DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

SCHAMBECK RI2012

Clarity Control Module   ENG

Contents

To facilitate the orientation in the **Schambeck RI2012** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

Open File (italics) describes the commands and names of fields in **Clarity**, parameters that can be entered into them or a window or dialog name.

WORK1 (capitals) indicates the name of the file and/or directory.

ACTIVE (capital italics) marks the state of the station or its part.

[Chromatogram](#) (blue underlined) marks clickable links referring to related chapters.

The bold text is sometimes also used for important parts of the text and the name of the **Clarity** station. Moreover, some sections are written in format other than normal text. These sections are formatted as follows:

Note: Notifies the reader of relevant information.

Caution: Warns the user of possibly dangerous or very important information.

▌ **Marks the problem statement or trouble question.**

Description: Presents more detailed information on the problem, describes its causes, etc.

Solution: Marks the response to the question, presents a procedure how to remove it.

1 Schambeck RI2012 Control Module

This manual describes the setting of the **Schambeck RI2012** detector (firmware revision 5.1 or higher), **S 2020** and **S 2030** detectors (firmware revision 1.1 or higher) and **RI2000** detector (firmware revision 4.86 or higher). The control module enables direct control of the instrument over serial line.
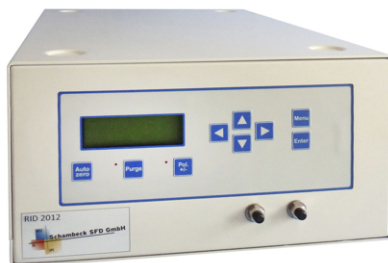
*Fig. 1: **Schambeck RI2012** detector*

Direct control means that the detector can be completely controlled from the **Clarity** environment. The Instrument method controlling the analysis conditions will be saved in the measured chromatograms.

The control is performed via the **UNI Ruby** control module and the **Schambeck RI2012** script.

2 Requirements

- **Clarity** Installation with LC Control (p/n A24) or GC Control module (p/n A23).
- Free serial COM port in the PC.

Note: Modern computers usually have only one (if any) serial (COM) port installed. To use more devices requiring the RS232 port, the **MultiCOM** adapter (p/n MC01) is available.

- Serial DB9F-DB9M straight cable (p/n SK02).

Note: Cables are not part of **Clarity** Control Module. It is strongly recommended that you order the required cables together with the Control Module.

3 Installation Procedure

3.1 Schambeck RI2012 detector communication

The **Schambeck RI2012** detector is controlled by serial (RS232) communication. It uses a standard serial DB9F‑DB9M straight cable (p/n SK02) described in the picture below.
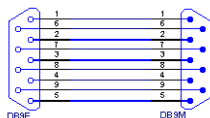
Fig. 2: Serial DB9F-DB9M straight cable
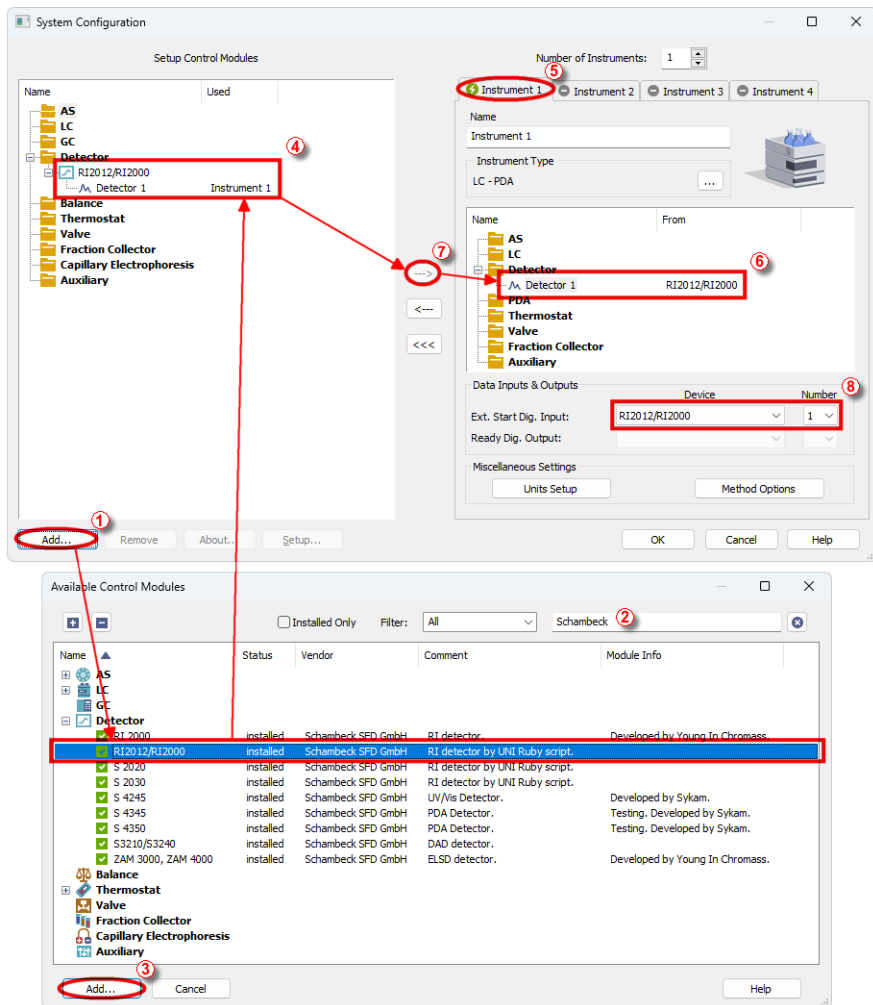
3.2 Clarity Configuration

Fig. 3: How to Add UNI Ruby module

- Start the **Clarity** station by clicking on the ⬤ icon on the desktop.
- Invoke the *System Configuration* dialog accessible from the *Clarity* window using the *System - Configuration...* command.
- Press the *Add* button (① on **Fig. 3** on pg. **4**.) to invoke the *Available Control Modules* dialog.

- You can specify the search filter ② to simplify the finding of the driver.
- Select the correct item and press the *Add* (③ on **Fig. 3** on pg. **4**.) button. Each device with already created UNI profile should have its own item named accordingly in the *Available Control Modules* dialog.
- The *DataApex UNI Setup* dialog will appear.
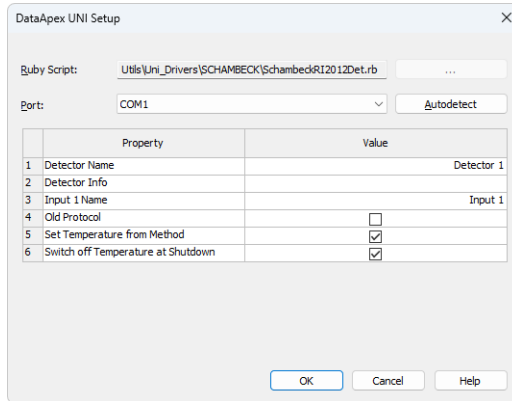
Fig. 4: DataApex UNI Setup

- Set the correct communication *Port* and click on the *AutoDetect* button to establish communication with the device.
- You may fill in the custom *Device Name*.

Note: The *DataApex UNI Setup* dialog is described in detail in the chapter **"DataApex UNI Setup"** on pg. **12**.

- The **Schambeck RI2012** item ④ will appear in the *Setup Control Modules* list of the *System Configuration* dialog.
- Drag the appropriate item from the *Setup Control Modules* list on the left side to the desired *Instrument* tab ⑤ on the right side ⑥ , or click on the ⟶ button ⑦ .
- Set the *Ext. Start Dig. Input* and *Ready Dig. Output* numbers ⑧ for your acquisition card according to the wires used for synchronization.

4 Using the control module

After adding and setting up the detector a new Acquisition tab will appear in the *Method Setup* dialog. A new **Schambeck RI2012** detector section enabling the monitoring of the current detector state will be also created in the *Device Monitor* window.

4.1 Method Setup - Acquisition

The *Method Setup - Acquisition* tab serves for setting the common parameters of the **Schambeck RI2012** detector. If more than one detector is available, it is possible to select between them by using the *Select Detector* combobox on the top of the dialog.
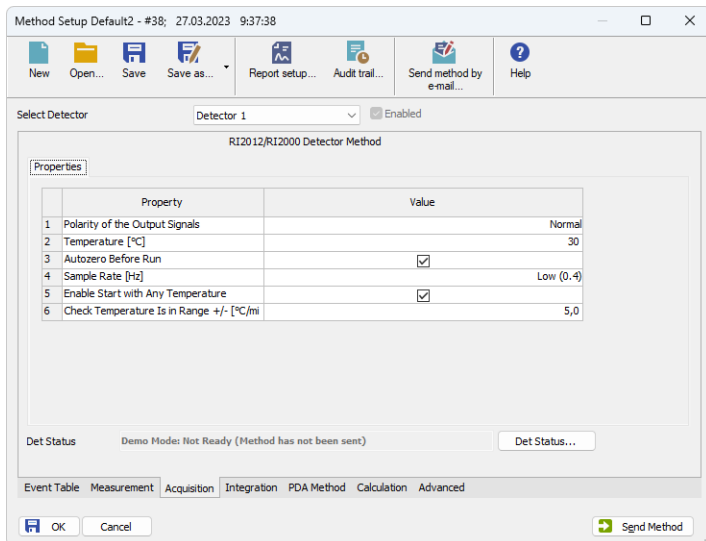

Fig. 5: Method Setup - Acquisition

Sample Rate [Hz]
Defines the frequency of data being gathered with the detector. Valid values for the **Schambeck RI2012** detector are *LOW (0.4)*, *1*, *2*, *5* and *10* Hz.

Note: When selecting the *LOW (0.4)* sample rate, signal will not be displayed in the *Data Acquisition* window outside run.

Polarity of the Output Signals
Sets the polarity of the acquired signal of the **Schambeck RI2012** detector. The signal can be acquired as the detector supplies it (*Normal*) or with inverted polarity (*Inversion*). The **RI2000** models with older communication protocol not supporting setting the polarity from the method display the *Setting Not Supported* label which can't be changed.

Temperature [°C]
Defines the working temperature of the **Schambeck RI2012** detector.

Enable Start with Any Temperature
Defines whether the **Schambeck RI2012** detector will start even when the temperature set in the *Temperature* field is not reached.

Check Temperature Is in Range +/- [°C]
Serves for the setting of the target temperature tolerance. When the temperature reaches the desired value with the tolerance set here, the detector gets to the *READY* state.

Note: The above settings for temperature are displayed only when "Set Temperature from Method" option is enabled in module's Setup.

Autozero before Run
Sets whether the detector should be autozeroed at the beginning of the analysis run.

Det Status
When invoked, opens the Hardware Configuration dialog showing the information regarding the connected detector.

4.2 Hardware Configuration

The *Hardware Configuration* dialog (invoked by using the *Det Status* button from the Method ⸱ Setup ⸱ - ⸱ Acquisition ⸱ dialog) displays the configuration of the **Schambeck RI2012**, namely the communication type and its parameters.
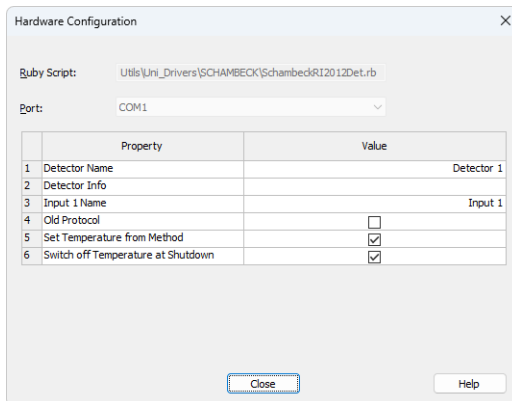

Fig. 6: Hardware Configuration

Set Temperature from Method

When checked, it allows to set the detector's cell temperature from Method. By default this option is checked. When inactive, the cell temperature must be set from the detector.

Note: When active, the temperature is set during method sending, this may cause some baseline disturbances.

Switch off Temperature at Shutdown

Switches the cell temperature control off when the Shutdown event is encoutered (from Device monitor, by error or during instrument closing). By default this option is checked. Set OFF when long term baseline stability should not be affected by Clarity closing or errors.

4.3 Method Setup - Advanced

The *Method Setup - Advanced* tab serves for setting the Auxiliary Signals of **Schambeck RI2012** detector.
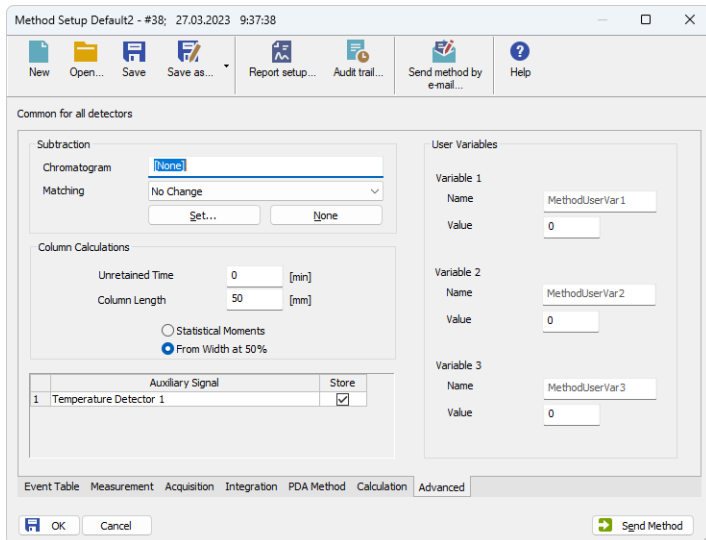

Fig. 7: Method Setup - Advanced

The auxiliary trace is active only outside the run, the detector does not give temperature values when acquisition is running.

4.4 Device Monitor

The window with the detector status can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the 🔵 *Device Monitor* icon.
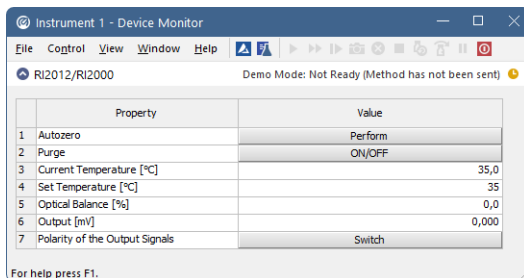

Fig. 8: Device Monitor

Autozero
Zeroes the connected detector. Zeroing the detector signal can only be performed outside of the analysis run.

Purge
Allows to set the purge valve on or off. Such action can only be performed outside of the analysis run.

Current Temperature [°C]
Shows the current temperature of the detector cell.

Set Temperature [°C]
Shows the set temperature of the detector cell. It is displayed only when the option " Set Temperature by Method" is checked in module's Setup.

Optical Balance [%]
Shows the balance between measurement and reference cell.

Output [mV]
Displays the current detector output.

. . . .

Note: Both the *Optical Balance* and *Current Temperature* values are only actualized outside of the run. When the analysis is running, these fields will show the last value known before the run started. *Output* value is not actualized outside of the run when the *LOW (0.4)* sample rate is set in the detector.

Polarity of the Output Signals
Switches the detector signal polarity.

. . . .

Note: **RI2000** detector with older communication protocol does not allow to set the signal output polarity from the method, it is however possible to switch the polarity at least from the *Device Monitor* window. **RI2012** detectors allow to set the polarity from the method too, when sending the method, the setting done from the *Device Monitor* is overridden by the information present in the method. Neither of the models allows to read out the current polarity setting.

4.5 DataApex UNI Setup

The appearance of the *DataApex UNI Setup* dialog depends on the presence of the selected Ruby Script - if the script is not present, only the *Ruby Script* field is visible.
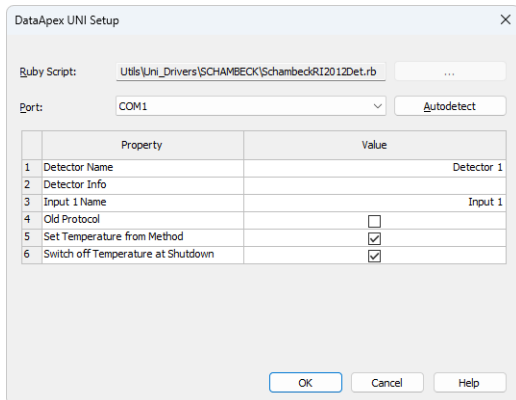

Fig. 9: DataApex UNI Setup

Ruby Script
Displays the selected Ruby Script. The correct SCHAMBECKRI2012DET.RB script for the **Schambeck RI2012** detector can be found in the UTILS/UNI_ DRIVERS/SCHAMBECK subdirectory (accessible through the [...] button) of the **Clarity** installation folder (C:\CLARITY\BIN by default).

Port
Defines the communication port used, possible values dependent on the type of communication of the device and/or available ports in the PC.

AutoDetect
It is used for verifying the device communication over the serial port selected above.

Detector Name
Allows you to set the custom name of the detector. This name (entered into the *Value* column) will be used throughout the **Clarity** station.

Detector Info
Displays the information autodetected from the device by using the *AutoDetect* button.

Input 1 Name
Sets the name of the Digital Input available on **Schambeck RI2012** detector. This input may be used for the external start by manual injector or autosampler.

Old Protocol
Displays the use of the older communication protocol or **RI2000** not supporting some of the commands used. The presence of the older communication protocol is

autodetected from the version of firmware reported by the detector (older firmware than 4.86).

Set Temperature from Method
Enable to set the cell temperature from Method.

Switch off Temperature at Shutdown
Switches the cell temperature control off when the Shutdown event is encoutered.

5 Report Setup

The detector section on the method report can be enabled by checking the *Instrument Control* checkbox on the **Method** tab of the **Report Setup** dialog.
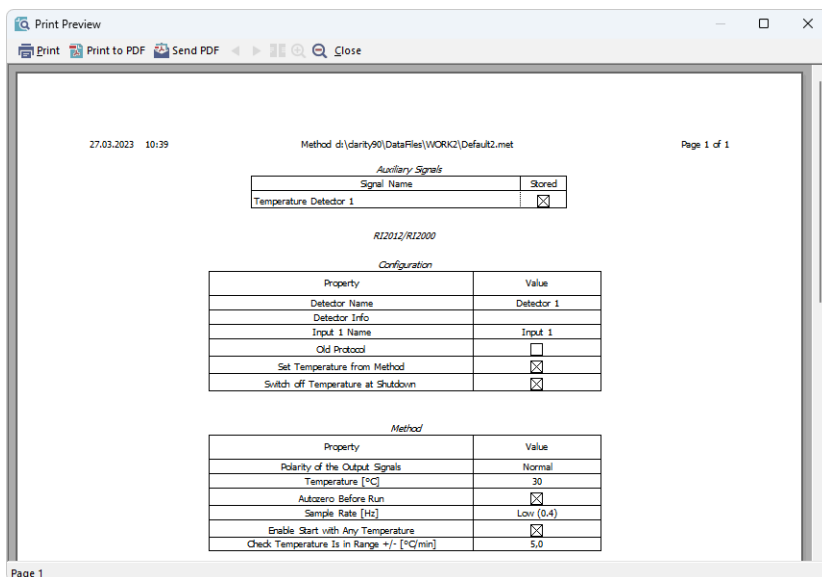

Fig. 10: Report Setup

All of the parameters set in the **Method Setup - Acquisition** dialog are reported, as well as the custom *Detector Name* and other parameters set in the **DataApex UNI Setup** dialog.

6 Troubleshooting

When the solution to a problem cannot be found easily, a recording of the communication between **Clarity** and the detector will significantly help **DataApex** support.

The data recording can be enabled by adding or amending the COMMDRV.INI file in the **Clarity** installation directory (C:\CLARITY\CFG by default). The file can be edited in any text editor (e.g. Notepad). The following section should be edited or added:

```
[COM1]
echo=on
textmode=on
filename=CommDrvCOM1_%D.txt

reset=off
```

Note: Instead of COM1, type the communication port used to communicate with the **Schambeck RI2012** detector. This port number is displayed when the *Det Status* button in the *Method Setup - Acquisition* dialog is invoked.

Note: *%D* (or *%d*) in the filename parameter means that the log will be created separately for each day. The *reset=off* parameter disables deleting the content of the log each time the station is started during the same day.

The created *.TXT files will be of great help in the diagnosis of not documented errors and communication issues.