

Metrohm IC Driver for Empower™ Instructions for Use

Manual
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Although all the information given in this documentation has been checked with great care, errors cannot be entirely excluded. Should you notice any mistakes please send us your comments using the address given above.

Change Control

Version	Date	Summary of Changes
1.0	July 2013	First Edition
1.1	December 2013	Addition of new IC devices 930 / 940

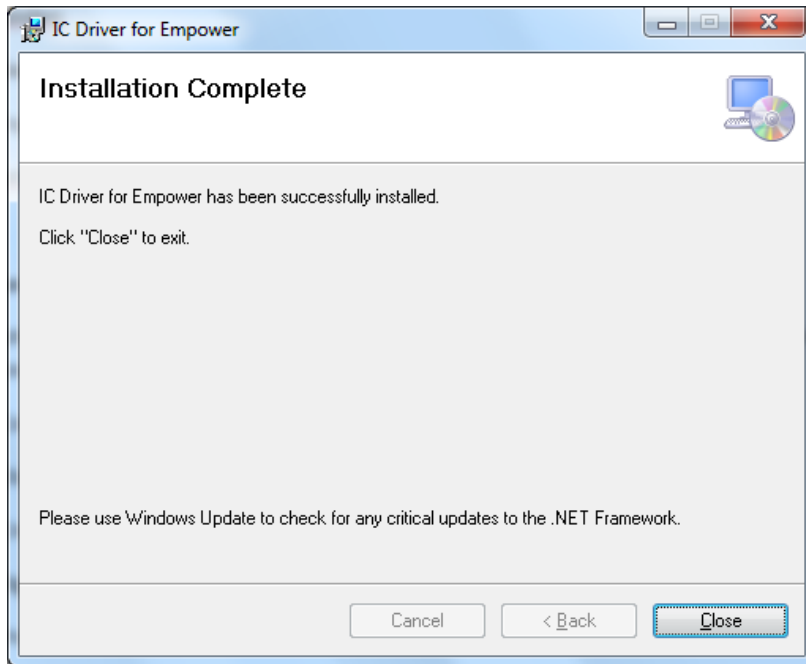
Contents

Change Control	3
Contents	4
1 Preconditions	5
2 Starting Empower™ and creating a node	6
2.1 Starting Empower™.....	6
2.2 Configuring the system.....	6
3 Setting up a chromatographic system	12
3.1 Generating a system.....	12
3.2 System selection.....	15
3.3 Access Control.....	16
4 Creating a project	20
5 Creating an instrument method	23
5.1 Opening the QuickStart interface.....	23
5.2 Setting the start parameters.....	25
5.2.1 Setting the parameters for the ion chromatograph.....	25
5.2.2 Setting the parameters for the Sample Processor.....	26
5.2.3 Setting the parameters for the Dosino.....	27
5.3 Creating the time program of the method.....	27
5.3.1 Time program – Example.....	29
6 Creating a processing method	31
7 Forming a method set	34
8 Running samples	36
8.1 Creating a sample table and starting the analysis.....	36
8.2 Manual control.....	39
8.3 Equilibrating the system.....	39
9 Evaluating recorded data	41
9.1 Example.....	46
10 Troubleshooting	48
10.1 Stopping the process.....	48
10.2 Message Center.....	49
11 Restrictions	50
12 Importing example methods	51
13 Measuring cations	53

1 Preconditions

The following preconditions must be met to ensure proper functioning:

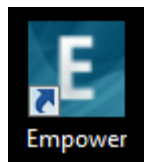
- Empower™ is installed according to the Waters instructions.
- The Metrohm driver is installed according to the instructions.



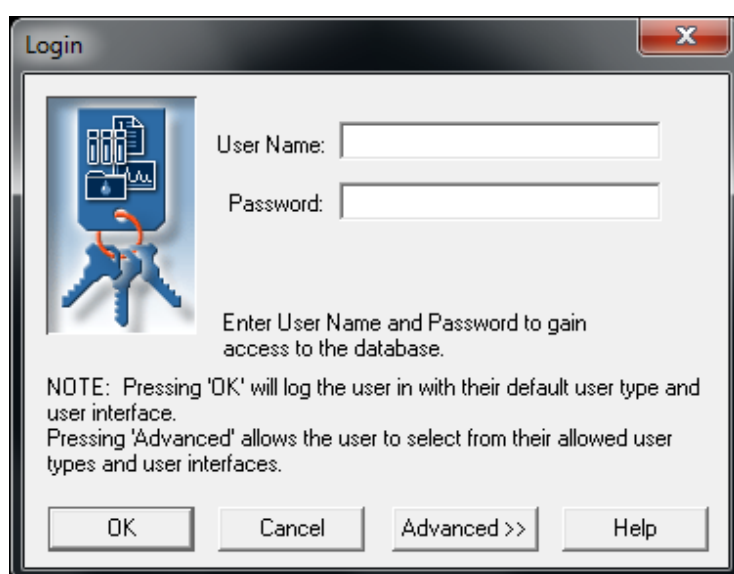
2 Starting Empower™ and creating a node

2.1 Starting Empower™

1. Connect the Metrohm instruments to the PC (via USB) and the power supply.
2. Switch the Metrohm instruments on.
3. Start Empower™.



4. Log in with your Empower™ password and click on **OK**.

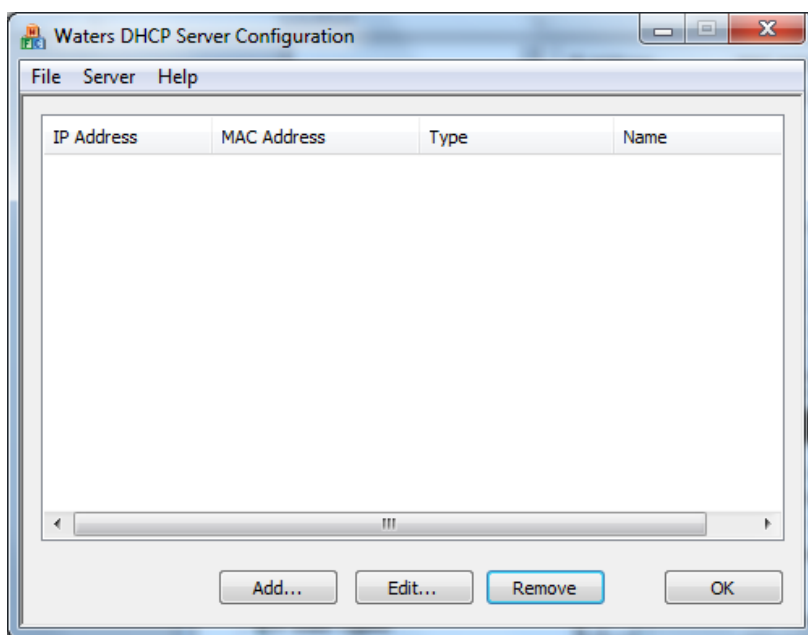


2.2 Configuring the system

1. Click on **Configure System**.



8. Click on **Add...**



Note: If several systems are added, both the **IP address** and the **MAC address** have to differ.

9. Enter the following parameters:

- IP address: 000.000.000.xxx, (where x = 001-255)
e.g. start with 000.000.000.001
- MAC address: 00-00-00-00-00-xx, (where xx = 00-FF)
e.g. start with 00-00-00-00-00-01
- Instrument type: Select "Metrohm IC"
This includes all implemented Metrohm instruments, also Sample Processors and Dosinos.
- Serial Number / Unique Name: These are the actual settings used to detect the instrument on the USB bus and must meet the following requirements:
- The serial number must be the last five characters (including leading 0s) printed on the serial number sticker found on the back of the instrument.
- The IC serial number must be prefixed with "IC="; the Sample Processor must be prefixed with "SP=" (excluding double quotes).
- The IC and SP serial numbers must be separated by a space.

Examples (excluding double quotes):

- IC only: "IC=21124"
- SP only: "SP=03534"
- Both: "IC=21124 SP=03534"

10. Click on **OK**.

Example:

The 'Add IP Address' dialog box contains the following information:

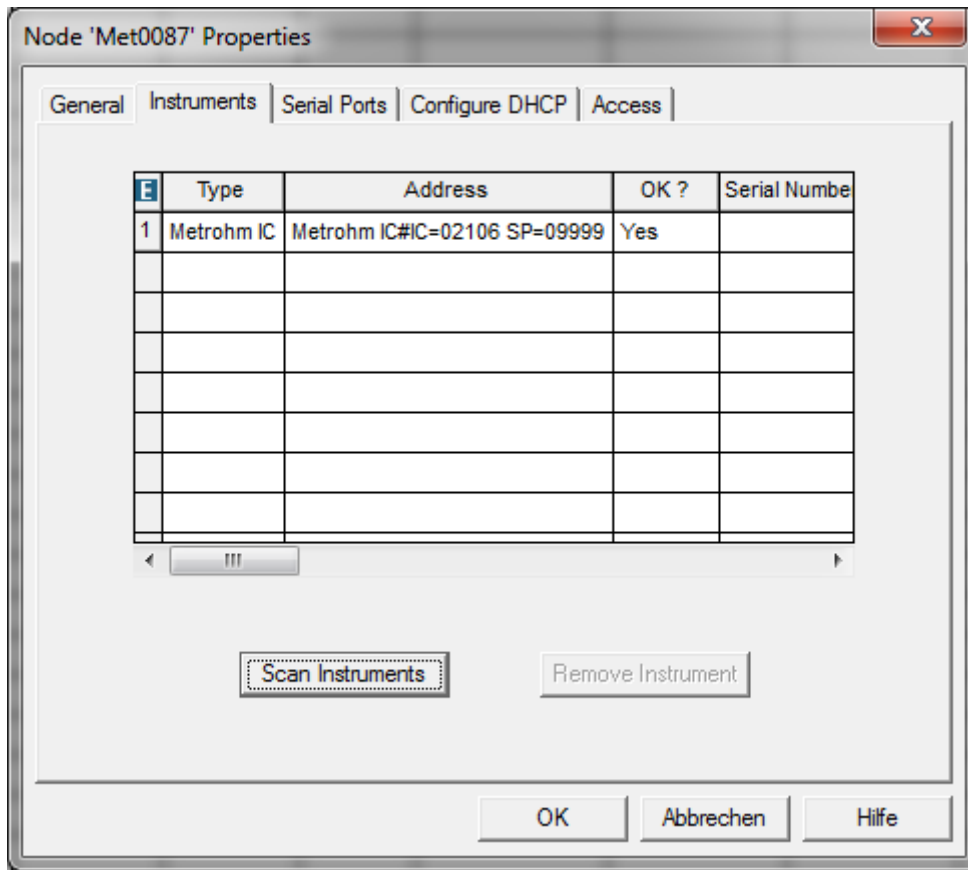
IP Address	000 . 000 . 000 . 001
MAC Address	00 - 00 - 00 - 00 - 00 - 01
Instrument Type	Metrohm IC
Serial Number/ Unique Name	IC=02106 SP=09999

11. Click on **OK**.

The 'Waters DHCP Server Configuration' window displays the following table:

IP Address	MAC Address	Type	Name
0.0.0.1	00-00-00-00-00-01	Metrohm IC	IC=02106 SP=09999

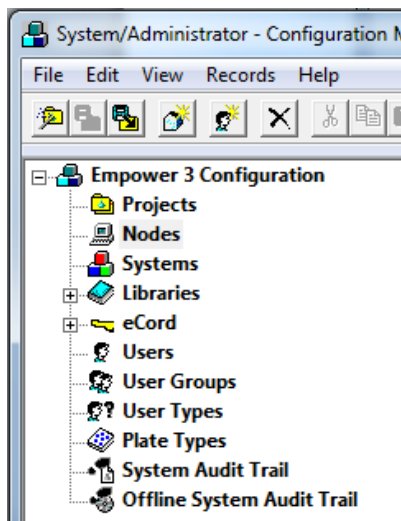
12. Click on **OK**.



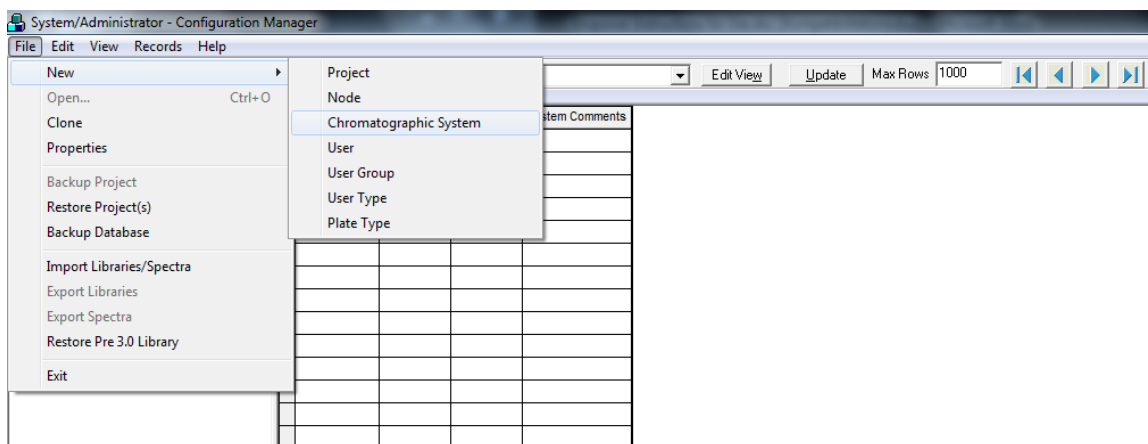
3 Setting up a chromatographic system

3.1 Generating a system

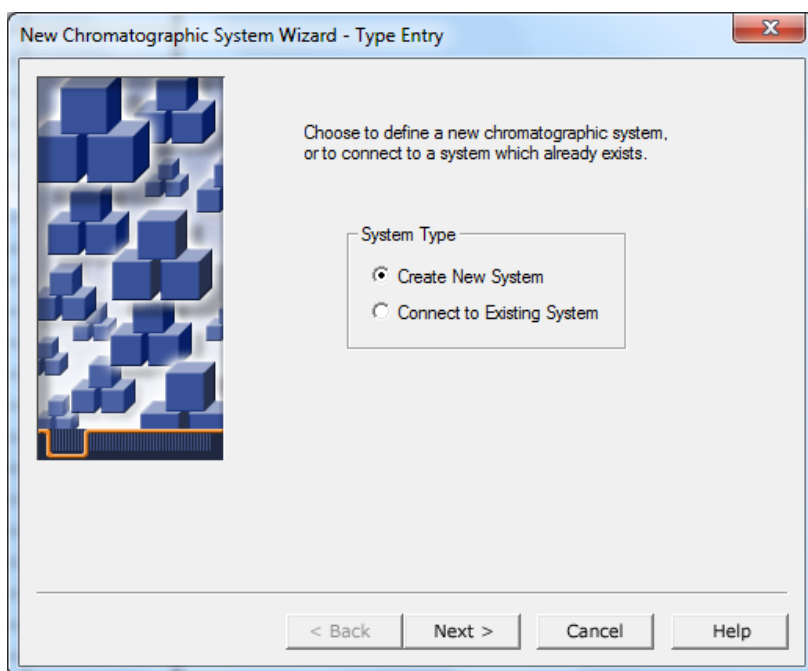
1. Go to **Systems**.



2. Create a new system by selecting the **New > Chromatographic System** menu item.



3. Select **Create New System** and click on **Next**.



Create New System

Specifies that you create a new chromatographic system using available instruments connected to an **acquisition server**. It is not necessary that the system is directly connected to your Empower™ workstation.

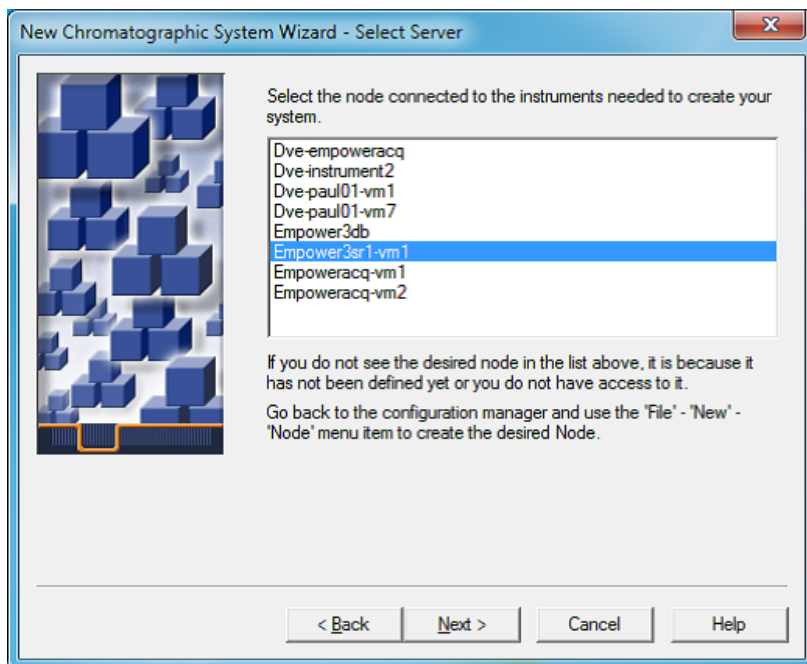
Connect to Existing System

Specifies that the current user can access the selected chromatographic system. If the system is password-protected, you need the password to access the system. Then you can use the chromatographic system to acquire and process data and to generate reports.

4. Click on **Next**.

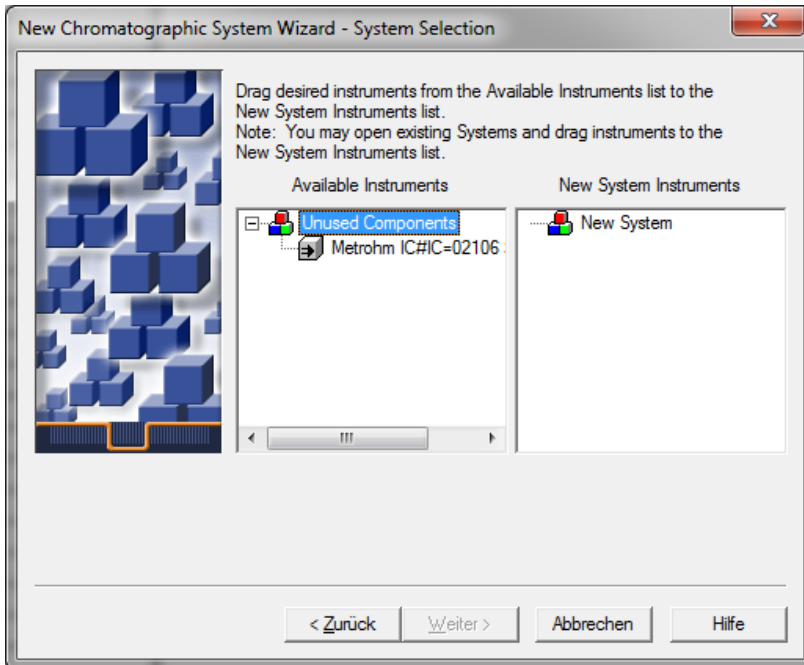
Choose (client/server) acquisition server.

5. In case of a client/Server installation, the **node** must be selected on which the **Metrohm IC Driver for Empower™** was installed.



3.2 System selection

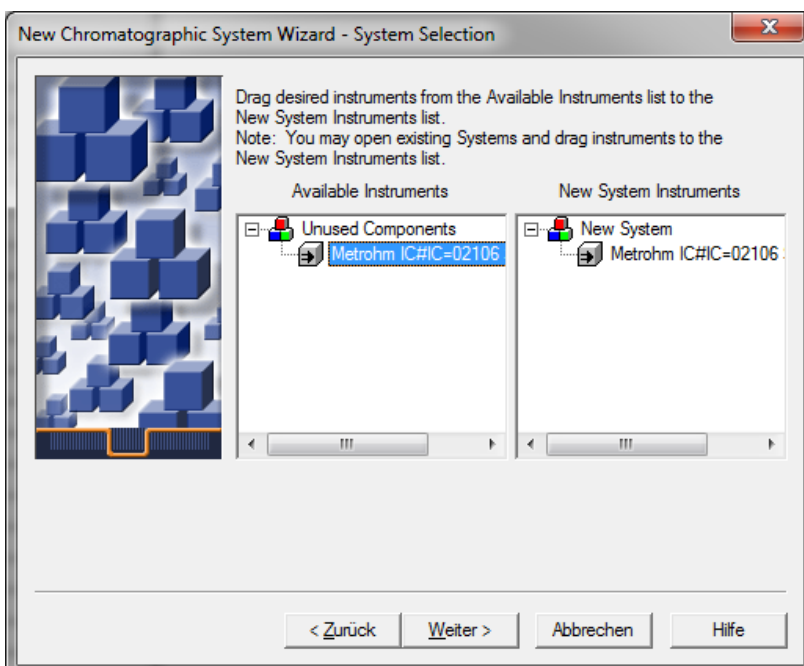
1. Select an instrument from the **Available Instruments** list and drag it to the list beneath **New System Instruments**. You can use instruments from the **Unused Components** and an existing system. If the instrument is not in the **Available Instruments** list, click on **Cancel** and check the properties of the **acquisition server**.



Note: Several IC systems cannot be controlled with one chromatographic system; two different systems are required for this (see Chapter 11).

2. Click on **Next**.

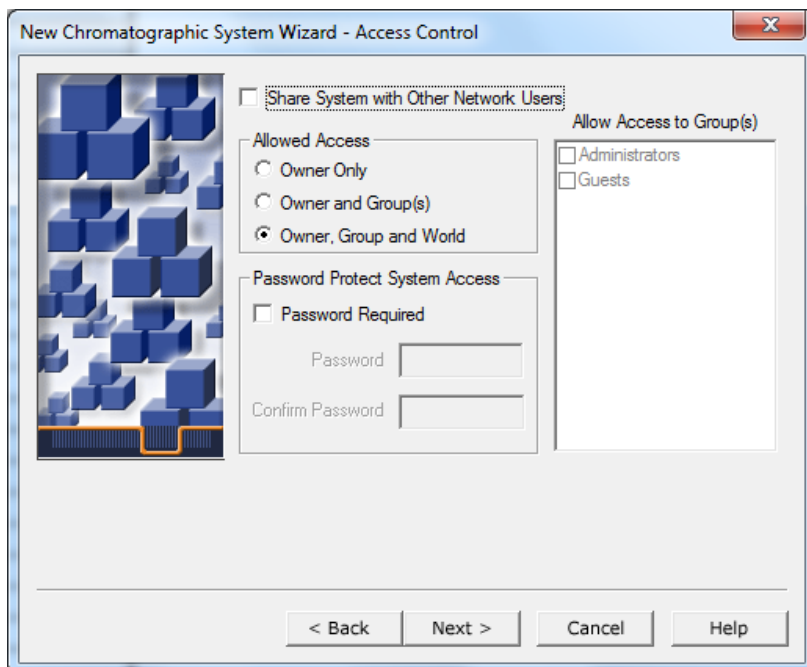
Note: You cannot drag the last instrument from an existing system. To free up the last instrument, delete the system.



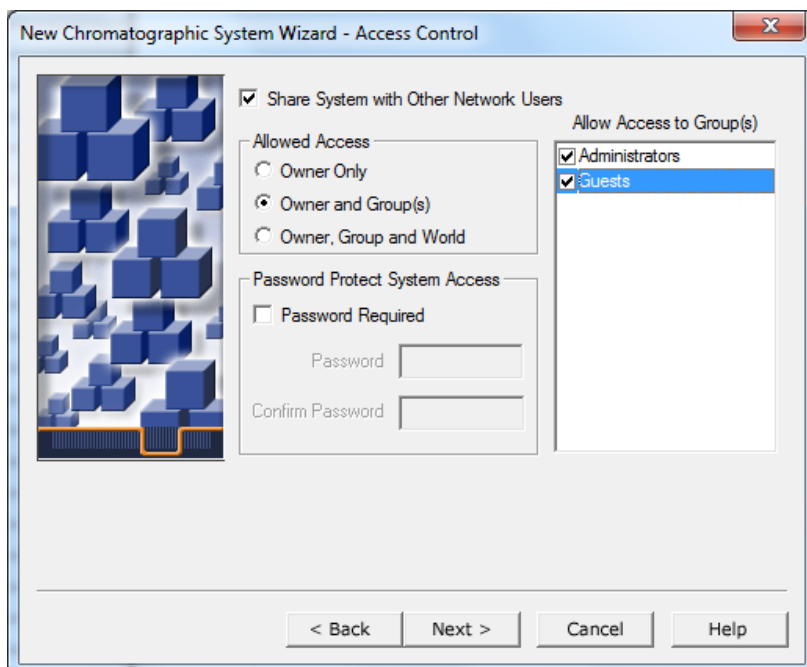
3.3 Access Control

Use this window to control how other users access the new system you are creating. You can share the system with other network users and password-protect it.

Note: If you have access to a chromatographic system, you do not need to enter the password unless you are crossing databases.



1. If required, enable the fields under **Allow Access to Group(s)**.



2. Click on **Next**.

Detailed explanations

Share System with Other Network Users

Specifies that other network users (determined by the access option you select; see below) can use the system. If you select this option, consider password-protecting the system to limit its use to authorized users.

Allowed Access

Owner Only

Specifies that the owner of the chromatographic system and users with administrator rights can access the selected chromatographic system.

Owner and Group(s)

Specifies that the owner of the chromatographic system, group members as specified in the **Allow Access to Group(s)** list and administrators can access the selected system. Group access only allows a user to operate a chromatographic system.

Note: To modify a chromatographic system, you need access to the chromatographic system and its **acquisition server**.

Owner, Group and World

Specifies that all users in the database can operate the selected chromatographic system.

Password Required

Specifies that users enter a password before they can access the selected chromatographic system across databases.

Password

Specifies that a password (up to 30 alphanumeric characters) is needed to access the selected chromatographic system across databases.

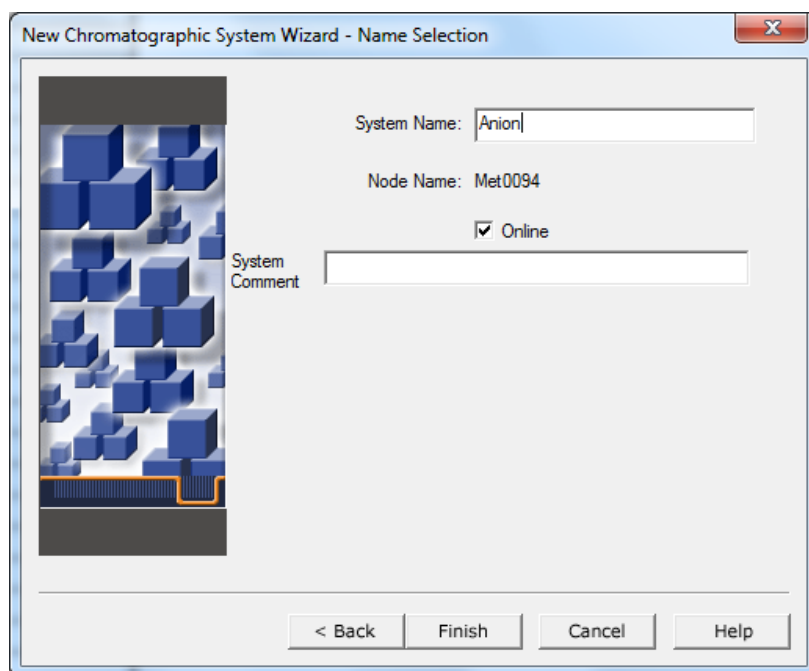
Confirm Password

Requires reentry of the password to confirm that it was spelled correctly.

Allow Access to Group(s)

Select the user group(s) that you want to give access to the selected chromatographic system. Access rights of these user groups override access rights of the selected World user type. If you select **Owner, Group and World**, groups that were not selected in the **Allow Access to Group(s)** list are assigned the **World** user type access.

3. Enter a system name and click on **Finish** to complete the creation of a new chromatographic system and to close the wizard.



Detailed explanations

System Name

Identifies the chromatographic system in the Empower™ database and in the **Configuration Manager**. Up to 30 alphanumeric characters are allowed for the system name. Use a meaningful system name in case other users have access to the system.

Acquisition Server Name

Name of the acquisition server to which the selected system is connected. This field is not editable.

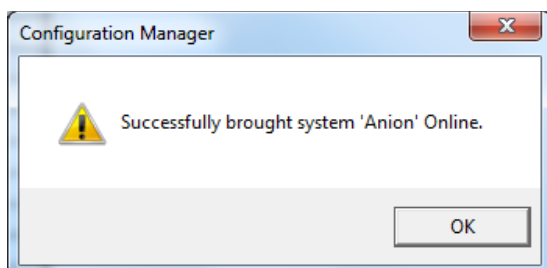
Online

If all configured system instruments are available (not configured in another online system), this brings the new system online. Default: selected.

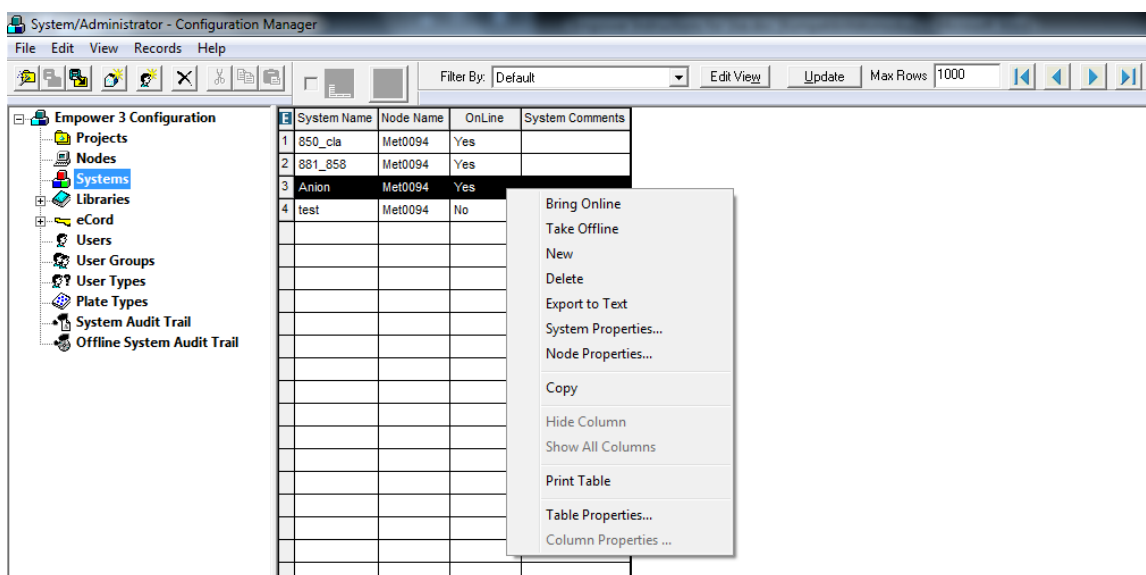
System Comment

Displays optional remarks (up to 250 characters). Comments that describe the chromatographic system, its components and its intended use can help others if they have access to the system.

4. Then the following window appears, and:
 - the IC instrument's LED stops blinking.
 - the Sample Processor initializes the sample rack.

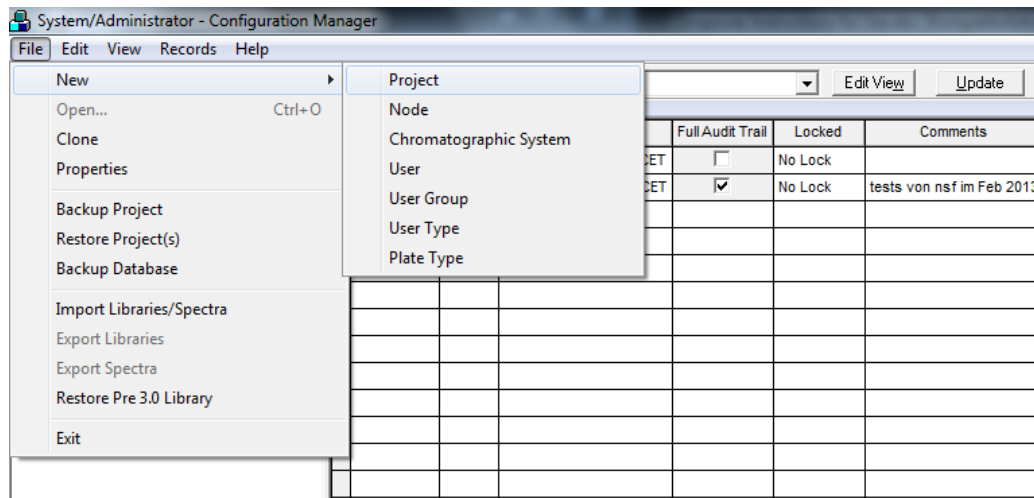


5. Right-click on the system to check whether it is online (with **Bring Online**).

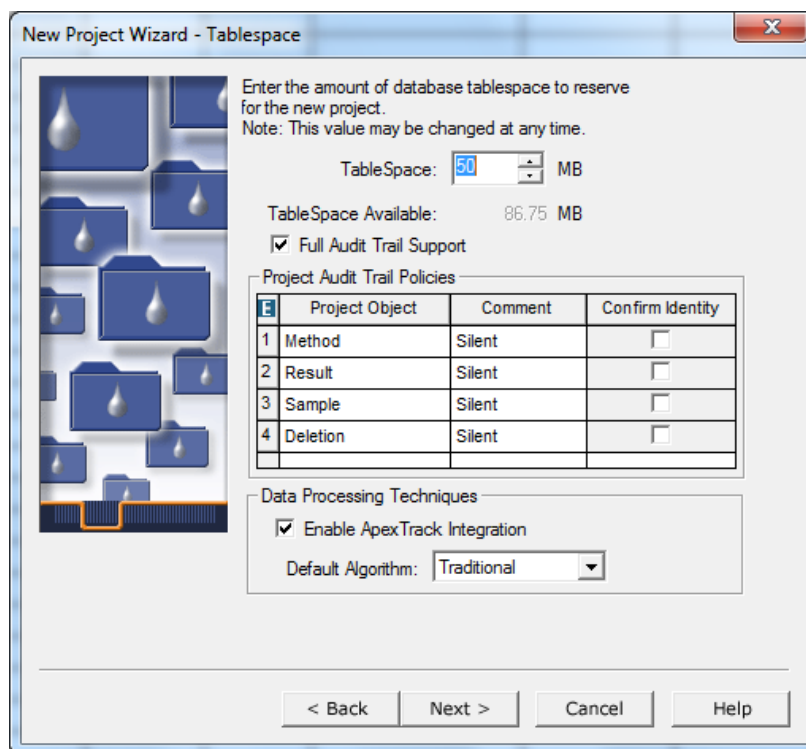


4 Creating a project

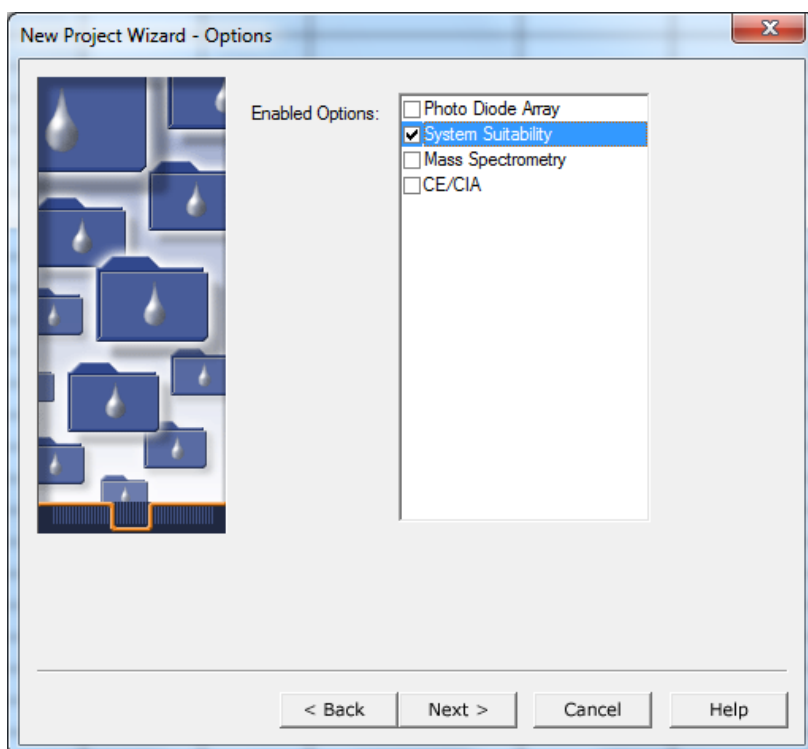
1. Create a new project by selecting the **New > Project** menu item.



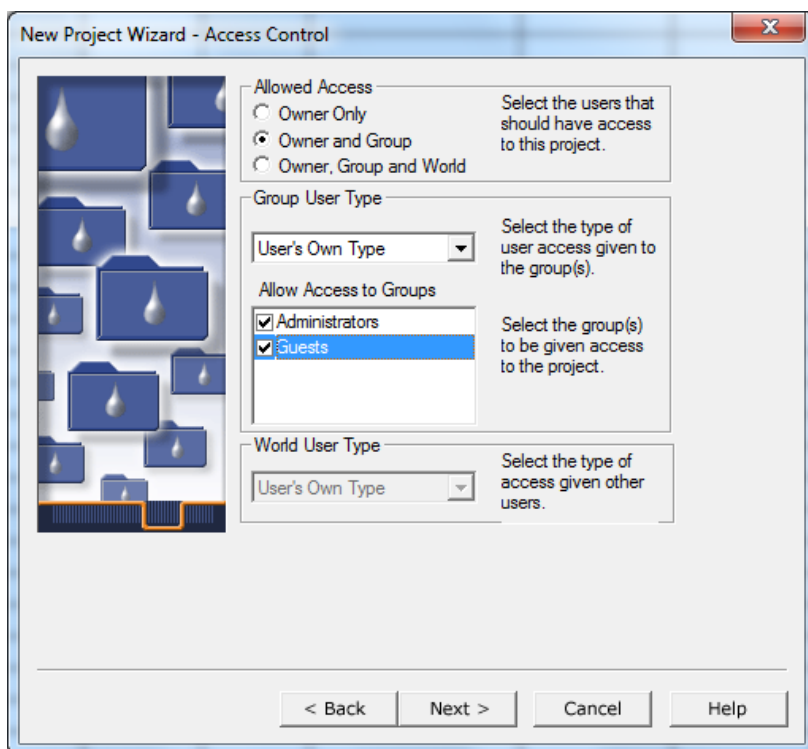
2. The **Tablespace** form appears.



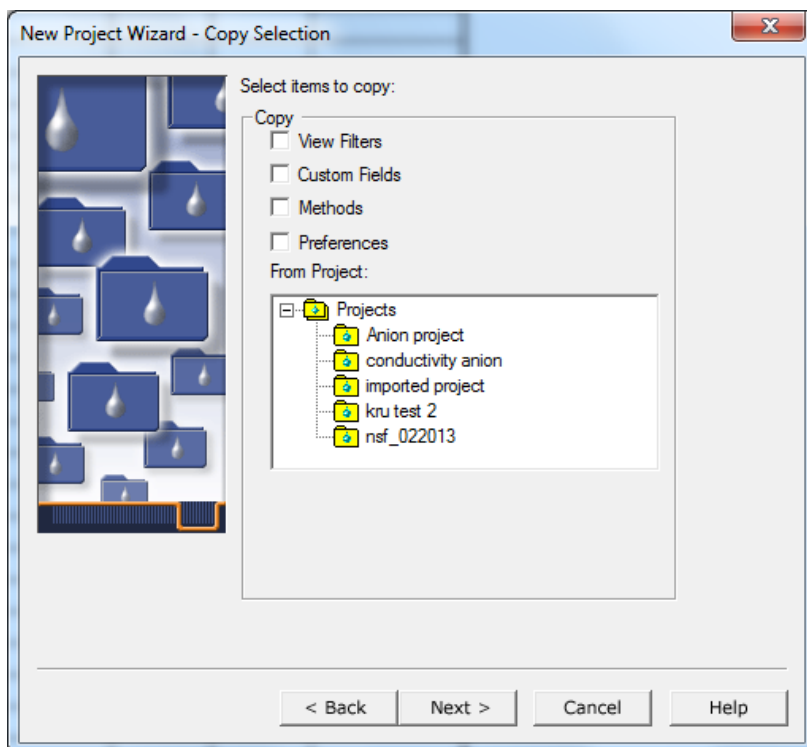
3. Click on **Next**.



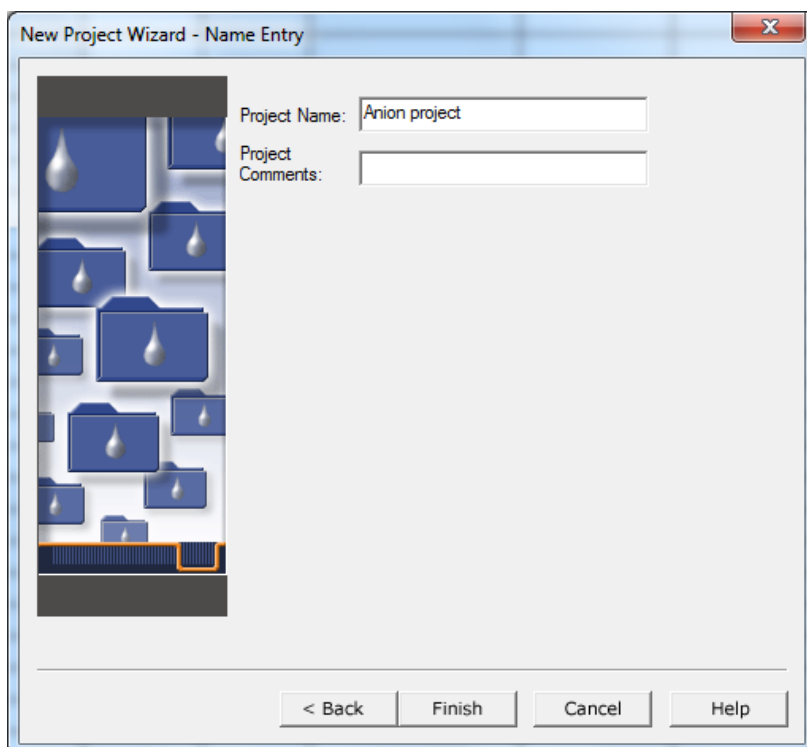
4. Click on **Next**.



5. In the **Projects** tree view, select an appropriate project for already existing settings.
6. Click on **Next**.



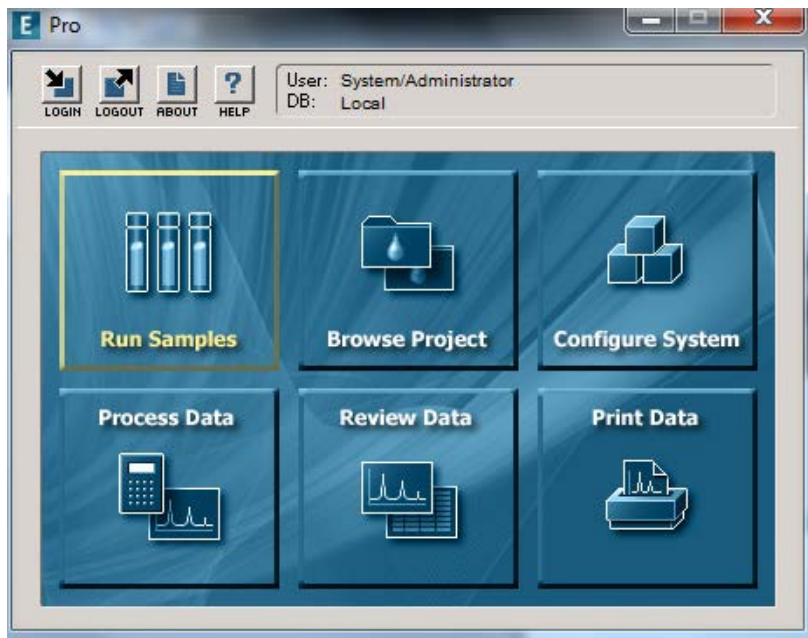
7. Click on **Finish**.



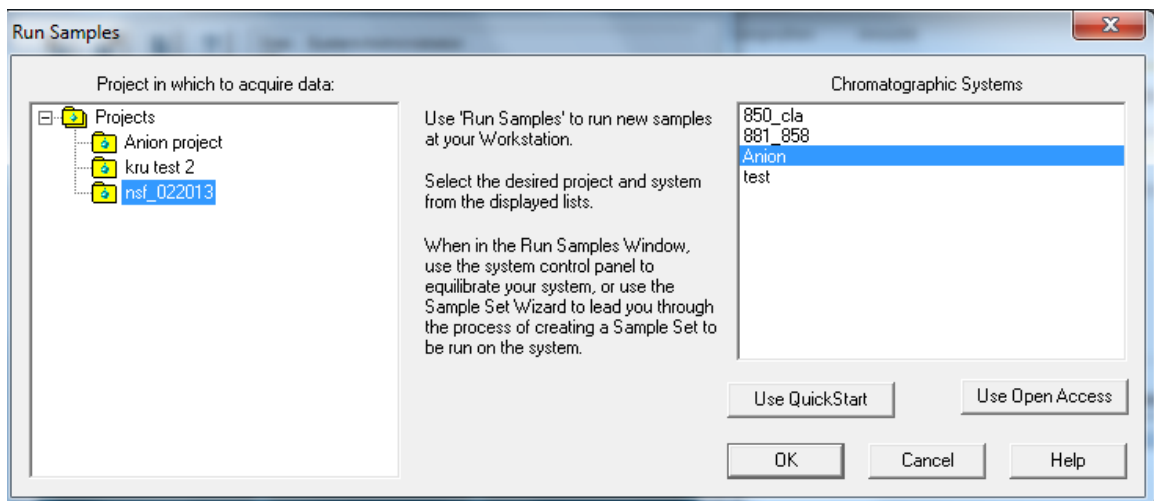
5 Creating an instrument method

5.1 Opening the QuickStart interface

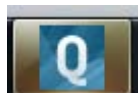
1. In the Empower™ start window, go to **Run Samples**.



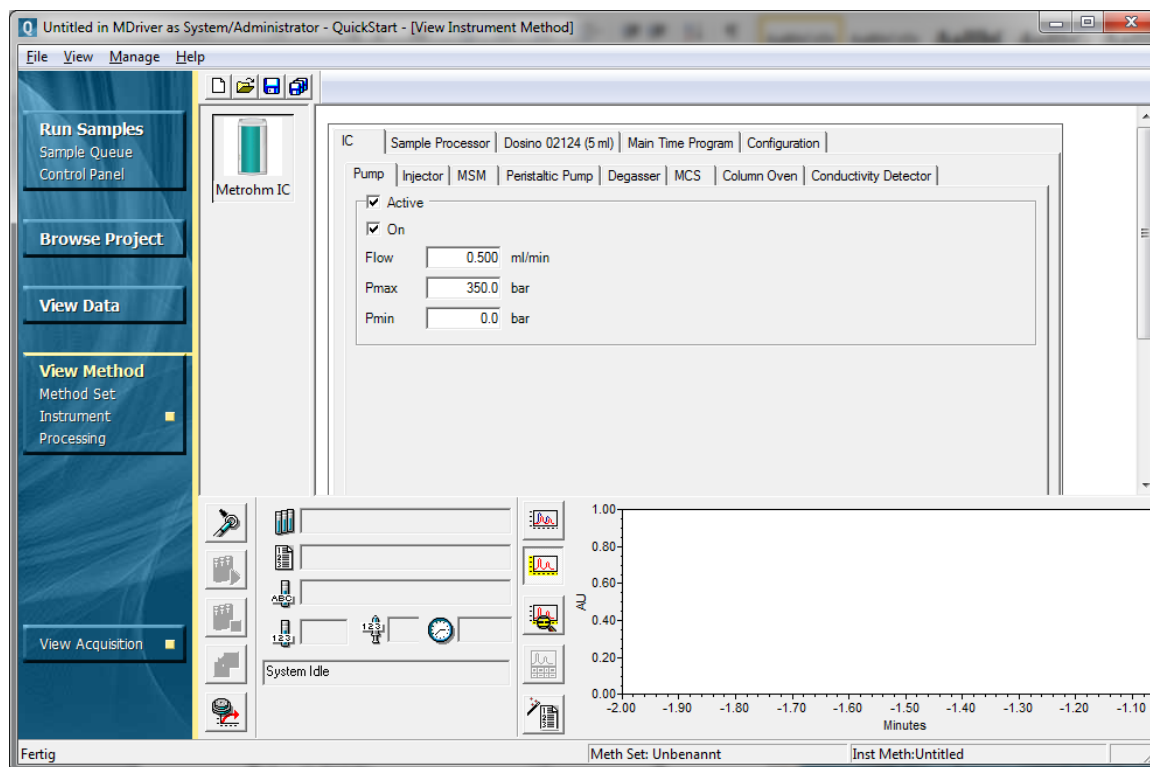
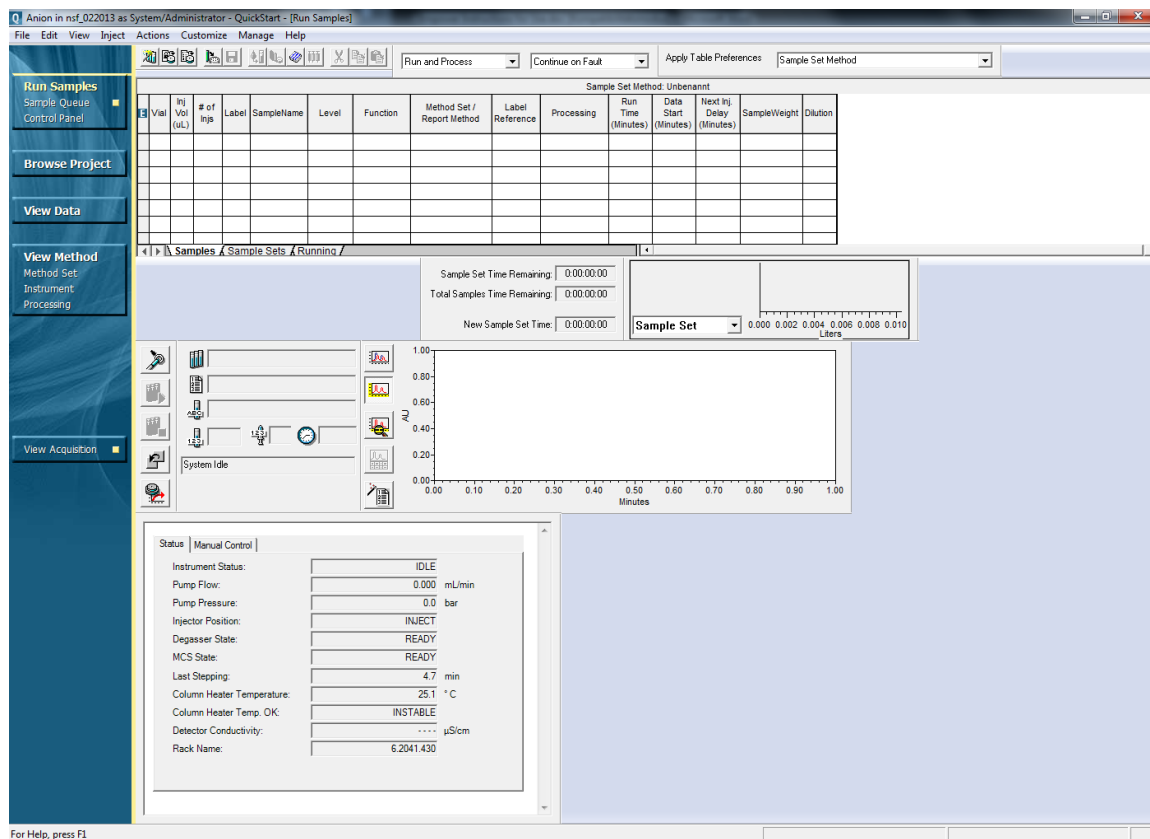
2. Choose your chromatographic system and click on **Use QuickStart**.



3. It will open in your task list.



- The status of the system should be **IDLE**. If this is the case, Select **View Method > Instrument**.



All modules of your setup should be visible. Enter the desired parameters. The following screenshots show parameters for a typical anion setup.

5.2 Setting the start parameters

5.2.1 Setting the parameters for the ion chromatograph

Note: The selection option with the tabs depends on the instrument types.

IC – Pump

IC	Sample Processor	Dosino 59290 (2 ml)	Main Time Program				
Pump	Injector	MSM	Peristaltic Pump	Degasser	MCS	Column Oven	Conductivity Detector
<input checked="" type="checkbox"/> Active							
<input checked="" type="checkbox"/> On							
Flow	0.700		ml/min				
Pmax	500.0		bar				
Pmin	0.0		bar				

IC – Injector

IC	Sample Processor	Dosino 59290 (2 ml)	Main Time Program				
Pump	Injector	MSM	Peristaltic Pump	Degasser	MCS	Column Oven	Conductivity Detector
<input checked="" type="checkbox"/> Active							
Position	Maintain Current						

IC – MSM

IC	Sample Processor	Dosino 59290 (2 ml)	Main Time Program				
Pump	Injector	MSM	Peristaltic Pump	Degasser	MCS	Column Oven	Conductivity Detector
<input checked="" type="checkbox"/> Active							
<input checked="" type="checkbox"/> Automatic stepping to next position during equilibration							
Interval	10.0		min				

IC – Peristaltic Pump

IC	Sample Processor	Dosino 59290 (2 ml)	Main Time Program				
Pump	Injector	MSM	Peristaltic Pump	Degasser	MCS	Column Oven	Conductivity Detector
<input checked="" type="checkbox"/> Active							
<input checked="" type="checkbox"/> On							
Rate	1						

IC – Degasser

IC	Sample Processor	Dosino 59290 (2 ml)	Main Time Program				
Pump	Injector	MSM	Peristaltic Pump	Degasser	MCS	Column Oven	Conductivity Detector
<input checked="" type="checkbox"/> Active							
<input checked="" type="checkbox"/> On							

IC – MCS

IC | Sample Processor | Dosino 59290 (2 ml) | Main Time Program |

Pump | Injector | MSM | Peristaltic Pump | Degasser | MCS | Column Oven | Conductivity Detector |

Active
 On

IC – Column Oven

IC | Sample Processor | Dosino 59290 (2 ml) | Main Time Program |

Pump | Injector | MSM | Peristaltic Pump | Degasser | MCS | Column Oven | Conductivity Detector |

Active
 On
 Wait for stable temperature
Temperature °C

IC – Detector

IC | Sample Processor | Dosino 59290 (2 ml) | Main Time Program |

Pump | Injector | MSM | Peristaltic Pump | Degasser | MCS | Column Oven | Conductivity Detector |

Active
Temperature Coefficient %/°C
Warning Limit µS/cm
Thermostat °C

5.2.2 Setting the parameters for the Sample Processor

Sample Processor – Tower

Note: These values are dependent on the racks and sample vessels used.

IC | Sample Processor | Dosino 59290 (2 ml) | Main Time Program |

Tower | Peristaltic Pump |

Lift Positions

Home mm
Work mm
Rinse mm
Shift mm
Special mm

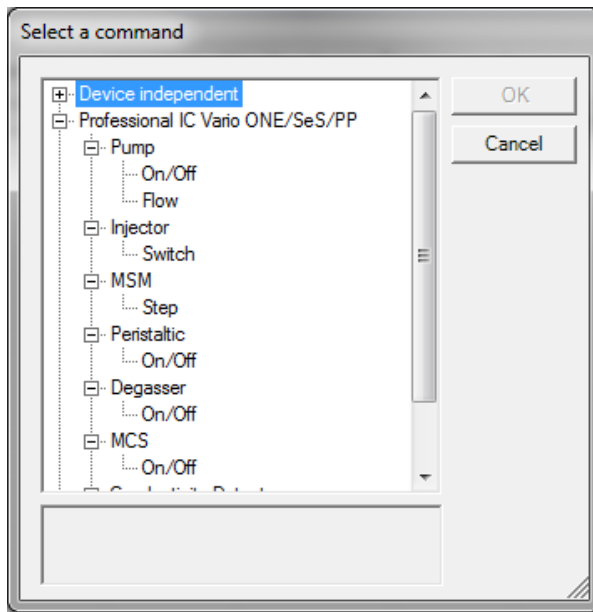
Sample Processor – Peristaltic Pump

IC | Sample Processor | Dosino 59290 (2 ml) | Main Time Program |

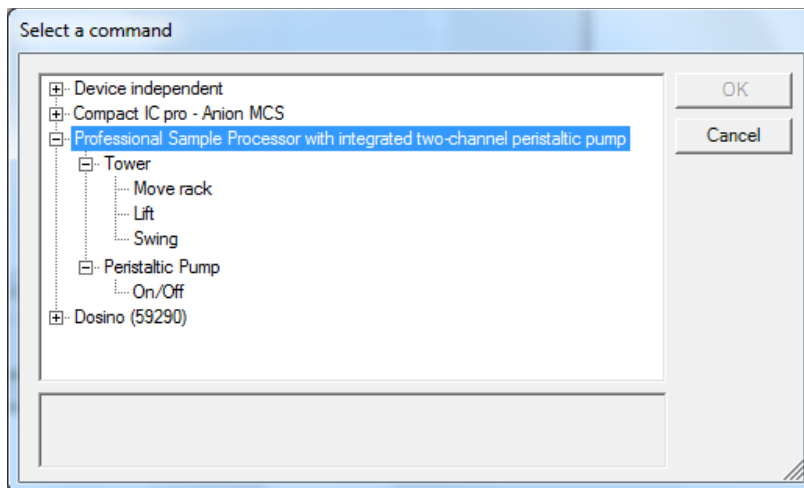
Tower | Peristaltic Pump |

Active
 On
Rate

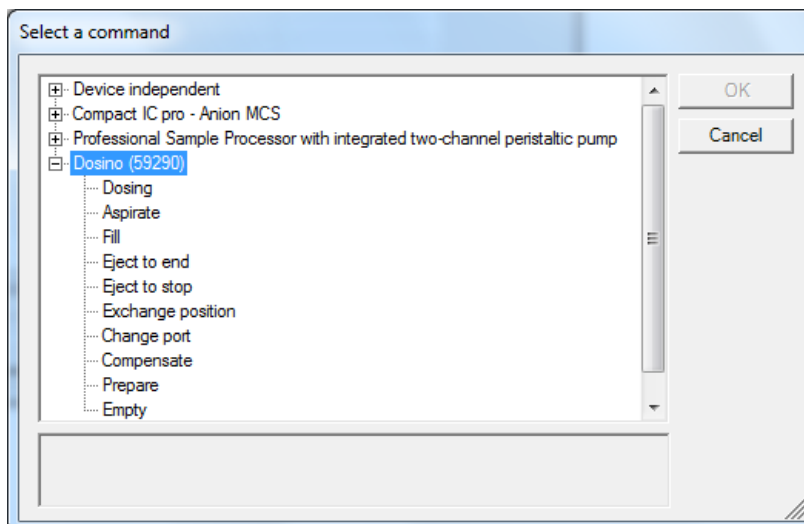
Depending on the instrument type, an IC instrument can perform the following actions:



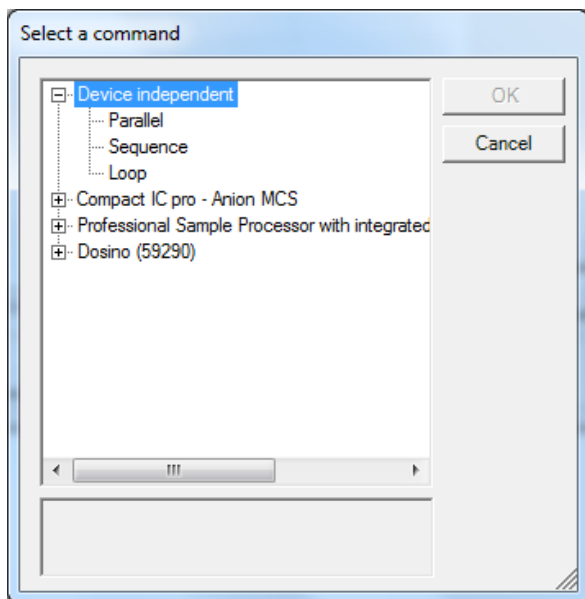
Actions that can be performed by a Sample Processor:



Commands for the Dosino:



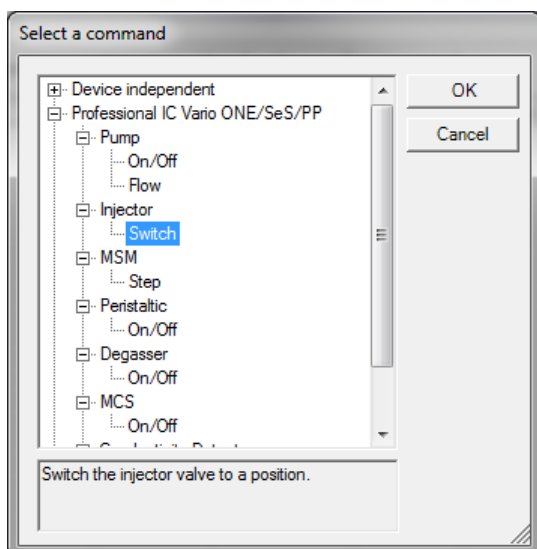
Device-independent commands are commonly used for the execution of subprograms. Subprograms can be used to create more complex time programs.



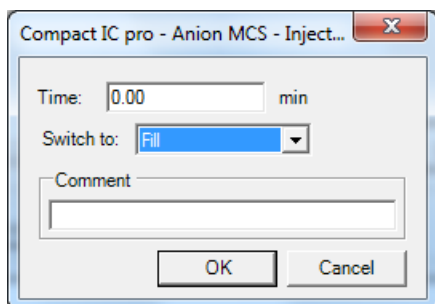
5.3.1 Time program – Example

To start a simple time program, you can proceed as follows:

1. Double-click on **Switch**.



2. Switch to **Fill**.



3. The first line in the time program looks as follows:

IC Sample Processor Dosino 59290 (2 ml) Main Time Program					
Time	Device	Module	Command	Parameter	Comment
0.00	Compact IC pro - Ani...	Injector	Switch	SwitchTo = Fill	

4. With **Add...** more lines can be added, e.g.:

IC Sample Processor Dosino 59290 (2 ml) Main Time Program					
Time	Device	Module	Command	Parameter	
0.00	Compact IC pro - Ani...	Injector	Switch	SwitchTo = Fill	
---	Professional Sample ...	Tower	Move rack	Move = 0, Numbe...	
---	Professional Sample ...	Tower	Lift	LiftPositionSelecti...	
0.00	Professional Sample ...	Peristaltic P...	On/Off	On = True, Rate ...	
2.00	Professional Sample ...	Peristaltic P...	On/Off	On = False, Rate ...	
2.00	Compact IC pro - Ani...	Injector	Switch	SwitchTo = Inject	
2.00	Compact IC pro - Ani...	Conductivity...	Start Data Acquisition		

Actions of indefinite time are highlighted in **gray** in the time program. The time counter restarts at zero after such a command.

5. Save your instrument method (e.g. as "**AnionInstrument**" to make clear that this is an instrument method).

- Click on **Components** to define the retention times of the analytes and the desired calibration parameters.

#	Name	Peak Label	Retention Time (min)	RT Window (min)	Peak Match	Channel	Y Value	X Value	Fit	Weighting	Internal Std	RT Reference	Rel RT Reference	Rel Resol Reference
1	Fluoride		4.263	0.213	Closest		Area	Amount	Quadratic	None				
2	Chloride		5.138	0.257	Closest		Area	Amount	Quadratic	None				
3	Nitrite		5.849	0.292	Closest		Area	Amount	Quadratic	None				
4	Bromide		7.600	0.360	Closest		Area	Amount	Quadratic	None				
5	Nitrate		8.600	0.408	Closest		Area	Amount	Quadratic	None				
6	Sulfate		10.381	0.519	Closest		Area	Amount	Quadratic	None				
7	Phosphate		11.399	0.570	Closest		Area	Amount	Quadratic	None				

The processing method can be adjusted later. It is not necessary to fill in all parameters. It is possible to start with the default settings.

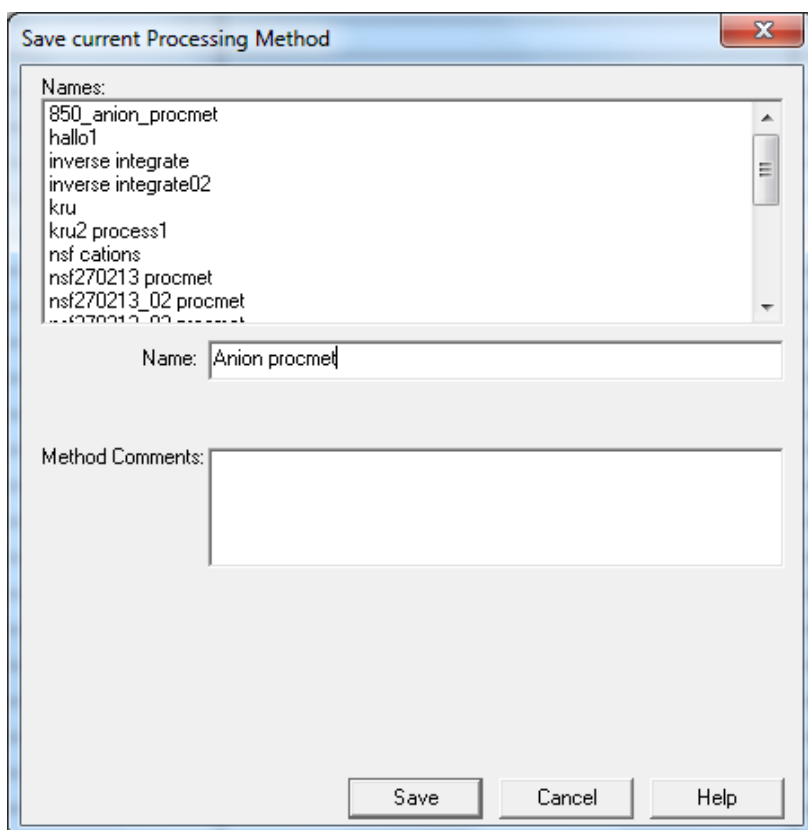
- Enter the levels of your standard solutions under **Default Amounts**.

#	Level	Fluoride	Chloride	Nitrite	Bromide	Nitrate
1	1	0.100000	0.500000	0.100000	0.100000	0.500000
2	10	1.000000	5.000000	1.000000	1.000000	5.000000
3	20	2.000000	10.000000	2.000000	2.000000	10.000000
4	5	0.500000	2.500000	0.500000	0.500000	2.500000
5	50	5.000000	25.000000	5.000000	5.000000	25.000000

- The integration parameters can be set on the **Integration** tab.

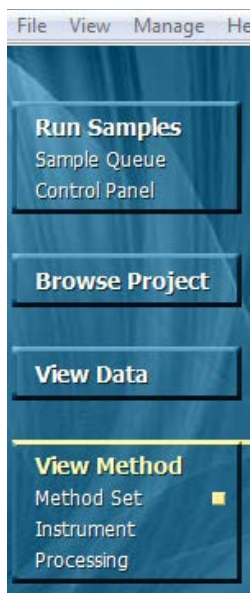
#	Time (min)	Type	Value
1	0.000	Inhibit Integration	
2	0.000	Valley to Valley	
3	11.700	Inhibit Integration	

8. Save the processing method.

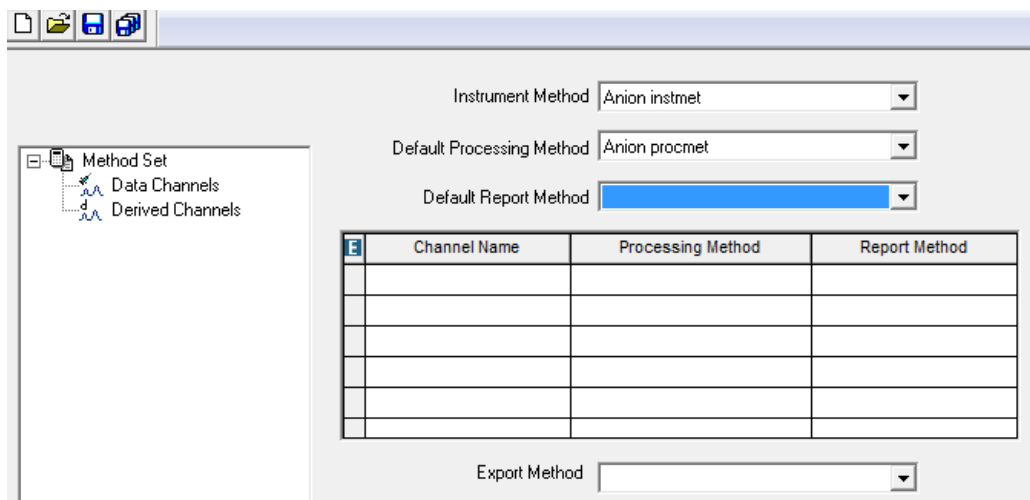


7 Forming a method set

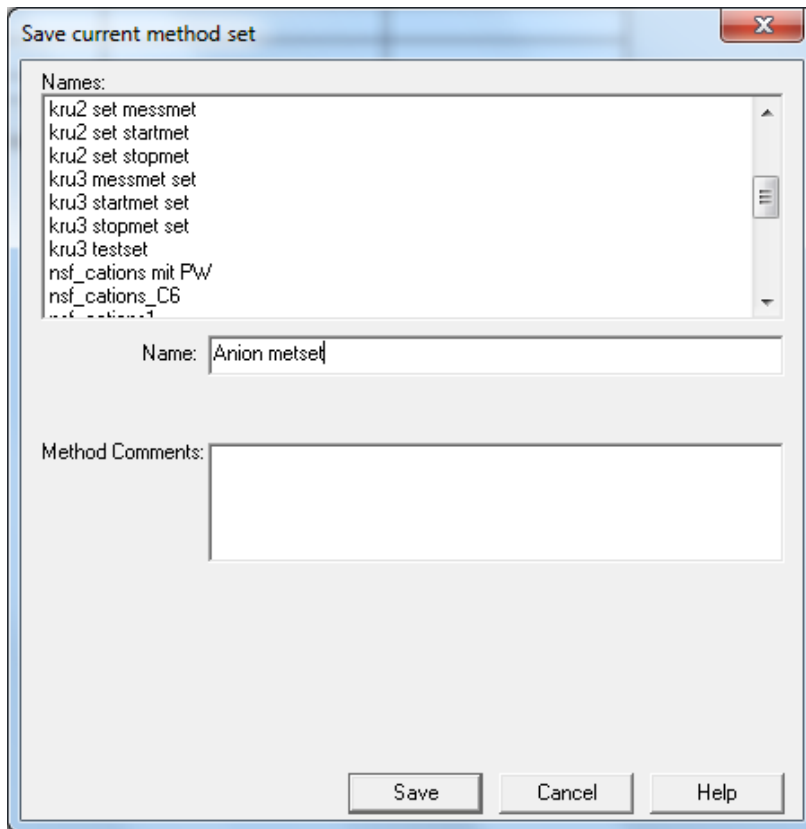
1. Go to **Method Set**.



2. Group your **Instrument Method** and your **Default Processing Method** to a **Method Set**.
Default Report Method and **Export Method** are optional.



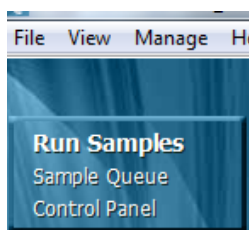
3. Save your **Method Set**.



8 Running samples

8.1 Creating a sample table and starting the analysis

1. Under **Run Samples**, go to **Sample Queue**.



The instrument status must be **IDLE** before starting a measuring series.

Status	Manual Control
Instrument Status:	IDLE
Pump Flow:	0.000 mL/min
Pump Pressure:	0.0 bar
Injector Position:	INJECT
Degasser State:	READY
MCS State:	READY
Last Stepping:	252.1 min
Column Heater Temperature:	25.1 °C

2. Start filling in the sample table.
 - Start with a line for equilibration of the system. Use the **Equilibrate** function for this.
 - Enter a long run time (e.g. 60 min). This makes sure that the system has a stable baseline before moving on to the next line. If the baseline was stable before reaching the total run time, it would still be possible to move to the next line immediately (with **Abort > Move to Next Line**).

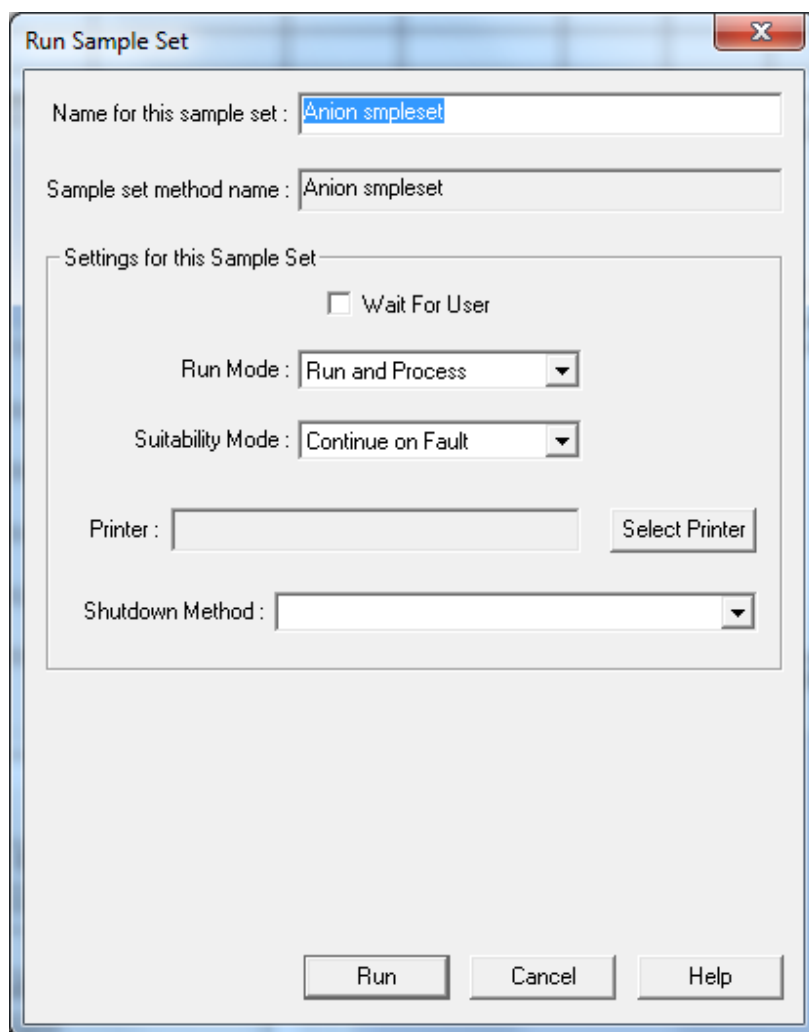
3. Create a sample table according to your needs.

	Vial	Inj Vol (uL)	# of Injs	Label	SampleName	Level	Function	Method Set / Report Method	Label Reference	Processing	Run Time (Minutes)	Data Start (Minutes)	Next Inj. Delay (Minutes)	SampleWeight	Dilution
1							Equilibrate	Anion metset			30.00	0.00	0.00		
2	1	20.0	1		Standard1	Level 1	Inject Standards	Anion metset		Normal	5.00	0.00	0.00	1.0000	1.0000
3	2	20.0	1		Standard2	Level 2	Inject Standards	Anion metset		Normal	5.00	0.00	0.00	1.0000	1.0000
4	3	20.0	1		Standard3	Level 3	Inject Standards	Anion metset		Normal	5.00	0.00	0.00	1.0000	1.0000
5	4	20.0	1		tap		Inject Samples	Anion metset		Normal	5.00	0.00	0.00	1.0000	1.0000

4. Click on **Start** to start the series (only if system is idle).



5. Give the sample set a name and click on **Run**.



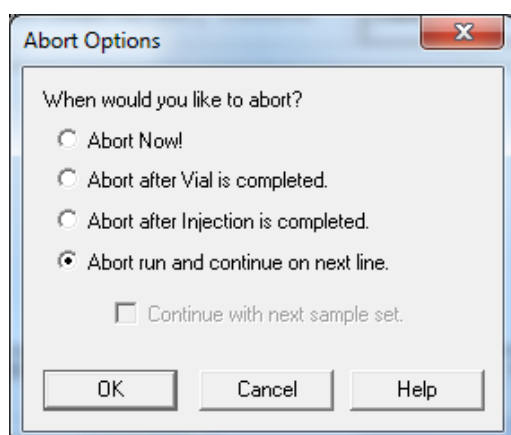
The 'Run Sample Set' dialog box contains the following fields and controls:

- Name for this sample set: Anion smpleset
- Sample set method name: Anion smpleset
- Settings for this Sample Set:
 - Wait For User
 - Run Mode: Run and Process
 - Suitability Mode: Continue on Fault
 - Printer: [Empty] [Select Printer]
 - Shutdown Method: [Empty]
- Buttons: Run, Cancel, Help

6. When your baseline is stable, you can click on **Stop** and select the **Abort run and continue on next line** option.



This will result in a short stop of all modules.



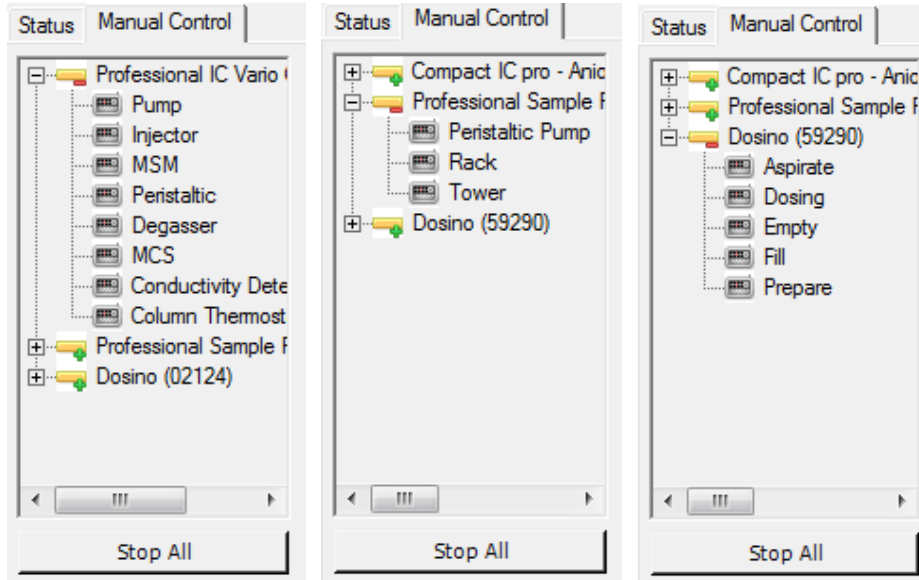
The 'Abort Options' dialog box contains the following options:

- When would you like to abort?
 - Abort Now!
 - Abort after Vial is completed.
 - Abort after Injection is completed.
 - Abort run and continue on next line.
- Continue with next sample set.
- Buttons: OK, Cancel, Help

8.2 Manual control

More options

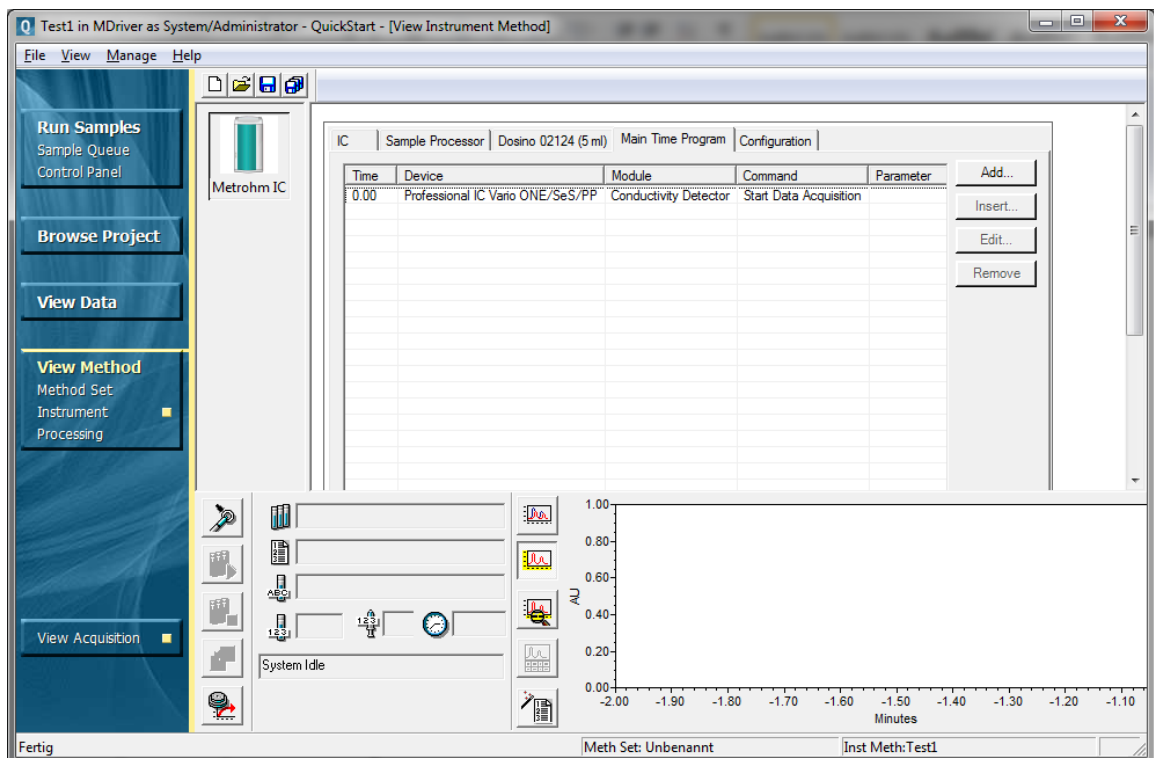
Under **Manual Control**, all hardware components can be operated individually (only when no measurement is running). The manual control is located next to the status parameters.



8.3 Equilibrating the system

In order to equilibrate the system, it might be useful to create an "Equilibration" method.

Create an instrument method named "Equilibration" (all parameters as desired, e.g. pump flow 0.7 mL/min, MSM autostep all 10 min, etc.). In the time program enter just one line to start data acquisition to be able to monitor the baseline during equilibration.



Create also a method set "Equilibration". This method set can be run in the first line of each sample table.

Method Set

- Data Channels
- Derived Channels

Instrument Method: Anion equilibrate instmet

Default Processing Method: Anion procmct

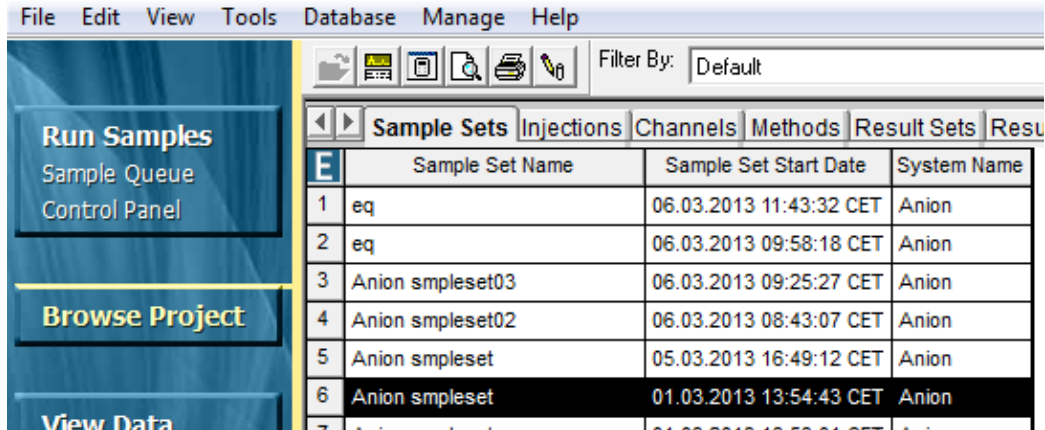
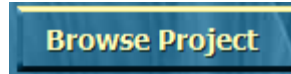
Default Report Method:

Channel Name	Processing Method	Report Method

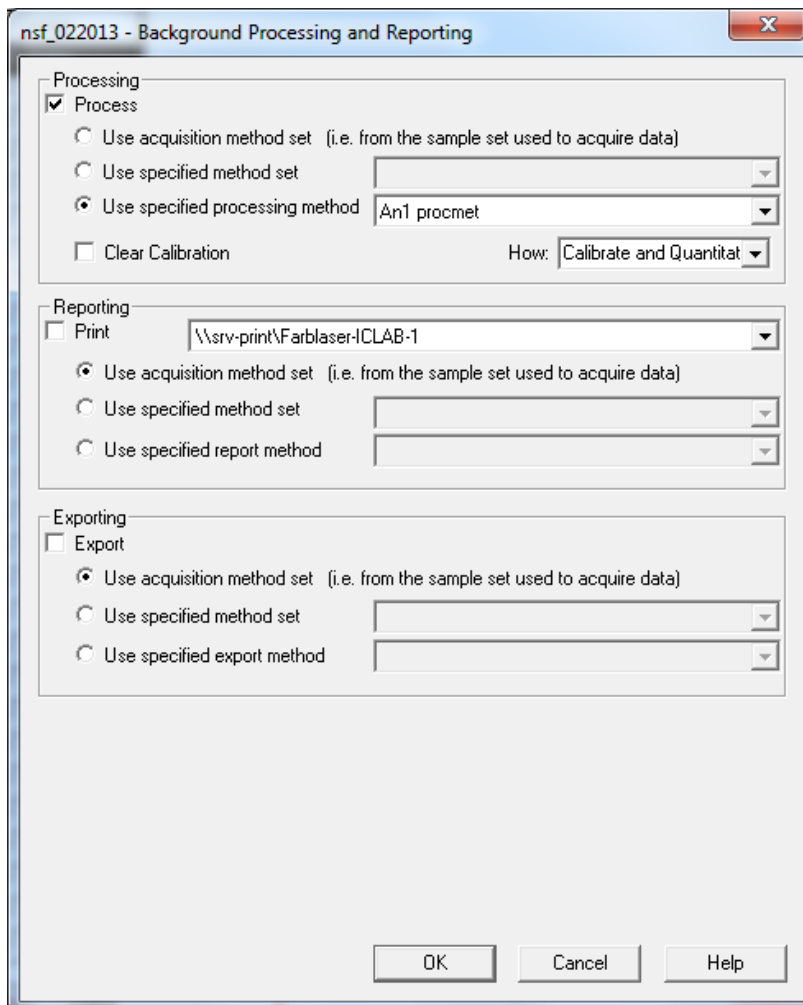
Export Method:

9 Evaluating recorded data

- To review recorded data, go to **Browse Project** and select the desired sample set.



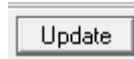
- Right-click on the name of the **sample set** and choose **process....**



- With **OK**, a result set is created out of the sample set. To view the results (e.g. calibration curve, amount of components in analyzed samples) go to the desired result set.

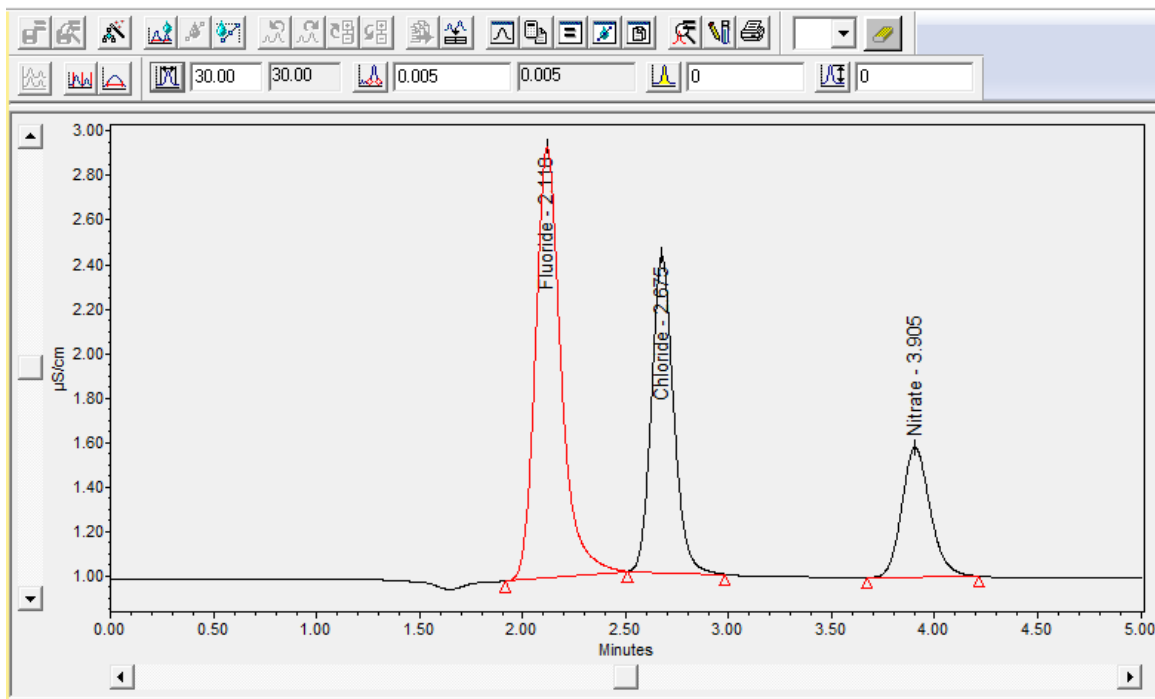
	Sample Sets	Injections	Channels	Methods	Result Sets	Results	Fractions	Sign Offs	Curves
E	Result Set Name		Result Set Date		System Name				
1	Anion smpleset03		06.03.2013 13:21:05 CET		Anion				
2	Anion smpleset03		06.03.2013 13:18:27 CET		Anion				
3	Anion smpleset03		06.03.2013 12:59:53 CET		Anion				
4	Anion smpleset03		06.03.2013 09:32:54 CET		Anion				
5	Anion smpleset02		06.03.2013 08:50:31 CET		Anion				
6	Anion smpleset		05.03.2013 16:56:37 CET		Anion				

4. Click on **Update** to see also the latest recalculations.




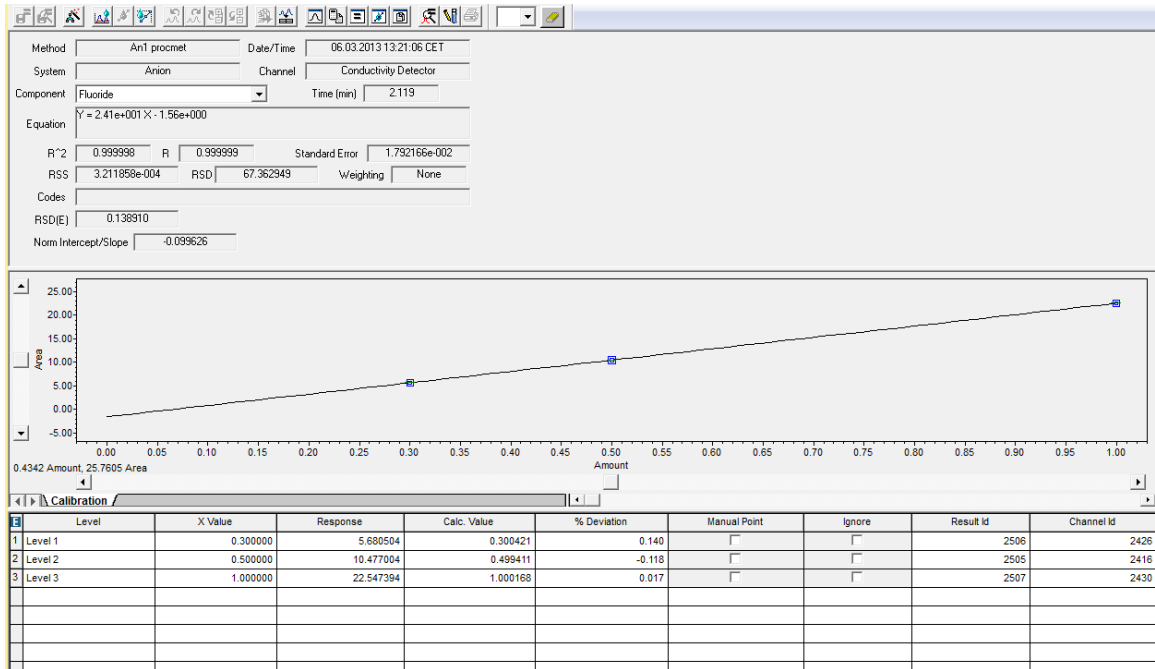
5. Double-click on a **result set** to open a review window and to see a single result.


	Sample Sets	Injections	Channels	Methods	Result Sets	Results	Fractions	Sign Offs	Curves
E	SampleName	Vial	Injection	Sample Type	Processed Channel Descr.	Date Acquired	Date Processed	Processing Method	Result Id
1	Standard2	24	1	Standard	Conductivity Detector	06.03.2013 09:25:34 CET	06.03.2013 13:21:06 CET	An1 procmct	2505
2	Standard1	25	1	Standard	Conductivity Detector	06.03.2013 09:33:02 CET	06.03.2013 13:21:06 CET	An1 procmct	2506
3	Standard3	26	1	Standard	Conductivity Detector	06.03.2013 09:40:28 CET	06.03.2013 13:21:06 CET	An1 procmct	2507
4	Check 0.8mg/L	27	1	Unknown	Conductivity Detector	06.03.2013 09:47:54 CET	06.03.2013 13:21:06 CET	An1 procmct	2508

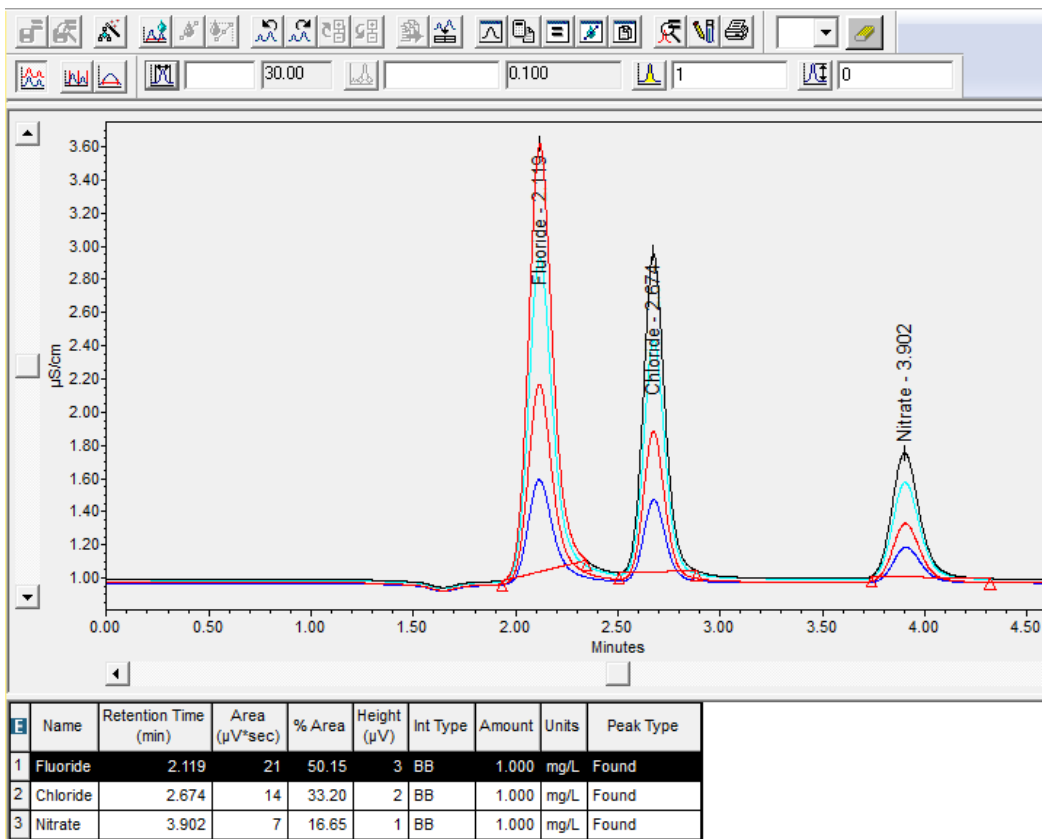


E	Name	Retention Time (min)	Area (μV*sec)	% Area	Height (μV)	Int Type	Amount	Units	Peak Type
1	Fluoride	2.118	17	50.85	2	BB	0.759	mg/L	Found
2	Chloride	2.675	11	32.27	1	BB	0.755	mg/L	Found
3	Nitrate	3.905	6	16.88	1	BB	0.785	mg/L	Found

6. The  icon shows the calibration.



7. Several results can be loaded into the review by highlighting them and then opening the review window. Use the icon  to overlay curves.



- For a report, right-click on the desired **sample** and select **Preview**.

The screenshot shows a software window titled "Anion in nsf_022013 as System/Administrator - QuickStart - [Find Data]". The main area contains a table with the following data:

SampleName	Vial	Injection	Sample Type	Processed Channel Descr.	Date Acquired	Date Processed	Processing Method	Result Id
Standard2	24	1	Standard	Conductivity Detector	06.03.2013 09:25:34 CET	06.03.2013 13:21:06 CET	An1 procmet	2505
Standard1	25	1	Standard	Conductivity Detector	06.03.2013 09:33:02 CET	06.03.2013 13:21:06 CET	An1 procmet	2506
Standard3	26	1	Standard	Conductivity Detector	06.03.2013 09:40:28 CET	06.03.2013 13:21:06 CET	An1 procmet	2507
Check 0.8mg/L	27	1	Unknown	Conductivity Detector	06.03.2013 09:47:54 CET	06.03.2013 13:21:06 CET	An1 procmet	2508

A context menu is open over the fourth row, with options including Review, Preview, Process..., Print..., Export..., Copy To Project..., Lock Channel, Unlock Channel, View As, Delete Row(s), Copy, Paste, Hide Column, Show All Columns, Print Table, Table Properties..., and Column Properties... The 'Preview' option is highlighted.

Below the table is a chromatogram showing a red trace on a white background. The y-axis is labeled "µS/cm" and ranges from 0.00 to 3.00. The x-axis is labeled "Minutes" and ranges from 0.00 to 10.00. There are three distinct peaks at approximately 2.5, 3.0, and 4.0 minutes. The text "Conductivity Detector" is visible in the top right corner of the plot area.

- A selection window appears in which you can select an appropriate **Report Method**:

The screenshot shows a dialog box titled "Open Report Method". The text inside reads: "Please select the Report Method that you would like to use to preview the data that you have selected." There are five radio button options:

- Use the Report Method in the acquisition Method sna 4uLmetset.
- Use the Report Method named Default.
- Use a Report Method that was generated to be appropriate for the selected data.
- Use the following Report Method: [dropdown menu]
- Use the currently open Report Method named Unbenannt.

At the bottom of the dialog box are three buttons: "OK", "Cancel", and "Help".

Unbenannt in Demo PM as System/Administrator - QuickStart - [Preview Data]

File Edit View Layout Help

Run Samples
Sample Queue
Control Panel

Browse Project

View Data

View Method
Method Set
Instrument
Processing

View Acquisition

Empower 3 Unbenannt

SAMPLE INFORMATION

Sample Name:	1000ppm F	Acquired By:	System
Sample Type:	Unknown	Sample Set Name:	1000ppm F
Vial:	99	Acq. Method Set:	ana 4ul.metset
Injection #:	1	Processing Method:	Standard Anions.prometh.cal
Injection Volume:	4.00 ul	Channel Name:	Conductivity Detector
Run Time:	6.0 Minutes	Proc. Chnl. Descr.:	Conductivity Detector
Date Acquired:	07.06.2013 12:23:38 CEST		
Date Processed:	07.06.2013 12:32:12 CEST		

Auto-Scaled Chromatogram

Peak Results

Name	RT	Area	Height	Amount	Units
1 Fluoride	4.193	5077230001	188799413		
2 Chloride	5.250				
3 Nitrite	6.000				
4 Bromide	7.500				
5 Nitrate	8.500				
6 Sulfate	10.000				
7 Phosphate	11.000				

Reported by User: System
Report Method: Unbenannt
Report Method ID: 125
Page: 1 of 1

Project Name: Demo PM
Date Printed: 24.08.2013
14:11:34 Europe/Berlin

10. The report can be modified as required using the **Edit Method** button.

Unbenannt in Demo PM as System/Administrator - QuickStart - [Preview Data]

File Edit View Layout Help

Run Samples
Sample Queue
Control Panel

Browse Project

View Data

View Method
Method Set
Instrument
Processing

View Acquisition

Chromatograms

- Auto Scaled Chromatogram
- Auto Scaled Fraction Chromatogram
- Auto Scaled with Legend
- Auto Scaled with Peak Labels
- Chromatogram w Gradient
- GPC Std Overlay
- Landscape Chromatogram
- Normalized Chromatograms
- Overlay Chrom w Basic Legend
- Overlay Chromatogram
- Stacked Chromatograms

Zeroed Baseline Chromatograms

Tables

- LC Calibration Curves
- Calibration Plot
- Overlay Calibration Plot
- LC Calibration Point Tables
- LC Calibration Avg. Point Tables
- Fraction Tables

Instrument Methods

Processing Methods

Report Methods

- Export Methods
- Method Sets
- Sample Set Methods

System Information

- Sample Sets
- Sample Components
- Comp Status Reports
- Post Run Reports
- Brief Report
- Full Report
- Summary Report

eCord Information

- Drawing Objects
- Special Information
- Fields
- Result Custom Fields
- Composite Groups
- Page Breaks
- Acquisition Logs
- Internal Standard Groups
- Peak Ratio Groups
- System Suitability Groups

SAMPLE INFORMATION

Sample Name:	1000ppm F	Acquired By:	System
Sample Type:	Unknown	Sample Set Name:	1000ppm F
Vial:	99	Acq. Method Set:	ana 4ul.metset
Injection #:	1	Processing Method:	Standard Anions.prometh.cal
Injection Volume:	4.00 ul	Channel Name:	Conductivity Detector
Run Time:	6.0 Minutes	Proc. Chnl. Descr.:	Conductivity Detector
Date Acquired:	07.06.2013 12:23:38 CEST		
Date Processed:	07.06.2013 12:32:12 CEST		

Auto-Scaled Chromatogram

Peak Results

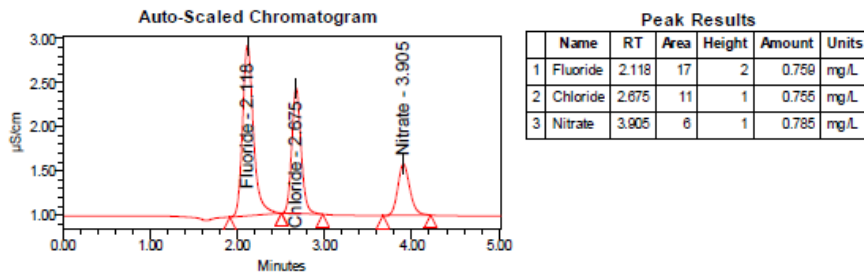
Name	RT	Area	Height	Amount	Units
1 Fluoride	4.193	5077230001	188799413		
2 Chloride	5.250				
3 Nitrite	6.000				
4 Bromide	7.500				
5 Nitrate	8.500				

11. The information can be applied directly to the report by double-clicking on the corresponding fields.

9.1 Example

Among many other things, the report can contain the chromatogram, the calibration curve, instrument parameters as well as the time program. A rudimentary example is shown below:

	SampleName	Sample Type	Vial	Inj #	Run Time (Minutes)	Injection Volume (ul)	Acquisition Method Set	Sample Weight	Processed Channel Descr.	Dilution
1	Check 0.8mg/L	Unknown	27	1	5.00	20.00	Anion metset	1.00000	Conductivity Detector	1.00000

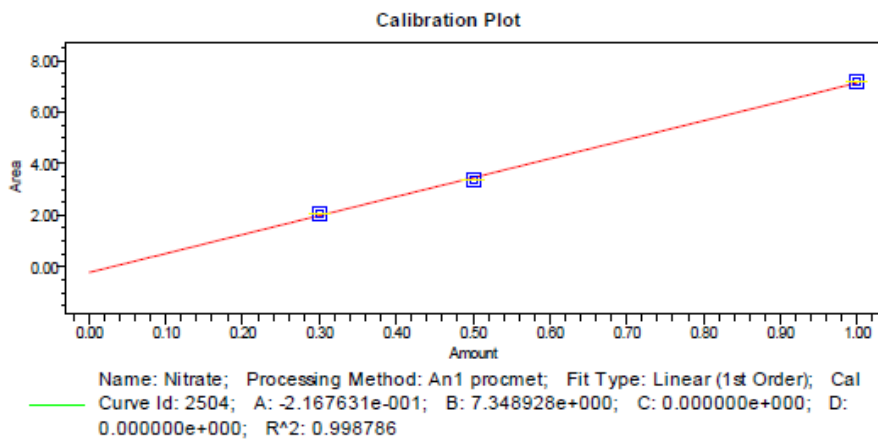
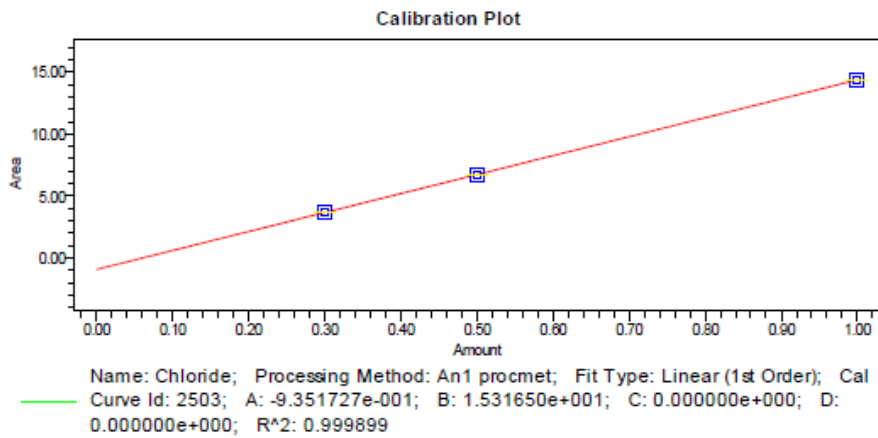
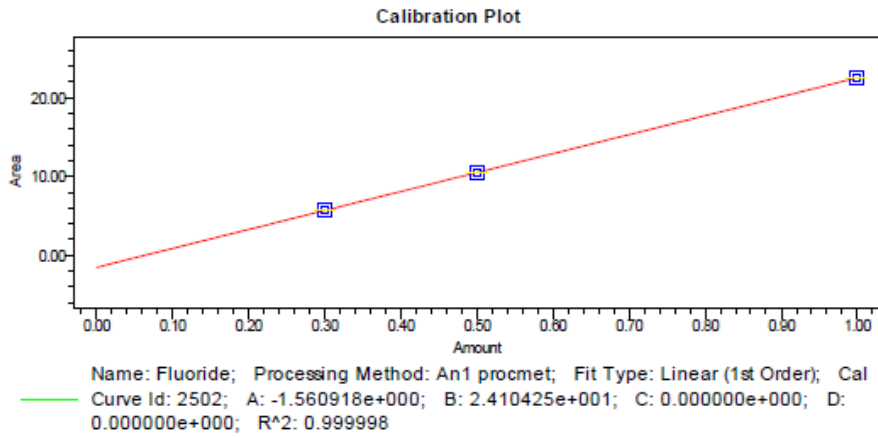


Metrohm IC Post Run Report

Sample: Anionen Vial: 1 Inj: 1

IC Properties

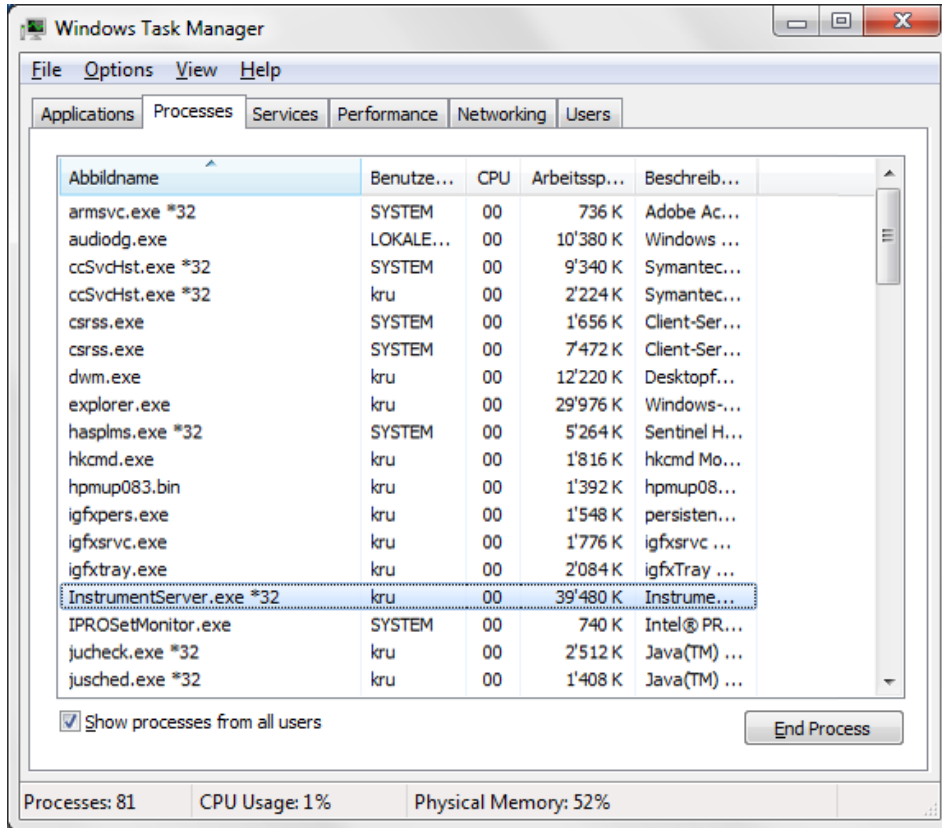
Device Type 0940.1500
 Program Version 5.940.0100
 Serial Number 2106



10 Troubleshooting

10.1 Stopping the process

1. If there is a system failure or if the connection is lost, it is recommended to close the software and also stop **InstrumentServer.exe** (with Task Manager/Processes).



2. Then restart the software to continue working.

10.2 Message Center

1. Double-clicking on the "E" in the task bar opens the Message Center, in which error messages are documented.



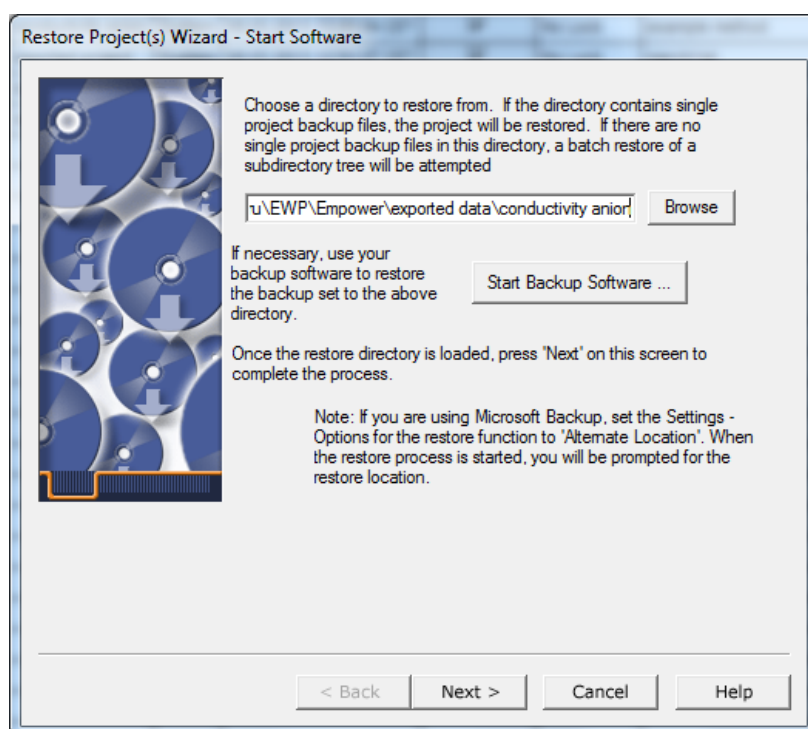
2. A list of all current messages appears (example list).

E Message Center							
File View Help							
	Type	Category	Time	Application	User	Project	Message
1	Error	General	09.07.2013 13:55:54 CEST	Login Window	System/Administrator		Oracle Error ORA-00001: unique constraint (MILLENNIUM.PK_NODEGROUP_N...
2	Warning	General	09.07.2013 13:55:54 CEST	Login Window	System/Administrator		INSERT INTO MILLENNIUM.NODEGROUP(NODENAME,GROUPNAME) VALUES(nodename,...
3	Error	Instrument	09.07.2013 13:56:34 CEST	881_8580010new	System/Administrator	Test1	Instrument Failure Metrohm 850/881#IC-99101 SP-04127
4	Inform	Instrument	09.07.2013 13:56:35 CEST	881_8580010new	System/Administrator	Test1	Connecting...
5	Error	Instrument	09.07.2013 13:56:35 CEST	881_8580010new	System/Administrator	Test1	Could not connect to the sample processor.
6	Error	Instrument	09.07.2013 13:56:38 CEST	881_8580010new	System/Administrator	Test1	PumpFlowActual[0] (Float)= : InvalidAction
7	Error	Instrument	09.07.2013 13:56:38 CEST	881_8580010new	System/Administrator	Test1	PumpState[0] (Enum)= : InvalidAction
8	Error	Instrument	09.07.2013 13:56:38 CEST	881_8580010new	System/Administrator	Test1	PumpPressureMax[0] (Float)= : InvalidAction
9	Error	Instrument	09.07.2013 13:56:38 CEST	881_8580010new	System/Administrator	Test1	PumpPressureActual[0] (Float)= : InvalidAction
10	Error	Instrument	09.07.2013 13:56:38 CEST	881_8580010new	System/Administrator	Test1	PumpUnderPressure[0] (Enum)= : InvalidAction
11	Error	Instrument	09.07.2013 13:56:38 CEST	881_8580010new	System/Administrator	Test1	PumpPressureMin[0] (Float)= : InvalidAction
12	Error	Instrument	09.07.2013 13:56:38 CEST	881_8580010new	System/Administrator	Test1	PumpOverPressure[0] (Enum)= : InvalidAction
13	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	InjectorState[0] (Enum)= : InvalidAction
14	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	InjectorStartPosition[0] (Enum)= : InvalidAction
15	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	DegasserState[0] (Enum)= : InvalidAction
16	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	PeristalticMSMState[0] (Enum)= : InvalidAction
17	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	PeristalticMSMDirection[0] (Enum)= : InvalidAction
18	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	PeristalticMSMRate[0] (Integer)= : InvalidAction
19	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	MSMState[0] (Enum)= : InvalidAction
20	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	MSMLastStepping[0] (Integer)= : InvalidAction
21	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	MSMStepTime[0] (Integer)= : InvalidAction
22	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	MSMAutoStepState[0] (Enum)= : InvalidAction
23	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	MCSState[0] (Enum)= : InvalidAction
24	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	MCSRate[0] (Integer)= : InvalidAction
25	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	ColumnHeaterState[0] (Enum)= : InvalidAction
26	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	ColumnHeaterTemperatureSet[0] (Float)= : InvalidAction
27	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	ColumnHeaterTemperatureActual[0] (Float)= : InvalidAction
28	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	ColumnHeaterTolerance[0] (Enum)= : InvalidAction
29	Error	Instrument	09.07.2013 13:56:39 CEST	881_8580010new	System/Administrator	Test1	ColumnIDCatNo[0] (String)= : InvalidAction
30	Error	Instrument	09.07.2013 13:56:40 CEST	881_8580010new	System/Administrator	Test1	Could not connect to the sample processor.
31	Error	Instrument	09.07.2013 13:56:48 CEST	881_8580010new	System/Administrator	Test1	Could not connect to the sample processor.
32	Error	Instrument	09.07.2013 13:56:55 CEST	881_8580010new	System/Administrator	Test1	Instrument Failure Metrohm 850/881#IC-99101 SP-04127
33	Error	Instrument	09.07.2013 13:56:57 CEST	881_8580010new	System/Administrator	Test1	Could not connect to the sample processor.
34	Error	Instrument	09.07.2013 13:57:06 CEST	881_8580010new	System/Administrator	Test1	Could not connect to the sample processor.
35	Error	Instrument	09.07.2013 13:57:15 CEST	881_8580010new	System/Administrator	Test1	Could not connect to the sample processor.

11 Restrictions

- This device driver allows you to operate one or several IC systems from one PC. One IC system may include a maximum of one changer, five Dosinos and one IC instrument with a conductivity detector.
- Two Metrohm IC instruments can be operated in parallel in two different systems.
- Two sample changers cannot be operated (with one PC) with this version.
- The **stop all** command does not only stop all components, but also the communication. As a result, the values are no longer updated in the status display.
- The column thermostat remains switched on with the **Abort Run** command.
- The MSM autostep is continued if the sample table is canceled with the **Abort after vial is completed** function. The column thermostat remains switched on as well. All other components are stopped.
- Information on the column used can be obtained via the **post run report**.
- The needle of the sample changer can only move to positions on the rack used (no external positions such as the rinsing station).
- If a Prep or Empty command is performed with the Dosino, then the "Dosing port 1" will always be used as the port for ejecting the solution (Port for Prep/Empty).
- For cation determination, the peaks in the live display are negative. In the analysis results, the chromatograms are displayed correctly (with positive peaks). For anion determination, the peaks are always positive.
- If the analytes are measured as negative peaks, the chromatogram has to be inverted by means of a **derived channel**. This means that the conductance measured is multiplied by "-1" (see chapter 13).

3. **Browse** to find the desired project.



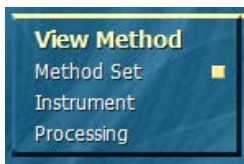
4. Click **Next** until finished.

The imported project will not only contain exemplary chromatograms, but also all instrument methods and processing methods that were used to record them.

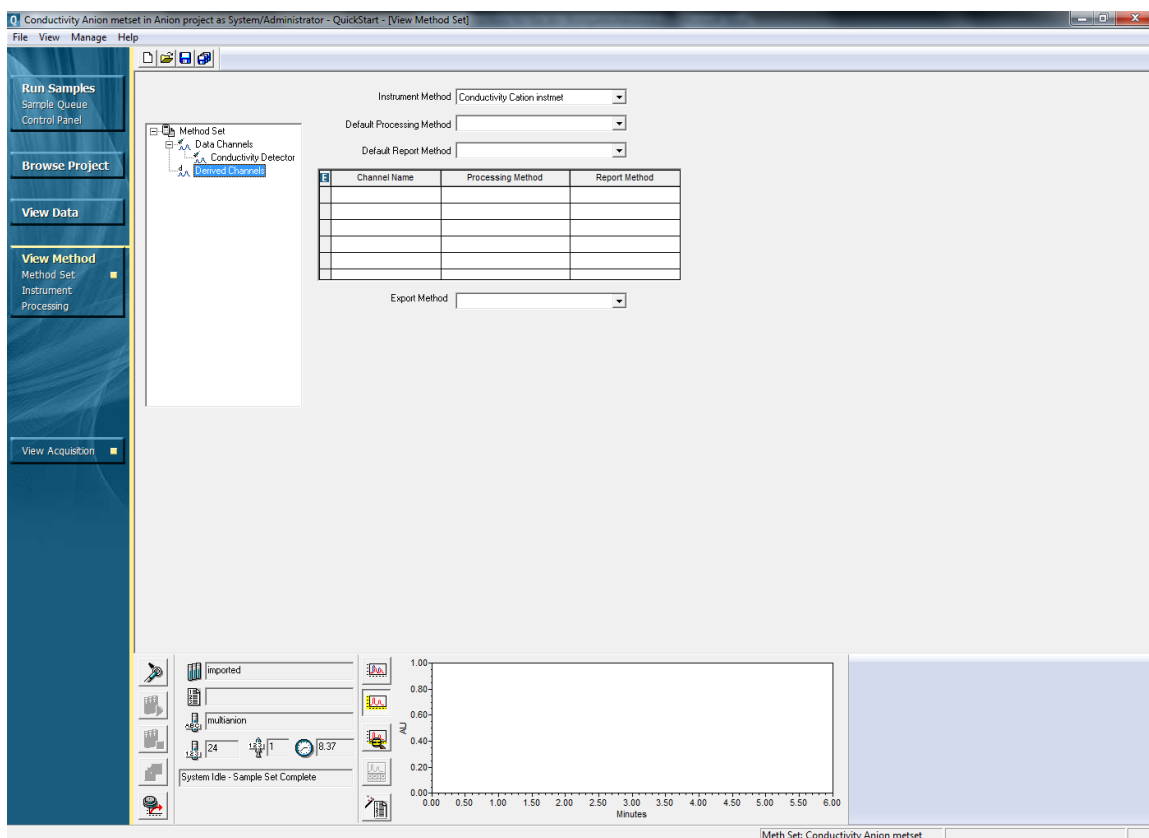
13 Measuring cations

For cations, the polarity needs to be changed because conductivity will show negative peaks for cations. In order to swap the chromatogram, the method set needs to be modified:

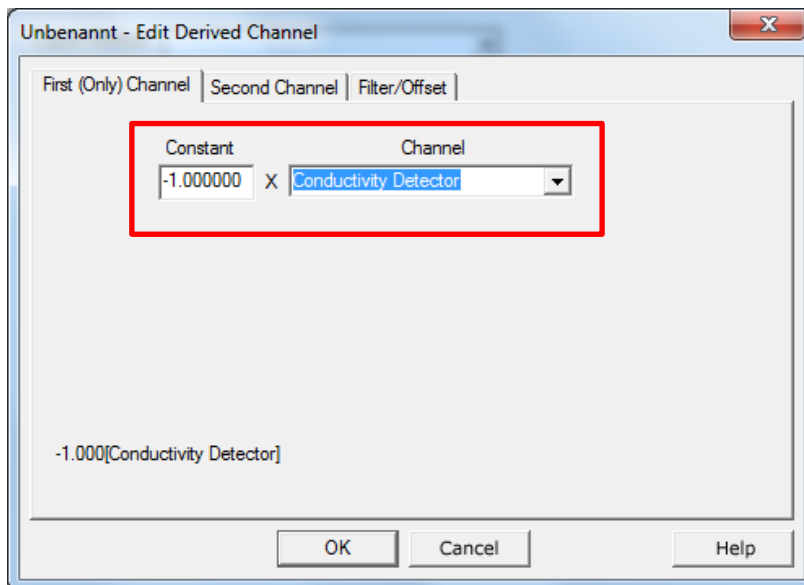
1. Go to **Method Set**.



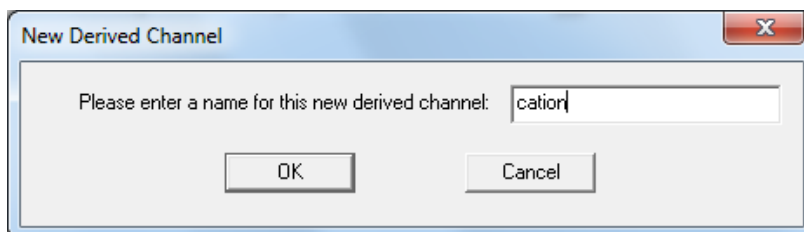
2. Create a derived channel by right-clicking on **Derived Channel > New > Derived channel**.



- For the derived channel, the conductivity needs to be multiplied by "-1" to obtain the inverse:



- Give the derived channel a name.



5. Choose a processing method for the cation channel.

Instrument Method

Default Processing Method

Default Report Method

	Channel Name	Processing Method	Report Method
1	cation	Conductivity Cation procmeth	