DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

SYKAM S32X0 UV/VIS DETECTOR

Clarity Control Module   ENG

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Contents

To facilitate the orientation in the **Sykam S32x0 UV/Vis Detector** 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 Sykam S3210/S3240 UV/Vis Detector Control Module

This manual describes the setting of the **Sykam S3210/S3240 UV/Vis** detector. The control module enables direct control of the instrument over serial line.

Fig. 1: Sykam S3210 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 USB with LC (p/n A24) or GC (p/n A23) Control module.

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Caution: Minimal firmware version required of the **Sykam S3210/S3240 UV/VIS** detector is **3.0.1**.

- 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 port, the **MultiCOM** adapter (p/n MC01) is available.

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

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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) for the start synchronization.
- For the processing and evaluation of the PDA data, the PDA Extension (p/n A29) is necessary.

3 Installation Procedure

3.1 Hardware - Wiring

The **Sykam S3210/S3240 UV/VIS** detector is controlled by serial (RS232) communication. It uses standard serial straight cable DB9F-DB9M wiring described in the picture.
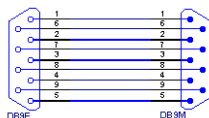

Fig. 2: Serial straight DB9F - DB9M cable

Caution: The detector cannot be started by external signal when controlled through the serial line. For this reason, the **Digital Input Device** (p/n DID01) may be used to start the detector by external signal over the serial line.

3.2 Detector Settings

If the detector has the DAD mode, it is necessary to select in which mode the detector will work. The selection of the mode influences (among other things) the number of signals in **Clarity** and the sampling rate of the detector:

Tab. 1: S3210/S3240 detector properties

Detector type + mode	Number of Signals when controlled by Clarity	Sampling Rate
S3210 - non-DAD mode	1 signal	10 Hz
S3240 - non-DAD mode	4 signals	5 Hz
S3210 or S3240 in the DAD mode	4 signals + DAD data	2 Hz

To switch the **Sykam S3210/S3240** detector into the *DAD MODE*, press the ↑ and ↓ button on the detector's front panel simultaneously for approximately 3 seconds. The detector will beep and the display should show the "DAD MODE" inscription. To switch the *DAD MODE* off, press the **Status** button on the front pannel.
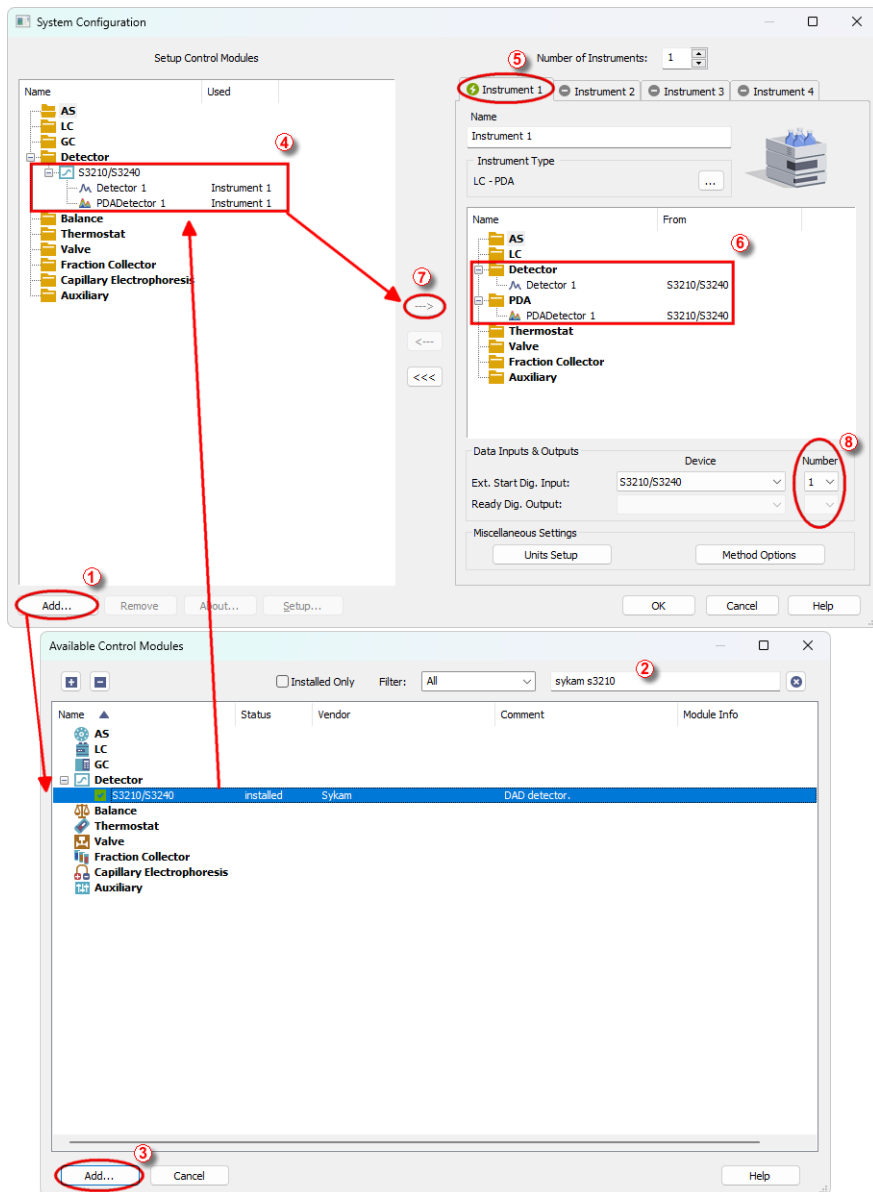
3.3 Clarity Configuration

Fig. 3: System Configuration

- 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 to invoke the *Available Control Modules* dialog.
  - You can specify the searching filter ② to simplify the finding of the driver.
  - Select the **Sykam S3210/S3240 UV/Vis** from the Detectors group and press the *Add* ③ button.
  - The Sykam S3210/S3240 UV/Vis Detector Setup dialog will appear.
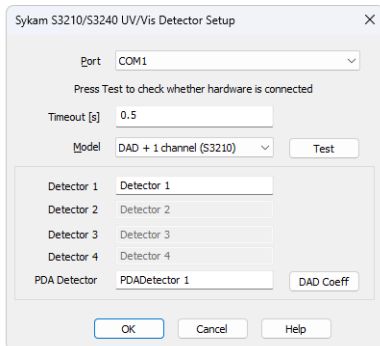

Fig. 4: Sykam S3210/S3240 UV/Vis Detector Setup

  - If the DAD mode should be used, it is necessary to set it on the front panel of the **Sykam S3210/S3240 UV/Vis** detector by pressing the up and down arrow simultaneously for approximately 3 seconds.

Note: The DAD mode must be enabled in the device to be able to switch it on from the front panel.

  - Select the correct COM *Port* and press the *Test* button.
  - Change *Timeout [s]* if it is necessary.
  - Select model of your Device or click the *Test* button, your model will be automatically detected on selected *Port*.
  - Fill in the signal name for each signal. Number of signals depends on model of your instrument.

Note: Other fields from this dialog are described later in the description of the Sykam S3210/S3240 UV/Vis Detector Setup dialog (for more details see also chapter **Sykam S3210/S3240 UV/VIS Detector Setup** on pg. **11**).

  - The **Sykam S3210/S3240 UV/Vis** item ④ will appear in the *Setup Control Modules* list of the *System Configuration* dialog.
  - Drag the whole **Sykam S3210/S3240 UV/Vis** detector group (including the possible PDA detector) from the *Setup Control Modules* list on the left side to

the desired *Instrument* tab ⑤ on the right side ⑥ , or use the [-->] button ⑦ to do so. The individual detector signals cannot be assigned to different **Clarity** Instruments.

Note: The configuration dialog of the **Sykam S3210/S3240 UV/Vis** (Sykam S3210/S3240 UV/Vis Detector Setup) can be displayed any time by double-clicking on its icon or using the *Setup* button.

4 Using the control module

New Acquisition tab for the **Sykam S3210/S3240 UV/VIS** detector is created in the *Method Setup* dialog. It can be accessed by switching to the desired detector in the *Select Detector* section on the top of the dialog.

4.1 Method Setup - Acquisition

The *Method Setup - Acquisition* tab for **Sykam S3210/S3240** detector allows to set the wavelength program for all detector signals and select the resolution/sensitivity priority.
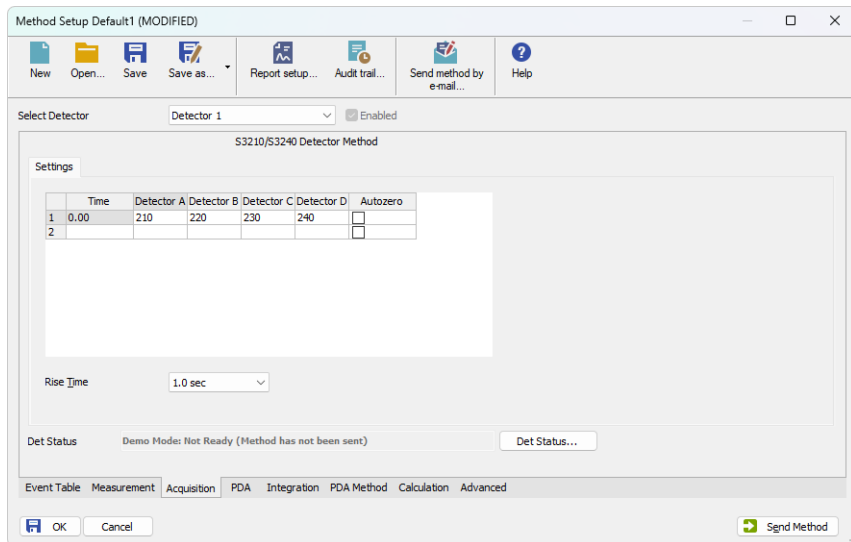

Fig. 5: Method Setup - Acquisition

The **Time Table** on the *Method Setup - Acquisition* tab for the **Sykam S3210/S3240** detector serves for defining the wavelengths used for the measurement at given time intervals (it is possible to change the wavelength during the analysis based on the pre-programmed **Time Table**). The number of Detector columns in the table is defined by the type of the detector (1 for the **S3210** detector, 4 for the **S3240** detector).

Time
Defines the analysis time in which the event (changing the wavelength, using *Autozero* function) should be performed. The **Time Table** always has at least one row for the initial *Time* (*0*).

Autozero
Performs the autozero operation on all present signals (it is not possible to autozero particular signals only).

Rise Time

Allows to turn on the signal filtering. To turn it on, set the appropriate *Rise Time* in seconds.
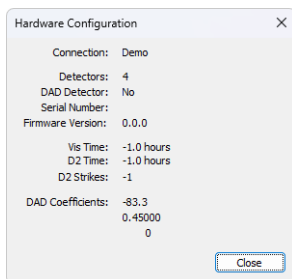
Det Status

Fig. 6: Hardware Configuration

After pressing the *Det Status* button the *Hardware Configuration* dialog opens. It displays the detector type, its serial number, serial port through which it is connected, used firmware version, lamp times for both the Vis and D2 lamps, number of D2 lamp ignitions and DAD Coefficients.

4.2 Method Setup - PDA

The **Sykam S3210/S3240** detector also provides the possibility to use the **DAD** mode, thus adding the *Method Setup - PDA* tab to the **Method Setup** dialog.
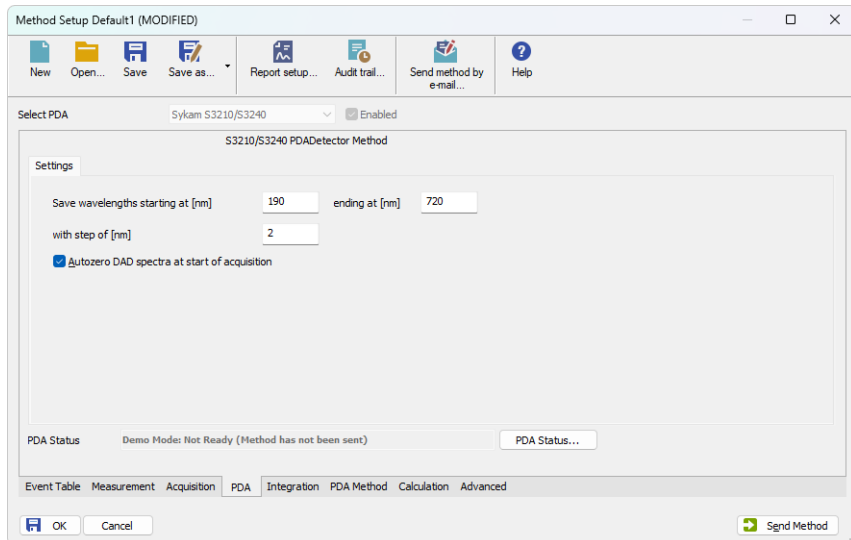

Fig. 7: Method Setup - PDA

This tab allows to set the parameters of gathered PDA data. Both the starting wavelength, ending wavelength and wavelength step can be defined:

Save wavelengths starting at
Defines the shortest wavelength for the acquired PDA data. Minimum value: *190* nm

ending at
Defines the longest wavelength for the acquired PDA data. Maximum value: *720* nm

with step of
Defines the wavelength step for the PDA data acquisition. Value range: *1 - 100* nm

Autozero DAD spectra at start of acquisition
Causes the signal of the detector to be reset to zero at the start of each run. The PDA signal of the detector is not zeroed as such, but the extracted signals are zeroed instead at each change of the wavelength.

4.3 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 allows to perform the *Autozero* operation or check the status of detector lamps.
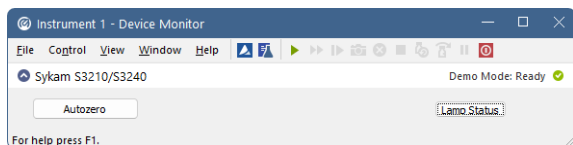

Fig. 8: Device Monitor

Autozero

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

Lamp Status

Invoking this button opens the *Sykam S3210/S3240* dialog showing the states of detector lamps and lamp energy. This dialog is accessible only when not in DAD Mode.
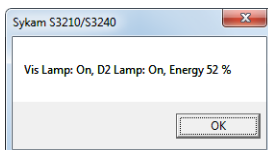

Fig. 9: Sykam S3210/S3240
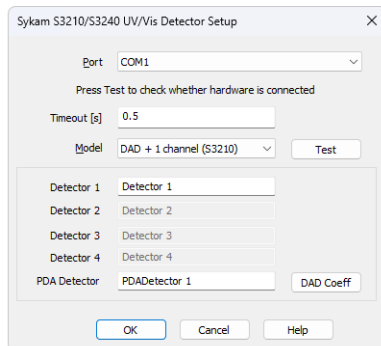
4.4 Sykam S3210/S3240 UV/VIS Detector Setup

Fig. 10: Sykam S3210/S3240 UV/VIS Detector Setup

Port
  Selection of the communication port.

Model
  Enables to select from different **Sykam S32x0** detector types (including the DAD mode presence in the hardware).

Test
  This button is used to test the connection to the **Sykam S32x0** detector using the previously set *Port*. Obtained data about the detector are then set in the dialog.

Detector 1 (..4)
  Fields belonging to particular detectors enable to set the relevant detector names.

PDA Detector
  Enables to set the name for the detector part giving DAD data.

DAD Coeff
  Enables to set the **DAD Calibrations Coefficients** in the *DAD Calibrations Coefficients* dialog.
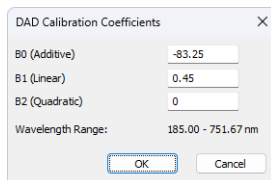

Fig. 11: Digital Inputs

This dialog allows to enter the values supplied along with the detector to produce the **Wavelength Range** interval. The calculated interval should be outside of the boundaries allowed by the detector (190-720 nm).

5 Report Setup

All of the detector settings accessible on the Method Setup - Acquisition tab for the **Sykam S3210/S3240** detector are reported, as well as the data accessible on the Method Setup - PDA tab. To do so, it is necessary to check the *Instrument Control* checkbox in the *Report Setup - Method* dialog.
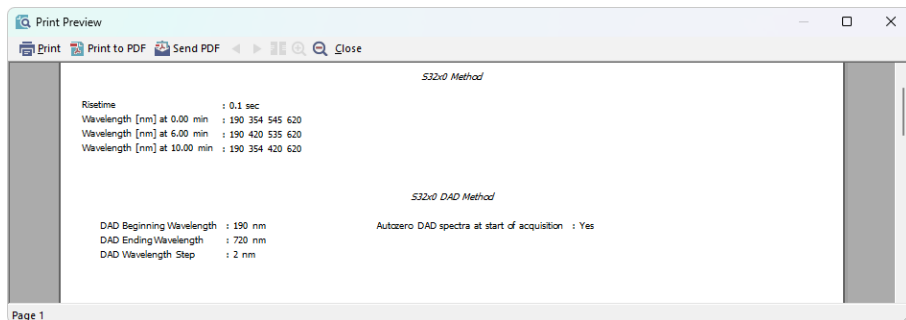

Fig. 12: Report Setup

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\CFG 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=SykamS32x0_%D.txt
reset=off
```

Note: Instead of COM1 type the correct serial port used to communicate with the **Sykam S32x0 UV/Vis Detector** 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 greatly help in diagnosis of unrecognized errors and problems in communication.

6.1 Specific Problems

▌ **The detector does not produce DAD data, even though it was configured with the DAD mode in the *System Configuration* dialog.**

Description: The DAD mode might be switched off by some action.

Solution: Try the following procedures:

- Make sure you have **Sykam S3210/S3240** detector with the *DAD MODE* option installed in it.
- Check the front panel of the **Sykam S32x0 UV/Vis Detector** The display should show the "DAD MODE" inscription. If it is not there, press and hold the ⬆ and ⬇ buttons on the front panel of the detector simultaneously for approximately 3 seconds, after which the detector produces a sound and the mode is changed to *DAD MODE*. It is recommended to switch off the *Instrument* window and open it again afterwards.
- Check the *System Configuration* dialog. There must be the PDA detector icon in the **Sykam S3210/S3240 UV/VIS** group on the left side of the dialog, as well as assigned to the correct Instrument tab on the right side of the dialog (for more details see the chapter **Clarity Configuration** on pg. **4**).. If it is not there, check the Sykam S3210/S3240 UV/VIS Detector Setup dialog and set the *DAD MODE* there in the Model field (for more details see also chapter **Sykam S3210/S3240 UV/VIS Detector Setup** on pg. **11**).

▌ **There is a spike peak in the chromatogram and the time when the detector changes the Wavelength.**

Description: This situation may only occur in the non-DAD mode.

Solution: Actually, this is the limitation given by the hardware. When the detector receives data (the command to change the wavelength in this case) during the acquisition, it stops sending data for a short moment, which results in a spike peak in the chromatogram. There may be more than one spike peak present for each wavelength switch as the detector sometimes need to repeat the command sending.

▌ **The detector in the DAD mode does not react on external start signal.**

Description: In DAD mode, the detector does not react on any signals. This is caused by its firmware.

Solution: The detector in the DAD mode can be started by using the **Digital Input Device** (p/n DID01). This device is connected between the communication cable and the computer port and adds two digital inputs, which are pre-programmed on the detector module itself and can be set in the *Ext. Start Dig. Input* field of the *System Configuration* dialog.