Agilent

OpenLab CDS

Requirements and Supported Instruments
Workstations, Clients, and Instrument Controller

Notices

Document Information

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This guide is valid for revision 2.6 of Agilent OpenLab CDS.

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In this Guide ...

This document details the minimum hardware and software requirements that need to be met to run an Agilent OpenLab Chromatography Data System (CDS). It is valid for Workstation, Workstation Plus, Client, or Analytical Instrument Controller components. It also lists supported Agilent and Non-Agilent instruments.

For server components, please see the *Agilent OpenLab Server and OpenLab ECM XT Hardware and Software Requirements* guide (ECM_XT_HardwareSoftwareRequirements.pdf), or the respective ECM requirements guide.

Table 1 Terms and abbreviations used in this document

Term	Description
Content Management	Component of OpenLab Server used to manage your analytical data, including a database.
AIC	Agilent's Analytical 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 Requirements

This chapter contains the hardware requirements for the different components of an OpenLab CDS system.

2 Software Requirements

This chapter contains the software requirements for the different components of an OpenLab CDS system.

3 Network Requirements

This chapter contains the network requirements for an OpenLab CDS system.

4 System Preparation Tool

The System Preparation Tool (SPT) checks and applies Windows settings on your machine.

5 Instrument Information

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

6 Software Compatibility

This chapter contains information on compatibility with other Agilent or non-Agilent software.

Contents

1 Hardware Requirements

This chapter contains the hardware requirements for the different components of an OpenLab CDS system.

OpenLab CDS Topologies

OpenLab CDS is available in different topologies. They differ on where the various software components (Clients, Shared Services and, if relevant, Content Management) are located. For details on the topologies refer to the respective installation guide or check with your Agilent representative.

OpenLab CDS Workstation and Workstation Plus

OpenLab CDS Workstation installations include all required components on the same PC.

Workstation

Networked Workstation

Networked Workstation is defined as a PC machine that supports both user interaction (i.e. sample submission and data review and processing) as well as automated functions (i.e. data acquisition and automated processing and printing). For OpenLab CDS, a Networked Workstation is an AIC used interactively for sample submission and data processing. The Client components are installed as part of the AIC installation.

OpenLab CDS Client/Server

With an OpenLab CDS Client/Server installation, you need multiple hardware components (see "OpenLab CDS Client/Server System Topologies" on page 9 for more detail). The *OpenLab CDS* software provides the CDS components on Analytical Instrument Controllers (AICs) and clients. On the server(s), the *OpenLab Server* software provides the Shared Services and Content Management components.

For configurations with multiple servers, you will receive a starter pack with two OpenLab Server software licenses; in addition, you will need an OpenLab Content Management Index server.

OpenLab CDS Client/Server System Topologies

Based on your expected system load, that depends on the number and type of instruments and users, OpenLab CDS Client/Server systems can be deployed with different topologies:

- 1-server all-in-one system (see Figure 1 on page 10),
- 2-server system: (see Figure 2 on page 11),
  - the database is hosted on a separate machine
- 4-server system (see Figure 3 on page 11)
  - Content Management and Shared Services on the first server
  - database on the second server
  - Index server on the third server
  - the file server on the fourth server
- as a Scalable System.

  For more information on scalable systems, please refer to the *Agilent OpenLab Server and OpenLab ECM XT Scalable System installation guide* (available from the **Documentation** tab of the OpenLab installer).

Consult with your Agilent support representative to decide which topology is appropriate for your environment.

The following diagrams are a conceptual representation of the system topology. They are not intended to represent the topology's network architecture.

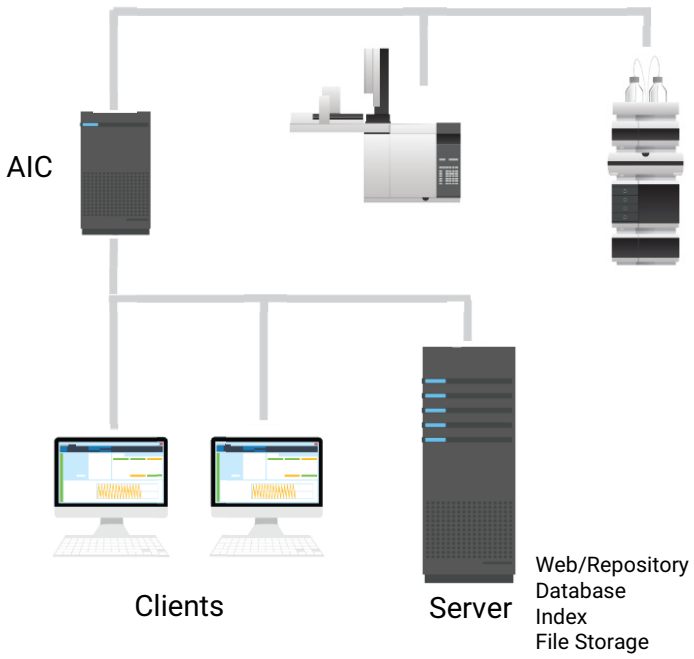


Figure 1 All-in-one topology: Clients and AIC link to one server

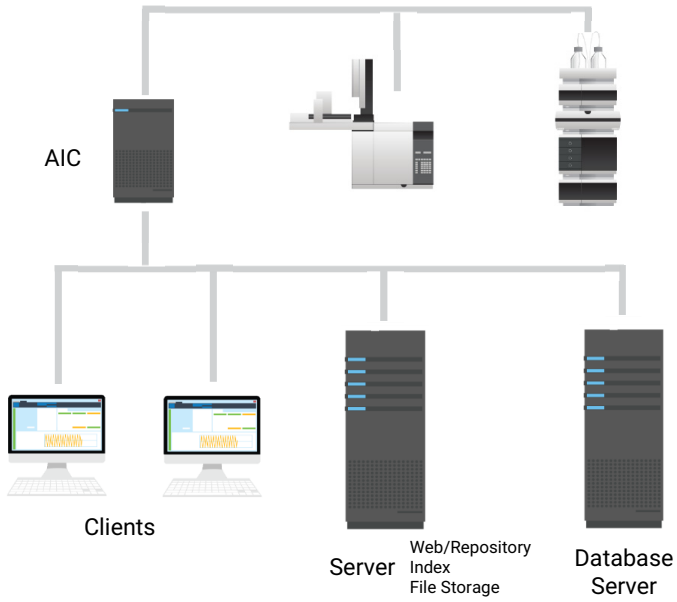


Figure 2 **2-Server topology: Clients and AIC link to two dedicated servers.**

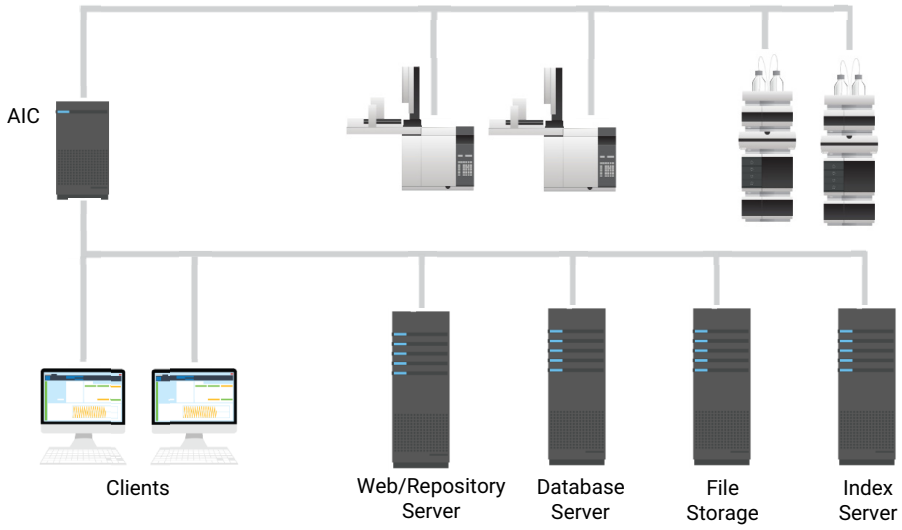


Figure 3 **4-Server topology: For high-load environments with multiple AICs**

Cloud Services Compatibility

OpenLab CDS client/server installations with OpenLab ECM XT as backend can run in an Amazon Web Services (AWS) or Microsoft Azure cloud environment, where OpenLab ECM XT is configured as the secured repository for OpenLab CDS. AWS China and Azure China are not supported; more compatibility statements listed below.

The table below provides a simplified view of the possible cloud configurations. See your Agilent representative for detailed specifications and information on how to deploy OpenLab CDS with OpenLab ECM XT in a cloud environment. Customers with a SMA may also check the guide *OpenLab CDS Configuration in the Cloud* found on the Agilent Software Service Desk (**https://servicedesk.li.agilent.com/plugins/servlet/desk)**.

Table 2 Supported Cloud configurations

OpenLab components	AWS EC2, or Azure VM	Azure File storage, or AWS S3	AWS RDS	Azure SQL (managed)
Workstations	-	-	-	-
Clients	c	c	n/a	n/a
Instrument controller	-	-	n/a	n/a
OpenLab ECM XT server	●	●	n/a	n/a
Index Server	●	●	n/a	n/a
Database Server	●	●	●	c
Content Storage	●	●	n/a	n/a

Terms used:

●	supported	AWS:	Amazon Web Services
-	Not supported	EC2:	Elastic Compute Cloud
n/a:	not applicable	RDS:	Relational Database Service - managed
c:	contact Agilent	S3:	Simple Storage Solution
VM:	Virtual machine	File Storage:	File based storage
		Azure SQL:	Azure database management service

Additional Cloud Service compatibility statements:

- English language only supported
- No support of AWS China nor Azure China
- On-Premises VM hosts must be at less than 50% capacity (client side)
- Azure Active Directory (AAD) is not supported
- Oracle is not supported in the cloud

Check the Agilent website for current information on cloud deployment.

Cloud deployments with OpenLab ECM 3.x as backend are not supported under a standard support agreement.

PC Recommendations

NOTE

The following tables are intended to be guidelines for minimum hardware and may need to be adjusted based on your intended load. Consult with your Agilent support representative to decide which hardware and topology is appropriate for your needs. Factors to consider include number of logical instruments, concurrent users, and other connection points. See also calculations for "Disk Space" on page 22 and "Number of Instruments" on page 18.

Workstation

The table below provides the minimum hardware configuration for Workstations with up to 4 instruments. Includes VL Workstations (Note: VL only supports 1 instrument)

The OpenLab CDS Workstation is available in two flavors: For storage in the local file system (OpenLab CDS Workstation software), or with a built-in Content Management database (OpenLab CDS Workstation Plus software). The workstation with Content Management (OpenLab CDS Workstation Plus) requires higher performing hardware.

Table 3 Minimum recommended hardware configuration for workstations

Item	OpenLab CDS Workstation	OpenLab CDS WS with Content Management
Processor speed (CPU)	Intel® i5, i7, or Xeon E3 or equivalent 3.0 GHz or greater, 4 Core	
Physical memory (RAM)	8 GB for 1-2 instrument or for up to 2 points configured 16 GB for 4 instruments or 3 or more instrument points	16 GB
	Ensure that at least 4 GB is reserved for the Windows operating system.	
Hard disk	1 x 500 GB 7200 RPM SATA drive minimum SSD drive recommended for better performance See Table 12 on page 22	2 x 500 GB or 1 TB 7200 RPM SATA drive minimum[1] SSD drive recommended for better performance See Table 12 on page 22

Table 3 Minimum recommended hardware configuration for workstations

Item	OpenLab CDS Workstation	OpenLab CDS WS with Content Management
Graphic Resolution	1600 x 900 minimum 1920 x 1080 recommended	
RS-232 port	1 serial port required for selected instruments that are still using RS-232 communication. See instrument specifications for details.	
USB port	USB 2 required for installation via provided media	
LAN card	100 MB/1 GB LAN for instrument control 2nd LAN card required for lab intranet connection	

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

Recommended PCs for OpenLab CDS (as tested by Agilent, for Win 10 (64bit)):

- OpenLab CDS Workstation with File System storage: HP Z2 G4 Workstation: Intel Core i5 9500 3.0 GHz, with 8 GB RAM + option to add 8 GB,
- OpenLab CDS WS with Content Management: HP Z2 G4 Workstation: Intel Core i5 9500 3.6 GHz, with 16 GB RAM.

Client

Table 4 Tested and recommended hardware configuration for a client

Item	HW requirements
Processor	Intel® i5, i7, or Xeon E3 or equivalent 3.0 GHz or greater 4 Core
Physical memory (RAM)	8 GB
	Ensure that at least 4 GB is reserved for the Windows operating system.
Hard disk	500 GB 7200 RPM SATA drives minimum or equivalent solid state drive
USB port	USB 2 required for installation via provided media
LAN Card	100 MB/1 GB LAN for instrument control
Graphic resolution	1600 x 900 minimum 1920 x 1080 recommended

Recommended PC, as tested by Agilent, for Win 10 (64 Bit): HP Z2 G4 with 8GB RAM

Analytical Instrument Controller (AIC)

The below table is applicable for AICs with up to 6 instruments. For AIC's configured with fewer instruments, the amount of memory required by the system may be decreased.

Table 5 Tested and recommended hardware for a non-bundle Instrument Controller

Item	HW requirements
Processor	Intel® i5, i7, or Xeon E3 or equivalent 3.0 GHz or greater, 4 Core
Physical memory (RAM)	16 GB reserve at least 4 GB for the Windows operating system.
Hard disk	2 x 500 GB or 1 TB 7200 RPM SATA drive minimum SSD drive recommended for better performance If the computer has a disc array controller Agilent recommends 2 x 1 TB in RAID1.
RS-232 port	1 serial port required for selected instruments that are still using RS-223 communication. See instrument specifications for details.
USB port	USB 2 required for installation via provided media
LAN card	100 MB/1 GB LAN for instrument control 2nd LAN card required for house, to isolate the instrument's data traffic from the lab intranet connection.
Graphic resolution (Monitor required for failover mode only)	1600 x 900 minimum 1920 x 1080 recommended

Recommended PC, as tested by Agilent, for OpenLab CDS AICs:

- HP Z2 G4 Workstation: Intel Core i5 9500 3.6 GHz, with 16 GB RAM

Shared Services Server

A separate Shared Services server is needed for configurations with OpenLab ECM as storage backend. For more information, please refer to the *Configuring OpenLab with ECM* guide. It is available from the **Planning** tab of the OpenLab installer (**OpenLab Shared Services Server** branch).

Number of Instruments

Instrument / Logical Instrument An analytical system, made up of one or more modules that are configured together to achieve the desired analytical functionality. Also known as a system, i.e. an LC/MSD system.

Points The relative level of load (load value) that an instrument or module puts on a physical or virtual system, aggregating CPU and RAM (memory) consumption. Different types of detectors require more processing power and memory than others, so they have been assigned higher "point" values.

Concurrent sessions The number of simultaneous connections to the system. This includes user connections and instrument connections. For OpenLab CDS, use Points as the measure of instrumentation as this reflects both number of instruments and the amount of data generated by each instrument system. See below for examples of number of points per instrument type.

Connections Connection Licenses refer to the licenses required in the software in order to run a specific instrument configuration. Note: Points do not equal instrument connection licenses.

The instrument capacity (number of configurable instruments) per Workstation or AIC depends on the type of instrument configured. Work with your Agilent representative to ensure your system is configured sufficiently for your projected number of users, concurrent sessions, instruments, and load.

You can configure any number of instruments that sum up to *4* instrument points per OpenLab CDS Workstation (Standard configuration). Per OpenLab CDS VL Workstation you can configure 1 instrument with up to 2 instrument points.

Table 6 Number of Instruments per Workstation

OpenLab CDS standard configuration	number of instrument points
Standalone Workstation	Up to 4 points
Standalone Workstation with Content Management	Up to 4 points
Standalone VL Workstation	1 instrument; up to 2 points
Standalone VL Workstation with Content Management	1 instrument; up to 2 points

Table 7 Number of Instruments per AIC

OpenLab CDS AIC	Instrument points per AIC[1]
Standalone PC	Up to 6 points
Virtualized PC[2]	Up to 6 points
Networked WorkStation	Up to 4 points
Client/Server	Scalable, with 6 points per AIC.

[1] For customers migrating from OpenLab ChemStation their existing computer hardware is supported. In this case it is possible to configure up to 10 points per AIC. See OpenLab ChemStation documentation for ChemStation AIC specifications

[2] AIC virtualization is supported but not recommended

Load Approximations

The following tables provide some guidance how to approximate load-based requirements for different instruments. Note that the load is also depending on actual instrument utilization and number of users.

Table 8 Capacity (Points vs Connections) – Agilent Liquid Chromatography Instruments

Module Type	Instrument Points (load value)	Connection Licenses
LC Instrument (= injector + pump + 2D detector[1] such as VWD)	1	1
Additional LC 2D detector	0	0
LC 3D detector (such as DAD or (3D)FLD)	1	1
HDR (High Dynamic Range)	2	1
Additional LC 3D detector	0	0[2]
MSD (Single quadrupole mass spectrograph)	2	1
OpenLab CDS Client	2	0

[1] Includes any detector connected via an Analog-to-Digital converter

[2] Assuming the same DAD model or a 3D-FLD. If a different DAD model is configured, an additional license is required

Table 9 Capacity (Points vs Connections) – Agilent Gas Chromatography Instruments

Module Type	Instrument Points (load value)	Connection Licenses
GC Instrument (GC=Inlet + detector i.e. FID[1])	1	1
Additional GC detector/ Headspace	0	0
GC Sampler e.g. PAL, Headspace	0	0
MSD (Single quadrupole mass spectrometer)	2	1
OpenLab CDS Client	2	0

[1] Includes any detector connected via an Analog-to-Digital converter

Table 10 Capacity (Points vs Connections) – Other

	Point Value (load value)	Connection Licenses
A2D instrument[1]	1	1 Non-Agilent Instrument connection
Agilent Instrument with A2D[2]	0	0
Non-Agilent Instrument with A2D[3]	0	0
Test Services (QualA)	1	0

[1] For a system that is configured using only an A2D module

[2] For a system that includes an A2D module as part of a supported Agilent instrument configuration, e.g. a 8890 with additional detector connected through A2D

[3] For a system that includes an A2D module as part of a supported non-Agilent instrument configuration, e.g. Waters LC with additional detector connected through A2D

NOTE The instruments points can be different for non-Agilent instruments. Please check the respective driver documentation.

Capacity approximations for some example configurations:

Table 11 Examples

System	Points (Capacity)	Connections (Licenses)
LC + DAD	2 points	2 Connections (1x LC + 1x LC 3D)
LC + HDR DAD	3 points	2 Connections (1 x LC + 1 x LC 3D)
LC + DAD + FLD	2 points	2 Connections (1 x LC + 1 x LC 3D)
LC + MS	3 points	2 Connections (1x LC + 1x MS)
LC + MS + DAD	4 points	3 Connections (1x LC + 1x MS + 1xLC 3D)
GC with HS	1 point	1 Connection (1x GC; HSS is 0 connections)
GC + MS	3 points	2 Connections (1x GC +1x MS)

Disk Space

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

Table 12 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

Recommended OpenLab Server / OpenLab ECM XT configurations

Table 13 Recommended OpenLab Server / OpenLab ECM XT configurations

Concurrent Sessions[1]	Instruments in Lab	Recommended OpenLab Server Configuration
Up to 50	Up to 25	All-in-One Server
Up to 90	Up to 50	Two-server
Up to 115	Up to 100	Four-server
Up to 290	Above 100	Scalable

[1] see Definition of Capacity (Points vs Connections) for details on how to calculate Concurrent Sessions for OpenLab CDS

2 Software Requirements

This chapter contains the software requirements for the different components of an OpenLab CDS system.

General Software Requirements

Component	Details
.NET framework	Both versions are required: • .NET 3.5.x and • .NET 4.x (will be installed by the OpenLab Installer if needed)
Web browser	• Google Chrome 40 or higher • Microsoft Edge (Chromium-based, as provided with the supported Win10 versions) • Internet Explorer 11 (for backwards compatibility only; not supported for Test Services, and Sample Scheduler for OpenLab)
Antivirus software[1]	• Symantec Endpoint Protection • Trend Micro • Microsoft Security Essentials • McAfee

[1] The listed antivirus software has been tested and is recommended by Agilent. However, the support is not limited to this software. Check with your Agilent service person in case you want to use other software.

You may use a PDF viewer to open PDF manuals in OpenLab Help & Learning. The PDF viewer is not required for the system to function correctly.

Operating Systems

Supported Operating Systems

Table 14 Supported Operating Systems

Windows Product	Workstation	Networked WorkStation[1]	Client	AIC
Windows 10 Pro, 64 bit (version 2004 or higher) Windows 10 Enterprise, 64 bit (version 1909 or higher)	✓	✓	✓	✓
Windows Server 2016 64-bit Standard or Datacenter	✗	✓[2]	✓[3]	✓[2]
Windows Server 2019 64-bit Standard or Datacenter	✗	✓[2]	✓[3]	✓[2]

[1] Networked WorkStation is defined as a PC machine that supports both user interaction (i.e. sample submission and data review and processing) as well as automated functions (i.e. data acquisition and automated processing and printing). For OpenLab CDS a Networked Workstation is an AIC used interactively for sample submission and data processing.

[2] supported, but not recommended

[3] virtual environment

For Windows 10 LTSC, 64 bit: Please contact your Agilent representative.

Language Compatibility

User interfaces are displayed in the language of the Windows operating system for the following languages:

- English
- Chinese
- Japanese
- Brazilian Portuguese
- Russian

The English language OpenLab CDS software is also supported with Western European language operating systems, provided the OS Regional Settings are configured correctly. Note, that Test Services (QualA) are supported only with English, Chinese, Japanese and Brazilian Portuguese Windows OS languages.

Non-localized instrument drivers are supported; They will appear in English even when running localized versions of OpenLab CDS.

NOTE Customized locale settings might be required for Non-Agilent drivers. Please check the localization statement in the driver documentation.

Database

OpenLab CDS Workstation uses a PostgreSQL database to host the Data Repository.

OpenLab CDS Workstation Plus uses a PostgreSQL database for Shared Services, the Data Repository and Content Management. It is installed and configured automatically during installation. Agilent supports only the use of the PostgreSQL version as installed by the OpenLab software.

For information on Content Management Databases please refer to OpenLab Server / OpenLab ECM XT, or OpenLab ECM documentation, respectively.

For information on Databases for standalone Shared Services Server please check the manual "Configuring OpenLab CDS with OpenLab ECM".

Virtualization

OpenLab CDS supports two separate virtualization technologies: *Application Publishing Technologies* such as Microsoft Remote Desktop Services (RDS/Terminal Server) and *Operating System Virtualization Technologies* such as Hyper-V for Windows Server, sometimes known as hardware virtualization.

Thin Client or Remote Access

OpenLab CDS has been tested with the following virtualization software. Note that the resource requirements are equal to those of the physical machines. On-Premises VM hosts must be at less than 50% capacity (client side).

Tested client application virtualization software

- Microsoft Remote Desktop Services (RDS/Terminal Server)

  Additional Information from Microsoft:
  https://docs.microsoft.com/en-us/windows-server/remote/remote-desktop-services/rds-deploy-infrastructure
- Citrix XenApp

  Additional Information from Citrix:
  https://docs.citrix.com/en-us/citrix-application-delivery-management-software/current-release/deploy.html

NOTE

For Citrix or plain Windows RDS, at least the **OpenLab Control Panel** needs to be registered on the server side to be shared for 'thin client' access. For the default installation folder this is: C:\Program Files (x86)\Agilent Technologies\OpenLab Services\UI\Agilent.OpenLab.ControlPanel.exe.

Further programs to optionally register for sharing are:

- OpenLab Help and Learning - C:\Program Files (x86)\Agilent Technologies\OpenLabHelp\en\index.htm
- Parts Finder - C:\Program Files (x86)\Agilent Technologies\Parts Finder\Parts Finder\PartsFinder.exe
- IMPORT - eMethod - C:\Program Files (x86)\Agilent Technologies\eMethodWizard\Agilent.eMethodWizard.OpenLabCDS.exe

NOTE

Be aware of a potential conflict when using an All-in-one Citrix environment: Both Citrix and OpenLab CDS use port 27000 for the License Manager Daemon. See "Firewall Settings" on page 40.

Tested client application virtualization software:

- VMware vSphere for Windows Server 2016 and 2019
- Hyper-V for Windows Server

NOTE

To prevent OpenLab CDS licensing issues when using client application virtualization software, disable the (default) dynamic MAC Address. The product licensing is based on the Mac address of the server. A change of Mac Address, will break licensing and the application won't be functional.

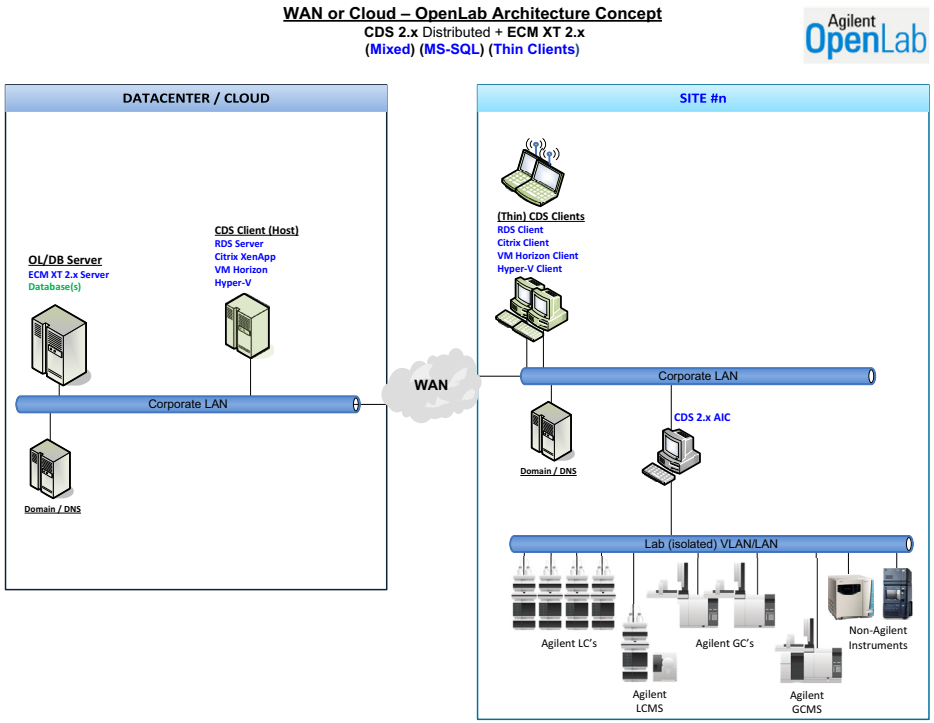


Figure 4 Example Topology

Please contact Agilent if you are interested in other application publishing technologies such as VMWare Horizon View.

AICs

Virtualizing AICs is supported with VMWare vSphere.

Agilent does not recommend virtualizing AICs due to the added risks associated with not locating the AIC near to the instrumentation. The Instrument-to-AIC connection is outside of the OpenLab communication redundancy protocols and, to reduce the chance of non-recoverable communication issues, it is recommended that this connection be in a local network. It is the responsibility of the customer to make the appropriate risk assessment when choosing where and how to deploy the AIC within their environment.

More Information

For details on virtualization of OpenLab servers please check the *OpenLab Server and ECM XT Hardware and Software Requirements Guide* (ECM_XT_HardwareSoftwareRequirements.pdf), or contact your Agilent support representative.

Licensing

OpenLab CDS uses FlexNet Publisher (v. 11.12) for the distribution and tracking of license entitlements. This software is installed with the OpenLab CDS components.

3 Network Requirements

This chapter contains the network requirements for an OpenLab CDS system.

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.

Use of other network topologies, such as wide area networks (WAN), are considered *non- standard configurations* and it is your responsibility to ensure performance to these specifications.

Cloud topologies are supported for OpenLab CDS. Please see "Cloud Services Compatibility" on page 12 for details.

Network Specifications

The specifications provided below apply to one or several of the following OpenLab network points:

- Client running OpenLab CDS
- Analytical Instrument Controller (AIC)
- Content Management server (OpenLab Server, ECM, or ECM XT)
- Shared Services Server (only in conjunction with OpenLab ECM 3.x.)
- Database Server
- File Server

The following diagram gives an overview of OpenLab network recommendations. Depending on the OpenLab products you have configured, your network may or may not include all of the network components described here.

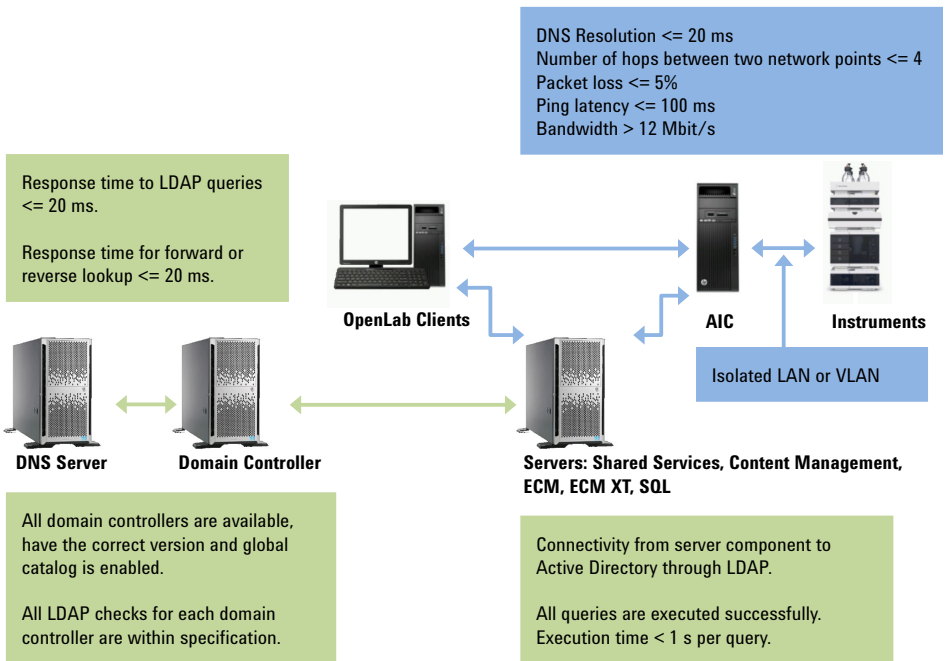


Figure 5 Specification summary (without IaaS)

Table 15 Basic network requirements

Check	Specification
Max MTU for Local Interfaces	> 999
MTU size	MTU size on all segments of the packet path is the same
IP Address Resolution Time (DNS Resolution)	<= 20 ms <= 200 ms server to internet
Number of hops between two network points	<= 4 <= 2 for Shared Services Server and SQL Server <= 2 for Shared Services Server and Content Management Server
Packet loss	<= 5 %
Percentage of loss by using ICMP protocol	0 %
Ping latency	<= 100 ms
Bandwidth	> 12 Mbps
Overall throughput for TCP and UDP protocols	>= 10 Mbps >= 100 Mbps for Shared Services Server and SQL Server >= 100 Mbps for Shared Services Server and Content Management Server >= 100 Mbps for ECM Server and Client
Connectivity from server component to Active Directory through LDAP: • Retrieve 2000 users from AD • Get all available domains • Get global catalog	All queries are executed successfully. Execution time is < 1 s per query.
All domains trusted from the currently running domain: • Domain Controller is available and the tool can establish connection • Requires domain functional levels Windows Server 2008 or higher • Global catalog is enabled • Run all standard LDAP Checks	All domain controllers are available, have the correct version and global catalog is enabled. All LDAP checks for each domain controller are within specification.

Table 16 Additional network requirements for Shared Services Server and Domain Controller Server

Check	Specification
Response time to LDAP queries	<= 20 ms

Additional network specifications for connections with a DNS Server:

- Shared Service Server and DNS Server
- ECM Server and DNS Server
- SQL Server and DNS Server
- Client and DNS Server

Table 17 Additional network specifications for DNS Server

Check	Specification
Response time for forward lookup like nslookup	<= 20 ms
Response time for reverse lookup like nslookup	<= 20 ms

About LAN Communications

When using LAN communications to connect workstations 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.

NOTE The J4100 Jet Direct Card is not supported. For example, use a G1369 LAN interface card instead.

- NIC teaming: 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.

Power Management

Avoid data capture or transfer interruptions in your data acquisition system by making network 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**[1].
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] View the items by icon to see a list of all items.

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, users must not operate using an administrator account.

Firewall Settings

Terms used in the following tables

ATS	Audit Trail Service
CertSvc	Certificate Service
CM	Content Management
DCS	Data Collection Service
DR	Data Repository
OLSS	OpenLab Shared Services

If you are using a third party firewall or antivirus software on a network with OpenLab CDS, you need to open the firewall ports listed in the following tables 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.The OpenLab CDS installer will automatically open these ports on an enabled Windows firewall during installation.

OpenLab Server or OpenLab ECM XT Server

Table 18 OpenLab Server - Inbound Rules

Application	Protocol	Port	Remote System	Description
CM Server[1]	FTP	21	Any	[Optional] Only if FTP service is turned on for OpenLab Server. By default it is off.
OpenLab Reverse Proxy (Apache HTTPD)	HTTP	80	Any	OpenLab Reverse Proxy
OpenLab Reverse Proxy (Apache HTTPD)	HTTPS	443	Any	OpenLab Reverse Proxy

Table 18 OpenLab Server - Inbound Rules

Application	Protocol	Port	Remote System	Description
OLSS Diagnostics	TCP (WCF)	3424	Clients, AICs, Servers	Used for collecting diagnostic logs
Content Management PostgreSQL Server	TCP	5432	Alfresco	For database access
DR PostgreSQL Server	TCP	5433	DR Services	Database port (Firewall rule gets applied during installation of DR) Used by all internal and external applications + services, which connect against DR/PG: DCS, Audit Trail Service, Test Services (QualA) .....
CM Server[1]	TCP	5701	Cluster Servers	OpenLab Server Cluster between the nodes Used by Tomcat.
Data Collection Service (DCS) [2]	HTTP	6328	Any	DCS Legacy Port (ChemStation and CDS 2.4 and earlier).
OLSS Server	TCP	6570	Clients, AICs	OpenLab Licensing (Flexera) Server
OLSS Server	TCP (WCF)	6577	Clients, AICs	OpenLab Shared Services WCF API
OLSS Server	HTTP	6624	Clients, AICs, Others	Legacy Shared Services REST API Legacy Licensing Support service REST API
OLSS Server	HTTP	6625	Clients, AICs	Shared Services REST API Licensing Support service REST API
OLSS Server	TCP	8084	Clients, AICs	Licensing Support service WCF API
OLSS Server	TCP	8085 - 8099	Clients, AICs	OpenLab Licensing view-only web UI (Flexera). Default is 8090. Other ports may be used if 8090 is in use.
CM Server[1]	HTTPS	8443	CM and Index Server	OpenLab Server website and REST APIs for index service
CM Search Service[3]	TCP	8983	Internal from CM	Search Service (Index Server) Used by Java.
CM Server[1]	HTTP	9083	Internal (accessed via Reverse Proxy only)	OpenLab Server website and REST APIs

Table 18 OpenLab Server - Inbound Rules

Application	Protocol	Port	Remote System	Description
Test Services (QualA)	HTTPS	9092	Any	Test Services Web Service hosts REST APIs and website on this port. The port number can be changed using Test Services Config tool.
Reverse Proxy Configuration Service[4]	HTTP	12876	Internal (accessible on localhost only)	Reverse Proxy Configuration Service hosts REST APIs to configure the Reverse Proxy Server (by programmatically modifying the configuration file).
OLSS Server	TCP	27000 - 27009	Clients, AICs	OpenLab Licensing (Flexera) Server
Data Collection Service[2] CertSvc[5] Audit Trail Service OLSS Server	HTTPS	52088	Any	Data Collection Service Certificate Service Audit Trail Service Shared Services REST API Licensing Support services REST API Test Services (QualA) Central Mgmt Service Sample Scheduler Webserver
RabbitMQ Server	TCP	5671, 5672	Any	AMQP Ports (http, https)
		15671, 15672	Any	RabbitMQ Management UI (http/https)
		4369	Server, Clients	Peer discovery service (used by RabbitMQ nodes and CLI tools)

1 C:\Program Files (x86)\Agilent Technologies\OpenLAB Data Store\tomcat\bin\tomcat8.exe

2 C:\Program Files\Agilent Technologies\OpenLab Data Collection Server\Bin\DataCollectionService.exe

3 C:\Program Files (x86)\Agilent Technologies\OpenLAB Data Store\java\bin\java.exe

4 C:\Program Files (x86)\Agilent Technologies\OpenLab Reverse Proxy Configuration Service\ConfigurationService\Agilent.OpenLab.ReverseProxy.ConfigurationService.exe

5 No program configured in Windows Firewall - exe path is: C:\Program Files\Agilent Technologies\OpenLab Certificate Service\Bin\Agilent.OpenLab.CertService.CertServiceCore.exe

Table 19 OpenLab Server - Outbound Rules

Application	Protocol	Port	Remote System	Description
OLSS Server	TCP	25	Email Server	If email server uses a different port, or uses secure ports, the destination port will be different.
OLSS Server	TCP/UDP	53	DNS Server	DNS
OLSS Server	TCP/UDP	67, 68	DHCP Server	DHCP or BootP
OLSS Server	TCP	137 -139	NetBios WINS	For NetBios/Name resolution for NT Share
OLSS Server	TCP	389	LDAP Server	LDAP
OLSS Server	TCP	445	NAS/Share Server	Server Message Block (SMB). Used for storage on a remote NAS share.
OLSS Server	TCP	636	Secure LDAP Server	Secure LDAP
CM Server, OLSS	TCP	1433	SQL Server	Only when using MS SQL Server. Configurable.
CM Server, OLSS	UDP	1434	SQL Server	Only when using MS SQL Server. UDP
CM Server, OLSS	TCP	1521	Oracle Server	Only when using Oracle Server. Configurable.
OLSS Server	TCP	3268	LDAP Server	Global Catalog LDAP
OLSS Server	TCP	3269	LDAP Server	Global Catalog LDAP SSL
CM Server, OLSS	TCP	5432	PostgreSQL Server	Only when using external PostgreSQL Server. Configurable

ECM XT Add-ons

Table 20 ECM XT Add-ons - Inbound Rules

Application	Protocol	Port	Remote System	Description
Import Scheduler	HTTP	9091	Server, Services for CM	Import Scheduler communication port for Web UI and REST API
Import Scheduler	HTTPS	9093	Server, Services for CM	Import Scheduler communication port for Web UI and REST API

OpenLab CDS AICs

Table 21 AIC - Inbound Rules

Application	Protocol	Port	Remote System	Description
OLSS Storage Client	TCP	2886	localhost	OpenLab Automation Server, used by Storage client
OLSS Diagnostics	TCP	3424	Clients, AICs, Servers	Used for collecting diagnostics logs.
OLSS Storage Client	HTTP	6628	Clients	Remote Work Area REST API
OLSS Storage Client	HTTPS	6629	Clients	Remote Work Area REST API
Test Services (QualA)	TCP	9092	Any	Test Services Web Service hosts REST APIs and website on this port. The port number can be changed using Test Services Config tool.
Acquisition	TCP	9753	Clients	CDS 2.5 or earlier Messaging communication
Acquisition	HTTPS	9753	Clients	CDS 2.6 or later Messaging communication

Table 22 AIC - Outbound Rules

Application	Protocol	Port	Remote System	Description
	TCP/UDP	53	DNS Server	DNS
	TCP/UDP	67, 68	DHCP Server	DHCP or BootP
CM	TCP	80	OpenLab Server	OpenLab Server website and REST APIs.
CM	TCP	443	OpenLab Server	OpenLab Server secure website & Secure REST APIs. Needed only if HTTPS is used.
OLSS Licensing API	TCP	6570	OpenLab Server	OpenLab Licensing (Flexera) Server
OLSS Client API	TCP	6577	OpenLab Server	OpenLab Shared Services WCF APIs
OLSS Client API, Control Panel	HTTP	6624	Clients, AICs, Others	Legacy Shared Services REST API Legacy Licensing Support service REST API
Control Panel	HTTP	6625	Clients, AICs	Shared Services REST API Licensing Support service REST API
Control Panel	TCP	8084	Clients, AICs	Licensing Support service WCF API
Control Panel	TCP	8085 - 8099	OpenLab Server	OpenLab Licensing view-only Web UI (Flexera). Default is 8090. If 8090 is in use, other ports may be used.
Control Panel	TCP	27000 - 27009	OpenLab Server	OpenLab Licensing (Flexera) Server
Control Panel	HTTPS	52088	Any	Shared Services REST API
OLCF Data Collection API, Data Collection Agent	HTTP HTTPS	6328 52088	OpenLab Server	Data Collection Service, 6328 used as fallback only if https is not available
Sample Scheduler	HTTPS	52088	OpenLab Server	Sample Scheduler activation check
Sample Scheduler	TCP	5433	OpenLab Server	Sample Scheduler OLDR connection (only if activated, only if OLDR configuration)

Please see the Table 29 on page 50 and Table 30 on page 52 sections for additional ports that are used by an AIC to communicate with instruments.

OpenLab CDS Clients

Table 23 Client - Inbound Rules

Application	Protocol	Port	Remote System	Description
OLSS Storage Client	TCP	2886	localhost	OpenLab Automation Service
Control Panel	TCP	3424	Clients, AICs, Servers	Used for collecting diagnostics logs
Test Services (QualA)	TCP	9092	Any	Test Services Web Service hosts REST APIs and website on this port. The port number can be changed using Test Services Config tool

Table 24 Client - Outbound Rules

Application	Protocol	Port	Remote System	Description/Comments
	TCP/UDP	53	DNS Server	DNS
	TCP/UDP	67, 68	DHCP Server	DHCP or BootP
	TCP	80	OpenLab Server	OpenLab Server website and REST APIs.
	TCP	443	OpenLab Server	OpenLab Server secure website & Secure REST APIs. Needed only if HTTPS is used.
OLSS Licensing API	TCP	6570	OpenLab Server	OpenLab Licensing (Flexera) Server
OLSS Client API	TCP	6577	OpenLab Server	OpenLab Shared Services WCF APIs
OLSS Client API, Control Panel	HTTP	6624	Clients, AICs, Others	Legacy Shared Services REST API Legacy Licensing Support service REST API
Control Panel	HTTP	6625	Clients, AICs	Shared Services REST API Licensing Support service REST API
	TCP	6628	AIC	Agilent OpenLab remote work area. Client talks to AICs on this port
Control Panel	TCP	8084	Clients, AICs	Licensing Support service WCF API

Table 24 Client - Outbound Rules

Application	Protocol	Port	Remote System	Description/Comments
Control Panel	TCP	8085 - 8099	OpenLab Server	OpenLab Licensing view-only web UI (Flexera). Default is 8090. If 8090 is in use, Flexera web UI is automatically moved to another port in the 8085-8099 range
Acquisition	TCP	9753	AIC	CDS 2.5 or earlier Messaging communication
Acquisition	HTTPS	9753	AIC	CDS 2.6 or later Messaging communication
Control Panel	TCP	27000 -27009	OpenLab Server	OpenLab Licensing (Flexera) Server
Control Panel	HTTPS	52088	Any	Shared Services REST API
OLCF Data Collection API, Data Collection Agent	HTTP HTTPS	6328 52088	OpenLab Server	Data Collection Service, 6328 used as fallback only if https is not available
Sample Scheduler	HTTPS	52088	OpenLab Server	Sample Scheduler activation check
Sample Scheduler	TCP	5433	OpenLab Server	Sample Scheduler OLDR connection (only if activated, only if OLDR configuration)

OpenLab ECM 3.x Server

Table 25 ECM 3.x Server - Inbound Rules

Application	Protocol	Port	Remote System	Description
	TCP	80	Clients	OpenLab ECM Server website and REST APIs operate on this port. Configurable.
	TCP	443	Clients	OpenLab ECM Server secure website & REST APIs operate on this port.
Reverse Proxy Configuration Service[1]	HTTP	12876	Internal (accessible on localhost only)	Reverse Proxy Configuration Service hosts REST APIs to configure the Reverse Proxy Server's configuration file. Currently, this modifies the Apache HTTPD server's httpd.conf file.

[1] C:\Program Files (x86)\Agilent Technologies\OpenLab Reverse Proxy Configuration Service\ConfigurationService\Agilent.OpenLab.ReverseProxy.ConfigurationService.exe

Table 26 ECM 3.x Server - Outbound Rules

Protocol	Port	Remote System	Description
TCP	25	Email Server	If email server uses a different port, it can be specified in OpenLab Control Panel.
TCP/UDP	53	DNS Server	DNS
TCP/UDP	67, 68	DHCP Server	DHCP or BootP
UDP	161		Simple Network Management Protocol (SNMP)
TCP	389	LDAP Server	LDAP
TCP	636	Secure LDAP Server	Secure LDAP
TCP	1433	SQL Server	Only when using MS SQL Server. Configurable.
UDP	1434	SQL Server	Only when using MS SQL Server. UDP
TCP	1521	Oracle Server	Only when using Oracle Server. Configurable.
TCP	3268	LDAP Server	Global Catalog LDAP
TCP	3269	LDAP Server	Global Catalog LDAP SSL

Table 26 ECM 3.x Server - Outbound Rules

Protocol	Port	Remote System	Description
TCP	8211	ECM Comm Service	If caller is a Service
TCP	18211	ECM Comm Service	If caller is Forms Host

OpenLab ECM 3.x Clients

Table 27 ECM 3.x Client - Inbound Rules

Protocol	Port	Remote System	Description
TCP	1801	MSMQ	MSMQ messages used in ECM Scheduler Agent

Table 28 ECM 3.x Client - Outbound Rules

Protocol	Port	Remote System	Description
TCP/UDP	53	DNS Server	DNS
TCP/UDP	67, 68	DHCP Server	DHCP or BootP
UDP	161		Simple Network Management Protocol (SNMP)
TCP	389	LDAP Server	LDAP
TCP	636	Secure LDAP Server	Secure LDAP

Instrument Communication

Table 29 Instruments - Inbound Rules

Protocol	Port	Remote System	Description
TCP, UDP	20	AIC, Workstation	FTP is required for some instruments.
TCP	21	AIC, Workstation	GC/MSD Firmware Installation (FTP). Needs to be open from PC used for FW update to instrument
TCP	22	AIC, Workstation	SFTP: Firmware installation & SmartCard Trace (7000 series GC-Triple-Quad, 7200A GC-QTOF)
TCP, UDP	23	AIC, Workstation	Required for all LC. Telnet: GC/MS Firmware installation & SmartCard Trace (MSD, GC Triple Quad, Q-TOF)
SMTP	25	AIC, Workstation	Instrument communication (MSD, 7000 series GC/MS)
TCP	37	AIC, Workstation	Firmware installation & SmartCard Trace (7000 series GC-QQQ, 7200A GC-QTOF)
UDP	69	AIC, Workstation	TFTP: Required for communication with legacy Instruments (Jet Direct Cards)
TCP	80	AIC, Workstation	Embedded web server (9000 and 88x0 series GC, and 5977, 5975 & 5973 MSDs)
UDP	111	AIC, Workstation	7000 Series Triple Quad GC/MS
TCP	113	AIC, Workstation	GC/MS instrument communication (7000 Series Triple Quad, 7200A GC-QTOF) auth
UDP	512	AIC, Workstation	GC/MS instrument communication (7000 Series Triple Quad, 7200A GC-QTOF) biff
TCP	1007, 1024 -1026	AIC, Workstation	LC/MS and GC/MS instrument communication (5975, 5973 MSD)
TCP	2883 -2886 3068, 3071	AIC, Workstation	GC/MSD Instrument control (5975, 5973 MSD) (Proprietary/SunRPC/TCP)
TCP	4879	AIC, Workstation	Instrument communication (Headspace)

Table 29 Instruments - Inbound Rules

Protocol	Port	Remote System	Description
TCP	5123	AIC, Workstation	GC/MS Firmware backdoor (7000 Series Triple Quad, 7200A GC-QTOF)
TCP	5813	AIC, Workstation	GC/MSD Firmware installation (ICMP/Ping)
TCP	5973	AIC, Workstation	GC/MSD Instrument control (Proprietary/SunRPC/TCP)
TCP	6001	AIC, Workstation	GC/MSD instrument communication (7200A GC-QTOF)
TCP	6002	AIC, Workstation	GC/MSD instrument communication (7000 Series Triple Quad)
TCP	7972, 7973	AIC, Workstation	GC/MSD Instrument Control (5977)
TCP	7980 -7983	AIC, Workstation	GC, GC/MSD Instrument Control (5977)
TCP	8194	AIC, Workstation	PAL3, data subscription
TCP	9001, 9002	AIC, Workstation	Instrument communication (GC, LC)
TCP	9100	AIC, Workstation	Instrument communication (GC, LC, 35900)
TCP	9101, 9102	AIC, Workstation	Instrument control (LC, GC (9000, 88x0, 78x0, 68x0 series), 7697Headspace)
TCP	9110	AIC, Workstation	Instrument control (GC, LC)
TCP	9111	AIC, Workstation	Instrument control (8697 Headspace)
TCP	10000 -10020	AIC, Workstation	Instrument communication (GC 78xx, 88xx, 9000)
TCP	30718	AIC, Workstation	Instrument utilities
TCP	55055 -55057	AIC, Workstation	Instrument utilities, Instrument diagnostics (7696A)
UDP	55065	AIC, Workstation	Direct Communication (5977 MSD, 7890B GC)
TCP	60000	AIC, Workstation	Instrument Control (PAL Sampler)
TCP	61001	AIC, Workstation	Instrument utilities

Table 29 Instruments - Inbound Rules

Protocol	Port	Remote System	Description
TCP	64000, 64001	AIC, Workstation	PAL3 communication
TCP	64500	AIC, Workstation	PAL3, plain socket protocol

Table 30 Instruments - Outbound Rules

Protocol	Port	Remote System	Description
TCP/UDP	53	DNS Server	DNS
TCP/UDP	67, 68	DHCP Server	DNS or BootP

Common Licensing Layer (Agilent Licensing 2.0)

Table 31 Licensing 2.0 - Inbound Rules

Application	Protocol	Port	Remote System	Description
Agilent.Licensing REST API	HTTP	52080	Clients	Machine hosting Agilent.Licensing service
Agilent.Licensing REST API	HTTPS	52088	Clients	Machine hosting Agilent.Licensing service

Table 32 Licensing 2.0 - Outbound Rules

Application	Protocol	Port	Remote System	Description
FNE License Server	HTTP	7070	Clients	Machine hosting FNE Licensing Server
FNE License Server	HTTPS	7071	Clients	Machine hosting FNE Licensing Server

Dynamic Ports

Dynamic Ports: used for temporary communications between clients. The ports used depend on the operating system in use and are configurable. See the operating system documentation for more information.

4 System Preparation Tool

The System Preparation Tool (SPT) checks and applies Windows settings on your machine.

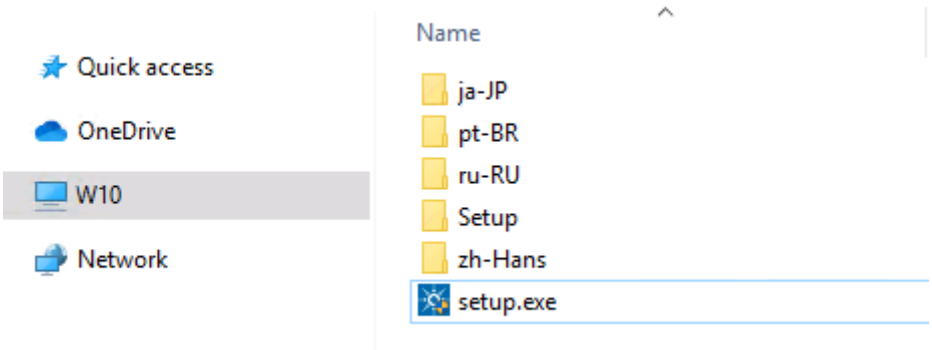
NOTE The SPT only checks that minimum requirements are met. Work with your Agilent representative to ensure your system is configured sufficiently for your projected number of users, instruments, and load.

Use the System Preparation Tool

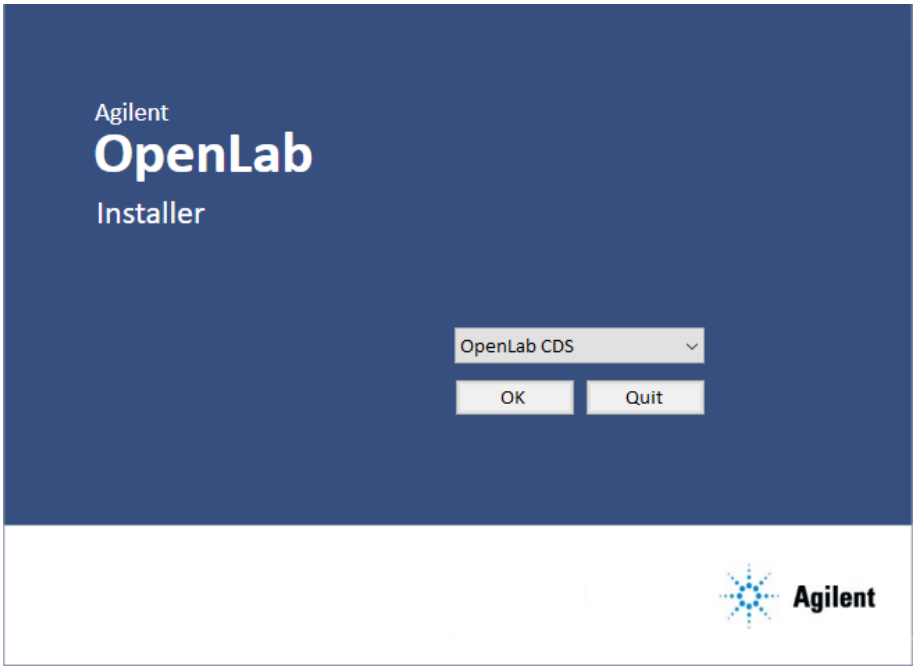
The settings are also applied automatically when you run the OpenLab installer. Running the SPT in advance helps you to shorten the installation process and gives you an overview of both mandatory and recommended settings.

1. If you want to keep your setting in the System Preparation Tool from one run to the next: Copy the entire content of the USB media to a local drive or centralized folder, then remove the USB media from the PC.
2. To open the installer, right-click the setup.exe file, and run it as administrator.

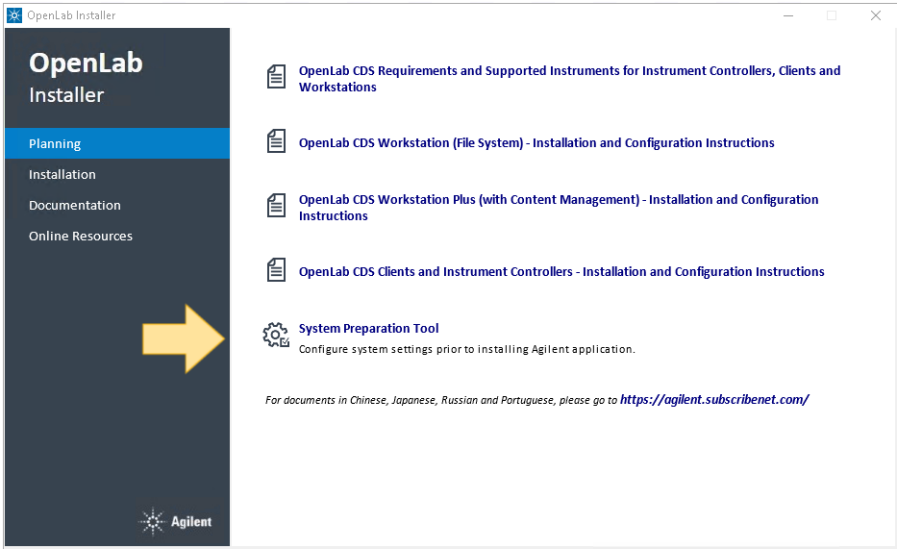
NOTE If User Account Control (UAC) is switched on, this step requires active confirmation to continue.



3 On the start screen, select **OpenLab CDS**, and click **OK**.



4 From the **Planning** tab, select **System Preparation Tool**.



The **System Preparation Tool** window opens.

5 Select the product configuration corresponding to your system:

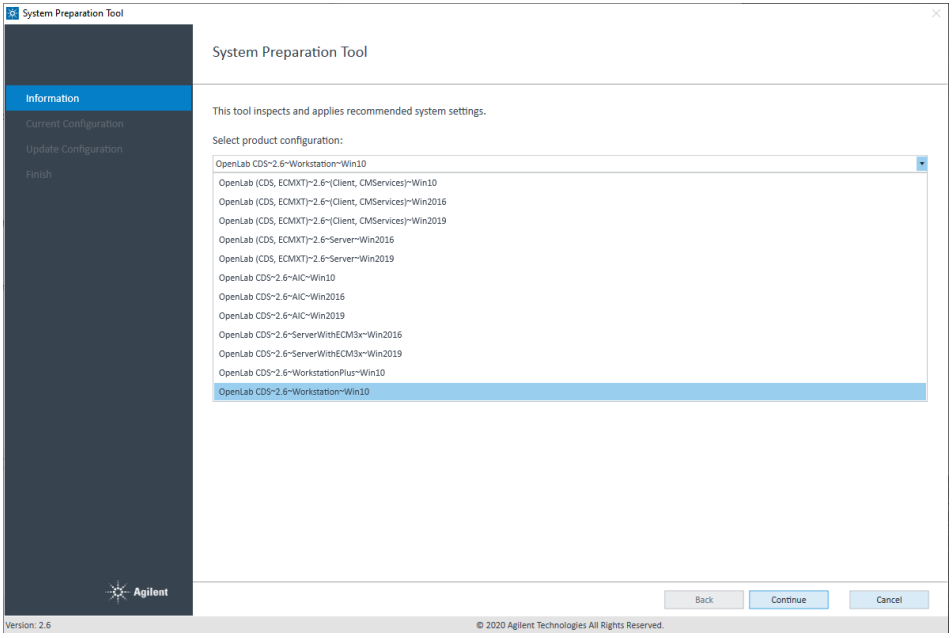
- For a Workstation with file system storage, select **OpenLab CDS~2.6~Workstation~Win10**.
- For a Workstation with Content Management, select **OpenLab CDS~2.6~WorkstationPlus~Win10**

For AICs:

- **OpenLab CDS~2.6~AIC~Win10**
- **OpenLab CDS~2.6~AIC~Win2016**
- **OpenLab CDS~2.6~AIC~Win2019**

For clients:

- **OpenLab (CDS, ECMXT)~2.6~(Client, CMServices)~Win10**
- **OpenLab (CDS, ECMXT)~2.6~(Client, CMServices)~Win2016**
- **OpenLab (CDS, ECMXT)~2.6~(Client, CMServices)~Win2019**



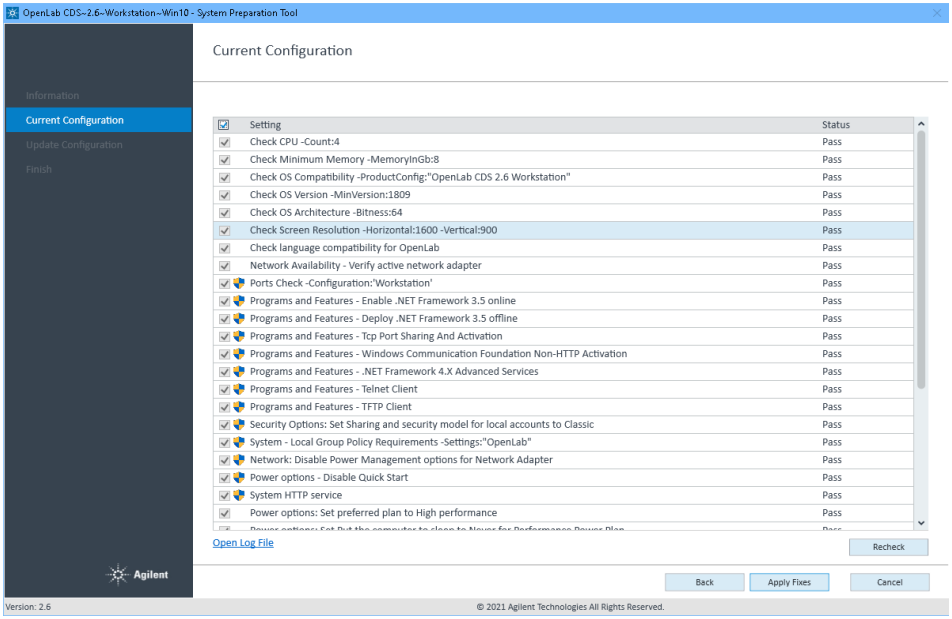
Click **Continue**. The installer automatically applies all mandatory Windows settings to ensure proper installation.

6 Select which recommended settings to apply to the system.

There are several settings that are recommended that can improve the performance and stability of your system, but do not need to be completed to deploy the application. The recommended settings are listed after the mandatory settings.

You can clear the check boxes for recommended settings. Mandatory settings cannot be cleared. Recommended actions are selected by default and will be applied unless they are cleared.

For more information on mandatory and recommended settings, see Table 33 on page 60.



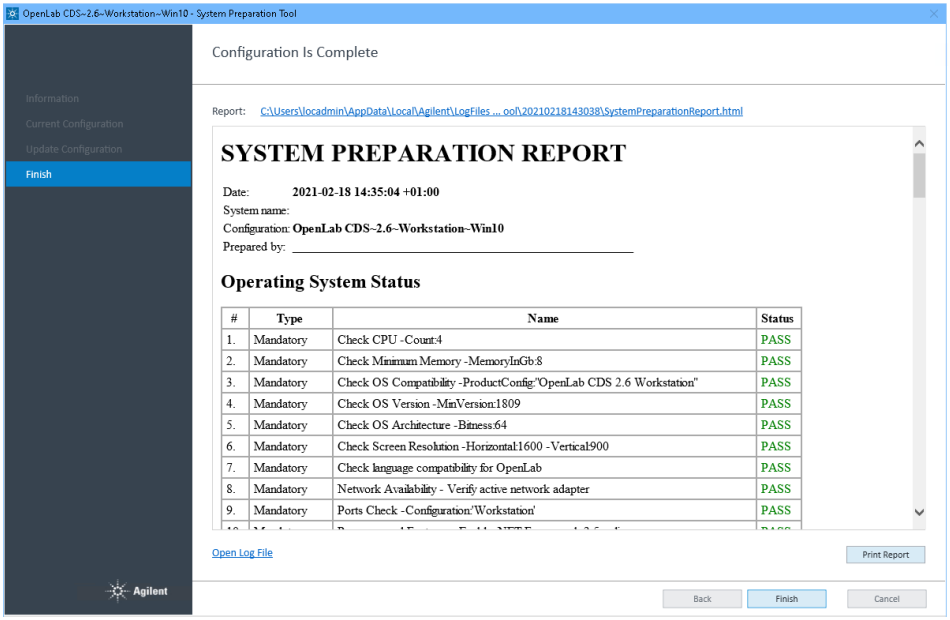
7 Click **Apply Fixes** to apply the correct settings.

The System Preparation Tool attempts to fix the selected settings and displays the new status on the **Update Configuration** page. All actions are saved to a log file.

8 Click **Next** to proceed to the **System Preparation Report** page.

The System Preparation Report is displayed. It lists the new status for all selected settings.

The System Preparation Report for each run is saved separately to disk. Its location is shown at the top of the page.



9 Click **Print Report** to print the *System Preparation Report*.

You may print to a file, for example, using the *Adobe PDF* printer, and add comments.

10 The System Preparation Report lists any mandatory or recommended settings that are not automatically updated by the System Preparation Tool. Follow the instructions provided in the System Preparation report to manually update operating system settings.

11 Click **Finish**.

12 Reboot your system if requested to do so.

Reference of SPT Checks

Table 33 Checks and Setting updates by the System Preparation Tool

Name	Workstation Workstation Plus	Client CM Services	OpenLab Server ECM XT OLSS Server for ECM 3.x	AIC
Mandatory				
Check Minimum Memory	●	●	●	●
Check CPU	●	●	●	●
Check OS Compatibility	●	●	●	●
Check OS Version	●			
Check OS Architecture (64 bit)	●			
Check Screen Resolution	●	●	●	●
Check language compatibility for OpenLab	●	●	●	●
Network Availability - Verify active network adapter	●	●	●	●
Ports Check	●	●	●	●
Programs and Features - Enable/deploy .NET Framework 3.5	●	●	●	●
Programs and Features - Tcp Port Sharing And Activation	●	●	●	●
Programs and Features - Windows Communication Foundation Non-HTTP Activation	●	●	●	●
Programs and Features - .NET Framework 4.X Advanced Services	●			
Programs and Features - Telnet Client	●	●		●
Programs and Features - TFTP Client	●	●		●
System - Local Group Policy Requirements[1]	●	●	●	●
Power options - Disable Quick Start	●	●	●	●
System HTTP service	●	●	●	●

Table 33 Checks and Setting updates by the System Preparation Tool

Name	Workstation Workstation Plus	Client CM Services	OpenLab Server ECM XT OLSS Server for ECM 3.x	AIC
Mandatory, manual				
Windows Update - Apply pending updates	●	●	●	●
Windows Activation	●	●	●	●
System domain membership	●	●	●	●
Region - Change system locale	●	●	●	●
Indexing options: Disable indexing Options for all drivers and locations			●	
Recommended				
System - Startup and Recovery Settings	●	●		●
System - Turn off system protection (restore points) for all drives	●			
Windows Update - Disable Windows Update service	●	●	●	●
Personalization - Disable advertising info	●	●		●
Personalization - Combine Taskbar Buttons	●	●		●
Recommended, manual				
File Explorer - Display Settings	●	●		●
Recycle Bin - Set Recycle Bin properties	●	●		●
System - Performance Settings	●	●		●
Privacy - Set privacy settings	●	●		●
Apps - Default browser	●	●		●
Personalization - Turn off show lockscreen background picture	●	●		●

[1] Local Group Policy Requirements for OpenLab: - Set "Hide entry points for Fast User Switching" to Enabled - Adds “Users” group to "Access this computer from the network" setting

5 Instrument Information

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

Instrument Drivers

The following Agilent instrument driver software revisions are part of the OpenLab CDS 2.6 software package.

Table 34 Agilent driver packages shipped with OpenLab CDS 2.6

Instrument Driver	Driver Software Revision	Auto-installed
Agilent LC and CE	3.3	●
Agilent LC/MS SQ	2.4	●
Agilent ELSD	1.8	
Agilent GC	3.5	●
Agilent GC/MS SQ	1.4	●
Agilent Micro GC	2.2	
Agilent G1888 Headspace Agilent 7697A-8697 Headspace	1.09.1 3.1	
Agilent Gas Analyser	2.6	
35900E A/D Converter	2.3	●
Agilent SS420X A/D Converter	1.2	●
Agilent Data Player	2.4	●
Agilent CTC PAL 3 (for GC only)	2.3	
Agilent CTC PAL-xt	B.01.08	

Drivers that are not automatically installed by the OpenLab CDS installer can be found on the media under Setup\Packages\Add-ons. To install these drivers see section *Install or Upgrade Driver Software* in chapter 2 of your *OpenLab CDS Workstation*, or *Clients and Instrument Controller* guide.

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. Note that Agilent and other vendors release drivers and firmware independent of the OpenLab CDS releases.

NOTE

Instrument driver versions must always match in a network system.

Accidental use of a method from a different driver version, and accidental launching of an AIC instrument from a client with a mismatched driver version will have unpredictable behavior, including subtle errors that might not be spotted immediately.

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

Non-Agilent Instrument Drivers

OpenLab CDS 2.6 supports various Non-Agilent instruments. Please check with your sales representative if a corresponding driver is available.

Always install the dedicated current driver available from SubscribeNet at **OpenLab CDS > OpenLab 3rd-Party Instrument drivers**.

Agilent LC and CE Instrument support

Recommended Firmware

OpenLab CDS 2.6 is shipped with Agilent LC and CE Drivers 3.3. With the release of this driver version it is recommended to use the following firmware revisions:

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.07.28 or later
Agilent 1200 Infinity Hosted Modules	C.07.20 or later
Agilent 1260/1290 Infinity II Modules	D.07.33 or later

Note that some driver features like valve-thermostat clusters and new temperature control modes require current firmware versions. Agilent recommends that you always use the most recent firmware revisions with your OpenLab CDS to have access to the latest firmware features and improvements. Download current LC/CE Firmware from **www.agilent.com/en-us/firmwareDownload?whid=69761**.

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

NOTE

Do not mix firmware revisions from one set with older or newer sets. A firmware update within set A/B/C/D.07.xx is required for all modules in that stack, not only new modules.

For detailed driver information please refer to the LC driver release notes. A recent version of *Release Note for Agilent LC and CE Drivers* (LC-and-CE-Driver-Release-Note-3-3.pdf) is available in the Docs/EN folder of the OpenLab CDS media.

Liquid Chromatography (LC) Modules

Most Agilent LC modules can be controlled with the current version of OpenLab CDS. LC and CE driver release 3.3 has been tested with this revision and is installed by default with the software.

NOTE

The Agilent LC drivers are backwards compatible. Modules with identical Product Numbers are supported, even if the tables below list only the name of the current model version. Look for the Product Number at the lower right of each module or system. 1100 Series models are supported on a best effort basis only.

For more detail please refer to the release notes of the driver revision you are using.

Table 35 Agilent LC - Sampling Systems

Product Number	Module Name	Compatibility Statement
G1329A	1200 Series Standard Autosampler	supported
G1329B	1260 Infinity Standard Autosampler	supported
G1330A	1200 Series Thermostat	supported
G1330B	1290 Infinity Thermostat	supported
G1367B	1200 Series High Performance Autosampler	supported
G1367C	1200 Series High Performance Autosampler SL	supported
G1367D	1200 Series High Performance Autosampler SL+	supported
G1367E	1260 Infinity High Performance Autosampler	supported
G1377A	1260 Infinity High Performance Micro Autosampler	not supported
G2258A	1260 Infinity Dual-Loop Autosamper	supported
G2260A	1260 Infinity Preparative Autosampler (High flow)	supported
G4226A	1290 Infinity Autosampler	supported
G4303A	1260 Infinity SFC Standard Autosampler	supported
G4767A	1260 Infinity II SFC Multisampler	supported
G5667A	1260 Infinity Bio-inert Multisampler	supported
G5668A	1260 Infinity II Bio-inert Multisampler	supported
G7129A	1260 Infinity II Vialsampler	supported

Table 35 Agilent LC - Sampling Systems

Product Number	Module Name	Compatibility Statement
G7129B	1290 Infinity II Vialsampler	supported
G7129C	1260 Infinty II Vialsampler	supported
G7137A	1290 Infinity II Bio Multisampler	supported (NEW)
G7157A	1260 Infinity II Preparative Autosampler	supported
G7158B	1290 Infinity II Preparative Open-bed Sampler / Collector	Module is represented by two modules in the driver: G7159B and G7169B
G7167A	1260 Infinity II Multisampler	supported Use legacy addressing scheme (P1-A1)
G7167B	1290 Infinity II Multisampler	

Table 36 Agilent CTC PAL Autosampler with Agilent LC

Product Number	Module Name	Compatibility Statement
G4277A	Agilent 1290 Infinity LC Injector HTS	supported
G4278A	Agilent 1290 Infinity LC Injector HTC	supported
G4270-CTC	HTC PAL Auto sampler	supported requires motherboard with FW 4.1.5 or higher
G4271-CTC	HTS PAL Auto sampler	

Table 37 Agilent LC – Pumps

Product Number	Module Name	Compatibility Statement
G1310A	1200 Series Isocratic Pump	supported
G1310B	1260 Infinity Isocratic Pump	supported
G1311A	1200 Series Quaternary Pump [1]	supported
G1311B	1260 Infinity Quaternary Pump [1]	supported
G1311C	1260 Infinity Quaternary Pump VL [1]	supported
G1312A	1260 Infinity Binary Pump [1]	supported

Table 37 Agilent LC – Pumps

Product Number	Module Name	Compatibility Statement
G1312B	1260 Infinity Binary Pump SL [1]	supported
G1312C	1260 Infinity Binary Pump VL [1]	supported
G1361A	1260 Infinity Preparative Pump [1]	supported
G1376A	1200 Micro Capillary Pump	not supported
G2226A	1200 Micro Nano Pump	not supported
G4204A	1290 Infinity Quaternary Pump [1]	supported
G4220A	1290 Infinity Binary Pump [1]	supported
G4220B	1290 Infinity Binary Pump[1]	supported
G4301A	1260 Infinity II SFC Control Module	supported
G4302A	1260 Infinity SFC Binary Pump [1]	supported
G4782A	1260 Infinity II SFC Binary Pump [1]	supported
G5611A	1260 Infinity Bio-inert Quaternary Pump [1]	supported
G5654A	1260 Infinity II Bio-inert Quaternary Pump [1]	supported
G7104A	1290 Infinity II Flexible Pump [1]	supported
G7104C	1260 Infinity II Flexible Pump[1]	supported
G7110B	1260 Infinity II Isocratic Pump [1]	supported
G7111A	1260 Infinity II Quaternary Pump VL [1]	supported
G7111B	1260 Infinity II Quaternary Pump[1]	supported
G7112B	1260 Infinity II Binary Pump[1]	supported
G7120A	1290 Infinity II High Speed Pump [1]	supported
G7132A	1290 Infinity II Bio High-Speed Pump	supported (NEW)
G7161A	1260 Infinity II Preparative Binary Pump	supported
G7161B	1290 Infinity II Preparative Binary Pump	supported

[1] Pump valve clusters are possible for marked pumps with up to 2 valves of type G1160A and/or G1170A with 5067-4159 or 5067-4147.

Table 38 Agilent LC – Column Compartments

Product Number	Module Name	Compatibility Statement
G1316A	1260 Infinity Thermostatted Column Compartment	supported
G1316B	1200 Series Thermostatted Column Compartment	supported
G1316C	1290 Infinity Thermostatted Column Compartment	supported
G1330A	1200 Thermostat	Not configurable w/ compact LC
TCC Cluster	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.	supported
G7116A	1260 Infinity II Multicolumn Thermostat	supported
G7116B	1290 Infinity II Multicolumn Thermostat	supported with host-module B.06.75/D.06.75
G7130A	Integrated Column Compartment ICC	supported
VTC Valve Thermostat Cluster	Combinations of G7116B, G1170A and G1316C (valve or column hosts) and G1316A/B and G7130A	See LC Driver Release Notes: *Valve-Thermostat Cluster*

Table 39 Agilent LC – Detectors

Product Number	Module Name	Compatibility Statement
G1314A	1100/1200 Variable Wavelength Detector	supported
G1314B	1260 Infinity Variable Wavelength Detector VL	supported
G1314C	1260 Infinity Variable Wavelength Detector VL+	supported
G1314D	1260 Infinity Variable Wavelength Detector	supported
G1314E	1290 Infinity Variable Wavelength Detector	supported
G1314F	1260 Infinity Variable Wavelength Detector	supported
G1315A	1100/1200 Diode-Array Detector	supported
G1315B	1200 Series Diode Array Detector	supported
G1315C	1260 Infinity Diode Array Detector VL+	supported
G1315D	1260 Infinity Diode Array Detector VL	supported

Table 39 Agilent LC – Detectors

Product Number	Module Name	Compatibility Statement
G1321A	1100/1200 Fluorescence Detector	supported
G1321B	1260 Infinity Fluorescence Detector Spectra	supported
G1321C	1260 Infinity Fluorescence Detector	supported
G1362A	Agilent 1100/1200 Refractive Index Detector	supported
G1365A	1100 Series Multiple Wavelength Detector	supported
G1365B	1200 Series Multi-Wavelength Detector	supported
G1365C	1260 Infinity Multiple Wavelength Detector	supported
G1365D	1260 Infinity Multiple Wavelength Detector VL	supported
G4212A	1290 Infinity Diode Array Detector	supported
G4212B	1260 Infinity Diode Array Detector	supported
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	supported: Up to 2 DAD
G7114A	1260 Infinity II Variable Wavelength Detector	supported
G7114B	1290 Infinity II Variable Wavelength Detector	supported
G7115A	1260 Infinity II Diode Array Detector WR	supported
G7117A	1290 Infinity II Diode Array Detector FS	supported
G7117B	1290 Infinity II Diode Array Detector	supported
G7117C	1260 Infinity II Diode Array Detector HS	supported
G7121A	1260 Infinity II Fluorescence Detector	supported
G7121B	1260 Infinity II Fluorescence Detector Spectra	supported
G7162A	1260 Infinity II Refractive Index Detector	supported
G7162B	1290 Infinity II Refractive Index Detector	supported
G7165A	1260 Infinity II Multiple Wavelength Detector	supported
G4260A	380-ELSD	supported
G4260B	1260 Infinity II Evaporative Light Scattering Detector	supported
G4261A	385-ELSD	supported

Table 39 Agilent LC – Detectors

Product Number	Module Name	Compatibility Statement
G4261B	1290 Infinity Evaporative Light Scattering Detector	supported
G7102A	1290 Infinity II Evaporative Light Scattering Detector	supported

Table 40 Agilent LC – Valve Solutions

Product Number	Module Name	Compatibility Statement
G1156A	1200 Series 6-Position/7-Port Valve (400 bar) part of purge kit	A module to hold valve head host required
G1157A	1200 Series 2-Position/10-Port Valve	supported
G1158A	1200 Series 2-Position/6-Port Valve	supported
G1158B	1200 Series 2-Position/6-Port Valve (600bar)	supported
G1159A	1200 Series 6-Position Selection Valve	supported
G1160A	1200 Series 12-Position/13-Port Valve	supported
G1162A	1200 Series 2-Position/6-Port Micro Valve	supported
G1163A	1200 Series 2-Position/10-Port Micro Valve	supported
G1170A	1290 Infinity II Valve Drive	host required. For details see latest LC driver release note.
G4231A	5067-4282 2-Position/6-Port Valve head 800 bar	Includes backward compatibility to the former 600 bar valves. For more detail on required driver versions see customer letter (p/n 01200-90134).
G4232C	5067-4283 2-Position/10-Port Valve head 800 bar	
G4234A	5067-4284 6-Position/14-Port, 6-column selector Valve head 800 bar	
G4237A	5067-4279 4-Position/10-Port, 4-column selector Valve head 800 bar	
G4734B	Preparative 6-column selector valve, 600 bar	supported
G5641A	2-Position/10-Port 1300 bar Bio Valve	supported
G9322A	1260 Infinity II Clustering Valve (solvent selection)	supported

Table 41 Fraction Collectors

Product Number	Module Name	Compatibility Statement
G1364A	1100 Series Automatic Fraction Collector	supported
G1364B	1260 Infinity Fraction Collector (preparative-scale)	supported
G1364C	1260 Infinity Fraction Collector (analytical-scale)	supported
G1364D	1200 Micro Fraction Collector	supported
G1364E	1260 Infinity II Preparative Fraction Collector	supported
G1364F	1260 Infinity II Analytical Fraction Collector	supported
G5664A	1260 Infinity Bio-inert Fraction Collector AS	supported
G5664B	1260 Infinity II Bio-inert Fraction Collector	supported
G7159B	1290 Infinity II Preparative Open-Bed Fraction Collector	supported
G7166A	1260 Infinity II Preparative Valve-Based Fraction Collector	supported
	Clustering Up to 3×G1364x, or 1×G5664A + 1×G1364; or 1×G5664A for recovery;	supported
NOTE: Mass Based Fraction Collection is not supported.		

Table 42 Other Modules

Product Number	Description	Compatibility Statement
G1390A	Agilent 1100 Series Universal Interface Box	supported Part of fraction collector
G1390B	Agilent InfinityLab Universal Interface Box	supported
G4227A	Agilent 1290 Infinity II Flexible Cube	supported
G4240A	Agilent 1260 Infinity Chip Cube MS Interface	not supported
G4301A	Agilent 1260 Infinity II SFC Control Module	supported
G7170B	Agilent 1290 Infinity II MS Flow Modulator	supported LC/MSD can be used as an analytical detector in the Purification Workflow

Table 43 Configurable Agilent Combined LC Systems

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

NOTE

Agilent 1120 and 1220 Compact LC Systems are not supported with Fraction Collection.

Capillary Electrophoresis (CE) Instruments

LC & CE Drivers 3.3 adds support of the Agilent 7100 Capillary Electrophoresis System in OpenLab CDS v2.5 or higher.

Configure CE instruments with the instrument type **Agilent LC**. This allows to view, review or report CE analytic data with same feature-set as for LCs. OpenLab CDS does not support all CE workflows nor many CE specific data analysis functionality.

It is possible to:

- Configure the CE instrument as part of the instrument type **Agilent LC**
- Connect to the CE instrument, create methods, and run analyses
- View CE monitor signals in Online Plot
- Review CE analytic data with same feature set as for LC
- Create reports from CE data with same feature set as for LC

The following Agilent Capillary Electrophoresis (CE) instruments may be configured with OpenLab CDS version 2.6.

Table 44 Capillary Electrophoresis

Product Number	System Name	Compatibility Statement
G7150A	Agilent 7100 Capillary Electrophoresis System	Supported
G7151A	Agilent 7100 Capillary Electrophoresis System (DAD)	supported

Agilent LC/MS Instrument support

NOTE

Mass Based Fraction Collection is not supported. However, an LC/MSD can be used as an analytical detector as part of Purification workflow

Recommended Firmware

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

LC/MS Modules

Agilent Single Quad 6100 Series instruments may be controlled with OpenLab CDS.

Table 45 Compatibility statements for Agilent LC/MS instruments

Product Number	Description	Compatibility Statement
61xxA	LC/MS family	not supported
G6160A	InfinityLab LC/MSD iQ	supported
61xxB	LC/MS family	requires smart card 4 update 6120B & 6130B via upgrade kit (G2735N) 6125B & 6135B via upgrade kit (G4934C)
G6150B	MS Module	not supported
G6120C G6125C G6130C G6135C	MS Module LC/MSD MS Module LC/MSD XT	supported, ESI or AJS source required for Tuning

Table 46 LC/MS Modules

Product Number	Description	Compatibility Statement
G1947B G1971B	APCI APPI (Photo Ionization)	supported
G1948B	ESI	supported
G1958B	Agilent Jet Stream for Single Quad	supported
G1978B	Multimode Source	supported
G1951A	Analog Output Accessory	not supported
G4240	Chip Cube Source	not supported

Agilent GC System and Sampler support

Agilent GC Firmware Interoperability

Agilent releases GC firmware updates independently of software releases. All Agilent GC instrument driver revisions have been designed to be backward compatible to the installed instrument base. Agilent recommends always using the latest module firmware revision to provide the highest level of system capability.

Upgrading firmware 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.

Agilent GC System support

Support statements for Agilent GC Systems with OpenLab CDS rev. 2.6

Table 47 Compatibility statements for Agilent GC systems

Product Number	Description	Compatibility Statement
G3950A G3952A G3953A	Intuvo 9000 GC system	supported
G3540A G3542A G3543A G3545A	8890 Series GC System	supported
G2970A	8860 Series GC System	supported
G3440A G3442A G3443A G3445A	7890A	supported
G3440B G3442B G3443B G3445B	7890B	supported

Table 47 Compatibility statements for Agilent GC systems

Product Number	Description	Compatibility Statement
G4350A G4350B	7820A	supported RTL, backflush, and EZ sample prep are not supported
G6589AA G6590AA	7820 VL	supported RTL, backflush, and EZ sample prep are not supported
G1530N G1540N	6890N	supported
G1530A G1540A	6890A 6890Plus	Non-EPC inlets and detectors are not supported
G2629A	6850 Handheld Controller	not supported
G2630A G2630B	6850	supported
G3581A G3582A	490 Micro GC 490 Micro GC Analyzer	supported, LAN only New 4.02 mainboard required (blue power LED or internal USB connector)
G3588A	990 Micro GC System	supported

Agilent GC Autosampler support

Table 48 7693 GC Autosampler

Product Number	Description	Support Statement
G3420A	GC ALS Controller	supported
G4513A	Injector	supported
G4514A	Tray	supported
G4515A	BCR/Mixer	supported
G4516A	External Controller for 68xx	supported
G4517A	6890 Plus Card Upgrade	supported
G4520A	Tray with BCR/Mixer	supported
G4521A	LVI Syringe Carriage	supported
G4522A	Cooling Accessory	supported

Table 49 7683A GC Autosampler

Product Number	Description	Support Statement
G2613A G2614A G2615A	7683A Injector Tray BCR/Mixer	supported, not compatible with 8860, 8890, and 9000 GC

Table 50 7683B GC Autosampler

Product Number	Description	Support Statement
G4516A G2912A G2913A G2614A G2615A	ALS Controller Board for 6890 Plus GC ALS Controller for 6890 7683B Injector Tray BCR/Mixer	supported, not compatible with 8860 Series, 8890 Series, or Intuvo 9000 GC systems

Table 51 Sampling Accessories

Product Number	Description	Support Statement
G3535A	GC Gasifier	supported
G3541A	GC Sample Selector	supported

Table 52 7650 and G2880A GC Autosamplers

Product Number	Description	Support Statement
G4567A	7650A ALS Injector	• Only one 7650 per GC • Operates on front or back inlet • No additional hardware required for the 7890 • Can be mounted and operated with second 7693A Auto injector but no dual injection on 7820A • Not compatible with 7693A 150 vial tray • Not compatible with 6850 and 6890 GC
G2880A	Injector	Supported; Only for 6850 GC

Agilent Headspace Sampler support

Table 53 7697A Headspace Sampler

Product Number	Description	Support Statement
G4556A	12 Vial	supported • 8890, 8860, 7890, 7820, 6890 and 6850 GCs with S/SL and PP inlets; • 8890, 8860, 7890 and 6890 GCs with VI inlet; • 8890, 8860, 7890GC with MMI inlet; • 8890, 8860, 7890, 6890 and 6850 GCs with CoC inlet; Not supported with PTV inlet
G4557A	111 Vial	supported
G4561A	Barcode Reader for 111 Vial	supported
G4562A	Carrier Gas EPC Module	supported
G4565A	Cooling Plate/Tray Assembly	supported with 111 Vial (G4557A) Not supported on 12 vial

Table 54 8697 Headspace Sampler

Product Number	Description	Support Statement
G4511A	8697 Headspace	supported Instrument control via GC touchscreen (8890, 8860, or Intuvo 9000 GCs)

Table 55 G1888 Headspace

Product Number	Description	Support Statement
G1888A	70 vial G1888 Headspace	supported The G1888 headspace has its own driver package beginning with B.01.09.1. There is a separate driver package for the 7697A and 8697A headspace instruments. If G1888 and 7697/8697 headspace instruments are configured on the same computer, both headspace drivers must be installed. Remove the installed headspace driver before doing an upgrade of the driver.

Table 56 Compatibilty of released Headspace Driver versions

HS Driver version	Compatible Devices
B.01.09[1]	G1888, 7697A
B.01.09.1	G1888
B.01.10	7697A
NEW! 3.1.106 or higher	7697A, 8697

[1] Launching B.01.09.1, B.01.10, or any 3.1+ installer will upgrade B.01.09. If only B.01.10 or 3.1 drivers are installed, any instrument with a G1888 configured will encounter an error message that will inform the user that the G1888 driver is not installed and the G1888 will be removed from the configuration. In this case install the B.01.09.1 driver and reconfigure the instrument with the G1888.

Agilent CTC Sampler support

Support statements for Agilent CTC / PAL samplers with OpenLab CDS rev. 2.6

Table 57 Agilent PAL-xt CTC Sampler with Agilent GC

Product Number	Description	Support Statement
G6500-CTC	CTC Combi-Pal for Liquid and Headspace Injection	Support on 8890, 8860, 7890, 7820, 6890 and 6850 GC, Not supported with any GC ALS
G6501-CTC	CTC Combi-Pal for Liquid Injection	
G6509-CTC	CTC Combi-Pal for Liquid Injection	
G6502-CTC	CTC GC-Pal for Liquid Injection	
G6501B	Agilent GC Sampler 80 for Liquid Injection	Support on 8890, 8860, 7890, 7820, 6890 and 6850 GC, Not supported with any GC ALS
G6502B	Agilent GC Injector 80 for Liquid Injection	
G6509B	Agilent GC Sampler 120 for Liquid Injection	Support on 8890, 8860, 7890, 7820, 6890 and 6850 GC, Not supported with any GC ALS

Table 58 Agilent CTC PAL-3 Autosampler with Agilent GC

Product Number	Description	Support Statement
G7366A	PAL3 LSI 85 Autosampler	Supported on 8890, 8860, 7890, 7820, 6890, and 6850 GC, not supported with additional samplers
G7367A	PAL3 RSI 85 Autosampler	
G7368A	PAL3 RSI 120 Autosampler	
G7370A	PAL3 RTC 120 Autosampler	
G7366B	PAL3 Series II LSI 85	supported
G7367B	PAL3 Series II RSI 85	
G7368B	PAL3 Series II RSI 120	
G7370B	PAL3 Series II RTC 120	

Mini Thermal Desorber

Table 59 G2880A

Product Number	Description	Support Statement
7667A	Mini Thermal Desorber	supported

Agilent GC/MS Instrument support

Recommended Firmware

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

The supported GC/MS firmware is available after installation of OpenLab CDS in **Program Files (x86) > Agilent Technologies > OpenLab Acquisition > GCMS > Firmware**. Open the appropriate MS folder (5977 or 5975) and run msupdate.exe to upgrade the MS firmware.

GC/MS Modules

The table below summarizes the compatibility of Agilent GC/MS Single Quad Series models with OpenLab CDS2.6.

For GC's supported as part of a GC/MS system - see "Agilent GC System and Sampler support" on page 77.

For Autosamplers, CTC Samplers and Headspace supported as part of a GC/MS system - see "Agilent GC Autosampler support" on page 79, "Agilent Headspace Sampler support" on page 81, or "Agilent CTC Sampler support" on page 83respectively.

Table 60 Compatibility statements for Agilent GC/MS Single Quad Series Models

Model number / series	Description	Compatibility Statement
5973	GC/MS family	not supported
5975A 5975B 5975C 5975E	MS System	supported CI added with GC/MS Driver A.01.02
5977A 5977B 5977E	MS System	supported CI added with GC/MS Driver A.01.02
5975T	Integrated GC/MS	not supported

Other supported Agilent Instruments

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

Table 61 Other Agilent modules

Model number	Description	Support Statement
35900E 35900E (Series II)	35900 A/D Interface	supported
SS420x	A/D Converter	supported

Non-Agilent Instruments

OpenLab CDS offers comprehensive multi-vendor instrument control for LC, GC, LC/MS and GC/MS systems. The following table lists the drivers available to control non-Agilent instruments with OpenLab CDS rev. 2.6.

NOTE

Always download the most recent instrument drivers available from **https://agilent.subscribenet.com** to control non-Agilent instruments.

Table 62 Agilent drivers for control of non-Agilent instrument with OpenLab CDS

Agilent Part number	Vendor	Driver Type
n/a	Antec ECD	LC
M8223BA	CTC	LC
M8227BA	Hitachi	LC
n/a	Metrohm	IC
M8229BA M8242BA	PerkinElmer	LC GC
M8237BA	Scion / Bruker/ Varian	LC
n/a	Sedere	ELSD
M8240BA M8232BA	Shimadzu	LC GC
n/a	Showa Denko	RID
M8236BA	Thermo Fisher	LC
M8244BA	Thermo Fisher SII	GC LC IC
M8224BA	Valco Instruments (VICI)	Valve
M8505BA	Waters	LC

NOTE

The support matrix for non-Agilent drivers is subject to frequent changes.

For a current list of supported instruments and support status refer to the FAQ page What instruments are supported in OpenLab CDS? on the Agilent web-site (**https://www.agilent.com/en/support/software-informatics/openlab-software-suite/chromatography-data-systems/faq-what-instruments-are-supported-in-openlab-cds**).

A detailed the PDF document *OpenLab_CDS_Non_Agilent_Compatibility_Matrix_External_2.6.pdf* is available from SubscribeNet **https://agilent.subscribenet.com** under product "OpenLab Software".

OpenLab CDS VL WorkStation and OpenLab CDS VL WorkStation Plus Instruments

The following subset of Agilent Chromatography instruments can be configured with a *OpenLab CDS VL Workstation* or *OpenLab CDS VL Workstation Plus*.

NOTE

VL WorkStation and VL Workstation Plus require LC driver release 3.0 or higher for control of Agilent LC instruments.

Table 63 VL-configurable 1260 Infinity LC series modules

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

Table 64 VL-configurable 1260 Infinity II LC series modules

Product number	Module Name
G7111A/B	1260 Infinity II Quat. Pump
G7110B	1260 Infinity II Isocratic Pump
G7116A	1260 Infinity II Multicolumn Thermostat
G7117C	1260 Infinity II Diode Array Detector HS
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

Table 65 Configurable Agilent Combined LC Systems

Product Number	System Name
G4286A	1120 Compact LC, Isocratic
G4286B	1220 Infinity II Isocratic LC System
G4286C	1220 Infinity LC System VL
G4287A	1120 Compact LC, Isocratic with Oven and ALS
G4287B	1220 Infinity LC Isocratic LC System
G4287C	1220 Infinity LC System VL
G4288A	1220 Infinity II Gradient LC System
G4288B	1220 Infinity II Gradient LC System
G4288C	1220 Infinity II Gradient LC System VL
G4289A	1120 Compact LC, Gradient with Oven
G4289B	1220 Infinity LC Gradient System
G4289C	1220 Infinity LC System VL
G4290A	1120 Compact LC, Gradient with oven and ALS
G4290B	1220 Infinity II Gradient LC System

Table 65 Configurable Agilent Combined LC Systems

Product Number	System Name
G4290C	1220 Infinity II Gradient LC System VL
G4291B	1220 Infinity LC System
G4291C	1220 Infinity LC System VL
G4292B	1220 Infinity LC System
G4292C	1220 Infinity LC System VL
G4293B	1220 Infinity LC System
G4293C	1220 Infinity LC System VL
G4294B	1220 Infinity II Gradient DAD LC System

Table 66 VL-configurable Agilent GC systems

Product Number	Module Name
G4350A	7820 GC System
	7820 VL GC System
G2790	8860 GC System, supported including supported Autosamplers, and PAL
G3581A	490 Micro GC System
G3588A	990 Micro GC System

6 Software Compatibility

This chapter contains information on compatibility with other Agilent or non-Agilent software.

OpenLab CDS System Compatibility

OpenLab CDS System Compatibility

Component	Supported Revisions	Comments
OpenLab Server	all 2.6 configurations	supported
OpenLab ECM XT	all 2.6 configurations	supported
OpenLab ECM	3.5 Update 6, or greater 3.6 (all)	Details of CDS data usage in ECM are documented within ECM. 3.6 update 2 or greater is required for certain search related features.
OpenLab Shared Services Server	3.5	For "OpenLab CDS with OpenLab ECM 3.x" only. Independent Shared Services Server is not supported with any workstation configuration.
SLIMS	SLIMS 6.6 or greater	Requires Sample Scheduler for OpenLab Check with SLIMS support for details

OpenLab ELN is not supported with OpenLab CDS 2.6.

NOTE

For Networked Workstations (Client Co-installed on AIC) not all add-ons are supported on all configurations. Check add-on Software product documentation for details.

Supported Content Management configurations

Supported Content Management configurations

Content Management	OpenLab Shared Services	Comments
OpenLab Basic Server	Included with OpenLab Server	Supported[1] Up to 4 total configured instruments – any data system.
OpenLab Server	Included with OpenLab Server	Supported[1]
OpenLab ECM XT	Included with OpenLab ECM XT	Supported[1]
OpenLab ECM	OpenLab Shared Services Server	See ECM requirements for additional details regarding capacity requirements

[1] See OpenLab ECM XT/ OpenLab Server Documentation for list of supported configurations.

Mixed configurations

Environments combining OpenLab CDS with other Agilent CDS products are supported with the following storage backends:

- OpenLab Server, or OpenLab ECM XT

  Mixed configurations are supported when OpenLab CDS and the CDS product can both connect to the same OpenLab Server/Shared Services version. See Agilent white-paper *Mixed Environment Support in OpenLab CDS* for details on the Mixed Environment design.

- OpenLab ECM with OpenLab Shared Services Server

  OpenLab CDS can be configured with OpenLab ECM to operate in an environment containing different Data Systems. OpenLab ChemStation or OpenLab EZChrom may be connected via a separate Shared Services server.

  For more details, please refer to the *Configuring OpenLab CDS with OpenLab ECM* guide (CDS_configure-with-ECM.pdf).

  Standalone deployment of OpenLab Shared Services Server without a content management solution (aka Distributed Workstations) with OpenLab CDS is not supported.

Compatible Libraries and Databases

The following libraries and databases are compatible with version 2.6 of OpenLab CDS:

NIST MS Search/ NIST Library

Supported:

- 2.4 / NIST20

  This library ships with NIST MS Search

Backwards compatibility to[1]

- 2.3 / NIST17
- 2.2 / NIST14
- Any library in the appropriate NIST format can be opened in NIST MS Search, and a basic search, e.g. name search, can be run against it.

NIST MS Search Software and Demo Library are available for download at **https://chemdata.nist.gov/**

Wiley/NIST Combined MS Library

Supported revisions:

- W12N20
- W11N17

1

Other Agilent Software

Other Agilent Software

The following Agilent Add-on Software is supported to be co-resident with OpenLab CDS components. For details on product versions, check the respective product information.

- ACE
- ADFExport for OpenLab [Rev.1.3 or higher]
- Atlas Method Import
- eMethod software[1]
- Galaxie Data Import
- GPC for OpenLab CDS
- Instrument Utilities for GC
- LabAdvisor for LC
- MassHunter WalkUp, Rev. 4.1
- Match Compare
- Migration Tools for OpenLab
- NGA/RGA
- Peak Evaluation
- Remote Advisor
- Results Viewer
- RTL wizard
- Sample Scheduler for OpenLab[2]
- Smart Alerts

[1] Rev.1.0 provided on OpenLab CDS Media. Newer versions to be reviewed by eMethods project(s).
[2] Rev. 2.6 provided on OpenLab CDS Media.

7 Sales and Support Assistance

Please check the following web site for your local sales and support contact:

https://www.agilent.com/en/support

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https://community.agilent.com/ To get answers to your questions, join over 10,000 users in the Agilent Community. Review curated support materials organized by platform technology. Ask questions to industry colleagues and collaborators. Get notifications on new videos, documents, tools, and webinars relevant to your work.

In This Book

This document details the minimum hardware and software requirements (PC specifications) that need to be met to run an Agilent OpenLab Chromatography Data System (CDS). It is valid for Workstation, Workstation Plus, Client, or Analytical Instrument Controller components. It also lists supported Agilent and Non-Agilent instruments.

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