Agilent

Agilent Drivers for Thermo Chromeleon

LC User Guide

Notices

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1 Introduction and Scope

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Introduction 7

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 ADC	Agilent Drivers for Thermo Scientific Chromeleon 7
Chromeleon	Thermo Scientific Chromeleon 7 Chromatography Data System (CDS)
Thermo Fisher	Thermo Fisher Scientific
DDK	Driver Development Kit (from Thermo Fisher Scientific)
ICF	Agilent Instrument Control Framework
CDS	Chromatography Data System

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 Agilent Drivers have been developed to support 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

Chromeleon is the acting Data System and hosts the integration of the Agilent Drivers.

The Agilent Drivers are a subcomponent controlling the communication to the Agilent Instrument. Chromeleon coordinates the communication and interaction with the Agilent Drivers.

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

2 Compatibility and Requirements

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This chapter contains important information about compatibility and the requirements.

NOTE For a complete overview of hardware and software requirements, see the *Release Notes for Agilent Drivers for Thermo Scientific Chromeleon 7*.

Chromeleon CDS/Agilent Driver Compatibility

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

X:\Chromeleon YZ\Packages\Agilent Chromeleon Driver

where X is the drive letter of the DVD drive and YZ is the Chromeleon version.

Software Components Required

NOTE Refer to "Installation of the Agilent Drivers" on page 14 for detailed information on the installation of the Agilent Drivers in combination with Chromeleon.

The Agilent Drivers comprises two major components:

- Agilent_Drivers_for_Thermo_Chromeleon.msi

  The Agilent Drivers installer is a single executable that includes
  - Agilent Drivers for Chromeleon 7
  - Agilent Instrument Control Framework
  - Agilent Instrument Control Framework - LC Driver
  - Agilent Instrument Control Framework - GC/HS Driver
  - Agilent Instrument Control Framework - ELSD Driver
- SFVtool.msi
  - Agilent Software Verification Tool

    This separate executable installs the Agilent Software Verification Tool (SVT). The SVT executes the installation verification.

The main components for the Agilent Drivers and the SVT are visible in the Windows sections **Program and Features**.

Chromeleon Licenses

The Agilent Drivers for Chromeleon will request a class 3 license for LC instruments and a class 2 license for GC instruments. This is however, dependent on the version of Chromeleon in use. Any Chromeleon version up to and including 7.2.10 MUa and 7.3 will request a class 3 license for a GC where normally only a class 2 would be required. Versions released after these will request the class 2 license as expected. Please contact your Thermo Scientific representative for the correct license if using those versions.

GCs configured in dual sequence mode will request only one license.

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 manuals for full details.

Hardware installation and operation manuals are available on **agilent.com**.

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.

NOTE

Install the same version of the Agilent Drivers on all PCs.

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*.

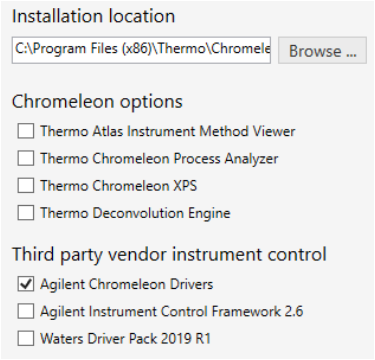

Figure 1 Advanced Options in Chromeleon Installer

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 check box as well.

Manual Installation

The files required for manual installation are located on the Chromeleon DVD in the folder X:\Chromeleon Y.Z\Packages\Agilent Chromeleon Driver, where X is the drive letter of the DVD drive. You can also download the files from the Thermo Fisher support pages. For instructions, contact Thermo Fisher.

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

If you received the Agilent Drivers as a stand-alone installer you can follow the same steps described below.

Manual Installation of the Software Verification Tool

1 Double-click the file SFVtool.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.

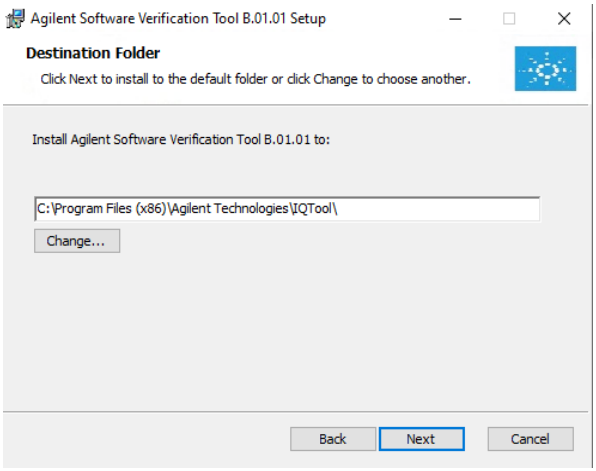

Figure 2 **Installation location for the SVT**

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.

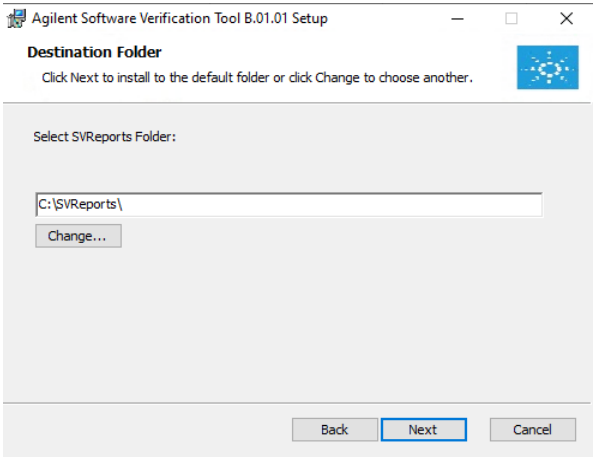

Figure 3 **Location for resulting verification reports**

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.

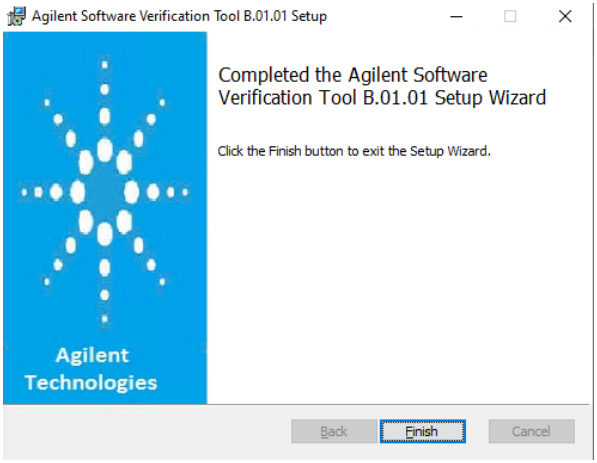

Figure 4 **Final Wizard Screen of the SVT installation**

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

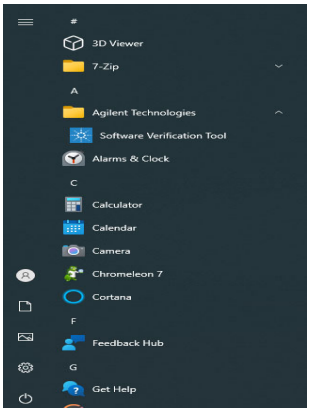

Figure 5 The SVT in the Windows Start Menu

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.

2 On the upcoming setup screen, accept the license terms and continue with **Install**.

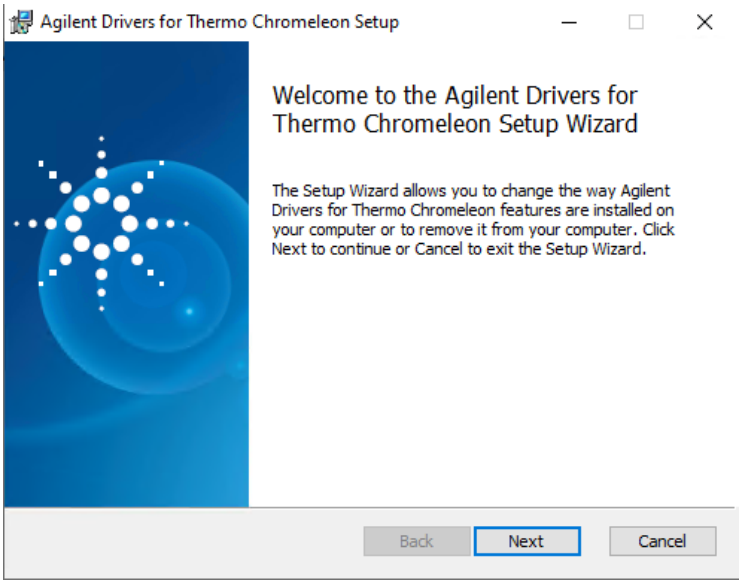

Figure 6 Accept license terms

3 Click **Yes** on the user account control to allow the installation of the Agilent Drivers.

4 To finalize the installation, click **Finish**.

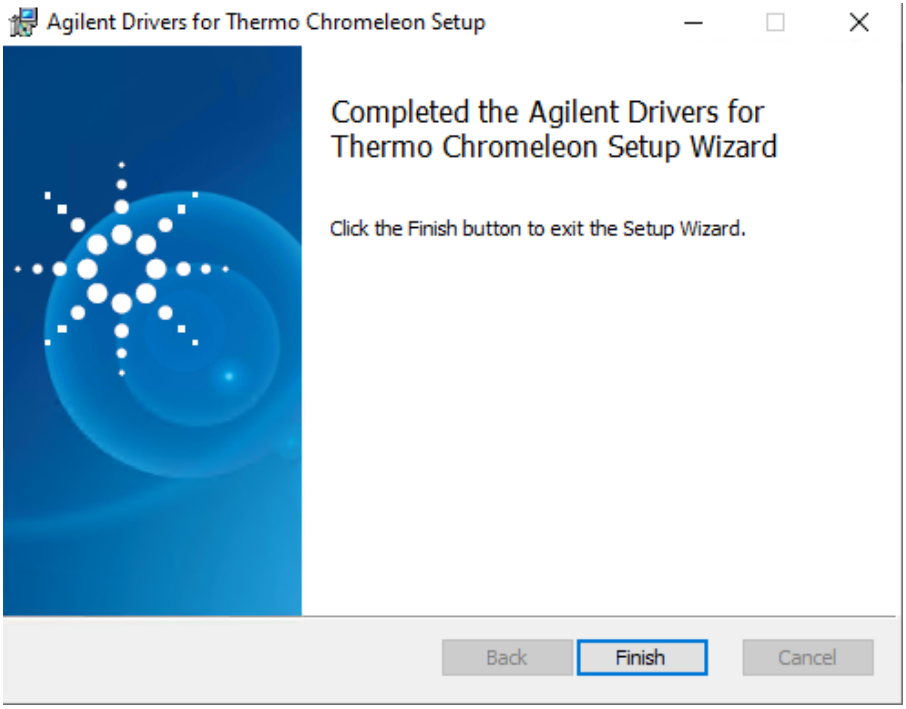

Figure 7 Finalize installation

The final location for the files for the default installation is C:\Program Files (x86)\Agilent Technologies\Agilent Drivers for Thermo Chromeleon (64 bit Windows).

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.

In order to check the successful installation of the Agilent Drivers and its subcomponents, execute SVT.

NOTE The Chromeleon IQ also verifies the driver installation. You can use either tool.

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**.

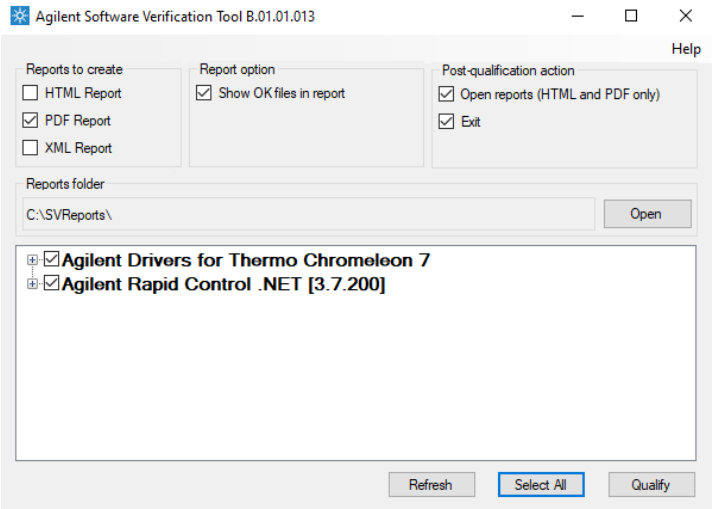

Figure 8 **Software Verification Tool dialog box**

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 Report:

Software Verification Report

Date:	Dienstag, 16. November 2021	**Time:**	11:22:23 [UTC +01:00:00]	**Host Name:**	3P-WIN10-R
Windows User Name :	locAdmin	**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 2.5.5
10004	Agilent Instrument Control Framework 2.6.37
10005	Agilent Instrument Control Framework - LC Drivers 2.19.205.0
10015	Agilent Instrument Control Framework - ELSD Drivers Version A.01.07 [19]
10028	Agilent Instrument Control Framework - GC-HS Drivers 3.6 [181]

Figure 9 **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 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 in silent mode by executing the following commands in the command console. Make sure to log on to the PC with a local Administrator account and administrative privileges. Start the command line with **Run as administrator**.

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

NOTE The installation can only run if the Temp folder exists beforehand. It is not created at runtime. Instead, the installation is aborted. Create folder C:\Temp.

- 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 7"`

  The command runs the SVT silently with the command window hidden and saves the report in html format (default option) for the selected product(s). It does not open the report.

- `SFVTool.exe -qt -p:"Agilent Drivers for Thermo Chromeleon 7"`

  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 7" -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-Execution with Other Drivers

Agilent Drivers 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*

  developed by Agilent, integrated by Agilent using the Chromeleon DDK adapter and certified by Thermo Fisher Scientific.
- *Agilent*

  Agilent ICF Interface provided by Agilent and integrated into Chromeleon by Thermo Fisher Scientific.
- Obsolete *Agilent/HP*

  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. These drivers are on the installation medium for compatibility purposes and should not be used.

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

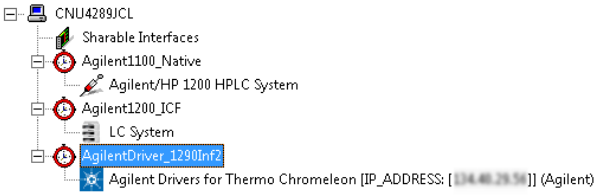

Figure 10 Possible configurations

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

NOTE Mixed LC instrument stacks are only supported for Thermo Fisher Scientific Corona Veo and WPS-3000.

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

As the Agilent Drivers 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	08.02.2019	279 MB	2.0.35
Agilent Instrument Control Framework - GC/HS Drivers A.03.02	Agilent Technologies	07.09.2018	260 MB	3.2.103
Agilent Instrument Control Framework - LC Drivers A.02.14	Agilent Technologies	07.09.2018	111 MB	2.14.115
Agilent Instrument Control Framework A.02.04	Agilent Technologies	07.09.2018	49,4 MB	2.4.124

Figure 11 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**
   - **Agilent**
6. Select the **Agilent Technologies** option in the **Manufacturers** panel.

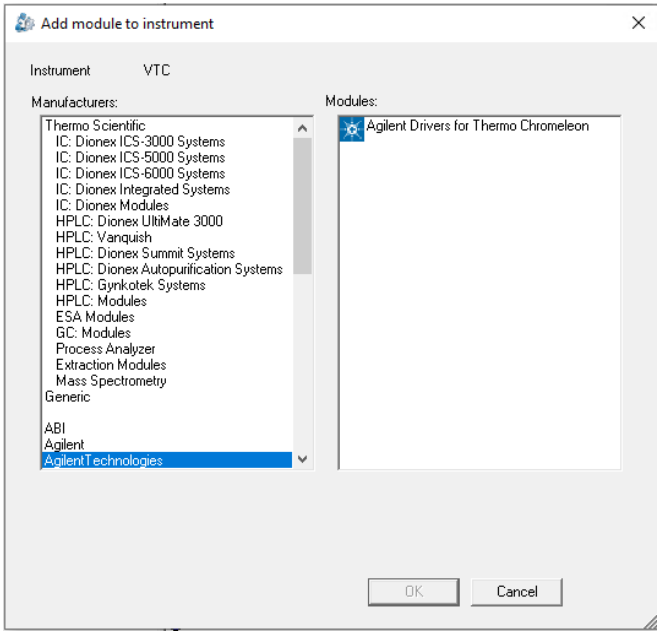


Figure 12 **Add modules using Agilent Drivers**

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**: The license is automatically pulled if available for 3D modules.
- **Script not fully supported**: This option is disabled for LC instruments.
- **Enable Dual Sequence**: This option is only available for GC instruments.
- **Convert mAu to µAU**: This option converts all 2D signals of unit mAU to µAU.

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.

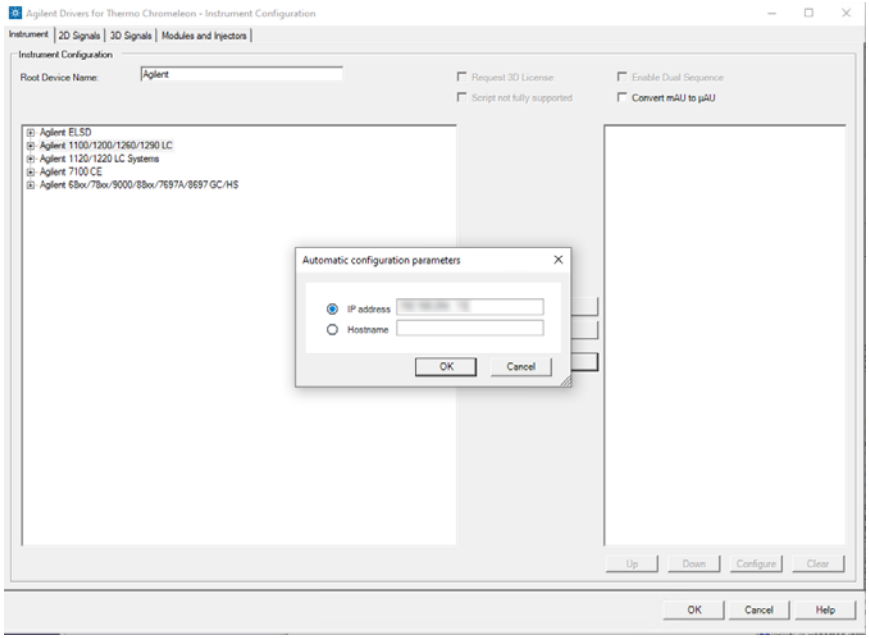


Figure 13 Auto Configuration

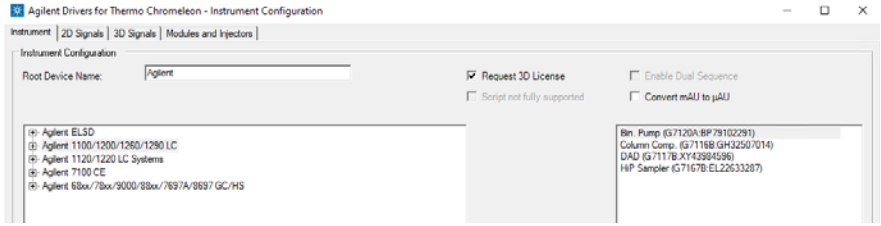


Figure 14 Auto Configuration result

Cluster Support:

The Agilent LC system offers the possibility to cluster dedicated modules. 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.

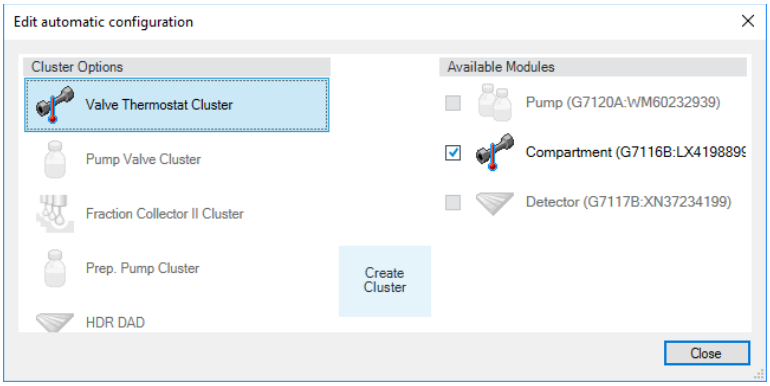


Figure 15 Cluster Configuration window

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 are available.

During the Auto Configuration, the system automatically detects the current configuration of the modules.

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.

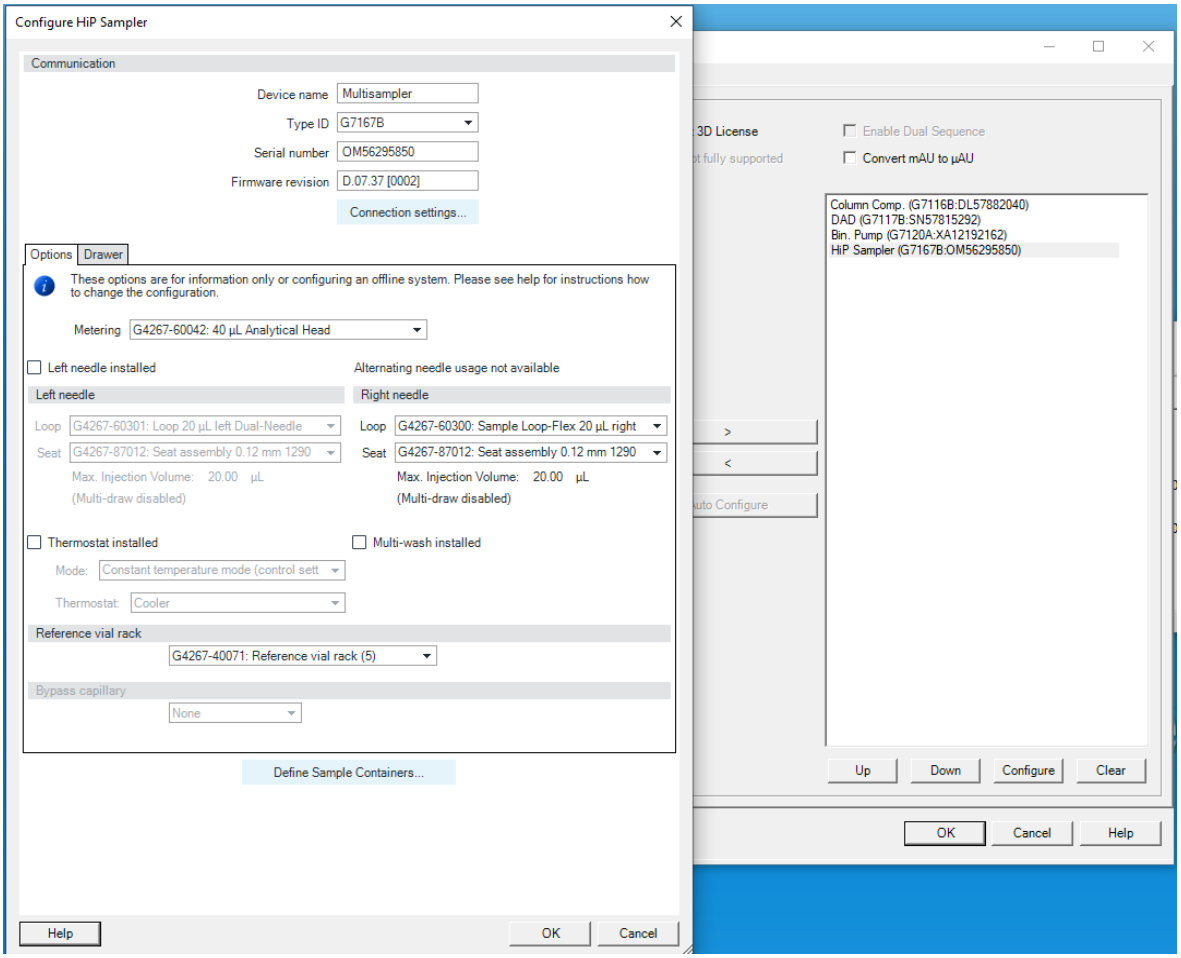


Figure 16 Module configuration

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.

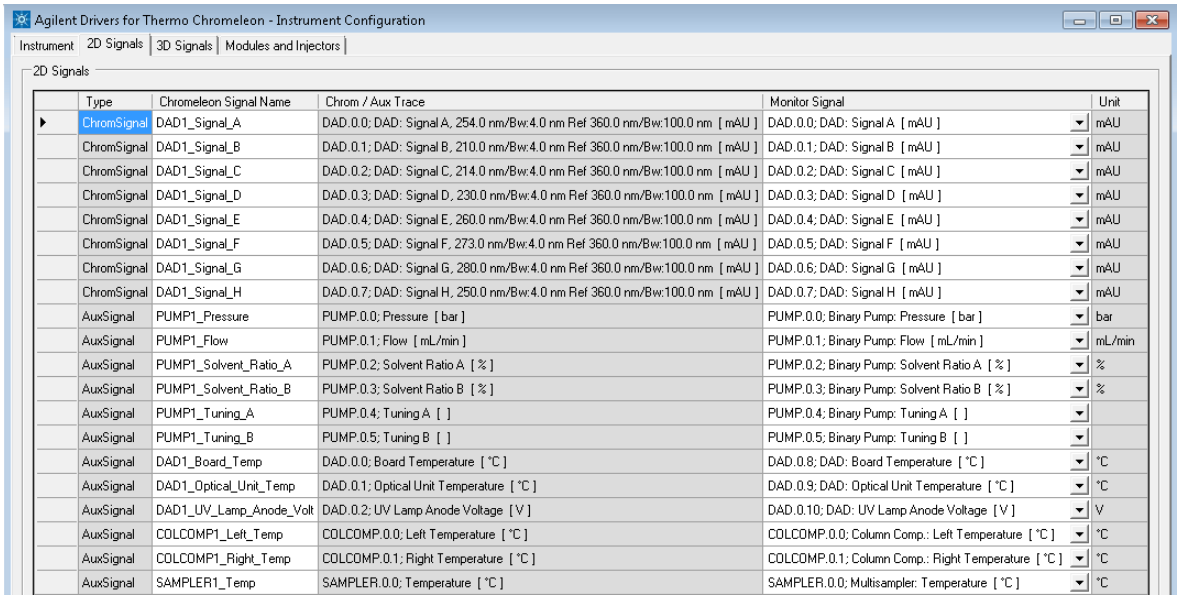
NOTE When the instrument configuration is changed, be sure to reconfigure the module in the **Chromeleon Instrument Configuration Manager** and to restart the **Chromeleon Console**.

NOTE

Changes to the instrument configurations can lead to a change of the available method parameters (for example, when adding the cooler option, additional temperature method parameters can be set). If you change the instrument configuration, you need to reconfigure and restart the **Chromeleon Console**.

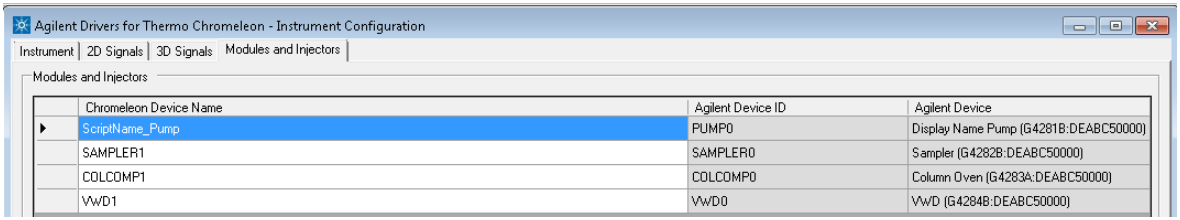
12 On the **2D Signals** and **3D Signals** tabs, and the **Modules and Injectors** tab, review all automatically assigned signal and module names for correctness. As these names are used in the Chromeleon command structure, they must conform to the Chromeleon naming restrictions. For example,

- 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 17 Naming configurations



Chromeleon Device Name	Agilent Device ID	Agilent Device
ScriptName_Pump	PUMP0	Display Name Pump (G4281B:DEABC50000)
SAMPLER1	SAMPLER0	Sampler (G4282B:DEABC50000)
COLCOMP1	COLCOMP0	Column Oven (G4283A:DEABC50000)
VWD1	VWD0	VWD (G4284B:DEABC50000)

Figure 18 Device names

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

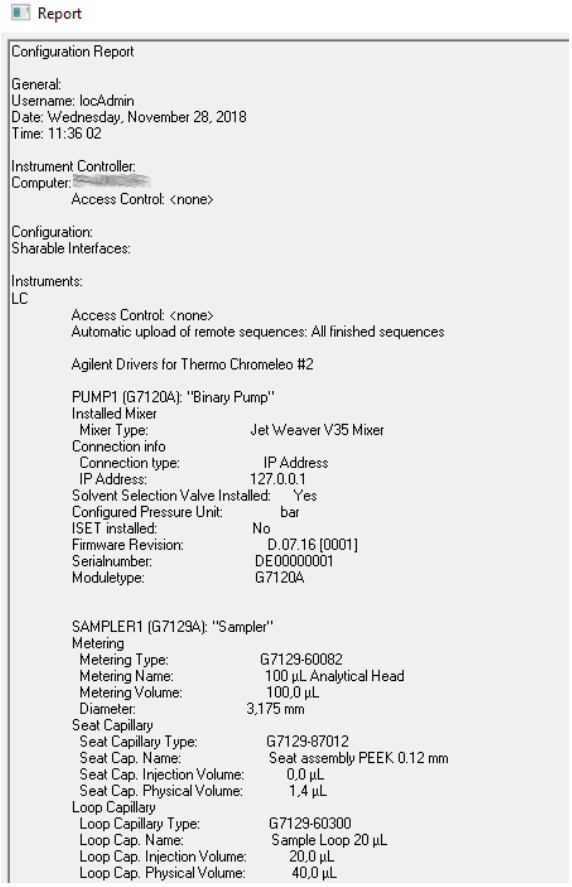
13 Leave the instrument configuration screen by clicking **OK**.

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. The configuration report lists absorbance unit signals according to the configuration settings as either mAU or µAU.

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



```
Report

Configuration Report

General:
Username: locAdmin
Date: Wednesday, November 28, 2018
Time: 11:36 02

Instrument Controller:
Computer:
        Access Control: <none>

Configuration:
Sharable Interfaces:

Instruments:
LC
        Access Control: <none>
        Automatic upload of remote sequences: All finished sequences

        Agilent Drivers for Thermo Chromeleo #2

        PUMP1 (G7120A): "Binary Pump"
        Installed Mixer
          Mixer Type:                Jet Weaver V35 Mixer
        Connection info
          Connection type:             IP Address
          IP Address:                127.0.0.1
        Solvent Selection Valve Installed:   Yes
        Configured Pressure Unit:          bar
        ISET installed:              No
        Firmware Revision:             D.07.16 [0001]
        Serialnumber:                DE00000001
        Moduletype:                  G7120A


        SAMPLER1 (G7129A): "Sampler"
        Metering
          Metering Type:             G7129-60082
          Metering Name:             100 µL Analytical Head
          Metering Volume:           100,0 µL
          Diameter:                3,175 mm
        Seat Capillary
          Seat Capillary Type:       G7129-87012
          Seat Cap. Name:            Seat assembly PEEK 0.12 mm
          Seat Cap. Injection Volume:   0,0 µL
          Seat Cap. Physical Volume:    1,4 µL
        Loop Capillary
          Loop Capillary Type:       G7129-60300
          Loop Cap. Name:            Sample Loop 20 µL
          Loop Cap. Injection Volume:   20,0 µL
          Loop Cap. Physical Volume:    40,0 µL
```

Figure 19 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 20 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, a warning appears and the setting must be corrected before the dialog box can be closed.

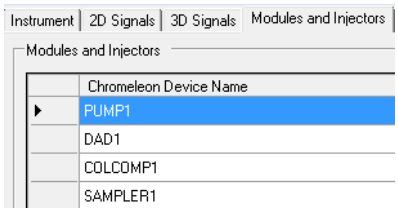


Figure 21 Chromeleon Device Name

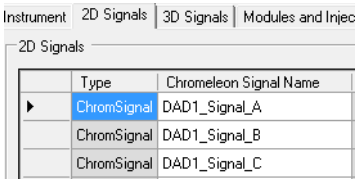


Figure 22 Chromeleon Signal Name

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.

Micro Absorbance Units

All 2D signals of unit mAU can be converted to micro absorbance units. This setting can be applied per instrument and all 2D signals of unit mAU are converted. Select the **Convert mAU to µAU** check box during instrument configuration to enable the conversion. This will convert the signals to µAU automatically and update the change is reflected in the unit column of the 2D signals table and the configuration report.

The converted unit is available in signal plots and calculations. The method UIs of Agilent detectors, status dashboards, the method script, audit trail, and method report still use the mAU unit.

In client server environments Agilent Drivers version 2.5 or later must be installed on client and server. Using the feature in environments with Agilent Drivers lower than version 2.5 is not supported.

Name appearance in the Chromeleon Console

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

Agilent Device Name (**Chromeleon Device Name**)

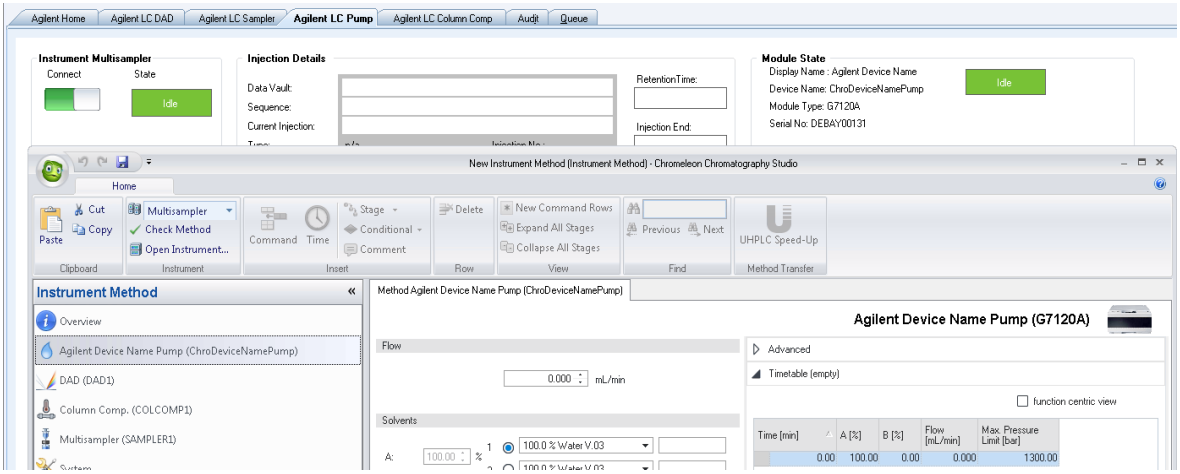


Figure 23 Naming in graphical components

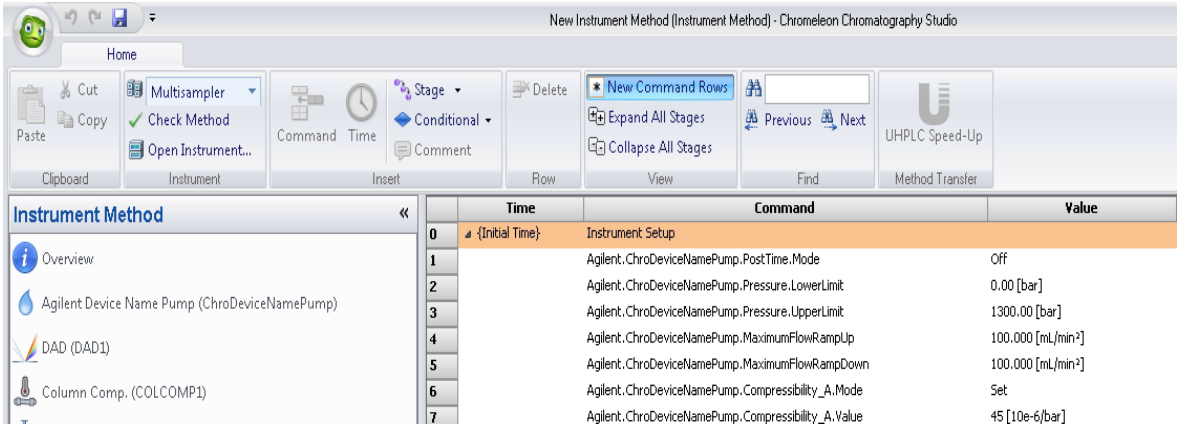


Figure 24 Naming in method script

5 Getting Started

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

Direct Control of the Instrument

The Agilent Drivers offer two ways to control the instrument:

- “Agilent Home” ePanel
- Module ePanels (only for LC modules)

“Agilent Home” ePanel

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

This ePanel is available for LC, CE, and GC/HS instruments.

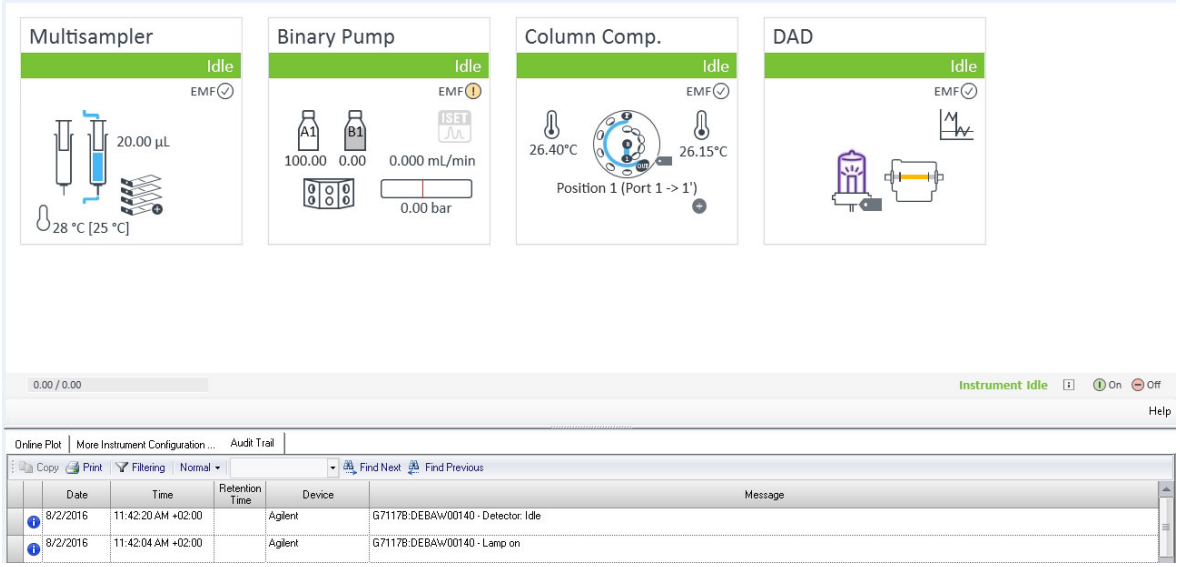
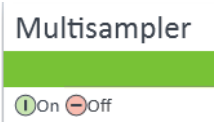


Figure 25 LC status dashboard with Audit Trail

All modules on the Status Dashboard must be in *ready* state 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 Drivers 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:

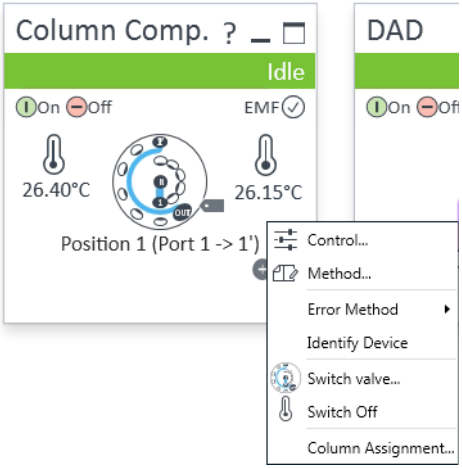


Figure 26 Module Tile

Control	enables change of current instrument control parameters. These 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 Status Dashboard

Changes to the instrument configurations can lead to a change of the available method parameters (for example, when adding the cooler option, additional temperature method parameters can be set). If you change the instrument configuration, you need to reconfigure and restart the **Chromeleon Console**.

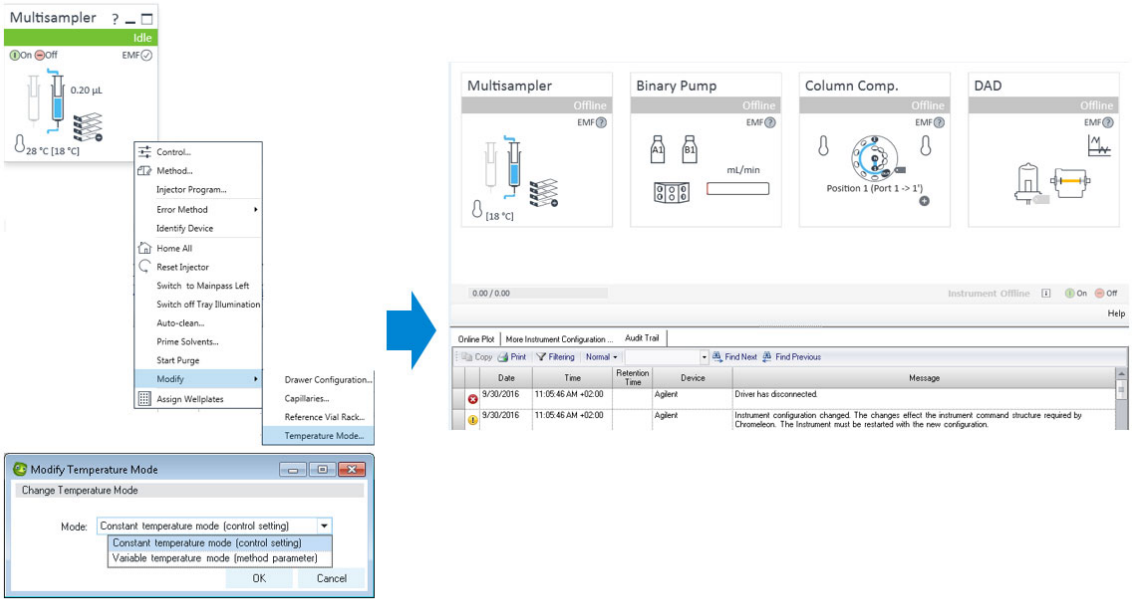


Figure 27 Configuration change in LC Status Dashboard affecting the structural Chromeleon Commands

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)
- GCs and headspace samplers

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

Module ePanels for GC, HS, and CE are not available.

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.

In Chromeleon **Expert Mode**, 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 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 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! Slit is not allowed to be changed during run.
8/1/2016	2:41:49 PM +02:00	1.793	Agilent.DAD1	Agilent.DAD1.Slitwidth = 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

Direct actions are the commands that are listed in the control menu of the dashboard panels. This capability is available for expert users only. Some direct actions, such as **Balance**, can be added to ePanels. Direct actions should not be added to the method script. If you have to add a direct action in the method script, then do not add it between the **Start Run** and **Stop Run** commands. An exception are the TurnOn and TurnOff commands when using shutdown methods.

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

Method Script and Command Tree

The command tree is only available for LC instruments. GC/HS instruments offer a basic method script. It is not possible to set method parameters in the method script.

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 as shown, This method can then be used in the last line of a sequence. It is not possible to use the turn off command as a post-run command to a regular 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

LC 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.
3 Select diagnostic channels.
4 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.

5 Be sure to enable, for example, required solvent channels by marking the corresponding check boxes.
6 For detector signals (DAD, MWD, VWD, FLD, RID) ensure that **Acquire** is checked for the signals of interest.
7 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.

8 Enter a comment and description as required and click **Finish** to complete the wizard.

9 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.

10 Run **Check Method** to ensure the method is valid.

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.

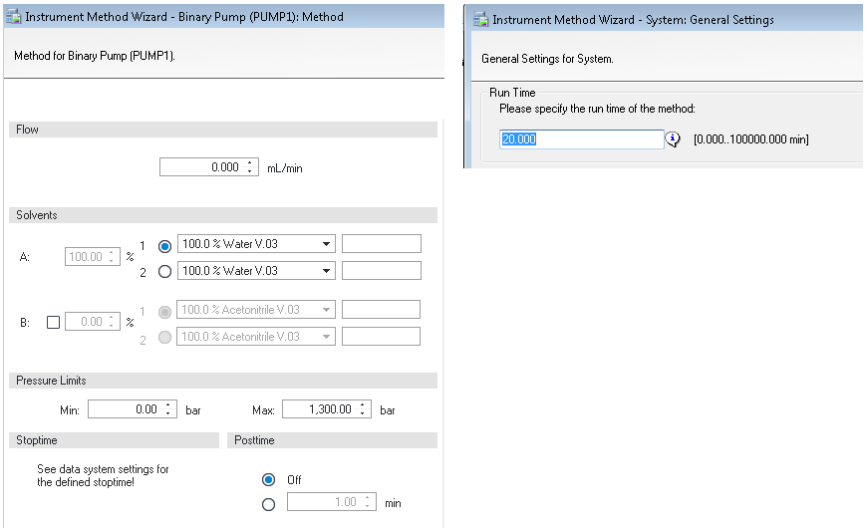


Figure 30 Agilent Module Stoptime (left) and Chromeleon Run Time (right)

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 than 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.

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 defined in the sequence only; therefore, the samplers do not offer the injection volume as a parameter entry. It is possible to add **Volume** and **Location** manually in the method script as Inject Command parameters.

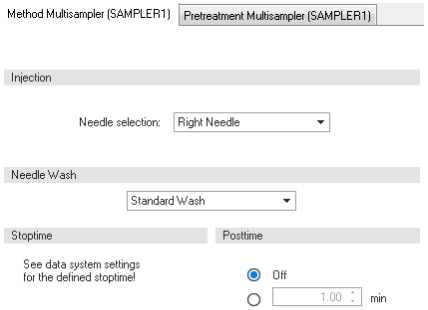


Figure 31 Sampler method screen without injection volume

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 inject command line 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**.

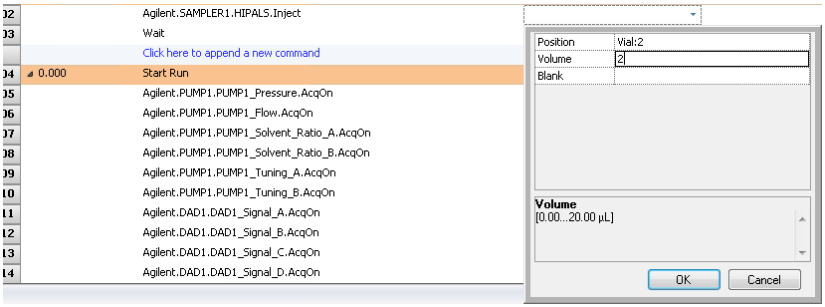


Figure 32 Manual edit of the method script

Graphical Instrument Method versus Instrument Method Script

The Agilent Drivers 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.

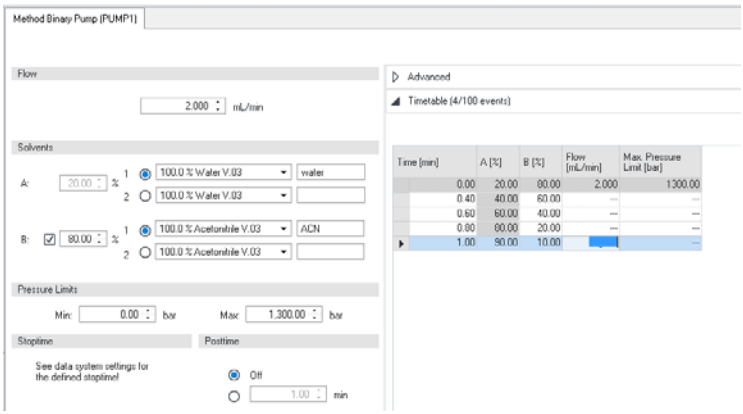


Figure 33 Graphical method screen

- 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.Prerun	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

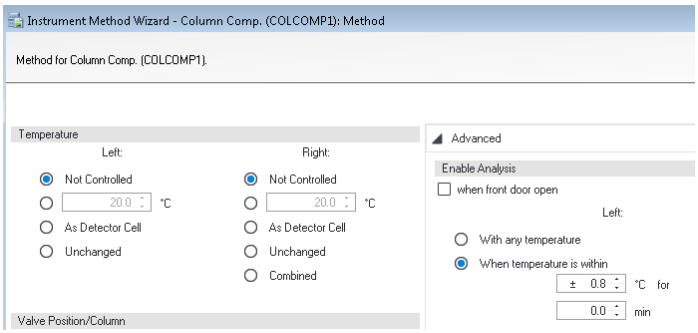


Figure 36 Graphical method screen — parameter

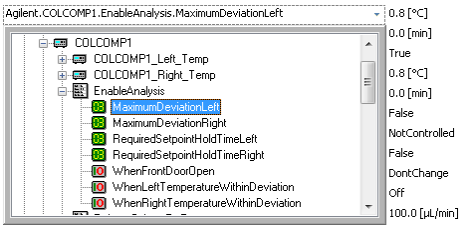


Figure 37 Method script — grouped parameters follow the graphical method screen

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

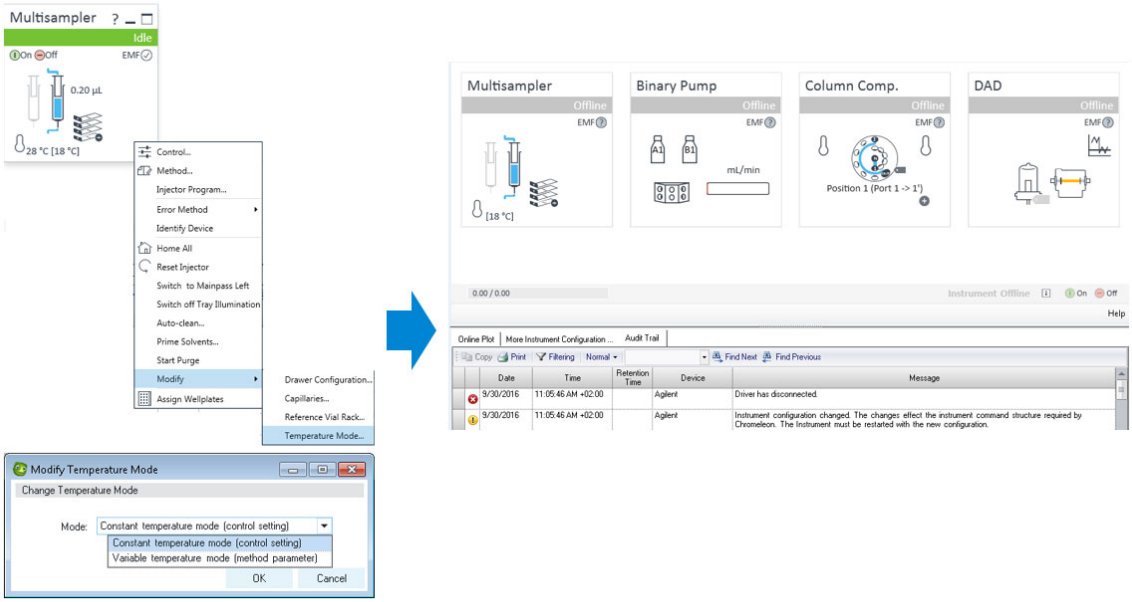
NOTE

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 55).

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.

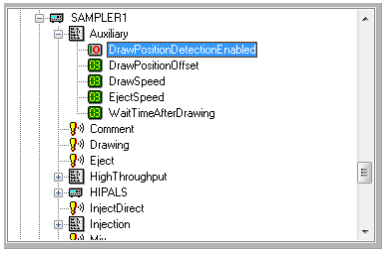


Figure 40 Example of parameter grouping

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.

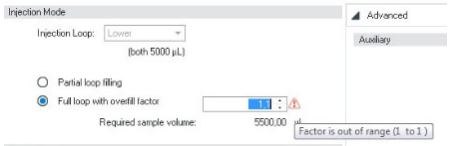


Figure 41 Restriction in graphical method interface

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.

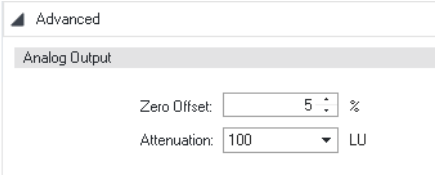


Figure 42 FLD Analog Output in the method user interface

```
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:

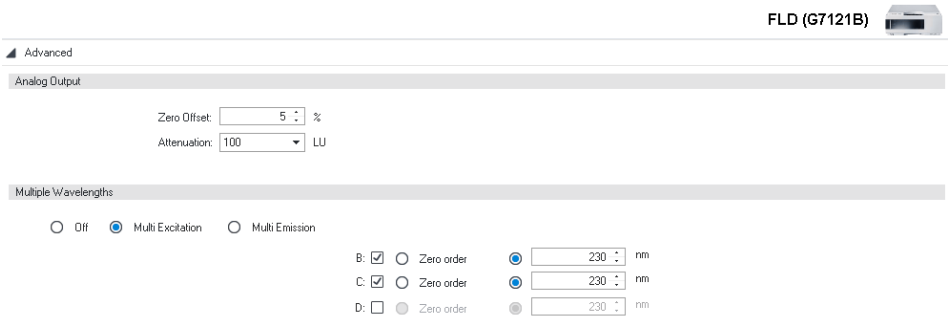


Figure 44 FLD Multiwavelength Setting in the method user interface

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

Method Migration

In case of a method migration, the method will be resolved to the new configuration. To keep the original method, save the method under a new name or abort.

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 or 2.0, 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 introduced 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.

Instrument methods for GCs (7890B, 8890, Intuvo 9000) created prior to version 2.3 of the Agilent Drivers for Thermo Chromeleon include two **Run Diagnostic Data** channels. Versions 2.3 and later of the Agilent Drivers for Thermo Chromeleon only use one **Run Diagnostic Data** channel to provide the same information. It is necessary to update the GC instrument methods manually to adjust for the change in the driver.

After opening the instrument method, the Chromeleon method translation tool starts automatically. Select **Adjust Manually** and open the method script. Delete the two command lines highlighted in red and save the method.

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 or 2.0. 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.

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	
		Agilent.PUMP1	A% will consume 0 ml in total.
		Agilent.PUMP1	B% will consume 0 ml in total.
		Agilent.PUMP1	C% will consume 0 ml in total.
		Agilent.PUMP1	D% will consume 0 ml in total.

Figure 46 Solvent Consumption Calculation

Manual Injection on LC Instruments

Configuration

Parts required

	#	p/n	Description
	1	G1328A	1100 Series Manual Injector, 400 bar
OR	1	G1328B	1200 Series Manual Injector, 400 bar
OR	1	G1328C	Agilent 1260 Infinity II Manual Injector , 600 bar
OR	1	G1328D	Agilent 1260 Infinity II Manual Preparative Injector, 600 bar
OR	1	G5628A	Agilent 1260 Infinity II Bio-inert Manual Injector, 600 bar

Preparations

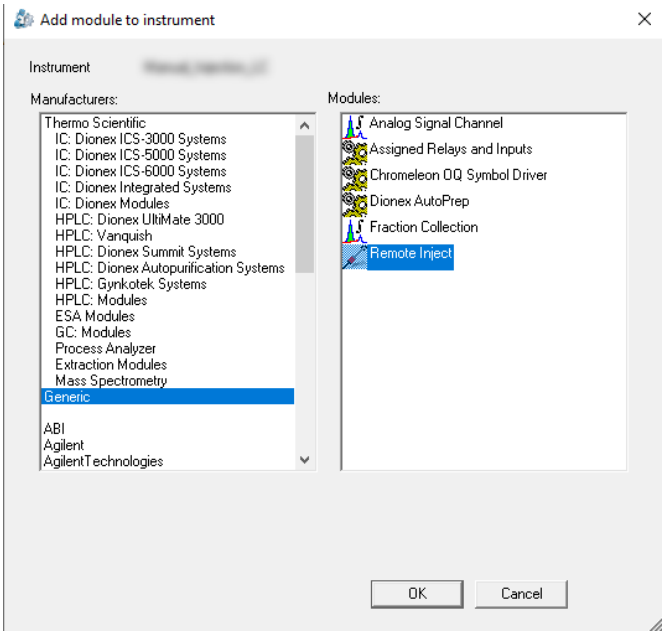
Connect the valve to the LC instrument.

NOTE

The Thermo Fisher Remote Inject driver only supports injections volumes up to 2000.0 µL.

1. Start the Chromeleon Instrument Controller Service.
2. Open the Chromeleon Instrument Configuration Manager.
3. Select the instrument to which the manual injection valve is connected.
4. Click **Add Module**.
5. Select **Generic** from the manufacturers list.

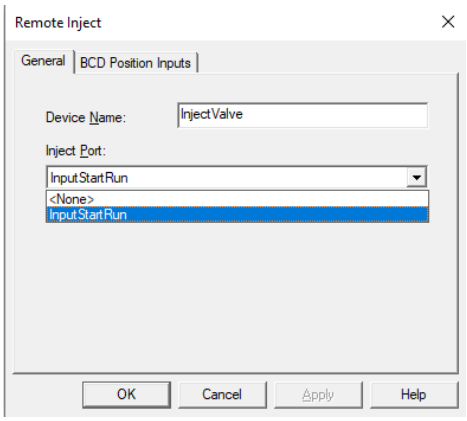
6 Select **Remote Inject** from the modules list.



7 Click **OK**.

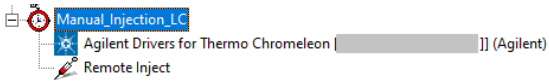
[OPTIONAL] 8 Enter a name for the valve.

9 From the **Inject Port** drop-down list select **InputStartRun**.



10 Click **OK**.

The **Remote Inject** driver is now added to the instrument configuration.



11 Save the instrument configuration.

Using the Manual Injector

The manual injector is not controlled by the software, therefore it does not show up as its own tile in the status dashboard. Only modules that are controlled by the software are shown, for example pumps and detectors.

Creating a Method

1. Open the Chromeleon console.
2. Start the Chromeleon instrument method wizard.
3. [OPTIONAL] Select the instrument used for manual injection and click **Next**.
4. [OPTIONAL] Select the manual injection valve from the list of injectors.
5. Set the desired method values.
6. Save the method.

Running the Method

1. Create a sequence.
2. Select a method that uses the manual injection valve.
3. Start the sequence.

   The first instrument method in the sequence is downloaded to the LC.
4. Wait until the LC is ready for injection.
5. Switch the manual injection valve to the **Load** position.
6. Inject the sample into the sample loop.
7. Switch the valve to the inject position.

NOTE When switching the valve to the inject position, the LC immediately changes into running state. Make sure all required setpoints, for example column temperature, are reached before switching.

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

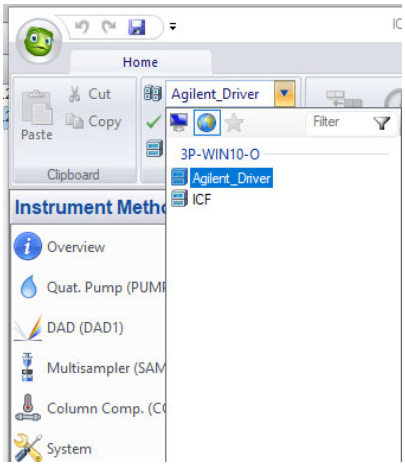
Method Migration

Migrating LC Methods

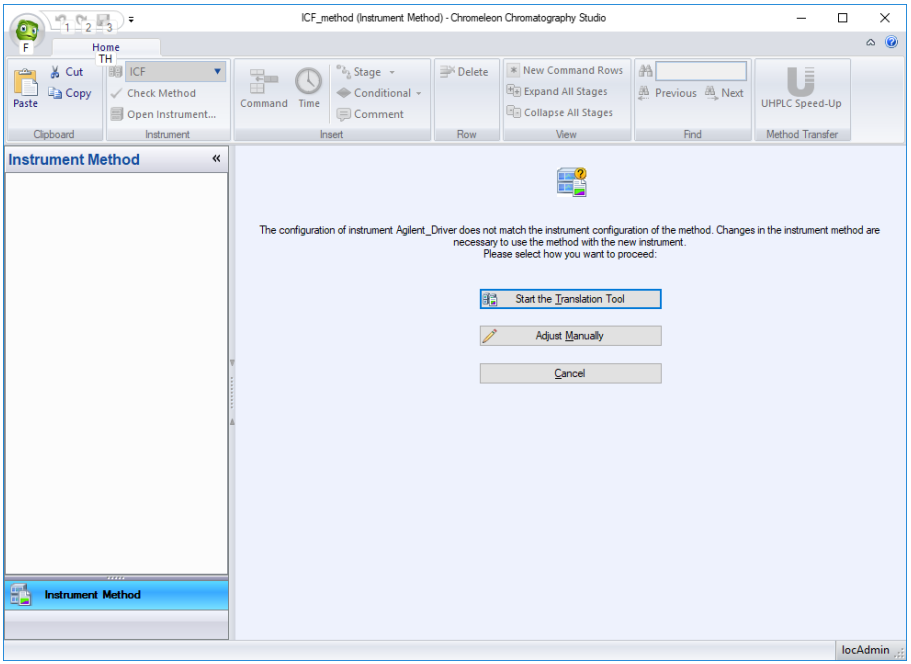
Methods created with native drivers or ICF can be migrated to Agilent Drivers. Also, methods created on one instrument can be migrated to an instrument with a different configuration. Opening a method created with native drivers, ICF or a configuration different from the current configuration starts a method migration and resolution process.

The method translation tool introduced to Chromeleon 7.2.8 by Thermo Scientific is currently not supported. To migrate anyway, you have to click **Adjust Manually** in the transfer tool.

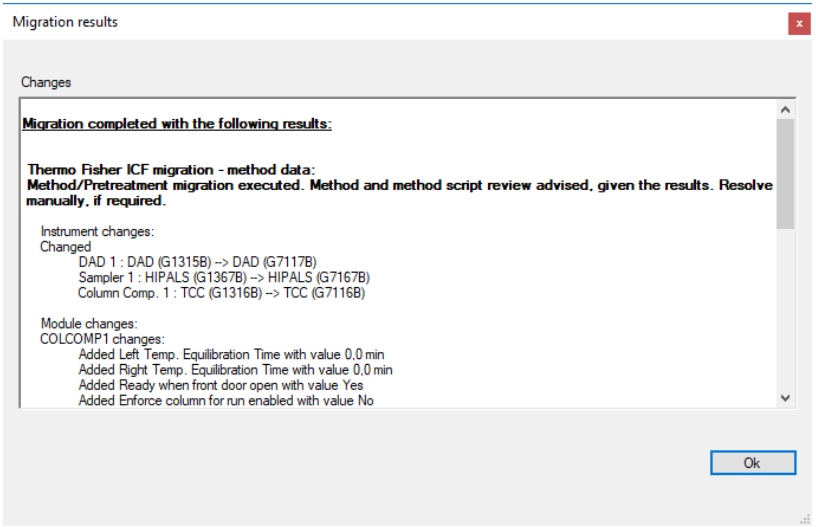
1 Open the method in the method editor and select the new instrument from the drop-down list.



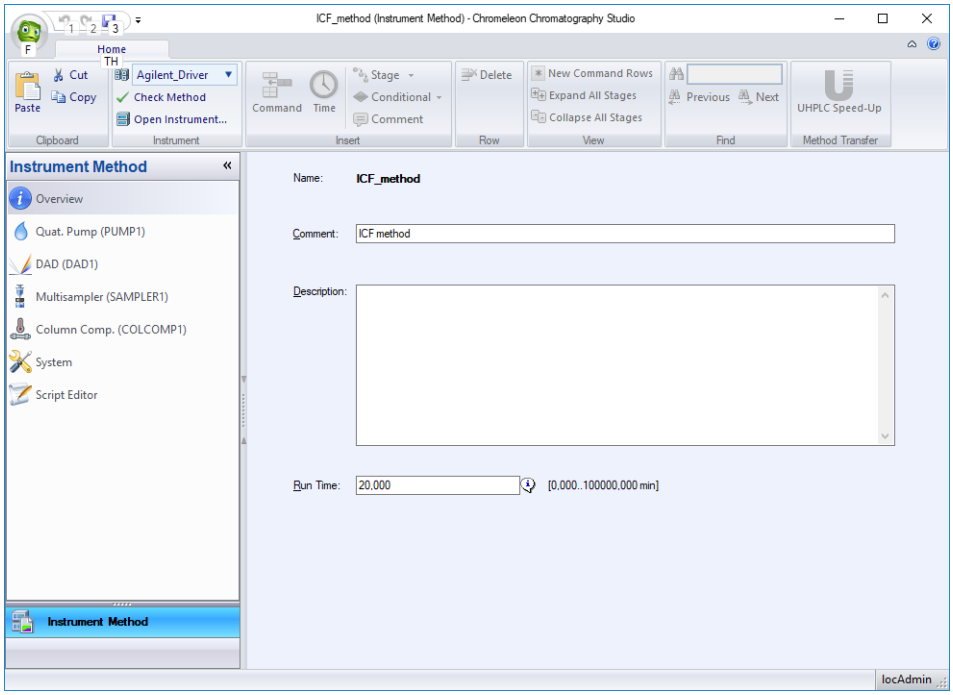
2 Select **Adjust Manually** to start the automatic method resolution.



After the automatic method resolution finishes, the **Migration results** window opens.

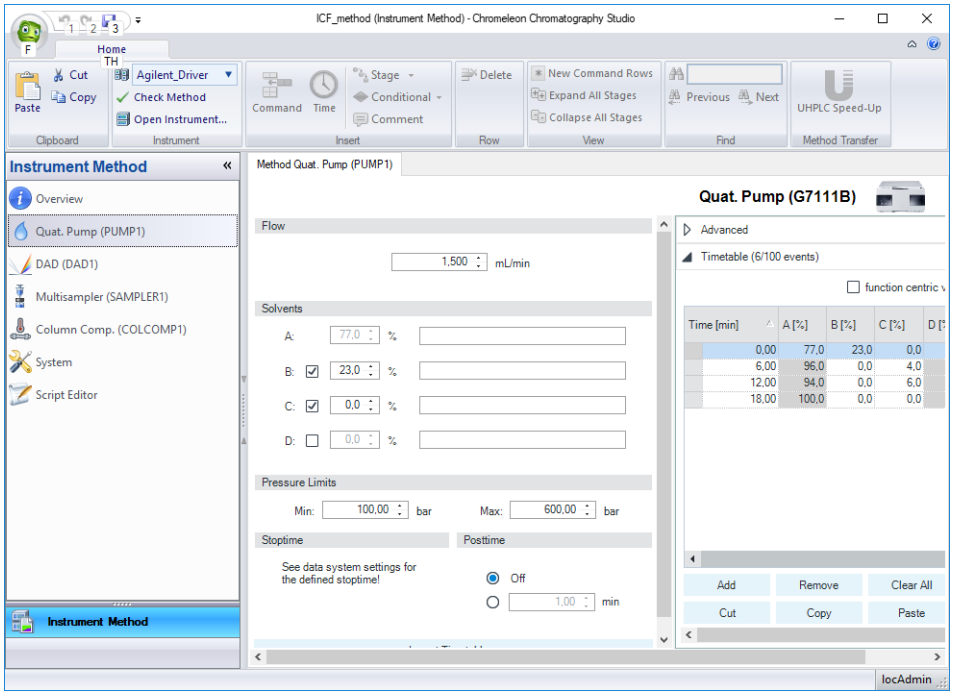


3 Click **OK** to open the migrated method in the method editor.



4 Select every individual module. A window opens and displays all settings that are currently not part of the method script. Click **Ok.**

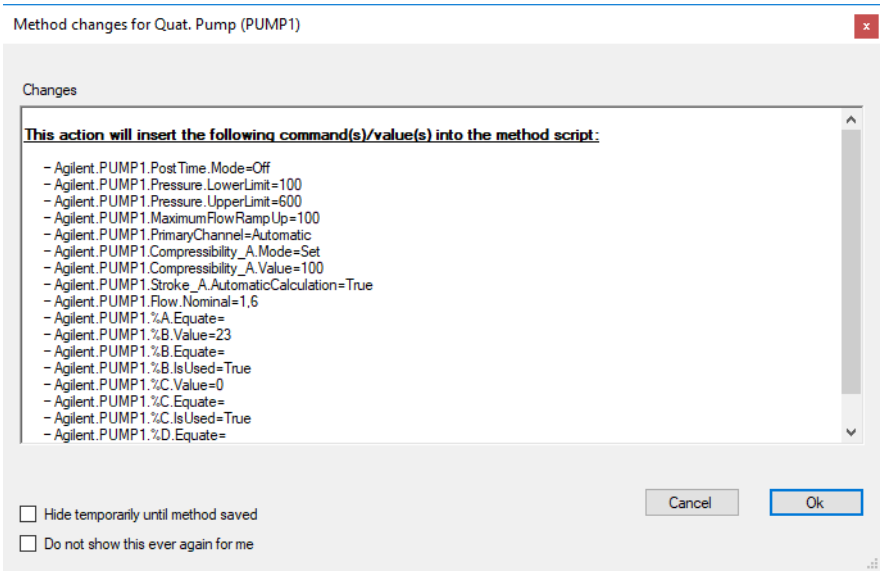
5 The migrated method is displayed for the individual module. You can now make the necessary changes.



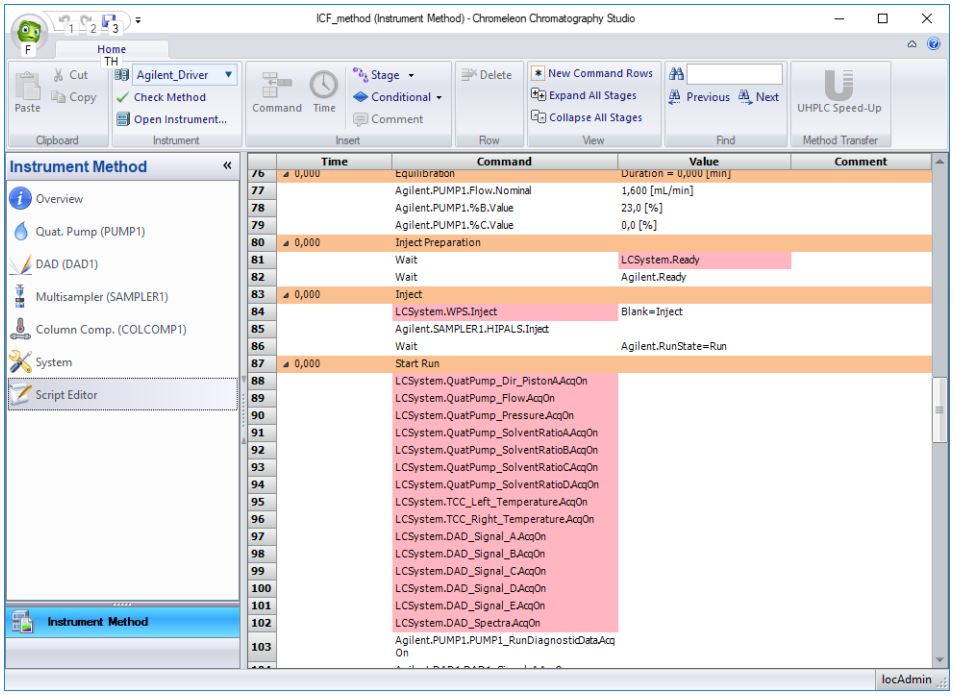
NOTE

The method script is only updated after a change was made in the method UI. Even if all values are correct it is necessary to change a value and then revert the change for the method script to be updated.

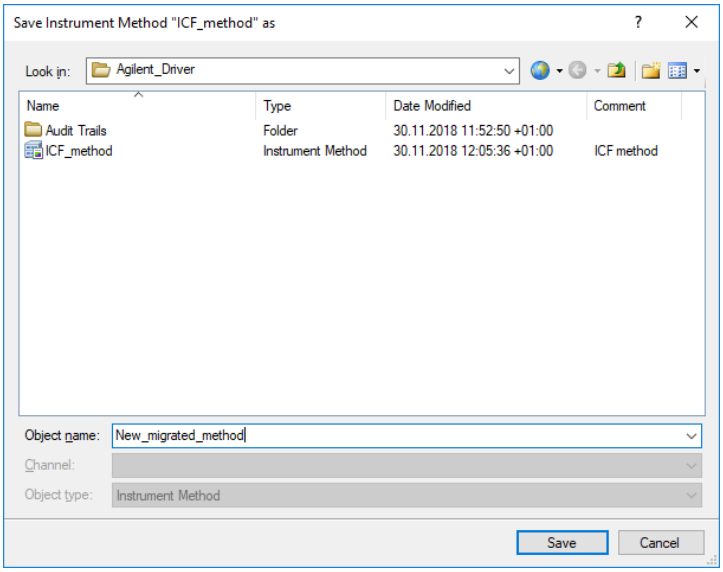
6 When you leave the screen, the method script is generated with the migrated and adjusted settings. Click **OK.**



7 Go to the **Script Editor** and delete all lines highlighted in red. These lines were migrated from the original method and are not automatically removed.



8 Save the migrated method under a new name.



6 Troubleshooting

Instrument Errors 75
Verify Correct Installation of Agilent Drivers 76
Information Required for Troubleshooting 77
Collect the Agilent Instrument Driver Log Files 78

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.

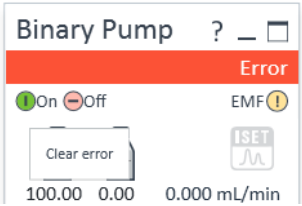


Figure 47 Module in Error state

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 19. If the SVT reports missing file, reinstall the Agilent Drivers in **Start >ControlPanel >Software and Features**.

Information Required for Troubleshooting

Note the instrument configuration.

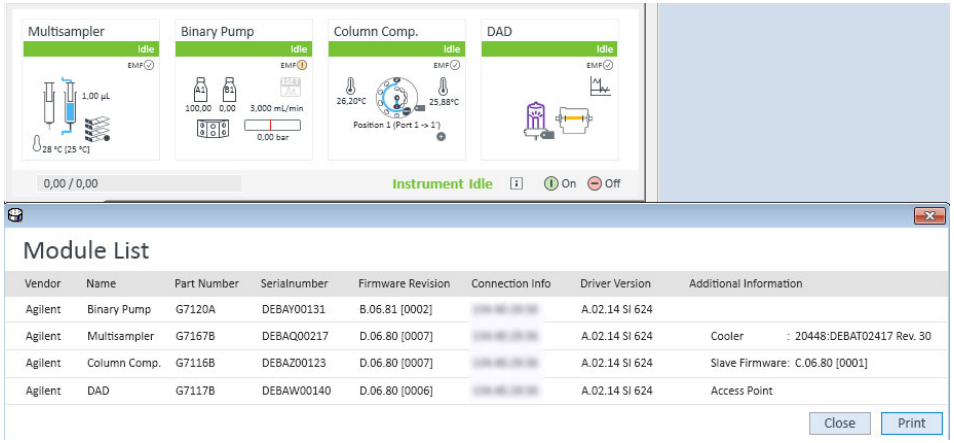


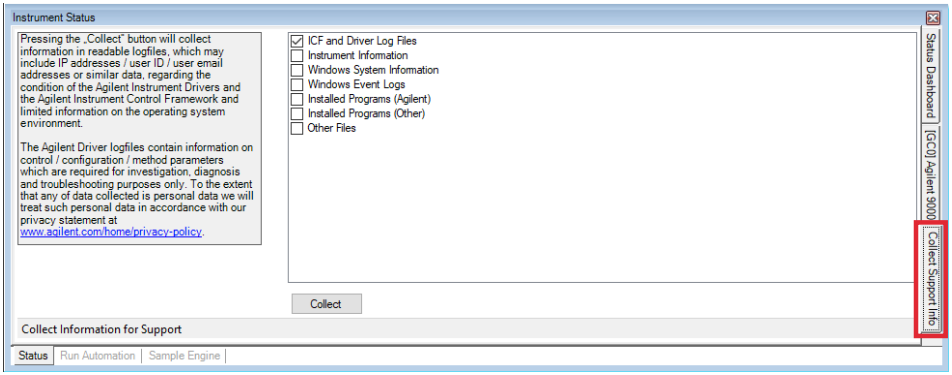
Figure 48 Detailed module information

Collect the Agilent Instrument Driver Log Files

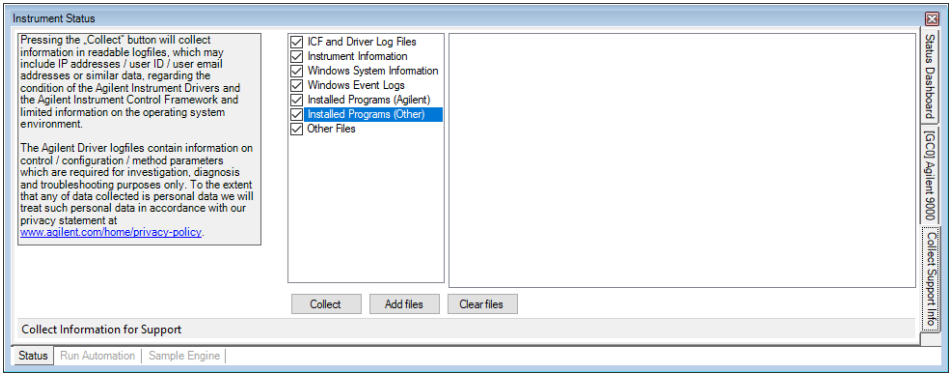
Collect the Support Information

NOTE You must have administrative rights to collect the support information.

1 On the right-hand side of the dashboard select the **Collect Support Info** tab.



2 Select the desired check boxes.



3 Click **Collect**.

4 Select file name and location. Click **Save**.

A zip file is created in the designated folder.

Types of Information

ICF Log Files

Log files created by ICF which underlies the Agilent Drivers. These are always required.

Instrument Information

Collects configuration and status information on the Agilent instruments.

Windows System Information

Collects basic operating system information.

Windows Event Logs

Collects the Windows Application and System logs.

Installed Programs (Agilent)

List of installed Agilent software.

Installed Programs (Other)

List of all installed software, but Agilent Software.

Other Files

Use this to add all files deemed useful. For example, an exported Chromeleon sequence.

7 Known Limitations

This chapter lists the known limitations of the current revision of the Agilent Drivers.

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

Agilent Drivers do 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.

Limited support for mixed module configurations

Mixing of third party modules with Agilent LCs has only been tested for Thermo Fisher WPS and Corona Veo modules. Mixing with other modules is not supported. GC instruments do not support mixing with modules from third party vendors.

Headspace sequence size limitation

Sequences using the 7697A headspace sampler should be restricted to 111 lines or less. Sequences using the 8697 headspace sampler should be restricted to 48 lines or less. Longer sequences or sequences with many extractions per line may result in high CPU usage of the Chromeleon Console. Additionally, following warning may be written to the audit trail:

Client response for 'Get Status Xml' could not be returned because limit of 1MB is exceeded

In this case, the number of extractions or sequence lines should be reduced.

Intuvo 9000 GC maintenance functions not available inside CDS

Agilent Drivers do not provide access to GC maintenance functions. Therefore, Chromeleon cannot offer any functionality for diagnostics. Maintenance functions are accessible via the instrument front panel.

G7100 CE Limitations

The G7100 CE instrument does not have a predefined ePanel. Furthermore, the ePanels of LC pumps and DADs are not loaded when configured along a CE instrument. The Agilent Home ePanel is still available. As the CE integration in ADC only provides a minimal set of commands there is no functionality that can be made available on ePanels.

The leak current signal is mapped to N/A by default. To acquire the leak current signal, go to the instrument configuration and map the signal manually.

Other Limitations

- Only one injector is allowed per LC instrument.
- Missing vials are handled slightly differently from Thermo Fisher 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.
- Use only a Windows zoom level of 100.
- Fraction collection modules and fraction collection clusters are not supported.
- Only LAN-based and RS232-communicating modules are supported.

  Modules connected using GPIB are not supported.
- The configuration of two samplers in one instrument stack is not supported.
- Changing the pressure unit requires a reconfiguration of the GC. It is not possible to mix pressure units, e.g. configuring the GC to use kPa and run a method that uses psi.
- 1000 Hz data rate for 7890 GC is not supported.
- Blank run evaluation is not supported.

In This Book

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

The manual describes the following:

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

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