

# 830 IC Interface

---





# 830 IC Interface

---

5.830.0020 Program

## Instructions for Use

Teachware  
Metrohm AG  
Oberdorfstrasse 68  
CH-9101 Herisau  
[teachware@metrohm.com](mailto:teachware@metrohm.com)

1<sup>st</sup> Edition 2003

These instructions are protected by copyright. All rights reserved.

Although all the information given in these instructions has been checked with great care, errors cannot be entirely excluded. Should you notice any mistakes please inform the author at the address given above.

# Table of contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Instrument description .....	1
1.2	Parts and controls.....	2
1.3	Information on the Instructions for Use.....	4
1.3.1	Organization .....	4
1.3.2	Notation and pictograms .....	5
1.4	Safety notes .....	6
<b>2</b>	<b>Installation .....</b>	<b>7</b>
2.1	Setting up the instrument .....	7
2.1.1	Packaging.....	7
2.1.2	Check.....	7
2.1.3	Location .....	7
2.1.4	Arrangement of the instruments.....	7
2.2	Mains connection.....	8
2.2.1	Mains voltage and fuses .....	8
2.2.2	Mains cable .....	8
2.2.3	Switching the instrument on/off.....	8
2.3	Connection to the PC.....	9
2.3.1	Connecting cable .....	9
2.3.2	Software installation .....	9
2.4	Connection of external instruments.....	10
2.4.1	General information .....	10
2.4.2	819 IC Detector, 820 IC Separation Center, 818 IC Pump .....	12
2.4.3	833 IC Liquid Handling Pump Unit .....	13
2.4.4	833 IC Liquid Handling Suppressor-Unit .....	14
2.4.5	833 IC Liquid Handling Sample Prep Unit .....	15
2.4.6	833 IC Liquid Handling Dialysis Unit.....	16
2.4.7	833 IC Liquid Handling Ultra Filtration Unit.....	17
2.4.8	Triathlon Autosampler .....	18
2.4.9	766 IC Sample Processor .....	19
2.4.10	791 IC VA Detector .....	20
2.4.11	761 Compact IC .....	21
2.4.12	812 IC Valve Unit and 817 Bioscan.....	22
2.4.13	816 IC Eluent Selector .....	23
2.4.14	828 IC Dual Suppressor .....	24
2.4.15	837 IC Combi Degasser .....	25
<b>3</b>	<b>Operation .....</b>	<b>26</b>
3.1	Switch instrument on/off .....	26
3.2	Settings in the "830 IC Interface" window.....	27
3.2.1	Event output lines .....	30
<b>4</b>	<b>Appendix .....</b>	<b>34</b>
4.1	Technical data.....	34
4.2	Scope of delivery .....	38
4.3	Optional accessories .....	39
4.4	Validation / GLP .....	40
4.5	Warranty and Conformity .....	41

4.5.1	Warranty .....	41
4.5.2	Declaration of Conformity .....	42
4.5.3	Quality Management Principles .....	43
<b>4.6</b>	<b>Index .....</b>	<b>44</b>

## List of illustrations

Fig. 1:	Connection possibilities at 830 IC Interface .....	1
Fig. 2:	Front of 830 IC Interface .....	2
Fig. 3:	Rear of 830 IC Interface .....	3
Fig. 4:	Connection of 830 IC Interface to PC .....	9
Fig. 5:	Connection of 819, 820 and 818 (MIC 1) .....	12
Fig. 6:	Connection of 820, 819, 818 and 833(Pump Unit) (MIC 2) .....	13
Fig. 7:	Connection of 2x819, 820, 2x818 and 833 (Suppressor Unit) (MIC 3)..	14
Fig. 8:	Connection of 833 (Sample Prep Unit) to MIC 6 for Neutralization.....	15
Fig. 9:	Connection of 819, 820, 818, 833 (Suppressor Unit) and 833 (Dialysis Unit) .....	16
Fig. 10:	Connection of 819, 820, 818, 833 (Suppressor Unit) and 833 (Ultra Filtration Unit).....	17
Fig. 11:	Connection of 819, 820, 818 and Triathlon .....	18
Fig. 12:	Connection of 819, 820, 818 and 766 .....	19
Fig. 13:	Connection of 819, 820, 818 and 791 .....	20
Fig. 14:	Connection of 819, 820, 818 and 761 .....	21
Fig. 15:	Connection of 817, 812 and 818 (MIC 8) .....	22
Fig. 16:	Connection to 819, 820, 818 and 816 .....	23
Fig. 17:	Connection to 819, 820, 2x818 and 828 (MIC 10).....	24
Fig. 18:	Connection to 819, 820, 818 and 837 .....	25

# 1 Introduction

## 1.1 Instrument description

The **830 IC Interface** provides the connection between the PC and external IC or HPLC peripheral instruments. Up to 16 instruments including 4 detectors can be connected to the 830 IC Interface and controlled by means of the «IC Net» PC software. The 830 IC Interface can also record and convert the analog signals from a maximum of 4 channels (two at once) which are processed at very high resolution.

Fig. 1 shows an overview of all the Metrohm instruments which can be connected to the 830 IC Interface and are described in these 'Instructions for Use'. It is also possible to connect Bischoff instruments; please refer to the «IC Net» on-line program help as well as the relevant Bischoff instruction manuals.

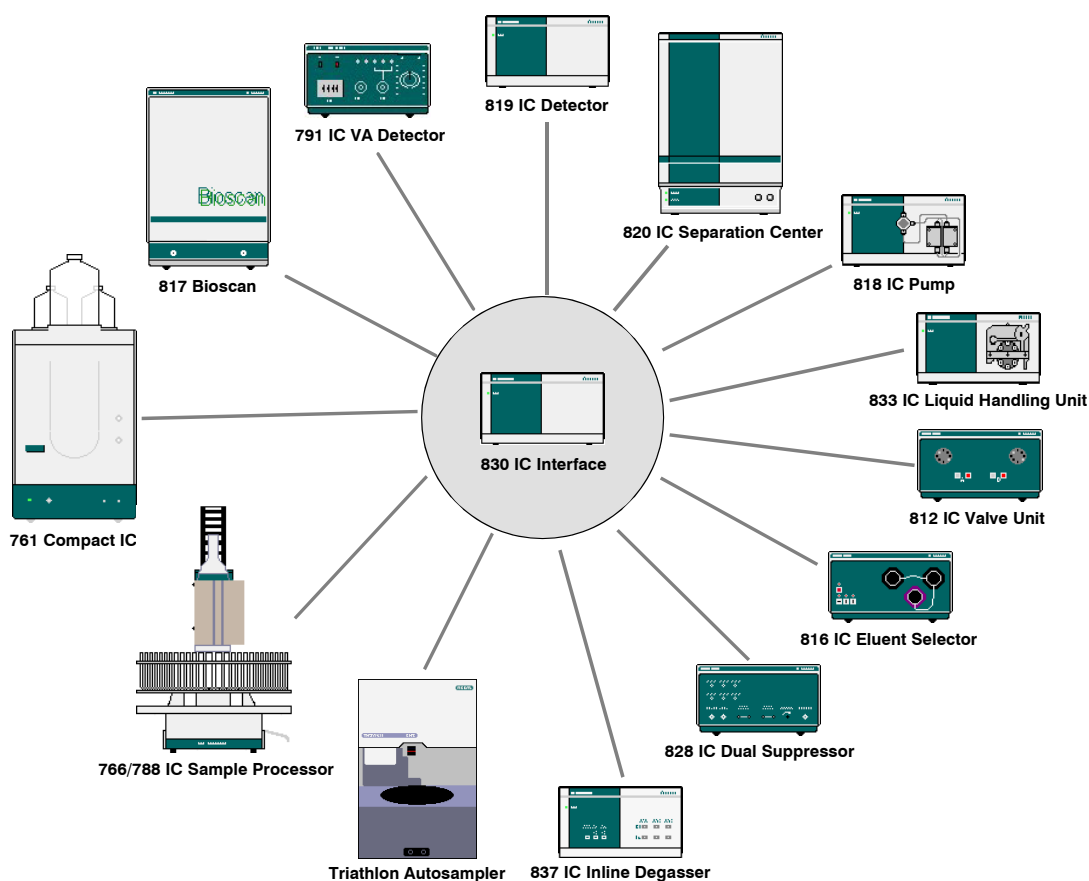
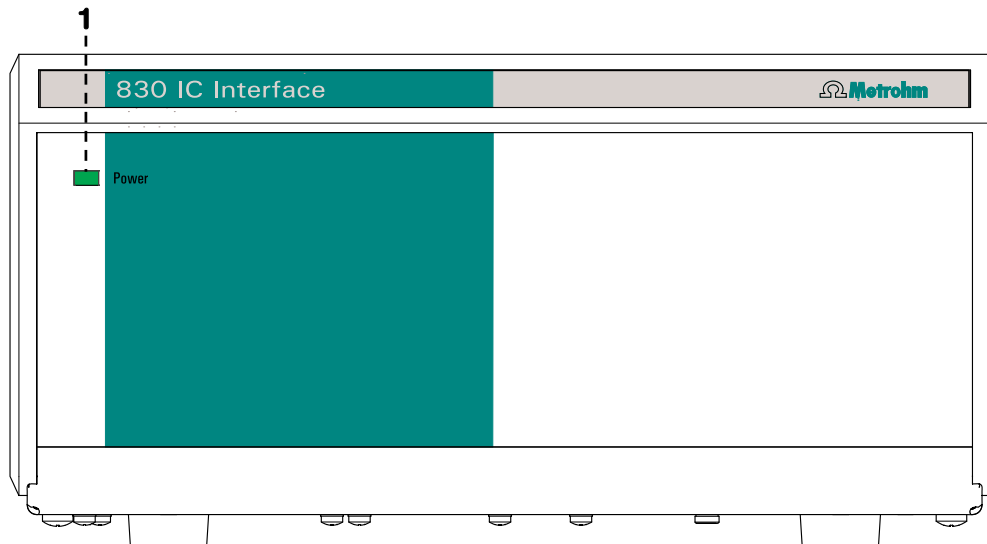


Fig. 1: Connection possibilities at 830 IC Interface

## 1.2 Parts and controls



In this section you will find the numbers and designations of the parts and controls of the 830 IC Interface. The numbering applies throughout the instructions for use, i.e. bold numbers in the text (e.g. **5**) refer to the parts and controls illustrated here.



**Fig. 2:** Front of 830 IC Interface

---

### 1 Mains pilot lamp

Lights up when instrument is switched on

---

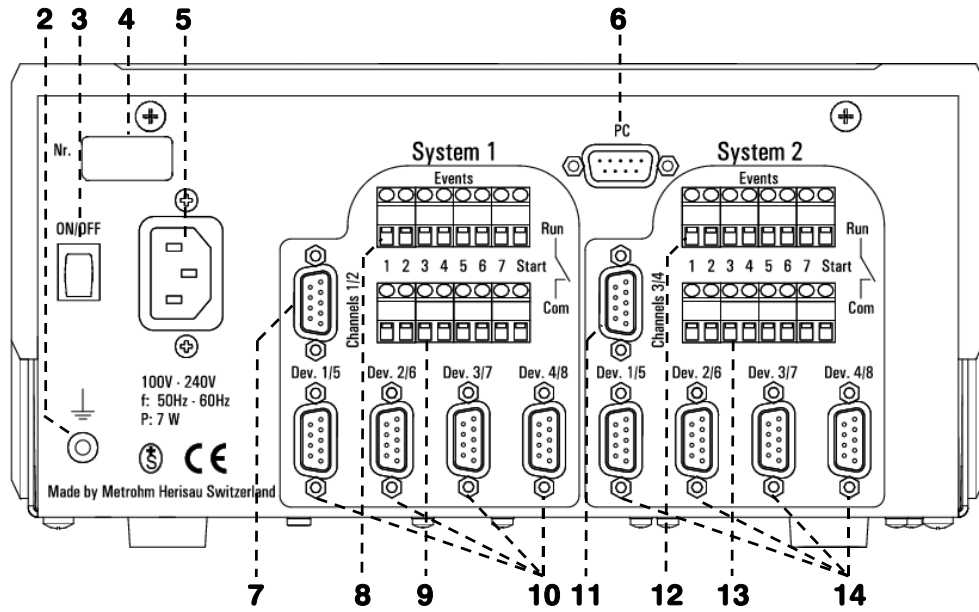


Fig. 3: Rear of 830 IC Interface

<b>2 Earthing socket</b>	<b>9 Remote input/output lines connection (COM)</b>
<b>3 Mains switch</b> For switching the instrument on/off.	<b>10 RS232 interfaces</b>
<b>4 Serial number</b>	<b>System 2</b>
<b>5 Mains connection plug</b> Mains connection see <i>section 2.2</i>	<b>11 Analog signal connection</b>
<b>6 PC connection</b> RS232 interface	<b>12 Remote input/output lines connection (RUN)</b>
<b>System 1</b>	<b>13 Remote input/output lines connection (COM)</b>
<b>7 Analog signal connection</b>	<b>14 RS232 interfaces</b>
<b>8 Remote input/output lines connection (RUN)</b>	

## 1.3 Information on the Instructions for Use



*Please read through these Instructions for Use carefully before you put the 830 IC Interface into operation. The Instructions for Use contain information and warnings to which the user must pay attention in order to assure safe operation of the instrument.*

### 1.3.1 Organization





These **8.830.1003 Instructions for Use** for the 830 IC Interface provide a comprehensive overview of the installation, startup procedure, operation and technical specifications of this instrument. The Instructions for Use are organized as follows:

- |                  |   |
|------------------|---|
| <b>Section 1</b> | <b>Introduction</b><br>General description of instrument, parts and controls and safety notes               |
| <b>Section 2</b> | <b>Installation</b><br>Mains connection, connection to PC, connection of external instruments               |
| <b>Section 3</b> | <b>Operation</b><br>Operation via «IC Net»  |
| <b>Section 4</b> | <b>Appendix</b><br>Technical data, standard equipment, options, warranty, declarations of conformity, index |

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

**1.3.2 Notation and pictograms**

The following notations and pictograms (symbols) are used in these Instructions for Use:

<b>Range</b>	<b>Menu item, parameter or entry value</b> in «IC Net» program
<b>SYSTEM STATE</b>	<b>Program window</b> in «IC Net» program
<b>&lt;OK&gt;</b>	<b>Button</b> in «IC Net» program
<b>4</b>	<b>Part or control of 830</b>
	<b>Danger/Warning</b> This symbol indicates a possible risk of death or injury to the user and possible damage to the instrument or its components by electricity.
	<b>Danger/Warning</b> This symbol indicates a possible risk of death or injury to the user and possible damage to the instrument or its components.
	<b>Attention</b> This symbol indicates important information that you should read before continuing.
	<b>Information</b> This symbol indicates additional information and tips which may be of particular use to you.

## 1.4 Safety notes

While electrical safety in the handling of the 830 IC Interface is assured in the context of the specifications IEC 1010-1 (protection class 1, degree of protection IP40), the following points should be noted:

- **Mains connection**



The **mains connection** must be effected in accordance with the instructions in section 2.2.

- **Opening the instrument**

Inside the instrument there are no parts which must be set or adjusted by the user.



If the 830 IC Interface is connected to the power supply, the instrument must not be opened nor must parts be removed from it, otherwise there is a danger of coming into contact with components which are live. Hence, always disconnect the instrument from all voltage sources before you open it and ensure that the **mains cable is disconnected from mains connection 5!**

- **Protection against static charges**



Electronic components are sensitive to static charging and can be destroyed by discharges. Before you touch any of the components inside the 830 IC Interface, 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 Installation

## 2.1 Setting up the instrument

### 2.1.1 Packaging

The 830 IC Interface is supplied together with the separately packed accessories in special packagings containing shock-absorbing foam linings designed to provide excellent protection. The instrument itself is packed in an evacuated polyethylene bag to prevent the ingress of dust. Please store all these special packagings as only they assure transport of the instrument free from damage.

### 2.1.2 Check

After receipt, immediately check whether the shipment is complete and has arrived without damage (compare with delivery note and list of accessories in *section 4.2*). In the case of transport damage, see instructions in *section 4.5.1 "Warranty"*.

### 2.1.3 Location

Position the instrument in the laboratory at a location convenient for operation, free from vibrations and protected against a corrosive atmosphere and contamination by chemicals.

### 2.1.4 Arrangement of the instruments

The modular IC instruments can be piled up in any order. The best place for the 830 IC Interface is on top of a modular IC system.



*The 830 IC Interface should always be placed above components carrying liquids so that any leaks which may occur in the tubing or connections cannot cause damage by leakage of liquids (e.g. acid).*

## 2.2 Mains connection

### 2.2.1 Mains voltage and fuses

The 830 Interface has a power supply which automatically adjusts itself to the existing mains voltage (100...240 V) and frequency (50...60 Hz). It is equipped with an electronic overload protection device and also has two fuses; however, these should only be exchanged by Metrohm service technicians.

### 2.2.2 Mains cable

The instrument is supplied with one of three mains cables

- 6.2122.020 with plug SEV 12 (Switzerland, ...)
- 6.2122.040 with plug CEE(7), VII (Germany, ...)
- 6.2133.070 with plug NEMA 5-15 (USA, ...)

which are three-cored and fitted with a plug with an earthing pin. If a different plug has to be fitted, the yellow/green lead (IEC standard) must be connected to the earthing socket **2** (protection class 1).



*Any break in the earthing inside or outside the instrument can make it a hazard!*

Plug the mains cable into mains connection plug **5** at the 830 IC Interface (see *Fig. 3*).

### 2.2.3 Switching the instrument on/off

The 830 IC Interface is switched on and off using mains switch **3** (see *Fig. 3*). When the instrument is switched on a start-up check routine is running the mains pilot lamp **1** flashes twice slowly and remains on.

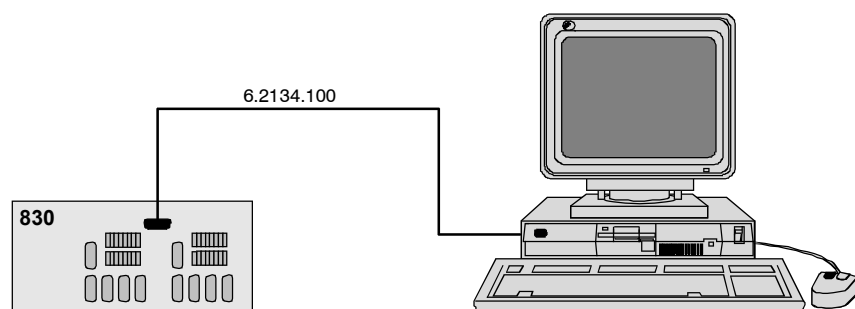
## 2.3 Connection to the PC

### 2.3.1 Connecting cable



Always switch off 830 IC Interface and PC before you connect the two instruments with the 6.2134.100 Cable

Connect the PC connection **6** at the 830 IC Interface to one of the serial COM ports at the PC using the 6.2134.100 Cable (9 pin/9 pin). If only a 25-pin COM interface is available on the PC then the 6.2125.110 Adapter cable or a commercially available adapter must be used.



**Fig. 4:** Connection of 830 IC Interface to PC

### 2.3.2 Software installation

The PC program «**IC Net 2.3**» is required for the operation of the 830 IC Interface; this is contained on the 6.6034.033 CD included in the accessories. This program runs under Windows 2000 and Windows XP operating systems and is installed according to *section 1.4.2* of the «*IC Net*» *Instructions for Use*.

## 2.4 Connection of external instruments

### 2.4.1 General information



*Before an external instrument is connected to the 830 IC Interface, the 830 IC Interface must always be switched off using mains switch **3!***

Each system of the two versions of the 830 IC Interface has four RS232 interfaces **10** or **14** for connection of a maximum of 8 external instruments, an **7** or **11** interface for analog signals from a maximum of 2 detectors and 8 remote output lines **8/9** or **12/13** for controlling external instruments by making contacts or impulses (see *Fig. 3*). Information about the technical data of these interfaces is given in *section 4.1*.

For installation and startup of external instruments proceed as follows:

---

#### 1 Switch off all instruments

- Switch off 830 IC Interface and all external instruments using the mains switch.

---

#### 2 Connect instruments

- Connect the instruments to the 830 IC Interface according to the connection diagrams shown in *sections 2.4.2* to *2.4.15* by using the cables named in the diagrams. Other instrument combinations can be set up by using these examples as a guide.

---

#### 3 Switch on all instruments

- Switch on 830 IC Interface and all external instruments using the mains switch.

---

#### 4 Instrument settings

Operation with the 830 IC Interface requires that the following settings must be made:

- **Advanced IC instruments:**  
**818 IC Pump**  
**819 IC Detector**  
**820 IC Separation Center**  
**833 IC Liquid Handling Unit**

These instruments are already pre-configured, no additional settings must be made.

Also all other Metrohm IC instruments can be operated with the 830 IC Interface, for the settings of the instruments please refer to the respective instructions for use.

- **732 IC Detector:**

```
>CONFIG/RS settings
handshake:          SWchar
```

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

- **709 IC Pump:**  
Switch on external control of the 709 IC Pump using the [ **EXT.** ] key.
- **752 IC Pump Unit, 753 IC Suppressor Module, 754 IC Dialysis Unit:**  
Switch on external control via remote interface using the [ **Remote** ] switch.
- **817 Bioscan:**  
This instrument is already pre-configured, no additional settings must be made.
- **761 Compact IC:**  
This instrument is already pre-configured, no additional settings must be made.
- **750 IC Autosampler:**  
Always switch on the 830 IC Interface first and then the 750 Autosampler.
- **766 IC Sample Processor:**

```
>RS232 settings
handshake:          SWchar
```

```
>RS232 settings
RS control:          on
```

- **Triathlon Autosampler:**  
This instrument is already pre-configured, no additional settings must be made.
- **812 IC Valve Unit:**  
This instrument is already pre-configured, no additional settings must be made.
- **816 IC Eluent Selector:**  
Switch on external control via RS232 interface using the [ **EXT** ] switch..
- **828 IC Dual Suppresso:**  
Switch on external control via remote interface using the [ **Remote** ] switch.
- **837 IC Degasser:**  
This instrument is already pre-configured, no additional settings must be made.

**5 Create new system in «IC Net»**

- Start the «IC Net» program.
- Create a new system file with the selected instruments (details see *IC Net Instructions for Use*).

## 2.4.2 819 IC Detector, 820 IC Separation Center, 818 IC Pump

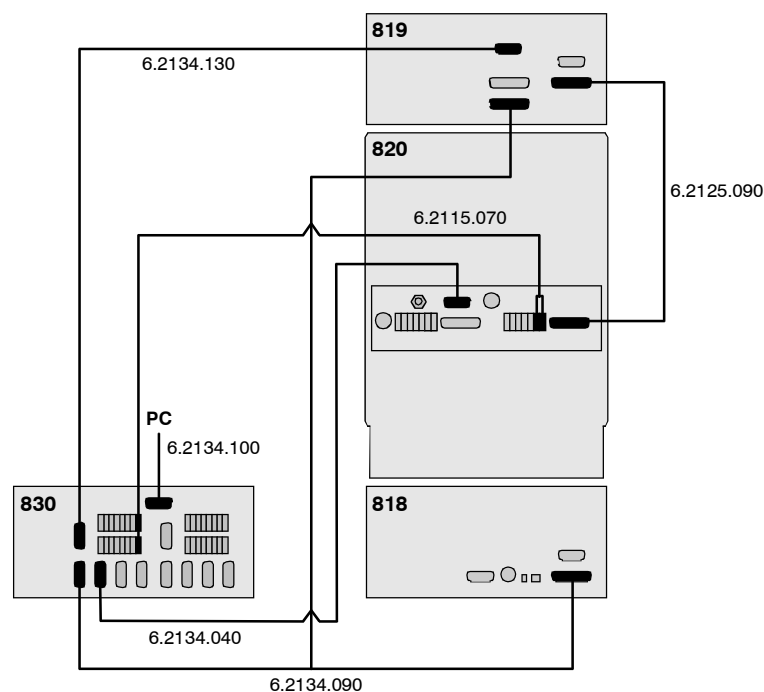
### Example

Analysis of anions or cations on a modular system with electronic suppression.

### Instruments

The setup of the instruments corresponds to the **Modular IC System 1 (MIC 1 Advanced)**.

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0210 820 IC Separation Center with 1 injector and column heater
- 2.818.0110 818 IC Pump



### Interconnection

**Fig. 5:** Connection of 819, 820 and 818 (MIC 1)

### 2.4.3 833 IC Liquid Handling Pump Unit

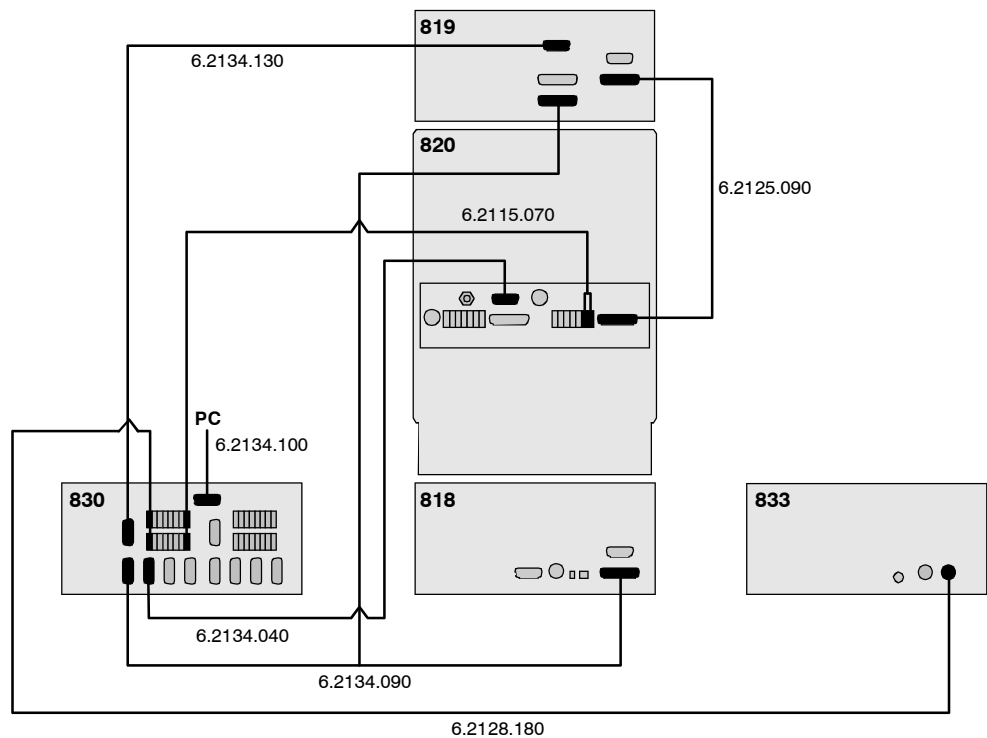
#### Example

Analysis of anions or cations on a modular system with chemical suppression.

#### Instruments

The setup of the instruments corresponds to the **Modular IC System 2 (MIC 2 Advanced)**.

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0230 820 IC Separation Center with 1 injector, suppressor module and column heater
- 2.818.0110 818 IC Pump
- 2.833.0010 833 IC Liquid Handling Pump Unit



#### Interconnection

Fig. 6: Connection of 820, 819, 818 and 833(Pump Unit) (MIC 2)



### 2.4.5 833 IC Liquid Handling Sample Prep Unit

#### Example

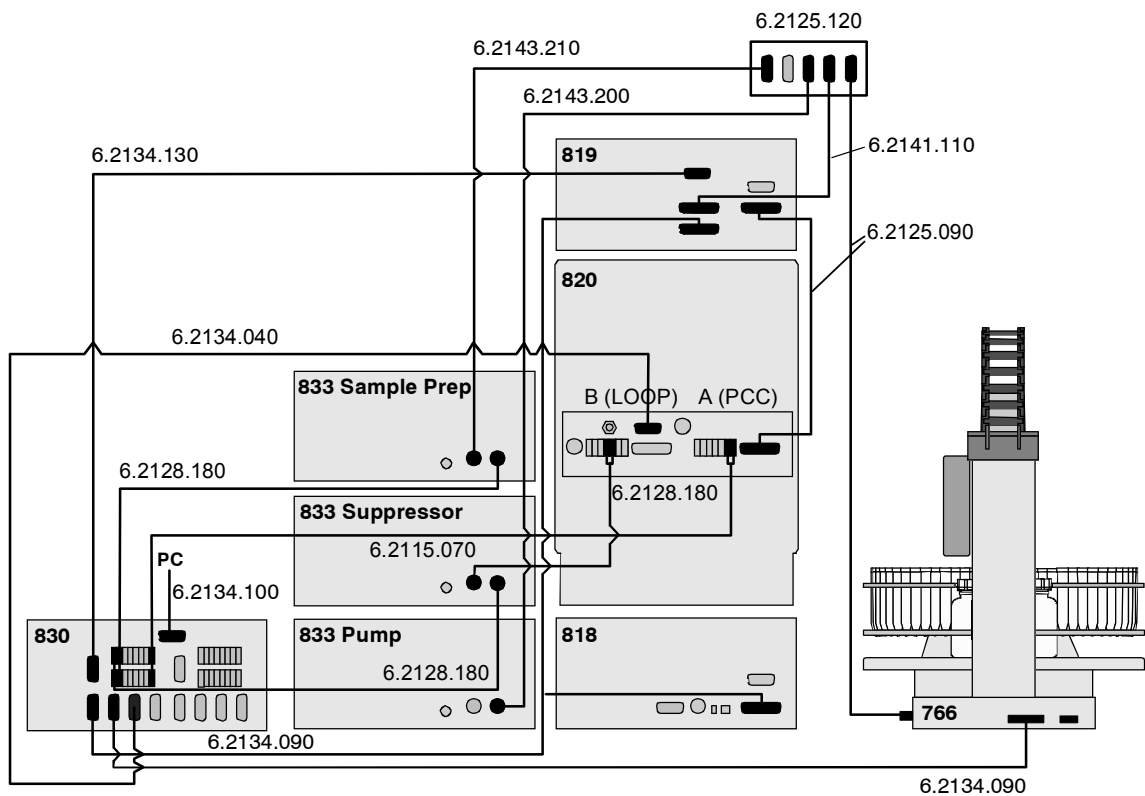
Neutralization of an alkaline sample for anion determination with chemical suppression.

#### Instruments

The setup of the instruments corresponds to the **Modular IC System 6 (MIC 6)** enhanced by the **IC Liquid Handling Sample Prep Module 833 (2.833.0030)**.

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0220 820 IC Separation Center with 2 injectors and column heater
- 2.818.0110 818 IC Pump
- 2.833.0010 833 IC Liquid Handling Pump Unit
- 2.833.0020 833 IC Liquid Handling Suppressor Unit
- 2.833.0030 833 IC Liquid Handling Sample Prep Unit

#### Interconnection



**Fig. 8:** Connection of 833 (Sample Prep Unit) to MIC 6 for Neutralization

## 2.4.6 833 IC Liquid Handling Dialysis Unit

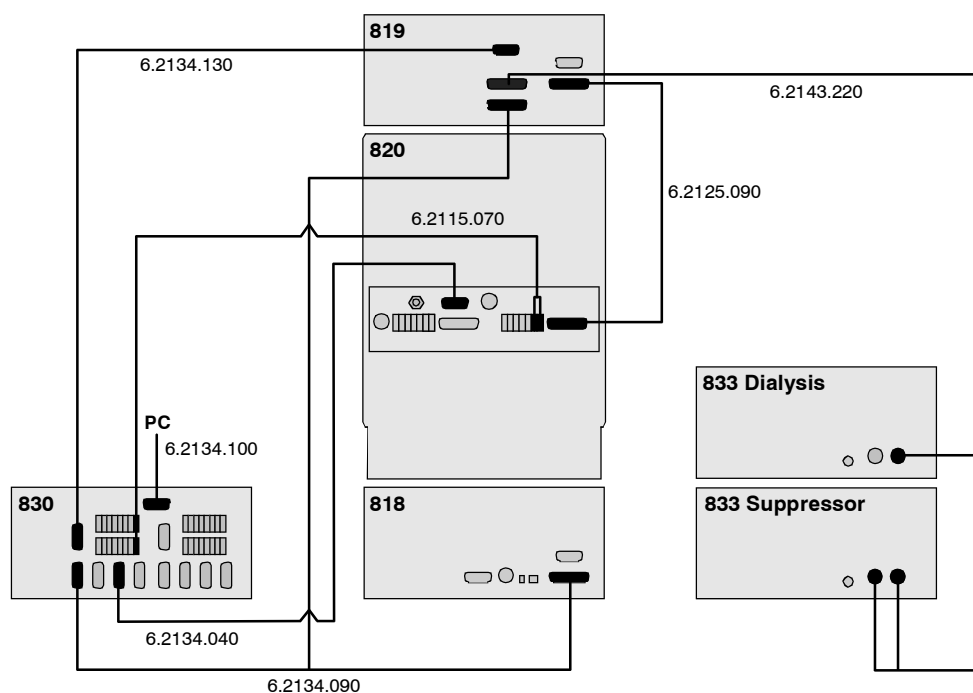
### Example

Analysis of anions on a modular system with chemical suppression after preceding sample dialysis.

### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0220 820 IC Separation Center 820 with 2 injectors and column heater
- 2.818.0110 818 IC Pump
- 2.833.0020 833 IC Liquid Handling Suppressor Unit
- 2.833.0040 833 IC Liquid Handling Dialysis Unit

### Interconnection



**Fig. 9:** Connection of 819, 820, 818, 833 (Suppressor Unit) and 833 (Dialysis Unit)

### 2.4.7 833 IC Liquid Handling Ultra Filtration Unit

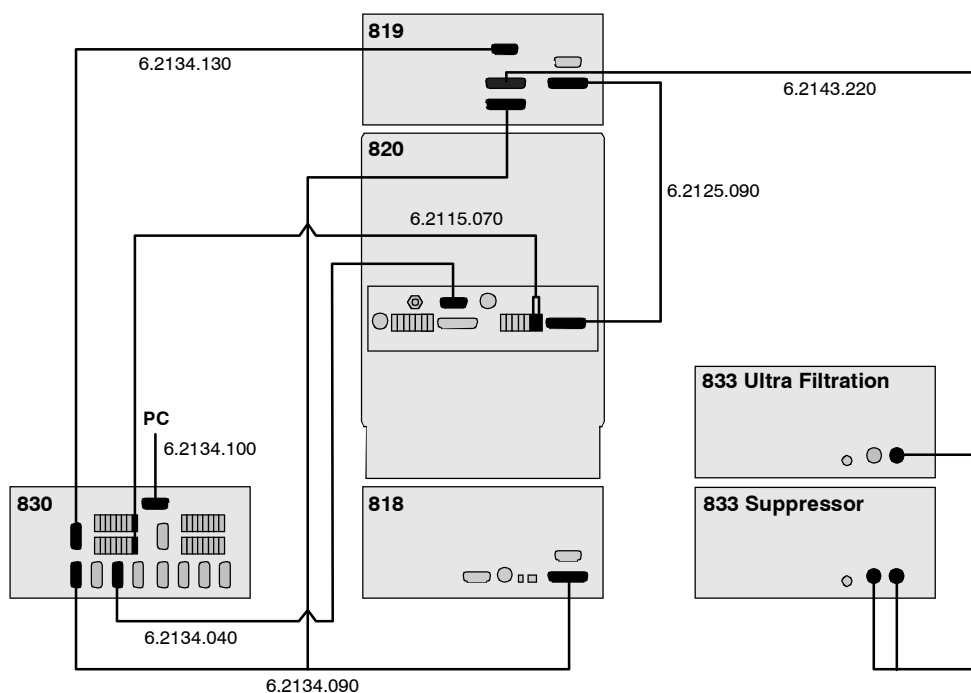
#### Example

Analysis of anions on a modular system with chemical suppression after preceding sample filtration, for strongly contaminated samples.

#### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0210 820 IC Separation Center 820 with 1 injector and column heater
- 2.818.0110 818 IC Pump
- 2.833.0020 833 IC Liquid Handling Suppressor Unit
- 2.833.0050 833 IC Liquid Handling Ultra Filtration Unit

#### Interconnection



**Fig. 10:** Connection of 819, 820, 818, 833 (Suppressor Unit) and 833 (Ultra Filtration Unit)

## 2.4.8 Triathlon Autosampler

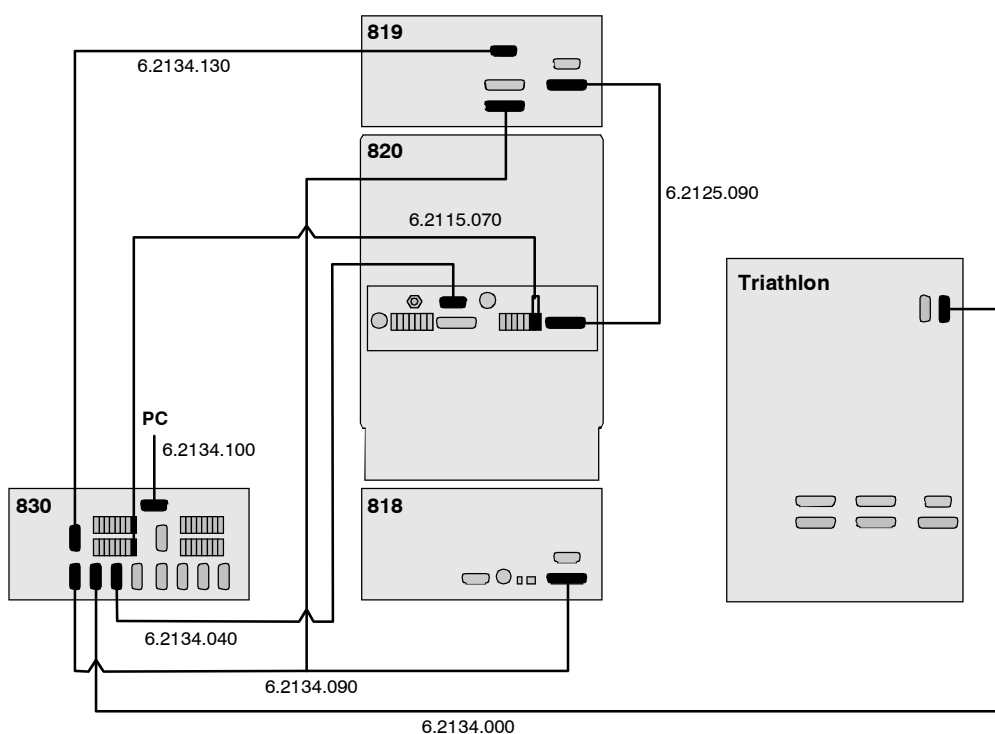
### Example

Automatic analysis of anions or cations on a modular system with electronic suppression using the Triathlon Autosampler.

### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0210 820 IC Separation Center 820 with 1 injector and column heater
- 2.818.0110 818 IC Pump
- 2.135.0100 Triathlon Autosampler

### Interconnection



**Fig. 11:** Connection of 819, 820, 818 and Triathlon

### 2.4.9 766 IC Sample Processor

#### Example

Automatic analysis of anions or cations on a modular system with electronic suppression using the 766 IC Sample Processor.

#### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0210 820 IC Separation Center 820 with 1 injector and column heater
- 2.818.0110 818 IC Pump
- 2.766.0010 766 IC Sample Processor

#### Interconnection

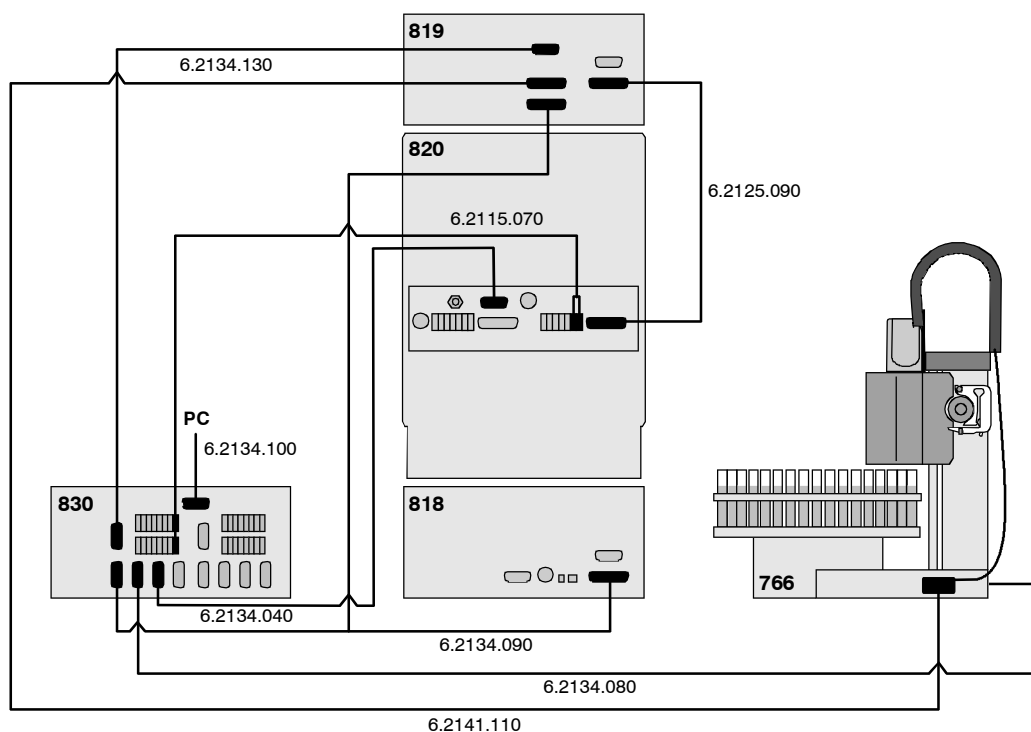


Fig. 12: Connection of 819, 820, 818 and 766

## 2.4.10 791 IC VA Detector

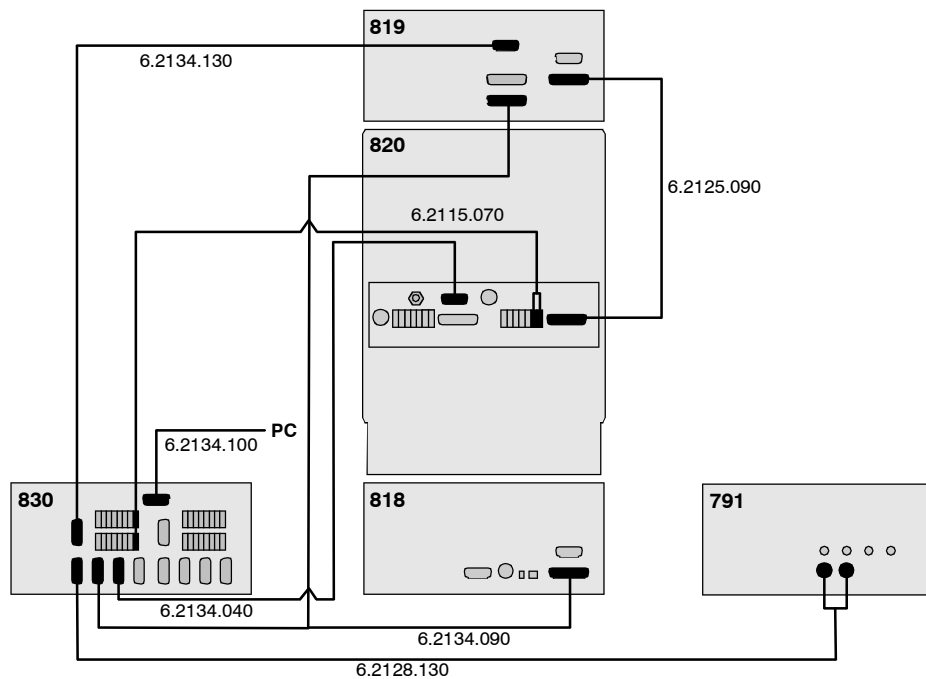
### Example

Analysis of anions or cations on a modular system with electronic suppression and with simultaneous conductometric and electrochemical detection.

### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0210 820 IC Separation Center with 1 injector and column heater
- 2.818.0110 818 IC Pump
- 2.791.0020 791 IC VA Detector

### Interconnection



**Fig. 13: Connection of 819, 820, 818 and 791**

### 2.4.11 761 Compact IC

#### Example

Connection of a modular system and a 761 Compact IC to a 830 IC Interface (if not enough COM ports are available at the PC).

#### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0210 820 IC Separation Center with 1 injector and column heater
- 2.818.0110 818 IC Pump
- 2.761.0020 761 Compact IC with suppressor module

#### Interconnection

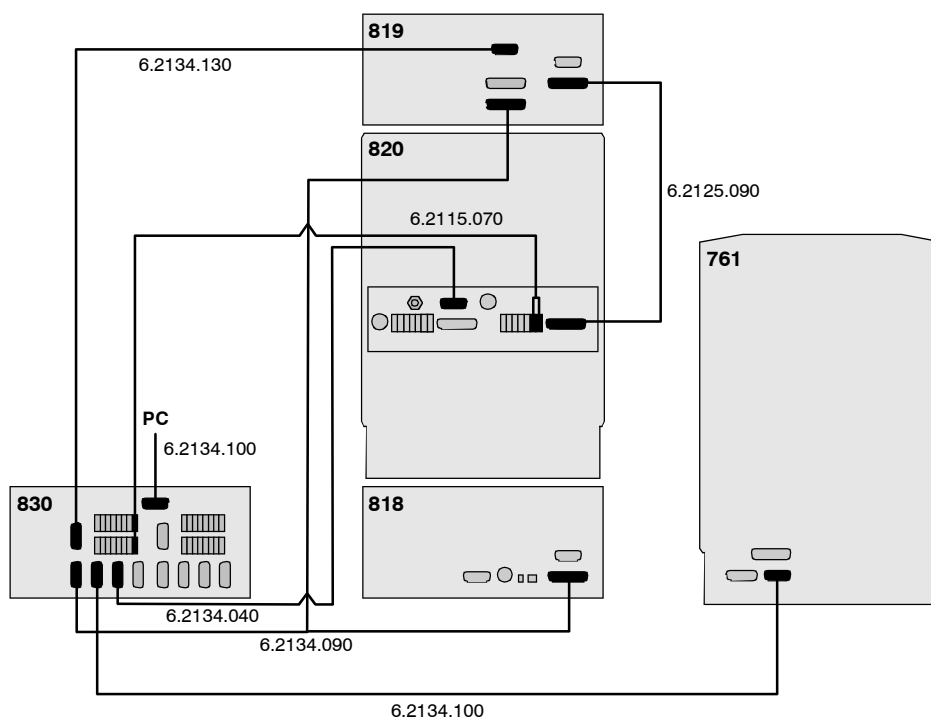


Fig. 14: Connection of 819, 820, 818 and 761

## 2.4.12 812 IC Valve Unit and 817 Bioscan

### Example

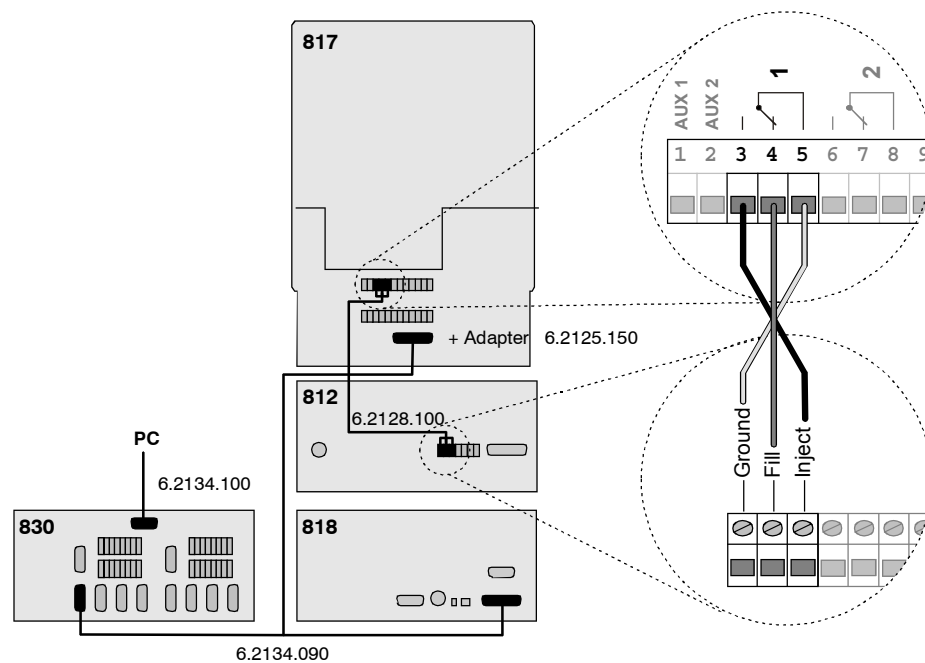
Modular system for sugar analysis.

### Instruments

The setup of the instruments corresponds to the **Modular IC System 8 (MIC 8 Advanced)** enhanced by the **830 IC Interface**.

- 2.830.0020 830 IC Interface
- 2.817.0010 817 Bioscan
- 2.812.0010 812 IC Valve Unit 812 with 1 valve
- 2.818.0110 818 IC Pump

### Interconnection



**Fig. 15: Connection of 817, 812 and 818 (MIC 8)**

### 2.4.13 816 IC Eluent Selector

#### Example

Analysis of anions on a modular system with chemical suppression and step gradients.

#### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0230 820 IC Separation Center with 1 injector, suppressor module and column heater
- 2.818.0110 818 IC Pump
- 2.816.0010 816 IC Eluent Selector

#### Interconnection

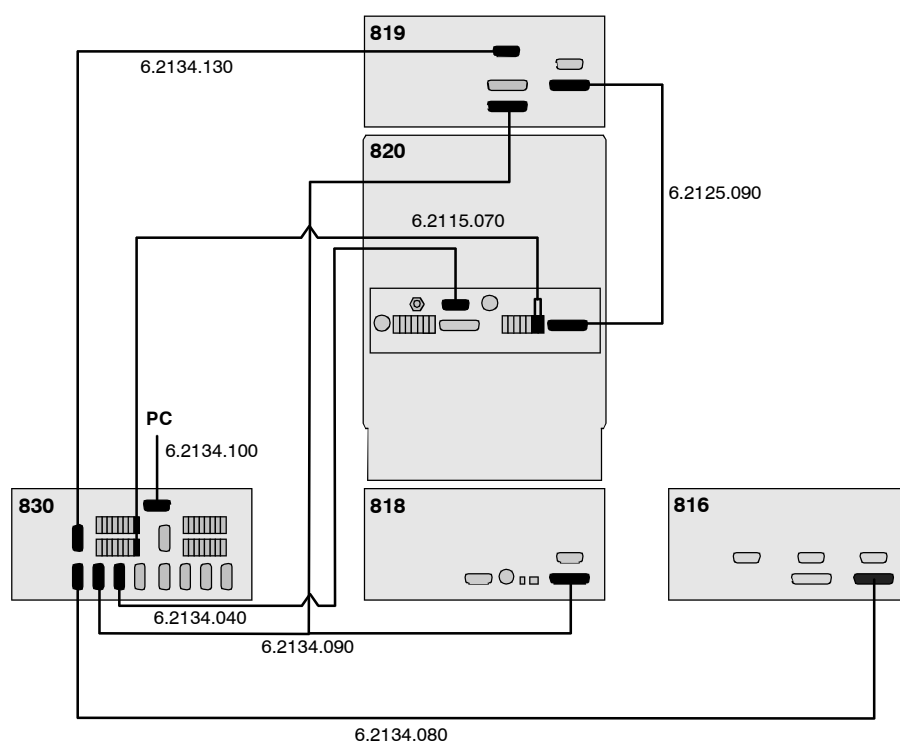


Fig. 16: Connection to 819, 820, 818 and 816

## 2.4.14 828 IC Dual Suppressor

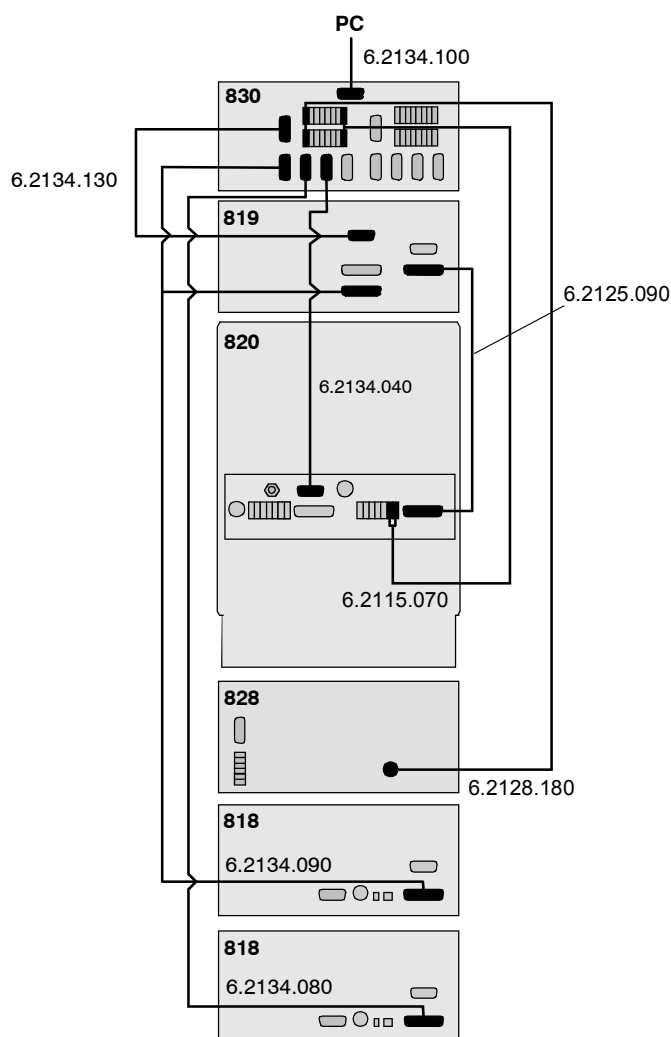
### Example

Analysis of anions on a modular system using binary high-pressure gradients with chemical suppression.

### Instruments

The setup of the instruments corresponds to the **Modular IC System 10 (MIC 10 Advanced)**

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0210 820 IC Separation Center with 1 injector, suppressor module and column heater
- 2.818.0110 818 IC Pump, 2 devices
- 2.828.0010 828 IC Dual Suppressor



### Interconnection

**Fig. 17:** Connection to 819, 820, 2x818 and 828 (MIC 10)

### 2.4.15 837 IC Combi Degasser

#### Example

Analysis of anions on a modular system with chemical suppression and automatic degassing of sample and eluent.

#### Instruments

- 2.830.0020 830 IC Interface
- 2.819.0110 819 IC Detector
- 2.820.0230 820 IC Separation Center with 1 injector and suppressor module and column heater
- 2.818.0010 818 IC Pump
- 2.837.0030 837 IC Combi Degasser

#### Interconnection

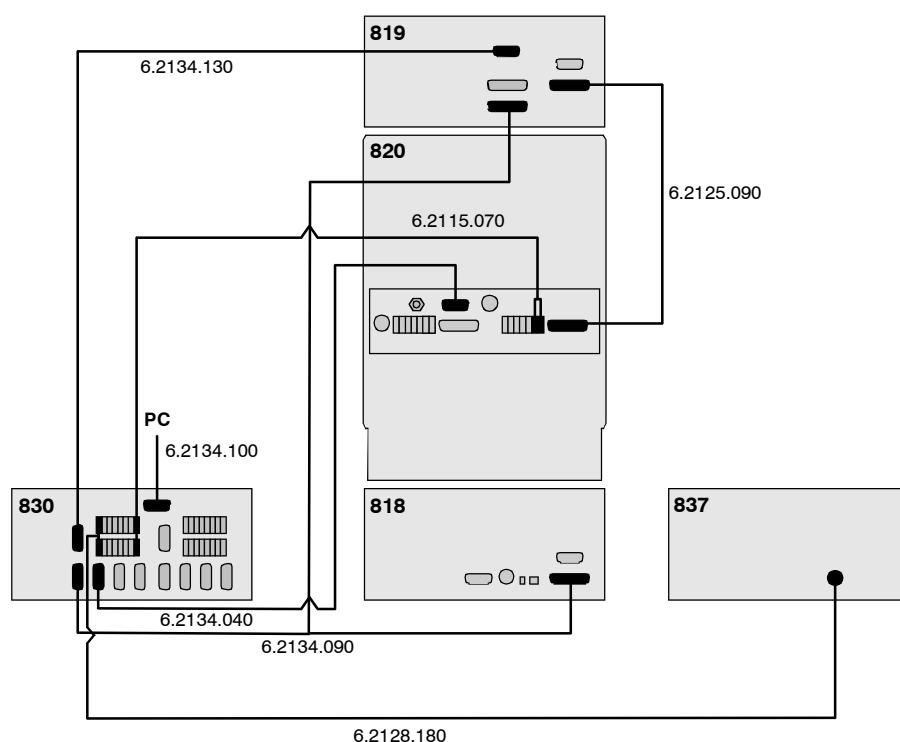


Fig. 18: Connection to 819, 820, 818 and 837

# 3 Operation

The operation of 830 IC Interface is made completely via the Metrohm software «IC Net».



*This section describes only the most important points concerning the operation of the 830 IC Interface. For further details please refer to the «IC Net» Instructions for Use and to the on-line help in the PC program.*

## 3.1 Switch instrument on/off

The 830 IC Interface is switched on and off using mains switch **3** on the rear of the instrument (see Fig. 3).

After the instrument has been switched on a self-test is running. The mains pilot lamp **1** flashes twice slowly and remains on to show that the instrument is ready for use, if an error occurs the mains pilot lamp **1** starts flashing fast.



*If the mains pilot lamp is flashing fast after the instrument is switched on an error occurred. Switch the instrument off and on, if the error remains, refer to the Metrohm service.*

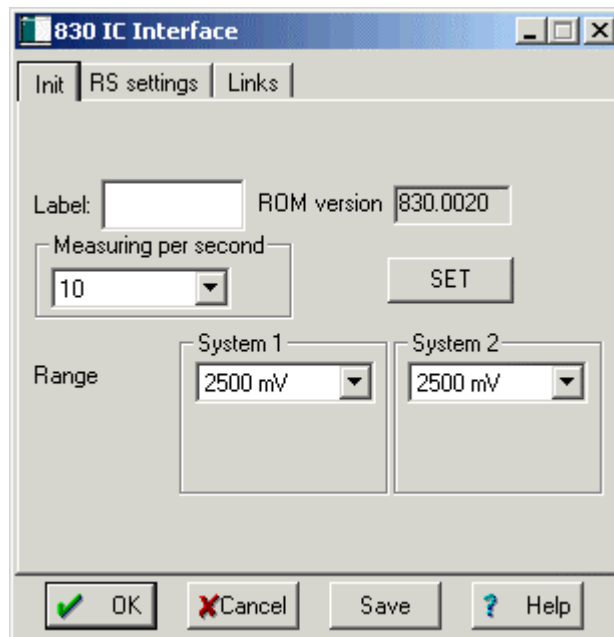
## 3.2 Settings in the "830 IC Interface" window



By clicking the 830 icon in the toolbar with the left mouse button or by clicking this icon with the right mouse button and selecting the **Open** menu item the **830 IC Interface** window for parameter settings is opened. It consists of three tabs **Init**, **RS settings**, and **Links**.

### Init

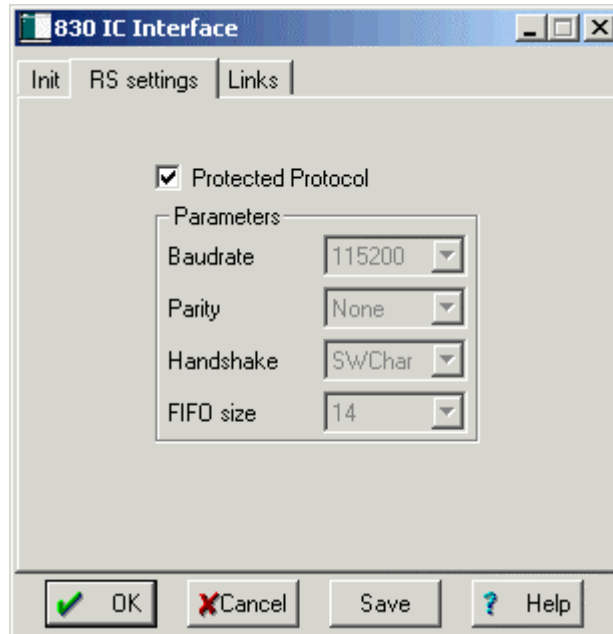
The **Init** tab of the **830 IC Interface** window contains data acquisition parameters for the 830 IC Interface.



<b>Label</b>	Optional label to <b>name</b> the interface with maximum 8 characters.
<b>ROM version</b>	Instrument program version number .
<b>Measuring per second</b>	Number of data points measured per s. Entry range: <b>10, 20, 30, 50, 60 points/s</b>
<b>Range</b>	Range for AD converter . Example: converts $\pm 2500$ mV to $2^{24}$ bits Entry range: <b>2500, 1250, 625, 312.5, 156.25, 78.125, 39.062 mV</b>
<b>&lt;SET&gt;</b>	Send current parameters to 830 IC Interface.

## RS settings

The **RS settings** tab of the **830 IC Interface** window contains RS232 parameters for the 830 IC Interface.



### Protected Protocol



Data transfer with Protected Protocol between **830 IC Interface** and **PC** for enhanced data security.



Data transfer without Protected Protocol between **830 IC Interface** and **PC**, select this option if there is a problem with the RS communication using the Protected Protocol.

---

### Baud Rate

Display of the baud rate of the device.

### Parity

Display of the parity check .

### Handshake

Display of the software handshake mode.

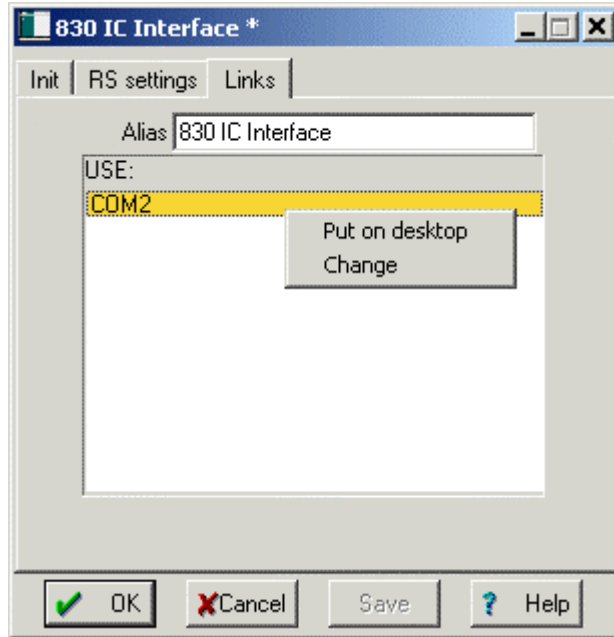
### FIFO size

Display of the intermediate memory in byte.

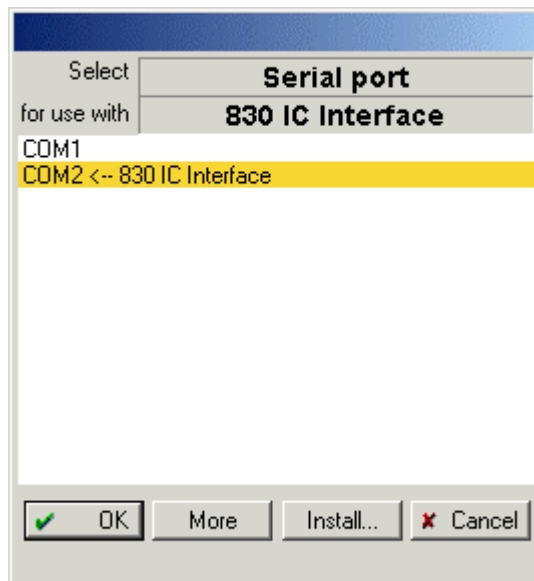
The values are displayed correctly only if the 830 IC Interface is connected and switched on.

**Links**

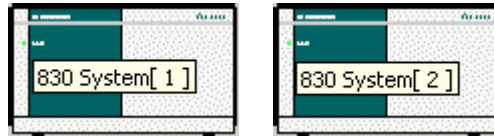
The **Links** tab of the **830 IC Interface** is used for RS232 interface (COM port) selection and settings.



<b>Alias</b>	Name of the instrument.
<b>COM #</b>	If this entry is clicked with the right mouse button, the following menu appears:
<b>Put on desktop</b>	Possibility for setting RS232 interface parameters (details see on-line help).
<b>Change</b>	Possibility for changing the RS232 interface. The following window is opened, where the COM port can be changed by clicking on the desired entry.



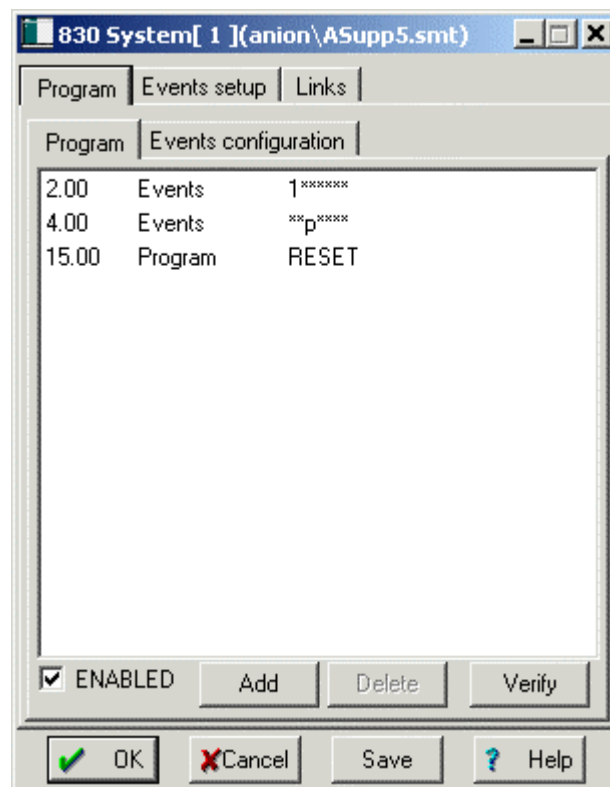
### 3.2.1 Event output lines



The **830 System [1]** or **830 System [2]** window are available in the **SYSTEM** window if the **830 System [1]** or **830 System [2]** have been installed with the **Install existing devices** option. The **830 System [#]** window with programs and settings for the seven event output lines is opened by selecting the **Open** menu item with the right mouse button or by double-clicking the **830 icon** added to the **SYSTEM** window. It consists of the tabs **Program** and **Events setup**.

#### Time program

On the **Program** tab of the **830 System [#]** window a user-defined time program for the event output lines of the 830 IC Interface can be entered. This program is started automatically as defined in the **Start mode** window either at the moment the determination is started (**Start with determination**) or at the moment the sample is injected (**Start with inject**).



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

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

## Program

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

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

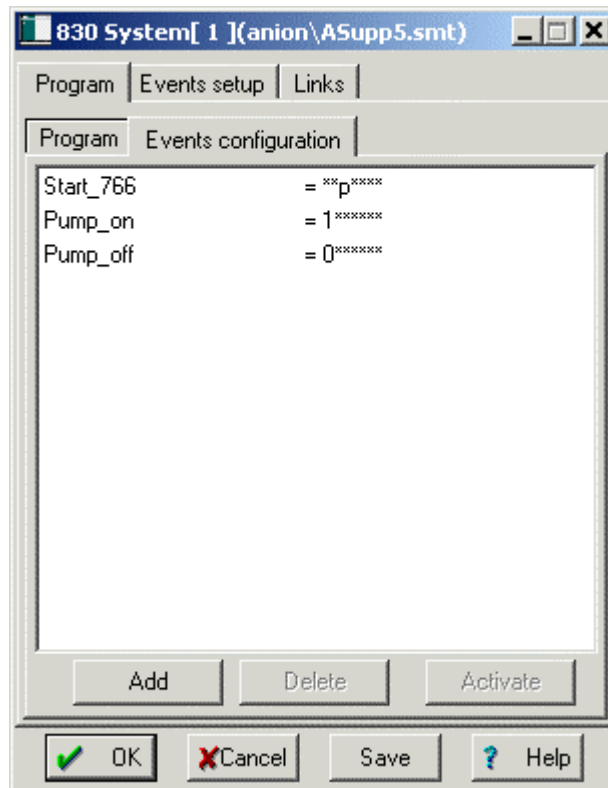
## List of program instructions

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

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

## Events configuration

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



**Name (1<sup>st</sup> column)** User-definable name of the event command (e.g. **Start\_766**).

**Remotebefehl (2<sup>nd</sup> column)** Setting the event output lines 1...7.  
Selection:

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

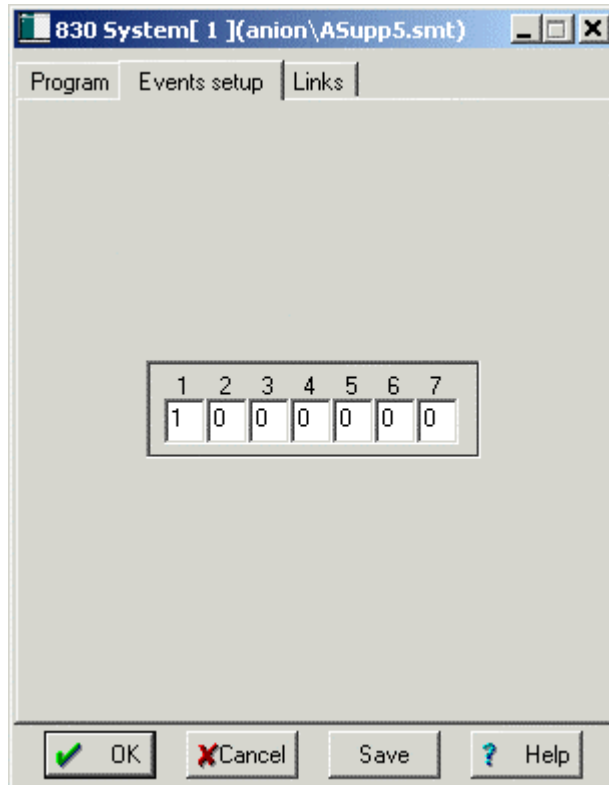
For entry of the first value, enter **1**, **0**, **p** or **\***. For entry of the other values, move the cursor in front of the value to be changed and enter **1**, **0**, **p** or **\***.

---

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

### Events setup

The **Events setup** tab of the **830 System [#]** window contains the **startup values** for the seven event output lines of system 1 or system 2 of the 830 IC Interface. These startup values are sent each time the system is connected or a determination is started.



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

- 0** Line off, inactive (open)
- 1** Line on, active (0 V)

For technical data to the event output lines see *section 4.1*.

# 4 Appendix

## 4.1 Technical data



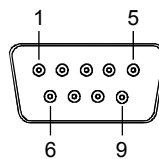
*Provided that nothing to the contrary is mentioned, the published data are typical values for the 830 IC Interface at an ambient temperature of 25°C.*

### Mains connection

<i>Voltage</i>	100...240 V
<i>Frequency</i>	50...60 Hz
<i>Power consumption</i>	7 W
<i>Fuse</i>	2 × 1 ATH (to be replaced by Metrohm Service only using the same type) Additional electronic overload protection

### PC interface (RS232)

*Connector* Dsub connector 9 pin (male)

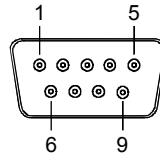


<i>Baud rate</i>	1'200...115'200
<i>Data bits</i>	8
<i>Stop bits</i>	1
<i>Handshake</i>	Xon/Xoff, none
<i>Parity</i>	none, even, odd
<i>FIFO</i>	0...16 Bytes
<i>Pin assignment</i>	Pin 1,4,6: internally connected Pin 2: RxD (Received Data) Pin 3: TxD (Transmitted Data) Pin 5: GND (Signal Ground) Pin 7,8: internally connected

**Rs232 interfaces**

*Connector*

Dsub connector 9 pin (male)



*Baud rate*

1'200...115'200 (für Dev. 8 1'200...19'200)

*Data bits*

7, 8

*Stop bits*

1, 2

*Handshake*

Xon/Xoff, none

*Parity*

none, even, odd

*FIFO*

0...16 Bytes (für Dev. 8 not available)

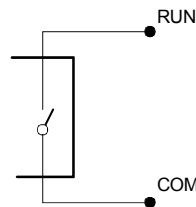
*Pin assignment*

Pin 2: RxD (Received Data) for Dev. 1...4  
 Pin 3: TxD (Transmitted Data) for Dev. 1...4  
 Pin 5: GND (Signal Ground) for Dev. 1...4  
 Pin 7: TxD (Transmitted Data) for Dev. 5...8  
 Pin 8: RxD (Received Data) for Dev. 5...8  
 Pin 9: GND (Signal Ground) for Dev. 5...8

**Remote interface (Events)**

*Output lines*

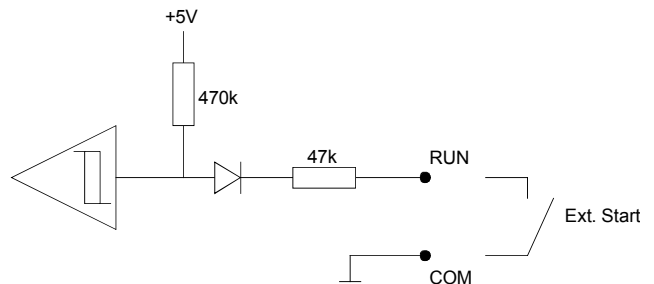
7 potential-free relay contacts per system for controlling external instruments.



Maximum contact load:  
30 V / 1 A DC

*Input lines*

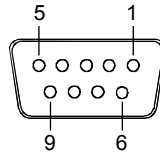
1 digital input per system for external method start.



Maximum load for external contact:  
approx. 0.1 mA at max. cut-off voltage of approx. 5 V

### Analog signal interface

*Function* 2 potential-free analog signal inputs per system.  
*Connector* Dsub connector 9 pin (female)



*Input voltage range*  $\pm 2.5$  V  
*Input amplification* 1, 2, 4, 8, 16, 32, 64 (selectable)  
*Sampling rate* 10, 20, 30, 50, 60 measuring points/s  
*Resolution* 24 bit (1 LSP = 0.298  $\mu$ V at amplification 1)  
*Noise* < 20  $\mu$ Vpp  
 < 3  $\mu$ Vrms (at 0 V input voltage, amplification 1 and sampling rate 10 Hz)  
*Zero error*  $\pm 2.5$  mV  
*Pin assignment* Pin 1,4,5,8,9: GND (ground, connected to housing)  
 Pin 2: Analog 1+  
 Pin 3: Analog 1-  
 Pin 6: Analog 2+  
 Pin 7: Analog 2-

### Safety specifications

*Construction/testing* according to EN/IEC 61010-1 / UL 3101-1, protection class 1, degree of protection IP40  
*Safety directions* The Instructions for Use include information and warnings which must be heeded by the user to assure safe operation of the instrument.

### Electromagnetic compatibility (EMC)

*Emitted interference* Standards met:  
 - EN/IEC 61326  
 - EN 55022  
 - CISPR 22  
*Immunity to interference* Standards met:  
 - EN/IEC 61326  
 - EN/IEC 61000-4-2  
 - EN/IEC 61000-4-3  
 - EN/IEC 61000-4-4  
 - EN/IEC 61000-4-5  
 - EN/IEC 61000-4-6  
 - EN/IEC 61000-4-8  
 - EN/IEC 61000-4-11  
 - EN/IEC 61000-4-14  
 - NAMUR

**Ambient temperature**

<i>Nominal operating range</i>	+5...+45°C (at 20...80 % atmospheric humidity)
<i>Storage, transport</i>	-20...+70°C

**Housing**

<i>Material of cover</i>	Polyurethane rigid foam (PUR) with fire protection for fire class UL94VO, CFC-free
<i>Material of base</i>	Steel, enameled

**Dimensions**

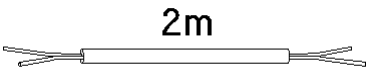
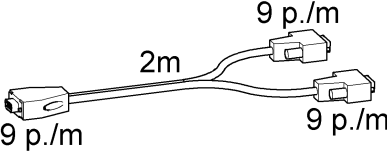
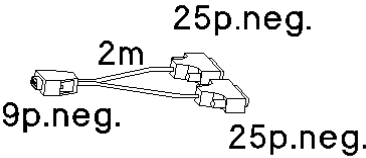
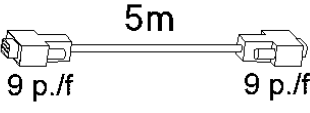
<i>Width</i>	260 mm
<i>Height</i>	130 mm
<i>Depth</i>	340 mm
<i>Weight (with accessories)</i>	4.8 kg

## 4.2 Scope of delivery



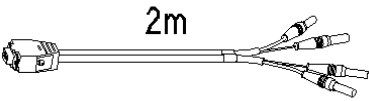
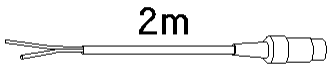
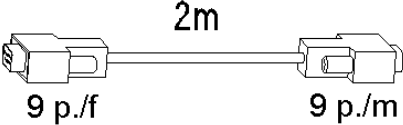
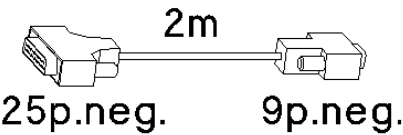
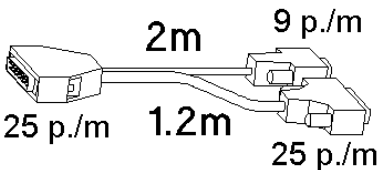
Subject to changes !

The 830 IC Interface 2.830.0020 for 2 IC systems includes the following parts:

Quant.	Order-No.	Description												
2	6.2115.070	<b>Remote Connection cable</b> Connection cable 830 IC Interface – 820 IC Separation Center 												
2	6.2134.130	<b>Connection cable</b> Connection cable 830 IC Interface – 819 IC Detrector 												
2	6.2134.090	<b>RS232 connection cable</b> Connection cable 830 IC Interface – 2 external devices (818, 819, 766, etc.) 												
1	6.2134.100	<b>RS232 connection cable</b> Connection cable 830 IC Interface – PC 												
1	6.6034.033	<b>Software CD «IC Net 2.3»</b>												
1	6.2122.0X0	<b>Mains cable</b> according to customer's specification: <table border="0" style="width: 100%;"> <tr> <td><u>Cable socket</u></td> <td><u>Cable plug</u></td> <td></td> </tr> <tr> <td>Type IEC 320/C 13</td> <td>Type SEV 12 (CH...)</td> <td>6.2122.020</td> </tr> <tr> <td>Type IEC 320/C 13</td> <td>Type CEE (7), VII (D...)</td> <td>6.2122.040</td> </tr> <tr> <td>Type CEE (22), V</td> <td>Type NEMA 5-15 (USA...)</td> <td>6.2122.070</td> </tr> </table>	<u>Cable socket</u>	<u>Cable plug</u>		Type IEC 320/C 13	Type SEV 12 (CH...)	6.2122.020	Type IEC 320/C 13	Type CEE (7), VII (D...)	6.2122.040	Type CEE (22), V	Type NEMA 5-15 (USA...)	6.2122.070
<u>Cable socket</u>	<u>Cable plug</u>													
Type IEC 320/C 13	Type SEV 12 (CH...)	6.2122.020												
Type IEC 320/C 13	Type CEE (7), VII (D...)	6.2122.040												
Type CEE (22), V	Type NEMA 5-15 (USA...)	6.2122.070												
1	8.830.1003	<b>Instructions for Use (english)</b> for 830 IC Interface												
1	8.110.8283	<b>Instructions for Use «IC Net» (english)</b> for PC program «IC Net 2.3»												
1	8.110.8293	<b>Compliance White Paper (english)</b> for PC program «IC Net 2.3»												
1	8.110.8303	<b>Administrator Manual «IC Cap 1.0» (english)</b> for PC program «IC Cap 1.0»												
1	8.110.8309	<b>User Manual «IC Cap 1.0» (english)</b> for PC program «IC Cap 1.0»												

1	8.110.8213	<b>Instructions for Use «Autodatabase» (english)</b> for PC program «Autodatabase 1.0»
1	8.110.8207	<b>Registration card</b>

### 4.3 Optional accessories

Order-No.	Description	
6.2128.130	<b>Connection cable</b> Connection cable 830 IC Interface – 732 analog output (channel 1/2 or 3/4)	 2m
6.2128.180	<b>Remote connection cable</b> Connection cable 830 IC Interface – 833	 2m
6.2134.000	<b>RS232 connection cable</b> Connection cable 830 IC Interface – Triathlon Autosampler	 2m 9 p./f      9 p./m
6.2134.080	<b>RS232 connection cable</b> Connection cable 830 IC Interface – 1 external device (818, 819, 766, etc.)	 2m 25p.neg.      9p.neg.
6.2141.110	<b>Connection cable</b> Connection cable 830 IC Interface – 819 IC Detector– 766/788 IC Sample Processor (accessory part of 766/788)	 2m      9 p./m 25 p./m      1.2m      25 p./m

## 4.4 Validation / GLP

**GLP (Good Laboratory Practice)** requires, among other things, that the precision and correctness of analytical instruments is checked at regular intervals by using SOPs (**Standard Operating Procedures, SOP**). An example of such a standard operating procedure is available from Metrohm under the title «**Application Bulletin No. 277 – Validation of Metrohm Ion Chromatography Systems by using Standard Operating Procedures (SOP)**». This SOP can be adapted for your ion chromatography system and used for its validation.

The 830 IC Interface must be included as a part of the whole ion chromatography system, whose most important components include the pumps, separation columns, detector and evaluation system, in the all-embracing validation of the whole system.

Please contact your local Metrohm agency in order to receive support in validating your 830 IC Interface. It can also provide you with validation documentation which will help you to carry out your installation qualification (IQ) and operational qualification (OQ).

Further information about QA, GLP and validation can also be found in the brochure «**Quality management with Metrohm**» which is also obtainable from your local Metrohm agency.

Checking the electronic and mechanical assemblies of Metrohm instruments can and should be undertaken within the framework of regular servicing by Metrohm technicians. All Metrohm instruments are equipped with start-up check routines which check that the relevant assemblies are functioning perfectly when the instrument is switched on. If no error message appears it can be assumed that the instrument is functioning properly.

The 830 IC Interface also contains a built-in diagnosis program which allows the service technicians to check the functioning of particular assemblies should faults or malfunctions occur and to localize them.

## **4.5 Warranty and Conformity**

### **4.5.1 Warranty**

The warranty on our products is limited to defects that are traceable to material, construction or manufacturing error which occur within 12 months from the day of delivery. In this case, the defects will be rectified in our workshops free of charge. Transport costs are to be paid by the customer.

For day and night operation, the warranty is limited to 6 months.

Glass breakage in the case of electrodes or other parts is not covered by the warranty. Checks which are not a result of material or manufacturing faults are also charged during the warranty period. For parts of outside manufacture insofar as these constitute an appreciable part of our instrument, the warranty stipulations of the manufacturer in question apply.

With the regard to the guarantee of accuracy, the technical specifications in the instruction manual are authoritative.

Concerning defects in material, construction or design as well as the absence of guaranteed features, the orderer has no rights or claims except those mentioned above.

If damage of the packaging is evident on receipt of a consignment or if the goods show signs of transport damage after unpacking, the carrier must be informed immediately and a written damage report demanded. Lack of an official damage report releases Metrohm from any liability to pay compensation.

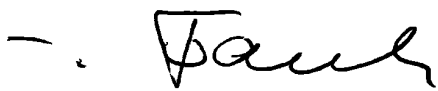

If any instruments and parts have to be returned, the original packaging should be used if at all possible. This applies above all to instruments, electrodes, burette cylinders and PTFE pistons. Before embedment in wood shavings or similar material, the parts must be packed in a dust-proof package (for instruments, use of a plastic bag is imperative). If open assemblies are enclosed in the scope of delivery that are sensitive to electromagnetic voltages (e.g. data interfaces etc.) these must be returned in the associated original protective packaging (e.g. conductive protective bag). (Exception: assemblies with built-in voltage source belong in a non-conductive protective packaging).

No warranty responsibility whatsoever will be accepted by Metrohm for damage which arises as a result of non-compliance with these instructions.

### 4.5.2 Declaration of Conformity

This is to certify the conformity to the standard specifications for electrical appliances and accessories, as well as to the standard specifications for security and to system validation issued by the manufacturing company.


**Metrohm**  
 Ion analysis  
 CH-9101 Herisau, Switzerland  
 Tel. +41 71 353 85 85  
 Fax +41 71 353 89 01  
 www.metrohm.com

<i>Name of commodity</i>	<b>830 IC Interface</b>
<i>System software</i>	Stored in ROMs
<i>Name of manufacturer</i>	Metrohm Ltd., Herisau, Switzerland
<i>Description</i>	PC controlled chromatography data system for remote control of IC instruments and for automatic evaluation of chromatograms.
<p>This Metrohm instrument has been built and has undergone final type testing according to the standards:</p> <p><i>Electromagnetic compatibility: Emission</i> EN/IEC 61326, EN 55022 / CISPR 22</p> <p><i>Electromagnetic compatibility: Immunity</i> EN/IEC 61326, EN/IEC 61000-4-2, EN/IEC 61000-4-3, EN/IEC 61000-4-4, EN/IEC 61000-4-5, EN/IEC 61000-4-6, EN/IEC 61000-4-8, EN/IEC 61000-4-11, EN/IEC 61000-4-14, NAMUR</p> <p><i>Safety specifications</i> EN/IEC 61010-1, UL 3101-1 protection class I</p> <p>It has also been certified by ElectroSuisse, which is member of the International Certification Body (CB/IEC).</p> <p><i>The instrument meets the requirements of the CE mark as contained in the EU directives 89/336/EEC and 73/23/EEC and fulfils the following specifications:</i></p>	
EN 61326	Electrical equipment for measurement, control and laboratory use – EMC requirements
EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
<p>Metrohm Ltd. is holder of the SQS-certificate of the quality system ISO 9001 for quality assurance in design/development, production, installation and servicing.</p> <p>The system software, stored in Read Only Memories (ROMs) has been validated in connection with standard operating procedures in respect to functionality and performance.</p> <p>The technical specifications are documented in the instruction manual.</p>	
<p>Herisau, May 28, 2003</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">             Dr. J. Frank            Development Manager         </div> <div style="text-align: center;">             Ch. Buchmann            Production and            Quality Assurance Manager         </div> </div>	

### 4.5.3 Quality Management Principles

Metrohm Ltd., CH-9101 Herisau, Switzerland



**Metrohm**  
l o n a n a l y s i s  
CH-9101 Herisau/Switzerland  
E-Mail info@metrohm.com  
Internet www.metrohm.com

Metrohm Ltd. holds the ISO 9001 Certificate, registration number 10872-02, issued by SQS (Swiss Association for Quality and Management Systems). Internal and external audits are carried out periodically to assure that the standards defined by Metrohm's QM Manual are maintained.

The steps involved in the design, manufacture and servicing of instruments are fully documented and the resulting reports are archived for ten years. The development of software for PCs and instruments is also duly documented and the documents and source codes are archived. Both remain the possession of Metrohm. A non-disclosure agreement may be asked to be provided by those requiring access to them.

The implementation of the ISO 9001 quality system is described in Metrohm's QM Manual, which comprises detailed instructions on the following fields of activity:

#### **Instrument development**

The organisation of the instrument design, its planning and the intermediate controls are fully documented and traceable. Laboratory testing accompanies all phases of instrument development.

#### **Software development**

Software development occurs in terms of the software life cycle. Tests are performed to detect programming errors and to assess the program's functionality in a laboratory environment.

#### **Components**

All components used in the Metrohm instruments have to satisfy the quality standards that are defined and implemented for our products. Suppliers of components are audited by Metrohm as the need arises.

#### **Manufacture**

The measures put into practice in the production of our instruments guarantee a constant quality standard. Production planning and manufacturing procedures, maintenance of production means and testing of components, intermediate and finished products are prescribed.

#### **Customer support and service**

Customer support involves all phases of instrument acquisition and use by the customer, i.e. consulting to define the adequate equipment for the analytical problem at hand, delivery of the equipment, user manuals, training, after-sales service and processing of customer complaints. The Metrohm service organisation is equipped to support customers in implementing standards such as GLP, GMP, ISO 900X, in performing Operational Qualification and Performance Verification of the system components or in carrying out the System Validation for the quantitative determination of a substance in a given matrix.

## 4.6 Index

### 7

709 IC Pump	
Settings	10
732 IC Detector	
Settings	10
750 IC Autosampler	
Settings	10
752 IC Pump Unit	
Settings	10
753 IC Suppressor Module	
Settings	10
754 IC Dialysis Unit	
Settings	10
761 Compact IC	
Connection to 830	21
Settings	10
766 IC Sample Processor	
Connection to 830	19
Settings	10
791 IC VA Detector	
Connection to 830	20

### 8

812 IC Valve Unit	
Connection to 830	22
Settings	10
816 IC Eluent Selector	
Connection to 830	23
Settings	10
817 Bioscan	
Connection to 830	22
Settings	10
818 IC Pump	
Connection to 830	12
Settings	10
819 IC Detector	
Connection to 830	12
Settings	10
820 IC Separation Center	
Connection to 830	12
Settings	10
828 IC Dual Suppressor	
Connection to 830	24
Settings	10
833 IC Liquid Handling Unit	
Dialysis Unit	
Connection to 830	16
Pump Unit	
Connection to 830	13
Sample Prep Unit	
Connection to 830	15
Settings	10
Suppressor Unit	
Connection to 830	14
Ultra Filtration Unit	
Connection to 830	17
837 IC Degasser	
Connection to 830	25
Settings	10

### A

<Activate>	32
AD converter	27
<Add>	31, 32
Advanced IC instruments	

Settings	10
<b>Alias</b>	29
Ambient temperature	37
Analog connection	
<b>11</b>	
Figure	3
Technical Data	36
<b>7</b>	
Figure	3
Technical Data	36
Analog signal interface	36
Appendix	34
Arrangement of the instruments	7
Attention	5

### B

<b>Baud Rate</b>	28
------------------	----

### C

Cable	
6.2125.070	38
6.2125.110	9
6.2128.130	39
6.2128.180	39
6.2134.000	38, 39
6.2134.080	39
6.2134.100	9, 38
6.2134.130	38
6.2141.110	39
CE mark	42
<b>Change</b>	29
Check	7
<b>COM #</b>	29
Compliance White Paper	
IC Net 2.3 8.110.8193	38
Connection possibilities	1
Connections	
Figure	3
Technical Data	34 ff
to external instruments	10
to PC	9
Contents	I

### D

Danger	5
Declaration of Conformity	42
Degree of protection	6, 36
<Delete>	31, 32
Dimensions	37

### E

Earthing	6, 8
Earthing socket <b>2</b>	
Figure	3
Electrical safety	6
Electromagnetic compatibility	36
EMC	36
Emitted interference	36
<b>ENABLED</b>	31
<b>END</b>	31
Event output lines	30
<b>Events</b>	31

<b>Events configuration</b>	32
<b>Events setup</b>	33
External instruments	10
External start	35

### F

<b>FIFO size</b>	28
Front	2
Fuse	34

### G

GLP	40, 43
GMP	43

### H

<b>Handshake</b>	28
Housing	37

### I

Illustrations	
List	II
Immunity to interference	36
Information	5
Information on the Instructions for Use	4
Init	27
Installation	7
Instructions for Use	
830 IC Interface 8.830.1003	4, 38
Autodatabase 8.110.8213	39
IC Cap 1.0 8.110.8303	38
IC Cap 1.0 8.110.8309	38
IC Net 2.3 8.110.8193	38
Instrument	
Description	1
Switch on/off	26
Introduction	1
IQ	40
ISO 9100	42

### L

<b>Label</b>	27
leakage	7
Links	29
List	
of illustrations	II
List of program instructions	31
Location	7

### M

Mains cable	
Mains connection	8
Ordering designation	38
Mains connection	
Procedure	8
Safety notes	6
Mains connection plug <b>5</b>	
Figure	3
Mains connection	8
Mains frequency	34

Mains pilot lamp **1**  
 Error .....26  
 Figure.....2  
 Ready for use display.....8, 26

Mains switch **3**  
 Figure.....3  
 Switching the instrument  
 on/off.....8, 26

Mains voltage .....8, 34

**Measuring per second** .....27

MIC 1 .....12  
 MIC 2 .....13  
 MIC 3 .....14  
 MIC 6 .....15  
 MIC 8 .....22  
 MIC 10 .....24

**N**

---

Name the interface .....27  
 Notation .....5  
 Number of data points .....27

**O**

---

Opening the instrument.....6  
 Operation  
 via IC Net .....26  
 Optional accessories.....39  
 OQ .....40  
 Organization .....4

**P**

---

Packaging.....7  
**Parity** .....28  
 Parity check .....28  
 Parts and controls .....2  
**PC connection 6**  
 Connection to the PC .....9  
 Figure.....3  
**PC interface 6**  
 Technical Data.....34  
 Pictograms .....5  
 Power consumption .....34  
**Program** .....30, 31  
 Program instruction.....31

Program step ..... 31  
 Programm version number..... 27  
**Protected Protocol**..... 28  
 Protection class ..... 6, 8, 36  
 Protective earth..... 8  
 Pulse ..... 32  
**Put on desktop** ..... 29

**Q**

QA ..... 40  
 Quality assurance ..... 40  
 Quality Management ..... 43

**R**

**Range** ..... 27  
 Rear ..... 3  
 Registration card 8.110.8207 ..... 39  
 Remote connection  
**12** Figure ..... 3  
**13** Figure ..... 3  
**8** Figure ..... 3  
 Technical Data ..... 35  
**9** Figure ..... 3  
 Remote connection **12**  
 Technical Data..... 35  
 Remote connection **13**  
 Technical Data..... 35  
 Remote connection **9**  
 Technical Data..... 35  
 Remote input lines..... 35  
 Remote output lines..... 30, 35  
**RESET** ..... 31  
**ROM version** ..... 27  
 RS settings..... 28  
 RS232 interface **10**  
 Figure..... 3  
 Technical Data..... 35  
 RS232 interface **14**  
 Figure..... 3  
 Technical Data..... 35  
 RS232 parameters..... 28

**S**

Safety directions..... 36  
 Safety notes ..... 6  
 Safety specifications ..... 36  
 Scope of delivery ..... 38  
 Serial number **4**  
 Figure ..... 3  
 <SET> ..... 27  
 Setting up the instrument..... 7  
 Settings ..... 27  
 Software CD 6.6034.033..... 38  
 Software installation ..... 9  
 SOP ..... 40  
 Standard operating procedures .. 40  
 Static charges ..... 6  
 Storage..... 37  
 Switch instrument on/off ..... 26  
 Switching on/off the instrument ..... 8

**T**

Technical data..... 34  
 Time program..... 30  
 Transport..... 7  
 Transport damage ..... 41  
 Triathlon Autosampler  
 Connection to Triathlon..... 18  
 Settings ..... 10

**U**

User-defined event commands... 32

**V**

Validation..... 40  
 <Verify> ..... 31

**W**

Warning ..... 5  
 Warranty ..... 41