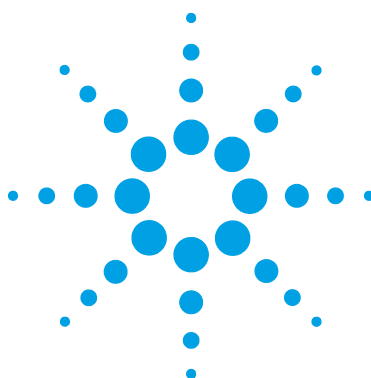




Agilent Drivers for Thermo Scientific Chromeleon 7

User's Guide



Agilent Technologies

Notices

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This guide is valid for the Agilent Drivers for Chromeleon 7 Version 1.2 executed in the environment of Thermo Scientific Chromeleon 7 Data System (CDS) Version 7.2 SR 5.

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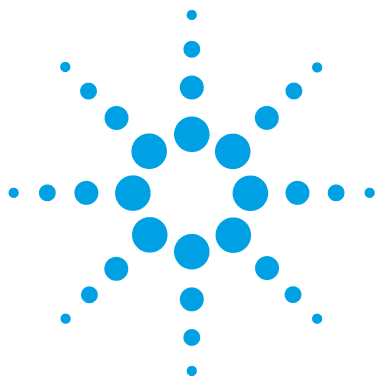
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1

Introduction and Scope

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This chapter provides introductory material for the User's Guide.



Terms and Abbreviations

Table 1 Terms and abbreviations used in this document

Term	Description
Agilent Drivers Agilent Drivers for Chromeleon 7	Agilent Drivers for Thermo Scientific Chromeleon 7
Chromeleon	Thermo Scientific Chromeleon 7 Chromatography Data System (CDS)
	NOTE Thermo Scientific and Chromeleon are registered trademarks of Thermo Fisher.
Thermo Fisher	Thermo Fisher Scientific
DDK	Driver Development Kit (from Thermo Fisher Scientific)
ICF	Agilent Instrument Control Framework

Introduction

Agilent Technologies first released the Instrument Control Framework (ICF) in March 2010 as a shell for the Agilent Instrument Driver Packages. Since then, ICF packages are built into the Chromeleon CDS by Thermo Fisher Scientific. Using ICF, certain Chromeleon-specific features are not supported; for example, the method script and direct instrument control using ePanels are not available.

The new integration of the Agilent Drivers for Chromeleon 7 includes the support for these Chromeleon-specific driver features.

This document describes

- how to install the Agilent Drivers
- how to configure the instrument
- how to run injections
- the method handling (Agilent Method user interface/Chromeleon Script Editor)
- how to troubleshoot

NOTE

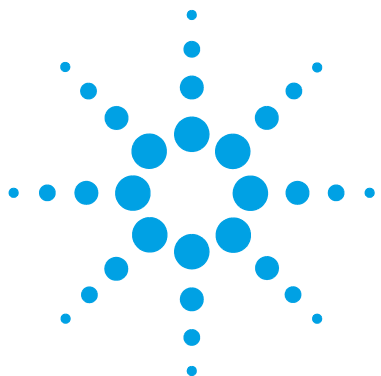
When Agilent Drivers are controlling Agilent instruments, the communication between the computer and the instrument is coordinated by the Agilent Drivers and the Chromeleon software integration. Chromeleon, as the acting Data System, hosts the integration; the Agilent Drivers for Chromeleon 7 are a subcomponent.

Both companies are working closely together. For questions regarding the LC hardware, contact your local Agilent representative; for all other questions, contact Thermo Fisher.

Overview of Features

Table 2 Overview of features

Feature	Chromeleon Native Driver	ICF Integration in Chromeleon	Agilent Drivers for Chromeleon 7
ePanels (Direct Control)	Yes	No	1.1
Command Tree/Script Method Parameters	Yes	No	1.1
Command Tree/Script Control Parameters	Yes	No	1.1 (direct control parameters)
Shutdown instrument	Yes	No	1.2
Built-In Diagnostics	Yes	No	No
Method Version comparison	Yes	No	1.1
Audit Trail with parameters outside and inside a run	Yes	Since A.02.01 ICF	1.1
Guided Method Wizard	Yes	No	1.1
Sampler Graphic Interface	Yes	No	No
Method Printing	Yes	Yes marked as ICF method	1.1 Printed as scripted method
Error Levels	Yes	No	No
Simulation of an online module	Yes	No	No
Blend Assist	No	Yes	Yes
ISET	No	No	Yes



2 Compatibility and System Requirements

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This chapter contains important information about compatibility and the hardware and software requirements.



Chromeleon CDS/Agilent Driver Compatibility

To ensure the alignment of compatible components, Thermo Fisher provides the tested and certified Agilent Drivers for Chromeleon 7 on the Chromeleon disk in the following location:

X:\Chromeleon XY\Packages\Agilent Chromeleon Driver

where X is the drive letter of the DVD drive.

Software Components Required

NOTE

Refer to [“Installation”](#) on page 19 for detailed information on the installation of the Agilent Drivers in combination with Chromeleon.

To operate Chromeleon 7 with the Agilent Driver for Chromeleon 7, the supported Chromeleon 7 /Agilent Drivers versions are:

Table 3 Required Components

Chromeleon Revision	Agilent Driver for Thermo Chromeleon 7	Including Agilent Instrument Control for
7.2 SR5 and its Mux	1.2	Agilent LC Instrumentation
7.2.6		(see “Appendix A” on page 89)
7.2.7		
7.2.8		

The Agilent Drivers for Chromeleon 7 comprises two major components:

- Agilent_Drivers_for_Thermo_Chromeleon.msi
The Agilent Drivers for Chromeleon 7 installer is a single executable .msi file, that includes
 - Agilent Driver for Thermo Chromeleon 7 (new integration adapter)
 - Agilent Instrument Control Framework (ICF)
 - Agilent Instrument Control Framework - LC Driver
- SVTTool.msi
 - Agilent Software Verification Tool (SVT)
This separate .msi file installs the Agilent Software Verification Tool (SVT) to run the installation verification.

The main components for the Agilent Drivers and the SVT are visible in the Windows sections **Program and Features** (previously **Add/Remove Programs**).

Chromeleon Licenses

The Chromeleon licenses that are required to control Agilent instrumentation are shown in the following table:

Table 4 Chromeleon Licenses

License	Required	Optional
Control Agilent LC	Instrument Class 3	3D Data Acquisition (to allow acquisition of 3D data from Diode-Array and Fluorescence Detectors)

Supported Operating Systems

The operating systems supported are dependent on the requirements of the Chromeleon software (including Service Releases) and the Agilent Drivers (including Driver Updates). The Agilent Drivers for Chromeleon 7 version 1.2 has been validated to work with Chromeleon running on the following operating systems:

- Microsoft Windows 7 and 7 SP1, 32 Bit and 64 Bit
- Microsoft Windows 8.1, 64 Bit
- Microsoft Windows 10, 64 Bit
- Microsoft Windows 2012 Server R2, 64 Bit

For further details on the operating system and other system components (for example, Internet Explorer, Antivirus software, etc.) refer to the Chromeleon documentation and the release notes for the corresponding Chromeleon version.

Supported Languages

The Agilent Drivers for Chromeleon 7 are supported in English language only. The LC instrument driver offers language support for English, Chinese, Japanese, and Portuguese languages.

Supported Hardware

Currently, only Agilent LC instrumentation is supported by the Agilent Drivers, and these modules are supported by Chromeleon. The detailed list of supported modules is listed in “[Appendix A](#)” on page 89 of this document, and can be found on the Agilent homepage <http://www.agilent.com/chem/icf>

Table 5 Supported Hardware

Agilent Instrumentation	Chromeleon Native Driver	ICF Integration in Chromeleon	Agilent Drivers for Chromeleon 7
Agilent LC	1100/1200 Series Modules 1120 Compact LC System	1100/1200 Series Modules	1100/1200 Series Modules
		1120 Compact LC System	1120 Compact LC System
		1220 Infinity LC System 1260 Infinity LC Modules 1290 Infinity LC Modules	1220 Infinity LC System 1260 Infinity LC Modules 1290 Infinity LC Modules
		InfinityLab Series 1290 Infinity II LC Modules	InfinityLab Series 1290 Infinity II LC Modules 1260 Infinity II LC Modules For a detailed list, see “ Appendix A ” on page 89
Agilent GC and Headspace	For supported modules, see the Chromeleon online help	GC support via native drivers, see the Chromeleon online help	Not supported
Agilent CE	Not supported	Not supported	Not supported

Other restrictions for Agilent Drivers are:

- Fraction collection modules (modules G1364A/B/C/D, G5664A, G7159B 1290 Infinity II Preparative Open-Bed Fraction Collector, G7166A 1260 Infinity II Preparative Valve-based Collector) and fraction collection clusters are not supported.

2 Compatibility and System Requirements

Supported Hardware

- The firmware versions listed in the tables in “[Appendix A](#)” on page 89 are minimum requirements. In general, Thermo Fisher Scientific and Agilent Technologies recommend that you use the latest version of firmware.

If your system does not comply with the list of modules and minimum firmware requirements given on the Agilent web page, you cannot use Chromeleon with Agilent Drivers. In this case, Thermo Fisher Scientific and Agilent Technologies recommend that you update the firmware accordingly.

- Agilent releases LC firmware updates as so-called "firmware sets". The module firmware contained in each set is fully compatible and interoperable with all other module firmware of the same set. Do not mix firmware revisions between different sets. Agilent does not guarantee the correct operation of modules with mixed firmware revisions from older and newer firmware sets.
- Only LAN-based and RS232C-communicating modules are supported.
Modules connected using GPIB are not supported.
- The configuration of two samplers in one instrument stack is not supported.
- Manual injection is not supported (also listed in limitations).

Software Updates

Best practice is always to use the recommended and validated versions of Agilent Drivers and Thermo Scientific Chromeleon. However, it is sometimes necessary to update one software component independently of the other, in which case there may be limitations in use.

Updating the Agilent Drivers

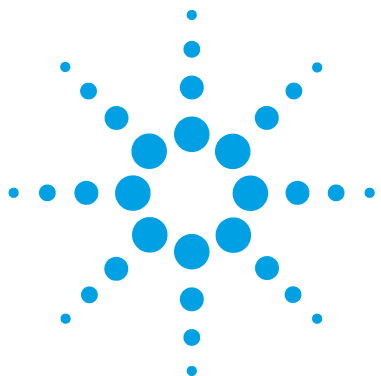
The Agilent Drivers can be updated without updating Chromeleon, for example, to fix Agilent LC Driver issues. Limitations: additional instruments and/or features included in the new version of the Agilent Drivers are not necessarily supported or functioning without errors.

Updating Chromeleon

Chromeleon can be updated without updating the Agilent Drivers, for example to fix Chromeleon issues. Limitations: new features designed to work with later versions of the Agilent Drivers will not work.

2 Compatibility and System Requirements

Software Updates



3 Installation

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This chapter describes the steps required to install the Agilent Drivers with Chromeleon.

NOTE

Ensure that the installation operator has full local Windows administrator privileges.



Hardware Installation

Before you install the software, ensure that the hardware is correctly installed. Refer to the corresponding Agilent instrument/module manual for full details. The individual Agilent modules are connected with CAN cables; communication between the Agilent instrument and the PC uses a LAN connection. Install the LAN card in the detector module with the highest data load (hierarchy: DAD>FLD>MWD>VWD>RID).

Software Installation

If an Agilent instrument is controlled from a remote client (for example, for editing methods or viewing instrument status), or when the Chromeleon instrument controller configuration containing the Agilent Drivers is changed from a remote client, install the Agilent Drivers package also on the remote client PC. Install the same version of the Agilent Drivers on all PCs.

Installation of the Agilent Drivers

NOTE

During the automatic installation of the Agilent Drivers using Chromeleon Installer, the Software Verification Tool (SVT) is installed automatically.

If you are installing the Agilent Drivers manually, the SVT must be installed before the Agilent Drivers are installed.

If you upgrade the Agilent Drivers, the SVT is already present and does not require an update.

Automatic Installation using the Chromeleon Installer

The Chromeleon Installer manages the installation of all required components, including the SVT.

Install the Agilent Drivers using the **Advanced Options** available during the Chromeleon installation. This is described in detail in the *Chromeleon Installation Guide*, which is provided in printed form and also in the Documents folder on the disk.

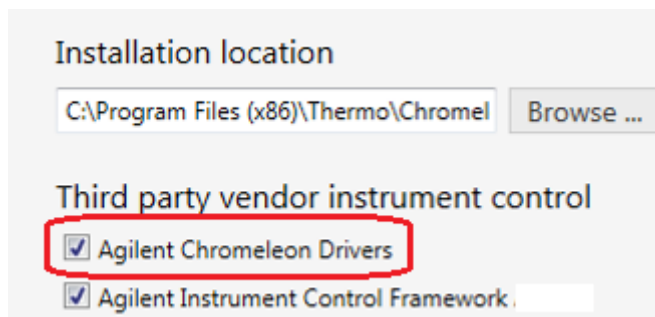


Figure 1 Advanced Options in Chromeleon Installer

Mark the check boxes for the components that you want to install.

NOTE

If you want to install the ICF drivers in addition, mark the **Agilent Instrument Control Framework** Version X.Y check box as well.

The Software Verification tool (Agilent Software Verification Tool (SVT)). is automatically installed along with the Agilent Drivers, and remains on the PC for further updates.

Manual Installation

The files required for manual installation are located on the Chromeleon DVD in the folder X:\Chromeleon X.Y\Packages\Agilent Chromeleon Driver (where as X is the driver letter of the DVD drive).

Before you install the Agilent Drivers, you must install the Software Verification tool, which is required for the installation of the Agilent Drivers.

Manual Installation of the Software Verification Tool

- 1** Double-click the file SVTtool.msi to start the installation of the Software Verification Tool.
- 2** On the upcoming installation wizard, click **Next** and follow the on-screen instructions.
 - a** If required, adjust the destination folders for the installation.

3 Installation

Installation of the Agilent Drivers

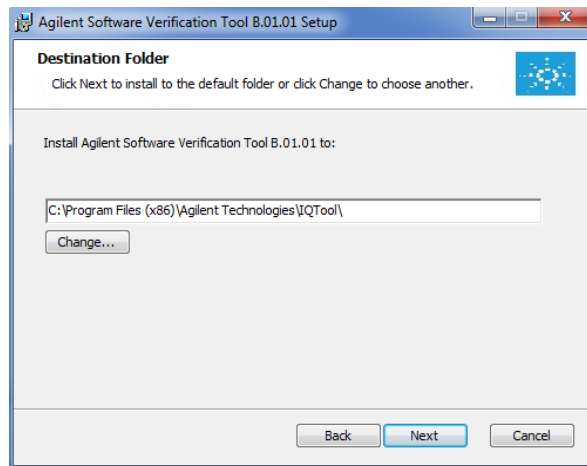


Figure 2 Installation location for the SVT

- b** Specify the destination of the resulting verification reports. The resulting report of a user-managed or silent installation verification can be found in this location.

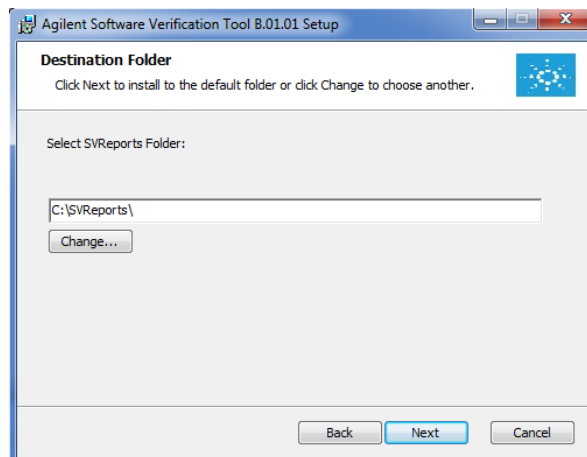


Figure 3 Location for resulting verification reports

- 3** Continue with **Next** and, on the next screen, click **Install** to start the installation.
- 4** After completion, click **Finish** to close the installation wizard.

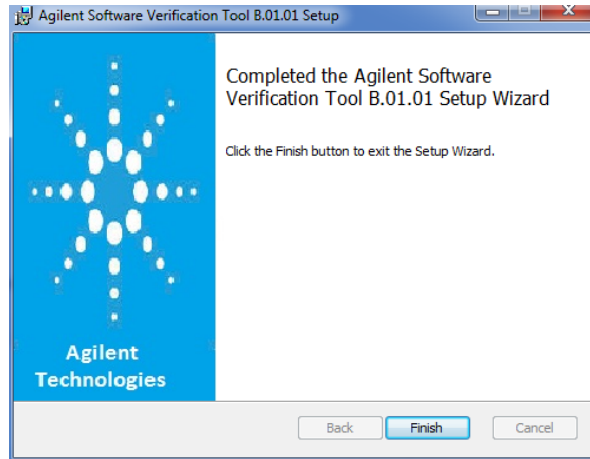


Figure 4 Final Wizard Screen of the SVT installation

The Software Verification tool is now available in the Windows **Start** menu:
Start > Agilent Technologies > Software Verification Tool.

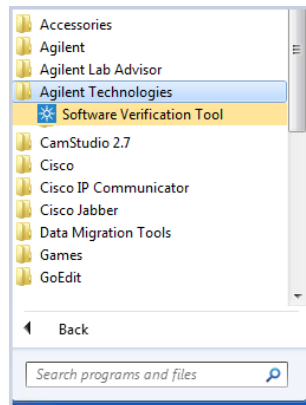


Figure 5 The SVT in the Windows Start Menu

Manual Installation of the Agilent Drivers

- 1 Double-click the file `Agilent_Drivers_for_Thermo_Chromeleon.msi` to start the installation of the Agilent Drivers for Thermo Chromeleon 7.
- 2 On the upcoming setup screen, accept the license terms and continue with **Install**.

3 Installation

Installation of the Agilent Drivers

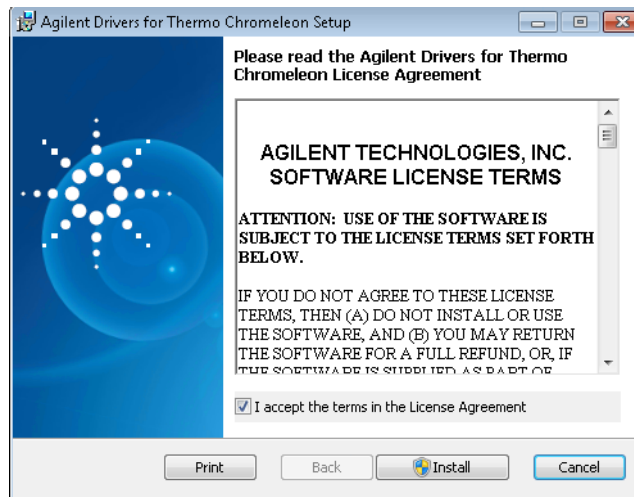


Figure 6 Accept license terms

- 3 Click **Yes** on the user account control to allow the installation of the Agilent Drivers.
- 4 To finalize the installation, click **Finish**.

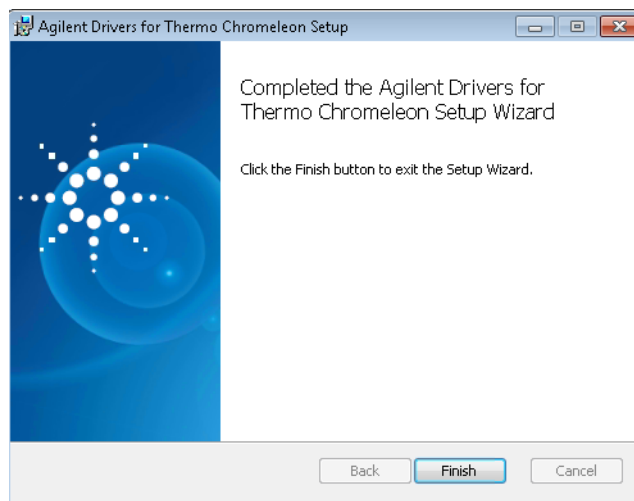


Figure 7 Finalize installation

The final locations for the files are:

- 64-bit Windows C:\Program Files (x86)\Agilent Technologies\Agilent Drivers for Thermo Chromeleon
- 32-bit Windows C:\Program Files\Agilent Technologies\Agilent Drivers for Thermo Chromeleon

Software Verification

Agilent offers a Software Verification tool (SVT) to verify the correct installation of the software components.

- When the Chromeleon installation routine is used, the tool is installed along with the Agilent Drivers.
- When the Agilent Drivers are installed manually, the Software Verification tool needs to be installed manually, as it is not part of the Agilent Drivers.

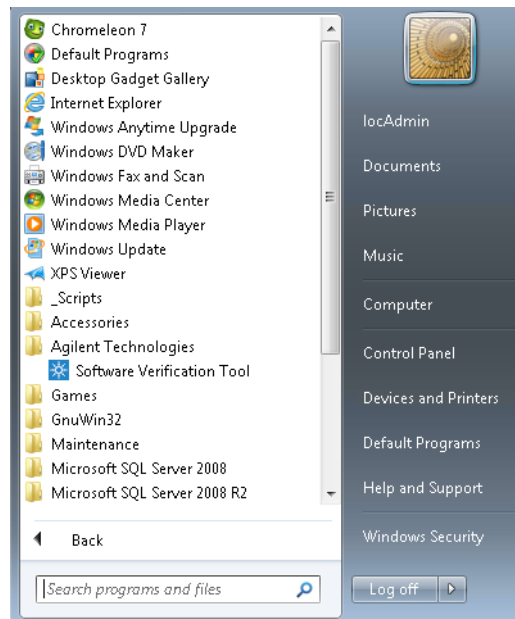


Figure 8 Software Verification Tool (SVT)

In order to check the successful installation of the Agilent Drivers and its subcomponents, execute SVT. The default file location for the SVT tool is C:\Program Files (x86)\Agilent Technologies\IQTool.

- 1 Open **Start > Programs > Agilent Technologies** and select **Software Verification Tool**.

- 2 In the upcoming dialog box, select the required report type and the components of interest and click **Qualify**.

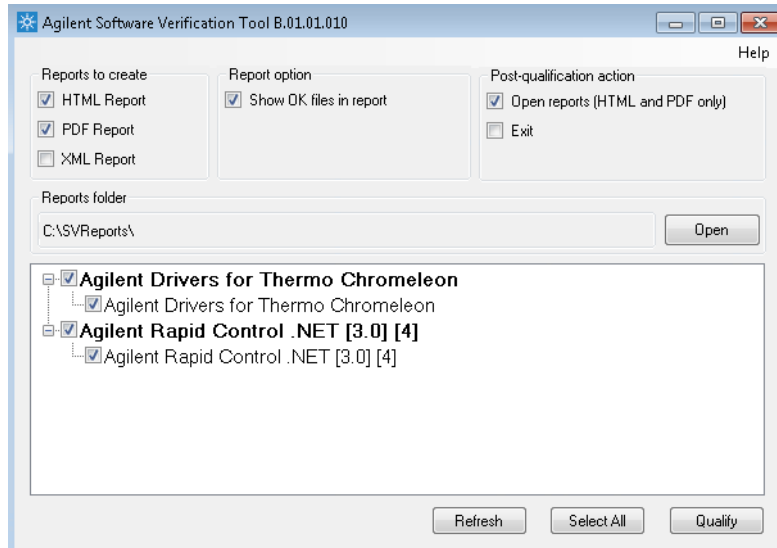


Figure 9 Software Verification Tool dialog box

The corresponding browser opens and shows the resulting files.

- 3 Close the SVT screen by clicking on the x in the upper right corner of the window.

Example Software Verification Reports:

Software Verification Report					
Date:	Thursday, September 01, 2016	Time:	2:38:41 PM [UTC+02:00:00]	Host Name:	CHU428NCL
Windows User Name :	admin	Base Revision Number:	01.00.000	Product Name :	Agilent Drivers for Thermo Chromeleon 7
Install Type:	Agilent_Drivers_for_Thermo_Chromeleon	Additional Packages:	Details		

Details

ID	Description
10003	Agilent Drivers for Thermo Chromeleon 7 - Version 1.1 [028]
10004	Agilent Instrument Control Framework A.02.04 [20]
10005	Agilent Instrument Control Framework - LC Drivers A.02.14 [41]
10015	Agilent Instrument Control Framework - ELSD Drivers Version A.01.06 [13]

Figure 10 Example: extract of SVT report

NOTE

The Chromeleon IQ does not start the Agilent SVT. You need to execute the Agilent Software verification tool manually.

NOTE

The Agilent Drivers for Chromeleon 7 are not listed among the third party components in the Chromeleon IQ report.

NOTE

Chromeleon IQ also reports the version number of the Agilent Instrument Control Framework (ICF) used by the ICF integration in Chromeleon.

Unattended Installation of the Agilent Drivers and Agilent Software Verification Tool

It is possible to install the Agilent Software Verification Tool and the Agilent Drivers for Chromeleon 7 in silent mode by executing the following commands in the command console.

NOTE

The Software Verification Tool must be installed before the Agilent Drivers are installed.

- Silent installation of the Agilent Software Verification Tool:

```
msiexec /i "\\<PathToMsi>\SFVTOOL.MSI" /passive
INSTALLDIR="C:\Program Files (x86)\Agilent Technologies\
IQTool" /L*v "C:\Temp\SFV.log" /quiet /qn
```

- Silent installation of the Agilent Drivers:

```
msiexec /i "\\<PathToMsi>\
Agilent_Drivers_for_Thermo_Chromeleon.msi" /quiet /L*v
"C:\Temp\install.log"
```

- Silent uninstallation:

```
msiexec /x "\\<PathToMsi>\
Agilent_Drivers_for_Thermo_Chromeleon.msi" /quiet /L*v
"C:\Temp\uninstall.log"
```

- Silent upgrade:

```
msiexec /i "\\<PathToMsi>\
Agilent_Drivers_for_Thermo_Chromeleon.msi" /quiet /L*v
"C:\Temp\upgrade.log"
```

The generated log file can be used for troubleshooting. Be sure to generate a logfile: c:\Temp\install.log

NOTE

The **Response File** section of the *Chromeleon Installation Guide* gives you further information on the unattended installation of Chromeleon.

Unattended Execution of the Software Verification Tool

It is possible to run the Agilent Software Verification Tool (SVT) in silent mode by executing one of the following commands in the command console:

- `SFVTool.exe -silent -p:"Agilent_Drivers_for_Thermo_Chromeleon"`
The command runs the SVT silently with the command window hidden, saves the report in html format (default option) for the selected product(s) and opens the report.
- `SFVTool.exe -qt -p:"Agilent_Drivers_for_Thermo_Chromeleon"`
The command runs SVT showing the progress in the command window, and saves the report in html format (default option) for the selected product(s).
- `SFVTool.exe -qt -p:"Agilent_Drivers_for_Thermo_Chromeleon" -html -pdf -open`
The command runs the SVT, showing the progress in the command window, saves the report in html format (default) and pdf for the selected product(s) and opens the reports.

Agilent Drivers Co-Existence /Co-Execution with other drivers

Agilent Drivers co-exist and co-execute with other driver solutions present on the same PC as long as the instrument stack is controlled purely by the Agilent Drivers.

Currently, it is possible to choose the kind of drivers per instrument, *but not per module*:

- *Agilent Technologies* (new integration Agilent Drivers)
developed by Agilent, integrated by Agilent using the Chromeleon DDK adapter and certified by Thermo Fisher Scientific.
- *Agilent (ICF integration)*
Agilent ICF Interface *ICF – Instrument Control Framework* provided by Agilent and integrated into Chromeleon by Thermo Fisher Scientific.
- *Obsolete Agilent/HP* (Chromeleon Native Drivers)
Native Drivers developed by Thermo Fisher Scientific/Dionex based on Agilent Control Code. These drivers are supported by Thermo Fisher only, and are limited to control of 1100/1200 Series modules.

For the time being, all three kinds of driver are available for configuration of Agilent Instrumentation.

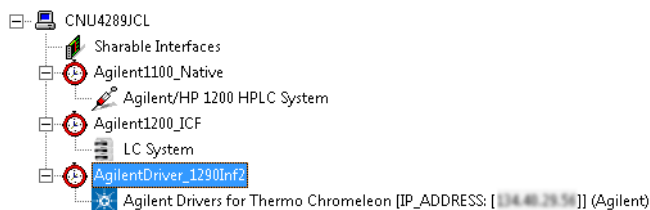


Figure 11 Possible configurations

NOTE

Only one driver instance of Agilent Drivers can be assigned to one instrument per PC.

NOTE

Mixed LC instrument stacks consisting of Agilent and non-Agilent LC instruments are not supported in this release of the Agilent Drivers. If you plan to add a non-Agilent LC instrument to the Agilent LC instrument stack, please contact your Agilent Sales or Support representative.

NOTE

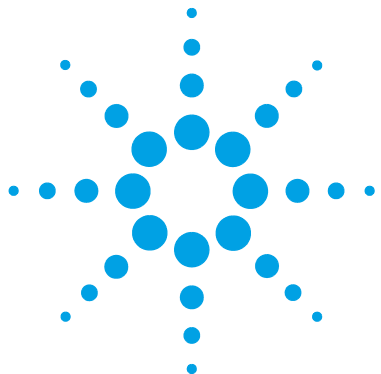
Agilent Drivers and Agilent ICF can be automatically installed using the Chromeleon Advanced Installation option. In this case, both integrations reside in parallel on the hosting computer. The drivers can co-exist and co-execute, but you cannot assign both drivers to one instrument stack.

It is possible to install the Agilent Drivers for Chromeleon 7 as well as the ICF integration. In this case, both drivers are listed in **Windows Control Panel > Programs and Features**.

As the Agilent Drivers for Chromeleon 7 includes all components in a shell, and ICF comes with three packages, the **Programs and Features** list shows both parallel integrations as follows:

	Agilent Drivers for Thermo Chromeleon	Agilent Technologies	4/28/2016	158 MB	01.00.100
	Agilent Instrument Control Framework	Agilent Technologies	3/9/2016	48.0 MB	2.3.99
	Agilent Instrument Control Framework - GC/HS Drivers A.02.02 Hotfix 1	Agilent Technologies	3/9/2016	240 MB	2.2.84
	Agilent Instrument Control Framework - LC Drivers A.02.11 SP1 HF2	Agilent Technologies	3/9/2016	113 MB	2.11.72

Figure 12 Example of different kinds of drivers



4

Configuring the Agilent Drivers in the Chromeleon Instrument Configuration

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This chapter gives you step-by-step instructions for configuring the Agilent Drivers in Chromeleon.



Configure your Agilent LC

To configure the Agilent LC instruments in Chromeleon, do the following:

- 1 Turn on all the modules of the LC system.
- 2 In the **Chromeleon Services Manager**, ensure that the **Instrument Controller Service** is running.
- 3 Start the instrument configuration using the **Chromeleon Instrument Configuration Manager** application.
- 4 Select the instrument controller, open the right mouse-click menu and select **Add Instrument**. Provide an instrument name.
- 5 Select the instrument, open the right mouse-click menu and select **Add Module**.

In the **Manufacturers** list, two Agilent integrations are offered:

- **Agilent Technologies** (new driver integration)
- **Agilent** (Instrument Control Framework (ICF))

- 6 Select the **Agilent Technologies** option in the **Manufacturers** panel.

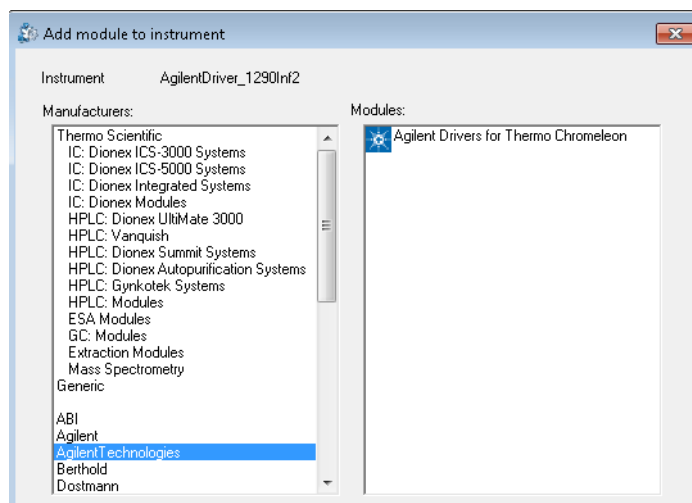


Figure 13 Add modules using Agilent Drivers

- 7 Select the **Agilent Drivers for Thermo Chromeleon** in the **Modules** panel and click **OK**

The **Agilent Drivers – Instrument Configuration** dialog box is displayed to enable you to configure the instrument.

- 8 Provide the following information:

- **Root Device Name:** The name is preset to Agilent; the name can be changed but it cannot be left empty. The **Root Device Name** is the root for the Chromeleon command tree and, correspondingly, the naming in the method script. The name must conform to the Chromeleon naming restrictions.
- **Request 3D License** is checked; the license is automatically pulled if available for 3D modules.

- 9 Select the configuration method.

To configure the instrument, automatic and manual paths are offered:

- **Manual configuration**

Some modules provide only RS232 ports (COM ports) for data transmission, some configurations require the use of two LAN cards in an instrument stack. In these cases, the modules must be added manually. Select the module in the left panel and use the arrows to move them over to the right panel.

NOTE

For manual set up, be sure to open the configuration and add the communication parameters. Otherwise, the module(s) remain offline.

- **Use Auto Configure** (Recommended)

If the **Auto Configure** function is active, enter an **IP Address** or **Hostname** and click **OK**. All online LC modules are automatically detected along with their current configurations, and are added to the right panel.

4 Configuring the Agilent Drivers in the Chromeleon Instrument Configuration

Configure your Agilent LC

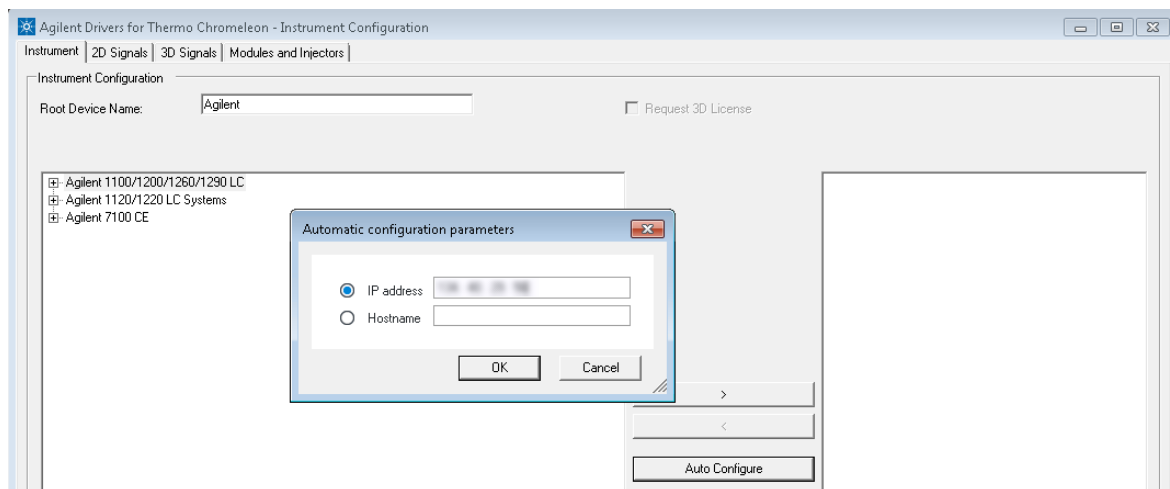


Figure 14 Autoconfiguration



Figure 15 Autoconfiguration result

Cluster Support:

The Agilent LC system offers the possibility to cluster dedicated modules; for example, two DADs can be clustered to form the High Dynamic Range Cluster (HDR). Cluster configurations are detected during autoconfiguration, and possible cluster configurations appear as active options on the right of the **Edit automatic configuration** dialog box.

- 10** If clustering is not required, click **Close** to proceed with the configuration of an unclustered system.

OR

Enter the **Configure <Name> Cluster** dialog box and specify the required cluster settings.

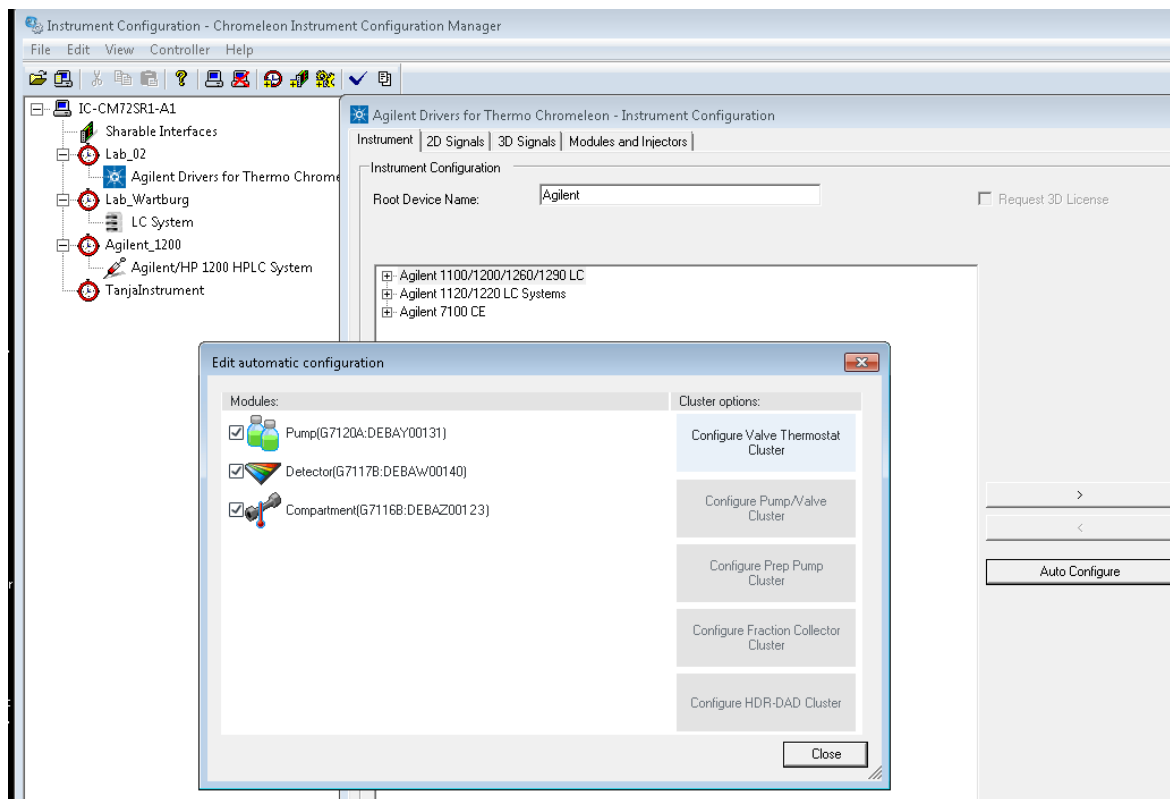


Figure 16 Possible Clusters

Setup and general information on the cluster are given in the Agilent Online Help of the modules, accessed using the Help button at the bottom of the instrument screen or by pressing **F1** while the instrument screen is open. In addition, cluster-specific manuals (for example, *High Dynamic Range – DAD Cluster*) are available.

During the Auto Configuration, the system automatically detects the current configuration of the modules (for example, added cooling devices, dual-needle configuration, seal wash options, and so on).

- 11 For each module, check the configuration and select user-defined options and/or change the module name. Open the configuration screen of the module of interest with a double click or using **Configure** at the bottom of the screen. **F1** or **Help** provide access to the driver help file.

Configure your Agilent LC

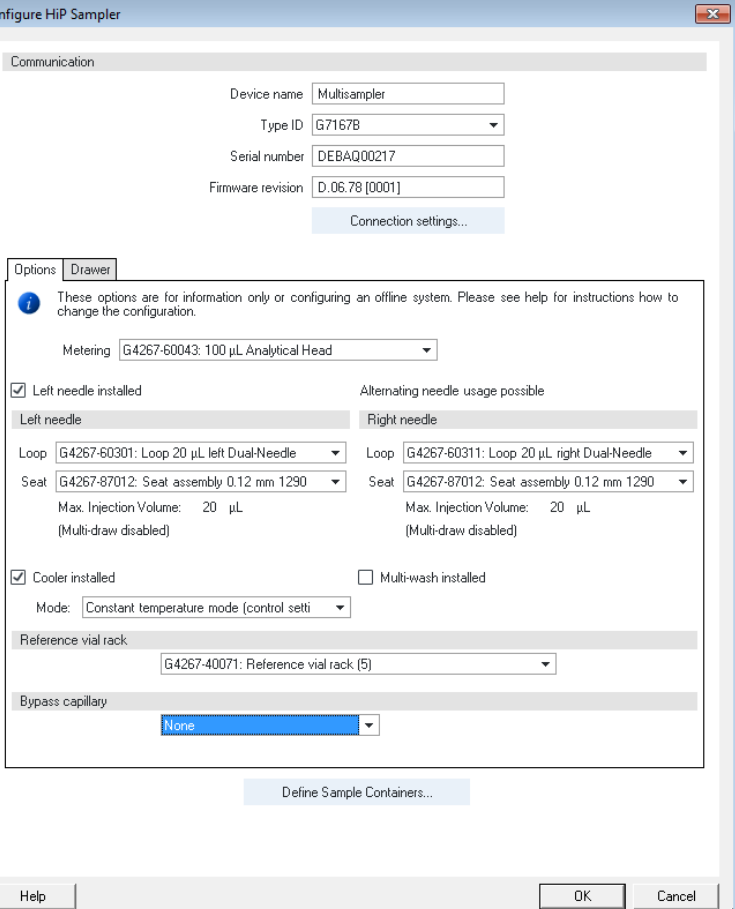


Figure 17 Module configuration

NOTE

If two modules of the same type are present, enter unique device names to distinguish the modules in question. The names must follow the Chromeleon naming conventions.

Any misconfiguration is listed in the instrument audit trail, and results in an offline instrument.

NOTE

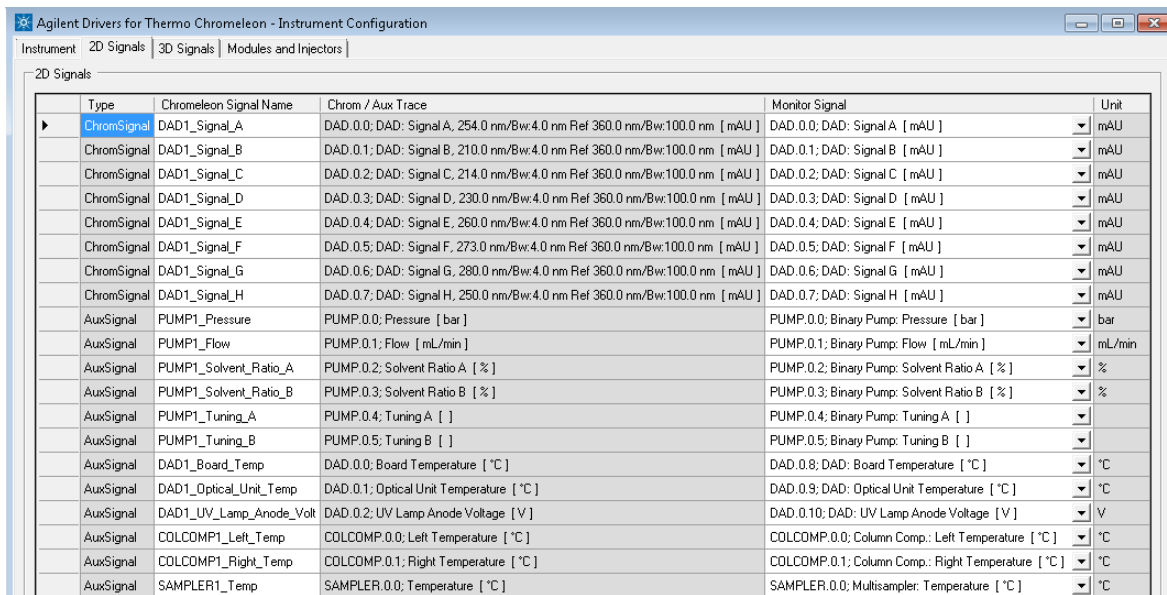
When the instrument configuration is changed, be sure to reconfigure the module in the **Chromeleon Instrument Configuration Manager** and, perhaps, to restart the **Chromeleon Console**.

NOTE

Certain instrument configurations affect the instrument method by either adding or removing method parameters (for example, if the cooler option is present, it offers additional temperature method parameters). As the Chromeleon Command Tree is generated during the startup of the **Chromeleon Console**, *structural changes* require a correct configuration (using **Auto Configure**) and a restart of the **Chromeleon Console**.

12 On the **2D Signals** and **3D Signals** tabs, and the **Modules and Injectors** tab, review all automatically assigned signal and module names for correctness. As these names are used in the Chromeleon command structure, they must conform to the Chromeleon naming restrictions. For example,

- Chromeleon signal names might be too long (more than 24 characters)
- The UIB shows two signals, but only one can be monitored; select the signal that you want to monitor.



Type	Chromeleon Signal Name	Chrom / Aux Trace	Monitor Signal	Unit
ChromSignal	DAD1_Signal_A	DAD.0.0: DAD: Signal A, 254.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.0: DAD: Signal A [mAU]	mAU
ChromSignal	DAD1_Signal_B	DAD.0.1: DAD: Signal B, 210.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.1: DAD: Signal B [mAU]	mAU
ChromSignal	DAD1_Signal_C	DAD.0.2: DAD: Signal C, 214.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.2: DAD: Signal C [mAU]	mAU
ChromSignal	DAD1_Signal_D	DAD.0.3: DAD: Signal D, 230.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.3: DAD: Signal D [mAU]	mAU
ChromSignal	DAD1_Signal_E	DAD.0.4: DAD: Signal E, 260.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.4: DAD: Signal E [mAU]	mAU
ChromSignal	DAD1_Signal_F	DAD.0.5: DAD: Signal F, 273.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.5: DAD: Signal F [mAU]	mAU
ChromSignal	DAD1_Signal_G	DAD.0.6: DAD: Signal G, 280.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.6: DAD: Signal G [mAU]	mAU
ChromSignal	DAD1_Signal_H	DAD.0.7: DAD: Signal H, 250.0 nm/Bw:4.0 nm Ref 360.0 nm/Bw:100.0 nm [mAU]	DAD.0.7: DAD: Signal H [mAU]	mAU
AuxSignal	PUMP1_Pressure	PUMP.0.0: Pressure [bar]	PUMP.0.0: Binary Pump: Pressure [bar]	bar
AuxSignal	PUMP1_Flow	PUMP.0.1: Flow [mL/min]	PUMP.0.1: Binary Pump: Flow [mL/min]	mL/min
AuxSignal	PUMP1_Solvent_Ratio_A	PUMP.0.2: Solvent Ratio A [%]	PUMP.0.2: Binary Pump: Solvent Ratio A [%]	%
AuxSignal	PUMP1_Solvent_Ratio_B	PUMP.0.3: Solvent Ratio B [%]	PUMP.0.3: Binary Pump: Solvent Ratio B [%]	%
AuxSignal	PUMP1_Tuning_A	PUMP.0.4: Tuning A []	PUMP.0.4: Binary Pump: Tuning A []	
AuxSignal	PUMP1_Tuning_B	PUMP.0.5: Tuning B []	PUMP.0.5: Binary Pump: Tuning B []	
AuxSignal	DAD1_Board_Temp	DAD.0.0: Board Temperature [°C]	DAD.0.8: DAD: Board Temperature [°C]	°C
AuxSignal	DAD1_Optical_Unit_Temp	DAD.0.1: Optical Unit Temperature [°C]	DAD.0.9: DAD: Optical Unit Temperature [°C]	°C
AuxSignal	DAD1_UV_Lamp_Anode_Volt	DAD.0.2: UV Lamp Anode Voltage [V]	DAD.0.10: DAD: UV Lamp Anode Voltage [V]	V
AuxSignal	COLCOMP1_Left_Temp	COLCOMP.0.0: Left Temperature [°C]	COLCOMP.0.0: Column Comp.: Left Temperature [°C]	°C
AuxSignal	COLCOMP1_Right_Temp	COLCOMP.0.1: Right Temperature [°C]	COLCOMP.0.1: Column Comp.: Right Temperature [°C]	°C
AuxSignal	SAMPLER1_Temp	SAMPLER.0.0: Temperature [°C]	SAMPLER.0.0: Multisampler: Temperature [°C]	°C

Figure 18 Naming configurations

4 Configuring the Agilent Drivers in the Chromeleon Instrument Configuration

Configure your Agilent LC

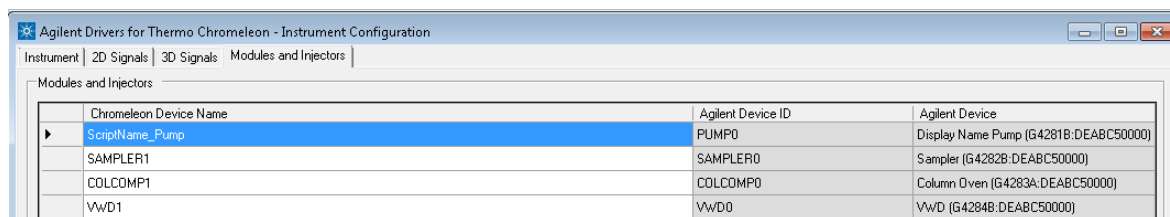


Figure 19 Device names

You can modify both Chromeleon Signal Names and Chromeleon Device Names.

13 Leave the instrument configuration screen by clicking **OK**.

14 Save the Chromeleon Instrument Configuration.

Create a Configuration Report

Chromeleon offers a summary report of the configured modules with the current configuration including the present module options.

- 1 Select **Create Report** in the **Chromeleon Instrument Configuration Manager > Controller**.

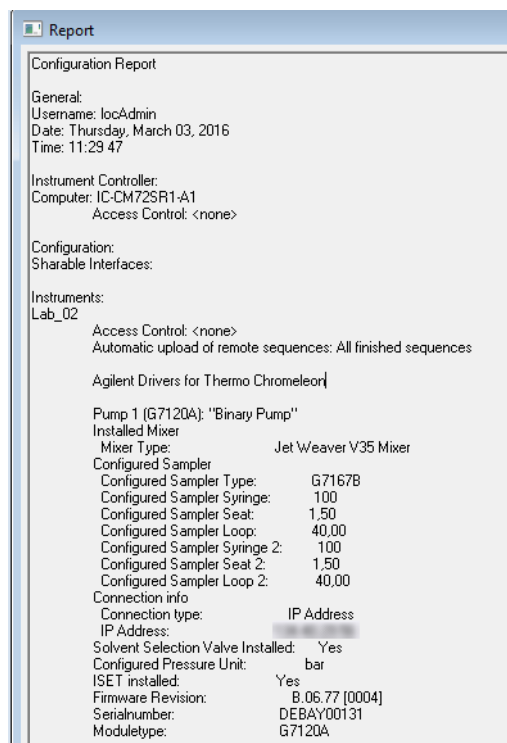


Figure 20 Chromeleon Configuration Report

Device and Signal Names

The Chromeleon Instrument Configuration Editor offers access to the module names and signal names.

Agilent Device Name

The Agilent **Device name** in the instrument tab is used on each graphical component of the module. These names have no naming restrictions.

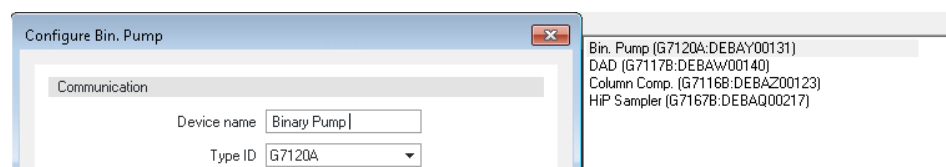


Figure 21 Agilent Device Name

Chromeleon Device and Signal Names

The Chromeleon device and signal names are subject to restrictions. If a restricted character is used, or a misconfiguration happens during manual interaction (for example, double assignments etc.), a warning appears and the setting must be corrected before the dialog box can be closed.

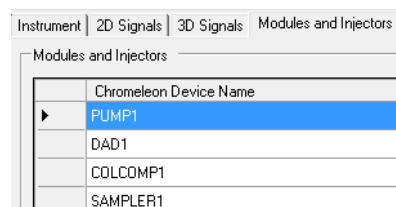


Figure 22 Chromeleon Device Name

Instrument	2D Signals	3D Signals	Modules and Injec
2D Signals			
	Type	Chromeleon Signal Name	
►	ChromSignal	DAD1_Signal_A	
	ChromSignal	DAD1_Signal_B	
	ChromSignal	DAD1_Signal_C	

Figure 23 Chromeleon Signal Name

In the Script Editor, only the **Chromeleon Device Name** can be used. If required, you can adjust the Agilent **Device name** to match the **Chromeleon Device names**.

NOTE

Both names (Agilent **Device name** and **Chromeleon Device Name**) appear in the graphical user interface.

4 **Configuring the Agilent Drivers in the Chromeleon Instrument Configuration**
Name appearance in the Chromeleon Console

Name appearance in the Chromeleon Console

The graphical Interface often shows both names in the following format:

Agilent Device Name (Chromeleon Device Name)

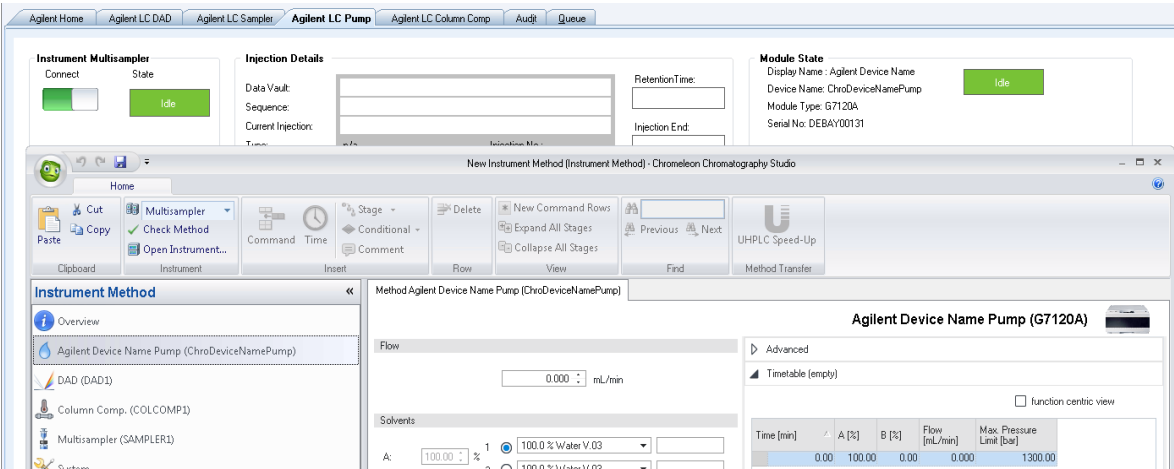


Figure 24 Naming in graphical components

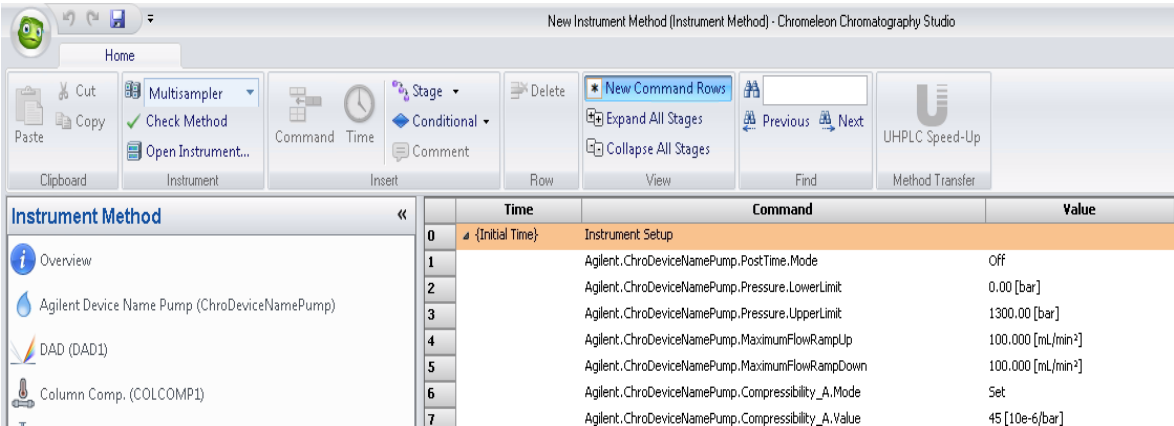
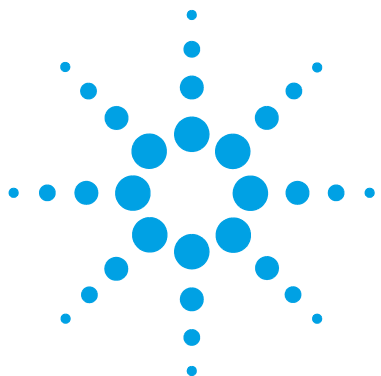


Figure 25 Naming in method script



5 Getting Started

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This chapter gives you the necessary information to allow you to start working with the Agilent Drivers for Chromeleon 7.



Direct Control of the Instrument

Agilent Drivers for Thermo Scientific Chromeleon (Agilent Drivers) offer two ways to control the instrument:

- “Agilent Home” ePanel
- Module ePanels

“Agilent Home” ePanel

The Agilent Home ePanel accesses the LC Status Dashboard which displays the status of each module in individual tiles, featuring the current parameter values for the module.

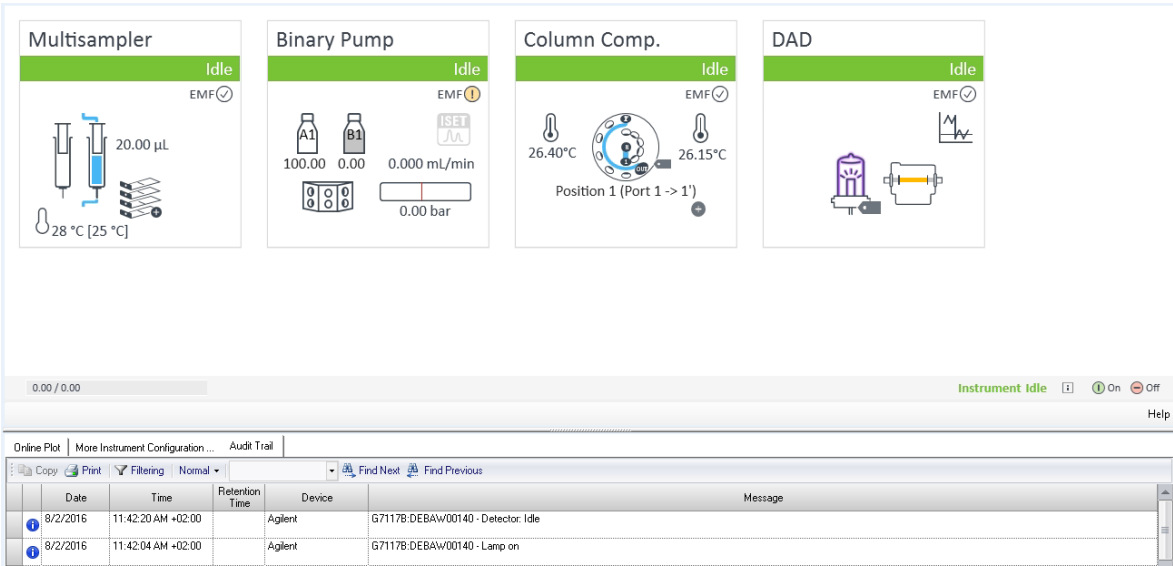
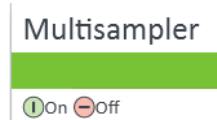


Figure 26 LC status dashboard with Audit Trail

All modules on the LC Status Dashboard must be in *ready* mode in order to proceed.

- The modules can be switched on and off individually. The on and off buttons are revealed by hovering over the module tile:



- The instrument (that is, all modules) can be switched on and off using the buttons at the bottom right of the LC Status Dashboard:



- A status bar located at the bottom of the LC Status Dashboard shows the overall status of the instrument.
- The **Help** button below the LC Status Dashboard provides access to the Agilent Driver help.
- EMF (Early Maintenance Feedback) can be enabled using the Agilent LabAdvisor.
- The  icon provides information on the hardware instrument, such as the module number and firmware in use.

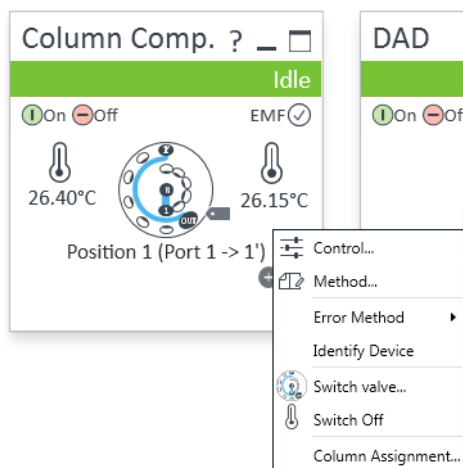
NOTE

There is no overall system run state. It is possible that the sequence has started, but the instrument state is still yellow, as the system is operating, for example, purging. An overall system state can be seen in the Queue tab; another indication is the presence of the injection details.

A right mouse click on the tile allows you to change the current instrument parameters or enable functions:

5 Getting Started

Direct Control of the Instrument



Module tile

Control	enables change of current instrument control parameters. These are generic parameters and cannot be changed within a method.
Method	enables change of current parameters that are present in the instrument. These parameters can be changed during a run by the instrument method.
Various direct commands	for example, Reset Injector (the action is directly executed).
Various indirect commands	for example, Auto-Clean (additional parameters are required).

NOTE

The majority of manual actions are disabled during *run* mode.

Changing Module Configuration using the LC Status Dashboard

Certain instrument configurations affect the instrument method by either adding or removing method parameters (for example, if the cooler option is present, it offers additional temperature method parameters). As the Chromeleon Command Tree is generated during the startup of the **Chromeleon Console**, structural changes require a correct configuration (using Auto Configure) and a restart of the **Chromeleon Console**.

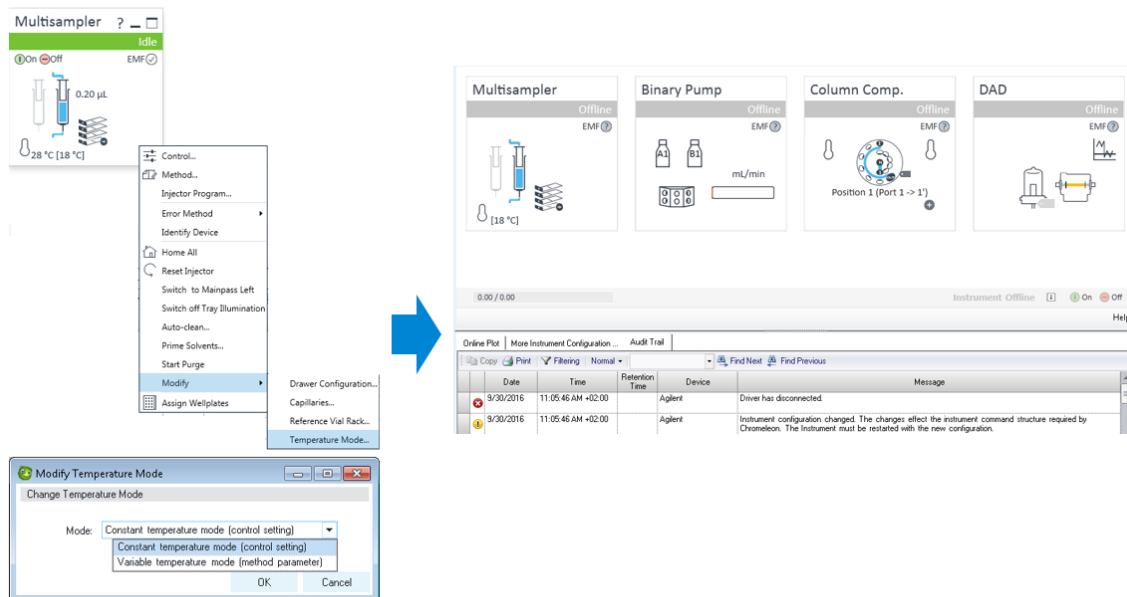


Figure 27 Configuration change in LC Status Dashboard affecting the structural Chromeleon Commands

NOTE

When the instrument configuration is changed, be sure to reconfigure the module in the **Chromeleon Instrument Configuration Manager** and, perhaps, to restart the **Chromeleon Console**.

More Instrument Configuration

The **More Instrument Configuration** tab is always present. However, the tab is relevant only if additional configuration parameters are available for the currently configured modules. This applies to:

- Prep modules (Cap/Nano pumps and samplers)
- Clustered LC systems
- Fraction Collection (not supported in Agilent Drivers for Thermo Chromeleon 7 Rev. 1.1)

Module ePanels

In addition to the "Agilent Home" ePanels, customizable ePanels are available per module class (pump, sampler, column compartment, DAD, FLD, RID, VWD). They are automatically present in the Chromeleon Console. These ePanels are customizable, and can be edited. The ePanels for the Agilent Drivers are present in the ePanel pool for Chromeleon, labeled **Agilent LC <module>**.

NOTE

The ePanels for the previous native driver integration are called **Agilent <module>**. It is not possible to use ePanels from the native driver integration for the Agilent Drivers or vice versa, and neither is a mix of these ePanels possible.

Customization of the module ePanels is possible for

- any method parameter
- all direct actions, for example,
 - ON/OFF for pumps, lamps, coolers,
 - Balance (Detectors)
 - Reject (sampler)

Customization is not possible for indirect actions requiring additional parameters (for example, priming).

As a module ePanel can serve several modules of a module class, the control parameters present on the ePanel may not all be relevant for a particular module. For example, Multisamplers offer smart overlap for dual needle operations in addition to high throughput for single needle configuration. Parameters that are not relevant for the configured needle operation are disabled.

NOTE

The ePanel property *enable if* is used in the ePanel to display only current, relevant parameters. If a parameter is not accessible in the first instance, but is present in the module, switch the parameter on in the module's Dashboard panel.

Agilent LC Sampler

During acquisition, the correct values of **Volume** and **Injection location** are displayed in the ePanel, but cannot be changed. In the Idle state, the latest values of **Volume** and **Injection location** are displayed.

A temperature range for the thermostatted cooler is set. In the case of the Multisampler, a fixed range of +/- 5 degree is given; therefore, the range information is not given, nor is the parameter offered.

Agilent LC Pump

For the pumps, the bottle filling, eluent information is display only; it cannot be set in the ePanel. Use the right mouse click on LC status dashboard pump tile. The panels reflect the current values once enabled.

The ePanel always offers four solvent channels; depending on the pump, only the available channels are accessible.

The solvent/equate values are read only. Agilent offers pumps with *premixed solvents*, some are predefined by the system, the solvent names can be changed using the LC status dashboard only, with a right mouse-click on **Method**.

Binary pumps with solvent selection valve (SSV) use channels A and B only; channels C and D are not used. The channel names A1/A2, B1/B2 with their assigned solvent names cannot be displayed. As only one channel A or B is accessible at a time, the ePanel displays A and B (not A1, B1) and both entered solvent names. In order to identify the active pump channel, you can put the valve position on the ePanel.

Agilent LC <Detectors>

When you choose **Lamp OFF**, both lamps are switched off.

When you are creating the ePanel, use both **lamps on required for acquisition** (command: lamp_required_for_run) and **Lamp Status** (command: UV_Lamp, property: UVLampState).

Manual parameter changes during a run

Chromeleon ePanels allow parameters to be changed during the execution of a run. Each manual change has to be approved and is documented in the audit trail. This interaction is allowed on the module ePanels, but not the LC Status Dashboard.

	8/1/2016	2:38:50 PM +02:00	1.288	Agilent.DAD1.DAD1_Signal_A	Agilent.DAD1.DAD1_Signal_A.RefWavelength = 366 nm
	8/1/2016	2:38:50 PM +02:00	1.288		Running sequence queue intercepted by user oemde.
	8/1/2016	2:38:40 PM +02:00	1.123	Agilent.DAD1	UseReference:DAD1_Signal_A changed from False to True
	8/1/2016	2:38:40 PM +02:00	1.123	Agilent.DAD1.DAD1_Signal_A	Agilent.DAD1.DAD1_Signal_A.UseReference = True
	8/1/2016	2:38:40 PM +02:00	1.123		Running sequence queue intercepted by user oemde.
	8/1/2016	2:37:54 PM +02:00	0.343	Agilent.DAD1	Wavelength:DAD1_Signal_A changed from 250 nm to 251 nm
	8/1/2016	2:37:54 PM +02:00	0.343	Agilent.DAD1.DAD1_Signal_A	Agilent.DAD1.DAD1_Signal_A.Wavelength = 251 nm
	8/1/2016	2:37:54 PM +02:00	0.343		Running sequence queue intercepted by user oemde.

Figure 28 Audit Trail, manual change accepted

Some instrument parameters cannot be changed during a run; these on-the-fly changes are rejected. The audit trail captures the attempt of the change and its rejection, and the parameters remain unchanged.

	Date	Time	Retention Time	Device	Message
	8/1/2016	2:41:49 PM +02:00	1.793	Agilent	G7115A:DE00000002 - Method download failed for module G7115A:DE00000002! Silt is not allowed to be changed during run.
	8/1/2016	2:41:49 PM +02:00	1.793	Agilent.DAD1	Agilent.DAD1.Siltwidth = 8 nm
	8/1/2016	2:41:49 PM +02:00	1.793		Running sequence queue intercepted by user oemde.

Figure 29 Audit Trail, manual change rejected

Direct Actions

Some direct actions, such as **Balance**, can be added to ePanels and the method script. Direct actions are the commands that are listed in the control menu of the dashboard panels. This capability is available for expert users only.

Only the most important direct actions can be added; actions that require user input (for example, using a dialog box) cannot be added.

NOTE

If you are adding an action to the method script, you must not add it during the Run stage (that is, between the commands **Start Run** and **Stop Run**).

Method Script and Command Tree

The command tree contains additional commands, such as actions that are performed but are not part of the method. However, not all of these additional commands are available for use.

For more information on the command tree, see the Chromeleon help.

Shutdown Method

You can use the method script to generate a shutdown method:

	Time	Command	Value	Comment
0	▲ {Initial Time}	Instrument Setup		
1	▲ 0.000	Inject Preparation		
2		Wait	Agilent.Ready	
3	▲ 0.000	Inject		
4		Agilent.SAMPLER1.ALS.Inject	Volume=0, Blank=Skip	
5	▲ 0.000	Start Run		
6	▲ 0.000	Run	Duration = 0.100 [min]	
7	▲ 0.100	Stop Run		
8		Wait	Agilent.RunState=Idle	
9		Agilent.PUMP1.TurnOff		
10		Agilent.DAD1.TurnOff		
11	End			

Setting Up an Instrument Method

Use the Chromeleon Instrument Method Wizard to generate an Instrument Method.

- 1 Start the Chromeleon Instrument Method Wizard.
- 2 Enter a run time for the Chromeleon Instrument Method.

For this first release, all diagnostic channels are enabled as part of the instrument method. They can be viewed and disabled (if required) in the method script.

- 3 Click **Next**.

NOTE

The stop time for the Agilent modules is automatically synchronized with the run time for the Chromeleon method. The corresponding field for the method parameter is not accessible.

The Chromeleon Instrument Method Wizard offers the module method screens sequentially. The values present in the screens are the Agilent Default Method parameters.

Each method window offers the main parameters on the left; the panel on the right offers:

- Timetables
- Advanced Setpoints
- Special Features such as ISET (Intelligent System Emulation Technology), Injector Path Cleaning, etc.

One window offers the pre-treatment parameters. By inserting lines, it is possible to specify special injection procedures that are executed before the sample is injected into the system.

- 4 Be sure to enable, for example, required solvent channels by marking the corresponding check boxes.
- 5 For detector signals (DAD, MWD, VWD, FLD, RID) ensure that **Acquire** is checked for the signals of interest.
- 6 Ensure that the setting **Lamps on for acquisition** is checked if the lamp is required for the method.

This setting also allows the instrument to reach a ready state if a lamp is not switched on. In particular running combinations for DAD/FLD where only one detector is used, this setting is of interest to save lamp burn time.

Volume and **Location** are defined in the sequence only. It is possible to add **Volume** and **Location** manually in the method script as Inject Command parameters; both values need to be supplied (volume and location).

- 7** Enter a comment and description as required and click **Finish** to complete the wizard.
- 8** In the method script, verify that there is an Acquisition ON (AcqOn) command for each auxiliary and chromatographic signal in the Start Run stage, and that each one is cleared (AcqOff) in the Stop Run stage.

Starting with the Agilent Drivers for Thermo Chromeleon 7 Rev. 1.1, the Method check is back, similar to the Native Driver Chromeleon integration. A consistency check for Agilent methods, for example, that the settings in the method are useful or correct, is executed. This consistency check was not available in the ICF integration.

Additional Information about the Instrument Method

Run Time/Stop Time

Chromeleon specifies the **Run Time** as a general part of the method, while the Agilent modules method windows offer a **Stoptime** and a **Posttime** per module. The module **Stoptime** has been disabled and the Chromeleon **Run Time** is automatically applied to all modules present in the method.

5 Getting Started

Setting Up an Instrument Method

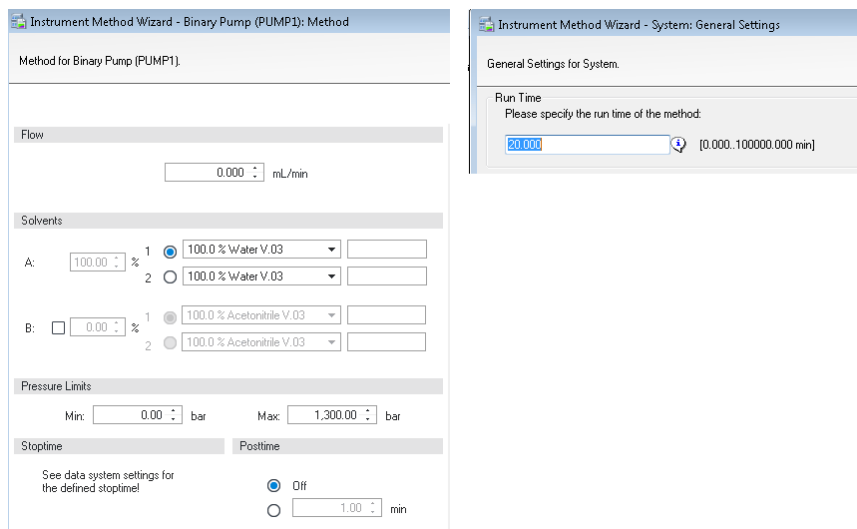


Figure 30 Agilent Module Stoptime (left) and Chromeleon Run Time (right)

Automatic Extension of Run Time due to Timetable Setup

The specified **Run Time** in the general settings of a Chromeleon method is automatically extended in the following cases:

- if a module **Timetable** is specified to be longer then the **Run Time**;
- if the pump **Timetable** is automatically adjusted based on the automatic calculation of the solvent gradients due to special features such as ISET (Intelligent System Emulation Technology).

The adjusted **Run Time** can be seen in the overview of the instrument method and in the **Time** steps in the method script.

Injection Volume Handling

Injection volume and location are, in general, specified in the sequence; therefore, the samplers do not offer the injection volume as a parameter entry.

Method Multisampler (SAMPLER1) **Pretreatment Multisampler (SAMPLER1)**

Injection

Needle selection: **Right Needle**

Needle Wash

Standard Wash

Stoptime Posttime

See data system settings for the defined stoptime!

☒ Off ☐ 1.00 min

Figure 31 Sampler method screen without injection volume

Chromeleon offers the possibility to manually edit the method script and add a line to specify a method-specific volume and location. In the **Inject** stage, select the command line **Agilent.SAMPLER.ALS.Inject** and specify the values for

- Position
- Volume

Using this manual method update, the method parameters overwrite the sequence parameters. The information on the parameters that are used is documented in the **Audit Trail**.

12	Agilent.SAMPLER1.HIPALS.Inject
13	Wait
	Click here to append a new command
14	Start Run
15	Agilent.PUMP1.PUMP1_Pressure.AcqOn
16	Agilent.PUMP1.PUMP1_Flow.AcqOn
17	Agilent.PUMP1.PUMP1_Solvent_Ratio_A.AcqOn
18	Agilent.PUMP1.PUMP1_Solvent_Ratio_B.AcqOn
19	Agilent.PUMP1.PUMP1_Tuning_A.AcqOn
20	Agilent.PUMP1.PUMP1_Tuning_B.AcqOn
21	Agilent.DAD1.DAD1_Signal_A.AcqOn
22	Agilent.DAD1.DAD1_Signal_B.AcqOn
23	Agilent.DAD1.DAD1_Signal_C.AcqOn
24	Agilent.DAD1.DAD1_Signal_D.AcqOn

Position: Vial:2

Volume: 2

Blank

Volume [0.00...20.00 µL]

OK Cancel

Figure 32 Manual edit of the method script

Graphical Instrument Method versus Instrument Method Script

The Agilent Drivers for Chromeleon offer method parameters in a graphical user interface as well as in scripted format.

- The Agilent method user interface offers initial parameters on the left of the method screen, additional parameters and timetable parameters on the right.

Time [min]	A [%]	B [%]	Flow [mL/min]	Max. Pressure Limit [bar]
0.00	20.00	80.00	2,000	1300.00
0.40	40.00	60.00	...	...
0.60	60.00	40.00	...	...
0.80	80.00	20.00	...	...
1.00	90.00	10.00	...	...

Figure 33 Graphical method screen

- In the **Chromeleon script editor**, all initial parameters (home values) are listed in the **Instrument Setup**, while the timetable values are listed in the **Run** stage at the time of execution.

0	{Initial Time}	Instrument Setup	
1		Agilent.DAD1.PostTime.Mode	Off
2		Agilent.DAD1.AnalogOutput_A.AnalogAttenuation	1000.00 [mAU]
3		Agilent.DAD1.AnalogOutput_A.AnalogOffset	5 [%]
4		Agilent.DAD1.Peakwidth	0.1000 [min]
5		Agilent.DAD1.Slitwidth	4 [nm]
6		Agilent.DAD1.UV_LampRequired	True
7		Agilent.DAD1.MarginForNegativeAbsorbance	100 [mAU]
8		Agilent.DAD1.Autobalance.Postrun	False
9		Agilent.DAD1.Autobalance.Prunrun	True

Figure 34 Initial/Home values in Instrument Setup

0.000	Run	Duration =
	Click here to append a new command	
0.400		
	Agilent.PUMP1.%B.Value	60.00 [%]
	Click here to append a new command	
0.600		
	Agilent.PUMP1.%B.Value	40.00 [%]
	Click here to append a new command	
0.800		
	Agilent.PUMP1.%B.Value	20.00 [%]
	Click here to append a new command	
1.000		
	Agilent.PUMP1.%B.Value	10.00 [%]

Figure 35 Timetable values in the Run stage

Commands in the Command Tree and Script Editor

The Command Tree and the Script Editor (available using the **Script Editor** link in the navigation pane) provide a structured list of the parameters of the method. The command includes the naming and section in which the parameter is present in the graphical method interface. The following naming convention for instrument parameters is used:

RootNode.Device.Feature.Parameter[_Detail]

for example, Agilent.COLCOMP1.EnableAnalysis.MaximumDeviationLeft

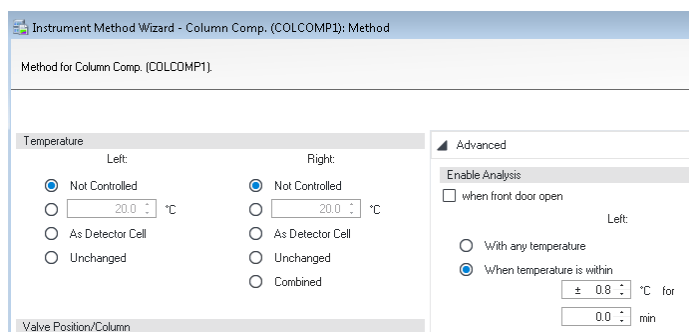


Figure 36 Graphical method screen — parameter

5 Getting Started
Setting Up an Instrument Method

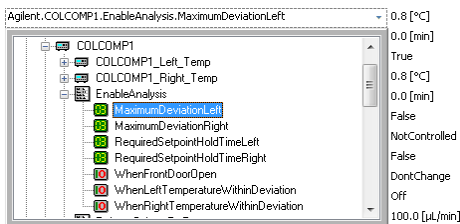


Figure 37 Method script — grouped parameters follow the graphical method screen

Timetable Entries

The initial/home values can be updated using timetable entries. In the Chromeleon script, it is possible to select a command to change a method parameter and, depending on the run stage (initial or run), the parameter is identified as either a home value (initial state) or a timetable value (run state). Therefore, the command name is the same; for example, **Flow** at initial time is the initial flow, **Flow** within the run stage is the corresponding timetable value at the specified time.

	Time	Command	Value
101	0.000	Equilibration	Duration = 0.000 [min]
102		Agilent.PUMP1.Flow.Nominal	1.000 [mL/min]
103		Agilent.PUMP1.%B.Value	80.00 [%]
*		Click here to append a new command	
*		New Time Step	
127	0.000	Run	Duration = 20.000 [min]
*		Click here to append a new command	
128	0.400		
129		Agilent.PUMP1.%B.Value	60.00 [%]
*		Click here to append a new command	
130	0.600		
131		Agilent.PUMP1.%B.Value	40.00 [%]
132		Agilent.PUMP1.Flow.Nominal	2.000 [mL/min]
*		Click here to append a new command	
133	0.800		

Figure 38 Method script: initial values (top) and timetable values (bottom)

For certain parameters, it is possible that the initial and timetable values differ, so that the timetable may offer a different number of parameters. In this case, timetable values are notified with a TT (timetable). These commands cannot not be used outside the run stage, for example:

Home Value

- Temperature TCC
- Not controlled
 - Set
 - As detector cell
 - Unchanged
 - combined

Timetable Value

- Temperature TCC increase
- Not controlled
 - Set

	Time	Command	Value
0	▲ {Initial Time}	Instrument Setup	
90		Agilent.COLCOMP1.TemperatureControlLeft.Mode	NotControlled
127	▲ 0.000	Run	Duration = 20.000 [min]
128		Agilent.COLCOMP1.TT.TemperatureControlModeLeft	Set
129		Agilent.COLCOMP1.TemperatureControlLeft.Nominal	22.0 [°C]
*		Click here to append a new command	

Figure 39 Method script — special timetable values

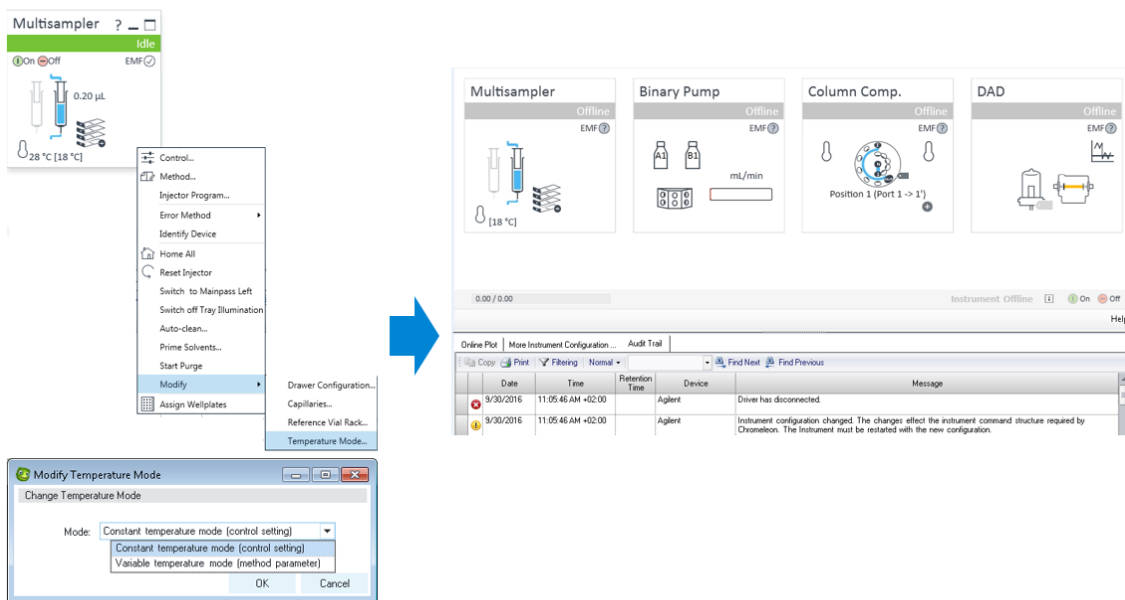
NOTE

Changing the timetable (adding, removing or modifying) in the script is not supported and not recommended. Changes to the timetable must be made in the graphical method user interface in order to ensure a fully specified method (see “[Special Information about the Command Tree, Instrument Method Commands and Method Script](#)” on page 64).

Special Information about the Command Tree, Instrument Method Commands and Method Script

Configuration change — impact on commands

Certain instrument configurations affect the instrument method by either adding or removing method parameters (for example, if the cooler option is present, it offers additional temperature method parameters). As the **Chromeleon Command Tree** is generated during the startup of the **Chromeleon Console**, structural changes require a correct configuration (using **Auto Configure**) and a restart of the **Chromeleon Console**.



NOTE

When the instrument configuration is changed, be sure to reconfigure the module in the **Chromeleon Instrument Configuration Manager** and, perhaps, to restart the **Chromeleon Console**.

Command tree grouping

In general, the command tree/Instrument Method commands follow the structure of the graphical interface. However, different modules may place the same command at a different position in the graphical method interface, for example:

Samplers The **Sample Flush Out Factor** is present in **High Throughput** for all samplers, even though older samplers list this field in the **Auxiliary** or **Advanced** method parameters.

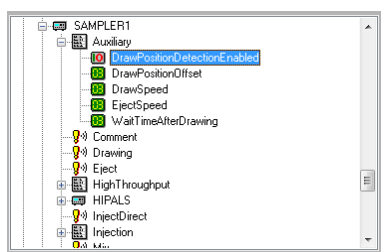


Figure 40 Example of parameter grouping

Value Ranges for Commands

If a parameter value range (min./max.) depends on the configured options or a specific method setup, the script offers the maximum range, because the Agilent method interface uses built-in intelligence to determine these dependencies. Therefore, the graphical method interface may offer a smaller value range than is allowed in the scripted method range.

For example:

- G2258A Dual Loop Sampler fill loop with overfill factor
the graphic method screen restricts the overfill factor, while the method script, allows a maximum overfill of 100.

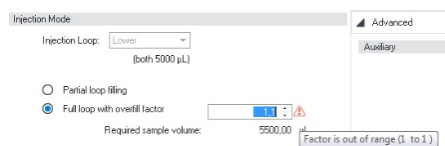


Figure 41 Restriction in graphical method interface

Script grouping

In general, the script groups commands by the structure of their hierarchy in the graphical method user interface. This means, for example, that all method parameters for the Analog Output are listed one below the other in the script.

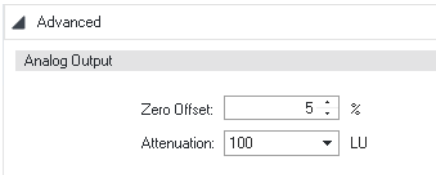


Figure 42 FLD Analog Output in the method user interface

```
Agilent.FLD1.AnalogOutput_A.AnalogAttenuation      100,000 [LU]
Agilent.FLD1.AnalogOutput_A.AnalogOffset           5 [%]
```

Figure 43 FLD Analog Output in the script

Please also note that if method is changed in the method user interface, all the commands of the changed module are moved to the end of the method script's instrument setup.

Very seldom, it may happen that the corresponding method parameters of a section are not listed one below the other; see, for example, the Multi-wavelength setting of the FLD:

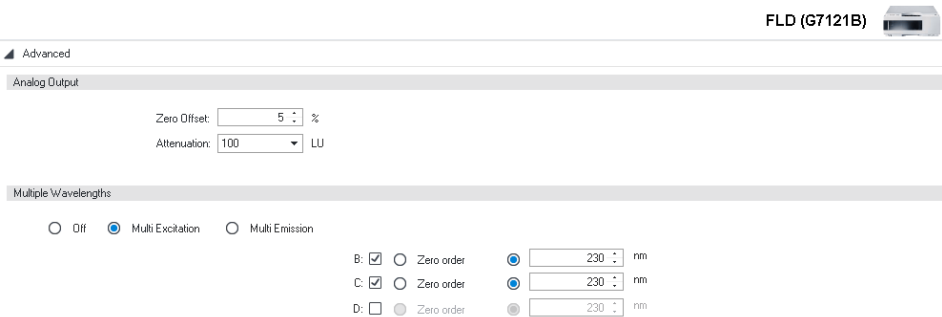


Figure 44 FLD Multiwavelength Setting in the method user interface

Agilent.FLD1.PostTime.Mode	Off
Agilent.FLD1.Detection.DetectionMode	Fluorescence
Agilent.FLD1.MultiWavelength.ScanMode	MultiExcitation
Agilent.FLD1.AnalogOutput_A.AnalogAttenuation	100,000 [LU]
Agilent.FLD1.AnalogOutput_A.AnalogOffset	5 [%]
Agilent.FLD1.Peakwidth	0,2000 [min]
Agilent.FLD1.Misc.SignalPolarity	Positive
Agilent.FLD1.Misc.BaselineBehavior	Append
Agilent.FLD1.Lamp.LampOnOnlyDuringRun	False
Agilent.FLD1.Lamp.LampRequired	True
Agilent.FLD1.Lamp.LampFlashRate	False
Agilent.FLD1.Lamp.LampEnergyReference	True
Agilent.FLD1.PmtGain	10
Agilent.FLD1.FLD1_Signal_A.Acquire	True
Agilent.FLD1.FLD1_Signal_A.Excitation_WavelengthMode	Set
Agilent.FLD1.FLD1_Signal_A.Excitation_Wavelength	230 [nm]
Agilent.FLD1.FLD1_Signal_A.Emission_WavelengthMode	Set
Agilent.FLD1.FLD1_Signal_A.Emission_Wavelength	460 [nm]
Agilent.FLD1.FLD1_Signal_B.Excitation_IsUsed	True
Agilent.FLD1.FLD1_Signal_B.Excitation_WavelengthMode	Set
Agilent.FLD1.FLD1_Signal_B.Excitation_Wavelength	230 [nm]
Agilent.FLD1.FLD1_Signal_C.Excitation_IsUsed	True
Agilent.FLD1.FLD1_Signal_C.Excitation_WavelengthMode	Set
Agilent.FLD1.FLD1_Signal_C.Excitation_Wavelength	230 [nm]
Agilent.FLD1.FLD1_Signal_D.Excitation_IsUsed	False

Figure 45 FLD Multiwavelength Setting in the script

Backward Compatibility

Changes to method script commands

Upgrading a method created with earlier Agilent Drivers versions may require manual intervention. After the first release, some commands and parameters were adjusted. If the following commands and parameters are used in your method scripts and these scripts will be used in Agilent Drivers 1.2, a manual update of these methods is necessary. Method script entries requiring intervention are shown on a red background in the method script editor.

G1390B UIB II command with two underscores

Prior to Agilent Drivers version 1.2 the acquisition on and off commands for Analog In unit are shown with two consecutive underscores in the command name. The command was changed to only contain one underscore, for example, `Agilent.UIB1.UIB1_Analog_In_.AcqOn`.

Action item: Instrument methods using the UIB acquisition commands for Analog In unit need to be updated to use the new command, for example, `Agilent.UIB1.UIB1_Analog_In.AcqOn`.

Needle Wash and Valve Position Parameter

Prior to Agilent Drivers 1.2, the NeedleWash and solvent composition valve position commands contained the prefix 'me_'. Starting with Agilent Driver 1.2, the prefix is dropped. For a sampler with the Multi Wash option installed, the method script contained the parameter `me_NeedleWash`, for example, `Agilent.Sampler1.MultiWash_1.me_NeedleWash`. Starting with Agilent Drivers 1.2, the prefix is dropped and the corresponding command is, for example, `Agilent.Sampler1.MultiWash_1.NeedleWash`.

Action item: Update affected instrument methods to use the new command.

Run Diagnostic Data (Analytical Results)

Agilent Drivers 1.2 introduces Analytical Results, which offer enhanced system and run information, for example, column information, system start and stop conditions, RFID tag information, used needle in dual needle mode. Adding the **RunDiagnosticData** commands to the method script enables printing of the information to the audit trail.

Action item: Add **RundiagnosticData** commands to method script to enable printing of extended information to the audit trail.

Solvent Compressibility

A method created with Agilent Drivers prior to version 1.2 raises method check warnings when opening with Agilent Drivers version 1.2. The warnings are specifically for G7112B 1260 Infinity II Binary Pump. The pump's method script contains parameters for compressibility settings while at the same time **UseSolventTypes** is set to **True**. These settings are mutually exclusive.

Action item: To use customized compressibility settings the parameter **UseSolventTypes** must be set to **False**.

If **Solvent Types** are to be used, **Solvent Types** must be set to **True**, and all compressibility parameters must be deleted from the method script. These changes can also be made in the graphical user interface.

Running Injections

This chapter provides additional information on the execution of injections and sequences using the Agilent Drivers for Chromeleon 7.

Extending a Running Sequence

It is possible to extend a sequence after it has been started. Only if the last injection has already started is it no longer possible to extend the sequence.

Solvent Consumption

The solvent consumption is calculated for the method run time. Additional time required during run initiation, data analysis and idle time until the start of the next run are not included in the calculation.

Ready check result: Successful			
	Source	Device	
i		Agilent.PUMP1	A% will consume 0 ml in total.
i		Agilent.PUMP1	B% will consume 0 ml in total.
i		Agilent.PUMP1	C% will consume 0 ml in total.
i		Agilent.PUMP1	D% will consume 0 ml in total.

Figure 46 Solvent Consumption Calculation

LC System

Overlapping Injection/Smart Overlap

In the sequence, all injections that use overlapped injection/smart overlap must use the same method. Where different methods are specified, the sequence continues, but the overlap of the injection is ignored.

During the execution of the sequence, the current sequence line in use and the next sequence line cannot be altered or another injection be added between these two lines.

Important restrictions for using Pretreatment/Injector Programs with Overlapped Injection:

- Overlapped Injection can handle pre-injection tasks but not post-injection tasks. This is because the next sample is being prepared for injection during the current injection.
- Some injector program commands, such as INJECT, cannot be used with Overlapped Injection. For details, refer to the help for the specific command.

Vial location

The sample position addressing in Chromeleon requires unique location identification. As Agilent offers ranges of vial plates and well plates offering different configurations (for example, 2 × 50 vial tray and external tray) the addressing needs to be applicable to these configuration. In order to achieve unique location, you must specify the vial location in the sequence with **Vial:x** (where **x** is the location).

The following schema is used for vial and plate locations throughout:

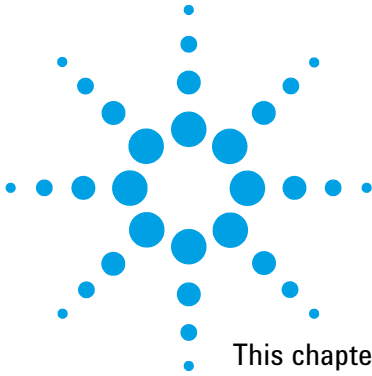
Position Type	Agilent Drivers Integration	Example
Vial	Vial:1 . n	Vial:1
Wellplate	P<n>:<x><y>	P1:A1
Drawer (Multisampler only)	D<n>F/B:<x><y>	D1F:A1

where

- <n> is the plate or drawer number
- <x> and <y> are the coordinates on the plate
- F and B are the position of the plate in the drawer (Front or Back)

This schema is used for vial and wellplate locations in all places:

- sequence wizard
- method script
- ePanels



6 Troubleshooting

This chapter describes what to do when something goes wrong.



Instrument Errors

In the case of an instrument error, the module tile reports an error by a red status field. The error message is revealed by hovering over the red status field, and gives you information about the error.

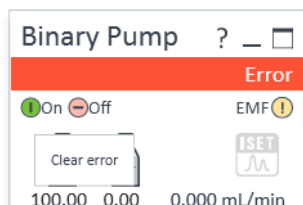


Figure 47 Module in Error state

To clear an error on the instrument, click **On** in the corresponding module tile. The module becomes green if the error can be corrected by the system; if user interaction is required, the module remains red. Refer to the instrument manual to get help on how to resolve the error.

Verify correct installation of Agilent Drivers

Run the Software Verification tool (SVT) to verify the correct installation of software components as outlined in section [“Software Verification”](#) on page 28. If the SVT reports missing file, reinstall the Agilent Drivers in **Start > ControlPanel > Software and Features**.

Information required for Troubleshooting

Note the LC-Stack configuration.

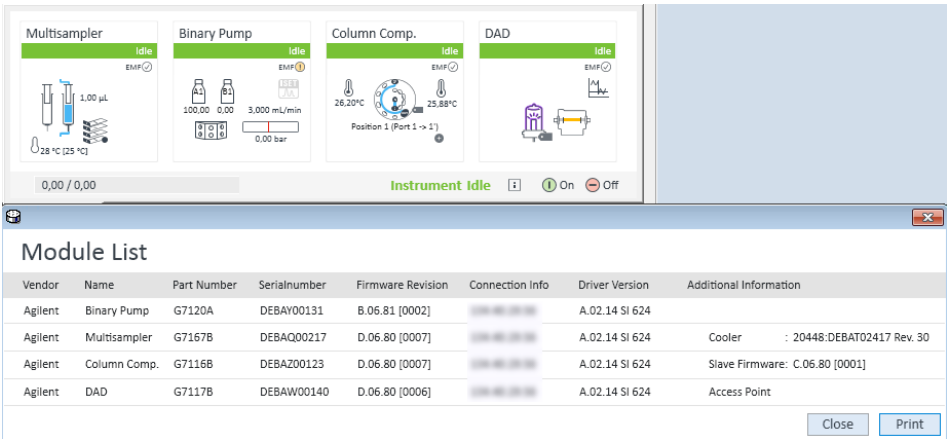


Figure 48 Detailed module information

Collect the Agilent Instrument Driver Log Files

The Driver log files help Agilent to investigate issues. A maximum of 200 files are stored before the files are overwritten.

Note the date and the time when the error occurred.

NOTE

The location of the Test Application for the Agilent Driver for Thermo Chromeleon 7 differs from that of an ICF integration. If both integrations are present on your system, be sure to call and execute the correct driver log file collector.

- 1 *64-Bit Windows Systems:* Locate the folder C:\Program Files (x86)\Agilent Technologies\Agilent Drivers for Thermo Chromeleon\Instrument Control Framework\Support
OR
32-Bit Windows Systems: Locate the folder C:\Program Files\Agilent Technologies\Agilent Drivers for Thermo Chromeleon\Instrument Control Framework\Support
- 2 Execute the **batch** file: Agilent.DriverLogFileCollector.bat. For more details, see the dialog box during execution.

6 Troubleshooting

Information required for Troubleshooting

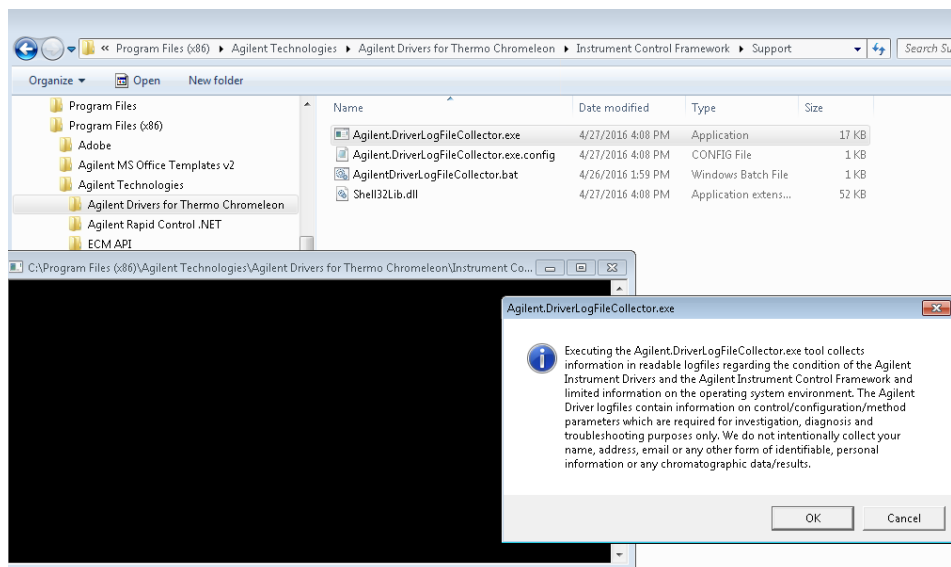


Figure 49 Running the log file collector

This collects all required *.log files, zips them automatically and saves the zipped file in the C:\Users\USERNAME\Documents folder. The name of the zipped file reflects the content, date and time the files were collected and zipped.

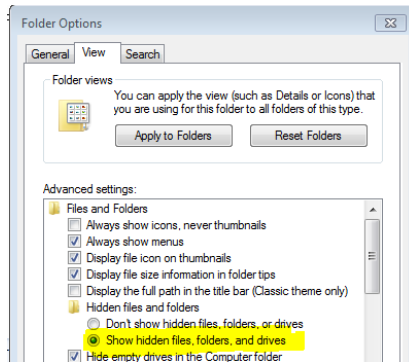
The following files are collected:

- Agilent driver log files: *DDK2ICF*.log
- Windows System.log
- Windows Application.log

- 3 Open the zip file and check that the Agilent driver log files were collected. If the Agilent driver log file are missing refer to the note below.

NOTE

If the .zip file is empty, verify that the check box **Show hidden files, folders, or drives** in the folder options in the Windows Explorer is selected.



Setting hidden files options

Monitor with the Test Application

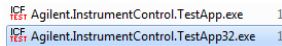
You can use the *Agilent Test Application* to verify that the instrument is working properly outside Chromeleon. The Test Application opens a connection to the instrument *without* any interaction of or with the CDS.

The Test Application is part of the third party instrument control packages and is present by default.

NOTE

For the Agilent Driver for Thermo Chromeleon 7, the location of the Test Application differs from that of an ICF integration. If both integrations are on your system, ensure to call the correct Test Application.

- 1 Close the application you are using. In particular, if you have Agilent modules using Firmware Revision A.xx.xx, these modules can connect with one control partner only.
 - Either explicitly disconnect the LC using the ePanel (recommended)
 - Or, stop the Instrument Controller Services using the Chromeleon Services Manager.
- 2 Using Windows Explorer, locate the file `Agilent.Instrument.Control.TestApp(32).exe` in the folder `C:\Program Files (x86)\Agilent Technologies\Agilent Drivers for Thermo Chromeleon\Instrument Control Framework`



- The `Agilent.Instrument.Control.TestApp32.exe` runs as a 32-bit process and all drivers are recognized.
- The `Agilent.Instrument.Control.TestApp.exe` runs as a 64-bit process. Not all drivers are recognized.

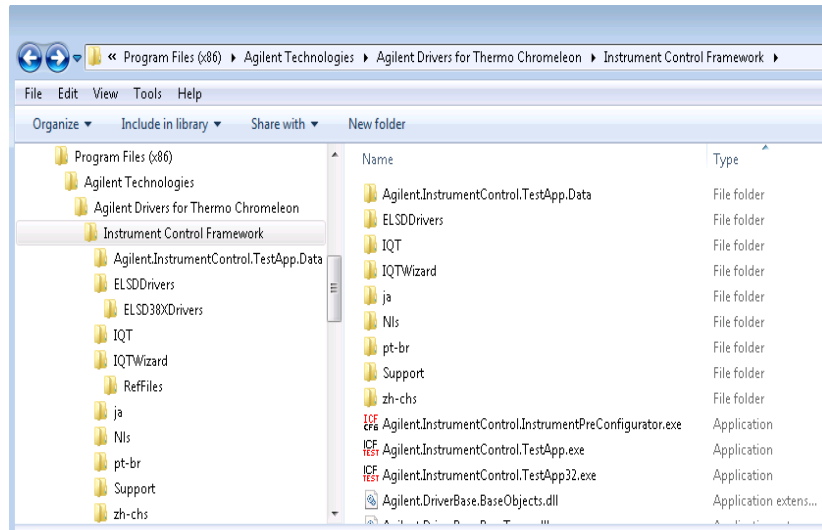


Figure 50 Location of TestApp executables

- 3** Start the application and, if the instrument is not yet listed, configure the instrument with the given IP address.
- 4** Open the instrument.
- 5** You need to **Initialize** the instrument in the actual instrument session.

6 Troubleshooting

Information required for Troubleshooting

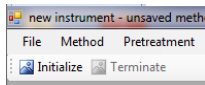


Figure 51 Close-up of the Initialize button

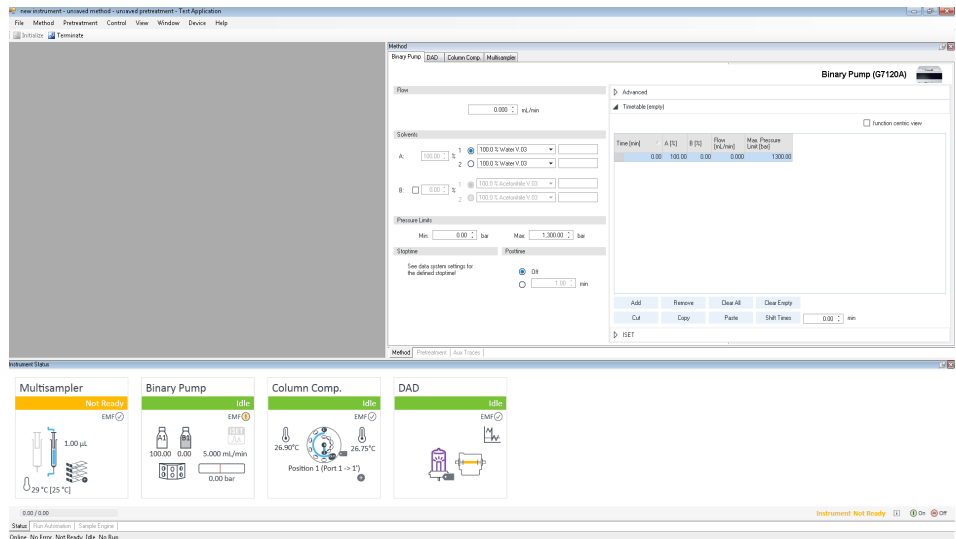


Figure 52 Running the Test Application

- 6 If the instrument is able to operate in the test application (click **Initialize** for activation) the issue is most probably related to the integration to the CDS.
- 7 You can set up, save and run a method to be sure that all parameters are transferred and the complete system is working. Edit the module parameters and save them.

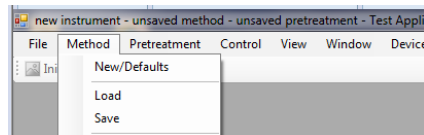


Figure 53 The Method menu

- 8 Run the method. (**Control > Start Run**)

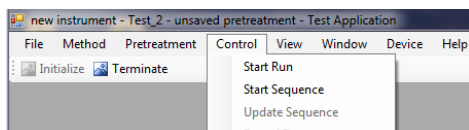


Figure 54 The Control menu

- 9 Be sure to **Terminate** the connection before leaving the test application. Otherwise, the CDS will not be able to connect to the modules later.

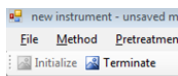
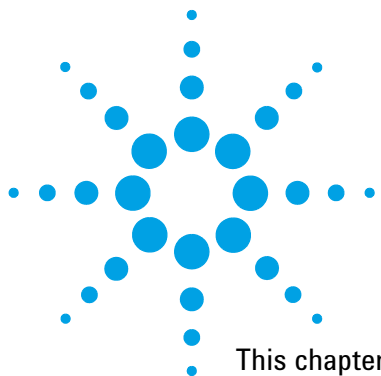


Figure 55 Close-up of the Terminate button

6 Troubleshooting
Information required for Troubleshooting



7

Known Limitations

This chapter lists the known limitations of the current revision of the Agilent Drivers for Thermo Chromeleon 7.

Only one CDS running the Agilent Drivers is supported

You can use only one CDS or other application using Agilent Drivers per computer. A different PC is required if you want to use another CDS with the Agilent Drivers.

Blend Assist is not supported

This release of Agilent Drivers does not support the Blend Assist functionality.

Diagnostic Functions are not supported

Agilent Drivers do not provide the functionality to access EMF counters or perform diagnostic/maintenance operations on the individual modules. Therefore, Chromeleon cannot offer any functionality for diagnostics. The Agilent Lab Advisor software is required to perform software diagnostic operations.

NOTE

Modules equipped with firmware revision A.xx.xx are not able to communicate with Chromeleon and the Lab Advisor simultaneously.

Mixed module configuration of Agilent /non-Agilent LC instrumentation is not supported

This release does not support the mixing in one LC stack of modules from different vendors. The controlled LC instrument stack must consist of Agilent modules only.



Other Limitations

- Only one injector is allowed per instrument.
- Manual Injection is not supported.
- Missing vials are handled slightly differently from Thermo Scientific instruments. Either the method continues to run without injection (for the current method run time) or the running queue is aborted immediately. The behavior can be controlled via the setting **Ignore Missing Vessel** available from the Agilent status window in the ePanel. Select **Control...** from the sampler's context menu to access this setting.
- Visual display of the rack layout is not available for Agilent LC systems. The tray position of the Agilent LC shows a list of positions but no valid tray geometry, as this is not characterized by the Agilent Drivers.
- Data from *ad-hoc runs* (started via the handheld controller) are not collected.
- Agilent LC instruments use built-in emergency methods; therefore, emergency instrument methods in the Chromeleon queue cannot be used. Instead, these methods must be specified using the context menu in the Agilent instrument status window. Refer to the Chromeleon help or Agilent Instrument Drivers help for details.
- The commands **Hold**, **Continue**, **StopFlow** and **Message** are not available with the Agilent Drivers. These commands are treated differently, depending on the LC instrument stack:
 - If a sampler is part of the instrument, Wait/Hold/Continue/StopFlow commands in the **Run** stage are rejected by the ready check
 - If no sampler is part of the instrument, Wait/Hold/Continue/StopFlow commands in the **Run** stage are not rejected by the ready check
- The command **TurnON** is not available in the method script. It is available as a command, for example, for ePanels.
- The **Monitor Baseline** control, which Chromeleon offers for Data Acquisition functions, but is not supported. Chromeleon offers **Monitor Baseline** to allow you to manually save the online signal in an idle state or after a manual injection. As Agilent modules offer a monitor signal (outside a run) and Chromatogram signals (inside a run) that are not delivered with the same frequency, Agilent does not support this feature for manual injections to generate analytical results.
- The configuration editor offers the setup of the column plumbing as well as a table for column information (for example, description, product number

etc.) for the G7116A/B Multi-Column Compartment and for the Valve-Thermostat-Cluster (VTC). The column plumbing is correctly displayed and used in the methods. The module is working in the expected setup.

The column information cannot be presented for selection in the G7116A/B graphical method interface and Valve-Thermostat-Cluster (VTC). As the column information is not offered in the GUI, the option **enforce column** cannot be selected.

The pump's *Pressure Unit Configuration* options allow you to select between bar (default), psi, and MPa as pressure unit. This setting is then used in the graphical user interface. However, the script always uses bar as its pressure units, regardless of configuration settings.

7 Known Limitations

Information required for Troubleshooting

8

Appendix A

This appendix tabulates the compatibility of Agilent instrumentation with the Agilent Drivers for Chromeleon 7.

Pumps

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G1310A	1200 Isocratic Pump	A.06.10	1.1
G1310B	1260 Infinity Isocratic Pump	A.06.32	1.1
G1311A	1200 Series Quaternary Pump ¹	A.06.10	1.1
G1311B	1260 Infinity Quaternary Pump ¹	A.06.32	1.1
G1311C	1260 Infinity Quaternary Pump VL ¹	A.06.32	1.1
G1312A	1200 Series Binary Pump ¹	A.06.10	1.1
G1312B	1260 Infinity Binary Pump ¹	A.06.10	1.1
G1312C	1260 Infinity Binary Pump VL ¹	A.06.32	1.1
G1361A	1260 Infinity Preparative Pump	A.06.50	1.1
G1376A	1260 Infinity Capillary Pump	A.06.10	1.1
G2226A	1260 Infinity Nanoflow Pump	A.06.10	1.1
G4204A	1290 Infinity Quaternary Pump ¹	B.06.50	1.1
G4220A	1290 Infinity Binary Pump ¹	B.06.23	1.1
G4220B	1290 Infinity Binary Pump VL ¹	B.06.43	1.1



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Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G4302A	1260 Infinity SFC Binary Pump ¹	A.06.32	1.1
G4782A	1260 Infinity II SFC Binary Pump ¹	D.07.13	1.2
G5611A	1260 Infinity Bio-inert Quaternary Pump ¹	A.06.32	1.1
G5654A	1260 Infinity II Bio-Inert Quaternary Pump ¹	D.07.01	1.1
G7104A	1290 Infinity II Flexible Pump ¹	B.06.71	1.1
G7104C	1290 Infinity II Flexible Pump ¹	D.07.20	1.2
G7110B	1260 Infinity II Isocratic Pump	D.07.01	1.1
G7111A	1260 Infinity II Quaternary Pump VL ¹	D.07.01	1.1
G7111B	1260 Infinity II Quaternary Pump VL ¹	D.07.01	1.1
G7112B	1260 Infinity II Binary Pump ¹	D.07.01	1.1
G7120A	1290 Infinity II High Speed Pump ¹	B.06.71	1.1
G7161A	1260 Infinity II Preparative Binary Pump		1.2
G7161B	1290 Infinity II Preparative Binary Pump		1.2
<i>Cluster</i>			
N/A	Pumps marked with ¹ are able to build a pump valve cluster with up to two valves of type G1160A and/or G1170A with 5067-4159 or 5067-4147	See modules	1.1
N/A	1260 Infinity Preparative Pump Cluster with up to four G1361As	A.06.50	1.1

Sampling Systems

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G1328A/B	Manual Injector	N/A	No
G1330A/B	Thermostat for Agilent Sampler	N/A	1.1
G1313A	1100 Series Autosampler	A.06.10	1.1
G1329A	1200 Series Standard Autosampler	A.06.10	1.1
G1329B	1260 Infinity Standard Autosampler	A.06.10	1.1
G1367A	1100 Series Well-plate Autosampler	A.06.31	1.1
G1367B	1200 Series High Performance Autosampler	A.06.31	1.1
G1367C	1200 Series High Performance Autosampler SL	A.06.31	1.1
G1367D	1200 Series High Performance Autosampler SL+	A.06.31	1.1
G1367E	1260 Infinity High Performance Autosampler	A.06.32	1.1
G1377A	1260 Infinity High Performance Micro Autosampler	A.06.12	1.1
G1389A	1100 Series Micro Thermostatted Autosampler	A.06.10	1.1
G2258A	1260 Infinity Dual-Loop Autosampler	A.06.50	1.1
G2260A	1260 Infinity Preparative Autosampler (High flow)	A.06.50	1.1
G4226A	1290 Infinity Autosampler	A.06.31	1.1
G4303A	1260 Infinity SFC Standard Autosampler	A.06.54	1.1
G4767A	1260 Infinity II SFC Multisampler	D.07.13	1.2
G5667A	1260 Infinity Bio-inert High Performance Autosampler	A.06.32	1.1
G5668A	1260 Infinity II Bio-inert Multisampler	D.07.01	1.1
G7129A	1260 Infinity II Vialsampler	D.06.60	1.1
G7129B	1290 Infinity II Vialsampler	D.06.60	1.1
G7129C	1260 Infinity II Vialsampler	D.07.20	1.2

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Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G7157A	1260 Infinity II Preparative Autosampler	D.07.01	1.2
G7167A	1260 Infinity II Multisampler	D.06.60	1.1
G7167B	1290 Infinity II Multisampler	D.06.60	1.1

Detectors

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G1314A	1100 Series Variable Wavelength Detector	A.06.10	1.1
G1314B	1260 Infinity Variable Wavelength Detector VL	A.06.10	1.1
G1314C	1260 Infinity Variable Wavelength Detector VL+	A.06.10	1.1
G1314D	1200 Series Variable Wavelength Detector	B.06.32	1.1
G1314E	1290 Infinity Variable Wavelength Detector	B.06.32	1.1
G1314F	1260 Infinity Variable Wavelength Detector	B.06.32	1.1
G1315A	1100 Series Diode Array Detector	A.06.10	1.1
G1315B	1200 Series Diode Array Detector	A.06.10	1.1
G1315C	1260 Infinity Diode Array Detector VL+	B.06.30	1.1
G1315D	1260 Infinity Diode Array Detector VL	B.06.30	1.1
G1365A	1100 Series Multiple Wavelength Detector	A.06.10	1.1
G1365B	1200 Series Multiple Wavelength Detector	A.06.10	1.1
G1365C	1260 Infinity Multiple Wavelength Detector	B.06.30	1.1
G1365D	1260 Infinity Multiple Wavelength Detector VL	B.06.30	1.1
G1321A	1200 Series Fluorescence Detector (FLD)	A.06.10	1.1
G1321B	1260 Infinity Fluorescence Detector Spectra	A.06.32	1.1

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G1321C	1260 Infinity Fluorescence Detector	A.06.54	1.1
G1362A	1260 Infinity Refractive Index Detector	A.06.10	1.1
G4212A	1290 Infinity Diode Array Detector	B.06.30	1.1
G4212B	1260 Infinity Diode Array Detector	B.06.30	1.1
G7114A	1260 Infinity II Variable Wavelength Detector	D.07.01	1.1
G7114B	1290 Infinity II Variable Wavelength Detector	D.06.70	1.1
G7115A	1260 Infinity II Diode Array Detector WR	D.07.01	1.1
G7117A	1290 Infinity II Diode Array Detector FS	D.06.70	1.1
G7117B	1290 Infinity II Diode Array Detector	D.06.70	1.1
G7117C	1260 Infinity II Diode Array Detector HS	D.07.01	1.1
G7121A	1260 Infinity II Fluorescence Detector	D.07.01	1.1
G7121B	1260 Infinity II Fluorescence Detector Spectra	D.07.01	1.1
G7165A	1260 Infinity II Multi Wavelength Detector	D.07.01	1.1
G4218A	1260 Infinity Evaporative Light Scattering Detector	1.3	No
G4260A	380-ELSD	25.00	1.1
G4261A	385-ELSD	25.00	1.1
G4260B	1260 Infinity II Evaporative Light Scattering Detector	30.35	1.1
G4261B	1290 Infinity Evaporative Light Scattering Detector	30.35	1.1
G7102A	1290 Infinity II Evaporative Light Scattering Detector	30.42	1.1
G7162A	1260 Infinity II Refractive Index Detector	D.06.76	1.1
G7162B	1290 Infinity II Refractive Index Detector	D.06.76	1.1
<i>Cluster</i>			

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Information required for Troubleshooting

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
HDR-DAD Cluster	2 × G4212A or 2 × G4212B or a combination of 1 × G4212A and 1 × G4212B	B.06.57	1.1
HDR-DAD Cluster	2 × G7117A or 2 × G7117B or a combination of 1 × G7117A and 1 × G7117BB	B.06.70	1.1

Column Compartments

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G1316A	1260 Infinity Thermostatted Column Compartment	A.06.10	1.1
G1316B	1200 Series Thermostatted Column Compartment SL	A.06.10	1.1
G1316C	1200 Series Thermostatted Column Compartment SL	A.06.14	1.1
G7116A	1260 Infinity II Multicolumn Thermostat	D.07.01	1.1
G7116B	1290 Infinity II Multicolumn Thermostat (Host with firmware B.06.75/D.06.75 required)	C.06.70	1.1
G7130A	Integrated Column Compartment ICC (option to G7129A/B)	C.06.76	1.1
<i>Cluster</i>			
N/A	Cluster with up to three G1316C with integrated 8-pos/9-port valves (product G4230A/B) or a minimum of two G1316C TCCs; the third TCC can be a G1316A, B or C.	See module	1.1

The Valve Thermostat Cluster is a combination of G7116B, G1170A and G1316C as valve or column hosts and G1316A/B and G7130A as column hosts.

Module	Min. Module Firmware	Min. Host Module Firmware	Min. version of Agilent Drivers for Chromeleon 7
G7116B	C.06.75	B.06.75/D.06.75	1.1
G1170A	C.06.75	B.06.75/D.06.75	1.1
G7130A (option of G7129A/B)	D.06.76	N/A	1.1
G1316C	A.06.55	N/A	1.1
G1316A/B	A.06.10	N/A	1.1

Quick Change Valves for Agilent LC Modules

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G1157A	1200 Series 2-Position/10-Port Valve	A.06.02	1.1
G1158A	1200 Series 2-Position/6-Port Valve	A.06.02	1.1
G1158B	1200 Series 2-Position/6-Port Valve (600bar)	A.06.02	1.1
G1159A	1200 Series 6-Position Selection Valve	A.06.02	1.1
G1160A	1100 Series Multiple Purpose Switching Valve (12-Position/13-Port)	A.06.02	1.1
G1162A	1200 Series 2-Position/6-Port Micro Valve	A.06.02	1.1
G1163A	1200 Series 2-Position/10-Port Micro Valve	A.06.02	1.1
G1170A	1290 Infinity Valve Drive (Host required with firmware B.06.40/D.06.060)	C.06.40	1.1

Other Modules

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G1390A	1100 Series Universal Interface Box (UIB)	A.06.02	1.1
G1390B	1200 Infinity Series Universal Interface Box II (Host required with B.06.53 firmware)	C.06.53	1.1
G4227A	1290 Infinity Flexible Cube (Host required with B.06.52 firmware)	C.06.52	1.1
G1364A	1100 Series Automatic Fraction Collector	A.06.53	No
G1364B	1260 Infinity Fraction Collector (preparative-scale)	A.06.53	No
G1364C	1260 Infinity Fraction Collector (analytical-scale)	A.06.53	No
G1364D	1100 Series Micro Fraction Collector	A.06.53	No
G5664A	1260 Infinity Bio-inert fraction collector AS	A.06.53	No
G4240A	1260 Infinity Chip Cube MS Interface	A.06.36	No
G4301A	1260 Infinity Analytical SFC System	A.03.07	1.1
G7170B	1290 Infinity II MS Flow Modulator		1.2
<i>Cluster</i>			
N/A	Any combination of G1364A/B/C or G566A plus a fourth G1364A/B/C or G5664A for recovery can be clustered. Multiple single Fraction Collectors are not supported	See module	No

Agilent LC Systems (1120 Compact, 1220 Infinity LC System, 1220 Infinity II LC System)

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
G4286A	1120 LC Isocratic	B.06.50	1.1
G4286B	1220 LC System Isocratic, Man. Inj., VWD, 600 bar	B.06.50	No
G4287A	1120 LC Isocratic with Oven and ALS	B.06.50	1.1
G4287B	1220 LC Isocratic, ALS, TCC, VWD, 600 bar	B.06.50	1.1
G4288A	1120 LC Gradient	B.06.50	1.1
G4288B	1220 LC Gradient, Man. Inj., VWD, 600 bar	B.06.50	No
G4289A	1120 LC Gradient with Oven	B.06.50	1.1
G4289B	1220 LC Gradient, ALS, TCC, VWD, 600 bar	B.06.50	1.1
G4290A	1120 LC Gradient with oven and ALS	B.06.50	1.1
G4290B	1220 LC Gradient, ALS, Man. Inj., TCC, VWD, 600 bar	B.06.50	1.1
G4291B	1220 LC Isocratic, Man. Inj., TCC, VWD, 600 bar	B.06.50	No
G4292B	1220 LC Isocratic, ALS, VWD, 600 bar	B.06.50	1.1
G4293B	1220 LC Gradient, ALS, VWD, 600 bar	B.06.50	1.1
G4294B	1220 LC Gradient, ALS, TCC, DAD, 600 bar	B.06.50	1.1
G4288C	1220 LC System VL Gradient, Man. Inj. VWD, 400 bar	B.06.50	No
G4289C	1220 LC System VL Gradient, Man. Inj. VWD, 400 bar	B.06.50	No
G4290C	1220 LC System VL Gradient, ALS, TCC, VWD, 400 bar	B.06.50	1.1
G4293C	1220 LC System VL Gradient, ALS, VWD, 400 bar	B.06.50	1.1

Capillary Electrophoresis

Module No.	Module Name	Min. Firmware	Agilent Drivers for Chromeleon 7
G7150A	G7100 Capillary Electrophoresis II	B.06.25	No
G7151A	Diode Array Detector for CE	B.06.25	No

Driver Add-Ons and Special Driver Features

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
Additional Driver Features	External Contacts Board G1351A		1.1
	Blend Assist		Not supported
	ISET G2197AA I		1.1
	ISET G2197AA II		1.1
	ISET G2197AA III		1.1
	ISET G2197AA IV		1.1

Module No.	Module Name	Min. Firmware	Min. version of Agilent Drivers for Chromeleon 7
Special Solutions	Buffer Advisor (G5617AA)	No	1.1 (Import Buffer Files)
	2DLC (G2198AA)	No	No
	Method Scouting Wizard (G2196AA)	No	No
	Automated Purification Software (M8368/M8369AA)	No	No

In This Book

This manual contains information for the installation and use of the Agilent Drivers for Thermo Chromeleon 7.

The manual describes the following:

- how to install the Agilent Drivers
- how to configure the instrument
- how to run injections
- the handling of methods
- how to troubleshoot

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