

## SOFTA ELSD

Clarity Control Module

ENG

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To facilitate the orientation in the **SofTA ELSD** 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:

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**Note:** Notifies the reader of relevant information.

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**Caution:** Warns the user of possibly dangerous or very important information.

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**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 SofTA ELSD Control Module

This manual describes the setting of the **SofTA ELSD** detector - models **200s**, **300s**, **400**, **1200**, **1300** and **1400 ELSD**. The control module enables direct control of the instrument over serial line.



*Fig. 1: SofTA ELSD detector*

Direct control means that the detector can be completely controlled from the **Clarity** environment, including the digital data acquisition. That way, no A/D converter is needed. Instrument method controlling the analysis conditions will be saved in the measured chromatograms.

## 2 Requirements

- **Clarity** Installation with LC Control module (p/n A24).
- Free serial COM port in the PC.

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*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).

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

- Digital Input Device (p/n DID01) adaptor for RS232 line required for the external start of the acquisition (for instance by a valve contact).

# 3 Installation Procedure

## 3.1 Hardware - Wiring

The **SofTA ELSD** detector is controlled by serial (RS232) communication. It uses standard serial straight cable DB9F-DB9M wiring described in the picture.



Fig. 2: Serial straight cable DB9F - DB9M

### 3.1.1 Starting the SofTA ELSD detector by external signal

The analysis is usually started by the injection using the injector valve or autosampler. This instrument then has to let **Clarity** know that the analysis is already running. While some of these instruments are also controlled and are able to send the notification of the start to **Clarity** via serial line, others can't do that and only send the notification via TTL signal.

Computers are not able to receive the start event signal sent by wire themselves. Formerly the ports able to receive the digital inputs were added as a part of the A/D converters connected to the computers or built into them, but without the analog acquisition, the A/D converter is not needed anymore. The digital input port allowing the TTL signal to start the analysis on the computer is thus missing.

**Digital Input Device** (p/n DID01) together with the **SofTA ELSD** control module utilizes the unused pins of the serial connector on the computer for receiving these digital inputs. When the **Digital Input Device** is placed between the PC and the detector, it is able to receive the TTL signals and transfer them to the **SofTA ELSD** detector control module. The digital input can be triggered either by the button or by Start contact (e.g. from the autosampler). The scheme of the **Digital Input Device** wiring is shown in the **Fig. 3** on pg. 3.

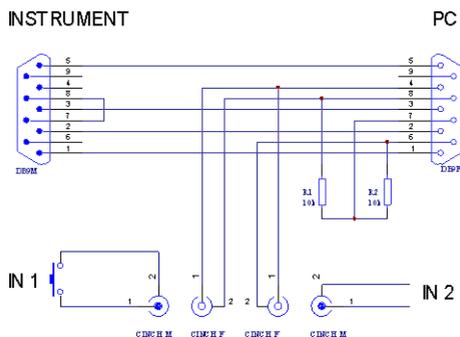


Fig. 3: Digital Input Device scheme

Detailed description of the **Digital Input Device** (p/n DID01) can be found in the datasheet **D025** available on the **Clarity** installation CD or the **DataApex** website ([www.dataapex.com](http://www.dataapex.com)).

## 3.2 Clarity Configuration

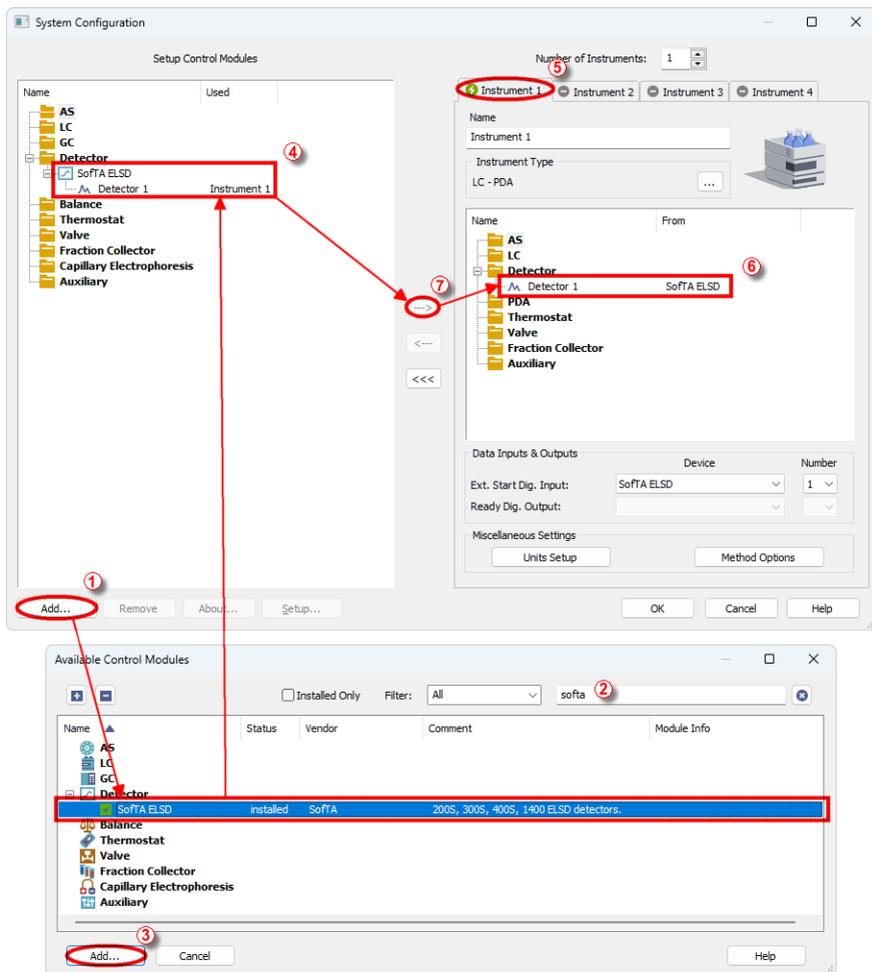
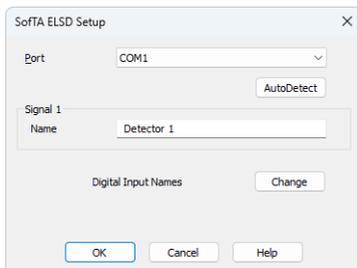


Fig. 4: System Configuration

- 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. 4** on pg. 4.) to invoke the *Available Control Modules* dialog.
- You can specify the searching filter ② to simplify the finding of the driver.
- Select the **SofTA ELSD** and press the *Add* ③ button.

The [SofTA ELSD Setup](#) dialog will appear (see **Fig. 5** on pg. 5.).



*Fig. 5: SofTA ELSD Setup*

- Select the correct *Port* and press the *AutoDetect* button. If the detector is connected correctly, dialog containing the detector model will be displayed.
- Fill in the signal name.

*Note:* Other fields from this dialog are described later in the description of the [SofTA ELSD Setup](#) dialog (for more details see also chapter **SofTA ELSD Setup** on pg. 6).

- Press the *OK* button.

The **SofTA ELSD** will appear in the *Setup Control Modules* list ④ of the *System Configuration* dialog.

- Drag and drop the **SofTA ELSD** 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).

*Note:* The configuration dialog of the **SofTA ELSD** detector ([SofTA ELSD Setup](#)) can be displayed any time by double-clicking on its icon or using the *Setup* button.

## 4 Using the control module

New [Acquisition](#) tab is created in the *Method Setup* dialog. If there are any other detectors configured on the instrument, then the **SofTA ELSD** detector can be accessed by switching to the desired signal in the *Select Detector* section on the top of the dialog.

### 4.1 SofTA ELSD Setup

The *SofTA ELSD Setup* dialog serves for the correct setting of the communication between **Clarity** and the detector.

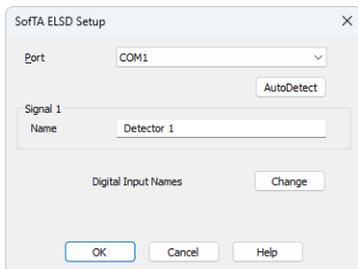


Fig. 6: SofTA ELSD Detector Setup

#### Port

Selection of the communication port.

#### AutoDetect

This button is used to test the connection to the **SofTA ELSD** detector using the previously set *Port*. Obtained data about the detector are then displayed in the dialog.

#### Signal 1 - Name

Enables to set the relevant detector name.

#### Digital Input Names

Displays the *Digital Input Names* dialog which enables to set the custom labels of **SofTA ELSD** digital inputs. These inputs are, however, only physically present when digital input device (p/n DID01) is used. The custom names are displayed in the *Device Monitor* window described in the chapter "**Device Monitor**" on pg. 10.

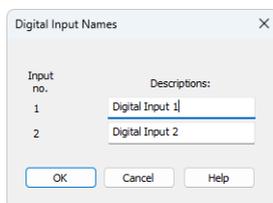


Fig. 7: Digital Input Names

## 4.2 Method Setup - Acquisition

This tab serves for the setting of the template method that is used by the **SofTA ELSD** detector for the acquisition. All parameters set on this tab are automatically sent to the **SofTA ELSD** detector prior to each injection in the *ACTIVE* sequence and may be sent there manually by using the *Send Method* button in the lower part of this tab or in the *Single Analysis* dialog. When you want to load an instrument method set in the **SofTA ELSD** detector itself into **Clarity**, use the *From Det* button.

Some analysis parameters cannot be modified neither from **Clarity** nor directly on the **SofTA ELSD** detector. These parameters (such as the Sample Rate of 20Hz) are not changed when sending the method to the detector.

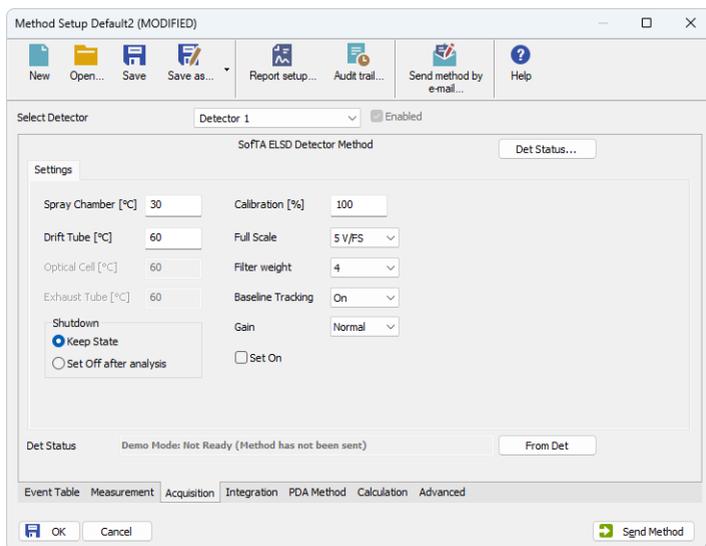


Fig. 8: Method Setup - Acquisition

The *Method Setup - Acquisition* tab serves for setting the detector method.

### Spray Chamber [°C]

Sets the temperature of the Spray Chamber.

### Drift Tube [°C]

Sets the temperature of the Drift Tube.

The temperatures of the **Optical Cell** and the **Exhaust Tube** are controlled at the same temperature as that of *Drift Tube* but their maximum temperature is limited.

### Shutdown

Sets the behavior of the detector after the analysis is completed.

#### Keep State

Detector keeps the *ON* state.

### Set Off after analysis

Set the detector *OFF* after an analysis is performed.

*Note:* This setting is most widely used as a part of the shut-down method at the end of the sequence. If used for a measurement in the middle of a sequence, switching the detector *OFF* will prevent further injections (the module would not be *READY*).

### Calibration [%]

Attenuates or amplifies (generally scales) the detector analog output from 20 % to 200 %. This feature is useful when digital acquisition is not used to match individual detector responses to each other for standardization within a lab, or to set the full scale output to a value other than 5 V or 10 mV. At 100 %, the signal is neither amplified nor attenuated. When the digital acquisition using the **SofTA ELSD** control module, this feature is not used.

### Full Scale

Sets the level for the maximum value of the analog output of the **SofTA ELSD** detector. Use whichever setting is appropriate for your data collection system. The *Full Scale* setting is further modified by the *Calibration [%]* parameter setting.

*Note:* Using the **SofTA ELSD** dedicated control module, **Clarity** uses digital data acquisition. Analog output of the detector is thus not used.

### Filter weight

Filter weight is the level of baseline noise filtration. *Off* indicates no filtration, 10 is maximum filtration. **Clarity** uses 4 as a default value.

### Baseline tracking

Serves for the selection of the Filter type. *On* corresponds to **FLT** (FLATT baseline flattening) and *Off* corresponds to **BFT** (Bruker-Fourier Transform) filter type. Most of the cases, *Off* should be selected.

### Gain

There are two gain settings: *EDR* and *Normal*. *EDR* (Extended Dynamic Range) provides a greater dynamic range than the *Normal* setting and is suitable for analyte quantities from 20 ng to 200 000 ng. Use the *Normal* setting for all analytical scale analyses.

### Set On

If the detector is in *Stand By* mode before the start of an analysis, checking this option will turn on the detector before the start of the analysis.

## Buttons in the Method Setup - Acquisition dialog

In the right section on all *Method Setup - Acquisition* sub-tab for **SofTA ELSD** detectors two buttons are placed:

### Det Status

After pressing the *Det Status* button the *Hardware Configuration* dialog opens. It displays the detector type, serial port through which it is connected and the detector serial number.

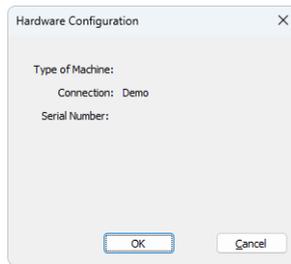


Fig. 9: Hardware Configuration

### From Det

Pressing the button loads all detector parameters as they are set in the **SofTA ELSD** detector. These parameters are entered in appropriate fields of the *Method Setup - Acquisition* dialog.

### 4.3 Device Monitor

The window with the detector status can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the  *LC Monitor* icon. It displays the actual detector temperatures and their settings in the [Method Setup - Acquisition](#) window, as well as other parameters set there.

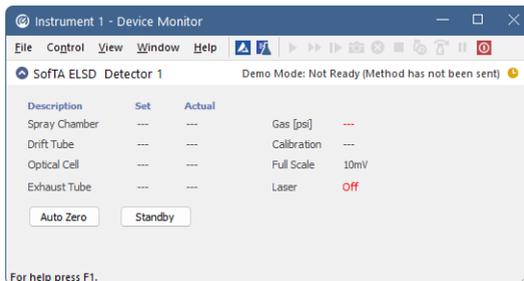


Fig. 10: Device Monitor

The detector can be monitored and partially controlled from the *Device Monitor* window. Available control commands are:

#### Auto Zero

This button performs the autozero operation.

#### Standby / Set On

Turns the detector to the *STAND BY* mode, if it is *ON*, or vice versa.

*Note:* *Standby* or *Set On* button is displayed depending on the detector state.

*Note:* Values which exceeds expected limits are displayed in red color.



## 6 Troubleshooting

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

*Note:* Instead of COM1 type the correct serial port used to communicate with the **SofTA ELSD** detector. This port number is displayed when the *Det Status* button in the [Method Setup - Acquisition](#) 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.

### 6.1 Specific Problems

**The SofTA ELSD detector cannot be added to the System Configuration dialog. The AutoDetect function will issue the Detector Not Found error message.**

*Description:* There might be problems with wrong communication cable, correct settings of the communication port or wrong communication parameters were probably sent to the detector during the *AutoDetect* test.

*Solution:* Try the following procedures:

- Check the communication cable used. It should be serial straight DB9F-DB9M cable (DataApex p/n SK02).
- If the cable is correct, try to check the COM port settings. Make sure that **SofTA ELSD** detector is connected to the same COM port as is set in the [SofTA ELSD Setup](#) dialog. Try to connect another device to the same port and test if it communicates.