Agilent

Agilent Drivers for Thermo Chromeleon

GC User Guide

Notices

Document Information

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Software Revision

This guide is valid for the Agilent Drivers for Chromeleon 7 Version 2.4.

Warranty

Technology Licenses

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Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

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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)
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 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 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 18 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
- SVTTool.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 now 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.

Supported Operating Systems

The supported operating system in use is determined by the hosting CDS.

- Microsoft Windows 8.1 Professional, 64 bit
- Microsoft Windows 10 Pro and Enterprise, 64 bit
- Microsoft Windows 2016, 64 bit
- Microsoft Windows 2012, 64 bit

The LC Drivers have been optimized for the Windows default font size. Larger font sizes may require increasing the window size or they may cause truncations.

Supported Languages and Regional Settings

The Agilent Drivers are developed for use with English (US) regional settings and are supported in English language only. The LC instrument driver offers language support for English, Chinese, Japanese, and Portuguese languages. The GC instrument driver offers language support for English, Chinese, Portuguese, and Russian.

Supported Hardware

For a detailed list of supported modules, see the Agilent Drivers Release Notes or refer to the Agilent homepage **https://www.agilent.com/chem/icf**.

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

Table 2 Supported Hardware

Agilent Instrumentation	Chromeleon Native Driver	Agilent Drivers for Chromeleon 7
Agilent LC	1100/1200 Series Modules 1120 Compact LC System	1100/1200 Series Modules 1120 Compact LC System 1220 Infinity LC System 1260 Infinity LC Modules 1290 Infinity LC Modules InfinityLab Series 1290 Infinity II LC Modules 1260 Infinity II LC Modules
Agilent GC and Headspace	For supported modules, see the Agilent Drivers release notes	Intuvo 9000 GC 7890B GC 7890B GC 7890A GC 7890A GC 7820A GC 8860 GC 8890 GC 6850 CG 6890 GC
Agilent CE	Not supported	Not supported

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.

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*.

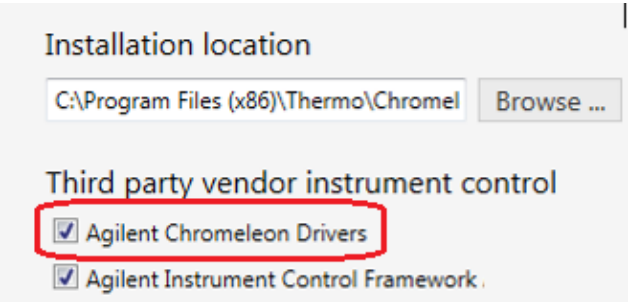


Figure 1 Advanced Options in Chromeleon Installer

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 X.Y\Packages\Agilent Chromeleon Driver, where X is the drive 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.

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 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.

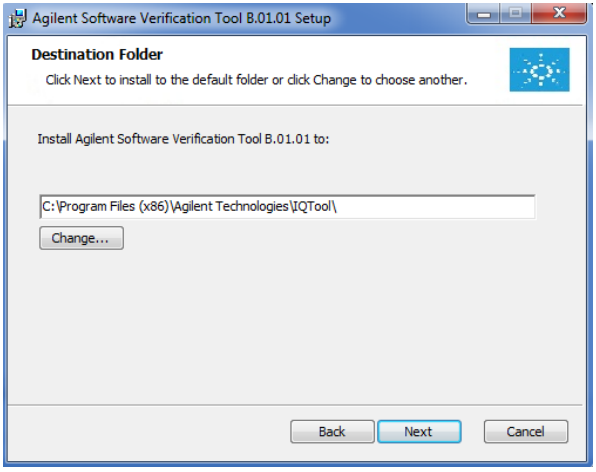


Figure 2 Installation location for the SVT

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.

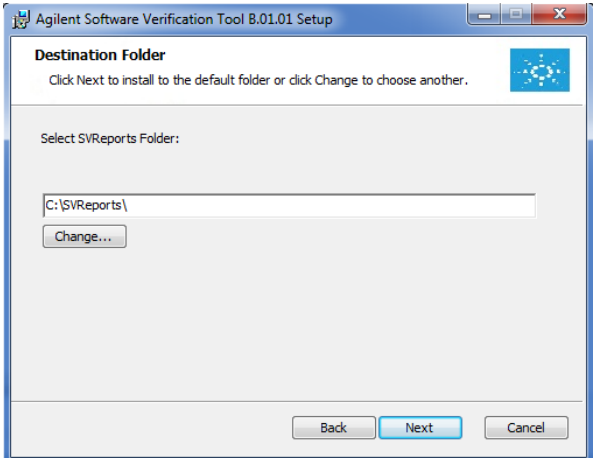


Figure 3 Location for resulting verification reports

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.

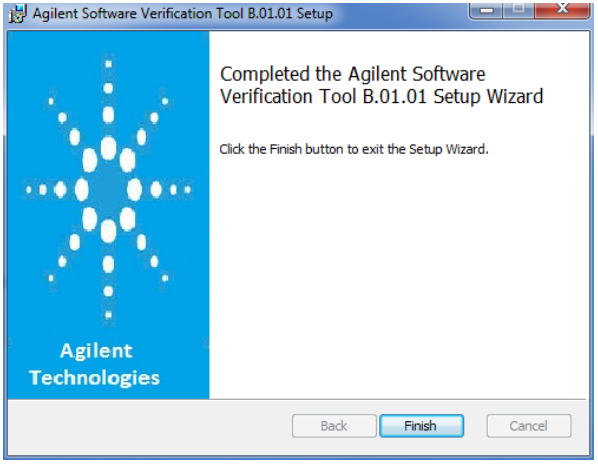


Figure 4 Final Wizard Screen of the SVT installation

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

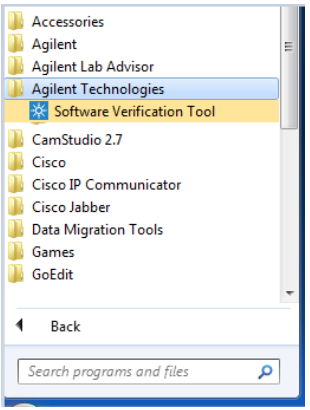


Figure 5 The SVT in the Windows Start Menu

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**.

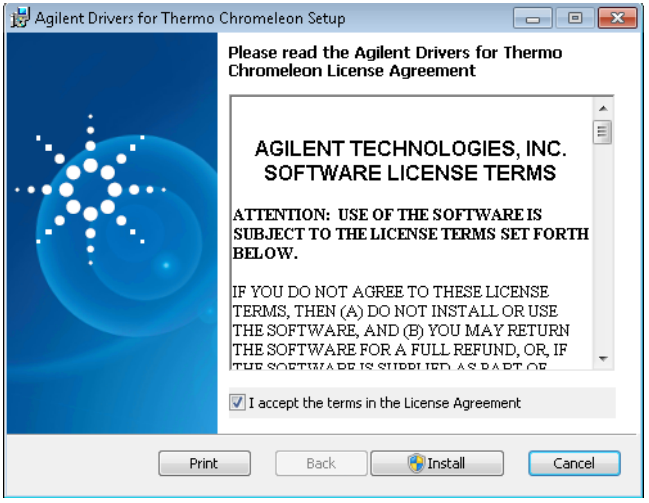


Figure 6 Accept license terms

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

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

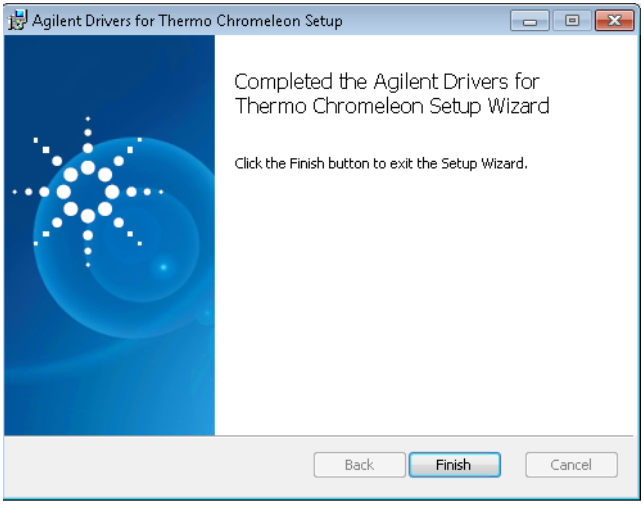


Figure 7 Finalize installation

The final locations for the files for the default installation 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.

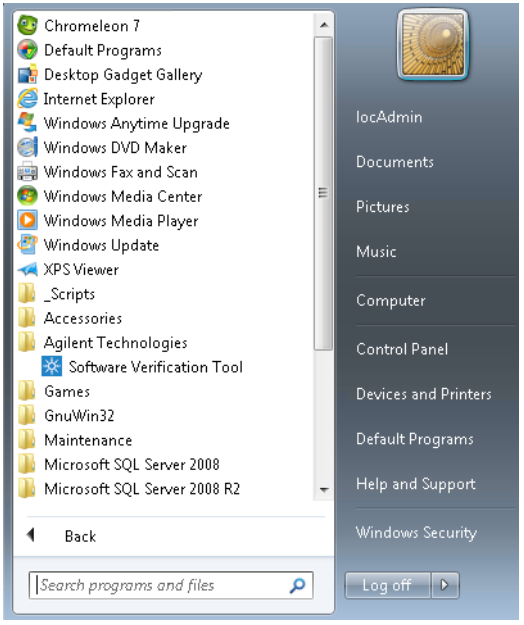


Figure 8 Software Verification Tool (SVT)

In order to check the successful installation of the Agilent Drivers and its subcomponents, execute SVT. For 64 bit systems, 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**.

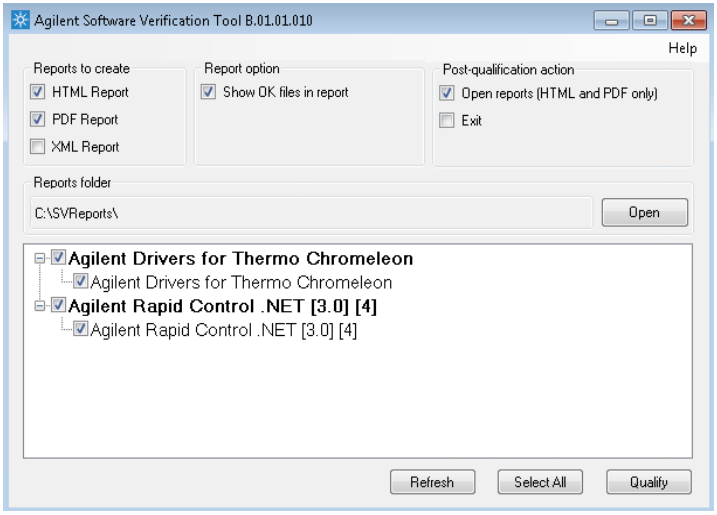
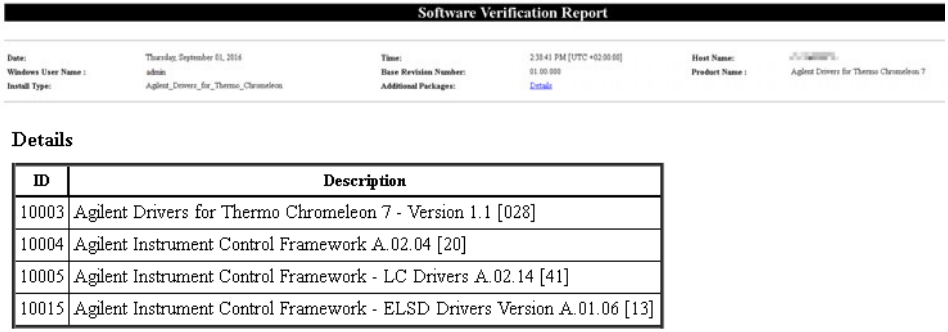


Figure 9 Software Verification Tool dialog box

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 Report:



Software Verification Report

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 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.

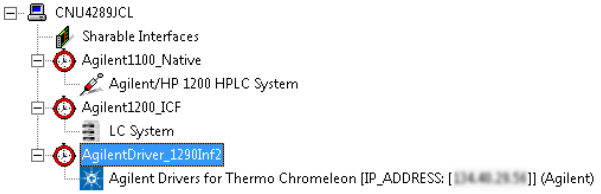


Figure 11 Possible configurations

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

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

When using the native driver, you need to manually add the **Wait** command in the script for a detector.

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:

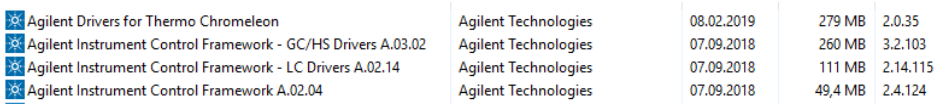


Figure 12 Example of different kinds of drivers

4 Configuring the Agilent Drivers in the Chromeleon Instrument Configuration

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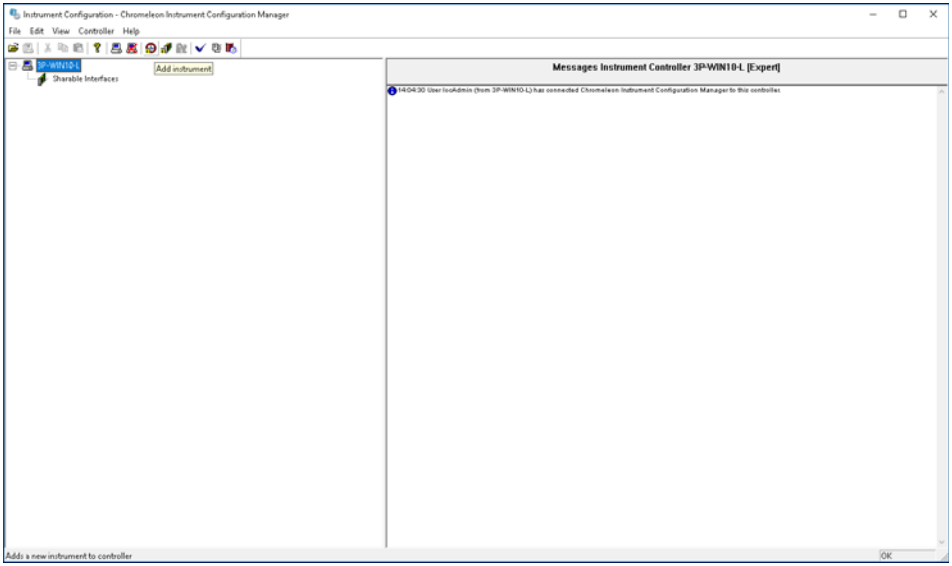
This chapter gives you step-by-step instructions for configuring the Agilent Drivers in Chromeleon.

Configure your Agilent GC

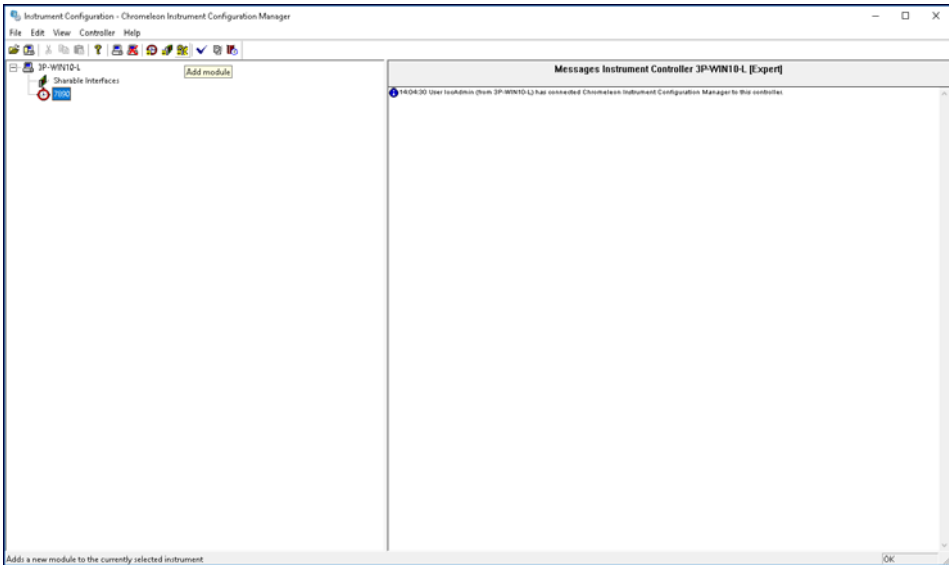
NOTE The configuration of a GC/HS system is a two-stage process. First configure the GC, then repeat the steps for the HS.

Step 1: Configure your Agilent GC

1. Turn on the GC 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. Right-click the instrument controller and select **Add Instrument**. Provide an instrument name.



5 Right-click the instrument and select **Add Module**.

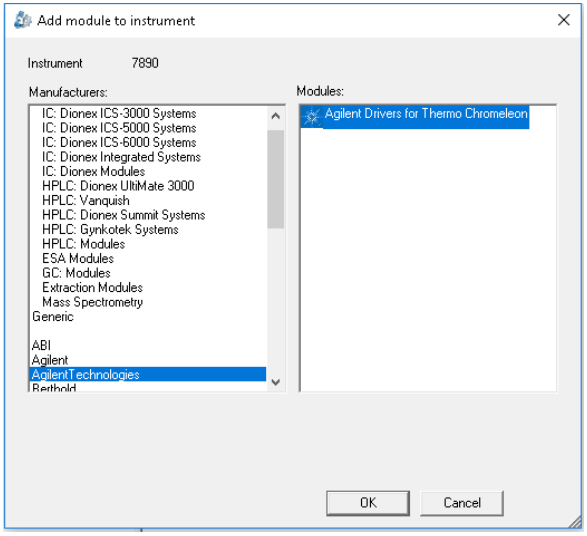


In the **Manufacturers** list, two Agilent integrations are offered:

- **Agilent Technologies**
- **Agilent**

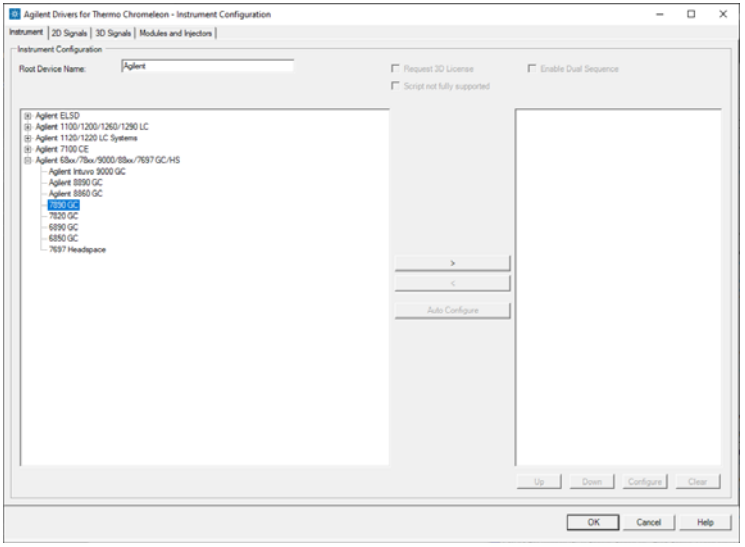
6 Select the**Agilent Technologies** option in the **Manufacturers** panel.

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

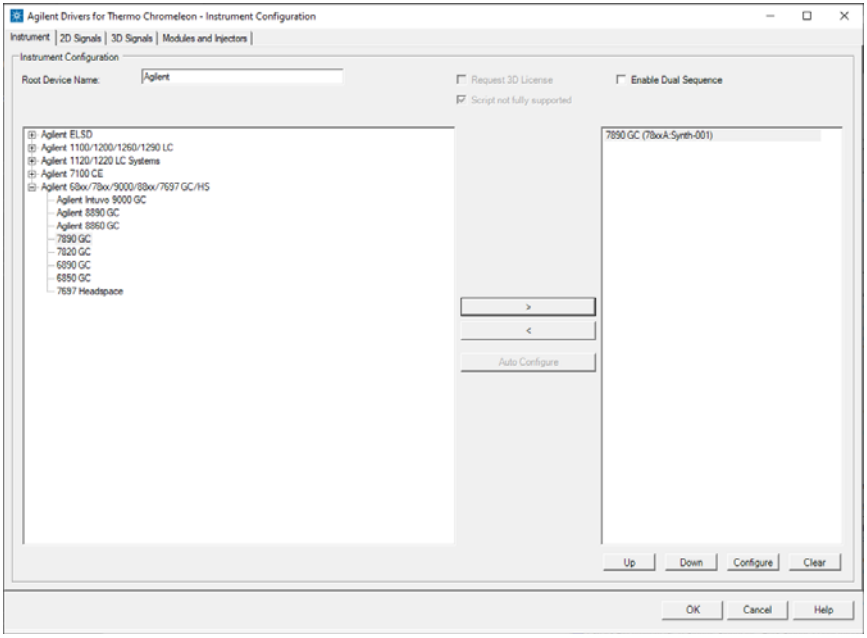


The**Agilent Drivers – Instrument Configuration**dialog box opens, where you can configure the instrument.

8 Provide the **Root Device Name**. The name is preset to Agilent. It 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.

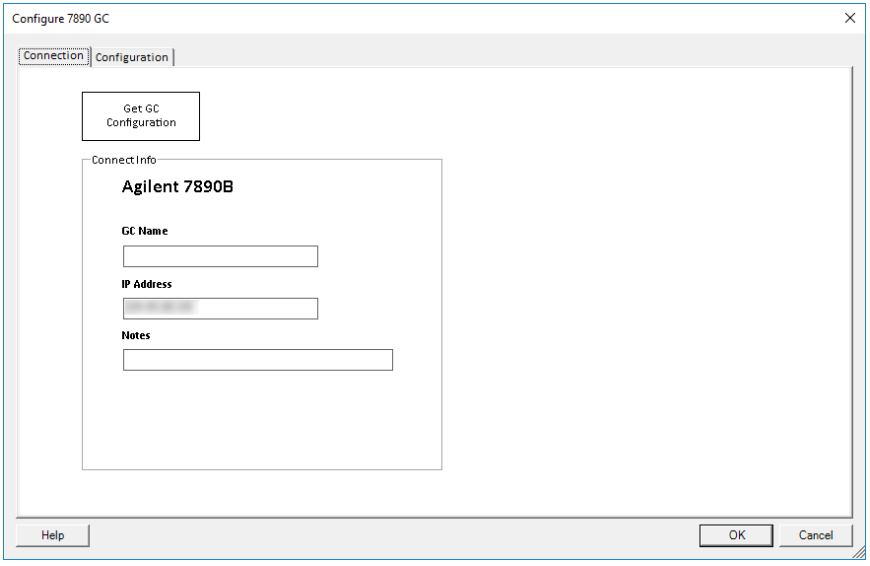


9 Select the GC model from the left panel and click the arrow to add it to the right panel.



10 Click **Configure**.

11 In the configuration window, enter the GC's IP address.



12 Click **Get GC Configuration**.

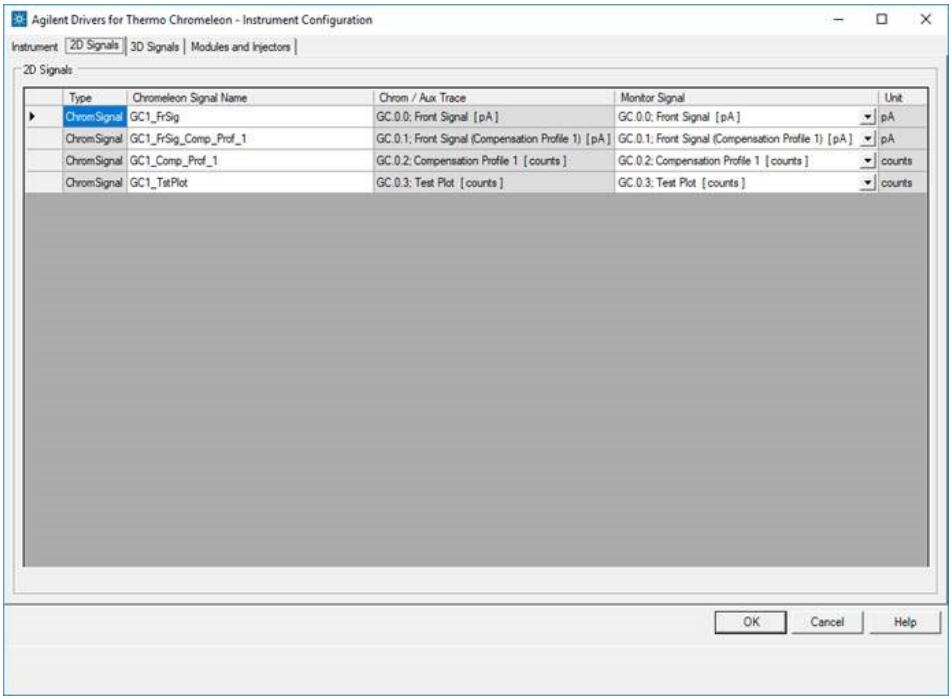
After a few seconds the GC configuration is downloaded from the GC.

13 In the **Configuration** tab, select the keypad lock. Depending on your GC model one or more of the following options are available:

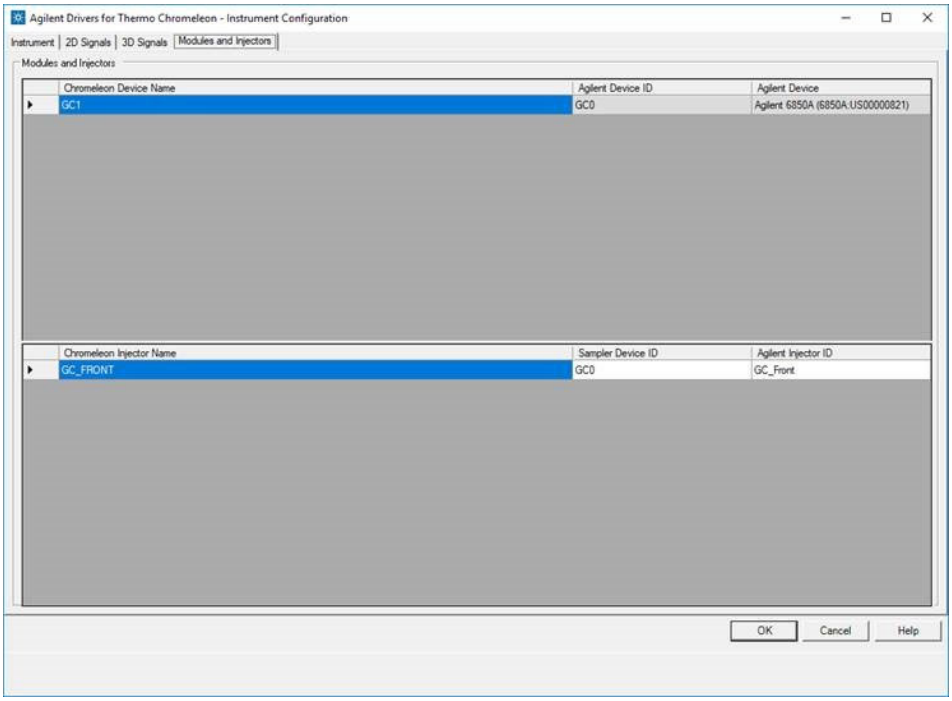
- **Keypad is locked during runs**: Disables the GC keypad during runs.
- **Keypad is locked while under software control**: Disables the GC keypad during live instrument sessions. This is the recommended setting.
- **Keypad is never locked**: Enables the GC keypad at all times.

14 Verify the detected configuration and click **OK** to accept the configuration settings.

15 Check the **2D Signals** tab. Optionally, you can rename the signals here.



16 Select the **Modules and Injectors** tab. The upper table lists all configured modules, while the lower table lists all configured injectors. New injection sources can be added manually. For details on adding injection sources, see "Handling Injector Changes" on page 45.



17 Click **OK**.

NOTE

A warning will be shown when saving a configuration of an instrument with more than one injector. This warning is to be expected and can be disregarded. No other warnings should be shown. The warning's text is:

Warning: More than one inject device installed for instrument

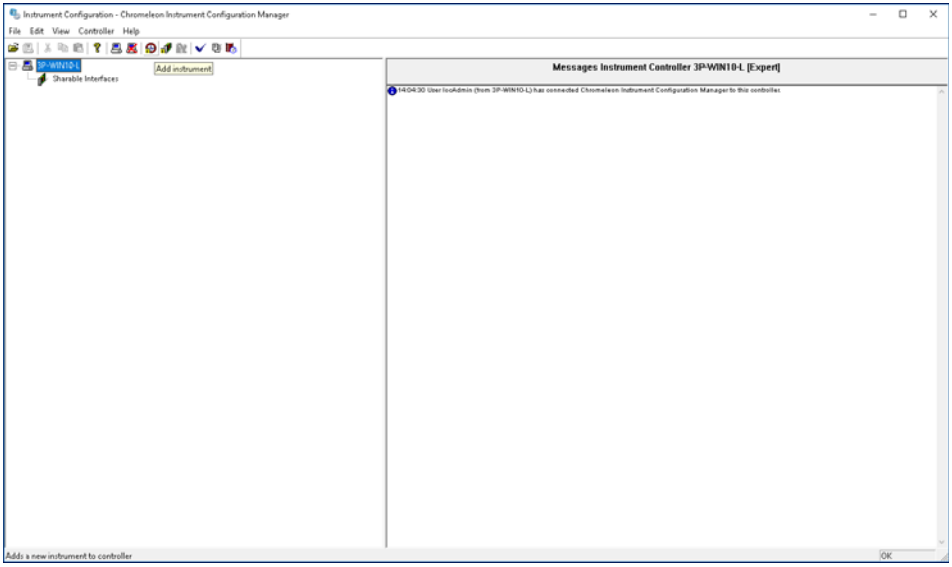
Step 2: Configure your Agilent GC/HS

1 Turn on the GC system.

2 In the **Chromeleon Services Manager**, ensure that the **Instrument Controller Service** is running.

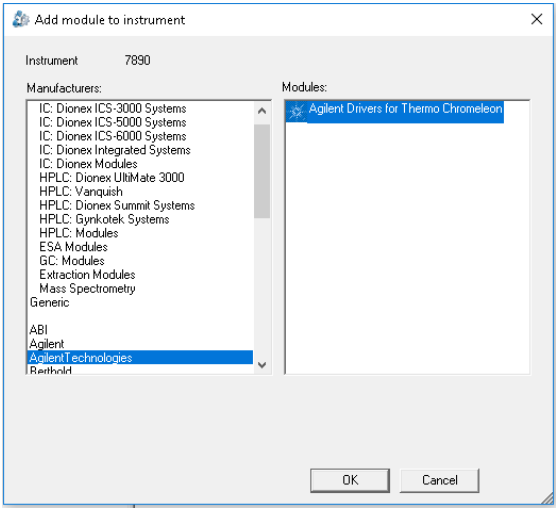
3 Start the instrument configuration using the **Chromeleon Instrument Configuration Manager** application.

4 Right-click the instrument controller and select **Add Instrument**. Provide an instrument name.



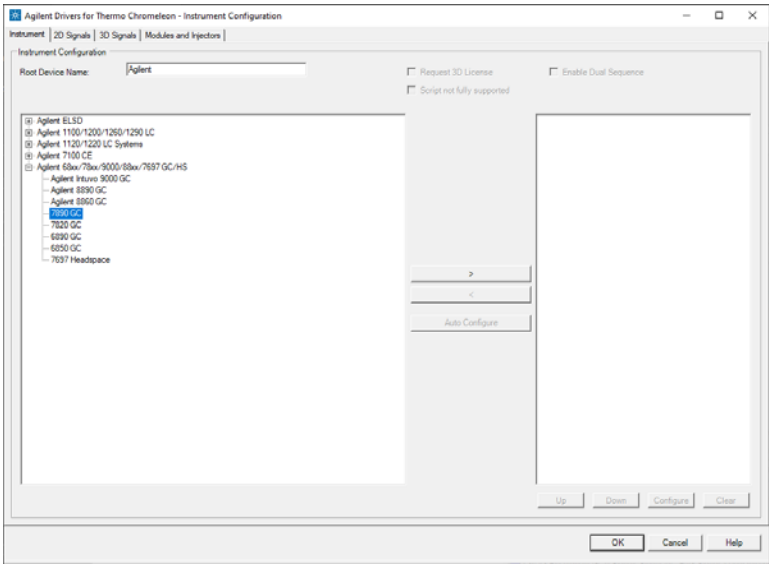
5 Select the **Agilent Technologies** option in the **Manufacturers** panel.

6 Select the **Agilent Drivers for Thermo Chromeleon** in the **Modules** panel and click **OK**.

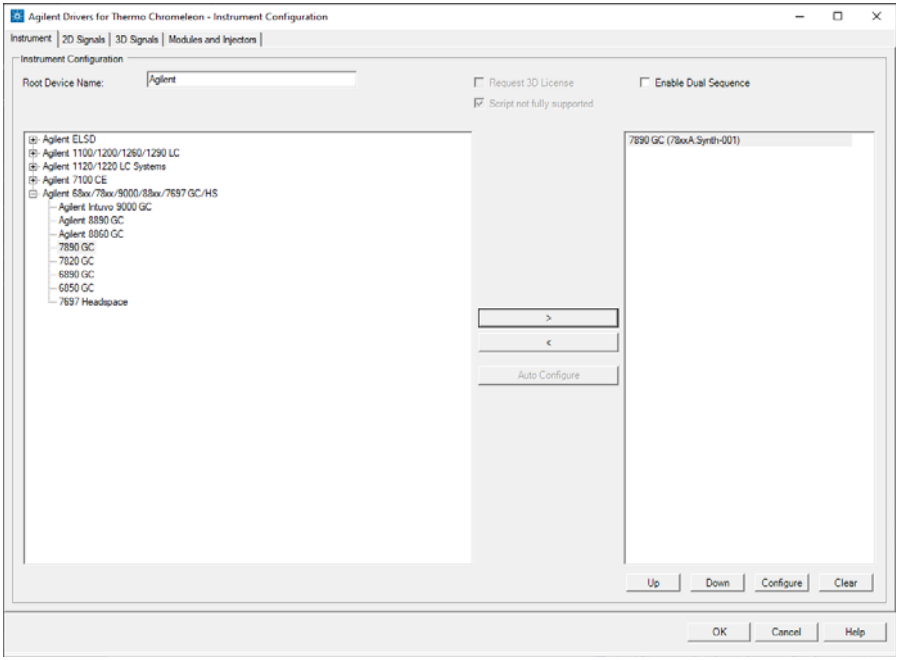


The**Agilent Drivers – Instrument Configuration**dialog box opens, where you can configure the instrument.

7 Provide the **Root Device Name**. The name is preset to Agilent. It 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.

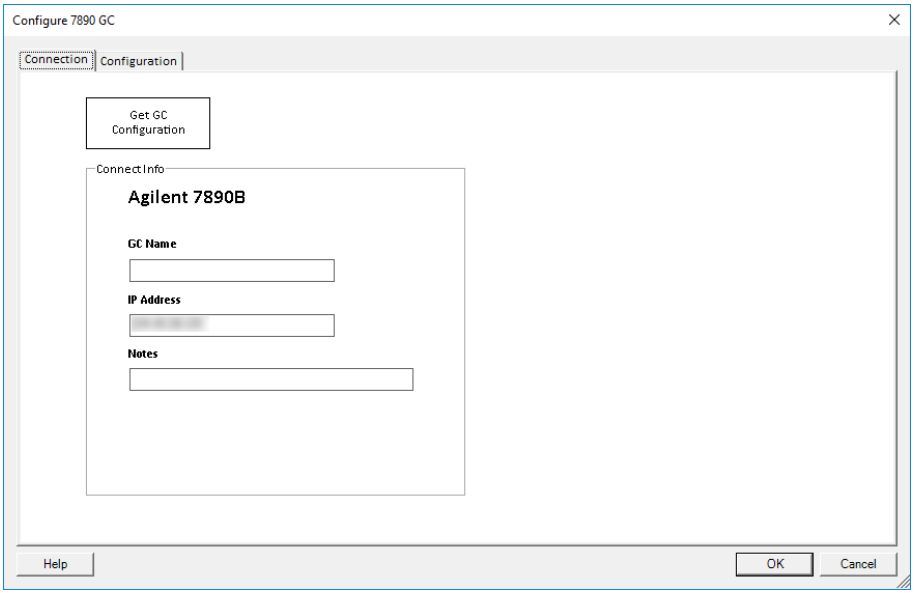


8 Select the GC model from the left panel and click the arrow to add it to the right panel.



9 Click **Configure**.

10 In the configuration window, enter the GC's IP address.



11 Click **Get GC Configuration**.

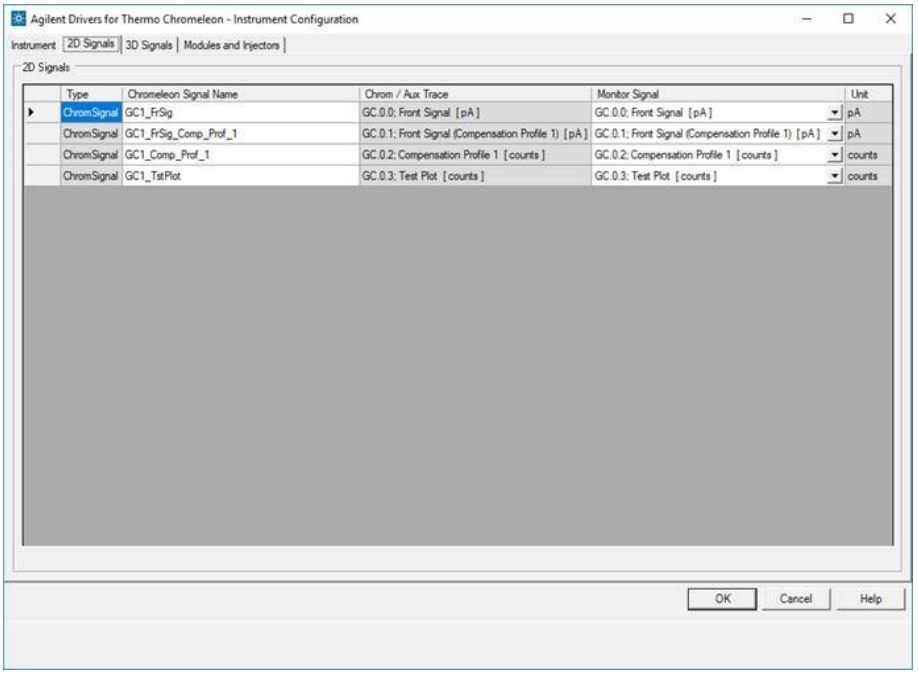
After a few seconds the GC configuration is downloaded from the GC.

12 In the **Configuration** tab, select the keypad lock. Depending on your GC model one or more of the following options are available:

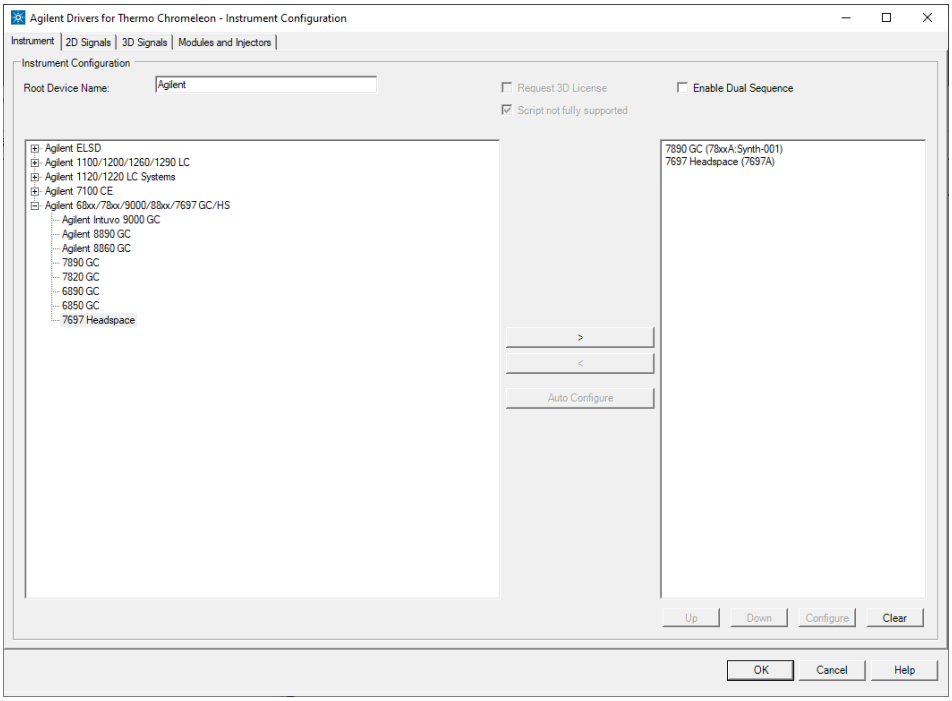
- **Keypad is locked during runs**: Disables the GC keypad during runs.
- **Keypad is locked while under software control**: Disables the GC keypad during live instrument sessions. This is the recommended setting.
- **Keypad is never locked**: Enables the GC keypad at all times.

13 Click **OK**.

14 Check the **2D Signals** tab. Optionally, you can rename the signals here.

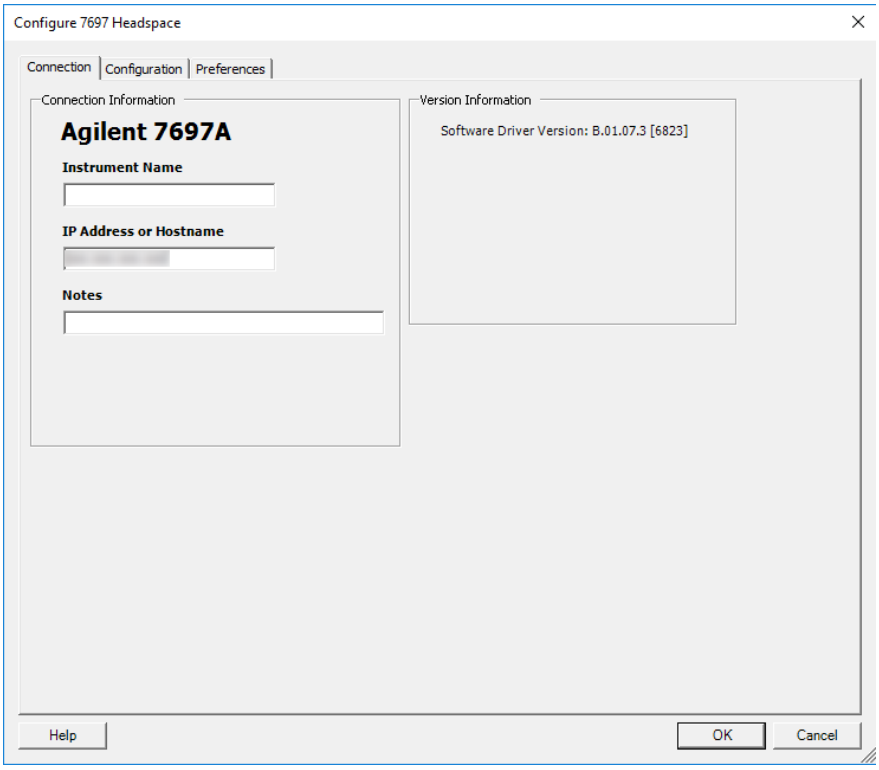


15 Select the HS model from the left panel and click the arrow to add it to the right panel.

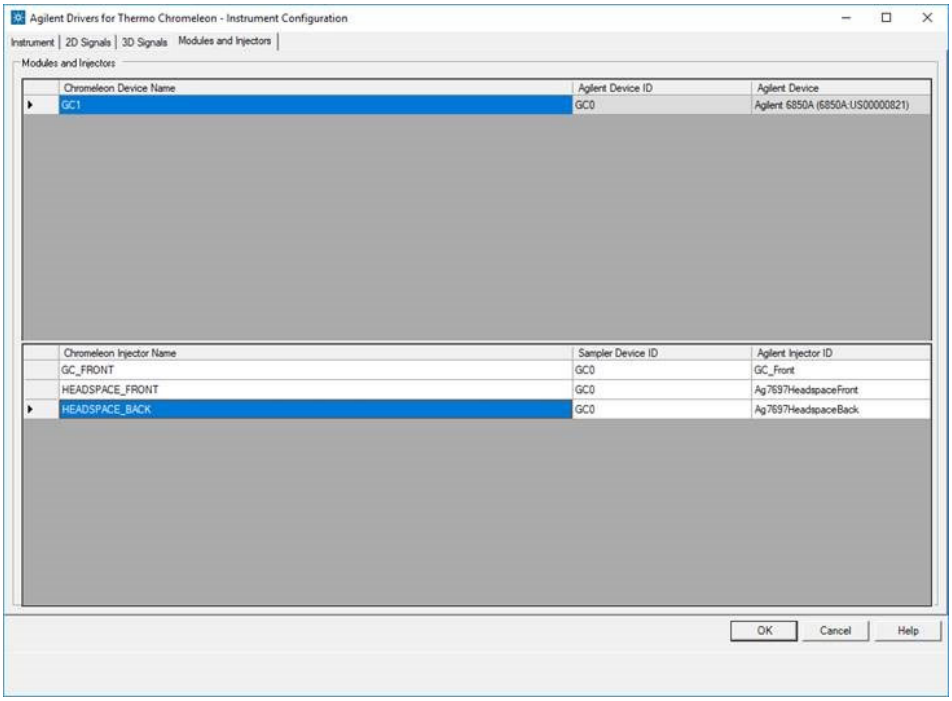


16 Click **Continue**.

17 In the configure window, enter the HS's IP address. Optionally, adjust the settings in the **Configuration and Preferences**tabs. Click **OK**.



18 On the **Modules and Injectors** tab the individual modules and injectors can be verified and renamed. Also, new injection sources can be added manually. For details on adding injection sources, see "Handling Injector Changes" on page 45.



19 Click **OK**.

NOTE

A warning will be shown when saving a configuration of an instrument with more than one injector. This warning is to be expected and can be disregarded. No other warnings should be shown. The warning's text is:

Warning: More than one inject device installed for instrument

Handling Injector Changes

It is possible to add and remove injector devices during normal operation without the need to reconfigure the instrument. For this feature to work all injectors that are to be used must be part of the instrument configuration before they are physically connected to the instrument.

To prepare the Agilent Drivers to handle injector changes add all injectors you are planning to use during the initial configuration.

To manually add an injection source, follow these steps:

1 Right click in the lower table and select **Add Injector** from the context menu.

2 Fill in **Chromeleon Injector Name**, **Sampler Device ID**, and the **Agilent Injector ID**. The sampler Device ID must be one of the Device IDs in the upper table.

NOTE

A warning will be shown when saving an instrument configuration with more than one injector for a single instrument. This warning is to be expected and can be disregarded. No other warnings should be shown. The warning's text is:

Warning: More than one inject device installed for instrument

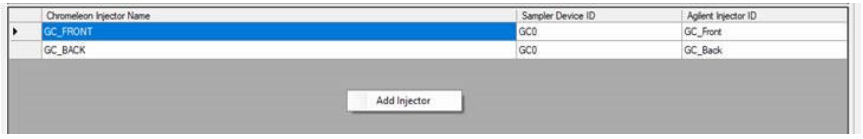


Figure 13 Select Add Injector to add a new injection source to the configuration

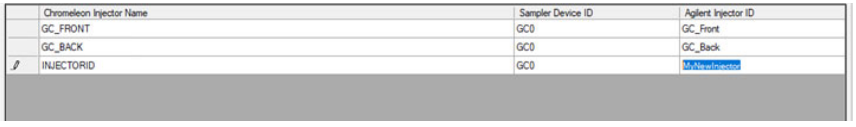


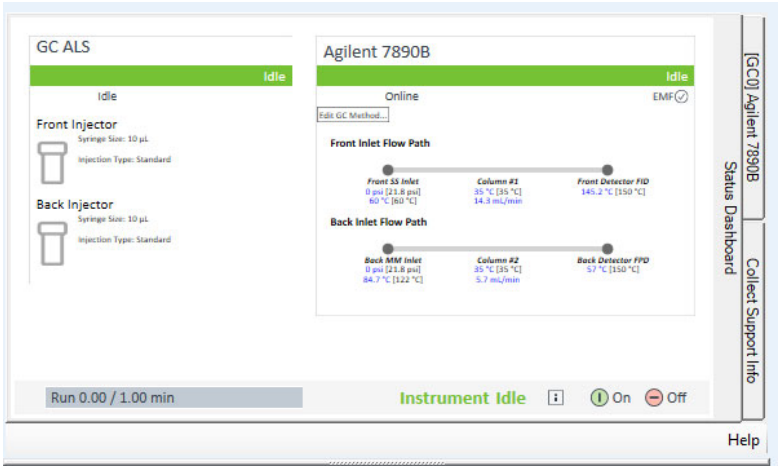
Figure 14 Manually fill in the table cells

Table 3 Mapping of injector device types to Agilent injector IDs

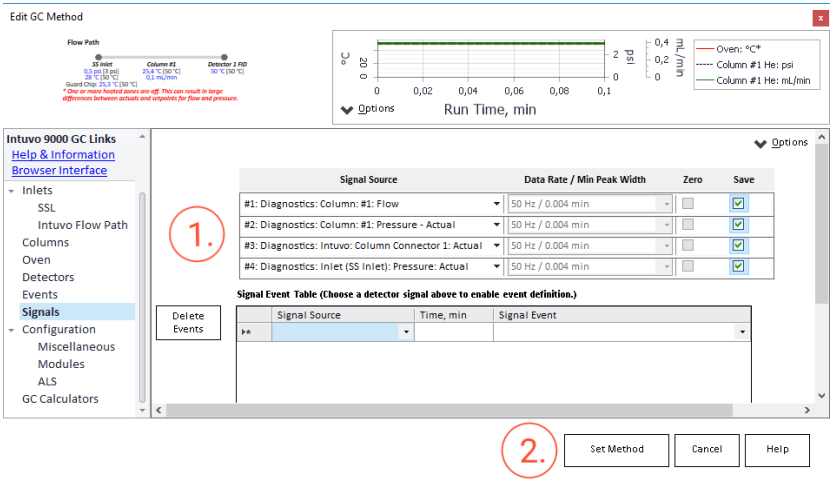
Injector Device Type	Agilent Injector ID
Front injector	GC_Front
Back injector	GC_Back
Headspace front injector	Ag7697HeadspaceFront
Headspace back injector	Ag7697HeadspaceBack
Sampling valve on position N	GC_ValveN

Baseline Monitoring with a GC Instrument

1 In the status dashboard, click **Edit GC Method...** on the GC status tile.



2 Select the signals which will be acquired during baseline monitoring. Then click **Set Method**.



3 Click **Monitor Baseline** and select the same channels as in step 2. Click **OK**.

NOTE

It is possible to deselect all channels in the online method and start baseline monitoring. No signal will be acquired until the GC method is edited and a signal acquired. The signal will then start at retention time 0.0min.

For more info on Baseline Monitoring refer to the Chromeleon help.

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**.

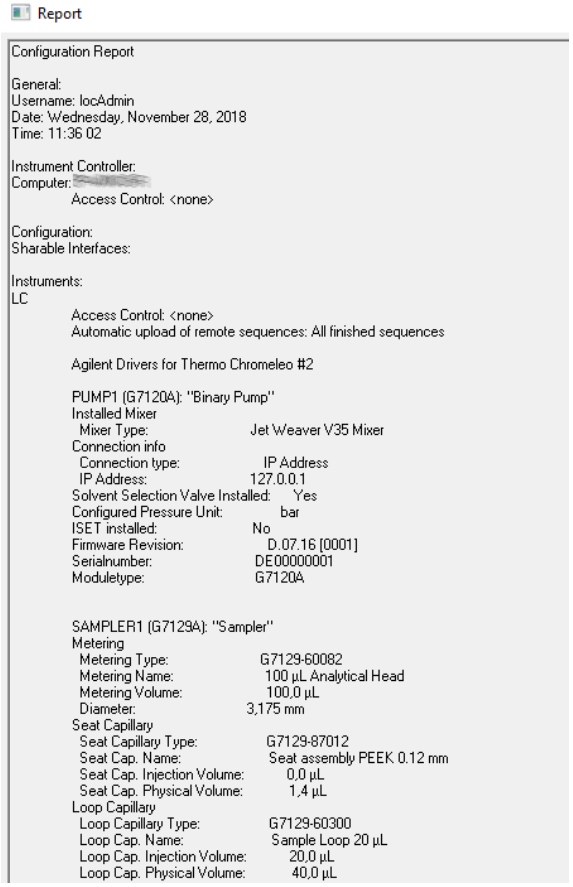


Figure 15 Chromeleon Configuration Report

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.

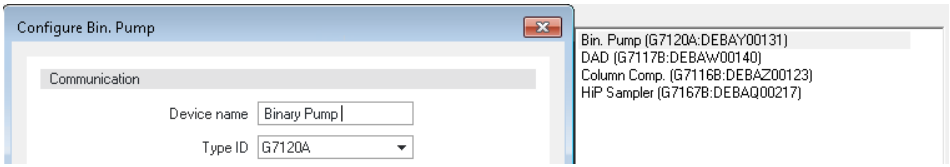


Figure 16 Agilent Device Name

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.

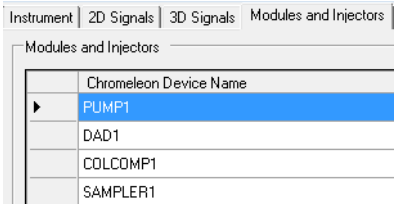


Figure 17 Chromeleon Device Name

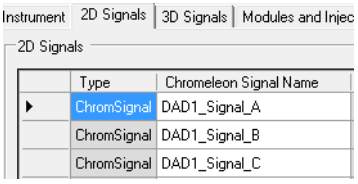


Figure 18 Chromeleon Signal Name

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.

Name appearance in the Chromeleon Console

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

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

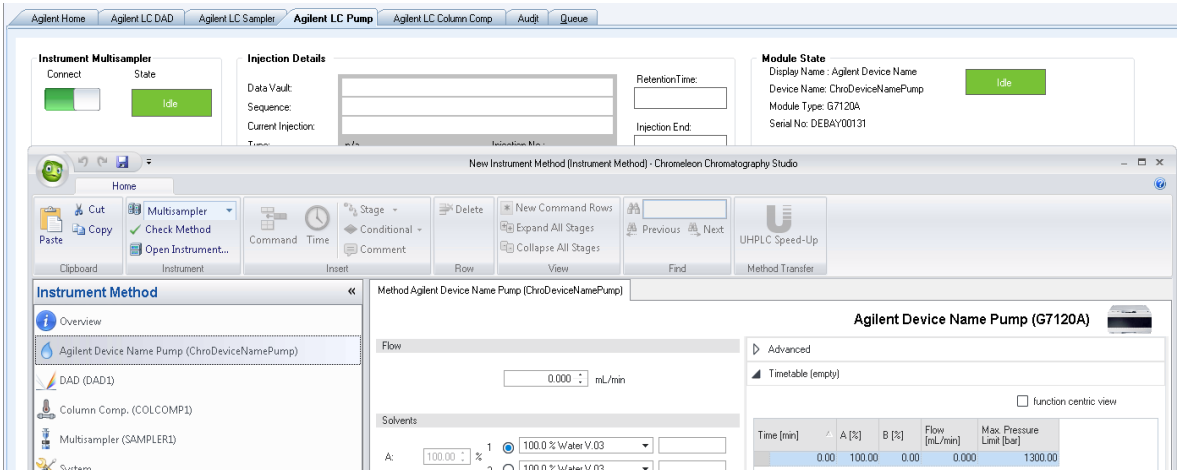


Figure 19 Naming in graphical components

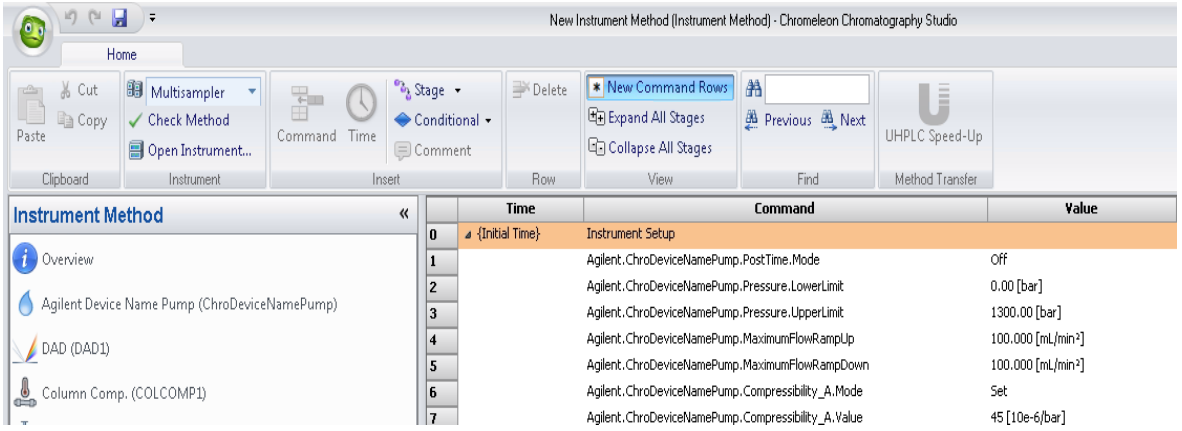


Figure 20 Naming in method script

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

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.

Setting Up an Instrument Method

GC and Headspace Instrument Method

NOTE

GCs 8860 and 7820 do not support the dual device functionality.

GC Instrument Method

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

1. Start the Chromeleon Instrument Method Wizard.
2. The **Run Time** is automatically adjusted based on the instrument method settings and should not be changed manually.
3. Click **Next**.
4. Select the injector device from the list.
5. Adjust method parameters. The Chromeleon Instrument Method Wizard offers the GC method in one window. The method parameters are displayed on the right panel. The **Flow Path** and the **Run Time** calculated on the current parameter settings are displayed at the top. The panel on the left side allows switching between instrument method sections.
6. The injection volume is not set in the Injector section. Instead, set the injection volume in the Chromeleon sequence.
7. Click **Next**.
8. Enter a comment and description as required and click **Finish** to complete the wizard.
9. Run **Check Method** to ensure the method is valid.

GC HS Instrument Method

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

1. Start the Chromeleon Instrument Method Wizard.
2. The **Run Time** is automatically adjusted based on the instrument method settings and should not be changed manually.
3. Click **Next**.
4. Select the injector device from the list.
5. Adjust GCHS method parameters. The method parameters are displayed on the right panel. The **Flow Path** and the **Run Time** calculated on the current parameter settings are displayed at the top. The panel on the left side allows switching between instrument method sections.
6. Click **Next**.
7. Enter a comment and description as required and click **Finish** to complete the wizard.
8. 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.

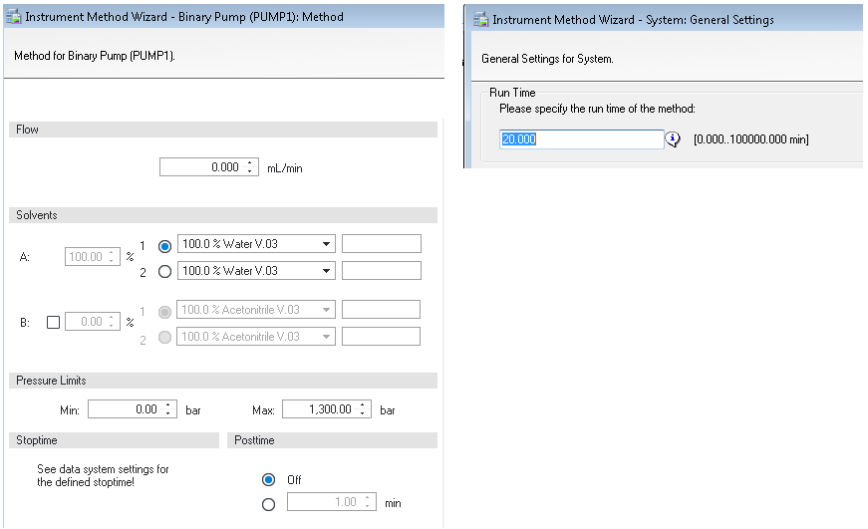


Figure 21 Agilent Module Stoptime (left) and Chromeleon Run Time (right)

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.

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.

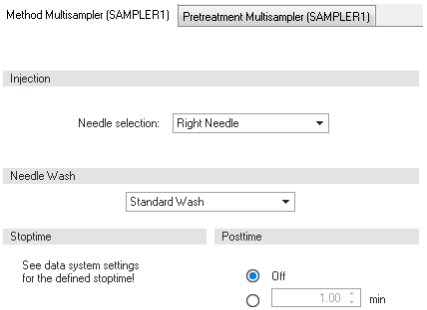


Figure 22 Sampler method screen without injection volume

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**.

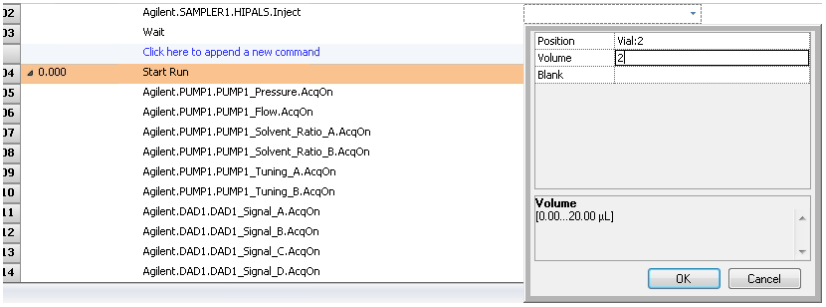


Figure 23 Manual edit of the method script

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.

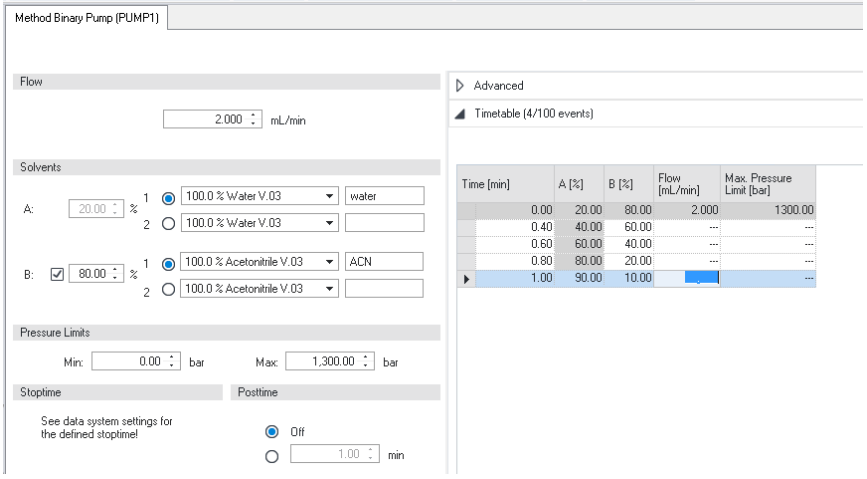
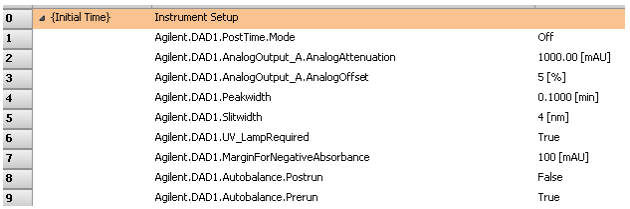


Figure 24 Graphical method screen

- 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.



	{Initial Time}	Instrument Setup	
0			
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 25 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 26 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

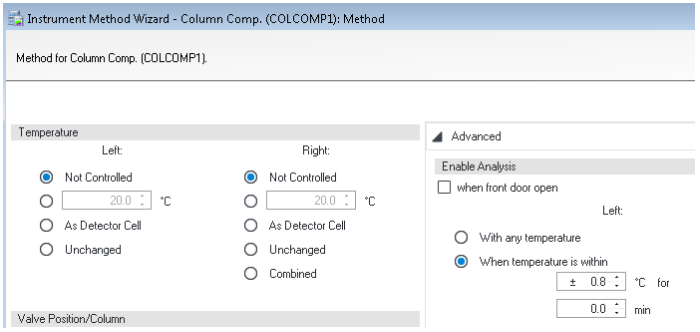


Figure 27 Graphical method screen — parameter

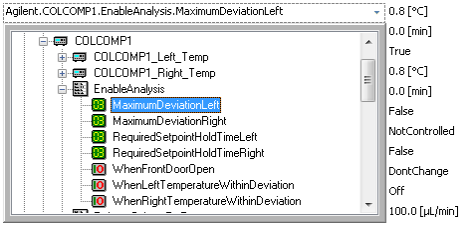


Figure 28 Method script — grouped parameters follow the graphical method screen

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.

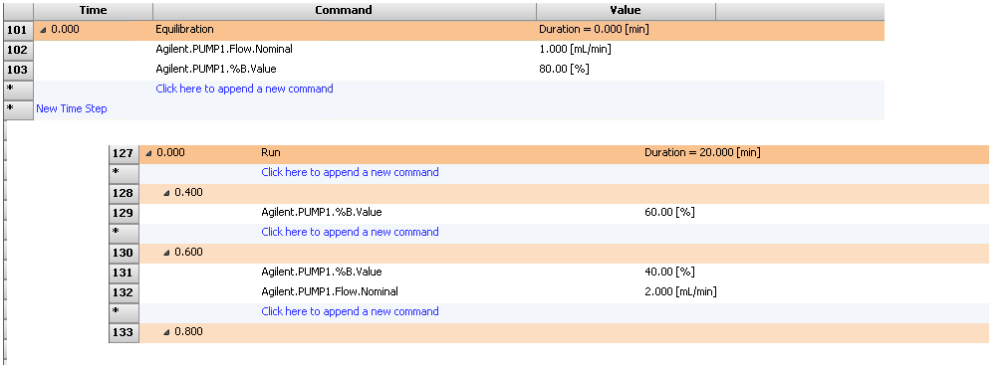


Figure 29 Method script: initial values (top) and timetable values (bottom)

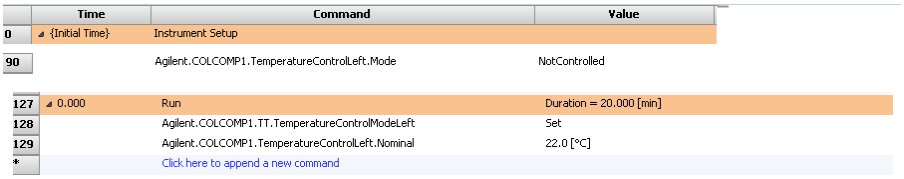
For certain parameters, it is possible that the initial and timetable values differ, so that the timetable may offer a different number of parameters. In this case, timetable values are notified with a TT (timetable). These commands cannot not be used outside the run stage, for example:

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 30 Method script — special timetable values

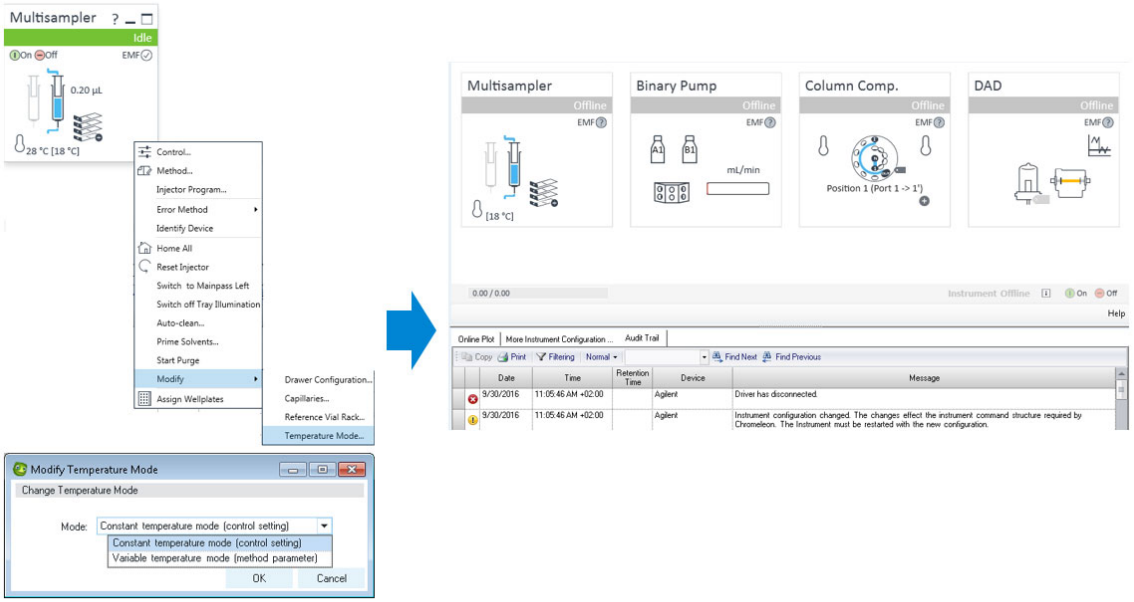
NOTE

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 62).

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.

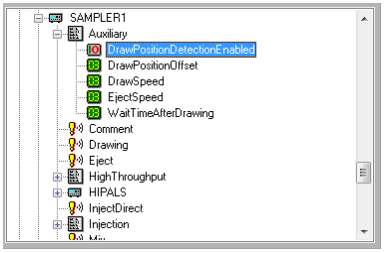


Figure 31 Example of parameter grouping

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.

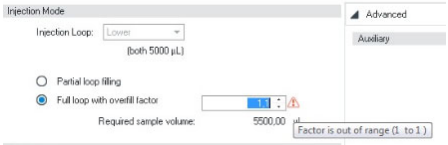


Figure 32 Restriction in graphical method interface

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.

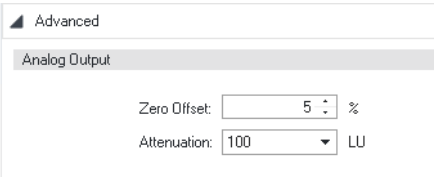


Figure 33 FLD Analog Output in the method user interface

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

Figure 34 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:

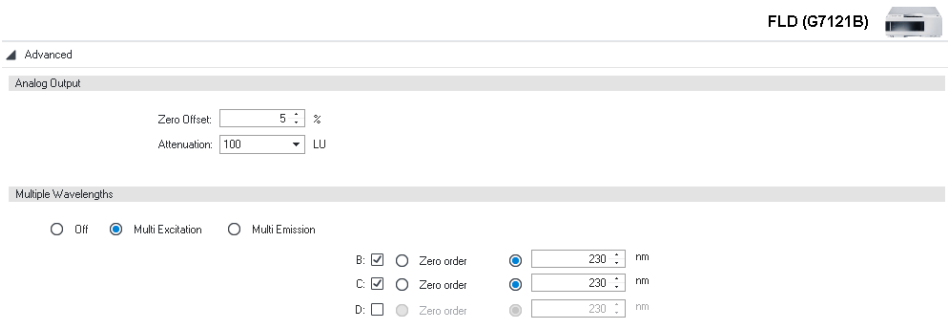


Figure 35 FLD Multiwavelength Setting in the method user interface

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 36 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.

GC Injector Selection

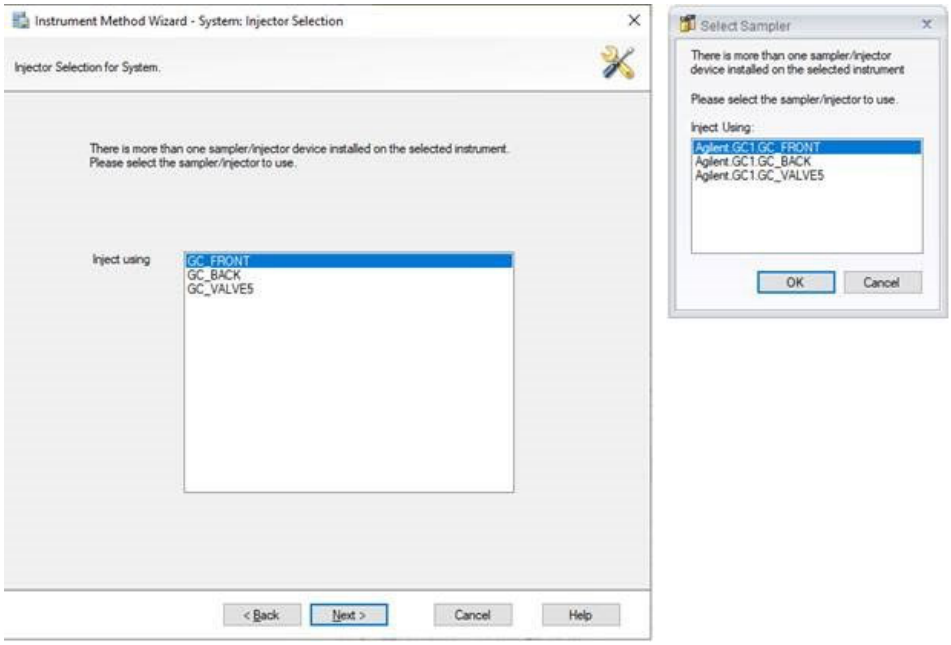


Figure 37 Method and sequence injector selection windows

The GC injector must be selected during sequence and method creation. The sequence and method wizards provide windows for convenient selection, in case more than one injector is configured. Ensure that the used instrument method and sequence use the same injector and that the injector is installed on the instrument. A mismatch causes the ready check to fail and the mismatch must be resolved.

Using ALS and HSS in the Same Sequence

A sequence only containing headspace sampler injections is fully downloaded to the sampler upon sequence start. In this full sequence mode, the sampler uses the sequence information to optimize the workflow. Samples can be appended to a sequence running in full sequence mode. These samples must use the headspace sampler as injection source. If a sample is appended or inserted using a different source, e.g., the ALS, then the sequence is aborted at the beginning of the next injection. Mixing HSS and ALS injections in the same sequence requires that both injection types are added to the sequence before it is started. Such a sequence will not run in full sequence mode and the HSS will work on each sample sequentially. A sequence not running in full sequence mode may be appended with injections of either sampler.

Manual Injection on GC Instruments

Agilent GCs offer the possibility to run manual injections while the GC is under CDS control. When injecting manually press the **Run** key at the moment of injection.

1. Create or open an instrument method.
2. Select **Script Editor**.
3. Delete the row in the script with the inject command in it. If no injector is configured this step can be skipped.
4. Save the method.

NOTE

A warning will be shown when running method check or ready check on an instrument method without inject command while an injector is configured. This warning is to be expected and can be disregarded. No other warnings should be shown. The warning's text is:

Missing Inject command.

5. Create a sequence. The values for position and volume must be filled in, although they are not used.
6. Start the sequence.
7. Click **Execute despite warning** or **Yes** when in the Queue ePanel when asked.

8 Wait for the message **Wait.Agilent.RunState=Run** in the audit trail. The GC and CDs are now ready for the injection.

Retention Time	Device	Message
0.000		Wait Agilent.RunState=Run
0.000		Entered stage "Inject"
0.000		Wait finished

9 Inject the sample and simultaneously press the run button on the GC front panel.

GC System

GC Online Method

The GC online method is accessible per the textual dashboard and provides means of making changes to the method on the instrument. To access the online method, right-click the textual dashboard and select **Edit GC Method...**while the GC is idle.

The online method editor provides access to the same parameters as the instrument method wizard but clicking **Set Method** sends the parameters directly to the GC without starting a run.

GC Online Method Changes - Impact on Saved Instrument Methods

Some changes to the online method impact previously saved instrument methods. These changes affect the command structure of the GC driver and an appropriate message is written to the audit trail. The changes require a reconfiguration of the GC driver.

Device	Message
Agilent	Driver has disconnected.
Agilent	Instrument configuration changed. The changes effect the instrument command structure required by Chromeleon. The Instrument must be restarted with the new configuration.

Figure 38 Audit trail messages after a configuration change with command structure change

Methods affected by these changes will automatically undergo method resolution once they are opened for editing. In the example below the pressure unit was changed from psi to bar. These inconsistencies must be resolved manually as described in “Manually Resolving Instrument Method Inconsistencies” on page 72.

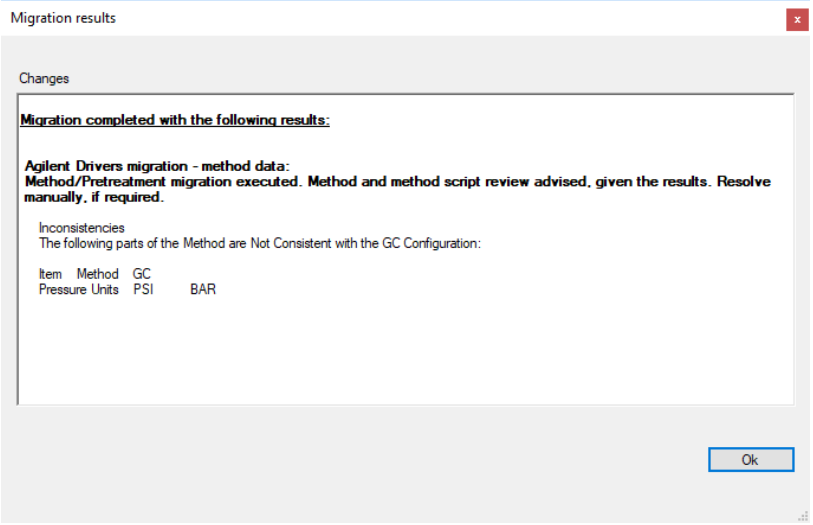


Figure 39 Migration results

Manually Resolving Instrument Method Inconsistencies

Changes to the physical setup of the instrument must be reflected in the online and instrument methods. The following chapter describes the workflow of manually resolving method inconsistencies using an example of changing the column length.

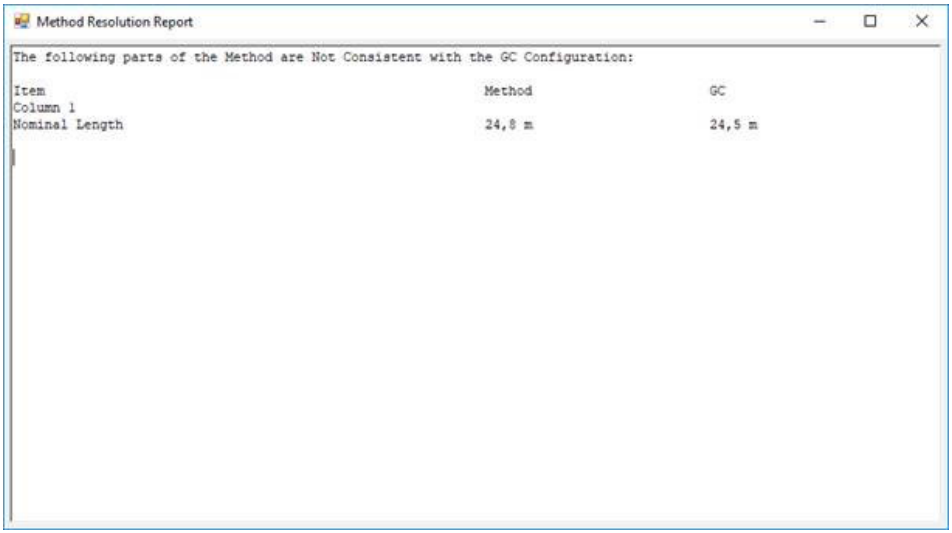
The column length of the installed column is part of the online method and the instrument method. After making changes to the column length, the length must be adjusted in the online method and the instrument method. The steps below outline the workflow after a physical change to the system.

1 Click **Edit GC Method...** to open the online method.

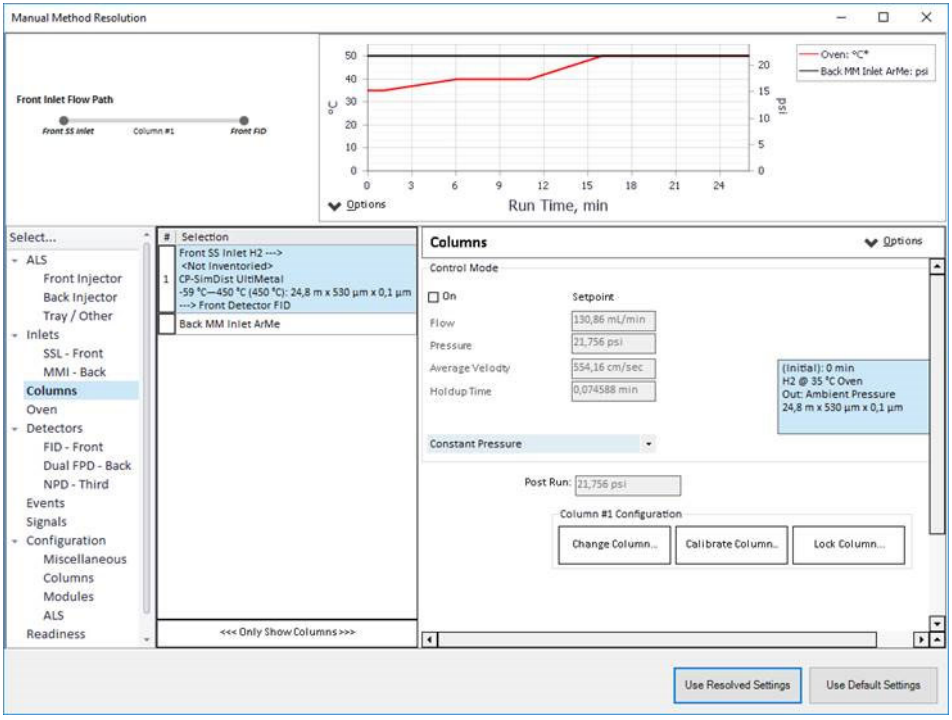
2 Select the columns pane and edit the column length.

3 Click **Set Method**.

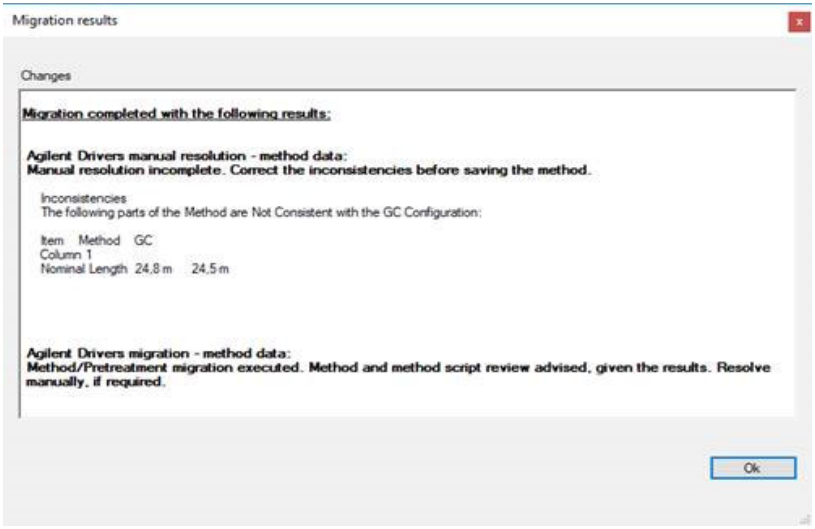
4 Open the instrument method. The method resolution process is started automatically and will try to resolve the method. Some settings may not be resolvable. In these cases, user interaction is required. The **Method Resolution Report** shows the inconsistencies which need to be resolved.



5 From the method resolution window, select **Use Resolved Settings** to apply the resolved setting or **Use Default Settings** to revert the instrument method to default values.



6 After selecting **Use Resolved Settings** the **Migration results** window shows settings which could not be resolved automatically. Take note of these settings and adjust the values appropriately.



7 Save the resolved instrument method.

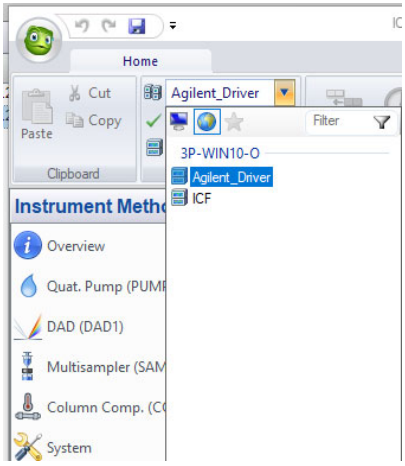
Method Migration

Migrating GC Methods

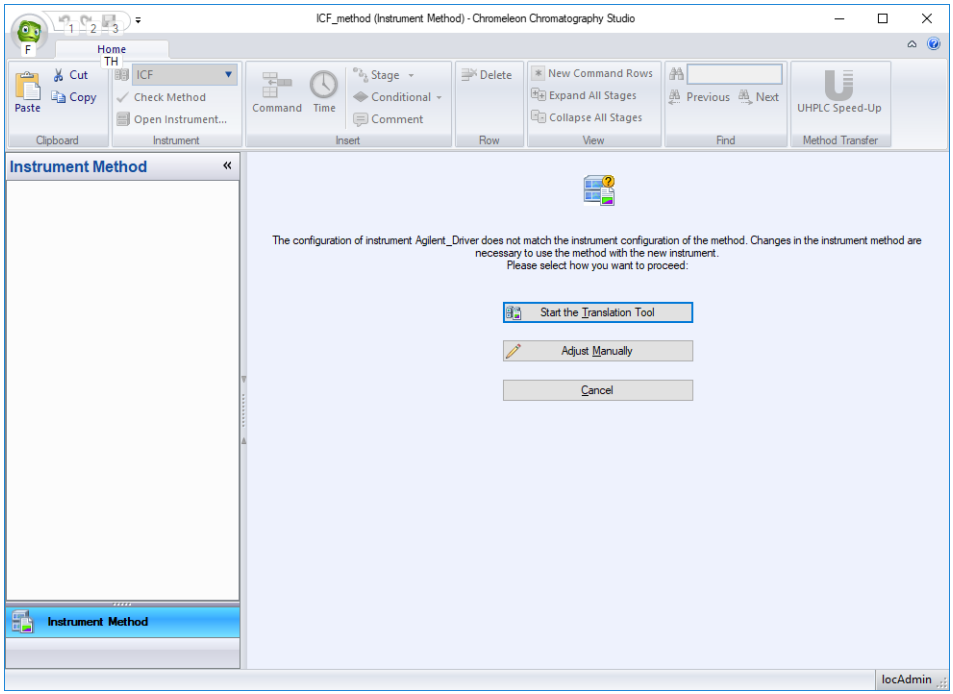
The method translation tool introduced to Chromeleon 7.2.8 by Thermo Scientific is currently not supported. To migrate anyway, you have to click **Adjust Manually** in the transfer tool.

Native Methods

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

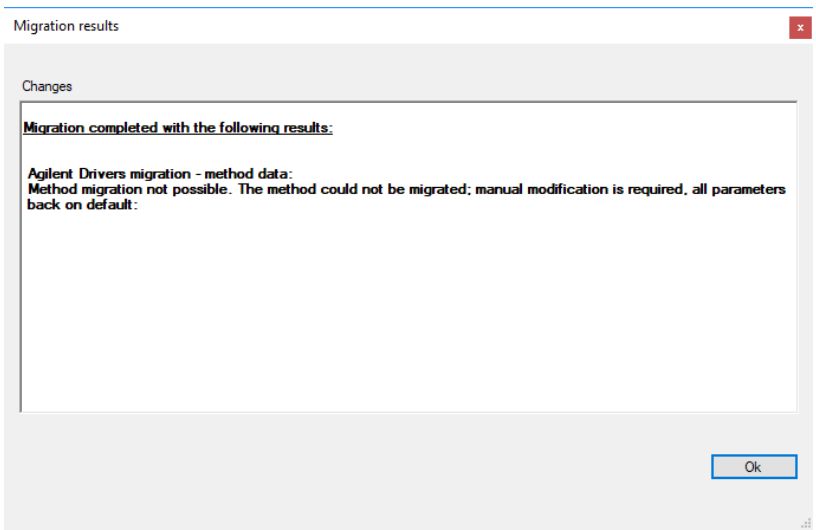


2 Select **Adjust Manually**. This starts an automatic method resolution.



After the automatic method resolution finishes a pop-up opens.

3 Close the pop-up.



4 Go to the **Script Editor** and delete all lines with a red background. These lines were migrated from the original method and are not automatically removed.

5 Save the migrated method.

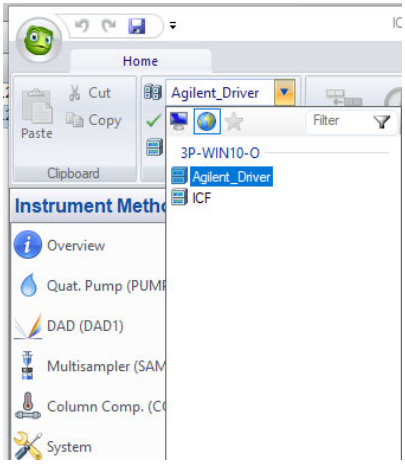
NOTE

Saving the migrated method under a new name will also restore the old method and start the migration tool again. This can safely be aborted.

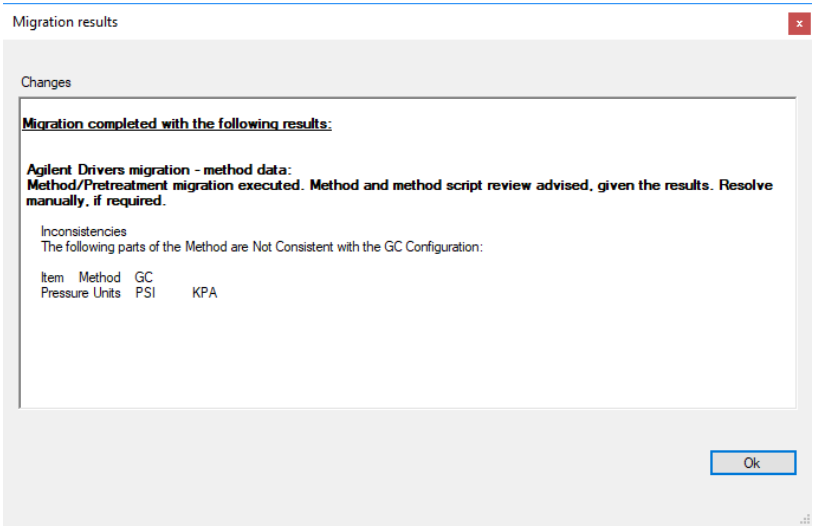
Migrating to a Different Configuration

A method can be migrated from one instrument to another even when the configuration differs. The migration tool lists all differences in the configuration which then must be adjusted manually.

1 Open the method to migrate and select the new instrument from the drop-down list.



2 Make a note of all differences shown in the pop-up window and click **OK**. In the example below the old configuration is using psi as the pressure unit while the new configuration uses kPa.



3 Manually adjust the instrument method according to the differences noted in the previous step.

4 Save the method.

NOTE

Saving the migrated method under a new name will also restore the old method and start the migration tool again. This can safely be aborted.

6 Dual Simultaneous Injection

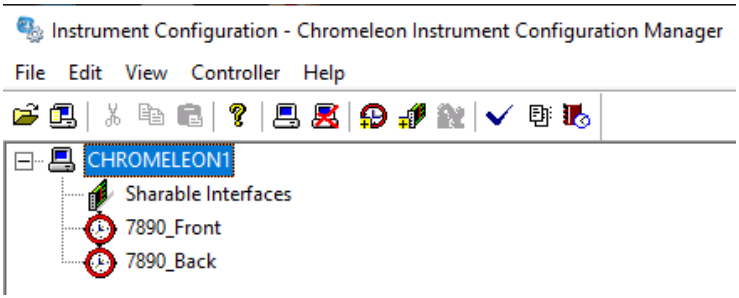
Dual GC Configuration 81
Deleting a Shared Driver 86
The Agilent Home ePanel for Dual Sequence GCs 87
Creating Methods for Dual Simultaneous Injection 88
Dual Simultaneous Injection Sequence 92
OnlyFront and OnlyBack Settings 93

Dual GC Configuration

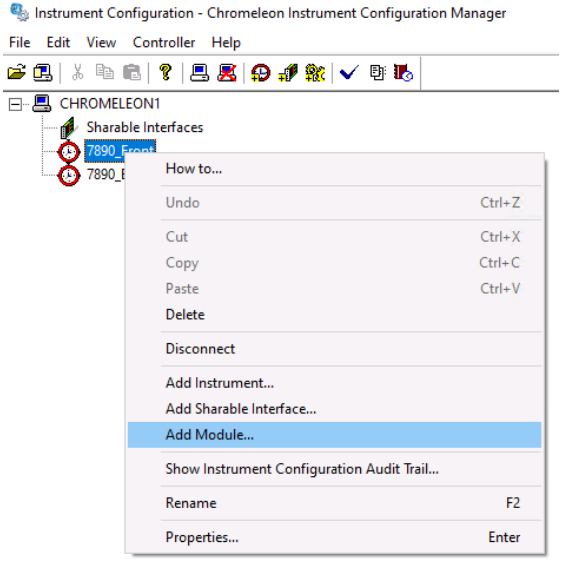
To setup the driver for dual simultaneous injections two instruments are created in the instrument configuration manager. Then a single driver instance is added to one instrument. The driver instance will be automatically added to the second instrument. Only one driver instance can be added to an instrument. Adding a second driver instance to the same instrument is rejected by the driver.

1 Open the Chromeleon Instrument Configuration Manager.

2 Create two instruments representing the front and back instruments.

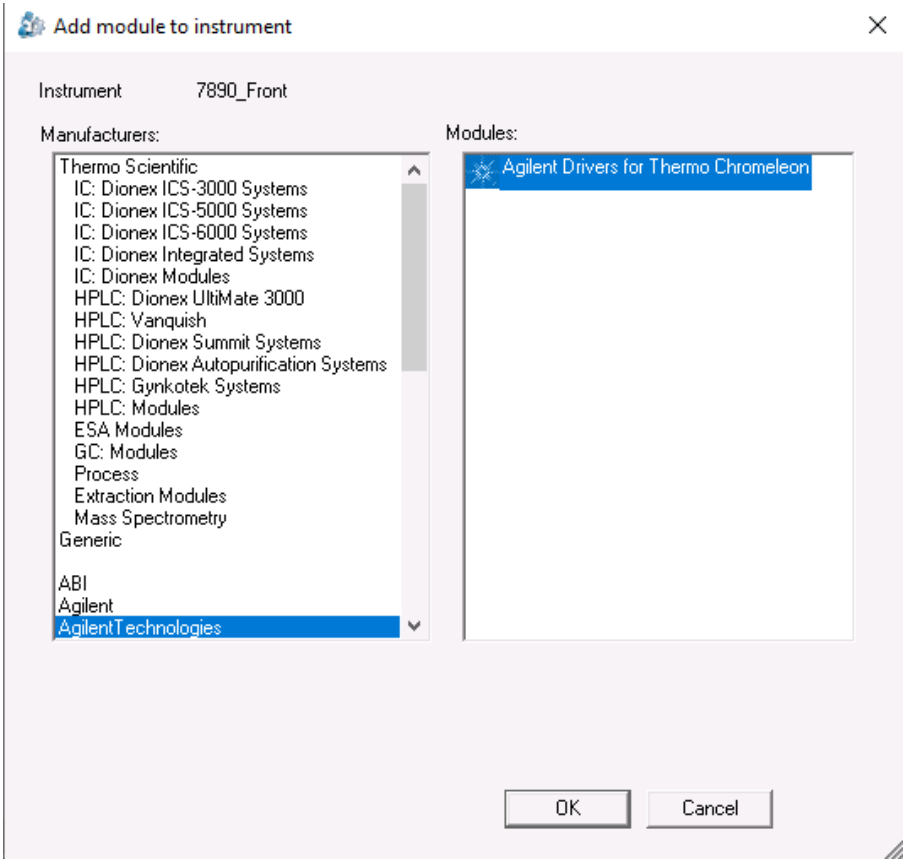


3 Right-click on the first instrument and select **Add Module...**.



4 From the manufacturer list select **Agilent Technologies**.

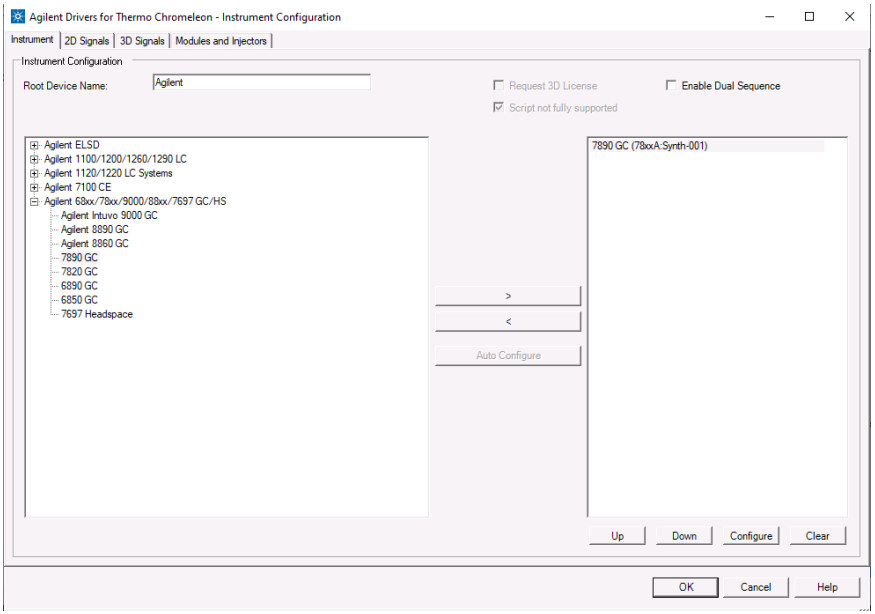
5 From the module list select **Agilent Drivers for Thermo Chromeleon**.



6 Click **OK**.

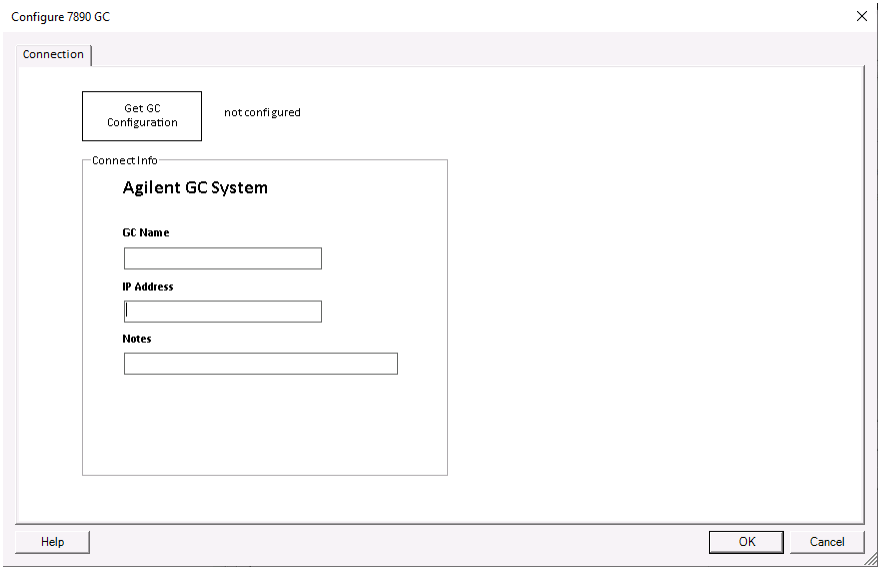
7 In the instrument configuration window select the appropriate instrument.

8 Click the arrow button to add it to the list on the right-hand side.



9 Click **Configure**.

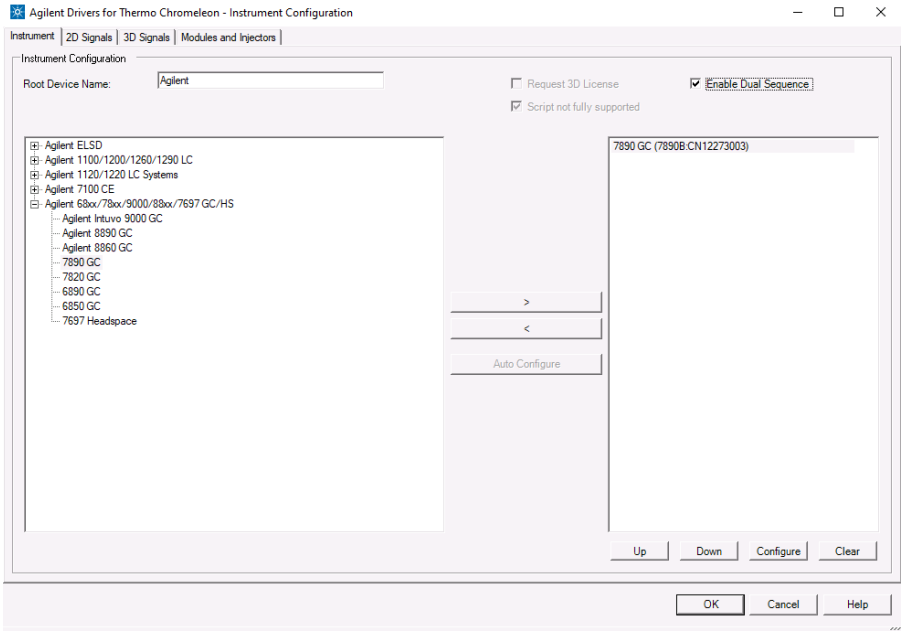
10 In the text box labeled **IP Address** enter the GC's IP.



11 Click **Get GC Configuration**.

12 After the GC configuration is loaded, click **OK**.

13 In the **Instrument Configuration** window select the **Enable Dual Sequence** check box.

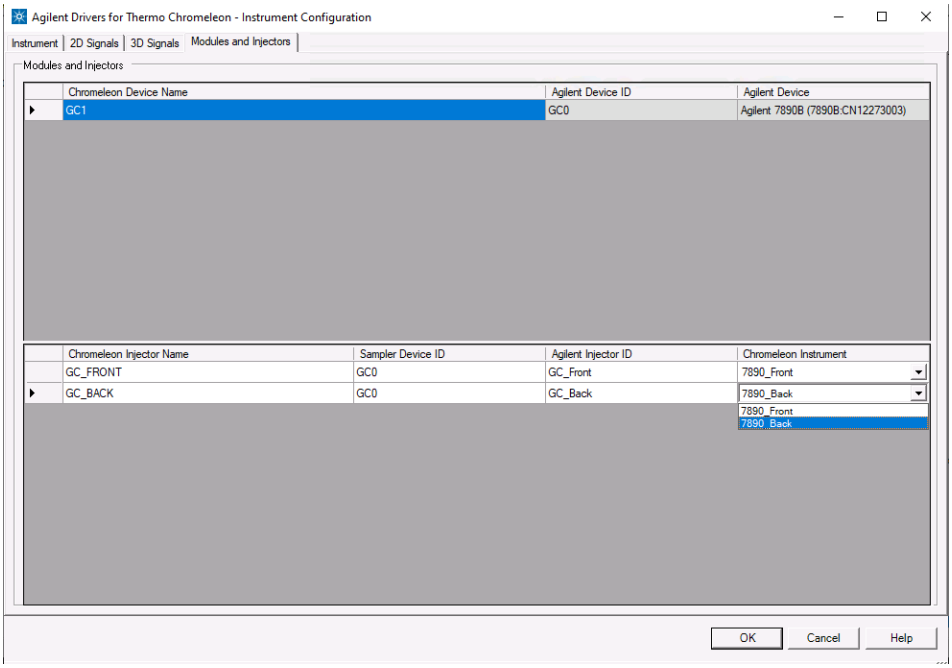


NOTE

The **Enable Dual Sequence** check box is only active when a dual sequence-capable 6890GC, 7890GC or 8890GC is configured. Other models are not capable of running dual sequences.

14 Click the**Modules and Injectors** tab.

15 In the lower table, assign the Chromeleon instruments to their respective injectors.



16 Click **OK**.

17 Save the configuration.

Deleting a Shared Driver

A GC configured in dual sequence mode shares a driver instance between both instruments. Therefore, changes made to the configuration in either instrument configuration are reflected in the other instrument. However, deleting the driver instance from either instrument is possible and the Chromeleon Configuration Manager offers to move the configuration to the remaining instrument. Doing so disables the **Enable Dual Sequence** check box on the remaining instrument and assigns all injectors to the same instrument.

The Agilent Home ePanel for Dual Sequence GCs

The Agilent Home ePanel for dual sequence GCs offers three radio buttons in the Dual Operation box as shown in Figure 40 on page 87.

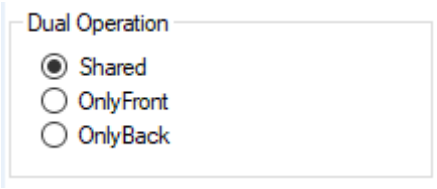


Figure 40 Dual Operation radio buttons

The possible values are:

- **Shared**: Select this setting to run sequences simultaneously
- **OnlyFront**: Select this setting to run sequences on the front instrument only
- **OnlyBack**: Select this setting to run sequences on the back instrument only

Creating Methods for Dual Simultaneous Injection

The instrument methods used in dual simultaneous injection mode must have the same setpoints. In case the instrument methods differ, the samples will run sequentially.

To ensure that the setpoints are identical, a method created for one instrument can be assigned to the second instrument and saved under a new name. Thereby eliminating the need to transfer the settings manually.

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.

Methods created for dual simultaneous injection include a script variable named **Sharable**. This variable value is set to **On** by default for use in dual simultaneous injections, but can be set to **Off** when the GC is used in OnlyFront or OnlyBack mode.

Creating methods for dual simultaneous injection:

NOTE

The script variable **Sharable** will always be set to **On** when a change in the method UI is made. Manually set the variable to **Off** if the method will be used in OnlyFront or OnlyBack mode.

1. In the Chromeleon Console select **Instrument Method...** from the **Create** menu.
2. If prompted, select the dual injection capable device from the instrument list, e.g., the front instrument.
3. Select the diagnostic channels to record, if any. The run time is set later via the oven program.
4. Click **Next**.
5. Enter all method parameters as required. The run time shown in the oven program settings is the run time used for this method.

NOTE

Always check all method settings.

6. Select the signals section. Use the slider next to the signals table to assign signals to the front and back instrument. The letter F in the Dual column means the signal is assigned to the front instrument, and a B means the signal is assigned to the back instrument.

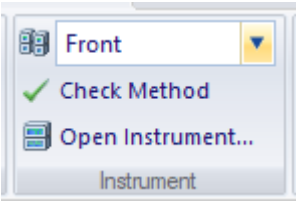
NOTE

When creating a new method, the method script only list the signals assigned to the selected instrument. In the method UI all signals, for both instruments, should be set.

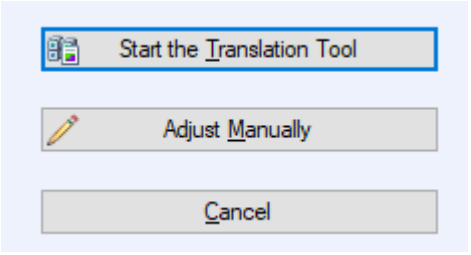
7 Click **Next**.

8 Save the instrument method and keep the method window open.

9 Change the assigned instrument in the menu bar. This workflow allows to transfer the method settings to the second instrument method. Alternatively, the second method could be created by repeating the above steps.

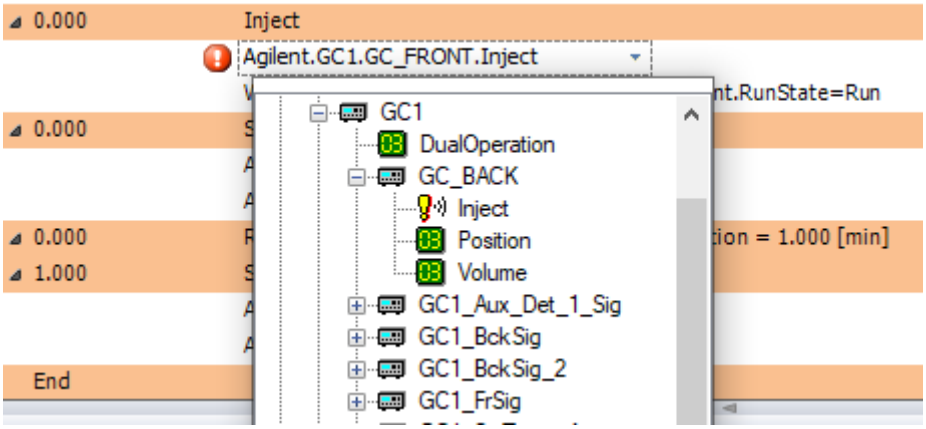


10 Select **Adjust Manually** from the method translation options.

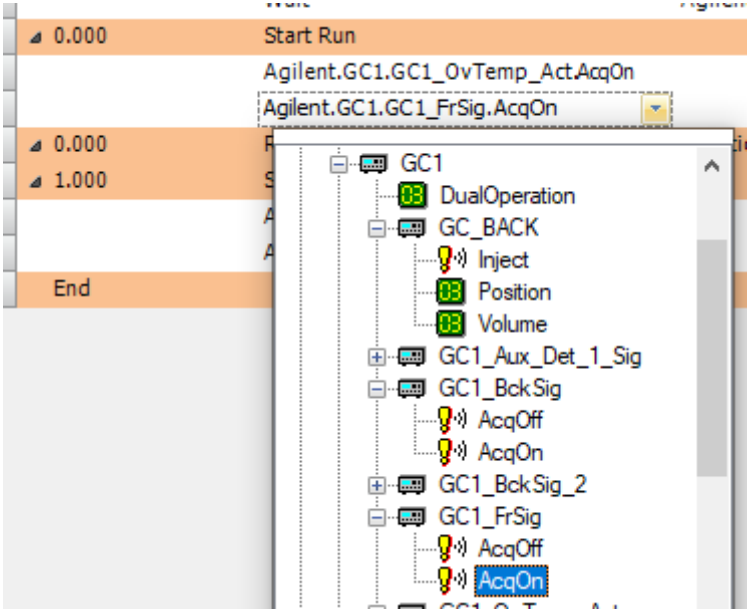


11 Select the **Script Editor**.

12 Click the inject command and adjust the command to the newly assigned instrument.



13 Click the **AcqOn** command in the **Start Run** stage and adjust the command to the newly assigned instrument.



14 Repeat step 13 for the **AcqOff** command.

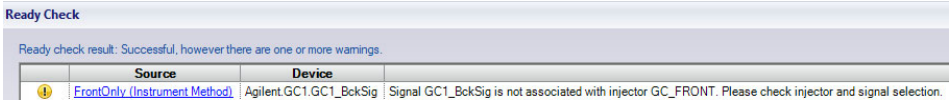
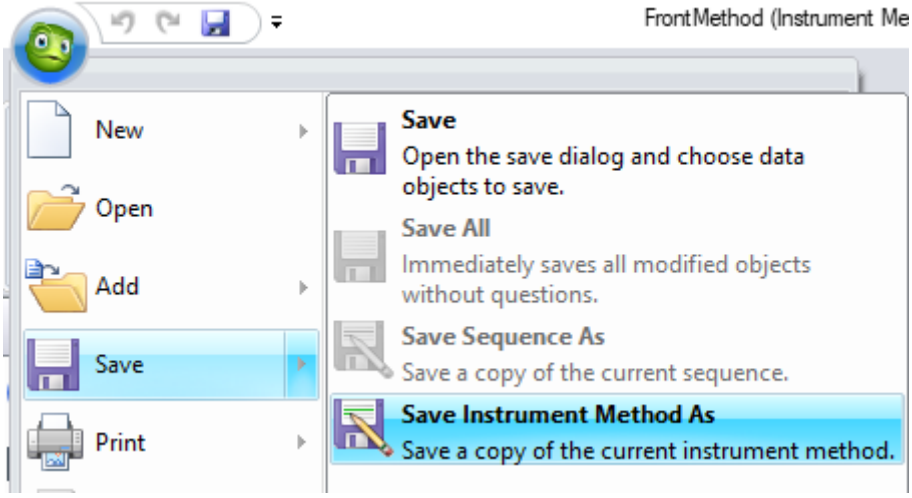


Figure 41 **A back detector signal assigned to the front instrument causing a Ready Check warning**

NOTE

A warning will be shown in the **Ready Check** results if the signal selection does not fit the instruments injector. In this case verify the signal selection in the method script.

15 Click the Chromeleon symbol in the upper left corner and select **Save Instrument Method as**.



16 Save the instrument method under a new name.

Dual Simultaneous Injection Sequence

Sequences are created as described in "Manual Injection on GC Instruments" on page 69. Chromeleon handles the two sequences required for dual simultaneous injections separately. That means for each instrument a sequence is submitted. The results will then be stored in the respective sequence.

Running sequences simultaneously requires that the same instrument method settings be used for both samples. In case the instrument methods differ, the samples will run sequentially. The injection volume is not part of the instrument method. Hence it is possible to run sequences with the same instrument method setpoints but differing injection volumes.

In case the same vial position is used for injection in both sequences at the same time, the samples will be run sequentially. Dual simultaneous injection mode is resumed with the next sample, if possible.

NOTE For best utilization ensure that all samples can be run in dual simultaneous injection mode.

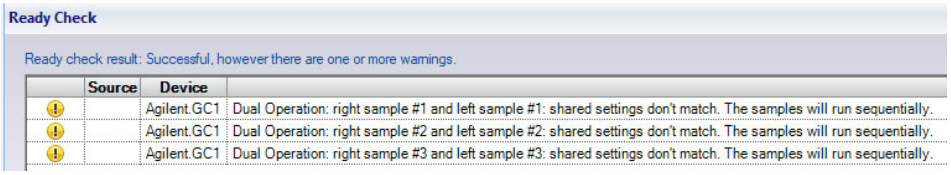


Figure 42 Ready Check warning informing that three sample pairs will be run sequentially

The Agilent Drivers for Chromeleon check whether it is possible to run the sample pairs simultaneously during Ready Check. When a sample pair is found for which dual simultaneous injection is not possible, a warning as shown in Figure 42 on page 92 is displayed. In this case, check the instrument methods and sample positions to enable dual simultaneous injection. Alternatively, the warning can be disregarded, and the samples will run sequentially.

OnlyFront and OnlyBack Settings

Selecting the OnlyFront or OnlyBack settings on the Agilent Home ePanel as shown in Figure 43 on page 93 temporarily disables the dual injection mode and sequences can be run on the front or back instrument respectively. Hence, a reconfiguration is not required if only one sequence will be run.

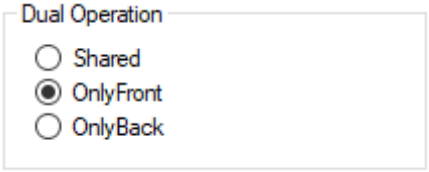


Figure 43 Dual Operation set to OnlyFront on the Agilent Home ePanel

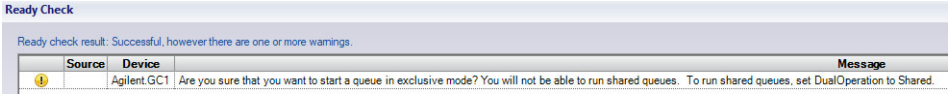


Figure 44 Ready Check warning in OnlyFront or OnlyBack mode

At the start of such a sequence, Chromeleon shows a **Ready Check** warning as shown in Figure 44 on page 93, informing that the current operation mode does not allow dual simultaneous injection. Disregard the warning to start the sequence or change the Dual Operation mode to **Shared** on the Agilent Home ePanel if dual simultaneous injection is desired.

7 Troubleshooting

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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.

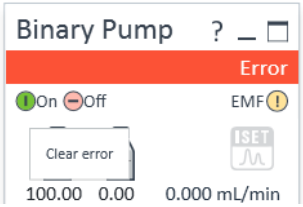


Figure 45 Module in Error state

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

Information Required for Troubleshooting

Note the instrument configuration.

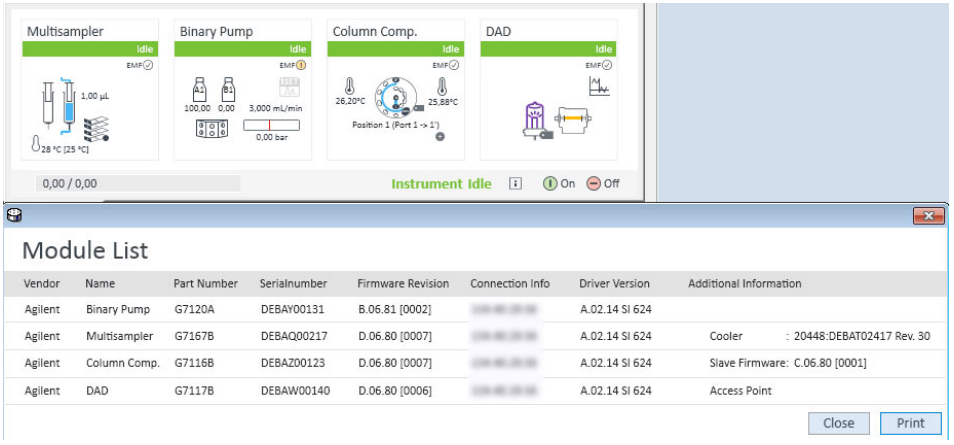


Figure 46 Detailed module information

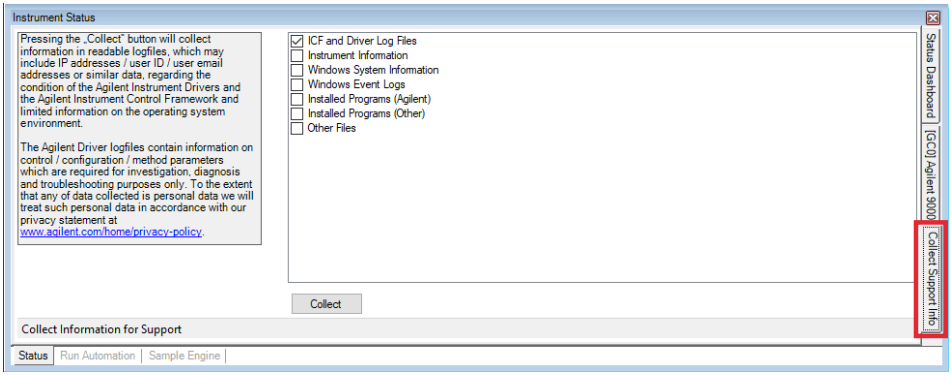
Collect the Agilent Instrument Driver Log Files

Collect the Support Information

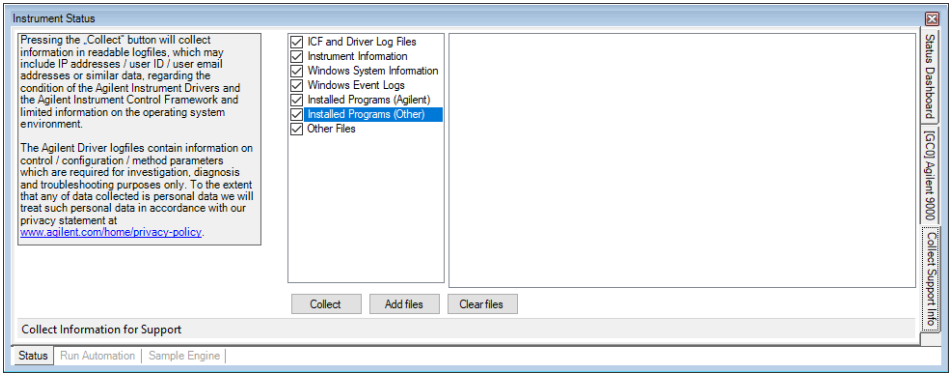
NOTE

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.

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 Drivers, 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 instrument 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.

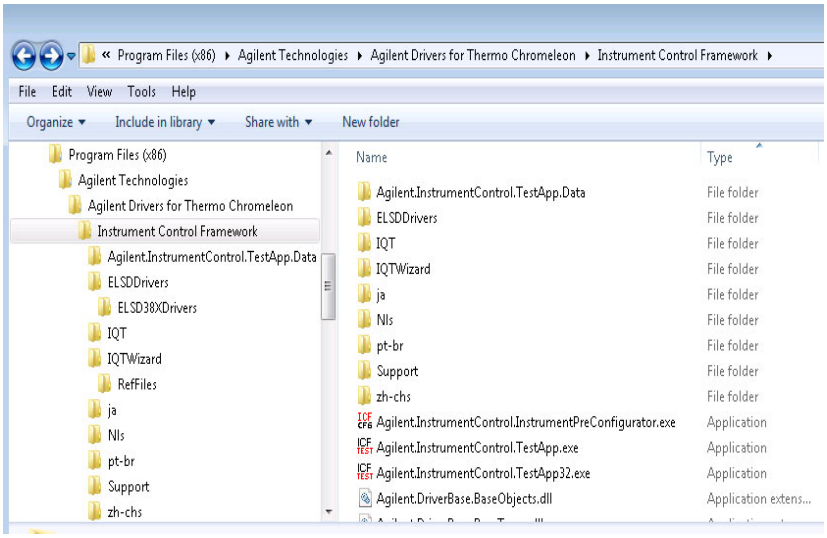


Figure 47 Location of TestApp executables

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.

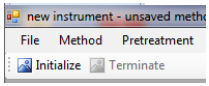


Figure 48 Close-up of the Initialize button

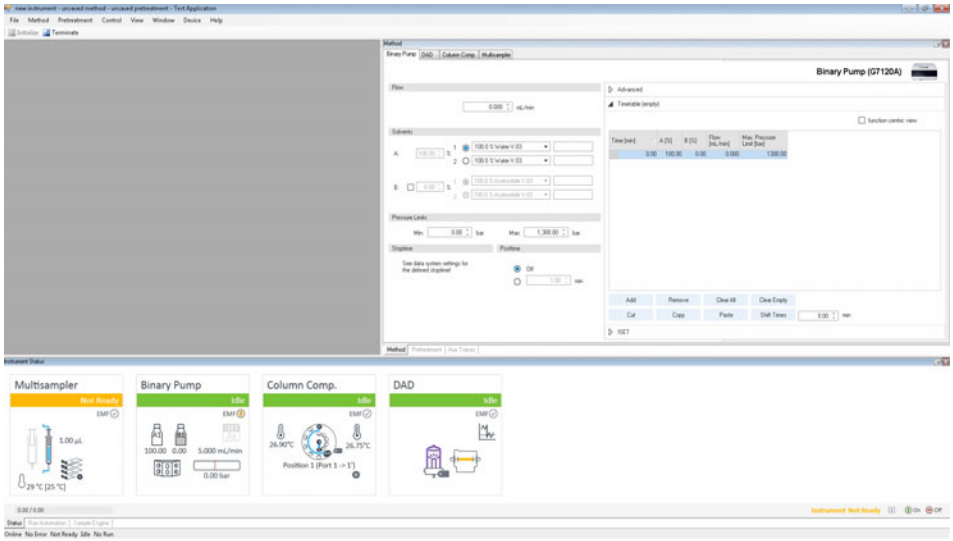


Figure 49 Running the Test Application

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.

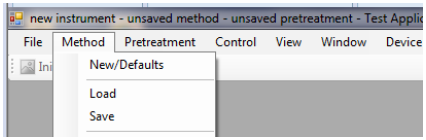


Figure 50 The Method menu

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

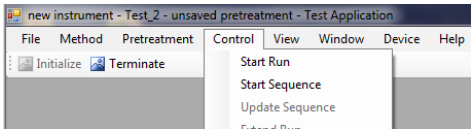


Figure 51 The Control menu

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.

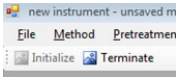


Figure 52 Close-up of the Terminate button

8 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.

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.

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.

Other Limitations

- Only one injector is allowed per LC instrument.
- Manual injection is supported for GC only.
- 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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