

Agilent 7890 Series Gas Chromatograph

GC Software Features Overview

Notices

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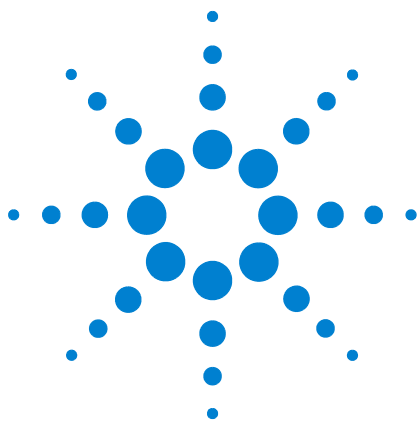
Safety Notices

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.

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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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Introduction

This guide describes how to begin using the Agilent 7890 Series Gas Chromatograph (GC) with the Agilent Integrated GC Software.

This guide assumes some familiarity with the Agilent 7890B Gas Chromatograph (GC) (Figure 1) and your specific Agilent data system. Refer to the user manuals that came with your GC and Agilent data system for details.



Figure 1 The Agilent 7890B GC with 7693A ALS

This guide shows software examples from Agilent's OpenLAB CDS ChemStation Edition. While the GC parameters are the same in any Agilent data system, how to access the GC parameters varies between data systems.

Refer to your specific data system user manuals for exact menu choices to access the GC control screens shown in this manual.

Refer to your 7890B GC Operation Guides for method parameters.

Before You Begin

This guide assumes the use of an Agilent 7890B GC with 7693A ALS installed. In addition, this guide assumes that:

- The latest version of your Agilent data system software is installed and configured.
- The GC has no error conditions.
- All gases are plumbed and turned on.

Agilent GC Configuration

To access the Agilent GC configuration, select the Agilent 7890B GC configuration menu option from your data system's instrument menu (Figure 2). Refer to your data system's user documentation for details.

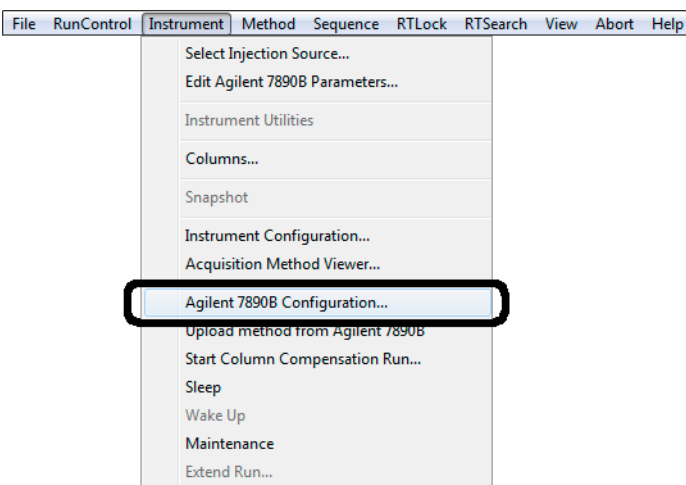


Figure 2 Accessing the **Agilent 7890B GC Configuration** from OpenLAB CDS ChemStation Edition

Connection

Use the **Connection** tab (Figure 3) to upload the latest GC hardware configuration, to access GC connection information, and to view any license keys for add-on software.

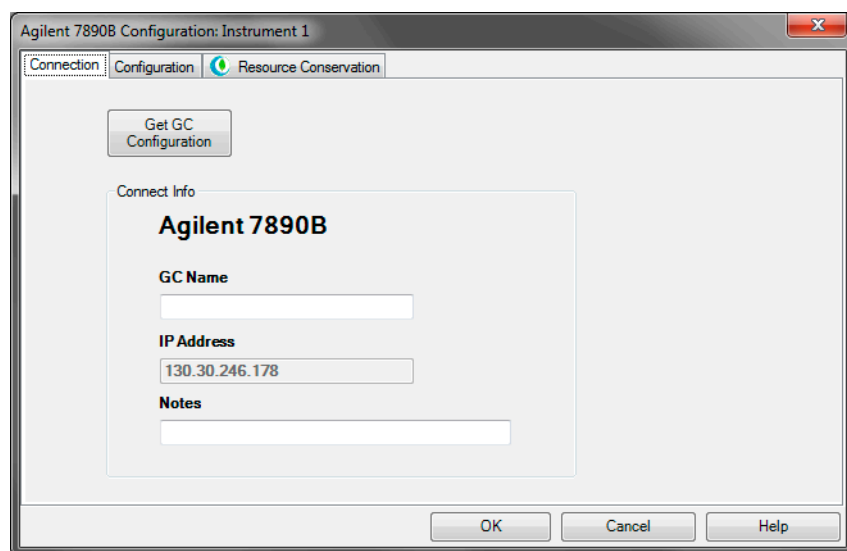


Figure 3 The **Connection** tab

Configuration

Use the **Configuration** tab to configure the **Keypad Lock** and **Prep Run on Manual Request** settings, and to browse your GC's configuration (Figure 4).

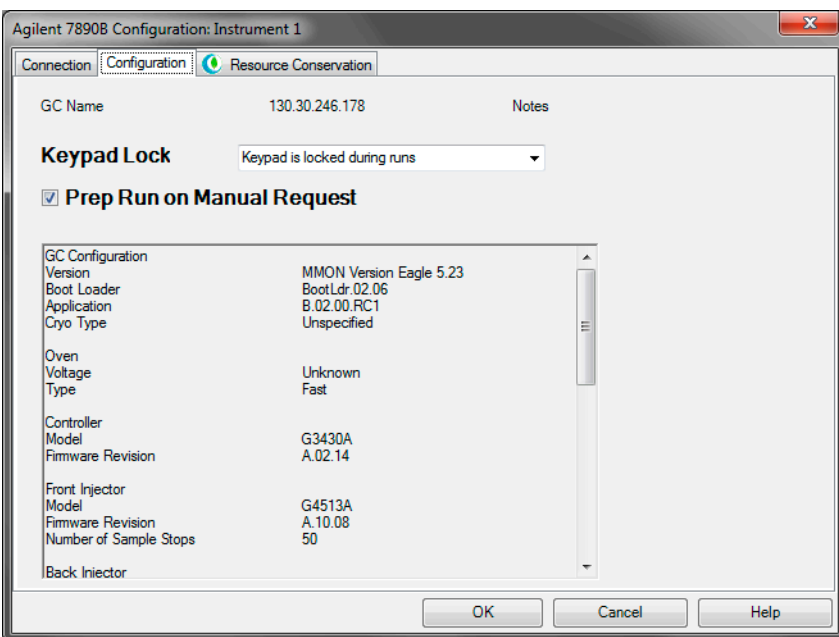


Figure 4 The Configuration tab

Keypad Lock

The **Keypad Lock** feature (Figure 5) on the **Configuration** tab provides the option of enabling or disabling the GC keypad for different levels of software control.

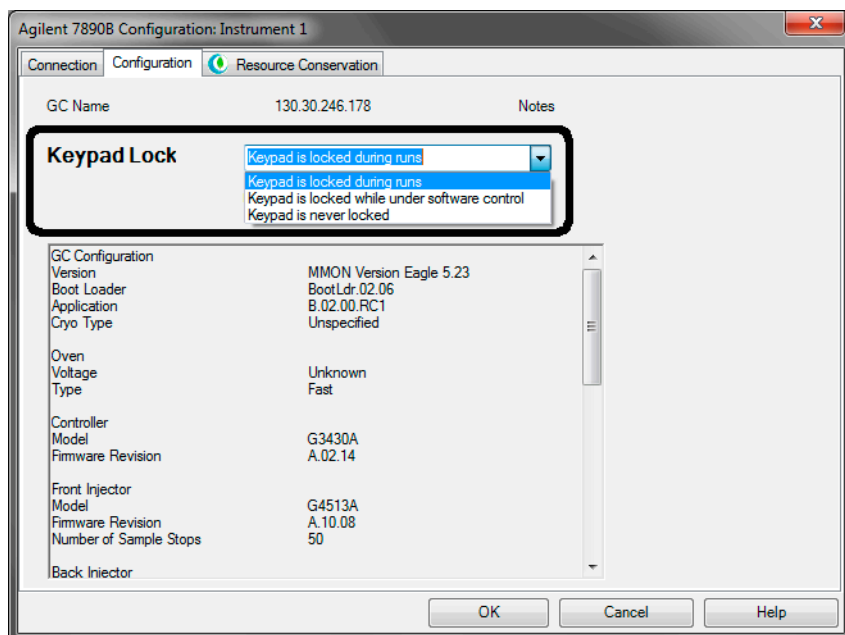


Figure 5 Keypad Lock options

Select the desired behavior:

- **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.
- **Keypad is never locked** – Enables the GC keypad at all times.

GC configuration information

You GC configuration information (Figure 6) displays on the **Configuration** tab. You can view your instrument model number, its firmware revision, and many other hardware configuration details.

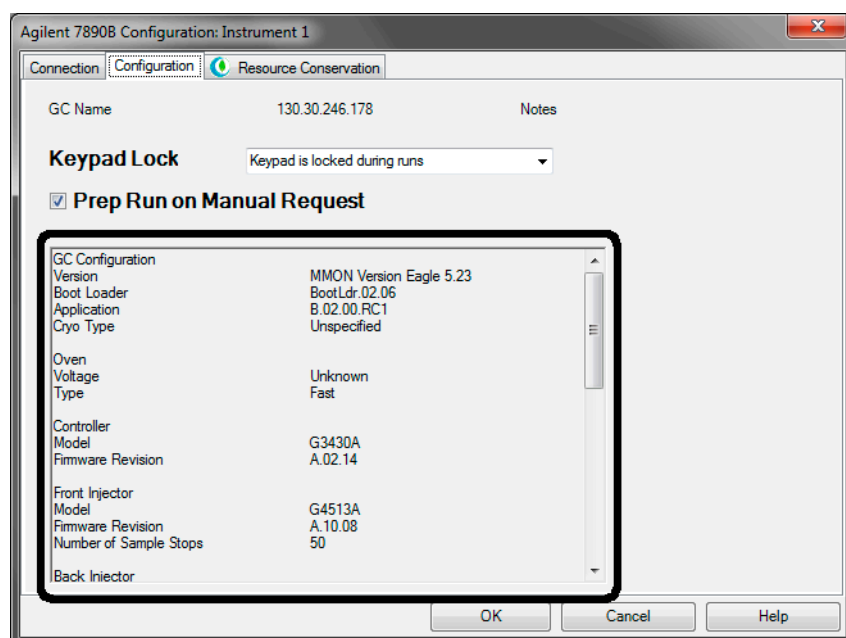


Figure 6 GC configuration information

Provide the information displayed here to Agilent when seeking service or phone assistance.

Resource Conservation

Use the **Resource Conservation** tab to configure special methods to run at specific times of the day to help conserve resources during laboratory downtime. You can configure **Sleep** and **Wake** methods for your GC, and set them to run on daily or weekly schedules to best match your lab's needs (Figure 7).

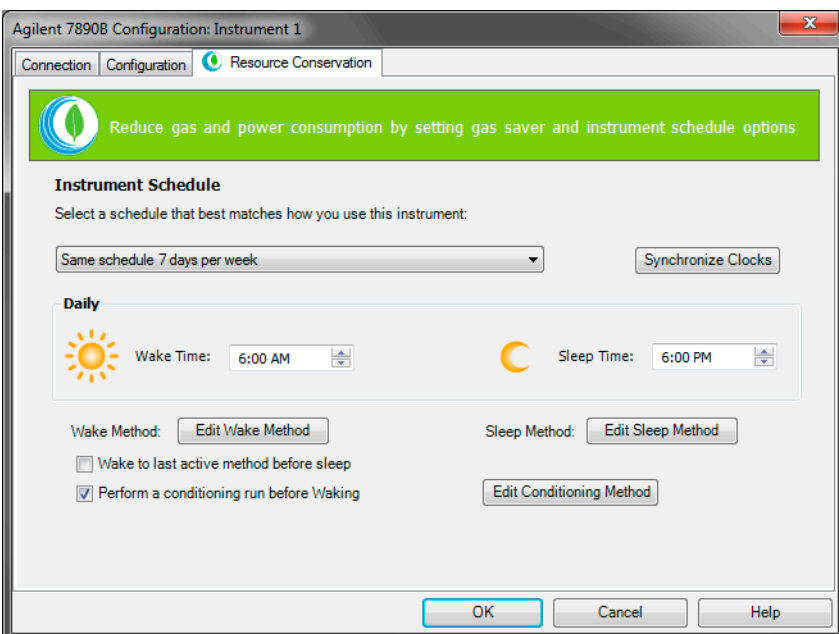


Figure 7 The **Resource Conservation** tab

Setting up a schedule

To set up a resource conservation schedule for your 7890B GC, you must first define the times and days to run your **Sleep** and **Wake** methods.

For example, select **Same schedule 7 days per week** from the **Instrument Schedule** drop-down list (Figure 7) to run your **Sleep** and **Wake** methods at the same time every day.

It is important to synchronize your PC and GC clocks when setting the instrument schedule. Click **Synchronize Clocks** to match your GC clock with your PC clock.

Sleep and Wake methods

Sleep and **Wake** methods use the same software controls that are available with your 7890B GC method editor. Refer to “[Method Editor](#)” on page 12 for specific information.

Use the **Sleep** method to load GC settings for periods of inactivity. When configuring your **Sleep** method, be sure to consider the following:

- In general, you need to set only the temperatures to conserve energy. Most other parameters apply only during a run.
- If using GC carrier gas control, set a reduced flow of carrier gas through the GC column by setting the method carrier gas parameters.
- To set reduced GC purge flows, see your inlet's gas saver settings.
- Be aware of stabilization times for your devices and set the temperatures accordingly. It may benefit you to leave certain detectors at temperature setpoint rather than waiting for the detector to stabilize and become ready during the wake method. Refer to the user information provided with your GC and devices for more information.

Use the **Wake** method to load settings after the sleep period ends, for example, to warm the vial oven or increase gas flows. If desired, the wake method can be simply the last analytical GC method run.

Method Editor

To open the **Method Editor**, select **Instrument > Agilent 7890B Parameters...** (Figure 8).

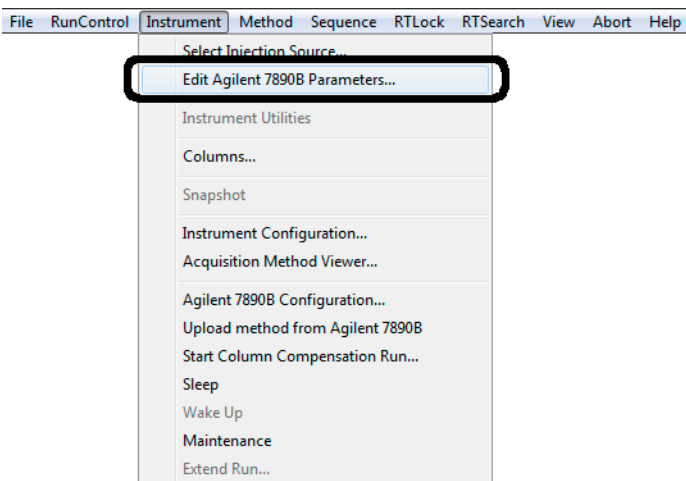


Figure 8 Opening the **Method Editor**

Configuration (Method)

Open **Method Configuration** (Figure 9). Select the **Configuration** tab on the Method Editor. Use the Configuration panel to set specific parameters for your ALS, valves, inlets, detectors, and columns.

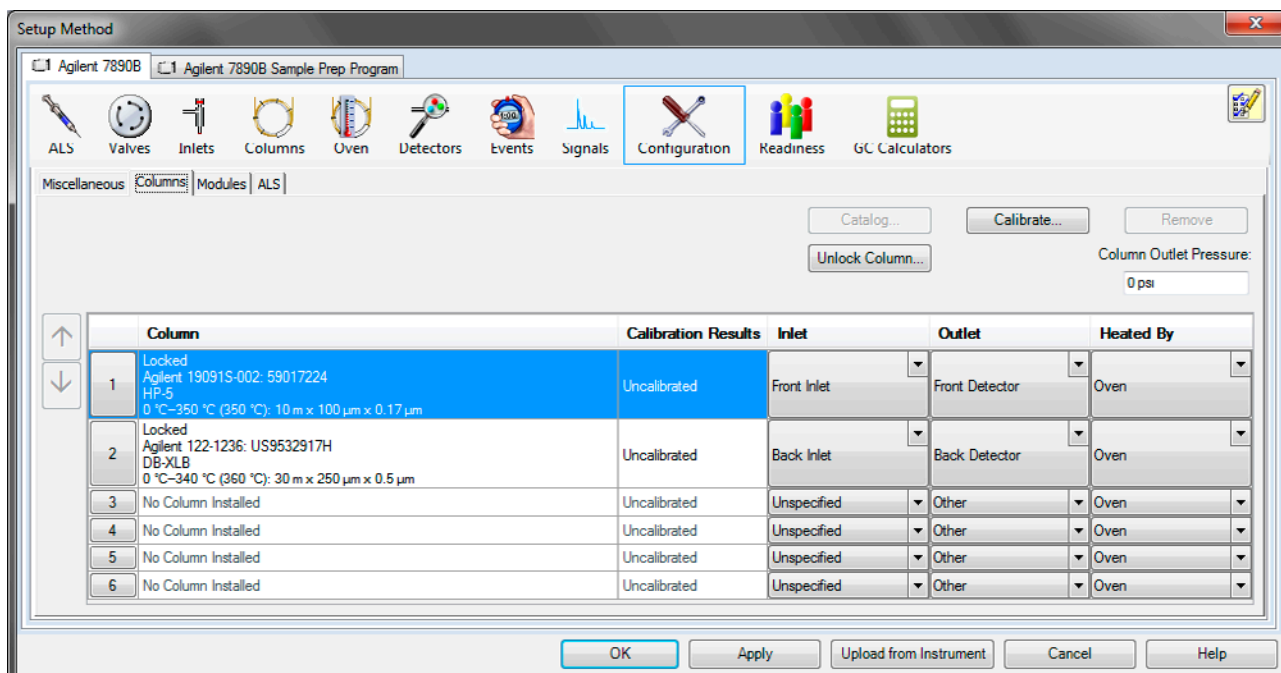


Figure 9 Accessing the **Configuration** parameters

Miscellaneous

Select the **Configuration > Miscellaneous** tab (Figure 10). Use the **Miscellaneous** tab to define your method's pressure units, configure valve types and oven fan parameters (slow fan), and view the thermal aux configuration.

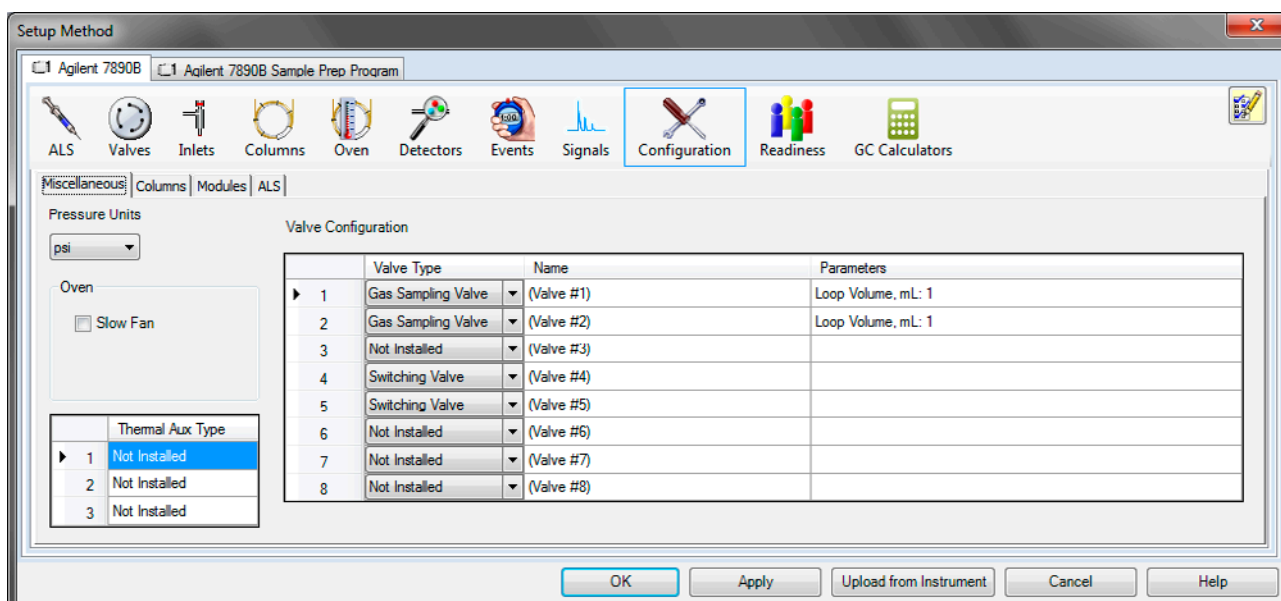


Figure 10 Setting the **Configuration > Miscellaneous** parameters

Columns

Select the **Configuration > Columns** tab (Figure 11). Use the **Columns** tab to define and configure a column for each position (1-6) in your GC. You can also calibrate a column, lock a column's configuration, describe how each column connects to GC devices, and tell the system how each column is heated.

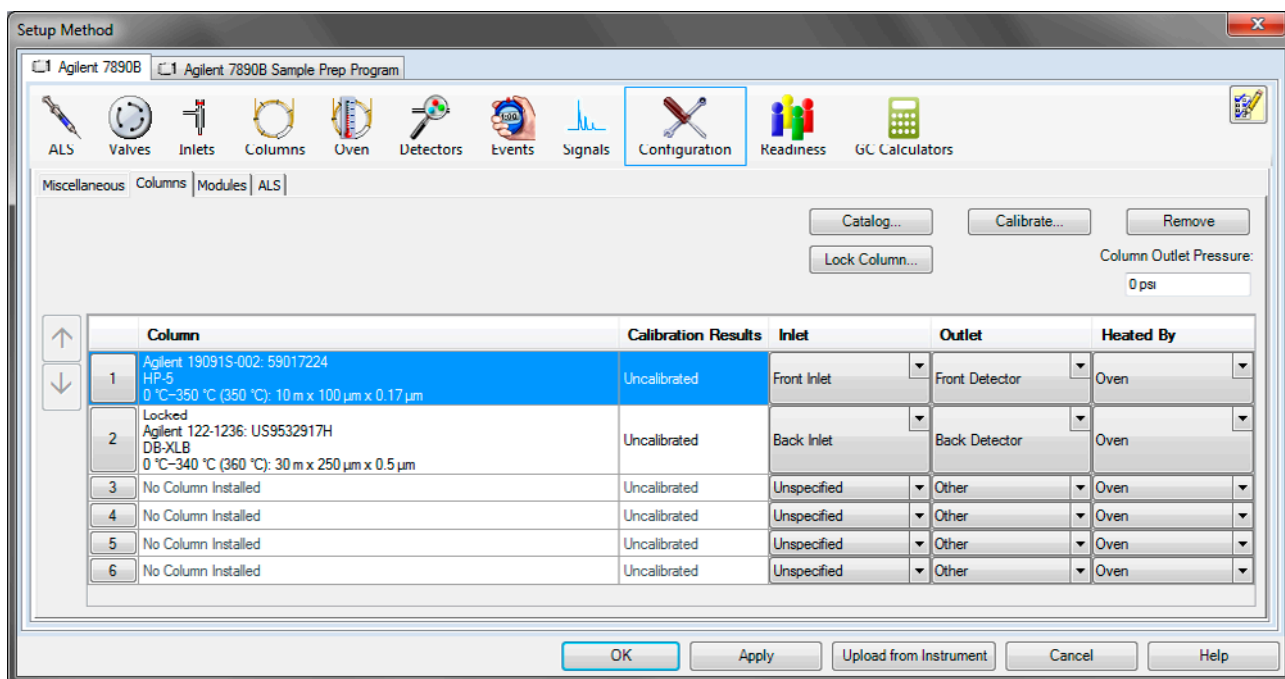


Figure 11 Accessing the **Configuration > Columns** parameters

GC Column Catalog The **GC Column Catalog** (Figure 12) is a local database shared across all instrument sessions on your data system. The database contains popular column models and any custom columns added.

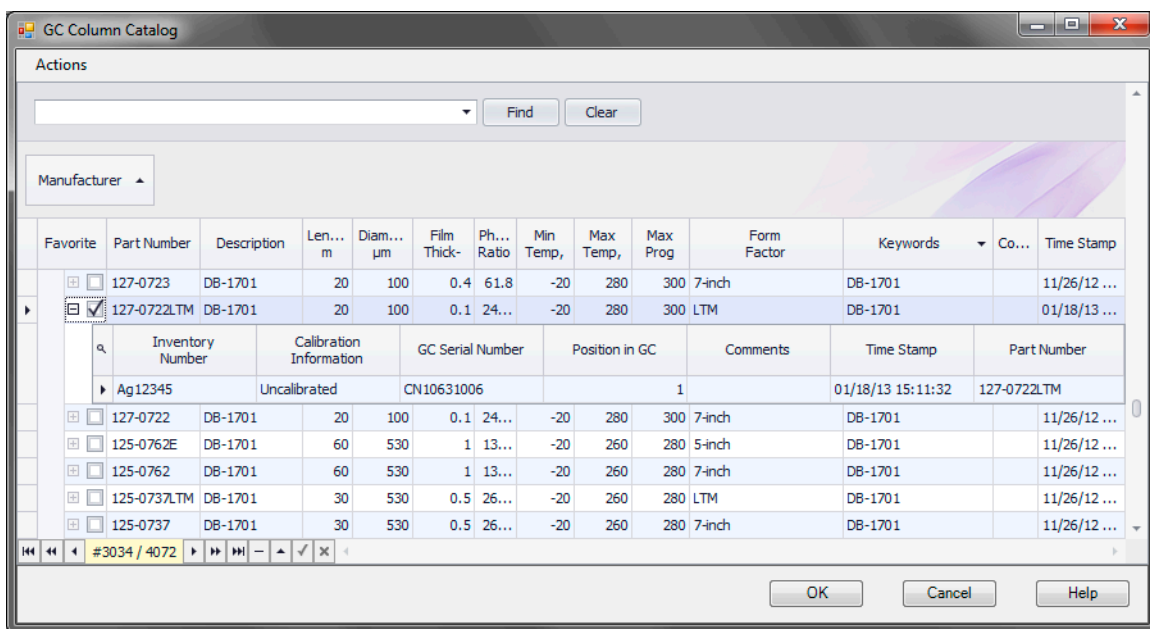


Figure 12 The **GC Column Catalog**

Use the **GC Column Catalog** to select a column model to add to your **Column Inventory** (a collection of columns available in your lab), or select a column model already entered in your inventory to define in your method.

Once you define a column using the **GC Column Catalog** or **Column Inventory**, the column information displays in your method editor, the GC actuals, and in the report following a run.

Column Lock If desired, lock the selected column's configuration. When a column is locked:

- Column parameters will not change when a different method is loaded.
- Only column segments are editable.
- The selected column's position is not changeable.

Modules

Select the **Configuration > Modules** tab (Figure 13). Use the **Modules** tab to define the gas types for your inlets, detectors, and any Aux EPC modules.

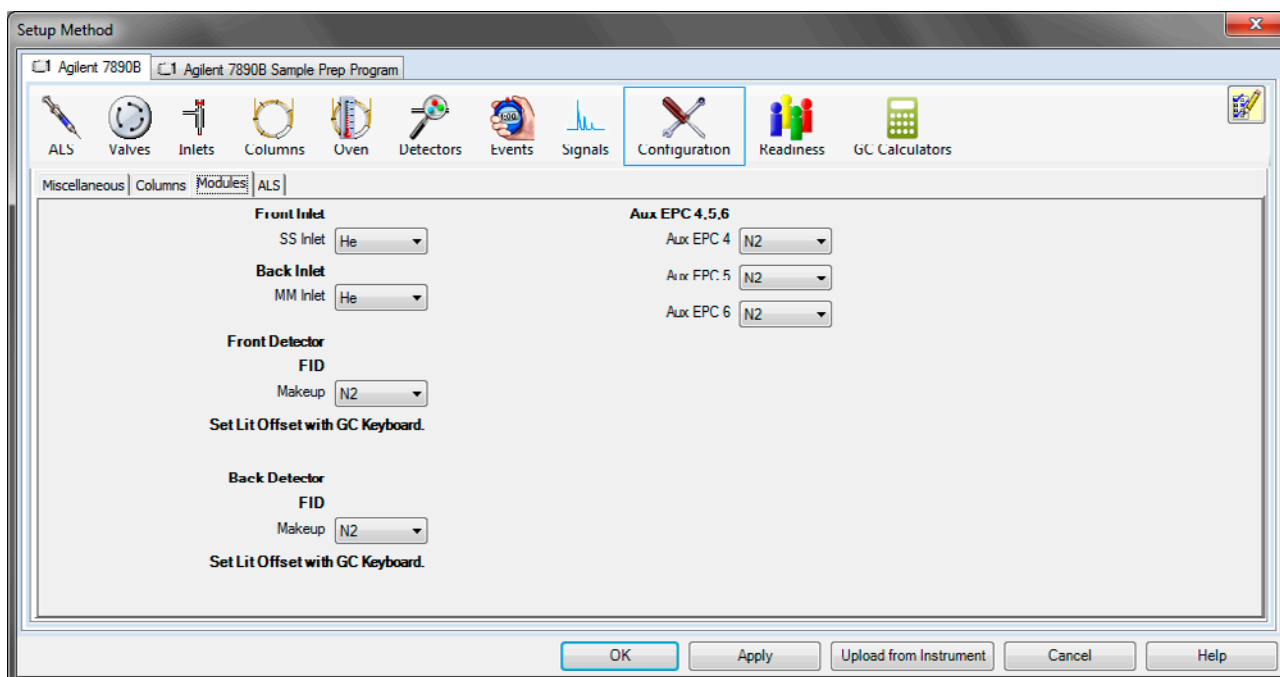


Figure 13 Setting the **Configuration > Modules** parameters

ALS

Select the **Configuration > ALS** tab (Figure 14). Use the **ALS** tab to define the solvent wash mode, the installed syringe model and size, and configure tray parameters.

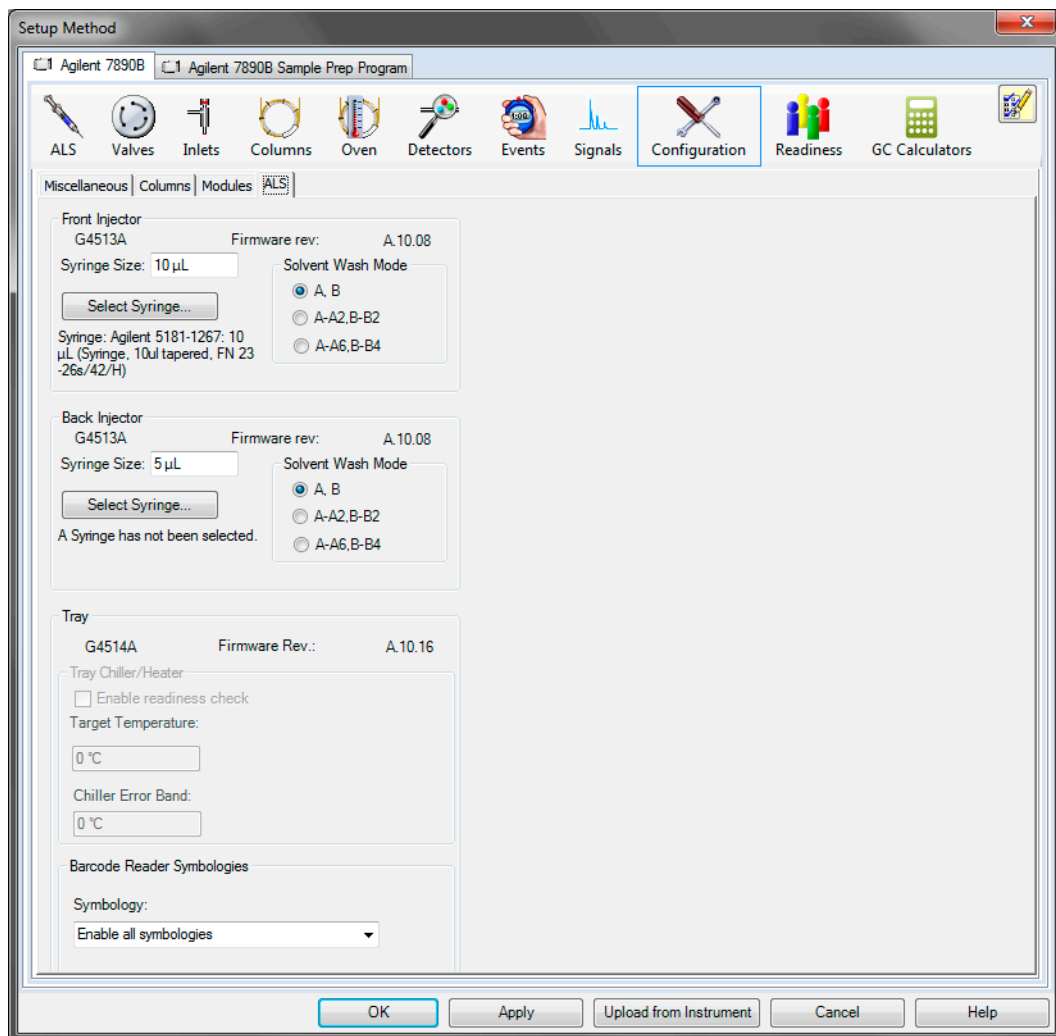


Figure 14 Setting the **Configuration > ALS** parameters

GC Syringe Catalog The **GC Syringe Catalog** is a local database shared across all instrument sessions on your data system. The database contains popular syringe models and any custom syringes added.

Use the **GC Syringe Catalog** to select a syringe model to add to your **Syringe Inventory** (a collection of syringes available in your lab), or select a syringe model already entered in your inventory to define in your method.

Once you define a syringe using the **GC Syringe Catalog** or **Syringe Inventory**, the syringe information displays in your method editor, the GC actuals, and in the report following a run.

Columns

Select the **Columns** icon to open the **Columns** panel. Use the **Columns** panel to control column flow and pressure behavior during the run (Figure 15).

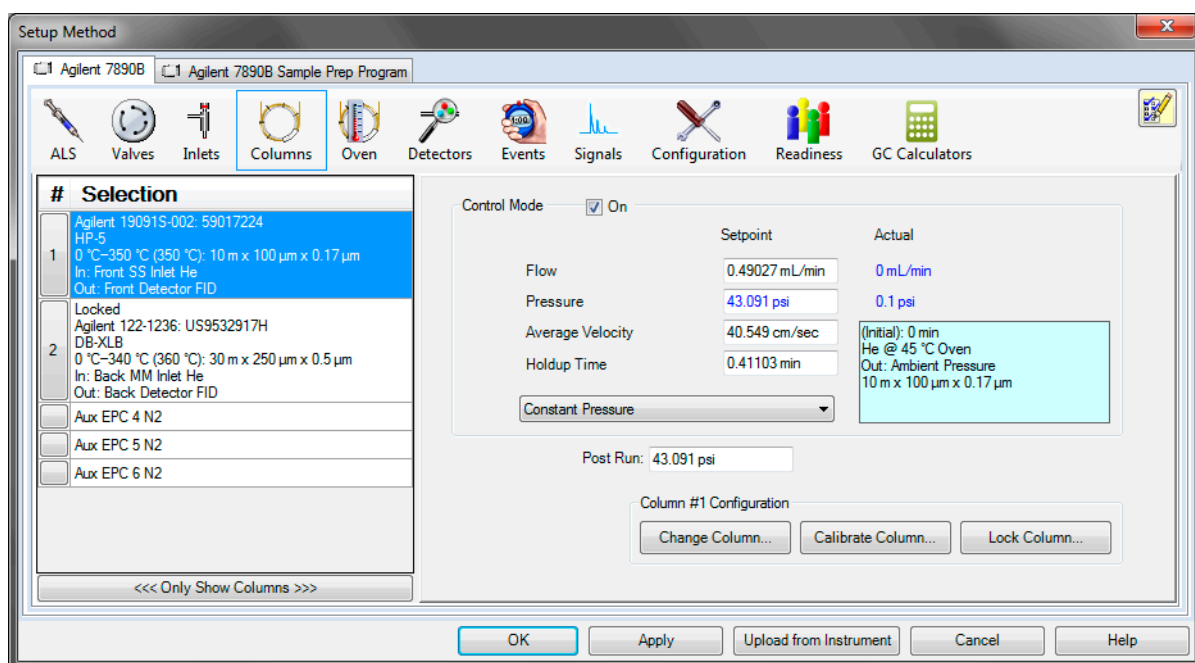


Figure 15 Accessing the **Configuration > Columns** parameters

Select the desired column or auxiliary pressure control device in the **Selection** box to define a flow or pressure program for the selected device (Figure 16).

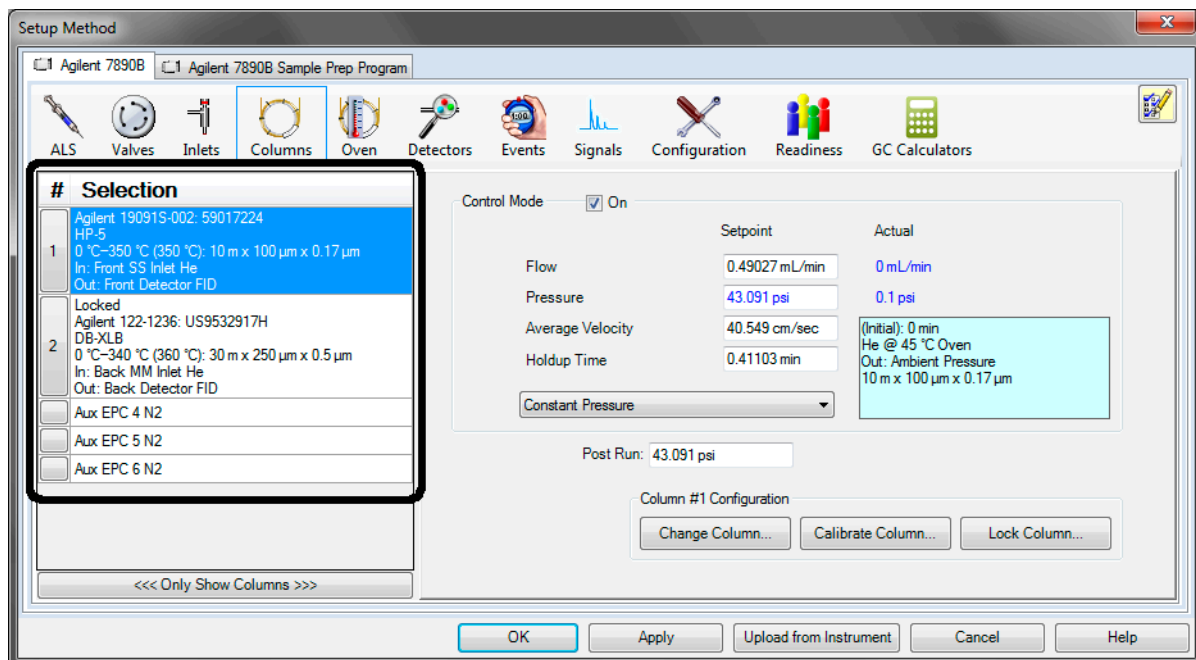


Figure 16 Selecting a column or other flow device to configure

Enable **Control Mode** to configure the column Flow, Pressure, Average Velocity, and Holdup Time parameters (Figure 17).

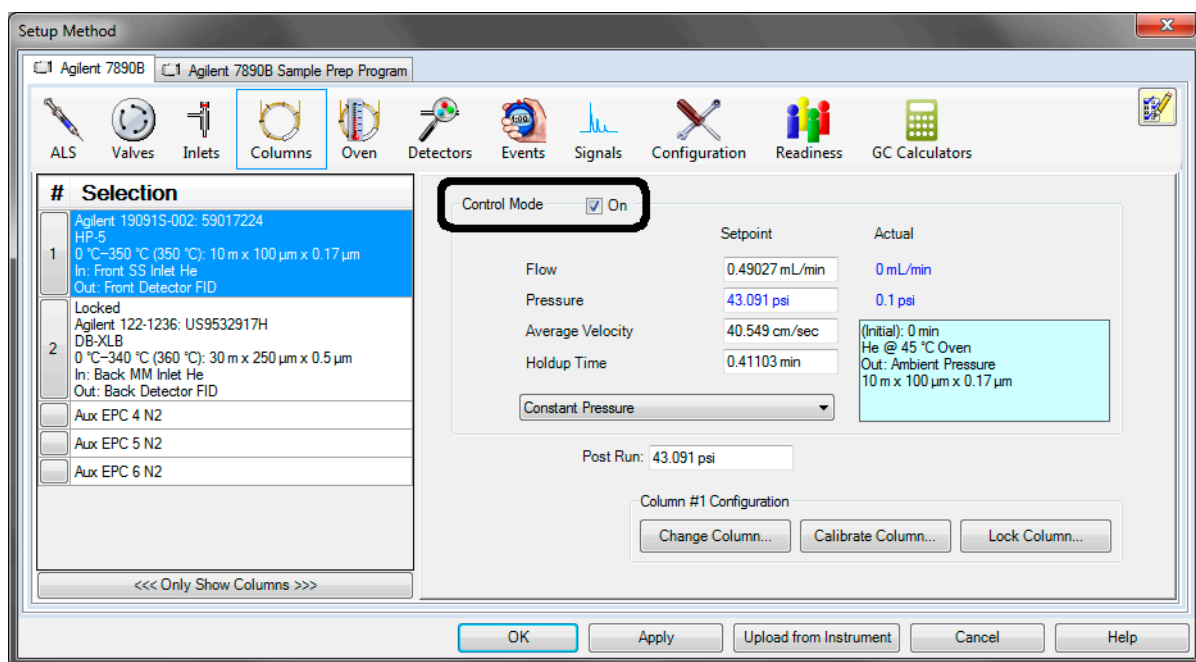


Figure 17 Enabling Control Mode

Select a constant pressure, constant flow, ramped pressure, or ramped flow program. If you selected a ramped pressure or ramped flow program, configure the ramp table (Figure 18).

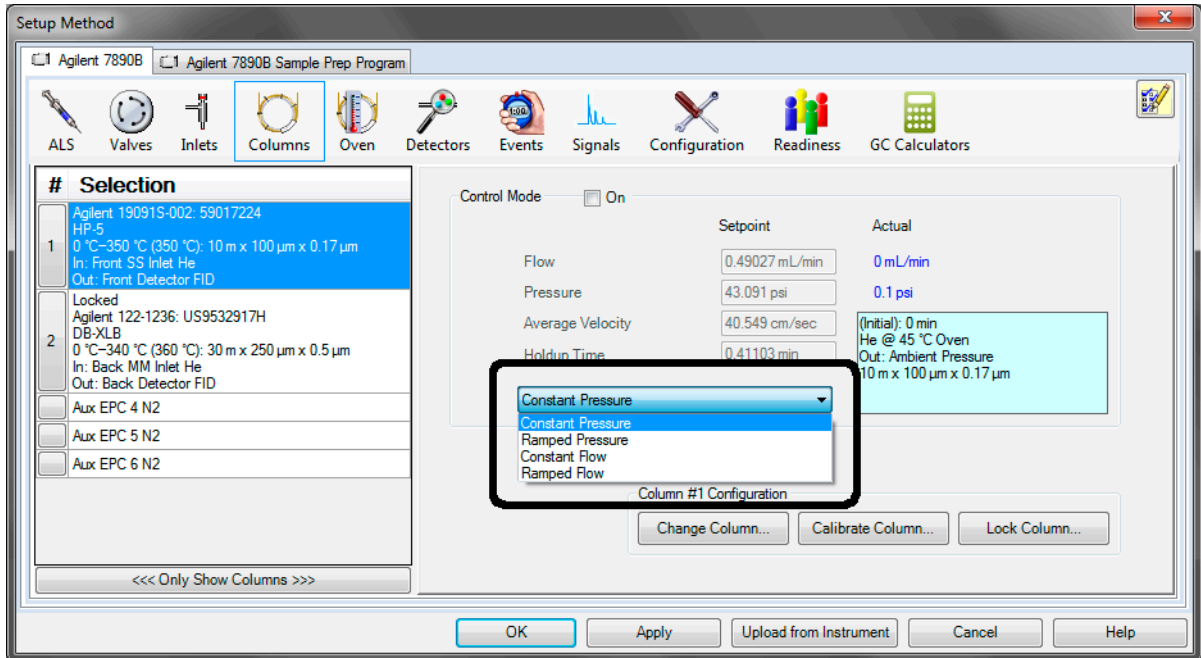


Figure 18 Selecting a ramped or constant flow or pressure program

If desired, you can change an installed column using the **GC Column Catalog**, calibrate a column, or lock/unlock the column configuration (Figure 19).

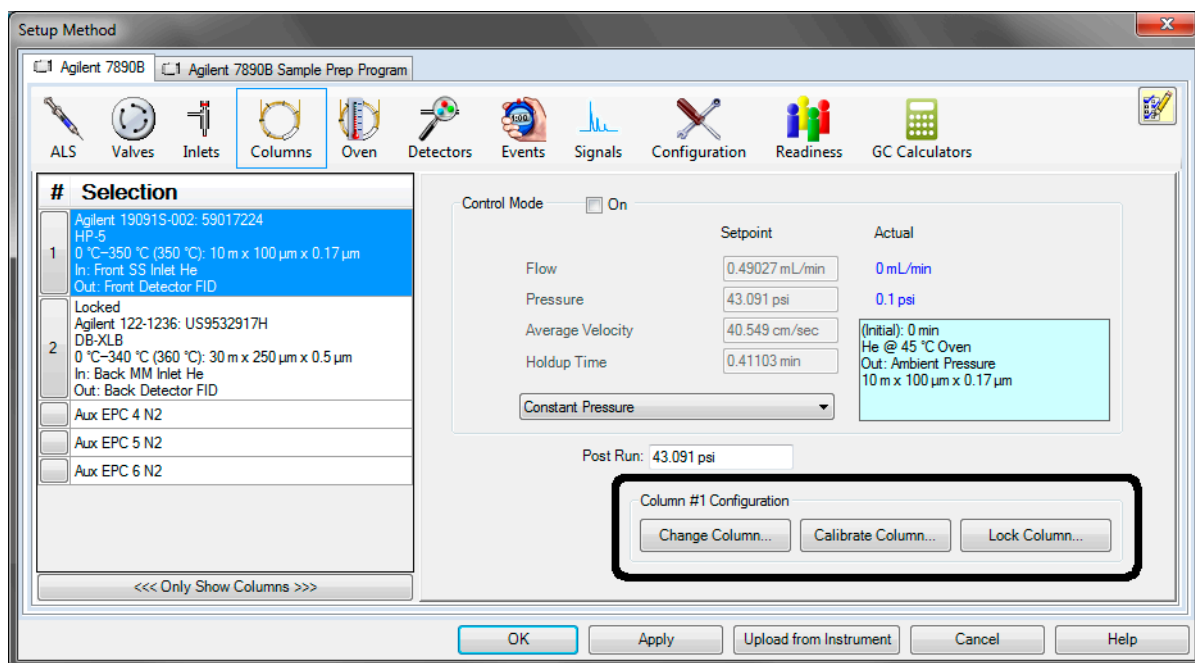


Figure 19 Accessing column configuration controls

GC Column Catalog

The **GC Column Catalog** is a local database of popular column models and custom column entries shared across all instrument sessions on your data system. See “[GC Column Catalog](#)” on page 16 for information.

Calibrate a column

If your column dimensions have changed since manufacture, use **Calibrate Column #** to enter or estimate the new column dimensions. When updated, the method editor automatically adjusts the column pressure and flow information in the method.

Lock a column

If desired, lock the selected column's configuration. This allows for a different method to be loaded without automatically updating the current column parameters in the GC with the column parameters previously stored with the different method.

Oven

Select the **Oven** icon to open the **Oven** panel. Use the **Oven** panel to control oven temperature parameters and to configure temperature ramps during and following a run (Figure 20).

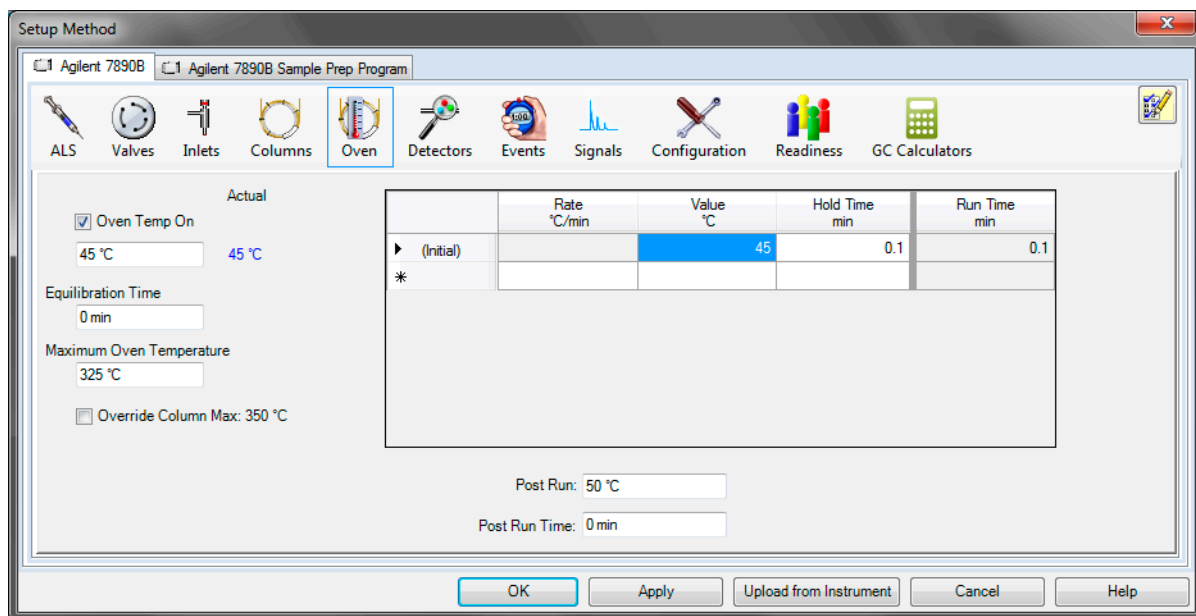


Figure 20 Accessing the **Oven** method parameters

If the **Oven** icon is highlighted in yellow (Figure 21), you must verify the maximum oven temperature setpoint. If the maximum oven temperature is higher than the column maximum temperature, it is possible to damage your column.

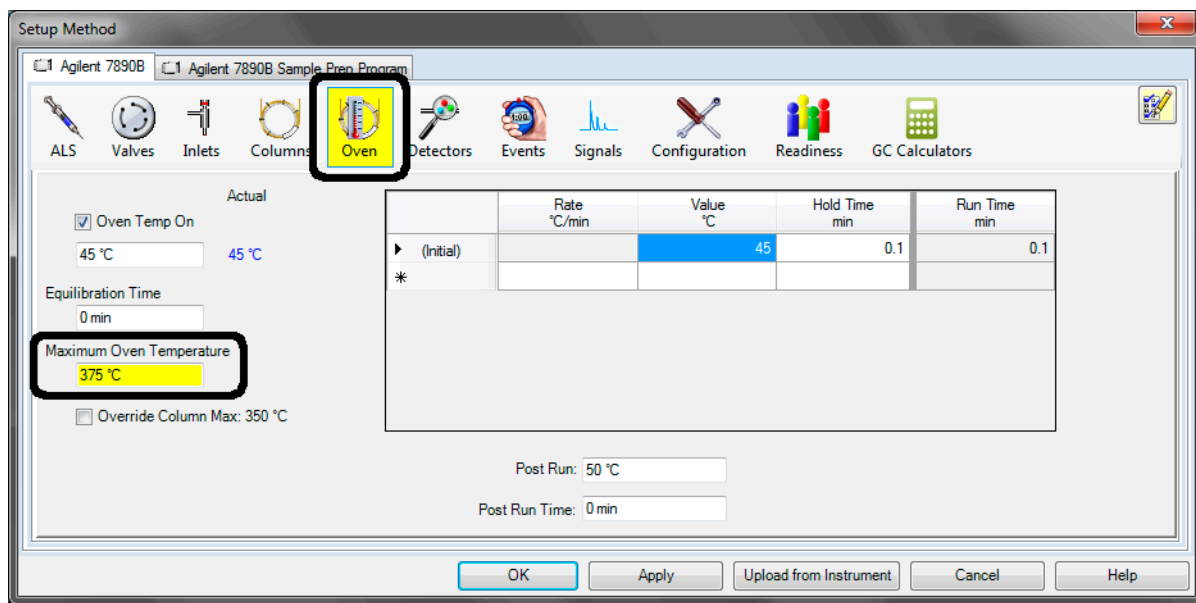


Figure 21 Oven setpoints out of range

ALS

Select the **ALS** icon to open the **ALS** panel. Use the **ALS** panel to set parameters for the injector and sample tray.

Front/Back Injector

Select the **ALS > Front Injector** (or **Back Injector**) tab. Use the **Front/Back Injector** panel to configure injection parameters, washes and pumps settings, dwell time, plunger speed, sample depth, and the type of your injection (Figure 22).

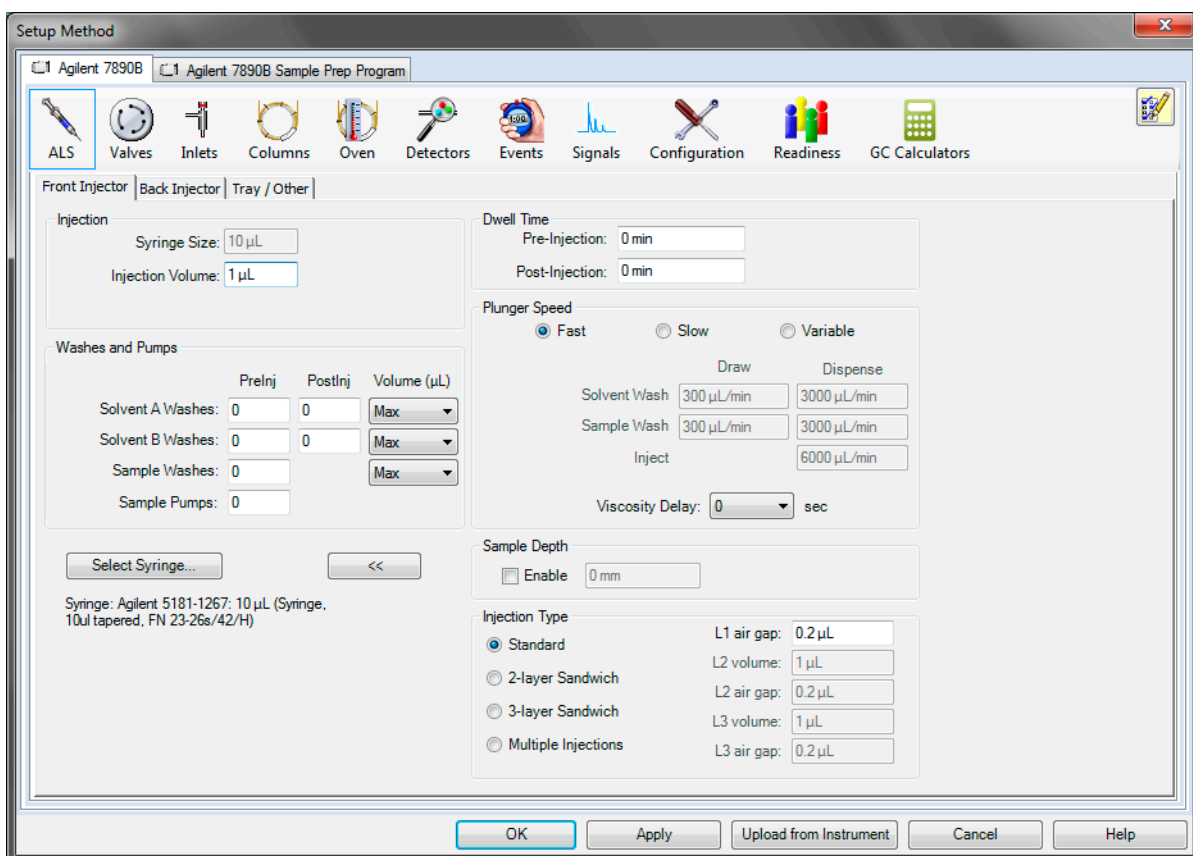


Figure 22 Accessing the **Front/Back Injector** method parameters

GC Syringe Catalog The **GC Syringe Catalog** is a local database shared across all instrument sessions on your data system. See “[GC Syringe Catalog](#)” on page 19 for information.

Tray / Other

Select the **ALS > Tray / Other** tab. Use the **Tray / Other** tab to configure the barcode, heating, and mixing modules, sample overlap settings, and to configure ALS error handling (Figure 23).

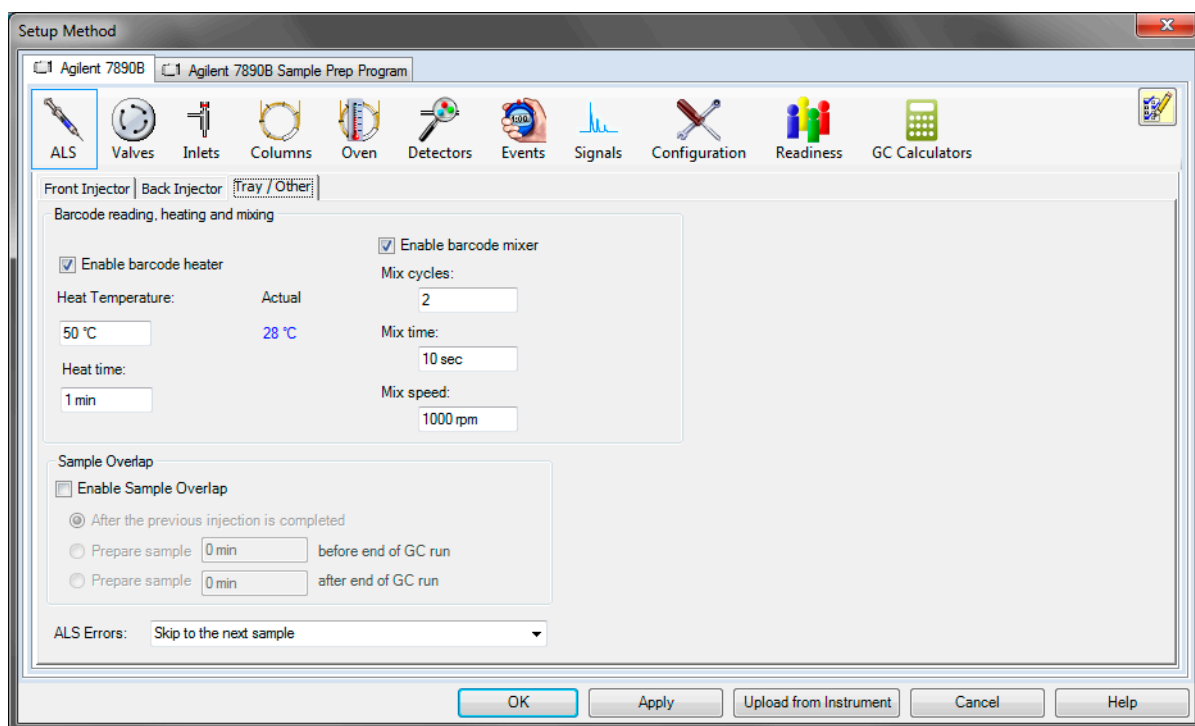


Figure 23 Accessing the sample tray parameters

ALS error handling The **ALS Errors** option is available if your GC has the 7693A ALS tray installed.

Configure how your ALS handles errors using one of the following options from the **ALS Errors** drop-down menu:

- **Pause for user interaction** – If an ALS error occurs, the system pauses and waits for a user response. This gives you a chance to correct the error, if possible.
- **Skip to the next sample** – If an ALS error occurs, the system skips to the next sample in the sequence and continues the run.
- **Abort the sequence** – If an ALS error occurs, the system aborts the sequence.

Valves

Select the **Valves** icon to open the **Valves** panel. Use the Valves panel to specify the initial settings for valve driver channels (Figure 24).

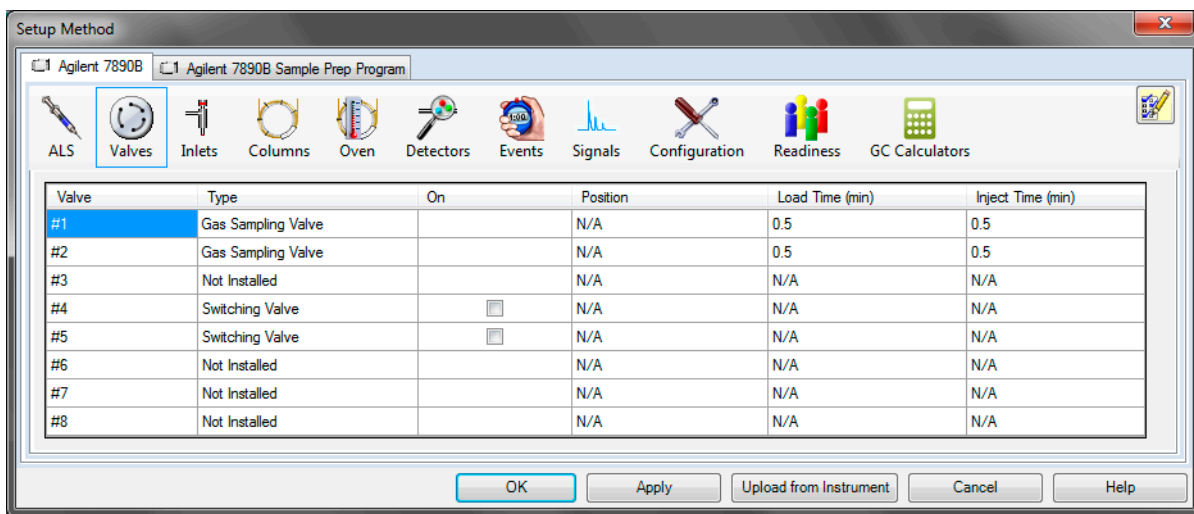


Figure 24 Accessing the **Valves** method parameters

Inlets

Select the **Inlets** icon to open the **Inlets** panel. Use the Inlets panel to set parameters for the front and back inlet installed in your GC (Figure 25).

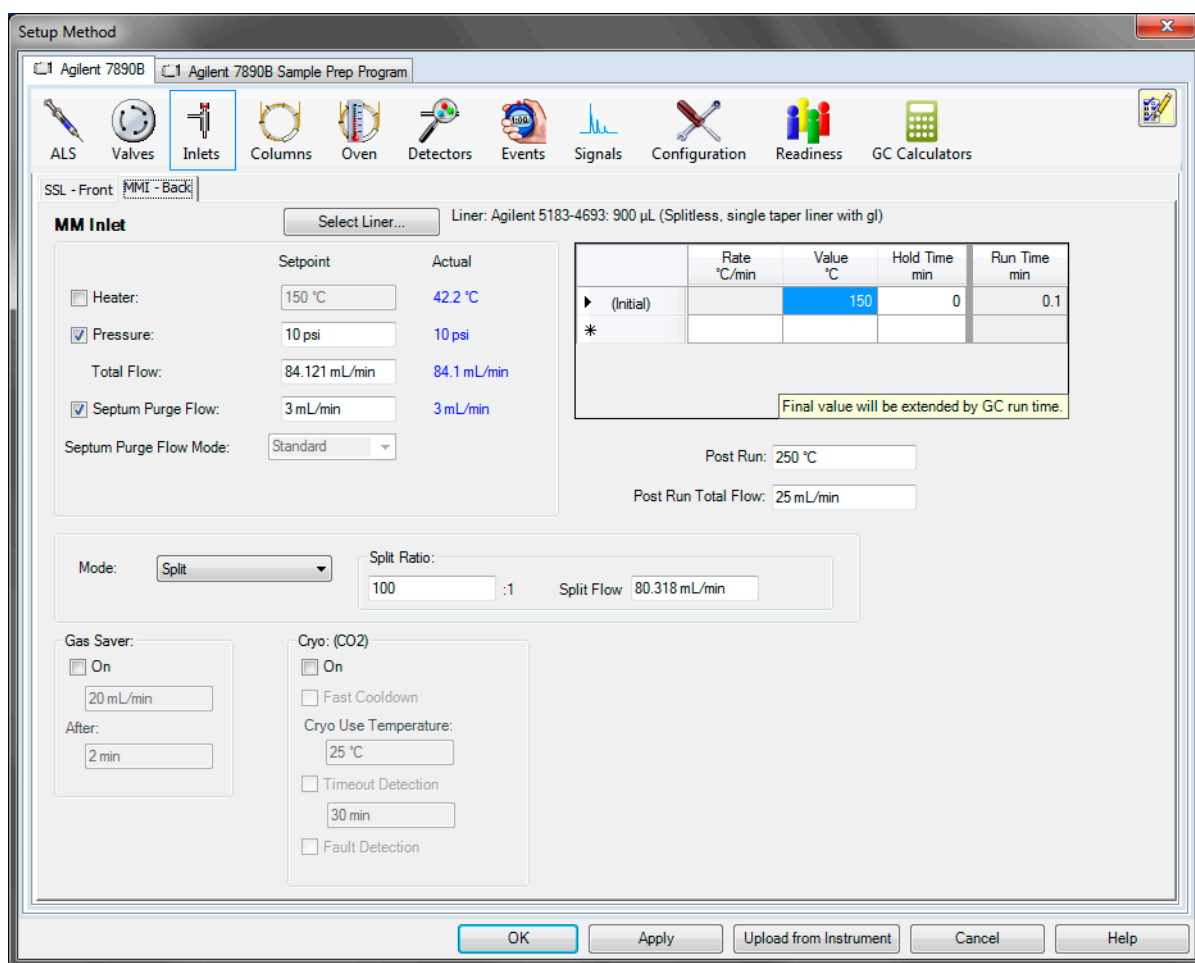


Figure 25 Accessing the **Inlets** method parameters

GC Liner Catalog

The **GC Liner Catalog** (Figure 26) is a local database shared across all instrument sessions on your data system. The database contains popular liner models and any custom liners added.

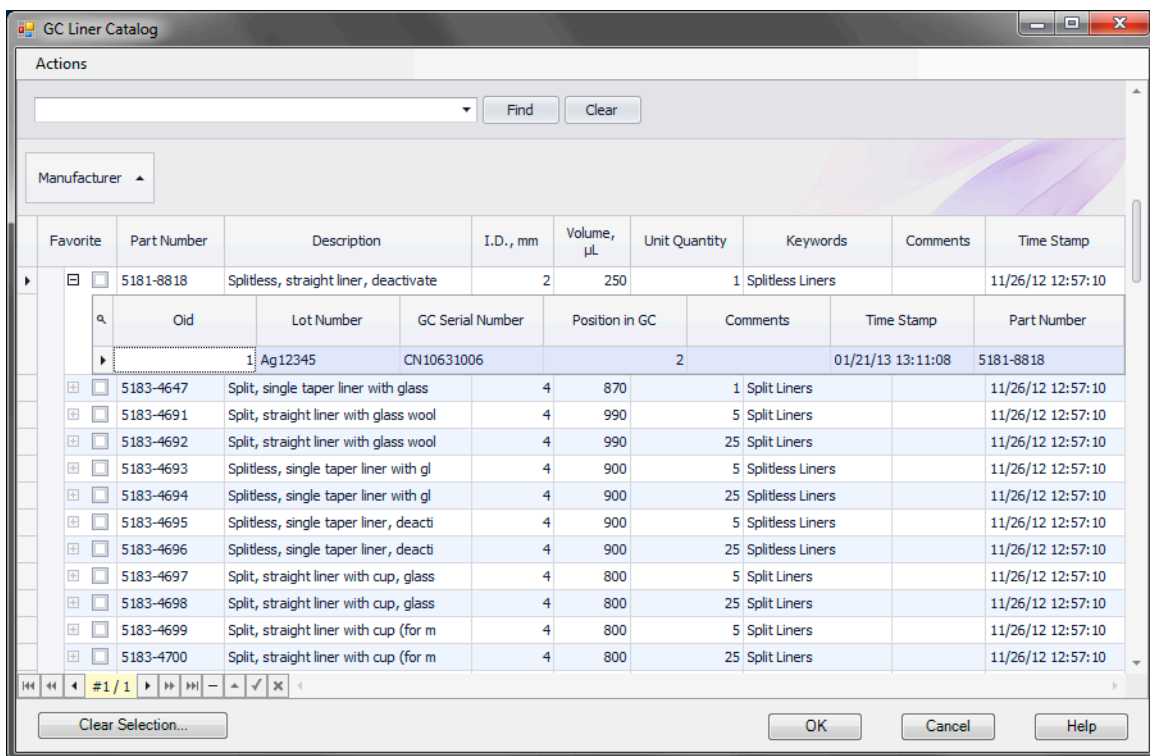


Figure 26 The GC Liner Catalog

Use the **GC Liner Catalog** to select a liner model to add to your **Liner Inventory** (a collection of liners available in your lab), or select a liner model already entered in your inventory to define in your method.

Once you define a liner using the **GC Liner Catalog** or **Liner Inventory**, the liner information displays in your method editor, the GC actuals, and in the report following a run.

Detectors

Select the **Detectors** icon to open the **Detectors** panel. Use the Detectors panel to set parameters that control the front, back, and auxiliary detectors on your GC (Figure 27).

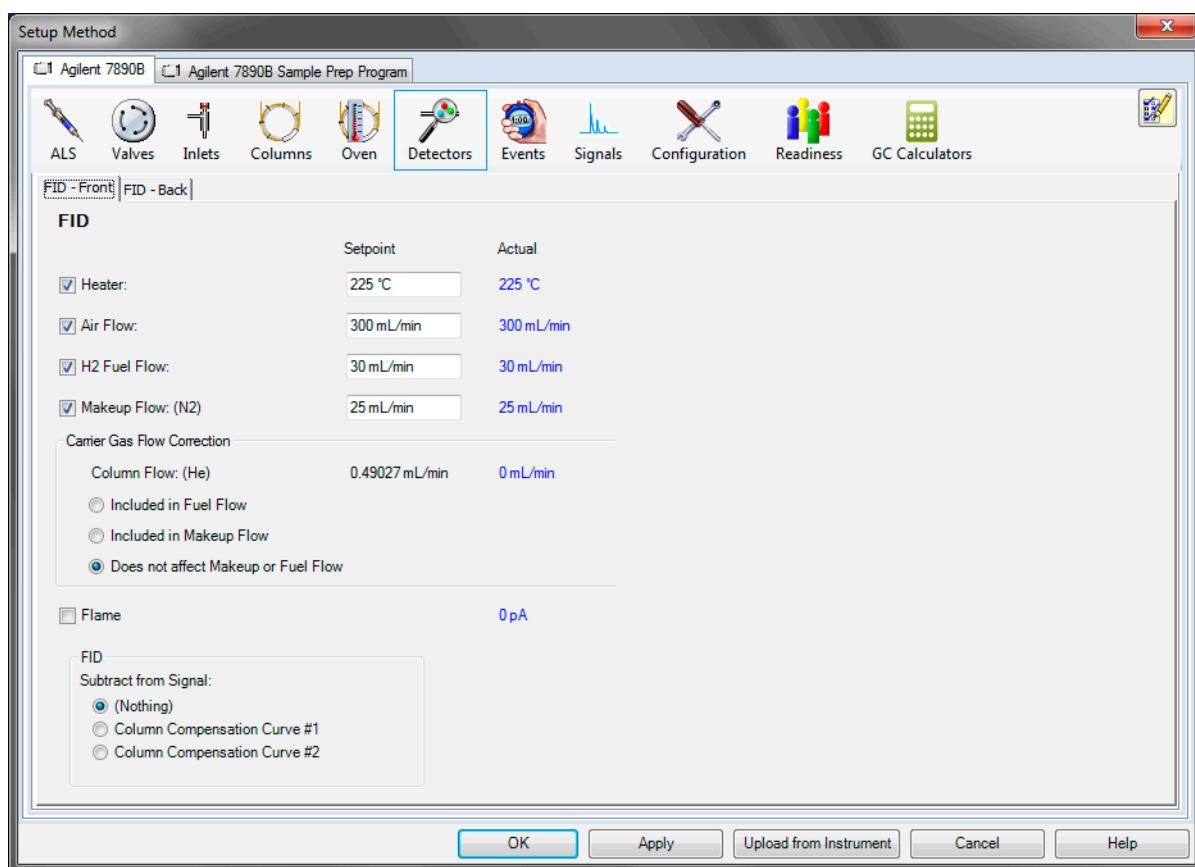


Figure 27 Accessing the **Detectors** method parameters

Aux Heaters

Select the **Aux Heaters** icon to open the **Aux Heaters** panel. Use the Aux Heaters panel to set parameters that enable or disable a specific auxiliary heated zone and to control its temperature (Figure 28).



Figure 28 Accessing the **Aux Heaters** method parameters

Events

Select the **Events** icon to open the **Events (Run Time Events)** panel. Use the Events panel to schedule events that occur automatically during a run. You can set event parameters for equipment installed on your instrument, for example, selected detector and inlet gas flows, auxiliary temperatures, valves, and selected signal handling functions (Figure 29).

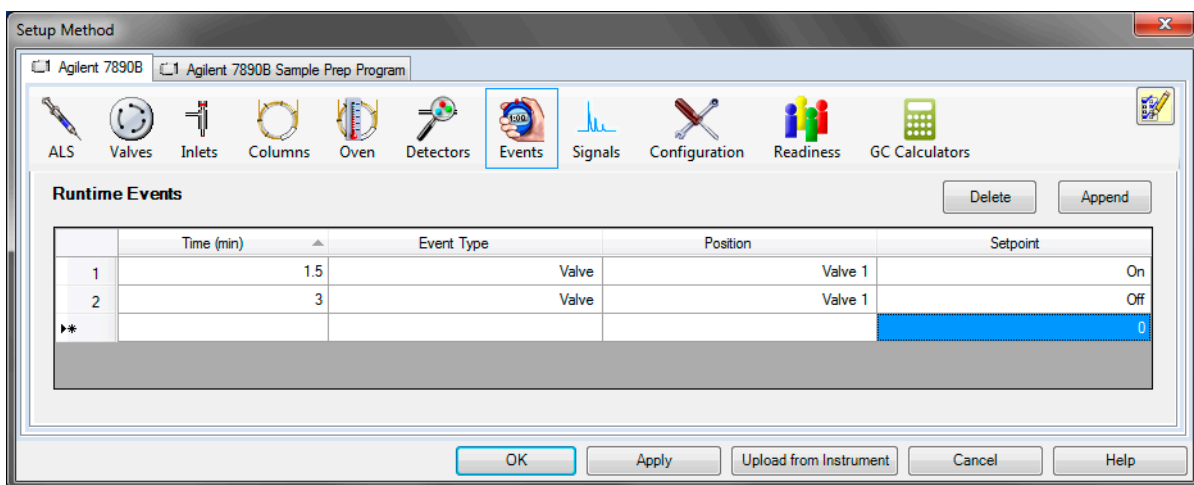


Figure 29 Accessing the **Events** method parameters

Signals

Select the **Signals** icon to open the **Signals** panel. Use the Signals panel to set the parameters that control the signal for analysis (Figure 30).

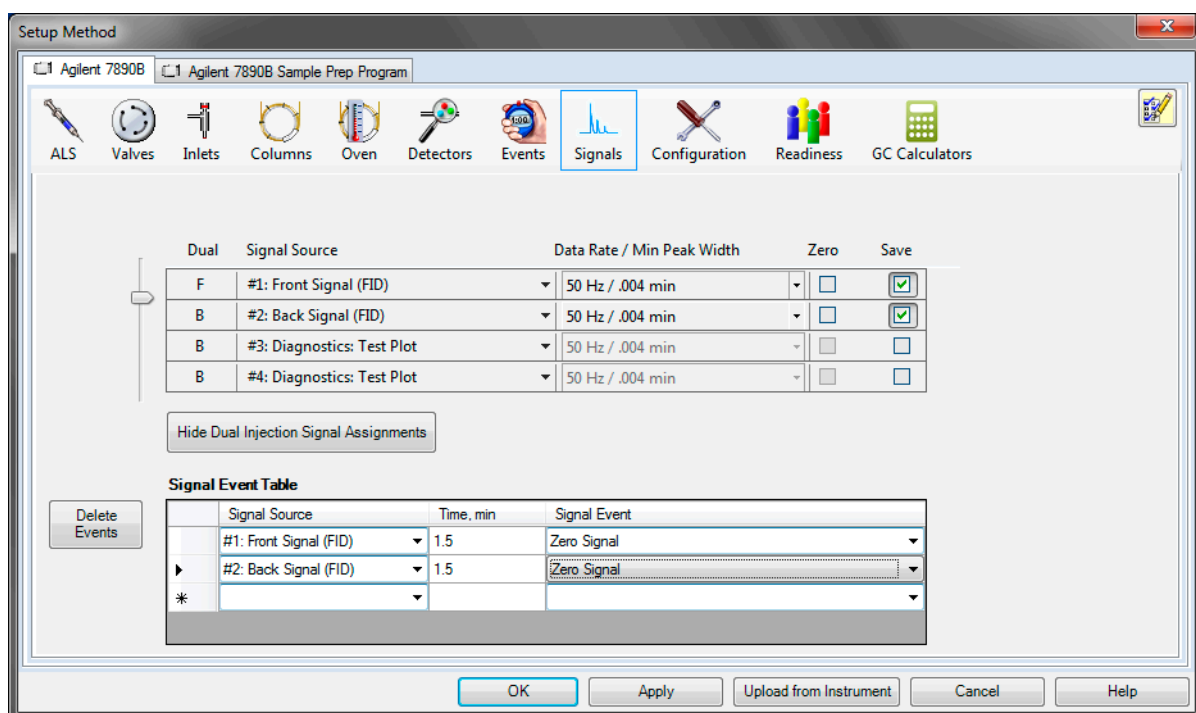


Figure 30 Accessing the **Signals** method parameters

Backflush

Select the **Backflush** icon to open the **Backflush** panel. The Backflush panel appears only if your system is configurable for backflushing. If available, use the Backflush panel to set up your system for backflush operations after all the other method parameters are set. A backflush wizard makes entries based on the method's expected configuration (Figure 31).

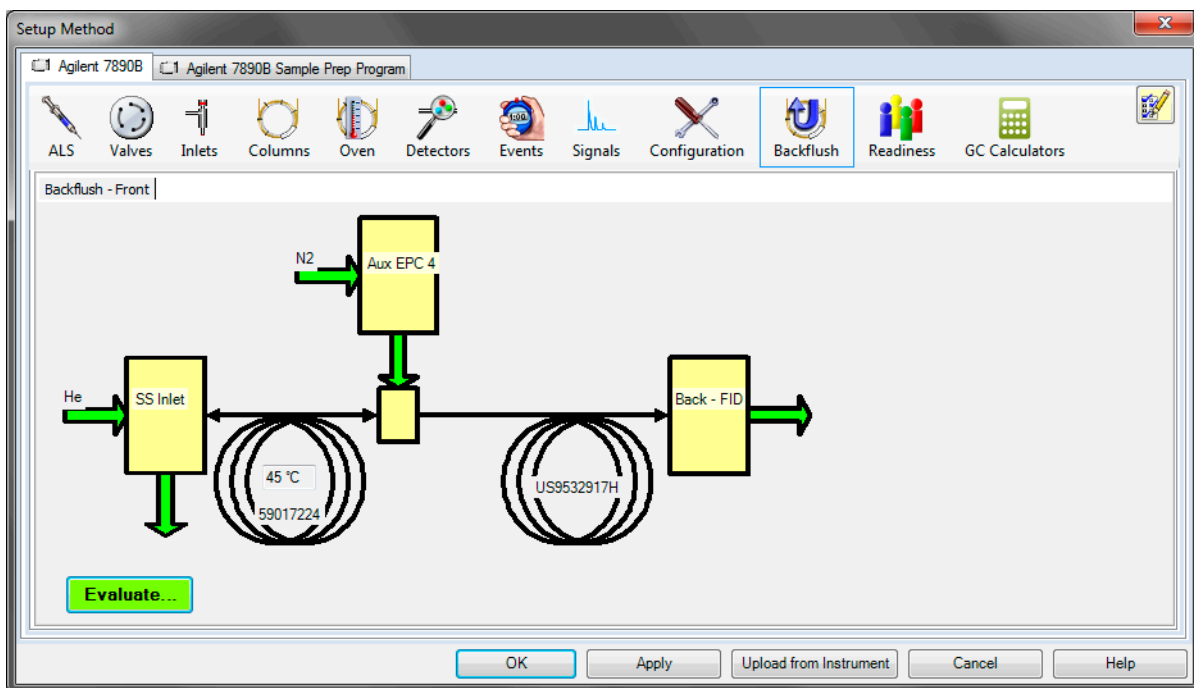


Figure 31 Accessing the **Backflush** parameters

Readiness

Select the **Readiness** icon to open the **Readiness** panel. Use the Readiness panel to select which instrument components you require to be ready before a run starts. For example, if you use only the front detector, you do not need to wait for the back detector to reach temperature before starting the run. Only selected components affect the readiness state of the GC (Figure 32).

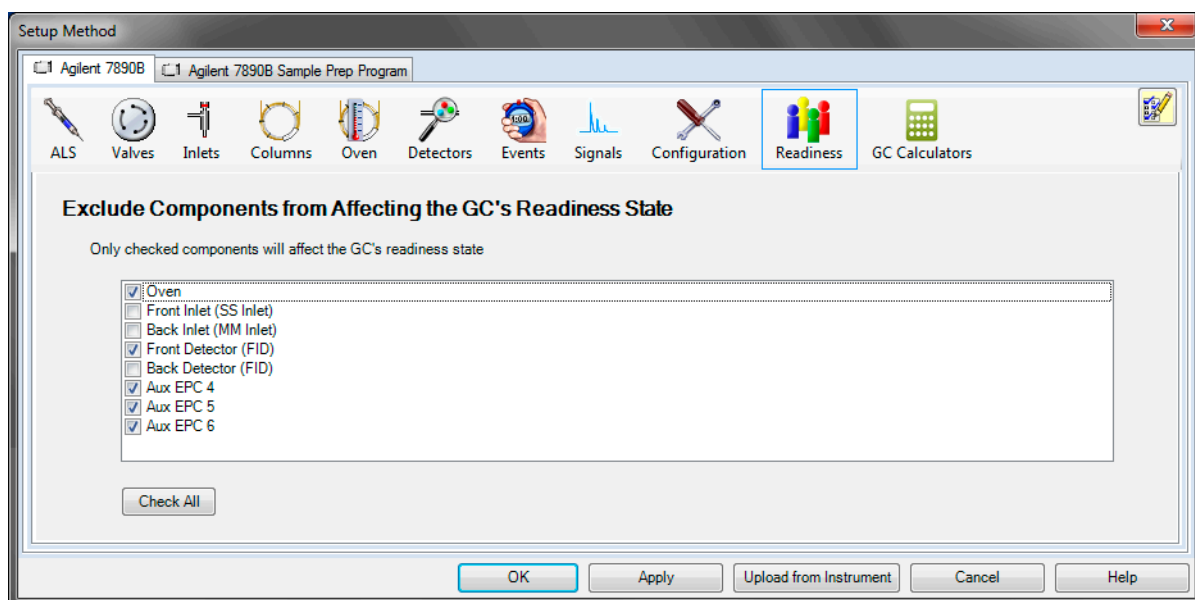


Figure 32 Accessing the **Readiness** parameters

GC Calculators

Select the **GC Calculators** icon to open the **GC Calculators** panel. Use the GC Calculators tab to select which method setpoints to use when initializing your calculator data, and to select the desired calculator tool.

Vapor Volume Calculator

Select the **Vapor Volume Calculator** to compare the estimated volume of gas produced by your method against the capacity of your liner ([Figure 33](#)).

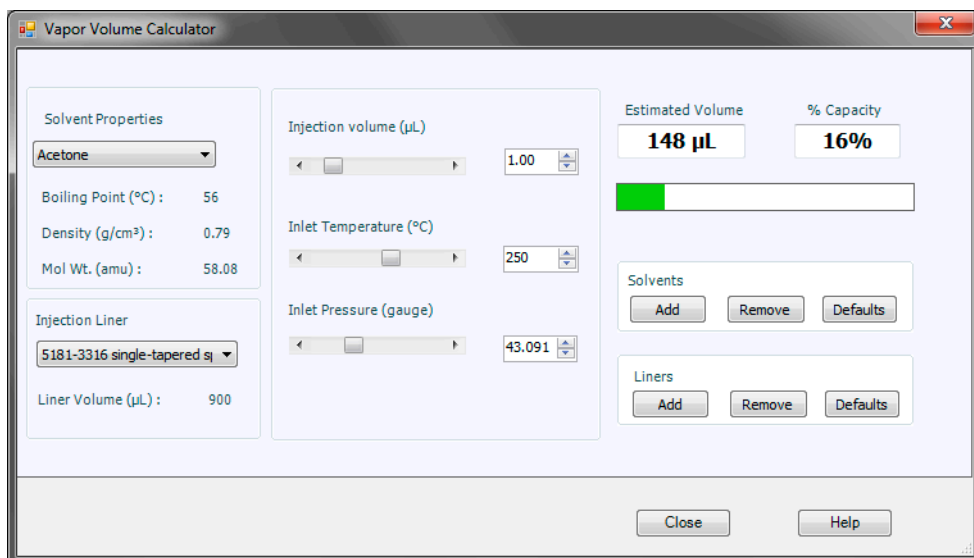


Figure 33 The Vapor Volume Calculator

Method Translator

Select the **Method Translator** to help optimize or convert a GC method from one configuration environment to another. From a given original GC method, the GC Method Translator computes a new translated method in such a way that the chromatograms resulting from both methods – original and translated – look like scaled versions of each other. This can be viewed as the re-scaling of the chromatograms along the time and the peak area axes (Figure 34).

The screenshot displays the Method Translator interface with the following data:

Parameter	Original Method Parameters (Gas: He)	Calculated Method Parameters (Gas: H2)
Length (m)	10 m	10 m
Inner Diameter (µm)	100 µm	100 µm
Film Thickness (µm)	0.17 µm	0.17 µm
Phase Ratio	147.06	147.06
Inlet Pressure (gauge)	43.091 psi	43.091 psi
Outlet Flow (mL/min)	0.49027 mL/min	1.0809 mL/min
Average Velocity (cm/s)	40.549 cm/sec	89.397 cm/sec
Outlet Pressure (abs)	14.696 psi	14.696 psi
Holdup Time	0.41103 min	0.18643 min
Outlet Velocity (cm/s)	111.02 cm/sec	244.76 cm/sec

#	Ramp Rate (°C/min)	Final Temp (°C)	Final Time (min)
Init		45	0.1

#	Ramp Rate (°C/min)	Final Temp (°C)	Final Time (min)
Init		45	0.05

Total Run Time: Original = 0.1 min, Translated = 0.05 min

Original Column Capacity: 0.17
Translated Column Capacity: 0.17

The column capacity of the translated method is 100% of the original column capacity. You may need to adjust your injection volume.

Figure 34 The Method Translator

Pressure Flow Calculator

Select the **Pressure Flow Calculator** to determine pressure settings and flow rates through a capillary GC column. Column dimensions, temperature, inlet and outlet pressure, and carrier gas type can be varied in the calculation of outlet flow rate, average linear velocity, and holdup time (Figure 35).

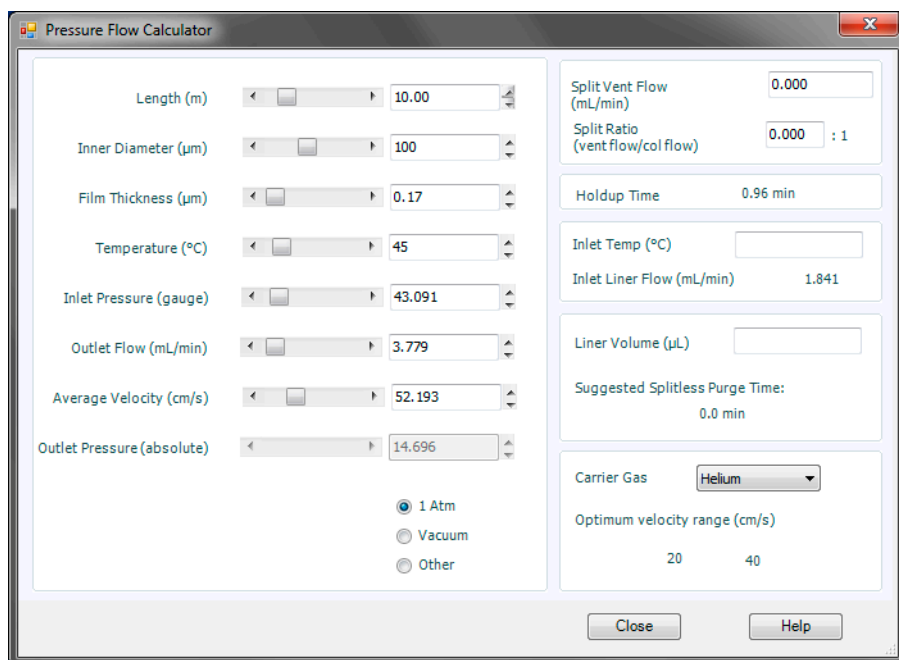
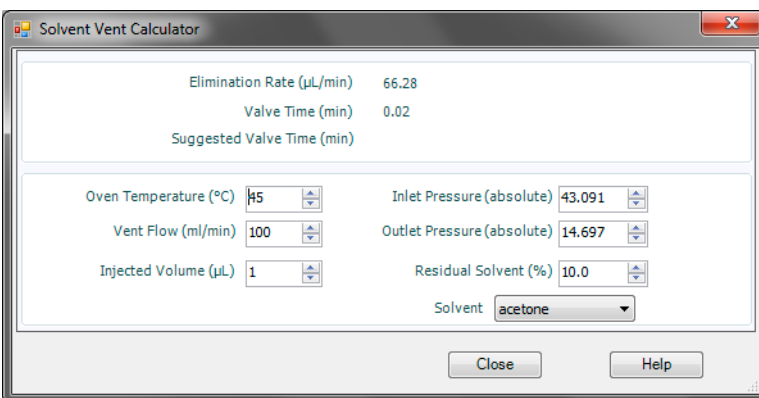


Figure 35 The Pressure Flow Calculator

Solvent Vent Calculator

Select the **Solvent Vent Calculator** to estimate the Agilent solvent vapor exit (SVE) accessory valve timing, which is based on solvent type, oven temperature, vent flow, and pressure (Figure 36).



The screenshot shows the 'Solvent Vent Calculator' window with the following data:

Parameter	Value
Elimination Rate ($\mu\text{L}/\text{min}$)	66.28
Valve Time (min)	0.02
Suggested Valve Time (min)	
Oven Temperature ($^{\circ}\text{C}$)	115
Vent Flow (ml/min)	100
Injected Volume (μL)	1
Inlet Pressure (absolute)	43.091
Outlet Pressure (absolute)	14.697
Residual Solvent (%)	10.0
Solvent	acetone

Figure 36 The **Solvent Vent Calculator**

Early Maintenance Feedback (EMF)

Use the **Early Maintenance** tool to track your GC's consumable resource and part usage, and to configure alerts for when they need to be replaced or serviced.

To access EMF counters, select **Instrument > Maintenance** from the data system top menu. The **Early Maintenance** window opens (Figure 37).

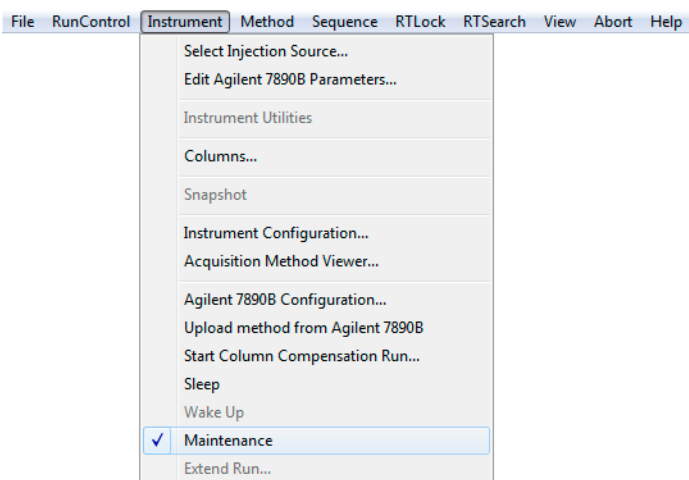


Figure 37 Opening the Method Editor

Select the **Early Maintenance Feedback Counters** tab. A list of GC components appear in tabs (Figure 38).

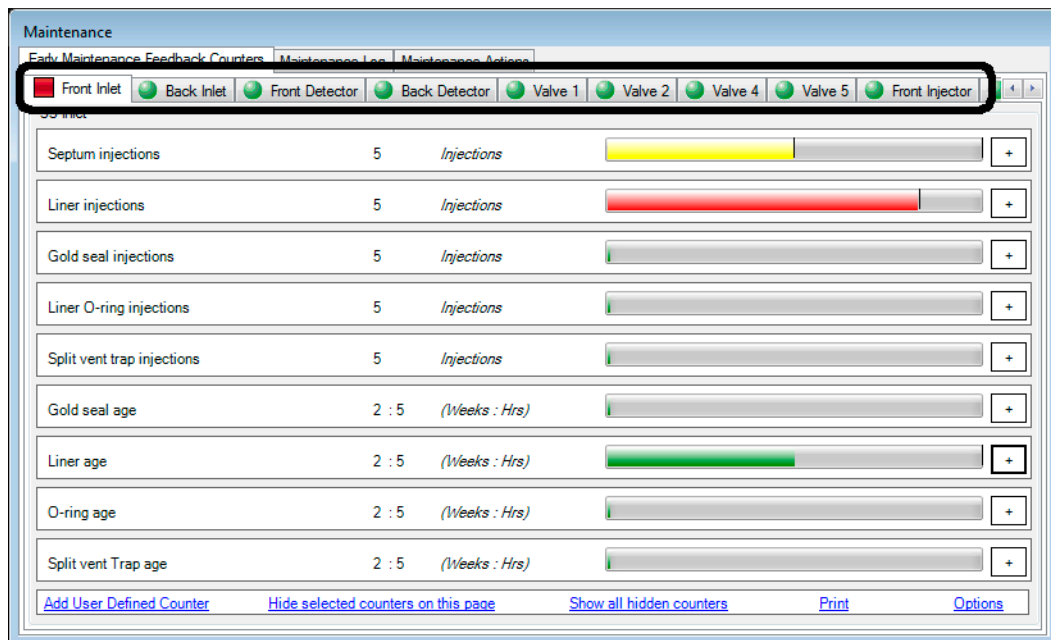


Figure 38 Early Maintenance Feedback Counters

A graphic indicator displays the current status of each EMF counter (Figure 39).

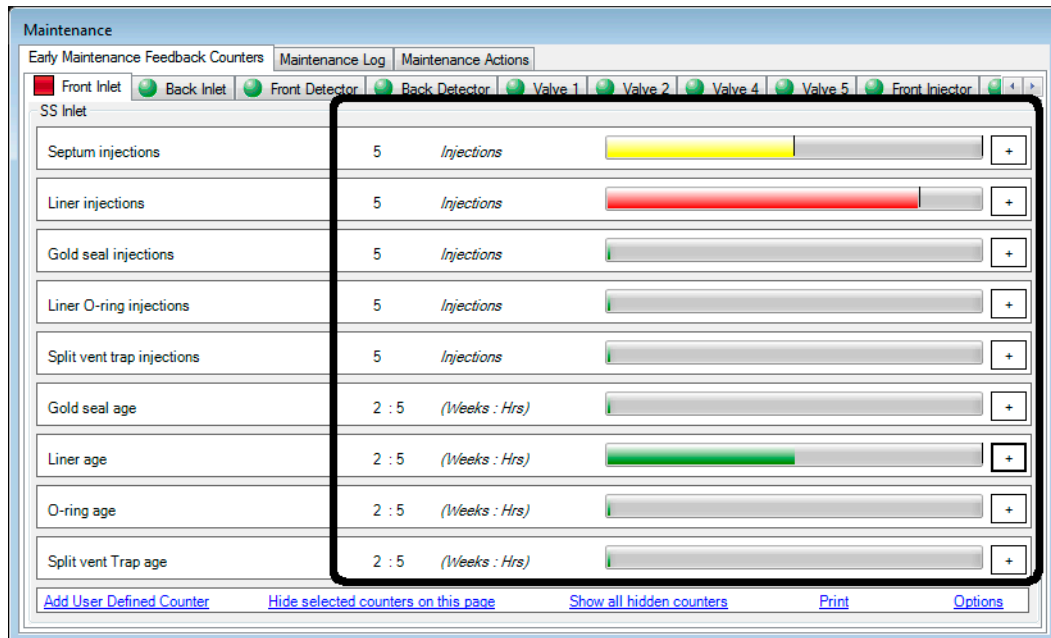


Figure 39 Graphic EMF indicators for GC components

Click the + box to display configurable parameters for each EMF counter (Figure 40).

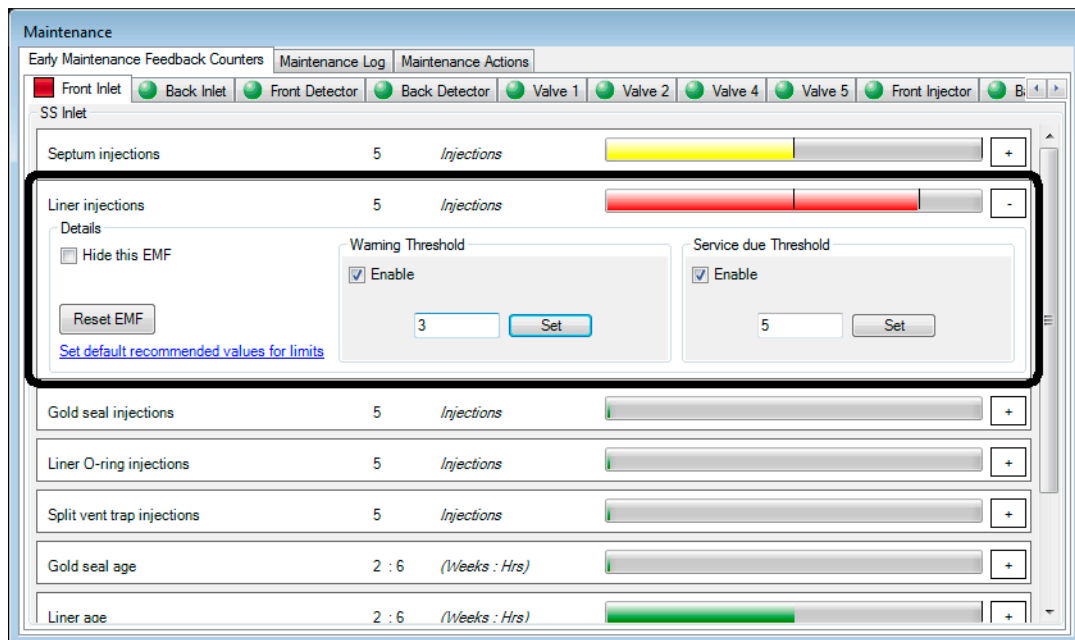


Figure 40 Displaying the EMF counter parameters

You can add a user-defined EMF counter, hide selected counters, and print your counter data (Figure 41).

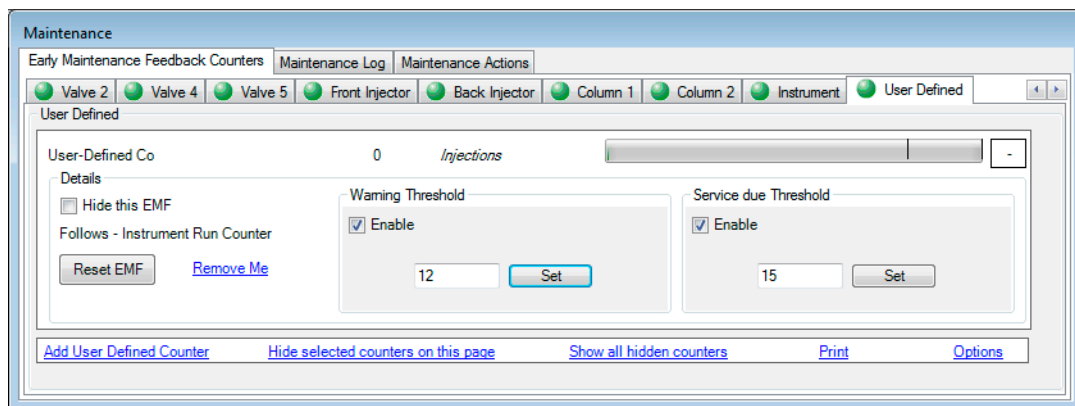


Figure 41 Additional EMF controls

Select the **Maintenance Log** tab to view a list of maintenance events, the time, and any associated messages (Figure 42).

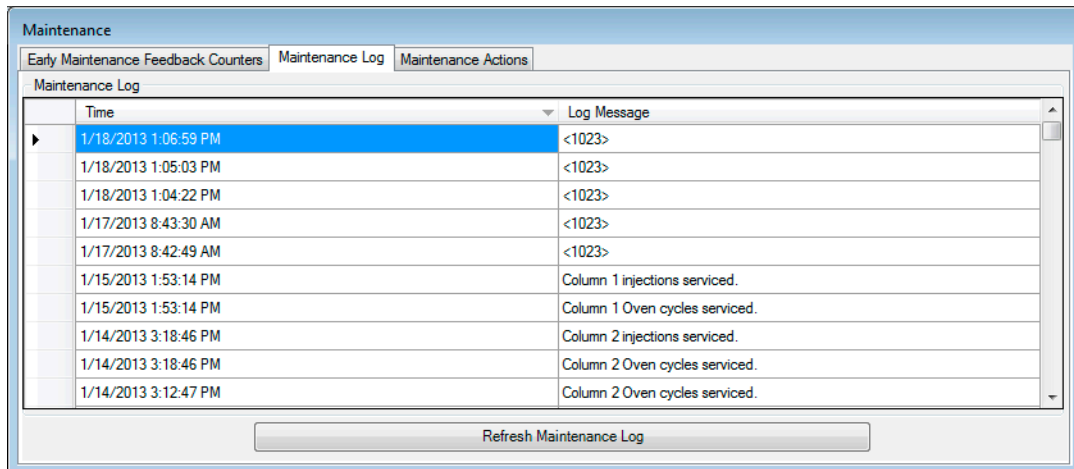


Figure 42 Viewing the Maintenance Log

Select the **Maintenance Actions** tab to access maintenance-related actions. For example, you can synchronize the GC clock with your PC clock, set a method in the event of an MS Vent action, or import/export/restore an EMF counter file (Figure 43).

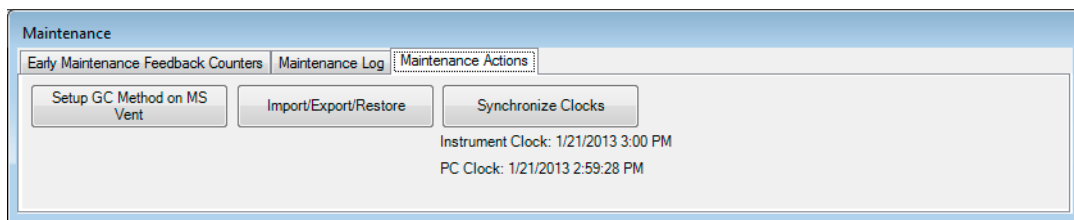


Figure 43 Maintenance Actions

Saving the Method

When your method edits are complete, download the settings to the GC and save the method. How you do this depends on the data system. For example, in OpenLAB CDS ChemStation Edition, click **OK** in the Method Editor to send the parameters to the GC, then select **Method > Save Method** or **Method > Save Method As...** to save the changes. (Figure 44).

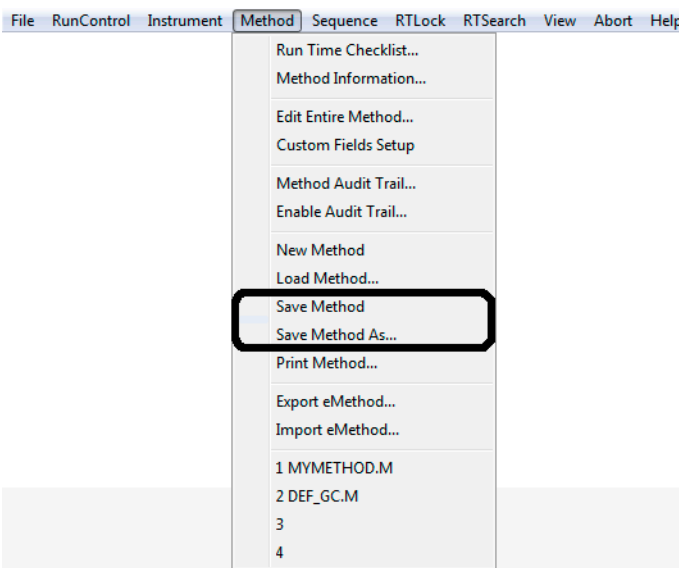


Figure 44 Saving a method in OpenLAB CDS ChemStation Edition

Viewing GC Temperatures and Flows

You can view GC temperatures and flows in your data system. How you access the actuals panel depends on the data system.

For example, in OpenLAB CDS ChemStation Edition, select **Instrument > GC Show/Hide Status** from the data system top menu (Figure 45).

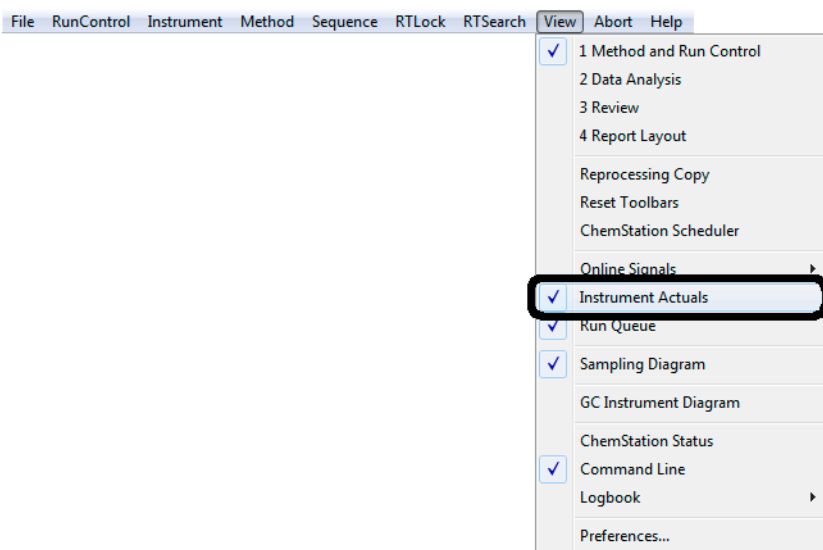


Figure 45 Accessing Instrument Actuals

The **GC Status** window opens and displays GC component actuals (Figure 46).

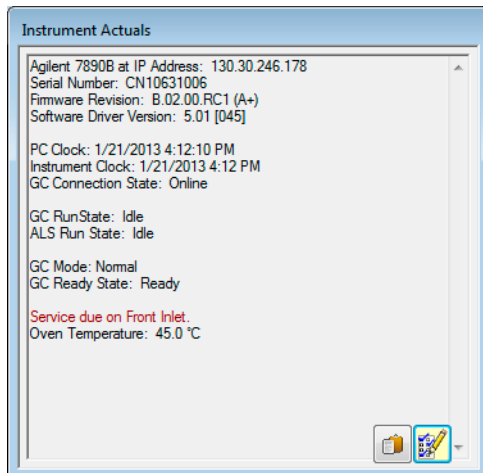


Figure 46 GC Status

Parts Finder

To open Agilent Parts Finder, navigate to **Instrument > Parts Finder**. Use Parts Finder to quickly locate replacement parts for your Agilent Technologies, Inc. instruments. Finding and ordering a part is as simple as clicking on an instrument model, locating the part, adding the part to a parts list, and printing or uploading the list to the Agilent online store for easy ordering.

When launched from your Agilent data system, Parts Finder incorporates the parts configuration information that you have already entered into your instrument. Parts Finder will include any parts configured in your 7890 Series GC and will show only the instrument component views that match the installed instrument system.

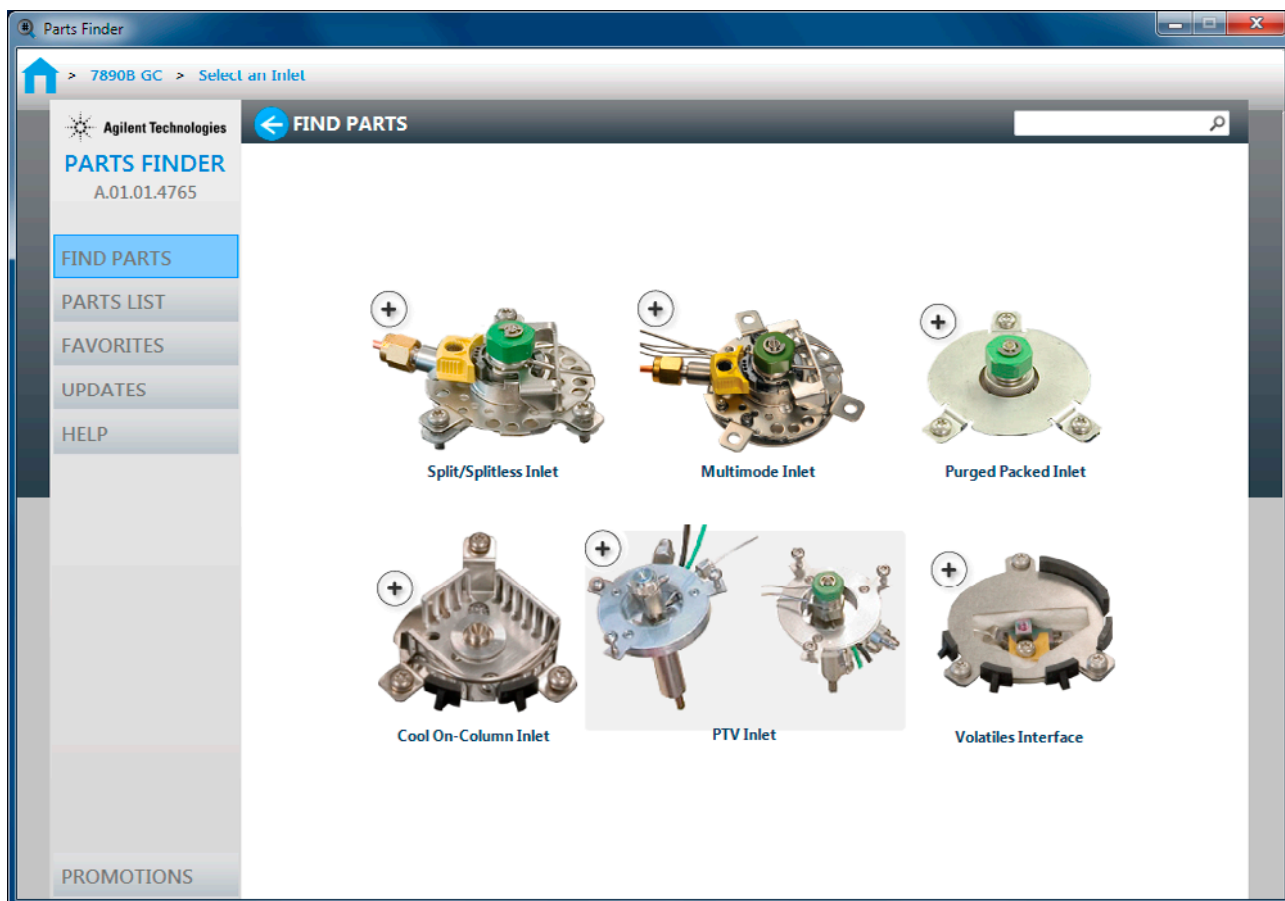


Figure 47 Agilent Parts Finder

Where to Find Information

In addition to this guide, Agilent provides several learning products and tools to assist you with your Agilent software and hardware products.

Agilent GC and GC/MS User Manuals & Tools DVD

The *Agilent GC and GC/MS User Manuals & Tools* DVD provides an extensive collection of manuals and tools for Agilent gas chromatographs, mass selective detectors, and samplers.



User manuals

The DVD provides a complete set of localized user manuals and related videos for your Agilent GC and GC/MS products covering the following topics:

- Site preparation information
- Installation and first startup information
- Getting started information
- Safety and regulatory information
- Operation information
- Advanced operation information
- Troubleshooting information
- Maintenance information

Tools

The DVD provides a set of tools for your Agilent GC and GC/MS instruments, including:

- A stand-alone version of Agilent Parts Finder
- GC Firmware Update Tool
- Backflush Wizard
- GC and HS method translators
- A stand-alone set of GC calculators.
- Agilent Instrument Utilities software

Software Help System

Each Agilent data system includes an extensive software help system with detailed information for each software screen and a collection of common tasks.

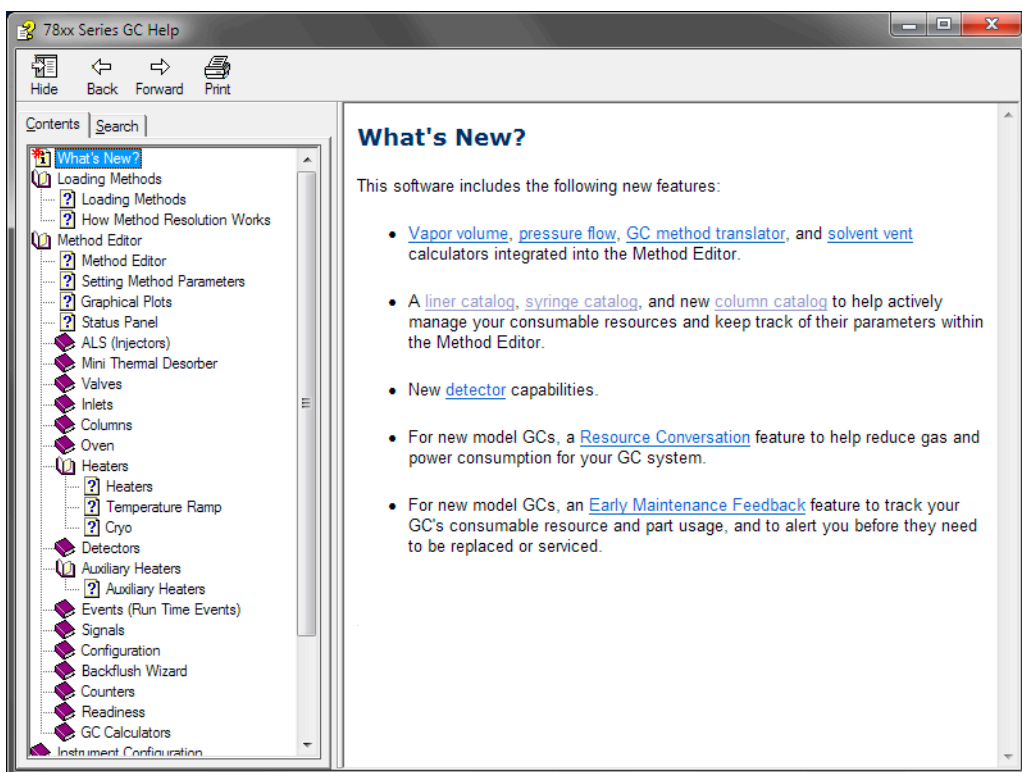


Figure 48 Software Help System

