

Agilent 1290 Infinity II Evaporating Light Scattering Detector (ELSD) in Empower Environment

Technical Note

Technical Guide for the configuration and use of the Agilent Evaporating Light Scattering Detector (ELSD) with Waters Empower 3.

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Introduction

Waters Instrument Control Software (ICS) includes the integration of the Agilent Instrument Control Framework (ICF) for Waters data systems. This guide describes how to configure the Agilent Evaporating Light Scattering Detector (ELSD) in a Waters Empower environment.

Waters Instrument Control Packages	Agilent ICF/ Agilent LC Driver	ELSD support in Waters Empower 3
ICF Support v2.2	A.02.04	Initial support for ELSD
#667005584	A.02.14	
ICF Support v2.2	A.02.03 DU2	Not supported
#667005449	A.02.13	
any previous ICF support integr	ation	

Table 1 Supported and unsupported configurations using ELSDs in Empower.

Table 2 ELSD Support Status in Waters Empower 3

Product No.	Module Name	Communication	Min. FW	Status
G4218A	1260 Infinity ELSD			Not supported
G4260A	380 ELSD			Not supported
G4260B	1260 Infinity ELSD / 1260 Infinity II ELSD	RS-232	31.06	Supported
G4261A	385 ELSD			Not supported
G4261B	1290 Infinity ELSD			Not supported
G7102A	1290 Infinity II ELSD	LAN only RS-232 not tested	31.06	Supported

ELSD Instrument set up

- **1** Close the Empower CDS.
- **2** Switch off the Agilent LC Tower and add the Agilent ELSD to the LC system.
- **3** Connect the power plug.
- 4 Switch on all modules of the LC instrument tower as well as the ELSD.
- 5 Ensure that all Agilent LC modules in the system meet or exceed the minimum firmware requirements specified by the 3rd-party CDS software vendor and Agilent's firmware set/firmware interoperability requirements. Agilent recommends using the latest available firmware set.

http://www.chem.agilent.com/ layouts/agilent/downloadFirmware.aspx?whid=79809

6 The G4260B ELSD requires an RS232 connection.

For 1260 ELSDs with Firmware 31.06 or greater, ensure RS232 communication is selected when powering the ELSD. This is done using the same procedure as described for the G7102A.

USB/Serial conversion is possible, but was not tested. If a USB-to-Serial Adapter is used, install the correct driver version for your adapter and define the COM Port in the device manager.

7 During start up, use the arrows on the G7102A ELSD to choose between RS232 and LAN connection in the display and press **OK** to confirm your choice.

- 8 Establish the communication cabling.
 - **a** G4260B: Use a RS232 cable and connect the instrument to the COM X (where X is a free COM port of the controller).
 - **b** G7102A: Plug the LAN cable into the ELSD module and connect it to the same switch that your LC instrument is connected to as well. Ensure that the IP address is in the same subnet as the Agilent system.

It is possible to use a static IP or DHCP assigned address for the LAN connection. Decide on one option and click **0k**. For DHCP make a note of the assigned IP address, as it is required during configuration in Empower.

9 Additionally, a start/stop cable is required to transfer the start impulse to the ELSD. Refer to the ELSD manual.

The ELSD Driver

The ELSD driver is *included* in the LC Driver and not listed as a separate component. Therefore, Agilent ICF consists of two components and the Waters integration adds one additional component. All three components must be present in the Windows Programs and Features view:

💥 Agilent Instrument Control Framework - LC Drivers A.02.14	Agilent Technologies	12/21/2016	111 MB	2.14.115
💥 Agilent Instrument Control Framework A.02.04	Agilent Technologies	12/21/2016	48.2 MB	2.4.124
🚱 Agilent LC	Waters Corporation	12/20/2016	16.8 MB	2.2.0.0

Figure 1 **Components in Programs and Features**

ELSD information can be viewed via the i symbol in the LC Status Dashboard.

6	2								
	Mod	ule List							
	Vendor	Name	Part Number	Serialnumber	Firmware Revision	Connection Info	Driver Version	Additional Inform	nation
	Agilent	Binary Pump	G7120A	DEBAY00131	B.07.10 [0004]	= 0 = = 1 = 0	A.02.14 SI 624		
	Agilent	DAD	G7117B	DEBAW00140	D.07.10 [0004]	10.00.00	A.02.14 SI 624	Access Point	
	Agilent	Column Comp.	G7116B	DEBAZ00123	D.07.10 [0004]	100.00.00.00	A.02.14 SI 624	Slave Firmwa	are: C.07.10 [0001]
	Agilent	Multisampler	G7167B	DEBAQ00217	D.07.17 [0002]		A.02.14 SI 624	Cooler	: 20448:DEBAT02417 Rev. 30
	Agilent	ELSD	G7102A			10.00.00.00	A.01.05 [9]		
									Close Print
			0.00 / 0.	.00		Ir	nstrument Idle	i 🕕 On 😑 C)ff
			Instrument Stat	tus Module Option	s Diagnostics Log				
F	iaure	2	Module	List					



Configuration of the ELSD

The configuration of the ELSD in Empower requires the use of the PreConfiguration Utility.

Using LAN communication for the LC /ELSD stack, separate LAN connections are required for the ELSD and the LC stack.

- The use of DHCP is not recommended.
- Use a fixed IP address for the LC stack and the ELSD.
- If an Agilent detector is present in the LC stack, ensure that this detector is the LAN communication host. If there is no Agilent detector present in the LC stack, use the pump as LAN communication module.

Via the Empower Configuration Manager

Software required ICF Support v2.2 (See page 16 for Waters support documentation TECN134936402).

 In the Empower Configuration Manager, select Tools > Agilent PreConfiguration.



Figure 3 Configuration Manager

NOTE

2 Enter the IP address or host name of the LAC/E box that your instrument is connected to into the pop-up screen **Configuration Directory** and click **Connect**.

Do not enter the IP address of the instrument here

Note



Figure 4 IP address to connect

3 Once the IP address is connected, click **New** to open the PreConfiguration Utility.

For the ELSD perform the following steps:

1 To manually configure the ELSD, select the correct ELSD type from the list of modules displayed on the left and click the right arrow button to add it to the list of modules for the current configuration displayed on the right.



Figure 5 Set up the ELSD

2 Double-click on the ELSD in the list of modules on the right, or select it and click **Configure** at the bottom of the screen.

Married Woman	Configuration Ed	ditor						0 (
	Aglert ELSD 38(ELSD 1260 ELSD 1260 ELSD 1290 ELSD Aglert 1100/122 Aglert 1120/122 Aglert 7100 CE	0/1260/1290 LC Configure 1290 ELS	D			8	Bin, Pump (G71204 DAD (G71178:DEE Column Comp. (G71 HIP Sampler (G716 1290 ELSD (G7103	KDEBAY00131) (AW00140) (168:DEBAZ00123) 78:DEBAQ00217) (A)
New		Communication						
(isin			Device name	ELSD	1			
			Type ID	G7102A	•			
			Serial number	[
		0	COM port	1	1			
		0	IP Address	() (c) (c)				
		۲	Hostname	10.0110.00				
		Options						
			🖬 Ca	coled model option				
		-						
		Help			OK	Cancel		

3 The ELSD configuration window opens.

Figure 6 Configure a G7102A ELSD

- **a** In the **Type ID** drop-down list, select the ELSD type.
- **b** Enter the serial number (located on the rear of the instrument or on the ELSD front panel display).
- **c** Enter the IP address (or COM X Port, where x is the number of the free port).
- d Click **OK** to close the screen.
- e Click OK to close the Configuration Editor.
- f Click **OK** to close the PreConfiguration Utility.

Using the ELSD in Empower

- 1 Start Empower and open the **Runs Sample** Screen.
- **2** The LC Status window automatically displays all available online modules now including the newly added ELSD.

Binary Pump	Column Comp.	DAD	ELSD					
Idle EMF()	Idle EMF⊘	Idle EMF		Not Ready EMF (2)				
	23 37%	<u>M.</u>	00000	M.				
100.00 0.00 0.000 mL/min	Position 1 (Port 1-> 1)	A 1	Ö	1				
0.00 bar	Nucleosil		두 61.4 LSU					
				>				
0.00 / 0.00 Instrument Not Ready I On Off								

Figure 7 LC Status Dashboard

- **3** Loading the instrument method, the system requests the user to update the given method configuration with the new instrument configuration. Click **OK** and the system opens the method dialog.
 - a Instrument Configuration Tab: The LC system configuration is displayed in the Instrument Configuration tab. All settings in this dialog are already defined using the PreConfiguration tool. Changes made in this section of the method are not applied to the system. Any changes e.g. modifying the IP address need to be made in the PreConfiguration tool on the LAC/E box controlling the instrument.
 - **b** *Instrument Method Tab*: The **Instrument Method** tab provides access to all method parameters of the LC system, one tab per module. Select the **ELSD** tab to enter the method parameters. For details on the parameters refer to the online help and the ELSD user manual.

Configuration of the ELSD

Untitled in Demo as System/Administrator - Instrument Method Editor		
Instrument Method Pretreatment Method Auxiliary Channels General Instrument Cor	nfiguration	
Binary Pump DAD Column Comp. Multisampler ELSD		
Operational Parameters	Stop time	ELSD (G7102A)
☑ On Evaporator Temperature 30 ÷ °C	As Pump/Injector	
🗹 On Nebulizer Temperature 30 📑 *C	O 1.00 🛨 min	
Gas Flow Rate 1.60 🔅 SLM	Post time	- 1
Output	Off	
Acquire Signal 🖌	O 1.00 min	
Data Rate 80 💌 Hz	Autozero	
Smoothing 30 (3.0 seconds)	Autozero at start of run	
	Switch Off	
	Switch off at end of run	
	Switch off on program exit	
Done		

Figure 8 ELSD Method Screen

NOTE

The stop time of the ELSD is independent of the run time of the LC stack and the run time set in Empower for the sample. Changes to the stop time on the LC stack or the run time in Empower are not applied to the ELSD. Ensure that all run times are the same.

NOTE

Empower offers an alternative process to shut down the ELSD. To do so, select the ELSD in the **General** tab of the Instrument Method.

To shut down the ELSD after a sequence, make sure to generate a method with the ELSD parameter **switch off at end of run** enabled. Save this method and used it as method for the last run.

Empower also offers the ELSD for module shutdown in the Selective Shutdown section of the **General** tab.

🔁 Untitled in ELSD4260B as System/Administrator - Instrument Method Editor
<u>File Edit View H</u> elp
Instrument Method Pretreatment Method Auxiliary Channels General Instrument Configuration
Fraction Collector Options I Start at Location: I System Shutdown Method Do not use this Instrument Method in a Sample Set for your regular analysis. Instead, specify this method as the Shutdown method on the Run Samples Defaults screen found under the Customize/Defaults menu selection of Run Samples or QuickStart. Default behavior: the system will attain initial conditions and run until the Stoptime. At the Stoptime, pump flow will go to zero, column temperature will be turned off, detector lamps will be turned off, and autosampler temperature will remain unchanged.
Selective Shutdown Selecting any of the modules below overrides the default shutdown behavior and ignores Stoptime. The selected modules will turn off after initial conditions are met. Unselected modules will remain on at the initial conditions specified in this Method. Quat. Pump (PUMP0) - Initial Conditions HiP Sampler (SAMPLER0) - Initial Conditions ELSD (ELSD0) - Initial Conditions

Figure 9 ELSD option present in Selective Shutdown

How does it look - ELSD in Empower

1 Running the ELSD in Empower, the LC Status Dashboard displays the run status of all the Agilent modules. As four modules fit to the current space in the status window, move the slider into the LC Status Dashboard to see the ELSD.

😫 DemoLC in Demo as System/Administrator - Run Samples											
File	Edit	t Viev	v Injec	t Actio	ins Customiz	e Help					
0	o ≈	9			*a I ta «	» III I +	H -C-		Run Only	▼ Contin	ue on Fa
Active sample set : DemoSampleSet1											
) -	Vial	Inj Vol (uL)	# of Injs	Label	SampleName	Level	Sample Matrix	Function	Method Set / Report Method	Label Reference	Proc
1	1	0.0	1	U0101	1Unk			Inject Samples	DemoMethodSet1		Norma
	Agilent	LC#DE Multisa	BAY001: mpler	31 Injecting EMF⊘	Binary Pum	Prerun EMF() 0.000 mL/min 0.00 bar	Column Co 25.57°C Patien 1 (Nucl Instr	mp. DA			
	[Inst	ruments	status []	module of	pilons j Diagnosi	ICS LOG					

Figure 10 ELSD in LC Status Dashboard

How does it look - ELSD in Empower

2 The online plot shows both the ELSD signal and the ELSD Aux Traces. Make sure Auxiliary Channels are enabled in your method.



Figure 11 Select the Auxiliary Channel of interest



Figure 12 ELSD Signal and AUX channels

3 Audit trail and error information appear in the diagnostic logbook, displayed in the **Diagnostics Log** section below the LC Status Window.

AgilentLC#DEBAY00131	E	3
7/4/2017 1:08:05 PM: Information: G7167B:DEBAQ00217 - Get System Ready triggered 7/4/2017 1:10:06 PM: Information: G7167B:DEBAQ00217 - Enabled Ignore Missing Vessel. 7/4/2017 1:11:44 PM: Information: G7167B:DEBAQ00217 - Font door open 7/4/2017 1:23:57 PM: Information: G7167B:DEBAQ00217 - Front door open 7/4/2017 1:24:15 PM: Information: G7167B:DEBAQ00217 - Front door closed 7/4/2017 1:24:45 PM: Information: G7167B:DEBAQ00217 - Cooler on 7/4/2017 1:24:44 PM: Information: G7167B:DEBAQ00217 - Cooler on 7/4/2017 1:24:33 PM: Information: G7157B:DEBAQ00217 - Cooler on 7/4/2017 1:28:33 PM: Information: G7120A:DEBAY00131 - Get System Ready triggered 7/4/2017 1:28:33 PM: Information: G7117B:DEBAY00131 - Get System Ready triggered 7/4/2017 1:28:33 PM: Information: G7167B:DEBAQ00217 - Cooler sensor has no condensate detected 7/4/2017 1:28:33 PM: Information: G7120A:DEBAY00131 - Get System Ready triggered 7/4/2017 1:28:33 PM: Information: G7167B:DEBAQ00217 - Get System Ready triggered 7/4/2017 1:28:33 PM: Information: G7167B:DEBAQ00217 - Get System Ready triggered 7/4/2017 1:28:33 PM: Information: G7167B:DEBAQ00217 - Get System Ready triggered 7/4/2017 1:28:33 PM: Information: G7167B:DEBAQ00217 - Get System Ready triggered 7/4/2017 1:28:33 PM: Warning: G7102A:ELSD - Already switched on	* III	
Instrument Status Module Options Diagnostics Log		

Figure 13 Audit Trail



Additional Information

Known limitation/restrictions

- No Analog out support for G4260B 1260 Infinity ELSD / 1260 Infinity II ELSD
- No RS-232 communication support for G7102A Infinity II ELSD
- Usage of RS-232/USB adapter not tested

Waters TechNotes

Additional information on the PreConfiguration Utility is provided on the Waters Support Webpage <u>http://www.waters.com/waters/support.htm?lid=134936402&cid=511442&type=TECN</u>.

Document reference: TECN134936402

Title: Using the Agilent PreConfiguration Utility with Agilent ICF Support Version 2.2



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