

## ERC REFRACTOMAX 520

Clarity Control Module

ENG

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To facilitate the orientation in the **ERC Refractomax 520** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

**Instrument** (blue text) marks the name of the window to which the text refers.

*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 (when you already are in the topic describing the window).

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

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

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:

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**Note:** Notifies the reader of relevant information.

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

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**■ 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 ERC Refractomax 520 Control Module

This manual describes the setting of the **ERC Refractomax 520** detector. The control module enables direct control of the instrument over serial line.



*Fig 1: ERC Refractomax 520 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 **ERC Refractomax 520** script.

## 2 Requirements

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

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*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).

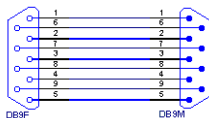
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*Note:* Cables are not part of **Clarity** Control Module. It is strongly recommended that you order the required cables together with the Control Module.

# 3 Installation Procedure

## 3.1 ERC Refractomax 520 detector communication

The **ERC Refractomax 520** 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

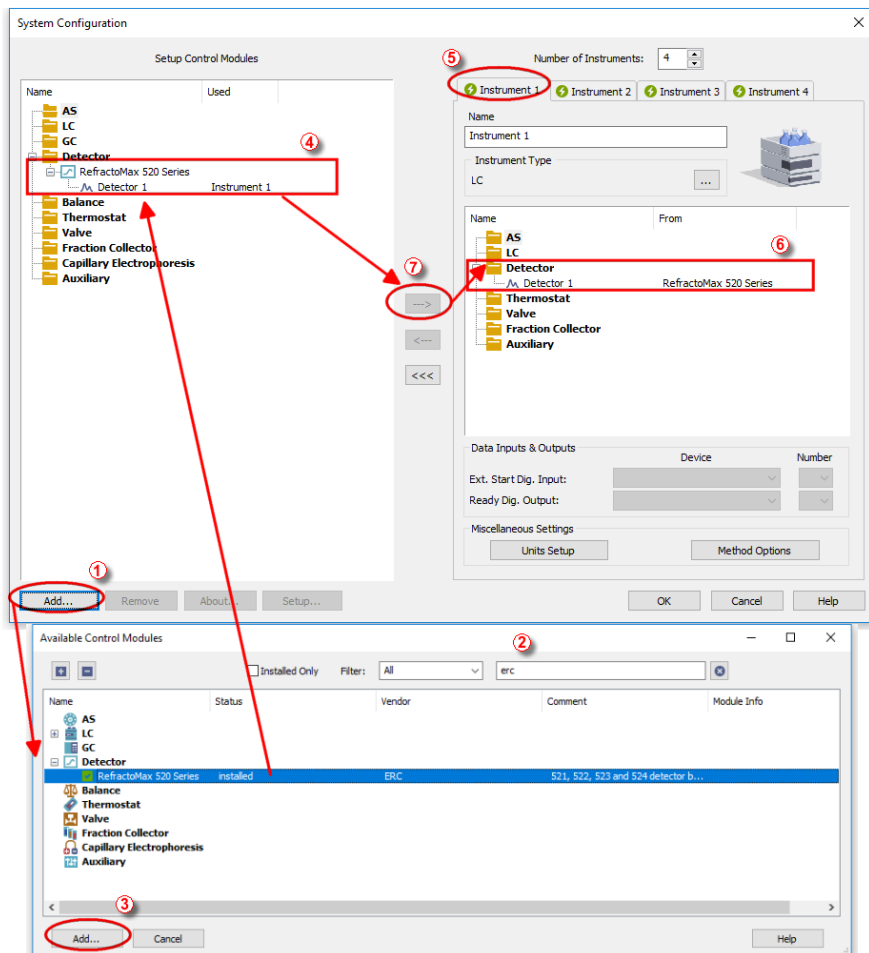



Fig 3: How to Add ERC Refractomax 520 module

- 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.

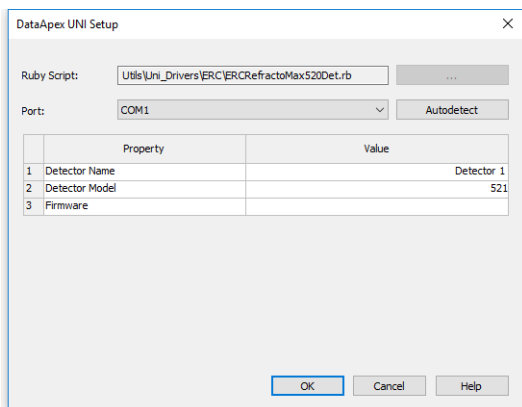


Fig 4: DataApex UNI Setup

- 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 **ERC Refractomax 520** 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).

## 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 **ERC Refractomax 520** 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 **ERC Refractomax 520** 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.

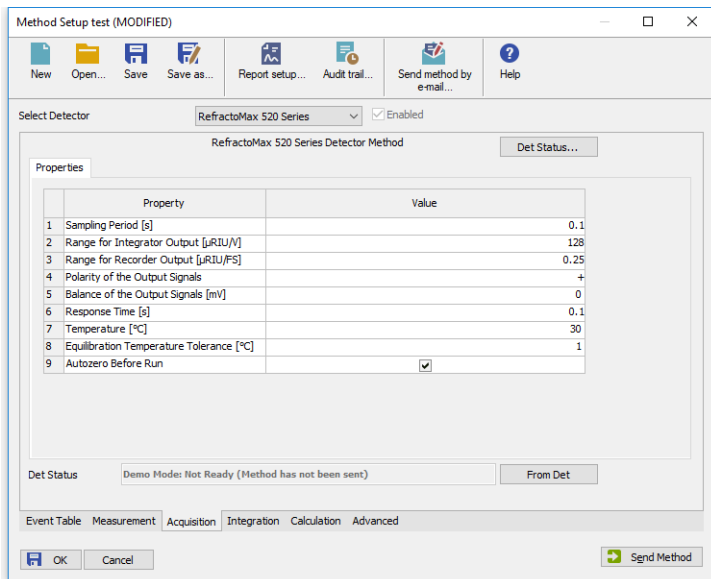


Fig 5: Method Setup - Acquisition

### Sampling Period [s]

Defines the frequency of data being gathered in the detector. The frequency of the data being sent to **Clarity** from the detector is defined by *Response Time* parameter. Valid values for the **ERC Refractomax 520** detector range from 0.1 to 2.0 s.

### Range for Integrator Output [ $\mu$ RIU/V]

Sets the output range for the Integrator Output analog output, as well as digital signal sent to **Clarity**. The available range is dependent on the *Detector Model* as set in the **DataApex UNI Setup** dialog.

### Range for Recorder Output [ $\mu$ RIU/FS]

Sets the output range for the Recorder Output analog output, as well as digital signal sent to **Clarity**.

### Polarity of the Output Signals

Determines the polarity of the output signal.

**Balance of the Output Signals [mV]**

Defines the value to which the signal level will be reset when *Autozero* function is used.

**Response Time [s]**

Sets the frequency of the data being sent to **Clarity** from the detector. Setting this parameter to other value than *Sampling Period* means that the detector will filter the data and only send averaged values to **Clarity**.

**Temperature [°C]**

Defines the working temperature of the **ERC Refractomax 520** detector.

**Equilibration Temperature Tolerance [°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.

**Autozero before Run**

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

**From Det**

Loads the detector control parameters from the detector to **Clarity**.

**Det Status**

When invoked, opens the [Hardware Configuration](#) dialog showing the information regarding the connected detector.

## 4.2 Method Setup - Advanced

The **Method Setup - Advanced** tab serves for setting the usage of auxiliary signals of the **ERC Refractomax 520** detector.

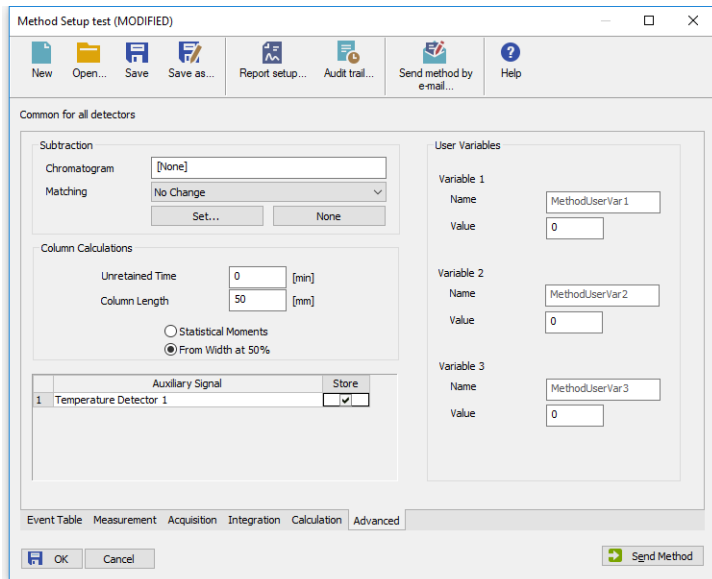
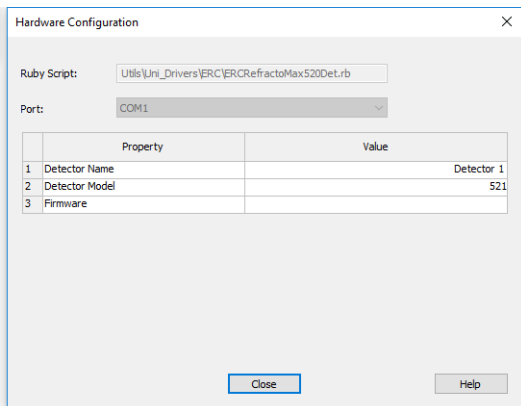


Fig 6: Method Setup - Advanced

The list of available auxiliary signals is shown in the table in the lower part of the dialog. By checking the checkbox in the *Store* column for the particular row, the given auxiliary signal will be stored into the measured chromatogram.


### 4.3 Hardware Configuration

The **Hardware Configuration** dialog (invoked by using the *Det Status* button from the **Method Setup - Acquisition** dialog) displays the configuration of the **ERC Refractomax 520**, namely the communication type and its parameters.



*Fig 7: Hardware Configuration*

## 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.

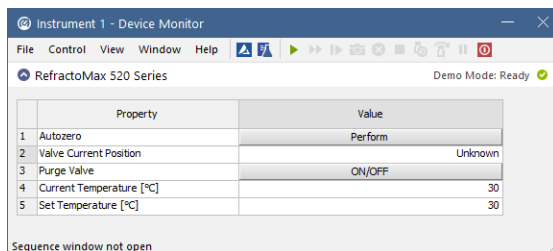


Fig 8: Device Monitor - Detector

### Autozero

Zeroes the connected detector.

### Valve Current Position

Shows the state of the purge valve. The valve position can be changed using the *Purge Valve* row.

### Purge Valve

Allows to set the purge valve on or off. The current state of the purge valve is visible in the *Valve Current Position* row. 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.

## 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.

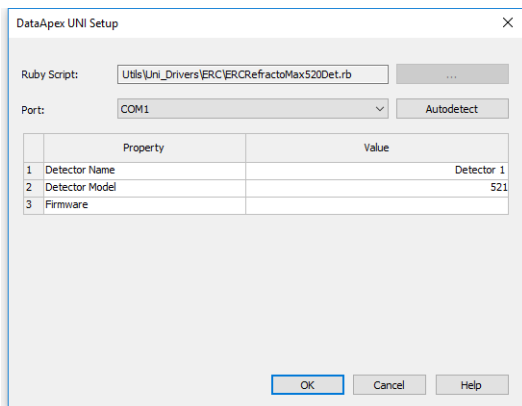


Fig 9: DataApex UNI Setup

### Ruby Script

Displays the selected Ruby Script. The correct ERCREFRACTOMAX520DET.RB script for the **ERC Refractomax 520** detector can be found in the UTILS/UNI\_DRIVERS/ERC 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 Model

Allows you to set the type of the detector. The selection influences several settings further in **Method Setup - Acquisition** dialog.

### Firmware

Displays the firmware & model version string upon pressing the *AutoDetect* button.



# 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. Auxiliary signals setting made on **Method Setup - Advanced** tab will be also printed.

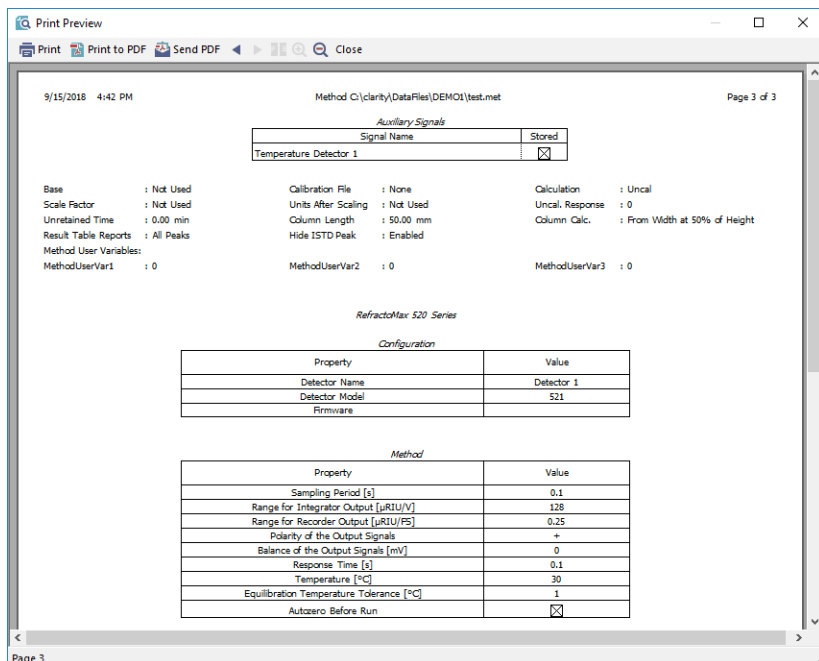


Fig 10: Report Setup

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
```

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*Note:* Instead of COM1, type the communication port used to communicate with the **ERC Refractomax 520** detector. This port number is displayed when the *Det Status* button in the [Method Setup - Acquisition](#) dialog is invoked.

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*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.