Agilent 7890 Series Gas Chromatograph

GC Software Features Overview
Warranty

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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](image-url)
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.

![Connection Tab](image)

**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).

![Configuration tab](image)

**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.

![GC configuration information](image)

**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](image-url)
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](image.png) **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.

![GC Column Catalog](image.png)

**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.

![Configuration > Modules](image)

**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](image)
**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.
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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).
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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
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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.

![Oven setpoints out of range](image)

**Figure 21** Oven setpoints out of range
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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](image)

**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.
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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).

![Valves panel](image)

**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.

![GC Liner Catalog](image)

**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).

![Detectors panel](image)

**Figure 27**  Accessing the **Detectors** method parameters
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**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](image)

**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](image)
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).

![Image of the Signals panel](image-url)

**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](image-url)
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**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).

![Vapor Volume Calculator](image)

**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 Method Translator](image)

**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).

![Pressure Flow Calculator](image)

**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).

![Solvent Vent Calculator](image)

**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).

![Opening the Method Editor](image-url)
Select the **Early Maintenance Feedback Counters** tab. A list of GC components appear in tabs (Figure 38).

![Early Maintenance Feedback Counters](image)

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

![Figure 40](image)

**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](image)

**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](image)

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](image)
Saving the Method

When you 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_method.png)
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](image-url)  Accessing Instrument Actuals
The **GC Status** window opens and displays GC component actuals (Figure 46).

![GC Status window](image)

**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