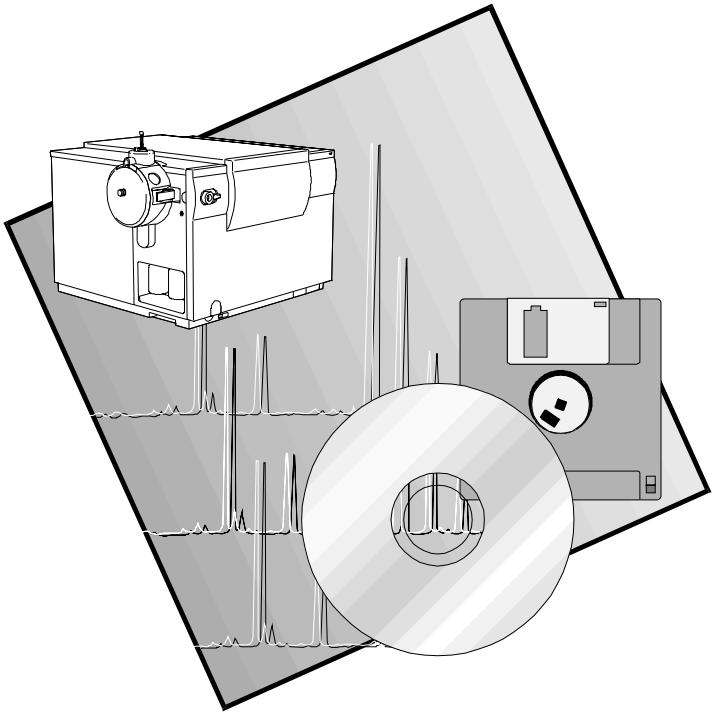

HP 1100 Series
LC/MSD

System Installation Manual

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Safety Information

Safety class

The HP 1100 Series LC/MSD is a Safety Class I instrument and has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.

WARNING

Connecting an LC/MSD to a power source which is not equipped with a protective earth contact creates a shock hazard for the operator and can damage the instrument. Likewise, interrupting the protective conductor inside or outside the LC/MSD or disconnecting the protective earth terminal creates a shock hazard for the operator and can damage the instrument.

WARNING

Any adjustment, maintenance or repair of the opened instrument while it is connected to a power source should be avoided if possible and, if required, should be carried out only by trained persons who are aware of the hazards involved.

WARNING

Nitrogen is the only acceptable drying and nebulizer gas. Use of air, oxygen, or other gases, when combined with solvents and high voltages in the spray chamber, could result in explosion.

Acoustic Noise Declaration

Deutsch

Die folgende Information wird in Übereinstimmung mit den Anforderungen der Maschinenlärminformationsverordnung vom 18. Januar 1991 erteilt. Schalldruckpegel am Arbeisplatz bei normalem Betrieb, Lp < 70 dB(A), nach EN 27779 (Typprüfung).

English

This statement is provided to comply with the requirements of the German Sound Emission Directive, from 18 January 1991. Sound Pressure Lp < 70 dB(A), at operator's position, normal operation, according to EN 27779 (Type Test).

Instrument Identification

Each HP 1100 Series LC/MSD is identified by a unique 10-character serial number. This serial number is located on a label on the lower right front corner of the instrument.

When corresponding with Hewlett-Packard about your instrument, be sure to include the model number and the full 10-character serial number.

The HP G1947A APCI Interface and HP G1948A Electrospray Interface each have separate serial numbers. These numbers are located next to the spray chamber latches.

Write the serial numbers of your HP 1100 Series LC/MSD and interfaces here for reference:

LC/MSD Serial #:

_____

APCI Interface Serial #:

_____

Electrospray Interface Serial #:

_____

Manual Conventions

Cautions

Cautions call attention to procedures which, if not correctly performed or adhered to, could result in ***damage to the instrument***.

Warnings

Warnings call attention to procedures which, if not correctly performed or adhered to, could result in ***personal injury***.

Part Numbers

In this manual, Hewlett-Packard part numbers are generally listed in parentheses after the name of the part (or in lists or pop-ups on the maintenance CD-ROM.) Most Hewlett-Packard part numbers are either four-digit-by-four-digit (1234-1234) numbers or five-digit-by-five-digit (12345-12345) numbers.

A few tools and supplies listed have no part numbers and are not available from Hewlett-Packard. Most of these can be obtained from laboratory supply companies.

Safety Symbols


Refer to operating instructions


Indicates hazardous voltage


Indicates hot surface


Indicates earth (ground) terminal

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1

General Information

Before you begin

This manual describes the installation of an HP 1100 Series LC/MSD system. This process is outlined as a sequence of steps.

Several options and accessories are included in this manual. They are presented in the recommended order of installation. Disregard the sections that do not apply to a specific instrument configuration.

The following installation instructions are intended for on-site installation by a trained HP Customer Engineer.

Additional information is available in the *HP 1100 Series LC/MSD Site Preparation Manual*, HP G1946-90038.

Installation of an LC/MSD system includes the following steps:

1 **Inspection of shipped materials**

2 **Data system installation**

3 **LC/MSD installation**

4 **LC installation and preparation**

5 **Performance evaluation**

6 **Customer familiarization**

NOTE Checkout and tuning samples are shipped separately, to comply with safety regulations and to ensure prompt delivery. Make sure these samples have been stored correctly, per the instructions in the box.

Customer responsibilities

The following are ***not*** included in the standard installation. They are the responsibility of the customer unless previous arrangements have been made between the customer and the Hewlett-Packard Customer Service Organization.

- Preparation of all site facilities including the provision of adequate space, supporting bench, ventilation and ac power as stated in the *HP 1100 Series LC/MSD Site Preparation Manual*, G1946-90004.
- Operating supplies: high-purity nitrogen, syringes, vials, and solvents

WARNING

Nitrogen is the *only* acceptable drying and nebulizing gas. Use of air, oxygen, or other gases, when combined with solvents and high voltages in the spray chamber, could result in explosion.

NOTE

Solvents that are acceptable for most LC applications may contain unacceptably high levels of background contaminants detectable by the more-sensitive LC/MSD. Ideally, LC solvents used with the LC/MSD should be rated for both HPLC and pesticide, environmental, or GC/MS analyses. Use the highest purity solvents you can obtain. Acceptability of solvents for a specific application must be *empirically* determined.

- Separate vents for pump exhaust and spray chamber waste.
- Secondary containment containers for the drain bottle and the foreline pump.
- Testing, modification, and/or repair of instruments not purchased as part of the HP 1100 LC/MSD system.
- Operational training for programs not specifically listed in this document
- Tests using customer-supplied samples or equipment.
- Any tasks not described in this manual

In addition, the customer is required to:

- Provide someone to help lift the LC/MSD (61.4 kg) onto the bench
- Have the primary user present during installation and familiarization

Other documentation

Additional information is contained in the following documentation:

- HP 1100 Series LC/MSD Maintenance and Reference CD-ROMs
- Hardware reference online help
- HP LC/MSD ChemStation online help
- HP 1100 Series LC manuals, maintenance CD-ROM, and online help
- Computer installation manuals
- Computer peripheral manuals (printer, backup drives, etc.)
- Windows ® NT 4.0 manual and online help

This installation manual is intended to be used in combination with these other resources. Many steps in this manual are explained in detail elsewhere, and the appropriate resource should be consulted if you are not sure of how to perform a particular step.

Web-based Product Update News

For the most current information on the HP ChemStation software, point your Web browser to HP web site at **http://www.hp.com/go/chem**. Look under **Service and Support** for **Software Status Bulletins and Patches**. You will need your product registration number to access the SSB site.

Warranty

Hewlett-Packard (HP) warrants its Analytical products against defects in materials and workmanship for the warranty period. During the warranty period, HP will, at its option, repair or replace products which prove to be defective. Products that are installed by HP are warranted from the installation date, all others from the date of delivery.

If Buyer schedules or delays installation more than 30 days after delivery, then warranty period starts on 31st day from the date of shipment. For international orders, the grace period is 60 days and the warranty period starts on the 61st day from the date of shipment.

HP software and firmware products which are designated by HP for use with a hardware product, when properly installed on that hardware product, are warranted not to fail to execute their programming instructions due to defects in materials and workmanship. If HP receives notice of such defects during the warranty period, HP shall repair or replace software media and firmware which do not execute their programming instructions due to such defects. HP does not warrant that the operation of the software, firmware or hardware shall be uninterrupted or error free.

Within HP service travel areas, warranty and installation services for products installed by HP and certain other products designated by HP will be performed at Buyer's facility at no charge. For installation and warranty services outside of HP's service travel area, HP will provide a quotation for the applicable additional services.

The foregoing warranty shall not apply to defects resulting from:

1 Improper or inadequate maintenance, adjustment, calibration or operation by Buyer.
2 Buyer-supplied software, hardware, interfacing or consumables.
3 Unauthorized modifications or misuse.
4 Operation outside of the environmental and electrical specifications for the product.
5 Improper site preparation and maintenance.
6 Customer-induced contamination or leaks.

This warranty may be modified in accordance with the laws of your country. Please consult your local HP office for the period of the warranty, for shipping instructions and for the applicable wording of the local warranty.

Warranty claims

If physical damage is found, or if operation is not as specified when the instrument is first received, notify the carrier and the nearest Hewlett-Packard office immediately. The HP office will arrange for repair or replacement of the instrument without waiting for settlement of a claim with the carrier. For other than initial inspection warranty claims, contact your local HP office.

Service agreements

Several service agreements are available, each designed to meet a specific need. In addition to a preventive maintenance agreement, others cover specific repair/ maintenance services for the HP 1100 Series LC/MSD, and can provide for the extension of warranty beyond the initial warranty period.

Details of these agreements, together with prices applicable to the particular installation, can be obtained from your local Hewlett-Packard office.

2

Installation

Unpacking and setup

Use the following procedure to unpack and set up the HP 1100 Series LC/MSD system.

NOTE Shipping containers should not be opened until a Hewlett-Packard (HP) representative is present to verify the contents of each carton. Warranty claims for missing items will only be honored if an HP representative is on site to verify the contents of each shipping container as it is unpacked.

NOTE Checkout and tuning samples are shipped separately, to comply with safety regulations and to ensure prompt delivery. Make sure these samples have been stored correctly, per the instructions in the box.

1 **Before unpacking, carefully examine all containers for external signs of damage.**

If damage is discovered, contact the carrier and the HP Service District Manager (DM) and California Analytical Division Technical Support Group immediately.

2 **Check off each item on the packing list, and verify the serial numbers.**

3 **Record the serial numbers in the installation documentation.**

4 **Retain shipping containers and material until contents are checked for completeness and instrument performance is verified.**

5 **Report any discrepancies to the supplying division.**

6 **Check the line voltage**

Verify the proper line voltage and outlet ratings according to the instructions given in the *HP 1100 Series LC/MSD Site Preparation Manual*, G1946-90004.

Installing the ChemStation

- Installing the ChemStation consists of:
- Installing the computer
- Installing the software
- Configuring the LC/MSD ChemStation software

Installing the computer

1 **Verify that the line voltage is correct.**

2 **Unpack the PC, monitor, printer, and modem.**

Modems are not included with all systems.

3 **Position the PC on the bench top.**

4 **Install the PC.**

See the installation documentation supplied with the PC.

5 **Verify that the HP 82341C HP-IB card is installed**

6 **Install the printer.**

See the printer installation documentation

7 **Install the modem. See the modem installation manual.**

Not all ChemStation bundles include a modem. Be sure the modem is connected to an ***analog*** telephone line.

8 **Connect a 2-meter HP-IB cable the PC.**

You will be connecting the other end to the LC/MSD.

9 **Turn on the modem, printer, monitor, and PC, in that order.**

Installing the software

Before installing the ChemStation software

1 **Make sure the PC meets the minimum hardware requirements and has Windows NT 4.0 installed and configured as described on page 52**

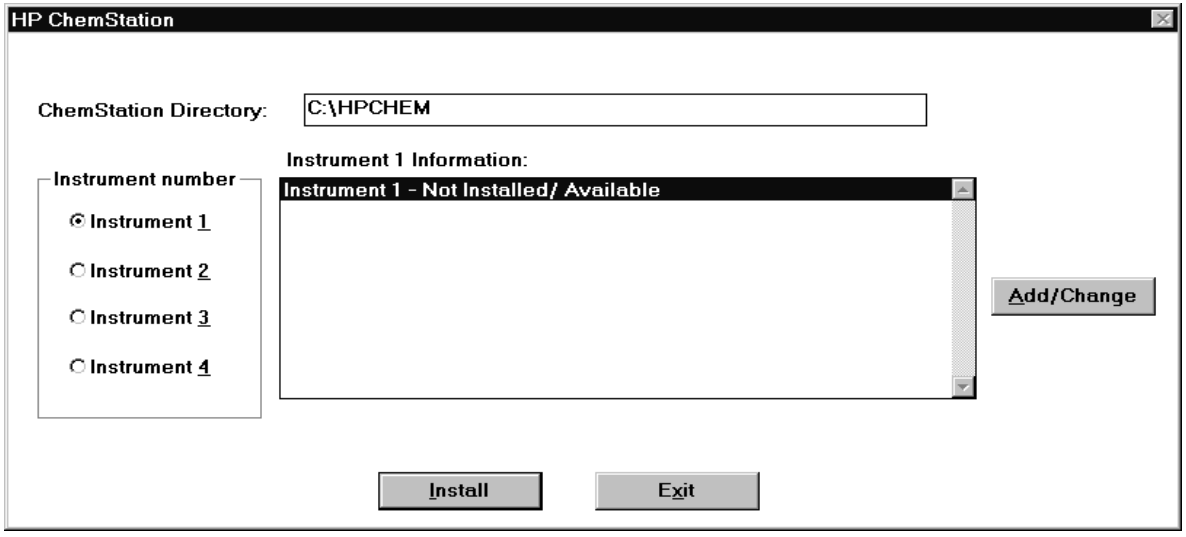
2 **Make sure an HP 82341C HP-IB communication board and SICL drivers are installed in the PC, as described on page 57**

3 **Install the remote access software for the modem (if applicable.)**

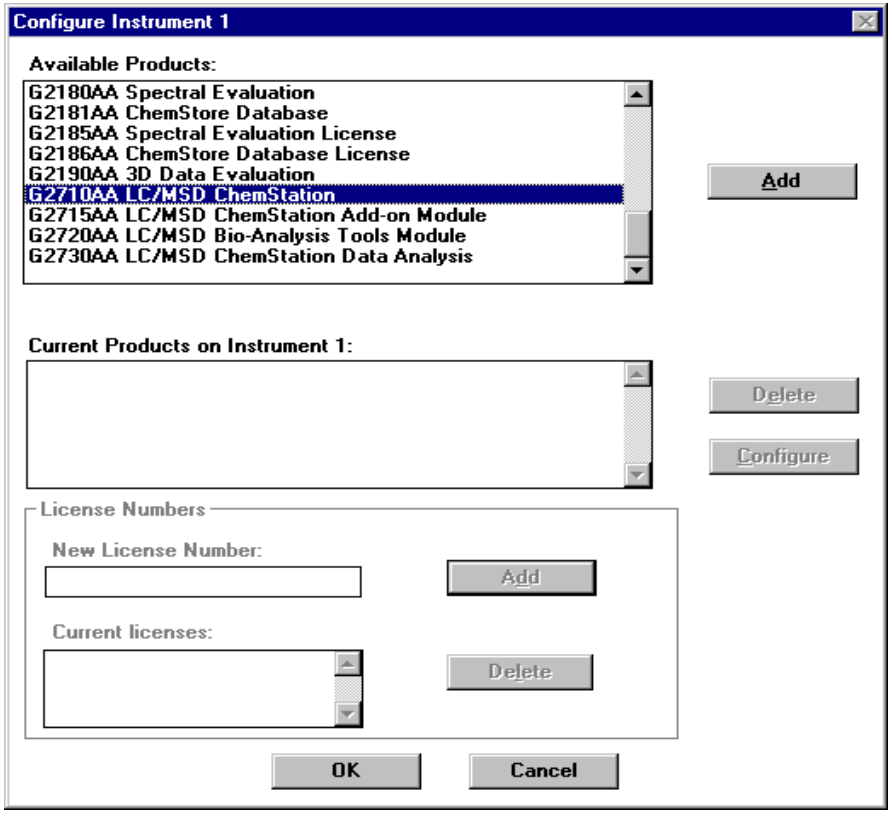
Installing the ChemStation software

1 **Insert HP ChemStation CD-ROM into the CD-ROM drive.**

2 **In Windows NT Explorer, double-click on SETUP.EXE on the CD-ROM drive.**
After a few seconds the Setup program will display the Instrument Setup dialog box, illustrated below.



3 **Select instrument number #1 and click Add/Change. The following dialog box will then be displayed.**



4 **Select G2710AA LC/MSD ChemStation from the list of available products in the Configure Instrument dialog and click Add.**

5 **Enter the license number for the selected module in the New License Number field and click Add.**

The numbers are printed on the Software Certificate and Registration Packet.

6 **Repeat steps 5 and 6 for each module you wish to install.**

7 **Click OK to return to the Instrument Setup dialog box.**

The selected modules with their license numbers will now be displayed under the instrument number.

8 **Click Install to continue.**

9 **Click Yes to allow the Setup program to update the path statement in the AUTOEXEC.BAT file.**

After the software is installed, the Setup program will prompt you to configure any new instruments you installed.

10 **Click Yes to access the HP Configuration Editor.**

Follow the instructions given in the next section to configure the LC/MSD ChemStation.

The software installation is now complete. The Setup program made changes to the WIN.INI file and saved a copy of the original file in a "Backup" directory located in the ChemStation directory (default is C:\HPCHEM).

11 **Remove the ChemStation CD-ROM and store it in a safe place.**

12 **Save the license numbers in a safe place.**

These will be required if you have to reinstall the software or for future upgrades.

See also

To uninstall the ChemStation software, see page 56.

Configuring the LC/MSD ChemStation software

1 **Start the HP ChemStation Configuration Editor.**

2 **Select Instruments from the Configuration menu. The Select Instrument dialog box will be displayed.**

3 **For Instrument Type select Modular LCMS System.**

4 **Assign a name to the instrument.**

5 **Specify the preferred startup screen window size (Normal, Icon, or Full Screen).**

6 **Click OK.**

7 **In the Device Configuration dialog box, select 1946 MSD from the list of modules and verify that the HP-IB address is set to 0. Click Add.**

8 **Also select the applicable LC modules (for an HP 1100 LC, select 1100 System Access).**

For a list of default HP-IB addresses for the different LC modules, click the Help button.

9 **Click OK to return to the Configuration Editor display.**

10 **Save the instrument configuration by selecting Save from the File menu.**

11 **Install any patches.**

12 **Install the HP 1100 Series Maintenance and Repair CD-ROMs.**

— Insert the HP1100 Series HPLC Maintenance CD-ROM in the CD-ROM drive.
— In Windows NT Explorer, double-click on **setup.exe.**
— Be sure to check the box to include the LC/MSD files.
— Follow the instructions on the screen.

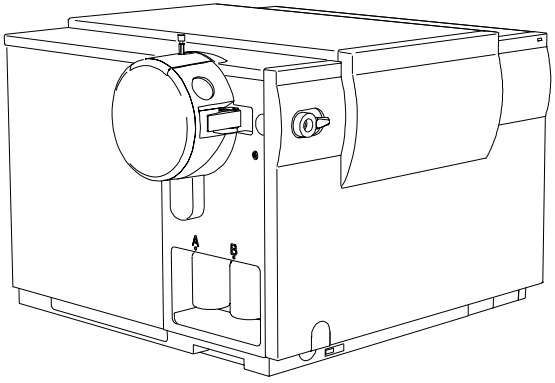
13 **Install the HP 1100 Series LC/MSD Reference Collection.**

— Insert the first HP1100 Series LC/MSD Reference Collection CD-ROM in the drive.
— In Windows NT Explorer, double-click on **setup.exe.**
— Follow the instructions on the screen.

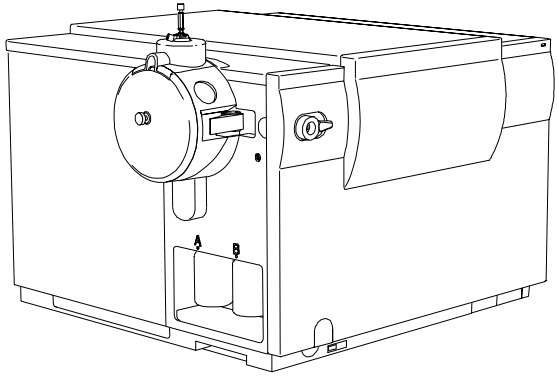
Installing the LC/MSD

Installing the LC/MSD requires several steps:

- Preparing for installation
- Connecting the LC/MSD
- Installing the spray chamber
- Installing the LC
- Baking out the LC/MSD



LC/MSD with electrospray interface



LC/MSD with APCI interface

Preparing for installation

Materials needed:

Edwards mist filter instructions
Edwards oil drain kit instructions
Oil return connector kit, Edwards part number A504-20-000
Pump oil pan, G1946-00034
Utility knife
Needlenose pliers

1 Using *two* people, lift the LC/MSD onto a stable bench or table.

Handholds are on the side and rear of the chassis. To avoid twisting while reaching, place the MSD on the bench facing backwards, then turn it around.

W A R N I N G **Do *not* attempt to lift the LC/MSD (62 kg) without assistance.**

2 Unpack the mist filter, exhaust hose, and stainless steel pump oil drip pan from the shipping kit.

3 Remove the foreline pump from its shipping container:

— Cut the outer cardboard sleeve.
— Tilt the box on its side and slide the pump out of the box
— Remove the plastic foam spacers

4 Set the pump into the pump oil drip pan.

The purpose of the pan is to catch any small amounts of oil that may seep out of the pump. Additionally, the pan can contain all of the oil in the pump in case of a catastrophic seal failure.

5 Remove the plugged outlet connector and install the new KF-25 fitting that came with the pump.

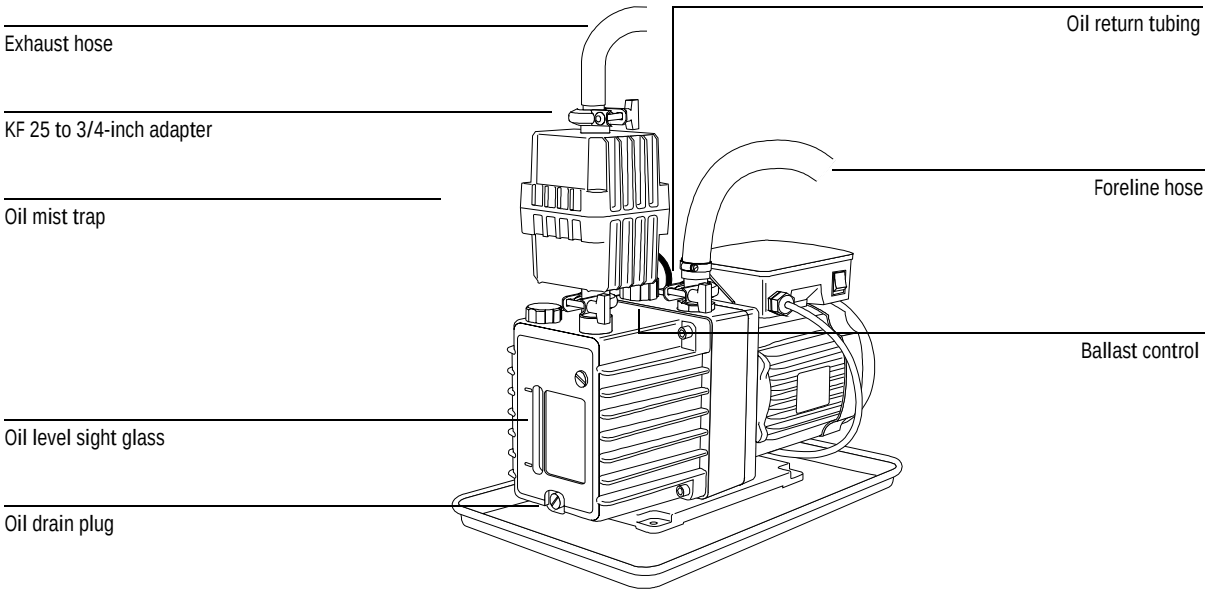
Do *not use* the outlet nozzle as described in the Edwards manual and on the warning tag.

6 Unpack the oil return kit from the pump box.

The felt plugs and screen are not needed.

7 Install the mist filter on the outlet port.

Be sure the small port on the side of the filter is on the side facing the ballast control and port (towards the motor end of the pump.)



8 Install the oil return line.

— Install the restrictor into the black nitrile rubber tubing

— Connect the tubing between the ballast port fitting and the oil mist filter. Use a pair of needlenose pliers to compress the clamps

9 Set the ballast control to fully *open* (fully counterclockwise).

This is to allow oil trapped by the filter to return to the pump. If the Stage 1 pressure is greater than 2.5 Torr after pumpdown, turn the ballast control one or two turns clockwise to partially close the ballast.

10 Use the KF 25 to 1/2-inch hose fitting adapter to connect the 3/4-inch OD Tygon exhaust hose to the mist filter.

Pump oil (fluid)

The foreline pump comes filled with Inland 45 pump oil. You do ***not*** need to add additional oil at installation.

Connecting the LC/MSD

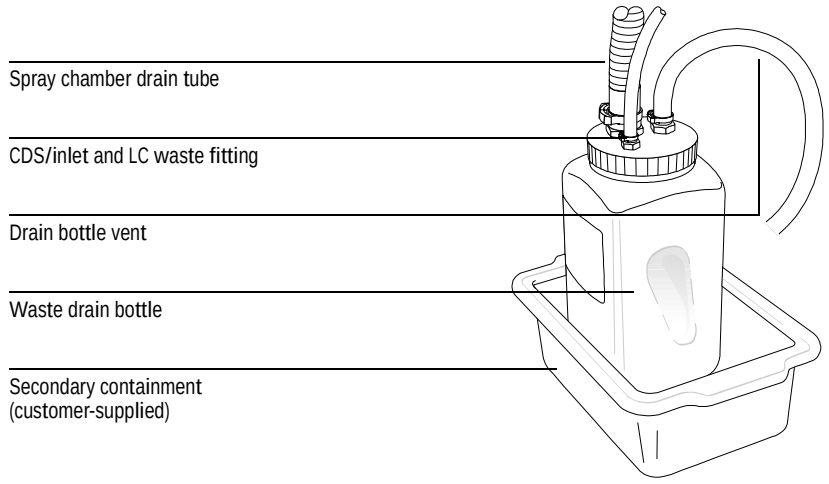
Many of the following procedures are demonstrated on the LC/MSD Maintenance CD-ROM. You can start it by double-clicking **HP 1100 Series CDROM** under the **HP ChemStations** program group, or by clicking the CD-ROM icon in the Diagnosis view.

1 **Connect the foreline hose to the foreline pump.**

If the foreline pump is to be located to the front of the LC/MSD, then disconnect the foreline hose from the stage 1 weldment on LC/MSD and route the foreline hose through the front hose exit port.

2 **Using the supplied hook / loop fastener tape, secure the drain bottle into a secondary containment tub.**

Check with the local fire department to determine whether secondary containment is necessary, and what materials are acceptable for the container.



3 **Connect the spray chamber drain tube to the 1-inch fitting on the drain bottle.**

The drain tube can also be routed out the front of the LC/MSD if necessary.

4 **Attach the 1/4-inch calibrant delivery system (CDS) / inlet module waste tubing from the LC/MSD to the 1/4-inch fitting on the drain bottle.**

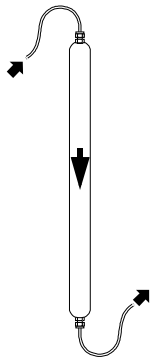
5 Connect the drain bottle vent tubing to the 3/4-inch fitting on the drain bottle, then connect other end of the tubing to a vent connection which is *separate* from the vent used for the foreline pump.

CAUTION

The drain bottle vent ***must*** be separate from the foreline pump vent. Otherwise, foreline pump exhaust will contaminate the spray chamber the LC/MSD.

6 Connect the nitrogen gas conditioner between the nitrogen tank regulator and the nitrogen gas fitting on the LC/MSD.

Use two lengths of 1/4-inch teflon supply tubing (0890-1793). Be sure to check the flow direction arrow on the nitrogen gas conditioner and connect the tubing accordingly. Secure the gas filter in a vertical position with tie wraps.



WARNING

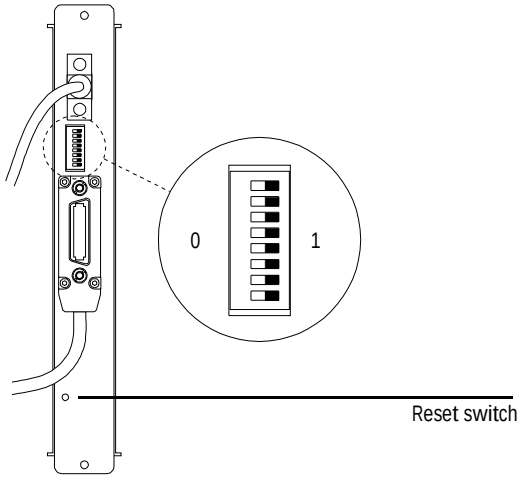
Nitrogen is the *only* acceptable drying and nebulizing gas. Air, oxygen, or other gases, when combined with solvents and high voltages in the spray chamber, could cause an explosion.

7 Set the pressure on the nitrogen supply regulator to 80 to 100 psi.

Turn on the nitrogen gas for a few minutes to purge the tubing and gas conditioner before connecting the nitrogen gas supply to the LC/MSD. Regulator pressure above 100 psi will result in nitrogen waste due to release from the bleed valve of the flow control module.

8 Verify the LC/MSD HP-IB address.

Default is 0, that is, all switches set to **Off** position, where **0** = **Off** and **1** = **On**.



9 Connect the HP-IB cable from the computer to the connector as shown above.

10 Connect the 1-meter HP-IB cable onto the same connector.

You will attach the other end of this cable to the LC later.

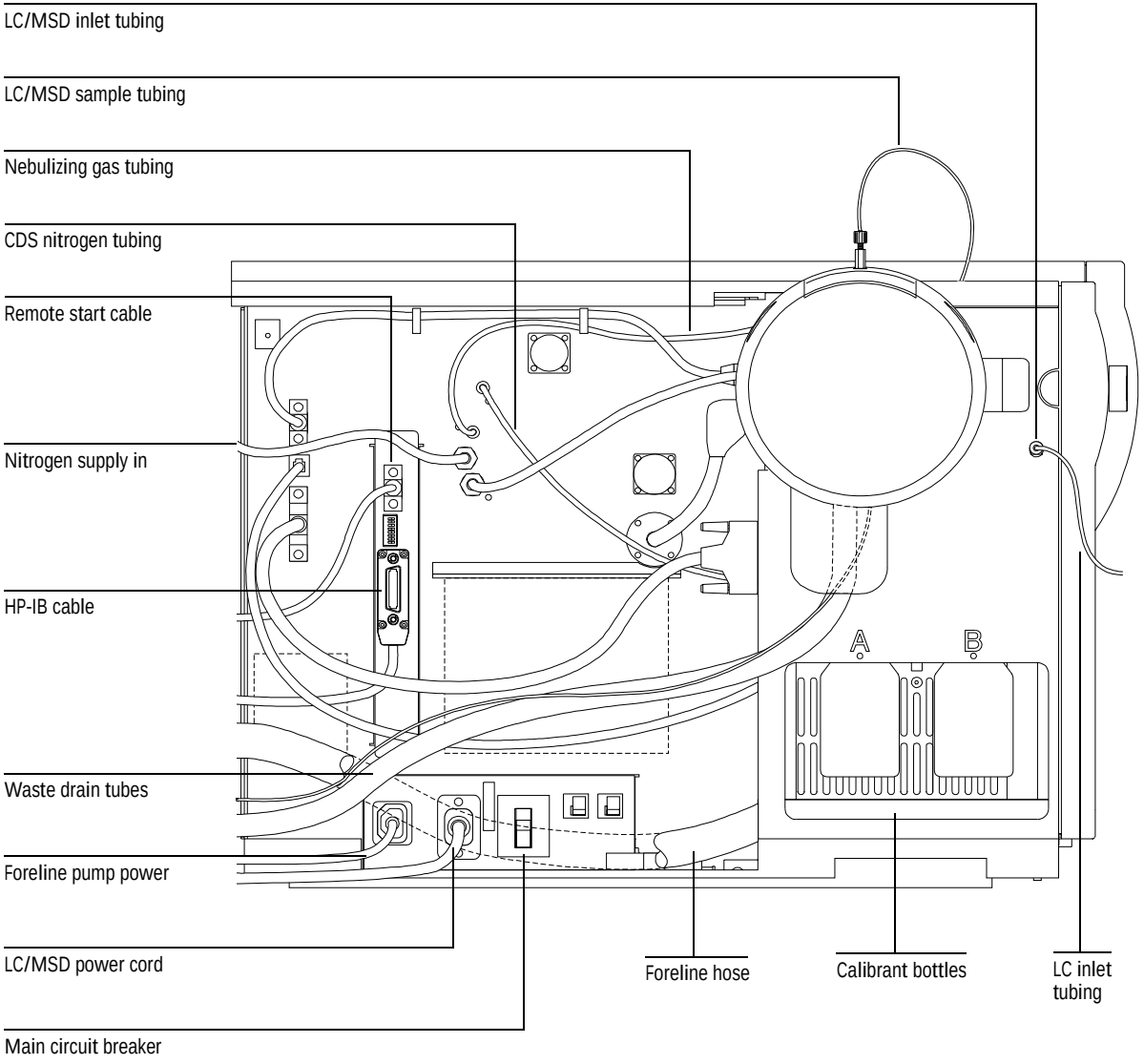
11 Connect the remote start cable to its connector on the LC/MSD.

You will attach the other end of this cable to the LC later.

12 Verify that the main circuit breaker on the side panel and the front power switch are both in the Off position,

13 Plug the foreline pump power cord into the foreline pump power connector on the LC/MSD.

14 Plug the LC/MSD power cord into the LC/MSD power connector on the LC/MSD and the other end of the LC/MSD power cord into the wall outlet.



15 Turn on the main circuit breaker but leave the front power switch off.

Installing the spray chamber

Materials needed

HP G1947A APCI interface
APCI calibrant, G2422A
or
HP G1948A Electrospray interface
Electrospray calibrant, G2421A

1 **Remove the foil covering the spray chamber mount, and the shipping cover from the spray chamber.**

2 **Install the appropriate spray chamber. See the maintenance CD-ROM.**

3 **Connect the 1/8-inch nebulizing gas tubing from the LC/MSD mainframe to the nebulizer gas fitting.**

4 **Connect the LC/MSD sample tubing to the nebulizer zero dead volume fitting.**

5 **Rinse the calibrant bottles with acetonitrile.**

6 **Add the appropriate calibrant to the correct bottle of the calibrant delivery system (CDS).**

Electrospray calibrant (blue label) in bottle B
or
APCI calibrant (red label) in bottle A

If you only have one spray chamber, you can use the other calibrant bottle for a 90:10 acetonitrile / water flushing solution. Cover the label on the bottle with one indicating the actual contents. Be aware that the restriction in the CDS is designed for use with HP standard LC/MSD calibrants. Because of viscosity differences, flow rates of different solvents will vary dramatically.

CAUTION

The O-ring seals in the CDS have ***poor*** compatibility with aliphatic, aromatic, and halogenated hydrocarbons. ***Never*** use these types of solvents in the CDS.

7 ***For APCI only*. Connect the APCI corona cable to the APCI HIGH VOLTAGE connector. Connect the vaporizer heater / cable to the APCI HEATER connector.**

Pumping down the LC/MSD System

1 Turn on the LC/MSD power switch in front to initiate pumpdown of the LC/MSD.

The foreline pump should get quieter within a few seconds.
Monitor the system pressure and temperature from the ChemStation software.

If you cannot communicate with the LC/MSD, see "Troubleshooting communication problems" on page 59.

2 Start up the ChemStation

If you cannot communicate with the LC/MSD, see "Troubleshooting communication problems" on page 59.

— Go to the **Diagnosis** view.
— Under the **Maintenance** menu, click **MSD Pumpdown**.
— Click More to monitor the pumpdown sequence.
— When the pumpdown is complete, the **Undo** button will change to **Close**.

See the online help for more details.

Installing the LC

Materials needed

HPLC (or better) grade methanol *or* isopropanol *or* acetonitrile
HPLC (or better) grade water

W A R N I N G

While it is *possible* to stack the HP 1100 Series LC modules on top of the LC/MSD without damaging the LC/MSD, this arrangement is potentially unstable and dangerous and is *not* recommended.

1 **Install the LC system according to the installation documents for that product. The supported LC systems include:**

- HP 1100 Series LC
- HP 1090 Series II LC

Other LCs are supported for remote start only, with no ChemStation control.

2 **Connect the remote start cable from the LC/MSD to a remote start connector on the LC.**

3 **Connect the 1-meter HP-IB cable from the LC/MSD to an HP-IB connector on an LC detector module.**

If no LC detector module is present, connect the HP-IB cable to the *pump* module.

4 **Prepare LC solvents for the LC/MSD performance evaluation.**

The organic solvent can be *methanol, isopropanol or acetonitrile*. (See note below)

- 50: 50 organic solvent / water for positive and negative ion verification.
- 49.5: 49.5: 1 organic solvent / water / acetic acid for multiply-charged compound verification.

NOTE

At least HPLC grade solvents should be used. Solvents that are acceptable for most LC applications may contain high levels of background detectable by the more sensitive LC/MSD. LC solvents used with the LC/MSD should be rated for both HPLC and pesticide, environmental, or GC/MS analyses. Use the highest purity solvents you can obtain. Acceptability of solvents must be *empirically* determined.

5 Prime each channel of the vacuum degasser by pumping 5 ml/min of solvent for at least 10 minutes on each channel

6 Verify the HP 1100 LC ALS firmware

If you are installing the LC/MSD with an HP 1100 Series LC, verify that the firmware of each LC module is the latest available.

Baking out the LC/MSD

1 **Connect the LC/MSD inlet tubing (p/n 0890-1915).**

2 **Start up the LC/MSD ChemStation.**

3 **Set the drying gas flow to: 10 l/min for the Electrospray interface or 5 l/min for APCI interface.**

4 **Set the nebulizer pressure to 40 psi.**

5 **Set the drying gas temperature to 350° C.**

6 **Set the vaporizer temperature to 500° C (APCI interface only).**

7 **Set LC flow to 0.5 ml/min using the 50: 50 organic/water solvent.**
Organic solvent can be methanol, isopropanol or acetonitrile.

8 **Allow the system to bake out at least 2 hours, preferably overnight.**

CAUTION If the system has been exposed to humid conditions during shipping or storage, a minimum of 4 hours bakeout is required to prevent arcing of the quadrupole.

9 **Begin customer software familiarization while the system is baking out.**

Verifying Installation

Verifying LC/MSD performance requires:

- Verifying ChemStation software installation (optional)
- Preparing performance evaluation samples
- Verifying LC/MSD sensitivity
- Familiarizing the user with the LC/MSD system

Verifying ChemStation software installation (optional)

After installing and configuring the HP ChemStation software, your internal validation procedure *may* require you to verify the correctness of the installation and to verify that the software is fully operational. This process is called Installation Qualification (IQ).

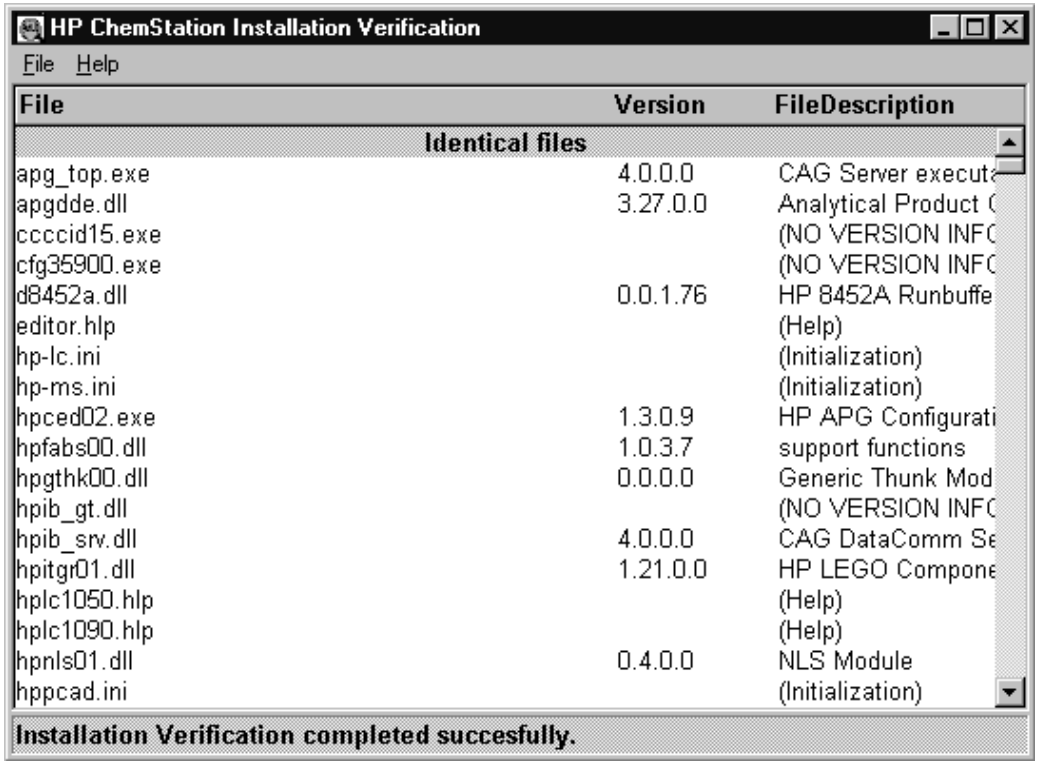
1 In the HP ChemStations program group, double-click on the Installation Qualification icon.

The following message box will display the name of each file as it analyzed. This takes several minutes.

2 The IQ utility will report the following categories of files:

File Category	Explanation	Action Required
Identical files	Required files have passed the check.	None.
Missing files	Necessary files are missing.	Reinstall the HP ChemStation software.
Modified files	Files have been modified or corrupted.	Reinstall unless you have customized the files.[a]
Invalid reference file	The original reference file is corrupt or has been modified since creation.	Reinstall the original reference file (requires reinstalling the HP ChemStation software.)

a. See the following page to learn how to create a reference file for a customized installation.



3 **If you have customized or added any system files (*.dlc, *.dll, *.drv, *.enu, *.exe, *.hlp, *.ini, *.mac, or *.mcx), generate a customized reference file:**

— Click the **Start** button and **Run** the HP IQ utility, typing the following:
C:\hpchem\sys\hpveri00.exe -f custom.ref

— Create an icon with the following command line in its properties:
hpveri00.exe -r custom.ref

For a complete description of the command line syntax of the IQ utility, click **Help** in the HP ChemStation Installation Verification window. You can also **Run** the help file, C:\HPCHEM\SYS\HPVERI.HLP.

Preparing performance evaluation samples

Materials needed:

1 ml graduated pipette, 9301-1423
50 ml volumetric flask, 9301-1424
APCI negative mode performance evaluation sample, G2425A
ES negative mode performance evaluation sample, G2424A
Multiply-charged compound evaluation sample, G2426A
Positive mode performance evaluation sample, G2423A
(for both interfaces)

The supplied performance evaluation samples must be diluted to concentrations required for the LC/MSD system checkout. Use the solvent mixes you prepared for the LC installation (see "Installing the LC" on page 28.)

- 50: 50 organic solvent / water is used for positive and negative ion verification.
- 49.5: 49.5: 1 organic solvent / water / acetic acid is used for multiply-charged compound verification.

NOTE

At least HPLC grade solvents should be used. Solvents that are acceptable for most LC applications may contain unacceptably high levels of background contaminants detectable by the more sensitive LC/MSD. LC solvents used with the LC/MSD should be rated for both HPLC and pesticide, environmental, or GC/MS analyses. Use the highest purity solvents you can obtain.

Acceptability of individual lots of solvents must be empirically determined. Methanol, isopropanol, and acetonitrile are all acceptable organic solvents for the performance evaluation samples; if one solvent shows too much background, another may be substituted.

NOTE

Use the diluted samples within a day of dilution. Do ***not*** use caps on the performance evaluation sample vials.

- Always rinse the graduated pipettes and volumetric flasks *thoroughly* with deionized water before, in between, and after use.
- Use polypropylene labware for preparing performance evaluation samples. Glass vessels will introduce unacceptable levels of sodium.

Electrospray and APCI, positive mode:

1 **Using a clean graduated pipette, transfer 1 ml of 5 ng/µl reserpine (G2423A) to a 50 ml volumetric flask.**

2 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

3 **Using a clean graduated pipette, transfer 1 ml of the of the first dilution to a second 50 ml volumetric flask.**

4 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

This will give the final 2 pg/µl reserpine concentration required for performance verification.

5 **Transfer approximately 1 ml of the second dilution to a vial for use in the LC autosampler.**

Electrospray, negative mode:

1 **Using a clean graduated pipette, transfer 1 ml of 10 ng/µl acid red 4 (G2424A) to a 50 ml volumetric flask.**

2 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

3 **Using a clean graduated pipette, transfer 5 ml of the of the first dilution to a second 50 ml volumetric flask.**

4 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

This will give the final 20 pg/µl acid red 4 concentration required for performance verification.

5 **Transfer approximately 1 ml of the second dilution to a vial for use in the LC autosampler.**

APCI, negative mode:

1 **Using a clean graduated pipette, transfer 1 ml of 10 ng/µl 4-nitrophenol (G2425A) to a 50 ml volumetric flask.**

2 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

3 **Using a clean graduated pipette, transfer 5 ml of the of the first dilution to a second 50 ml volumetric flask.**

4 Dilute to the 50 ml mark with 50:50 organic solvent / water.

This will give the final 20 pg/µl 4-nitrophenol concentration required for performance verification.

5 Transfer approximately 1 ml of the second dilution to a vial for use in the LC autosampler.

Electrospray, multiply-charged compound test

1 Prepare this sample only if the optional HP G2720AA deconvolution software was purchased with the LC/MSD system.

2 The sample and solvent for the multiply-charged compound test are found in the electrospray test sample kit (G2326A).

3 Using a clean graduated pipette, transfer 3.0 ml of the electrospray test solvent (49.5:49.5:1 methanol / water / acetic acid) to a bottle containing the electrospray test sample (lyophilized horse skeletal muscle myoglobin) and swirl the bottle to dissolve and mix the sample.

This will give a final 3.33 pmole/µl myoglobin sample concentration.

	ES Positive Mode	ES Negative Mode	ES Multiply-Charged Mode	APCI Positive Mode	APCI Negative Mode
Sample	Reserpine, 5 ng/µl	Acid Red 4, 10 ng/µl	Myoglobin	Reserpine, 5 ng/µl	Nitrophenol, 10 ng/µl
Concentration after dilution	2 pg/µl	20 pg/µl	3.33 pmoles/µl	2 pg/µl	20 pg/µl
Total sample amount injected	10 pg	100 pg	50 pmole	10 pg	100 pg
Sample part number	G2423A	G2424A	G2326A	G2423A	G2425A
Solvent	50: 50 organic / water	50: 50 organic / water	49.5: 49.5:1 organic / water / acetic acid	50: 50 organic / water	50: 50 organic / water
Method name	MSSUPRES.M	MSSUPAR4.M	MSSUPMYO.M	MSSUPCI.M	MSSUP4NP.M
Performance Specification	10: 1 pk-pk 50: 1 rms	none	none	10: 1 pk-pk 50: 1 rms	none

Verifying LC/MSD sensitivity

Use the methods specified below to verify the performance of the LC/MSD system for the interface types that were purchased with the system.

The performance verification requires that the LC column be removed from the LC flow path. Disconnect the LC column and install a short piece of 0.005-inch bypass tubing in place of the column, between the column heat exchanger outlet and the detector inlet. You can also connect the injector output directly to the inlet of the LC/MSD.

The performance verification methods require an HP 1100 LC with an autosampler. If you are installing the LC/MSD with an HP 1090 Series II LC, see page 76 for information on how to configure the system for the installation verification.

CAUTION Be sure that you have entered the custom parameters. Otherwise it may not be possible to tune the LC/MSD.

Electrospray interface, positive mode

1 **Start up the LC/MSD ChemStation software and load the method MSSUPRES.M.**

2 **Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.**

All other LC and MS parameters should correspond to the parameters given in LC and MSD parameters for installation verification, 61.

3 **Perform an autotune.**

After the autotune has completed, you may need to wait up to 30 minutes before continuing in order to allow for the calibrant solution to be pumped out of the MSD. This will minimize any background signal due to the calibrant.

NOTE You may need to further optimize the nebulizer pressure by running FIA experiments in order to achieve maximum instrument sensitivity.

4 Place the vials into the LC autosampler.

- Position #1: empty, uncapped vial
- Position #2: uncapped vial of the solvent used for dilution (solvent blank)
- Position #3: uncapped vial with the electrospray reserpine sample (2 pg/µl)

5 Run the method.

The method will do an FIA run with one injection of the empty vial, five injections of the solvent blank, and five injections of the reserpine sample.

After the method has completed, a report will be printed which will give the signal-to-noise ratio for all peaks integrated in the chromatogram.

6 Compute an average of the signal-to-noise ratios for the five reserpine peaks, and from that value subtract the average of the signal-to-noise ratios of the five solvent blank peaks.

The resulting value must be greater than or equal to 10:1 peak-to-peak (50:1 RMS)

Electrospray interface, negative mode

1 Load the method MSSUPAR4.M.

2 Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.

All other LC and MS parameters should correspond to the parameters given in LC and MSD parameters for installation verification, 61.

3 Perform an autotune.

You do not need to perform a second autotune if you have already run one as part of the positive mode verification.

If you *do* perform an autotune, you may need to wait up to 30 minutes before continuing in order to allow for the calibrant solution to be pumped out of the MSD. This will minimize any background signal due to the calibrant.

NOTE

You may need to further optimize the nebulizer pressure in order to achieve maximum instrument sensitivity.

4 Place the vials into the LC autosampler.

- Position #1: empty, uncapped vial
- Position #2: uncapped vial of the solvent used for dilution (solvent blank)
- Position #3: uncapped vial with the acid red #4 sample (20 pg/µl)

5 Run the method.

The method will do an FIA run with one injection of the empty vial, five injections of the solvent blank, and five injections of the acid red 4 sample.

After the method has completed, a report will be printed which will give the signal-to-noise ratio for all peaks integrated in the chromatogram. There is no sensitivity specification for this sample.

Electrospray interface, multiply-charged compound test

Perform this test only if the optional HP G2720AA Deconvolution software was purchased with the LC/MSD system.

1 Load the method MSSUPMYO.M.

2 Edit the method.

Ensure that 49.5: 49.5: 1 organic solvent / water / acetic acid is selected as the LC solvent. All other LC and MS parameters should correspond to the parameters given in LC and MSD parameters for installation verification, 61.

3 Perform an autotune.

You do not need to perform another autotune if you have recently performed one as part of the positive mode or negative mode electrospray verification. If you *do* perform an autotune, you may need to wait up to 30 minutes before continuing in order to allow for the calibrant solution to be pumped out of the MSD. This will minimize any background signal due to the calibrant.

4 Place the vials into the LC autosampler.

- Position #1: empty, uncapped vial
- Position #2: uncapped vial with the myoglobin sample

5 Run the method.

The method will do an FIA run with one injection of the empty vial and five injections of the myoglobin sample.
After the method has completed, a report will be printed which display the extracted ion chromatograms of the masses 893.90, 1131.10 and 1413.10, and will give the signal-to-noise ratios for all peaks integrated in the extracted ion chromatograms. Also the report will list the calculated, deconvoluted molecular weight of the myoglobin peaks, and will give “% error” of the calculated molecular weight compared to the theoretical myoglobin molecular weight.

There is no sensitivity specification for this sample.

APCI interface, positive mode

1 **Load the method MSSUPCI.M.**

2 **Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.**

All other LC and MS parameters should correspond to the parameters given in LC and MSD parameters for installation verification, 61.

3 **Perform an autotune.**

After the autotune has completed, you may need to wait up to 30 minutes before continuing in order to allow for the calibrant solution to be pumped out of the MSD. This will minimize any background signal due to the calibrant.

NOTE You may need to further optimize the nebulizer pressure in order to achieve maximum instrument sensitivity.

4 **Place the vials into the LC autosampler.**

- Position #1: empty, uncapped vial
- Position #2: uncapped vial of the solvent used for dilution (solvent blank)
- Position #3: uncapped vial with the reserpine sample (2 pg/µl)

5 **Run the method.**

After the method has completed, a report will be printed which will give the signal-to-noise ratio for all peaks integrated in the chromatogram. Compute an average of the signal-to-noise ratios for the five reserpine peaks, and from that value subtract the average of the signal-to-noise ratios of the five solvent blank peaks. The resulting value must be greater than or equal to 10:1 peak-to-peak (50:1 RMS)

APCI interface, negative mode:

1 **Load the method MSSUP4NP.M.**

2 **Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.**

All other LC and MS parameters should correspond to the parameters given in LC and MSD parameters for installation verification, 61.

3 Perform an autotune.

You do not need to perform a second autotune if you have already run one as part of the positive mode verification.

If you *do* perform an autotune, you may need to wait up to 30 minutes before continuing in order to allow for the calibrant solution to be pumped out of the MSD. This will minimize any background signal due to the calibrant.

NOTE You may need to further optimize the nebulizer pressure in order to achieve maximum instrument sensitivity.

4 Place the vial into the LC autosampler.

- Position #1: uncapped vial with the 4-nitrophenol sample (20 pg/µl).

5 Run the method.

The method will do an FIA run of 10 injections of the 4- nitrophenol sample. After the method has completed, a report will be printed which will give the signal-to-noise ratio for all peaks integrated in the chromatogram. There is no sensitivity specification for this sample.

Familiarizing the user with the LC/MSD system

Follow the topics given in the familiarization checklist in Chapter 3 to familiarize the customer with the LC/MSD system.

Topics of ***special*** importance:

— Small drips of oil from the foreline pump are not unusual.
— For cleaning the capillary, pre-wet the inside of the capillary with isopropanol before inserting the cleaning wire. The alcohol acts as a lubricant, making it easier to insert the wire.

Special spray chamber maintenance

— Be sure to clean the spray chamber ***every day***, as shown in the HP 1100 Series LC/MSD Maintenance and Repair CD-ROM.
— The ***electrospray*** spray chamber must needs ***extra cleaning at least weekly***:
  - Remove the spray chamber and place it cover side down.
  - Fill the spray chamber with 50: 50 organic: water solution to cover the standoffs for the mesh electrode.
  - Gently scrub the insulators with a cotton swab (8520-0023).

3

Checklists

Installation checklist

☐ Inspection of shipped material

- ☐ Shipping containers must be opened only with a Hewlett-Packard representative is present to verify the contents of each container.
- ☐ Containers unpacked
- ☐ Each item checked off on the packing list
- ☐ Record the serial numbers in the installation documentation.
- ☐ Retain shipping containers and material until contents are checked for completeness and instrument performance is verified.
- ☐ Notify supplying division of any missing or damaged items.
- ☐ Shipment damaged or incomplete:

  Product Support or Order Processing notified:

  Date _____

  Person contacted _____

  DM notified (date) _____

  Carrier notified (date) _____

  Damaged/missing material:

  _____

  _____

  _____

  _____

☐ LC/MSD ChemStation computer installation

- ☐ Line voltage verified
- ☐ PC, monitor, printer, and modem unpacked
- ☐ PC positioned on the bench
- ☐ Verify HP 82341C HP-IB card installed
- ☐ PC installed
- ☐ Printer installed
- ☐ Modem installed (if applicable)
- ☐ Modem, printer, monitor, and PC turned on (in that order)

☐ LC/MSD ChemStation software installation

- ☐ Windows NT 4.0 and Service Pack 3 installation and configuration verified
- ☐ Remote access software installed (if applicable)
- ☐ Run **Setup.exe** on ChemStation CD-ROM
- ☐ **Instrument 1** selected, **Add/Change** clicked
- ☐ G2710AA LC/MSD ChemStation selected
- ☐ Registration number entered
- ☐ Other modules selected and registered
- ☐ **OK** to install
- ☐ Setup allowed to edit configuration files
- ☐ LC/MSD correctly configured as Modular LCMS System
- ☐ Instrument named
- ☐ **1946 MSD** at HP-IB address 0 added
- ☐ LC modules configured
- ☐ Instrument configuration saved
- ☐ Software and license numbers safely stored
- ☐ Maintenance CD-ROMs installed (LC *and* LC/MSD)
- ☐ LC/MSD Reference Collection CD-ROM set installed

☐ LC/MSD installation

- ☐ LC/MSD placed on bench (two-person lift)
- ☐ Foreline pump unpacked and placed on the oil drip pan
- ☐ Mist filter installed
- ☐ Oil return line installed
- ☐ Ballast control set to fully *open* (counterclockwise)
- ☐ Exhaust hose installed and connected to vent
- ☐ Foreline hose connected
- ☐ Drain bottle secured and all four lines connected
- ☐ Nitrogen regulator set to 80-100 psi
- ☐ Nitrogen supply tubing and gas conditioner installed
- ☐ Gas conditioner purged before connecting to LC/MSD
- ☐ HP-IB address on the LC/MSD is set to 0
- ☐ HP-IB cable from the LC/MSD to the PC connected
- ☐ Remote start cable from the LC to the LC/MSD connected
- ☐ Foreline pump and ac supply power cords connected to the LC/MSD
- ☐ Line voltage verified
- ☐ LC/MSD power cord connected to an appropriate ac outlet
- ☐ Main circuit breaker turned on (front power switch is still off)
- ☐ Spray chamber installed
- ☐ LC/MSD front power switch on
- ☐ Foreline pump operation verified
- ☐ LC/MSD baked out at least 2 hours

☐ LC installed per LC documentation

- ☐ LC firmware revisions verified
- ☐ LC solvents prepared
- ☐ Vacuum degasser primed

☐ Performance verification

- ☐ Performance evaluation samples prepared
- ☐ Tune performance verified
- ☐ Sensitivity performance verified

Customer familiarization checklist

Purpose of Familiarization

Familiarization is intended to give operators a basic overview of the operation and maintenance of new instruments, systems, and application software and is *not* designed to substitute for a full operator training course.

Customer Responsibilities

The customer should ensure that necessary operating supplies, consumables and usage dependent items such as vials, syringes and solvents are available. Users of the instrument should be present at all times during the familiarization, otherwise important information on operation and maintenance may be missed.

Hardware overview

☐ Identify PC hardware and peripherals

- ☐ Power connections
- ☐ Keyboard, mouse, and monitor connections
- ☐ Printer connections
- ☐ Modem connections
- ☐ Instrument control (HP-IB) connections

☐ Locate and identify LC/MSD system hardware

- ☐ Identify LC/MSD components and connections
  - CDS components and operation
  - Vacuum system components and review venting requirements
- ☐ Identify electrospray interface components and describe function
- ☐ Identify APCI interface components and describe function

☐ Start up procedure

- ☐ Switching on the LC/MSD
- ☐ Switching on the LC modules
- ☐ Switching on PC and peripherals

LC/MSD ChemStation Software Overview

☐ Identify ChemStation software materials

- ☐ Backup media (CD-ROM)
- ☐ User information: maintenance and repair CD-ROM, Quick Reference, LC/MSD Reference Collection CD-ROM, online help

☐ Starting the ChemStation software

- ☐ Windows NT overview
  Keyboard, monitor and mouse configuration
  Printer configuration
- ☐ Describe software configuration of the instruments (HP Config editor)
- ☐ Demonstrate use of online Help, both from Help menu and from Diagnosis
- ☐ Demonstrate Maintenance and Repair CD-ROM, and LC/MSD Reference Collection CD-ROM
- ☐ Review changing access levels and passwords

☐ LC/MSD Tune View

- ☐ Perform a manual tune and describe the tune procedure. (Refer to the online help)
- ☐ Save the tune file and discus the importance of retaining tuning records
- ☐ Generate a tune report and explain how to interpret the report
- ☐ Describe the autotune feature and perform an autotune
- ☐ Demonstrate using Check Tune to verify tune stability, and importance of not tuning more often than necessary
- ☐ Discuss spray chamber contamination, diagnosis of contamination, and use of control charts

☐ Method and Run Control view

- ☐ Describe features of the Graphical User Interface (GUI) and pull-down menu items
- ☐ Develop a method with appropriate LC/MSD parameters. Use demo methods to illustrate both scan and SIM
- ☐ Review how to save the acquisition parameters as part of a method
- ☐ Review data file structure and how to create a data file using Auto and Prefix/Counter
- ☐ Create a simple sequence table and describe how it can be used to run a batch of samples
- ☐ Inject the performance sample to demonstrate acquiring data as part of the system verification
- ☐ Demonstrate how to take a snapshot

☐ **Data Analysis view**

- ☐ Demonstrate loading UV and MS data files
- ☐ Demonstrate overlaying and separating UV and MS TIC signals
- ☐ Demonstrate zooming in, zooming out, and displaying EIC and UV spectra
- ☐ Demonstrate manual and automatic integration of UV and MS data
- ☐ Describe how to add annotations
- ☐ Demonstrate and describe use of peak purity
- ☐ Discuss the differences and use of offline and online data analysis

☐ **Report Layout view**

- ☐ Create a new report layout using the simple layout example
- ☐ Modify an existing report layout and save it as a style
- ☐ Generate a report using modified layout

☐ **Verification (OQ/PV) view**

- ☐ Review OQ/PV Standard Operating Procedure manual

☐ **Diagnosis View**

- ☐ Describe software diagnostic features
- ☐ Describe software early maintenance feedback (EMF) utility
- ☐ Demonstrate how to access instrument logs
- ☐ Describe use of OQ/PV and Analytic tests

☐ ***If Deconvolution software is present***

- ☐ *Generate a deconvolution and mass accuracy report*

☐ ***If Protein and Peptide software is present***

- ☐ *Demonstrate the function of Peptide Tools with the data provided on the data system*

☐ Maintenance and support

☐ **ChemStation maintenance**

- ☐ Discuss safe storage of software master diskettes and CD ROMs
- ☐ Discuss hierarchy and maintenance of HPCHEM files
- ☐ Discuss data backup options - tape backup, CD-ROM writers, and optical drives. Mention importance of security passwords for restoring data
- ☐ Discuss hard disk maintenance including temp file removal and use of Scandisk. Mention importance of using a defragmentation utility (***not*** defrag.exe.)
- ☐ Caution against use of Defrag on NT (truncates long file and folder names)

☐ **LC/MSD maintenance**

- ☐ Demonstrate how to use the maintenance CD-ROM and online help
- ☐ Describe proper LC/MSD venting procedure
- ☐ Show reference data for LC/MSD operational maintenance procedures
- ☐ Review LC/MSD preventative maintenance
- ☐ Review the use of EMF and instrument logs

☐ **Remote - modem and diagnostics**

- ☐ Describe Carbon Copy software
  - How to configure the system
  - How to call out
  - What is the difference between Guest vs. Host

☐ **Additional support information**

- ☐ Explain HP support services and how to obtain help
  - Hardware
  - Software
  - Assist packages

4

Supplemental Information

Configuring Windows NT 4.0

Minimum PC hardware requirements

- HP Vectra 166 MHz or equivalent personal computer
  The power saver (Energy Star) feature of the PC must be disabled.
- 64 MB RAM
- CD-ROM drive
- Speakers or headphones
- 2 GB Hard Drive
- Printer: LaserJet 5 with 2 MB RAM
- 17-inch monitor with 1024 × 768 × 32,768 colors
- HP 82341C HP-IB interface card
- Data backup device is highly recommended
- Modem for remote support

Software configuration requirements

- Windows NT® Workstation revision 4.0 plus Service Pack 3
- NTFS disk partitions, but no compression for active data files
- User accounts and passwords set up. See the HP CAG CE CD-ROM
- Minimal desktop configuration (wallpaper, desktop icons).
- Both NetBUI and TCP/IP networking.
- Microsoft Internet Explorer for Internet access.
- The system registry should be modified to prevent network session time-out (TCP/IP only), and subsequent loss of network connections:
  - Run **Windows \ system32 \ regedit32.exe.**
  - Navigate through the menus following this path:
  - HKEY_LOCAL_MACHINE on **Local Machine | System | CurrentControlSet | Services| NetBT | Parameters | SessionKeepAlive**.
  - With Radix set to Hex, set **Data** to **ffffffff** (eight “F”s).
  - Click **OK**.
- Not all NT supported devices are supported for ChemStation products. Magneto-optical devices and CD-ROM writing units are not supported for data collection.
- HP-IB SICL driver components from the **hpiolibs** directory of the ChemStation CD-ROM.
- Windows NT 4.0 system recovery disks created at completion of installation.

Upgrading from an older ChemStation

Before upgrading from a previous LC ChemStation software revision to the LC/MSD ChemStation software revision A.05.01:

Before starting the upgrade

1 **Make sure to back up all LC data files, methods, sequences, report templates, custom macros, etc. in case they are overwritten or deleted in the process of upgrading the ChemStation.**

2 **Make sure you have all the LC ChemStation software product registration packets or the software registration numbers from the currently installed LC ChemStation.**

3 **Make sure the PC meets the minimum hardware requirements and has Windows NT 4.0 installed and configured as described in Appendix A.**

4 **Make sure an HP 82341C HP-IB communication board and SICL drivers are installed in the PC, as described in Appendix C.**

5 **Install the remote access software for the modem.**

Upgrading from LC ChemStation software to the LC/MSD ChemStation software

1 **Insert HP ChemStation CD-ROM into the CD-ROM drive.**

2 **In Windows NT Explorer, double-click on SETUP.EXE on the CD-ROM drive.**
After a few seconds the Setup program will display the Instrument Setup dialog box.

3 **The installation program will detect any currently installed ChemStation software and asks you if you want to upgrade your system. Click Yes.**

4 **After the LC ChemStation software has been upgraded to revision A.05.xx, the installation program will ask you if you want to add any additional instruments. Click Yes.**
The Instruments Setup dialog box will be displayed.

5 **Select Instrument 1 and click Add/Change.**

6 **The Configure Instrument dialog box will then be displayed. Select the appropriate module from the list of available products in the Configure Instrument dialog box and click Add.**

7 **Enter the license number for the selected module in the New License Number Field and click Add. The applicable product and license numbers are printed on the software certificate and registration packet.**

8 **Click OK to return to the Instrument Setup box. The selected modules with their license numbers will now be displayed under the instrument number.**

9 **Click on Install at the Instrument Setup box to continue.**

10 **Click on Yes to allow the Setup program to update the configuration files.**

C A U T I O N The HP ChemStation core directory (default: C:\HPCHEM) and HP ChemStation system directory (default: C:\HPCHEM\SYS) must be included in the **PATH** setting.

After the software is installed, the setup program will prompt you to configure any new instruments you installed.

11 **See "Configuring the LC/MSD ChemStation software" on page 18.**

The software installation is now complete. The Setup program made changes to the WIN.INI file and saved a copy of the original WIN.INI file in the files named WIN.XXX (i.e., WIN.000, WIN.001, WIN.002, WIN.003) in a Backup directory located in the ChemStation directory (default is C:\HPCHEM).

12 **Remove the CD-ROM and store it in a safe place with the license numbers.**

13 **Install the HP 1100 Series Maintenance and Repair CD-ROMs.**

— Insert the HP1100 Series LC Maintenance CD-ROM in the CD-ROM drive
— In Windows NT Explorer, double-click on **setup.exe**
— Be sure to check the box to include the LC/MSD CD-ROM.
— Insert the LC/MSD Maintenance CD-ROM in the drive.

You will need to refer to procedures on this CD-ROM to complete the LC/MSD installation.

Removing (uninstalling) the ChemStation software

The following procedure should only be followed if you are comfortable with editing system files. Have your system administrator perform this task if you are unsure.

1 If there are any data, methods, libraries, or other files or directories that you wish to save, move or copy them to a directory outside of those to be deleted.

2 Close ALL applications except Explorer.

— In Windows NT Explorer, navigate to C:\Temp.
Select all the files and press <Delete>. (Do not delete the Temp directory itself.)
Click **Yes** to send them all to the Recycle Bin.

— Delete the file **c:\winnt\system\vhpibd.386**.

— Drag all ChemStation icons to the Recycle Bin.

3 Click on the Start button on the taskbar and select Run.

— Type **sysedit** and click **OK**.

— In autoexec.bat:
Delete the C:\HPCHEM and C:\HPCHEM\SYS references from the **SET PATH=** statement.

— In win.ini, delete the following sections:
[PCS] and **[PCS, #]**, where # may be 1– 4

— In system.ini:
Delete the following line: **EMMExclude=dc00-dfff**

— Save and exit Sysedit.

4 On the taskbar, click Start with right mouse button and select Open All Users.

— Double-click on the Programs icon.
Right-click on the icon for the HP ChemStation group and click **Delete** (or drag to Recycle Bin). Click on **Yes** to send the group to the recycle bin.
Close the C:\WINNT\Profiles window(s).

— Empty the Recycle Bin (click icon with right mouse button and select Empty).

— Reboot the computer. You are now ready to load new software.

Installing the HP 82341C HP-IB card and the SICL driver

Installing the HP-IB card

1 **Note the switch settings of the HP-IB card.**
The default of 0000 implies an IO address of 0x250-0x257.

2 **Install the HP-IB card into the computer as any other PC adapter card.**

3 **If a removable drive configured as D:, turn it off.**

4 **Turn on the PC, and wait for Windows NT to start.**

Install the SICL driver for the HP-IB card

1 **Close any Windows applications that are running.**

2 **Insert the ChemStation CD-ROM into the drive.**

3 **In the Windows NT Explorer, double-click on the self-extracting installation program D:\HPIB\hpiolibs.exe. Click Next or Back to navigate through the installation panels.**
The version of the driver you install *must* be F.01.02 or later.

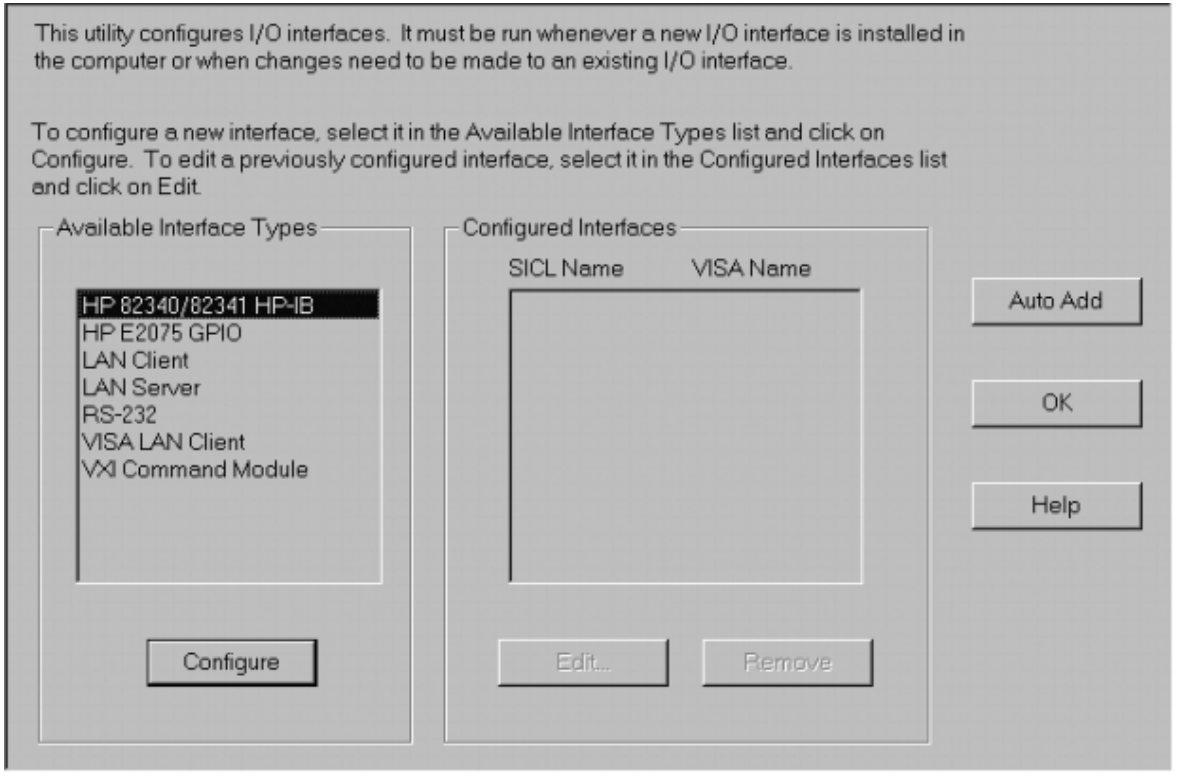
4 **Accept the default directories for both SICL and VISA software.**

5 **After the install shield finishes copying files and creating program groups, check Configure Interfaces.**

N O T E If you choose to view the readme file, you *must* close the file to continue the configuration.

6 Select HP 82340/82341 in the configuration panel.

- Change **SICL Interface Name** to **hp82341** (note: make sure it is ***lower case***).
- Change the Bus Address to **30**. You must use the arrows on the scroll bar to change this value; typing the number won't work. Leave all other settings at their default values.
- Click **OK** twice to leave the HP-IB SICL configuration.



7 Click OK when you are asked to restart your system to activate the driver.

Troubleshooting communication problems

Ideally, the whole system should be connected (HP-IB and remote start cables) with all components powered off, then turned on in the following sequence:

1 **LC modules**

2 **LC/MSD**

3 **Printer**

4 **Computer**

Since the LC/MSD needs to start baking out before the LC is installed, this ideal sequence is not feasible. As documented in chapter 2, the actual sequence is:

1 **Printer**

2 **Computer**

3 **LC/MSD**

4 **LC modules**

If you can't communicate with the LC/MSD with the computer, try:

— Verify the correct HP-IB address, both on the LC/MSD and in the software
— Reconnect the HP-IB cables
— Press the HP-IB reset switch on the LC/MSD (under the HP-IB connector)
— Disconnect the LC

As a ***last resort***, shut down the LC/MSD, the LC, and the computer, and start them up in the recommended order.

C A U T I O N

Only use the following procedure if you cannot communicate with the LC/MSD; otherwise use the **vent** utility. *Never* switch off the LC/MSD while the turbo pumps are spinning.

To shut down the LC/MSD in case of computer failure:

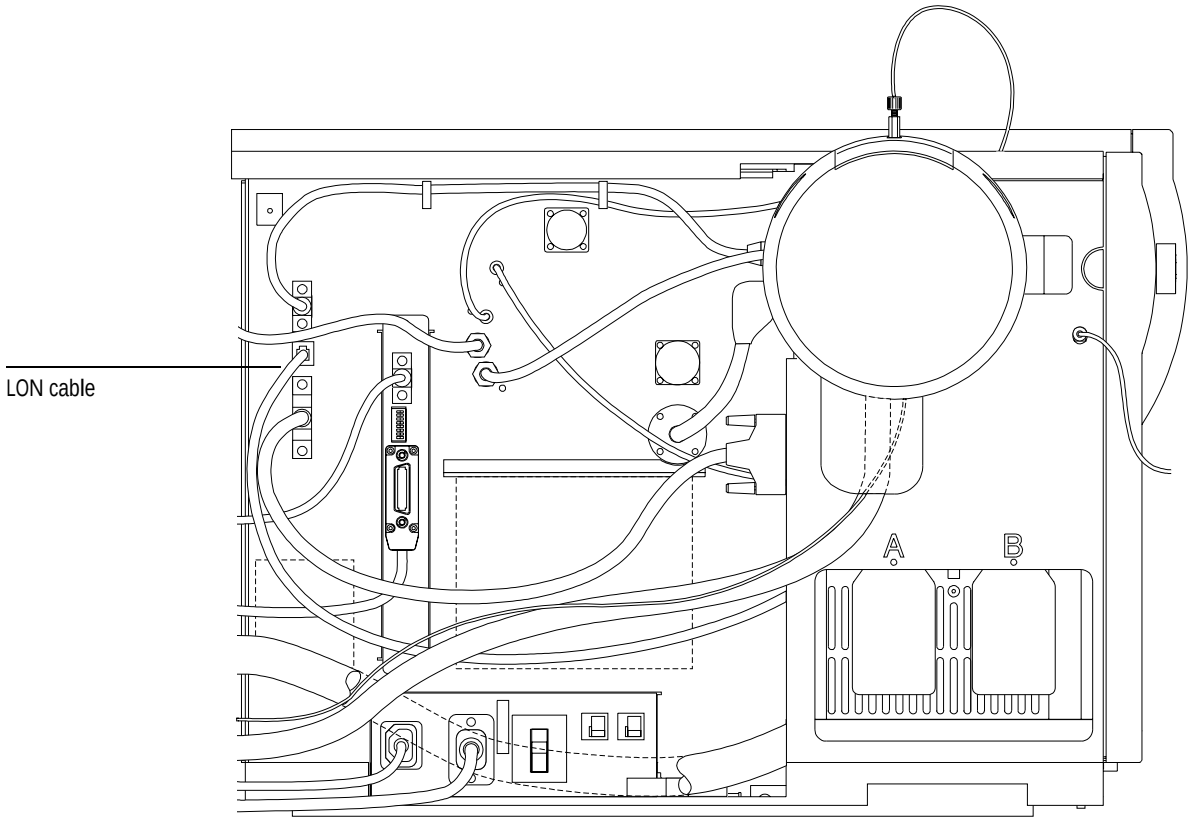
1 **Disconnect the LON cable on the side panel.**

2 **Wait 10 minutes for the turbo pumps to stop.**

3 **Turn off the front LC/MSD power switch.**

4 **Reconnect the LON cable.**

C A U T I O N Do not reconnect this cable with the LC/MSD power on.



LC and MSD parameters for installation verification

Electrospray positive ion sensitivity: MSSUPRES.M

Method Information

Reserpine SIM method
ESI Positive Ion Sensitivity Test

Run Time Checklist	
Pre-Run Cmd/Macro	macro _automspath$ + “mssup_sn.mac”
Data Acquisition	on
Standard Data Analysis	off
Customized Data Analysis	on
Macro Name	rsp_sn,,,0.6
Save GLP Data	off
Post-Run Cmd/Macro	off
Save Method with Data	off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	0.400 ml/min
Stoptime	No Limit
Posttime	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

Mass Spectrometer Detector

General Information

Use MSD:	Enabled
Ionization Mode	API-ES
Tune File	atunes.tun
Polarity	Positive
StopTime	No Limit
Peakwidth	0.040 min
Scan Speed Override	Not Applicable
Time Filter	Disabled
Data Storage:	Not Applicable
Fragmentor Ramp:	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	609.30	3.0	150	High	220

[MSZones]

Gas Temp	350° C	maximum 350° C
DryingGas	10.0 l/min	maximum 13.0 l/min
Neb Pres	40 psig	maximum 60 psig
VCap	4000 V	

[Time Table]

Time Table is disabled

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	air blank	1
2	2	solvent blank	5
3	3	10 pg Reserpine	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector volume	5.0 µl
Auxiliary	
Drawspeed	200 µl/min
Ejectspeed	200 µl/min
Draw position	0.0 mm
Time	
Stoptime	As Pump
Posttime	Off

Electrospray negative ion sensitivity: MSSUPAR4.M

Method Information

Acid Red 4 SIM method	
ESI Negative Ion Sensitivity Test	
Run Time Checklist	
Pre-Run Cmd/Macro	macro _automspath$ + “mssup_sn.mac”
Data Acquisition	on
Standard Data Analysis	off
Customized Data Analysis	on
Macro Name	rsp_sn,357.1,,0.6
Save GLP Data	off
Post-Run Cmd/Macro	off
Save Method with Data	off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	0.400 ml/min
Stoptime	No Limit
Posttime	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	API-ES
Tune File	atunes.tun
Polarity	Negative
StopTime	No Limit
Peakwidth	0.040 min
Scan Speed Override	Not Applicable
Time Filter	Disabled
Data Storage	Not Applicable
Fragmentor Ramp	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	357.1	3.0	120	High	220

[MSZones]

Gas Temp	350° C	maximum 350° C
DryingGas	10.0 l/min	maximum 13.0 l/min
Neb Pres	40 psig	maximum 60 psig
VCap	4000 V	

[Time Table]

Time Table is disabled

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	air blank	1
2	2	solvent blank	5
3	3	10 pg Acid Red 4	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector volume	5.0 µl
Auxiliary	
Drawspeed	200 µl/min
Ejectspeed	200 µl/min
Draw position	0.0 mm
Time	
Stoptime	As Pump
Posttime	Off

APCI positive ion sensitivity: MSSUPCI.M

Method Information

Reserpine SIM method	
APCI Positive Ion Sensitivity Test	
Run Time Checklist	
Pre-Run Cmd/Macro	macro _automspath$ + “mssup_sn.mac”
Data Acquisition	on
Standard Data Analysis	off
Customized Data Analysis	on
Macro Name	rsp_sn,,,0.6
Save GLP Data	off
Post-Run Cmd/Macro	off
Save Method with Data	off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	1.000 ml/min
Stoptime	No Limit
Posttime	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	APCI
Tune File	atunes.tun
Polarity	Positive
StopTime	15.00
Peakwidth	0.040 min
Scan Speed Override	Not Applicable
Time Filter	Disabled
Data Storage	Not Applicable
Fragmentor Ramp	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	609.30	3.0	150	High	220

[MSZones]

Gas Temp	350° C	maximum 350° C
Vaporizer	435° C	maximum 500° C
DryingGas	3.0 l/min	maximum 13.0 l/min
Neb Pres	60 psig	maximum 60 psig
VCap	4000 V	
Corona	4.0 µA	

[Time Table]

Time Table is disabled

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	air blank	1
2	2	solvent blank	5
3	3	10 pg Reserpine	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector volume	5.0 µl
Auxiliary	
Drawspeed	200 µl/min
Ejectspeed	200 µl/min
Draw position	0.0 mm
Time	
Stoptime	As Pump
Posttime	Off

APCI negative ion sensitivity: MSSUP4NP.M

Method Information

p-Nitrophenol SIM method
APCI Negative Ion Sensitivity Test

Run Time Checklist

Pre-Run Cmd/Macro	macro _automspath$ + “mssup_sn.mac”
Data Acquisition	on
Standard Data Analysis	off
Customized Data Analysis	on
Macro Name	rsp_sn,138,,0.6
Save GLP Data	off
Post-Run Cmd/Macro	off
Save Method with Data	off

HP 1100 High Pressure Gradient Pump 1

Control

Flow	1.000 ml/min
Stoptime	No Limit
Posttime	Off

Solvents

Solvent A	100.0%
Solvent B	Off

Pressure Limits

Minimum Pressure	0 bar
Maximum Pressure	400 bar

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	APCI
Tune File	atunes.tun
Polarity	Negative
StopTime	15.00
Peakwidth	0.040 min
Scan Speed Override	Not Applicable
Time Filter	Disabled
Data Storage	Not Applicable
Fragmentor Ramp	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	138.00	3.0	100	High	220

[MSZones]

Gas Temp	350° C	maximum 350° C
Vaporizer	425°	maximum 500° C
DryingGas	3.0 l/min	maximum 13.0 l/min
Neb Pres	60 psig	maximum 60 psig
VCap	2500 V	
Corona	20 µA	

[Time Table]

Time Table is disabled

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	100 pg p-Nitrophenol	10

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector volume	5.0 µl
Auxiliary	
Drawspeed	200 µl/min
Ejectspeed	200 µl/min
Draw position	0.0 mm
Time	
Stoptime	As Pump
Posttime	Off

Multiply charged ion deconvolution test: MSSUPMYO.M

Method Information

Myoglobin FIA method
Multiply Charged Ion Deconvolution Test

Run Time Checklist

Pre-Run Cmd/Macro	macro _automspath$ + “mssup_sn.mac”
Data Acquisition	on
Standard Data Analysis	off
Customized Data Analysis	on
Macro Name	myo_sn
Save GLP Data	off
Post-Run Cmd/Macro	off
Save Method with Data	off

HP 1100 High Pressure Gradient Pump 1

Control

Flow	0.400 ml/min
Stoptime	No Limit
Posttime	Off

Solvents

Solvent A	100.0%
Solvent B	Off

Pressure Limits

Minimum Pressure	0 bar
Maximum Pressure	400 bar

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	API-ES
Tune File	atunem.tun
Polarity	Positive
StopTime	10.00
Peakwidth	0.10 min
Scan Speed Override	Disabled
Time Filter	Enabled
Data Storage	Full
Fragmentor Ramp	Disabled

RAW Scan Parameters

Time (min)	Mass Range Low	Mass Range High	Gain EMV	Fragmentor	Threshold	Stepsize
0.00	500	1600	3.0	120	0	0.10

[MSZones]

Gas Temp	350 C	maximum 350 C
DryingGas	10.0 l/min	maximum 13.0 l/min
Neb Pres	40 psig	maximum 60 psig
VCap	4000 V	

[Time Table]

Time Table is disabled

FIA Series

FIA Series in this Method	Enabled

Time Setting

Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	air blank	1
2	2	50 pmole Myoglobin	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector volume	15.0 µl
Auxiliary	
Drawspeed	200 µl/min
Ejectspeed	200 µl/min
Draw position	0.0 mm
Time	
Stoptime	As Pump
Posttime	Off

Verifying installation with HP 1090 Series II LC

The performance verification methods supplied with the LC/MSD ChemStation use FIA acquisition. FIA, however, is not supported with the HP 1090 Series II LC. Nevertheless, you can still use the methods to perform an instrument verification, but you must make the following modifications to the instrument configuration and performance verification methods:

1 **Configure the instrument as a G1946 detector only, no LC.**

2 **Start up the LC/MSD ChemStation software and load the appropriate performance verification method.**

3 **Disable FIA in the method. Make sure the acquisition has a stop time of 15 minutes.**

4 **Place the HP 1090 series II LC into local mode and using the local keypad configure the injections as per the FIA information in the performance verification method (see page 76). Place the blanks and samples in the appropriate positions in the LC ALS.**

5 **Disconnect the remote start cable between the LC and the LC/MSD.**

6 **Start the method on the LC/MSD ChemStation.**

7 **Manually start the injections on the LC through the LC keypad.**

8 **After the method has completed, the performance verification report will be printed.**

9 **Further modify the method as required.**

Part number corrections

Please make a note of the following part numbers. These numbers have changed or the parts have been added since the last revision of the HP 1100 Series LC/MSD Maintenance and Repair CD-ROM.

Description	Old part number	New part number
APCI calibrant solution	G1946-85002	G2422A
APCI nebulizer needle	G1946-20097	G2428A
APCI negative ion performance standard	G1946-85006	G2425A
Corona needle (package of 3)	9301-1397	G2429A
Electrospray / APCI positive ion performance standard	G1946-85004	G2423A
Electrospray calibrant solution	G1946-85001	G2421A
Electrospray negative ion performance standard	G1946-85005	G2424A
Myoglobin standard (multiply-charged)	59987-20014	G2426A
Electrospray nebulizer needle	G1946-20177	G2427A
Foreline pump oil drip pan	N/A	G1946-00034
LC/MSD tool kit	N/A	G1946-60157
Foreline pump oil drain tool	N/A	3162-0177
Spray chamber window	G1946-20195	G1946-20159
Gasket for spray chamber window	N/A	G1946-20189
Spray chamber latch post	N/A	G1946-20196
Screw for latch post	N/A	0515-1034
Vented standoff for electrospray mesh electrode	N/A	G1946-20163
LC/MSD waste tubing system		
Cross fitting, 1/4-inch	N/A	0101-0950
Hose fitting, 1/4-inch	N/A	0101-0952
Tubing, flex 1/4-inch id	N/A	0890-1711
PEEK tubing assembly	N/A	G1946-60153
Waste line assembly	N/A	G1946-60152

CDS leak sensor, short	N/A	G1946-60140
CDS leak sensor, long	N/A	G1946-60139
Electrospray and APCI spray chamber		
Window gasket		G1946-20189
Spray chamber window		G1946-20159
Electrospray mesh electrode vented standoff		G1946-20163
Latch post		G1946-20196
M4x16mm screw		0515-1034
LC/MSD Install Manual		G1946-90005
LC/MSD Getting Started		G1946-90006
OQ/PV SOP Manual		G1946-90015
HP ChemStation w/ NT		G1946-90021
Fuse, 6.3A, power distribution board		2110-0917

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