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Agilent 7820A Gas Chromatograph

Operating Guide

Agilent Technologies

Notices

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CAUTION

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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.

Contents

6 Configuration Tasks

1 Introduction

This document provides an overview of the individual components that make up the Agilent 7820A Gas Chromatograph (GC).

Where to Find Information

In addition to this document, Agilent provides several learning products that document how to install, operate, maintain, and troubleshoot the Agilent 7820A GC.

Before operating your GC, be sure to read the safety and regulatory information included on the Agilent GC and GC/MS Hardware User Information & Utilities DVD. The most common safety hazards when working on the GC are:

- Burns caused by touching heated areas on or in the GC
- Release of pressurized gas containing hazardous chemical compounds caused by opening inlets
- Glass cuts or puncture wounds caused by sharp capillary column ends
- Use of hydrogen as a GC carrier gas

Online User Documentation

Now your Agilent instrument documentation is in one place, at your fingertips.

The Agilent GC and GC/MS Hardware User Information & Utilities DVD that ships with your instrument provides an extensive collection of online help, videos, and books for current Agilent gas chromatographs, mass selective detectors, and GC samplers. Included are localized versions of the information you need most, such as:

- Getting Familiar documentation
- Safety and Regulatory guide
- Site Preparation information
- Installation information

- Operating guides
- Maintenance information
- Troubleshooting details

Agilent Customer Portal

Agilent also provides customized information for the products you own through a customer portal. This web service provides many customizable services as well as information related directly to your Agilent products and orders. Log onto the portal at http://www.agilent.com/chem.

Chromatography Using a GC

Chromatography is the separation of a mixture of compounds into individual components.

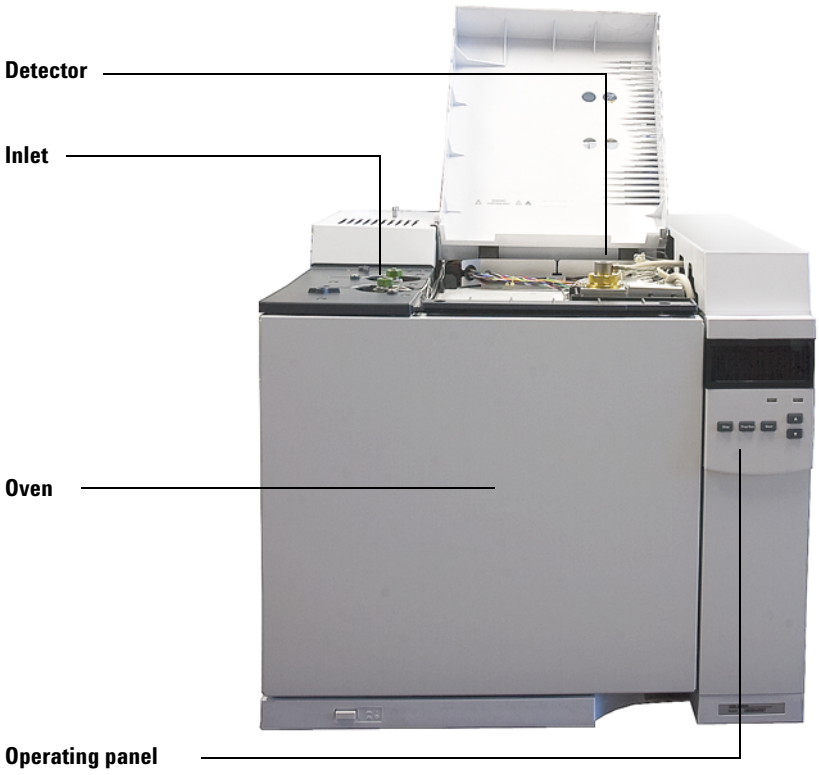
There are three major steps involved with separating and identifying components of a mixture using a GC. They are:

1 **Injecting** a sample into the GC. (This takes place at the inlet.)

2 **Separating** the sample into individual components. (This takes place inside the column in the oven.)

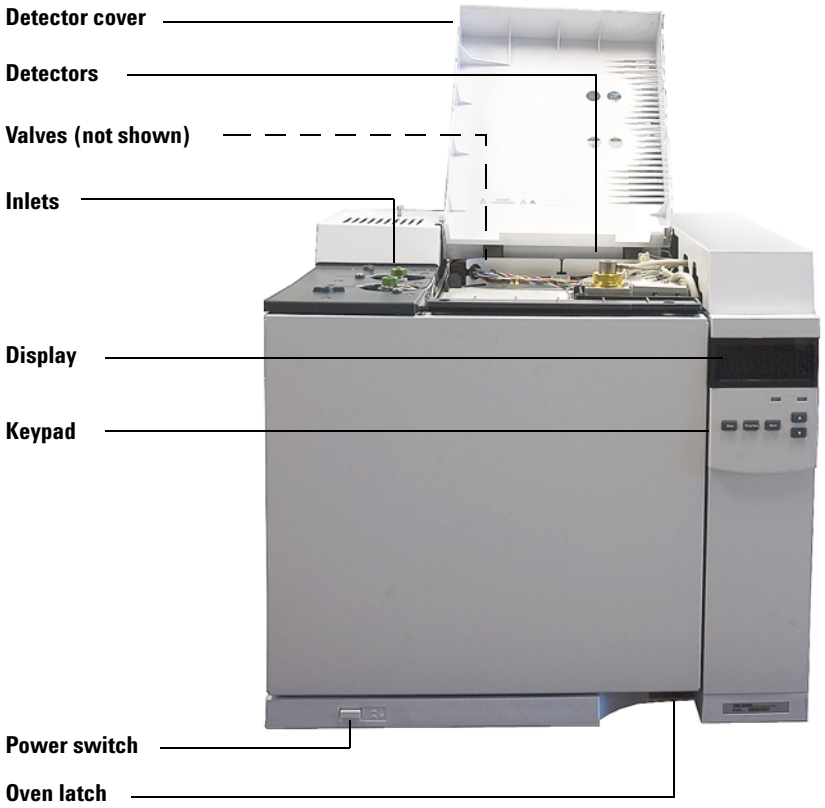
3 **Detecting** what compounds were in the sample. (This is done in the detector.)

During this process, status messages from the Agilent 7820A GC are displayed, and user changes to parameter settings can be made through the software keypad.

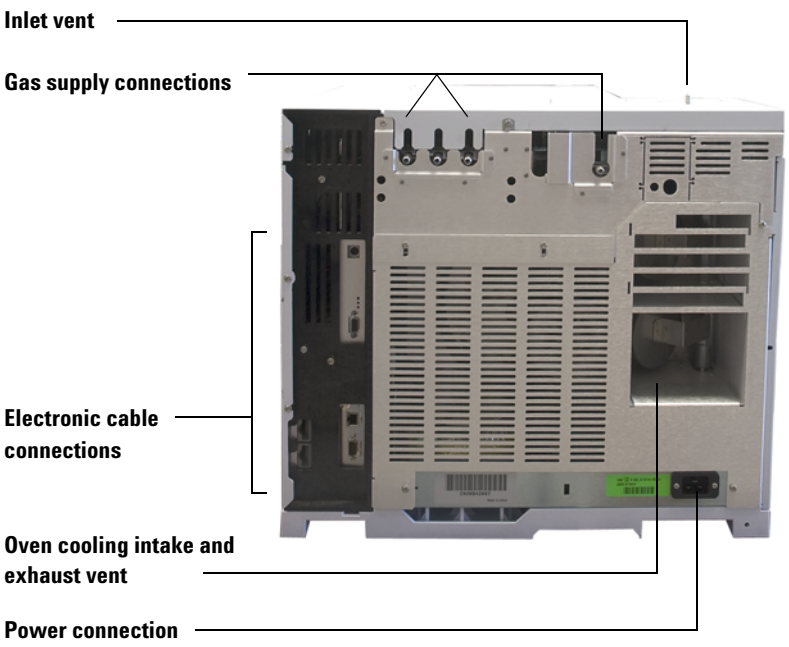


Each part of this process is described in brief on the following pages of this document. Refer to the Advanced User Guide for more details.

The Front View of the Agilent 7820A GC



The Back View of the Agilent 7820A GC

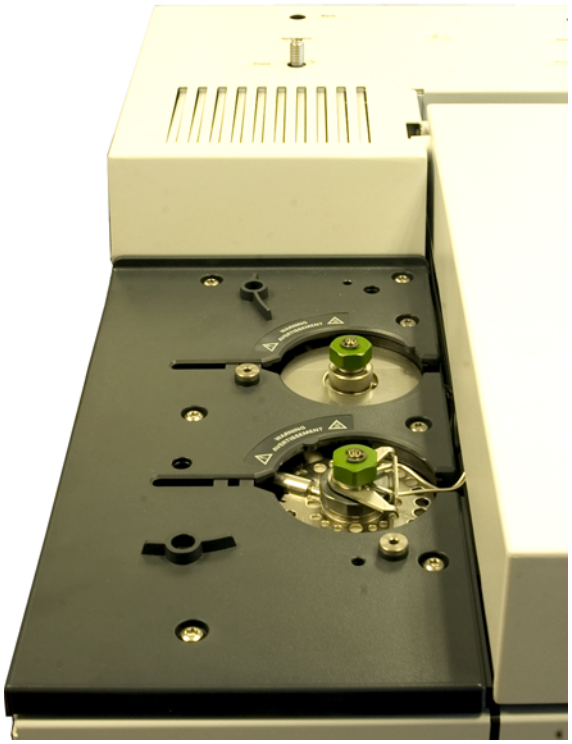


The Inlets

Inlets are where samples are injected into the GC. The Agilent 7820A GC can have a maximum of two inlets, identified as **Front Inlet** and **Back Inlet**.

Two inlets—split/splitless and purged packed—are available.

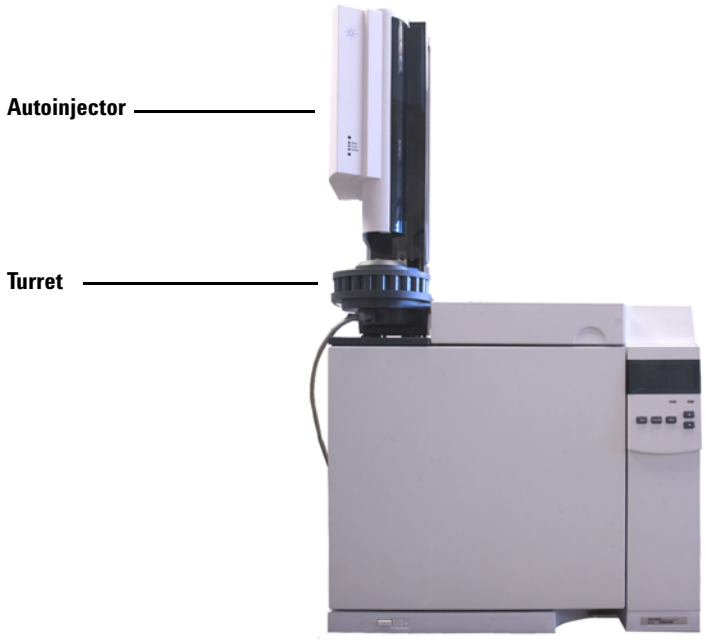
The type of inlet chosen is based on the type of analysis being done, the type of sample being analyzed, and the column being used.



Samples can be injected into the inlets by hand using a syringe, or an automatic sampling device (such as an Agilent Automatic Liquid Sampler or Agilent Headspace Sampler).

Automatic injectors

The Agilent 7820A GC can accommodate up to two autoinjectors, identified as **Front Injector** and **Back Injector**.



Automatic gas sampling valves

The sampling valves are simple mechanical devices that introduce a sample of fixed size into the carrier gas stream. Valves are most frequently used to sample gases in constantly flowing streams.

The Agilent 7820A GC can accommodate up to two gas sampling valves, identified as **Valve # 1** and **Valve #2**.

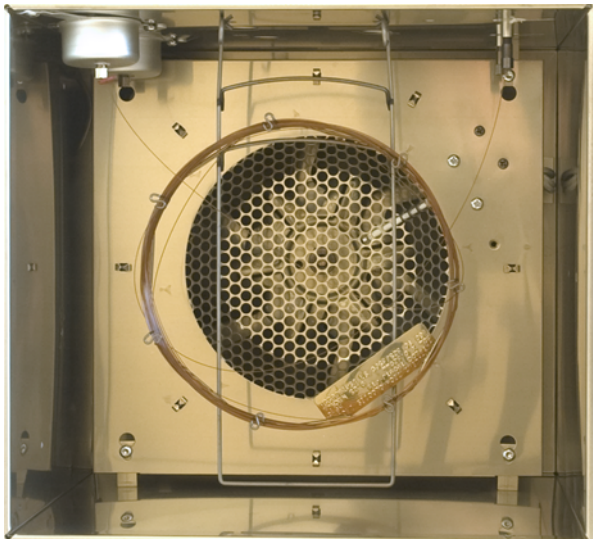
The valves are located inside the gas sampling valve box.

The GC Column and Oven

GC columns are located inside a temperature-controlled oven. Generally, one end of the column is attached to the inlet, while the other end is attached to the detector.

Columns vary in length, diameter, and internal coating. Each column is designed for use with different compounds.

The purpose of the column and the oven is to separate the injected sample into individual compounds as it travels through the column. To aid this process, the GC oven can be programmed to speed the sample flow through the column.



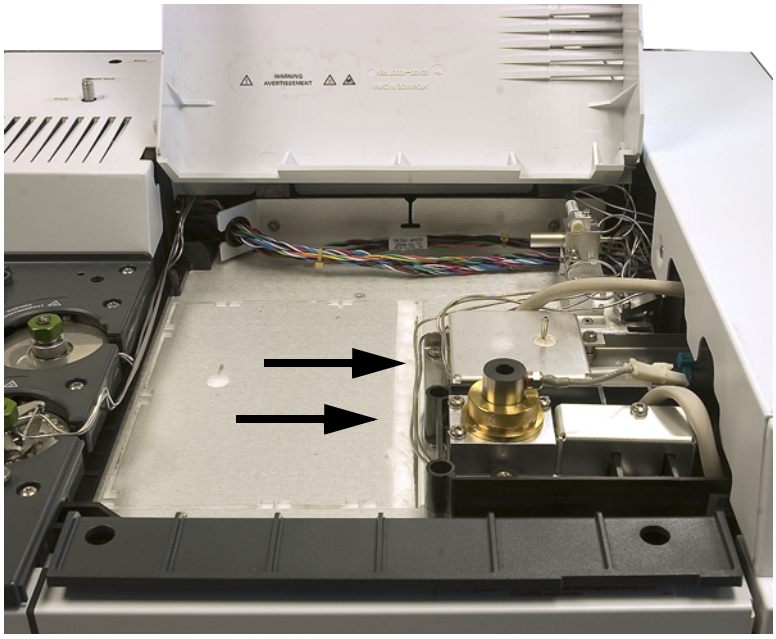
Detectors

Detectors identify the presence of compounds as they exit the column.

As each compound enters the detector, an electrical signal proportional to the amount of compound detected is generated. This signal is generally sent to a data analysis system—such as Agilent ChemStation—where it shows up as a peak on a chromatogram.

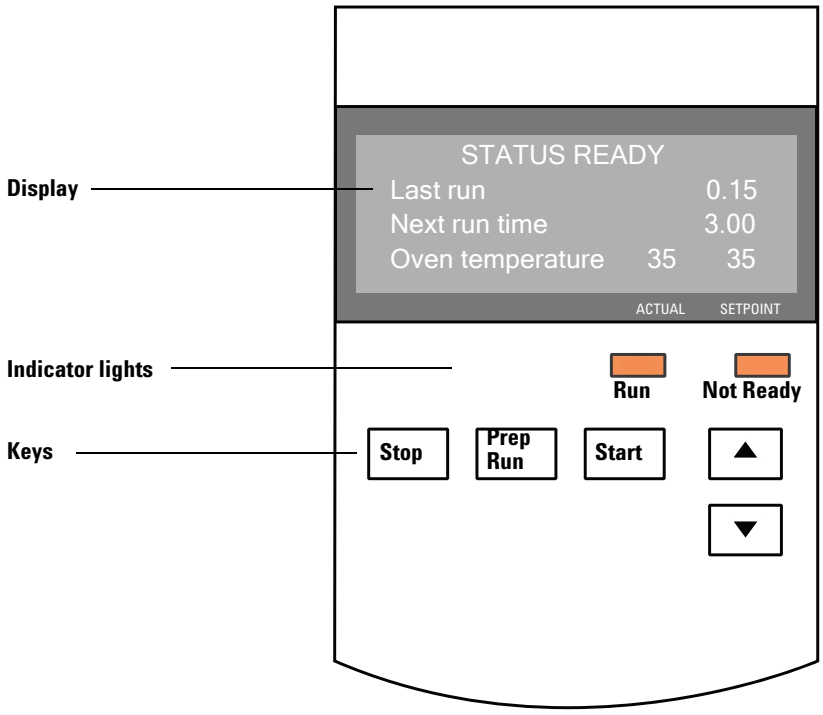
The Agilent 7820A GC can accommodate up to two detectors, identified as **Front Det** and **Back Det.**

A complete selection of detectors (FID, TCD, NPD, FPD, µECD, and MSD) is available. The type of detector chosen is based on the type of analysis required.



The Operating Panel

The operating panel consists of the display, status lights, and keypad. See "Software Keypad Operation" and the Advanced User Guide, along with the complete suite of documentation included on the Agilent GC and GC/MS Hardware User Information & Utilities DVD that shipped with your instrument for more detailed information.



The display

The display shows details of what is currently happening in the Agilent 7820A GC.

Use the scroll keys to view additional lines in the display. The display shows current temperatures, flows, pressures, and information about GC readiness.

Indicator Lights

The GC has two status indicators below the display, **Run** and **Not Ready**.

Not Ready	*Lights* when the GC is not yet ready to process a sample and *blinks* when a fault occurs. Scroll to see which parameters are not ready or what faults have occurred.
Run	*Lights* when the instrument is executing a chromatographic run. *Blinks green* when in pre-run state, for example when a split/splitless inlet is purging.

When the GC is ready to begin a run, the display screen shows **STATUS Ready for Injection**. Alternatively, when a component of the GC is not ready to begin a run, the **Not Ready** indicator lights. Scroll to see a message explaining why the GC is not ready.

Alert Tones

A series of warning beeps sounds before a shutdown occurs. After a short time the component with the problem shuts down, the GC emits one beep, and a brief, numbered message is displayed. For example, a series of beeps sounds if the front inlet gas flow cannot reach setpoint. The message **Front inlet flow shutdown** is briefly displayed. The flow shuts down after 2 minutes. See “Correcting Problems”.

A continuous tone sounds if a hydrogen flow is shut down or a thermal shutdown occurs.

WARNING **Before resuming GC operations, investigate and resolve the cause of the hydrogen shutdown. See Hydrogen Shutdown in the Troubleshooting manual for details.**

One beep sounds when a problem exists, but the problem will not prevent the GC from executing the run. The GC will emit one beep and display a message. The GC can start the run and the warning will disappear when a run starts.

Other messages indicate hardware problems that require user intervention. Depending on the type of error, the GC emits no beep or a single beep.

The keypad

The GC has three operating keys.

[Stop] Immediately terminates the run. If the GC is in the middle of a run, the data from that run may be lost. Refer to the Advanced User Guide for information on how to restart the GC after pressing **[Stop]**.

[Prep Run] Activates processes required to bring the GC to the starting condition dictated by the method (such as turning off the inlet purge flow for a splitless injection or restoring normal flow from gas saver mode).

[Start] Starts a run after manually injecting a sample. (When you are using an automatic liquid sampler or gas sampling valve, the run is automatically activated at the appropriate time.)

Scrolls up and down through the display one line at a time. Use to view:

- Remaining run time
- Next run time
- Current status messages (what the GC is doing)
- Current temperatures, pressures, and flows
- Valve state
- GC firmware revision
- GC IP address
- System date and time

1 Introduction

2
Operating Basics

This section describes the tasks that an operator performs when using the Agilent 7820A GC.

Overview

Operating the GC involves the following tasks:

- Installing the software keypad.
- Setting up the GC hardware for an analytical method.
- Starting up the GC. See "To Start Up the GC".
- Preparing the automatic liquid sampler. Install the method-defined syringe; configure solvent and waste bottle usage and syringe size; and prepare and load solvent, waste, and sample vials.
  - For the 7693A ALS, see its Installation, Operation, and Maintenance manual.
- Loading the analytical method or sequence into the GC control system.
  - See the Agilent data system documentation.
  - For standalone GC operation see "To load a method" and "To load a sequence".
- Running the method or sequence.
  - See the Agilent data system documentation.
  - For standalone GC operation, see "To manually inject a sample with a syringe and start a run", "To run a method to process a single ALS sample", and "To start running a sequence".
- Monitoring sample runs from the GC control panel or the Agilent data system program. See "About GC Status in the Software Keypad" or the Agilent data system documentation.
- Shutting down the GC. See"To Shut Down the GC for Less Than a Week" or "To Shut Down the GC for More Than a Week".

Operation requires an available PC with the software keypad installed. See "Software Keypad Operation" for details.

Instrument Control

The Agilent 7820A GC is typically controlled by an attached data system such as Agilent EZChrom Elite Compact. Alternately, the GC can be controlled entirely from a software keypad, with output data being sent to an attached integrator for report generation.

Agilent Data System Users – Please refer to the online help included in the Agilent Data System for details on how to load, run, or create methods and sequences using the data system.

Standalone GC Users – If you are running your GC without an attached data system, for details on loading methods and sequences from the software keypad see:

- "To Install the Software Keypad"
- "To load a method"
- "To load a sequence"

For details on running methods and sequences from the software keypad see:

- "To manually inject a sample with a syringe and start a run"
- "To run a method to process a single ALS sample"
- "To start running a sequence"

Refer to the Advanced User Guide for details on how to create methods and sequences using the software keypad.

Correcting Problems

If the GC stops operation because of a fault, for example a flow module shutdown after running out of carrier gas, do the following:

1. Use the software keyboard or data system to stop the alert tone. Click **[Clear]** on the software keyboard or turn off the offending component in the data system. (For details on the software keyboard, see “Software Keypad Operation”.)
2. Resolve the problem, for example, by changing gas cylinders or fixing the leak. See the Troubleshooting Guide for details.
3. Once the problem is fixed, you may need to either power cycle the instrument, or use the software keyboard or data system to turn the problem component off, then on again. For shutdown errors, you will need to do both.

To Start Up the GC

Successful operation begins with a properly installed and maintained GC. The utility requirements for gases, power supply, venting of hazardous chemicals, and required operational clearances around the GC are detailed in the Site Preparation Checklist and Site Preparation Guide.

1 Check gas source pressures. For required pressures, see the Site Preparation Guide.

2 Turn on the carrier and detector gases at their sources and open the local shutoff valves.

3 Turn on the GC power. Wait for **Power on successful** to be displayed.

4 If removed, install the column.

5 Check that the column fittings are leak free.

6 Load the analytical method.

7 Wait for the detector(s) to stabilize before acquiring data. The time required for the detector to reach a stable condition depends on whether the detector was turned off or its temperature was reduced while the detector remained powered.

Detector type	Stabilization time starting from a reduced temperature (hours)	Stabilization time starting from detector off (hours)
FID	2	4
TCD	2	4
uECD	4	18 to 24
FPD	2	12
NPD	4	18 to 24

To Shut Down the GC for Less Than a Week

1 Wait for the current run to finish.

2 If the active method has been modified, save the changes.

WARNING **Never leave flammable gas flows on if the GC will be unmonitored. If a leak develops, the gas could create a fire or explosion hazard.**

3 Turn off all gases, except the carrier gas, at their sources. (Leave the carrier gas on to protect the column from atmospheric contamination.)

4 Reduce detector, inlet, and column temperatures to between 150 and 200 °C. If desired, the detector can be turned off. See the following table to determine if it is advantageous to shut down the detector for a short time period. The time required to return the detector to a stable condition is a factor.

Detector type	Stabilization time starting from a reduced temperature (hours)	Stabilization time starting from detector off (hours)
FID	2	4
TCD	2	4
uECD	4	18 to 24
FPD	2	12
NPD	4	18 to 24

To Shut Down the GC for More Than a Week

1 Load a GC maintenance method and wait for the GC to become ready. For more information about creating maintenance methods, see the Maintaining Your GC manual. (If a maintenance method is not available, set all heated zones to 40 °C.)

2 Turn off the main power switch.

3 Shut off all gas valves at the gas source.

WARNING **Be careful! The oven, inlet, and/or detector may be hot enough to cause burns. If they are hot, wear heat-resistant gloves to protect your hands.**

4 When the GC is cool, remove the column from the oven and cap both ends to keep out contaminants.

5 Cap the inlet and detector column fittings and all GC external fittings.

3
Software Keypad Operation

This section describes the basic operation of the Agilent 7820A GC Remote Controller (software keypad). This software provides a keypad interface that allows you to connect to and control a 7820A GC. The software keypad provides the same functionality as a real keypad on the GC. For additional information on keypad functionality, see the Advanced User Guide.

To Install the Software Keypad

Agilent provides 7820A GC Remote Controller software on the Agilent GC and GC/MS Hardware User Information & Utilities DVD. To install the software, insert the DVD into your PC's DVD drive, then follow the online instructions for installing the 7820A GC documentation. After installation, you can open the software keypad from a desktop icon or from the Start menu.

The software keypad requires a LAN connection to the GC.

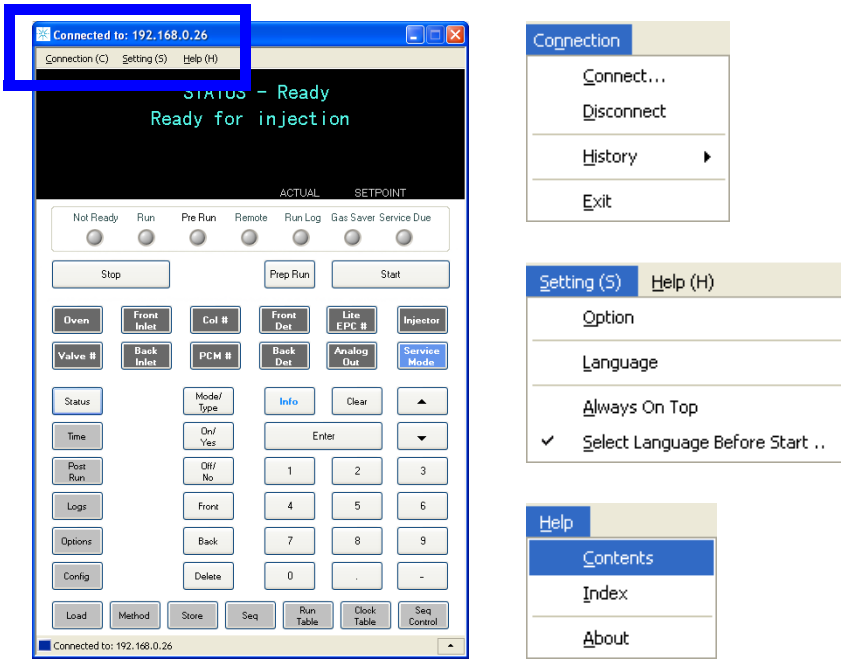
The Software Keypad

Use the software keypad to:

- Operate the GC without an Agilent data system
- View instrument error conditions
- Prepare the GC for maintenance
- Clear fault conditions

The software keypad can control only one 7820A Series GC at a time. It can connect to any 7820A GC on the PC's network.

CAUTION Use only one software keypad at a time to connect to a given GC.



To connect to a GC

1. Go to **Connection > Connect**.
2. Select **IP** to enter/select an IP address, or **Name** to select a GC using a previously assigned name.
3. From the **Target** list, either enter or select the GC IP address or name.

4 Click **Connect**.

The software keyboard window title displays the name or IP address of the connected GC. This information also appears at the bottom of the window.

If desired, you can enable **AutoConnect** to always connect to the selected GC when launching the software keypad.

To disconnect from a GC

Select **Connection > Disconnect**.

Other program settings

Settings > Option > Connection

The **Connection** tab provides options for displaying user-friendly names for GCs and for enabling automatic connection to a GC when the software loads.

Enable **AutoConnect** to connect to the default GC when starting the software keypad. You can also set this feature from **Connection > Connect**.

Use **Connection History** to assign the default GC that appears in the **Connect** list. The connection history lists each GC to which you have connected.

To assign a name that will appear in the **Connect** list, select the GC, then click **Change Name**. Enter the name in the **Name** field, then click **Save Name**.

To make a GC appear as the first entry in the **Connect** list, select it in the history then click **Set as Default**.

To permanently delete all saved names and all connection history, click **Clear History**.

Settings > Option > ShortCuts

The **ShortCuts** tab allows you to enable, disable, and customize keyboard shortcuts usable with the software.

To enable keyboard shortcuts, select **Enable shortcut on main panel**.

Once shortcuts are enabled, you can use the default shortcuts, or select and modify them as desired. To change a shortcut, select it then click **Change**. Press the keystrokes for

the new shortcut, then click **Store** to save it and **OK** to close the **Option** dialog. Shortcuts must be unique. Click **Default** to restore the factory shortcut values.

Settings > Option > Log

Select the **Log** tab to display the log entries compiled by the software keypad. The software logs connection events, communication errors, and similar events.

Settings > Language

Use **Settings > Language** to select the language for the software keypad user interface. After a brief pause, the UI reloads in the new language. This setting changes only the software keypad language, not the language of the GC.

You can also turn off language selection during program startup by deselecting **Settings > Select Language Before Startup**.

To minimize or expand the software keypad

Click ▲ or ▼ in the bottom right corner of the window to toggle keypad display.

To troubleshoot a connection

If the software keypad cannot connect to the GC, check the following:

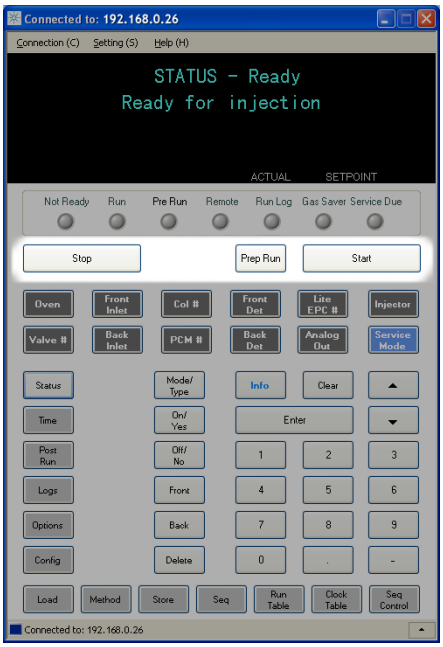
- Verify GC is turned on.
- Verify LAN cabling is connected properly.
- Verify entered IP address is correct for GC. On the GC front panel, press ▲ or ▼ to scroll to the **IP** entry. This the GCs current IP address.
- Verify basic communications to the GC by using the **ping** command. See the Troubleshooting manual.
- Verify that no one else is currently controlling the GC.
- Make sure your PC is able to communicate with the GC. The PC IP address must be set for a similar network and subnet. For example, if the GC IP address reads 192.168.0.26, then your PC IP address must be 192.168.0.xx, where xx is any number from 0 to 25 or 27 to 255. If the PC is set for a different LAN than the GC, you must change the PC IP address. Refer to Windows help for details. This operation may require administrative privileges on the PC.

To get help

To open the keypad software help, go to **Help > Contents**.

The Run Keys

These keys are used to start, stop, and prepare the GC to run a sample.



[Prep Run] Activates processes required to bring the GC to the starting condition dictated by the method (such as turning off the inlet purge flow for a splitless injection or restoring normal flow from gas saver mode). See the Advanced User Guide for details.

[Start] Starts a run after manually injecting a sample. (When you are using an automatic liquid sampler or gas sampling valve, the run is automatically activated at the appropriate time.)

[Stop] Immediately terminates the run. If the GC is in the middle of a run, the data from that run may be lost. Refer to the Advanced User Guide for information on how to restart the GC after pressing **[Stop]**.

The Service Mode Key

[Service Mode] Is used to access maintenance functions and settings, service counters, and diagnostics for the GC. See the Advanced User Guide for details.

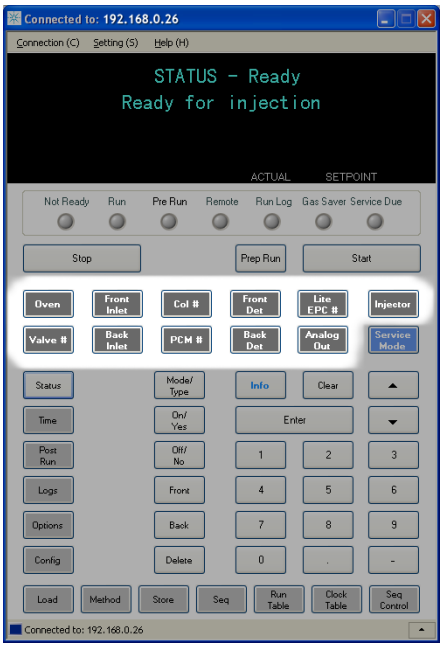
The GC Component Keys

These keys are used to set the temperature, pressure, flow, velocity, and other method operating parameters.

To display the current settings, press any one of these keys. More than three lines of information may be available. Use the scroll keys to view additional lines, if necessary.

To change settings, scroll to the line of interest, enter the change, and press **[Enter]**.

For context-sensitive help, press **[Info]**. For example, if you press **[Info]** on a setpoint entry, the help provided would be similar to: *Enter a value between 0 and 350.*



[Oven] Sets oven temperatures, both isothermal and temperature programmed.

[Front Inlet] **[Back Inlet]** Controls inlet operating parameters.

[Col #] Controls column pressure, flow, or velocity. Can set pressure or flow ramps.

[PCM #] Controls column pressure, flow, or velocity for accessory pneumatic control module(s). Can set pressure or flow ramps.

[Front Det] **[Back Det]** Controls detector operating parameters.

[Lite EPC #] Provides pneumatics to an inlet, detector, or other device. Use to configure the detector EPC for use. Can be used for pressure programming.

[Injector] Edits injector control parameters such as injection volumes and sample and solvent washes.

[Valve #] Allows for configuration or control of the gas sampling valve (GSV) and/or switching valves on or off.

[Analog Out] Assigns a signal to the analog output. The analog output is located on the back of the GC.

The Status Key

[**Status**]

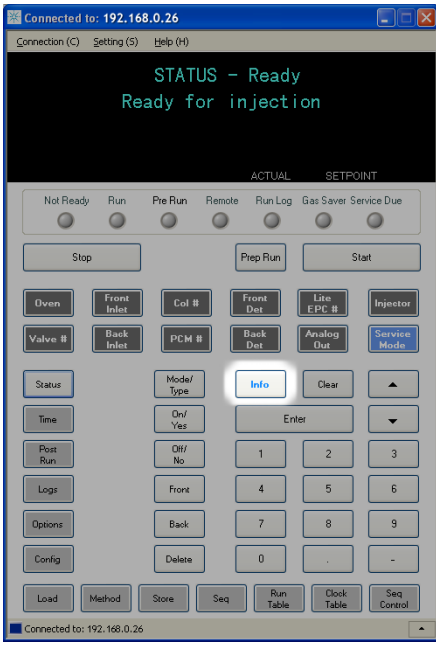
Toggles between setpoint/actual values for most commonly reviewed parameters and displays “ready,” “not ready,” and “fault” information.

When the **Not Ready** status light is *blinking*, a fault has occurred. Press [**Status**] to see which parameters are not ready and what fault has occurred.

The order in which items appear in the scrolling display window for [**Status**] can be modified. You may, for example, want to display the things you most frequently check in the top three lines so that you do not need to scroll to see them. To change the order of the **Status** display:

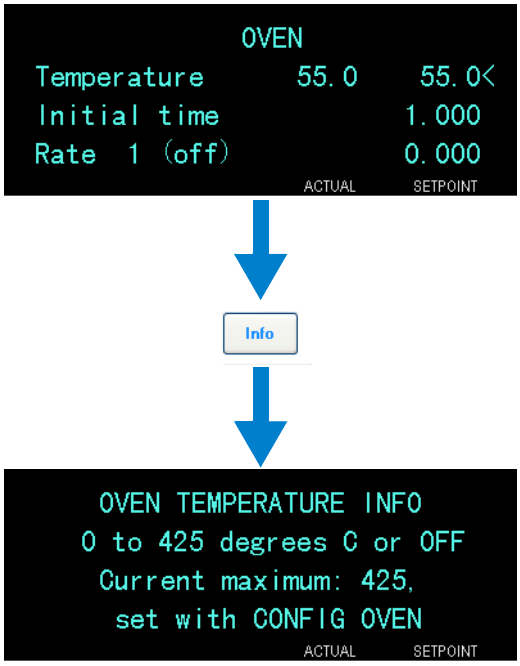
1. Press [**Config**] [**Status**].
2. Scroll to the setpoint you want to appear first and press [**Enter**]. This setpoint will now appear at the top of the list.
3. Scroll to the setpoint you want to appear second and press [**Enter**]. This setpoint will now be the second item on the list.
4. Continue as above until the list is in the order you require.

The Info Key

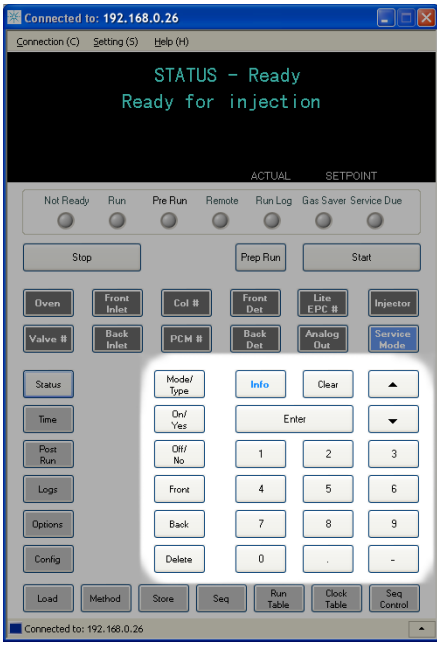


[**Info**]

Provides help for the currently shown parameter. For example, if **Oven Temp** is the active line in the display (has a < next to it), [**Info**] will display the valid range of oven temperatures. In other cases, [**Info**] will display definitions or actions that need to be performed.



The General Data Entry Keys



[**Mode/Type**] Accesses a list of possible parameters associated with a component's nonnumeric settings. For example, if the GC is configured with a split/splitless inlet and the [**Mode/Type**] key is pressed, the options listed will be split, splitless, pulsed split, or pulsed splitless.

[**Clear**] Removes a misentered setpoint before pressing [**Enter**]. It can also be used to return to the top line of a multiline display, return to a previous display, cancel a function during a sequence or method, or cancel loading or storing sequences and methods.

[**Enter**] Accepts changes you enter or selects an alternate mode.

Scrolls up and down through the display one line at a time. The < in the display indicates the active line.

Numeric Keys Are used to enter settings for the method parameters. (Press [**Enter**] when you are finished to accept the changes.)

[**On/Yes**] [**Off/No**] Are used when you are setting up parameters, such as the warning beep, method modification beep, and key click or for turning on or off a device like a detector.

[Front] [Back] Are mostly used during configuration operations. For example, when configuring a column, use these keys to identify the inlet and detector to which the column is attached.

[**Delete**] Removes methods, sequences, run table entries, and clock table entries. [**Delete**] also aborts the adjust offset process for nitrogen-phosphorus detectors (NPD) without interrupting other detector parameters. See the Advanced User Guide for more details.

The Supporting Keys

[Time] Displays the current date and time on the first line.

The two middle lines show the time between runs, the elapsed time and time remaining during a run, and the last run time and post-time during a post-run.

The last line always displays a stopwatch. While on the stopwatch line, press **[Clear]** to set the clock to zero and **[Enter]** to start or stop the stopwatch.

[Post Run] Is used to program the GC to do something after a run, such as bakeout or backflush a column. See the Advanced User Guide for details.

[Logs] Toggles between two logs: the Run Log and the System Event Log. The information in these logs can be used to support Good Laboratory Practices (GLP) standards.

[Options] Accesses the instrument parameters setup option, such as keypad and display. Scroll to the desired line and press **[Enter]** to access the associated entries. See the Advanced User Guide for details.

[Config] Is used to set up components that are not automatically detectable by the GC but are essential to running a method, such as column dimensions, carrier and detector gas types, makeup gas configurations, and column plumbing to inlets and detectors. These settings are part of, and are stored with, the method.

To view the current configuration for a component (such as the inlet or detector), press **[Config]**, then the component key of interest. For example, **[Config][Front Det]** opens front detector configuration parameters.

Method Storage and Automation Keys

These keys are for loading and storing methods and sequences locally on your GC. They cannot be used to access methods and sequences stored by your Agilent ChemStation.

[**Load**] [**Method**] [**Store**] [**Seq**]

Are used to load and store methods and sequences on your GC.

To load a method, press [**Load**] [**Method**] and select one from the list of methods stored in the GC. See the Advanced User Guide for more details on these operations.

[**Run Table**] Is used to program special events you require during a run. A special event could be switching a valve, for example. See the Advanced User Guide for details.

[**Clock Table**] Is used to program events to occur at a time of day, as opposed to during a specific run. This could, for example, be used to start a shutdown run at 5:00 p.m. every day. See the Advanced User Guide for details on this function.

[**Seq Control**] Starts, stops, pauses, or resumes a sequence, or views the status of a sequence. See the Advanced User Guide for details.

Keypad Functionality When the GC Is Controlled by an Agilent Data System

When an Agilent data system controls the GC, the data system defines the setpoints and runs the samples. The Remote indicator on the software keypad lights when a data system is controlling the GC.

CAUTION Using the software keypad to change setpoints when a data system controls the GC can cause erroneous data. When using the software keypad, the GC does not automatically communicate setpoint changes to the connected data system.

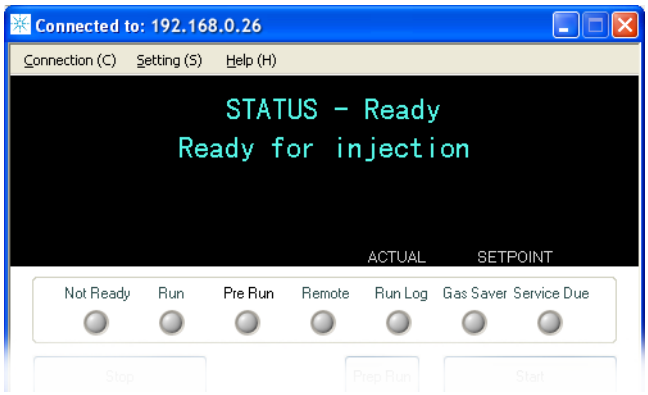
When an Agilent data system controls the GC, the software keypad should be used:

- To view run status by selecting [**Status**]
- To view the method settings by selecting the GC component key
- To display the last and next run times, the run time remaining, and the post-run time remaining by repeatedly selecting [**Time**]
- To abort a run by selecting [**Stop**]
- To find which computer is controlling the GC by pressing **[Options] > Communication**, then scrolling. The name of the computer controlling the GC is listed under the **Enable DHCP** setting, along with the number of hosts connected to the GC.

About GC Status in the Software Keypad

When the GC is ready to begin a run, the display screen shows **STATUS Ready for Injection**. Alternatively, when a component of the GC is not ready to begin a run, the **Not Ready** indicator on the software keypad is lit. Press [**Status**] to see a message explaining why the GC is not ready.

Indicators



A lit indicator means:

- The current progress of a run (**Pre Run** or **Run**).
- Items which may require attention (**Not Ready**, **Service Due**, and **Run Log**.
- The GC is controlled by an Agilent data system (**Remote**).
- The GC is in gas saver mode (**Gas Saver**).

WARNING **Before resuming GC operations, investigate and resolve the cause of the hydrogen shutdown. See Hydrogen Shutdown in the Troubleshooting manual for details.**

Error conditions

If a problem occurs, a status message appears. If the message indicates broken hardware, more information may be available. Press the applicable component key (for example, **Front Det**, **Oven**, or **Front Inlet**).

Blinking setpoint

If the system shuts down a gas flow or the oven, **Off** will blink on the appropriate line of the component's parameter listing.

If there is a detector pneumatics shutdown or failure in another part of the detector, the detector **On/Off** line of the detector's parameter list blinks.

About Logs

Two logs are accessible from the keypad: the run log and the system event log. To access the logs, press **[Logs]** to toggle to the desired log. The display will indicate the number of entries the log contains. Scroll through the list.

Run log

The run log is cleared at the start of each new run. During the run, any deviations from the planned method (including keypad intervention) are listed in the run log table. When the run log contains entries, the **Run Log** indicator lights.

System event log

The system event log records significant events during the GC's operation. Some of the events also appear in the run log if they are in effect during a run.

4 Running a Method or a Sequence from the Software Keypad

This section explains how to load, store, and run a method or sequence using the software keypad, without the use of an Agilent data system. The keypad can be used to select and run a method or automated sequence stored in the GC and run it. In this case, the data generated from the run is normally sent to an integrator for the data analysis report.

For information on creating a method or sequence using keypad entry, see the Advanced User Guide.

Loading, Storing, and Running Methods from the Software Keypad

To load a method

1. Press **[Load]**.
2. Press **[Method]**.
3. Enter the number of the method to be loaded (1 through 9).
4. Press **[On/Yes]** to load the method and replace the active method. Alternatively, press **[Off/No]** to return to the stored methods list without loading the method.

To store a method

1. Ensure that the proper parameters are set.
2. Press [**Store**].
3. Press [**Method**].
4. Enter the number of the method to store (1 through 9).
5. Press [**On/Yes**] to store the method and replace the active method. Alternatively, press **[Off/No]** to return to the stored methods list without storing the method.

To manually inject a sample with a syringe and start a run

1. Prepare the sample syringe for injection.
2. Load the desired method. (See "To load a method".)
3. Press **[Prep Run]**.
4. Wait for **STATUS Ready for Injection** to be displayed.
5. Insert the syringe needle into the inlet and puncture the septum.
6. Simultaneously depress the syringe plunger to inject the sample and press **[Start]**.

To run a method to process a single ALS sample

1. Prepare the sample for injection.
2. Load the sample vial into the assigned location in the ALS turret.
3. Load the desired method. (See "To load a method".)
4. Press **[Start]** on the GC keypad to initiate the ALS syringe cleaning, sample loading, and sample injection method.

After the sample is loaded into the syringe, the sample is automatically injected when the GC reaches the ready state.

To abort a method

1 Press **[Stop]**.

2 When you are ready to resume running analyses, load the appropriate sequence or method. (See "To load a method" or "To load a sequence".)

Loading, Storing, and Running Sequences from the Software Keypad

A sequence can specify up to five subsequences to be run, as well as post-run sequences, if defined. Each sequence is stored as a number (from 1 to 9).

To load a sequence

1 Press **[Load][Seq]**.

2 Enter the number of the sequence to be loaded.

3 Press **[On/Yes]** to load the sequence or **[Off/No]** to cancel the load.

An error message is displayed if the specified sequence number has not been stored.

To store a sequence

1 Press **[Store][Seq]**.

2 Enter the number of the sequence to be stored.

3 Press **[On/Yes]** to store the sequence or **[Off/No]** to cancel the store.

To start running a sequence

1 Load the sequence. (See "To load a sequence".)

2 Press **[Seq Control]**.

3 Verify the status of the sequence:

- **Running**—the sequence is running
- **Ready/wait**—the instrument is not ready (due to oven temperature, equilibration times, etc.)
- **Paused**—the sequence is paused
- **Stopped**—proceed to step 4
- **Aborted**—the sequence stopped without waiting for the run to finish (See "Aborting a sequence".)
- **No sequence**—the sequence is off or not defined

4 Scroll to the **Start sequence** line and press **[Enter]** to change the status to **Running**.

The **Run** indicator will light and stay lit until the sequence is completed. The sequence continues to run until all subsequences are executed or until the sequence is aborted.

To pause a running sequence

1 Press **[Seq Control]**.

2 Scroll to **Pause sequence** and press **[Enter]**.

The sequence stops when the current sample run is complete.

To resume a paused sequence

1 Press **[Seq Control]**.

2 Scroll to **Resume sequence** and press **[Enter]**.

The sequence resumes with the next sample.

To stop a running sequence

1 Press **[Seq Control]**.

2 Scroll to **Stop sequence** and press **[Enter]**.

The sequence stops at the end of the currently running subsequence unless **[Seq] > Repeat sequence** is **On**.

To resume a stopped sequence

1 Press **[Seq Control]**.

2 Scroll to **Resume sequence** and press **[Enter]**.

The sequence restarts from the beginning of the sequence.

Aborting a sequence

When a sequence is aborted, it stops immediately without waiting for the current run to finish.

The following will cause a sequence to abort:

- The **[Stop]** key is pressed.
- A sampler error occurs, producing an error message.
- The GC detects a configuration mismatch during a method load.

- A running sequence tries to load a method that doesn't exist.
- The sampler is turned off.

To resume an aborted sequence

1. Correct the problem. (See "Aborting a sequence".)
2. Press **[Seq Control]**.
3. Scroll to **Resume sequence** and press **[Enter]**.

   The aborted sample run will be repeated.

5
About Methods, Sequences, and Data Analysis

What Is a Method?

A method is the group of settings required to accurately analyze a specific sample.

Since every type of sample reacts differently in the GC—some samples require a higher oven temperature, others require a lower gas pressure or a different detector—a unique method must be created for each specific type of analysis.

What Is Saved in a Method?

Some of the settings saved in a method define how the sample will be processed when the method is used. Examples of method settings include:

- The oven temperature program required
- The type of carrier gas required
- The type of detector to be used
- The type of inlet to be used
- The type of column to be used
- The length of time to process a sample

Data analysis and reporting parameters are also stored in a method when it is created on an Agilent data system, for example EZChrom Elite Compact. These parameters describe how to interpret the chromatogram generated by the sample and what type of report to print.

See the Advanced User Guide for more details on what can be included in a method.

What Happens When You Load a Method?

There are two kinds of methods:

- **The active method**—This is sometimes referred to as the current method. The settings defined in this method are the settings the GC is currently maintaining.
- **User-stored methods**—Up to 9 methods can be stored in the GC.

When a method is loaded from the GC or Agilent data system, the setpoints of the active method are immediately replaced with the setpoints of the method loaded.

- The method loaded becomes the active (current) method.
- The **Not Ready** light will stay lit until the GC reaches all of the settings specified by the method that was just loaded.

Refer to "Running a Method or a Sequence from the Software Keypad" for details on using the keypad to load, modify, and save methods.

What Is a Sequence?

A sequence is a list of samples to be analyzed along with the method to be used for each analysis. Once defined, the sequence may run unattended, automatically processing the samples defined in the sequence.

Refer to "Running a Method or a Sequence from the Software Keypad" and the Advanced User Guide for details on how to create, load, modify, and save sequences using the keypad.

Automating Data Analysis, Method Development, and Sequence Development

Data compiled from samples (the output of the detectors) is digitized and can be sent to an automated data analysis system (such as the Agilent ChemStation), where it is analyzed and the results summarized in reports.

The Agilent ChemStation also can be used to create and store methods and sequences that are sent to the GC through a network.

6
Configuration Tasks

This section describes a several configuration tasks that may be required as part of normal operation.

About the GC IP Address

From the factory, the GC is set to:

IP address	192.168.0.26
Subnet Mask	255.255.255.0
Gateway	192.168.0.1

The installation procedures assume that you will connect to the GC using this address. However, after installation you may need to change the GC IP address or set it to use DHCP.

To set the IP address at the GC

1 Start the software keyboard. From the Windows® Start program menu, **Agilent > All Programs > Agilent Technologies > 7820A GC Remote Controller**.

2 Connect to the GC. Go to **Connection > Connect...**. In the **Target** field, enter the current GC IP address.

If the connection fails, see "To troubleshoot a connection".

3 Click **[Options]**. Scroll to **Communications** and click **[Enter]**.

4 Verify DHCP is Off. Scroll to **Enable DHCP**. If **Enable DHCP** is **Off**, skip to the next step.

If **Enable DHCP** is **On**, turn it off by clicking **[Off/No]**. Scroll to **Reboot GC**. Click **[On/Yes]** and **[On/Yes]**. After reboot, click **[Options]**. Scroll to **Communications** and click **[Enter]**.

5 Scroll to **IP**. Use the numeric keypad to enter the numbers of the GC IP address, separated by dots, and click **[Enter]**. A message tells you to power cycle the instrument. Do not power cycle yet. Click **[Clear]**.

6 Scroll to **GW**. Enter the Gateway number and click **[Enter]**. A message tells you to power cycle the instrument. Do not power cycle yet. Click **[Clear]**.

7 Scroll to **SM** and click **[Mode/Type]**. Scroll to the appropriate subnet mask from the list given and click **[Enter]**. A message tells you to power cycle the instrument. Do not power cycle yet. Click **[Clear]**.

8 Scroll to **Reboot GC**. Click **[On/Yes]** and **[On/Yes]** to power cycle the instrument and apply the LAN setpoints.

9 Ping the GC using the IP address entered above. See the Troubleshooting manual for details or if the GC does not respond.

To Use DHCP to Provide the GC IP Address

To set the GC to use DHCP:

1. Turn off the GC.
2. While pressing and holding **[Prep Run]** and **[Stop]** on the GC keypad, turn on the GC. This will set the GC to use DHCP to obtain an IP address.
3. Ping the GC using the static IP address or hostname assigned to the GC by your network administrator. See the Troubleshooting manual for details or if the GC does not respond.

You can also set the GC to use DHCP using the software keypad.

1. Click **[Options]**. Scroll to **Communications** and click **[Enter]**.
2. Set **Enable DHCP** to **On** (press **[On/Yes]**).
3. Reboot the GC.

To restore the default GC IP address

During installation and sometimes during operation, you may need to reset the GC IP address or change its IP addressing mode.

To restore the default IP address, press and hold the **[Prep Run]** key while power cycling the GC. After reboot, the GC IP address will return to:

IP address	192.168.0.26
Subnet Mask	255.255.255.0
Gateway	192.168.0.1

To Reconfigure the EPC Module for Another Detector

Agilent provides a configurable flow module that supplies gas flows to the detectors installed in the GC. However, since the 7820A GC is a single channel instrument, a single flow module can supply gases to only one detector at a time.

If you have one detector flow module and two detectors, and wish to switch the detector used, reconfigure the flow module as described below.

If you have two detectors and two flow modules, you do not need to perform this procedure.

To reconfigure the GC to use a detector flow module with another detector:

1. Determine the gas types needed for the new detector. The new detector may require changes to the gas supply plumbing. Prepare the tubing and gas supplies before beginning. See the Installation Guide for gas plumbing details and the Site Preparation Guide supply requirements.
2. Connect to the GC with the software keypad.
3. Cool down the detector in use. The detector must be cool in order to prevent damage during the changeover.

   If changing the carrier gas, or if you will need to disconnect or shut off the carrier gas supply in order to change detector gases, also cool down the inlet and oven.
4. Turn off the detector flows. If changing detector gas types, also shut off detector gas supplies.
5. Close any online data system session for this GC.
6. Remove the detector cover.
7. Remove the pneumatics cover to expose the detector flow modules. See Figure 1.

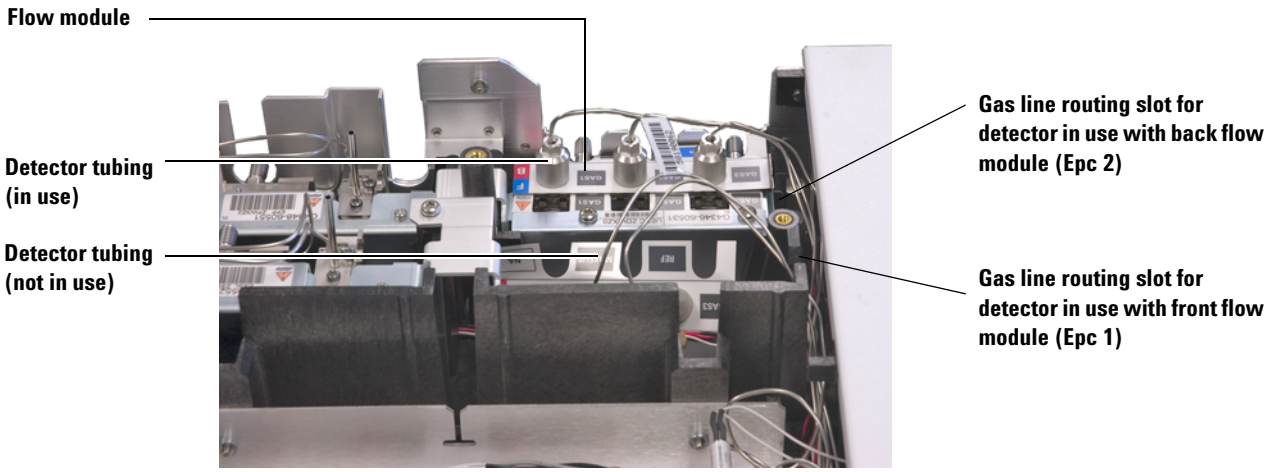
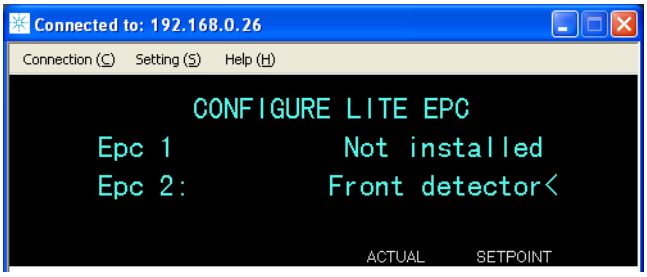


Figure 1 Example back detector EPC flow module with FID tubing attached

8 Click **[Config][Lite EPC#]**.

9 Scroll to the EPC module to reconfigure.

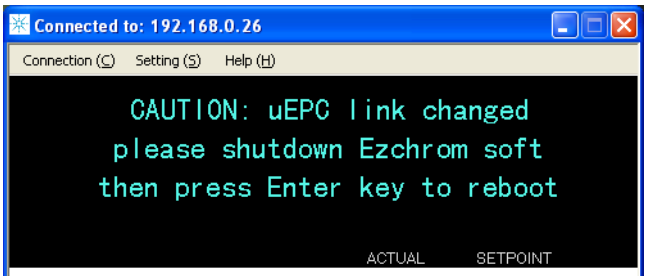


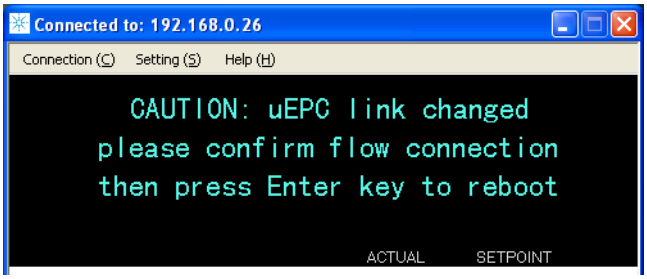
10 Click **[Mode/Type]**.

11 Scroll to the desired detector to use, then click **[Enter]**. The choices are:

- Front detector
- Back detector
- No linkage (do not use the flow module for a detector)

12 Follow the prompts in the software keypad display. Click **[Enter]** to continue when prompted. As a minimum, you will be prompted to close any online data session, then to reboot the GC.





After the GC reboots, the software keypad will temporarily loose communication with the GC. When the GC completes reboot, click **Reconnect**, or simply wait a few moments.

13 Turn off the new detector and its gas flows. Turning off the detector and its flows protects the detector and prevents shutdown errors while you connect any new gas supplies.

CAUTION When handling the detector flow tubing, avoid bending the tubing at sharp angles.

14 Loosen the thumbscrews that secure the old detector tubing to the flow module, then lift the old detector tubing from the flow module. See Figure 1.

CAUTION Be careful not to cross-thread the knurled nuts onto the supply fittings.

15 Locate the new detector's tubing. Place the new tubing over the flow manifold fittings, then fully tighten the thumbscrews. Make sure the gas type label is shown clearly.

16 Carefully arrange the new detector tubing so that it fits through the correct routing slot. See Figure 1.

17 Route the tubing for the unused detector tubing through the other routing slot, and gently push its fittings into the open manifold space. See Figure 1.

18 If the detector gas types differ between the new detector and the old detector, connect the new gas supplies to the detector flow module.

- Refer to the label on the detector tubing for the expected gas type for each flow module fitting.
- Turn on the supply gases and check for supply gas leaks at the fittings.
- Set source gas pressures. [Typically, set helium, hydrogen, and nitrogen supplies to 400 kPa (60 psi), and detector air to 550 kPa (80 psi).]

19 Click **[Lite EPC#]**. The new detector should be listed as the owner of the flow module.

20 Use the software keypad to configure any new gases (carrier or detector). For example, click **[Config][Back Det]**, then scroll to **Makeup gas type**.

21 Turn on the detector gas flows using the software keypad.

22 Reinstall the covers.

After reconfiguring the flow module, you will need to update any configuration settings in your Agilent data system. You will also need to resolve your method to use the new detector and column configuration, or create a new method.

NOTE If using Agilent EZChrom Elite Compact, you may wish to create a new instrument for the GC when configured for the second detector.