DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

HT800L

Clarity Control Module ENG

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Contents

To facilitate the orientation in the **HT800L** 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 HTA HT800L control module

This manual describes the setting of the **HTA HT800L** autosampler. The control module enables direct control of the instrument over serial line. 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.

Fig. 1: HTA HT800L

Note: It is recommended to check the user manual of the autosampler for its operating principles and restrictions.

2 Requirements

- **Clarity** Installation with AS Control module (p/n A26).
- Serial straight cable 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.

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

Caution: Required autosampler firmware version: ***1.07*** or higher.

3 Installation Procedure

3.1 Hardware - Wiring

Commands for the autosampler are communicated with **Clarity** through a serial communication cable. The cable (described in the chapter **"Requirements"** on pg. **2**.) is common standard and can be acquired either from **DataApex** company or from local computer stores.

3.1.1 Connections of the autosampler and chromatographic system

The connection of the whole chromatography set is dependent on many factors, such as control modules available for each particular part of the set. The common options for the **HT800L** autosampler will be either all modules controlled, or some of them not controlled. The typical wirings are shown on diagrams below:

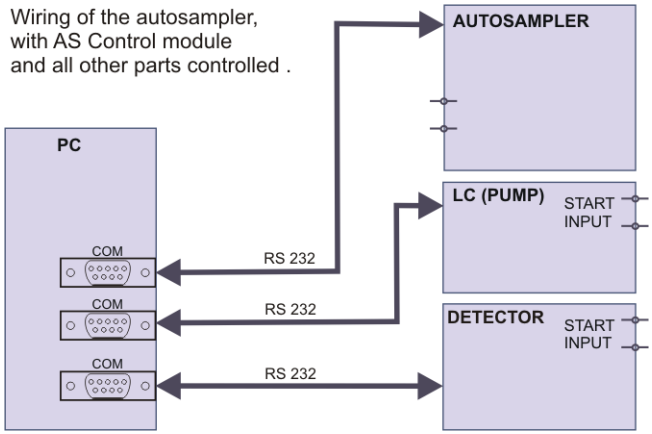

Fig. 2: Wiring of the autosampler - all parts of the set controlled

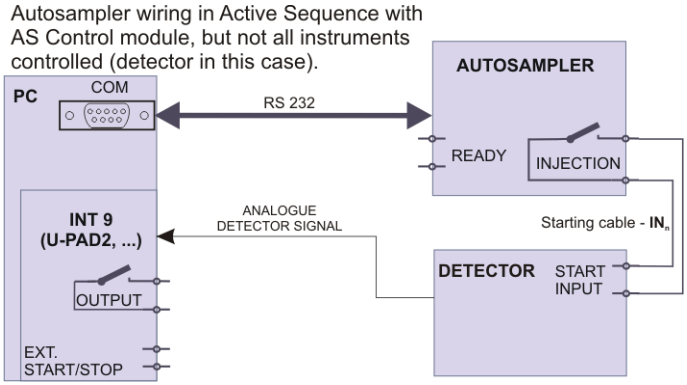

Fig. 3: Wiring of the autosampler - some parts of the set not controlled

Note: Other typical connections of a set with Autosampler can be found in the **Getting Started** manual (chapter **Device Setup and Wiring**).

3.2 HT800L setup - communication

The **HT800L** autosampler can be controlled from **Clarity** via serial (RS-232) interface. Some HT800L units also have a USB port, but Clarity doesn't support USB communication with this autosampler.

3.3 Clarity Configuration

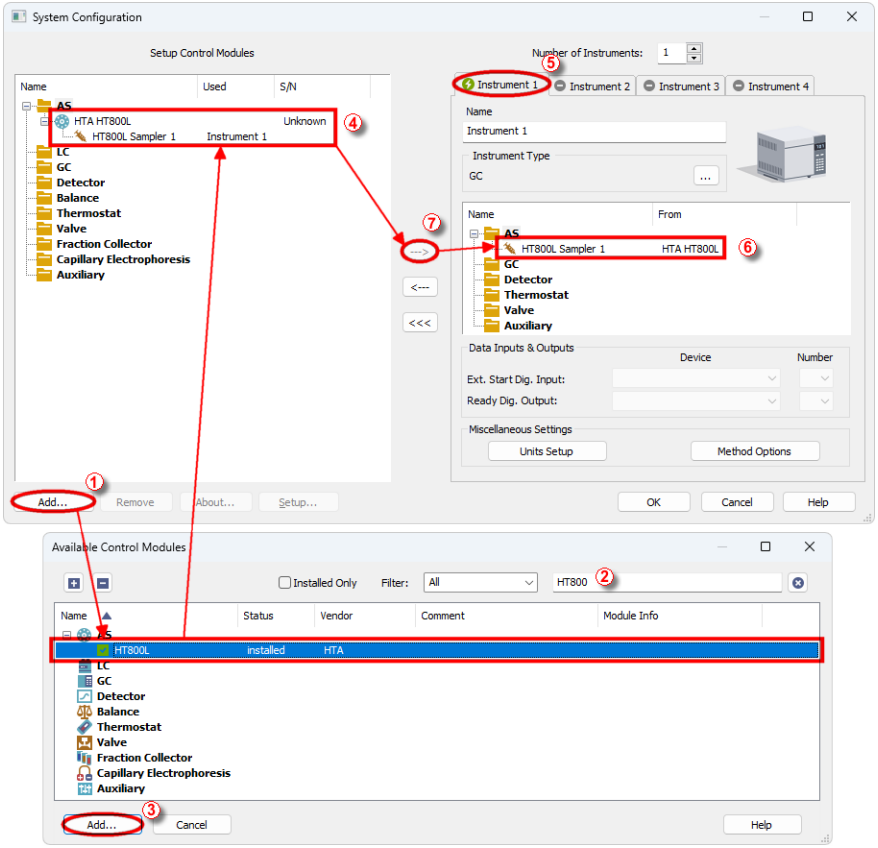

Fig. 4: System Configuration

- Start the **Clarity** station by clicking 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 (see **Fig. 4** on pg. **6**.) to invoke the *Available Control Modules* dialog.
- You can specify the searching filter ② to simplify the finding of the driver.
- Select the **HT800L** and press the *Add* ③ button.

The HT800L Setup dialog will appear.

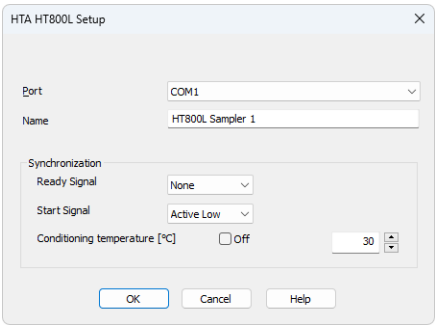

Fig. 5: HT800L Setup

- Select the *Port* number and other autosampler options and press the *OK* button.

Note: The HTA HT800L Setup dialog is more closely described in the chapter **"HTA HT800L Setup"** on pg. **19**..

The **HT800L** autosampler item will appear in the *Setup Control Modules* list of the *System Configuration* dialog.

- Drag and drop the**HT800L** icon from the *Setup Control Modules* list ④ on the left side of the *System Configuration* dialog to the desired *Instrument* ⑤ tab on the right side ⑥ (or use the ---> button ⑦ to do so).

4 Using the control module

New Method Setup - AS tab appears in the ***Method Setup*** dialog, enabling the setting of the **HT800L** autosampler control method.

4.1 Method Setup - AS

The *Method Setup - AS* dialog consists of seven sub-tabs assigned for the various parts of the **HT800L** autosampler method. These sub- tabs areInjection,Move,Wash,Reagent 1 to 3 andPositions. The *AS Status* button opens the Hardware Configuration dialog of the **HT800L** autosampler. The *Send Method* button sends the method configuration to the autosampler every time it is pressed. Other actions in different windows may also cause the sending of the instrument method to the controlled devices including the autosampler - most notable cases being pressing the *Send Method* button in the ***Single Run*** dialog or starting a new injection from the ***Sequence*** window (each injection is preceded with sending the instrument method).

4.1.1 Injection

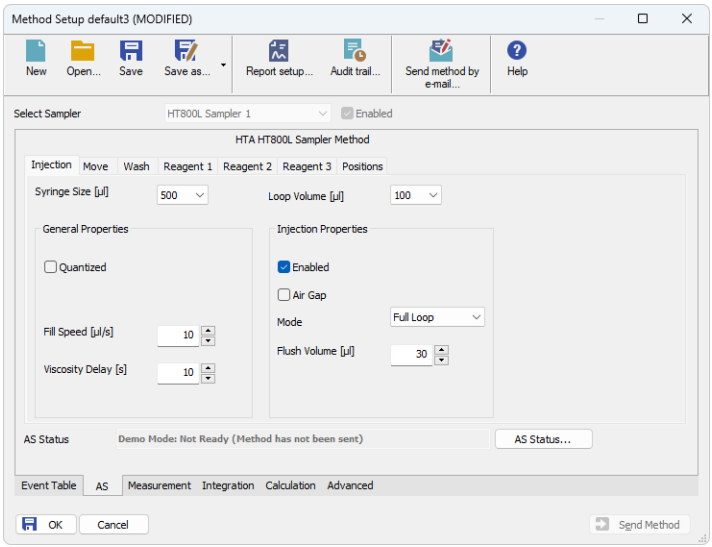

Fig. 6: Method Setup - AS - Injection

This is the main tab defining the AS control method. It defines which parts of the **HT800L** method will be performed and sets some other parameters.

Syringe size

Available syringe volumes: 250 µl, 500 µl, 1000 µl, 2500 µl and 5000 µl.

Loop volume

Available loops: 2 µl, 5 µl, 10 µl, 20 µl, 50 µl, 100 µl, 250 µl, 500 µl and 1000 µl.

General properties:

Quantized

Enables or disables the move sample phase. In quantized preparation the sample is drawn from a vial of the left rack and dispensed into the corresponding vial on the right rack. Intermediate washings can also be made during this phase. The quantized preparation is useful when making a dilution or a sample preparation with a known volume of sample when starting from an unknown volume.

Fill speed

How fast to draw a volume of sample. In general it is possible to set the fill speed from 1 µl/s to 2500 µl/s.

Viscosity delay

This is a wait time after each draw or dispense of liquid. It is used when the autosampler is working with viscous liquids. When the sample is very viscous it is also advisable to set a low fill speed.

Injection properties:

Enabled

Check this box if you want to make an injection, so you can set the injection parameters.

Air gap

Check this box if you want to draw 5 µl of air to divide sample from system liquid and transfer buffer liquid from system liquid (for µl pick up injection).

Mode

Available modes: *Full Loop* (loop is completely filled with sample), *Partial Loop* (loop is partially filled with sample), or *Pick up µl* (loop is partially filled with sample and the sample is carried to the loop using a transfer buffer liquid).

Flush volume

The volume of liquid used to wash the hydraulic circuit (between needle and injection valve) before the sample injection. It can be set from 20 µl to 250 µl.

4.1.2 Move

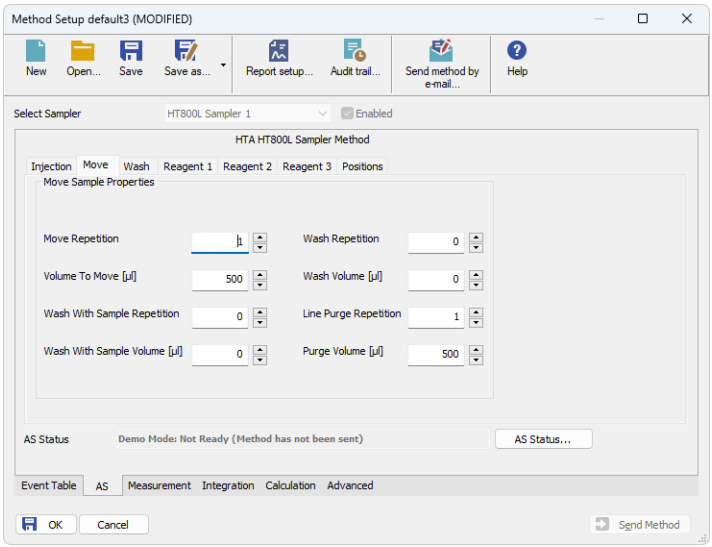

Fig. 7: Method Setup - AS - Move

To enable the Move section, you have to check the *Quantized* box in the "Injection" on page 9 section.

Move Repetition

It can run from 1 to 9 cycles. For each cycle the autosampler draws the set volume of sample from a vial on the left rack (e.g. L2) and it dispenses it all into the corresponding vial of the right rack (in this case R2).

Volume to Move

This is the volume drawn for each *move sample* cycle. It can be set from 1 µl to the syringe volume.

Wash With Sample Repetition

This can be set from 1 to 9 cycles. For each cycle the autosampler draws the set volume of sample from a vial on the left rack (e.g. L-2) and dispenses it into waste.

Wash With Sample Volume

The volume drawn in the wash with sample cycles. It can be set from 1 µl to the syringe volume.

Wash Repetition

This can be set from 1 to 9. For each cycle, the autosampler draws the set volume from a reagent/solvent vial and dispenses it into waste.

Wash Volume

This is the volume used in the wash cycles. It can be set from 1 µl to the syringe volume.

Line Purge Repetition

This can be set from 1 to 9. For each cycle, the autosampler draws the set volume from a solvent/reagent vial and dispenses it into waste.

Purge Volume

The volume used in the purge cycles. It can be set from 1 µl to the syringe volume.

Caution: When using a quantized preparation method, it is possible to set a sample position intervals related to the whole tray. However, only sample intervals related to the left tray can be performed by the HT800L autosampler.

4.1.3 Wash

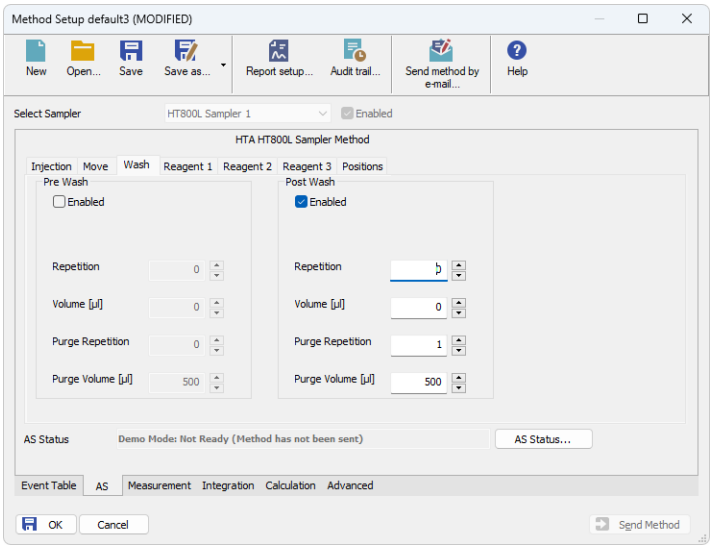

Fig. 8: Method Setup - AS - Wash

This tab defines the behavior of the **HT800L** autosampler when it comes to washing the sample loop. Two washing stages are possible: *Pre Wash* and *Post Wash*. Their settings work the same way.

Enabled

Check this box if you want to do a pre/post wash, so you can set the parameters.

Repetition

Number of pre wash repetitions which can be from 1 to 15. For each cycle the autosampler draws the set volume from a solvent vial and dispenses it into waste.

Volume

This is the volume used for the pre/post wash. It can be set from 1 µl to the syringe volume.

Purge Repetition

Number of purges. This can be set from 1 to 15. For each cycle autosampler draws the set volume from the tank and dispenses it into waste.

Purge Volume

This is the volume used for the pre/post purge. It can be set from 1 µl to the syringe volume.

4.1.4 Reagent

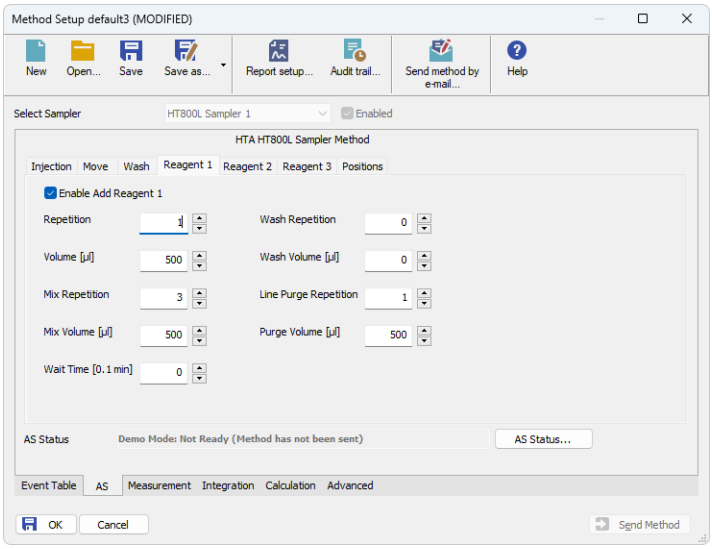

Fig. 9: Method Setup - AS - Reagent 1/2/3

The three tabs *Reagent 1* through *Reagent 3* contain settings for using the optional reagents. The available settings are identical on all three tabs, the only difference is the reagent number they apply to.

Enable Add Reagent 1, 2 or 3

Check this box if you want to add reagent 1/2/3, so you can set the related parameters.

Repetition

This can be set from 1 to 9 cycles. For each cycle the autosampler draws the set volume of reagent from a reagent vial and dispenses it all into the sample vial.

Volume

The volume drawn in the add reagent cycles. It can be set from 1 µl to the syringe volume.

Mix Repetition

This can be set from 0 to 99 cycles. At the end of the addition step it's possible to mix the obtained solution by drawing and dispensing from the needle a set number of times.

Mix Volume

The volume used in the mixing cycles. It can be set from 1 µl to the syringe volume.

Wait Time

This is the wait time after the addition (and mixing) of reagent to make the reaction. It can be set from 0 to 1000 (steps of 0.1 minutes).

Wash Repetition

It can be set from 1 to 9. For each cycle autosampler draws the set volume from a reagent/solvent vial and dispenses it into waste.

Wash Volume

This is the volume used in the wash cycles. It can be set from 1 µl to the syringe volume.

Line Purge Repetition

It can be set from 1 to 9. For each cycle autosampler draws the set volume from a vial of reagents and dispenses it into waste.

Purge Volume

The volume used in the purge cycles. It can be set from 1 µl to the syringe volume.

4.1.5 Positions

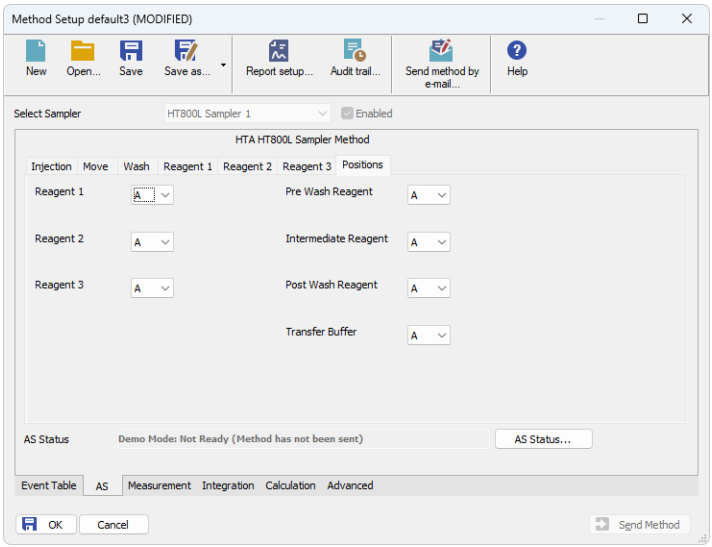

Fig. 10: Method Setup - AS - Positions

This tab defines vial positions to be used for the corresponding operations selected on the previous tabs of the autosampler setup window.

Reagent 1

This is the position of the vial that contains the first reagent. The first reagent is used if *Add Reagent 1* has been enabled in the correspondent method. This position can be set to: A, B, C, D, E, F, G, H, I or J.

Reagent 2

This is the position of the vial that contains the second reagent. The second reagent is used if *Add Reagent 2* has been enabled in the correspondent method. This position can be set to: A, B, C, D, E, F, G, H, I or J.

Reagent 3

This is the position of the vial that contains the third reagent. The third reagent is used if *Add Reagent 3* has been enabled in the correspondent method. This position can be set to: A, B, C, D, E, F, G, H, I or J.

Pre Wash Reagent

This is the position of the vial that contains the pre wash fluid. The pre wash fluid is used if the method has activated the pre wash phase. This position can be set to: A, B, C, D, E, F, G, H, I or J.

Intermediate Wash Reagent

This is the position of the vial that contains the intermediate wash fluid. The intermediate wash fluid is used if the method has activated the washing cycles

inside the *Move Sample* or *Add Reagent* phases. This position can be set to: A, B, C, D, E, F, G, H, I or J.

Post Wash Reagent

This is the position of the vial that contains the post wash fluid. The post wash fluid is used if the method has activated the post wash phase. This position can be set to: A, B, C, D, E, F, G, H, I or J.

Transfer Buffer

This is the position of the vial that contains the transfer buffer fluid. The buffer fluid is used in the *Pick up µl* injection. This position can be set to: A, B, C, D, E, F, G, H, I or J.

The letters A to J denote reagent vial positions on the **HT800L** autosampler's tray:

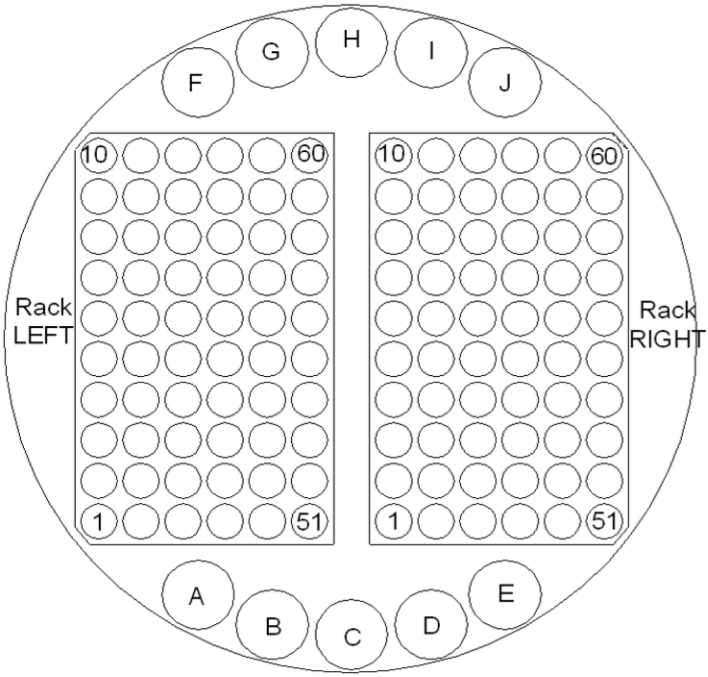

Fig. 11: HTA HT800L vial position chart

4.2 Hardware Configuration

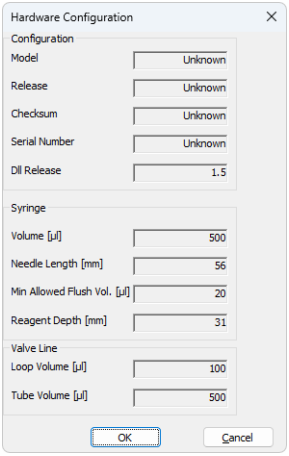

Fig. 12: Hardware Configuration

The *Hardware Configuration* dialog is accessible by the *AS Status* button in the Method Setup - AS or Device Monitor window. It displays various parameters retrieved from the HT800L autosampler. In case they couldn't be retrieved (e.g. the autosampler is not connected), the text "Unknown" and some default values are shown. The displayed values are read-only, they can only be modified via the autosampler's control panel (see the **HT800L User Manual** for details).

Caution: Any configuration change made via the HT800L control panel (e.g. tube volume, mounted tray type change or any other setup parameter) requires to restart the Clarity station in order to be detected.

4.3 HTA HT800L Setup

HTA HT800L Setup dialog (accessible through the ***System Configuration*** dialog) allows to manually set the parameters needed for the communication with the **HT800L** autosampler.

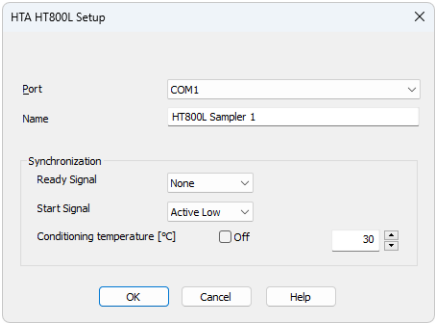

Fig. 13: HT800L Setup

Port

Select the communication port where the serial cable of the autosampler is connected (e.g. COM1).

Name

Allows to set the custom name of the **HT800L** autosampler, which will then be shown in the ***Device Monitor*** window, in the reports and on other places in **Clarity**.

Ready signal

Set the Ready Signal to Active Low or Active High or None or Data System. This signal is read from the HPLC by the sampler and starts the injection. **None** means the autosampler does not wait for the ready signal before injection. **Data System** means the software of the HPLC provides the Ready Signal to the sampler via RS232 serial communication.

Start signal

Set the start signal to *Active Low* or *Active High*. This signal is given to HPLC or data system when the injection is made.

Conditioning Temperature

This function is effective only if you have the sampler with the cooling capability. If you don't want the vial tray be cooled, check the *Off* box. If you want the vial tray be cooled, uncheck the *Off* box and set the desired temperature.

4.4 Device Monitor

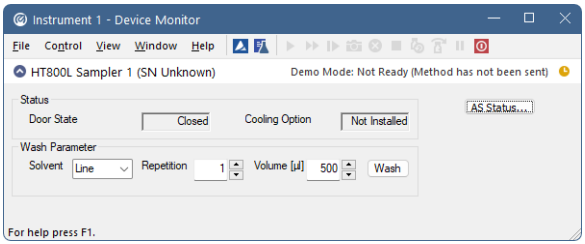

Fig. 14: HT800L Device Monitor

Device Monitor window for the **HT800L** autosampler can be accessed by *Analysis - Device Monitor* menu command from the *Instrument* window. It provides controls for some of the actions of the autosampler.

Status

This section is read-only.

Door Status

Indicates the status of the Door, it can be *Opened* or *Closed*. Note: when the door is open, the autosampler's motors run at reduced speed for safety reasons.

Cooling Option

Indicates the status of the cooling source. It can be *Installed* or *Not Installed*.

Wash parameter

This section lets you perform a wash cycle.

Solvent

Indicates the position where the solvent is located. This can be set to: *Line, A, B, C, D, E, F, G, H, I* or *J*. The *A* to *J* options are the solvent vial positions on the tray. If the *Solvent* parameter is set to *Line*, pressing *Wash* will run the line purge.

Repetition

Indicates the number of the washing cycles. It can be set from 1 to 15.

Volume

Indicates the volume of fluid that is used in the washing cycles at each repetition. It can be set from 1 µl to the syringe volume.

Wash

Press this button to start a wash cycle with the selected parameters.

5 Report Setup

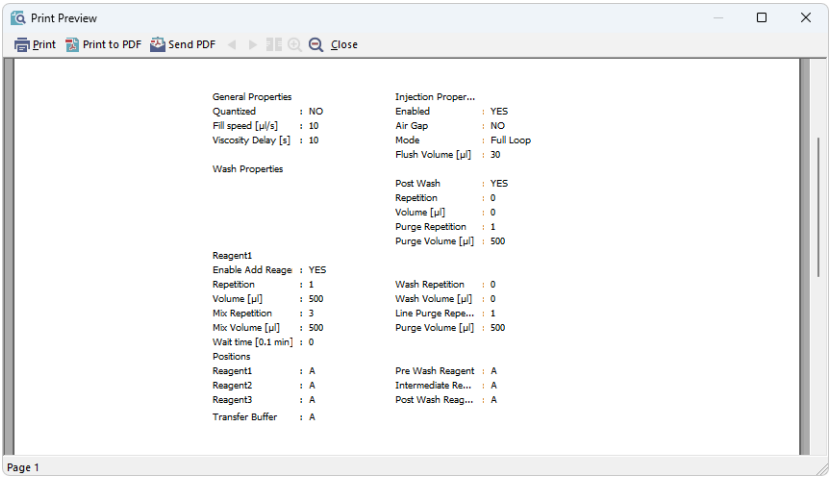

Fig. 15: HT800L report preview

All autosampler-specific settings (that means the data from all sub-tabs of the Method Setup - AS tab) are reported as a part of the data displayed by the use of *Injection Control* checkbox of the ***Report Setup - Method*** dialog.

6 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=HT800L_%D.txt
reset=off
```

Note: If your autosampler is connected to other serial port than COM1, change the number accordingly.

Note: The *%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. Note that the file size may be quite significant, so in case the error occurs on a regular basis, it might be better to set the Reset=on, start **Clarity**, invoke the error, close **Clarity** and send the diagnostics file (the file will be once more reset during the next start of **Clarity**).