

# SEDERE ELSD

Clarity Control Module

ENG

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To facilitate the orientation in the **Sedere 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:

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 Sedere ELSD**

This manual describes the setting of the **Sedere ELSD** detectors - models **Sedex** LT-ELSD 80, 85, 90 , FP , LC, 100.



Fig. 1: Sedere ELSD detectors

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).
- Sedex LT-ELSD 80 & 85: Free serial COM port in the PC.
- *Caution:* The serial communication in **Sedex LT-ELSD 80** is optional. In case your instrument does not support control by a software, please contact the manufacturer.
  - Sedex LT-ELSD 90: Free serial COM or USB port in the PC.
  - Sedex LC: Free serial COM or USB port in the PC.
  - Sedex 100LT: Free serial COM or USB port in the PC.
- *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) and DB9F-DB9F reduction (p/n SK07) in case of the serial COM connection. The straight serial DB9F-DB9F cable could be used as well, but it is not widely available.
  - USB A-B cable (p/n SK06) in case of the USB connection. After connecting the instrument to the PC a virtual COM port is created in Windows.

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

Caution: The minimal required firmware version in Sedex LT-ELSD 80 is 1.3, in Sedex LT-ELSD 85 is 2.7, in Sedex LT-ELSD 90 is 1.0, in Sedex LC is 1.0, in Sedex 100LT is 1.0 and in AG (G4218A) is 1.4.

# **3 Installation Procedure**

# 3.1 Hardware - Wiring

In case the **Sedere ELSD** detector is controlled by serial (RS232) communication, it uses standard serial straight cable DB9F-DB9M wiring described in the picture.

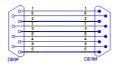


Fig. 2: Serial straight cable DB9F - DB9M

Detector uses External Autozero input for Start of the acquisition. Start condition is determined by the close state of this input. External Autozero input has to be connected to the Relay output (NO) from external control device, not the TTL !

# 3.2 Clarity Configuration

System Configuration						×
Setup Control Modules		Number of Instr	ruments: 1 🔺			
Name Used S/N		strument 1 🗢 Instrum	nent 2 🔘 Instrument 3	Instrume	nt 4	
AS LC	Name					
- 🔁 GC 🥢	Instr	ument 1		in the second	-	
Detector     Sedere ELSD     DemoSN		rument Type		Ulinu		
M Detector 1 Instrument 1	EA					
Balance	Nam		From			-
Valve		AS				
Fraction Collector     Capillary Electrophoresis		GC Detector		_6		
Auxiliary		A Detector 1	Sedere ELSD	-		
	<	Balance Thermostat				
	~~~	Valve				
		Auxiliary				
	Data	Inputs & Outputs	Device		Number	
	Ext.	Start Dig. Input:	Sedere ELSD	~	1 ~	
	Read	ly Dig. Output:		~	~	
	Misc	ellaneous Settings				
		Units Setup		lethod Options		
Add Remove About Setup			ок	Cancel	Help	
				_		
Available Control Modules				- 0	×	
Installed Only	Filter: All	✓ sedere (	2		0	
Name 🔺 Status Vendor		Comment	Module	Info		
(©) AS						
i dc						
Sedere ELSD installed Sedere		Sedex LT-ELSD 80, 8	85 90 100 E			
බර Balance						
Thermostat						
Fraction Collector						
Gapillary Electrophoresis						
Add Cancel				Help		

Fig. 3: System Configuration

- Install the driver for using Sedere ELSD (the drivers are copied to the PC during installation, but they are not installed automatically). Follow the instructions in the SEDEX 90LT USB INSTALLATION.PDF document located in C:\CLARITY\HW\_DRIVERS\SEDERE\SEDEX90\_USB\_DRIVER\ folder.
- Connect the instrument to the PC using the serial or USB cable. In case of the USB cable, a virtual COM Port is created in Windows you will be able to select it in the Sedere ELSD Setup dialog.
- Start the **Clarity** station by clicking on the A 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. 3** 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 Sedere ELSD and press the Add ③ button.

The Sedere ELSD Setup dialog will appear (see Fig. 4 on pg. 6.).

Sedere ELSD		×
COM Port:	COM1	~
		Autodetect
Signal		
<u>N</u> ame:	Detector 1	
Dig	ital Input Names	Change
ОК	Cancel	Help

Fig. 4: Sedere 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 <u>Sedere</u> <u>ELSD Setup</u> dialog (for more details see also chapter **Sedere ELSD Setup** on pg. 7).
  - Press the OK button.

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

- Drag and drop the Sedere 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).
- Set the *Ext. Start Dig. Input* to *Sedere 8x Device* and appropriate *Number* (1) for external start of acquisition.
- *Note:* The configuration dialog of the **Sedere ELSD** detector (<u>Sedere ELSD Setup</u>) can be displayed any time by double-clicking on its icon or using the *Setup* button.

# 4 Using the control module

New <u>Acquisition</u> tab is created in the *Method Setup* dialog. If there are any other detectors configured on the instrument, then the **Sedere ELSD** detector can be accessed by switching to the desired signal in the *Select Detector* section on the top of the dialog.

# 4.1 Sedere ELSD Setup

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



Fig. 5: Sedere 8x Setup

# **COM Port**

Selection of the communication port.

## Autodetect

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



Fig. 6: Sedere ELSD - Detector found

## Signal - Name

Enables to set the detector name.

## **Digital Input Names - Change**

Displays the *Digital Input Names* dialog which enables to set the custom label of **Sedere ELSD** digital input. The custom names are displayed in the *Device Monitor* window described in the chapter "Device Monitor" on pg. 15.

Digital Input Name	es		×
Input no.	Descripti	ons:	
1	External Start		
ОК	Cancel	Help	

Fig. 7: Digital Input Names

# 4.2 Method Setup - Acquisition

The Method Setup - Acquisition tab has four sub-tabs<u>Basic</u> - <u>Limit Check</u> -<u>Time</u> <u>Table</u> and<u>Preview</u> dedicated to setting and viewing parameters of the method. All parameters set on those sub-tabs are automatically sent to the **Sedere ELSD** detector prior to each injection in the ACT/VE 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 **Sedere ELSD** detector itself into **Clarity**, use the From Det button.

Method Setup Def	ault2 (MODIFIE	D)					×		
New Open		as Rep	ort setup Audit trail	Send method by e-mail	? Help				
Select Detector 1									
Basic Limit Ch	eck Time Table		ELSD Detector Method		Det Status				
Sample Time Temperature Offset Gain Filter Shutdown Turn Off	33 ms (30 Hz) 1 Off Gas 30	20 [°C] 0 [mV] ~ [5] min. After Rur	Free (No Autozer Autozero (After Append (Keeps E	i Change ro) Gain Change)					
Det Status			od has not been sent)		From Det				
	surement Acqu	isition integration	on Calculation Advanced	1		Send Met	hod		

Fig. 8: Method Setup - Acquisition

# Buttons in the Method Setup - Acquisition dialog

In the right section on all *Method Setup - Acquisition* sub-tab for **Sedere 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.

Hardware Configura	tion	×
Type of Machine:	80 ~	
S/N:	DemoSN	
Firmware:	A.6 / ID=Demo	
Communication:	Demo	
Standby	at Shutdown	
	OK Cancel	

Fig. 9: Hardware Configuration

## From Det

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

# 4.2.1 Method Setup - Acquisition - Basic

This sub-tab server for setting the operating parameters of the detector.

Method Setup Default2 (MODIFIED)	– 🗆 X								
New Open Save Save as Report setup Audit trail Send method by e-mail	? Help								
Select Detector 1									
Sedere ELSD Detector Method	Det Status								
Basic Limit Check Time Table Preview									
Sample Time 33 ms (30 Hz)									
Temperature     20     [PC]     Autozero After Gain Change       Offset     0     [mV]        • Free (No Autozero)       • Autozero (After Gain Change)       • Append (Keeps Baseline)       Shutdown     [s]       Turn Off Gas     30									
Det Status         Demo Mode: Not Ready (Method has not been sent)           Event Table         Measurement         Acquisition         Integration         Calculation         Advanced	From Det								
R OK Cancel	Send Method								

Fig. 10: Method Setup - Acquisition - Basic tab

## Sample Time

Sample time (frequency) the detector is measuring.

#### Temperature

Set the Temperature of the detector during the measurement. The acquisition starts after the requested temperature is reached.

#### Offset

Set the offset in mV.

# Gain

Set one of the Gain options from the drop-down menu.

## Filter

Set the filter time in seconds.

# Autozero before run

Check this option if the detector should perform the Autozero function before start of the measurement.

# Autozero after gain change

Choose one of the option *Free*, *Autozero* or *Append* for requested operation when the change of gain is performed (for example in the <u>Time Table</u>).

# Shutdown

The shutdown parameters (check boxes) are intended for use in the shutdown method. Such method could be run from last line of unattended sequence table operation. The pumps should be switched off in this method as well.

*Caution:* Please note that pumping eluent to the detector without a gas flow could damage it!

# **Turn Off Gas**

Set the time in minutes. After the period, the gas will be turned off.

# Turn off Lamp After Run

Turns Lamp off after the measurement.

# 4.2.2 Method Setup - Acquisition - Limit Check

The limits tests in this sub-tab will ensure the detector will not be *READY* unless the values are within the limits specified.

Method S	Setup Defa	ult2 (MO	DIFIED	)							×
New	Open	R Save	Save		Report setup	Audit trail	Send method by e-mail	? Help			
Select De	tector			Detecto	r 1	✓ 🖉 Er	abled				
					Sedere ELSD Dete	ctor Method		Det Status			
Basic	Limit Che	ck Time	Table	Preview							
	Monitor Pre	ssure Valu	ie to be	0							
		0,35	[MPa	1	+/-	0,01 [MPa]					
0	Monitor Ten	perature	Value t	o be with	nin +/-:						
		1	[°C	]							
			Equi	libration	Time	1 [min]					
Det Sta	itus	Demo M	ode: No	t Ready	(Method has not b	een sent)		From Det			
Event T	able Meas	urement	Acquis	ition In	tegration Calcula	tion Advanced	l				
	K Car	ncel							<b>3</b> s	end Meth	od

Fig. 11: Method Setup - Acquisition - Limit check tab

### Monitor Pressure Value to be

Set the pressure in *MPa* and its range the detector will be watching.

#### Monitor Temperature Value to be within +/-

Set the temperature in °C the detector will be watching.

## **Equilibration Time**

Time within defined conditions are reached.

# 4.2.3 Method Setup - Acquisition - Time Table

This sub-tab serves for time program to change operating parameters during run. Meaning of the columns is the same as in the Basic sub-tab.

New	Open	Save	Save as		Audit trail	Send method by e-mail	Help		
ect De	tector		Detector		V Ena	abled			
				Sedere ELSD Detector	r Method		Det Status		
Basic	Limit Ch	neck Time	Table Preview						
	Time [min]	Temp [°C]	Gain	Offset [mV]	Filter				
1	0,20	40	1	0	Off				
2	0,50	40	2	10	Off				
3	0,80	40	4	10	Off				
4	1,20	40	6	10	Off				
5	2,00	40	1	10	Off				
6									
Det Sta	hus	Demo M	ode: Not Ready (	Method has not beer	a sent)		From Det		
				egration Calculation			Prom Det		

Fig. 12: Method - Setup - Acquisition - Time Table

## Time [min.]

Set the time when the parameters entered on this line are applied.

# Temp [°C]

Set the temperature.

#### Gain

Choose the gain from the list.

### Offset [mV]

Set the offset.

## Filter

Choose the filter from the list.

# 4.2.4 Method Setup - Acquisition - Preview

Preview of the time table in graphical form.

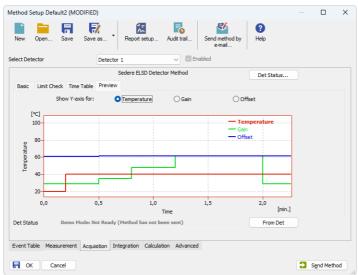


Fig. 13: Method Setup - Acquisition - Preview

## Show Y-axis for

Switch the right axis to *Temperature*, *Gain* or *Offset*, values are scaled to the permissible ranges.

# 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 t

-	it 1 - Device N						×
Eile Co <u>n</u> trol	<u>V</u> iew <u>W</u> ind	low <u>H</u> elp	ムり	► →   ► 🛅 🕄 🔳		0	
🛇 Sedere EL	SD Detector 1	1 (SN Dem	o Demo I	Mode: Not Ready (Method H	nas not be	en sent)	C
Temperature	20 °C	Lamp	Turn On	🔥 Lamp time 5018 h	Det St	atus	
Set Temp.	???	Gas	Turn Off		Auto	zero	
Pressure	0,4 MPa				Star	ndby	
Gain	6						
Filter	3,0 s		•	External Start			

Fig. 14: Device Monitor

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

### Lam - Turn Off/On

Turn the lamp OFF or ON state.

### Gas - Turn Off/On

Turns the gas flow to OFF or ON state.

#### Autozero

Performs the Autozero operation.

#### **External Start**

Indicates the status of the external signal.

# **5 Report Setup**

All of the detector settings accessible on the <u>Method Setup - Acquisition</u> tab for the given signal are reported. To do so, the *Instrument Control* parameter on the *Method* tab of the *Report Setup* dialog must be checked.

C Print Preview		×
🖶 Print 📸 Print to PDF 🖉 Send PDF 🤞 🕨 🔠 🕘 🥥 📿 Close		
20.03.2023 16:45 Method di\clarhy90\DetaFfee}\WORK2\Defaul2.met Autlary.Sgnab Temperature Soned Temperature I Pressure Sedere B.SD Method Detector 1	Page 1 of 1	
Sample Rate : 33,00 ms Autozero Before Run : OFF Autozero After Gain Change		
	: 1	
Rher : Off Turn Off Gas After Run : No Turn Off Lamp After Run Oneck Pressure Limit : OFF Oneck Temperature Limit : OFF	: No	L
Type of Machine : 80 Serial Number : DemoSN Firmware version Communication : COM1	: A.6	

Fig. 15: Print Preview of the Report Setup

# 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=SedereELSD.txt; %D or %d could be used to include a current date (recommended in combination with the Reset=off option) reset=off

- *Note:* Instead of COM1 type the correct serial port used to communicate with the **Sedere ELSD** detector. This port number is displayed when the *Det Status* button in the <u>Method Setup Acquisition</u> 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.

#### Status: Error 1008 concerning communication error.

*Reason:* Communication is blocked by status info on the ELSD display.

Solution: Check ELSD display as it shows some info on hardware malfunction, e.g. Laser lifetime expiration. After solving the hardware problem and clearing the error messages on ELSD, the communication should be established again after restarting.

#### The device does not communicate using USB.

- *Reason:* USB drivers are probably outdated.
- Solution: See Clarity\Bin\HW\_DRIVERS\Sedere\<model> folder for USB DRIVER INSTALLATION.PDF with detailed description on how to install USB drivers.