



Agilent OpenLAB CDS

Requirements and Supported Instruments



Agilent Technologies

Notices

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In this Guide ...

This document details the minimum hardware and software, network requirements, as well as firmware required to run an Agilent OpenLAB Chromatography Data System (CDS), and lists supported instruments. It includes operating system configuration.

Table 1 Terms and abbreviations used in this document

Term	Description
Content Management	Database to manage your analytical data. The database is provided as a component of OpenLAB Server. Always used in Client/Server systems, optional for Workstations.
AIC	Agilent Instrument Controller
Control Panel	Control Panel for Agilent OpenLAB software
Microsoft Control Panel	Part of the Microsoft Windows operating system
Shared Services	Set of administrative services that control, for example, the security policy and the central configuration of OpenLAB CDS. Shared services are accessed via the Control Panel.

1 Hardware and Software Requirements

This chapter contains the hardware and software requirements for the different components of an OpenLAB CDS system.

2 Network Requirements

This chapter describes the network requirements that must be met in order to support the environmental computing needs of an OpenLAB Chromatography Data System (CDS).

3 Operating System Configuration

This chapter describes the configuration of the different operating systems for workstations, clients, and AICs.

4 Instrument Connections

This chapter provides information on the instruments supported by the current revision of OpenLAB CDS and the required respective instrument drivers and firmware revisions.

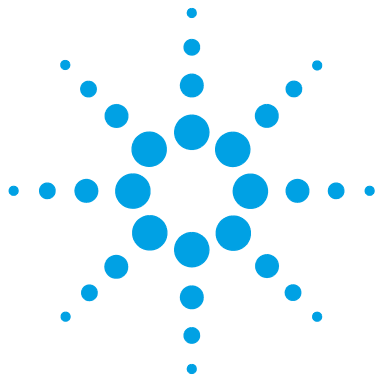
5 Software Compatibility

This chapter contains information on compatibility with other Agilent or Non-Agilent Software.

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This chapter contains the hardware and software requirements for the different components of an OpenLAB CDS system.



Introduction

Depending on the type of installation, you may need different hardware components. The following graphics show the required components for each scenario.

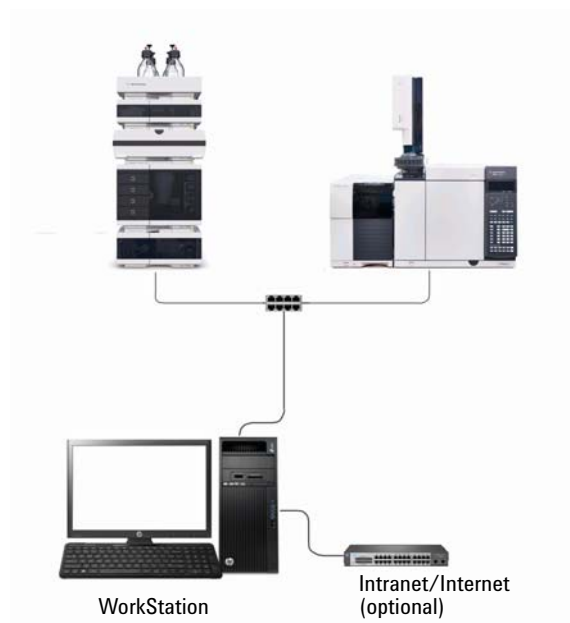


Figure 1 OpenLAB CDS Workstation

All required components (Shared Services and, if relevant, Content Management) are installed on the workstation.

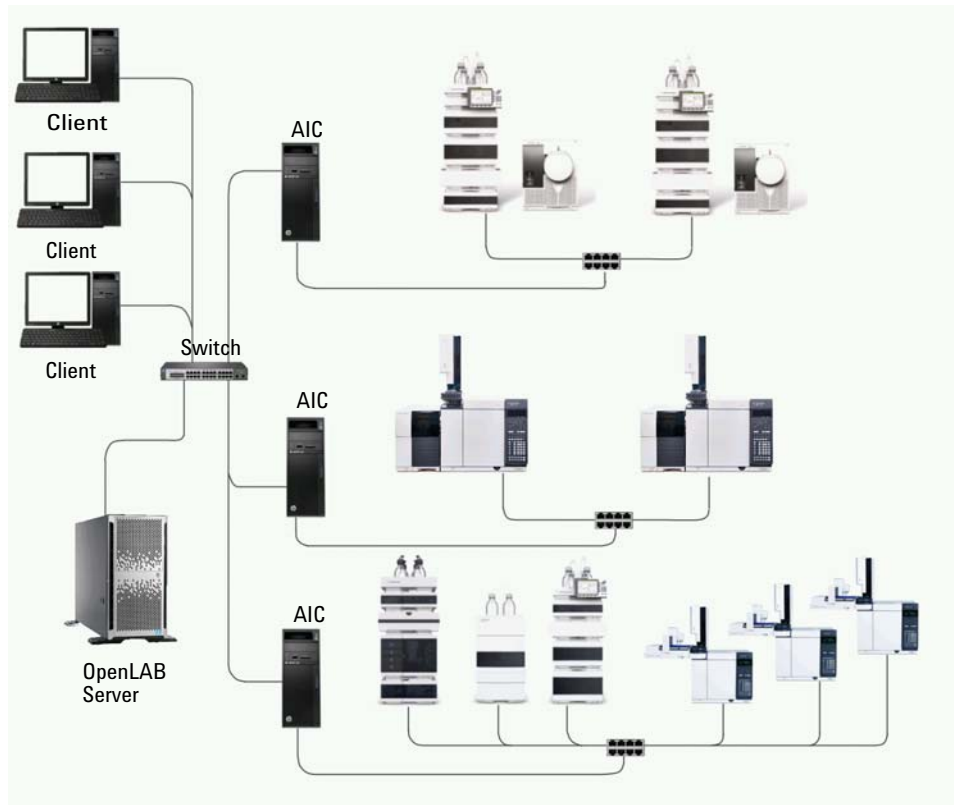


Figure 2 Client/Server System

Both Shared Services and Content Management are installed on the OpenLAB Server.

General Software Requirements

Component	Details
.NET framework	<ul style="list-style-type: none">.NET 3.5.1 must be enabled on systems running on Windows 8.1, Windows 10, or Windows Server 2012 R2. and <ul style="list-style-type: none">.NET 4.5.1 or above (if needed, it will be installed automatically by the OpenLAB Installer)
Web browser	<ul style="list-style-type: none">Internet Explorer 11Google Chrome 40 or higherEdge
Antivirus software ¹	<ul style="list-style-type: none">Symantec Endpoint ProtectionTrend MicroMicrosoft Security EssentialsMcAfee

¹ The listed antivirus software has been tested and is recommended by Agilent. Check with your Agilent service person in case you want to use other software.

The following software is recommended to be installed or enabled on any supported operating system prior to installing OpenLAB CDS components. It is not required for the system to function correctly. You will need it, however, to view videos or PDF manuals in OpenLAB Help & Learning.

- Adobe Flash Player 17*
- Adobe Reader XI*

NOTE

If these tools are not installed on your system, you can install them from the OpenLAB CDS Installer.

Language Compatibility

The English version of OpenLAB CDS is validated on Windows English and Western European language operating systems. Regional settings (locales) can be adjusted as required. In a Client/Server system make sure regional settings are the same for the server, AIC and clients.

Localized versions of OpenLAB CDS are supported on localized language versions of Windows, using default system fonts:

- Chinese: Microsoft YaHei
- Japanese: Meiryo UI
- Brazilian Portuguese: Calibri

OpenLAB CDS can run on other language versions of Windows as well, but the user interface will be English.

Non-localized instrument drivers are supported and will appear in English even when running localized versions of OpenLAB CDS.

Important Notes

Disk Space

Disk space requirements should be adjusted based on the number and type of instruments and archival periodicity. Agilent recommends providing enough disk space for one year of lab operation, in addition to the operating system and OpenLAB CDS requirements.

Table 2 Typical expected file sizes

	Run time	Description	Expected data size
2D data	60 min	10 Hz, 2 channel data	300-700 KB
3D data	60 min	10 Hz, 5 channel data, plus spectra at 1 nm resolution from 200 to 400 nm	100-300 MB
LC/MS data (SQ)	60 min	Scan mode	20-40 MB
GC/MS data (SQ)	60 min	Scan mode	50-300 MB
GC/MS data (SQ)	60 min	SIM mode with 2 ions	1-3 MB

Standalone Workstations

Workstation Storage Options

The OpenLAB CDS Workstation is available either with storage in the local file system (OpenLAB CDS Workstation software) or in a built-in Content Management database (OpenLAB CDS Workstation Plus software).

A workstation with Content Management (OpenLAB CDS Workstation Plus) requires higher performing hardware.

PC Recommendation

Table 3 provides the recommended hardware configuration for Workstations with up to 4 instruments. Add 4 GB RAM per additional operational instrument.

Table 3 Tested and recommended hardware configuration for workstations

Item	Workstation	Workstation with Content Management
Processor speed (CPU)	Intel® Xeon E3 (3.2 GHz, 8 MB SmartCache, 4 Core, Hyper Threading) Intel® vPro™ Technology, Intel® HD Graphics, or equivalent	Intel® Xeon® E5-1620 v3 (3.5 GHz, 10 MB SmartCache, 4 Core), or equivalent
Physical memory (RAM)	8 GB	16 GB
Hard disk	1 x 500 GB SATA 7200 RPM See Table 2 on page 12	2 x 500 GB or 1 TB SATA 7200 RPM ¹ See Table 2 on page 12
Graphic Resolution	1600 x 900	1600 x 900
RS-232 port	1 serial port (certain instruments require a serial port)	

Table 3 Tested and recommended hardware configuration for workstations

Item	Workstation	Workstation with Content Management
USB port	1 USB port required for installation.	
LAN card	Integrated Intel® I217LM PCIe GbE Controller	Integrated Intel® I217LM PCIe GbE Controller Intel® Ethernet I210-T1 PCIe as 2nd NIC ²

¹ If the computer has a disc array controller we recommend 2 x 1 TB in RAID1.

² A second LAN interface is recommended to isolate the instrument's data traffic.

Recommended bundle PC for a workstation with Content Management: HP Z440 Workstation or equivalent.

Number of Instruments

With the standard configurations you can configure any number of instruments that sums up to 4 instrument points per OpenLAB CDS Workstation.

With the VL configurations you can configure only 1 instrument with up to 2 instrument points per OpenLAB CDS VL Workstation.

Instrument points are an indicator for the data stream that needs to be managed, and thus also for the required hardware and software. Instruments count as follows:

GC:	1 instrument point
LC:	1 instrument point
3D LC:	2 instrument points
GC/MS:	3 instrument points
LC/MS:	3 instrument points
3D LC/MS	4 instrument points

Software

Table 4 Supported operating systems for a workstation

Operating System	Details
Windows	<ul style="list-style-type: none"> • Windows 10, Enterprise or Pro, 64bit or • Windows 7 SP1, Enterprise or Professional, 64bit or • Windows 8.1, Enterprise or Professional, 64bit

Database

SQL Server 2012 and SQL Server 2014 (both 64-bit), as well as Oracle 12c 164-bit are supported for use with this version of OpenLAB CDS.

Workstation Plus uses PostgreSQL 9.3 database for both Shared Services and Content Management. It is installed and configured automatically during installation. For the Workstation Plus with Content Management, Agilent does not support the use of a PostgreSQL version other than the one installed by the OpenLAB software.

Clients and Agilent Instrument Controllers

PC Recommendation

Client

Table 5 Tested and recommended hardware configuration for a client

Item	HW requirements
Processor	Intel® Xeon E3 (3.2 GHz, 8 MB Cache, 4 Core, Hyper Threading) Intel® vPro™ Technology, Intel® HD Graphics or equivalent
Physical memory (RAM)	8 GB
Hard disk	7200 rpm SATA drives, 500 GB
LAN Card	Integrated Intel® I217LM PCIe GbE Controller or equivalent
Remote Management	Intel® vPro™ with Intel® AMT 9.0
Graphic resolution	1600 x 1200

Instrument Controller

Table 6 Tested and recommended hardware for an AIC

Item	HW requirements
Processor	Intel® Xeon® E5-1620 (3.5 GHz, 10 MB Cache, 4 Core) or equivalent
Physical memory (RAM)	16 GB
Hard disk	7200 RPM SATA, 2 x 500 GB or 1 TB If the computer has a disc array controller Agilent recommends 2 x 1 TB in RAID1.
RS-232 port	1 serial port

Table 6 Tested and recommended hardware for an AIC

Item	HW requirements
Removable media	1 USB port
LAN card ¹	Integrated Intel® I217LM PCIe GbE Controller Intel® Ethernet I210-T1 PCIe as 2nd NIC

¹ A second LAN interface is recommended to isolate the instrument's data traffic.

Recommended bundle PC for AICs: HP Z440 with 16 GB RAM

Server

For requirements of an OpenLAB Server, please refer to the *Agilent OpenLAB Server Hardware and Software Requirements* (ServerHardwareSoftwareRequirements.pdf) guide.

Number of Instruments

Any configuration of instruments that sums up to a maximum of 6 instrument points per AIC is supported. Per OpenLAB CDS client/server system, you can configure a maximum of up to 200 instrument points.

Instrument points are an indicator for the data stream that needs to be managed, and thus also for the required hardware and software. Instruments count as follows:

GC:	1 instrument point
LC:	1 instrument point
3D LC:	2 instrument points
GC/MS:	3 instrument points
LC/MS:	3 instrument points
3D LC/MS	4 instrument points

Software

Table 7 Supported operating systems for instrument controllers and clients

Operating System	Details
Windows	<ul style="list-style-type: none">• Windows 10, Enterprise or Pro, 64bit• Windows 7 SP1, Enterprise or Professional, 64bit• Windows 8.1, Enterprise or Professional, 64bit• Windows Server 2012 R2

For supported operating systems on an OpenLAB Server, please refer to the *Agilent OpenLAB Server Hardware and Software Requirements* guide.

Virtualization

Clients

OpenLAB CDS has been tested with the following virtualization software. The resources requirements are equal to those of the physical machines. Windows Server 2012 R2 requires domain environment.

- Citrix XenApp 7.8 with Windows 2012 Server

NOTE

Be aware of a potential conflict when using an All-in-one Citrix XenApp environment: Both Citrix and OpenLAB CDS use port 27000 for the License Manager Daemon. See “[Firewall Settings](#)” on page 24.

- VMware vSphere 5.x
- Remote Desktop Services with Windows 2012 Server R2
- Hyper-V with Windows 2012 Server R2

AICs

Virtualizing AICs is not recommended. Operational continuity cannot be guaranteed for virtualized AICs.

More Information

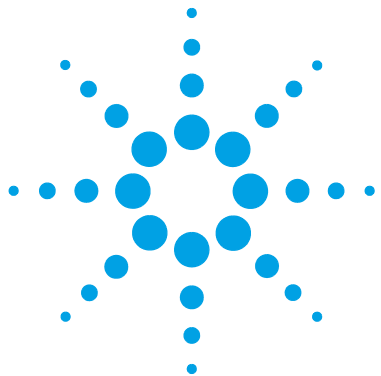
For more detail, please refer to the documentation on virtualization provided by Agilent.

Databases

In Distributed Systems, Agilent OpenLAB Server manages information using a database. The database is installed and configured either manually or automatically during installation. For details on the supported database software, please refer to the *OpenLAB Server Hardware and Software Requirements* guide (OpenLABServerHardwareSoftwareRequirements.pdf).

1 **Hardware and Software Requirements**

Clients and Agilent Instrument Controllers



2 Network Requirements

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This chapter describes the network requirements that must be met in order to support the environmental computing needs of an OpenLAB Chromatography Data System (CDS).



2 Network Requirements

Introduction

Introduction

OpenLAB CDS systems rely on network infrastructure in order to support the communication between various system nodes. This communication is based on standard TCP/IP protocols. In order to provide optimum performance and uptime, the network must meet design criteria for available bandwidth, IP address assignment, name resolution and appropriate isolation of the lab subnet from the corporate network.

LAN Connectivity

When using LAN communications to connect workstations or instrument controllers to an instrument, use one of these methods:

- Connect via an isolated switch using standard CAT-5 network cabling
- LAN communication hardware should be 100/1000 mbps (or higher) speed capable.
- NIC teaming¹: LAN cards should *not* be teamed on workstations, instrument controllers, or clients.
- LAN communication must be on the same subnet as instruments, and preferably on the same segment.

NOTE

See the separate driver installation guides for further information regarding vendor specific instrument connections. GPIB or RS232 might be required.

LAN Power Management

Avoid data capture or transfer interruptions in your data acquisition system by making LAN communication cards available for instrument and system component communications.

Windows may be set to turn instruments/components off to save power while sleeping or hibernating. To change this setting:

- 1 In the Microsoft Control Panel, open the **Network and Sharing Center**².
- 2 Select **Change adapter settings**. Right-click **Local Area Connection > Properties > Configure**.
- 3 Select the **Power Management** tab.
- 4 Clear the **Allow the computer to turn off this device to save power** check box.

¹ Network Interface Card (NIC) teaming is also known as Load Balancing and Failover (LBFO)

² View the items by icon to see a list of all items.

Firewall Settings

If you are using a third party firewall or antivirus software on the network where OpenLAB CDS is installed, open these firewall ports to allow communication between the system components of OpenLAB CDS. These apply to workstations as well as to Client/Server systems as component communications rely on these communication channels:

Ports	Comment, required for
21	Content Management FTP GC MSD - Firmware Installation (FTP)
22	Content Management SFTP
23	GC MSD - Firmware Installation (Telnet)
25	eMail (SMTP) send by Agilent OpenLAB
67 and 68	BootP Server communications
80	Content Management HTTP GC MSD - Embedded Web Server HTTP McAfee
111, 1007, 1024-1025	GC MSD - Instrument Control (Proprietary/SunRPC/TCP)
443	Content Management HTTPS
1433	SQL Server (Default Port)
1521	Oracle (Default Port)
2883-2885	GC MSD - Instrument Control (Proprietary/SunRPC/TCP)
2886	Agilent OpenLAB Automation Services GC MSD - Instrument Control (Proprietary/SunRPC/TCP)
3068 and 3071	GC MSD - Instrument Control (Proprietary/SunRPC/TCP)
3424	Transfer of diagnostics information between OpenLAB CDS system components
4879	Required for Headspace events
5432	PostgreSQL (Default Port)
5701	OpenLAB Server Cluster
5813	GC MSD - Firmware Installation (ICMP/Ping)

Ports	Comment, required for
5973	GC MSD - Instrument Control (Proprietary/SunRPC/TCP)
6570	SubscribeNet: active retrieval and release of product licenses
6577	Communications of OpenLAB CDS administrative information. This includes instrument and run status, active trace data, and global configurations.
6624	Agilent OpenLAB REST API
6628	Agilent OpenLAB Remote Work Area
7972 and 7973	GC MSD - Instrument Control
7980-7983	GC MSD - Instrument Control - RSlick (TCP)
8084	Agilent OpenLAB Licensing support
8085-8089	Alternative to port 8084 if that port is in use by another page or process
8090	Hosts the viewing page of current license grants and consumptions found in the OpenLAB Control Panel administration interface
9001-9002	AIC communication with instruments and shared servers
9110	Instrument communication (GC/LC)
9753	Task-based messaging communication between acquisition controllers and chromatography clients Configurable during AIC registration. It is required that all ports designated during AIC registration be opened for access.
10000-10010	Status and acquisition communication with Agilent 7890 GCs
27000-27009	Communication of license availability
55065	GC MSD - Instrument Control - RSlick (TCP)
Dynamic Ports	Temporary communications between clients and instrument controllers The ports used depend on the operating system in use and are configurable. Refer to the operating system documentation for more information.

The OpenLAB CDS installer will automatically open these ports on an enabled Windows firewall during installation.

Domain Requirements

Domains support the flow of information and user access rights across machines in the network. This means that all machines and instruments within the networked OpenLAB CDS system must reside within the same domain or have the appropriate cross domain trusts to allow name based communications between all components in the system. In the case of a workstation installation, domains are only relevant if you are using a Windows domain-based authentication model. In this case the workstation or client must always be able to communicate with domain components in order to function as expected.

Installing OpenLAB CDS will apply network exceptions to the Windows firewall under the domain profile to result in a functional system. The components necessary to support OpenLAB CDS on a domain are:

- *Domain controller* – broadcasts the domain name and negotiates access to machines.
- *Domain name server (DNS)* – maintains records of what hostnames belong to which IP on the network. This component is always required for effective components communications in networked systems.
- *Active directory* – maintains the list of users and their access rights on the domain.

NOTE

The domain name server (DNS) must be able to resolve the IPv4 address of all instrument controllers and instruments. Any unresolved instrument controller or instrument will disrupt the functionality of OpenLAB resulting in errors or delays. IPv6 is not supported and must be deactivated.

NOTE

OpenLAB CDS components must not be installed on the same machine as the domain controller.

The domain components above host a variety of services and settings that must be configured appropriately to allow communication across machines. The following services and settings will need to be configured to fit your domain. Your internal IT group is responsible for proper configuration of any custom domain solutions. These include settings for:

- Lookup zones and hostnames
- Group and security policies

- Subnet masks and Virtual LANs
- IP reservation (static or DHCP)

Environments with Proxy Servers

The OpenLAB server must be accessible via http or https in the network. If you use proxy servers, verify that they can be accessed. If required, adjust the proxy settings.

Network Isolation

An OpenLAB CDS Client/Server system should be isolated from network environments that experience frequent failures due to faulty switching, viruses, or worms. If network isolation is not possible, the machines should be reconfigured and disconnected from the problematic network until these issues can be resolved. On an isolated network, name resolution services must be hosted by a separate machine to enable proper communications between system components by name.

An isolated network is completely physically isolated, so that no LAN switch connections on the network are shared with the corporate network infrastructure. [Figure 3](#) on page 29 shows a simple client/server topology. In this example, the connection highlighted in red prevents isolation of the system.

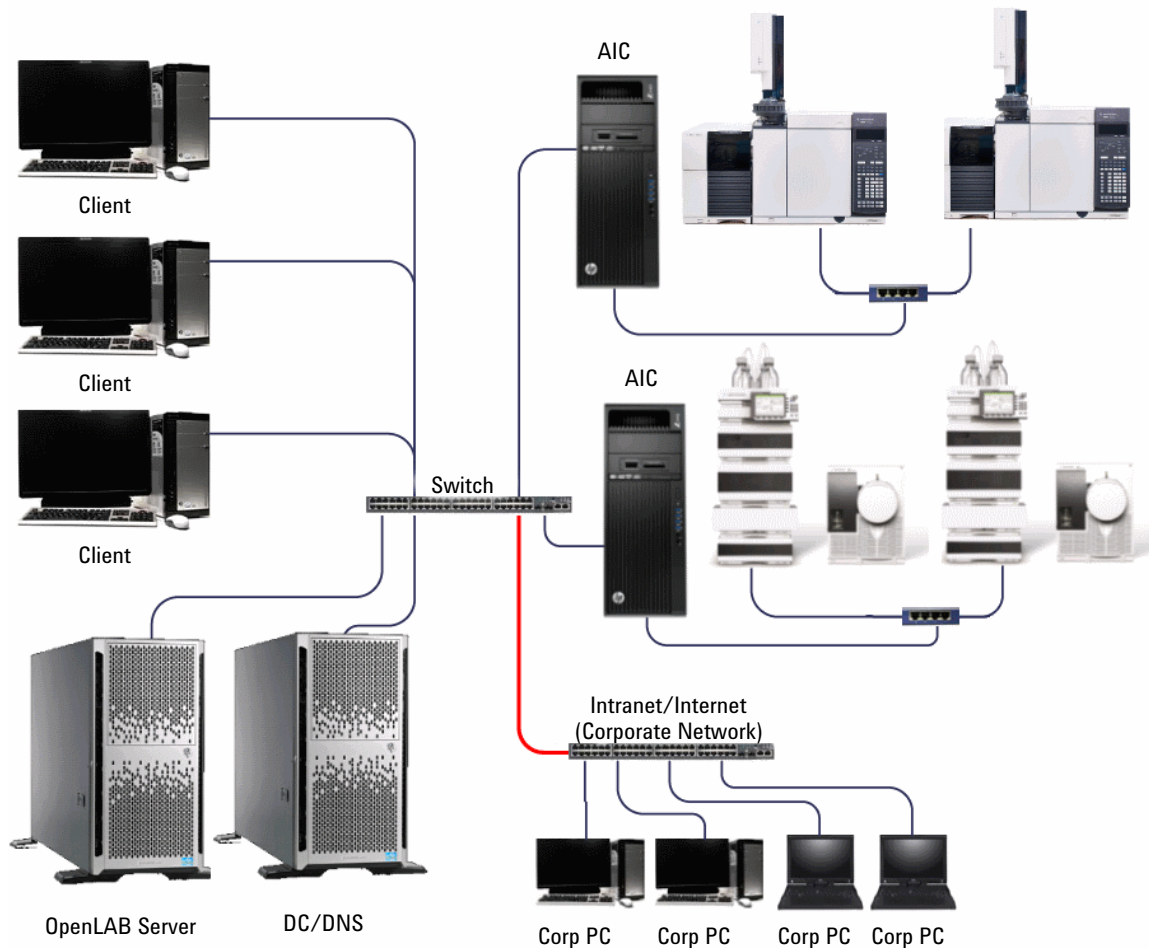
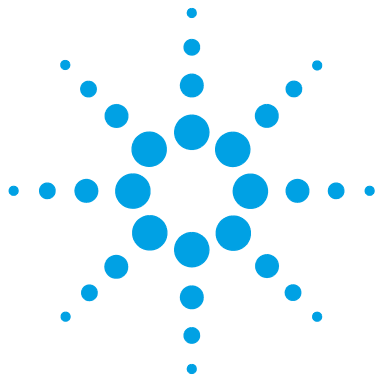


Figure 3 Sample client/server topology: Network Isolation

Specific Requirements for Compliant Systems

If you intend to use your system in a compliant environment, ensure the following settings related to time synchronization:

- Your network must have a time synchronization service to make sure that all systems are using a consistent and valid time.
- To ensure that users cannot change the time on a client system, users must not operate using an administrator account. This is important as the client time is used during buffered activity logging during network outages.



3 Operating System Configuration

Configure Windows 10 32

Configure Windows 7 37

Configure Windows 8.1 42

This chapter describes the configuration of the different operating systems for workstations, clients, and AICs.



Configure Windows 10

- [MUST] 1 **System** (Microsoft Control Panel)¹: Register Windows with Microsoft.
- 2 **File Explorer Options** (Microsoft Control Panel): In the **View** tab:
- Select **Always show menus**.
 - Select **Display the full path in the title bar**.
 - Clear **Hide extensions for known file types**.
 - Clear **Use Sharing Wizard**.
- [MUST] 3 **Start > Settings > Update and Security**:
- a Click **Check for updates** to check for updates and apply all patches. Before proceeding, ensure that all updates are downloaded and installed. Ensure that there is no reboot pending.
 - b Click **Advanced options**.
 - c Select the **Defer feature updates** check box.
 - d Click **Choose how updates are delivered**.
 - e Turn off **Updates from more than one place**.
- [MUST] 4 Settings for updates: **Windows Update** service MUST NOT be running during installation.
- [MUST] 5 **Indexing Options** (Microsoft Control Panel): Disable indexing. Click the **Modify** button. Clear all drives and locations.
- [MUST] 6 **Start > Settings > System > Tablet Mode**: For **When I sign in**, select **Use desktop mode**.
- [MUST] 7 **Power Options** (Microsoft Control Panel):
- a As preferred plan select **High performance**
 - b Click **Change Plan settings**
 - c Set the option **Put the computer to sleep** to **Never**.
 - d Click **Change advanced power settings**.
 - e Open the nodes for **Hard disk > Turn off hard disk after**.
 - f Set the Minutes to 0 (=Never).

¹ View the items by icon to see a list of all items.

- [MUST] **8 Start > Settings > System > Offline Maps:** Turn **Metered connections** and **Map updates** off.
- [MUST] **9 Administrative Tools** (Microsoft Control Panel): Configure security options:
 - a Double-click **Local Security Policy**.
 - b Navigate to **Security Settings > Local Policies > Security Options**
 - c Double-click the following policy listed in the right hand panel: **Network Access: Sharing and security model for local accounts**
 - d In the displayed dialog select the following item from the drop-down list: **Classic - local users authenticate as themselves**
- [MUST] **10 Security and Maintenance** (Microsoft Control Panel):
 - a Click **Change Windows SmartScreen settings**.
Select **Don't do anything (turn off Windows SmartScreen)**.
- [MUST] **11 Date and Time** (Microsoft Control Panel): Choose the time zone of your machine's location.
- [MUST] **12 Network and Sharing Center** (Microsoft Control Panel):
 - a Select **Change adapter settings**. Right-click **Local Area Connection > Properties > Configure**.
 - b On the **Power Management** tab, clear all check boxes.
- [MUST] **13 Programs and Features** (Microsoft Control Panel):
 - a Click **Turn Windows features on or off**.
 - b Enable .NET 3.5 by selecting the **.NET Framework 3.5 (includes .NET 2.0 and 3.0)** check box.
This option requires an internet connection.

NOTE

If this procedure does not work as expected, or the computer has no internet access, install .NET 3.5 from the Windows installation media (see details for Windows 10 under <https://support.microsoft.com/en-us/kb/2734782>). If you do not have installation media, create them as described under <https://www.microsoft.com/en-us/software-download/windows10>.

- c To make sure that all the net.tcp components are properly initialized, Non-HTTP activation must be enabled. Expand the **.NET Framework 3.5 (includes .NET 2.0 and 3.0)** node and select the **Windows Communication Foundation Non-HTTP Activation** check box.

3 Operating System Configuration

Configure Windows 10

- d Select the **.NET Framework 4.6 Advanced Services** check box. Use the default values for sub items.
- e Select the **Internet Explorer 11** check box.
- f Select the **Telnet Client** check box.
- g Select the **TFTP Client** check box.
- h Reboot the PC.

[MUST] **14 Start > Settings > System > Default Apps:** For best user experience in OpenLAB Help and Learning, select Internet Explorer or Google Chrome as default Web browser.

[MUST] **15** Disable Compatibility View in Internet Explorer.

- a Open Internet Explorer.
- b Click the Tools menu, and then click **Compatibility View Settings**.
- c Clear the **Display intranet sites in Compatibility View** check box.

[MUST] **16** Enable the navigation pane:

Open Windows Explorer, then select **View > Navigation pane** from the ribbon and make sure that **Navigation pane** is selected.

[PERFORMANCE] **17 System** (Microsoft Control Panel): Change performance options:

- a Click **Advanced system settings**.
- b On the **Advanced** tab > **Performance** click **Settings**.
- c On the **Visual Effects** tab, select **Adjust for best performance**.
- d Under **Custom**, select the following check boxes for better usability:
 - **Smooth edges of screen fonts**
 - **Show shadows under mouse pointer**
 - **Show shadows under windows**

[PERFORMANCE] **18 Start > Settings > Personalization > Colors:** Turn **Make Start, taskbar, and action center transparent** off.

[PERFORMANCE] **19 System** (Microsoft Control Panel): Change system properties:

- a Click **Advanced system settings**.
- b On the **Advanced** tab > **Performance** click **Settings**.
 - **Advanced** tab > **Virtual Memory:** For optimum performance use the **Change** button to adjust the paging file size to a value of 2 to 3 times of

the physical RAM on the PC. If possible locate the paging file on a drive different from the system installation drive.

- **Data Execution Prevention** tab: Select **Turn on DEP for essential Windows programs and services only**.

c Advanced > Startup and Recovery > Settings button:

- **System startup** section:
 Change both **Time to display ...** fields from **30** to **3** sec.
- **System failure** section:
 Select **Automatically restart**, in the **Write debugging information** section select **Kernel memory dump** from the drop-down list.

d System Protection tab

Make sure that **Protection** is turned off. If required, click **Configure** and select **Disable system protection**.

e Remote tab

- In the **Remote Assistance** section, clear the check box **Allow Remote Assistance connections to this computer**.
- In the **Remote Desktop** section, select **Don't allow connections to this computer**.

[OPTIONAL] 20 Start > Settings > Personalization: Disable advertising info:

- a** On the **Lock screen** page:
- Under **Background**, select **Picture** or **Slideshow**.
 - Turn off **Get fun facts, tips, tricks, and more on your lock screen**.
 - Turn off **Show lock screen background picture on the sign-in screen**.
- b** On the **Start** page:
 Turn off **Occasionally show suggestions in Start**.

[OPTIONAL] 21 Start > Settings > Privacy:

- a** On the **General** page, turn off the following:
- **Let apps use my advertising ID**
 - **Turn on SmartScreen Filter to check web content**
 - **Send Microsoft info about how I write**
- b** On the **Location** page, turn off **Location**.

3 Operating System Configuration

Configure Windows 10

- [OPTIONAL] **22 Start > search for 'gpedit.msc':** Welcome Center:
- a Navigate to **Local Computer Policy > Computer Configuration > Administrative Templates > System > Logon**.
 - b Set **Don't display the Getting Started welcome screen at logon** to **Enabled**.

- [OPTIONAL] **23 Recycle Bin Properties:** (right-click on desktop icon **Recycle Bin**) Select the following options:

- **Custom size:** Select a size corresponding to approximately 10% of the complete disk space for the drive.
- Select **Display delete confirmation dialog**.

Repeat these steps for all drives of your computer.

- 24 Region** (Microsoft Control Panel): Language for non-Unicode programs:

On the **Administrative** tab, click **Change system locale...** From the drop down list, select **English (United States)**.

NOTE

Do not the change system locale if you are using an English, Portuguese, Japanese or Chinese Operating System.

- [OPTIONAL] **25** Right-click the taskbar to open the **Taskbar and Start Menu Properties** dialog. In the **Taskbar** tab, under **Taskbar buttons** select **Combine when taskbar is full**.
This will simplify switching between open CDS instances.

Configure Windows 7

- [MUST] **1 System** (Microsoft Control Panel)¹: Register Windows with Microsoft.
- [MUST] **2 Folder Options** (Microsoft Control Panel): In the **View** tab,
 - Select **Always show menus**.
 - Select **Display the full path in the title bar**.
 - Clear **Hide extensions for known file types**.
 - Clear **Use Sharing Wizard**.
- [MUST] **3 Windows Update** (Microsoft Control Panel):
 Click **Check for updates** to check for updates and apply all critical security patches.
- [MUST] **4 Windows Update** (Microsoft Control Panel): Change the settings for updates:
 Click **Change settings**. In the **Important updates** section, select **Never check for updates**. Clear the other update options.

NOTE

This setting is required during installation of OpenLAB CDS.

On clients in a client/server system, you may activate automatic updates again after finishing the installation.

On Agilent Instrument Controllers (AIC) or standalone workstations, keep the **Never check for updates** setting. This setting is important to avoid data loss due to system reboot during data acquisition.

-
- [MUST] **5 Indexing Options** (Microsoft Control Panel): Disable indexing.
 Click the **Modify** button. Clear all drives and locations.
 - [MUST] **6 Only for Standalone Workstations that do not belong to a domain: Start > search for 'gpedit.msc'**: Windows logon options:
 - a** Navigate to **Local Computer Policy > Computer Configuration > Administrative Templates > System > Logon**.
 - b** Set **Hide entry points for Fast User Switching** and **Always use classic logon** to **Enabled**.

¹ View the items by icon to see a list of all items.

3 Operating System Configuration

Configure Windows 7

- [MUST] 7 **Power Options** (Microsoft Control Panel):
- As preferred plan select **High performance**
 - Click **Change Plan settings**
 - Set the option **Put the computer to sleep** to **Never**.
 - Click **Change advanced power settings**.
 - Open the nodes for **Hard disk > Turn off hard disk after**.
 - Set the Minutes to 0 (=Never).
- [MUST] 8 **Administrative Tools** (Microsoft Control Panel): Configure security options:
- Double-click **Local Security Policy**.
 - Navigate to **Security Settings > Local Policies > Security Options**
 - Double-click the following policy listed in the right hand panel: **Network Access: Sharing and security model for local accounts**
 - In the displayed dialog select the following item from the drop-down list: **Classic - local users authenticate as themselves**
- [MUST] 9 **Date and Time** (Microsoft Control Panel): Choose the time zone of your machine's location.
- [MUST] 10 **Network and Sharing Center** (Microsoft Control Panel):
- Select **Change adapter settings**. Right-click **Local Area Connection > Properties > Configure**.
 - On the **Power Management** tab, clear all check boxes.
- [MUST] 11 **Programs and Features** (Microsoft Control Panel):
- Click **Turn Windows features on or off**.
 - Expand the **Microsoft .NET Framework 3.5.1** node and select the **Windows Communication Foundation Non-HTTP Activation** check box.
 - Select the **Internet Explorer 11** check box.
 - Select the **Telnet Client** check box.
 - Select the **TFTP Client** check box.
 - Reboot the PC.
- [MUST] 12 Disable Compatibility View in Internet Explorer.
- Open Internet Explorer.
 - Click the Tools menu, and then click **Compatibility View Settings**.

- c Clear the **Display intranet sites in Compatibility View** check box.

[PERFORMANCE] **13 System** (Microsoft Control Panel): Change performance options:

- a Click **Advanced system settings**.
- b On the **Advanced** tab > **Performance** click **Settings**.
- c On the **Visual Effects** tab, select **Adjust for best performance**.
- d Under **Custom**, select the following check boxes for better usability:
 - **Smooth edges of screen fonts**
 - **Show shadows under mouse pointer**
 - **Show shadows under windows**

[PERFORMANCE] **14 System** (Microsoft Control Panel): Change system properties:

- a Click **Advanced system settings**.
- b On the **Advanced** tab > **Performance** click **Settings**.
 - **Advanced** tab > **Virtual Memory**: For optimum performance use the **Change** button to adjust the paging file size to a value of 2 to 3 times of the physical RAM on the PC. If possible locate the paging file on a drive different from the system installation drive.
 - **Data Execution Prevention** tab: Select **Turn on DEP for essential Windows programs and services only**.
- c **Advanced > Startup and Recovery > Settings** button:
 - **System startup** section:
 Change both **Time to display ...** fields from **30** to **3** sec.
 - **System failure** section:
 Select **Automatically restart**, in the **Write debugging information** section select **Kernel memory dump** from the drop-down list.

[OPTIONAL] **15 General Layout: (right-click Start > Properties)**

- a **Start Menu Tab**: In the **Privacy** section select both items
- b **Start Menu Tab > Customize** button: In **Customize Start Menu** dialog:
 - Clear the following option:
 - **Favorites menu**
 - Select the following options:
 - Computer **Display as a link**
 - **Connect To**

3 Operating System Configuration

Configure Windows 7

- Control Panel: **Display as a menu**
- **Default Programs**
- **Devices and Printers**
- Documents: **Display as a link**
- **Enable context menus and dragging and dropping**
- Games: **Don't display this item**
- **Help**
- **Highlight newly installed programs**
- Music: **Don't display this item**
- **Network**
- **Open submenus when I pause on them with the mouse pointer**
- Personal folder: **Display as a link**
- Pictures: **Display as a link**
- **Run command**
- Search other files and libraries **Search with public folders**
- **Search programs and Control Panel**
- **Sort All Programs menu by name**
- System administrative tools: **Display on the All Programs menu and in the Start menu**
- **Use large icons**

[OPTIONAL] **16 Start > search for 'gpedit.msc':** Welcome Center:

- a Navigate to **Local Computer Policy > Computer Configuration > Administrative Templates > System > Logon**.
- b Set **Don't display the Getting Started welcome screen at logon** to **Enabled**.

[OPTIONAL] **17 Recycle Bin Properties:** (right-click on desktop icon **Recycle Bin**) Select the following options:

- **Custom size:** Select a size corresponding to approximately 10% of the complete disk space for the drive.
- Select **Display delete confirmation dialog**.

Repeat these steps for all drives of your computer.

[OPTIONAL] **18 Region and Language** (Microsoft Control Panel): Set the language for non-Unicode programs.

On the **Administrative** tab, click **Change system locale...** From the drop down list, select **English (United States)**.

NOTE

Do not the change system locale if you are using an English, Portuguese, Japanese or Chinese Operating System.

Configure Windows 8.1

- [MUST] 1 **System** (Microsoft Control Panel)¹: Register Windows with Microsoft.
- [MUST] 2 **Folder Options** (Microsoft Control Panel): In the **View** tab,
- Select **Always show menus**.
 - Select **Display the full path in the title bar**.
 - Clear **Hide extensions for known file types**.
 - Clear **Use Sharing Wizard**.
- [MUST] 3 **Windows Update** (Microsoft Control Panel):
Click **Check for updates** to check for updates and apply all critical security patches.
- [MUST] 4 **Windows Update** (Microsoft Control Panel): Change the settings for updates:
Click **Change settings**. In the **Important updates** section, select **Never check for updates**. Clear the other update options.

NOTE

This setting is required during installation of OpenLAB CDS.

On clients in a client/server system, you may activate automatic updates again after finishing the installation.

On Agilent Instrument Controllers (AIC) or standalone workstations, keep the **Never check for updates** setting. This setting is important to avoid data loss due to system reboot during data acquisition.

-
- [MUST] 5 **Indexing Options** (Microsoft Control Panel): Disable indexing.
Click the **Modify** button. Clear all drives and locations.
- [MUST] 6 **Power Options** (Microsoft Control Panel):
- a As preferred plan select **High performance**
 - b Click **Change Plan settings**
 - c Set the option **Put the computer to sleep** to **Never**.
 - d Click **Change advanced power settings**.

¹ View the items by icon to see a list of all items.

- e Open the nodes for **Hard disk > Turn off hard disk after**.
 - f Set the Minutes to 0 (=Never).
- [MUST] **7 Administrative Tools** (Microsoft Control Panel): Configure security options:
- a Double-click **Local Security Policy**.
 - b Navigate to **Security Settings > Local Policies > Security Options**
 - c Double-click the following policy listed in the right hand panel: **Network Access: Sharing and security model for local accounts**
 - d In the displayed dialog select the following item from the drop-down list: **Classic - local users authenticate as themselves**
- [MUST] **8 Date and Time** (Microsoft Control Panel): Choose the time zone of your machine's location.
- [MUST] **9 Network and Sharing Center** (Microsoft Control Panel):
- a Select **Change adapter settings**. Right-click **Local Area Connection > Properties > Configure**.
 - b On the **Power Management** tab, clear all check boxes.
- [MUST] **10 .NET settings** (Go to **Control Panel > Programs and Features**):
- a Click **Turn Windows features on or off**.
 - b Enable .NET 3.5 by selecting the **.NET Framework 3.5 (includes .NET 2.0 and 3.0)** check box.
- This option requires an internet connection.

NOTE

If this procedure does not work as expected, or the computer has no internet access, install .NET 3.5 from the Windows installation media (see Method 3 under <https://support.microsoft.com/en-us/kb/2734782>). If you do not have installation media, create them as described under <http://windows.microsoft.com/en-US/windows-8/create-reset-refresh-media?woldogcb=0>.

- c To make sure that all the net.tcp components are properly initialized, Non-HTTP activation must be enabled. Expand the **.NET Framework 3.5 (includes .NET 2.0 and 3.0)** node and select the **Windows Communication Foundation Non-HTTP Activation** check box.
- [MUST] **11 Disable Compatibility View in Internet Explorer**.
- a Open Internet Explorer.

3 Operating System Configuration

Configure Windows 8.1

- b Click the Tools menu, and then click **Compatibility View Settings**.
- c Clear the **Display intranet sites in Compatibility View** check box.

- [PERFORMANCE] **12 System** (Microsoft Control Panel): Change performance options:
- a Click **Advanced system settings**.
 - b On the **Advanced** tab > **Performance** click **Settings**.
 - c On the **Visual Effects** tab, select **Adjust for best performance**.
 - d Under **Custom**, select the following check boxes for better usability:
 - **Smooth edges of screen fonts**
 - **Show shadows under mouse pointer**
 - **Show shadows under windows**

- [PERFORMANCE] **13 System** (Microsoft Control Panel): Change system properties:
- a Click **Advanced system settings**.
 - b On the **Advanced** tab > **Performance** click **Settings**.
 - **Advanced** tab > **Virtual Memory**: For optimum performance use the **Change** button to adjust the paging file size to a value of 2 to 3 times of the physical RAM on the PC. If possible locate the paging file on a drive different from the system installation drive.
 - **Data Execution Prevention** tab: Select **Turn on DEP for essential Windows programs and services only**.
 - c **Advanced > Startup and Recovery > Settings** button:
 - **System startup** section:
Change both **Time to display ...** fields from **30** to **3** sec.
 - **System failure** section:
Select **Automatically restart**, in the **Write debugging information** section select **Kernel memory dump** from the drop-down list.

- [OPTIONAL] **14 Start > search for 'gpedit.msc'**: Welcome Center:
- a Navigate to **Local Computer Policy > Computer Configuration > Administrative Templates > System > Logon**.
 - b Set **Don't display the Getting Started welcome screen at logon** to **Enabled**.

[OPTIONAL] 15 Recycle Bin Properties: (right-click on desktop icon **Recycle Bin**) Select the following options:

- **Custom size:** Select a size corresponding to approximately 10% of the complete disk space for the drive.
- Select **Display delete confirmation dialog**.

Repeat these steps for all drives of your computer.

16 Region (Microsoft Control Panel): Language for non-Unicode programs:

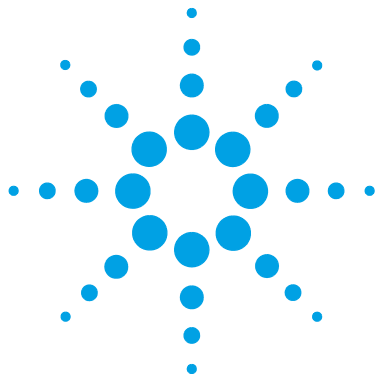
On the **Administrative** tab, click **Change system locale...** From the drop down list, select **English (United States)**.

NOTE

Do not the change system locale if you are using an English, Portuguese, Japanese or Chinese Operating System.

3 Operating System Configuration

Configure Windows 8.1



4 Instrument Connections

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This chapter provides information on the instruments supported by the current revision of OpenLAB CDS and the required respective instrument drivers and firmware revisions.



RC.NET Drivers and OpenLAB CDS

OpenLAB CDS can control instruments and modules that use **RC.NET** based driver software only.

Agilent and other vendors may release RC.net drivers independent of the OpenLAB CDS releases. Agilent recommends always using the most recent firmware revisions which include latest firmware features and improvements. Agilent driver software is forward compatible with respect to firmware, i.e. the firmware can be updated without the need of updating the driver or CDS.

More information on instrument drivers and firmware is available in the respective RC.net driver release notes.

The following Agilent instrument driver software revisions are part of the OpenLAB CDS 2.2 software package, and are installed by default with the software:

Table 8 Agilent driver packages shipped and installed with OpenLAB CDS 2.2

RC.net Instrument Driver	Driver Software Revision
Agilent LC	A.02.16
Agilent LC/MS SQ	A.01.02
Agilent GC	B.01.02
Headspace	B.01.07
Agilent GC/MS SQ	A.01.01
Agilent 35900E A/D	2.3.0
Agilent SS420X	A.01.01.64
Agilent Data Player	A.01.02.010
Pal 3	A.01.03
Pal-xt	B.01.08

Additional **RC.NET** instrument drivers are supported with OpenLAB CDS. You will need to install them separately (see section *Install or Upgrade Driver Software* in chapter 1 of your Workstation or Client Server guide).

Supported Agilent drivers are listed in the following table with their minimum software revisions.

Table 9 Other compatible Agilent Instrument Drivers (on the installation medium)

RC.net Instrument Driver	Driver Software Revision
CTC PAL3	A.01.03
PAL XT	B.01.08
ELSD	A.01.07
Agilent 490 Micro GC	B.01.12
Agilent Headspace	B.01.07.2

Third Party Drivers

OpenLAB CDS 2.2 supports selected third party instruments. See [Table 16](#) on page 64 for more details.

Always install dedicated RC.net drivers available from SubscribeNet at OpenLAB CDS > OpenLAB 3rd-Party Instrument drivers.

Agilent LC and LC/MS

Most Agilent LC Modules can be controlled with the current version of OpenLAB CDS. LC driver release A.02.16 has been tested with this revision and is installed by default with the software.

Recommended Firmware

Agilent recommends using current LC firmware sets with your OpenLAB CDS. The latest LC firmware sets are 7.01, 6.50, and 6.30. Firmware Set 7.01 can be downloaded from

<http://www.agilent.com/en-us/firmwareDownload?whid=99818>.

NOTE

LC and CE firmware revisions are grouped into sets for each module or system. Firmware sets include just the latest firmware of each module.

Modules combined into one LC instrument always need to have firmware from the same set. Firmware of one set is fully compatible with your CDS that supports this firmware set. However, if one module uses a firmware revision lower than the specified Minimum Firmware Revision some functionality might not be supported.

Do not mix firmware revisions from one set with older or newer sets. Firmware is not tested across set borders!

Device	Recommended Firmware
Agilent 1100 Series, 1200 Series and 1200 Infinity	A.07.01 or later
Agilent 1200 Series, 1200 Infinity and 1120 Compact LC	B.07.20 or later
Agilent 1200 Infinity Hosted Modules	C.07.20 or later
Agilent 1260/1290 Infinity II Modules	D.07.20 or later

You need to upgrade all existing modules to the latest version only if

- you add a new LC module to the existing system (recommended).
- one of the existing modules requires an upgrade due to a bug fix solved with the latest release.

For more information on downloading the current LC firmware, please refer to the Agilent website at <http://www.agilent.com/en-us/firmwareDownload?whid=69761> (LC Firmware News and Downloads) and <http://www.agilent.com/en-us/firmwareDownload?whid=83974> (Firmware Update Tools & Procedures).

The tables below “Supported LC modules” on page 51 list the supported LC modules with the minimum required firmware. Please note that using some driver features like valve-thermostat clusters and new temperature control modes require firmware updates beyond the minimum required firmware for related modules. For more information please refer to the respective release notes. The current *Release Note for Agilent LC and CE drivers Revision A.02.16* (LC Driver Release Note A0216.pdf) is available in the Docs/Enu folder of the OpenLAB CDS media.

Supported LC modules

HINT

Check for the product number at the lower right of each module or system.

Agilent LC - Sampling Systems

Product Number	Module Name	Minimum Firmware Revision
G1313A	1100 Series Standard Autosampler	A.06.10
G1329A	1200 Series Standard Autosampler	A.06.10
G1329B	1260 Infinity Standard Autosampler	A.06.10
G1330A	1100 Series Thermostat	n/a
G1330B	1290 Infinity Thermostat	n/a
G1367A	1100 Series Well-plate Sampler	A.06.31
G1367B	1200 Series High Performance Autosampler	A.06.31
G1367C	1200 Series High Performance Autosampler SL	A.06.31
G1367D	1200 Series High Performance Autosampler SL+	A.06.31
G1367E	1260 Infinity High Performance Autosampler	A.06.32

4 Instrument Connections

Agilent LC and LC/MS

Product Number	Module Name	Minimum Firmware Revision
G4226A	1290 Infinity Autosampler	A.06.31
G4303A	1260 Infinity SFC standard autosampler	A.06.54
G4767A	1260 Infinity II SFC Multisampler	D.07.13
G5667A	1260 Infinity Bio-inert Multisampler	A.06.32
G5668A	1260 Infinity II Bio-inert Multisampler	D.07.01
G7129A	1260 Infinity II Vialsampler	D.06.76
G7129B	1290 Infinity II Vialsampler	D.06.76
G7167A	1260 Infinity II Multisampler	D.06.75
G7167B	1290 Infinity II Multisampler	D.06.75

Table 10 Agilent CTC PAL Autosampler with Agilent LC

Product Number	Module Name	Minimum Firmware Revision
G4277A	Agilent 1290 Infinity LC Injector HTS	4.3.0
G4278A	Agilent 1290 Infinity LC Injector HTC	4.3.0
G4270-CTC	HTC PAL Auto sampler	Agilent 2.6.8 or 4.1.5
G4271-CTC	HTS PAL Auto sampler	Agilent 2.6.8 or 4.1.5

Agilent LC – Pumps

Product Number	Module Name	Minimum Firmware Revision
G1310A	1200 Series Isocratic Pump	A.06.10
G1310B	1260 Infinity Isocratic Pump	A.06.32
G1311A	1200 Series Quaternary Pump Pump ¹	A.06.10
G1311B	1260 Infinity Quaternary Pump ¹	A.06.10

Product Number	Module Name	Minimum Firmware Revision
G1311C	1260 Infinity Quaternary Pump VL ¹	A.06.32
G1312A	1260 Infinity Binary Pump ¹	A.06.10
G1312B	1260 Infinity Binary Pump SL ¹	A.06.10
G1312C	1260 Infinity Binary Pump VL ¹	A.06.32
G4204A	1290 Quaternary Pump ¹	B.06.50
G4220A	1290 Infinity Binary Pump ¹	B.06.23
G4220B	1290 Infinity Binary Pump	B.06.43
G4302A	1260 Infinity SFC Binary Pump ¹	A.06.10
G4782A	1260 Infinity II SFC Binary Pump	D.07.13
G5611A	1260 Infinity Bio-inert Quaternary Pump ¹	A.06.10
G5654A	1260 Infinity II Bio-inert Pump	D.07.01
G7104A	1290 Infinity II Flexible Pump	B.06.71
G7110B	1260 Infinity II Isocratic Pump	D.07.01
G7111A	1260 Infinity II Quaternary Pump VL	D.07.01
G7111B	1260 Infinity II Quaternary Pump	D.07.01
G7112B	1260 Infinity II Binary Pump	D.07.01
G7120A	1290 Infinity II High Speed Pump	B.06.71

¹ Pump valve clusters are possible for marked pumps with up to 2 valves of type G1160A and/or G1170A

Agilent LC – Column Compartments

Product Number	Module Name	Minimum Firmware Revision
G1316A	1260 Infinity Thermostatted Column Compartment	A.06.10
G1316B	1200 Series Thermostatted Column Compartment	A.06.10

Product Number	Module Name	Minimum Firmware Revision
G1316C	1290 Infinity Thermostatted Column Compartment ¹	A.06.14
G7116A	1260 Infinity II Multicolumn Thermostat	B.07.01
G7116B	1290 Infinity II Multicolumn Thermostat	B.06.75
G7130A	Integrated Column Compartment ICC	D.06.76
VTC Valve Thermostat Cluster	Combinations of G7116B, G1170A and G1316C (valve or column hosts) and G1316A/B and G7130A	See LC Driver Release Notes: <i>Valve-Thermostat Cluster</i>

¹ Cluster with up to three G1316C with integrated 8pos/9port valves (products G4230A/B). Minimum two G1316C TCCs, the third TCC can be a G1316A, B or C.

Agilent LC – Detectors

Product Number	Module Name	Minimum Firmware Revision
G1314A	1100 Series Variable Wavelength Detector	A.06.10
G1314B	1260 Infinity Variable Wavelength Detector VL	A.06.10
G1314C	1260 Infinity Variable Wavelength Detector VL+	A.06.10
G1314D	1200 Series Variable Wavelength Detector	B.06.32
G1314E	1290 Infinity Variable Wavelength Detector	B.06.32
G1314F	1260 Infinity Variable Wavelength Detector	B.06.32
G1315A	1100 Series Diode Array Detector	A.06.10
G1315B	1200 Series Diode Array Detector	A.06.10
G1315C	1260 Infinity Diode Array Detector VL+	B.06.30
G1315D	1260 Infinity Diode Array Detector VL	B.06.30
G1321A	1200 Series Fluorescence Detector	A.06.10
G1321B	1260 Infinity Fluorescence Detector Spectra	A.06.32
G1321C	1260 Infinity Fluorescence Detector	A.06.54

Product Number	Module Name	Minimum Firmware Revision
G1362A	1260 Infinity Refractive Index Detector	A.06.10
G1365A	1100 Series Multiple Wavelength Detector	A.06.10
G1365B	1200 Series Multi-Wavelength Detector	A.06.10
G1365C	1260 Infinity Multiple Wavelength Detector	B.06.30
G1365D	1260 Infinity Multiple Wavelength Detector VL	B.06.30
G4212A	1290 Infinity Diode Array Detector	B.06.30
G4212B	1260 Infinity Diode Array Detector	B.06.30
HDR-DAD Cluster	2x G4212A, 2x G4212B, 2x G7117A or 2x G7117B, or a combination of either 1x G4212A and 1x G4212B, or 1x G7117A and 1x G7117B	B.06.57
G7114A	1260 Infinity II Variable Wavelength Detector	D.07.01
G7114B	1290 Infinity II Variable Wavelength Detector	D.06.70
G7115A	1260 Infinity II Diode Array Detector WR	D.07.01
G7117A	1290 Infinity II Diode Array Detector FS	D.06.70
G7117B	1290 Infinity II Diode Array Detector	D.06.70
G7117C	1260 Infinity II Diode Array Detector HS	D.07.01
G7121A	1260 Infinity II Fluorescence Detector	D.07.01
G7121B	1260 Infinity II Fluorescence Detector Spectra	D.07.01
G7162A	1260 Infinity II Refractive Index Detector	D.06.76
G7162B	1290 Infinity II Refractive Index Detector	D.06.76
G7165A	1260 Infinity II Multiple Wavelength Detector	D.07.01
<i>Evaporative Light Scattering Detector</i>		
G4260A	380-ELSD	25.00
G4261A	385-ELSD	25.00
G4260B	1260 Infinity II Evaporative Light Scattering Detector	32.06

4 Instrument Connections

Agilent LC and LC/MS

Product Number	Module Name	Minimum Firmware Revision
G4261B	1290 Infinity Evaporative Light Scattering Detector	32.06
G7102A	1290 Infinity II Evaporative Light Scattering Detector	32.06

Agilent LC – Valve Solutions

Product Number	Module Name	Minimum Firmware Revision
G1156A	1200 Series 6 Position / 7 Port Valve (400 bar)	A.06.02
G1157A	1200 Series 2 Position / 10 Port Valve	A.06.02
G1158A	1200 Series 2 Position / 6 Port Valve	A.06.02
G1158B	1200 Series 2 Position / 6 Port Valve (600bar)	A.06.02
G1159A	1200 Series 6 Position Selection Valve	A.06.02
G1160A	1200 Series 12 Position/13 Port Valve	A.06.02
G1162A	1200 Series 2 Position/ 6 Port Micro Valve	A.06.02
G1163A	1200 Series 2 Position/ 10 Port Micro Valve	A.06.02
G1170A	1290 Infinity Valve Drive ¹	B.06.40
G4227A	1290 Infinity Flexible Cube ¹	B.06.52
G1390B	UIB II	B.06.53

¹ A host may be required. For details see latest driver release note.

Agilent LC Systems

Product Number	Module Name	Minimum Firmware Revision
G4286A	1120 Compact LC, Isocratic	B.06.50
G4286B	1220 Infinity II Isocratic LC System	B.06.50
G4286C	1220 Infinity LC System VL	B.06.50
G4287A	1120 Compact LC, Isocratic with Oven and ALS	B.06.50
G4287B	1220 Infinity LC Isocratic LC System	B.06.50
G4287C	1220 Infinity LC System VL	B.06.50
G4288A	1220 Infinity II Gradient LC System	B.06.50
G4288B	1220 Infinity II Gradient LC System	B.06.50
G4288C	1220 Infinity II Gradient LC System VL	B.06.50
G4289A	1120 Compact LC, Gradient with Oven	B.06.50
G4289B	1220 Infinity LC Gradient System	B.06.50
G4289C	1220 Infinity LC System VL	B.06.50
G4290A	1120 Compact LC, Gradient with oven and ALS	B.06.50
G4290B	1220 Infinity II Gradient LC System	B.06.50
G4290C	1220 Infinity II Gradient LC System VL	B.06.50
G4291B	1220 Infinity LC System	B.06.50
G4291C	1220 Infinity LC System VL	B.06.50
G4292B	1220 Infinity LC System	B.06.50
G4292C	1220 Infinity LC System VL	B.06.50
G4293B	1220 Infinity LC System	B.06.50
G4293C	1220 Infinity LC System VL	B.06.50
G4294B	1220 Infinity II Gradient DAD LC System	B.06.50

Agilent LC/MS

Recommended Firmware

Always use the most recent Firmware installation package that comes with the driver package.

Agilent LC/MS Single Quad 6100 Series

The following Agilent LC/MS instruments can be controlled with OpenLAB CDS.

Product number	Description	Note
G6120C	MS Module	61x0B to 61x0C via upgrade kit (G2725N)
G6125C	LC/MSD	
G6130C	MS Module	
G6135C	LC/MSD XT	
G1947B	APCI	ESI or AJS capable source required
G1971B	APPI (Photo Ionization)	
G1948B	ESI	
G1978B	Multimode Source	
G1958B	Agilent Jet Stream for Single Quad	

Agilent GC and GC/MS

Agilent GC

Agilent recommends using the latest firmware revision in order to provide the highest level of system capability.

The tables below list the firmware used during the last software tests. Upgrading firmware to this version is not required in all cases. A firmware upgrade should be done if you face problems or want to add system capability to your GC. Refer to latest Hardware Service Notes for latest firmware available.

Supported GC Systems

Product Number	Description	Firmware Revision
G3950A G3952A G3953A	Intuvo 9000 GC system	A.01.01
G3440A G3445A	7890A	A.01.16
G3440B G3445B	7890B	B.02.04.2
G4350A	7820A	A.01.17.004
G1530N G1540N	6890N	N.06.07
G1530A G1540A	6890A 6890Plus	A.03.08
G2630A	6850 Serial # >= US10243001 Serial # < US00003200	A.06.02 A.03.07
G3581A	490 Micro GC	3.32

Supported Autosamplers

Table 11 Agilent GC Autosampler

Model number	Description	Firmware Revision
G4513A	7693 Injector	A.10.09
G4514A	Tray	A.10.16
G4515A	BCR/Mixer	A.10.05
G4516A	ALS Controller Board for 6890 Plus GC	A.01.07
G4517A	ALS Controller for 6890A GC	A.01.07
G2912A	7683B ALS Controller for 6890	A.02.01
G2613A	7683A Injector	A.10.07
G2913A	7683B Injector	A.11.03
G2614A	Tray	A.02.01
G2615A	BCR/Mixer	n/a
G4567A	7650A ALS Injector	A.10.02
G2880A	6850 ALS Injector	A.10.05

Table 12 Agilent Headspace Autosampler

Product number	Description	Firmware Revision
G4556A G4557A	7697A Headspace	A.01.07.1
G1888A	G1888 Headspace	A.01.10

Table 13 Agilent CTC and PAL-xt CTC Sampler with Agilent GC

Product number	Description	Firmware Revision
G6500-CTC	CTC Combi-Pal for Liquid and Headspace Injection	Agilent 2.6.8 or 4.3.0
G6501-CTC	CTC Combi-Pal for Liquid Injection	Agilent 2.6.8 or 4.3.0
G6509-CTC	CTC Combi-Pal for Liquid Injection	Agilent 2.6.8 or 4.3.0
G6502-CTC	CTC GC-Pal for Liquid Injection	Agilent 2.6.8 or 4.3.0
G6501B	Agilent GC Sampler 80 for Liquid Injection	4.3.0
G6502B	Agilent GC Injector 80 for Liquid Injection	4.3.0
G6509B	Agilent GC Sampler 120 for Liquid Injection	4.3.0

Table 14 Agilent CTC PAL-3 Autosampler with Agilent GC

Product number	Description	Firmware Revision
G7366A	PAL RTC 120 Robotic Tool Change X-rail	2.2.3
G9256A	PAL RSI 120 Robotic Sample Injection X-rail	2.2.3
G7368A	PAL RSI 53 Robotic Sample Injection X-rail	2.2.3
G7370A	PAL LSI 53 Liquid Sample Injection X-rail	2.2.3

Agilent GC/MS

Recommended Firmware

Always use the most recent MS Firmware installation package that comes with the driver package.

Agilent GC/MS Single Quad Series

The following GC/MS Models can be controlled with OpenLAB CDS.

Model number / series	Description	Note
5975A 5975B 5975C 5975E 5977A 5977E	MS System	EI only
5977B	MS System	HES and EI supported
7890A 7890B 7820 6890N 6850	GC System	GC's supported as part of GC/MS system - see " Supported GC Systems " on page 59 for details
7693 7683B 7650	GC ALS	Samplers supported as part of GC/MS system - see " Supported Autosamplers " on page 60 for details
PAL-XT PAL-3	CTC	
G7697A G1888	Headspace	

Other supported Agilent Instruments

Other Agilent instruments or modules that you can connect with the latest revision of OpenLAB CDS:

Table 15 Other Agilent modules

Product number	Description	
35900E	35900 A/D Interface	E.01.02
35900E (Series II)		E.02.04
SS420x	A/D Interface	
7667A	Mini Thermal Desorber	

Drivers for non-Agilent Instruments

The following Non-Agilent Instruments can be controlled with OpenLAB CDS 2.2.

NOTE

This list may not be current some time after release. For a current list of supported versions please check in SubscribeNet.

Always download the most recent instrument drivers available from SubscribeNet to control non-Agilent Instruments.

Table 16 Drivers for non-Agilent instruments compatible with OpenLAB CDS 2.2

Part Number	3rd Party Vendor	Driver Type	Instrument Name	Driver Version
M8505BA	Waters	LC	Acquity and Acquity H-Class	A.1.2
M8505BA	Waters	LC	Waters Alliance 2690, Waters Alliance 2695, e-Alliance e2695, Waters 996 PDA, Waters 2996 PDA, Waters 2487 UV, Alliance 2489 DWD, Alliance 2998 PDA	6.1.4
M8237BA	Scion / Bruker/ Varian	GC	430/436 450/456 CP3800, CP3900, and associated Auto-samplers	A.02.02
M8240BA	Shimadzu	LC	LC-20 (Prominence), LC-30 (Nexera), LC-2030 (Prominence-i), LC-2040 (Nexera-i), SPD-M20A/SPD-M30A	Release expected for Oct'17
M8232BA	Shimadzu	GC	GC 2010,GC 2014, GC 2010 Plus, GC-2014C, HS-10, HS-20	Release expected for Oct'17

Table 16 Drivers for non-Agilent instruments compatible with OpenLAB CDS 2.2

Part Number	3rd Party Vendor	Driver Type	Instrument Name	Driver Version
M8224BA	Valco Instruments (VICI)	Valve	EMHCA-CE (High Speed), EMHA-C (Two Position), EMTCA-C (High Torque)	A.01.01
M8236BA	Thermo Fisher	LC	Accela, Surveyor	4.1.4.28
M8241BA	Thermo Fisher	LC, GC and IC	Accela, Surveyor Focus GC, Trace GC Ultra, Trace 1300/1310 plus samplers (TriPlus AS, TriPlus RSH, TriPlus 300 HS, TriPlus 100 LS, AI-1310, AS-1310) Ultimate 3000, Vanquish, Corona Veo and Veo RS, ISC – (900, 1100, 1500, 1600, 2100, 3000, 4000, 5000)	Expected availability within 2017 ¹
M8227BA	Hitachi	LC	Chromaster	Expected availability within 2017 ¹
M8227BA	PerkinElmer	GC	Clarus 400/480/500/600/680	Expected availability within 2017 ¹
	Nexis	GC	2030 High-End Gas Chromatograph	Expected availability within 2017 ¹

¹ For further information, please contact your local Agilent Sales representative

Incompatible Instruments and Modules

The following tables summarize selected instruments or modules that can *not* be controlled with the current revision of OpenLAB CDS.

Incompatible LC and LC/MS Modules

Product Number	Module Name
G1364A-D	Fraction Collector / Fraction Cluster
G5664A	1260 Infinity Bio-inert fraction collector AS
G1377A	1260 Infinity High Performance Micro Autosampler
G1389A	1100 Series Micro Thermostatted Autosampler
G2258A	1260 Infinity Dual-Loop Autosampler
G2260A	1260 Infinity Preparative Autosampler (High flow)
G7157A	1260 Infinity II Preparative Autosampler
G1376A	1260 Infinity Capillary Pump
G2226A	1260 Infinity Nanoflow Pump
G1361A	1260 Infinity Preparative Pump
G7161A	1260 Infinity II Prep Binary Pump
G4218A	1260 Infinity Evaporative Light Scattering Detector
G1390A	UIB
G4240A	1260 Infinity Chip Cube MS Interface
6120B, 6125B 6130B, 6135B 6150B	LC/MS Single Quad modules 6120B, 6125B, 6130B and 6135B systems are supported after upgrade with Smart Card product (G2735N)

Incompatible CE Instruments

OpenLAB CDS 2.2 can *not* be used to control CE Instruments.

Incompatible GC and GC/MS Instruments

Product Number	Instrument Name
4890D	GC system
5890	5890A GC system and 5890 Series II GC system
G1176A	6820 GC system
G1180A	6820 GC system
G2629A	6850 Handheld Controller
G3581A	3000 Micro GC, M200, M400
19405A/B	Sampler Event Control Module (SECM)
18593A 18594A 18596A	7673A GC Autosampler family
18593B 18594B 18596B	7673B GC Autosampler family
G1512A G1513A 18596C	7673C GC Autosampler family
7694A	Headspace
G1289A G1290A G1883A	Headspace
G8130A	Workbench Tray
G7361A	Archon Purge and Trap Auto sampler for Needle Sparge
G7360A	Archon Purge and Trap Auto sampler for Water only
G5975T	Integrated GC/MS
G1926A	Barcode Reader
G4557A	Barcode Reader for 111 vial, not supported on 12 vial
G2403A	LAN/RS232 converter Dudley box
G2629A	6850 Handheld Controller

Agilent VL WorkStation and VL WorkStation Plus instruments

The following subset of the Agilent instrument hardware are compatible with the OpenLAB CDS VL Workstation and OpenLAB CDS VL Workstation with Content Management.

1260 Infinity LC series

Product number	Module Name
G1310B	1260 Infinity Isocratic Pump
G1311B	1260 Infinity Quaternary Pump
G1311C	1260 Infinity Quaternary Pump VL
G1329B	1260 Infinity Standard Autosampler
G1316A	1260 Infinity Thermostatted Column Compartment
G1315C	1260 Infinity Diode Array Detector VL+
G1315D	1260 Infinity Diode Array Detector VL
G4212B	1260 Infinity Diode Array Detector
G1365C	1260 Infinity Multiple Wavelength Detector
G1365D	1260 Infinity Multiple Wavelength Detector VL
G1314B	1260 infinity Variable Wavelength Detector VL
G1314C	1260 Infinity Variable Wavelength Detector VL+
G1314F	1260 Infinity Variable Wavelength Detector
G1321B	1260 Infinity Fluorescence Detector Spectra
G1321C	1260 Infinity Fluorescence Detector
G1362A	1260 Infinity Refractive Index Detector
G1390B	1200 Infinity Series Universal Interface Box II

1260 Infinity II LC series

Product number	Module Name
G7111A/B	1260 Infinity II Quat. Pump
G7110B	1260 Infinity II Isocratic Pump
G7116A	1260 Infinity II Multicolumn Thermostat
G7129A	1260 Infinity II Vialsampler
G7115A	1260 Infinity II Diode Array Detector WR
G7165A	1260 Infinity II Multiple Wavelength Detector
G7114A	1260 Infinity II Variable Wavelength Detector
G7162A	1260 Infinity II Refractive Index Detector
G7121A	1260 Infinity II Fluorescence Detector
G7121B	1260 Infinity II Fluorescence Detector Spectra

Agilent LC Systems

Product Number	Module Name	Minimum Firmware Revision
G4286A	1120 Compact LC, Isocratic	B.06.50
G4286B	1220 Infinity II Isocratic LC System	B.06.50
G4286C	1220 Infinity LC System VL	B.06.50
G4287A	1120 Compact LC, Isocratic with Oven and ALS	B.06.50
G4287B	1220 Infinity LC Isocratic LC System	B.06.50
G4287C	1220 Infinity LC System VL	B.06.50
G4288A	1220 Infinity II Gradient LC System	B.06.50
G4288B	1220 Infinity II Gradient LC System	B.06.50
G4288C	1220 Infinity II Gradient LC System VL	B.06.50
G4289A	1120 Compact LC, Gradient with Oven	B.06.50

4 Instrument Connections

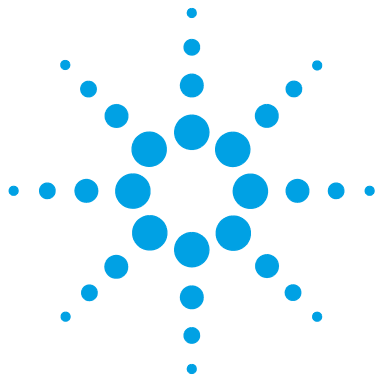
Agilent VL WorkStation and VL WorkStation Plus instruments

Product Number	Module Name	Minimum Firmware Revision
G4289B	1220 Infinity LC Gradient System	B.06.50
G4289C	1220 Infinity LC System VL	B.06.50
G4290A	1120 Compact LC, Gradient with oven and ALS	B.06.50
G4290B	1220 Infinity II Gradient LC System	B.06.50
G4290C	1220 Infinity II Gradient LC System VL	B.06.50
G4291B	1220 Infinity LC System	B.06.50
G4291C	1220 Infinity LC System VL	B.06.50
G4292B	1220 Infinity LC System	B.06.50
G4292C	1220 Infinity LC System VL	B.06.50
G4293B	1220 Infinity LC System	B.06.50
G4293C	1220 Infinity LC System VL	B.06.50
G4294B	1220 Infinity II Gradient DAD LC System	B.06.50

Agilent GC systems

Table 17 GC systems for VL

G4350A	7820 GC System
G3581A	Micro-GC



5 Software Compatibility

Agilent Software 72

Libraries and Databases 73

This chapter contains information on compatibility with other Agilent or Non-Agilent Software.



Agilent Software

The following Agilent software is compatible with version 2.2 of OpenLAB CDS:

- LabAdvisor for LC
- Instrument Utilities for GC
- ACE
- Remote Advisor
- Sample Scheduler 2.0 for OpenLAB CDS
- OpenLAB ELN
- Match Compare

Libraries and Databases

The following libraries and databases are compatible with version 2.2 of OpenLAB CDS:

Thoroughly tested:

- **NIST MS Search/ NIST Library, Revision 2.2 / NIST14**

This library ships with NIST MS Search

Functionally tested libraries are:

- NIST MS Search/ NIST Library revisions:

- 2.0g / NIST11
- 2.0f / NIST08 NIST Functionally tested PLLI
- 2.0f / NIST08Demo

- Wiley/NIST Combined MS Library revisions:

- W10N14

Ships with the NIST MS Search appropriate to the NIST version (N), e.g. W10N14 contains MS Search v2.2.

- W10N14
- W10N11
- W9N08

- Other libraries of NIST format:

Any library in the appropriate NIST format, can be opened in NIST MS Search and a basic search e.g. name search, run against it.

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In This Book

This document details the minimum hardware and software, network requirements, as well as minimum firmware required to run an Agilent OpenLAB Chromatography Data System (CDS), and lists supported instruments. It includes operating system configuration.

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