

# **IC Metrodata for Win95**

6.6027.153



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Short Operating Guide





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**6.6027.153**

# **IC Metrodata for Win95**

**Version 1.44**

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## **Help!**

This Short Operating Guide has been kept very short. You will find only a brief introduction to the operation in section 3. For all details, please refer to the on-line Help in the program. This will provide you with the necessary information anywhere in the program quickly and conveniently.

**8.714.8053 Short Operating Guide**

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# 1 Introduction

## 1.1 General information

«IC Metrodata for Win95», the new evaluation tool consisting of the 1.714.0310 PC Board, the 6.2145.010 Dongle and the 6.6027.153 Software, is a versatile integrator system for all chromatographic methods, especially ion chromatography. The evaluation software is based on Windows 95® and supports the corresponding functions such as multitasking and easy export of data to other Windows applications. «IC Metrodata for Win95» offers the following possibilities:

### Hardware

- 1.714.0310 PC Board for analog/digital conversion with a resolution of 24 bit and a voltage range of  $\pm 2.5$  V, data acquisition rate up to 60 points/s.
- Two entry channels that can be used simultaneously or independently from each other.

### Software

- Data acquisition via methods that contain the corresponding acquisition and evaluation parameters, either with the 1.714.0310 PC Board or with the 1.714.0010 CSI interface.
- Real time monitoring of chromatograms during recording.
- Diverse possibilities for graphical representation and manual reprocessing of chromatograms.
- Calibration with internal or external standard method, multipoint calibrations with linear, quadratic or cubic regression.
- Free formatting of result printouts.
- Automatic reprocessing of evaluated chromatograms ("Queue").
- Export and import possibilities for chromatograms and reports.
- Remote control of IC instruments.

## 1.2 System requirements

Computer	recommended min. 486 processor running at 33 MHz or faster, 1 free slot
Operating system	Windows 95
Disk space	min. 4 MB on hard disk
RAM	min. 8 MB, recommended 16 MB

## 2 Installation



### **Protection against static charges**

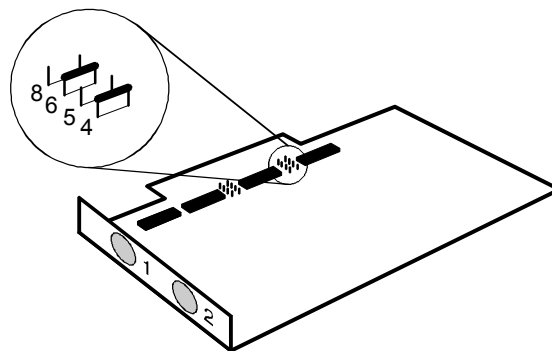
*Electronic components are sensitive to static charging and can be destroyed by discharges. Before you touch the PC board or any of the components inside the PC, you should earth yourself and any tools you are using by touching an earthed object (e.g. housing of the instrument or a radiator) to eliminate any static charges which exist.*

### 2.1 Hardware installation

The hardware installation comprises the installation of 1 or 2 PC boards in a free PC slot, the installation of the dongle in a LPT port and the connection of the PC board to 732 IC Detector and 733 IC Separation Center. Proceed as follows:

#### **Installation of 1<sup>st</sup> PC Board (1.714.0310)**

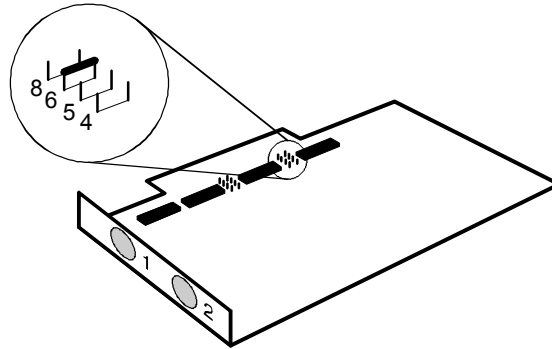
- 1) Switch off PC and disconnect power cable from the power socket.
- 2) Disconnect all other cables to computer peripherals (keyboard, display, printer, etc.).
- 3) Check 1.714.0310 PC Board: the two jumpers at position 4 and 6 have to be installed.



- 4) Disassemble PC and install 1.714.0310 PC Board in a free slot (see instruction manual of the PC).
- 5) Reassemble PC.

**Installation of 2<sup>nd</sup> PC Board (1.714.0310)**

- 1) Switch off PC and disconnect power cable from power socket.
- 2) Disconnect all other cables to computer peripherals (keyboard, display, printer, etc.).
- 3) Change jumper settings on board 2: only jumper at position 6 must be installed.



- 4) Disassemble PC and install 1.714.0310 PC Board in a free slot (see instruction manual of the PC).
- 5) Reassemble PC.

**Installation of the 6.2145.010 Dongle**

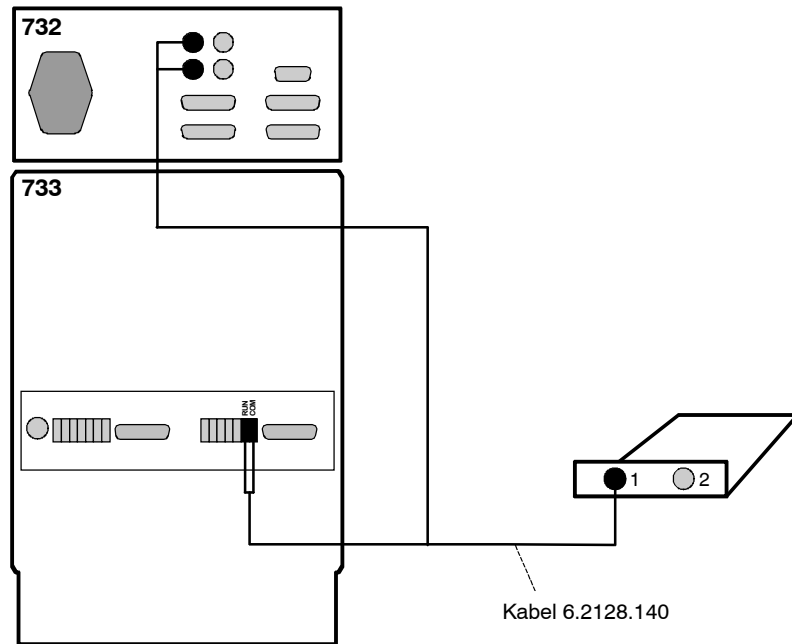
- 1) *PC with 1 LPT port*  
Install 6.2145.010 Dongle into the LPT1 printer port. Insert printer cable into the dongle.
- 2) *PC with 2 LPT ports*  
Install 6.2145.010 Dongle into the LPT2 printer port. Insert printer cable into the LPT1 printer port.

**Check PC**

- 1) Plug in all cables of the peripheral units at the PC.
- 2) Connect power cable to the power socket.
- 3) Switch on PC.
- 4) Check if the PC boots normally and all PC components and peripherals run properly.
- 5) Switch off PC.

### Connect IC system 1

- 1) Connect 6.2128.140 cable to socket **1** (channel 1) of the PC board.
- 2) Connect the two open cable endings to the sockets "Integr. Start" on the right terminal block **38** of the 733 IC Separation Center so that the two connections "COM" and "RUN" are connected with each other.
- 3) Connect the black banana plug to the black socket and the red banana plug to the red socket of the analog output **11** (0...1 V) of the 732 IC Detector.



**Connection of the PC board to the 732/733 IC System**

### Connect IC system 2

- 1) Connect the second 6.2128.150 cable to socket **2** (channel 2) of the PC board.
- 2) Connect the two open cable endings to the sockets "Integr. Start" on the left terminal block **45** of the 733 IC Separation Center (two channel system) or the right terminal block **38** of the 733 IC Separation Center (one channel system) so that the two connections "COM" and "RUN" are connected with each other.
- 3) Connect the black banana plug to the black socket and the red banana plug to the red socket of the analog output **11** (0...1 V) of the 732 IC Detector.

## 2.2 Software installation

The installation program copies the files from the installation diskettes to the drive and directory you specify and creates the following sub-directories:

<i>Data</i>	Directory for data files (*.chw)
<i>Methods</i>	Directory for method files (*.mtw)
<i>Reports</i>	Directory for report files (without extension) and graphic files (*.wmf)

### Installation with Windows 95

- 1) Start Windows 95. Find a drive that has at least 4 MB free storage space.
- 2) Insert installation disk into drive A.
- 3) In the Start menu, select the menu item **Run** and enter **a:setup**. Follow the instructions of the setup program.
- 4) Make a backup copy of your installation diskettes.

### Update from version 1.38 and 1.38a

- 1) During the installation (see above), specify a new directory for the program.
- 2) Copy the old data and method files into the subdirectories **Data** and **Methods** in the new program directory.
- 3) Delete the old program directory.

### Full program version and demo version

The 6.2145.010 Dongle is part of the standard equipment of the 6.6027.153 full program version. Install this dongle into LPT port 1 or 2 (see *section 1.3*).

The 6.6027.158 demonstration version of "IC Metrodata for Win95" contains only the software without dongle. With this version no chromatograms can be acquired, but all other functions are identical with the full program version. You can upgrade your demo version at any time if you install a 6.2145.010 Dongle into the LPT port.

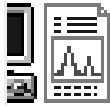
### Registration

Please send us your 8.714.8067 Registration card as soon as possible so we can register you as an official user. Only registered users will get updated program versions at a special price.

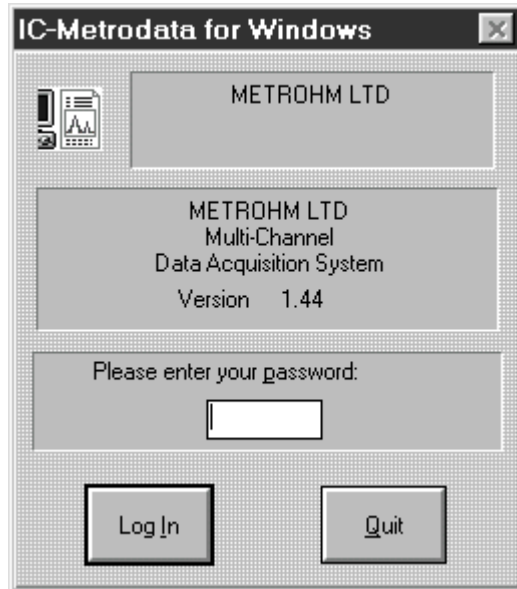


*The data files \*.chw and the method files \*.mtw are not write-protected. To prevent these files from being deleted by mistake, switch on the write-protection or make a backup copy in another directory.*

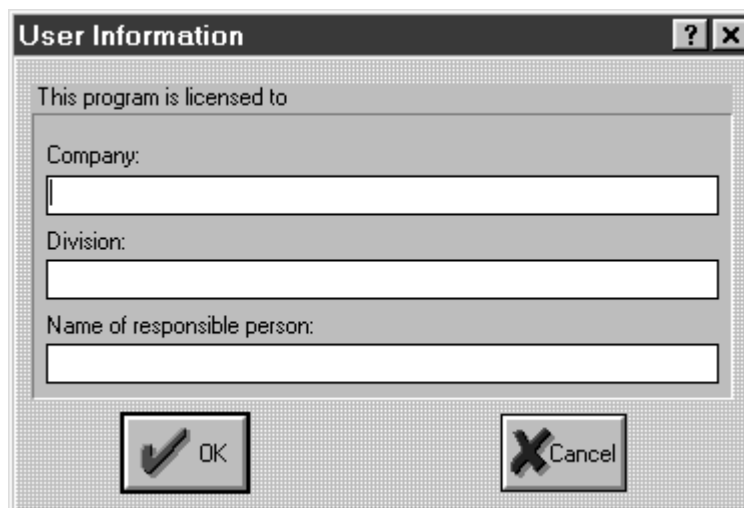
## 2.3 First program start



Double-click the software icon to start the program. The program window with the opening picture is opened and the Log In window appears on the screen:



Do not enter any password here, just click the **Log In** button. The following window appears:



Enter company, division and name and click the **OK** button. This window appears only one time after software installation.

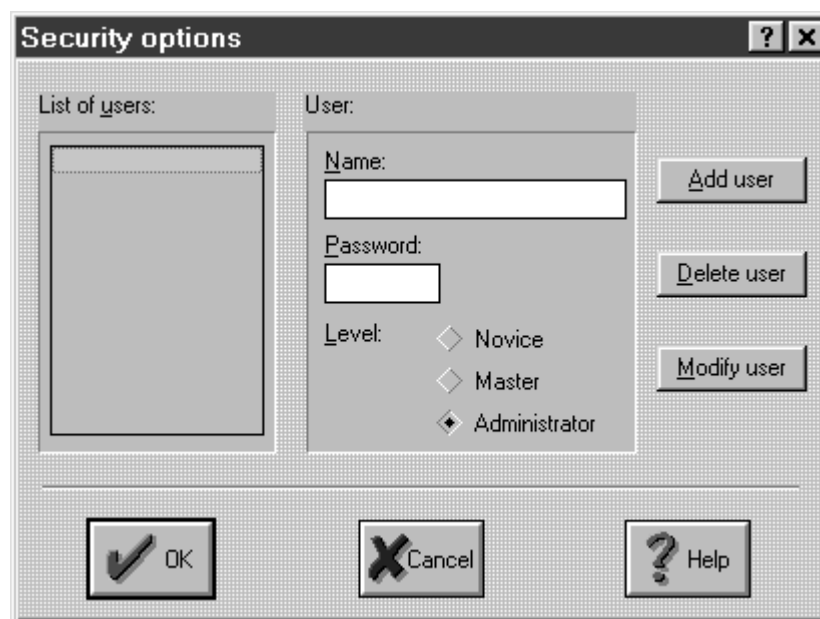
Afterwards a window appears with the message **New hardware found: Serial port [COM#]** specifying the next free serial port for remote control. Click the **OK** button.

## 2.4 Security system

The «IC Metrodata for Win95» program has a security system based on the list of users. Every user has his unique password and one of the following access levels:

- Novice** Only most commonly used parameters can be modified by the user. Recommended for routine users. Existing data files cannot be overwritten, they are saved under a new name (8<sup>th</sup> character is increased by +1).
- Master** Most parameters are available for modification with exception of hardware configuration parameters. Recommended for method development.
- Administrator** Access to all parameters. Recommended for software installation and modification of user lists.

It is recommended to make user lists and enter passwords as a first action after system installation. So, select the menu item **Options / Security** and click the **Log In** button in the Log In window without entering a password. The **Security options** window appears, where users and passwords can be entered:

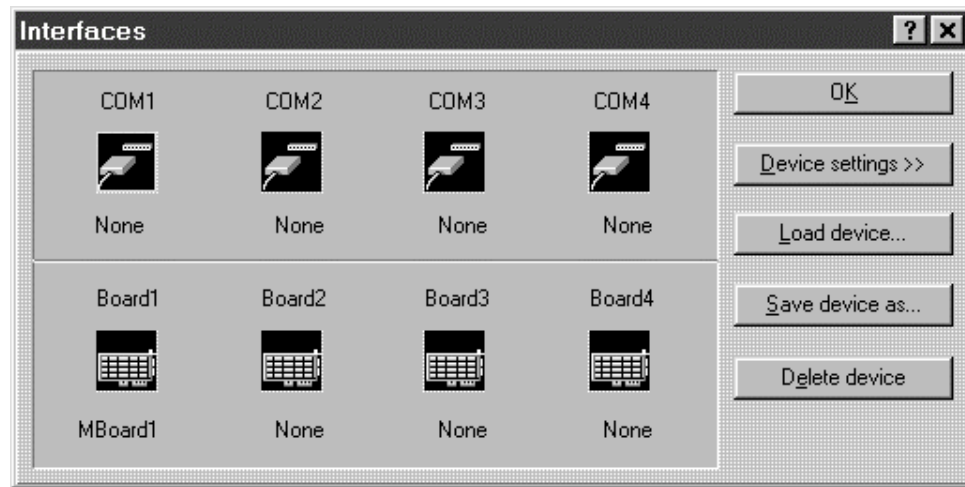


Enter user name, password and access level for all users. Don't forget to make one of the user an **Administrator**, otherwise this menu will never be opened again. At the end, click the **OK** button.

After the security system is successfully configured the program prompts for the password every time the system starts and installs the user name that corresponds to the password. This user name stamps all methods, chromatograms and reports created during the working session. It is possible at any time to change the user with the menu item **Options / Lock system**.

## 2.5 Interface configuration

Open the menu item **Options / Interfaces** for configuration of the interfaces to the IC system.



### 1.714.0310 PC Board

The **MBoard1** driver for operation of the first PC board **Board1** with 2 channels is installed automatically during the software setup.

If a second PC board is installed, select **Board2** with the mouse and click the **Load device** button. Select the file **MBoard2.dew** for operation of second PC board with 2 channels and click the **OK** button.

### 1.714.0210 PC Board

Select **Board1** with the mouse and click the **Delete device** button. Confirm the question **Do you really mean do delete device Mboard1?** with **Yes**. Click the **Load device** button, select the **m732b1.dew** file for operation of the first PC board with 2 channels and click the **OK** button.

If a second PC board is installed, select **Board2** with the mouse and click the **Load device** button. Select the file **m732b2.dew** for operation of second PC board with 2 channels and click the **OK** button.

### 1.714.0010 CSI Interface

Select one of the serial interfaces **COM1...COM4** with the mouse and click the **Load device** button. Select the **csi.dew** file for operation of the CSI interface with 1 channel.



*The **csi\*.mtw** methods are configured for the **COM2** interface. If you use a different serial interface, the **Acquisition** parameter under **Method / Acquisition Setup** has to be changed accordingly.*

## 3 Learning by doing

### 3.1 General remarks

#### Main menu

After starting the "IC Metrodata for Win95" program and entering the password, an empty window with the following menu items appears:

<b><u>F</u>ile</b>	Open, save, close, import and delete chromatograms, methods, sample data tables (Queue/Batch), print, page layout
<b><u>V</u>iew</b>	Display settings for chromatograms
<b><u>A</u>cquire</b>	Load and run methods
<b><u>P</u>rocess</b>	Reports, re-integration, peak editor, calibration
<b><u>M</u>ethod</b>	Develop and modify methods
<b><u>O</u>ptions</b>	Settings for interfaces, remote control of instruments, fonts, colors, security system, change of user
<b><u>W</u>indow</b>	Arrange and select windows
<b><u>H</u>elp</b>	On-Line Help

#### Window

All chromatograms and reports appear in its own windows which can be tiled horizontally or vertically or displayed on the full screen.

#### Help

By selecting the menu item **Help / Index** or by using the <F1> key you can get help on the current topic anywhere in the program.

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

#### Backup

You should back up your data in the directories "Data", "Methods" and "Reports" at regular intervals using an appropriate backup tool.


## 3.2 Developing a new method

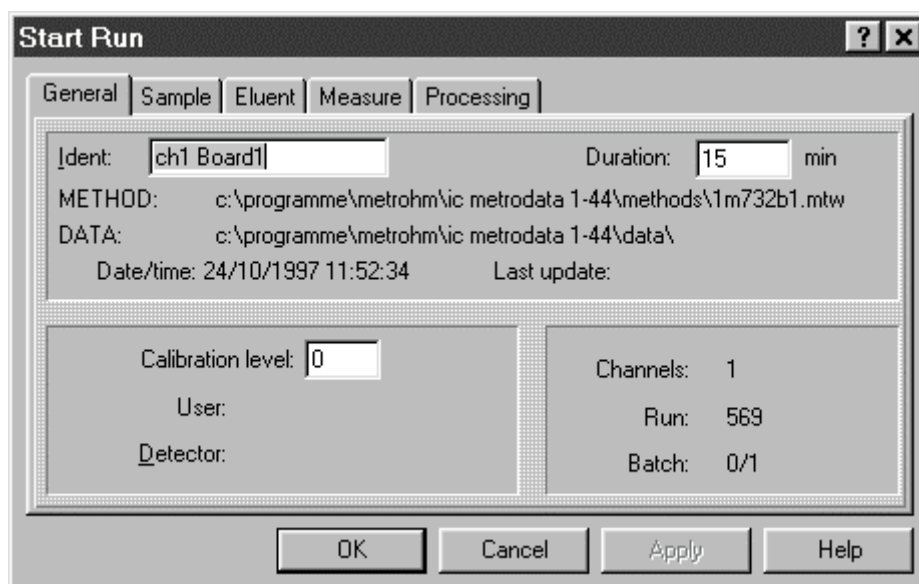
This section describes the procedure how to develop a new, user-specific method based on a standard method.

### Preparation

- Insert separating column in IC system and condition it.
- Prepare standards and sample.

### Load standard method and run

- Click on  or select **L**oad method and run from the **A**cquire menu.
- Select the file **1m732b1.mtw** in the **F**ile **O**pen window and click the **O**K button.

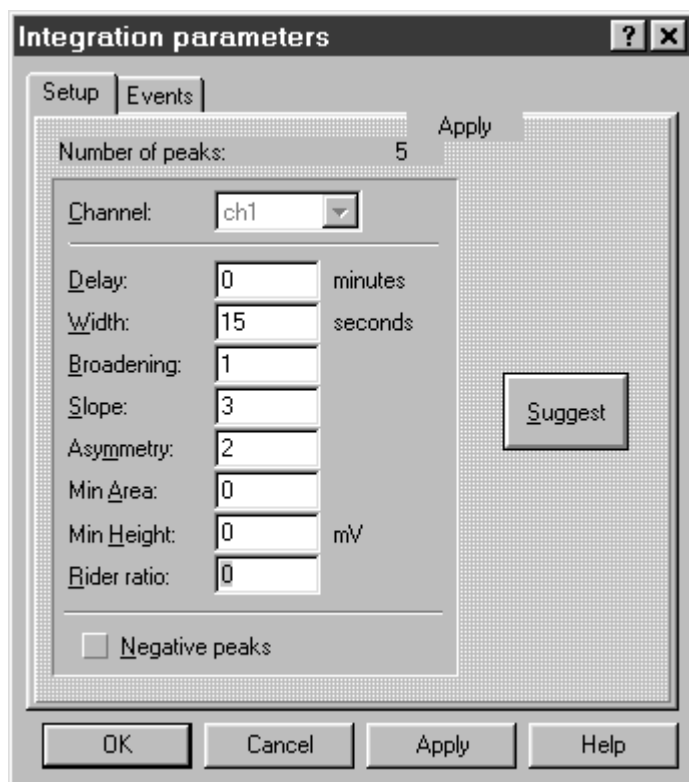


- In the **Start Run** window, enter a sample name as **Ident** to characterize the chromatogram (max. 14 characters, e.g. "standard").
- Enter the estimated analysis time as **Duration**.
- Select the tabs **Sample**, **Eluent**, **Measure** and **Processing** to enter more parameters to characterize sample and acquirement conditions if required.
- Click the **OK** button.  
The window for the on-line display of the chromatogram opens. The window title line contains sample name, method and run number (e.g. **standard (1m732b1.mtw)01.run**). The status display below shows the message **Waiting**.

- Set injection valve at 733 IC Separation Center to "FILL" (manually or by program) and fill sample loop with standard.
- Set injection valve at 733 IC Separation Center to "INJECT" (manually or by program). The data acquisition is started automatically. The status display shows **Measure**, beside it running time, analysis time and measuring signal (in mV) are displayed. As soon as the analysis time has passed, the data acquisition is stopped automatically and the chromatogram is integrated.


### Modify integration parameters

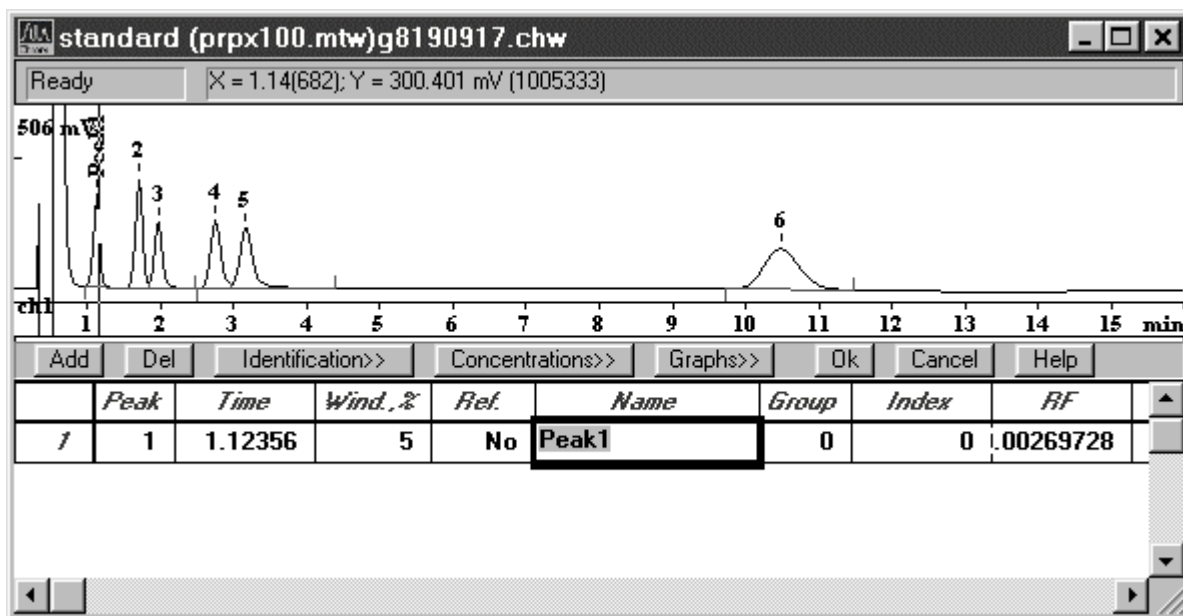
- Click on  or select **I**ntegration of the **M**ethod menu.



- As **D**elay, enter the time delay before starting peak integration at the first peak to be detected.
- Click the **A**pply button. The chromatogram is reintegrated.
- Repeat this procedure for all other integration parameters until the result satisfies your expectations. Click **A**pply after each parameter changing.
- Close the **I**ntegration Parameters window with **O**K.

### Enter components for calibration

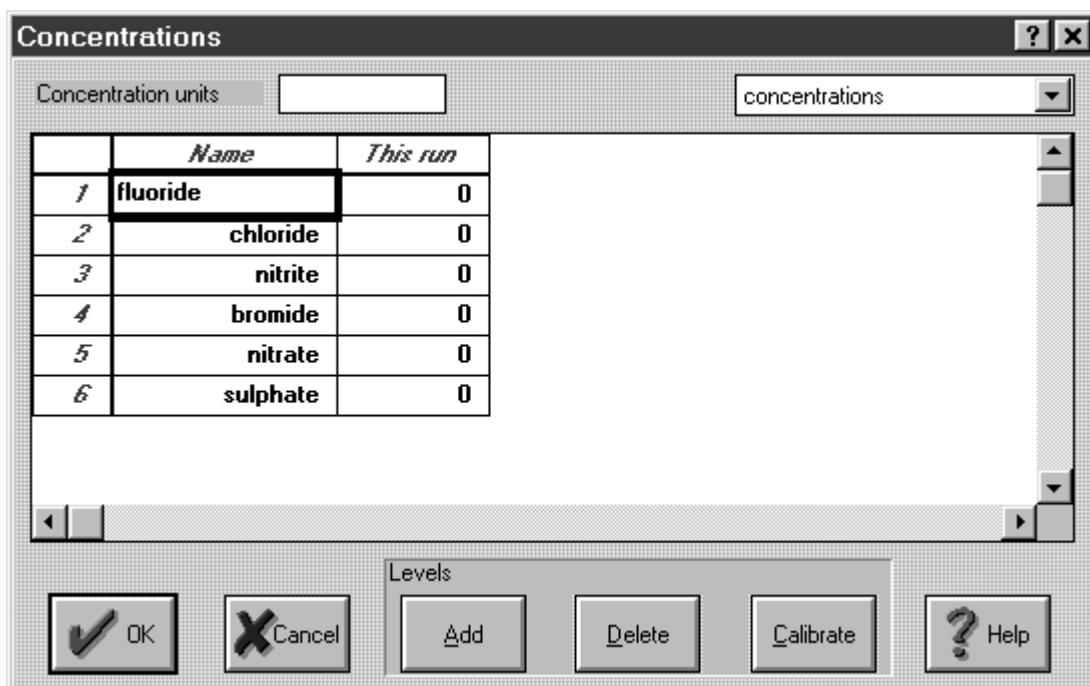
- Click on  or select **Calibration / Components** of the **Method** menu. An empty table for components is displayed below the chromatogram.
- Click the **Add** button in the components window. A first line is added to the table containing peak number, retention time and a standard name.



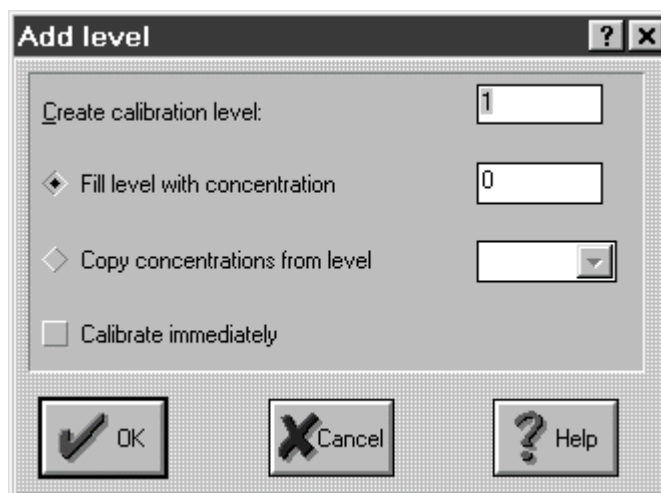
- Replace the name **Peak1** in the column **Name** by the component name of the first peak. The values of the other columns can be left unchanged.
- Enter data for all other components by clicking first the **Add** button and then entering the component names in the **Name** column in the new line.

### Enter concentrations for calibration

- When all components have been entered click the **Concentrations>>** button.



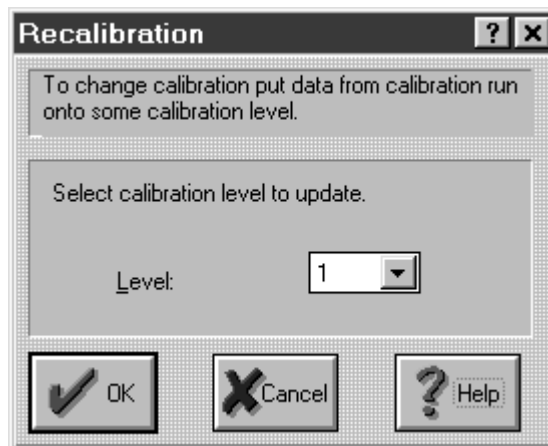
- Enter the desired concentration unit (e.g. ppm) in the **Concentration units** field.
- Click the **Add** button. The **Add level** window appears.



- Enter the desired number in the **Create calibration level** field. After clicking **OK** a new column is added in the **Concentrations** window.
- Enter the concentrations of all components in the new **Level** column.

### Start calibration

- Click the **Calibrate** button. The **Recalibration** window appears.




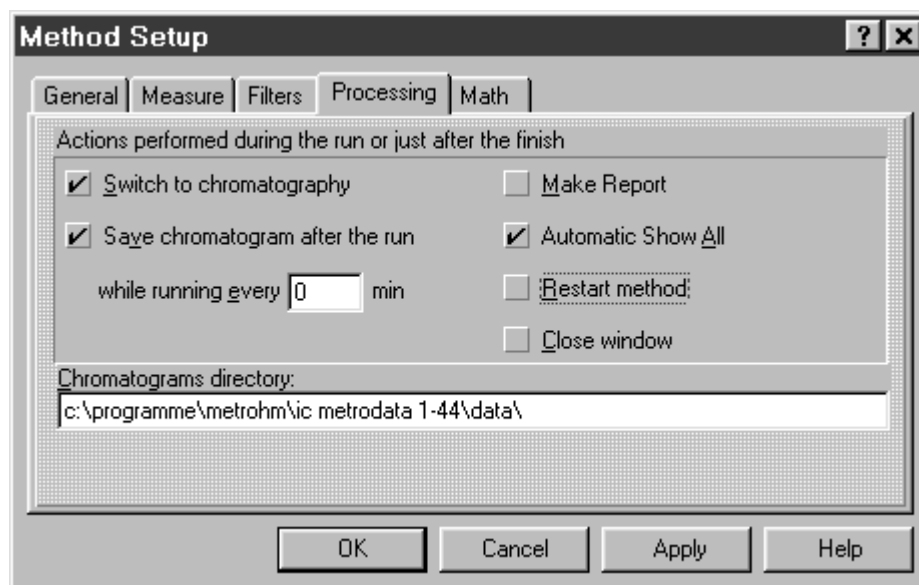
- Select the desired **Level** and click on **OK**.
- Click the **OK** button in the **Concentrations** window.

### Display calibration curves

- Click the **Graphs>>** button in the **Components** window.
- Select the desired component in the **Component** field for which the calibration curve should be displayed.
- Close the **Component** window by clicking **OK**.
- Close the **Components** window below the chromatogram by clicking **OK**.

### Set processing options

- Click on  or select **Method setup** of the **Method** menu. Select the **Processing** tab in the **Method Setup** window.



- The options **Switch to chromatography** (return to «IC Metrodata for Win95» after finishing of the chromatogram if the program runs in background), **Save chromatogram** (automatic saving) and **Automatic Show All** (automatic scaling of axes) are selected by default.
- If you click the **Make Report** option, the report defined under **Report Options** will be printed out automatically after finishing of the chromatogram.
- Click the **Restart method** option. This option opens automatically a window for acquiring a new chromatogram after finishing the old one.
- If you click the option **Close window** in addition, the data acquisition window is closed automatically after finishing of the method.
- In the **Chromatograms directory** window, a directory path for saving the chromatogram can be entered.
- Close the window by clicking **OK**.

### Save new method

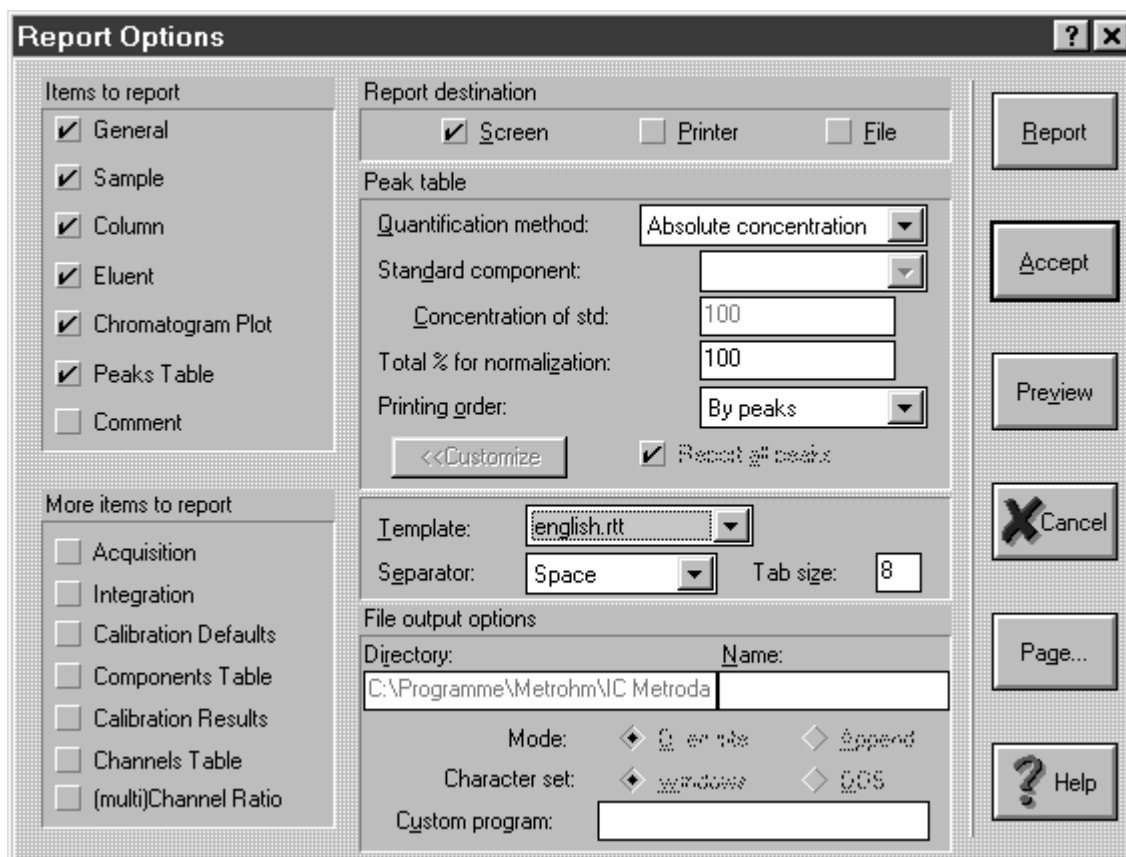
- Select **Save method as** of the **File** menu.
- Enter a name **\*.mtw** for the new method in the **File Save As** window and click the **OK** button.



*The 1m732b1.mtw method is not write-protected!*


### Report output to screen

- Click on  or select **Make report** of the **Process** menu. The **Report Options** window appears.




- In the **Template** field, select the preset standard template **eng-metro.rtt** instead of **english.rtt**.
- Click the **Report** button. A new window appears on the screen which displays the results (without chromatograms).

### Print report

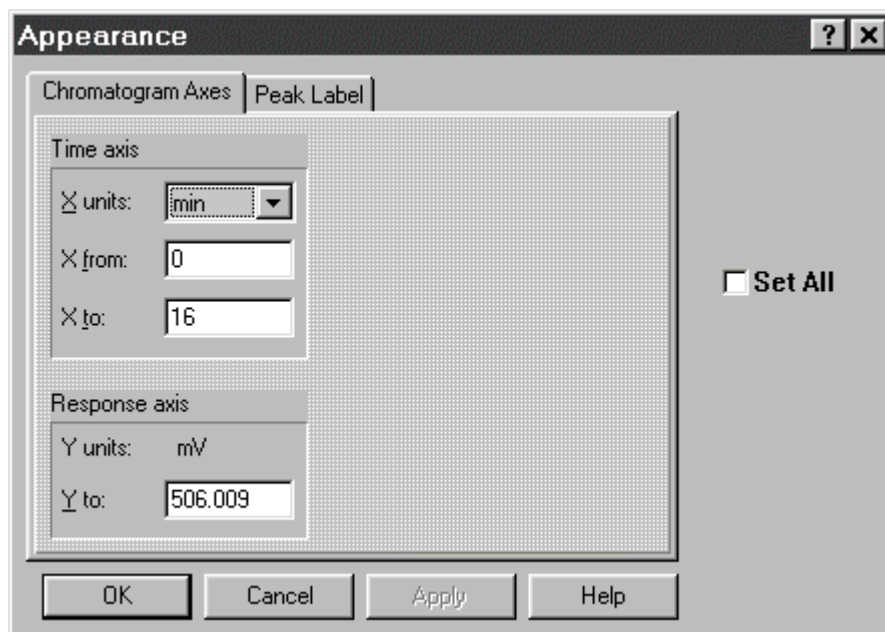
- Click on  or select **Print** of the **Report** menu while the report window is open. The standard printing window of Windows 95 is opened where printer, printing range and number of copies can be selected. After confirmation with **OK** the results including the chromatogram are printed out.
- Close the report window.


A report can also be printed out without preceding screen output:

- Click on  or select **Make report** of the **Process** menu.
- Under **Report Destination**, switch off **Screen** and switch on **Printer**.
- Click the **Report** button. The standard printing window of Windows 95 is opened where printer, printing range and number of copies can be selected. After confirmation with **OK** the results including the chromatogram are printed out.
- Close the report window.

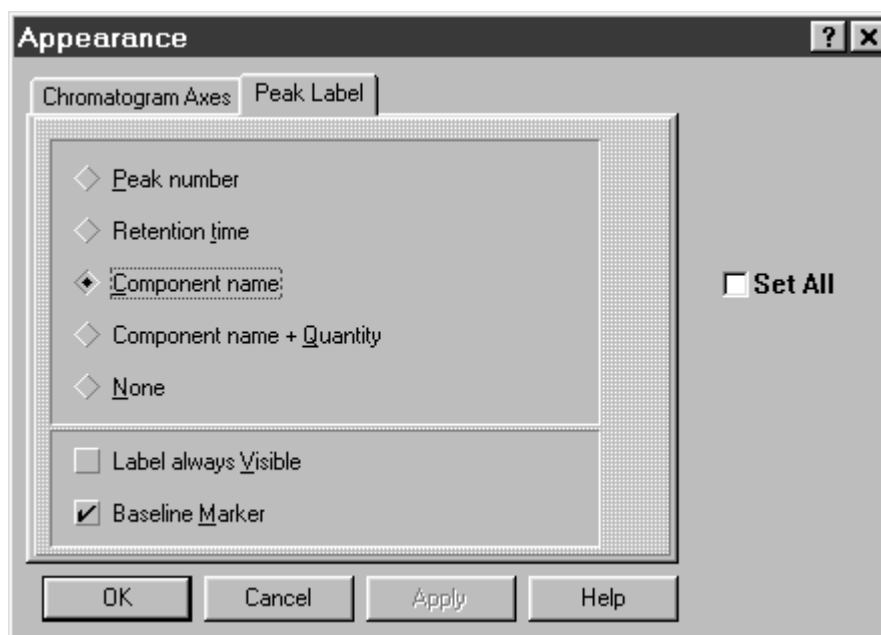
### Set chromatogram view


- Click on  or select **Appearance** of the **View** menu.




- Enter the desired limits for the x and y axis in the **Chromatogram Axes** tab and click **Apply**. The selected range is displayed immediately in the chromatogram window. The chosen axes settings apply also for the printout of chromatograms, but they are only preserved if the chromatogram is saved by clicking on  or with **File / Save** before closing the chromatogram window.

- Open the **Peak Label** tab.




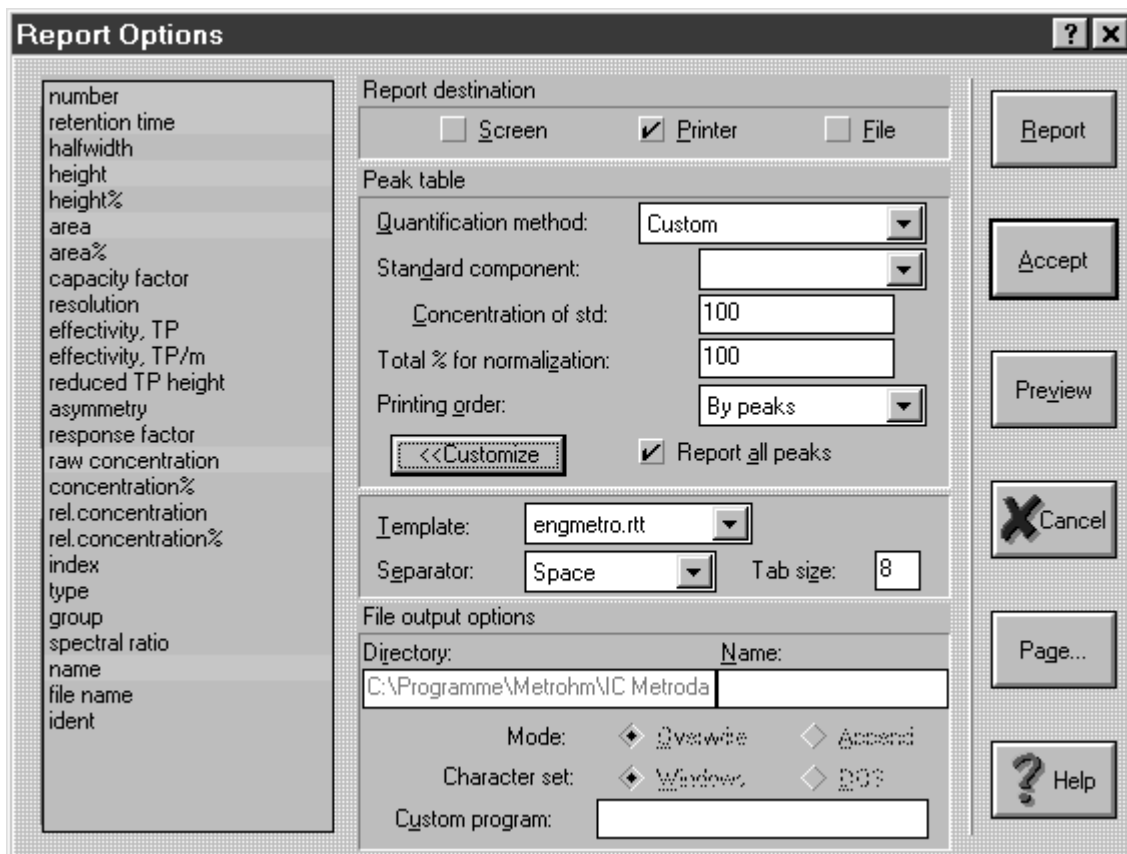
- Select the desired peak label. The **Baseline Marker** option for display of peak start and peak end is enabled by default. Enable the **Label always Visible** option in addition, if the peak label should be always displayed even with zooming. Afterwards, close the **Appearance** window with **OK**.
- Click on  or select **View all** from the **View** menu or double-click on the chromatogram to return to the initial display of all peaks. Then the chromatogram view is immediately optimized for the highest peak after the delay time.

### Zoom by mouse

- Select the desired region in the chromatogram by clicking the left mouse button at one corner of the region and dragging the mouse cursor to the other corner of the region. The region of interest is displayed immediately in the chromatogram window. The zoom settings apply also for the printout of chromatograms and are preserved on saving the chromatogram with **File / Save**.
- Click on  or select **View all** from the **View** menu or double-click on the chromatogram to return to the initial display of all peaks. Then the chromatogram view is immediately optimized for the highest peak after the delay time.

### Change report options

- Click on  or select **Report options** of the **Method** menu.
- Under **Items to report** and **More items to report**, click all desired elements for the report.
- Select **Custom** in the **Quantification Method** field.
- Click the **<<Customize** button.




- Click all desired elements for printout in the report table.
- Click the **<<Customize** button to close the element selection window.
- Click the **Accept** button to save the report options for the next screen or printer output.

### Close chromatogram window

- Close the chromatogram window. A window appears with the message **Changes in \*.chw. Modified: Calibration, Integration, Peaks, Report. Save changes?**
- Click the **Yes** button. A window appears with the message **\*.chw already exists. Overwrite?**
- Click the **Yes** button. A window appears with the message **Method \*.mtw was modified. Save changes?**
- Click the **Yes** button. The **File Save As** window appears.
- Click the **OK** button. A window appears with the message **c:\..... already exists. Overwrite?**
- Click the **OK** button. Method and chromatogram are saved under the selected name.

### Record a sample chromatogram

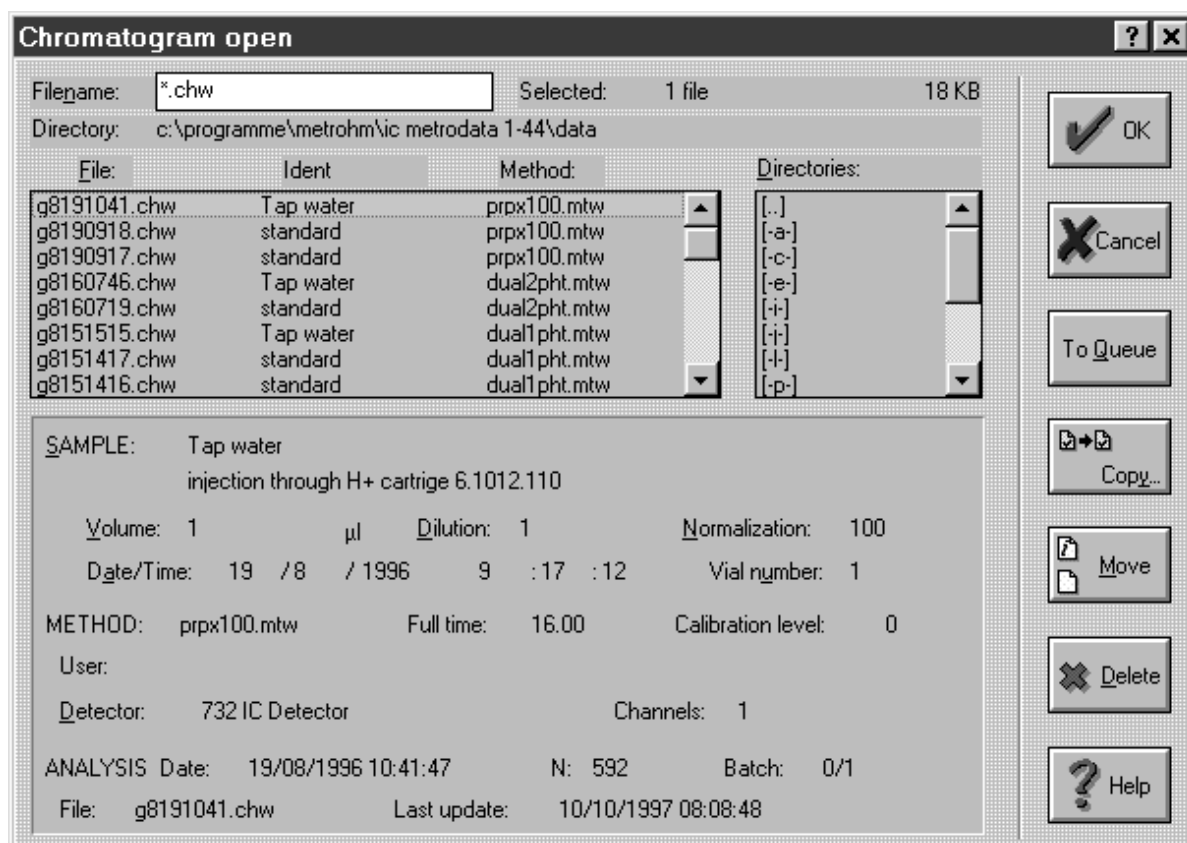
- Click on  or select **Load method and run** of the **Acquire** menu.
- Select the previously saved method **\*.mtw** in the **File Open** window and click **OK**.
- Enter a sample name (max. 14 characters, e.g. "drinking water") as **Ident** in the **Start Run** window.
- If required, enter more parameters to characterize sample and acquisition conditions.
- Click the **OK** button.  
The window for the on-line display of the chromatogram opens. The status display in the upper left corner shows the message **Waiting**.
- Set the injection valve at the 733 IC Separation Center to "FILL" (manually or by program) and fill the sample loop with sample.
- Set the injection valve at the 733 IC Separation Center to "INJECT" (manually or by program). The data acquisition is started automatically. The status display shows **Measure**, beside it running time, analysis time and measuring signal (in mV) are displayed. As soon as the analysis time has passed, the data acquisition is stopped automatically and the chromatogram is integrated. The status display in the upper left corner shows the message **Waiting** again. Now more samples can be recorded with the same method.
- The name of the saved chromatogram is generated automatically and contains date and time in a coded form:  
1<sup>st</sup> numeral:   Alphabetical code for year  
                  (e.g. h = 1997, i = 1998, k = 1999, etc.)

2<sup>nd</sup> numeral: Code for month  
 (1...9 = Jan. ... Sept., a...c = Oct. ... Dec.)  
 3<sup>rd</sup> + 4<sup>th</sup> numeral: Day (01 ... 31)  
 5<sup>th</sup>...8<sup>th</sup> numeral: Time (hh:mm)

- Close the empty chromatogram window. The message **Data acquisition is active! Standby?** appears.
- Click the **Yes** button.

#### Open recorded chromatogram

- Click on or select **Open** of the **File** menu.
- Select the desired file **\*.chw** in the **Chromatogram open** window. The lower part of the window shows the information entered at the recording of the chromatogram.



- Click the **OK** button. The chromatogram window is opened.

### 3.3 Use of existing methods

This section describes the procedure how to record, integrate and calibrate chromatograms using existing methods. The **dual1sup.mtw** method is used as an illustrative example.

#### Available methods

In addition to the standard methods, the **Methods** sub-directory contains several methods configured for the most important separating columns supplied by Metrohm. You will find detailed information concerning these columns in the Application Bulletins (AB) mentioned. All these methods are not write-protected. If you make any change on one of these methods, you should save the method as a new file with a new name.


The **csi\*\*\*\*.mtw** methods are dedicated for use with the 1.714.0010 CSI interface and can be deleted, if you work only with the 1.714.210 or 1.714.310 PC Board.

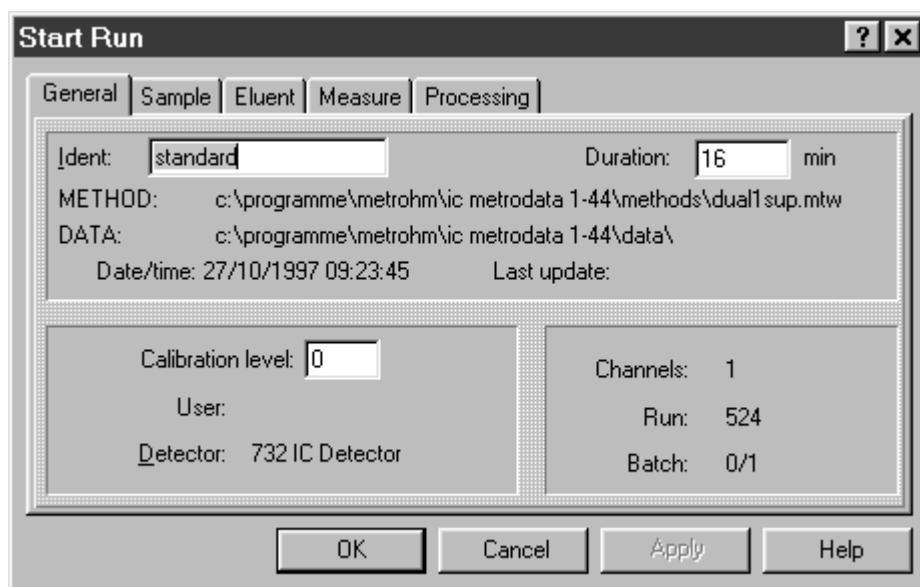
<b>Method</b>	<b>Column</b>	<b>Eluent</b>	<b>Loop</b>	<b>Full Scale</b>	<b>Standards</b>	<b>AB</b>
<b>cation12.mtw</b> <b>(csicat12.mtw)</b>	Metrosep Cation 1-2 6.1010.000	4 mmol/L Tartaric acid 1 mmol/L Dipicolinic acid	10 µL	5 µS/cm	1...10 ppm	257
<b>dual1pht.mtw</b> <b>(csid1pht.mtw)</b>	Metrosep Dual 1 6.1006.020	8 mmol/L Phthalic acid 2 % Acetonitrile pH 4.0 (TRIS)	100 µL	10 µS/cm	5...10 ppm	260
<b>dual1sup.mtw</b> <b>(csid1sup.mtw)</b>	Metrosep Dual 1 6.1006.020 with suppressor	2.4 mmol/L NaHCO <sub>3</sub> 2.5 mmol/L Na <sub>2</sub> CO <sub>3</sub>	20 µL	10 µS/cm	2...10 ppm	260
<b>dual2pht.mtw</b> <b>(csid2pht.mtw)</b>	Metrosep Dual 2 6.1006.100	5 mmol/L Phthalic acid 5 % Acetonitrile pH 4.6 (NaOH)	100 µL	5 µS/cm	5...10 ppm	261
<b>dual2sup.mtw</b> <b>(csid2sup.mtw)</b>	Metrosep Dual 2 6.1006.100 with suppressor	2.0 mmol/L NaHCO <sub>3</sub> 1.3 mmol/L Na <sub>2</sub> CO <sub>3</sub>	20 µL	5 µS/cm	2...10 ppm	261
<b>prpx100.mtw</b> <b>(csi prpx.mtw)</b>	PRP-X100 6.1005.000	2 mmol/L Phthalic acid 10 % Acetone pH 5.0 (NaOH)	100 µL	4 µS/cm	5...10 ppm	265
<b>mpoint.mtw</b>	Metrosep Dual 1 6.1006.020 with suppressor; multi- point calibration	2.4 mmol/L NaHCO <sub>3</sub> 2.5 mmol/L Na <sub>2</sub> CO <sub>3</sub>	20 µL	10 µS/cm	0.4...50 ppm	260
<b>1m732b1.mtw</b>	Standard method for PC board 1 and channel 1					
<b>2m732b1.mtw</b>	Standard method for PC board 1 and channel 2					
<b>1m732b2.mtw</b>	Standard method for PC board 2 and channel 1					
<b>2m732b2.mtw</b>	Standard method for PC board 2 and channel 2					
<b>csi.mtw</b>	Standard method for CSI interface					
<b>importrd.mtw</b>	Standard method for import of chromatograms recorded with the DOS program IC Metrodata 714					

### Preparations

- Insert separating column in IC system and condition it.
- Prepare standards and sample.

### Load standard method and run


- Click on  or select **L**oad method and run from the **A**cquire menu.
- Select the desired method (e.g. **dual1sup.mtw**) in the **F**ile **O**pen window and click the **O**K button. The window **S**tart **R**un appears.



- Enter a name as **Ident** to characterize the standard (max. 14 characters, e.g. "standard").
- Change the analysis time **Duration** if required.
- Enter more parameters to characterize sample and acquirement conditions if required.
- Click the **O**K button.  
The window for the on-line display of the chromatogram opens. The window title line contains sample name, method and run number (e.g. **standard (dual1sup.mtw)01.run**). The status display below shows the message **Waiting**.
- Set injection valve at 733 IC Separation Center to "FILL" (manually or by program) and fill sample loop with standard.
- Set injection valve at 733 IC Separation Center to "INJECT" (manually or by program). The data acquisition is started automatically and stopped as soon as the analysis time has passed. As the **Restart method** option is switched on in the method, the chromatogram is saved automatically and deleted in the chromatogram window.

- Before starting the sample determination, you have to calibrate and perhaps modify the method. Therefore close the empty chromatogram window. The message **Data acquisition is active! Standby?** appears.
- Click the **Yes** button.

### Open the standard chromatogram

- Click on  or select **O**pen from the **F**ile menu.
- Select the chromatogram \*.chw just recorded in the **Chromatogram open** window. The lower part of the window shows the information entered at the recording of the chromatogram.
- Click the **OK** button. The chromatogram window is opened.


### Modify integration parameters

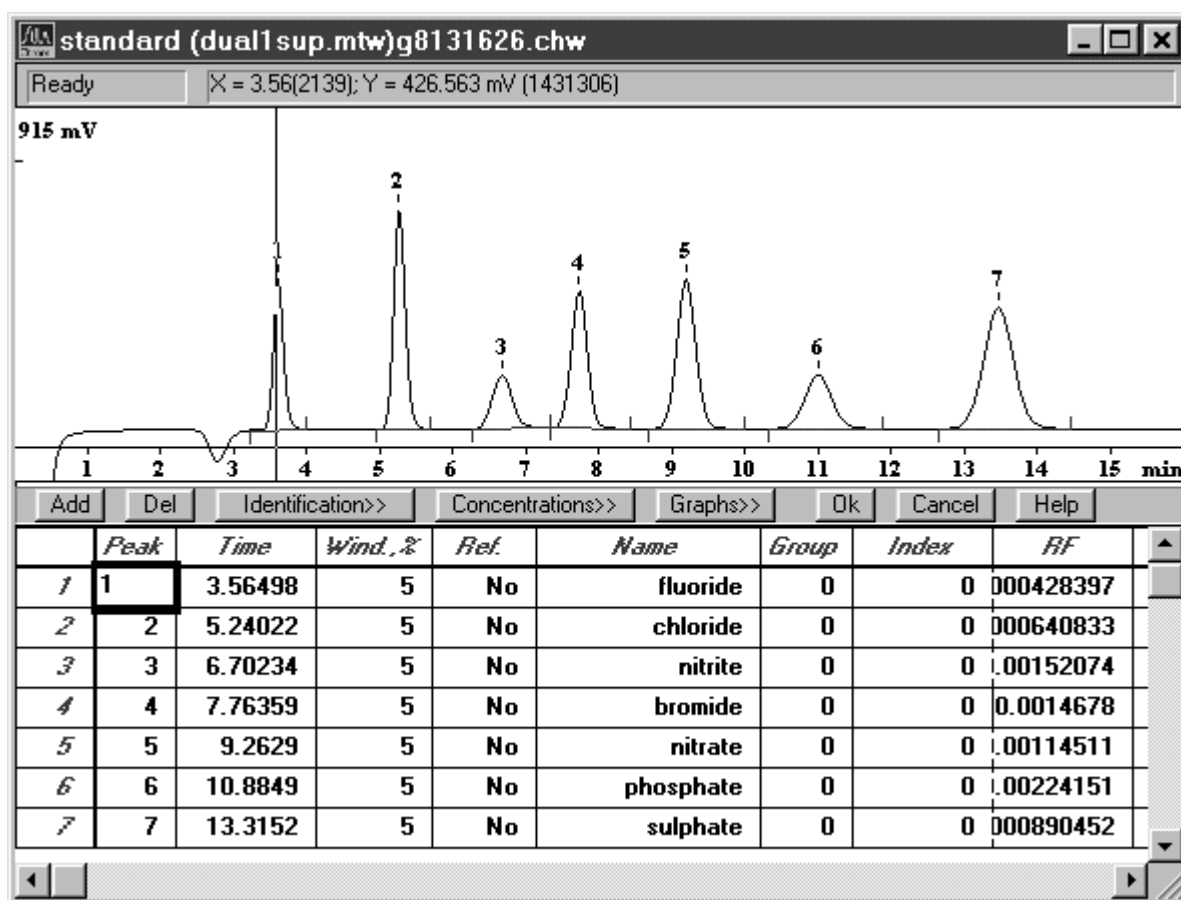
- Click on  or select **I**ntegration from the **M**ethod menu.



- If required, enter the time delay as **Delay** before starting peak integration at the first peak to be detected.
- Click the **Apply** button. The **Integration Parameters** window remains open and the chromatogram is reintegrated.
- Repeat this procedure for all other integration parameters until the result satisfies your expectations. Click **Apply** after each parameter changing.
- Close the **Integration Parameters** window with **OK**.

### Modify peak allocation

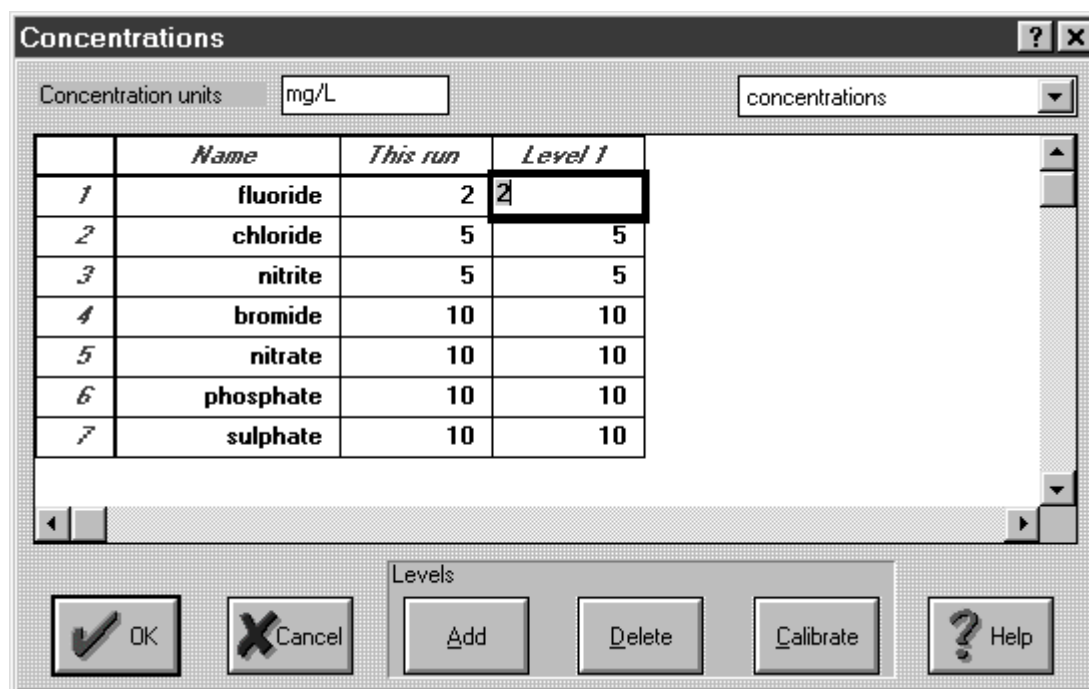
- Click on  or select **Calibration / Components** of the **Method** menu. For all peaks which could be allocated unambiguously to a component this table contains the peak number in the **Peak** column and the corresponding retention time in the **Time** column.



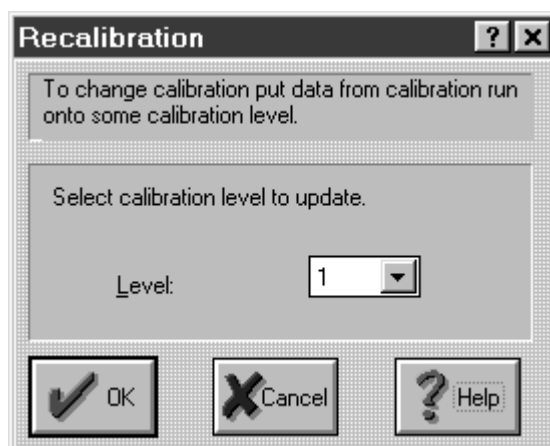
- If the **Peak** column contains a **0** the peak must be manually allocated to a component. In this case, insert the peak number from the chromatogram into the **Peak** column and click the **Time** field with the mouse. The corresponding retention time is then inserted automatically as the new time for this component.

### Start calibration

- Click the **Concentrations>>** button.



- If necessary, change the concentrations of the components in the **Level 1** column.
- Click the **Calibrate** button. The **Recalibration** window appears.



- Select the **L**evel and click on the **OK** button.
- Click the **OK** button in the **Concentrations** window.


### Display calibration curves

- Click the **Graphs>>** button in the **Components** window.
- Select the desired component in the **Component** field for which the calibration curve should be displayed.
- Close the **Component** window by clicking **OK**.
- Close the **Components** window below the chromatogram by clicking **OK**.

### Save chromatogram and method

- Close the chromatogram window. A window appears with the message **Changes in \*.chw. Modified: Calibration, Integration, Peaks, Report. Save changes?**
- Click the **Yes** button. A window appears with the message **\*.chw already exists. Overwrite?**
- Click the **Yes** button. A window appears with the message **Method \*.mtw was modified. Save changes?**
- Click the **Yes** button. The **File Save As** window appears.
- Since the initially loaded method (e.g. **dual1sup.mtw**) is not write-protected, the modified method should be saved with a new name. Therefore enter a new name in the **Filename** field and click **OK**.

### Recording of a sample chromatogram

- Click on  or select **L**oad method and run from the **A**cquire menu.
- Select the previously saved method **\*.mtw** in the **File Open** window and click **OK**.
- Enter a sample name (max. 14 characters, e.g. "drinking water") as **I**dent in the **Start Run** window.
- If required, enter more parameters (e.g. **Dilution**) to characterize sample and acquirement conditions.
- Click the **OK** button.  
The window for the on-line display of the chromatogram opens. The status display below shows the message **Waiting**.
- Set the injection valve at the 733 IC Separation Center to "FILL" (manually or by program) and fill the sample loop with sample.

- Set the injection valve at the 733 IC Separation Center to "INJECT" (manually or by program). The data acquisition is started automatically. The status display shows **Measure**, beside it running time, analysis time and measuring signal (in mV) are displayed. As soon as the analysis time has passed, the data acquisition is stopped automatically and the chromatogram is integrated. The status display in the upper left corner shows the message **Waiting** again. Now more samples can be recorded with the same method.
- Close the empty chromatogram window. The message **Data acquisition is active! Standby?** appears.
- Click the **Yes** button.

## 3.4 Multipoint calibration

This section describes the procedure how to perform a calibration with multiple standards using either an existing or an user-developed method and to save this multipoint calibration as a new method.


### Preparations

- Insert separating column in IC system and condition it.
- Select the full scale range at the 732 IC Detector so that all peaks of the standard with the highest concentration will be inside the measuring range.
- Prepare standards and sample.

### Record first standard chromatogram

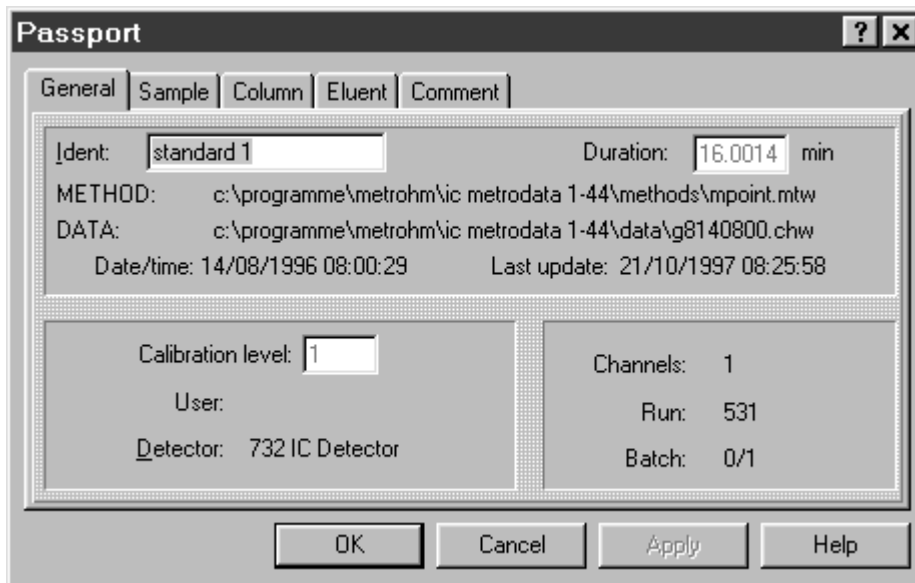
- If you wish to develop a new method based on a standard method proceed according to *section 3.1* (without sample recording).
- If you wish to use an existing example method proceed according to *section 3.2* (without sample recording).
- In both cases, you receive the new method **\*.mtw** and the first standard chromatogram **\*.chw**.

### Record second standard chromatogram

- Click on  or select **Load method and run** from the **Acquire** menu.
- Select the method saved on recording the first standard chromatogram in the **File Open** window and click the **OK** button.
- In the **Start Run** window, enter a name as **Ident** to characterize the standard (max. 14 characters, e.g. "standard #").
- Click the **OK** button.  
The window for the on-line display of the chromatogram opens.  
The status display shows the message **Waiting**.
- Set injection valve at 733 IC Separation Center to "FILL" (manually or by program) and fill sample loop with standard.
- Set injection valve at 733 IC Separation Center to "INJECT" (manually or by program). The data acquisition is started automatically and stopped as soon as the analysis time has passed. The chromatogram is saved and deleted in the chromatogram window. The status display shows the message **Waiting** again.

### Record third to x<sup>th</sup> standard chromatogram

- Click on  or select **Passport** of the **Method** menu.



**Passport** [?] [X]

General | Sample | Column | Eluent | Comment

Ident:  Duration:  min

METHOD: c:\programme\metrohm\ic metrodata 1-44\methods\mpoint.mtw

DATA: c:\programme\metrohm\ic metrodata 1-44\data\g8140800.chw

Date/time: 14/08/1996 08:00:29 Last update: 21/10/1997 08:25:58

Calibration level:

User:

Detector: 732 IC Detector

Channels: 1

Run: 531

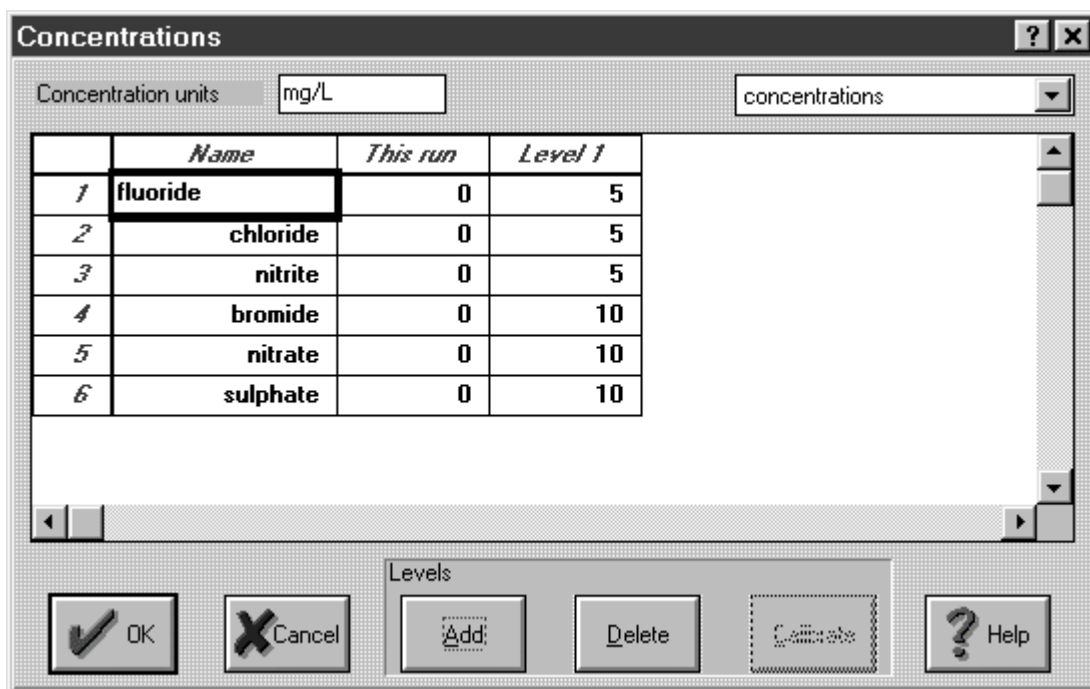
Batch: 0/1

OK Cancel Apply Help

- In the **General** tab, enter a new name as **Ident** characterizing the standard (e.g. "standard #") and click **OK**.
- Set injection valve at 733 IC Separation Center to "FILL" (manually or by program) and fill sample loop with standard.
- Set injection valve at 733 IC Separation Center to "INJECT" (manually or by program). The data acquisition is started automatically and stopped as soon as the analysis time has passed. The chromatogram is saved and deleted in the chromatogram window. The status display shows the message **Waiting** again.
- Repeat this procedure until the last standard has been recorded.
- Close the empty chromatogram window. The message **Data acquisition is active! Standby?** appears.
- Click the **Yes** button.

**Enter concentrations for calibration**

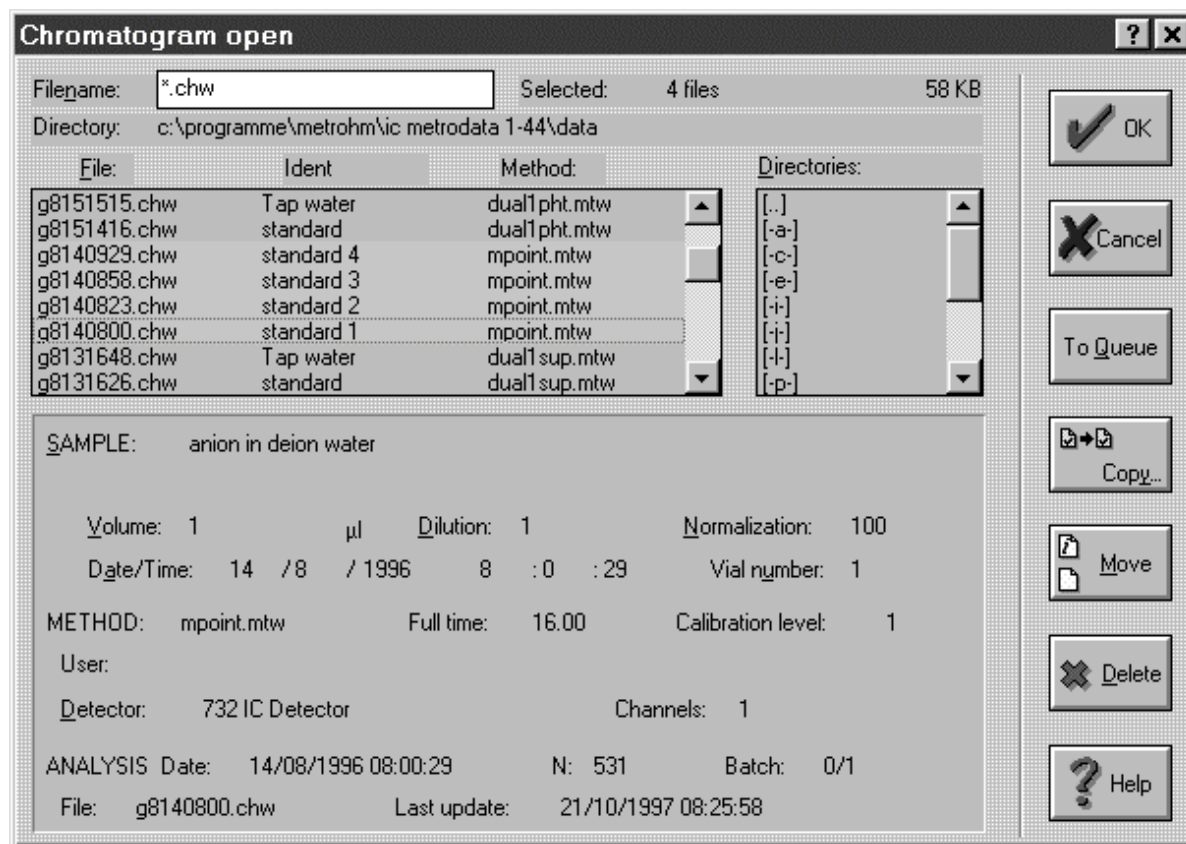
- Select **Open method** of the **File** menu.
- Select the previously saved method in the **File Open** window and click **OK**.
- Select **Calibration / Concentrations** of the **Method** menu.



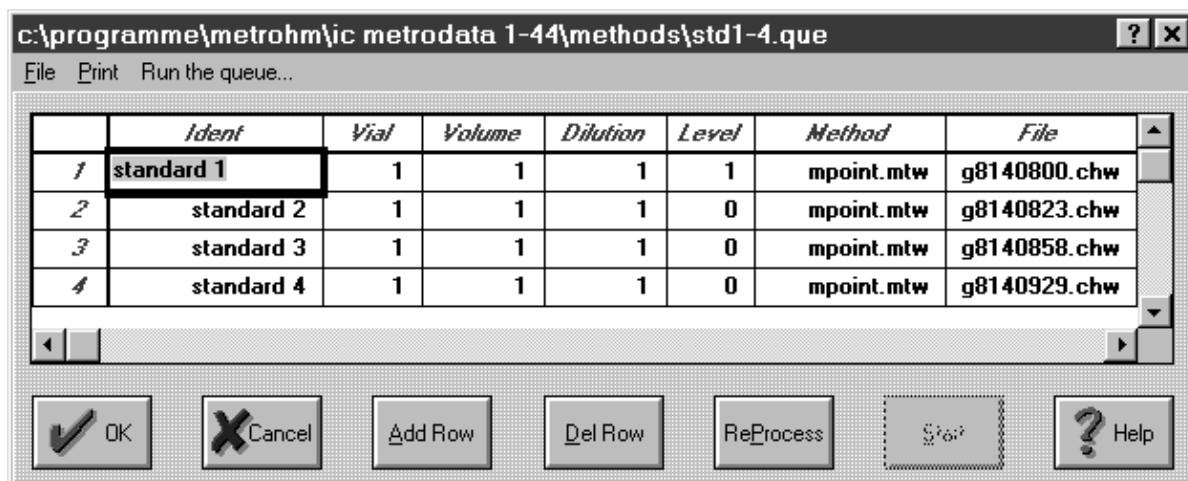
- Click the **Add** button and confirm the suggested number **2** for the **Level** in the **Add level** window by clicking **OK**.
- Enter the concentrations of all components of the second standard in the new **Level 2** column.
- Repeat this procedure for every further standard.
- If all standards have been entered, close the **Concentrations** window by clicking **OK**.
- Close the empty chromatogram window. The message **Method \*.mtw was modified. Save changes?** appears.
- Click the **Yes** button. The **File Save As** window appears.
- Click the **OK** button. A window appears with the message **c:\..... already exists. Overwrite?**
- Click the **OK** button.

### Start calibration

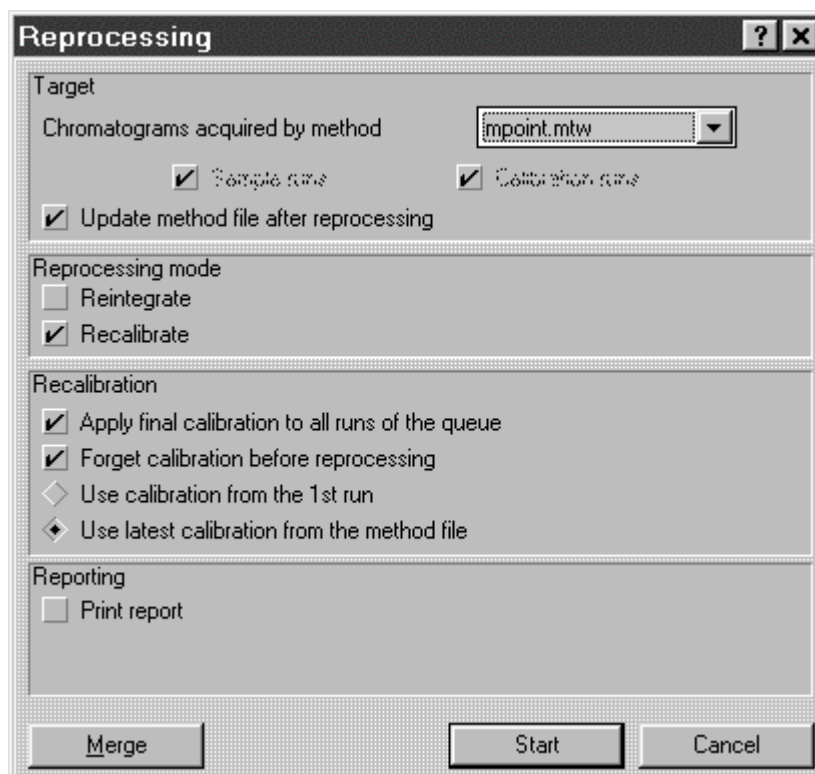
- Click on  or select **Open** of the **File** menu.



- Select all previously recorded standard chromatograms in the **Chromatogram open** window by clicking them with the mouse.
- Click the **To Queue** button. The **Set to Queue** window appears.
- Enter a name for the new queue and click **OK**. The chromatograms are loaded into the queue and a window with the list of all chromatograms added to the queue appears.



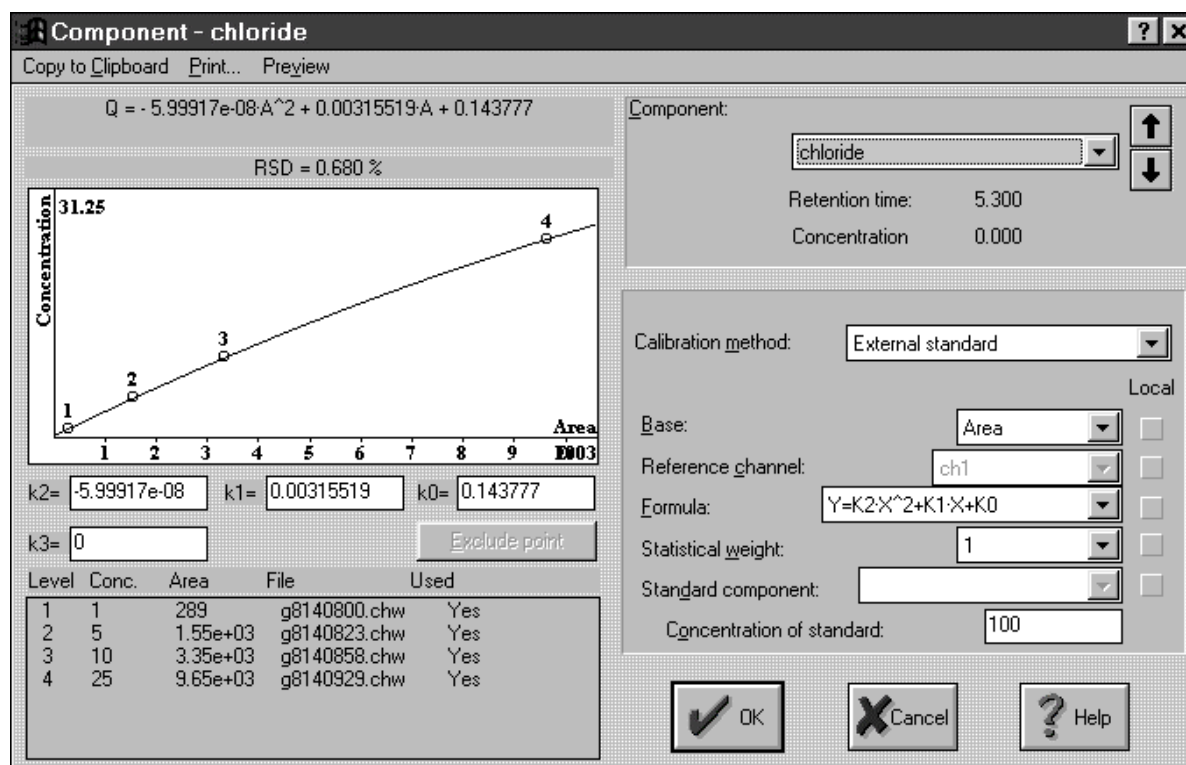
- Because the second up to the  $x^{\text{th}}$  standard have been recorded as samples (0) the levels belonging to the standard have to be entered into the **Level** column. For each level enter the level numbers already defined in the **Concentrations** window into this column (standard 1 = Level 1, standard 2 = Level 2, etc.).
- Afterwards click the **ReProcess** button. In the **Reprocessing** window, switch on the options as shown below.



- Click the **Start** button.

### Modify calibration

- Select **Open method** of the **File** menu.
- Select the method used for calibration in the **File Open** window and click **OK**. An empty chromatogram window appears.
- Select **Calibration / Graphs** of the **Method** menu. The **Component** window appears in which the calibration curves and the corresponding data are displayed.
- Check with the aid of the graphic representation and the displayed percentage residual mean standard deviation **RSD** whether the calibration curve fits optimally the calibration points. Select another function in the **Formula** field if this is not the case.
- If you select a new function the message **You attempt to change GLOBAL parameter! Recalculate all components?** appears. Click either **Yes**, if all components should be recalculated with this new function or **No**, if only the displayed component should be recalculated.
- Select one component after the other in the **Component** field and repeat the procedure to modify the calibration curves.
- Close the **Component** window by clicking **OK**.



**Component - chloride**

Copy to Clipboard Print... Preview

$Q = -5.99917e-08 \cdot A^2 + 0.00315519 \cdot A + 0.143777$

RSD = 0.680 %

Concentration vs. Area graph showing four data points (1, 2, 3, 4) and a fitted curve. The y-axis is labeled 'Concentration' with a value of 31.25. The x-axis is labeled 'Area' with a value of 1003.

Component: chloride

Retention time: 5.300  
Concentration: 0.000

Calibration method: External standard

Base: Area  Local

Reference channel: ch1

Formula:  $Y = K2 \cdot X^2 + K1 \cdot X + K0$

Statistical weight: 1

Standard component:

Concentration of standard: 100


Buttons: OK, Cancel, Help

Level	Conc.	Area	File	Used
1	1	289	g8140800.chw	Yes
2	5	1.55e+03	g8140823.chw	Yes
3	10	3.35e+03	g8140858.chw	Yes
4	25	9.65e+03	g8140929.chw	Yes

### Save method

- Select **S**ave method as of the **F**ile menu. The **File Save As** window appears.
- Click the **OK** button. A window appears with the message **c:\..... already exists. Overwrite?**
- Click the **OK** button.

### Record a sample chromatogram

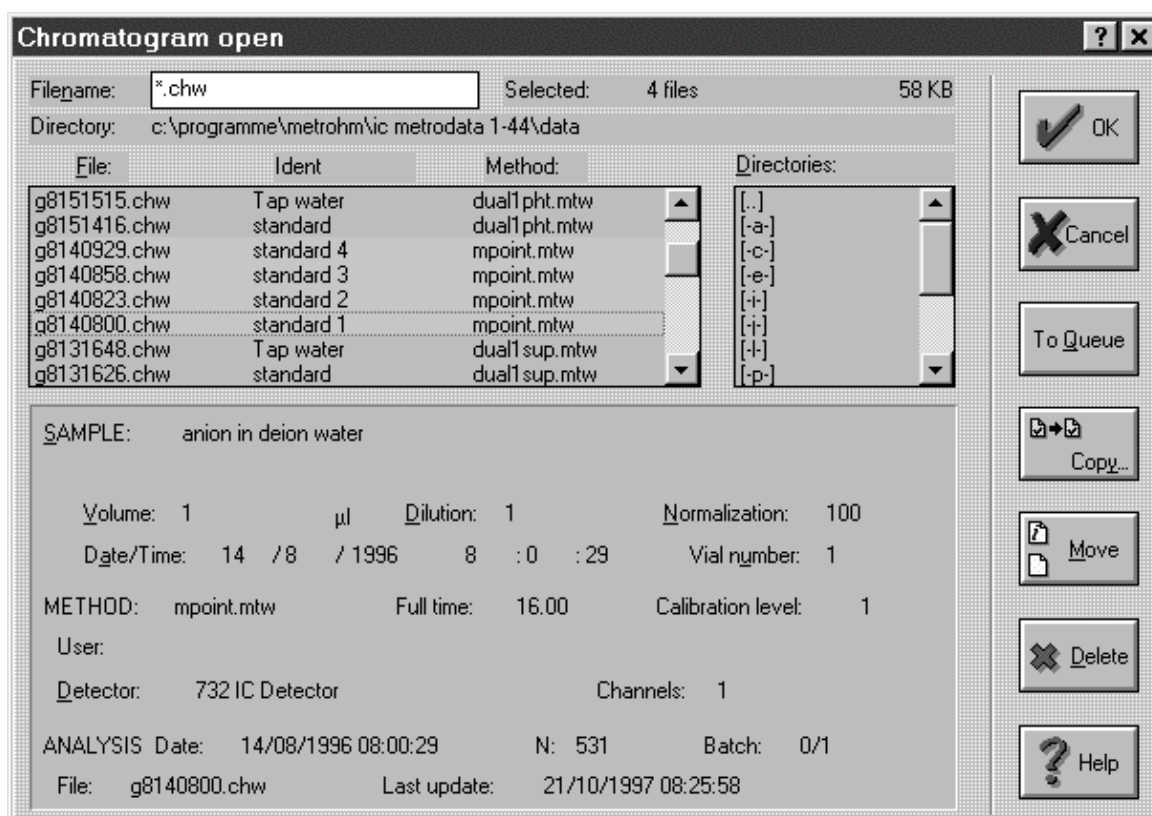
- Click on  or select **R**estart method of the **A**cquire menu.
- Enter a sample name (max. 14 characters, e.g. "drinking water") as **I**dent in the **S**tart **R**un window.
- If required, enter more parameters (e.g. **D**ilution) to characterize sample and acquirement conditions.
- Click the **OK** button.  
The window for the on-line display of the chromatogram opens.  
The status display below shows the message **Waiting**.
- Set the injection valve at the 733 IC Separation Center to "FILL" (manually or by program) and fill the sample loop with sample.
- Set the injection valve at the 733 IC Separation Center to "INJECT" (manually or by program). The data acquisition is started automatically and stopped as the analysis time has passed.

## 3.5 Modify several chromatograms

This section describes the procedure for reintegrating, recalculating and reprinting of several already recorded chromatograms with the aid of a queue.

### Load chromatograms into queue

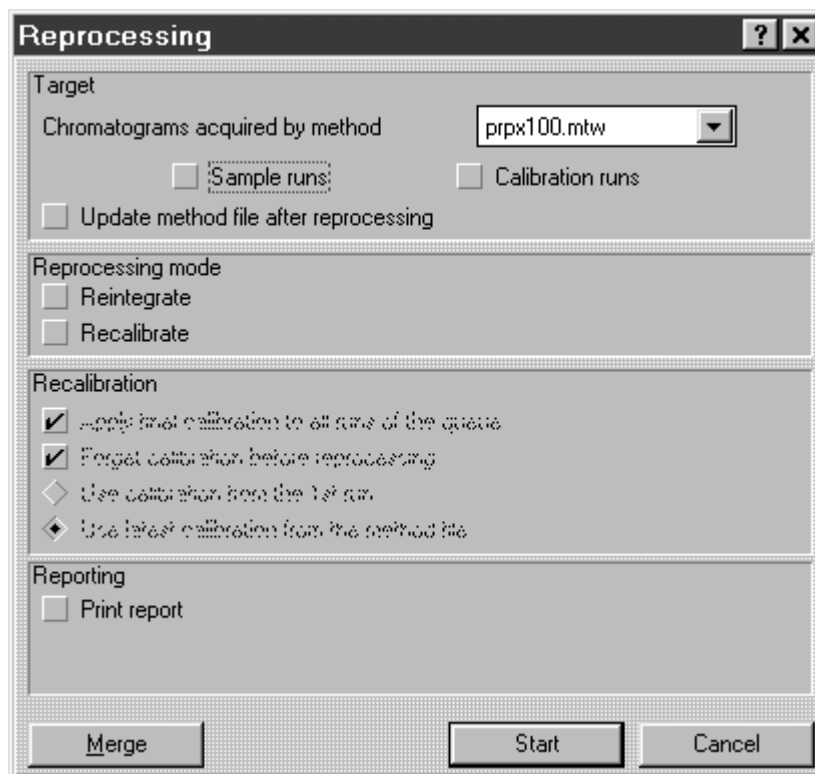
- Click on  or select **Open** of the **File** menu.



- Select all chromatograms to be modified in the **Chromatogram open** window by clicking them with the mouse.
- Click the **To Queue** button. The **Set to Queue** window appears.
- Enter a name for the new queue and click **OK**. The chromatograms are loaded into the queue and a window appears with the list of all chromatograms added to the queue.

### Start recalculation

- Click the **ReProcess** button. The name of the method used for recording of the first chromatogram appears in the **Chromatograms acquired by method** field. If the queue contains other chromatograms recorded with different methods these could be selected in this list field with the mouse.



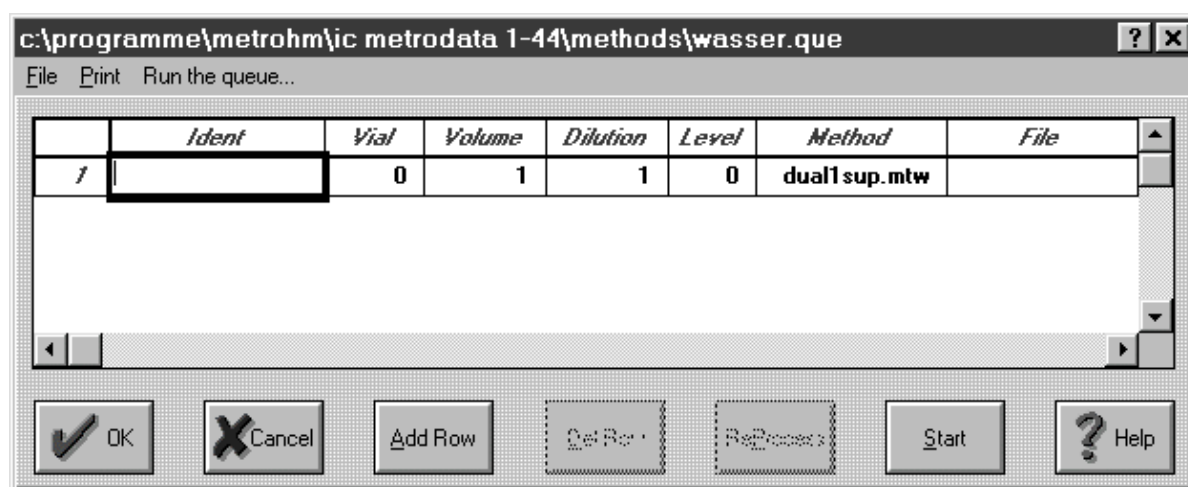
- Select the desired method for recalculation of all chromatograms recorded with this method in the **Chromatograms acquired by method** field.
- If the sample chromatograms (Level = 0) should be recalculated switch on the **Sample runs** option.
- If the standard chromatograms (Level  $\geq 1$ ) should be recalculated switch on the **Calibration runs** option.
- If the chromatograms should be reintegrated switch on the **Reintegrate** option (if the queue contains standards, the **Recalibrate** option is switched on automatically). When the reprocessing is started the **Integration parameters** window appears (procedure see *section 3.2 – Modify integration parameters*).
- If a new calibration should be performed switch on the **Recalibrate** option. In this case, select the desired options in the **Recalibration** part of the window.
- If a report should be printed out automatically for all recalculated chromatograms switch on the **Print report** option. When the reprocessing is started the **Report options** window appears (procedure see *section 3.2 – Change report options*).
- Click the **Start** button.

## 3.6 Use of sample tables

This section describes how to construct sample data tables with the aid of a queue. These tables can be processed automatically and are suited for operation with an Autosampler.

### Create new queue

- Select **Queue/Batch** of the **File** menu.
- Enter a name for the new queue in the **Filename** field and click **OK**.
- In the **File open** window, select the method to be used in the queue. A window with a sample table appears, which contains a row for sample data entry.



- Enter a sample name in the **Ident** field.
- Enter the vial number on the Autosampler in the **Vial** field.
- Enter the volume of the sample loop in the **Volume** field (only if the volume is changed).
- Enter the dilution factor for the sample in the **Dilution** field.
- Enter the following numbers in the **Level** field:
  - 0 for samples
  - ≥ 1 for standards (the level concentrations have to be defined in advance in the method)
- Enter the name **\*.mtw** of the method for processing the sample in the **Method** field (the method name has to be defined in advance).
- The **File** field needs no input (the name of the saved file is entered automatically in this field at the end of the data acquisition).
- When all data are filled in in the first line, click the **Add Row** button to insert a second line for entering sample data. At the same moment the data of the first line are copied into the second line.

- Overwrite the fields of the second line with the data for the second sample.
- Repeat this procedure until all sample data have been entered.

### Start queue

- Click the **Start** button to start the processing of the sample table. The window **Do you really wish to start the queue?** appears.
- Click the **Yes** button. The window for the on-line display of the chromatogram opens. The status display shows the message **Waiting**. Now the program waits for a start command which is normally triggered by an Autosampler.



*With methods with automatic report output (**Make Report** option in **Method / Method setup / Processing** switched on), pay attention that the start command by the Autosampler is not triggered before the report output has been finished.*

### Open queue during data acquisition

- Select **Batch** of the **View** menu. The sample data table is displayed, where all the samples worked off have an entry in the **File** field. These rows and the first row without file entry (current sample) cannot be changed during data acquisition.
- All other rows with samples not worked off can be changed at any time. For changing the method, select the menu point **File / Change method** and select the new method from the list of all existing methods.
- New rows can be added with **Add Row**, existing rows can be deleted with **Del Row**.
- When you have finished the changes, click the **OK** button. The window is closed again.

### Start reprocessing

- For reprocessing of the recorded chromatograms proceed according to *section 3.5*.

### Start existing queue

- Select **Queue/Batch** of the **File** menu.
- Select the desired queue **\*.que** in the **File open** window and click **OK**.
- Select **Clear file names** of the **File** menu to delete all files **\*.chw** in the **File** column recorded at the last start of the queue.
- Click the **Start** button or select **Run the queue...** to start the processing of the sample table. The message **Do you really wish to start the queue?** appears.
- Click the **Yes** button. The window for the on-line display of the chromatogram opens. The status display shows the message **Waiting**. Now the program waits for a start command which is normally triggered by an Autosampler.




*With methods with automatic report output (**Make Report** option in **Method / Method setup / Processing** switched on), pay attention that the start command by the Autosampler is not triggered before the report output has been finished.*



## 3.7 Export data

This section describes how to export data via clipboard or report output for further processing with other programs.



### Export chromatogram via clipboard

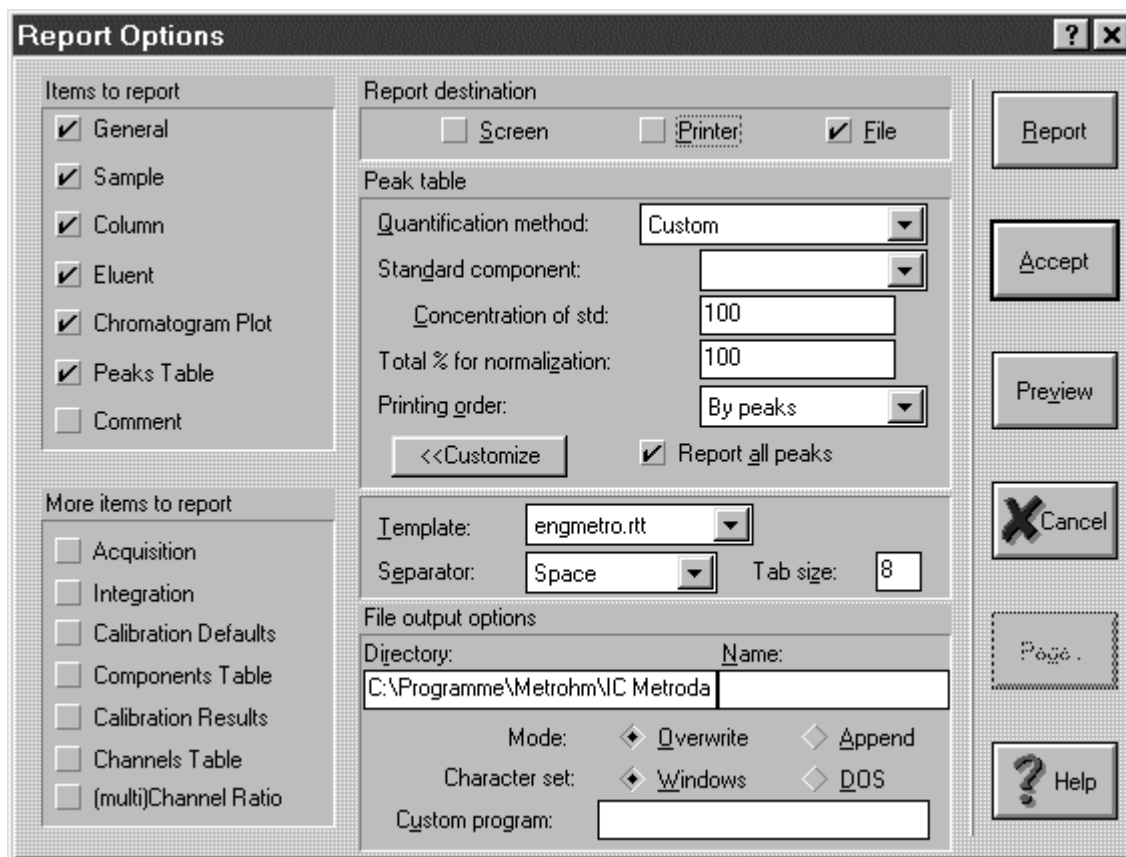
- Click on  or select **O**pen of the **F**ile menu.
- Select the desired chromatogram in the **Chromatogram open** window and click **OK**. The recorded chromatogram is displayed in a window.
- Select the desired view of the chromatogram in the **V**iew menu or by zooming with the mouse (see *section 3.2*).
- Select **C**opy to **C**lipboard of the **E**dit menu. The chromatogram is copied into the Windows clipboard from where it can be inserted into another program.

### Export report via clipboard

- Click on  or select **O**pen of the **F**ile menu.
- Select the desired chromatogram in the **Chromatogram open** window and click **OK**. The recorded chromatogram is displayed in a window.
- Click on  or select **M**ake **r**eport of the **P**rocess menu. The **Report Options** window appears.
- Switch on the **S**creen option under **R**eport **D**estination.
- If required, change the report options (see *section 3.2*).
- Click the **R**eport button. A window appears in which the results (without chromatograms) are displayed.
- Select **C**opy to **C**lipboard of the **E**dit menu. The report is copied into the Windows clipboard from where it can be inserted into another program.

### Export via file report


- Click on  or select **Open** of the **File** menu.
- Select the desired chromatogram in the **Chromatogram open** window and click **OK**. The recorded chromatogram is displayed in a window.
- Click on  or select **Make report** of the **Process** menu. The window **Report Options** appears.
- Switch on the **File** option under **Report Destination**.

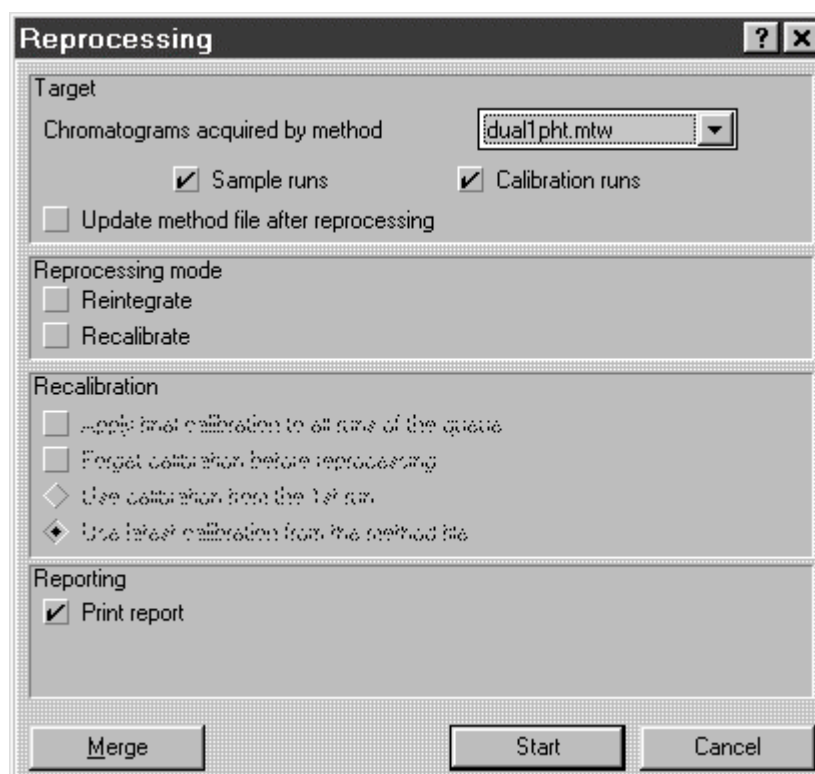


- Enter a name for the file to be saved in the **Name** field under **File output options**.
- Reports and chromatogram plots are saved into the **.../reports** directory. Click the **Directory** button if you wish to change the standard directory for saving chromatogram plots or reports. The new directory must have been defined in advance.
- For **Mode**, click one of the options **Overwrite** (overwrite data) or **Append** (append data in file).
- For **Character Set**, click one of the options **Windows** or **DOS**.

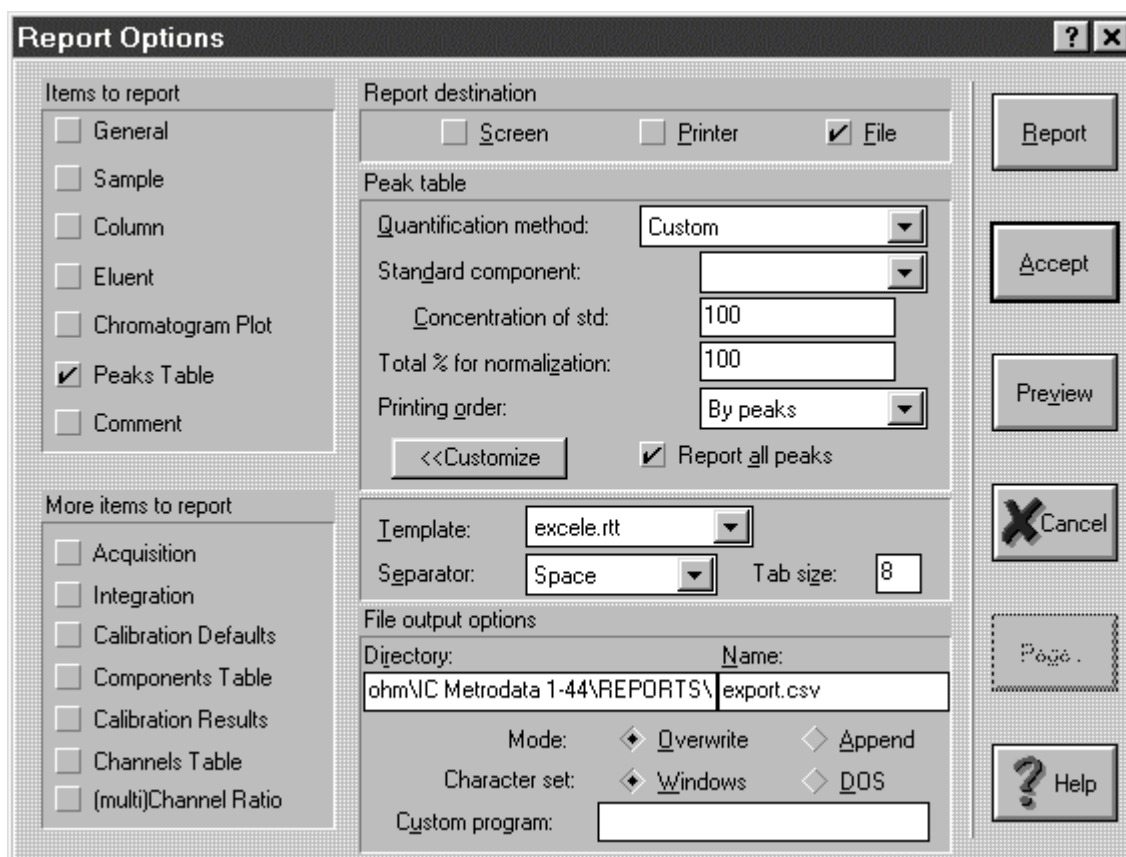
- If required, change the other report options (see *section 3.2*). Switch on the **Chromatogram Plot** option if also the chromatogram plot should be exported in addition to the report.
- Click the **Report** button. The two files \* (text file) and \*.wmf (graphic file) are saved in the specified report directory with the desired file names and can be inserted from there into other programs.

### Export to Excel

- Click on  or select **Open** of the **File** menu.
- In the **Chromatogram open** window, select all chromatograms to be exported (see *section 3.5*).
- Click the **To Queue** button. The **Set to Queue** window appears.
- Enter a name for the new queue and click **OK**. The selected chromatograms are loaded into the queue. A window appears where all the chromatograms added to the queue are listed.
- Click the **ReProcess** button.



- In the **Chromatograms acquired by method** window, select the desired method for export of all the chromatograms recorded with this method (chromatograms recorded with different methods cannot be exported at the same time).
- If the chromatograms should not be reintegrated or recalibrated, switch off the **Reintegrate** and **Recalibrate** options.
- Switch on the **Sample runs** option for export of sample run data and **Calibration runs** for export of calibration run data.
- Switch on the **Print Report** option.
- Click on the **Start** button. The **Report Options** window appears.



**Report Options**

**Items to report**

- General
- Sample
- Column
- Eluent
- Chromatogram Plot
- Peaks Table
- Comment

**More items to report**

- Acquisition
- Integration
- Calibration Defaults
- Components Table
- Calibration Results
- Channels Table
- (multi)Channel Ratio

**Report destination**

- Screen
- Printer
- File

**Peak table**

Quantification method: Custom

Standard component: [ ]

Concentration of std: 100

Total % for normalization: 100

Printing order: By peaks

<<Customize  Report all peaks

**File output options**

Template: excele.rtt

Separator: Space Tab size: 8

Directory: ohm\IC Metrodata 1-44\REPORTS\ Name: export.csv

Mode:  Overwrite  Append

Character set:  Windows  DOS

Custom program: [ ]

Buttons: Report, Accept, Preview, Cancel, Help

- Switch on the **Peaks table** option in the **Items to report** field and switch off all other options.
- Switch on the **File** option in the **Report destination** field and switch off all other options.
- Select **Custom** in the **Quantification method** field.
- Click on **<<Customize** and select all data elements to be exported.
- Select **excele.rtt** in the **Template** field.
- Select **Semicolon** in the **Separator** field.

- Enter the directory for storage of the exported files in the **D**irectory field.
- Enter the name of the exported file **\*.csv** in the **N**ame field.
- Select the **O**verwrite option (existing data in the file are overwritten) or the **A**ppend option (data are added to the file) for **M**ode.
- Select the **W**indows option for **C**harter Set.
- Click on **R**eport. The data are saved in the **\*.csv** file.
- Open the exported file **\*.csv** in Microsoft Excel (select file type **Text files \*.prn; \*.txt; \*.csv**).
- Mark all columns containing data.
- Select **S**ort... of the **D**ata menu.
- Select the desired column(s) for sorting (e.g. **N**ame or **I**dent) and click the **M**y list has header row option. Start the sorting with **O**K.
- Delete all unnecessary rows containing horizontal lines, sums and units.

## 3.8 Method associated remote control

This section describes the procedure how to associate a time program for the 732 IC Detector with a method. In order to do this, a COM port of the PC and the serial interface of the 732 IC Detector must have been connected by a 6.2125.060 (25 pin/25 pin) or a 6.2125.110 (25 pin/9 pin) cable. For remote control of the 709 IC Pump, the pump must have been connected to the 732 IC Detector by a 6.2125.060 cable (see 732/733 Instruction Manual).

### Set RS232 parameters at 732 IC Detector

- Set the parameters for the RS232 interface of the 732 IC Detector as follows:

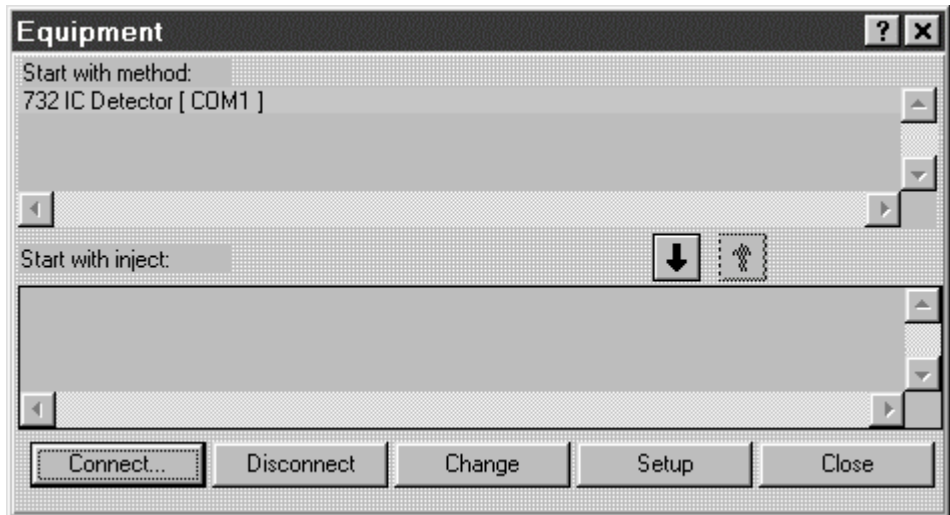
```
>CONFIG/RS settings
  baud rate:           9600
  data bit:            8
  stop bit:            1
  parity :             none
  handshake:           HWS
  RS control:         on
```

### Load driver for 732 IC Detector

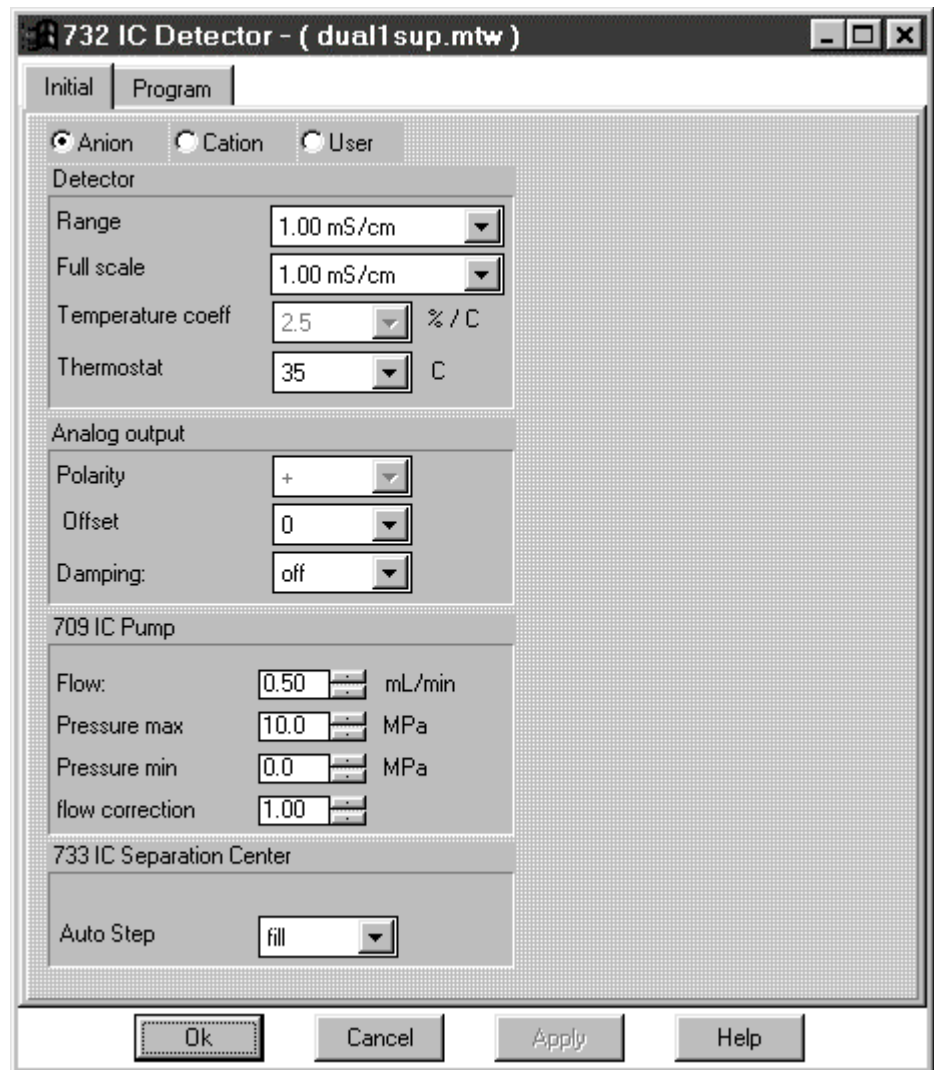
- Select **Equipment setup** of the **Options** menu.
- Click on **Load device...** and open the **ic732.equ** file in the **File Open** window.
- In the **Select driver for use with 732 IC Detector** window just opened, double-click the desired **Serial Port** to which the 732 IC Detector is connected.
- Close the **Configured equipment control drivers** window. Confirm the question **Equipment configuration is modified. Save changes?** with **Yes**.

### Associate time program with existing method

- Select **Open method** of the **File** menu.
- Select the method with whom a time program should be associated and click **OK**.
- Select **Equipment** of the **Method** menu.
- Click the **Connect** button in the **Equipment** window.
- Double-click **732 IC Detector[ COM# ]** in the **Select driver for use with \*** window.
- **732 IC Detector[ COM# ]** is entered into the **Start with method** field in the **Equipment** window. This corresponds to a "cycle program" in the 732 IC Detector. If the program should be started by an "Inject" at valve A, this row must be moved into the lower **Start with inject** field by clicking the **↓** button.



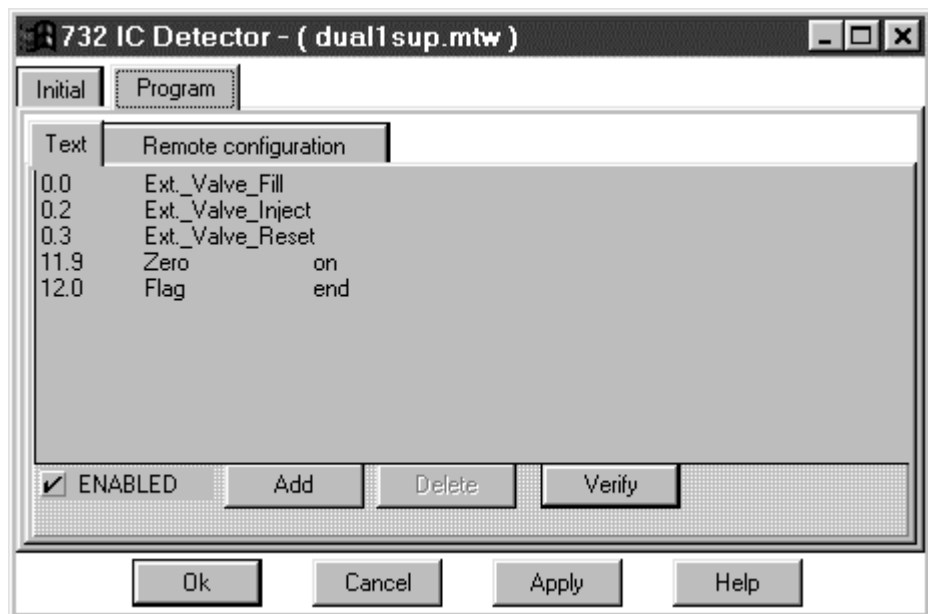
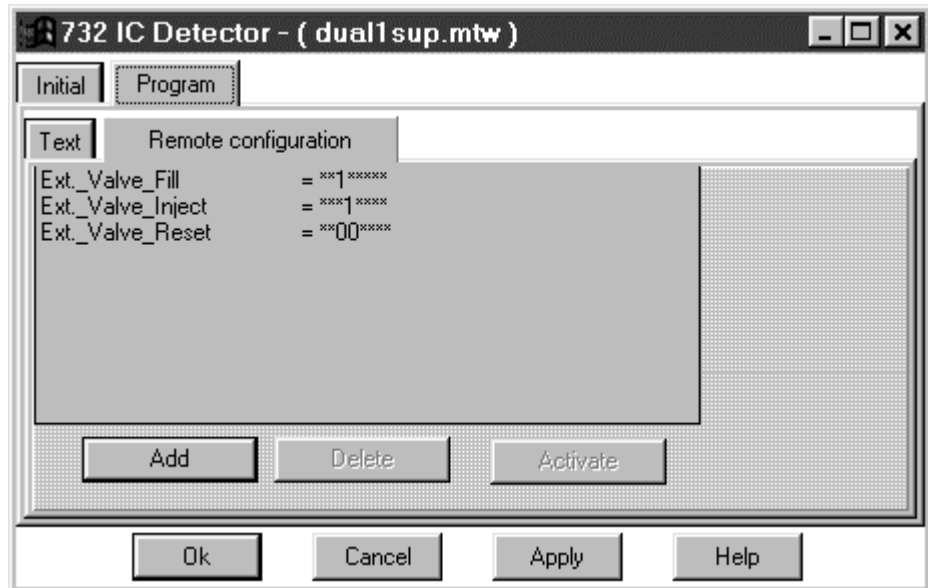
- First click to **732 IC Detector[ COM# ]** and then click the **Setup** button.




- Select the IC system type in the **Initial** tab. With **Anion** and **Cation** temperature coefficient and polarity are set automatically, with **User** these values can be combined independently.
- Change the parameters for 732 IC Detector, 733 IC Separation Center and 709 IC Pump to the values to be set for these instruments at the start of the method.
- First open the **Program** tab, then open the **Text** tab. Click the **Add** button to add a new program line.
- Enter the time **x.x** in min into the first field of the program line.
- Select the desired program point in the second field.
- Select the parameter belonging to the program point in the third field. For **Flow**, **Pmax** and **Pmin** values must be entered, for **Remote 1**, **0** or **\*** must be entered. A certain remote line position can be changed by moving the cursor in front of this position and then entering **1**, **0** or **\***.
- Click the **Add** button to add new program lines or click the **Delete** button to delete program lines. Faulty program points are displayed in the lower part of the program field.
- If you wish to use predefined remote instructions, open the **Remote configuration** tab.
- Click the **Add** button to add a new remote instruction.
- Enter any name you like for the remote instruction (max. 19 characters, e.g. **Ext. Valve Fill**) in the first field.
- Enter **1**, **0** or **\*** for the corresponding remote instruction for remote control lines 1...8 in the second field. A certain remote line position can be changed by moving the cursor in front of this position and then entering **1**, **0** or **\***.
- Click the **Add** button to add more remote instructions or click the **Delete** button to delete remote instructions.
- Click the **Activate** button. The entered remote instruction are added to the standard program points and can also be selected.
- Open the **Text** tab and add the predefined remote instructions into the time program.
- After finishing the programming, click the **Apply** button. The program and the parameters are tested for consistency.
- Switch on the **ENABLED** option and close the window with **OK**.
- Close the **Equipment** window with **Close**.
- Select **Save method as** of the **File** menu and save the changed method under the same or a new name.

**Example for remote instructions and time program**

In the **Remote configuration** tab, three instructions for control of an external valve with contact closure at the remote lines 3 and 4 are defined. These instructions are then used in the **Text** tab in the time program.



### Start cycle program and data acquisition

- Click on  or select **R**estart method of the **A**cquire menu.
- Update the parameters in the **Start Run** window and start method with **OK**.
- The parameters stored in the method and the time program are sent to the 732 IC Detector. \* in the lower left part of the window shows that the PC is sending data.
- As soon as the program at the 732 IC Detector is ready, it will be started automatically. This is indicated by the blinking LED in the <PROG R/S> key at the 732 IC Detector. Depending on the configuration in the **M**easure tab, the data acquisition proceeds as follows:

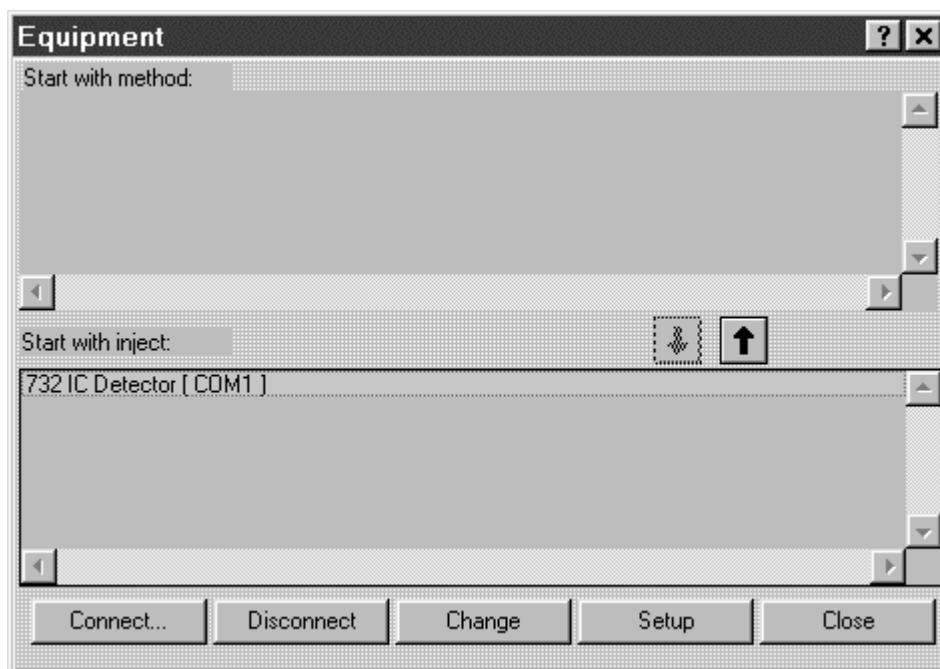
**S**tart mode = **E**xtern → Data acquisition is started with the **I**nject instruction in the time program.


**S**tart mode = **M**anual → Data acquisition is started as soon as the time program at the 732 IC Detector is running.

- If the **R**estart Method option is selected in the **M**ethod / **M**ethod Setup / **P**rocessing menu, the time program is restarted at the end of the program. If the **R**estart Method option is not selected in the **M**ethod / **M**ethod Setup / **P**rocessing menu, only one cycle of this program is performed. If the method is started from a queue, the program is stopped as soon as all rows of method X are worked off.
- The time program is stored as program type **c**ycle with **n**umber of **c**ycles = 1. The time program and the parameters are sent again to the 732 IC Detector at the end of the chromatogram. Therefore, program and parameters can be changed during a running method, but the changes are not effective until the next cycle.

**Start inject programm and data acquisition**

- Select **Equipment** of the **Method** menu.
- Click on **732 IC Detector[ COM# ]** in the **Start with method** field. Afterwards, click the **↓** button to move this entry into the lower **Start with inject** field.



- Click on  or select **Restart method** of the **Acquire** menu.
- Update the parameters in the **Start Run** window. Open the **Measure** tab and select the **Extern** option for **Start mode**. Start the method with **OK**.
- The parameters stored in the method and the time program are sent to the 732 IC Detector. \* in the lower left part of the window shows that the PC is sending data.
- As soon as the program at the 732 IC Detector is ready, the LED in the <PROG R/S> key at the 732 IC Detector lights up. The program is now waiting for an **Inject** at the valve A of the 733 IC Separation Center.
- If the **Restart Method** option is selected in the **Method / Method Setup / Processing** menu, the time program is restarted at the end of the program. If the **Restart Method** option is not selected in the **Method / Method Setup / Processing** menu, the program is performed only once. If the method is started from a queue, the program is stopped as soon as all rows of method X are worked off.
- A time program of the **Inject** type is also stored as program type **cycle** with **number of cycles = 1**. The time program and the parameters are sent again to the 732 IC Detector at the end of the chroma-


togram. Therefore, program and parameters can be changed during a running method, but the changes are not effective until the next data acquisition.

### Stop a running program


During the program run (green LED in the <PROG> key of the 732 IC Detector is blinking) the <PROG> key is blocked. A running program can be stopped as follows:

- **Stop data acquisition, reject chromatogram, stop and restart program**

Click on  or select **A**cquire / **S**uspend chromatogram to stop data acquisition.

Click on  or select **A**cquire / **R**estart method. Confirm the question **Available data will be lost. Continue?** with **Yes**. The **Start Run** window appears. Send the program to the 732 IC Detector by clicking **OK**.

- **Stop data acquisition, save chromatogram, stop program**  
Close the data acquisition window. Confirm the question **Data acquisition is activ! Standby?** with **Yes**. If the chromatogram should be saved, confirm the question **01.run not saved. Save?** with **Yes**. Also confirm the question **Method x modified. Save changes?** with **Yes**.
- **Stop data acquisition, save chromatogram, continue program**

Click on  or select **A**cquire / **F**inish chromatogram to stop the data acquisition. The program continues until the **End** flag is set.

If a **R**estart method is set before the program at the 732 IC Detector has been finished, the following messages appear:

- **Can't use 732 IC Detector while time program running!** Confirm this message with **OK**.
- **Detection of hardware failed on 732 IC Detector.** The program at the 732 IC Detector is stopped. This is shown in the upper left part of the field with **TempStop**. Restart the program with **A**cquire / **R**estart method.

## 3.9 Manual remote control

This section describes the procedure how to send parameters and time programs to the 732 IC Detector and trigger manually certain functions. In order to do this, a COM port of the PC and the serial interface of the 732 IC Detector must have been connected by a 6.2125.060 (25 pin/25 pin) or a 6.2125.110 (25 pin/9 pin) cable. For remote control of the 709 IC Pump, the pump must have been connected to the 732 IC Detector by a 6.2125.060 cable (see 732/733 Instruction Manual).

### Set RS232 parameters at 732 IC Detector

- Set the parameters for the RS232 interface of the 732 IC Detector as follows:

```
>CONFIG/RS settings
  baud rate:           9600
  data bit:            8
  stop bit:           1
  parity :            none
  handshake:          HWS
  RS control:         on
```

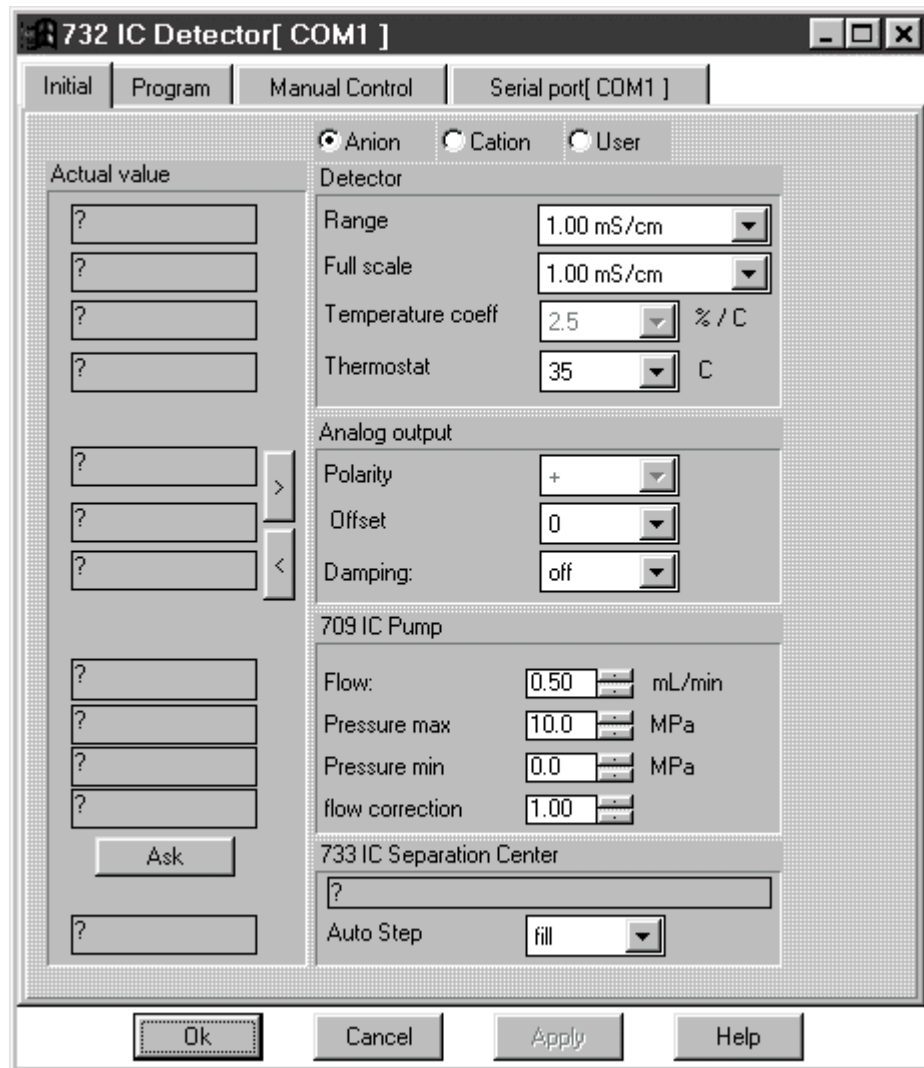
### Load driver for 732 IC Detector

- Select **Equipment setup** of the **Options** menu.
- Click on **Load device...** and open the **ic732.equ** file in the **File Open** window.
- In the **Select driver for use with 732 IC Detector** window just opened, double-click the desired **Serial Port** to which the 732 IC Detector is connected.
- Close the **Configured equipment control drivers** window. Confirm the question **Equipment configuration is modified. Save changes?** with **Yes**.

### Send and receive parameters

- Select **Equipment setup** of the **Options** menu.
- Click on **732 IC Detector[ COM# ]** in the **Configured equipment control drivers** window. Click the **Setup** button. The **INITIAL** tab in the **732 IC Detector[ COM# ]** window is opened.
- Click on **Ask**. The current parameters of the 732 IC Detector are entered into the **Actual value** fields. \* in the lower left part of the window shows that the PC is receiving data.
- Click on **>**. The parameters are now entered into the fields at the right side of the **Initial** tab.
- Select the IC system type in the **Initial** tab. With **Anion** and **Cation** temperature coefficient and polarity are set automatically, with **User** these values can be combined independently.

- Change the parameters for 732 IC Detector, 733 IC Separation Center and 709 IC Pump on the right side to the desired values to be set for these instruments.
- Click on < . The parameters are now sent to the 732 IC Detector. \* in the lower left part of the window shows that the PC is sending data.



### Write, send and activate a program

- Select **Equipment setup** of the **Options** menu.
- In the **Configured equipment control drivers** window, click on **732 IC Detector[ COM# ]** and afterwards on **Setup**. The **INITIAL** tab in the **732 IC Detector[ COM# ]** window is opened.
- First open the **Program** tab, then open the **Text** tab. Click the **Add** button to add a new program line.
- Enter the time **x.x** in min into the first field of the program line.
- Select the desired program point in the second field (examples see *section 3.8*).
- Select the parameter belonging to the program point in the third field. For **Flow**, **Pmax** and **Pmin** values must be entered, for **Remote** **1**, **0** or **\*** must be entered. A certain remote line position can be changed by moving the cursor in front of this position and then entering **1**, **0** or **\***.
- Click the **Add** button to add new program lines or click the **Delete** button to delete program lines. Faulty program points are displayed in the lower part of the program field.
- If you wish to use predefined remote instructions, open the **Remote configuration** tab.
- Click the **Add** button to add a new remote instruction.
- Enter any name you like for the remote instruction (max. 19 characters, e.g. **Ext. Valve Fill**) in the first field.
- Enter **1**, **0** or **\*** for the corresponding remote instruction for remote control lines 1...8 in the second field. A certain remote line position can be changed by moving the cursor in front of this position and then entering **1**, **0** or **\***.
- Click the **Add** button to add more remote instructions or click the **Delete** button to delete remote instructions.
- Click the **Activate** button. The entered remote instruction are added to the standard program points and can also be selected.
- Open the **Text** tab and add the predefined remote instructions into the time program.
- After finishing the programming, click the **Apply** button. The program and the parameters are tested for consistency.
- Switch on the **ENABLED** option.
- Open the **Initial** tab.
- Click on **<**. The parameters and the time program are now sent to the 732 IC Detector. **\*** in the lower left part of the window shows that the PC is sending data. The time program is stored in the 732 IC Detector as program type **cycle** with **number of cycles = 1**.

### Manual triggering of actions via PC

- Select **Equipment setup** of the **Options** menu.
- In the **Configured equipment control drivers** window, click on **732 IC Detector[ COM# ]** and afterwards on **Setup**. The **INITIAL** tab in the **732 IC Detector[ COM# ]** window is opened.
- Open the **Manual Control** tab.
- **Program RUN/STOP:** The program at the 732 IC Detector is started or stopped.
- **Valve A FILL/INJECT:** Valve A at the 733 IC Separation Center is switched to the **Fill** or **Inject** position.
- **Valve B FILL/INJECT:** Valve B at the 733 IC Separation Center is switched to the **Fill** or **Inject** position (only possible with the 733.0020 IC Separation Center).
- **Suppressor STEP:** The suppressor is switched to the next position (only possible with the 733.0030 IC Separation Center).
- **Zero ON/OFF:** The auto-zero is switched on or off.
- **Pump RUN/STOP:** The 709 IC Pump is started or stopped.

### Log data transmission

The data transmission logging is used for error diagnosis if the communication between PC and 732 IC Detector is faulty. Normally, it should not be used because the data transmission rate is lowered.

- Select **Equipment setup** of the **Options** menu.
- In the **Configured equipment control drivers** window, click on **732 IC Detector[ COM# ]** and afterwards on **Setup**. The **INITIAL** tab in the **732 IC Detector[ COM# ]** window is opened.
- Open the **Serial port[ COM# ]** tab.
- Select the log type:
  - **Formatted I/O:** The data transmission between PC and 732 IC Detector 732 is logged line by line.
  - **Byte stream:** The data transmission between PC and 732 IC Detector 732 is logged character by character (1 character per line).
  - **File:** The data transmission logging is saved into the **MemDump.log** file in the program directory.

## 4 Appendix

### 4.1 Software license

The «IC Metrodata for Win95» program is installed as a full program package together with the **6.2145.010 Dongle**. Installations without dongle are demo versions which are unable to acquire chromatograms. If a demo version is equipped with a dongle, it runs as a full version. Methods generated during the demonstration time are retained in full in such a case.

Please send us your **8.714.8067 Registration card** as soon as possible so we can register you as an official user. Only registered users will get updated program versions at a special price.

### 4.2 Standard equipment

<b>IC Metrodata for Win95</b> .....	<b>2.714.0310</b>
including the following accessories:	
PC Board with 2 channels.....	1.714.0310
Cable 714/732/733, length = 3 m.....	6.2128.140
Cable 714/732/733, length = 5 m.....	6.2128.150
Dongle.....	6.2145.010
Software «IC Metrodata for Win95» .....	6.6027.153

### 4.3 Optional accessories

<b>Extension kit for 4 channels</b> .....	<b>2.714.0320</b>
including the following accessories:	
PC Board with 2 channels.....	1.714.0310
Cable 714/732/733, length = 3 m.....	6.2128.140
Cable 714/732/733, length = 5 m.....	6.2128.150
<b>RS232 Cable</b> .....	<b>6.2125.060</b>
25 pin neg. / 25 pin neg., length = 3 m	
<b>RS232 Cable</b> .....	<b>6.2125.110</b>
25 pin neg. / 9 pin neg., length = 3 m	



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