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Tutorial

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Table of contents

1	Introduction	1
1.1	Structure of the tutorial	1
1.2	Program description	2
1.3	Visualization conventions	3
2	Configuration	4
2.1	Starting the software	4
2.2	Configuring devices	6
2.3	Configuring column	8
2.4	Defining eluent	12
2.5	Adding solutions	15
2.6	Adding accessories	17
3	Creating method	20
3.1	Method for manual injection	20
3.1.1	Creating new method	20
3.1.2	Defining devices and start parameters	23
3.1.3	Time program	27
3.1.4	Evaluation	31
3.1.5	Saving method	37
3.2	Method with sample processor	38
3.2.1	Creating new method	38
3.2.2	Defining devices and their start parameters	38
3.2.3	Time program	46
3.2.4	Evaluation	58
3.2.5	Saving method	58

1 Introduction

1.1 Structure of the tutorial

The present tutorial guides you through your first steps with the software **Magic Net**. You will be introduced to the most important operating features by recording a chromatogram. The introduction will involve determining the concentration of the anions F^- , Cl^- , NO_2^- , Br^- , NO_3^- , PO_4^{3-} and SO_4^{2-} in tap water. An 940 Professional IC Vario and a Metrosep A Supp 5 - 100/4.0 column with integrated chip are used in the determinations.

The tutorial is arranged in four parts:

- Configuring hardware which is managed by the system and used in the method
- Method for performing a determination
- Performing the determination
- Evaluating the determination, reprocessing and printing out a report

You will be shown how the determination is performed using a simple system with manual injection. We shall also describe a determination using an automated system with sample changer.

- Manual control of a workplace
- Manual control of all devices

1.3 Visualization conventions

The following symbols and formats will be used in this documentation:

1	Instruction step Carry out these steps in the sequence shown.
Method	Dialog text, parameters in the software
File ► New ►	Menu or menu item
[Continue]	Buttons or keys
	Note This sign highlights additional information and tips



2 Configuration

The Metrohm devices connected to the PC via a USB connector are automatically recognized when the program is started, as are the devices (dosinos, stirrers, pumps, remote box) connected to MSB connectors of USB devices. Metrohm devices and external devices connected to the PC via an RS232 connector must be added manually to the device table.

All hardware components used in a method must be saved in the program part **Configuration**. This can include:

- Devices (940 Professional IC Vario, 858 Professional Sample Processor etc.)
- Columns
- Eluents
- Accessories (Pump tubing, pump tubing connections etc.)
- Solutions
- Common variables
- Rack data
- Amperometric cells
- Rotors

2.1 Starting the software



NOTICE

Devices and intelligent columns are recognized automatically.
All elements can be monitored by the system.

- 1 Click on the **MagIC Net** icon on the desktop.

3 Click on the **[Configuration]** icon.

Shows the automatically recognized and manually added devices.

Shows the data of the automatically recognized and manually added columns.

Shows the data of the eluents.

Shows the data of the automatically recognized and manually added accessories.

Shows the data of automatically recognized solutions in a dosing unit and of solutions that have been added manually.

Shows the data of the automatically recognized Metrohm sample racks and the manually imported Metrohm sample racks.

Shows the data of all common variables.

Shows the automatically recognized cells of the amperometric detector.

Shows the manually added rotors with type, serial number, etc.

2.2 Configuring devices

Proceed as follows to start the **940 Professional IC Vario** for the first time:

Connecting 940 Professional IC Vario

1 Connecting instrument

Connect device to the PC using a USB cable.

2 Switching on device

The device parameters of the **940 Professional IC Vario** are automatically recognized.

3 Saving device in the table

Confirm the message with **[Yes]**.

4 Checking properties

Check the data in the **Properties** dialog window and close with **[OK]**.

The **940 Professional IC Vario** is entered in the device list in the **Devices** subwindow.

5 Changing device name (optional)

Proceed as follows to give your device another name:

- In the device table, double click on the line with the entry **940 Professional IC Vario**.
- Select the **General** tab.
- Enter the new name in the **Device name** field.
- Close the dialog window with **[OK]**.

Connecting 858 Professional Sample Processor

1

Connect device to the PC using a USB cable.

2

The device parameters of the **858 Professional Sample Processor** are automatically recognized.

3

Confirm the message with **[Yes]**.

4

- Select the tab **Rack**.
The number of the default rack, 6.2041.440, must be entered in the **Rack name** field.
- Click on the **[Rack Data]** button.
- Select the **Lift positions** tab.
- Use the **Work position** field to enter the value **125**.
- Select the **Special beaker** tab.
- Click on **[Edit]** and open the **Special beaker 1** dialog window.
- Use the **Rack position** field to enter the value **149**.
- Use the **Work position of tower 1** to enter the value **125**.

Close all dialog windows with **[OK]**.

The **858 Professional Sample Processor** is entered in the device list in the **Devices** subwindow.

Säule mit Chip

1 Inserting column in holder

2 Saving column in the table

3 Editing Column tab

4 Editing Properties tab

Column - Metrosep A Supp 5

Column | **Properties** | Precolumn | GLP

Maximum working values

	Maximum value	Highest measured value
Pressure	15.00 MPa	0.00 MPa
Flow	0.8 mL/min	0.0 mL/min

Recommended working values

Standard flow: 0.7 mL/min

Standard injection volume: 20.0 µL

Standard temperature: 25 °C

Standard eluent: 1.0 mM NaHCO₃ / 3.2 mM Na₂CO₃

pH range: 3.0 - 12.0

Technical Data

Inner diameter: 4.0 mm

Length: 100.0 mm

Particle size: 5 µm

OK Cancel

5 Editing Precolumn tab

Activate the **Use precolumn** check box.

Simultaneously to the activation, the system defines that the precolumn is to be monitored together with the column.

6 Monitoring tab



NOTICE

This tab is only available for automatically recognized columns with a chip.

- Use the **Determinations** field to enter the value **500** (example) and activate the **Monitoring** check box.
- Use the **Working hours** field to enter the value **72** (example) and activate the **Monitoring** check box.

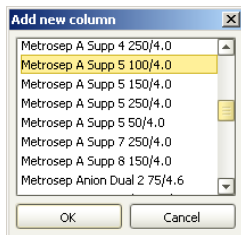
- For the **Determinations** and **Working hours** of the **precolumn** enter the same limit values as for the column, and activate the check box for monitoring it. The precolumn is monitored in the same way as the column.
- In the **Message** area, activate the **Acoustic signal** check box.

Column without chip

If you use a column without a chip, this must first of all be configured. Use the **[Edit]** menu in the **Columns** subwindow for this. In the case of known columns, several parameters are automatically entered, while with unknown columns these parameters have to be taken from the column information sheet and entered.

1 Add column

Use the **Edit ► New...** menu to open the **Add new column** dialog window.



2 Selecting column

Highlight the column **Metrosep A Supp 5 - 100/4.0** in the list and click on **[OK]**.

The **Column - Metrosep A Supp 5 - 100/4.0** dialog window is opened.

3 Editing column

- Select the **Column** tab
 - Use the **Column name** field to enter the name **Met-rosep A Supp 5 - 100/4.0**.
 - In the **Set to work** field click on the button  and select the date of first use.
- The **Column type** and **Order number** fields are automatically filled in for known columns.
- The entries in the **Serial number**, **Batch number** and **Comment** fields are optional.

4 Editing Properties tab

If the columns are known, the values for pressure flow etc. are automatically entered. If the columns are unknown, the values have to be taken from the column information sheet and entered.

5 Editing Precolumn tab

The fields are filled in automatically if the columns are known. If the columns are unknown, the values have to be taken from the column information sheet and entered.

Proceed as follows to enter the date of first use:

- Select the **Precolumn** tab.
- Activate the **Use precolumn** check box.
- Click on the button  of the **Set to work** field.
- Select the date and confirm with **[OK]**.

6 Editing GLP tab (optional)

This tab only has to be edited if monitoring in accordance with GLP rules is necessary.

- Select the **GLP** tab.
- In the **GLP test date** field, click on the button  and select the date of the last GLP test.



- Activate the **Monitoring of GLP validity** check box.
- Use the **GLP test interval** field to enter the value **100**.
The date of the next GLP test is automatically entered in the **Next GLP test** field.
- In the **Message** area, activate the **Acoustic signal** check box.
- In the **Action** area, activate the **Display message** option.
- Close the dialog window by clicking on **[OK]**.

2.4 Defining eluent

Eluents are defined in the **Eluent** subwindow.

- 1 Use the **Edit ► New...** menu to open the **Eluent** dialog window.

2 Eluent properties

- Select the **Eluent** tab.
- Make the following entries:

Field	Input
Eluent name	Std-ASUPP5
Order number	optional
Manufacturer	optional
Batch number	optional
Composition	3.2 mmol/L sodium carbonate, 1.0 mmol/L sodium hydrogen carbonate
Comment	optional

The screenshot shows a software window titled "Eluent - Std-ASUPP5". It has a tabbed interface with "Eluent" selected. Inside the "Eluent" tab, there are several input fields: "Eluentname" (containing "Std-ASUPP5"), "Bestellnummer", "Hersteller" (containing "Metrohm"), "Batch-Nummer", "Zusammensetzung" (containing "3.2 mmol/L Sodium Carbonate" and "1.0 mmol/L Sodium Hydrogen-carbonate"), and "Kommentar". At the top of the dialog are buttons for "Überwachung" and "GLP". At the bottom are "OK" and "Abbrechen" buttons.

3 Editing Monitoring tab

- Select the **Monitoring** tab.
- The date of the first use is automatically entered when entering the eluent.
- Activate the **Eluent monitoring** check box.
- Use the **Working life** field to enter the value **30** (the working life depends on the eluent).
If you click on the button  the date will automatically be entered in the **Expiry date** field.
- In the **Message** area, activate the **Acoustic signal** check box.



- In the **Action** area, activate the **Display message** option.

Eluent - Std-ASUPP5

Eluent **Monitoring** GLP

Set to work: 2007-01-24

☒ **Eluent monitoring**

Working life: 30 days

Expiry date: 2007-02-23

Message

☐ Message by e-mail

☒ Acoustic signal

Action

☐ Record message

☒ Display message

☐ Stop determination

OK Cancel

- Close the dialog window by clicking on **[OK]**.

4 Editing GLP tab (optional)

- Select the **GLP** tab.
- In the **GLP test date** field, click on the button  and select the date of the last GLP test.
- Activate the **Monitoring of GLP validity** check box.
- Use the **GLP test interval** field to enter the value **100**.

The date will automatically be entered in the **Next GLP test** field.

- In the **Message** area, activate the **Acoustic signal** check box.

- In the **Action** area, activate the **Display message** option.

The screenshot shows the 'Eluent - Std-ASUPP5' dialog box with the 'Monitoring' tab selected. The 'GLP' section contains the following fields and options:

- GLP test date:** 2007-03-15 (with a calendar icon)
- Comment on GLP test:** A text area.
- Monitoring of GLP validity:** A checked checkbox.
- GLP test interval:** 100 days
- Next GLP test:** 2007-06-23 (with a calendar icon)
- Message:**
 - ☐ Message by e-mail (with an 'E-mail...' button)
 - ☒ Acoustic signal
- Action:**
 - ☐ Record message
 - ☒ Display message
 - ☐ Stop determination

At the bottom are 'OK' and 'Cancel' buttons.

- Click on **[OK]** and close the **Eluent Std ASUPP5** dialog window.

2.5 Adding solutions

Solutions for the suppressor are defined in the **Solutions** sub-window.

- 1 Use the **Edit ► New** menu to open the **Solution** dialog window.
- 2 Edit the **Solution** tab
 - Use the **Solution name** field to enter the name **MSM regeneration solution H₂OSO₄**.
 - Use the **Concentration** field to enter the concentration value **100** and select the concentration unit **mmol/L** in the list field.

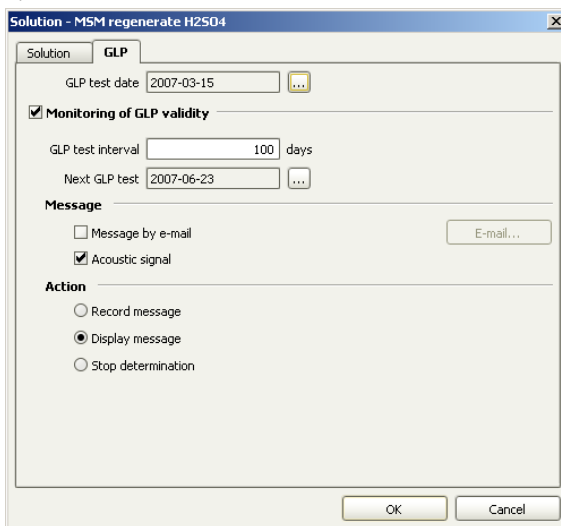


- In the **Production date** field, click on the  in the toolbar.
- Select the date and conform with **[OK]**.
- Activate the **Solution monitoring** check box.
- Use the **Working life** field to enter the value **100**.
If you click on the button  the date will automatically be entered in the **Expiry date** field.
- In the **Message** area, activate the **Acoustic signal** check box.
- In the **Action** area, activate the **Display message** option.
- Close the dialog window by clicking on **[OK]**.

3 Editing GLP tab (optional)

- Select the **GLP** tab.
 - In the **GLP test date** field, click on the button  and select the date of the last GLP test.
 - Activate the **Monitoring of GLP validity** check box.
 - Use the **GLP test interval** field to enter the value **100**.
- If you click on the button  the date will automatically be entered in the **Expiry date** field.
- In the **Message** area, activate the **Acoustic signal** check box.

- In the **Action** area, activate the **Display message** option.



- Click on **[OK]** and close the **Solution** dialog window.

2.6 Adding accessories

Accessories must always be added and configured manually. The individual steps are executed in the **Accessories** subwindow.

A pump tubing and one pump tubing connection with security device and filter are added. The pump tubing connection with inline filter is used to protect the suppressor from potential contamination from the rinsing solution.

Adding new accessories

- 1 Use the **Process ► New** menu to open the **Accessory** dialog window.



- In the **Accessory** tab, use the **Accessory name** field to enter the name **Pump Tubing**.
- Enter the number **6.1826.420** in the **Order number** field.

Accessory Monitoring GLP

Accessory name Pump Tubing H2O

Order number 6.1826.320

Manufacturer

Comment

OK Cancel

- 4 Select the **Monitoring** tab.
- 5 Activate the **Accessory monitoring** check box.
- 6 In the **Working life** field enter the value **30**.
- 7 In the **Expiry date** click on the  button.
The expiry date is entered automatically.

- 8
- 9

Accessory - Pump Tubing H2O

Accessory **Monitoring** GLP

Set to work: 2007-05-03 ...

☒ **Accessory monitoring**

Working life: 30 days

Expiry date: 2007-06-02 ...

Message

☐ Message by e-mail E-mail...

☒ **Acoustic signal**

Action

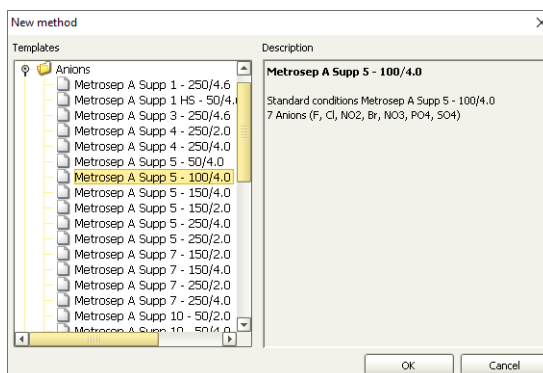
☐ Record message

☒ Display message

☐ Stop determination

OK Cancel

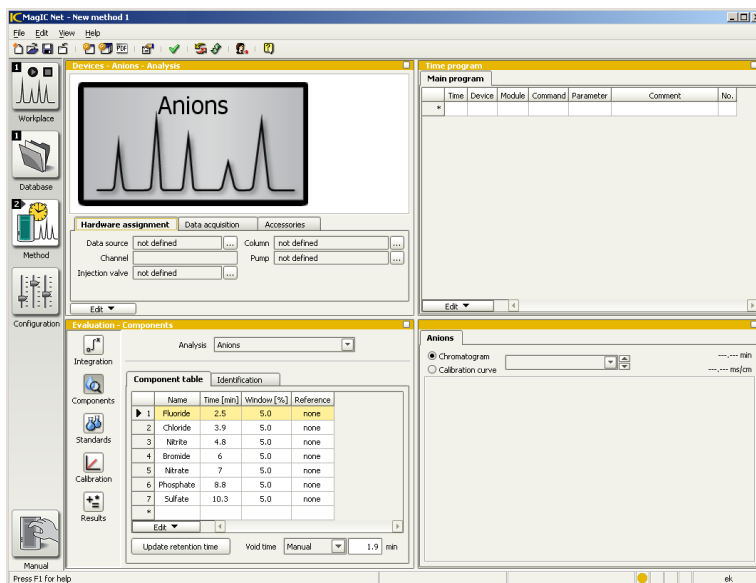
The **Pump tubing connection with s**
ter has the order number **6.2744.180**.



- 3 Under **Templates**, in the left part of the window, highlight **Anions ► Metrosep A Supp 5 - 100/4.00** and confirm with **[OK]**.

The method template is opened.

The **Devices** subwindow shows the symbol of the analysis method **Anions**. The **Evaluation - Components** subwindow shows the component table with the ions of the method template and their retention times.



The program part **Method** has a total of four subwindows:

Devices

Visualization of the devices assigned to the method and the analysis.

Time Program

Visualization of the time program.

Evaluation

The subwindow consists of the areas **Integration**, **Components**, **Standards**, **Calibration** and **Results**.

Chromatograms

Shows the chromatograms of the last determination recorded with this method, the chromatograms of the standard which are used for calibrating the samples, and those of the calibration curves.

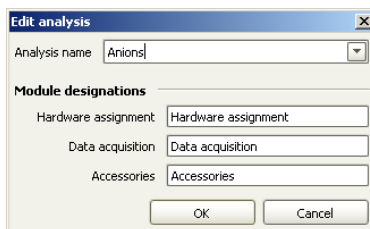
Assembling devices

- 1 In the **Devices** subwindow, click on the menu **Edit ► Add ► Device**.
- 2 In the **Add device** dialog window, select the **From device table** option.
- 3 Select the **940 Professional IC Vario 1** device in the **Name** field and click on **[OK]**.

The image of the **940 Professional IC Vario** appears in the upper part of the **Devices** subwindow.

Changing the analysis name (optional)

- 1 Click on the icon of the **Anions** analysis in the upper part of the **Devices** subwindow.
- 2 Open the **Edit analysis** dialog window using the **Edit ► Edit** menu.



- 3** In the **Analysis name** field, enter the new name **Tap water** and confirm with **[OK]**.

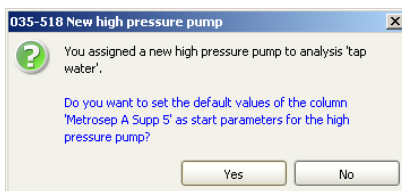
Defining the parameters for the analysis

- 1** Click on the **Tap water** icon.

2 Editing the Hardware assignment tab

- Select the **Hardware assignment** tab.
- In the **Data source** field, click on the  button.
- In the **Tap water-assign data source** dialog window under **940 Professional IC Vario 1 > Conductivity detector 1**, highlight the entry **Conductivity** and click on **[OK]**.
- In the **Channel** field, **Conductivity** is entered automatically.
- Click on the  button in the **Injection valve** field.
- In the **Tap water-assign injection valve** dialog window under **940 Professional IC Vario 1**, highlight the entry **Injector** and click on **[OK]**.
- Click on the  button in the **Column** field.
- In the **Tap water-assign column** dialog window under **Column table**, highlight the entry of the assigned column **Metrosep A Supp 5 - 100/4.0** and click on **[OK]**.
- Click on the  button in the **Pump** field.
- In the **Tap water-assign pump** dialog window under **940 Professional IC Vario 1**, highlight the entry **Pump** and click on **[OK]**.

- Confirm the message **New high-pressure pump** with **[Yes]**.



3 Editing the Data acquisition tab

- Select the **Data acquisition** tab.
- In the **Recording time** field, enter a time of **15 min**.

4 Editing the Accessories tab

- Select the **Accessories** tab.
- Click on the **[Add]** button.
- In the selection list of the **Add accessory** dialog window, select the H_2SO_4 pump tubing.
- Click on **[OK]**.

The pump tubing is entered in the accessories table. The pump tubing connection is added to the table in the same way.

Defining the parameters for the IC device

- Click on the image of the **940 Professional IC Vario 1**.

The tabs of the **940 Professional IC Vario 1** modules appear and can be edited.



NOTICE

The **Active** check box needs to be activated so that a module can be used in a method (default setting).

2 Editing the Pump tab

- Select the **Pump** tab (or click on the symbol of the pump).
- The values of the fields **Flow**, **P_{min}** and **P_{max}** are read automatically.
- Use the **Eluent** selection list to select the previously defined eluent **Std-ASUPP5**.

3 Editing the Injector tab

- Select the **Injector** tab (or click on the symbol of the injector).
- Accept the default settings.

4 Editing the Peristaltic tab

- Select the **Peristaltic** tab (or click on the symbol of the Peristaltic MSM).
- Activate the **On** option.
- In the **Rate** field, accept the value **3**.
(There are 7 speed levels, with 6 revolutions/min per level.)
- In the selection list **Solution 1**, select the solution **H₂O**.
- In the selection list **Solution 2**, select the solution **MSM regeneration solution H₂SO₄**.

5 Editing the MSM tab

- Select the **MSM** tab (or click on the symbol of the MSM).

- ## 6 Editing the MCS tab

- ## 7 Editing the Degasser tab

- ## 8 Editing the Column thermostat tab

- ## 9 Editing the Detector 1 tab

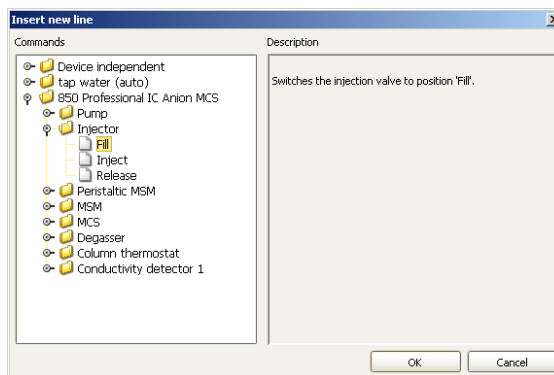
- ### 3.1.3 Time program

The time program is a component of each method. It provides a step by step description of the sequence for processing a sample. The time program is compiled in the **Time program** sub-window of the program part **Method**.

Defining time program

1 Switching injection valve to fill

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **940 Professional IC Vario ► Injector ► Fill** in the left of the window under commands.



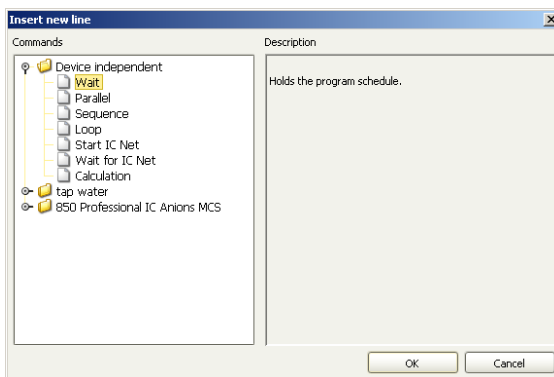
- Confirm with **[OK]**.
The dialog window **940 Professional IC Vario - Injector - Fill** is opened.
- Accept the time data **0** min.
- Confirm with **[OK]**.

2 Interrupting program

The program is stopped in order to fill the injection valve manually.

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.

- Select **Device-independent ► Wait** In the left of the window under commands.



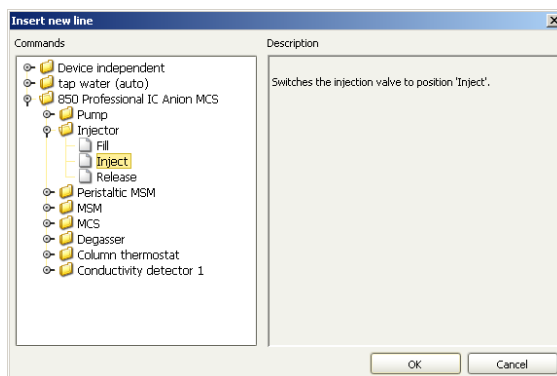
- Confirm with **[OK]**.
The dialog window **Wait** opens.
- Highlight the option **Stop program and waiting for [Continue]**.
- Click on the button  and enter a text for the message.
- Confirm twice with **[OK]**.

3 Switching injection valve to inject

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.



- Select **940 Professional IC Vario ▶ Injector ▶ Inject** in the left of the window under commands.



- Confirm with **[OK]**.
The dialog window **940 Professional IC Vario - Injector - Inject** is opened.
- Accept the time data **0** min.
- Confirm with **[OK]**.

4 Starting data acquisition

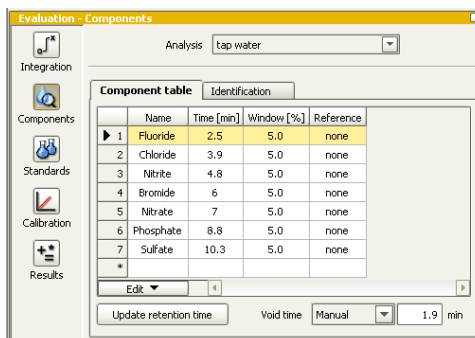
- Use the **Edit ► New** menu to open the **Insert new line** dialog window.

-
- Insert new line
- | Commands | Description |
|-------------------------------|-------------|
| Device independent | |
| tap water | |
| Start data acquisition | |
| 850 Professional IC Anion MCS | |
- OK Cancel

- The complete time program for manual filling of the injection valve appears as follows:

3.1.4 Evaluation

Tutorial



- 2 The entries in the tabs **Component table** and **Identification** are accepted.

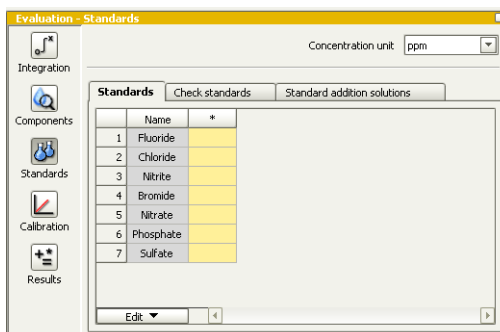
Standards

In the Standards area, the concentrations of the components are indicated in the standard solutions.



- 1 Click on the **Standards** button.

The Standard Table lists all the components defined in the method template.





- In the **Concentration unit** field, select the **ppm** option.
- In the **Standards** tab, use the **Edit ► New** menu to open the **New Standard** dialog window.

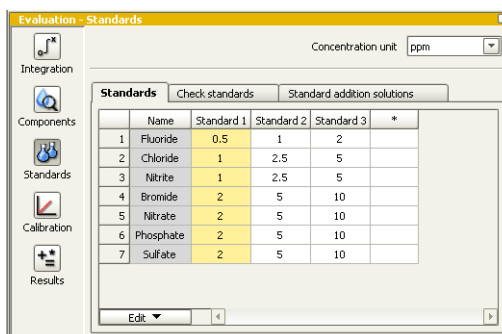
New Standard

Standard

Fluoride	0	ppm
Chloride	0	ppm
Nitrite	0	ppm
Bromide	0	ppm
Nitrate	0	ppm
Phosphate	0	ppm
Sulfate	0	ppm

- 4 In the **Fluoride** field, enter the concentration value **0.5**. In each of the fields **Chloride** and **Nitrite** enter **1** as a value, and in each of the fields **Bromide**, **Nitrate**, **Phosphate** and **Sulfate** enter the value **2**.
- 5 Click on **[OK]**.
- 6 Repeat steps **3** to **5** for standard 2 and standard 3. The number of the next standard is automatically entered in the **Standard** field. The concentrations of the components in standard 2 and standard 3 are indicated in the following table:

Table with the standard concentrations



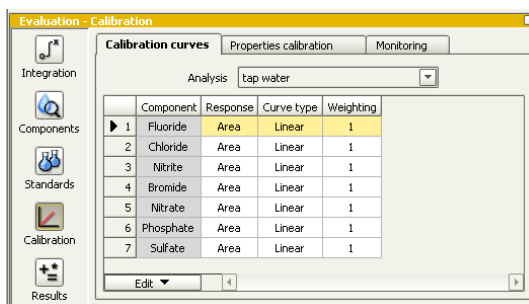
Calibration

The calibration is performed after the method of the external standards. The peak areas in the chromatogram of an unknown sample are compared with the peak values of the components of a standard solution with known concentrations. The calibration method is specified in the method template.



1 Click on the **Calibration** button.

2 Select the **Calibration curves** tab.



The component names, measured quantity, curve type and evaluation are specified in the method template. The table



can be edited line by line. Either via the **Edit ► Edit** menu or by double clicking on a line, which opens the **Calibration curve** dialog window of the corresponding component.

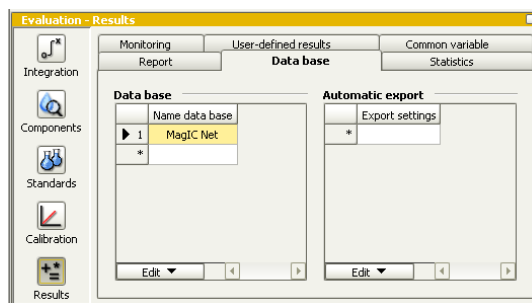
Results

The results of the determinations are saved in the standard database **MagIC** (further databases can be defined). You can also indicate that a report is to be generated once the evaluation is complete.



1 Saving results in database

- Click on the **Results** button.

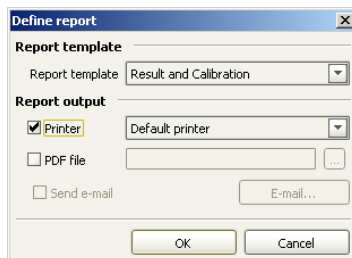


- Select the **Database** tab.
- In the **Database** area, select the database in which the determination data are to be saved. The **MagIC Net** database is indicated by default.

2 Printing out results

- Select the **Report** tab.
- Use the **Edit ► New** menu to open the **Define report** dialog window.
- In the **Report template** list box, highlight the **Result and Calibration** template.

- In the **Report output** area, activate the **Printer** list box.
- Select a printer in the **Printer** list box.



- Confirm with **[OK]**.

You also have the option of creating your own report template (see chapter 8, page 90).

3.1.5 Saving method

Saving method

After having entered all the relevant parameters for the method, save the method as follows:

- 1 Use the **File ► Save as...** menu to open the **Save method** dialog window.
- 2 In the **Method name** field, enter **Tap water** as the name for the method.
- 3 Click on **[Save]**.



3.2 Method with sample processor

The way a method for a determination with a sample processor is compiled only differs from the method for a manual injection in respect to the following points:

- Defining devices and their start parameters
- Time program

3.2.1 Creating new method

(see chapter 3.1.1, page 20)

3.2.2 Defining devices and their start parameters

Putting together devices

- 1 In the **Devices** subwindow, click in the menu **Edit ► Add ► Device**.
- 2 In the **Add device** dialog window, select the **From device table** option.
- 3 In the **Name** field, select the device **940 Professional IC Vario** and click on **[OK]**.

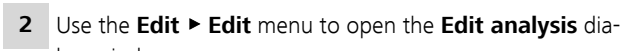
The top of the **Devices** subwindow will display the figure of the **940 Professional IC Vario**.

- In the **Devices** subwindow, click in the menu **Edit ► Add ► Device**.
- In the **Add device** dialog window, select the **From device table** option.

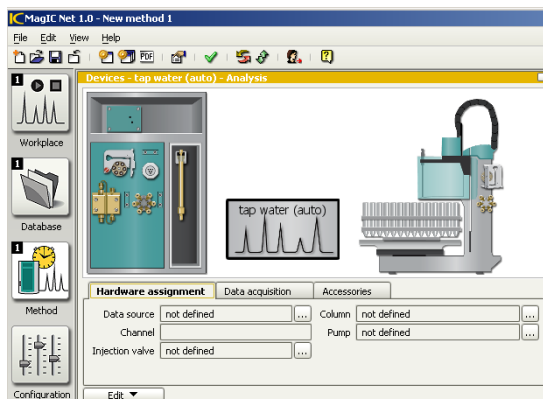
- The top of the **Devices** subwindow will display the symbol of the **858 Professional Sample Processor**.

Changing analysis name (optional)

- 1 In the top of the **Devices** subwindow, click on the symbol



- 3 In the **Analysis name** field, enter the new name **Tap**



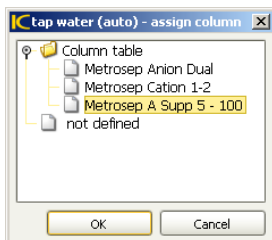
Defining parameters for analysis

1 Click on the symbol **Tap water (auto)**.

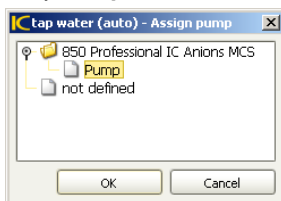
2 Editing Hardware assignment tab

- Select the **Hardware assignment** tab.
- In the **Data source** field, click on the button.
- In the **Tap water (auto)-assign data source** dialog window, under **940 Professional IC Vario** ► **Conductivity detector 1** highlight the entry **Conductivity** and click on **[OK]**.
- In the **Channel** field, **Conductivity** is entered automatically.
- In the **Injection Valve** field click on the button.
- In the **Tap water (auto)-assign injection valve** dialog window, under **940 Professional IC Vario** highlight the entry **Injector** and click on **[OK]**.
- In the **Column** field click on the button.

- In the **Tap water (auto)-assign column** dialog window, under **Column table** highlight the entry **Metrosep A Supp 5 -100/4.0** and click on **[OK]**.

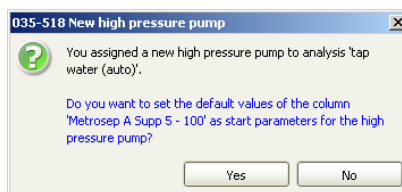


- In the **Pump** field click on the  button.
- In the **Tap water (auto)-assign pump** dialog window, under **850 Professional IC Anions MCS** highlight the entry **Pump** and click on **[OK]**.

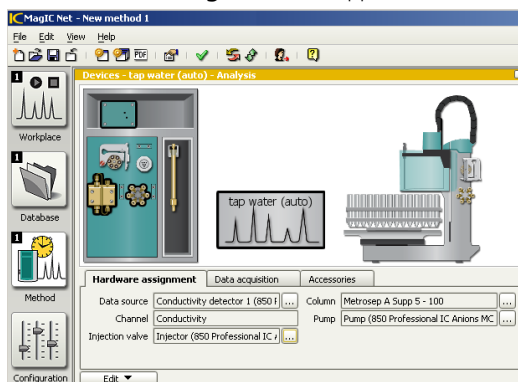




- Confirm the message **New high pressure pump** with [Yes].



The **Hardware assignment** tab appears as follows:



3 Editing Data acquisition tab

- Select the **Data acquisition** tab.
- In the **Recording time** field, enter a time of **15 min**.

4 Editing Accessories tab

- Select the **Accessories** tab.
- Click on the **[Add]** button.
- In the list box of the **Add accessory** dialog window, select the pump tubing H₂O.
- Click on **[OK]**.

The pump tubing is entered in the accessories table. The pump tubing H₂SO₄ and the pump tubing connection with

Defining parameters for IC device

The tabs of the **940 Professional IC Vario** modules appear and can be edited.

- Select the **Pump** tab (or click on the symbol of the pump).
- The values of the fields **Flow**, **P_{min}** and **P_{max}** are read in automatically.
- Use the **Eluent** list box to select the **Std-ASUPP5** previously defined.
- Activate the **Active** check box.

- Select the **Injector** tab (or click on the symbol of the injector).
- Accept the default settings.

- Select the **Peristaltic MSM** tab (or click on the symbol of the peristaltic MSM).
- Activate the **On** option.
- Accept the value 3 in the **Rate** list box.
(There are 7 speed levels, with 6 revolutions/min per level.)
- Use the **Solution 1** list box to select the solution **MSM regeneration solution H₂SO₄**.



5 Editing MSM tab

- Select the **MSM** tab (or click on the symbol of the MSM).
- Accept the default settings.

6 Editing MCS tab

- Select the **MCS** tab (or click on the symbol of the MCS).
- Accept the default settings.

7 Editing Degasser tab

- Select the **Degasser** tab (or click on the symbol of the degasser).
- Accept the default settings.

8 Editing Column thermostat tab

- Select the **Column thermostat** tab (or click on the symbol of the column thermostat).
- Accept the default settings.

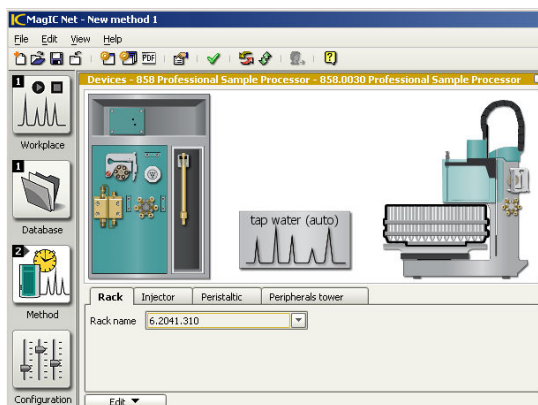
9 Editing Conductivity detector 1 tab

- Select the **Conductivity detector 1** tab (or click on the symbol of the conductivity detector).
- Accept the default settings.

Defining parameters for sample processor

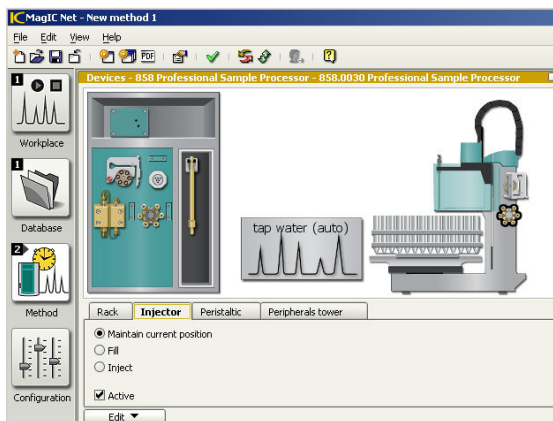
1 Edit Rack tab

- Select the **Rack** tab.
- Use the **Rack name** list box to select the number of the rack.



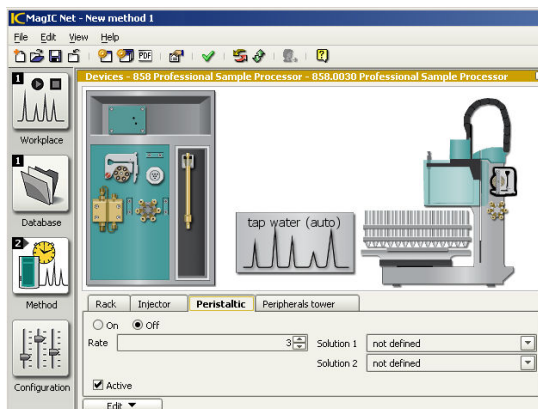
2 Editing Injector tab

- Select the **Injector** tab.
- Accept the default settings.



3 Editing Peristaltic tab

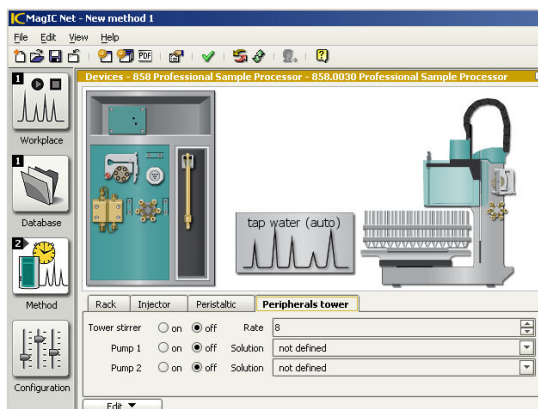
- Select the **Peristaltic** tab.
- Activate the **Off** option.



4 Editing Peripherals tower tab

- Select the **Peripherals tower** tab.

The settings are accepted, as no further devices are used.



3.2.3 Time program

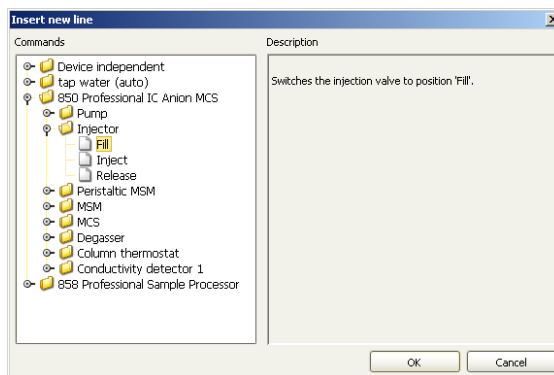
The time program is a component of each method. It provides a step by step description of the sequence for processing a sample. The time program is compiled in the **Time program** sub-window of the program part **Method**. The time program for an

automated sequence of determinations contains additional commands for the sample processor, in contrast to a manual method.

Defining time program

1 Switching injection valve to fill

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **940 Professional IC Vario ► Injector ► Fill** in the left of the window under commands.



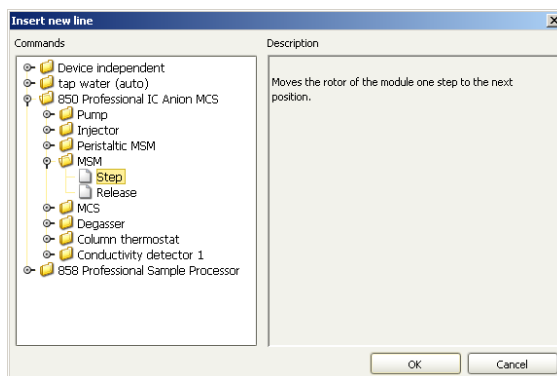
- Confirm with **[OK]**.
The dialog window **940 Professional IC Vario - Injector - Fill** is opened.
- Accept the time data **0** min.
- Confirm with **[OK]**.

2 Switching MSM to next position

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.



- Select **940 Professional IC Vario ► MSM ► Step In** in the left of the window under commands.

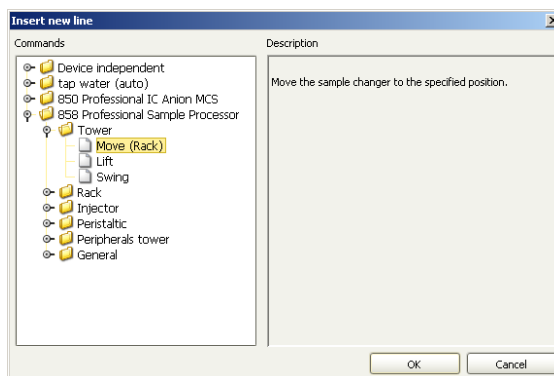


- Confirm with **[OK]**.
The dialog window **940 Professional IC Vario - MSM - Step** is opened.
- In the **Time** field, accept the time data **0 min**.
- Confirm with **[OK]**.

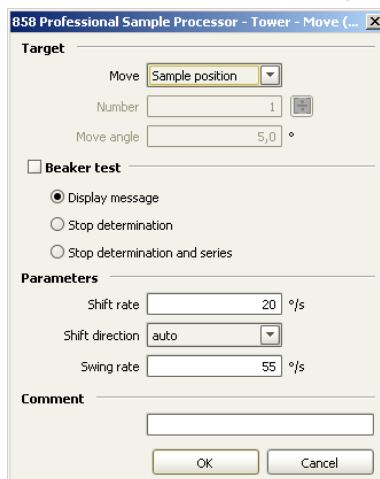
3 Moving to sample position

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.

- Select **858 Professional Sample Processor ► Tower ► Move (Rack)** in the left of the menu under commands.



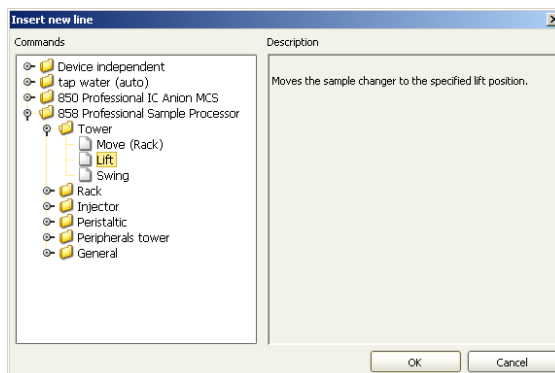
- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Tower - Move (Rack)** opens.



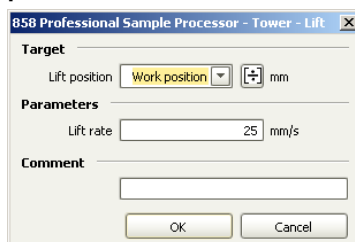
- Accept the field values.
- Confirm with **[OK]**.

4 Dipping aspiration needle in sample

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **858 Professional Sample Processor ► Tower ► Lift** in the left of the menu under commands.



- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Tower - Lift** opens.
- Use the **Lift position** list box to select the entry **Work position**.

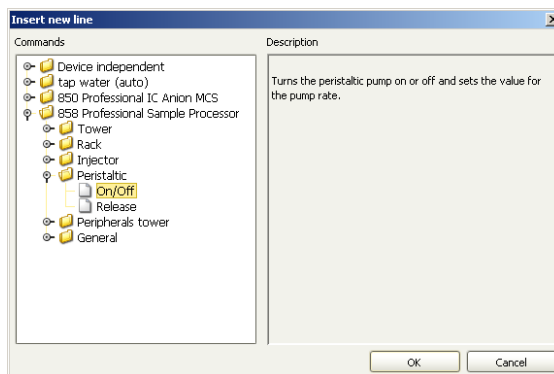


- Confirm with **[OK]**.

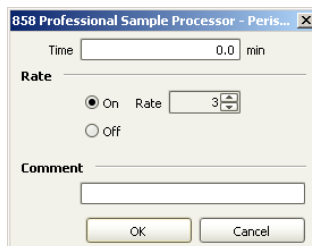
5 Filling injection valve with sample

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.

- Select **858 Professional Sample Processor ► Peristaltic ► On/Off** in the left of the menu under commands.



- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Peristaltic - On/Off** opens.
- In the **Time** field, accept the time data **0** min.
- Also accept the other field values.



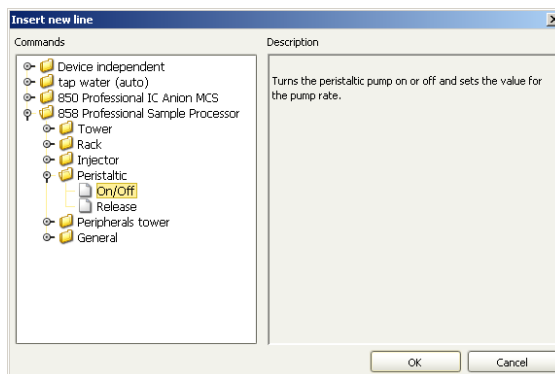
- Confirm with **[OK]**.

6 Switching off peristaltic pump of the sample processor

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.



- Select **858 Professional Sample Processor** ► **Peristaltic** ► **On/Off** in the left of the menu under commands.

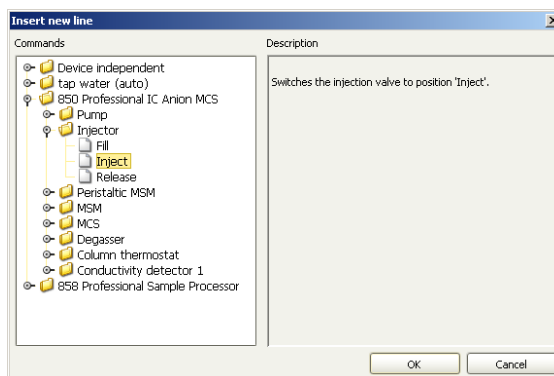


- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Peristaltic - On/Off** opens.
- Use the **Time** field to enter the time data **2.5**.
- In the **Rate** area, select the option **Off**.
- Confirm with **[OK]**.

7 Switching injection valve to inject

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.

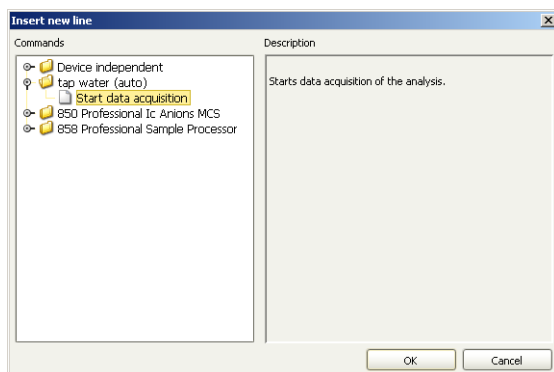
- Select **940 Professional IC Vario ► Injector ► Inject** in the left of the menu under commands.



- Confirm with **[OK]**.
The dialog window **940 Professional IC Vario - Injector - Inject** is opened.
- Use the **Time** field to enter the value **2.5**.
- Confirm with **[OK]**.

8 Starting data acquisition

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **Tap Water (auto) ► Start Data acquisition** in the left of the menu under commands.





- Confirm with **[OK]**.
The dialog window **940 Professional IC Vario - Tap Water (auto) - Start Data Recording** opens.
- Use the **Time** field to enter the value **2.5**.
- Confirm with **[OK]**.

9 Moving to special beaker position

The so-called special beakers have a large volume (e.g. 250 mL) and mostly contain the rinsing solution. These beakers are preferably set at high rack positions so that sample series can start from rack position 1. Lift positions must be separately assigned for special beakers. Lift positions must be separately assigned for special beakers.

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **858 Professional Sample Processor ► Tower ► Move (Rack)** in the left of the menu under commands.
- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Tower - Move (Rack)** opens.

- Use the **Move** list box to select the entry **Special beaker** and the **Number** field to enter the value **1**.

858 Professional Sample Processor - Tower - Move

Target

Move: **Special beaker**

Number: **1**

Move angle: **5,0 °**

☐ **Beaker test**

☒ Display message

☐ Stop determination

☐ Stop determination and series

Parameters

Shift rate: **20 °/s**

Shift direction: **auto**

Swing rate: **55 °/s**

Comment

OK Cancel

- Confirm with **[OK]**.

10 Dipping aspiration needle in special beaker

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **858 Professional Sample Processor ► Tower ► Lift** in the left of the menu under commands.

Insert new line

Commands

- Device independent
 - tap water (auto)
 - 858 Professional IC Anion MCS
 - 858 Professional Sample Processor
 - Tower**
 - Move (Rack)
 - Lift**
 - Swing
 - Rack
 - Injector
 - Peristaltic
 - Peripherals tower
 - General

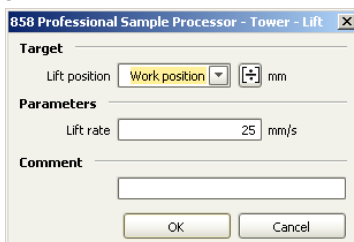
Description

Moves the sample changer to the specified lift position.

OK Cancel



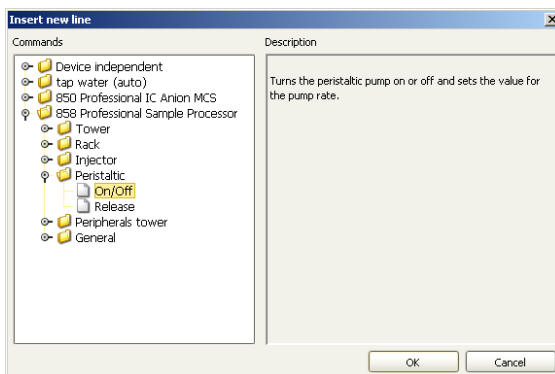
- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Tower - Lift** opens.
- Use the **Lift position** list box to select the entry **Work position**.



- Confirm with **[OK]**.

11 Switching on rinsing

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **858 Professional Sample Processor ► Peristaltic ► On/Off** in the left of the menu under commands.

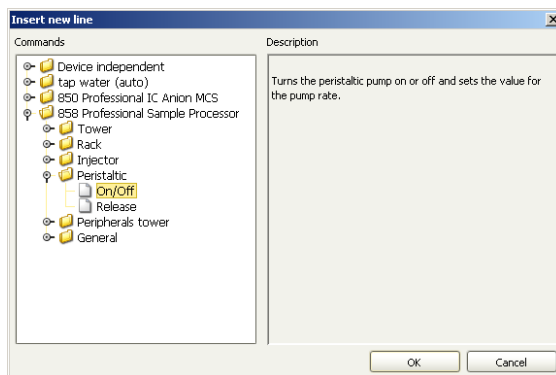


- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Peristaltic - On/Off** opens.
- Use the **Time** field to accept the time data **0 min**.

- Also accept the other field values.
- Confirm with **[OK]**.

12 Switching off rinsing

- Use the **Edit ► New** menu to open the **Insert new line** dialog window.
- Select **858 Professional Sample Processor ► Peristaltic ► On/Off** in the left of the menu under commands.



- Confirm with **[OK]**.
The dialog window **858 Professional Sample Processor - Peristaltic - On/Off** opens.
- Use the **Time** field to enter the value **1.5**.
- In the **Rate** area, select the option **Off**.
- Confirm with **[OK]**.

The complete time program appears as follows:



Time program							
Main program							
Time	Device	Module	Command	Parameter	Comment	No.	
0.0	850 Professional IC Anion MCS	Injector	Fill			1	
0.0	850 Professional IC Anion MCS	MSM	Step			2	
	858 Professional Sample Processor	Tower	Move (Rack)	Sample position		3	
	858 Professional Sample Processor	Tower	Lift	Work position		4	
0.0	858 Professional Sample Processor	Peristaltic	On/Off	On, Rate=3		5	
2.5	858 Professional Sample Processor	Peristaltic	On/Off	Off		6	
2.5	850 Professional IC Anion MCS	Injector	Inject			7	
2.5	tap water (auto)		Start data acquisition			8	
	858 Professional Sample Processor	Tower	Move (Rack)	Special beaker 1		9	
	858 Professional Sample Processor	Tower	Lift	Work position		10	
0.0	858 Professional Sample Processor	Peristaltic	On/Off	On, Rate=3		11	
▶ 1.5	858 Professional Sample Processor	Peristaltic	On/Off	Off		12	
*							
Edit ▾ ◀ ▶							

3.2.4 Evaluation

(see chapter 3.1.4, page 31)

3.2.5 Saving method

Saving method

After having entered all the relevant parameters for the method, save the method as follows:

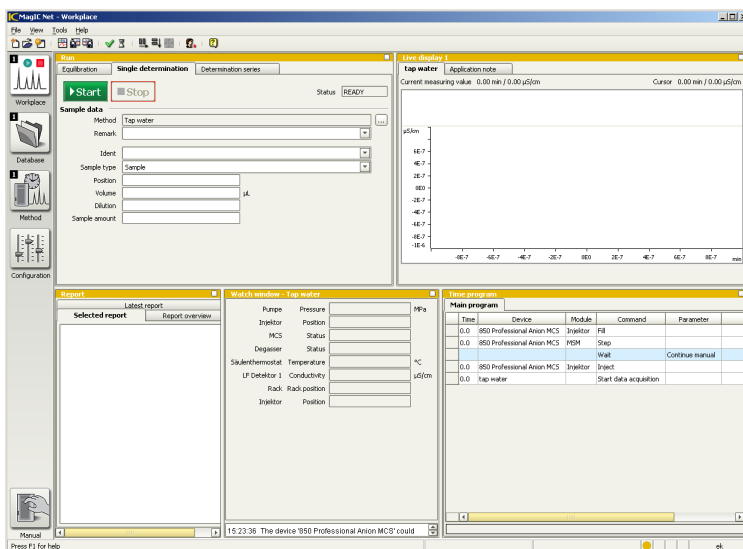
- 1 Use the **File ▶ Save as...** menu to open the **Save method** dialog window.
- 2 In the **Method name** enter **Tap water (auto)** as a name for the method.
- 3 Click on **[Save]**.

4 Performing the determination

In this section you will learn how to:

- Check retention times of the analytes
- Enter sample data
- Measure standards and samples.

These steps are performed in the program part **Workplace**. The following subwindows are available:



Run

Control of processes and management of the sample data

Live display 1

Visualization of the chromatogram during the analysis

Report

Displays the reports of analyses

Watch window

Information on the methods and associated devices

Time Program

Visualization of the method execution

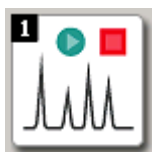
Live display 2

Visualization of a second chromatogram running in parallel

4.1 Equilibration

Starting equilibration

Before the analysis is carried out, the IC device must be balanced for around 30 minutes until the baseline is stable.



- 1 Change to the program part **Workplace**.
- 2 Use the **Run** subwindow to select the **Equilibration** tab.
- 3 In the **Method** field, click on the  button.
- 4 In the **Open method** dialog window, highlight the method **Tap water**.

If several method groups already exist, the group the method belongs to must first of all be selected in the **Method group** list box.
- 5 Click on **[Start HW]**.

Recording of the baseline begins. As soon as the baseline is stable, the measurement can be started (after approx. 30 min).



Preparing suppressor manually

- 1 Change to the program part **Manual**.
- 2 Select **Workplace** list box and highlight the **940 Professional IC Vario** in the left part of the window.
- 3 Select the **MSM** tab.
- 4 Click on the **[Next]** button.
- 5 Click on the **[Next]** button again after 10 min.
- 6 Repeat step 5 twice again.
This ensures that all three chambers of the suppressor are regenerated.

4.2 Measuring standards and samples manually

Standards

- 1 Change to the program part **Workplace**.
- 2 In the **Run** subwindow, select the **Single determination** tab.



- 3** In the **Method** field, check whether the **Tap water** method is selected.

- 4** Use the **Sample type** list box to select **Standard 1**.

5 Enter sample data

Enter the following values in the fields:

- Use the **Ident** field to enter the name **Standard 1**.
- Use the **Position** field to enter the value **1**.
- Use the **Volume** field to enter the value **20**.
- Use the **Dilution** field to enter the value **1**.
- Use the **Sample amount** field to enter the value **1**.

- 6** Click on the **[Start]** button.

The determination is started and the time program executed for manual determination

Lines highlighted in red show the current program stage, lines highlighted in blue show the processed program stage.

- 7 As soon as the message for filling appears, fill the injector manually.

- 8** Confirm the message with **[Next]**.

The data recording is started and the determination executed to the end.

Repeat steps **4** to **8** for the measurements of standard 2 and standard 3. The **Sample type** list box is used to select **Standard 2** or **Standard 3** and the **Ident** field is used to enter the name **Standard 2** or **Standard 3**.

Information on the methods and associated devices is displayed in the **Watch window** subwindow.

Sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

- 1 Use the **Sample type** list box to select the entry **Sample**.

2 Enter Sample data

Enter the following values in the fields:

- Use the **Ident** field to enter the name **Tap water**.
- Use the **Position** field to enter the value **1**.
- Use the **Volume** field to enter the value **20**.
- Use the **Dilution** field to enter the value **1**.
- Use the **Sample amount** field to enter the value **1**.

- 3** Click on the **[Start]** button.

The determination is started and the time program executed for manual determination.

- 4** As soon as the message for filling appears, fill the injector manually.

- 5** Confirm the message with **[Next]**.

The data recording is started and the determination executed to the end.

If several method groups already exist, the group the method belongs to must first of all be selected in the **Method group** list box.

In the **Method** field, **Tap water (auto)** is automatically entered.

5 Entering values for Standard 1

Enter the following values in the fields:

- Use the **Ident** field to enter the name **Standard 1**.
- Use the **Sample type** list box to select **Standard 1**.
- Use the **Position** field to enter the value **1**.
- Use the **Injections** field to enter the value **1**.
- Use the **Volume** field to enter the value **20**.
- Use the **Dilution** field to enter the value **1**.
- Use the **Sample amount** field to enter the value **1**.
- Click on **[Apply]**.

The values are written in the first line of the sample table.

6 Entering values for Standard 2

- In the **Line** field click on the  button.

The next higher value is automatically entered in the **Position** field. The values of standard 1 are automatically accepted in the **Injection**, **Volume**, **Dilution** and **Sample amount** fields.



- Use the **Ident** field to enter the name **Standard 2**.
- Use the **Sample type** list box to select **Standard 2**.
- Click on **[Apply]**.

7 Entering values for Standard 3

To enter standard 3, proceed in the same way as for step 6:

- Use the **Ident** field to enter the name **Standard 3**.
- Use the **Sample type** list box to select **Standard 3**.

8 Entering values for sample

To enter sample data, proceed in the same way as for step 5:

- Use the **Ident** field to enter the name **Tap water**.
- Use the **Sample type** list box to select the entry **Sample**.
- Once all the data for the standards and the sample have been entered, click on the **[Close]** button and return to the **Determination series** tab.

9 Stopping hardware

- Activate the check box **Stop hardware when sample table is finished**.



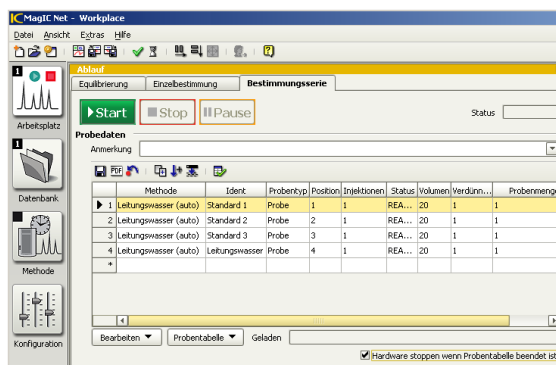
NOTICE

The check box **Stop hardware when sample table is finished** must be activated if the devices are to be switched off after completion of the measurements (e.g. when measuring over night).

10 Saving sample table

- Use the **Sample table ► Save as...** to open the **Save sample table** dialog window.
- Use the **Name** field to enter the name **Tap water sample**.
- Click on **[Save]**.

The complete table with standards and sample appears as follows:



Measuring standards and samples

- In the **Determination series** tab, click on the **[Start]** button.

The chromatograms of the three standards are then measured, followed by those of the sample. The current chromatogram recording can be tracked in the **Live display** subwindow. The current rack position as well as various IC parameters, such as conductivity, pressure, flow, degasser etc. are displayed in the **Watch window - tap water** subwindow.

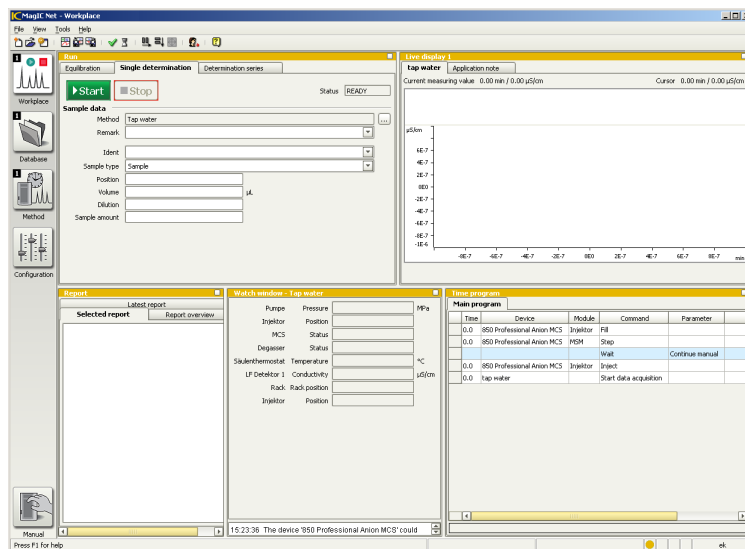
Samples undergoing processing are highlighted in red, while measured samples are highlighted in blue.

4.4 Performing the determination

In this section you will learn how to:

- Check retention times of the analytes
- Enter sample data
- Measure standards and samples.

These steps are performed in the program part **Workplace**. The following subwindows are available:



Run

Control of processes and management of the sample data

Live display 1

Visualization of the chromatogram during the analysis

Report

Displays the reports of analyses

Watch window

Information on the methods and associated devices

Time Program

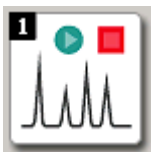
Visualization of the method execution

Live display 2

Visualization of a second chromatogram running in parallel

4.4.1 Equilibration**Starting equilibration**

Before the analysis is carried out, the IC device must be balanced for around 30 minutes until the baseline is stable.



1 Change to the program part **Workplace**.

2 Use the **Run** subwindow to select the **Equilibration** tab.

3 In the **Method** field, click on the  button.

4 In the **Open method** dialog window, highlight the method **Tap water**.

If several method groups already exist, the group the method belongs to must first of all be selected in the **Method group** list box.

5 Click on **[Start HW]**.

Recording of the baseline begins. As soon as the baseline is stable, the measurement can be started (after approx. 30 min).



Preparing suppressor manually

- 1 Change to the program part **Manual**.
- 2 Select **Workplace** list box and highlight the **940 Professional IC Vario** in the left part of the window.
- 3 Select the **MSM** tab.
- 4 Click on the **[Next]** button.
- 5 Click on the **[Next]** button again after 10 min.
- 6 Repeat step 5 twice again.

This ensures that all three chambers of the suppressor are regenerated.

4.4.2 Measuring standards and samples manually.

Standards

- 1 Change to the program part **Workplace**.
- 2 In the **Run** subwindow, select the **Single determination** tab.

- 4** Use the **Sample type** list box to select **Standard 1**.

Enter the following values in the fields:

- 6** Click on the **[Start]** button.

Lines highlighted in red show the current program stage, lines highlighted in blue show the processed program stage.

- 8** Confirm the message with **[Next]**.

Repeat steps **4** to **8** for the measurements of standard 2 and standard 3. The **Sample type** list box is used to select **Standard 2** or **Standard 3** and the **Ident** field is used to enter the name **Standard 2** or **Standard 3**.



The current chromatogram recording can be tracked in the **Live display** subwindow.

Information on the methods and associated devices is displayed in the **Watch window** subwindow.

Sample

- 1 Use the **Sample type** list box to select the entry **Sample**.

2 Enter Sample data

Enter the following values in the fields:

- Use the **Ident** field to enter the name **Tap water**.
- Use the **Position** field to enter the value **1**.
- Use the **Volume** field to enter the value **20**.
- Use the **Dilution** field to enter the value **1**.
- Use the **Sample amount** field to enter the value **1**.

- 3** Click on the **[Start]** button.

The determination is started and the time program executed for manual determination.

- 4** As soon as the message for filling appears, fill the injector manually.

- 5** Confirm the message with **[Next]**.

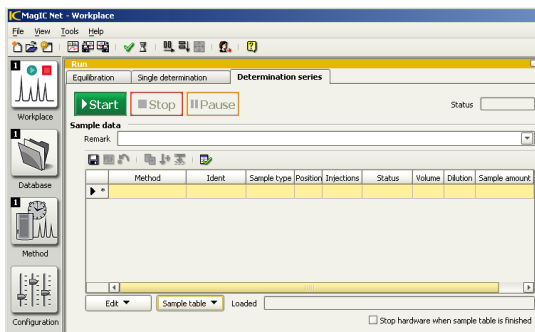
The data recording is started and the determination executed to the end.

4.4.3 Measuring standards and samples automatically

Just as for a manual measurement, the IC device is first of all balanced (*see chapter 4.1, page 60*). The sample table is then created and the sample measured.

Creating new sample table

- 1 Change to the program part **Workplace**.
- 2 Use the **Run** subwindow to select the **Determination series** tab.



- 3 Use the **Edit ► Edit line** menu to open the dialog window **Edit line - Working sample table - Workplace**.
- 4 In the **Method** field, click on the  button.

Highlight the method name **Tap water (auto)** in the table and click on **[Open]**.

If several method groups already exist, the group the method belongs to must first of all be selected in the **Method group** list box.

In the **Method** field, **Tap water (auto)** is automatically entered.

Edit line - Working sample table - Workplace Workplace

Method ...

Ident

Sample type Sample

Position

Injections

Volume µL

Dilution

Sample amount

Info 1

Line 1 of 1

Apply Close

5 Entering values for Standard 1

Enter the following values in the fields:

- Use the **Ident** field to enter the name **Standard 1**.
- Use the **Sample type** list box to select **Standard 1**.
- Use the **Position** field to enter the value **1**.
- Use the **Injections** field to enter the value **1**.
- Use the **Volume** field to enter the value **20**.
- Use the **Dilution** field to enter the value **1**.
- Use the **Sample amount** field to enter the value **1**.
- Click on **[Apply]**.

The values are written in the first line of the sample table.

6 Entering values for Standard 2

- In the **Line** field click on the  button.

The next higher value is automatically entered in the **Position** field. The values of standard 1 are automatically accepted in the **Injection**, **Volume**, **Dilution** and **Sample amount** fields.

- Use the **Ident** field to enter the name **Standard 2**.
- Use the **Sample type** list box to select **Standard 2**.
- Click on **[Apply]**.

7 Entering values for Standard 3

To enter standard 3, proceed in the same way as for step 6:

- Use the **Ident** field to enter the name **Standard 3**.
- Use the **Sample type** list box to select **Standard 3**.

8 Entering values for sample

To enter sample data, proceed in the same way as for step 5:

- Use the **Ident** field to enter the name **Tap water**.
- Use the **Sample type** list box to select the entry **Sample**.
- Once all the data for the standards and the sample have been entered, click on the **[Close]** button and return to the **Determination series** tab.

9 Stopping hardware

- Activate the check box **Stop hardware when sample table is finished**.



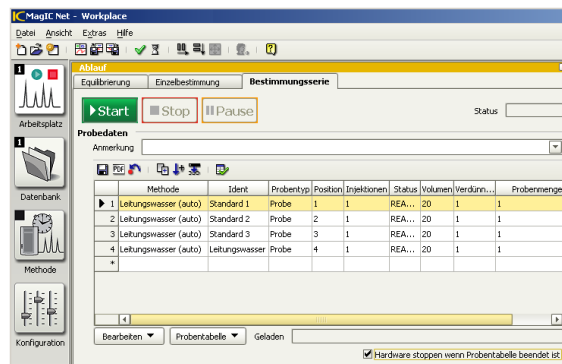
NOTICE

The check box **Stop hardware when sample table is finished** must be activated if the devices are to be switched off after completion of the measurements (e.g. when measuring over night).

10 Saving sample table

- Use the **Sample table ► Save as...** to open the **Save sample table** dialog window.
- Use the **Name** field to enter the name **Tap water sample**.
- Click on **[Save]**.

The complete table with standards and sample appears as follows:



Measuring standards and samples

- 1 In the **Determination series** tab, click on the **[Start]** button.

The chromatograms of the three standards are then measured, followed by those of the sample. The current chromatogram recording can be tracked in the **Live display** subwindow. The current rack position as well as various IC parameters, such as conductivity, pressure, flow, degasser etc. are displayed in the **Watch window - tap water** subwindow.

Samples undergoing processing are highlighted in red, while measured samples are highlighted in blue.

4.4.4 Modifying retention times manually

In order to check and eventually modify the retention times of the seven components fluoride, chloride, nitrite, bromide, nitrate, phosphate and sulfate (specified in the method), the mean standard is measured in a single measurement.

Single measurement of a standard

- 1 Change to the program part **Workplace**.
- 2 In the **Run** subwindow, select the **Single determination** tab.
- 3 Use the **Method** field to select the method **Tap water**.
- 4 Use the **Sample type** list box to select **Standard 2**.

5 Enter sample data

Enter the following values in the fields:

- Use the **Ident** field to enter the name **Standard 2**.
- Use the **Position** field to enter the value **1**.
- Use the **Volume** field to enter the value **20**.
- Use the **Dilution** field to enter the value **1**.
- Use the **Sample amount** field to enter the value **1**.

- 6** Click on the **[Start]** button.

The determination is started and the time program executed for manual determination.

- 7 As soon as the message for filling appears, fill the injector manually.

- 8** Confirm the message with **[Next]**.

The data recording is started and the determination executed to the end.



Correcting the retention times

Compare the retention times from the chromatogram with those in the method template. If there are deviations, enter the new retention times from the chromatogram into the component table as follows:

- 1 Change to the program part **Method**.
- 2 Click on the **Edit ► Refresh**.
- 3 In the **Evaluation** subwindow, click on the **[Component]** button and select the **Component table** tab.
- 4 Click on the line with the component whose retention time is to be corrected.
- 5 Click in the peak belonging to this in the **Chromatograms** subwindow.
- 6 In the **Evaluation** subwindow, click on the **[Update retention time]** button.

The retention time from the chromatogram is transferred to the component table.
- 7 Repeat steps **4** to **6** for all the components to be corrected.

5 Editing determinations

5.1 Viewing determinations

You have several options for selecting and viewing your determinations:

- Sort according to column
- Find via a quick filter
- Find with a special filter
- Via the **Search** menu
- Select via a batch (user-defined filter)

Sorting



1 Click on the symbol of the program part **Database**.

2 First click on the heading of the column for sorting in the table with all the databases.

The table is sorted according to the selected column in increasing order.

3 Click again on the same column title.

The table is sorted according to the selected column in decreasing order.



Quick filter

- 1 Click on the menu **Determinations** ► **Filter** ► **Quick filter**.

The cursor turns into a special filter symbol. When navigating within the table, the cells in which the cursor is located will have a yellow background.

- 2 Place the cursor in a cell serving as a filter criterion and click with the left mouse button.

The datasets are filtered according to the content of the required table field. The quick filter can be applied again within the filtered table.

Special filter

The special filter allows you to specify the filter conditions in detail.

- 1 Open the corresponding dialog window via the **Determinations ► Filter ► Special filter** menu.

- 2 Use the **Edit ► Edit line** menu to open the dialog window **Edit filter criterion New filter**.

Edit filter criterion New filter

Link

AND

Field

Method name More...

Details

Condition

Type Text

Operator =

Comparative value tap water

☐ Match case

☐ Use asterisk (*) as wildcard

OK Cancel

3 In the **Field** list box, highlight the entry **Method name**.

4 Use the **Comparison value** field to enter the method name **Tap water** and click on **[OK]**.

5 In the **Special filter** dialog window, click on the **[Apply filter]** button and close the window.

The **Determination overview** subwindow then displays the table with all the datasets of the **Tap water** method.

The data of a highlighted dataset appears in the other sub-windows.

The **Results** subwindow then displays a table with the components, their concentrations, retention times etc. The parameters of the table can be brought together in the **Properties result window** dialog window. It is opened by double clicking in the field of the results display or the menu **View ► Properties ► Properties Results**.

The chromatograms and the calibration curve are shown in the **Curves 1** subwindow.

Data of the sample, the devices etc., can be displayed in the **Information** subwindow via the individual tabs.

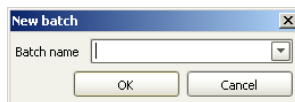
Search

- 1 Use the **Determinations ► Search** menu to open the **Search - Database 'MagIC Net'** dialog window.
- 2 In the **Search in** list box, highlight the entry **User (short name)**.
- 3 Enter your short name in the **Search word** field.
- 4 Click on **[Search next]**.

The first line corresponding to the search term is highlighted.

Batch (user-defined filter)

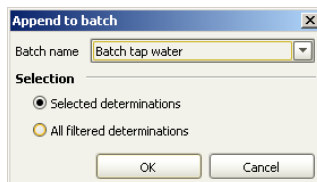
- Create batch**
 - Use the **Determinations ► Batch ► New batch** to open the **New batch** dialog window.



- In the **Batch name** field, enter the name **Batch tap water**.
- Click on **[OK]**.

2 Add determinations to batch

- Highlight the datasets in the table, which are to be added to the batch.
- Use the **Determinations ► Batch ► Append to batch** menu to open the **Append to batch** dialog window.



- In the **Batch name** list box, select the name **Batch tap water**.
- Highlight the option **Selected determinations**.
- Click on **[OK]**.

The datasets selected in the Determination overview are added to the batch and are available for selection at any time.

3 Deleting batch

- Use the **Determinations ► Batch ► Delete batch** menu to open the **Delete batch** dialog window.



- In the **Batch name** list box, select the name **Batch tap water**.
- Click on **[OK]**.

The batch is deleted from the database.

4 Delete applied filter

The **Determinations ► Filter ► Remove filter** menu is used to remove a special or quick filter currently applied



and to remove a selected batch. All datasets are displayed again.

6 Viewing results

Zoom with mouse

The zoom function can be used to magnify individual areas of a chromatogram.

- 1 Highlight a dataset in the overview table.

The associated chromatogram is shown in the **Curves 1** subwindow.

- 2 Zoom in on the area to be magnified while keeping the left mouse button pressed.

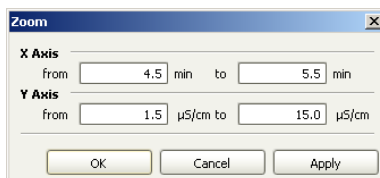
Zoom with dialog

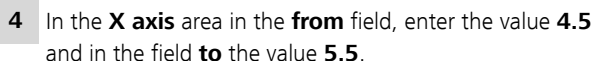
- 1 Highlight a dataset in the Overview Table.

The associated chromatogram is shown in the **Curves 1** subwindow.

- 2 Click in the chromatogram with the right mouse button.

- 3 The **Zoom** context menu can be used to open the **Zoom** dialog window for entering the zoom range.





5 Click on **[OK]**.

The peak of nitrite is zoomed in.

- 1 Click in the chromatogram with the right mouse button.

2 Click on the context menu **Unzoom**.

The chromatogram is shown in its original size.

Changing the chromatogram visualization

You have the option of editing the properties of a chromatogram. You can change the visualization of the chromatogram, the labeling of the axes or the labeling in the chromatograms. Afterwards change the labeling of the peaks and the axes in the chromatogram. Proceed as follows:

1 Changing peak labeling

- Click in the chromatogram with the right mouse button.
- Select the menu item **Properties**.
- Select the **Chromatogram** tab.
- Activate the **Retention time** check box and deactivate the **Concentration** check box.
- Click on **[OK]**.

2 Changing axis labeling

- Click in the chromatogram with the right mouse button.
- Select the menu item **Properties**.
- In the **Properties - Graphics** dialog window, select the **Axes** tab.
- In the **X axis** area, click in the **Axis label** field, and enter **Retention time**.
- In the **Y axis** area, click in the **Axis label** field and enter **Conductivity**.
- Click on **[OK]**.

Visualizing calibration curve

- 1 Highlight a dataset in the overview table.
- 2 In the **Curves 1** subwindow, select the option **Calibration curve**.
- 3 In the **Component** list box, select the entry **Nitrite**.

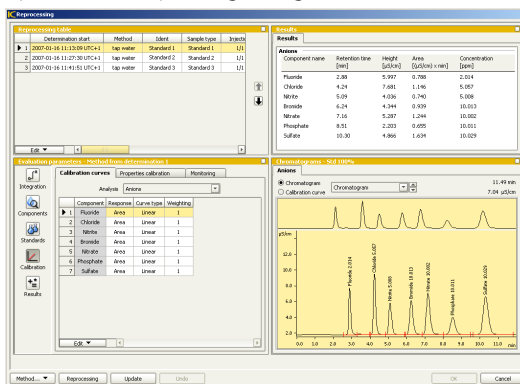
The calibration curve of **Nitrite** and the calibration function are shown.

When reprocessing determinations, sample data, evaluation parameters and curve spread can be changed and the results recalculated.

As an example, the evaluation over the peak height is described instead of over the peak area, which is defined in the method template.

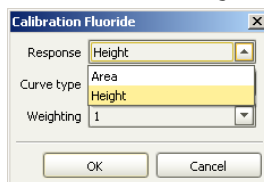
1 Reprocessing calibration curve

- Highlight the three standards in the **Determination overview** subwindow.
- Use the **Determinations ► Reprocess...** menu to open the corresponding dialog window.



- In the **Evaluation parameters** subwindow, click on the **[Calibration]** button.
- Select the **Calibration curves** tab.
- Highlight the first component (fluoride) in the table.

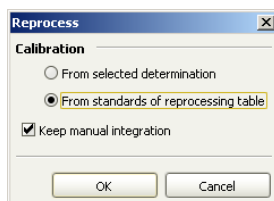
- Use the **Edit ► Edit** menu to open the **Calibration curve Fluoride** dialog window:



- In the **Response** field, select **Height** as a new parameter and click on **[OK]**.
- Use the **Edit ► Take over settings for all components** menu to accept the new measured quantity (response) for all components in the table. Repeat steps 5 to 8 for standard 2 and standard 3.
- Click on **[Update]**.

The calibration curves of the three standards are recalculated.

- Open the Reprocess dialog window via the **[Reprocessing]** button.

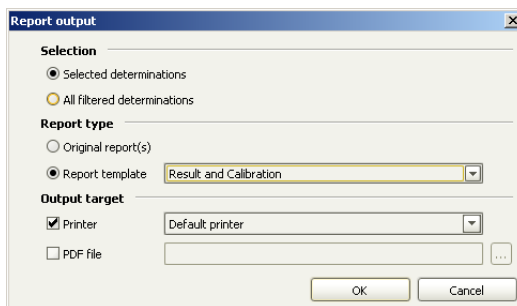


- Click on **[OK]**.

- ## Report template for result table/chromatogram

1

- 



- 8 Close the **Report output** dialog window with **[OK]**.

Printing results table/chromatogram

- 1 In the **Determination overview** subwindow, highlight the line with the entry **Tap water**.
- 2 Use the **File ► Print ► Report...** menu to open the **Report output** dialog window.
- 3 In the **Selection** area, highlight the **Selected determinations** option.
- 4 In the **Report type** area, highlight the **Report template** option and select the **Result and Calibration** report template.
- 5 In the **Output line** area, deactivate the **Printer** check box activate the **PDF file** check box.
- 6 Click on the button  and in the **Save as** dialog window, use the **File name** field to enter the name **Sample**.