DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

CETAC ASX-8000

Clarity Control Module ENG

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Contents

To facilitate the orientation in the **Cetac ASX-8000** 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 CETAC ASX-8000 control module

This manual describes the setting of the **CETAC ASX-8000** autosampler. The control module enables direct control of the instrument over USB interface.

Fig. 1: CETAC ASX-8000

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.

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 allowed (p/n A26).
- USB A-B cable (p/n SK06) for USB communication.

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

- Free USB port in your computer.

Caution: Required autosampler firmware versions: ***1.12.***

3 Installation Procedure

3.1 Hardware - Wiring

3.1.1 Connections of the autosampler and chromatographic system

The connection of the whole chromatography set is dependent on the many factors, such as control modules available for each particular part of the set. The common options for the **Cetac ASX-8000** autosampler will be either all modules controlled, or some of them not controlled. The typical wirings are shown on schemes below:

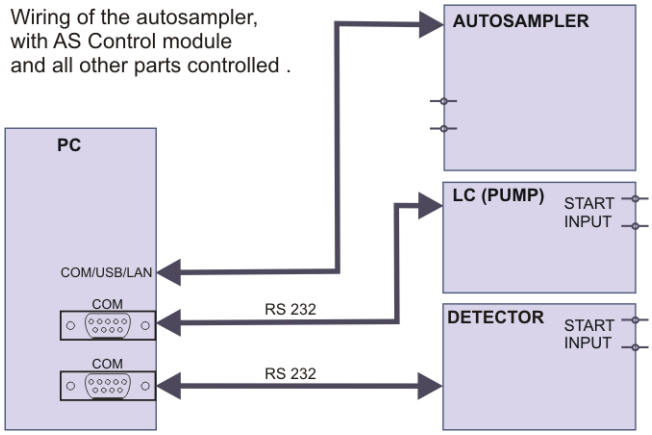

Fig. 2: Wiring of the autosampler - all parts of the set controlled

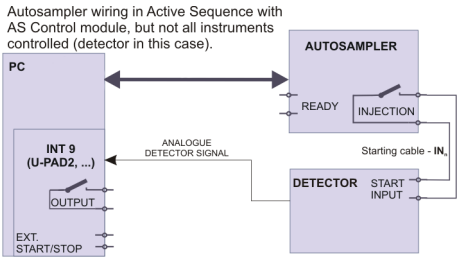

Fig. 3: Wiring of the autosampler - some parts of the set not controlled

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

3.2 Cetac ASX-8000 Setup - communication

The **Cetac ASX-8000** autosampler is controlled from **Clarity** via USB.

3.2.1 Digital Inputs and outputs

The digital inputs and outputs of the **Cetac ASX-8000** autosampler are both present on the back panel of the instrument and controlled over the communication line. When other instrumentation needs to be acknowledged of the analysis start etc. by wire, the I/O connector on the back panel of the autosampler may be used.

The input nr.1 (Host Ready) on the input terminal of the AS is not displayed in the *Device Monitor*, but its state influences *Ready* state of the AS. With both its poles interconnected (TTL **Low** state), AS switches into *Not Ready* state.

On the output terminal, only outputs 4, 5 and 6 can be directly controlled by Clarity.

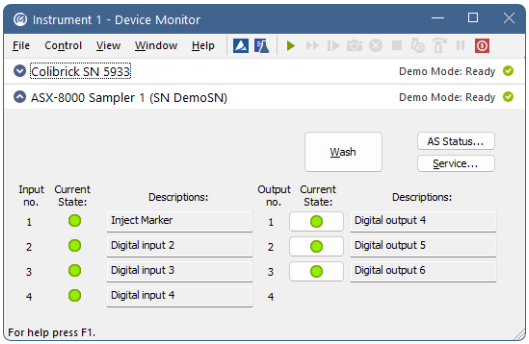

Fig. 4: Cetac ASX-8000 Digital inputs and outputs

3.2.2 Digital Outputs

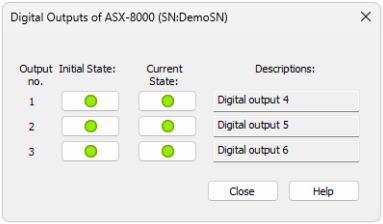

Fig. 5: Cetac ASX-8000 Digital outputs

This dialog can be invoked from Clarity main screen, by using menu item *File - Digital Outputs*…. It serves for setting of the initial and current state of digital outputs of Cetac ASX-8000.

3.3 Clarity Configuration

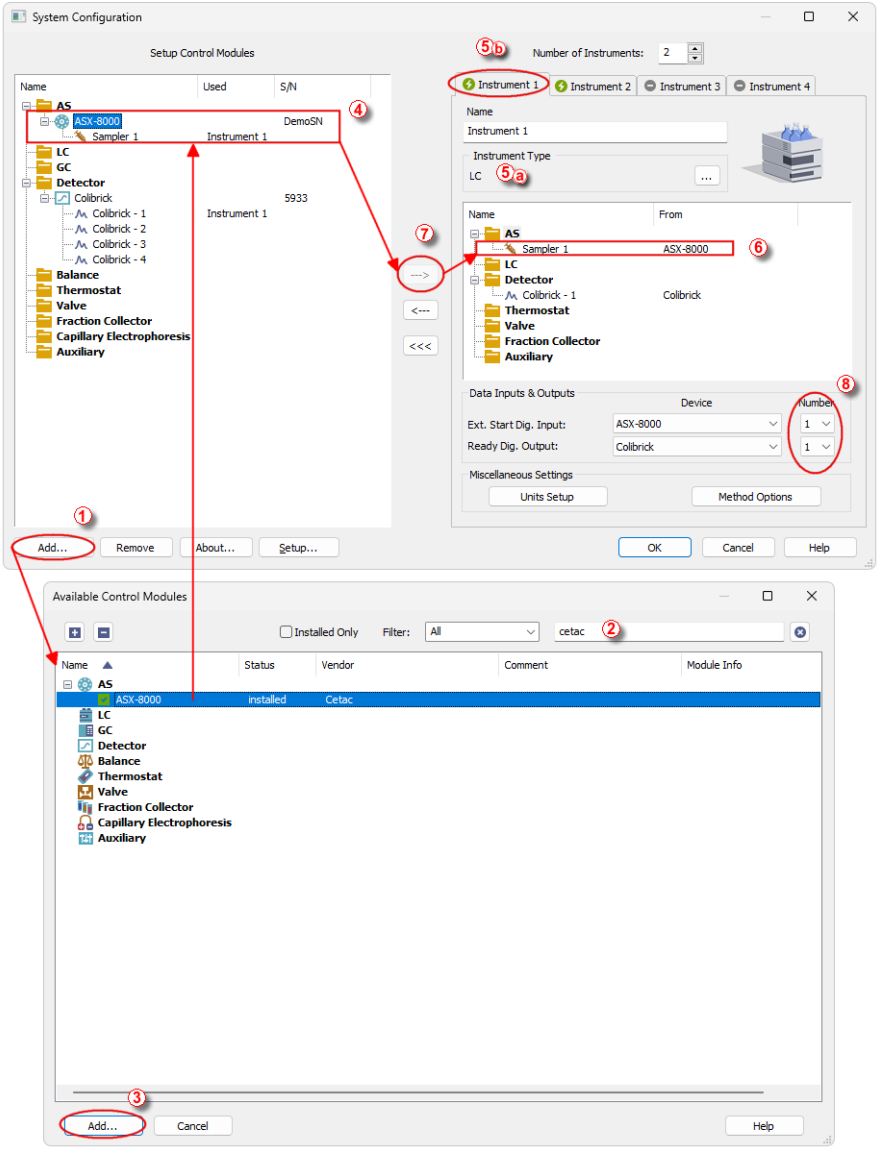

Fig. 6: System Configuration

- 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 **3.3** 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 **ASX-8000** sampler and press the *Add* ③ button.

The CETAC ASX-8000 Setup dialog will appear.

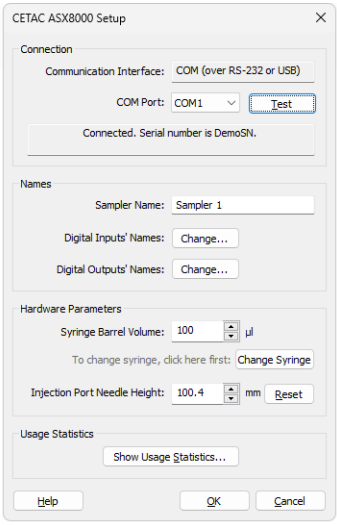

Fig. 7: ***Cetac ASX-8000*** *Setup*

- Select the correct *COM Port*, then press the *Test* button. If the communication is established , the *Connected* inscription along with serial number of the autosampler will be shown in the *Status* row.

Note: The CETAC ASX-8000 Setup dialog is more closely described in the chapter **"CETAC ASX-8000 Setup"** on pg. **13**.

The **ASX-8000** autosampler item will appear in the *Setup Control Modules* list of the *System Configuration* dialog.

- Change the *Instrument Type* ⑤ ⓐ on the desired *Instrument* tab ⑤ ⓑ to LC.
- Drag the **ASX-8000** item from the *Setup Control Modules* list on the left ④ to the *Instrument* tab on the right ⑥ , or use the ---> button ⑦ .

- 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 over serial line, you can set the **ASX-8000** in the *Ext. Start Dig. Input* drop-down menu, using the *1* as a input *Number*.

4 Using the control module

New Method Setup - AS tab appears in the *Method Setup* dialog, enabling the setting of the **Cetac ASX-8000** autosampler control method.

4.1 Method Setup - AS

The *Method Setup - AS* dialog consists of three sub-tabs assigned for the various parts of the **Cetac ASX-8000** autosampler method. These sub-tabs are Injection,Wash and Layout. Additional buttons allow to display the Hardware Configuration dialog of the **Cetac ASX-8000** autosampler or to read the instrument method from the **Cetac ASX-8000** 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 **Cetac ASX-8000** 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 **Cetac ASX-8000** 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 Injection

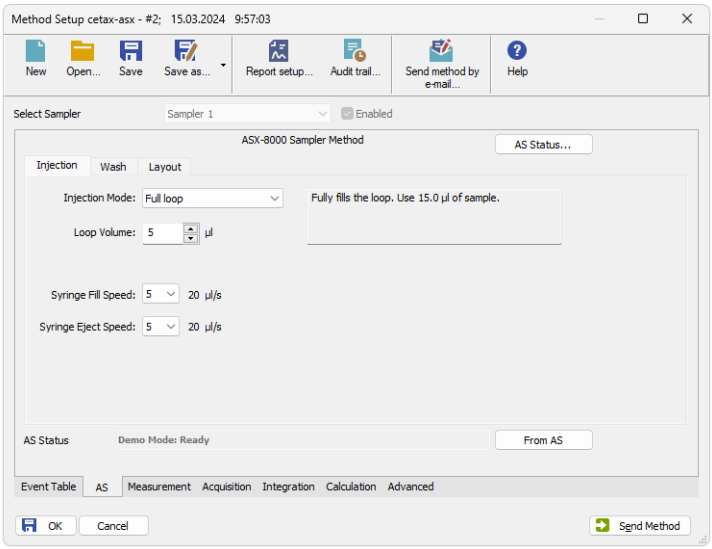

Fig. 8: Method Setup - AS - Injection

This is the tab defining the AS control method of injection.

Injection Mode

Sets the injection mode. Available options are: *Full loop*, *Partial loop* and *Zero loss partial loop*.

Loop Volume

Sets the volume of sampling loop.

Syringe Fill Speed

Sets the speed of the syringe when filling the sample. There are seven speed levels available, from **1** (1 µl/s) to **7** (80 µl/s). The real value of filling speed also depends on the size of the installed syringe and it is displayed right to the drop-down box.

Syringe Eject speed

Sets the speed of the syringe when ejecting the sample.

4.1.2 Wash

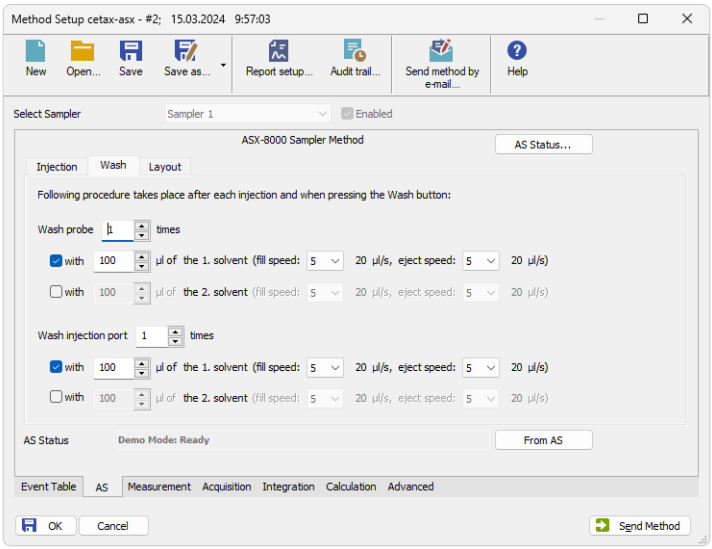

Fig. 9: Method Setup - AS - Wash

This tab defines the behaviour of the **Cetac ASX-8000** autosampler when it comes to washing the probe and the injection port. Both parts of the AS can be washed using two different solvents.

Wash Probe

Sets the number of washings, volume of the solvent used and speed of filling and emptying the syringe. All parameters can be set independently for both solvents.

Wash Injection Port

Sets the number of washings, volume of the solvent used and speed of filling and emptying the syringe. All parameters can be set independently for both solvents.

4.1.3 Layout

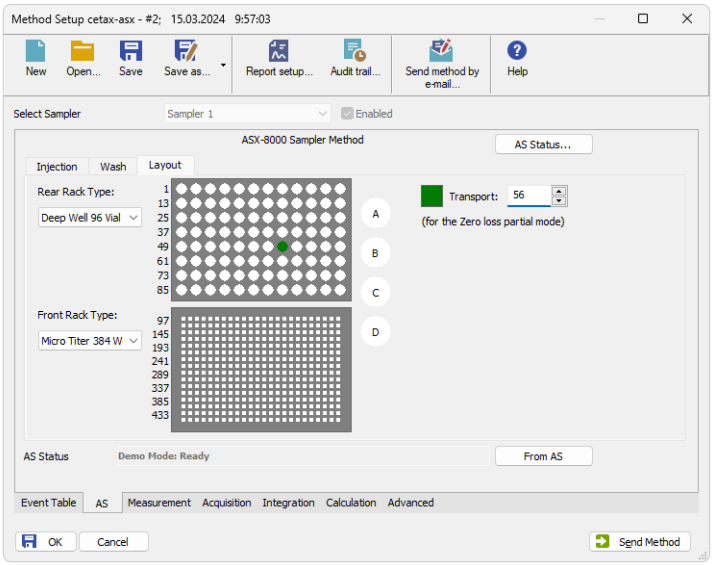

Fig. 10: Method Setup - AS - Layout

Shows the visualization of the **Cetac ASX-8000** autosampler tray(s), along with the mapping of the vials.

Rear Rack Type

Sets the type of rack installed in rear position. Offered are only racks supported by actually installed version of AS firmware.

Front Rack Type

Sets the type of rack installed in front position.

Transport

Shows the number of selected vial, used within the Sequence table.

4.2 Hardware Configuration

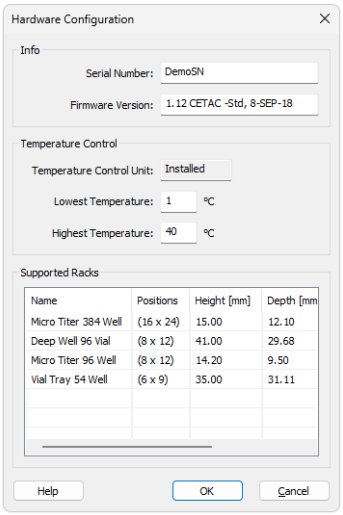

Fig. 11: Hardware Configuration

The *AS Status* button in the Method Setup - - AS displays the *Hardware Configuration* dialog. This dialog displays autosampler serial number, firmware revision, the presence of *Temperature Control Unit* and list of supported racks.

Info

This section shows the serial number of autosampler and version of its firmware.

Temperature Control

This section shows the state of Temperature Control Unit and its temperature limits.

Supported Racks

In this section there is a list of all types of trays supported by current version of firmware.

4.3 CETAC ASX-8000 Setup

CETAC ASX8000 Setup dialog (accessible through the ***System Configuration*** dialog) allows to manually set the parameters needed for the communication with the **ASX-8000s** autosampler.

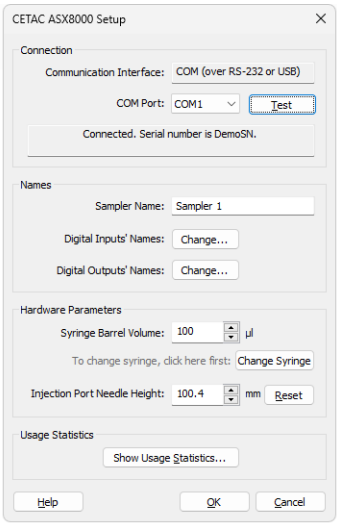

Fig. 12: CETAC ASX8000 Setup

COM Port

Sets the COM Port used for the communication between the **Cetac ASX-8000** autosampler and **Clarity**. The virtual COM port is created automatically after connecting **Cetac ASX-8000** into USB port of used computer.

Test

When pressed, checks whether there is the **Cetac ASX-8000** autosampler present using the given *Serial Port*. After successful detection the state of connection and serial number of AS are displayed in the panel below.

Sampler Name

Allows to set the custom name of the **Cetac ASX-8000** autosampler, which will be then shown in the ***Device Monitor*** window, in the reports and on other places in **Clarity**.

Digital Input Names

Pressing the *Change* button opens the *Digital Input Names* dialog which allows to set the custom names for the virtual **Cetac ASX-8000** digital inputs.

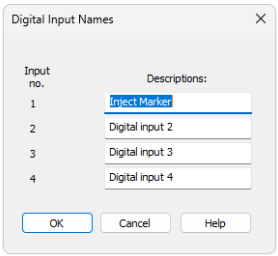

Fig. 13: Digital Input Names

Digital Output Names

Pressing the *Change* button opens the *Digital Output Names* dialog which allows to set the custom names for the virtual **Cetac ASX-8000** digital outputs.

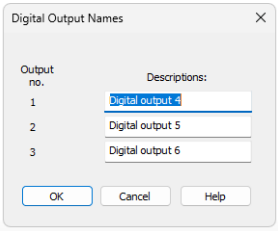

Fig. 14: Digital Output Names

Syringe Barrel Volume

Sets the volume of the syringe installed on the **Cetac ASX-8000**.

Change Syringe/Done

Sets the syringe into position suitable for its unscrewing and changing. After the change, press button again to set the syringe into normal position.

Injection Port Needle Height

Sets the depth of the needle (distance from basic level of the needle) used for reaching the injection port.

Reset

Resets the Injection Port Needle Height to its original value.

Show Usage Statistics

Opens the window displaying statistics on usage of the autosampler.

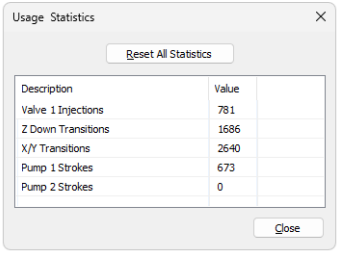

Fig. 15: Usage Statistics

Reset All Statistics

Resets all statistics on usage of the autosampler.

4.4 Device Monitor

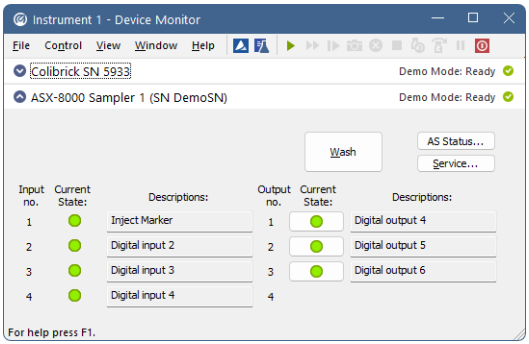

Fig. 16: Cetac ASX-8000Device Monitor

The Device Monitor window for the **Cetac ASX-8000** autosampler enables to control some of the actions of the **Cetac ASX-8000** autosampler.

Temperature
Shows current and target temperature of autosampler trays.

Wash
Performs washing of all tubing, following the settings from *Method Setup - AS - Wash* tab.

AS Status...
Opens Hardware Configuration window.

Service...
Opens *Service Dialog* window, allowing to set *Hardware Parameters* of the AS, the same as in CETAC ASX-8000 Setup.

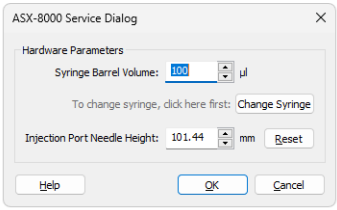

Fig. 17: Cetac ASX-8000Service Dialog

Input
Shows current states of **Cetac ASX-8000** inputs.

Output
Shows current states of **Cetac ASX-8000** outputs and allows to manually switch them by clicking the cursor on the green indicators.

5 Report Setup

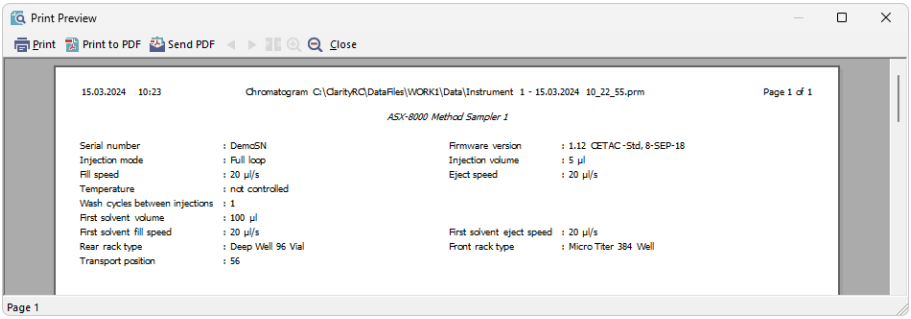

Fig. 18: Cetac ASX-8000 report preview

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=CETACASX8000_%D.txt
reset=off
```

Note: Instead of COM1 type the correct port used to communicate with the **Cetac ASX-8000** autosampler.

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**).

6.1 Specific Problems

An error message "Cannot establish communication with …" appears when opening Clarity Instrument.

Solution: Check the power cable (Cetac ASX-8000 sampler must be switched on), communication cable and communication settings in the CETAC ASX-8000 Setup dialog.

An error message "AS Error" appears during the Clarity operation.

Solution: The communication has been interrupted. Check the communication cable as it is most probably disconnected. This message may also occasionally appear after aborting the *ACTIVE* Sequence.

Injection volume set in the *Sequence* window is not accepted.

Solution: Either you are using the *Full Loop* option and the injection volume doesn't match the one of the installed injection loop, or you are trying to enter the volume that is greater than the half of the installed *Loop Volume* in the *Partial Loopfill* injection mode.