762 IC Interface using the 6.2128.180 cable. Examples for interconnections with the 828 IC Dual Suppressor can be found in the **828 Instructions for Use**.

For detailed information about the 828 IC Dual Suppressor see **828 Instructions for Use**.

6.15.2 828 IC Dual Suppressor icon

The **828 icon** is available in the **SYSTEM** window if a **828 IC Dual Suppressor** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *6.1.2*).

If the system is connected and the **828 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **828 IC Dual Suppressor** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **828 icon** from the system.

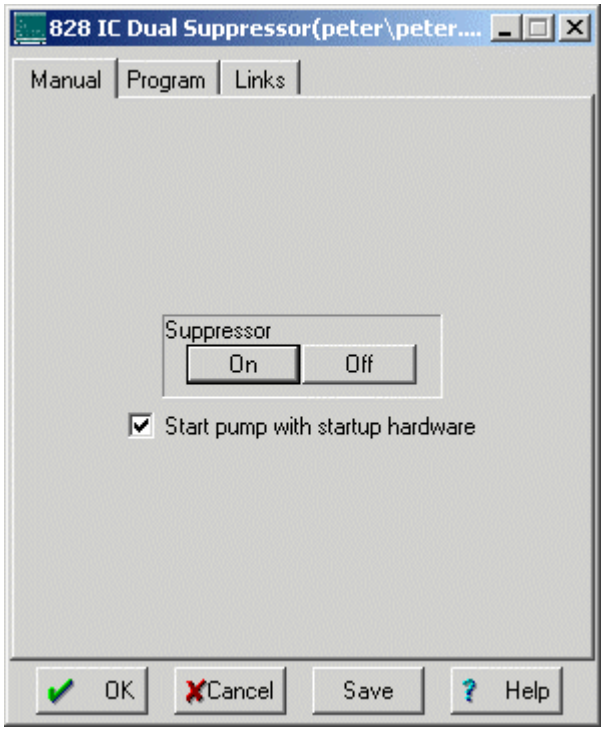
6.15.3 828 IC Dual Suppressor window

828 icon / Open

The **828 IC Dual Suppressor** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **828 icon** in the **SYSTEM** window. It consists of the four tabs **Manual**, **Program**, and **Links**.

Manual

The **Manual** tab of the **828 IC Dual Suppressor** window for manual operation is only available for a **connected system**.



Suppressor

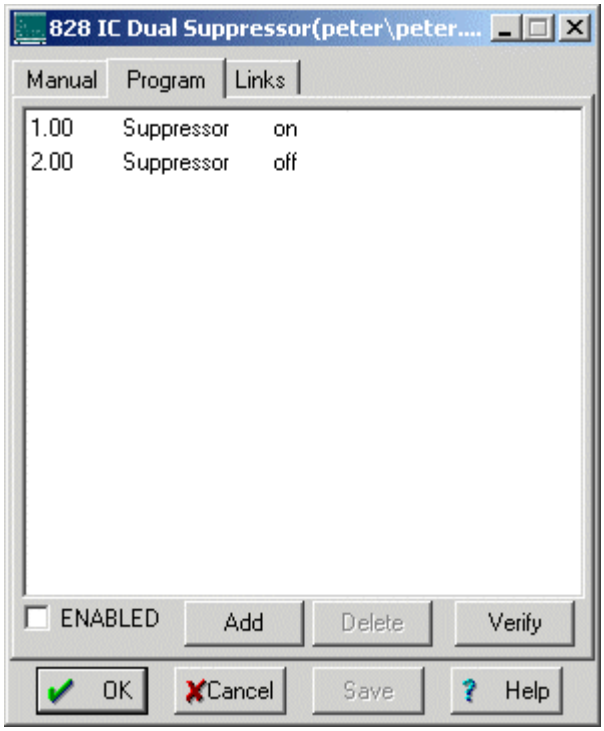
<On>	Switch the **Suppressor** on.
<Off>	Switch the **Suppressor** off.

Start with startup hardware

Start the **Suppressor** with the startup of the system hardware.

Time program

On the **Program** tab of the **828 IC Dual Suppressor** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



First column	**Time** at which program instruction is applied. Entry range: **0.0 ... 999.9 min** If no time is entered, the program instruction is applied together with the last instruction with time entry.
Second column	**Program instruction** (see below).
Third column	**Parameter** for program instruction (see below).
Enabled	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.
<Verify>	Test the time program (error messages are displayed if program is wrong).

List of program instructions

The following program instructions can be added to the time program on the **Program** page:

Instruction	*Parameter entry*	*Meaning*
Suppressor	**on, off**	Switch the Dual Suppressor on/off.

Links

The **Links** tab of the **828 IC Dual Suppressor** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.16 750 Autosampler

6.16.1 750 Autosampler features

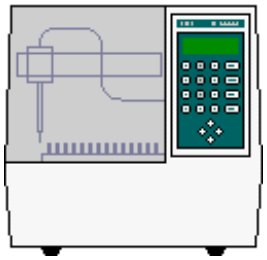
The Metrohm **750 Autosampler** is a sampler for automatic sample injection for ion chromatography. It has a capacity of up to 128 samples each with an effective volume of ca. 700 µL.

The 750 Autosampler, which is normally operated using the keypad of the instrument, can be fully operated using the «IC Net» program. The 750 Autosampler is normally connected to the 762 IC Interface using the 6.2134.000 cable and to the 733 IC Separation Center using the 6.2128.100 cable. Examples for interconnections with the 750 Autosampler can be found in the **762 Instructions for Use**.

If the 750 Autosampler is connected to the 762 IC Interface, first switch on the 762 IC Interface and then the 750 Autosampler. In order to operate the 750 Autosampler with «IC Net», the remote control via RS232 must be switched on using the [REM/LOC] key.

For detailed information about the 750 Autosampler see **750 Instructions for Use**.

6.16.2 750 Autosampler icon



The **750 icon** is available in the **SYSTEM** window if a **750 Autosampler** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **750 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **750 Autosampler** window for parameter settings (this window can also be opened by double-clicking the icon).

Unlink Delete the **750 icon** from the system.

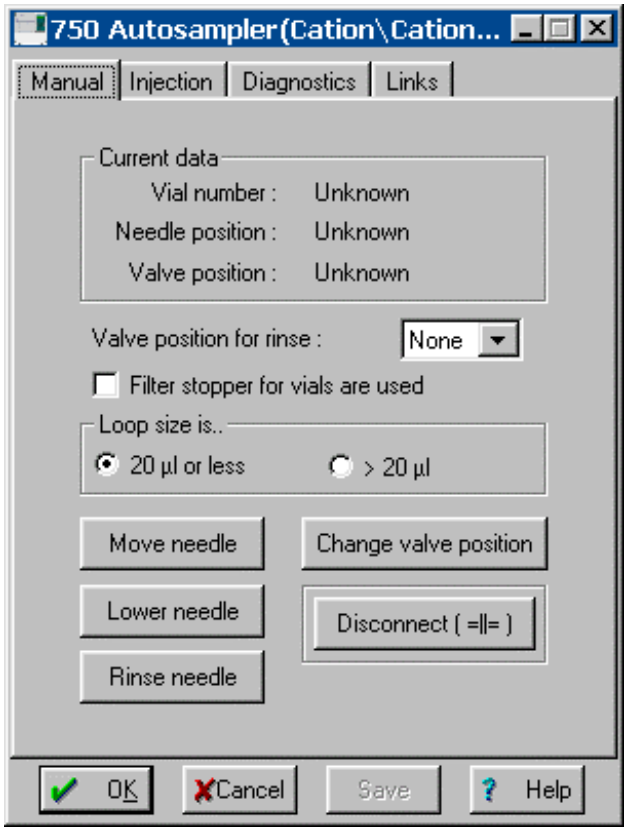
6.16.3 750 Autosampler window

750 icon / Open

The **750 Autosampler** window for parameter settings is opened by selecting this menu option with the right mouse button or by double-clicking the **750 icon** in the **SYSTEM** window. It consists of the four tabs **Manual**, **Injection**, **Diagnostics** and **Links**.

Manual

The **Manual** tab of the **750 Autosampler** window for manual operation is only available for a **connected system**.



Current data

Vial number	Live display of current vial number.
Needle position	Live display of current needle position.
Valve position	Live display of current valve position at the 733 IC Separation Center.

Valve position for rinse

Position of the injection valve at the 733 IC Separation Center during rinsing.

Filter stopper for vials are used

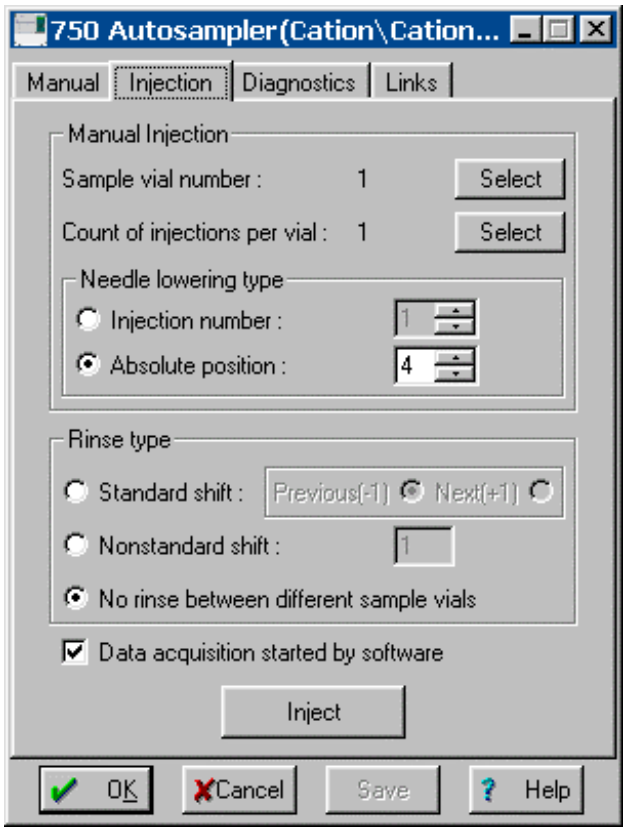
If 6.2743.030 Filter stoppers are used, only 3 injections per sample vial are possible.

Loop size is	Size of the sample loop at the 733 IC Separation Center. If the loop size is > 20 µL, only 3 injections per sample vial are possible.
<Move needle>	Move transfer needle to the desired vial position (**1...128** or **Home**).
<Lower needle>	Lower transfer needle to the desired position (**1...4**).
<Rinse needle>	Start manual rinsing using the desired vial (**1...128**).
<Change valve position>	Switch injection valve at the 733 IC Separation Center to the desired position (**FILL** or **INJECT**).
<Disconnect>	Enable manual operation of the 750 Autosampler using the keypad.

For detailed information about the 750 Autosampler see **750 Instructions for Use**.

Injection

The **Injection** tab of the **750 Autosampler** window for performing manual injections is only available for a **connected system**.



Manual injection

Sample vial number

Number of sample vial to be used for manual injection.

<Select> Selection of the vial number (**1...128**).

Count of injections per vial

Number of injections per vial (**1...4**).

<Select> Selection of the injection number (**1...4**).

Needle lowering type

Injection number Position where the needle is moved to in case of multiple injections (**1...4**).

Absolute position Position where the needle is moved to in case of single injections (**1...4**).

Rinse type

Standard shift Use **previous** or **next** vial for rinsing.

Nonstandard shift For every sample, skip this number of vials and use this vial for rinsing.

No rinse between different sample vials

No rinsing.

Data acquisition started by software

If this option is enabled, the data acquisition is started with "Inject". No cable is required between the injection valve and the interface.
If this option is disabled, the 6.2115.070 cable is needed to start data acquisition.

<Inject> Start injection.

For detailed information about the 750 Autosampler see **750 Instructions for Use**.

Links

The **Links** tab of the **750 Autosampler** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.17 766 IC Sample Processor

6.17.1 766 IC Sample Processor features

The Metrohm **766 IC Sample Processor** is a sampler for automatic sample injection for ion chromatography. It has a capacity of up to 127 samples each with an effective volume of up to 11 mL.

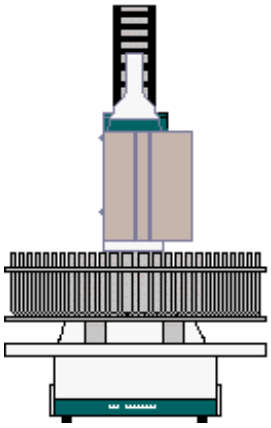
The 766 IC Sample Processor, which is normally operated using the keypad of the instrument, can be fully operated using the «IC Net» program. The 766 IC Sample Processor is normally connected to the 762 IC Interface using the 6.2134.080 or 6.2134.090 cable. If the injection valves at the 733 IC Separation Center are to be controlled by the 766 IC Sample Processor, the 6.2141.110 cable is required for the connection of the 766 IC Sample Processor and the 732 IC Detector. Examples for interconnections with the 766 IC Sample Processor can be found in the **762 Instructions for Use**.

In order to operate the 766 IC Sample Processor with «IC Net», the following RS settings have to be made using the **[CONFIG]** *key on the 766 keyboard:*

```
>RS232 settings
handshake:          SWChar
RS control:             ON
```

For detailed information about the 766 IC Sample Processor see **766 Instructions for Use**.

6.17.2 766 IC Sample Processor icon



The **766 icon** is available in the **SYSTEM** window if a **766 IC Sample Processor** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **766 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **766 IC Sample Processor** window for parameter settings (this window can also be opened by double-clicking the icon).

Timeout Open a window for setting the timeout time (in s) for the scan command.

Unlink Delete the **766 icon** from the system.

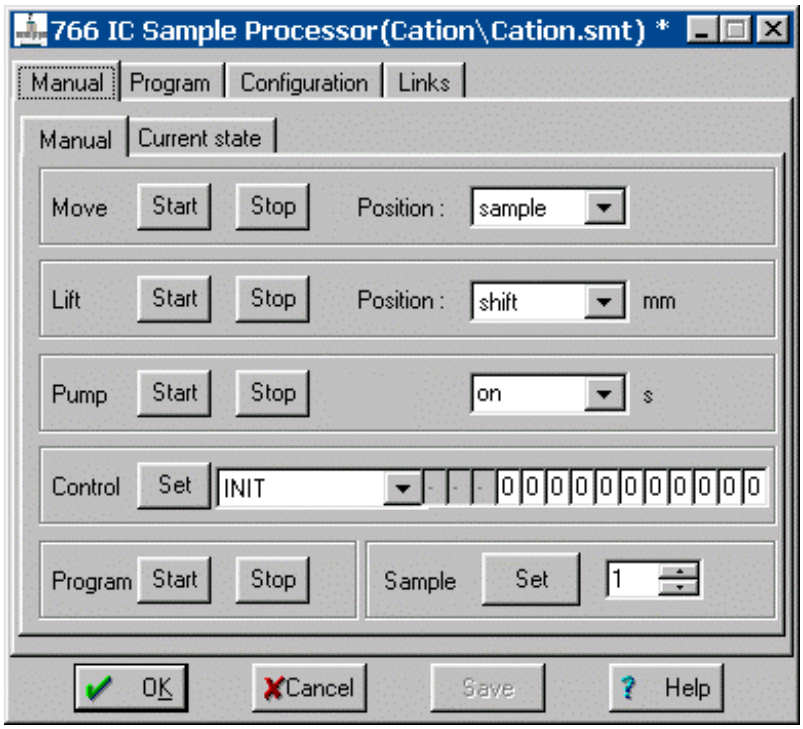
6.17.3 766 IC Sample Processor window

766 icon / Open

The **766 IC Sample Processor** window for parameter settings and manual control is opened by selecting this menu option with the right mouse button or by double-clicking the **766 icon** in the **SYSTEM** window. It consists of the four tabs **Manual**, **Program**, **Configuration** and **Links**.

Manual

The manual control of the 766 IC Sample Processor can be done on the **Manual** subtab of the **Manual** tab which is only available for a **connected system**.



Move

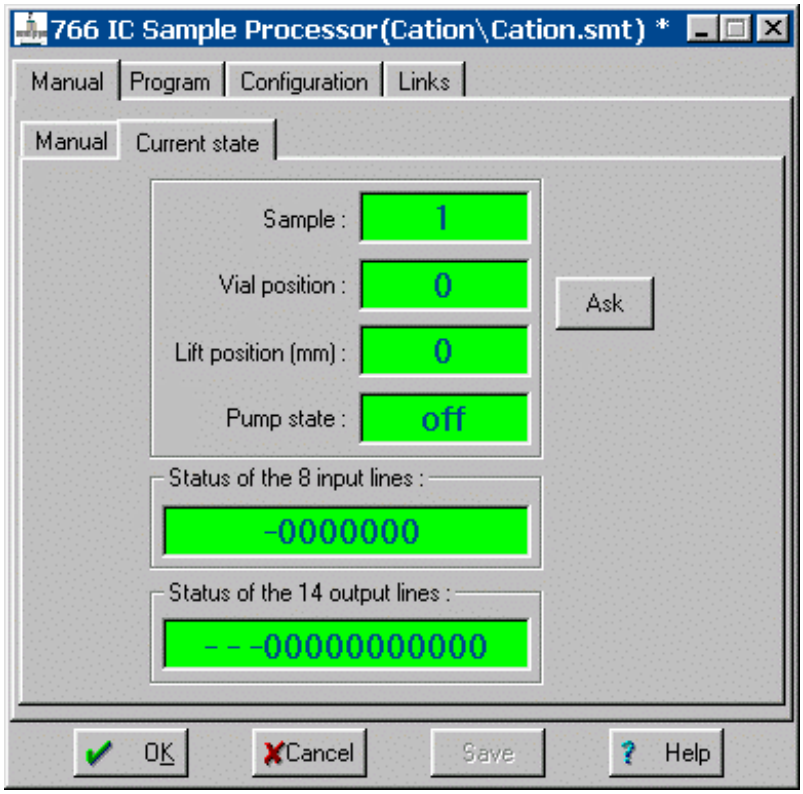
<Start> Start moving the rack to place the specified vessel at the needle.

<Stop>	Stop moving the rack to place the specified vessel at the needle.
Position	Selection of the vessel to be placed at the needle. Selection: **sample, sample+1, spec.#, 1...n**
Lift	
<Start>	Start raising or lowering the lift to the specified position.
<Stop>	Stop raising or lowering the lift to the specified position.
Position	Selection of the position. Selection: **shift, work, rinse, special, 0, 1...125 mm**
Pump	
<Start>	Switch on peristaltic pump at the tower for the specified time.
<Stop>	Switch off peristaltic pump at the tower.
Time	Selection of the pump time. Selection: **on** (infinite), **1...999 s**
Control	
<Set>	Send specified signal via remote control lines of the 766 IC Sample Processor.
Control lines	Selection of special remote line commands or individual control line settings (details see **766 Instructions for Use**).
Program	
<Start>	Start program of the **Program** tab.
<Stop>	Stop program of the **Program** tab.
Sample	
<Set>	Sample number for manual program start.
Number	Selection of the rack position. Selection: **1...n**

For detailed information about the 766 IC Sample Processor see **766 Instructions for Use**.

Status display

The current status of the 766 IC Sample Processor can be displayed on the **Current state** subtab of the **Manual** tab which is only available for a **connected system**.

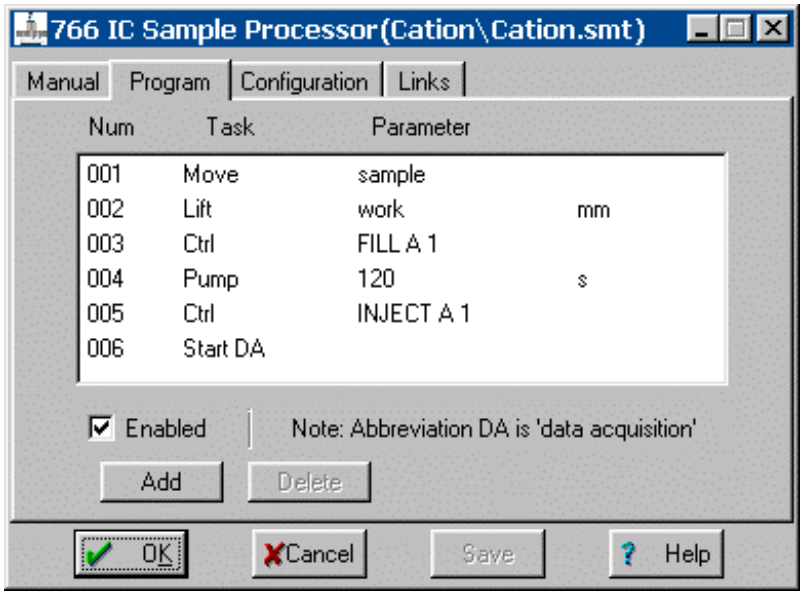


Sample	Display of current sample position.
Vial position	Display of current beaker position.
Lift position	Display of current lift position in mm.
Pump state	Display of current pump state (**on**, **off**).
Status of the 8 input lines	Status of the remote input lines.
Status of the 14 output lines	Status of the remote output lines.
<Ask>	Read current values from 766 IC Sample Processor.

For detailed information about the 766 IC Sample Processor see **766 Instructions for Use**.

Time program

On the **Program** tab of the **766 IC Sample Processor** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



Num	Row number (read-only).
Task	**Program instruction** (see below).
Parameter	**Parameter** for program instruction (see below).
Enabled	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.

List of program instructions

The following program instructions can be added to the time program on the **Program** tab:

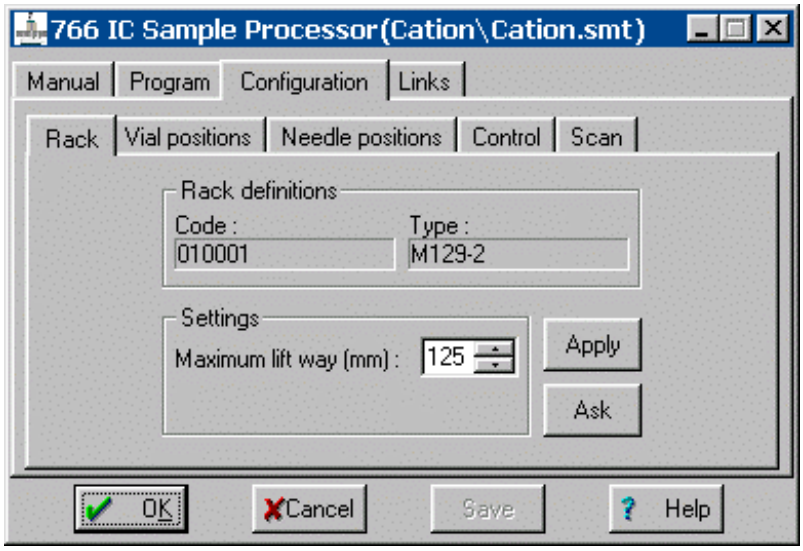
Instruction	*Parameter entry*	*Meaning*
Move	**sample, sample+1, spec.#, 1...n**	Move rack to place the specified vessel at the needle.
Lift	**shift, work, rinse, special, 0, 1...125 mm**	Raise or lower the lift to the specified position.
Pump	**on, off, 1...999 s**	Switch on/off peristaltic pump at the tower.
Scan	**"scan command"**	Scan remote interface until the specified signal is received. In addition to the normal scan commands (details see **766 Instruction for Use**) special commands defined on the **Configuration** tab can be used.

Ctrl	**"control command"**	Set the specified remote output signal. In addition to the normal control commands (details see **766 Instruction for Use**) special commands defined on the **Configuration** tab can be used.
Wait	**1...9999 s**	Waiting time.
StartDA		Start data acquisition.

Configuration

The **Configuration** tab of the **766 IC Sample Processor** window contains parameters settings on the five subtabs **Rack**, **Vial positions**, **Needle positions**, **Control**, and **Scan**.

Rack



Rack definitions

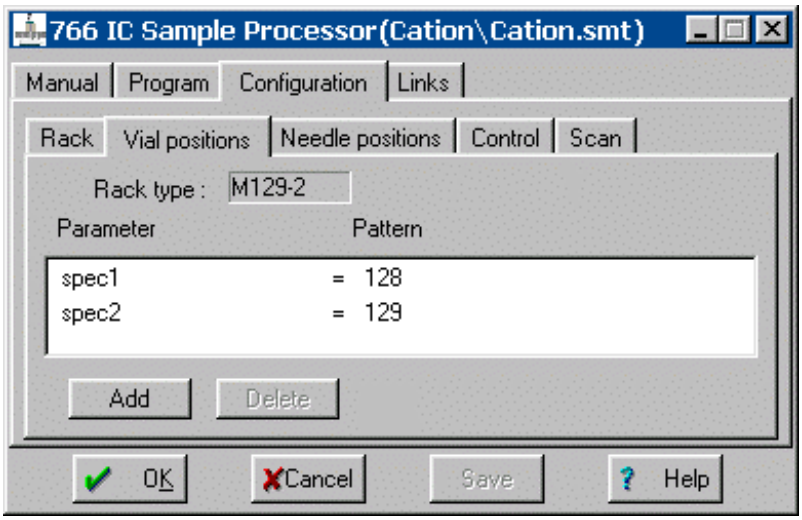
Code	Binary ID code for rack identification (read-only).
Type	Predefined rack type (read-only).

Settings

Maximum lift way	Definition of lowest lift position possible in mm. Entry range: **0...125 mm**

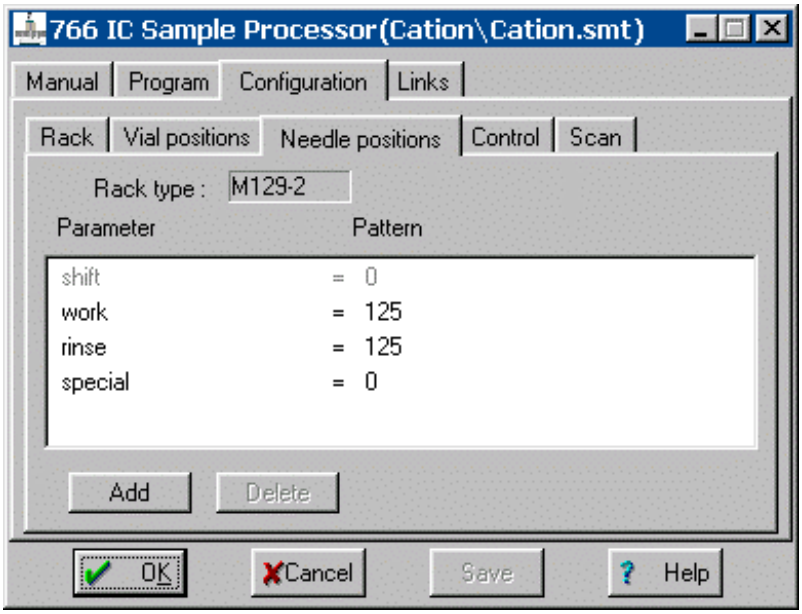
<Apply>	Send parameters to 766 IC Sample Processor.
<Ask>	Read current parameters from 766 IC Sample Processor.

Vial positions



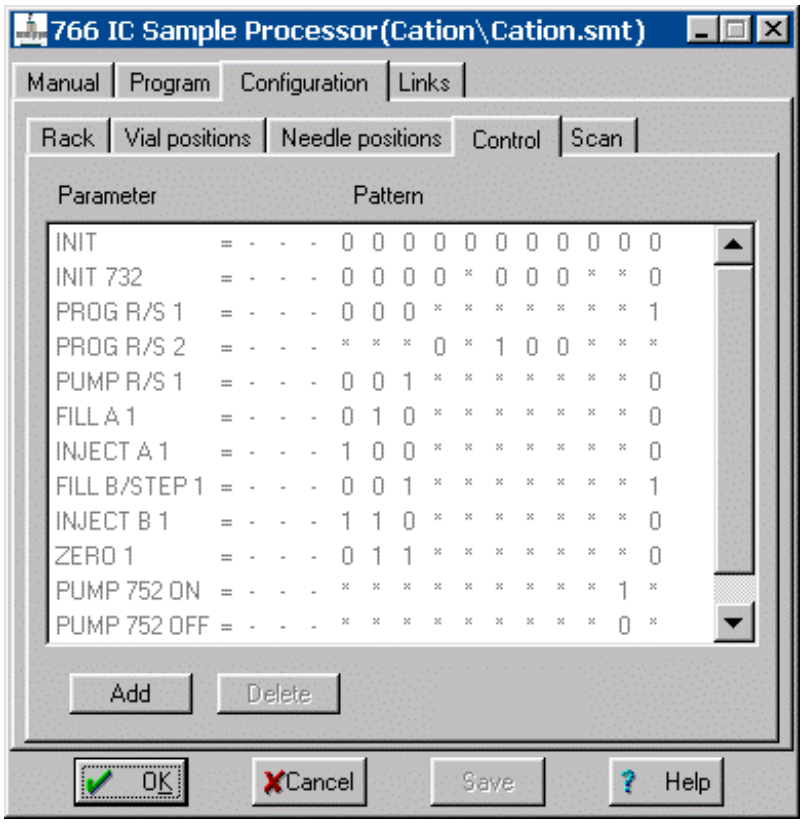
Rack type	Current rack type (read-only).
Parameter	Name for special vial position.
Pattern	Number of special vial position.
<Add>	Add a new special vial position.
<Delete>	Delete the selected special vial position.

Needle positions



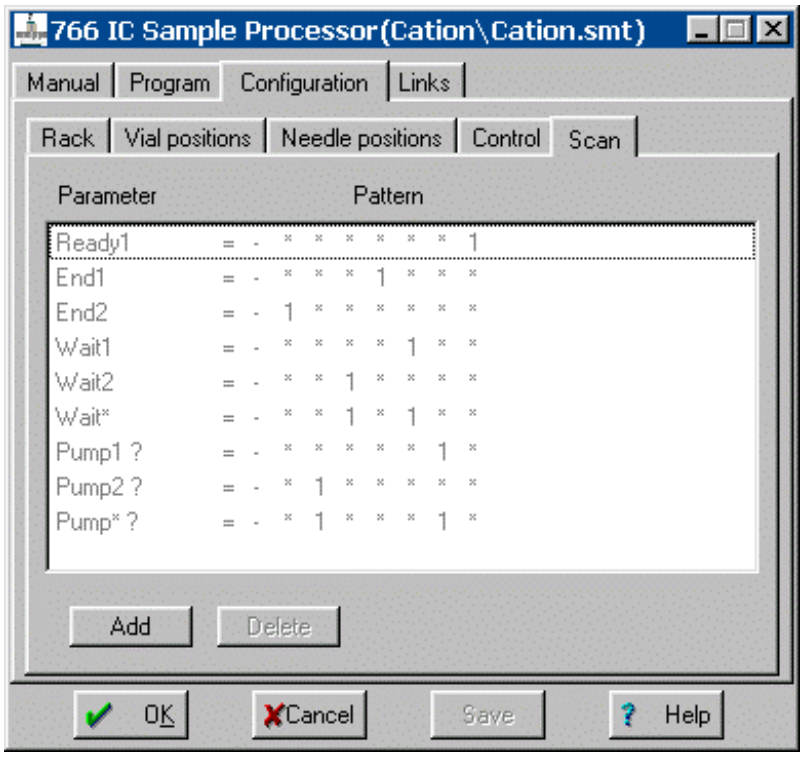
Rack type	Current rack type (read-only).
Parameter	Name for special needle position.
Pattern	Lift position of special needle position in mm.
<Add>	Add a new special needle position.
<Delete>	Delete the selected special needle position.

Control



Parameter	Name for special control command.
Pattern	Remote line settings for special control command.
<Add>	Add a new special control command.
<Delete>	Delete the selected special control command.

Scan



Parameter	Name for special scan command.
Pattern	Remote line settings for special scan command.
<Add>	Add a new special scan command.
<Delete>	Delete the selected special scan command.

Links

The **Links** tab of the **766 IC Sample Processor** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.18 788 IC Filtration Sample Processor

6.18.1 788 IC Filtration Sample Processor features

The Metrohm **788 IC Filtration Sample Processor** is a sampler for automatic filtration and injection of samples. It has a capacity of up to 127 samples each with an effective volume of up to 11 mL.

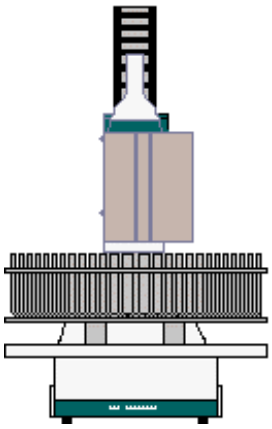
The 788 IC Filtration Sample Processor, which is normally operated using the keypad of the instrument, can be fully operated using the «IC Net» program. The 788 IC Filtration Sample Processor is normally connected to the 762 IC Interface using the 6.2134.080 or 6.2134.090 cable. If the injection valves at the 733 IC Separation Center are to be controlled by the 788 IC Filtration Sample Processor, the 6.2141.110 cable is required for the connection of the 788 IC Filtration Sample Processor and the 732 IC Detector. Examples for interconnections with the 788 IC Filtration Sample Processor can be found in the **762 Instructions for Use**.

In order to operate the 788 IC Filtration Sample Processor with «IC Net», the following RS settings have to be made using the **[CONFIG]** *key on the 788 keyboard:*

```
>RS232 settings
handshake:          SWChar
RS control:             ON
```

For detailed information about the 788 IC Filtration Sample Processor see **788 Instructions for Use**.

6.18.2 788 IC Filtration Sample Processor icon



The **788 icon** is available in the **SYSTEM** window if a **788 IC Filtration Sample Processor** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

If the system is connected and the **788 icon** is clicked with the right mouse button, the following menu appears:

Open Open the **788 IC Filtration Sample Processor** window for parameter settings (this window can also be opened by double-clicking the icon).

Timeout Open a window for setting the timeout time (in s) for the scan command.

Unlink Delete the **788 icon** from the system.

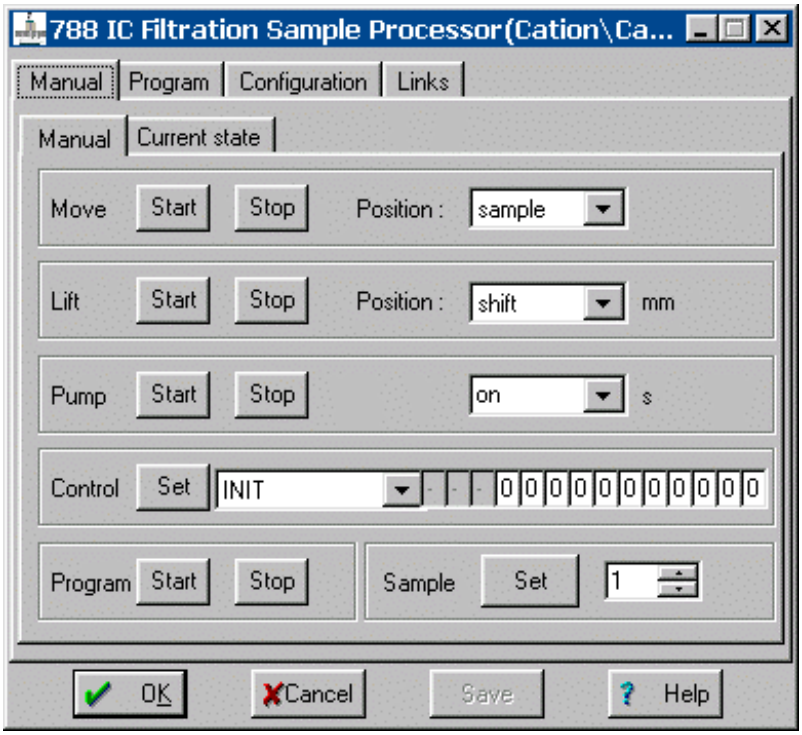
6.18.3 788 IC Filtration Sample Processor window

788 icon / Open

The **788 IC Filtration Sample Processor** window for parameter settings and manual control is opened by selecting this menu option with the right mouse button or by double-clicking the **788 icon** in the **SYSTEM** window. It consists of the four tabs **Manual**, **Program**, **Configuration** and **Links**.

Manual

The manual control of the 788 IC Filtration Sample Processor can be done on the **Manual** subtab of the **Manual** tab which is only available for a **connected system**.



Move

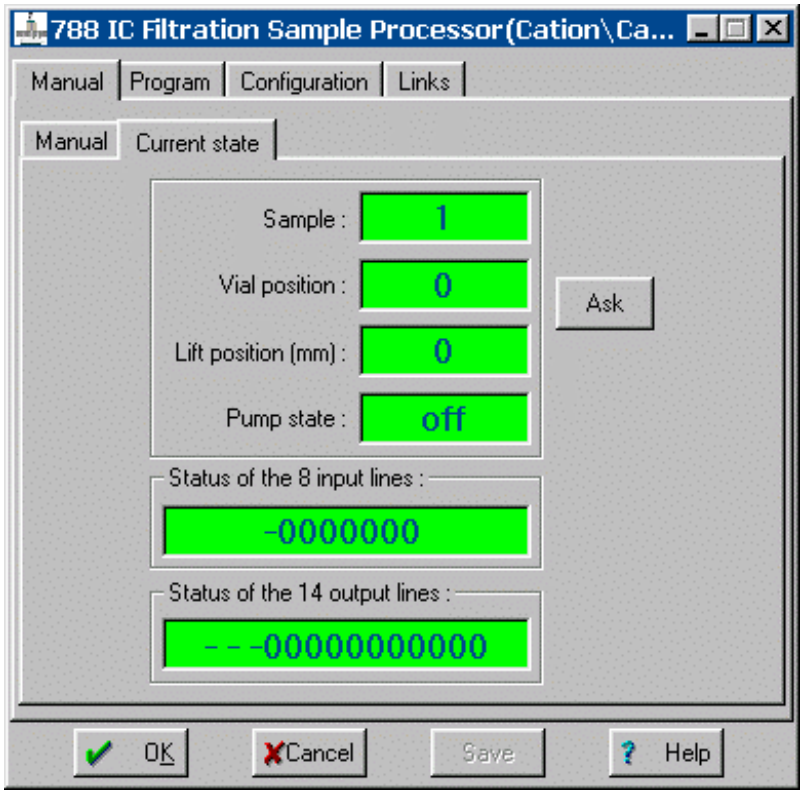
<Start> Start moving the rack to place the specified vessel at the needle.

<Stop>	Stop moving the rack to place the specified vessel at the needle.
Position	Selection of the vessel to be placed at the needle. Selection: **sample, sample+1, spec.#, 1...n**
Lift	
<Start>	Start raising or lowering the lift to the specified position.
<Stop>	Stop raising or lowering the lift to the specified position.
Position	Selection of the position. Selection: **shift, work, rinse, special, 0, 1...125 mm**
Pump	
<Start>	Switch on peristaltic pump at the tower for the specified time.
<Stop>	Switch off peristaltic pump at the tower.
Time	Selection of the pump time. Selection: **on** (infinite), **1...999 s**
Control	
<Set>	Send specified signal via remote control lines of the 788 IC Filtration Sample Processor.
Control lines	Selection of special remote line commands or individual control line settings (details see **788 Instructions for Use**).
Program	
<Start>	Start program of the **Program** tab.
<Stop>	Stop program of the **Program** tab.
Sample	
<Set>	Sample number for manual program start.
Number	Selection of the rack position. Selection: **1...n**

For detailed information about the 788 IC Filtration Sample Processor see **788 Instructions for Use**.

Status display

The current status of the 788 IC Filtration Sample Processor can be displayed on the **Current state** subtab of the **Manual** tab which is only available for a **connected system**.

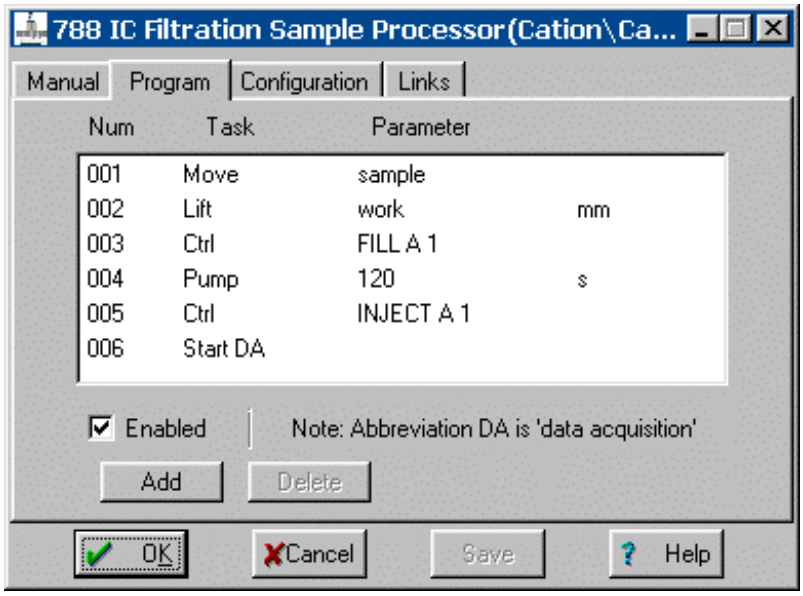


Sample	Display of current sample position.
Vial position	Display of current beaker position.
Lift position	Display of current lift position in mm.
Pump state	Display of current pump state (**on**, **off**).
Status of the 8 input lines	Status of the remote input lines.
Status of the 14 output lines	Status of the remote output lines.
<Ask>	Read current values from 788 IC Filtration Sample Processor.

For detailed information about the 788 IC Filtration Sample Processor see **788 Instructions for Use**.

Time program

On the **Program** tab of the **788 IC Filtration Sample Processor** window a user-defined time program can be entered. This program is started automatically as defined in the **Start mode** window (see *section 4.4.3*) either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



Num	Row number (read-only).
Task	**Program instruction** (see below).
Parameter	**Parameter** for program instruction (see below).
Enabled	Enable program start (a disabled program is not started).
<Add>	Add new program instruction.
<Delete>	Delete selected program instruction.

List of program instructions

The following program instructions can be added to the time program on the **Program** tab:

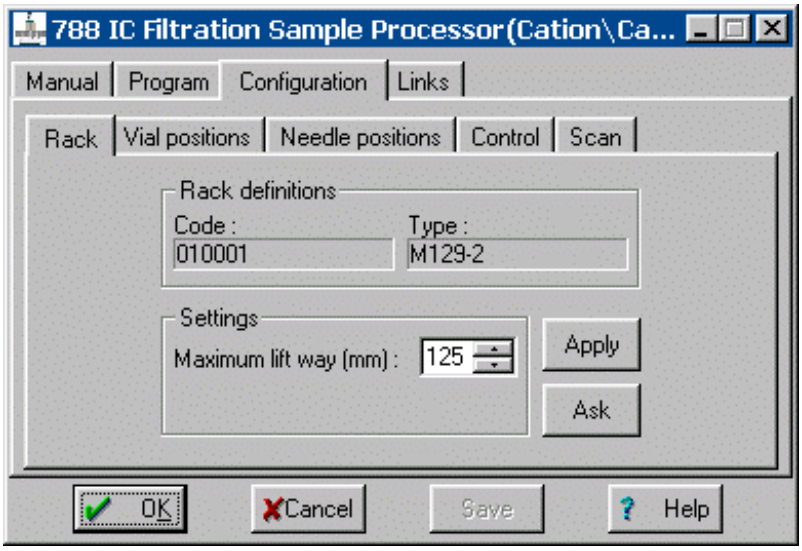
Instruction	*Parameter entry*	*Meaning*
Move	**sample, sample+1, spec.#, 1...n**	Move rack to place the specified vessel at the needle.
Lift	**shift, work, rinse, special, 0, 1...125 mm**	Raise or lower the lift to the specified position.
Pump	**on, off, 1...999 s**	Switch on/off peristaltic pump at the tower.
Scan	**"scan command"**	Scan remote interface until the specified signal is received. In addition to the normal scan commands (details see **788 Instruction for Use**) special commands defined on the **Configuration** tab can be used.

Ctrl	**"control command"**	Set the specified remote output signal. In addition to the normal control commands (details see **788 Instruction for Use**) special commands defined on the **Configuration** tab can be used.
Wait	**1...9999 s**	Waiting time.
StartDA		Start data acquisition.

Configuration

The **Configuration** tab of the **788 IC Filtration Sample Processor** window contains parameters settings on the five subtabs **Rack**, **Vial positions**, **Needle positions**, **Control**, and **Scan**.

Rack



Rack definitions

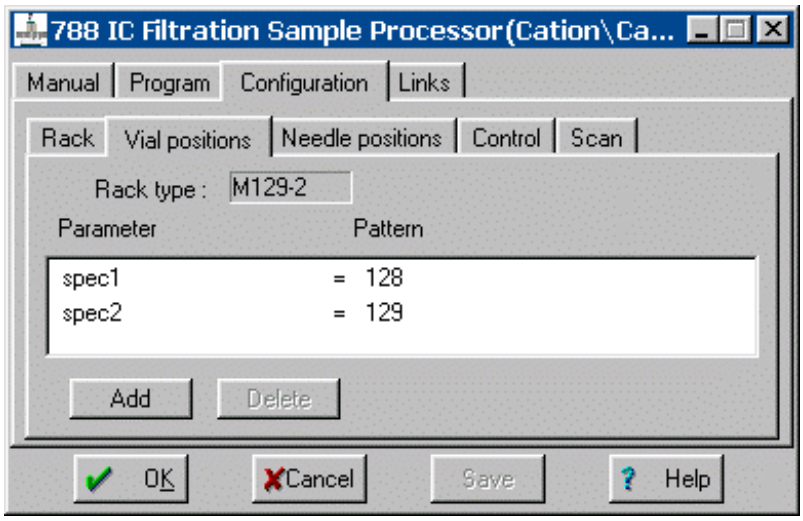
Code	Binary ID code for rack identification (read-only).
Type	Predefined rack type (read-only).

Settings

Maximum lift way	Definition of lowest lift position possible in mm. Entry range: **0...125 mm**

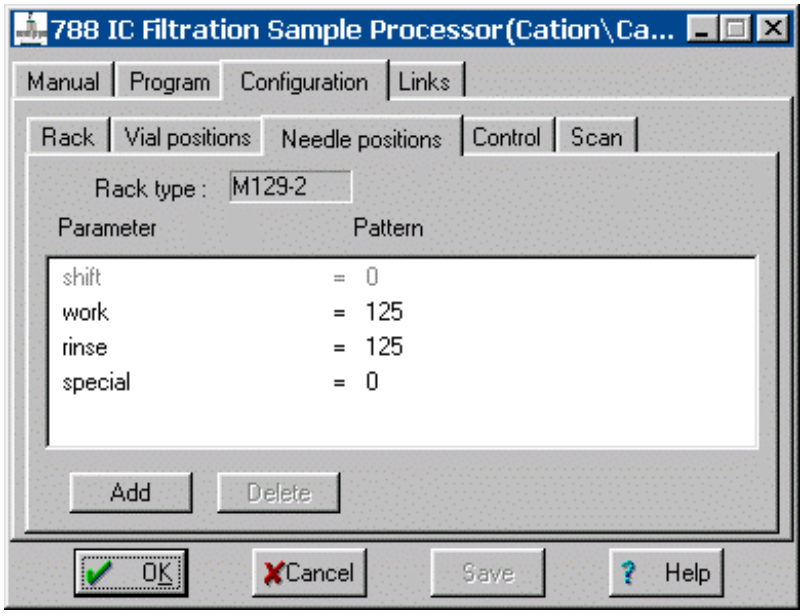
<Apply>	Send parameters to 788 IC Filtration Sample Processor.
<Ask>	Read current parameters from 788 IC Filtration Sample Processor.

Vial positions



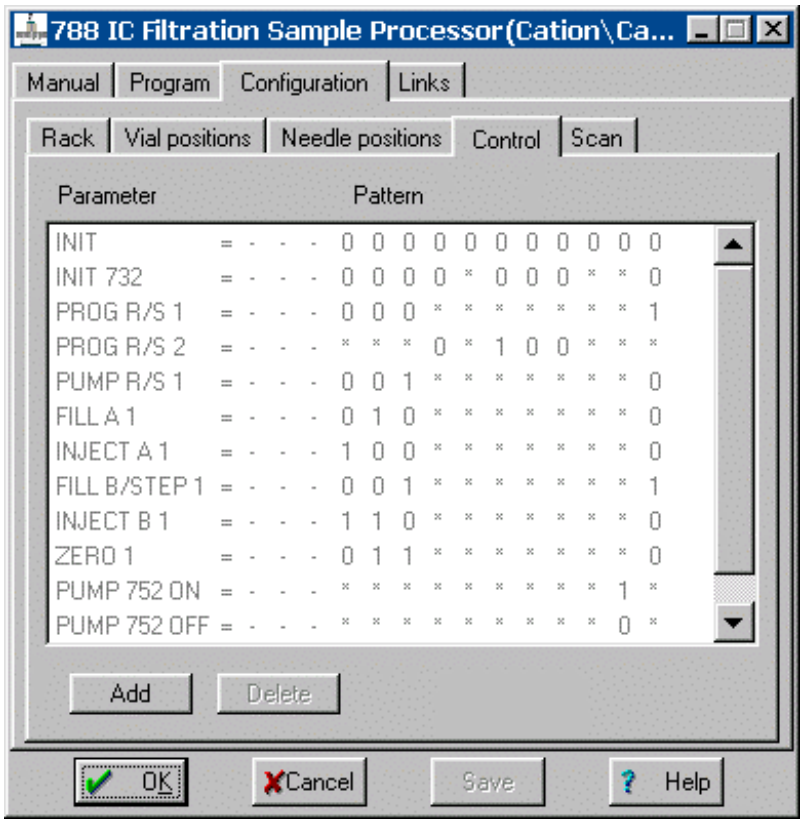
Rack type	Current rack type (read-only).
Parameter	Name for special vial position.
Pattern	Number of special vial position.
<Add>	Add a new special vial position.
<Delete>	Delete the selected special vial position.

Needle positions



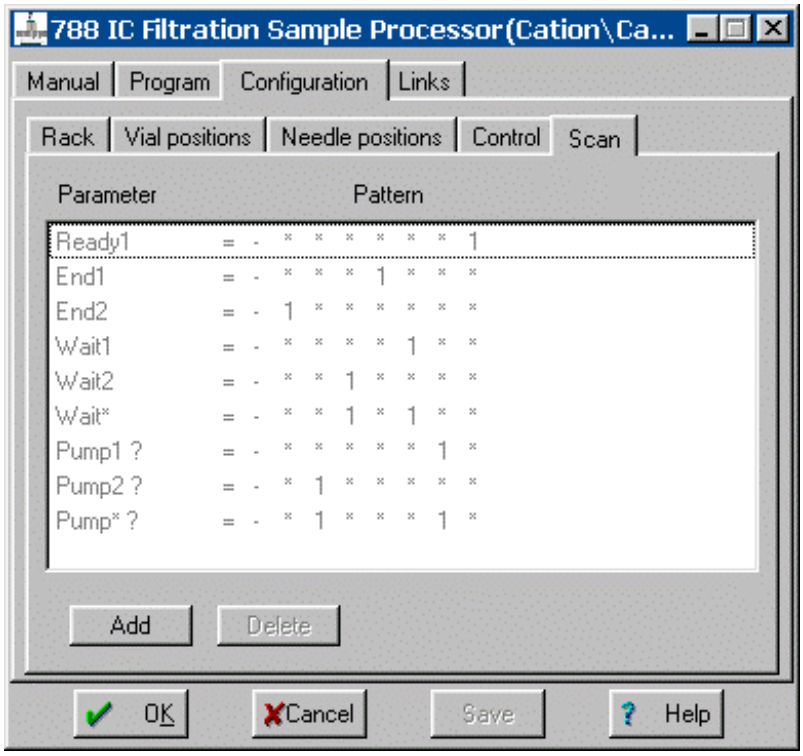
Rack type	Current rack type (read-only).
Parameter	Name for special needle position.
Pattern	Lift position of special needle position in mm.
<Add>	Add a new special needle position.
<Delete>	Delete the selected special needle position.

Control



Parameter	Name for special control command.
Pattern	Remote line settings for special control command.
<Add>	Add a new special control command.
<Delete>	Delete the selected special control command.

Scan



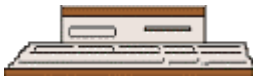
Parameter	Name for special scan command.
Pattern	Remote line settings for special scan command.
<Add>	Add a new special scan command.
<Delete>	Delete the selected special scan command.

Links

The **Links** tab of the **788 IC Filtration Sample Processor** is used for COM port selection and settings (details see *section 5.2.4 Links*).

6.19 Data recorder

6.19.1 Data recorder icon



The **Data recorder icon** is one of the components always present in a new **SYSTEM** window. If the system is connected and this icon is clicked with the right mouse button, the following menu appears:

Open Load the processing method linked to the system and open an empty chromatogram window (this window can also be opened by double-clicking the icon).

Setup Open data recorder setup window for selection of processing method and data source (see below).

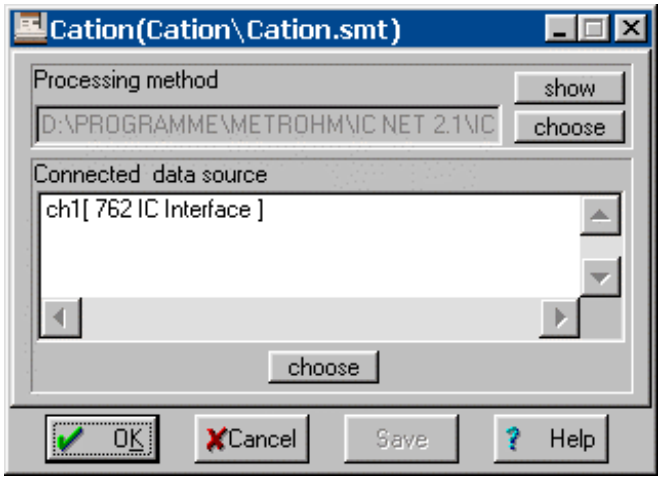
Upload buffer Upload of last chromatogram which was acquired with the 762 IC Interface (**Upload buffer** doesn't work for all other interfaces). The chromatogram is immediately drawn on screen and saved under a new name.

Unlink Delete the **Data recorder icon** from the system.

To record several **single-channel chromatograms** at the same time, data recorder icons must be installed for each detector. To record **multi-channel chromatograms**, only one data recorder icon must be installed, but several data source channels have to be linked to this data recorder.

6.19.2 Select processing method and data source

The **Data recorder icon** / **Setup** menu item opens the following window:



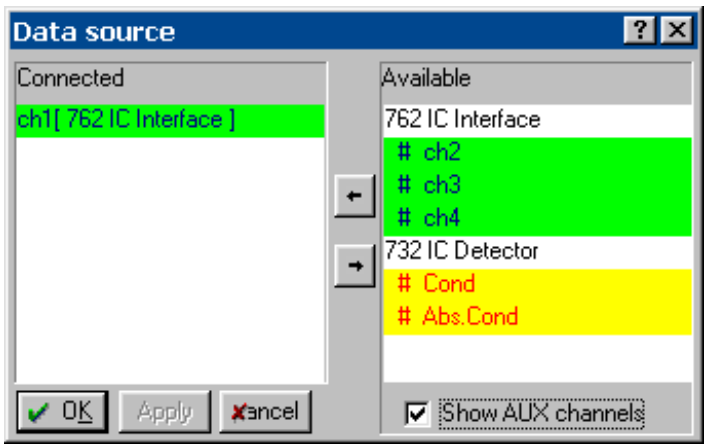
Processing method Name of the method file (***.mtw**) linked to the system.

<show> Open processing method.

<choose> Select the method file (***.mtw**) to be linked to the system.

Connected data source Data source for main measurement channel.

<choose> Open the **Data source** window for selection of the data source:



Connected Connected data source.

Available

762 IC Interface

 # ch1 to ch4 Data source channels of the 762 IC Interface.

771 Compact Interface

 # ch1 and ch2 Data source channels of the 771 Compact Interface.

761 Compact IC

 # Cond Conductivity channel of the 761 Compact IC.

 # Press Pressure channel of the 761 Compact IC.

732 IC Detector

 # Cond Conductivity channel of the 732 IC Detector.

 # Abs.Cond Absolute conductivity channel of the 732 IC Detector.

PC Board#

 # ch1 and ch2 Data source channels of the PC Board 1 or PC Board 2.

817 Bioscan

 # Cell Cell potential channel of the 817 Bioscan.

 # Temp Temperature channel of the 817 Bioscan.

 # E Potential channel of the 817 Bioscan.

709 IC Pump

# flow	Flow channel of the 709 IC Pump.
# pressure	Pressure channel of the 709 IC Pump.

Pump control system (SDU)

# flow	Flow channel of the SDU.
# pressure	Pressure channel of the SDU.
# % A	Percentage of Eluent A channel of the SDU.
# % B	Percentage of Eluent B channel of the SDU.
# % C	Percentage of Eluent C channel of the SDU.
# % D	Percentage of Eluent D channel of the SDU.

Show AUX channels	If this option is enabled, the auxiliary data source channels (yellow items) of devices and interfaces are displayed in addition to the main data source channels (green items).

The data sources can be moved from one field to the other using the  or  buttons (only one data source can be connected).

6.20 System timer

6.20.1 Timer icon

The **system timer** is used for programming system tasks which are started automatically daily or once at the desired time. The **System timer icon** is available in the **SYSTEM** window if a **Timer** has been installed with the **New system wizard** or by using the **Setup/New devices/Install new device** option of the **SYSTEM** window (see *section 6.1.2*).

6.20.2 Timer program

The timer program of the system program is identical to the global timer program (see *section 5.5.2*).

7 Methods

A method contains all information necessary for **data acquisition**, **integration**, **peak evaluation** and **quantification**. It can be considered as the chromatogram template, i.e. chromatogram without raw data. Methods are stored as **method files** (***.mtw**) in the **Methods** directory.

Each system is linked to a method. This method is called **processing method** and is opened automatically at the start of a new determination.

7.1 Method file handling

The following menu items are used for opening and saving of methods:

IC NET / File / Open / Method

Load an existing method file (***.mtw**) from the **Methods** directory and open an empty chromatogram window.

The name of the method is displayed in the title bar of the **SYSTEM** window. A star (*****) at the end of the name indicates that the method has been changed since the last saving.

IC NET / File / Save / Method

Save the method of the current chromatogram in a method file (***.mtw**) in the **Methods** directory.

7.2 Passport

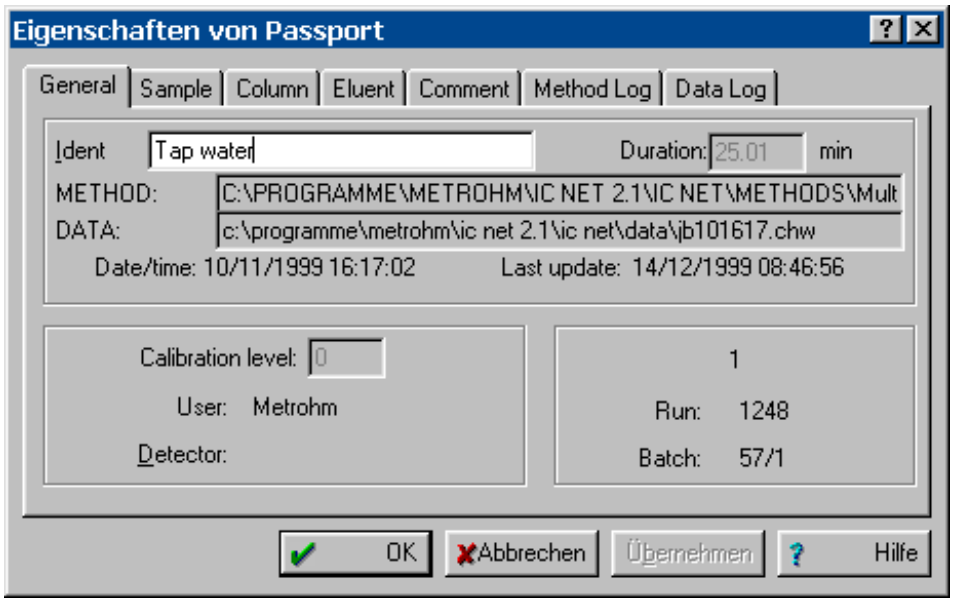
IC NET / Method / Passport

This menu item opens the **Passport** window which includes a detailed textual description of the chromatographic run and consists of the following tabs:

General	General information on determination.
Sample	Sample information.
Column	Column information.
Eluent	Eluent information.
Comment	User comments on chromatogram.

7.2.1 General

Tab **General** of the passport with general description of the method and determination.



Ident — User defined identifier (title) for the chromatogram to be displayed in the title bar of the chromatogram window and in the **Chromatogram open** window.

Duration — Duration of the chromatogram in min. You can modify this value when the chromatogram is running.

METHOD — Path and file name of the **method** used for data acquisition (read-only).

DATA — Path and file name of the current **chromatogram** (read-only).

Date/time — Date and time of the chromatogram start (read-only).

Last update — Date and time of the last chromatogram modification and saving (read-only).

Calibration level — If the current run is used for calibration, the calibration level is a positive integer, otherwise it equals 0. You can modify this value when the chromatogram is running.

User — Full name of the current user (read-only).

Detector — Name of the detector. It can be entered with **Method setup** / **Measure**.

Run — Number of the current run starting from the very first one. All runs are automatically numbered by the system (read-only).

To reset the **Run** *number press [Ctrl] [F8]. The* **Analysis number** *window is opened where the run number for the next run can be modified to the desired value.*

Batch X/Y: total number of started sample queues / current analysis number in the sample queue (read-only).

7.2.2 Sample

Tab **Sample** of the passport with sample information.

Info 1 First sample description (max. 256 characters).

Info 2 Second sample description (max. 256 characters).

Volume Injected volume in µL.

Dilution Dilution of the sample.

Vial number Autosampler vial position to take sample from.

Amount Sample amount. If this value is different for the calibration run (**c**) and the sample run (**s**), the component concentrations of the sample are calculated as follows:

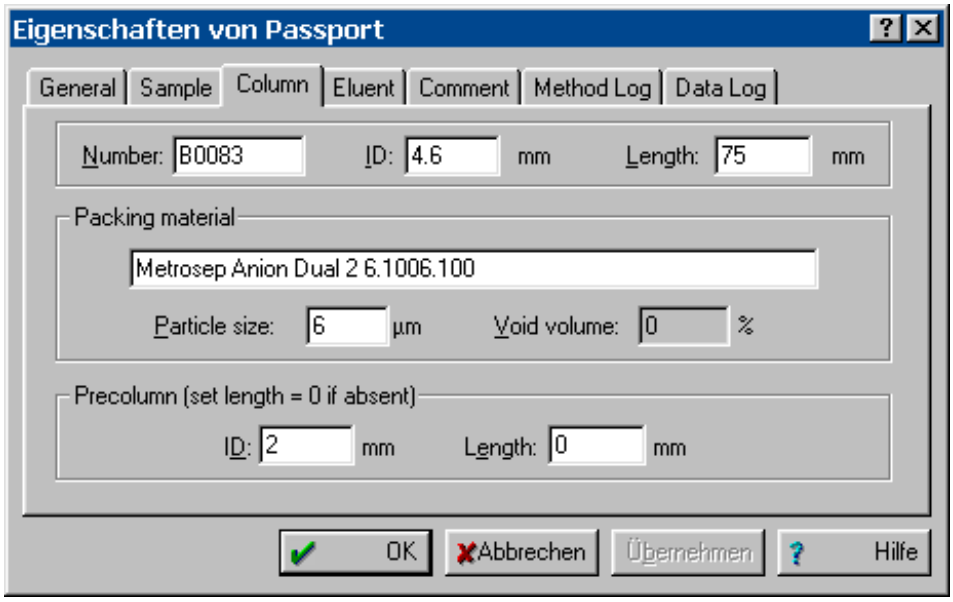
$$C_s = C_c \cdot \text{Amount}_s / \text{Amount}_c$$

Internal standard amount
Concentration of the internal standard component for relative concentration calculations.

Date/time when... Date and time of sample collection (the default values are equal to the date and time when the chromatogram starts).

7.2.3 Column

Tab **Column** of passport with column information.



Number Serial number of column (max. 256 characters).

ID Internal diameter of the column in mm.

Length Length of the column in mm. This parameter is used to calculate **Linear flow**.

Packing material

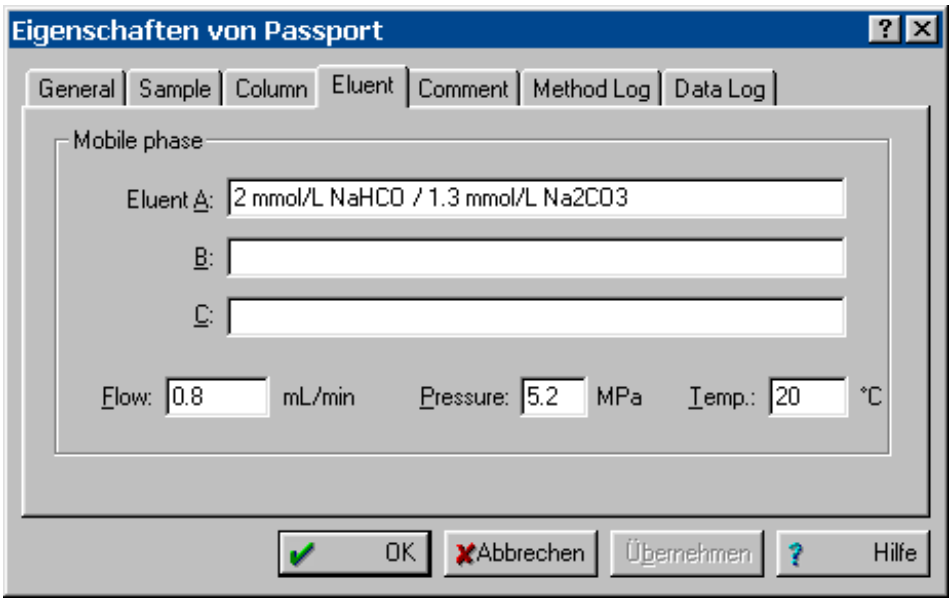
- **Column** Column description (max. 256 characters).
- **Particle size** Particle size of the column in µm. This value is used for the calculation of reduced theoretical plate height **Reduced TP height**.
- **Void volume** Void volume for the column in %. Used to calculate **Logarithmic index**, **Capacity factor** and **Linear flow**. It is calculated by the system in accordance with the settings defined on **Method setup** / **Math**.

Precolumn

- **ID** Internal diameter of the precolumn in mm.
- **Length** Length of the precolumn in mm (set length to 0 if no precolumn is used).

7.2.4 Eluent

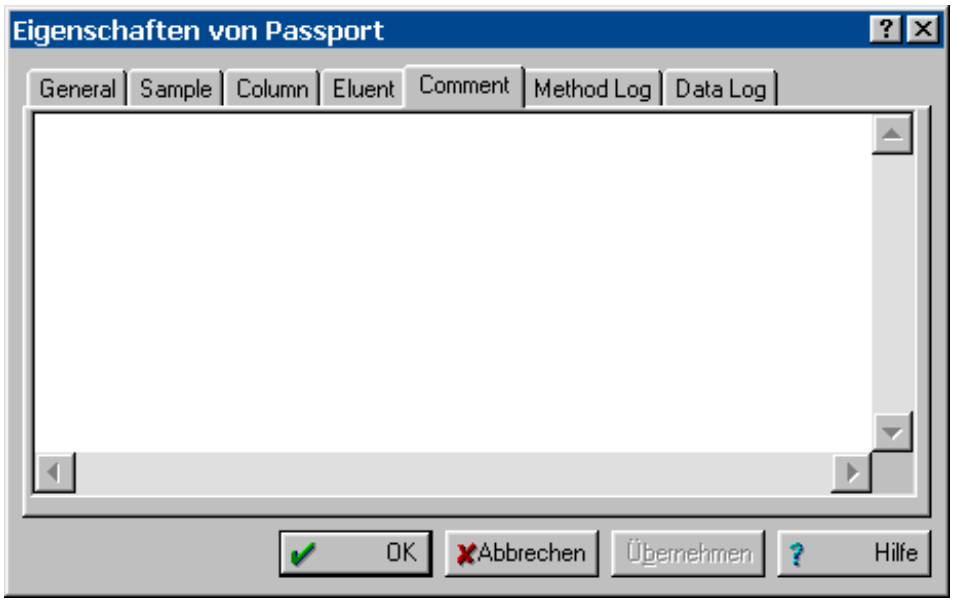
Tab **Eluent** of passport with eluent information.



Eluent A	Description of eluent composition (max. 256 characters).
Eluent B	Description of eluent composition (max. 256 characters).
Eluent C	Description of eluent composition (max. 256 characters).
Flow	Flow rate of the high-pressure pump in mL/min or µL/min. The flow rate is used to recalculate the time axis into volumetric units. The system startup value for the flow rate is entered automatically into this field at the start of a determination with **Start with inject**.
Pressure	Pressure in MPa, psi, bar, or atm. The measured value for the pressure is entered automatically into this field at the start of a determination with **Start with inject**.
Temp.	Temperature in °C. Here you can enter the temperature of the column's thermostat or the ambient temperature.

7.2.5 Comment

Tab **Comment** of passport for entry of free-text user comments into the chromatogram description. Use this feature to enter any additional information about the chromatogram not included in other sections of the method.



7.3 Method setup

IC NET / Method / Method setup

This menu item opens the **Method setup** window which includes the most common parameters for data acquisition and evaluation of the method and consists of the following tabs:

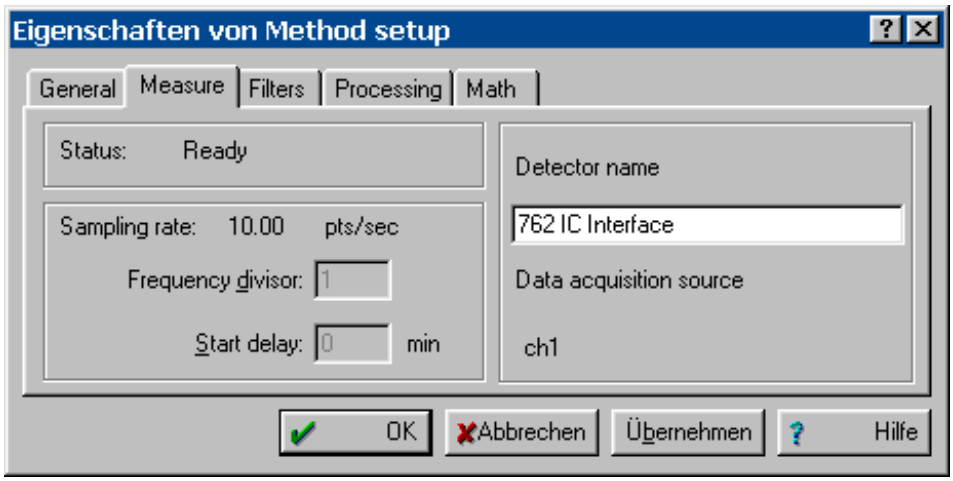
General	General information on determination.
Measure	Important data acquisition parameters.
Filters	Parameters for noise filtration.
Processing	Set actions that are performed when the chromatogram finishes.
Math	Parameters that are used for various types of calculations.

7.3.1 General

Tab **General** of **Method setup** window with general description of the method and determination. This tab is identical to the **General** tab called with **Method** / **Passport** (see *section 7.2.1*).

7.3.2 Measure

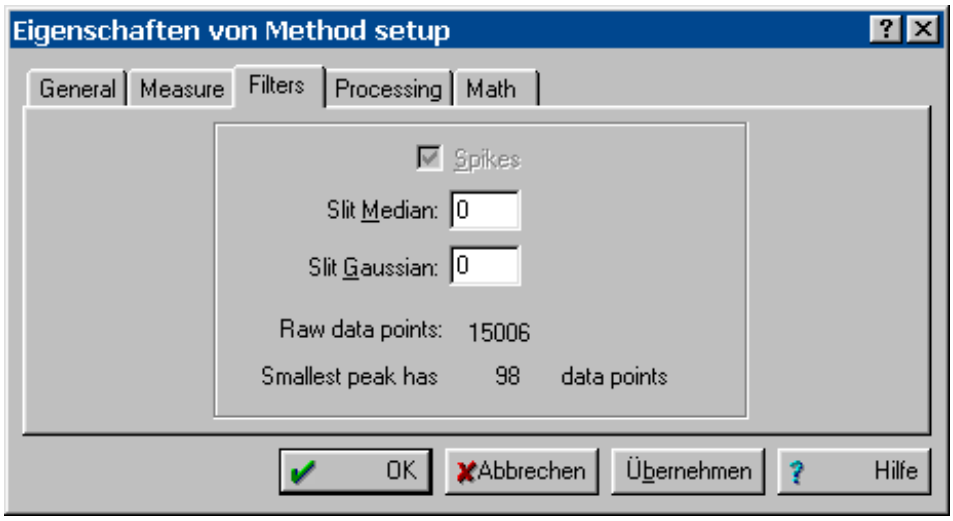
Tab **Measure** of **Method setup** window with data acquisition parameters.



Status	Chromatogram measurement status (read-only).
Sampling rate	Sampling rate for recording the chromatogram (read-only; only displayed correctly for running or recorded chromatograms).
Frequency divisor	Divisor to reduce the sampling rate. Entry range: **1...9999**
Start delay	Time delay before starting data acquisition in min.
Detector name	User-defined detector name.
Data acquisition source	Measuring channel (read-only).

7.3.3 Filters

Tab **Filters** of **Method setup** window with parameters for noise filtration of raw data. Three different filtration algorithms are available to reduce noise and increase apparent signal-to-noise ratio.



Spikes — **Spikes filter**. The Spikes filter smoothes the first and last points of the chromatogram and the points identified as spikes. The spike is exchanged with half of the sum of two neighboring signal values.

Slit Median — **Median filter**. Performs filtration if non-zero smoothing degree is entered. Smoothing degree should be a natural number. The values within the window are sorted by increasing response level and the response corresponding to the middle of the window is replaced with the value in the middle of a sorted array. This method affects chromatographic peaks in minimal extent, improves baseline and eliminates single-point spikes. In this case the spike will be replaced with one of the neighboring points.

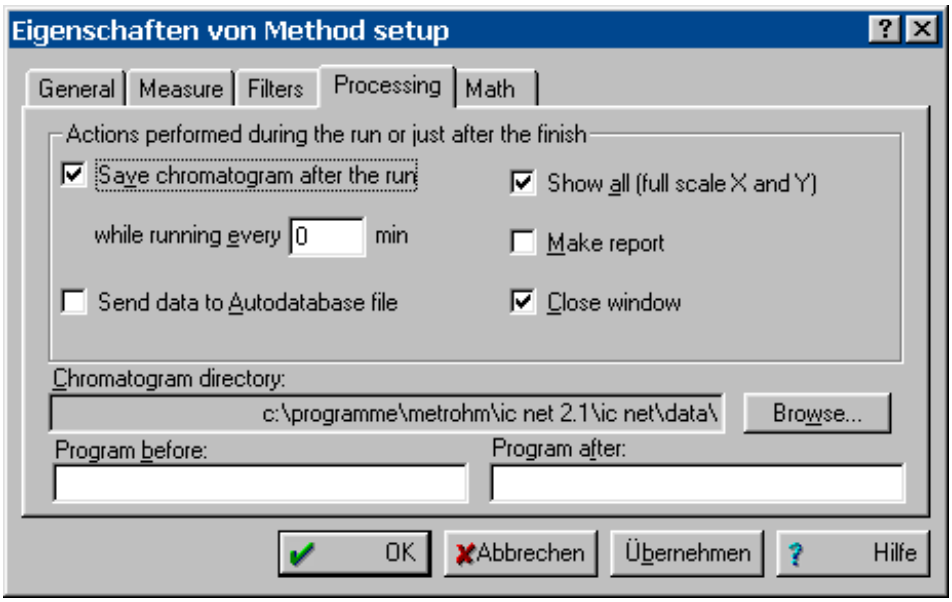
Slit Gaussian — **Gauss filter**. Performs filtration if non-zero smoothing degree is entered. The sum of all window points with Gaussian weights distribution is calculated and is used as a new raw data value. The peaks become a bit smaller and wider after smoothing, but their area does not change.

Raw data points — Number of data points per chromatogram (read-only).

Smallest peak has ... — Number of data points per smallest peak on the chromatogram (read-only). This information is valuable to perform the **Compress** procedure (data compression).

7.3.4 Processing

Tab **Processing** of **Method setup** window for definition of actions that are performed during the run or when the chromatogram finishes. Automatic post-run data processing is especially useful for chromatographic systems that include an autosampler.



Save chromatogram after the run

If checked, autosaving of the chromatogram will be performed on data acquisition ending.

while running every ... min

Save the chromatogram during the run for data safety at the time interval set (if **0** is set, the chromatogram is not saved during the run).

Send data to Autodatabase file

If checked, the chromatogram data are automatically sent to the Autodatabase file specified in the **Autodatabase options** window (see *section 8.6.7*).

Show all

If checked, scales on X and Y axes will be automatically chosen so that the recorded chromatogram fits the window.

Make report

If checked, report auto-printing will be performed on data acquisition ending.

Close window

If checked, the window is closed automatically after the run (or sample queue) is finished.

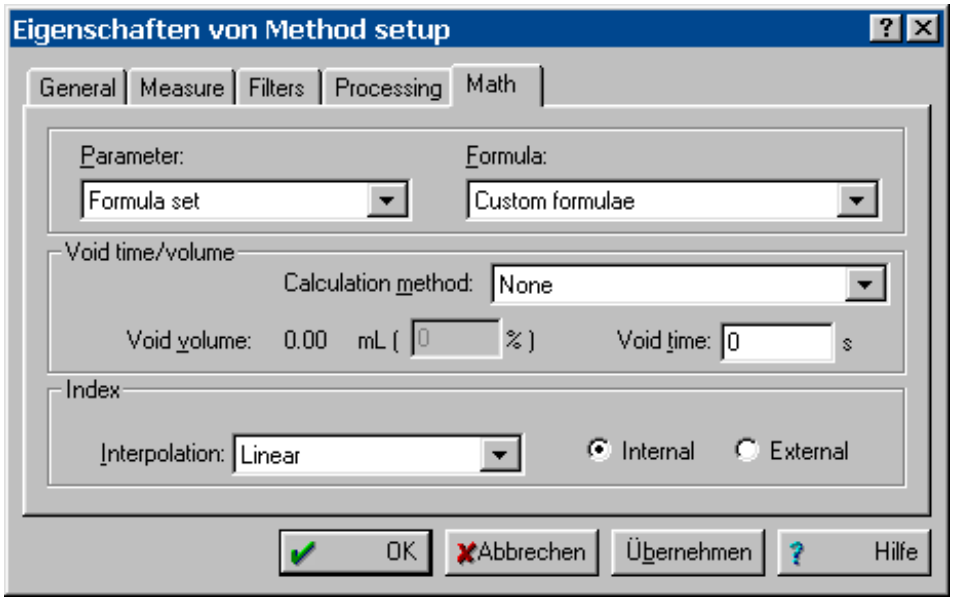
Chromatogram directory

Directory where the current chromatogram is saved. Use the **<Browse>** button to select a new directory.

Program before	Name and path of the program to be started automatically before the run is started.
Program after	Name and path of the program to be started automatically after the run is finished.

7.3.5 Math

Tab **Math** of **Method setup** window with parameters that are used for various types of calculations.



Parameter	Selection of **calculation parameter**:
Formula set	Formula setting by customer (**Custom formulae**) or according either to **European Pharmacopoeia** or **US Pharmacopoeia**.
Theoretical plates	Selection of calculation formula for number of theoretical plates if **Formula set** = **Custom formulae** is set.
Resolution	Selection of calculation formula for resolution if **Formula set** = **Custom formulae** is set.
Asymmetry	Selection of calculation formula for asymmetry if **Formula set** = **Custom formulae** is set.
Formula	Selection of **calculation formula** for the calculation parameter selected for **Parameter**. With **Parameter = Formula set** the following settings are possible:
Custom formulae	Formula setting by customer.

European Pharmacopoeia
Formula setting according to European Pharmacopoeia.

US Pharmacopoeia Formula setting according to US Pharmacopoeia.

Void time/volume Calculation of **void time/void volume**:

Calculation method Selection of the method for void time calculation:

None Manual entry in the **Void time** field.

1st component The peak corresponding to the first component is selected as a void time marker and its retention time replaces the previous value of the void time. If the first component is not identified, the expected retention time is used.

1st peak The first detected peak is used as a void time marker for the run and its retention time is stored in the **Void time** field.

From void volume %
For the calculation of the void time, the % value entered in the **Void volume** field is multiplied by the ratio of empty column volume and eluent flow rate.

Void volume Void volume in mL and % of column volume. The % value can be entered manually if **Calculation method = From void volume %** is set.

Void time Void time in s. This value can be entered manually if **Calculation method = None** is set.

Index Calculation of **Retention index**:

Interpolation Use of linear or logarithmic interpolation scale for retention index calculation.

Internal The index scale is constructed on the basis of the current chromatogram. All components used for index scale calibration should be present in the current sample.

External The index scale is constructed on the basis of another standard chromatogram.

7.4 Integration

7.4.1 General information

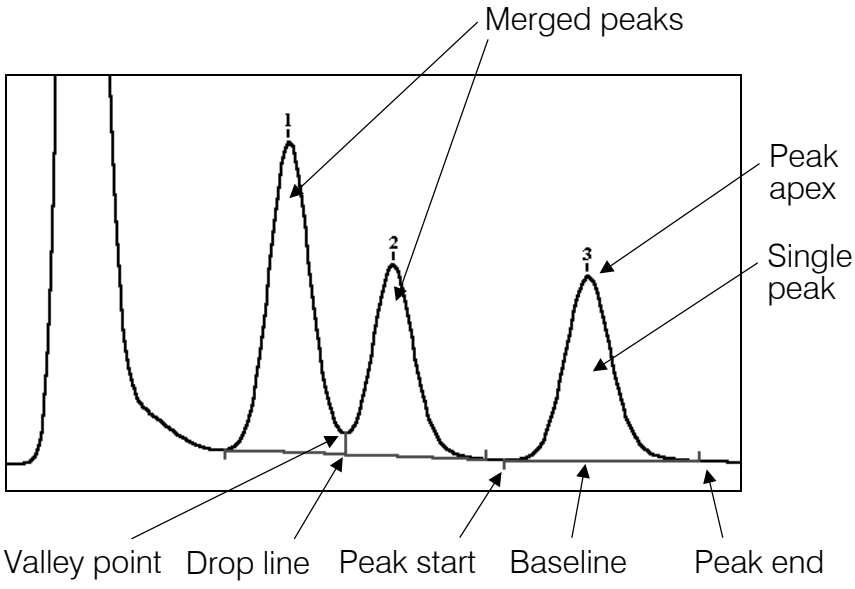
IC NET / Method / Integration

This menu item opens the **Integration parameters** window which contains parameters and events for peak integration and consists of the two tabs **Setup** (see *section 7.4.2*) and **Events** (see *section 7.4.3*).

The «IC Net» software includes a built-in automatic integration algorithm to detect peaks on the chromatographic curve and to evaluate them using calculated baselines. The integration procedure is tuned by the integration parameters on the **Setup** tab and the integration events on the **Events** tab. Integration events have higher priority than integration parameters. The integration can be modified manually using the peak editor (see *section 8.4*).

The built-in integrator algorithm is based on the use of the first derivative (slope). In order to decide whether the slope at some point is significant, the first derivative value is divided by the baseline noise and the result is compared with a threshold value called **Slope**. The threshold values for the upslope and downslope differ.

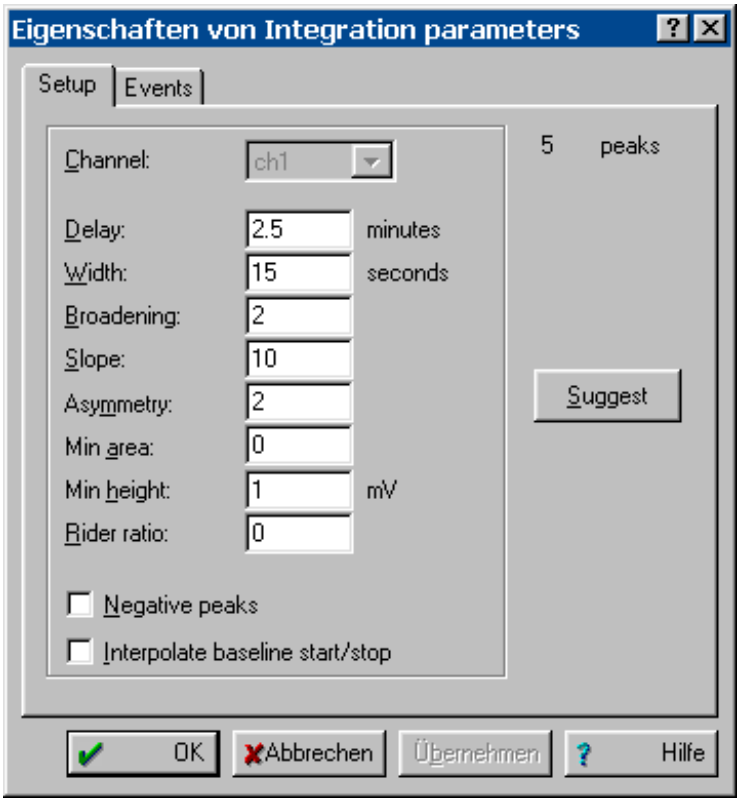
The baseline and the starting and finishing points are determined for each peak. For separated peaks the baseline consists of a straight line between the starting point and the finishing point. For neighboring peaks which overlap a common baseline is normally constructed; this connects the starting point of the first peak with the finishing point of the last peak. The peaks are separated from one another by dropping a perpendicular line from the lowest point (valley) between the peaks to the common baseline. Alternatively the baseline can also be drawn directly between the valleys of the peaks with the event **Enable valley-to-valley** (see integration events for baseline).



7.4.2 Setup

Tab **Setup** of **Integration parameters** window with integration parameters. The two most important of these parameters for peak recognition are **Width** and **Slope**.

If the signal-to-noise ratio of the chromatogram is high enough (e.g. 100:1 or higher), the integration algorithm is not too sensitive to changes in integration parameters. On the contrary, if the baseline noise is high, careful tuning of these parameters may be needed.



Number of peaks	Number of peaks detected (read-only).
Channel	Data acquisition channel for peak detection (read-only)
Delay	Time delay before starting peak detection (in min). Entry range: **0...1440 min**
Width	**Peak width** (at the baseline, in s). This parameter is used for setting baseline start and end points. If this value is too low, excessive narrow peaks are detected from the baseline noise. If it is too large, several adjacent peaks or baseline drift can be integrated as a single peak. For an optimal evaluation, it is recommended to enter the

width of the narrowest peak on the chromatogram (normally 2…10 s).
Entry range: **0.1…480 s**

Broadening
Broadening for peaks in the end of the chromatogram compared to peaks in the beginning. This parameter is used for automatic adjustment of **Width**.
Entry range: **0.1…100**

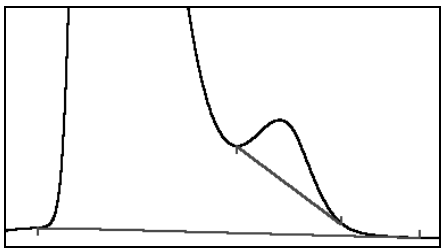
Slope
Threshold for peak recognition.
The value of the first derivation (slope) of the curve is divided by the baseline noise (which is estimated using a special algorithm) and the result is compared with the **Slope** threshold value. Reasonable range of **Slope** parameter is 0.5...5.
Entry range: **0.1…400**

Asymmetry
Ratio of slope threshold at the start of the peak to slope threshold at the end of the peak. This parameter is used for automatic adjustment of **Slope**.
Entry range: **0.2…5**

Min area
Minimum area of peaks to be detected.

Min height
Minimum height of peaks to be detected.

Rider ratio
Ratio of peak heights for two adjacent peaks. If this threshold value is exceeded, the smaller peak is separated from the higher one by tangent skimming. This function is switched off always if 0 is entered.
Entry range: **0…100**



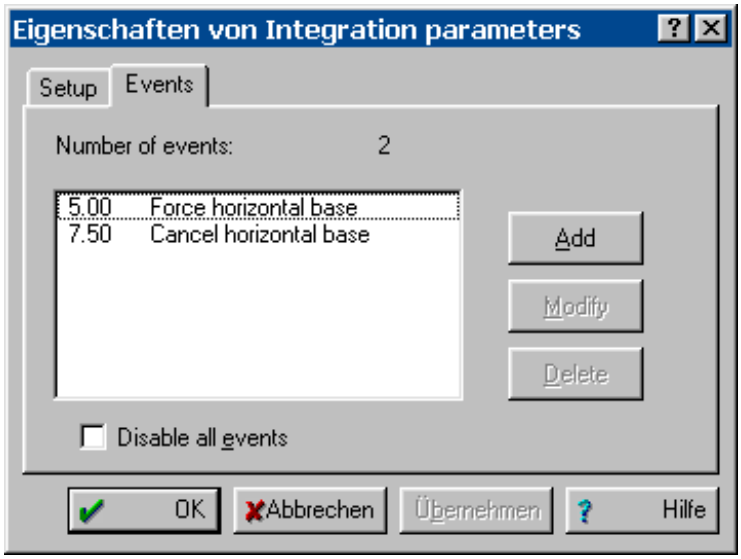
Negative peaks
If this option is enabled, negative peaks are also detected.

Interpolate baseline start/stop
If this option is enabled, the baseline start and stop points are interpolated. This setting is recommended for very sensitive determinations with high noise

<Suggest>	This function sets up reasonable integration parameters in the following way: • **Slope** is set to a reasonable value. • **Asymmetry** is set to a reasonable value. • **Width** and **Broadening** are calculated by fitting a straight line through the measured peak halfwidth values vs. retention time. **Width** is determined as the y value of this line at the **Delay** time, **Broadening** is calculated as the y value at the end of the chromatogram divided by the y value at the **Delay** time. If this procedure does not provide adequate result, • **Width** is set equal to the minimum value of peak width for the chromatogram, • **Broadening** is set to a reasonable value.

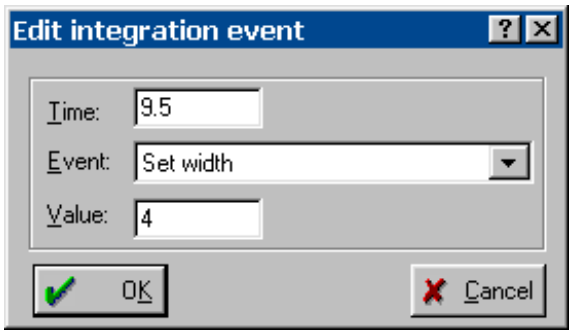
7.4.3 Events

Tab **Events** of **Integration parameters** window for definition of integration events. Integration events have a higher priority than integration parameters and are used for fine tuning of the integration process. They should be used only in the case when problems cannot be solved by tuning a set of parameters from the integration parameters window.



Number of events	Number of integration events (read-only).
<Add>	Add event to the list.
<Modify>	Edit the selected event.
<Delete>	Delete the selected event.
<Apply>	Accept integration parameters and perform reintegration.

If an integration event is added or modified, the **Edit integration event** window is opened where the following parameters can be set:



Time Start time for integration event in min.

Event List box with integration events to be selected (see below).

Value Parameter value for selected integration event. This field appears for events that demand input of an additional parameter.

Integration events for peak detection

Disable detection Set this mode to stop detection of new peaks. If a peak is available at the moment of the event it is either finished (downslope peaks) or rejected (upslope peaks).

Enable detection Clear **Disable detection** mode.

Enable negative peaks Enable detection of negative peaks. In some cases this mode may result in instability of detection algorithm.

Disable negative peaks Disable detection of negative peaks. This event does not influence negative peaks which already started.

Disable peak reject Set this mode, if a small peak should not be rejected because of its flat apex.

Enable peak reject Clear **Disable peak reject** mode.

Integration events for peak start/end

Set peak start Force the beginning of a new peak. If a peak is available at the moment of the event it is either rejected (upslope) or terminated (downslope).

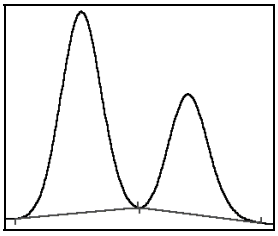
Set peak end Force peak end at the time of the event. Upslope peaks are rejected (except those born by **Set peak start** event), downslope peaks are terminated.

Stop single peak mode Disable peak end detection. All peaks of any group after this event will be treated as one peak. The group end will be treated as peak end.

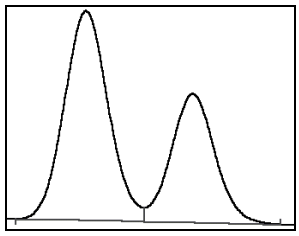
Start single peak mode Set normal detection mode, when valley causes perpendicular drop or skim line separation.

Split peak Terminates the current peak and starts a new one.

Integration events for baseline



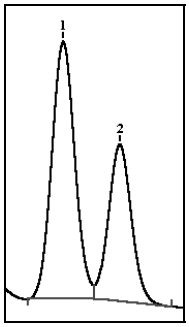
Enable valley-to-valley



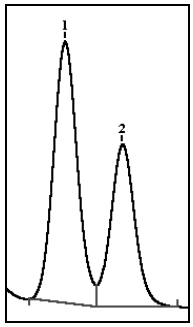
Disable valley-to-valley

Enable valley-to-valley Disable perpendicular drop peak separation. All peaks are considered to be baseline-separated. The bottom of the valley becomes the baseline point.

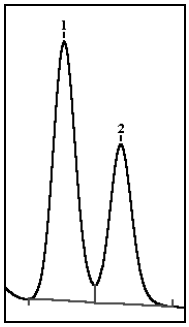
Disable valley-to-valley Enable perpendicular drop peak separation (default setting).



Set horizontal baseline



Set back horizontal base



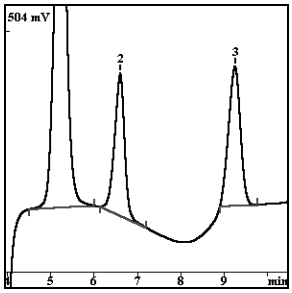
Set normal baseline

Set horizontal baseline Set horizontal baseline for all peaks except the last one of adjacent peaks that are not separated. The baseline is drawn **forwards** from the peak start point.

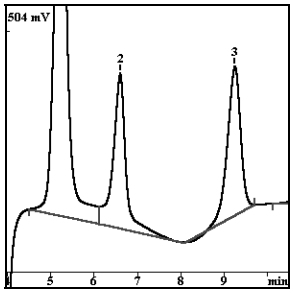
Set back horizontal base

Set horizontal baseline for all peaks except the first one of adjacent peaks that are not separated. The baseline is drawn **backwards** from the peak end point.

Set normal baseline Set default baseline detection mode.

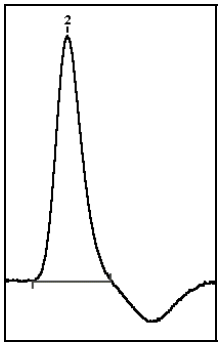


Set baseline point at **4.5, 6, 7.2, 8.9 and 9.8 min**

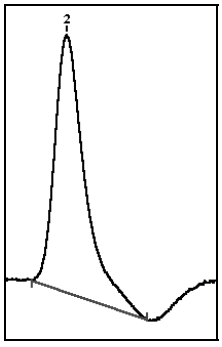


without **Set baseline point**

Set baseline point Set defined baseline point for better evaluation of peaks on descending or ascending baselines. The baseline between two successive baseline points is set to zero for optimum integration.



Force horizontal baseline



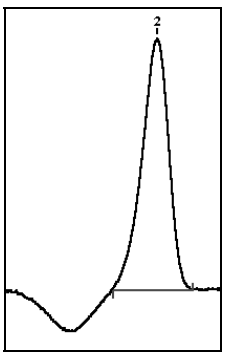
Cancel horizontal baseline

Force horizontal baseline

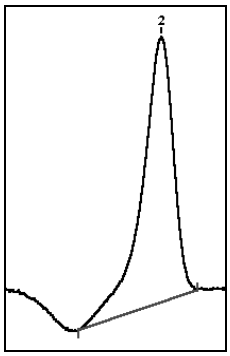
Set horizontal baseline for a single peak. The baseline is drawn **forwards** from the peak start point. The intersection of the baseline with the signal is defined as peak end point.

Cancel horizontal baseline

Clear **Force horizontal baseline** mode.



Force horizontal base back



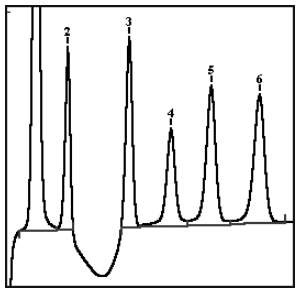
Cancel horizontal base back

Force horizontal base back

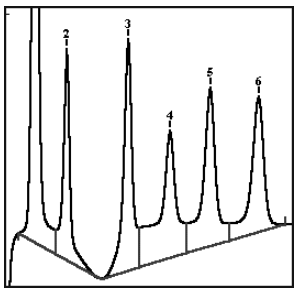
Set horizontal baseline for a single peak. The baseline is drawn **backwards** from the peak end point. The intersection of the baseline with the signal is defined as peak start point.

Cancel horizontal base back

Clear **Force horizontal base back** mode.



Enable baseline penetration



Disable baseline penetration

Enable baseline penetration

Allow crossing of the signal by the baseline.

Disable baseline penetration

Clear **Enable baseline penetration** mode.

Integration events for integration parameters

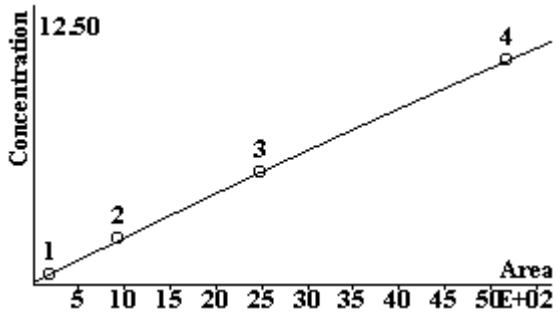
Set width	Sets new **Width** parameter that supersedes default linear growth of expected peak.
Set slope	Sets new **Slope** value.
Set min height	Sets new **Minimum peak height** value.
Set rider ratio	Sets new value of **Rider ratio** parameter.

7.5 Calibration and quantification

7.5.1 General information

The aim of any chromatographic analysis is to answer the question "What components are present in the sample and what are their concentrations?". Two procedures are used to achieve this goal: the first step is called **calibration**, the second step includes **quantification**.

Calibration has two aims: to get retention characteristics for all components of interest (these data are stored in the component table) and to establish a relation between injected amounts and corresponding instrumental responses for all components of interest (stored in the concentration table). Calibration is performed by running one or several chromatograms of samples with known composition and known concentration of components (standards). For each calibrated component a **calibration curve** is constructed as a result.



With «IC Net» three different procedures can be used for the construction of the calibration curve. By far the most important method for ion chromatography is the **external standard calibration** (absolute calibration) which is described in detail in this section. The other methods of **internal standard calibration** (relative calibration) and **tabulated calibration** (relative gradient factor, a modified method for external standard calibration) are of lesser importance and are not described in detail here (for details please refer to on-line help).

Identification is a procedure that enables to decide what peaks on the chromatogram correspond to what components. The identification is performed on the basis of the **Component table** created for calibration.

Quantification is a calculation procedure that determines components concentrations, on the basis of instrumental response (peak height or area), using the calibration curves obtained earlier for each component.

7.5.2 Notations

R	Stands for response value, either **area** or **height**, depending on setting selected in the **Calibration graphs** window.
V	Sample **Volume** injected.
D	**Dilution** coefficient, shows number of times to which the initial solution is dissolved before injection.
V' = V / D	**Adjusted volume** of injected sample. A correction is made for the dilution coefficient.
C	Concentration of the component in the initial solution (before dilution).
Q = C • V'	**Quantity** of component, used for calibration curve construction.
t	**Retention time**. Time needed by the mobile phase to flow through the separation system.
$\mathbf{t_0}$	**Void time**. Dead time needed by the mobile phase to flow through the separation system.
$\mathbf{t' = t - t_0}$	**Corrected retention time**, called also net retention time.
L	Column length.
$\mathbf{v = L / t_0}$	Linear **Flow rate**.
$\mathbf{W(R) = k_2R^2 + k_1R + k_0}$	Calibration function (component quantity **W** vs. detector response **R**). In the case of the most common linear calibration curve $\mathbf{Q = W(R) = k_1R}$ it comes through the origin. The concentration of the component in the analyzed mixture is calculated by the formula **C = W(R) / V'**.
RSD(Q, R)	Procedure, used for computation of regression coefficients ($\mathbf{k_0}$, $\mathbf{k_1}$ and $\mathbf{k_2}$) of the calibration function **W(R)** using RSD (Residual Standard Deviation). The procedure gets input as a set of calibration points (quantity **Q** vs. response **R**) and outputs the calibration function **W(R)** used for prediction of the component quantity $\mathbf{Q_i = W(R_i)}$.

Subscript values used:

j	Stands for j-th calibration level run.
s	Stands for standard component.
i	Stands for component number.

7.5.3 External standard calibration

External standard calibration (absolute calibration) is a key way of calibration. Basically this procedure calculates the dependence of injected component's quantity versus area (or height) of the corresponding peak. This dependence is showed as a calibration plot with injected quantity along the Y axis and peak area (or height) along the X axis. The injected quantity $\mathbf{Q_i}$ is calculated as product of component's concentration $\mathbf{C_i}$ to the reduced injected sample volume $\mathbf{V'}$:

$$\mathbf{Q_i = C_i \cdot V'}$$

The calibration function $\mathbf{W_i(R)}$ for each component is calculated using the RSD method.

$$\mathbf{W_i(R) = RSD(Q_{ij}\ ,\ R_{ij}) = RSD((C_i \cdot V'),\ R_{ij})}$$

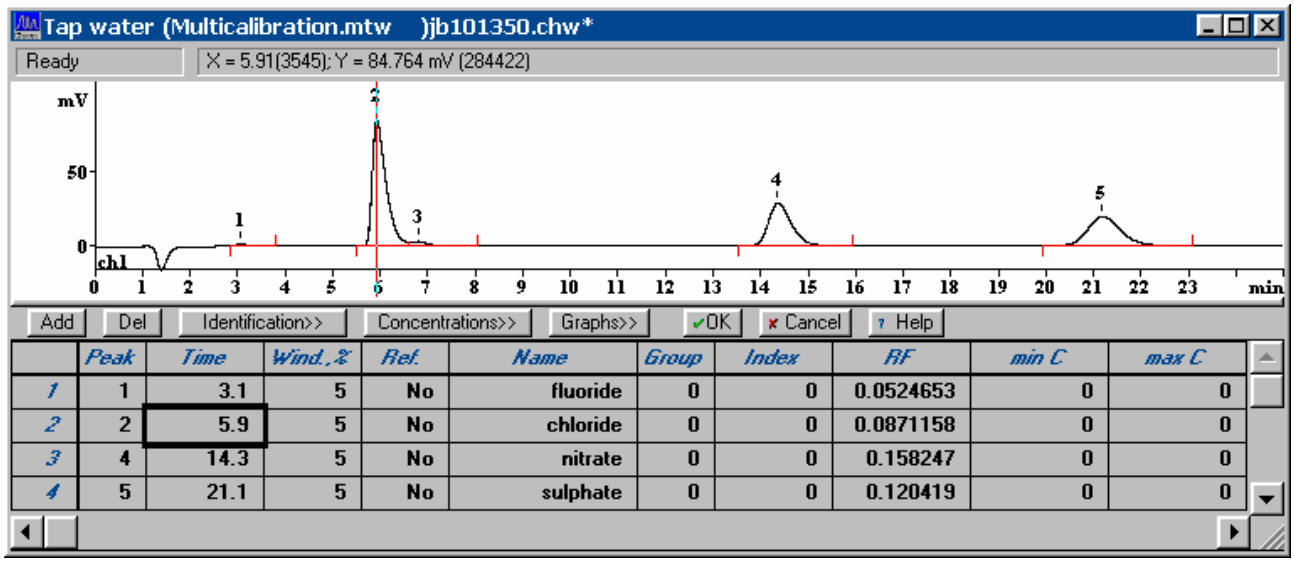
When quantification procedure is performed, a concentration $\mathbf{C_i}$ (absolute concentration of a component in the sample) is determined as a ratio of the computed quantity $\mathbf{W_i(R_i)}$ to the corrected volume of sample injected $\mathbf{V'}$:

$$\mathbf{C_i = W_i(R_i) / V'}$$

7.5.4 Component table

IC NET / Method / Calibration / Components

If the component table is opened, the chromatogram window is split into two parts. The upper one shows the chromatogram, the component table appears in the bottom part of the screen. When moving into the component table, a special cursor in the upper part of the window jumps to the peak corresponding to the current component.



	Peak	Time	Wind.,%	Ref.	Name	Group	Index	RF	min C	max C
1	1	3.1	5	No	fluoride	0	0	0.0524653	0	0
2	2	5.9	5	No	chloride	0	0	0.0871158	0	0
3	4	14.3	5	No	nitrate	0	0	0.158247	0	0
4	5	21.1	5	No	sulphate	0	0	0.120419	0	0

The component table stores the following information on the components to be analyzed:

Number	Row number (read-only).
Peak	Number of the peak in the chromatogram that corresponds to the given component. If this field contains a **0**, the **peak number** must be entered manually.
Time	**Expected retention time** of the component in the calibration run. After a new entry of the peak number the corresponding retention time is entered automatically as soon as this field is clicked on with the mouse.
Wind.%	**Identification window** of the component. This value is the maximum allowed difference of the actual retention time of the component and its expected retention time, measured as % of expected retention time. The component will be identified within its identification window only.
Ref.	**Reference component**. The entry **Yes** defines components as reference components; these ensure improved peak identification of the other **Ordinary components** (details see on-line help).
Name	**Component's name** (cannot include spaces).
Group	Number of the **group** to which the components are allocated. If group numbers ≥ 1 are entered here then a group report can be outputted for each group; this also contains the intermediate totals for this group. This group report is produced after the main report table.
Index	**Retention index** for components with known index. In the case of an unknown index this value should be equal to **0**. For index calculation the user must define index values for at least two peaks, and all other values will be calculated by the software using linear or logarithmic approximation (details see on-line help).
RF	**Response factor**. This value corresponds to the slope of the calibration curve (coefficient $\mathbf{k_1}$ of the calibration formula).

min C (max C)	**Minimum (Maximum) concentration** value for the component. Components whose concentration leaves the range **min C…max C** are marked in the peak table by the sign " **!** ".

Additionally, the component table contains the following buttons:

<Add>	Add a new component (an empty column) to the component table.
<Del>	Delete the current component from the component table.
<Identification>	Open the **Peak identification** window (see *section 7.5.5*).
<Concentrations>	Open the **Concentration table** (see *section 7.5.6*).
<Graphs>	Open the component window with display of calibration curve and calibration parameters.
<OK>	Accept all changes and close the component table.
<Cancel>	Reject all changes and close the component table.

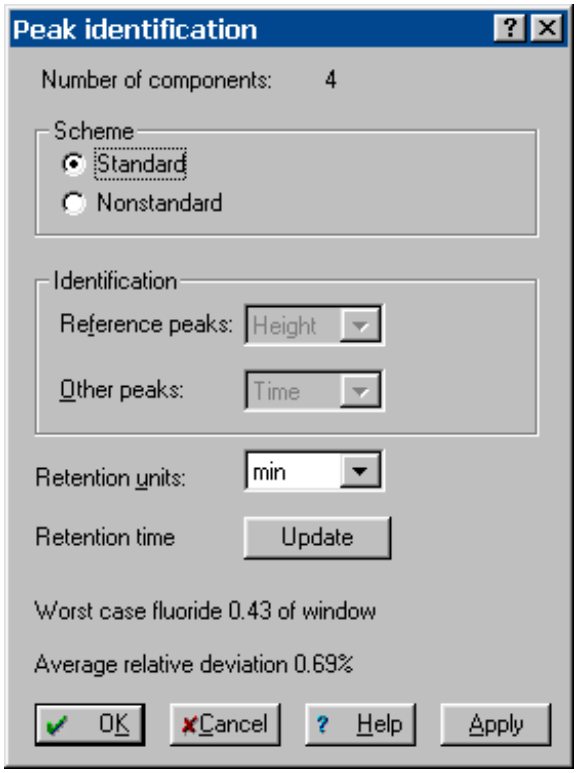
The standard methods supplied with the «IC Net» program all contain a component table with pre-defined components with entries for the names and retention times.

If the output of all peaks is required in the result report then a so-called universal component can be defined in the component table for this purpose; this receives the value **0** *in the* **Time** *field and no peak is allocated to it. The name entered under* **Name** *(e.g.* **unknown***) is then used for all peaks for which no component can be allocated.*

7.5.5 Peak identification

IC NET / Method / Calibration / Identification

Selecting this menu item or clicking on **<Identification>** in the component table opens the **Peak identification** window with parameters for tuning the peak identification procedure.



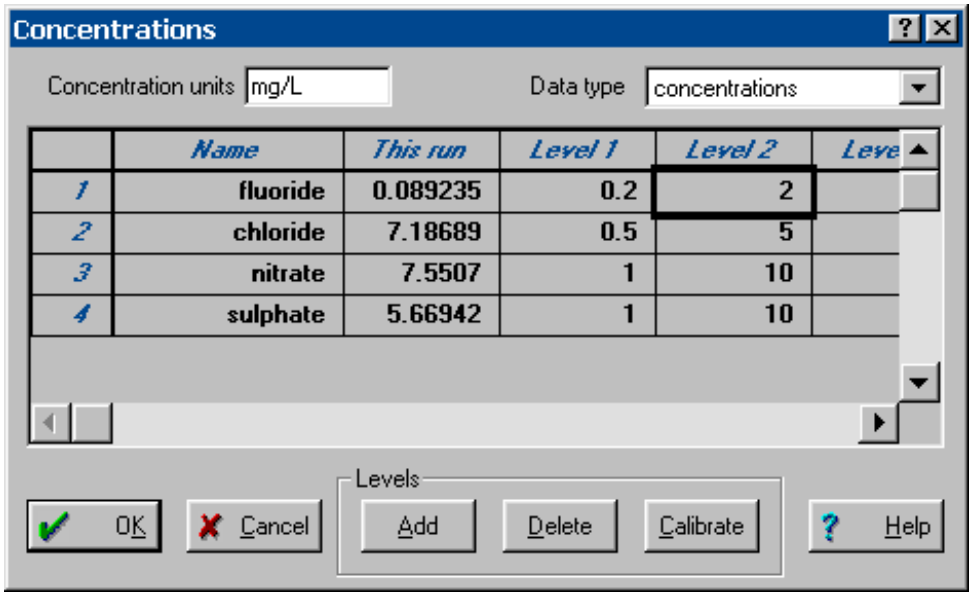
Number of components	Number of components in the component table (read-only).
Scheme	Quick choice of identification parameters scheme.
Standard	Set default meanings of identification parameters: **Height** for reference components, **Time** for all other components (ordinary components).
Nonstandard	Set custom meanings of identification parameters.
Identification	Identification parameters.
Reference peaks	Identification parameter for reference components. Default is **Height**.
Other peaks	Identification parameter for ordinary components. Default is **Time**.
Retention units	Choice of retention units. Default is **min**.
Retention time	Retention time.
<Update>	Updates expected retention times of components according to the current chromatogram.

Worst case...	Information on the component with the worst (largest) deviation of actual and expected retention time. Deviation is given as a part of component's identification window.
Average relative deviation	Relative deviation averaged for all components.

7.5.6 Concentration table

IC NET / Method / Calibration / Concentrations

Selecting this menu item or clicking on **<Concentrations>** in the component table opens the **Concentrations** window with the concentration table containing concentrations of all components for all **Calibration levels**. Each calibration level corresponds to a sample used for calibration and to a point on the calibration curve.



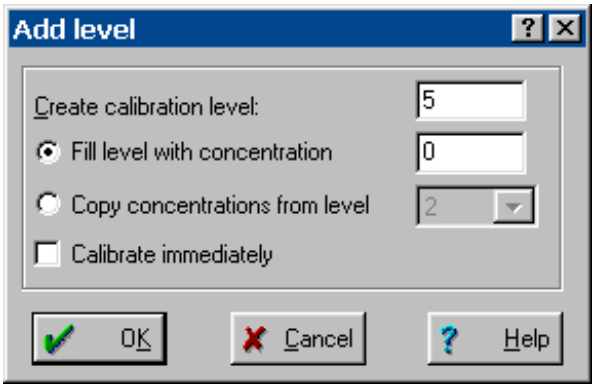
Concentration units	User defined units of concentration which will appear in the report. Nevertheless, entry of new concentration units does not cause recalculation of concentrations.
Data type	Choice of the data type that will be shown in the concentration table: **concentrations** (default setting), peak **heights**, peak **areas**, **volumes**.
Number	Number of the component (read-only).
Name	Name of the component taken from the component table (read-only).
This run	Contains concentrations (or other chosen values) obtained in the current run (read-only, except for universal component).

Level 1...Level N

Contains concentrations (or other chosen values) of components for corresponding **Calibration level**.

<Add>

Add a new **Calibration level** to the concentration table. The following window appears:



Create calibration level

Number of calibration level to add.

Fill level with concentration

Concentration to be filled in for all components.

Copy concentrations from level

Number of calibration level from which concentrations are copied.

Calibrate immediately

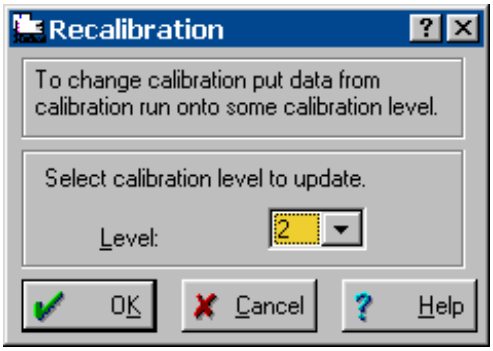
Recalibration with new calibration levels.

<Delete>

Delete the current calibration level (where cursor is situated) from the concentration table.

<Calibrate>

Calibrate the current chromatogram with the selected calibration level. The following window appears:



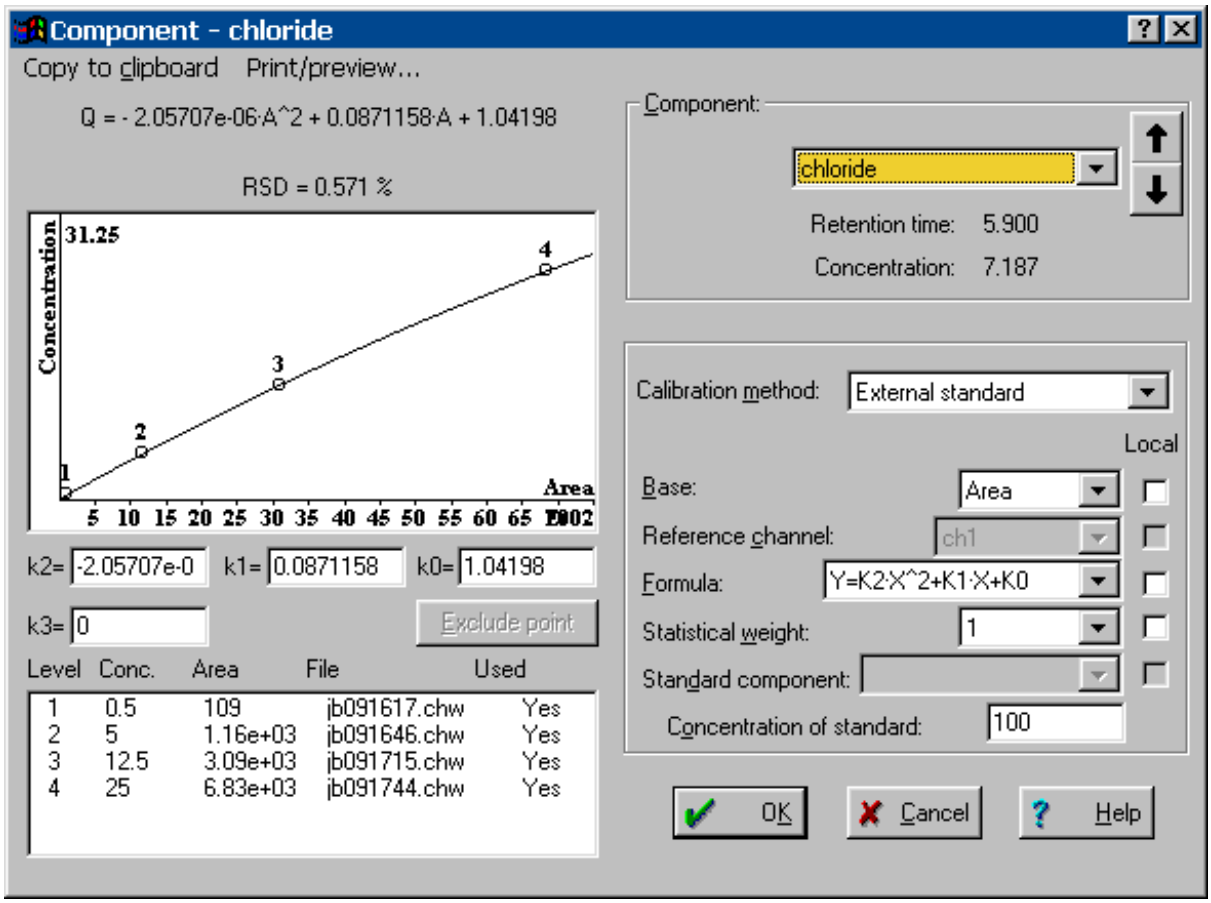
Level

Calibration level to be used for recalibration.

7.5.7 Calibration curve

IC NET / Method / Calibration / Graphs

Selecting this menu item or clicking on **<Graphs>** in the component table opens the **Component** window.



In this window the results of the calibration are shown for each component together with the calibration curve. The parameters for calculating the calibration curve can also be entered here.

Calibration results and curve

Analytical expression — A line above the calibration curve looking like $Q = k_3 \cdot A^3 + k_2 \cdot A^2 + k_1 \cdot A + k_0$. This formula is used for approximation of the calibration curve.

RSD — RSD (Residual Standard Deviation) value to evaluate the error of calibration curve approximation.

Corr. — Correlation coefficient value is available only in the case of linear calibrations without weighting of data points.

Calibration curve — Plot of measured calibration points and calculated calibration curve.

k0, k1, k2, k3 — Calibration coefficients k_0, k_1, k_2 and k_3 (coefficients of the calibration formula).

Calibration points table

This table contains the basic information used to construct the calibration curve:

Level Number of **Calibration level**.

Conc. Concentration of the current component in the calibration sample. It is taken from the concentration table.

Area (or Height) Peak height or area of the current component, depending on calibration base.

File File name of calibration chromatogram that stores data on the given calibration level.

Used Information whether the calibration level is used for calibration curve calculation or not.

<Exclude point> Exclude the selected calibration point from the list and recalculate calibration coefficients for the current component. Repeated pressing includes the point again. You can exclude points that drop out of the calibration curve watching for RSD values.

Component information

Component Allows to select the current component from the list. It is possible also to scroll the list of components by mouse, using the special arrow buttons on the right.

Retention time Retention time of the selected component (read-only).

Concentration Concentration of the selected component (read-only).

Calibration parameters

Calibration method Method used for calibration procedure:

External standard calibration
Absolute calibration. It is the basic calibration procedure in ion chromatography.

Internal standard calibration
Relative calibration.

Tabulated calibration
Relative response factor calibration (simplified method of external standard calibration).

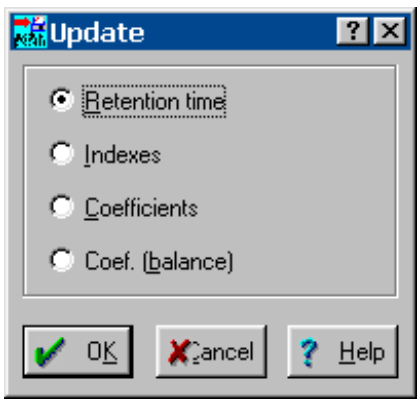
Local If this checkbox is marked then the corresponding parameter is valid for the current component only. Otherwise this parameter is global (i.e. default for all other components).

Base	Base for calculations (**Area** or **Height**) in quantification and calibration procedures. Indicates, which parameter is to be used as a peak response.
Reference channel	Channel which is used to measure area or height (read-only).
Formula	Formula for calibration function. There are six possible calibration dependencies for linear and nonlinear calibration curves.
Statistical weight	Weighting parameter used to weight calibration points deviations on calculating coefficients of the calibration formula. Apart from the uniform weighting **1** the values **1/x**, **1/x²**, **1/y** and **1/y²** are also possible.
Standard component	Name of standard component in the case of **Internal standard calibration** or **Tabulated calibration** method (details see on-line help).
Concentration of standard	Concentration of standard component in the case of **Internal standard calibration** or **Tabulated calibration** method (details see on-line help).

7.5.8 Update calibration

IC NET / Method / Calibration / Update

Selection of this menu item opens the **Update** window.



Retention time	Replace the expected retention times of the components with the retention times of the corresponding peaks obtained in the current run.
Indexes	Fill **Index** field for components with zero index.
Coefficients	Recalculate all calibration coefficients for all components (performs recalibration).
Coef. (balance)	Recalculate coefficient of the universal component. The aim of this action is to adjust the response factor of this component so, that the total

amount of the injected components becomes equal to the declared value. This declared summary amount is entered into the **Concentration** field of the universal component for **This run** level.

7.5.9 Calibration data handling

Load and save calibration data

IC NET / Method / Calibration / Load from method

Load the calibration from the method. This option is used to update the calibration for the current run by the one taken from the method used for acquisition.

IC NET / Method / Calibration / Save to method

Save the current calibration to the method. This option is used to transfer the updated calibration from the run to the current method (i.e. the method associated with the current chromatogram window).

Import and export calibration data

IC NET / Method / Calibration / Import calibration

This option imports a calibration from a calibration file ***.cal** to the current method or chromatogram. It is used to transfer the updated calibration from chromatogram-to-chromatogram or from method-to-method. Different methods can be processed in this case using the same calibration.

IC NET / Method / Calibration / Export calibration

This option exports a calibration to a in calibration file ***.cal**. It is useful to transfer a calibration from chromatogram-to-chromatogram that were obtained by different methods.

Put out calibration curves

COMPONENT / Copy to clipboard

This option allows to copy the calibration curve of the selected component to the clipboard so that it is available for other Windows applications, such as WinWord, Excel, etc.

COMPONENT / Print/Preview / Preview this

Display calibration curve print preview of the selected component.

COMPONENT / Print/Preview / Preview all

Display calibration curve print preview of all components.

COMPONENT / Print/Preview / Print this

Print selected calibration curve of the selected component.

COMPONENT / Print/Preview / Print all

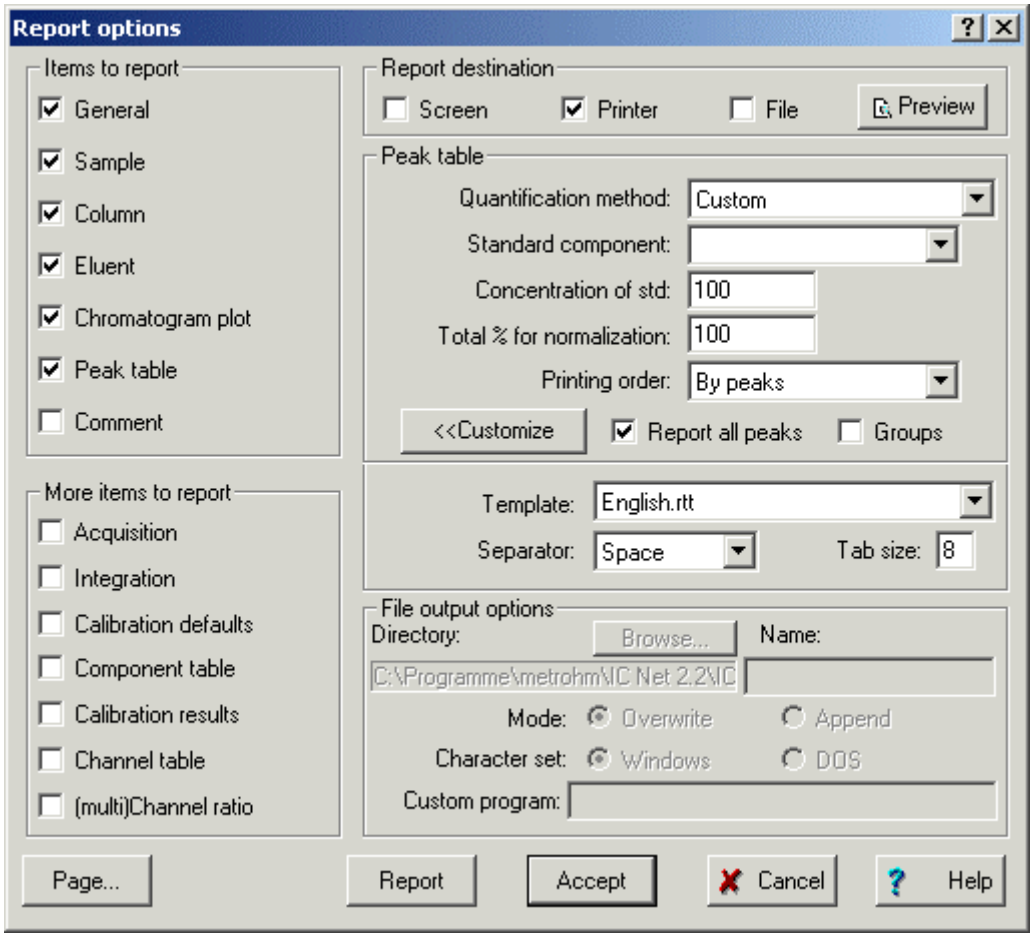
Print calibration curves of all components.

7.6 Report output

7.6.1 Report options window

IC NET / Method / Report options
IC NET / Process / Make report

The **Report options** window is divided into several regions that combine parameters for report output on their functionality and includes several different areas. The report output is started by clicking on **<Report>**.



7.6.2 Items to report

This part of the **Report options** window contains a list of important report items that can be included into the report on the user's choice:

General General description on the analysis from the Passport. The **Report date** and the logged-in user **Printed by** are also put out.

```
Report date:          07/12/1999 15:59:10
Printed by:           Roland Dörig

Ident:                Tap water
Analysis from:        10/11/1999 16:17:02
File:                 jb101617.chw              Last save:
16/11/1999 15:02:14
Modified!
Method:               Multicalibration.mtw
Last save: 10/11/1999 08:34:40
Run operator:         Metrohm
Analysis number:      1248
```

Sample Sample information from the **Sample** tab of the passport.

```
SAMPLE:               Tap water from Application Laboratory
      :               Herisau, Switzerland
Vial number:          13
Volume:               20.0 µl
Dilution:             1.00
Amount:               1.0000
```

Column Column information from the **Column** tab of the passport.

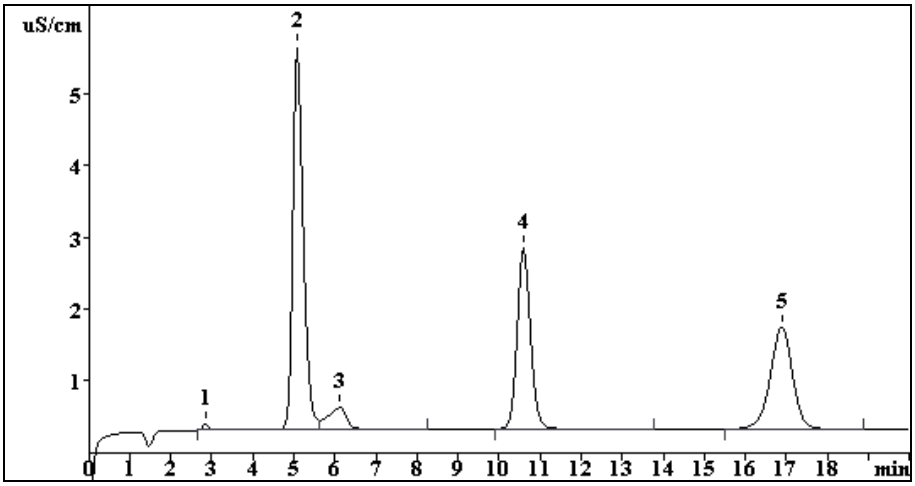
```
COLUMN:               METROSEP Anion Dual 2 (6.1006.100)
Size:                 4.6 x 75 mm
Number:               B0083
Part.size:            6.0 µm
```

Eluent Eluent information from the **Eluent** tab of the passport.

```
ELUENT:               2 mmol/L NaHCO / 1.3 mmol/L Na2CO3


Flow:                 0.80 mL/min
Temperature:          20.0°C
Pressure:             5.2 MPa
```

Chromatogram plot Plot of the chromatogram (only for **Printer** or **File** destination).



Peak table Peak table with results. The structure of the peak table depends on the selected **Quantification method**. The following report is put out as default:

Quantitation method: Custom

No	Retention min	Height mV	Area mV*sec	Conc. mg/L	Name
1	3.04	1.85	21.062	0.079	fluoride
2	5.91	82.44	1703.350	7.173	chloride
3	6.83	3.58	97.495	0.000	
4	14.29	29.27	969.705	7.561	nitrate
5	21.21	19.34	935.179	5.571	sulphate
5	25.01	136.48	3726.790	20.383	

Comment User defined comment from the **Comment** tab of the passport.

Method example for tap water determination.

7.6.3 More items to report

This part of the **Report options** window contains a list of rarely used report items that can be included into the report on the user's choice:

Acquisition Parameters used for data acquisition from the from the **General**, **Measure** and **Filters** tabs of the **Method setup** window.

```
ACQUISITION PARAMETERS
Channels:               1
Method duration:        25.00min
Run duration:           25.01min
Measurements (method): 15006
Measurements (run):     15006
Freq.divisor:           1
Sampling:               10.00 pts/sec
Start delay:             sec
Device:
Program before:
Program after:
Spikes filter:          Yes
Median filter:          No
  slit:                 0
Gauss filter:           No
  slit:                 0
```

Integration Integration parameters and integration events.

```
INTEGRATION DEFAULTS
Channel:                ch1
Delay:                  2.50 min
Width:                  15.00 sec
Broadening:             2.00
Slope:                  10.00
Asymmetry:              2.00
MinArea:                0.00
MinHeight:              1.00
Rider ratio:            0.00
No.   min
1  5.00 Force horizontal base = 0.00
2  7.50 Cancel horizontal base = 0.00
```

Calibration defaults Calibration parameters defined in the component window and on the **Math** tab of the **Method setup** window.

```
CALIBRATION
Channel:                ch1
Method:                 External standard
Response:               Area
Standard:               No
IDENTIFICATION
Reference peaks:        Height
Other peaks:            Time
Retention units:        min
```

Component table Component table.

No	Retention	Window%	RF	Conc.	Index	Type	Group	Name
1	3.05	5.0	2.623e-03	0.08	0.000		0	fluoride
2	5.92	5.0	4.356e-03	7.17	0.000		0	chloride
3	8.70	5.0	6.691e-03	0.00	0.000		0	nitrite

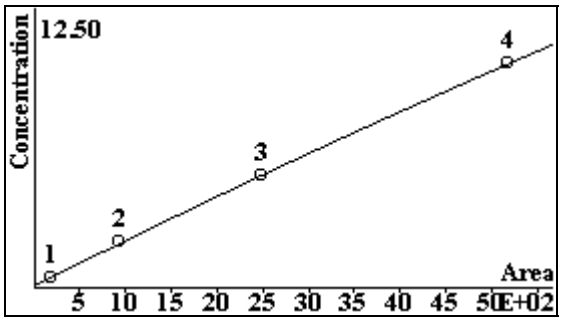
4	11.19	5.0	9.933e-03	0.00	0.000		0 bromide
5	14.60	5.0	7.912e-03	7.56	0.000	S	0 nitrate
6	16.80	5.0	1.556e-02	0.00	0.000		0 phosphate
7	21.26	5.0	6.021e-03	5.57	0.000		0 sulphate

Calibration results

Calibration results of the component window. For each component a new page with calibration results and calibration curve is put out.

```
CALIBRATION OF COMPONENT  fluoride

Method:     Multicalibration.mtw
Equation:   Q = - 7.48163·A^2 + 0.00262326·A + 0.0233088
RSD:        0.691 %
Correlation coefficient: 0.999277
```




```
K3 = 0     K2 = -7.48163e-08     K1 = 0.00262326     K0 = 0.0233088
Base:         Area
Ref.channel: ch1
ISTD:
Formula:     Y=K2·X^2+K1·X+K0
Weight:      1
```

Level	Height	Area	Conc.	Volume	Retention	Used	File
1	6.46	173	2	1	10.8	Yes	g8140800.chw
2	34	897	10	1	10.8	Yes	g8140823.chw
3	90.9	2.36e+03	25	1	10.8	Yes	g8140858.chw
4	198	5.04e+03	50	1	10.8	Yes	g8140929.chw

Channel table

Parameters of the data acquisition channel used.

CHANNELS TABLE

ch1

No	Name	Units	Input	Minimum	Zero	Maximum	Range	Coefficient	Noise	Shift
1	ch1	mV	1	-8388607	0	8388607	2.500e+03	2.980e-04	4.15	0

#	Name/Units	Noise	RMS	PeakToPeak	Drift/hour
1	ch1	4.2	29976.5	330509.6	3585.801
	mV	0.00124	8.93	98.5	1.07

Name Channel's name. This text appears as **Channel label** in the chromatogram.

Units User-defined units of detector response.

Input Number of data acquisition channel.

Minimum Minimum value of the linear range of the AD converter (in ADC conversion units). This

	parameter is used to detect an underflow condition.
Zero	A signal level on a baseline (in ADC conversion units). This parameter is a result of the ADC calibration.
Maximum	Maximum value of the linear range of the AD interface (in ADC conversion units). This parameter is used to detect overflow condition.
Range	An input signal value in maximum in user-defined units. **Range** = (**Maximum** - **Zero**) • **Coef**
Coefficient	ADC sensitivity coefficient (weight of ADC bit in user-defined units).
Noise	Estimated baseline noise value of the channel in ADC conversion units (bits).
Shift	Shift of the current channel in time. This parameter is useful in the case of multi-channel chromatograms only.
(multi)Channel ratio	Spectral ratios. The option is valid for multi-channel chromatograms only.

7.6.4 Report destination

The following output devices can be selected simultaneously in any combination as targets for report output:

Screen Output report (without curves) to screen.

Printer Output report to printer.

File Output report to file (see *section 7.6.7*).

7.6.5 Peak table

The following parameters can be selected for peak table output with determination results:

Quantification method Selection of the method to calculate concentrations of components:

Response normalization

The method normalizes the sum of responses for all peaks of the chromatogram to the **NORM** factor entered in the **Total % for normalization** field:

$$R_i\% = NORM \cdot R_i / \sum R_i.$$

All peaks are calculated and reported no matter whether they have been recognized or not.

The peak table includes the following columns: **Peak number**, **Retention time**, **Area + Area% or Height + Height%**, **Name**

Normalized concentration

The method normalizes the sum of absolute concentrations for all peaks of the chromatogram to the **NORM** factor entered in the **Total % for normalization** field:

$$C_i\% = NORM \cdot W_i(R_i) / \sum W_i(R_i)$$

As long as no universal component is defined, only peaks with non-zero concentrations are listed.

The peak table includes the following columns: **Peak number**, **Retention time**, **Height**, **Area**, **Response factor**, **Concentration%**, **Name**

Absolute concentration

This quantification method reports raw quantity (absolute concentration) of the component which is calculated directly from the calibration formula:

$$Q_i = W_i(R_i) / V'$$

As long as no universal component is defined, only peaks with non-zero concentrations are listed.

The peak table includes the following columns: **Peak number**, **Retention time**, **Height**, **Area**, **Response factor**, **Concentration**, **Concentration%**, **Name**

Relative concentration

This quantification method uses the internal standard method to calculate the relative concentrations of the components. For this procedure, a **Standard component** must be selected and the concentration of this internal standard must be entered in the **Concentration of std** field.

As long as no universal component is defined, only peaks with non-zero concentrations are listed.

The peak table includes the following columns: **Peak number**, **Retention time**, **Height**, **Area**, **Response factor**, **Relative concentration**, **Relative concentration%**, **Name**

Index

This column reports retention indexes of identified components.

The peak table includes the following columns: **Peak number**, **Retention time**, **Width/2**, **Height**, **Index**, **Name**

Column test

Column test quantification method calculates multiple values that are necessary to evaluate column performance.

The peak table includes the following columns: **Peak number**, **Retention time**, **K'** (capacity factor), **TP** (number of theoretical plates per column), **TP/m** (number of theoretical plates per m), **HETP/dp** (reduced height equivalent to theoretical plate), **Asym.** (peak asymmetry), **Name**

Custom

This quantification method enables to customize the peak table on the user's choice using the **<Customize>** button.

The peak table for the methods supplied contains the following columns as standard: **Peak number**, **Retention time**, **Height**, **Area**, **Conc.**, **Name**

Standard component

Internal standard component for quantification procedure.

Concentration of std	Concentration of the internal standard component for relative concentration calculations. This value is stored in **This run** column of the concentration table.
Total % for normalization	A value to which the sum of concentrations is normalized. It is used for **Response normalization** and **Normalized concentrations** quantification methods. The default value is 100.
Printing order	Determines the order of the components in the peak table.
By peaks	Lists run results for all peaks detected. Unidentified peaks (corresponding to the universal component) are included, but missing components are not listed.
By components	Missing components are always included into the report, even those with concentration equal to zero. In the case of presence of universal component the summary for all unidentified peaks is presented as a single line.
<Customize>	Calls up a box with a list of columns that can be included into the report (see *section 7.6.8*). It is available only if **Quantification method = Custom** has been selected.
Report all peaks	Checkbox that includes all peaks irrespective of the concentration of the substance. Otherwise the report generator excludes lines with zero concentration of the component. It is available only if **Quantification method = Custom** has been selected.
Groups	If this checkbox is checked, a separate peak table report is put out for every group specified in the component table.

7.6.6 Template options

For report output using a report template the following parameters can be modified:

Template Selection of the report template file ***.rtt**. Several templates for different languages and applications are available.

Separator Defines which character separates report columns in tables. A separator other than **Space** is useful when the report is printed to a file and this file is imported into a spreadsheet software.

Tab size Sets tab stop value for the screen window. Important only when **Separator = Tabulation** has been selected or there are tab characters in the template file ***.rtt**.

7.6.7 File output options

If **File** has been selected for the report destination, the following parameters can be modified:

Directory Directory for report output. For creation of a new directory, use the **<Browse>** button.

Name File name to save report to. The report is saved in text form in the ANSI or ASCII format. So add an extension like ***.txt** to the file name. If the chromatogram plot checkbox is checked, the plot is saved in a separate file ***.wmf** in the WMF format under the same name.

Mode The two options **Overwrite** (overwrite the file) or **Append** (append to existing file) are available.

Character set The two options **Windows** (ANSI) or **DOS** (ASCII) are available. This settings are essential for printing of non-English symbols (e.g. ö, ä, ü).

Custom program Path and name of the program to be started after report output. This option enables to transfer the report to a database, an electronic table or another application for further processing.

7.6.8 Report elements

If **Quantification method = Custom** has been selected, the peak table can be customized on the user's choice. After clicking the **<Customize>** button, the following columns can be included in the peak table.

number Peak number.

retention time Retention time of the component (in minutes, irrespective of the chosen retention units on the chromatogram graph axes). The total value in the column is equal to the chromatogram duration.

halfwidth Width of the peak at half height (in minutes).

height Height of the peak (in mV). The total value in this column is the sum of heights for all identified peaks.

height% Normalization of peak heights for all peaks using the **NORM** value entered in the **Total % for normalization** field (default setting 100%):

$$H_i\% = NORM \cdot H_i / \sum H_i$$

area Area of the peak. Depends on the units on the X and Y axes of the chromatogram. The total value in this column is the sum of areas for all identified peaks (including universal component).

area% Normalization of peak areas for all peaks using the **NORM** value entered in the **Total % for normalization** field (default setting 100%):

$$A_i\% = NORM \cdot A_i / \sum A_i$$

capacity factor The capacity factor k'_i of the component is equal to the ratio of its corrected retention time $(t - t_0)$ to the void time of the system t_0:

$$k'_i = (t_i - t_0) / t_0$$

Total for this column is equal to the capacity factor of the last peak of the chromatogram.

resolution Resolution R for two neighboring peaks is calculated as:

$$R = (t_{i+1} - t_i) / (w_{0.607i} + w_{0.607(i+1)})$$

where **i** and **i+1** indexes refer to the neighboring peaks, and $w_{0.607}$ stands for the peak width at 60.7 % of the peak height.

effectivity, TP

Effectivity for the peak in number of theoretical plates. The number of theoretical plates N_i per column for a chosen peak is calculated for a chromatographic peak by one of two formulas:

$$N_i = 2\ PI\ (t_i \cdot H_i / A_i)^2,$$

where PI = 3.1415926..., t_i = retention time, H_i = height, A_i = area of the peak. The more commonly used formula is:

$$N_i = 5.54\ (t_i / w_i)^2,$$

where w_i is the width on the half-height of the peak. The first formula offers better estimates for fused or unresolved peaks, because the half-width errors for those peaks are much greater than height or area errors.

Total for this column includes average value for the peaks listed.

effectivity, TP/m

Effectivity for the peak in number of theoretical plates per meter. The number of theoretical plates per meter N' for the given component is calculated as:

$$N' = N_i \cdot 1000 / L,$$

where L is length of the column in mm and N_i is effectivity of the column for i-th component.

Total for this column includes average value for the peaks listed.

reduced TP height, HETP/dp

The height of theoretical plate divided by particle size, called also reduced height, is calculated by formula:

$$H_i = 1000 \cdot L / (N_i\ dp).$$

where L is length of the column in mm, dp is particle diameter in µm.

gaussian factor

The Peak gaussian factor PGF is the ratio of the width at half peak height $w_{1/2}$ to the width at $^1/_{10}$ peak height $w_{1/10}$ multiplied with the reciprocal value of this ratio for an ideal gaussian peak shape.

$$PGF = 1.83 \cdot w_{1/2} / w_{1/10}$$

$\mathbf{PGF = 1}$ for an ideal peak with gaussian shape.

asymmetry

Peak asymmetry $\mathbf{A_s}$ is calculated at $^1/_{10}$ of the peak height as a ratio of width after the top of the peak $\mathbf{w_2}$ to the width before the top $\mathbf{w_1}$.

$$\mathbf{A_s = w_2 / w_1}$$

response factor

Coefficient $\mathbf{k_1}$ of the calibration curve.

raw concentration

Absolute concentrations (raw quantity) of the components, calculated as

$$\mathbf{C_i = W_i(R_i) / V'}$$

Total value for the column is the sum of concentrations for all components.

concentration%

Normalization of concentrations for all peaks using the **NORM** value entered in the **Total % for normalization** field (default setting 100%):

$$\mathbf{C_i\% = NORM \cdot W_i(R_i) / \sum W_i(R_i)}$$

Total value for the column equals **NORM** for the main table, and the sum of concentrations in the group for the group table.

rel. concentration

Relative concentration of the component relative to the standard component, assumes concentration of one of the components to be known in advance. The concentration of the component is calculated by the formula:

$$\mathbf{C'_i = W_i(R_i) / V' = W_i(R_i) \cdot C_s / W_s(R_s)},$$

where $\mathbf{V' = W_s(R_s) / C_s}$ is the effective (reduced) volume of injected sample. The standard component concentration $\mathbf{C_s}$ is entered by the user.

Total value for relative concentration column does not include the concentration of the standard component.

rel. concentration%

Relative concentration percent differs from **concentration%** by exclusion of standard component(s) from summation, so that sum of all concentrations (excluding standard) equals **NORM**.

Total value for the column equals **NORM** value for main peak table, and the sum of concentrations in the group for Group table.

peak amount Absolute amount of substance which is contained in the sample loop volume. It is the product of the absolute concentration **C(i)** multiplied to the volume of the sample loop.

The amount is displayed without unit in the report, pay attention to the order of magnitude of the displayed value!

index Linear or logarithmic retention index for identified components.

Total value for the column is a weighted index average with absolute concentration as weight.

$$\mathbf{I = \sum \{ (I_i C_i) / \sum C_i \}.}$$

type The types of components are designated by a one-letter code:

R Reference component (used for peak identification).

S Standard component.

C Calibration standard in the case it is different from the quantification standard.

? Some points of corresponding peak are out of ADC or detector range – suspicious result.

! Component concentration is outside of minimum (**min C**) and maximum limits (**max C**), set in the component table.

p Special component (it has one of the special flags checked on in the component window).

N The component response is outside of calibrated region.

In the case of peaks additional letters precede the component type information, indicating, how peaks are separated from other peaks, for example:

BD_ Peak that starts on the baseline (**B**) and ends on the drop line (**D**) that separates it from another adjacent peak.

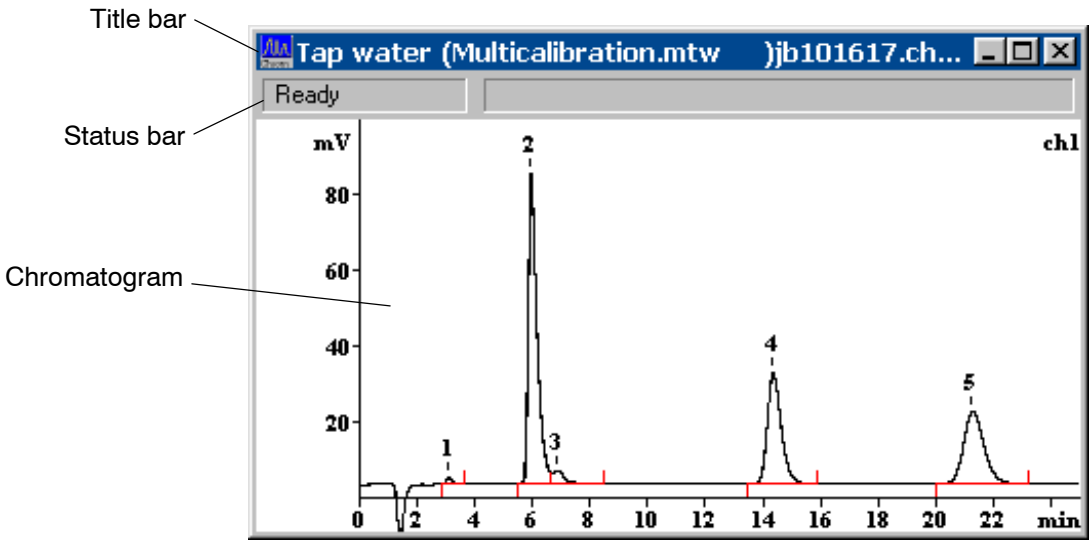
BBR Special case of a rider (**R**) peak that is tangentially separated from the main one. A main peak will have a third letter **H** (horse) in this case.

	The complete component type may look like: **BBD : !R**.
group	Number of the group for the component.
spectral ratio	Ratio of responses on different channels for multi-channel chromatograms.
name	Name of the component.
file name	File name of chromatogram. This column is very useful for the purpose of processing of exported data.
ident	Title (identifier) of the chromatogram. This column is useful for the processing of exported data.

8 Chromatograms

8.1 Chromatogram window

The **CHROMATOGRAM** window is used to show a running or recorded chromatogram.



The **title bar** of the chromatogram window contains buttons for minimizing, maximizing and closing the window. The window name consists of the elements "**Ident (method name) chromatogram name**". A star (*) at the end of the name indicates that the chromatogram has been changed since the last saving.

The **status bar** contains two fields. The first field indicates the current measurement status, one of the listed below:

Ready	Chromatogram is ready to start.
Waiting	Chromatogram is waiting for the first measuring points.
Measure	Chromatogram is being measured.
Measure(Baseline)	Recording of baseline.
Finished	Measurement finished, but the chromatogram is not processed.
Processing	Chromatogram is being processed after finishing.
Failure	Failure, e.g. unexpected pump stop, etc.
COM error	Error on COM port interface.

During active data acquisition the elapsed time, the duration of the chromatogram or program and the current X and Y values are shown in the second field of the status bar. If the peak editor is switched on then the position of the cursor will be shown.

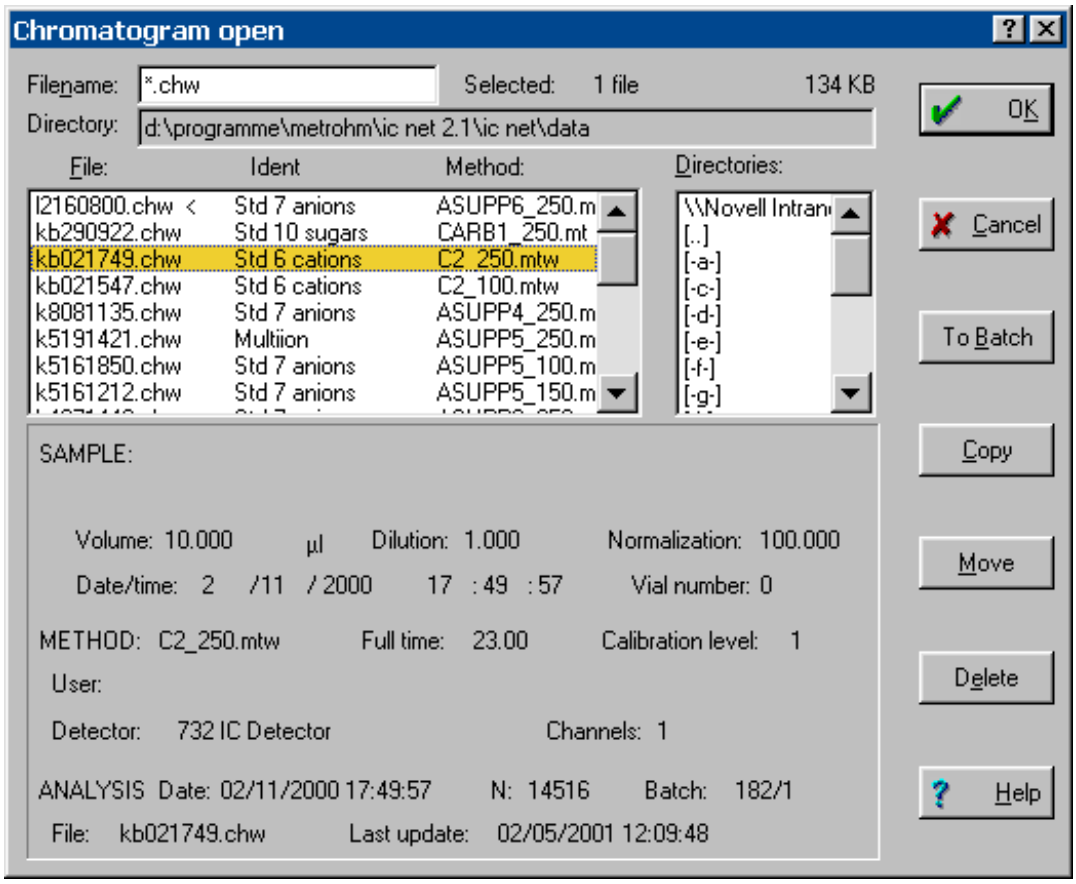
A chromatogram can be scaled with the help of keyboard or mouse functions or through the **Chromatogram axes** window opened with **IC NET** / **View** / **Appearance** / **Chromatogram axes**. Some of the window control functions are collected in the **Window** menu.

8.2 Chromatogram file handling

8.2.1 Open chromatogram

IC NET / **File** / **Open** / **Chromatogram**

Load an existing chromatogram file (***.chw**) from the **Data** directory and open the chromatogram window. The following window appears:



Filename	Filename (common wildcards as ***** and **?** are possible).
Selected	Number of selected chromatograms and their total size.
Directory	Path name of the working directory
File window	Box with the list of files residing in the working directory sorted by time (the last recorded chromatogram is at the top of the list). As additional short information on the chromatogram the two parameters **Ident** and **Method** are also displayed. Files in this box can be selected by moving the selection bar to the desired chromatogram and pressing the [Space] key or by a single mouse click. It is possible to select several chromatograms at once. Press [Shift] and the left mouse button to select all chromatograms up to last item clicked, press [Ctrl] and the left mouse button to add a single chromatogram to the selection already made. All selected items are painted.
Directories	Box with the list of directories. Allows to change the working directory defined in the method, if necessary.
Chromatogram description	A set of fields with the description of the current chromatogram. Selected fields from the passport are listed here.
<OK>	Load all selected chromatogram files (***.chw**) and open each in its own window.
<Cancel>	Close this window without any action.
<To Batch>	Add selected chromatograms to the specified batch reprocessing file.
<Copy>	Copy selected chromatograms to the specified location.
<Move>	Move selected chromatograms to the specified location.
<Delete>	Delete selected chromatograms and move them to the Windows waste-basket.

8.2.2 Save chromatogram

IC NET / File / Save / Chromatogram

Save the selected chromatogram in a chromatogram file (***.chw**) in the working directory. If this chromatogram has been already stored in this directory, the message **File ... exists. Overwrite?** appears. If it is preferable to overwrite the previous copy (for example, after the reprocessing), press the **<OK>** button. Pressing **<No>** saves the chromatogram into the new file (a new copy of the chromatogram is created).

8.2.3 Close chromatogram

IC NET / File / Close

Close the selected chromatogram window. If the data were not saved or the method was modified, a warning appears. Usually it is more convenient to close the window by clicking the  button at the top corner area of the window.

8.2.4 Delete chromatogram

IC NET / File / Delete

Delete the selected chromatogram window. A warning will be generated by the software in any case.

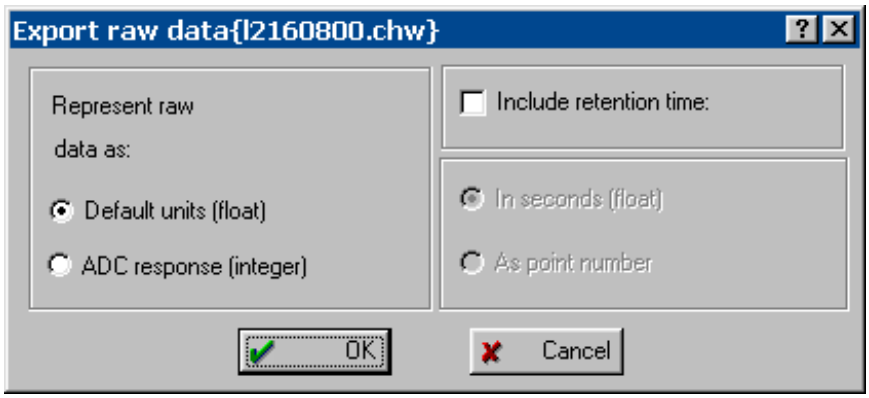
8.2.5 Export chromatogram

IC NET / File / Export / AIA file

Export the selected chromatogram in the AIA format (Analytical Instrument Association) as CDF file (***.cdf**).

IC NET / File / Export / Raw data to txt

Export chromatographic raw data into an ASCII text file (***.txt**). The following window appears:



Represent raw data as Output of raw data:

Default units (float) Y values are exported in default units for the channel.

ADC response (integer) Y values are exported in bits.

Include retention time

In seconds (float) X values are exported in seconds.

As point number X values are exported as point number.

8.2.6 Import chromatogram

IC NET / File / Import / Chromatogram

Import chromatogram of the following formats:

***.chm** Chromatogram files of the «Chrom&Spec» program (DOS version).

***._rd** Chromatogram files of the «714 IC Metrodata» program (DOS version). After selection of the file to be imported you are asked to load a method.

***.chr** Chromatogram files of the «EnviroChrom» program.

***.dar** Chromatogram files of the «AtomChrom» program.

LongInteger (*.*) Chromatogram files in Long Integer format.

IC NET / File / Import / AIA file

Import chromatogram in the AIA format (Analytical Instrument Association) from a CDF file (***.cdf**).

IC NET / File / Import / Raw data from txt

Import chromatographic raw data from a text file ***.txt** (ASCII format). This is only possible if an appropriate method has been opened.

8.3 Graphical representation

8.3.1 Appearance

IC NET / View / Appearance

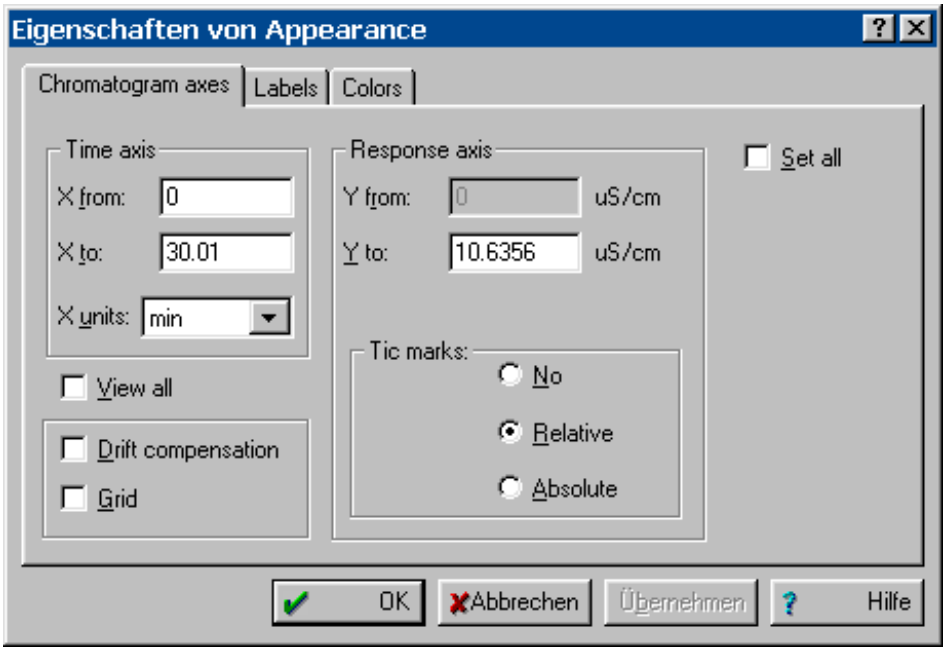
This menu item opens the **Appearance** window. It determines the appearance of the chromatogram and consists of four tabs:

Chromatogram axes	Scaling of chromatogram axes.
Labels	Settings for peak labels and baseline drawing.
Select channel	Select channels to be displayed (only available for multi-channel chromatograms).
Colors	Color settings for chromatogram elements.

The appearance settings for a chromatogram are not saved automatically on closing the chromatogram. In order to have the same appearance after reopening the chromatogram, it must be saved explicitly after modification of these parameters with **IC NET / File / Save / Chromatogram**.

Chromatogram axes

Tab **Chromatogram axes** of the **Appearance** window with parameters for scaling of the chromatogram axes.



Time axis

X from	Beginning of the window on X axis.
X to	End of the window on X axis.
X units	Selection of unit (**Retention unit**) for X axis.

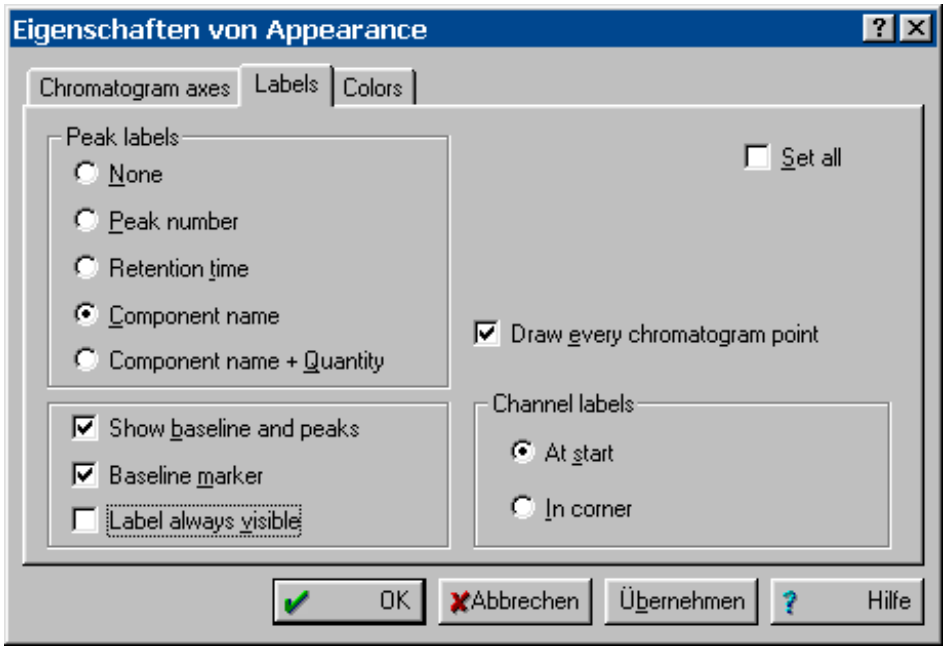
Response axis

Y from	Beginning of the window on Y axis.
Y to	End of the window on Y axis.
Tic marks	Plot axes labels and tic marks on Y axis with **no**, **relative** or **absolute** scaling.

View all	Set scales on X and Y axes so that the whole chromatogram is visible.
Drift compensation	Turns the chromatogram screen image so that the last and first points of the chromatogram are on the same level. This option is useful for gradient chromatograms. Drift compensation has no effect while a chromatogram is running.
Grid	Plot dotted grid lines in the selected chromatogram window.
Set all	Set scales on X and Y axes of all opened chromatograms automatically to the settings in the selected chromatogram window.

Labels

Tab **Labels** of the **Appearance** window with parameters for peak labeling and baseline drawing.



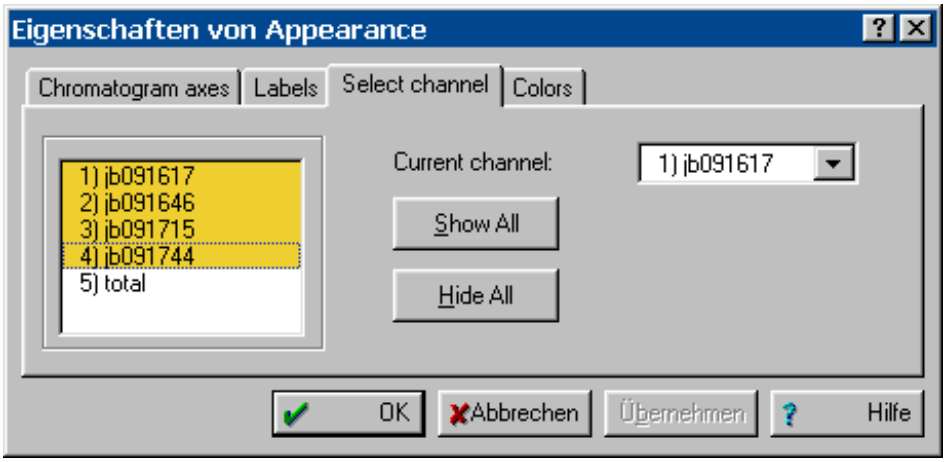
Peak labels

None	No peak labels.
Peak number	Peak number.
Retention time	Retention time.

Component name	Name of the component.
Component name + Quantity	Name and quantity of the component.
Channel labels	Label for data acquisition channel.
At start	Channel label is shown at the start of the chromatogram.
In corner	Channel label is shown in the upper right corner of the chromatogram.
Show baseline and peaks	Baselines are shown.
Baseline marker	Start and end of baselines are marked.
Label always visible	Label is shown always with zooming.
Set all	Set peak labeling of all opened chromatograms automatically to the settings in the selected chromatogram window.
Draw every chromatogram point	Show chromatogram with all measured points (disable smoothing).

Select channel

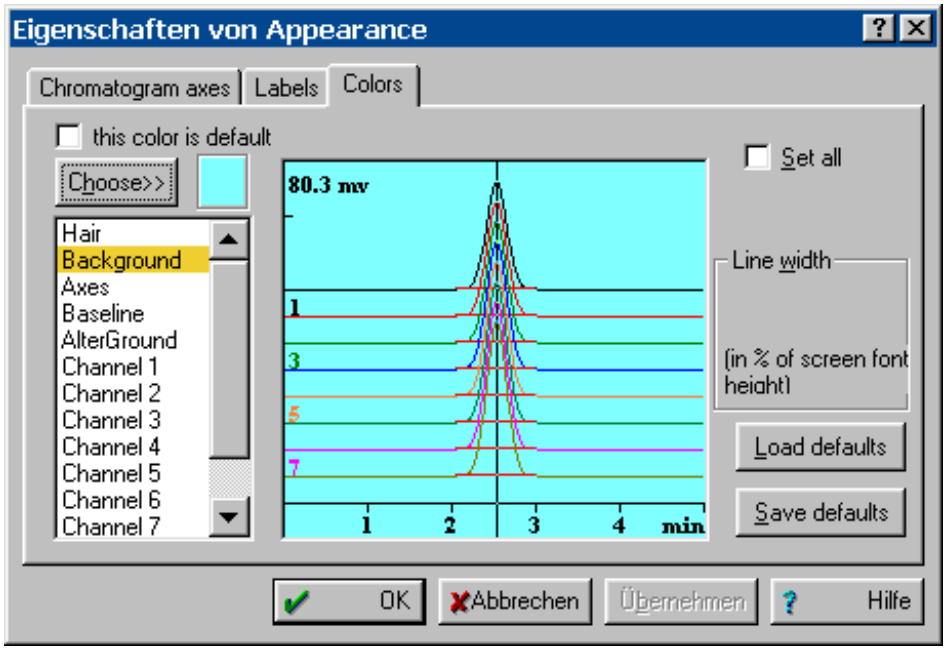
Tab **Select channel** of the **Appearance** window for selection of channels for multi-channel chromatograms.



Selection window	The selection window shows all chromatograms of the batch reprocessing queue which can be selected for display. If **total** is selected, all chromatograms are added and the resulting addition curve is shown.
<Show all>	Select all chromatograms in the selection window.
<Hide all>	Deselect all chromatograms in the selection window.

Colors

Tab **Colors** of the **Appearance** window with color settings parameters for chromatograms.



this color is default	Reset the selected element to the default color.
<Choose>	Choose a new color for the selected element. An example of the chosen color is shown beside the button.
Hair	Cursor's color.
Background	Background color.
Axes	Axes and axes labels color.
Baseline	Baseline color.
AlterGround	Alternative background color for **Measure baseline** option.
Channel 1...8	Color of the selected channel. Each channel can be of a unique color.
Line width	Line width for the selected element (**Axes** or **Channel 1...8**) in % of selected plot font height. Range: **0** ... **232**
Set all	Set colors of all opened chromatograms automatically to the settings in the selected chromatogram window.
<Load defaults>	Set colors in the selected chromatogram window to the set defaults colors.
<Save defaults>	Save color settings in the selected chromatogram window as default colors.

8.3.2 Other graphical functions

IC NET / View / X full scale

By selecting this menu item or pressing [Ctrl] + [Home] the X axis is scaled so that the chromatogram perfectly fits the window horizontally.

IC NET / View / Y full scale

By selecting this menu item or pressing [Ctrl] + [End] the Y axis is scaled so that the chromatogram perfectly fits the window vertically.

IC NET / View / View all

By selecting this menu item or pressing [Alt] + [V] the X and Y axes are scaled so that the chromatogram perfectly fits the window horizontally and vertically.

IC NET / View / Recorder autoscale

This option allows to look at the chromatogram so that the last point is always visible on the screen while data are acquired.

If the **Recorder autoscale** option is switched on, the following autoscaling rules apply:

- If the last acquired point comes out of the window down, autozero is performed.
- If the last point is too high, the recorder scale shrinks twice until the point comes to screen.
- If the last point comes outside of the plotting area to the right, the window is shifted half-screen right.

If the **Recorder autoscale** option is switched off, the window scale does not change automatically during data acquisition.

8.4 Peak editor

8.4.1 Switching on/off the peak editor

IC NET / Process / Peak editor

The peak editor mode is used for subsequent manual correction of the automatic integration for chromatogram peaks (see *section 7.4*). It can be used to select the most important points for the peak evaluation (start, end and top of peak, valley between peaks) and move them to the required position.

If the peak editor mode is enabled, the vertical bar cursor appears in the chromatogram window. At the same time, the **Peak** menu appears in the menu bar and the peak editor icons appear in the icon bar of the main window.

The peak editor mode is switched on or off by clicking on  or by pressing [Alt] + [C]. It is also possible to click the right mouse button somewhere in the chromatogram window and to select the **Peak editor** item.

You cannot edit the peak pattern while the component table is active and vice versa, when the peak editor mode is switched on the component table option is disabled.

8.4.2 Peak editor functions

The functions of the peak editor can be triggered with the corresponding menu items of the **Peak** menu, by the peak editor symbols in the symbol bar or with key combinations.

IC NET / Peak / Undo

Undo the last action.

IC NET / Peak / Insert peak [Insert]

Add a peak to the chromatogram.

IC NET / Peak / Delete peak [Delete]

Delete selected peak.

IC NET / Peak / Select nearest point

Move the cursor to the nearest start, top, end, or valley point and select the peak.

IC NET / Peak / Select start point

Move the cursor to the beginning of the nearest peak and select the peak.

IC NET / Peak / Select top point

Move the cursor to the top of the nearest peak and select the peak.

IC NET / Peak / Select end point

Move the cursor to the end of the nearest peak and select the peak.

IC NET / Peak / Select valley point

Move the cursor to the valley of the two nearest peaks.

IC NET / Peak / Unselect peak

Delete the selection.

IC NET / Peak / Move selected point [–]

Move a selected point (start, top, end, valley) to the cursor position.

IC NET / Peak / Merge peaks [+]

Merge two neighboring peaks into a single peak.

IC NET / Peak / Fuse peaks [*]

Fuse the beginning of the previous and the end of the next peak at the cursor position.

IC NET / Peak / Split peaks [/]

Split a single peak into two peaks at the cursor position.

IC NET / Peak / Delete all left

Delete all peaks to the left of the selected point.

IC NET / Peak / Delete all right

Delete all peaks to the right of the selected point.

8.4.3 Moving the cursor

The cursor can be dragged by the **mouse** when the right mouse button is pressed. Releasing the button will leave the cursor at the new position. The position of the cursor is displayed in the status bar of the chromatogram window.

The cursor can also be moved using the **keyboard**:

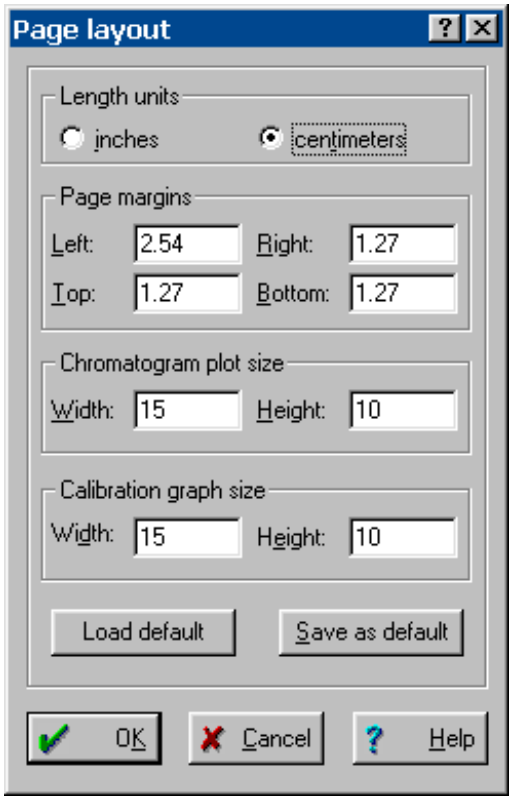
[←]	Move cursor left.
[Shift] + [←]	Move cursor left quickly.
[→]	Move cursor right.
[Shift] + [→]	Move cursor right quickly.
[/]	Move cursor to the beginning of the window.
[/]	Move cursor to the end of window.

8.5 Printing

8.5.1 Page layout for printing

IC NET / File / Page layout

The selection of this menu item or clicking on **<Page...>** in the **Report options** window opens the **Page layout** window for page layout parameters.



Length units	Selection of length units.
inches	Inches.
centimeters	Centimeters.
Page margins	Selection of page margins.
Left	Left margin.
Right	Right margin.
Top	Top margin.
Bottom	Bottom margin.
Chromatogram plot size	Selection of plot area for chromatograms.
Width	Width of plot area.
Height	Height of plot area.
Calibration graph size	Selection of plot area for calibration curves.
Width	Width of plot area.
Height	Height of plot area.
<Load default>	Load default values for page layout parameters.

<Save as default> Save set page layout parameters as default values.

8.5.2 Printer settings

IC NET / File / Printer setup

By selecting this menu item the **Print setup** window is opened where printer, paper size and format can be defined.

8.5.3 Print preview

IC NET / File / Preview

By selecting this menu item the **Preview** window appears on the screen where the report is shown in the appearance formatted for the desired printer as defined in the **Report options** window.

8.5.4 Printing

IC NET / File / Print

By selecting this menu item the **Printing** window is opened where printer, printing range and number of copies can be defined. All settings defined in the **Report options** window will be active except the destination of the printout.

In order for the chromatogram to be printed, the option **Chromatogram plot** must be switched on in the **Report options** window under **Items to report**.

IC NET / Process / Make report

Selection of this menu item opens the **Report options** window for report output to screen, printer or file (details see *section 7.6*).

8.6 Miscellaneous functions

8.6.1 Reintegration

IC NET / Process / Reintegrate

This menu item opens the **Integration parameters** window where the reintegration of the chromatogram can be started (details see *section 7.4*).

8.6.2 Recalibration

IC NET / Process / Calibrate

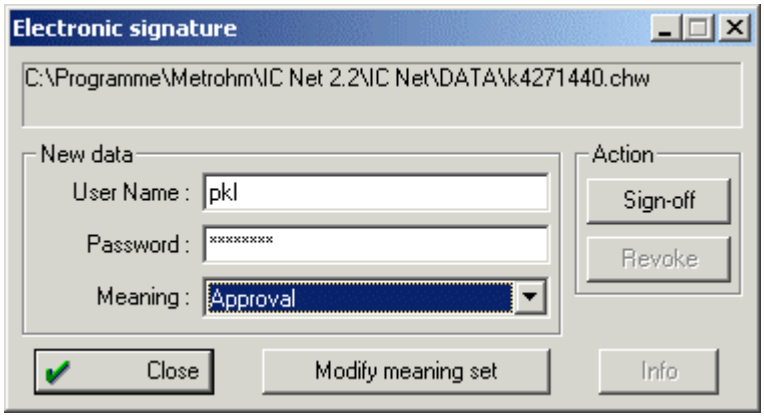
This menu item opens the **Recalibration** window for entry of the calibration level and recalibration of the chromatogram using this level (details see *section 7.5*).

8.6.3 Electronic signature

IC NET / Process / Electronic signature

This menu item opens the **Electronic signature** window that allows to sign (or alter the signature of) the chromatogram in the **active** window. Once a chromatogram is signed it cannot be altered. To alter a signed chromatogram the signature has to be revoked.

The chromatogram that is to be signed has to be the active window.



The first line of the window shows the **path** and **file name** of the chromatogram to be signed. The user has to sign the chromatogram with his user name, password and a meaning.

New data

User name	User name of the signing user.
Password	Password of the user.

Meaning	Meaning of the signature, can be selected from a pop-up list that is predefined in the **Meaning set** window.

Actions	
<Sign-off>	Sign the chromatogram.
<Revoke>	Revoke the signature.

Once a chromatogram is signed it cannot be altered. To alter a signed chromatogram the signature has to be revoked.

<Close>	Close the **Electronic signature** window .
<Modifiy meaning set>	Opens the **Meaning set** window.
<Info>	Opens the **Signatures** table, which displays **state**, **user**, **date**, **time** and **meaning** of the signatures of a chromatogram.

Meaning set

This window contains an editable list of predefined **meanings** for the electronic signature.

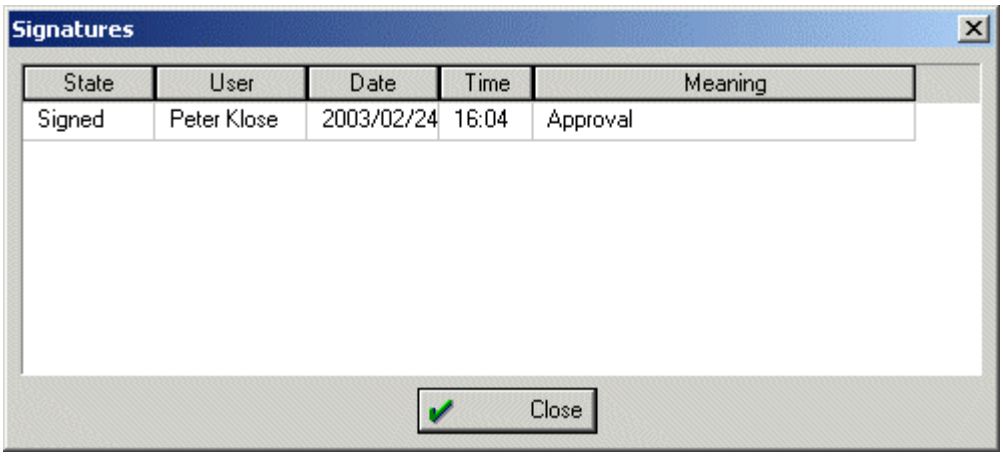
Meaning	Default entries are: **Approval,** **Review,** **Rejection,** **Responsibility,** **Authorship**. The signature meanings can be sorted alphabetically by clicking the title. A star (*) at the end of the title indicates the sorting.

<Add>	Add a signature meaning, the entry window for the signature meaning opens.
<Delete>	Delete signature meaning.
<Modifiy>	Modify a signature meaning, the entry window for the signature meaning opens.

Info

IC NET / Process / Electronic signature

This window displays the signatures of the chromatogram in the active window.

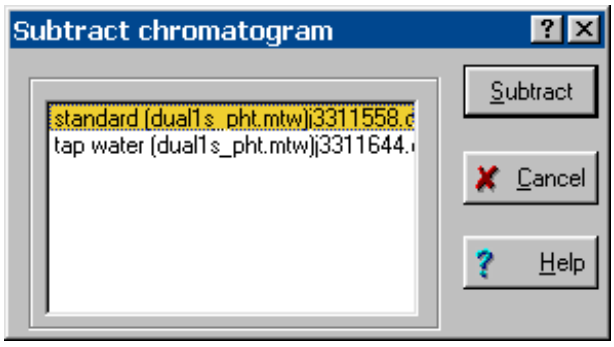


The signature table can be sorted according to one of the five columns by clicking the title. A star (*) at the end of the title indicates the sorting criterion.

8.6.4 Subtraction of a chromatogram

IC NET / Process / More / Subtract

This menu item opens the **Subtract chromatogram** window allowing the subtraction of any opened chromatogram from the active, selected chromatogram.



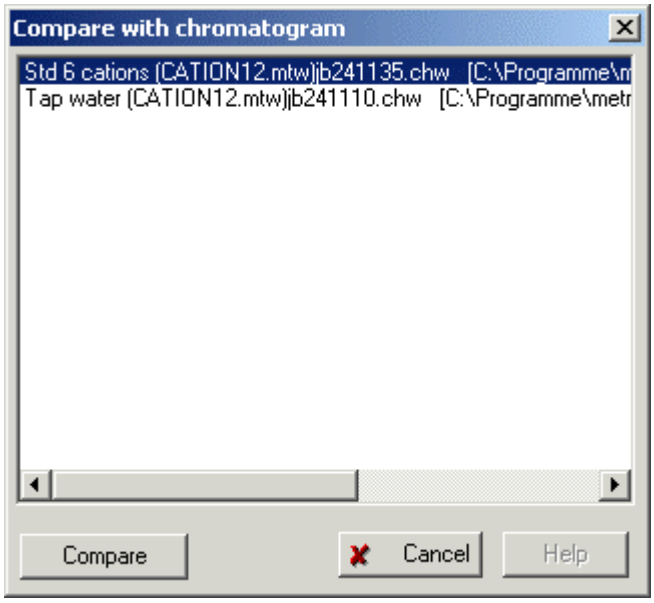
Select the chromatogram that should be subtracted, click on **<Subtract>** and then on **IC NET / View / View all**. The result is shown in the active chromatogram window, which is considered as a new chromatogram and will be stored under a new name to avoid overwriting of old data.

8.6.5 Compare chromatogram

IC NET / Process / More / Compare

This menu item opens the **Compare with** window that allows the comparison of the active open chromatogram to any other opened chromatogram or method.

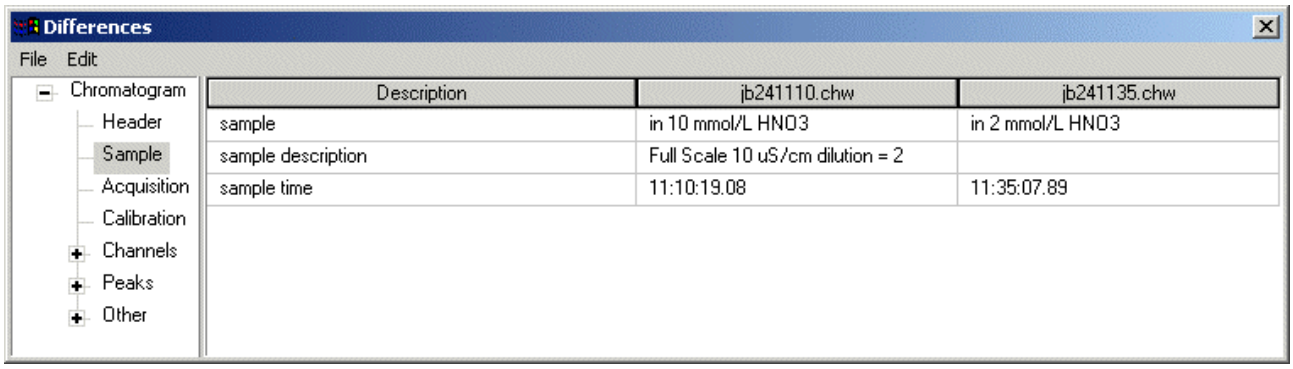
The chromatogram (or method) that is to be compared has to be the active window.



<Compare> Compare the selected file of the list to the chromatogram (or method) of the active window and display the result in the **Differences** window.

Differences

This window displays the differences between the compared files.



File

Close Close window and return to **Compare with** window.

Edit

Copy Copy the data of the comparison to the clipboard.

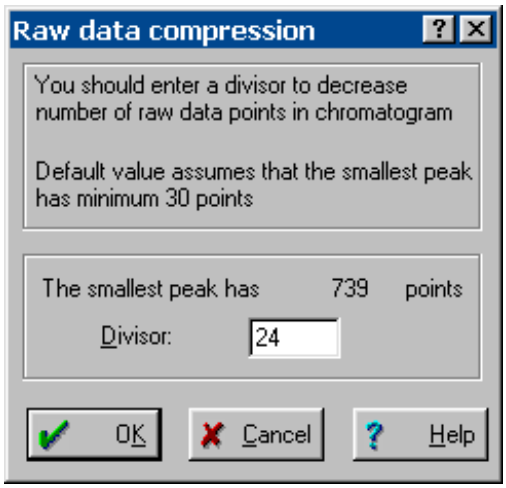
Left frame Overview of the found differences, arranged in a menu tree. Click on the interesting menu point to display its properties in the **Right frame**. The displayed menu point is inverted.

Right frame Table of the property values of the selected menu point. The table can be sorted according to one of the three columns **Description**, **file1**or **file2** by clicking the title. A star (*) at the end of the title indicates the sorting criterion.

8.6.6 Data compression

IC NET / Process / More / Compress

Selection of this menu item opens the **Raw data compression** window for compression of the raw data of the active chromatogram by summing up several neighboring points.



Divisor Coefficient of compression (the number of data points is reduced by this value). The default value of the compression coefficient is calculated so that the width at half-height of the narrowest peak will be digitized by at least 30 points. If the user enters a coefficient of compression that exceeds the value offered by the software, integration precision may decrease.

8.6.7 Invert chromatogram

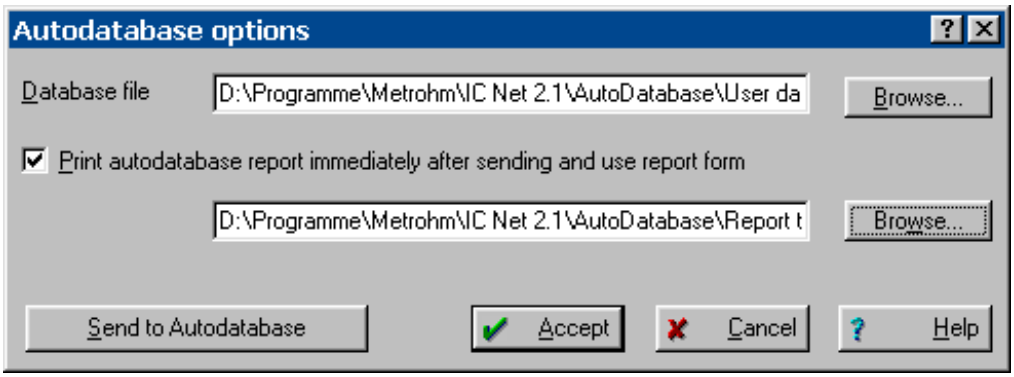
IC NET / Process / More / Invert!

This menu item inverts the response curves for all channels of the chromatogram so that negative peaks become positive and vice versa (useful for chromatograms with wrong input polarity).

8.6.8 Autodatabase

IC NET / Method / Autodatabase

The **Autodatabase options** window contains parameters and settings for sending chromatograms to the **Autodatabase** program.



Database file
Definition of the database file (***.adb**) to which chromatograms are sent manually with **<Send to Autodatabase>** or automatically if the **Send data to Autodatabase file** option is enabled in the **Processing** tab of the **Method setup** window. Use **<Browse>** to select a new database file.

Print autodatabase report immediately after sending
If this option is enabled, a report is automatically printed using the defined report template file (***.rt**). Use **<Browse>** to select a new report template file.

<Send to Autodatabase>
Send data of selected chromatogram to specified Autodatabase file.

<Accept>
Accept changes in **Autodatabase options** window.

<Cancel> Close the window and abandon changes.

For details on the «Autodatabase 1.0» program, open this program and call on-line help.

IC NET / Options / Indicate AutoDB server

Indicate Autodatabase program icon on the task bar if it has been already activated in the background by sending data.

9 Sample queue

A **sample queue** is a table containing sample-specific data which is used to facilitate work with autosamplers and multiple analyses. The number of rows of the sample queue table defines the number of determinations which are run automatically. Once the queue has been started, the sample-specific data are transferred line-by-line to the running determination overwriting the corresponding fields of the method.

A sample queue is stored in a sample queue file ***.que** in a subfolder of the **Methods** directory.

9.1 Sample queue file handling

9.1.1 Open sample queue

IC NET / File / Open / Sample queue
SYSTEM / System / Sample queue

These two menu items open the **OPEN** window for opening an existing sample queue file ***.que** or creation of a new sample queue file ***.que** by entering a new name. After confirmation with **<OK>** the sample queue overview table is opened (see *section 9.2*).

9.1.2 Save sample queue

QUEUE EDITOR / File / Save

Save the sample queue table in a sample queue file (***.que**) in the working directory. The sample queue editor window remains open.

QUEUE EDITOR / File / Save & exit

Save the sample queue table in a sample queue file (***.que**) in the working directory and close the sample queue editor window.

SAMPLE QUEUE OVERVIEW / File / Save as

Save a copy of the current sample queue into a new sample queue file (***.que**) in the working directory.

9.1.3 Delete sample queue

SAMPLE QUEUE OVERVIEW / File / Delete

Close the sample queue overview window and delete the sample queue file (***.que**).

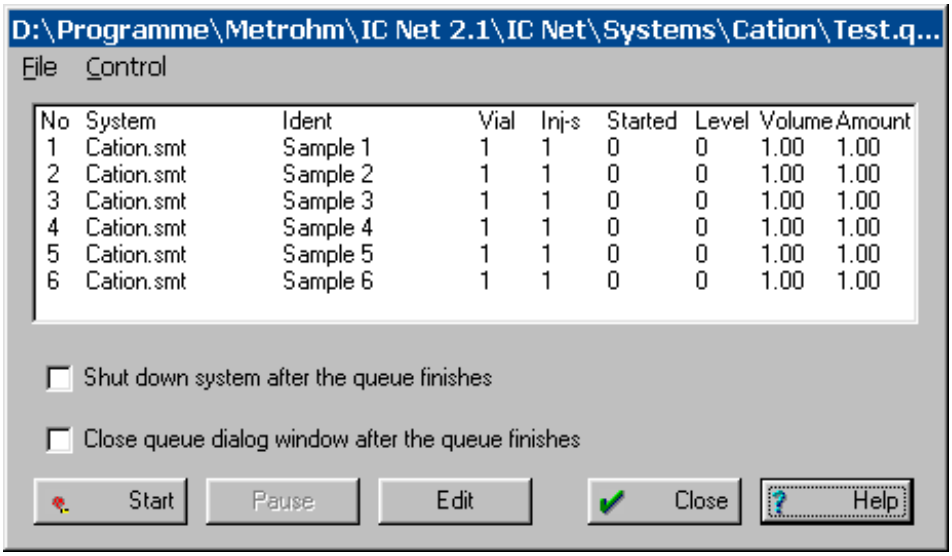
9.2 Sample queue control

9.2.1 Sample queue overview table

IC NET / File / Open / Sample queue

SYSTEM / System / Sample queue

These two menu items open the **OPEN** window for opening an existing sample queue file ***.que** or creation of a new sample queue file ***.que** by entering a new name. After confirmation with **<OK>** the sample queue overview table is opened showing the current status of the sample queue:



No — Row number.

System — System file to be used for the determination.

Ident — User defined identifier for chromatogram. Will be placed into appropriate passport field when starting the chromatogram.

Vial — Autosampler vial position to take sample from.

Inj-s — Number of injections for the same vial position (only 1 injection is permissible for **Level ≥ 1**).

Started — Indication whether the sample has been started or not:

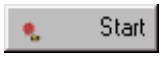
- **0** sample not started
- **1** sample started
- **2…n** number of injections done

Level — Calibration level (see *section 7.5*) for the sample: Level **0** stays for normal analysis, levels **1** and greater for calibration runs. Correct filling of this column enables to calculate calibration coefficients automatically.

Volume — Injected volume of sample in µL.

Amount	Sample amount. If this value is different for the calibration run (*c*) and the sample run (*s*), the component concentrations of the sample are calculated as follows: $C_s = C_c \cdot \text{Amount}_s / \text{Amount}_c$
Shut down system after the queue finishes	If this option is enabled, the system hardware is shut down after the sample queue has been finished (all pumps are switched off), but it remains connected.
Close queue dialog window after the queue finishes	If this option is checked, the sample queue overview table is closed at the end of the last determination of the queue.
<Start>	Start execution of the sample queue from the first line with **Started = 0**.
<Pause>	Stop execution of the sample queue after the current determination has been finished.
<Edit>	Open the sample queue editor program for editing the sample queue table (see *section 9.3*).
<Close>	Close the sample queue overview table.

9.2.2 Start sample queue



SAMPLE QUEUE OVERVIEW / Control / Start

Start execution of the sample queue from the first row with **Started = 0**. For each row, the sample-specific data are transferred to the method of the current determination and the parameter **Started** is set to **1** for this row.

A running sample queue can be interrupted with **<Pause>**. It can be restarted with **<Start>** (with a running chromatogram only when data acquisition is finished).

9.2.3 Pause sample queue

SAMPLE QUEUE OVERVIEW / Control / Pause

Interrupt execution of the sample queue after the current determination has been finished.

A running sample queue can be interrupted with **<Pause>**. When the current determination has been finished, the sample queue can be restarted with **<Start>** or stopped with **Control / Stop determination** in the **SYSTEM** window.

9.2.4 Cancel last run

SAMPLE QUEUE OVERVIEW / Control / Cancel last run

Cancel the last run (set **Started = 0** for this row). If the queue is re-started, this row is executed again.

This function is only available if the sample queue has been interrupted by pressing the **<Pause>** button.

9.2.5 Reset sample queue

SAMPLE QUEUE OVERVIEW / Control / Reset

Reset sample queue table (set **Started = 0** for all rows).

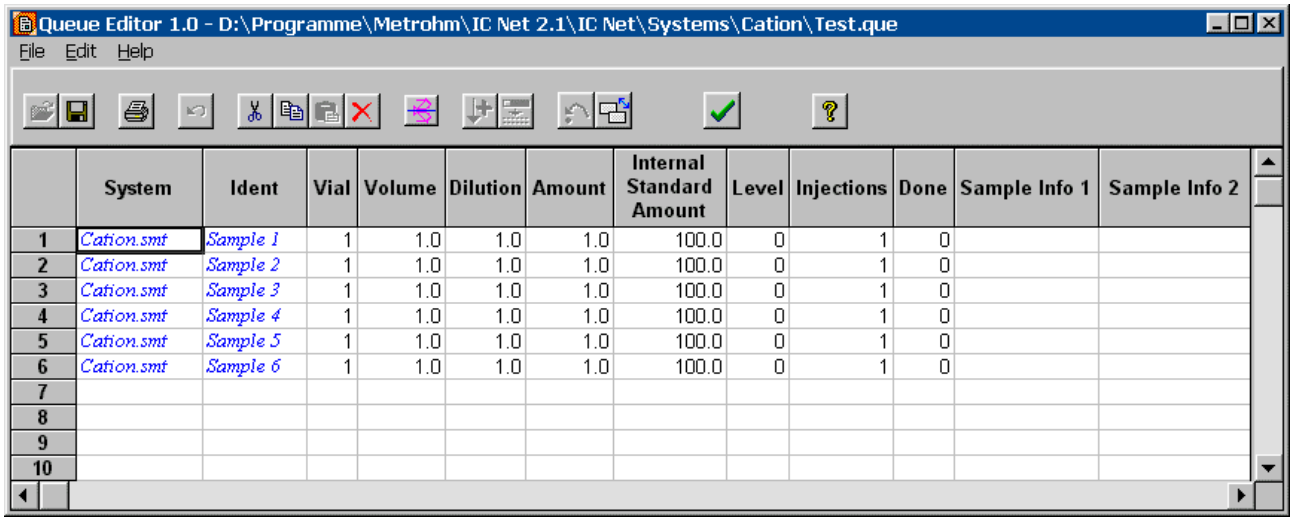
This function is only available if the sample queue has been interrupted by pressing the **<Pause>** button.

9.3 Sample queue editor

9.3.1 Open queue editor window

SAMPLE QUEUE OVERVIEW / Control / Edit

This menu item opens the **Queue editor** window for editing the sample queue table.



	System	Ident	Vial	Volume	Dilution	Amount	Internal Standard Amount	Level	Injections	Done	Sample Info 1	Sample Info 2
1	Cation.smt	Sample 1	1	1.0	1.0	1.0	100.0	0	1	0		
2	Cation.smt	Sample 2	1	1.0	1.0	1.0	100.0	0	1	0		
3	Cation.smt	Sample 3	1	1.0	1.0	1.0	100.0	0	1	0		
4	Cation.smt	Sample 4	1	1.0	1.0	1.0	100.0	0	1	0		
5	Cation.smt	Sample 5	1	1.0	1.0	1.0	100.0	0	1	0		
6	Cation.smt	Sample 6	1	1.0	1.0	1.0	100.0	0	1	0		
7												
8												
9												
10												

No Row number.

System System file to be used for the determination. The system is automatically opened and connected.

All system files of the sample queue must be stored in the same system subfolder.

Ident User defined identifier for chromatogram. Will be placed into appropriate passport field when starting the chromatogram.

Vial Autosampler vial position to take sample from.

Volume Injected volume of sample in µL.

Dilution Sample dilution prior to injection.

Amount Sample amount. If this value is different for the calibration run (*c*) and the sample run (*s*), the component concentrations of the sample are calculated as follows:

$$C_s = C_c \cdot \text{Amount}_s / \text{Amount}_c$$

Internal standard amount Concentration of the internal standard component for relative concentration calculations.

Level Calibration level (see *section 7.5*) for the sample: Level **0** stays for normal analysis, levels **1** and greater for calibration runs. Correct filling of this column enables to calculate calibration coefficients automatically.

Injections Number of injections for the same vial position (only 1 injection is permissible for **Level ≥ 1**).

Done Indication whether the sample determination has been done or not:

- **0** determination not yet done
- **1…n** determination or injection done

Sample Info 1 First sample description.

Sample Info 2 Second sample description.

9.3.2 Sample queue editor functions

The functions in the editor window for sample queues can be triggered with the corresponding menu items of the **Edit** menu or with the corresponding symbols in the symbol bar.

QUEUE EDITOR / Edit / Undo

Undo the last modification of the sample queue table.

QUEUE EDITOR / Edit / Cut row(s)

Cut the selected rows of the sample queue table and copy them into the clipboard.

QUEUE EDITOR / Edit / Copy row(s)

Copy the selected rows of the sample queue table into the clipboard.

QUEUE EDITOR / Edit / Paste row(s)

Paste the rows from the clipboard into the sample queue table.

QUEUE EDITOR / Edit / Delete row(s)

Delete the selected rows from the sample queue table.

QUEUE EDITOR / Edit / Duplicate row(s)

Duplicate the selected rows of the sample queue table.

QUEUE EDITOR / Edit / Increment

Fill selected column fields with values automatically incremented by 1. The last character of the first selected field must be a number. This function is available for the fields **Ident**, **Vial**, **Level**, **Sample Info 1** and **Sample Info 2**.

QUEUE EDITOR / Edit / Propagate

Fill selected column fields with the same value as the first field.

QUEUE EDITOR / Edit / Reset

Reset sample queue table (set **Done = 0** for all rows).

QUEUE EDITOR / Edit / Change system

Change system file (***.smt**) to be used for the selected rows.

9.3.3 Print sample queue

QUEUE EDITOR / File / Print

Print the sample queue table in landscape format.

9.3.4 Close sample queue editor

QUEUE EDITOR / File / Save & Exit

Save the modified sample queue table and close the sample queue editor window.

QUEUE EDITOR / File / Exit

Close the sample queue editor window. An inquiry appears asking whether or not the sample queue should be saved.

10 Batch reprocessing

Reprocessing is understood to be the subsequent reprocessing of a series of chromatograms which have been loaded in a **queue (Batch reprocessing queue)**. For reprocessing according to a selected method the settings for calibration, integration, passport, appearance and report can be altered at will.

A batch reprocessing queue is stored in a batch reprocessing queue file ***.bar** in the **Data** directory.

10.1 Batch reprocessing queue file handling

10.1.1 Open batch reprocessing queue

IC NET / File / Open / Batch reprocessing

Load an existing batch reprocessing file (***.bar**) from the **Data** directory and open the **Reprocess** window.

IC NET / File / Open / Last batch

Load the last opened batch reprocessing file (***.bar**) from the **Data** directory and open the **Reprocess** window.

10.1.2 Create new batch reprocessing queue

IC NET / File / Open / Chromatogram

For creation of a new batch reprocessing queue, open the **Chromatogram open** window. Select the desired chromatograms (***.chw**) and click the **<To Batch>** button. Enter the name of the new batch reprocessing file and press **<OK>**. The selected chromatograms are then added to this batch reprocessing queue.

If the reprocessing includes reintegration and/or recalibration, only chromatograms recorded with the same method should be loaded into the batch reprocessing queue.

10.1.3 Save batch reprocessing queue

QUEUE EDITOR / File / Save

Save the batch reprocessing queue in a batch reprocessing queue file (***.bar**) in the working directory. The batch reprocessing queue editor window remains open.

QUEUE EDITOR / File / Save & exit

Save the batch reprocessing queue in a batch reprocessing queue file (***.bar**) in the working directory and close the batch reprocessing editor window.

10.2 Perform batch reprocessing

10.2.1 Reprocess options window

IC NET / File / Open / Batch reprocessing

IC NET / File / Open / Last batch

These two menu items are used to open the **Reprocess** window, in which the various options for reprocessing are set and can then be triggered.

Use method from file for reprocessing

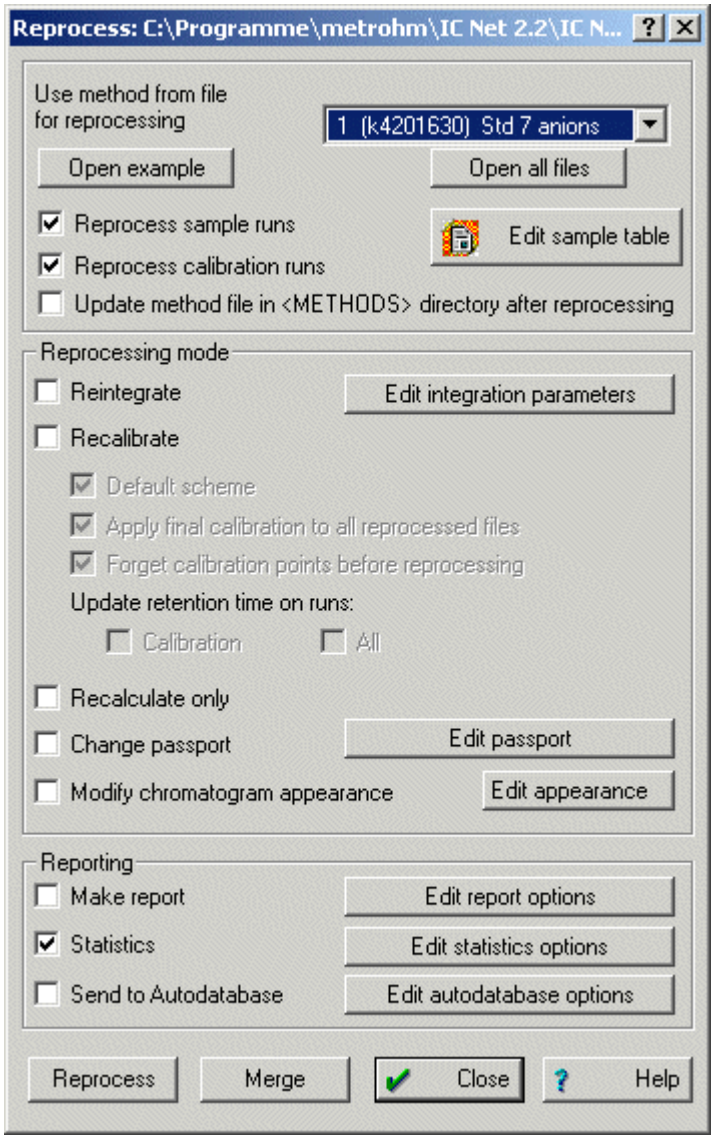
Selection of the desired chromatogram file whose method should be used for reprocessing.

If the reprocessing includes reintegration and/or recalibration, only chromatograms recorded with the same method should be loaded into the batch reprocessing queue.

<Open example>	Open the chromatogram selected above in the **Use method...** field.
<Open all files>	Open all chromatograms of the batch reprocessing queue.
<Edit sample table>	Open the batch reprocessing editor program for editing the batch reprocessing table (see *section 10.3*).

Reprocess sample runs

Reprocess all sample chromatograms (**calibration level = 0**).



Reprocess calibration runs

Reprocess all calibration chromatograms (**calibration level > 0**).

Update method file in <METHODS> directory after reprocessing

Save the method file ***.mtw** after reprocessing if the method is changed.

Reintegrate

Reintegrate chromatograms according to the current settings of the integration parameters and integration events.

<Edit integration parameters>

Open the **Integration parameters** window for modification of integration parameters and integration events.

Recalibrate

Reprocess all calibration chromatograms (if **Reprocess calibration runs** is switched on) and apply new calibration to all sample chromatograms (if **Reprocess sample runs** is

switched on) by updating the concentration table.

Default scheme Default setting for recalibration reprocessing. The two options **Apply final calibration...** and **Forget calibration points...** are switched on. A new calibration is performed with the calibration runs and the resulting new calibration parameters (component table, concentration table and calibration curve) are applied to all sample runs.

Apply final calibration to all reprocessed files
Apply the updated calibration to all calibration and sample runs. If this option is switched off, the calibration stored in the first chromatogram is used for all other chromatograms.

Forget calibration points before reprocessing
Forget old calibration points of the calibration curve and perform a new calibration using all calibration runs of the batch reprocessing queue. In this case each calibration chromatogram adds a new point to the calibration curve. If this option is switched off, the calibration curve stored in the first chromatogram remains active. Each further calibration chromatogram in the batch reprocessing queue adds a new point to this calibration curve.

Recalculate only Enable recalculation of chromatograms with values for **Volume**, **Dilution**, **Amount** and **Internal standard amount** entered in the batch reprocessing table.

The recalculation is done automatically if the **Reintegrate** *and/or* **Recalculate** *options are enabled. If the* **Recalculate only** *option is enabled, the* **Reintegrate** *and* **Recalculate** *options are disabled automatically.*

Change passport If this option is enabled, those parameters of the passport which have been changed after clicking the **<Edit passport>** button are applied to all chromatograms.

<Edit passport> Open the **Passport** window for modification of the passport parameters.

Only some of the passport parameters can be modified. The passport parame-

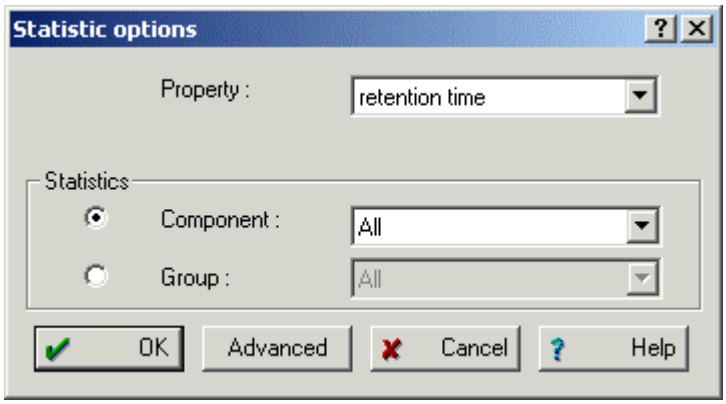
ters **Ident**, **Sample Info 1** *and* **Sample Info 2** *entered in the batch reprocessing table are overwritten if these values are modified in the* **Passport** *window.*

Modify chromatogram appearance	If this option is enabled, the chromatogram **Appearance** parameters which have been changed after clicking the **<Edit appearance>** button are applied to all chromatograms.
<Edit appearance>	Open the **Appearance** window for modification of the settings for chromatogram axes, labels and colors.
Make report	Print report for all chromatograms using the current report settings of the selected chromatogram in the **Use method...** field.
<Edit report options>	Open the **Report options** window for modification of the report settings, see *section 7.6.1*.
Statistics	Output of a statistics report for the chromatogram batch.
<Edit statistics options>	Open the **Statistics options** window for modification of the settings for the statistical evaluation of the data and the output options.
Send to Autodatabase	Send chromatogram data to specified Autodatabase file.
<Edit Autodatabase options>	Open the **Autodatabase options** window for modification of the Autodatabase settings, see *section 8.6.8*.
<Reprocess>	Start reprocessing.
<Merge>	Combine all chromatograms of the batch reprocessing queue into a single multichannel chromatogram.
<Close>	Close the **Reprocess** window.

Statistics Options

REPROCESS / <Edit statistics options>

The **Statistics options** window is used to set the parameters for the statistical evaluation of the loaded batch reprocessing file.



Property

Select the property which is to be evaluated statistically. It can be selected by clicking the pop-up menu.

retention time
halfwidth
height
height%
area
area%
capacity factor
resolution
effectivity, TP
effectivity, TP/m
reduced TP height
gaussian factor
asymmetry
response factor
raw concentration (default value)
concentration
concentration%
rel. concentration
rel. concentration%
peak amount

Statistics

Component

Select the component which is to be evaluated statistically. It can be selected by clicking the pop-up list.
default value: **All**

Group

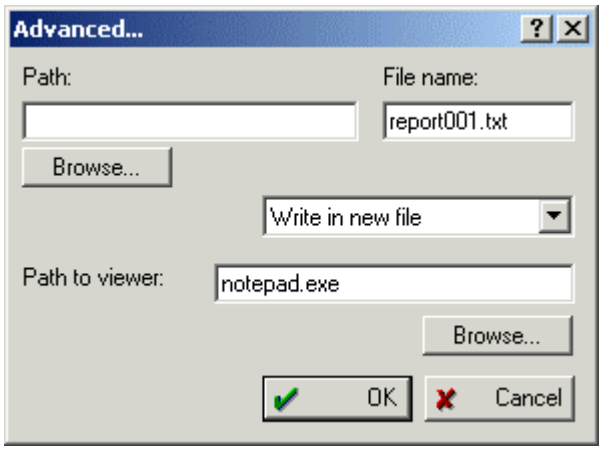
Select the component group which is to be evaluated statistically. It can be selected by clicking the pop-up list.
default value: **All**

<Advanced>	Open the **Advanced** window for export settings of the statistics.

Advanced

REPROCESS / <Edit statistics options> / <Advanced>

The **Advanced** window is used to specify **Path** and **File name** of the output file. If a **Viewer** program for the output file is specified, the file opens with this viewer when the file is created. This feature can be used for further processing of the statistical data.



Path	Type in the directory path for the statistics output file or select it with the **<Browse>** button.
<Browse>	Open the **Select directory** window to select the output directory for the statistics output file in a explorer.
File name	Type in the file name for the statistics output file. default name: **report001.txt** recommended file extensions: ***.xls, *.txt**
	Setting for the saving of the report file. **Overwrite old report** **Write in new file** (default) **Ask before writing**
Path to viewer	Type in the path of the **Viewer** program of the statistics output file or select it with the **<Browse>** button.
<Browse>	Open the **Open** window the MS Windows Explorer™ to select the viewer program for the statistics output file. recommended viewers: MS Excel™, any ASCII editor e.g. MS Notepad™

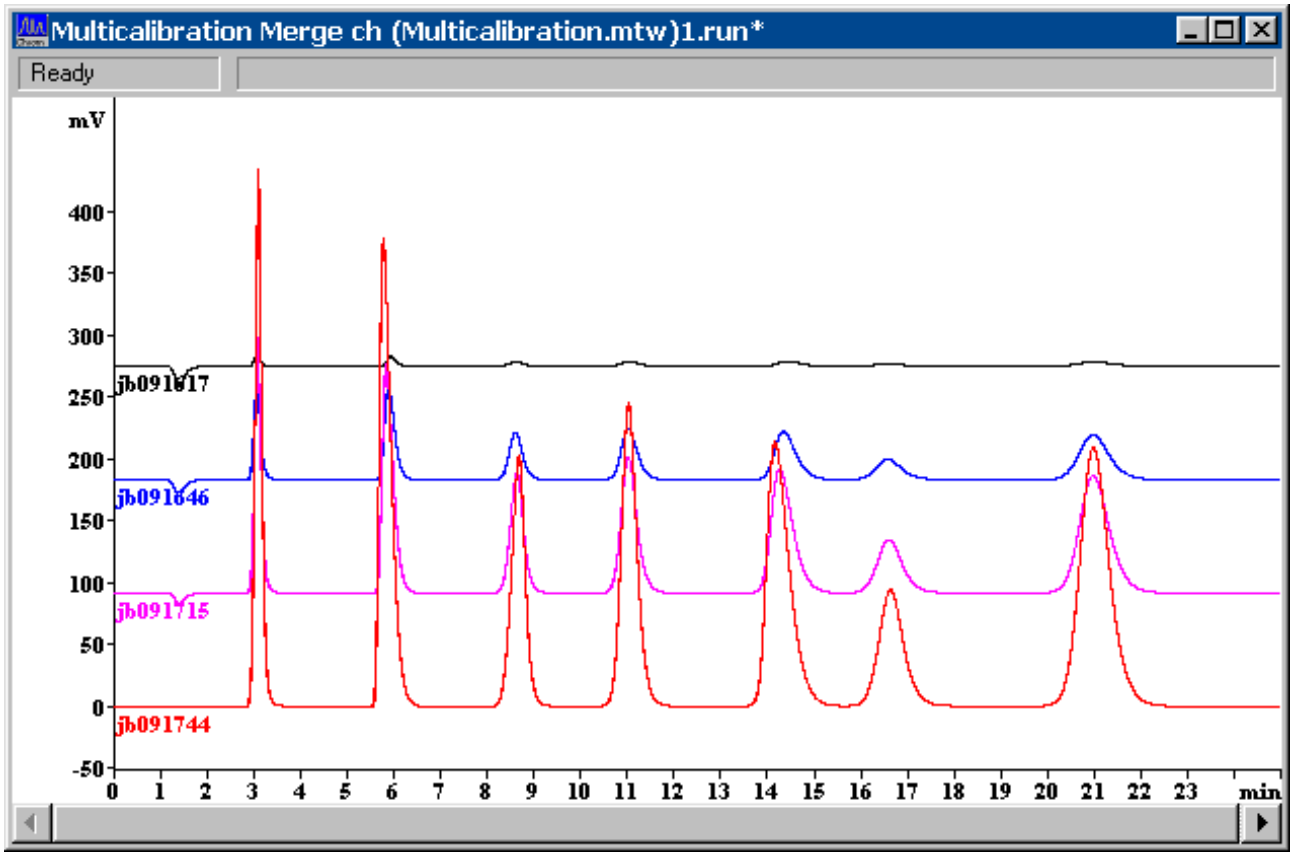
*The statistics output file is a **ASCII** file. It can be edited by any text editor, but the file structure of the output file allows also the processing of this file in MS Excel ™. This provides access to all the powerful spread sheet functionalities of this program and thus an easy opportunity to create meaningful diagrams from your statistical data.*

*The statistics output file is a **ASCII** file, even if it is saved with the *.xls file extension. This is recognized by Excel ™ when saving the file. In this case the **Save as** window of MS Windows ™ opens. The file name 'filename.xls' is highlighted in quotes and the file type *.txt is displayed. To save the file in the Excel ™ file format type in a file name and select the *.xls extension.*

10.2.2 Merge chromatograms

REPROCESS / <Merge>

Combine all chromatograms of the batch reprocessing queue into a single multi-channel chromatogram.



The chromatograms are displayed in the same order as in the batch reprocessing table slightly displaced one upon the other. The distance between the curves can be increased by pressing [Shift] + [↑] and decreased by pressing [Shift] + [↓].

The chromatogram axes, labels and colors can be set in the **Appearance** window.

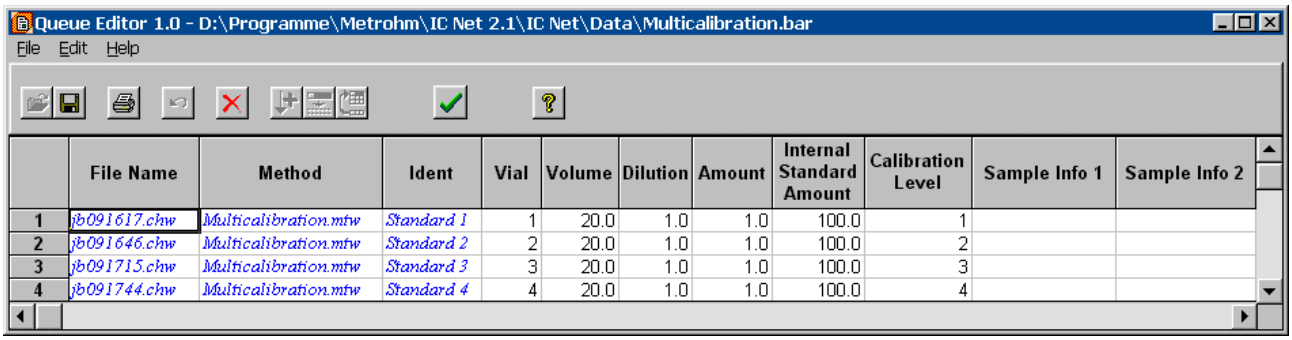
The multi-channel chromatogram can be saved with **File** / **Save** / **Chromatogram**.

10.3 Batch reprocessing queue editor

10.3.1 Open batch reprocessing queue editor window

REPROCESS / **<Edit sample table>**

This menu item opens the batch reprocessing editor program for editing the batch reprocessing table.



	File Name	Method	Ident	Vial	Volume	Dilution	Amount	Internal Standard Amount	Calibration Level	Sample Info 1	Sample Info 2
1	jb091617.chw	Multicalibration.mtw	Standard 1	1	20.0	1.0	1.0	100.0	1		
2	jb091646.chw	Multicalibration.mtw	Standard 2	2	20.0	1.0	1.0	100.0	2		
3	jb091715.chw	Multicalibration.mtw	Standard 3	3	20.0	1.0	1.0	100.0	3		
4	jb091744.chw	Multicalibration.mtw	Standard 4	4	20.0	1.0	1.0	100.0	4		

No Row number.

File name Name of the chromatogram file (read-only).

Method Name of the method file ***.mtw** used for recording the chromatogram (read-only).

Ident User defined identifier for chromatogram. Will be placed into appropriate passport field when starting the chromatogram.

Vial Autosampler vial position to take sample from. Will be placed into appropriate passport field.

Volume Injected volume of sample in µL. Will be placed into appropriate passport field.

Dilution Sample dilution prior to injection. Will be placed into appropriate passport field.

Amount Sample amount. If this value is different for the calibration run (c) and the sample run (s), the component concentrations of the sample are calculated as follows:

$$C_s = C_c \cdot \text{Amount}_s / \text{Amount}_c$$

Will be placed into appropriate passport field.

Internal standard amount

Concentration of the internal standard component for relative concentration calculations. Will be placed into appropriate passport field.

Calibration level	Calibration level (see *section 7.5*) for the sample: Level **0** stays for normal analysis, levels **1** and greater for calibration runs. Correct filling of this column enables to calculate calibration coefficients automatically.
Sample Info 1	First sample description. Will be placed into appropriate passport field.
Sample Info 2	Second sample description. Will be placed into appropriate passport field.

10.3.2 Batch reprocessing queue editor functions

The functions in the editor window for the batch reprocessing queues can be triggered with the corresponding menu items of the **Edit** menu or with the corresponding symbols in the symbol bar.

QUEUE EDITOR / Edit / Undo

Undo the last modification of the batch reprocessing queue.

QUEUE EDITOR / Edit / Delete row(s)

Delete the selected rows from the batch reprocessing queue.

QUEUE EDITOR / Edit / Increment

Fill selected column fields with values automatically incremented by 1. The last character of the first selected field must be a number. This function is available for the fields **Ident**, **Vial**, **Calibration level**, **Sample Info 1** and **Sample Info 2**.

QUEUE EDITOR / Edit / Propagate

Fill selected column fields with the same value as the first field.

QUEUE EDITOR / Edit / Rotate rows

Rotate selected rows by one position (the bottom line is moved to the first position; all other lines are moved down by 1 position).

10.3.3 Print batch reprocessing queue

QUEUE EDITOR / File / Print

Print the batch reprocessing table in landscape format.

10.3.4 Close batch reprocessing queue editor

QUEUE EDITOR / File / Save & Exit

Save the modified batch reprocessing queue and close the **QUEUE EDITOR** window.

QUEUE EDITOR / File / Exit

Close the batch reprocessing **QUEUE EDITOR** window without saving the modified batch reprocessing table.

11 Appendix

11.1 Software license

The use of the Software is subject to this License Agreement between you and Metrohm AG. With the offer, you have received this License Agreement and taken note of it. You have already accepted this License Agreement upon the placement of your order with Metrohm AG or one of its distributors or upon confirmation of the order by Metrohm or one of its distributors. At the very latest, you agree to be bound by the terms of this License Agreement when you start using the Software.

1. Metrohm grants you the non-transferable and non-exclusive right to use this Software in connection with Metrohm analysis devices.
2. The copyright to the Software is retained by Metrohm or a licensor of Metrohm. You are not permitted to alter or remove any notes regarding confidential handling, indications of title or indications of copyright. You are not permitted to sell the Software, lease it to or otherwise pass it on to third parties, except in conjunction with its use with analysis devices of the Metrohm Group and if the third party expressly agrees to the terms of this License Agreement. It is not permitted to change or copy the Software in its entirety or in part. It is only permissible to make one copy for backup purposes.
3. The license fee for the above use is included in the sales price of the analysis device. If the software is supplied separately, the fee is billed along with the Software. If for any reason the sales price or the license fee is not paid in full by the due date, the right to use the Software lapses and Metrohm is entitled to demand the return of the Software or its deletion from your system.
4. Metrohm warrants that the Software is suitable for the indicated use with analysis devices of the Metrohm Group if properly operated and that the Software is properly stored on the data carrier. If this is not the case, you are entitled to demand that Metrohm and/or its distributor provide you with a new flawless Software in exchange for handing in the Software you have complained about. This warranty applies to initial operators of the Software only.

5. Metrohm and its distributor disclaim all other warranties and liability. In particular, Metrohm and its distributor assume no liability for third-party damage or consequential damage, loss of data, lost profits, interruption of business, etc.
6. This Agreement applies until it is terminated. You can terminate this Agreement by destroying the Software and every copy of it. The Agreement is also deemed terminated if you violate any of its terms, in which case you are also obligated to destroy the Software and every copy of it, whereby Metrohm is also entitled to explicitly demand this of you.
7. Any changes and amendments to this Agreement must be rendered in writing to attain validity. This stipulation requiring written form also applies to a change in this provision. If parts of this Agreement prove to be null and void or legally ineffective now or in the future, the remainder of the Agreement continues to apply. The Agreement must then be interpreted and applied so that the intended purpose of the ineffective section is nevertheless achieved to the greatest extent possible.
8. Venue: Any disputes arising from this Agreement shall be decided by the courts at the location of the registered office of Metrohm AG. Metrohm is also entitled to demand that the venue be the location of the defendant's registered office.

11.2 Declaration of conformity – Software validation

The software "Metrodata IC Net 2.2" was developed in accordance with the requirements of the ISO 9001 quality system regarding the design, testing and servicing of Metrodata software. The relevant procedures are described in the document "Project procedure for creating Metrodata software" which is available at your Metrohm agency on request.

The software was validated with respect to functionality, analytical performance and accuracy of results. The technical specifications and software functions are described in the Instructions for Use.

Herisau, February 24, 2003

Dr. J. Frank	Ch. Buchmann
Development Manager	Production and Quality Assurance Manager

11.3 Ordering designations

6.6034.023	**«IC Net 2.2» Software** incl. «IC Net 2.2» and «Autodatabase 1.0» software
8.110.8263	**«IC Net 2.2» Software Manual**
8.110.8213	**«Autodatabase 1.0» Software Manual**
8.110.8207	**Registration card**

11.3 Index

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