DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

HTA HT4000L

Clarity Control Module ENG

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Contents

To facilitate the orientation in the **HTA HT4000L** 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 HT4000L Control module

This manual describes the setting of **HT4000L** autosampler. The control module enables direct control of the instrument over LAN. Direct control means that the autosampler can be completely controlled from the **Clarity** environment. Instrument method, controlling for example the vials and further device specific functions (e.g. washing), will be saved to the measured chromatograms.

Fig. 1: HT4000L autosampler

2 Requirements

- **Clarity** Installation with AS Control module (p/n A26).
- Free LAN port in the PC (for connection to both the autosampler and to the Internet, two LAN cards might be necessary) or in the local network.
- LAN cross cable (p/n SK08) for direct connection of the autosampler to PC or local network.

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 HT4000L setup - communication

The **HT4000L** autosampler communicates with PC via LAN using the LAN cable, either directly or using the local network.The cable used might differ from LAN cross cable (p/n SK08) used for direct connection to LAN straight cable used for the connection via local network, however, modern switches usually can use the LAN cross cable as well.

3.1.1 Additional connections

The **HT4000L** control module can send and receive synchronization signals via standard communication line, however, some of the non-controlled instruments must be synchronized separately using the synchronization wiring. For that occasion, **HT4000L** sampler has a Mini DIN 8 pins I/O connector on the rear panel. The exact wiring depends on the type of the device to be synchronized and its inner settings, the description of PINs on the **HT4000L** autosamplers can be found in the following table:

Tab. 1: HT4000L - Analyzer connector

PIN	Function	Note
1	FREEOUT-NO	Output = Relay contact (open by default)
2	FREEOUT-COM	Relay common contact
3	SAMPINS-NO	Output = Relay contact (open by default)
4	+5 Volts	Output = max. 20 mA
5	SAMPINS-COM	Relay common contact
6	RDY	Signal input (true low); Low-Level = 0÷0.5 V Hi-level = 4÷12 V
7	GND	Ground
8	FREE-IN	Signal input (true low); Low-Level = 0÷0.5 V Hi-level = 4÷12 V

Legend - relay contact: NC = normally closed, NO = normally open, COM = common contact

Relay specification - V_{max} = 24V; I_{max} =1A

See the **HT4000L User Manual** provided by **HTA** to see more details on connections.

3.2 Clarity Configuration

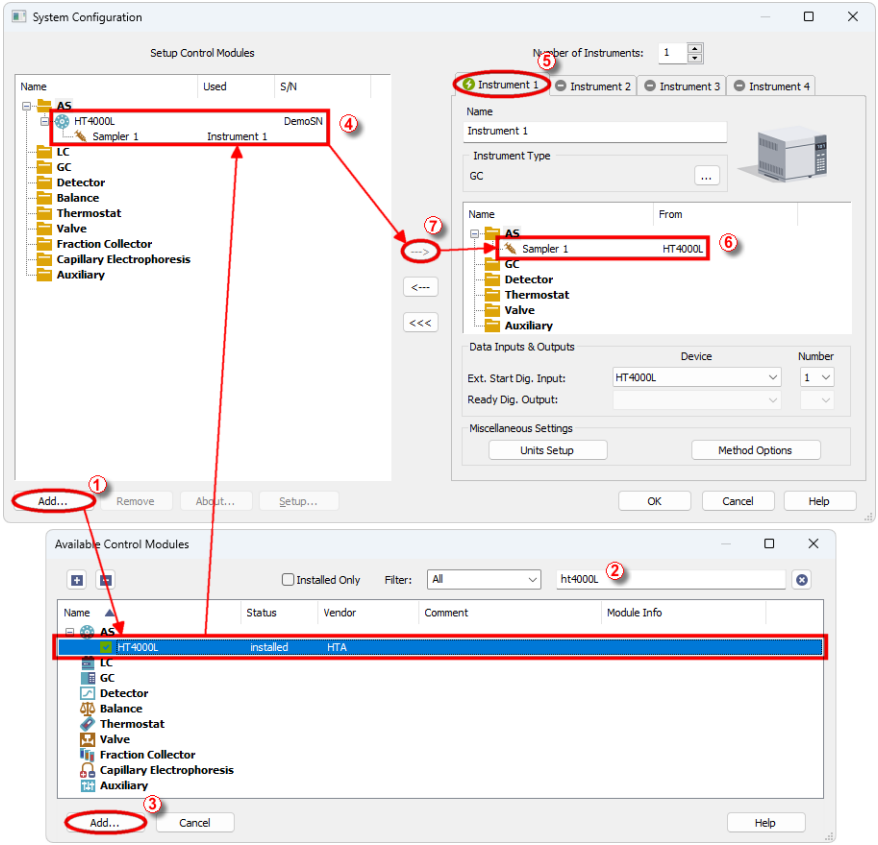

Fig. 2: System Configuration

- 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 (see **Fig. 2** on pg. **5**.) to invoke the ***Available Control Modules*** dialog.
- You can specify the searching filter ② to simplify the finding of the driver.
- Select the **HT4000L** sampler and press the *Add* ③ button.

The Setup dialog for **HTA 4000L** will appear.

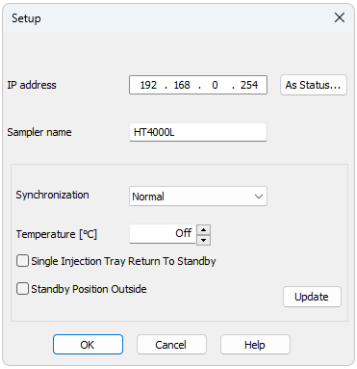

Fig. 3: HTA HT4000L Setup

- Fill in the appropriate *IP Address* field and press the *As Status…* button. If the communication is correct, the Hardware Configuration dialog displaying the autosampler configuration appears.

Note: The Setup dialog for HTA 4000L is more closely described in the chapter **"HT4000L Setup"** on pg. **16**.

The **HT4000L** autosampler item will appear in the *Setup Control Modules* list of the *System Configuration* dialog.

- Drag and drop the **HT4000L** icon from the *Setup Control Modules* ④ list 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).
- Set the *Ext. Start Dig. Input* and *Ready Dig. Output* numbers ⑧ for your acquisition card according to the wires being used for synchronization. If you wish to synchronize the **Clarity** start with the autosampler via digital communication, you can set the **HT4000L** in the *Ext. Start Dig. Input* drop-down menu, using the *1* as a input *Number*. In such case it is necessary to change the behavior on the *Method Setup - Measurement* tab later from *Down* to *Up*, else the start signal will be delayed by pulse length (approximately 2 seconds).

4 Using the control module

New Method Setup - AS tab appears in the *Method Setup* dialog, enabling the setting of the **HT4000L** autosampler control method. It consists of three sub-tabs with content varying according to the autosampler model and installed options.

4.1 Method Setup - AS

The *Method Setup - AS* dialog consists of multiple sub-tabs assigned for the various parts of the **HT4000L** autosampler method. Additional buttons allow to display theHardware Configuration dialog of the **HT4000L** autosampler or to read the instrument method from the **HT4000L** autosampler. The method is sent to the autosampler every time the *Send Method* or *OK* button is pressed. Other actions in different windows may also cause the sending of the instrument method to the controlled devices including the **HT4000L** 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).

To read the **HT4000L** method from the autosampler it is necessary to use the *From AS* button available from all sub-tabs of the *Method Setup - AS* dialog. If the injection method is already established in the sampler, it is advisable to download it to **Clarity** using the *From AS* button and save it as a **Clarity** method.

4.1.1 General

Main tab defining the basics of AS control method.

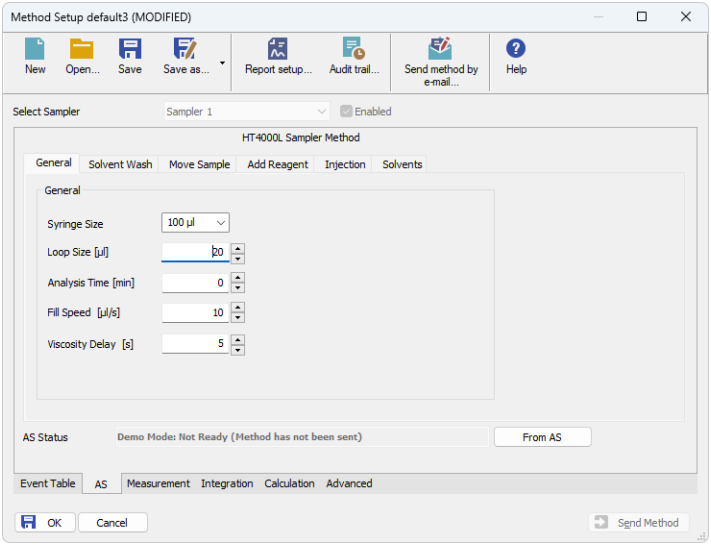

Fig. 4: Method Setup - AS - General

Syringe Size

Volume of the syringe. The syringe volume affects the limits of other parameters such as speed and volume.

Loop Size [µl]

Volume of the loop. The loop volume affects the limits of other parameters such as volume.

Analysis Time [min]

Time of the sample analysis (time from the injection to the moment in which the analyzer will be ready again). This parameter is taken into consideration by the autosampler only if *Synchronization* option is set to *Normal w/o Rdy.*. For more details see the chapter **HT4000L Setup** on pg. **16**.

Fill Speed [µl/s]

Sets the syringe aspiration speed.

Viscosity Delay [s]

Sets the time the syringe remains in the sample vial after the plunger has been raised. It allows viscous samples time to fill the syringe.

4.1.2 Solvent Wash

The *Method Setup - AS - Solvent Wash* tab allows to set the parameters for washing of the solvent.

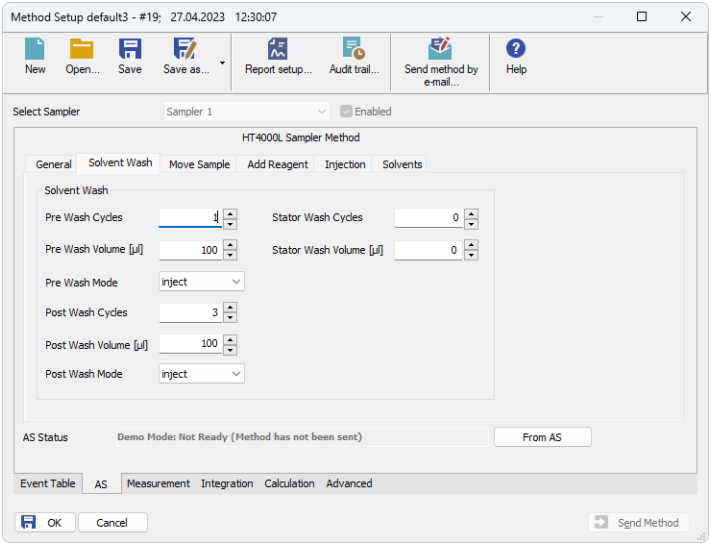

Fig. 5: Method Setup - AS - Solvent Wash

For more details on the setting of the Solvent Wash please see the **User Manual** of the autosampler provided by **HTA**.

4.1.3 Move Sample

The *Method Setup - AS - Move Sample* tab allows to set details on moving the samples.

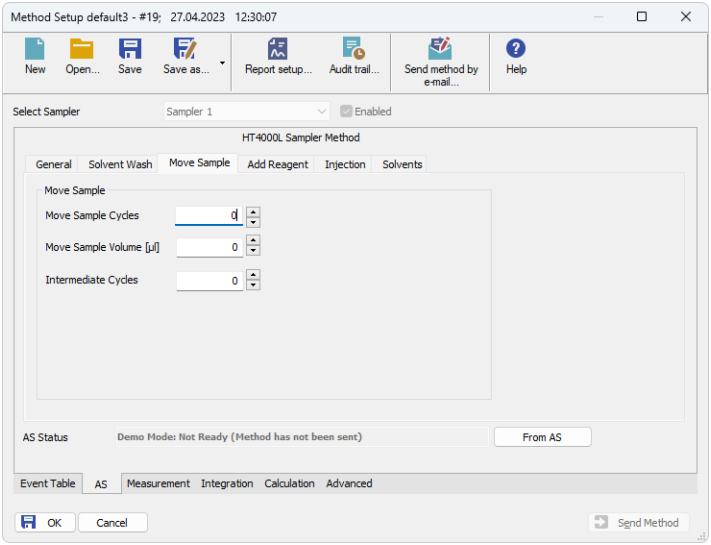

Fig. 6: Method Setup - AS - Move Sample

For more details on the setting of the *Move Sample* please see the **User Manual** of the autosampler provided by **HTA**.

4.1.4 Add Reagent

The *Method Setup - AS - Add Reagent* tab allows to set the behavior when adding a reagent.

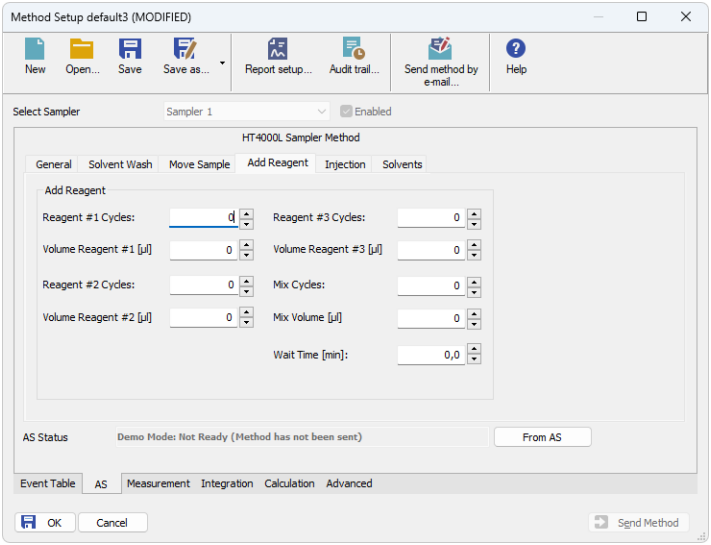

Fig. 7: Method Setup - AS - Add Reagent

For more details on the setting of the *Add Reagent* please see the **User Manual** of the autosampler provided by **HTA**.

4.1.5 Injection

The *Method Setup - AS - Injection* tab allows to set the injection mode of the **HT4000L** autosampler.

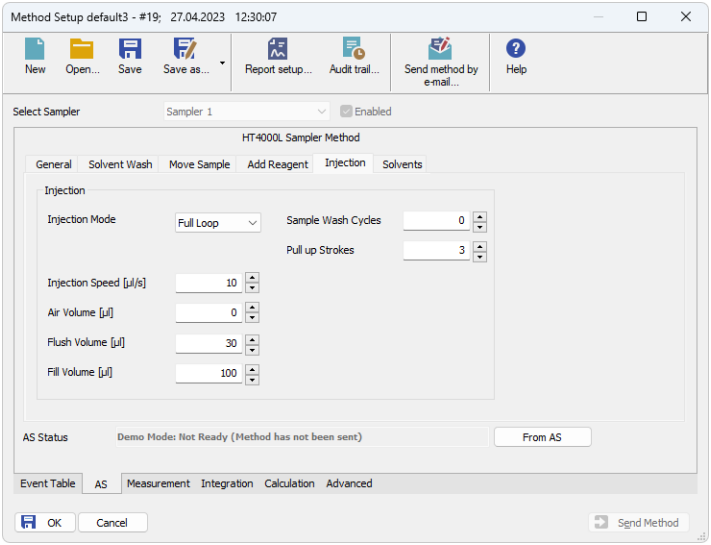

Fig. 8: Method Setup - AS - Injection

For more details on the setting of the *Injection* please see the **User Manual** of the autosampler provided by **HTA**.

Note: As of firmware version 2.24, the lower flow rate limit for the 10 ml syringe is 10 µl/s.

4.1.6 Solvents

The *Method Setup - AS - Solvents* tab allows to set particular position of regencies and solvents.

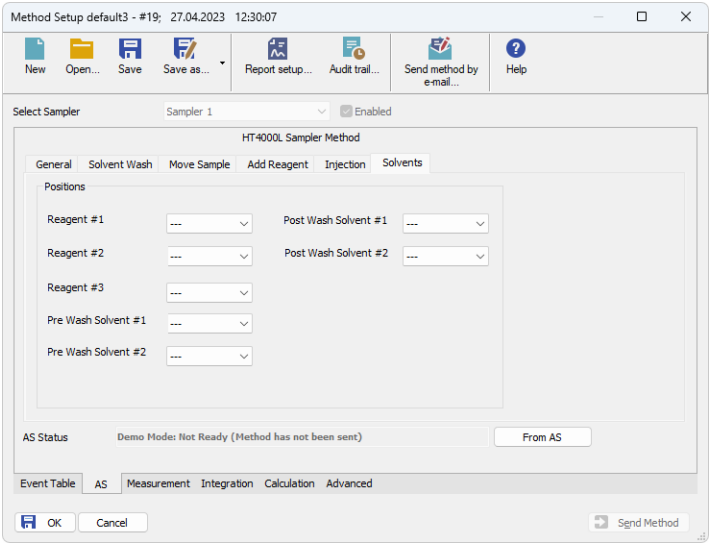

Fig. 9: Method Setup - AS - Solvents

For more details on the setting of the *Solvents* please see the **User Manual** of the autosampler provided by **HTA**.

4.2 Hardware Configuration

The *AS Status* button in the Device Monitor dialog displays the *Hardware Configuration* dialog. It displays autosampler serial number, settings and configuration of module which is used in the autosampler.

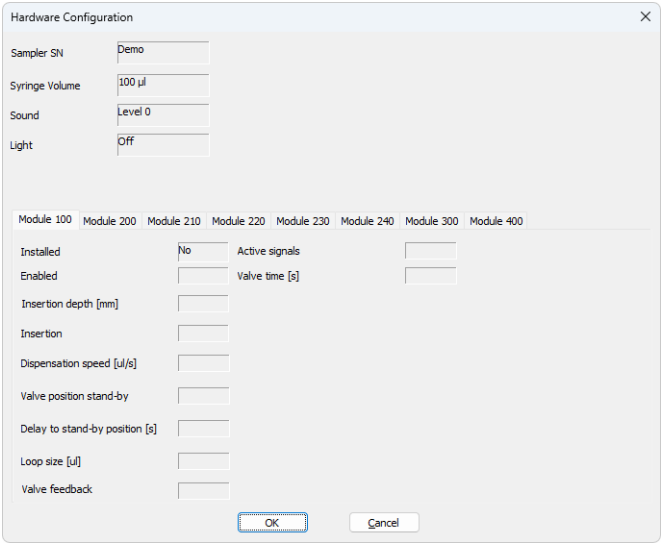

Fig. 10: HTA HT4000L Hardware Configuration

Sampler SN

Detected serial number of the device.

Syringe Volume

Size of the syringe used in the autosampler.

Sound

Detected sound level.

Light

Detected light set on the autosampler.

Depending on the module type installed in the autosampler, the proper settings of *Module 100*, *200*, *210*, *220*, *230*, *240*, *330* or *400* are displayed.

4.3 Device Monitor

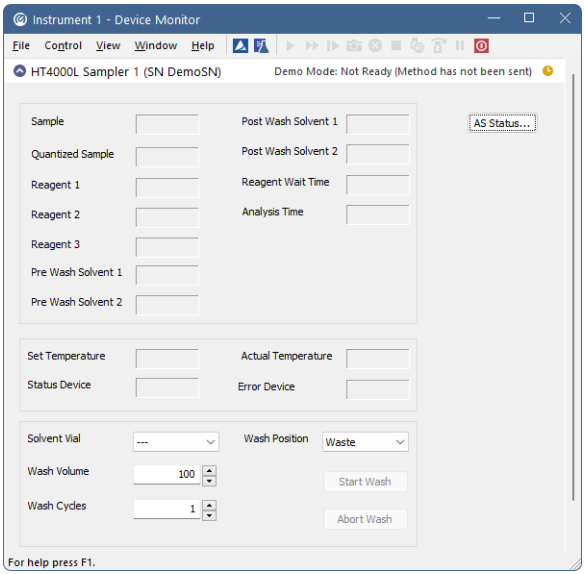

Fig. 11: HT4000L Device Monitor

The Device Monitor window for the **HT4000L** autosampler enables to monitor the status of the **HT4000L** autosampler and display its configuration.

AS Status…

Opens the Hardware Configuration dialog described in the chapter **"Hardware Configuration"** on pg. **14**.

4.4 HT4000L Setup

HTA HT4000L Setup dialog (accessible through the ***System Configuration*** dialog) allows to manually set the parameters needed for the communication with the **HT4000L** autosampler.

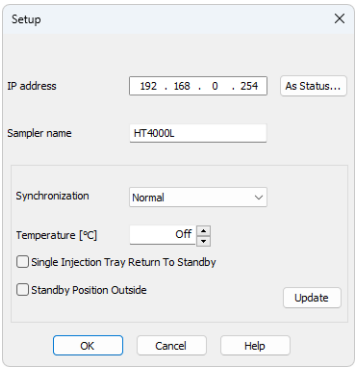

Fig. 12: HTA HT4000L Setup

IP Address

In case of LAN communication sets the IP address of the **HT4000L** autosampler connected to the computer via network.

AS Status…

When pressed, checks whether there is the **HT4000L** autosampler present using the selected *Communication* option, with the given *Serial Port* or *IP Address*. The result of the autodetection is then displayed in the Hardware Configuration dialog or an error message, depending on the success of the detection.

Synchronization

Allows to set the synchronization of the injection.

Option	AS starts the sample preparation (pre wash, pull up strokes...)	AS injects the sample in the injector	AS gives the *Start* signal to the analyzer
Normal	At the reception of the *Ready* signal from the analyzer	After ending the sample preparation the AS again checks the presence of the *Ready* signal from the analyzer and then starts the injection	At the beginning of the syringe plunger movement
Normal w/o Ready	At the end of the analysis time set in AS method	After ending the sample preparation	At the beginning of the syringe plunger movement
Normal Sng Ready	At the reception of the *Ready* signal from the analyzer	After ending the sample preparation	At the beginning of the syringe plunger movement

Temperature [°C]

Set the tray temperature. This value can be between *4°C* and *40°C* (active conditioning) or *Off* (inactive conditioning). Other values changes the value to *Off*.

Single Injection Tray Return To Standby

If checked, the tray return to standby position after the single injection finishes.

Standby Position Outside

If checked, the tray Standby position remains open.

5 Report Setup

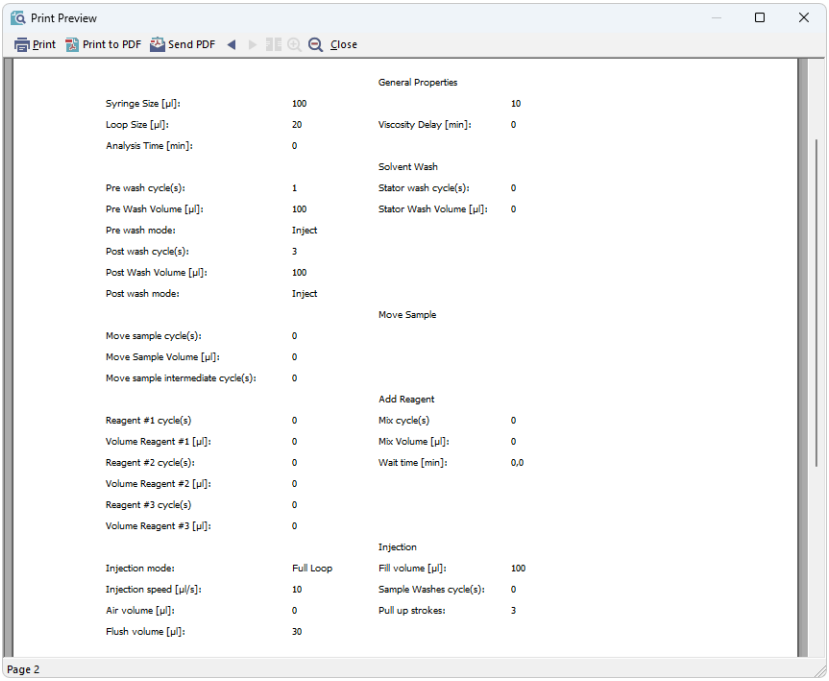

Fig. 13: HT4000L report preview

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:

```
[TCP_IP x.x.x.x:20101]
echo=on
textmode=on
filename=HT4000L_%D.txt
reset=off
```

Note: Instead of x.x.x.x type the correct IP address used to communicate with the **HTA HT4000L** autosampler. This information is displayed when the *AS Status* button in the Method Setup - AS 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. 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**).

FAILED to send the method to sub-device.

Possible cause: The selected flow rate is lower than the minimum supported by the device firmware (e.g., setting <10 µl/s with firmware version below 2.24 for a 10 ml syringe).

Solution: Adjust the injection speed to match the limits of your current firmware version, or contact HTA to request a firmware update if the lower speed is required.