



SYKAM S4300 AMINO ACID ANALYZER

Clarity Control Module

ENG

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To facilitate the orientation in the **Sykam S4300 Amino Acid Analyzer** 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 S4300 Amino Acid Reaction Module

This manual describes the setting of the **Sykam S4300 Amino Acid Reaction Module**. The module contains thermostat, integrated pump and a detector with analog output. It uses two wavelengths in order to be able to detect all amino acids .



Fig. 1: Sykam S4300 reaction module

The control module enables direct control of the instrument over serial line. Direct control means that the module can be completely controlled from the **Clarity** environment. Instrument method controlling the analysis conditions is saved in the measured chromatograms.

2 Requirements

- **Clarity** Installation USB with LC (p/n A24) Control module.

Caution: Minimal firmware version required of the **Sykam S4300 Reaction Module** is **1.0.4**.

- **Colibrick** A/D converter (p/n U32).
- 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 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 Hardware - Wiring

The **Sykam S4300** reaction module is controlled over serial (RS232) communication. It uses standard serial straight cable DB9F-DB9M wiring described in the picture.



Fig. 2: Serial straight DB9F - DB9M cable

3.2 Clarity Configuration

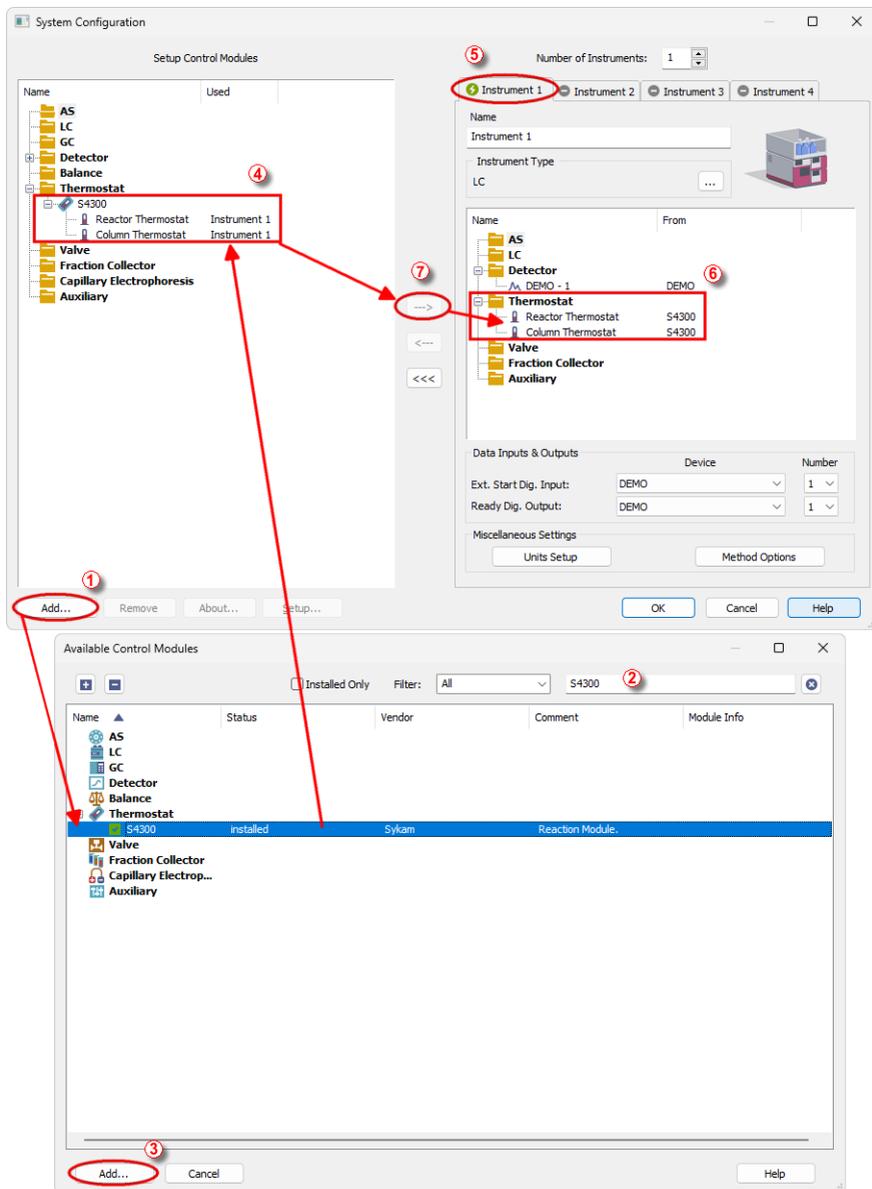


Fig. 3: System Configuration

- 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 S4300** from the Thermostats group and press the **Add** ③ button.
- The **Sykam S4300 Setup** dialog will appear.

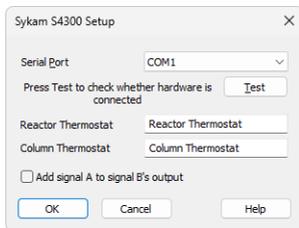


Fig. 4: Sykam S4300 Module Setup

- Select the correct COM Port and press the **Test** button.
- The **Sykam S4300** item ④ will appear in the **Setup Control Modules** list of the **System Configuration** dialog.
- Drag the whole **S4300** thermostat group 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 thermostat signals cannot be assigned to different **Clarity** Instruments.
- Repeat steps 1 - 7 to add **Colibrick**. Parameters of the Method Setup – Acquisition dialog of **Colibrick** depend on the type of analysis (measuring conditions), refer to Colibrick manual.

Note: The configuration dialog of the **Sykam S4300** (Sykam S4300 Setup) can be displayed any time by double-clicking on its icon or using the **Setup** button.

4 Using the control module

New [Thermostat](#) tab for the **Sykam S4300** reaction module appears in the *Method Setup* dialog. This tab allows to set the Detector, Pump and Temperatures settings.

4.1 Method Setup - Thermostat - Detector

Integrated dual-channel photometer for the detection of amino acids at 440 and 570 nm. Signals are available as analog outputs only.

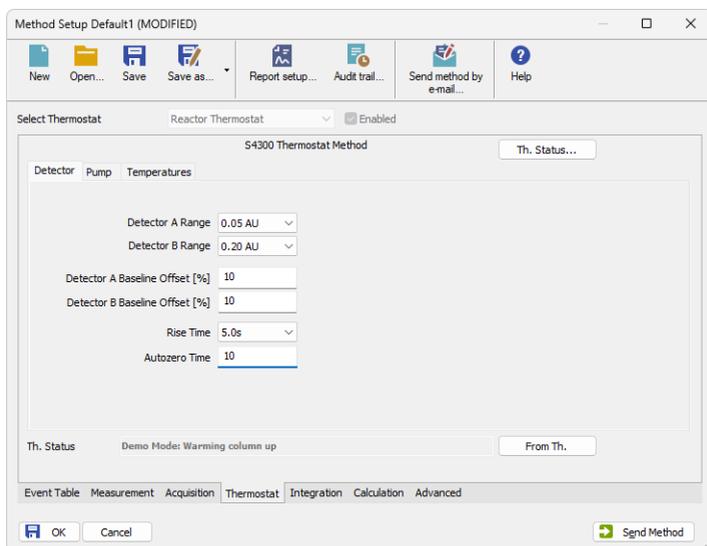


Fig. 5: Method Setup - Thermostat - Detector

Detector Range

Sets detector A/B range. Available values are 0.05, 0.1, 0.2, 0.5, 1.0 and 2.0 AU.

Detector Baseline Offset

Shifts the signal value baseline.

Rise Time

Allows to turn on the signal filtering. To turn it on, set the appropriate *Rise Time* in seconds. Available values are 0.1, 1.0 and 5.0 s.

Autozero

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

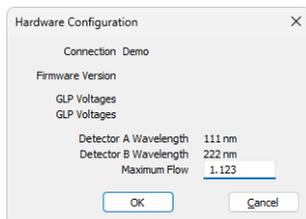
Th. Status...

Fig. 6: Hardware Configuration

After pressing the *Th. Status...* button the *Hardware Configuration* dialog opens. It displays the serial port through which it is connected, used firmware version, GLP voltages and detector wavelengths and maximum flow.

4.2 Method Setup - Thermostat - Pump

Integrated 2-plunger reagent dosing pump with a flow rate from 0.01 to 2.0 ml/min.

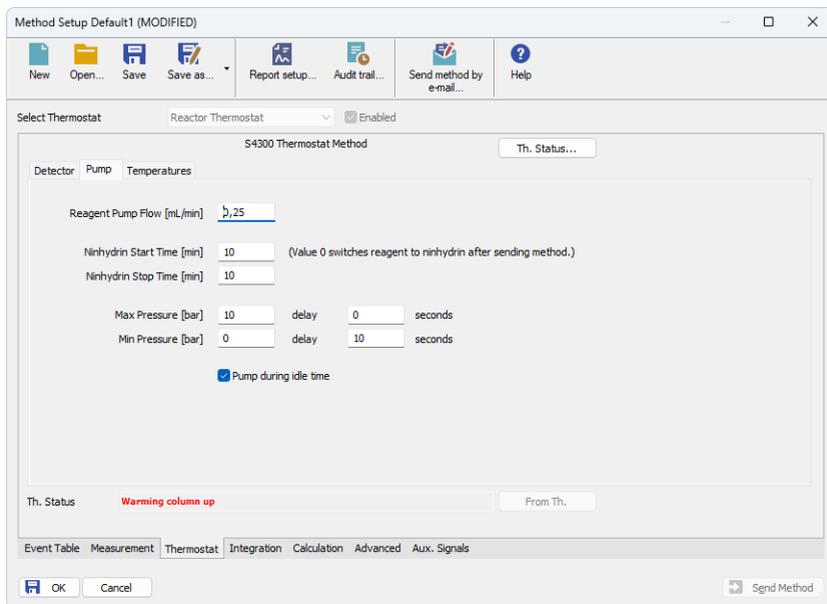


Fig. 7: Method Setup - Thermostat - Pump

Reagent Pump Flow

Sets the reagent pump flow within rate from 0.01 to 2.0 ml/min

Ninhydrin Start Time

The value represents the time (in minutes) from the start of the analysis when the solvent is switched to ninhydrin. The range is 0 - 999,9 min.

If the *Start Time* is set to 0, the solvent is switched to ninhydrin after the method is sent to the instrument.

Ninhydrin Stop Time

Sets the ninhydrin stop time. The range is 0 - 999,9 min.

Max Pressure

Sets the maximum pressure for the pump. When pressure reaches the set value, the pump will shut down. This serves to prevent the damage to the pump when the column is blocked. The range for Max. Pressure values is 0 - 100 bar.

Min Pressure

Sets the minimum pressure for the pump. When pressure drops to the set value, the pump will shut down. This prevents the solvent leakage. The range for Min. Pressure values is 0 - 100 bar.

Delay

Pressure checking doesn't start immediately after the pump is started, but with some delay. During this delay the pressure in chromatographic system can stabilize. When starting the pump, it is necessary for the min pressure to allow the pressure to stabilize.

Pump during idle time

Maintains the flow rate defined in the method after it is sent, even when no analysis is running.

4.3 Method Setup - Thermostat - Temperatures

The thermostat has temperature controlled post-column derivatisation reactor (up to 180° C \pm 1° C) and temperature controlled column oven (20 to 99° C \pm 1° C) with active cooling capability.

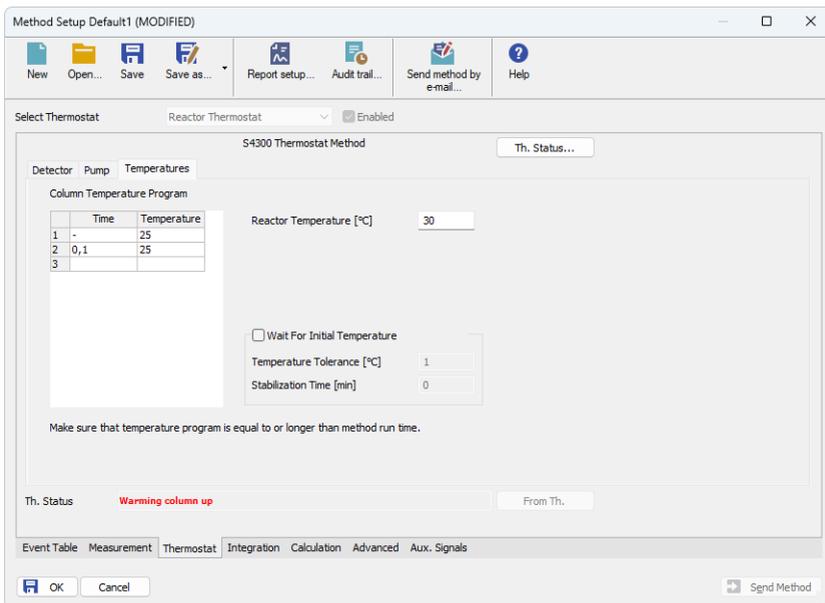


Fig. 8: Method Setup - Thermostat - Temperatures

The *Time Table* on the *Method Setup - Thermostat - Temperatures* tab for the **Sykam S4300** module serves for programming the column oven temperature during run.

The *Time* is the analysis time at which the set temperature will be changed to new value. The *Time Table* always has at least one row for the initial *Time* (0).

It is strongly recommended to set the temperature time program equal to or longer than the *Run Time* defined on the *Measurement* tab or equal to the longest time program defined in other control modules, because if the last time defined in the *Time Table* is shorter than the *Run Time*, the pump will stop at the time specified in the last row of the *Time Table*.

Reactor Temperature

Sets temperature of the reactor

Wait For Initial Temperature

This option allows to set *Temperature Tolerance*, when waiting for the initial temperature, and to set *Stabilization Time* for the column temperature.

4.4 Device Monitor

The window with the Reactor Thermostat status can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window. It allows to *Set Volumes*, *Wash* or *Stop* the operation or check the Reactor and Column temperature, Run Time, Flow and Pressure.

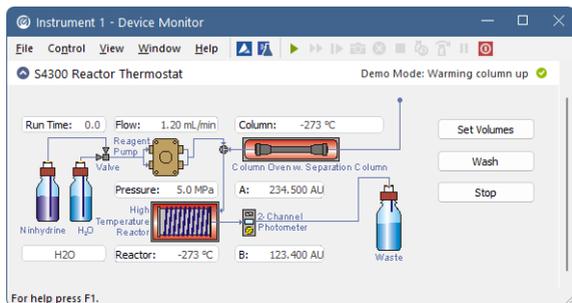


Fig. 9: Device Monitor

Set Volumes

The *Set remaining solvents* dialog will be opened. It shows actual volume of solvents and it enables to set refill volume. Warn field allows user to set minimal volume of solvent. When reached, warning message will appear. When the solvent volumes reach zero, the system will be stopped by invoking error.

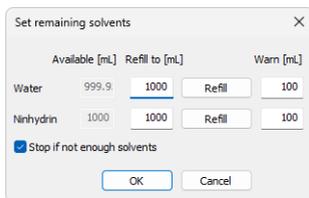


Fig. 10: Set remaining solvents

Wash

This dialog allows to manually perform system wash. To set reactor's and column's temperatures, reagent pump flow and choose solvent type.

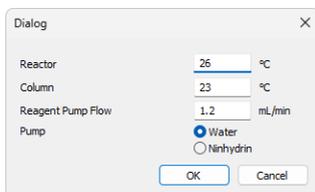


Fig. 11: Wash dialog

Shutdown

After issuing the *Shutdown* command, the S4300 switches to the *Flushing* state. During *Flushing*, the flow rate is maintained according to the value defined in the active method. If *Ninhydrin* was used, the solvent is automatically switched to *Water*. The flushing process is terminated automatically after approximately 50 minutes and can be terminated manually using the *Stop* button.

4.5 Sykam S4300 Reaction Module Setup

To invoke this window, double click on the module in the *System Configuration* window or use the *Setup...* button in the same window.

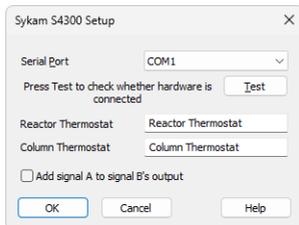


Fig. 12: Sykam S4300 Reaction Module Setup

Port

Selection of the communication port.

Test

This button is used to test the connection to the **Sykam S4300** detector using the previously set *Port*.

Reactor Thermostat

In this field it is possible to change the reactor thermostat's name.

Column Thermostat

In this field it is possible to change the column thermostat's name.

Add signal A to signal B's output

This module has two signal outputs. Check to have all result in one signal.

5 Report Setup

All of the module settings accessible on the [Method Setup - Thermostat](#) tab for the **Sykam S4300** module are reported. To do so, it is necessary to check the *Instrument Control* checkbox in the *Report Setup - Method* dialog.

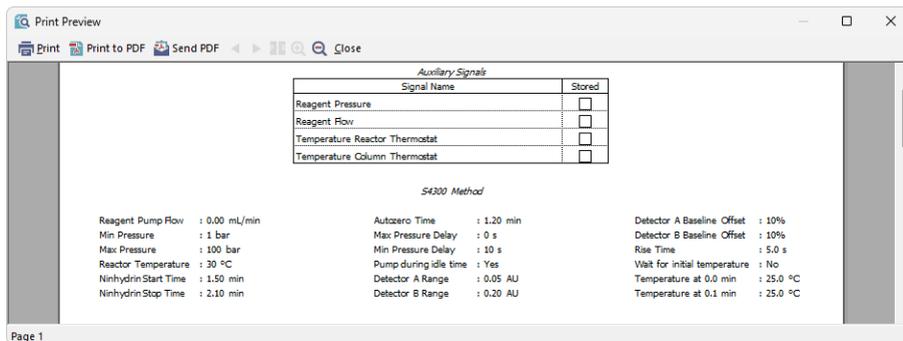


Fig. 13: Report Setup

6 Troubleshooting

When the remedy for some problem cannot be discovered easily, the recording of communication between **Clarity** and the module 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=SykamS4300_%D.txt
reset=off
```

Note: Instead of COM1 type the correct serial port used to communicate with the **Sykam S4300 Amino Acid Analyzer** module. This port number is displayed when the *Th. Status...* button in the [Method Setup - Thermostat](#) 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.