

Clarity Controls

Ecom Sapphire

DET

ENG

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To facilitate the orientation in the **Ecom Sapphire** 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, there are text sections written in format other than normal text. These sections are formatted as follows:

Note: Notifies the reader of possibly interesting information.

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

█ Marks the problem statement or trouble question.

Description: Presents any closer information on the problem, describes its causes etc.

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

1 Ecom Sapphire Control Module

This manual describes the setting of the **Ecom Sapphire** detector. The control module enables direct control of the **Ecom Sapphire 600** and **Ecom Sapphire 800** detectors (including subtypes) over serial line.



Fig 1: Ecom Sapphire detector

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

2 Requirements

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

Note: Modern computers usually have only 1 (if any) serial (COM) port installed. To use more devices requiring the RS232 port, the **MultiCOM** adapter (p/n MC01) is available.

- Serial cross DB9F-DB9F cable (p/n SK01).

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

- Digital Input Device (p/n DID01) adaptor for RS232 line required for external start.

3 Installation Procedure

3.1 Hardware - Wiring

The **Ecom Sapphire** detector is controlled by serial (RS232) communication. It uses standard serial cross DB9F-DB9F cable described in the picture.

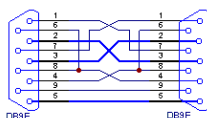


Fig 2: Serial cross DB9F - DB9F cable

Moreover, the **Digital Input Device** (p/n DID01) has to be placed between the PC and the detector to be able to use the digital inputs on the **Ecom Sapphire** detector control module. The digital input can be triggered either by the button or by Start contact (e.g. from LC).

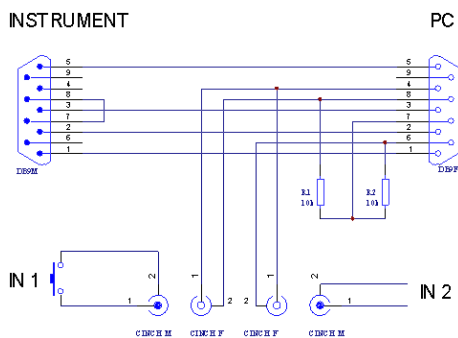



Fig 3: Digital Input Device scheme

Detailed description of the **Digital Input Device** (p/n DID01) can be found in the datasheet D025.

3.2 Clarity Configuration

- Invoke the [System Configuration](#) dialog accessible from the [Clarity](#) window using the *System - Configuration* command.
- Press the [Add](#) button  to invoke the [Available Control Modules](#) dialog.

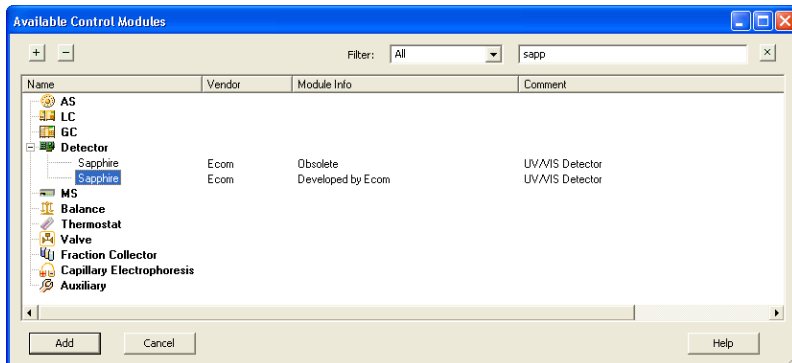


Fig 4: Available Control Modules

- Select the **Ecom Sapphire** from the **Detector** group and press the *Add* button.
- There are two **Ecom Sapphire** drivers available, one marked as *Developed by Ecom* - use this one if you are installing a new detector. The second one (marked as *Obsolete*) is retained only for purpose of back compatibility (a method developed with this driver cannot be used with the new driver). This manual describes the old driver version. Please check the new driver Help file for the its description.
- The [Ecom Sapphire Setup](#) dialog will appear.

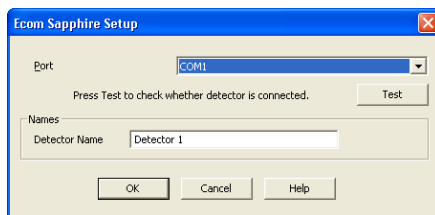



Fig 5: Ecom Sapphire Setup

- Select the correct *Serial Port* and press the *Test* button. The message stating the detector type and serial number will show.
- Fill in the signal name for the detector signal.

Note: The [Ecom Sapphire Setup](#) dialog is described later (for more details see also chapter [Ecom Sapphire Setup](#) on pg 11).

- The **Ecom Sapphire** item ② will appear in the *Setup Control Modules* list of the **System Configuration** dialog.
- Drag the separate detector signals from the *Setup Control Modules* list on the left side ③ to the desired *Instrument* tab ④ on the right side ⑤, or use the  button ⑥ to do so. The individual detector signals cannot be assigned to different **Clarity** Instruments.

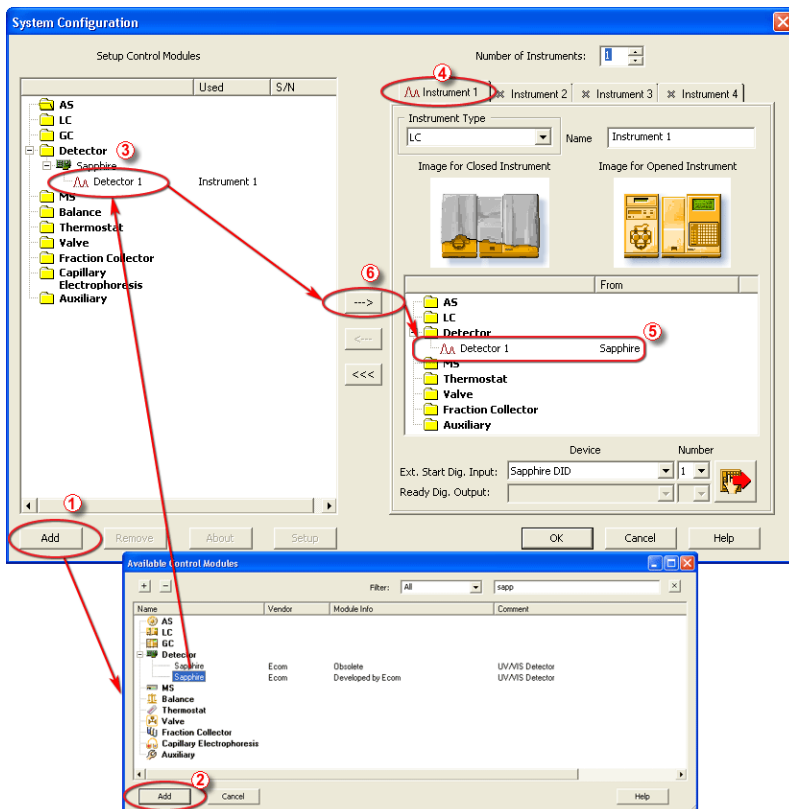


Fig 6: System Configuration

4 Using the control module

New [Acquisition](#) tabs (one for each detector signal assigned to the Instrument) are created in the [Method Setup](#) dialog. They can be accessed by switching to the desired signal in the *Select Detector* section on the top of the dialog.

4.1 Method Setup - Acquisition

The [Method Setup - Acquisition](#) tab for each signal of the **Ecom Sapphire** detector has two sub-tabs: [Detector](#), where basic information on the signal is set, and the [Wavelength Program](#) sub-tab containing the *Time table* governing the time program of the detector.

In the right section on all [Method Setup - Acquisition](#) sub-tabs for **Ecom Sapphire** detectors two buttons are placed:

From Det

Pressing the button loads all detector parameters as they are set in the **Ecom Sapphire** detector. These parameters are set in appropriate fields of the [Method Setup - Acquisition](#) dialog.

Det Status

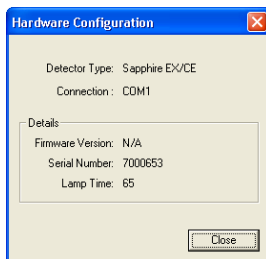


Fig 7: Hardware Configuration

After pressing the *Det Status* button the [Hardware Configuration](#) dialog opens. It displays the detector type, serial port through which it is connected, serial number and firmware version of the instrument and the information on the lamp usage time.

4.1.1 Method Setup - Acquisition - Detector

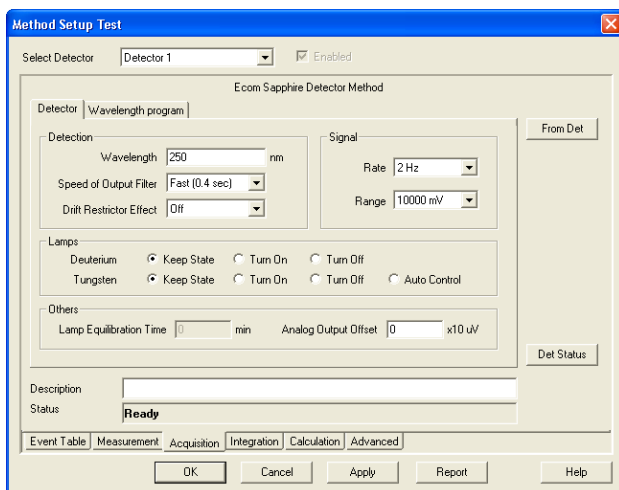


Fig 8: Method Setup - Acquisition - Detector

The **Detector** sub-tab of the **Method Setup - Acquisition** dialog is used to specify the operation mode of the particular detector and its other parameters.

Detection

Wavelength

Serves for the setting of the initial wavelength used on the detector cell. The wavelength may be later changed (based on the time program) on the **Method Setup - Acquisition - Wavelength Program** tab.

Speed of Output Filter

Sets the speed of output filter. Slower output filter (longer time constant) improves overall detector output noise at the cost of reduction of response speed.

Drift Restriction Effect

Sets the effect level of the drift restrictor. Drift restriction improves the detector output signal by compensating instability of the detector base-line (drift). However, its improper use may cause peak distortion in the region of very small signals. We recommend using *High* level for the region of signals larger than 10 mAU, *Medium* level for the region of signals larger than 4 mAU, *Low* level for the region of signals larger than 0.5 mAU and switch the drift effect *Off* for signals smaller than 0.5 mAU.

Signal

Rate

Selects the data acquisition rate (frequency) for the creation of chromatograms.

Range

Sets the signal range of the detector.

Lamps

This section governs the behavior of the detector lamps at the time the method is sent to the **Ecom Sapphire** detector. Two lamps - *Deuterium* and *Tungsten* - can be set individually to the following behavior:

Keep state - The state of the lamp will not change when the method is sent to the detector. This is the default setting for both lamps.

Turn On - The lamp will be turned on (if it already is not) when the method is sent to detector. When the *Deuterium* lamp is set to this mode, it is possible to select the necessary *Lamp Equilibration Time*.

Turn Off - The lamp will be turned off (if it is not already switched off) when the method is sent to detector.

Auto Control - The lamp state will be controlled by the **Ecom Sapphire** detector itself.

Others

Lamp Equilibration Time

Sets an additional delay time before the detector becomes ready when lamp is switched on. This field is only used when the *Deuterium* lamp is set to *Turn On*.

Analog Output Offset

Sets the baseline offset for analog output signals.

4.1.2 Method Setup - Acquisition - Wavelength Program

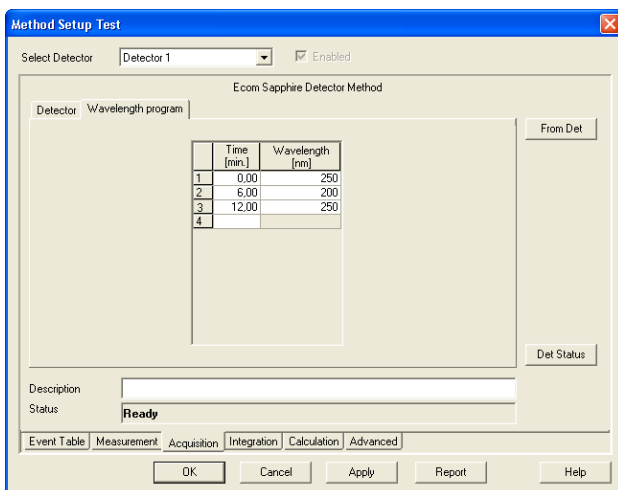


Fig 9: Method Setup - Acquisition - Wavelength Program


The **Time Table** allows to change the wavelength of the detector lamps during the analysis run based on the pre-set time program.

Note: The first row of the **Time Table** has to be set for the *Time* = 0 min. This setting overrides the *Wavelength* setting for the signal from the [Method Setup - Acquisition - Detector](#) tab.

After entering the desired *Time* for the event (in minutes), it is possible to fill in the desired wavelength value in the *Wavelength* column.

Caution: After executing the wavelength program the hardware will be using wavelengths from the last line. Initial conditions will be restored only after the method has been sent to the detector. In **Sequence** mode this is done automatically before each injection. In **Single Analysis** mode, however, this must be done manually (using the *Send Method* button). It is recommended to restore the initial conditions on the last line in the **Time Table** to prevent problems.

4.2 Device Monitor

The window with the detector status can be invoked by the *Monitor - Device Monitor* command from the **Instrument** window or using the  *LC Monitor* icon. It displays the analysis *Run Time*, *Wavelength* value and the signal value. The window also allows to perform several operations - to switch the lamps on and off and zero the detector.

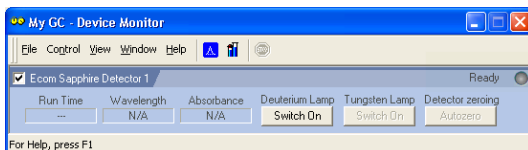


Fig 10: Device Monitor

The detector can be monitored and partially controlled from the **Device Monitor** window. Available control commands and fields are:

Run Time

Shows the run time of the current analysis.

Wavelength

Displays the actual wavelength set for the measurement on the detector cell.

Absorbance

Shows the actual signal value.

Deuterium (Tungsten) Lamp - Switch Off/On

Using these buttons switches the particular detector lamp either *ON* or *OFF*, depending on its own current state.

Detector Zeroing - Autozero

This button performs the autozero operation - the output signal of the detector is set to zero.

4.3 Ecom Sapphire Setup

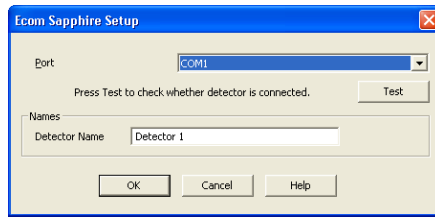


Fig 11: Ecom Sapphire Setup

Serial Port

Selection of the communication port.

Test

This button is used to test the connection to the **Ecom Sapphire** detector using the previously set *Serial Port*. Obtained data about the detector are then shown to the right of the *Test* button.

Detector Name

Allows to set the custom name for the detector signal.

Digital Input Names

Invoking the button opens the [Digital Inputs](#) dialog, which allows to set the digital input names provided by the **Digital Input Device** used for the external starts.

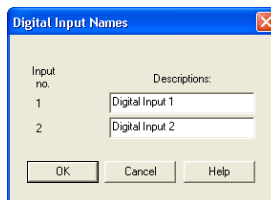


Fig 12: Digital Input Names

5 Report Setup

All of the detector settings accessible on the [Method Setup - Acquisition](#) tab are reported. To do so, the *Instrument Control* parameter on the [Method](#) tab of the [Report Setup](#) dialog must be checked.

If the **Time Table** on the [Method Setup - Acquisition - Wavelength Program](#) is left empty, both initial *Wavelength* values are reported instead.

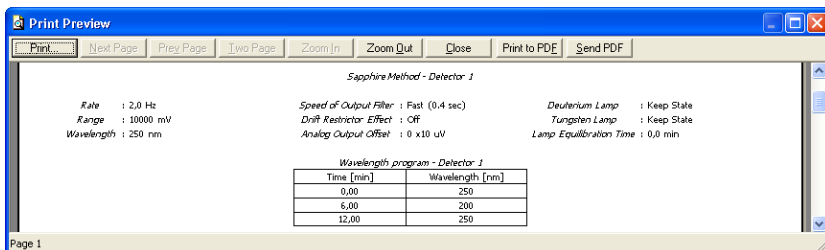


Fig 13: Report Setup

6 Troubleshooting

When the remedy for some problem cannot be discovered easily, the recording of communication between **Clarity** and the detector can significantly help the **DataApex** support to discover the cause of the problem.

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

```
[COM1]
                                echo=on
                                textmode=on
filename=EcomSapphire.txt; %D or %d could be used to include a
current date (recommended in combination with the Reset=Off option
reset=off
```

Note: Instead of COM1 type the correct serial port used to communicate with the **Ecom Sapphire** detector. This port number is displayed when the *Det Status* button in the [Method Setup - Acquisition](#) dialog is invoked.

The created *.TXT files will greatly help in diagnosis of unrecognized errors and problems in communication.