

SYKAM S5200

Clarity Control Module

ENG

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To facilitate the orientation in the **Sykam S5200** 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:

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 S5200 Control module

This manual describes the setting of the **Sykam S5200** autosampler and its OEM versions (**Chromsystems CLC 200**, **AIS AS2000**). The control module enables direct control of the instrument over serial line.



Fig 1: Sykam S5200

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

Caution: Sample cooling function may not be controlled via the **Sykam S5200** control module as the communication protocol doesn't allow this. It may only be set from the front keyboard.

2 Requirements

- **Clarity** Installation CD ROM with AS Control module (p/n A26).

Caution: Minimal firmware version required is **2.0**.

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

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

3 Installation Procedure

3.1 Sykam S5200 communication

The autosampler communicates with the PC using serial straight DB9F-DB9M cable. No baudrate setting is necessary on either side.

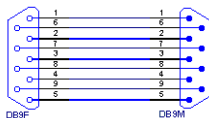


Fig 2: Serial straight DB9F - DB9M cable

Note: Only pins 2, 3 and 5 need to be connected. However, full RS232 DB9F-DB9M cable will work just as fine.

The **S5200** has to be in the *SERIAL OPERATION MODE*. You can switch it to this mode by pressing *MENU* on front panel, use cursor keys (or key 3) to enter **INSTRUMENT CONFIGURATION MENU**, then use arrow keys to move to **OPERATION MODE** setting and use *SELECT ▲* and *SELECT ▼* to switch to **SERIAL**.

It is recommended (though not necessary) to connect the **S5200** autosampler with the PC via the start cable (for more details see the chapter **Signalization of injection** on pg 3).. This connection is made from the **Remote Control** connector of the autosampler to the **A/D converter** input.

The firmware of the **Sykam S5200** sampler has to be 2.00 or higher.

3.2 Signalization of injection

When the sampler injects, the data acquisition and methods should start. There are two alternatives how to inform **Clarity** about finished injection.

- Select **Sykam S5200** sampler as a source of *Ext. Start Dig. Input*.
- When using the optional starting wire, select the appropriate digital input of the A/D converter as a source of *Ext. Start Dig. Input*.

Using sampler as a source of start is convenient since this approach does not need any wiring. However, it adds delay and small time uncertainty.

Using detector as a source of start gives excellent repeatability but requires wire from sampler to the detector.

Sampler emits start signal in both of these scenarios so you can wire the instruments anyway. (Note that firmware in some instruments does not handle starting from wire and from computer at the same time and may freeze as a result.)

If you decide to use wiring, connect wires to pins 5-9 (normally open) or 7-9 (normally closed) in sampler's **REMOTE CONTROL** connector.

Note: You will need the DB9F connector, to which the contacts have to be attached.

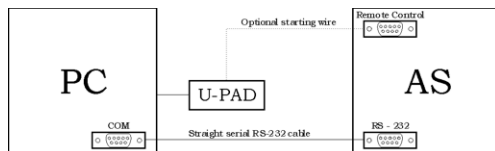


Fig 3: Scheme of Sykam S5200 connection

Instead of the U-PAD, the optional starting cable can be connected to any other A/D converter (e.g. DataApex INT7 card). For the connection to be used for starting the data acquisition, the U-PAD (or the respective A/D converter) must be set as device used for Start input in the [System Configuration](#) dialog.

Note: Typical wiring of controlled instruments is described in the **Clarity Getting Started** manual.

3.3 Clarity Configuration

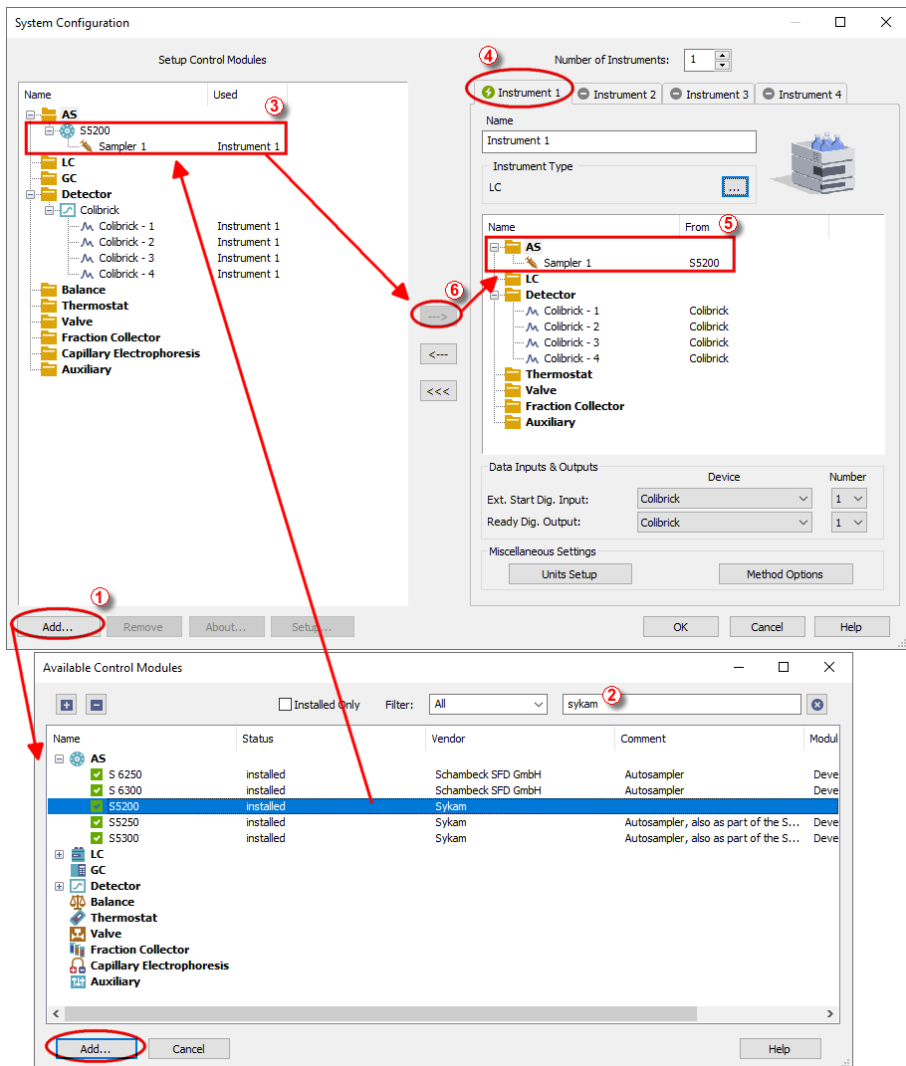


Fig 4: System Configuration

- In the **System Configuration** dialog press the **Add** button ① to invoke the **Available Control Modules** dialog.
- Select the **Sykam S5200** item from the **AS** group and press the **Add** ②

- button.
- The **Sykam S5200 Setup** dialog will appear.

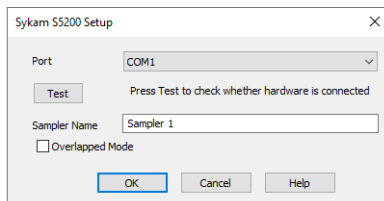


Fig 5: Sykam S5200 Setup

- Fill in the *COM Port*. Use the *Test* button to check whether the hardware is connected to the selected port.

If the **S5200** autosampler was not detected, make sure the device is switched to the *SERIAL MODE* (for more details see the chapter **Installation Procedure** on pg 3), data cables are connected and correct COM port is selected.

- Fill in the *Sampler Name* field.
- Check *Overlapped Mode* if you want to optimize sequence processing time by starting the derivatization of the vial while analysis of the previous vial is still in progress.
- Press the *OK* button. The **Sykam S5200** item will appear in the *Setup Control Modules* list ③ of the **System Configuration** dialog.
- Drag the AS icon from the *Setup Control Modules* list ③ on the left side to the desired *Instrument* tab ④ on the right side ⑤, or use the button ⑥ to do so.

4 Using the control module

New **AS** tab appears in the **Method Setup** dialog, enabling the setting of the **Sykam S5200** autosampler control method.

Click on **AS Status** button to display the **Hardware Configuration** dialog.

Click on **From AS** button to retrieve the injections settings from the sampler.

Caution: Only *Needle Depth*, *Extra Volume* and *Eluent Segment* are retrieved from the **Sykam S5200** autosampler.

4.1 Method Setup - AS - Injection Settings

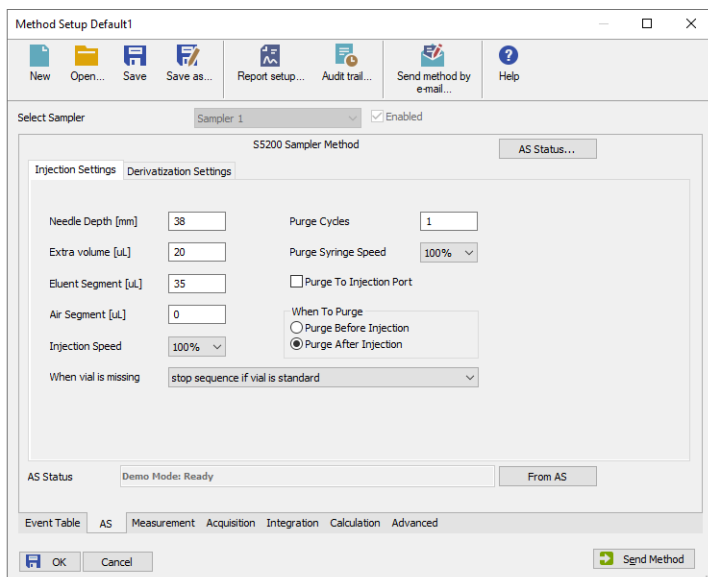


Fig 6: Method Setup - AS - Injection Settings

The first tab of the **Method Setup - AS** dialog contains injection method parameters.

Needle Depth [mm]

Specifies the depth of the injection needle movement. This value has to be adjusted to specific vials (e.g. Eppendorf vials use *Needle Depth* of 39 mm). Larger number means deeper penetration.

Caution: Avoid setting the *Needle Depth* too high as you can damage the vial or the needle.

Note: If the Needle Depth is set to too small value then the machine will not be able to detect if the value is missing and injects as if a vial was present.

Extra Volume [μ l]

The volume of the sample that is aspirated in addition to the injected volume. This amount is used to overfill the injection valve.

Eluent Segment [μ l]

The eluent segment describes the specific volume of wash solution used for delivering the sample into the sample loop.

Air Segment [μ l]

Sets the size of the air segment between the taken sample and the eluent. This feature prevents the mixing of the eluent and the sample which would lead to an inaccurate sample injection.

Injection Speed

Selects different speed for the syringe movement during injection, reagents adding and mixing.

Purge Cycles

Specifies the number of times the syringe should be flushed.

Purge Syringe Speed

Selects different speed for the syringe movement during purge.

Purge To Injection Port

Selects the port to which the wash step will be performed. If left unchecked, the wash will be performed to the Washing Port.

When To Purge

Determines when the purge operation will be performed. The options are either *Purge Before Injection* or *Purge After Injection*.

When vial is missing

Determines behavior when the sampler detects the vial is missing.

4.2 Method Setup - AS - Derivatization Settings

Derivatization is an optional process of mixing sample with reagents A, B and C. It is well described in the **Sykam S5200** manual. The only difference is that **Clarity** expects sample vials at positions 1 - 60 and mixing vials at respective positions 61 - 120.

For example, if you specify to analyze vials 3 to 8 in the **Sequence Table** and select a method with derivatization enabled, vials in positions 63 to 68 will be used for mixing.

It is possible to use methods both with the derivatization and without derivatization in the same sequence. It is up to the user to make sure that no vial is derivatized more than once and no vial in range 61 to 120 is used for derivatized injection. However, vials 61 - 120 can be used for the injection that does not use the derivatization, even in the sequence that uses both types of methods.

The screenshot shows the 'Method Setup Default' dialog box with the 'AS - Derivatization Settings' tab selected. The 'Perform derivatization' checkbox is checked. The 'Sample Dilution' is set to 1. The 'AS Status' is 'Demo Mode: Ready'. The 'AS Status...' button is visible in the top right of the settings area.

	Volume	Mixing Cycles	Wait [s]
Solution A	100	1	2
Solution B	100	1	2
Solution C	100	1	2

Length of Preceding Analysis [min]: 1

Derivatization will start 0.1 min before previous analysis finishes.

AS Status: Demo Mode: Ready

Buttons: OK, Cancel, Send Method

Fig 7: Method Setup - AS - Derivatization Settings

Perform derivatization

Determines whether the sample should be derivatized before the injection. When disabled, the sample will be injected in its original state. Checking the checkbox will cause other settings on this tab to become editable. The sample will be taken from sample vial to the mixing vial, specified amounts of reagents will be added and resulting mix will be injected.

Sample Dilution

Specifies the amount that will be taken from the sample vial to use in derivatization process. The volume taken is calculated as a multiple of *Sample Amount* set in the **Sequence Table** and the *Sample Dilution* parameter.

Note: The amount set in the **Sequence Table** will be injected to the column from the mixing vial.

Volume

Specifies the volume of the reagent to add to the mixing vial. If the volume is set to zero, then the reagent will not be added and no mixing cycles and no waiting will be performed for that reagent.

Mixing Cycles

Determines how many times the mixing vial should be mixed. If the volume of certain reagent is zero, associated mixing and waiting steps will be skipped.

Wait

Determines how many seconds should the module wait for reaction before doing next step. If the volume of certain reagent is zero, associated mixing and waiting steps will be skipped.

Total Method Time

This setting is not used if the *Overlapped Mode* checkbox in the **Sykam S5200 Setup** dialog is disabled (for more details see also chapter **Sykam S5200 Setup** on pg 13). It represents the total time to analyze one sample. In the overlapped mode, the module takes into account the length of the derivatization (only waiting times at present) and starts the derivatization before the end of the analysis of the previous vial so the derivatization will be almost finished when the previous analysis ends.

However, the *Total Method Time* parameter cannot be calculated exactly from the lengths of instrument methods since the durations may depend on factors not known at the start of the acquisition (for example temperature settling time depends on the room temperature).

Note: If you set this parameter too small, the derivatization will start and finish earlier and the sample will have to wait for injection, which may impair results.

4.3 Hardware Configuration

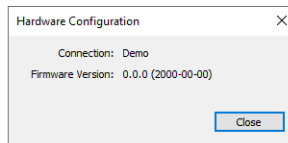


Fig 8: Hardware Configuration

This dialog is invoked by pressing the *AS Status* button in the [Method Setup - AS](#) dialog. [Hardware Configuration](#) dialog displays only the COM port used for the communication with the sampler, no additional information is shown.

4.4 Device Monitor

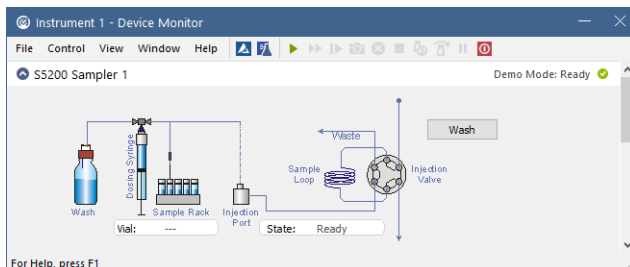


Fig 9: Sykam S5200 Device Monitor

The Monitor window for the **Sykam S5200** autosampler enables to monitor the state of the **S5200** sampler and the vial it is currently using. It also presents the possibility to perform the wash operation directly from the **Clarity** environment.

Wash

When invoked, opens the [Wash](#) dialog.

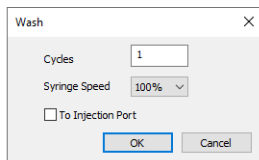


Fig 10: Wash dialog

Pressing the **OK** button will perform the operation set, while pressing the **Cancel** button leaves the [Wash](#) dialog without washing.

Cycles

Determines the number of wash cycles that will be performed.

Syringe speed

Selects different speed for the syringe movement during the purge. Possible values are *100%*, *50%* and *33%* speed.

To Injection Port

Selects the port to which the wash step will be performed. If left unchecked, the wash will be performed to the **Washing Port**.

4.5 Sykam S5200 Setup

Sykam S5200 Setup dialog (accessible through the **System Configuration** dialog) allows to set the basic connection parameters of the autosampler.

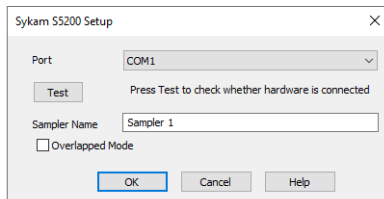


Fig 11: Sykam S5200 Setup

Port

Sets the COM port to which the **Sykam S5200** autosampler is connected.

Test

When invoked, tests the connection to the autosampler. Unsuccessful connection (signaled by the "*Hardware not connected or unsupported type*" inscription below the *Port* field) may be caused by wrong COM *Port* selected, inappropriate cabling or the fact that the sampler is not set in the *SERIAL MODE* (for more details see the chapter **Installation Procedure** on pg 3)..

Sampler Name

Serves for setting of the custom name for the autosampler.

Overlapped Mode

While checked and the sample preparation is used, the sampler will start to prepare next sample while the previous one is still running (for more details see the chapter **Method Setup - AS - Derivatization Settings** on pg 9)..

5 Troubleshooting

When the remedy for some problem cannot be discovered easily, the recording of communication between **Clarity** and the autosampler 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=SykamS5200_%D.txt
reset=off
```

Note: Instead of COM1 type the correct serial port used to communicate with the **Sykam S5200** autosampler. This port number is displayed when the *AS Status* button in the [Method Setup - AS](#) dialog is invoked or in the [Sykam S5200 Setup](#) dialog.

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.