

Agilent 7697A Headspace Sampler

Software Familiarization



Agilent Technologies

Notices

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Agilent 7697A Headspace Sampler Software Familiarization

Getting Familiar with the Agilent Integrated Headspace Software

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Introduction

This guide describes how to begin using the Agilent 7697A 111-Vial Headspace Sampler (HS) with the Agilent Integrated Headspace Software.

This guide assumes some familiarity with the Agilent 7890A Gas Chromatograph (GC) (Figure 1) and the Agilent GC ChemStation software. Refer to the GC and Agilent GC ChemStation software user documentation for details.



Figure 1 The Agilent 7890A GC–7697A 111-Vial HS system with 7693A ALS and the 7000 GC/MS Triple Quad

The Agilent GC ChemStation data system is used as an example in this guide. Use with other data systems is similar.

Before You Begin

This guide assumes the use of an Agilent 7890A GC-7697A 111-Vial HS system. In addition, this guide assumes that:

- The Agilent Integrated Headspace Software is installed and configured.
- The latest version of the Agilent GC ChemStation software is installed and configured.
- The 7890A GC-7697A 111-Vial HS system is configured as **Instrument 1**.
- The GC and HS currently have no error conditions.
- All gases are plumbed and turned on.
- Your GC/HS system is configured for GC carrier gas control.
- You have a 1-mL sample loop installed in your HS.
- You are using 20-mL sample vials.

Getting Started

Starting Up the GC, HS, and Computer

If not already running, start up the GC, HS, and computer in the following order:

- **1** Turn on the GC.
- 2 Turn on the HS.
- **3** Turn on all gases and set to the proper source pressures. For details refer to the user documentation provided with your instruments.
- **4** Check for any error messages on the GC and HS displays. If any problems exist, resolve them. For details refer to the user documentation provided with your instruments.
- 5 Turn on the Agilent data system computer.

Starting an Online Instrument Session

Start an online instrument session. For Agilent GC ChemStation, select Start > All Programs > Agilent ChemStation > Instrument 1 Online (Figure 2).





An Instrument Configuration dialog window appears (Figure 3). If you select Yes, the instrument configuration opens. If you select No, the dialog window closes and the instrument session begins. To hide this dialog window at future online instrument session startups, select Suppress this message.

In this example, select **No** to close the dialog window and start the online instrument session.





Instrument configuration

Instrument Configuration

Instrument Configuration

1 To access **Instrument Configuration**, select **View > Full Menu** in the data system's top menu (Figure 4). This allows access to special menu items in the data system.



Figure 4 Viewing the Full Menu in Agilent GC ChemStation

2 Select **Instrument > Instrument Configuration...** from the data system's top menu (Figure 5).





3 Use **Instrument Configuration** to configure your HS (Figure 6). Select **Configure...** to view configuration parameters and licensing information for the selected instrument. Refer to the software help for more information.

Instrument Configuration: 7890A GC			
Configurable Modules		Selected Modules	
Agilent 7890 GC System		Agilent 7890 GC System	
7694B	Auto Configuration	Agilent 7697A [7697A]	
7697A			•
G1888	>		4
	+		\frown
	++		Configure
✓ Ask for configuration change at ChemS	tation startup		
,	Ca	ncel Help	

Figure 6 Instrument Configuration

Agilent 7697A Configuration

1 To access the Agilent 7697A Configuration, select Instrument > Agilent 7697A Configuration... from the data system's top menu (Figure 7).





2 Select the **Connection** tab (Figure 8) to access instrument connection information, license keys, and system version information.

Version Information contains information to provide to a support engineer during a support call.

Agilent 7697A Configuration: Instrument 1	X
Agilent 7697A Configuration: Instrument 1 Connection Configuration Preferences Connection Information Agilent 7697A Instrument Name 7697A Headspace Sampler IP Address or Hostname	License Keys Instrument License XXXXX-XXXXX-XXXXX Version Information
222.22.222.22 Notes	Software Driver Version: B.01.01 [4041] Model: G4557A Serial Number: 0000000000 Firmware Revision: A.00.99
	OK Cancel Help



3 Select **Configuration > Instrument and System** (Figure 9) to configure the instrument settings and to select your desired system carrier gas configuration.

Select **Upload Config from Instrument** to view your current instrument configuration. This overwrites any unsaved configuration changes made to the software.

Agilent 7697A Configuration: Instrument 1									
Connection Configuration Preferences									
Upload Config from Instrument									
Instrument and System 🚺 Resource Conservation									
Instrument Settings									
Vial pressurization gas: Helium									
Loop size: Custom V Loop Size: 0.000 mL									
Pressure unit: psi									
Keypad locked while in use by software									
System Configuration									
Instrument controlling carrier setpoints:									
GC instrument									
OK Cancel Help									

Figure 9 Setting instrument and system information

4 Select **Configuration > Resource Conservation** (Figure 10) to configure gas and instrument schedules that can help conserve resources during laboratory downtime.

Agilent 7697A Configuration: Instrument 1	×
Connection Configuration Preferences	
Upload Config from Instrument	
Instrument and System 🔇 Resource Conservation	
Reduce gas and power consumption by setting gas saver and instrument schedule options	
Gas Saver	
Set reduced flows between uses:	
✓ Vial standby flow: 20 mL/min	
Instrument Schedule	
Select a schedule that best matches how you use this Headspace instrument:	
Always on	
Custom Same schedule 7 days per week Same schedule M-F, off on Sat & Sun Same schedue M-F, alternate schedule on Sat & Sun Always on	
OK Cancel Help	

Figure 10 Setting resource conservation parameters

5 Select the Preferences tab (Figure 11) to configure the Method Editor and Instrument Actuals preferences.

Select **Show method time line** to display the method editor time line (as shown in Figure 21).

Agilent 7697A Configuration: Instrument 1	
Connection Configuration Preferences	
Method Editor	
Show method timeline	
Show actual values next to setpoints	
Instrument Actuals	
 Use standard instrument actuals coloring 	
Select a specific color for instrument actuals	
	Cancel Help

Figure 11 Setting the Method Editor and Instrument Actuals preferences

Creating a New Method

Creating a New Method

1 Open the **Method Editor**. Select **Instrument >** Edit Parameters... (Figure 12).

File	RunControl	Instrument	Method	Sequence	View	RTLock	RTSearch	Abort	Help
		Select Inj	ection Sou	urce					
		Edit Para	meters						
		Instrumer	nt Utilities						
		Agilent 76 Upload mi	697A Conf ethod fror	iguration n Agilent 769	_				
		Agilent 78 Upload m Start Colu	390A Conf ethod fror umn Comp	iguration n Agilent 789 ensation Rui	90A 1	_			



2 The Method Editor opens (Figure 13). Select the Agilent 7697A tab to open the method parameters for the 7697A Headspace Sampler.

s	etun Method										×
	🖞 Agilent 7697A 🗛 🛔	lent 7890A 🛛 Agil	ent 7890A Sam	ple Prep Progra	am						
	Time (min) for Hea	adspace metho	bd			1	rotal method	run time: 13	.13 min		
	-										
								_	_	_	
	++	Č.		Ē			3		-		
	-7.50 -6.25	-5.00	-3.75	-2.50	-1.25	0.00	1.25	2.50	3.75	5.00	
	Temperatures	() Times	Vial an	d Loop	Carrier	Advance	d Functions	Sequence Acti	ons Metho	Development	t
	Temperature	es									
		S	etpoint	Actua	al						
	Vven:	1	.00 °⊂	100.0) ℃						
	🔽 Loop:	1	10 ℃	110.0) ℃						
	✓ Transfer Line:	1	15 °C	115.0) °⊂						
			ОК		Apply	Upload fr	om Instrument	Cano	el 🛛	Help	

Figure 13 The Agilent 7697A Method Editor

3 Select the **Temperatures** icon and set the parameters shown in Figure 14.

Be sure to select **Oven**, **Loop**, and **Transfer Line** to enable the temperature zone for each item.

s	etup Method										×
Γ.	🖞 Agilent 7697A	Agilent 7890A	Agilent 7890A Sar	mple Prep Progra	am						
	Time (min) for Headspace method Total method run time: 13.13 min										
								_	_	_	
	-7.50 -6	 5.25 -5.00	0 -3.75	-2.50	-1.25	 0.00	1.25	 2.50	 3.75	5.00	
	Temperatures	Times) Vial a	nd Loop	Carrier	Advance	d Functions	Sequence Act	ions Metho	Development	t
	Temperat	ures	Setpoint	Actua	al						
	Voven:		100 °C	100.0) °⊂						
	🖌 Loop:		110 °⊂	110.0) °⊂						
	🖌 Transfer	Line:	115 °C	115.0) °⊂						
			OK		Apply	Upload fr	om Instrument	Cano	cel	Help	

Figure 14 Setting the temperature parameters

4 Select the **Times** icon and set the parameters shown in Figure 15.

Note that the colored boxes below correspond to sections of the time line. Click a colored box to change its color in the time line.

Setup M	Aethod										×
👌 Agi	ilent 7697A	Agilent 7890A 🛛 Agi	ent 7890A Sam	ple Prep Prog	jram 🛛						
Time	e (min) for H	eadspace meth	bd			I	otal method	l run time: 13	.13 min		
								_	_		
+ -7.5	i0 -6.2	25 -5.00	 -3.75	-2.50	-1.25	 0.00	 1.25	 2.50	 3.75	5.00	
Terr	peratures	Times	Vial an	d Loop	Carrier	Advance	d Functions	Sequence Acti	ons Metho	Dd Development	
Tim Vi In Gi	es ial Equilibration jection Duratio C Cycle:	Set : 7 n n: 0.5									
			ОК		Apply	Upload fr	om Instrument	Canc	el	Help	

Figure 15 Setting the time parameters

5 Select the **Vial and Loop** icon and set the parameters shown in Figure 16.

For this example, select **Custom** as the **Vial Fill Mode** type, and select **Flow to Pressure**. Select **Default** as the **Loop Fill** mode, which is sufficient for many analyses.

Setup Method									
Agilent 7697A Agilent 7890A Agilent 7890A Sample Prep Program									
Time (min) for Hea	dspace metho	d			т	otal method	run time: 13.1	3 min	
							_	_	
-7.50 -6.25	-5.00	-3.75	-2.50	-1.25	 0.00	1.25	 2.50	 3.75	5.00
Temperatures	() Times	Vial and L	оор	Carrier	Advance	d Functions	Sequence Action	is Metho	d Development
Vial and Loo	р								
<u>Vial Settings</u>									
Vial Size:	20 mL 🗸								
🖌 Shake vials while	in oven	Q		Freque	ncy:	18 shakes/min	1		
		Less	Mo	re Accele	ration:	60 cm/s²			
Fill Modes									
Vial Fill Mode:	Custom	~]						
	Flow to Pres	ssure		0	Pressure			O Co	onstant Volume
	mL min→ (>)	Fill Flow:	50 mL/min		•			mĻ	
		Fill Pressure:	15 psi						
		Hold Time:	0.1 min						
Loop Fill mode:	Default	*	Loop fill va	alues will be ca	lculated by th	ie instrument			
		ОК		Apply	Upload fro	om Instrument	Cancel		Help

Figure 16 Setting the vial and loop parameters

6 Select the **Carrier** icon. In this example, the GC controls the carrier flow, as shown in Figure 17. If you have the optional EPC module installed with your HS system, the HS carrier control parameters appear here.

Setup Method										X
📋 Agilent 7697	7A Agilent	t 7890A Agilen	t 7890A Sample Pre	p Program						
Time (min)	for Heads	pace method				То	tal method	run time: 13.1	3 min	
								_	_	
-7.50	-6.25	-5.00	-3.75 -2	 .50 ·	+ 1.25	0.00	1.25	2.50	3.75	5.00
Temperature	es	(F) Times	Vial and Loop	(arrier	Advanced	Functions	Sequence Action	is Meth	nod Development
Carrier Carrier will be controlled by the GC instrument. Optional accessories are available for your Headspace instrument to provide carrier control.										
		(ок	Ар	oly 🛛	Upload from	m Instrument	Cancel		Help

Figure 17 Setting the carrier parameters

7 Select the **Advanced Functions** icon and set the parameters shown in Figure 18.

The bar code reader settings shown in Figure 18 only appear if your HS has a bar code reader installed.

Click the blue heading hyperlinks to view pop-up textual explanations of the feature.

Setup Method										
Agilent 7697A Agilent 7890A Agilent 7890A Sample Prep Program										
Time (min) for Headspace method Total method run time: 13.13 min										
· · · · ·	1 1	1 1								
-7.50 -6.25 -5.0	0 -3.75 -2.50	-1.25 0.00	1.25 2.50	3.75 5.00						
Temperatures Times	Vial and Loop	Carrier Advanced	Functions Sequence Act	tions Method Development						
Advanced Functions										
Extraction Mode										
 Single extraction 	Multiple extractions	🔘 Concentra	ated extractions							
<u>ه</u> م ال	<u>In In</u>		M							
Venting and Purging										
Vent vial pressure after e:	xtraction									
Post-injection purge:	Default 💙 Purge	e flow: 100 mL/min	Purge time:	1 min						
Dynamic Leak Checking										
Acceptable leak rate:	Default 🖌 Leak	flow: 0.2 mL/min								
Barcoding of Vials										
Barcode symbology:	Enable All									
Vial barcodes include checksum										
	OK ,	Apply Upload fro	m Instrument Can	icel Help						

Figure 18 Setting the advanced functions

8 Select the **Sequence Actions** icon and set the parameters shown in Figure 19.

This panel provides logical control over HS errors that can occur when handling sample vials for a run or a sequence of runs. Refer to the user documentation and software help for information.



Figure 19 Setting the sequence actions

9 Use **Method Development** (Figure 20) when developing new methods. Wizards are provided here to help convert existing methods. Refer to the software help for more information.

Setup Method								
Agilent 7697A Agilent 7890A Agilent 7890A Sample Prep Program								
Time (min) for Headspace method Total method run time: 13.13 min								
-7.50 -6.25 -5.00 -3.75 -2.50 -1.25 0.00 1.25 2.50 3.75 5.00								
Temperatures Times Vial and Loop Carrier Advanced Functions Sequence Actions Method Development								
Method Development Manual Would you like to increment a method setting over subsequent runs? None Assisted								
Create method based on a specific application								
Convert an existing valve and loop Headspace method								
Convert an existing pressure transfer Headspace method								
OK Apply Upload from Instrument Cancel Help								

Figure 20 Setting the Method Development parameters

10 View the time line at the top of each **Method Editor** panel for a graphical display of HS method parameters and GC cycle times for a single vial (Figure 21).



Figure 21 The method time line

Saving the New Method

Basic method edits are complete. To save your new method, select **Method > Save Method As...** (Figure 22) and enter a new name for the method (Figure 23). When saving a method, you are saving parameters for all instruments connected to your GC-HS system.



Figure 22 Accessing Save Method as...

Save Method as	: 7890A GC		? 🛛
Name: MyMethod 100FID.M CBT.M DEF_GC.M ESTD_EX.M FID_TCD.M ISTD_EX.M LOADTEST.M NPD_ECD.M		Eolders: c:\chem32\1\methods c:\ c:\ chem32 1 methods 100fid.m cbt.m cbt.m cbt.m def_gc.m fid_tcd.m istd_ex.m LOADTEST.M npd_ecd.m	OK Cancel
	~		
<u>T</u> ypes:		Dri <u>v</u> es:	
Method(*.M)	~	🖃 c:	Network



Additional Features of the Agilent Integrated Headspace Software

Instrument Actuals

1 To view Instrument Actuals for the GC and HS, select View > Instrument Actuals from the data system top menu (Figure 24).



Figure 24 Accessing Instrument Actuals

The Instrument Actuals window opens (Figure 25).

Instrument Actuals							
Agilent 7697A Status	-	Agile	nt 7890A Status 📃				
Ready	tatus	Ag 00 Se	ilent 7890A at IP Address:				
Name	Setpoint	Firmware Revision: A.01.11	mware Revision: A.01.11 fhware Driver Version: 4.01 (035)				
Oven Temperature	OFF	10	40-45 AM				
Loop Temperature	OFF	GC	Connection State: Online				
Transfer Line Tempera	OFF	G	RunState: Idle				
Vial Pressure	Not Specified	AL	S Run State: Idle				
Vial Flow	Not Specified	GC	Ready State: Waiting for Prep Run				
Carrier Pressure	External Supply						
	v	0	ren Temperature: 50.0 °C				

Figure 25 Instrument Actuals

2 To view the full Agilent 7697A **Instrument Actuals** panel, hide the **Agilent 7890A Status** panel by clicking the minimize icon in the top-right corner (Figure 26).

Instrument Actuals			
Agilent 7697A Status			Agilent 7890A Status
Ready A			Agilent 7890A at IP Address: 000.00.000.000 Serial Number: CN00000000
Name	Setpoint		Firmware Revision: A.01.11 Software Driver Version: 4.01 [035]
Oven Temperature	OFF		10-40-45 AM
Loop Temperature	OFF		GC Connection State: Online
Transfer Line Tempera	OFF		GC BunState: Idle
Vial Pressure	Not Specified		ALS Run State: Idle
Vial Flow	Not Specified		GC Ready State: Waiting for Prep Run
Carrier Pressure	External Supply		
<	~		Oven Temperature: 50.0 °C

Figure 26 Minimizing Agilent 7890A Status panel

The **Agilent 7697A Status > Instrument Actuals** panel displays (Figure 27).

Instrument Actuals									
A	Agilent 7697A Status								
	Ready Instrument Clock: 10:34 AM 👻								
	Instrument Actuals Vial Status								
	Name	Setpoint	Actual						
	Oven Temperature	OFF	41.0 ℃						
	Loop Temperature	OFF	44.7 ℃						
	Transfer Line Temperature	OFF	28.4 °C						
	Vial Pressure	Not Specified	0.126 psi						
	Vial Flow	Not Specified	20.00 mL/min						
	Carrier Pressure	External Supply	-0.059 psi						
III I Agilent 7890A Status									



3 To view the **Agilent 7697A Status** > **Vial Status** panel, select the **Vial Status** tab (Figure 28).

Ir	Instrument Actuals								
A	Agilent 7697A Status								
	Running Instrument Clock: 10:36 AM 👻								
	Instrument Actuals Vial Status								
		Via	al St	atus Pro	gress				
		Vial	Sample	Method	Status	Progress			
	ÂA	1		E.M	Completed	100%			
	۵.	1		E.M	Completed	100%			
	۵.	1		E.M	Ready	80%			
	۵.	1		E.M	Ready				
Detailed Status									
1	🔟 🚍 🔲 Agilent 7890A Status								



Sampling Diagram

To view the **Sampling Diagram**, select **View > Sampling Diagram** from the data system top menu (Figure 29).





The Sampling Diagram appears (Figure 30).

💽 Sampling Diagram							
in the sequence in the sequence in the sequence is the sequenc	😑 Stop		_	_			
Agilent /69/A (active	e) Agilent 7890A						
Idle							
Priority 3 () Priority 2 () Priority 1 ()	0 0	0 0	000 000 000 000 000 000 000 000 000 00				



Sequence Logbook

To access the **Sequence Logbook** in the Agilent GC ChemStation, select **View > Logbook > Current Logbook** (Figure 31).



Figure 31 Accessing the current Sequence Logbook file in Agilent GC ChemStation

The **Sequence Logbook** displays the current sequence log file. This file indicates what has happened during the running of a sequence. It is useful for identifying when errors occurred if the sequence is running unattended or overnight (Figure 32).

Current Lo	gbook	File BARCODE.LOG			×
Module	#	Event Message	Date	Time	Â
7697A	1	Vial 1 moving from oven position 4 to shutter. Instrument time = 2/4/2011 2:23:29	02/04/11	14:27:01	
7697A	1	Vial 1 purging. Instrument time = 2/4/2011 2:22:58 PM.	02/04/11	14:26:30	
7697A	1	Vial 1 injecting. Instrument time = 2/4/2011 2:22:57 PM.	02/04/11	14:26:29	
CP Macro		Data not available; Data Analysis not done	02/04/11	14:26:03	=
CP Macro		Analyzing rawdata 001F0301.D	02/04/11	14:26:03	
7697A	1	Vial 1 triggering external run. Instrument time = 2/4/2011 2:22:25 PM.	02/04/11	14:25:57	
7697A	1	Continuing vial. Details: 215, SL_CONTINUE, Vial 1 continue,	02/04/11	14:25:40	
7697A	1	Leak test failed. Details: 229, SL_FAIL_LEAK_TEST, Leak rate 0.427 mL/r	02/04/11	14:25:40	
7697A	1	Vial 1 extracting. Instrument time = 2/4/2011 2:22:08 PM.	02/04/11	14:25:40	
7697A	1	Vial 1 pressurizing. Instrument time = 2/4/2011 2:22:07 PM.	02/04/11	14:25:39	
7697A	1	Vial 1 beginning extraction cycle. Instrument time = 2/4/2011 2:21:09 PM.	02/04/11	14:24:41	
7697A	1	Vial 1 equilibrating in the oven. Instrument time = 2/4/2011 2:21:08 PM.	02/04/11	14:24:40	
7697A	1	Vial 1 beginning repetition 1 of 1. Instrument time = 2/4/2011 2:20:38 PM.	02/04/11	14:24:10	
Method		Instrument running sample Vial 1 (front)	02/04/11	14:24:06	
7697A	1	Vial 1 moving from the shutter to oven position 4. Instrument time = 2/4/2011 2:20	02/04/11	14:24:06	
Method		Method started: (F) line# 3 at 1 inj# 1	02/04/11	14:24:06	
7890A	1	Back inlet purging Run Time 0.00	02/04/11	14:23:25	-

Figure 32 The Sequence Logbook file

Where to Find Information

Agilent GC and GC/MS Hardware User Information & Utilities DVD



In addition to this guide, Agilent provides several learning products that document how to install, operate, maintain, and troubleshoot the Agilent 7697A Headspace Sampler. This information can be found on the *Agilent GC and GC/MS Hardware User Information & Utilities DVD* that ships with your instrument.



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

- Site Preparation information
- Installation and First Startup information
- Getting Started information
- Safety and Regulatory information
- Operation information
- Advanced Operation information
- Troubleshooting information
- Maintenance information

Online Help System

The Agilent Integrated Headspace Software includes an extensive online help system with detailed information and common tasks on how to use the software.



