Agilent

Agilent OpenLab CDS

Workstations, Clients, and Instrument Controller

Requirements and Supported Instruments

Notices

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Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051,

USA

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In this Book

This document details the minimum hardware and software requirements that need to be met to run OpenLab CDS. It is valid for Workstation, Workstation Plus, client, or analytical Instrument Controller (AIC) components. It also provides information on supported Agilent- and Non-Agilent instruments.

For server components, see *OpenLab Server and OpenLab ECM XT Hardware and Software Requirements (ECM_XT_v2.8_HardwareSoftwareRequirements_en.pdf)* or *OpenLab ECM Software and Hardware Requirements (OpenLab_ECM_SW_HW_Requirements.pdf)*, respectively.

Table 1: Terms and abbreviations used in this document

Term	Description
Secure Storage	Component of OpenLab Server including a database, used to manage your analytical data
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

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OpenLab CDS Topologies

OpenLab CDS is available in different topologies. They differ in the location and availability of OpenLab software components (shared services, secure storage, clients). 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.

Agilent provides two different storage options for this topology: *CDS Workstation* Workstation with (local) file storage, and *Workstation Plus* with included content management (provided by the local Secure Storage component).

Figure 1: All components on the same PC

Networked Workstation

A OpenLab CDS 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). It typically provides access to a remote secure storage. 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. The *OpenLab CDS* software provides the chromatography data system components for instrument control, data analysis and reporting on Analytical Instrument Controllers (AICs) and clients.

On the server(s), the *OpenLab Server* software provides the Shared Services and content management components.

Based on your expected system load (depends on the number and type of instruments and users) OpenLab CDS client/server systems can be deployed with different topologies. Consult with your Agilent support representative to decide which topology is appropriate for your environment.

OpenLab CDS Deployment in a Cloud Environment

OpenLab CDS client/server installations with OpenLab ECM XT as back-end can run in an Amazon Web Services (AWS) or Microsoft Azure cloud environment. In this configuration OpenLab ECM XT is configured as the secured repository for OpenLab CDS. More information on supported cloud configurations is available in *OpenLab Server and OpenLab ECM XT Hardware and Software Requirements (ECM_XT_v2.8_HardwareSoftwareRequirements_en.pdf)* (accessible on the Agilent web-page at https://www.agilent.com/en/product/software-informatics/analytical-software-suite/data-management/openlab-ecm-xt).

Cloud deployments with OpenLab ECM v3.x as back-end are not supported under a standard support agreement.

For more information and assistance with cloud deployment consult with your Agilent support representative.

PC Recommendations

NOTE

The following tables are intended to be guidelines for hardware configuration. The minimum requirements depend on your intended load. Factors to consider include number of logical instruments, concurrent users, and other connection points. For more details on how to estimate your requirements, see Disk Space on page 18, Table 11 on page 18 and Configuration Capacity on page 14. Load Approximations on page 15.
Consult with your Agilent support representative to decide which hardware and topology is appropriate for your needs.

For information on pre-configured Agilent original bundle PCs see https://www.agilent.com/en/products/software-informatics/chromatography-data-systems/openlab-cds/originalpcbundle.

Workstations

OpenLab CDS software is available in two workstation flavors: OpenLab CDS Workstation with storage in the local file system, or OpenLab CDS Workstation Plus that provides a built-in content management database.

Based on the number of instruments Agilent recommends two PC configurations for the CDS Workstation: A small (default) with 8GB to control up to 2 instruments, and one with upgraded memory (16GB) that can be used to control up to 4 instruments. Refer to Load Approximations on page 15 and Table 11 on page 18 to estimate your requirements.

Table 2 on page 11 provides the hardware configuration for Workstations as tested by Agilent, for Win 11 (64 Bit). It also applies for OpenLab CDS Workstation VL (Note: VL only supports 1 instrument).

Table 2: Recommended hardware configuration for OpenLab CDS workstations

Item	CDS Workstation	CDS Workstation Plus
Tested Agilent original bundle PC	HP Z2G9 SFF Workstation: Intel® Core i5-12500; 3.0 GHz, 18MB cache, 6 Core;	HP Z2G9 SFF Workstation: Intel® Core i5-12500, 3.0 GHz, 18MB cache, 6 Core
Processor (CPU) - minimum	Intel® i5, i7, or Xeon E3, or equivalent, 3.0 GHz or greater, 4 Core	Intel® i5, i7, or Xeon E3, or equivalent, 3.0 GHz or greater, 4 Core
Physical memory (RAM)	1-2 instrument points: 8 GB 3 or more instrument points: 16 GB	16 GB (16 GB DDR5-4800 MHz RAM (2x 8 GB))
	4 GB is reserved for the Windows operating system.	
Hard disk	1 x 500 GB 7200 RPM SATA drive (minimum) or equivalent SSD drive (recommended)	1 TB 7200 RPM SATA drive (minimum). If the computer has a disc array controller we recommend 2 x 1 TB in RAID1, and SSD drive.
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, to isolate the instrument's data traffic from the lab intranet connection.	

Client

Table 3: Recommended hardware configuration for OpenLab CDS clients

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 operating system.
Hard disk	500 GB 7200 RPM SATA drive (minimum) or equivalent solid state drive

Item	HW requirements
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

Analytical Instrument Controller (AIC)

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

Table 4: Required hardware configuration for an instrument controller (AIC)

Item	HW requirements
Tested Agilent original bundle PC	HP Z2G9 SFF WorkStation: Intel® Core i5-12500, 3.0 GHz, 18MB cache, 6 Core
Processor (minimum)	Intel® i5, i7, or Xeon E3, or equivalent, 3.0 GHz or greater, 4 Core
Physical memory (RAM)	16 GB 4 GB is reserved for the Windows operating system.
Hard disk	2x500 GB, or 1 TB 7200 RPM SATA (minimum), or equivalent SSD drive recommended 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

Shared Services server

A separate Shared Services server is needed for configurations with OpenLab ECM as storage backend.

For more information, see *Configuring OpenLab CDS with OpenLab ECM (CDS_v2.8_configure-with-ECM_en.pdf, D0028024)* (access from the Planning tab of the OpenLab installer or from the OpenLab Help & Learning page .

Configuration Capacity

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.

Instrument licenses 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 supports 1 instrument with up to 2 instrument points.

Table 5: Instrument capacity of OpenLab CDS workstations

OpenLab CDS standard configuration	Supported Instrument points
Workstation (with local file storage)	Up to 4 points
Workstation Plus (with local secure storage)	Up to 4 points
VL Workstation (with local file storage)	1 instrument; up to 2 points
VL Workstation Plus (with local secure storage)	1 instrument; up to 2 points

Table 6: Instrument capacity of OpenLab CDS AICs

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	6 points per AIC

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 7: Points vs licenses – OpenLab CDS system with Agilent LC instruments

Module Type	Instrument Points	Connection Licenses
LC Instrument (= injector + pump + Agilent 2D detector [3] such as VWD)	1	1
LC 2D detector	0	0
LC 3D detector (such as DAD or (3D) FLD) [4]	1	1
HDR (High Dynamic Range)	2	1
MSD (Single quadrupole mass spectrograph)	2	1
OpenLab CDS Client	2	0

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

3 Includes any detector connected via an Analog-to-Digital converter

4 Additional Agilent DAD (if same DAD model) or a 3D-FLD, does not consume an additional license. Non-Agilent 2D or 3D detectors require a specific own connection license.

Table 8: Points vs licenses – Openlab CDS with Agilent GC instruments

Module Type	Instrument Points (load value)	Connection Licenses
GC Instrument (GC=Inlet + detector i.e. FID [5])	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

Table 9: Points vs licenses – other OpenLab CDS system components

	Instrument Points	Connection Licenses
A2D instrument [6]	1	1 [7]
Agilent Instrument with A2D [8]	0	0
Non-Agilent Instrument with A2D [9]	0	1 [7]
Test Services (QualA)	1	0

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

5 Includes any detector connected via an Analog-to-Digital converter

6 For a system that is configured using only an A2D module

7 Non-Agilent Instrument connection

8 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

9 Non-Agilent 2D or 3D detectors require a connection license on their own

Table 10: Capacity approximations for some example configurations

System	Points	Connection 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 11: 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 200 - 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

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General Software Requirements

Component	Details
.NET Framework (64-bit)	.NET 3.5.x [10] .NET 4.8 or higher [11]
.NET Core (64 bit) [12]	.NET 6.x [11]
Web browser	• Google Chrome 98 or higher • Microsoft Edge (Chromium-based, as shipped with the supported OS versions)
Antivirus software [13]	• Symantec Endpoint Protection (64 bit) • Trend Micro • McAfee • Microsoft Security Essentials

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.

10 Some OpenLab CDS components require Microsoft .Net 3.5. By default, this version of framework does not enforce the usage of TLS 1.2 or higher. In most IT environments, TLS 1.2 is enabled for .Net 4.5 or older frameworks. Verify that TLS 1.2 (or higher) is enabled before proceeding with the installation. Transport Layer Security (TLS) security protocols TLS 1.0, TLS 1.1, and SSL 3.0 are not required by OpenLab CDS. They present a security risk. Disable them according to instructions from Microsoft.

11 Will be installed by the OpenLab installer if needed

12 Both Frameworks are required, they coexist.

13 The listed antivirus software has been tested and is recommended by Agilent. Support is not limited to this software. Check the specific requirements and support of each product.

Operating Systems

Language Compatibility

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

- English
- Chinese
- Japanese
- Brazilian Portuguese

The English language OpenLab CDS software is also supported with Western European language operating systems, provided the OS Region settings are configured correctly.

Russian operating systems are not supported with this version.

The English version of add-on software or drivers may be used where a specific product or feature is not localized. They will appear in English even when running localized versions of OpenLab CDS.

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

Supported operating systems

Table 12: Supported Operating Systems by components of OpenLab CDS

Windows Product	Workstation	Networked Workstation	Client	AIC
Windows 11 64 bit, Professional or Enterprise	✔	✔	✔	✔
Windows 10 64 bit, Professional or Enterprise	✔	✔	✔	✔
Windows Server 2016 64-bit Standard or Datacenter	✘	✘	✘	✘

Windows Product	Workstation	Networked Workstation	Client	AIC
Windows Server 2019 64-bit Standard or Datacenter	✗	✓ [14]	✓ [15]	✓ [14]
Windows Server 2022 64-bit Standard or Datacenter	✗	✓ [14]	✓ [15]	✓ [14]

Table 13: Microsoft Windows: Supported versions (Type 64 bit required) [16]

OpenLab CDS Windows Product	v2.5	v2.6	v2.7	v2.8
Windows 11 Pro, 64 bit	✗	✗	21H2 or greater	21H2 or greater
Windows 11 Enterprise, 64 bit [17]	✗	✗	21H2 or greater	21H2 or greater
Windows 10 Pro, 64 bit [17]	1909 or greater	2004 or greater	20H2 or greater	21H2 or greater
Windows 10 Enterprise, 64 bit [17]	1809 or greater	1909 or greater	20H2 or greater	21H2 or greater
Windows 10 LTSC/LTSB	✗	Check FAQ on Agilent.com / OpenLab CDS [18]		
Windows Server 2022 [19]	✗	✗	✗	Standard Data Center
Windows Server 2019	Standard Data Center	Standard Data Center	Standard Data Center	Standard Data Center
Windows Server 2016	Standard Data Center	Standard Data Center	Standard Data Center	✗

14 supported, but not recommended

15 virtual environment

16 Agilent supports the versions supported at release per Windows life-cycle fact sheet (https://learn.microsoft.com/en-us/lifecycle/faq/windows). Agilent expects, but cannot guarantee, that newer minor product versions will be compatible.

17 Agilent does not support use on Windows Home Edition, or Windows Education Edition

18 Any system using LTSC must be managed under a custom support agreement. See https://www.agilent.com/en/support/software-informatics/analytical-software-suite/chromatography-data-systems/openlab-cds/faq-openlab-cds-ltsc.

19 All Windows Server compatibility is provided per ECM XT/OpenLab Server compatibility. Other content management compatibility is defined by that product.

Agilent may ship any supported Windows version. Updating to a different version is the responsibility of the end user and is not part of standard installation process.

Upgrade to current version of Windows OS

Upgrading to a different version is the responsibility of the end user and is not part of the standard installation process. Refer to https://www.agilent.com/en/support/windows-upgrade-faq for more information.

Supported Databases

OpenLab CDS supports PostgreSQL databases for hosting the Data Repository.

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

If you are using OpenLab Server/ECM XT or OpenLab ECM to store data, please refer to the respective product documentation for information on supported databases (available on Cloud-Ready SDMS Software - OpenLab ECM XT | Agilent.

For information on Databases for Shared Services Server, see *Configuring OpenLab CDS with OpenLab ECM (CDS_v2.8_configure-with-ECM_en.pdf, D0028024)*.

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. Basic machine and processing requirements do not change when virtualizing your machine. Ensure to comply with the recommendations provided in this guide.

Thin Client or Remote Access

OpenLab CDS clients can be virtualized on application virtualization platforms like Citrix. OpenLab CDS clients have 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 publishing software

- Microsoft Remote Desktop Services (RDS/Terminal Server) for Windows Server 2019, and 2022

  Additional information (Microsoft): https://docs.microsoft.com/en-us/windows-server/remote/remote-desktop-services/rds-deploy-infrastructure
- Citrix XenApp for Windows Server 2019 and 2022

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

Registration

For Citrix or plain Windows RDS, at least the **OpenLab Control Panel** needs to be registered on the server side to allow '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

Terminating client sessions when there is data in the File Upload Queue will result in data loss (for example, when reprocessing a large data set).
To avoid the risk of data loss do not use aggressive session management settings that automatically terminate client sessions as a way to save server resources. Session management should only *disconnect* idle sessions but not terminate them.

NOTE

Users opening Data Analysis in a restricted mode (Snapshot, Review completed Injections) may lose access to their Data Analysis sessions in Citrix / RDS OpenLab CDS environments. This could occur when a user closes the Citrix session but not DA. When restarting Citrix, this user may be distributed to a different Citrix client.
To minimize the risk of losing unsaved changes to your results in restricted Data Analysis mode, Agilent recommends to always allocate the user to Citrix / RDS clients for one entire work day or shift (8-10) hours. This mitigates the risk that the restricted Data Analysis closes automatically without saving, due to loss of user server allocation within the persistence time.

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 37.

Tested Operating System virtualization software

- VMware vSphere (64 bit) for Windows Server 2019 and 2022
- Hyper-V (64 bit) for Windows Server 2019 and 2022

NOTE

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

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

Analytical Instrument Controllers (AIC)

Virtualizing AICs is supported with VMWare vSphere.

Agilent does not recommend virtualizing AICs. AIC located far from the instrumentation add risks especially if the Instrument-to-AIC connection is outside of the OpenLab communication redundancy protocols. 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

See the Technical Overview *Virtualizing OpenLab CDS Client/Server Systems (5994-3609EN)* at https://www.agilent.com/cs/library/technicaloverviews/public/te-virtualizing-openlab-cds-5994-3609en-agilent.pdf for more detail.

For details on virtualization of OpenLab servers 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.

Agilent Add-on software such as the *Spectral MS Deconvolution for OpenLab* product (M8455AA), the Sample Scheduler for OpenLab, or the *2D-LC Data Analysis* software require separate licenses.

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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.

NOTE

The communication path between instruments and workstations or instrument controllers is intolerant of latency, competitive traffic or service interruptions. For this reason, the instruments and their controllers should be on an isolated network segment. This means there should be no routing within the segment, switching must provide dedicated resources for instrument communication, and the segment should have no other traffic including broadcast messages or network management traffic.
Failure to isolate instrument traffic properly may make data acquisition unreliable.

Servers used in an OpenLab CDS environment (for example, OpenLab Server or license server) must be accessible via http or https in the network. This might require adjusting the proxy settings.

Cloud topologies are supported for OpenLab CDS. Please see *OpenLab ECM XT Enterprise topology Installation (openlab-server-ecmxt-v2.8-enterprise-installation-guide-en.pdf)* 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)
- Application server (OpenLab Server / ECM XT or OpenLab ECM)
- Database server
- File server
- Shared Services server (only in conjunction with OpenLab ECM)

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

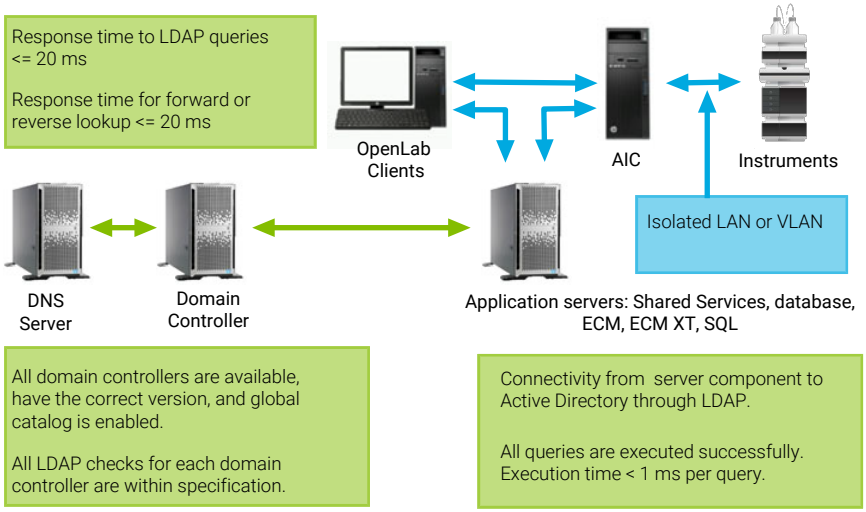


Figure 2: Specification summary (without IaaS)

Table 14: Basic network requirements

Network Specification description	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
Packet loss	= 0 % - ok > 1 % - warning > 2 % - indicates serious problems
Ping latency	<= 100 ms
Overall throughput for TCP and UDP protocols • Small system • Medium System with local database • Large System • File storage server • Application server with external database	 >= 1 Gbps to clients/AIC >= 1 Gbps to clients/AIC >= 2 Gbps to clients/AIC >= 2 Gbps to server backend >= 10 Gbps to server backend >= 2 Gbps 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.
Domain names	Consistent with RFC-1034
TLS Protocol	TLS 1.2, or TLS 1.3

Table 15: 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:

E.g. apply to the following topologies

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

Table 16: 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-5E or Cat-6 network cabling
- LAN communication hardware should be 100/1000 Mbps (or higher) speed capable. The J4100 Jet Direct Card is not supported. 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.

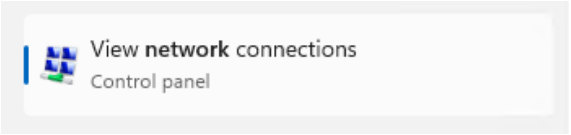
NOTE See the separate driver installation guides for further information regarding vendor specific instrument connections. GPIB or RS232 might be required.

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 Windows Start menu, search for *Network*. Open **View network connections**.



2 Right-click the relevant connection, and select **Properties**. In the Properties dialog, click **Configure**.

3 Select the **Power Management** tab.

4 Clear the **Allow the computer to turn off this device to save power** check box.

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

If you are using a third party firewall or anti-virus software on a network with OpenLab CDS, the firewall ports listed in this section may not be in use by other applications to allow communication between the system components of OpenLab CDS. These apply to workstations as well as to client/server topologies as component communications rely on these communication channels.

For any mixed distributed configurations (clients or server) also the ports required for the legacy version need to be opened and available. The System Preparation Tool (SPT) of OpenLab installer will check the ports during installation, and set up firewall rules that apply including v2.6 to allow for mixed mode configurations during upgrade.

NOTE The ports listed only in the column for v2.7, or v2.6 and earlier are not needed for new installations of OpenLab CDS. They may be closed manually.
Local ports are used for internal communications only and do not need to be opened in the firewall.

Terms used in the following tables

- ATS: Audit Trail Service
- CertSvc: Certificate Service
- CM: Content Management component of OpenLab CDS v2.7 and earlier
- DCS: Data Collection Service
- DR: Data Repository
- OLSS: OpenLab Shared Services

NOTE Ports in bold are required in secure systems.

OpenLab Server /OpenLab ECM XT

Table 17: OpenLab Server - inbound rules

Application	v2.8 Port		v2.7 Port		v2.6 or earlier		Remote System	Comments/Description
						Port		
CM Server [20]	n/a	n/a	FTP	21	FTP	21	Any	Optional - Only if FTP service is turned on for OpenLab Server. By default it is off
OpenLab Reverse Proxy :Apache HTTPD	n/a	n/a	HTTP	:80/	HTTP	:80/	Any	OpenLab Reverse Proxy
			HTTPS	:443/	HTTPS	:443/	Any	
OpenLab Reverse Proxy :YARP	HTTPS	:443/	-	-	-	-	-	Framework Reverse Proxy
OLSS Diagnostics	HTTPS	443	HTTPS	443	TCP	3424	Clients, AICs, Servers	Used for collecting diagnostic logs
Content Management PostgreSQL Server	upgrades only		TCP	**5432**	TCP	**5432**	Alfresco	*Required for secure system on PostgreSQL systems* For database access
DR PostgreSQL Server	TCP	**5432**	TCP	**5433**	TCP	**5433**	DR Services	*Required for Sample Scheduler Desktop or configuration* Database port Firewall rule gets applied during installation of DR Used by all internal and external applications + services, which connect against DR/PG: e.g. DCS, Audit Trail Service, Test Services, Sample Scheduler Desktop Client
CM Server [20]	n/a	n/a	HTTP	**5701**	TCP	**5701**	Cluster Servers	OpenLab scalable servers, between the nodes

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

Application	v2.8 Port		v2.7 Port		v2.6 or earlier		Remote System	Comments/Description
						Port		
Data Collection Service [21]	HTTPS	:443/ openlab/ dcs	HTTPS HTTP	:443/ openlab/ dcs 6328 used by ECM XT	HTTPS HTTP	52088 6328 used by ECM XT	ChemStation ECM XT Server	DCS (until CDS 2.4, ChemStation) ECM XT - may or may not be remote
OLSS Server	HTTPS -WCF HTTPS	**443** 443, 8084	TCP	**6570**	TCP	**6570**	Clients, AICs	OpenLab Licensing Flexera Server
			HTTPS - WCF	**443**	TCP - WCF	**6577**	Clients, AICs	OpenLab Shared Services WCF APIs
			-	-	HTTP	6624	Clients, AICs, others	Legacy Shared Services REST API, Legacy Licensing Support service REST API
			HTTPS	443, 8084	TCP	8084	Clients, AICs	Licensing API
			HTTP	**8090 8098, 8099**	HTTP	**8085 - 8099**	Clients, AICs	OpenLab Licensing view-only web UI. Default is 8090. Other ports may be used if 8090 is in use.
			TCP	**27000 - 27009**	TCP	**27000 - 27009**	Clients, AICs	OpenLab Licensing (Flexera) Server
OLSS Server: REST API			HTTP HTTPS	**6625** [22] **443**	HTTP HTTPS	**6625** **443**	Clients, AICs	SSL Termination: Shared Services REST API, Licensing Support service REST API
OLSS Server - OpenLab Distributed Cache Service - Enterprise topology [23]	TCP	7501, 7502, 7503	n/a	n/a	n/a	n/a	OLSS Server	Shared Services Instrument Status Caching - Enterprise topology only
CM Server [20]	n/a	n/a	HTTP	localhost: 8006	HTTP	8006	Internal for CM	Content Management Server

21 Set the "Programs" property for this port to "Any"

22 As of 2.7, called only by OpenLab Installer

23 C:\Program Files\OpenLab Distributed Cache\Hazelcast\lib\Hazelcast-{version}.jar

Application	v2.8 Port		v2.7 Port		v2.6 or earlier	Port	Remote System	Comments/Description
			HTTPS	**8443**	HTTPS	**8443**	CM and Index Server	OpenLab Server website and REST APIs for index service
CM Search Service [24]	n/a	n/a	HTTPS	**8983**	HTTPS	**8983**	Index server	Search Service
CM Server [20]	n/a	n/a	HTTP	localhost: 9083	HTTP	9083	Internal	OpenLab Server website and REST APIs, accessed via Reverse Proxy only
Test Services Web Service (REST APIs and website)	HTTPS	**:443/ testservices/**	HTTPS	**:443/ testservices/ :443/ openlab/ ca/**	HTTPS	**9092**	Any	formerly QualA. The port number can be changed using the Config tool
Test Services Central Management Service			HTTPS	**:443/ testservicesserver/**	HTTPS	**:52088/ openlab/ testservicesserver/**	Any	Central Management Service manages scheduling and email notifications for Test Services
Reverse Proxy Configuration Service [25]			HTTP	12876	HTTP	12876	Internal	Disabled after install Reverse Proxy Configuration Service hosts REST APIs to configure the Reverse Proxy Server.

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

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

Application	v2.8 Port		v2.7 Port		v2.6 or earlier		Remote System	Comments/Description
						Port		
DCS [26] CertSvc [27] ATS OLSS Server			HTTPS HTTPS	:443/openlab/dcs /openlab/certservice/	HTTPS HTTPS	52088 **52088**	Any	Certificate Service • *Required for internal communication on secure systems* • Not required in a secure configuration for incoming traffic Not required for secure systems: • Data Collection Service, • Audit Trail Service
RabbitMQ Server			TCP	5671	TCP	5671, 5672	Any	AMQP Ports; HTTPS
				15671		15671, 15672	Any	RabbitMQ Management UI: HTTPS
				4369		4369	Server, Clients	Peer discovery service, used by RabbitMQ nodes and CLI tools
Sample Scheduler Webserver, Orchestrator, DB-Management			HTTPS	**443**	HTTPS	**52088**	Any	
Backup and Restore	HTTP	**8045, 8046**	HTTP	**8045, 8046**	HTTP	**8045, 8046**	Server, WS/WS+	Backup Notification Service Backup Task Status Cache Service
OpenSearch	HTTPS	**9200**		-		-	Server, SearchServer, WS/WS+	SearchServer port required in secure system

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

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

Table 18: 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	389 636	On-prem Active Directory	LDAP LDAPS Server (only if used)
OLSS Server	TCP	445	NAS/Share Server	Server Message Block (SMB). Used for storage on a remote NAS share.
CM Server, OLSS	TCP UDP	1433 1434	SQL Server	Only when using MS SQL Server. Configurable
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
Backup Notification Service	HTTP	6624	OLSS API	Uses OLSS API to send email notifications.
CM Server, OLSS	TCP	7501, 7502, 7503	Hazelcast (cluster topology only)	For communication of Hazelcast instances on each redundant node within the cluster topology. They need to communicate with one another but not outside the cluster.
Backup Monitoring Service	HTTP	8045, 8046	Backup Notification Service Backup Task Status Cache Service	Backup Monitoring Service uses HTTP connection to track state of the scheduled backups and send notification about their statuses.
Server, search-server, WS/WS+	TCP	9200	OpenSearch	REST API of OpenSearch

ECM XT Add-ons

Table 19: 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 20: OpenLab CDS AIC - inbound rules

Application	v2.7 or higher		v2.6 or earlier		Remote System	Comments/Description
	Protocol	Port	Protocol	Port		
OLSS Storage Client			TCP	2886	localhost	*Local traffic only, does not require open port* OpenLab Automation Service (Work Area, Buffered Upload)
OLSS Diagnostics	HTTPS (WCF)	443	TCP (WCF)	3424	Clients, AICs, Server	WCF. Used for collecting troubleshooting logs
OLSS Storage Client	HTTPS	443	HTTP	6628	Clients	Remote Work Area REST API
Test Services (QualA) Website & REST APIs	HTTPS	:443/ testservices/ :443/openlab/ ca	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.

Application	v2.7 or higher		v2.6 or earlier		Remote System	Comments/Description
	Protocol	Port	Protocol	Port		
Acquisition	WS	:443/openlab/AcquisitionServices	TCP	9753		CDS 2.5 or earlier messaging communication [28]
	WS HTTPS	:443/openlab/AcquisitionServices/{ID} 443	HTTPS	9753	Clients	CDS 2.6 messaging communication [29]
			HTTPS	443		CDS 2.7 or later messaging communication [30]
Sample Scheduler Agent	HTTPS	443	HTTPS	52088	Clients	CDS 2.7 or later - messaging communication [30]

Table 21: OpenLab CDS AIC - outbound rules

Application	Protocol	Port	Remote System	Description
	TCP/UDP	53	DNS Server	DNS
	TCP/UDP	67, 68	DHCP Server	DHCP or BootP
Content Management	TCP	80	OpenLab Server	OpenLab Server secure website & secure REST APIs. Needed only if HTTPS is used. 443 should always be open
OLSS Licensing API	TCP	6570	OpenLab Server	OpenLab Licensing (Flexera) Server
Acquisition	TCP	27000 - 27009	OpenLab Server	OpenLab Licensing (Flexera) Server
OLCF Data Collection API, Data Collection Agent	HTTPS HTTP	443 6328	OpenLab Server	Data Collection Service 6328 used as fallback only if HTTPS is not available
Sample Scheduler	HTTPS	443	OpenLab Server	Sample Scheduler, connection to Orchestrator service

Please see the instruments "outbound" section at Instrument communication on page 46 for additional ports that certain drivers listen on for incoming communications from instruments.

Firewalls on AICs must be configured to allow such traffic.

28 Reverse proxy is not installed and communication is TCP based

29 Reverse proxy is installed but dormant, so 9753 is used directly

30 Reverse proxy is installed and active; all incoming connections are routed through the proxy

OpenLab CDS clients

Table 22: OpenLab CDS client - inbound rules

Application	v2.8		v2.7		v2.6 or earlier		Remote System	Comments/ Description
			Protocol	Port	Protocol	Port		
OLSS Storage Client			-	-	TCP	2886	localhost	*Local traffic only, does not require open port* OpenLab Automation Service: work area, buffered upload
Test Services (QualA)	HTTPS	52088	HTTPS	9092 optional	HTTPS	9092	Any	The port number can be changed using QualA Config tool. Only if remote access it required this port should be open so users can access https://<client-fqdn>:xxxx/ from remote systems.

Table 23: OpenLab CDS 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
OLSS Client API	HTTPS	443	OpenLab Server	OpenLab Server secure website and secure REST APIs. OpenLab Shared Services WCF APIs OpenLab remote work area. Client talks to AICs on this port
OLSS Licensing API	TCP	6570	OpenLab Server	OpenLab Licensing (Flexera) Server
Control Panel	TCP	8084	Clients, AICs	Licensing API (WCF)
	HTTP	8090 8098, 8099	OpenLab Server	OpenLab Licensing view-only web UI (Flexera). Default is 8090. If 8090 is in use, other ports may be used.
	TCP	27000 - 27009	OpenLab Server	OpenLab Licensing (Flexera)Server

Application	Protocol	Port	Remote System	Description/Comments
Acquisition	TCP HTTPS HTTPS	9753 9753 443	AIC AIC AIC	CDS 2.5 or earlier CDS 2.6 CDS 2.7 or later
OLCF Data Collection API, Data Collection Agent	HTTPS HTTP	443 6328	OpenLab Server	Data Collection Service, 6328 used as fallback only if HTTPS is not available
Sample Scheduler	HTTPS TCP	443 5433	OpenLab Server, AIC OpenLab Server	Sample Scheduler Sample Scheduler Desktop Client / Configuration OLDR connection (only if activated, and OLDR configuration)

Instrument communication

Table 24: Instruments - inbound rules

Protocol	Port	Remote System	Description
TCP, UDP	20	AIC, Workstation	FTP GC MSD Firmware installation: GCMS SQ 597*
TCP	21		
TCP	22	AIC, Workstation	SFTP - Firmware installation & SmartCard Trace for some instruments, e.g. 7200A GC-QTOF
TCP, UDP TCP	23	AIC, Workstation	Telnet - GC MSD Firmware installation, SQ 597* Instrument communication: LC, CE
UDP	69	AIC, Workstation	TFTP - Required for communication with legacy instruments, Jet Direct Cards
TCP	111, 1007, 1024-1026	AIC, Workstation	LC/MS instrument communication GC MSD instrument communication
TCP	2883-2886 3068, 3071	AIC, Workstation	GC MSD instrument control: 5975, 5973 MSD proprietary/SunRPC/TCP
TCP	4879	AIC, Workstation	Instrument communication: Headspace
TCP	5813	AIC, Workstation	GC MSD Firmware installation: ICMP/Ping
TCP	5973	AIC, Workstation	GC MSD instrument control proprietary/SunRPC/TCP

Protocol	Port	Remote System	Description
TCP	7972, 7973	AIC, Workstation	GC MSD instrument control : 597* MSD Slick protocol
TCP	8194	AIC, Workstation	PAL3, data subscription
TCP	9001, 9002	AIC, Workstation	Instrument communication: GC, LC, CE
TCP	9100	AIC, Workstation	Instrument communicatione: GC, LC, CE, 35900
TCP	9101, 9110	AIC, Workstation	Instrument communication: GC, LC, CE
TCP	10000-10020	AIC, Workstation	Instrument communication: GC 78xx, 88xx, 9000
TCP	30718 55055-55057	AIC, Workstation	Instrument utilities
UDP	55065	AIC, Workstation	GC MSD instrument control
TCP	60000	AIC, Workstation	PAL XT communication
TCP	61001	AIC, Workstation	Instrument utilities
TCP	64000, 64001	AIC, Workstation	PAL3 communication
TCP	64500	AIC, Workstation	PAL3, plain socket protocol

Table 25: Instruments - outbound rules

Protocol	Port	Remote System	Description
TCP/UDP	53	DNS Server	DNS
TCP/UDP	67, 68	DHCP Server	DNS or BootP
TCP	7980 - 7983	AIC, Workstation	GC MSD - Reverse Slick

OpenLab ECM server

Table 26: OpenLab ECM 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 [31]	HTTP	12876	Internal accessible on localhost only	Reverse Proxy Configuration Service hosts REST APIs to configure the Reverse Proxy Server's configuration file. This modifies the Apache HTTPD server's httpd.conf file.

Table 27: OpenLab ECM 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	SNMP Server	Simple Network Management Protocol
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
TCP	8211	ECM Comm Service	If caller is a Service
TCP	18211	ECM Comm Service	If caller is Forms Host

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

OpenLab ECM clients

Table 28: OpenLab ECM client - inbound rules

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

Table 29: OpenLab ECM 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	SNMP	Simple Network Management Protocol (SNMP)
TCP	389	LDAP Server	LDAP
TCP	636	Secure LDAP Server	Secure LDAP

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

About the System Preparation Tool 51

Use the System Preparation Tool 52

Reference of SPT Checks 56

About the System Preparation Tool

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

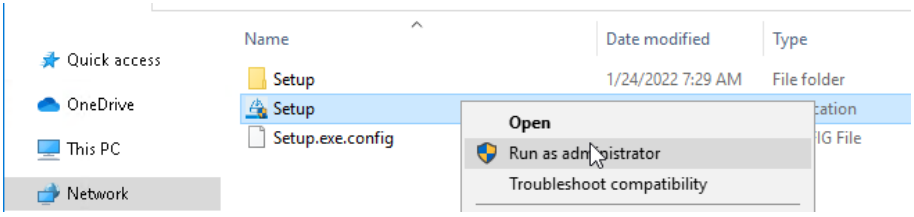
NOTE The SPT only checks that minimum requirements are met. Work with your Agilent representative to ensure your system is configured sufficiently for your projected number of users, instruments, and load.

Use the System Preparation Tool

The System Preparation Tool (SPT) checks and applies Windows settings on your machine. The OpenLab installer applies these settings automatically when run. Running the SPT in advance helps you to shorten the installation process and avoid PC reboots. For an overview of both mandatory and recommended settings, refer to the chapter *System Preparation Tool* in *OpenLab CDS Requirements and Supported Instruments (CDS_v2.8_Requirements_en.pdf, D0028027)*.

1 Optional: Copy the entire content of the USB media to a local drive or centralized folder, then remove the USB media from the PC.

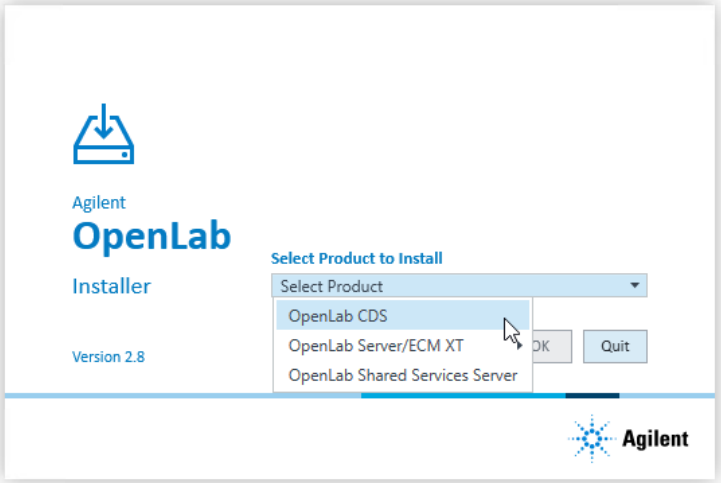
2 To open the installer, right-click the **setup.exe** file, and run it as administrator.



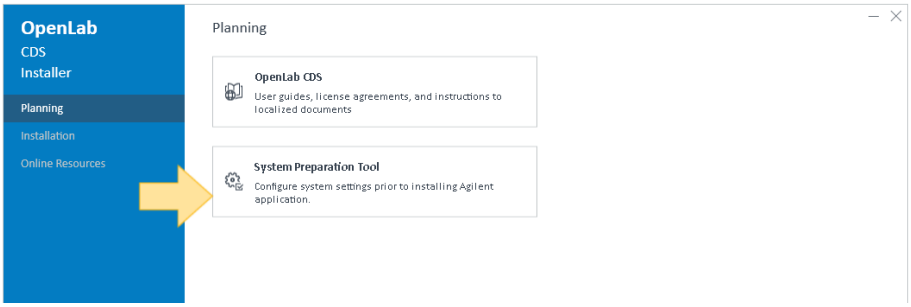
NOTE

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~Workstation~Win10** or **OpenLab CDS~Workstation~Win11**
- For a Workstation with Content Management, select **OpenLab CDS~WorkstationPlus~Win10** or **OpenLab CDS~WorkstationPlus~Win11**
- For clients select one of:

OpenLab (CDS, ECMXT)~(Client, CMServices)~Win10

OpenLab (CDS, ECMXT)~(Client, CMServices)~Win11

OpenLab (CDS, ECMXT)~(Client, CMServices)~Win2022

OpenLab (CDS, ECMXT)~(Client, CMServices)~Win2019

- For AICs select one of:

  OpenLab CDS~AIC~Win10

  OpenLab CDS~AIC~Win11

  OpenLab CDS~AIC~Win2022

  OpenLab CDS~AIC~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.

Recommended settings can improve the performance and stability of your system, but are not required to deploy the application.

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 Reference of SPT Checks on page 56.

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

The System Preparation Tool attempts to update the selected settings and displays the new status on the **Update Configuration** page. All actions are saved to a log file. A link to the log file is provided at the bottom of the page.

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 is saved 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 **Actions Required** section of 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 30: Mandatory settings

	Workstation Workstation Plus	Client CM Services	AIC	OpenLab Server ECM XT OLSS Server
Programs and Features				
Enable/deploy .NET Framework 3.5	●	●	●	●
Tcp Port Sharing and Activation	●	●	●	●
Windows Communication Foundation Non-HTTP Activation	●	●	●	●
.NET Framework 4.X Advanced Services	●	●	●	
Telnet Client	●	●	●	
TFTP Client	●	●	●	
System				
Local Group Policy Requirements [32]	●	●	●	●
Set Services Timeout	●	●	●	●
HTTP service	●	●	●	●
Set Services Timeout	●	●	●	●
Power options				
Set preferred plan to High performance	●	●	●	●
Set "Put the computer to sleep" to "Never for Performance Power Plan"	●	●	●	●
Set "Turn off hard disk" after to "Never for Performance Power Plan"	●	●	●	●
Disable Quick Start	●	●	●	

32 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

	Workstation Workstation Plus	Client CM Services	AIC	OpenLab Server ECM XT OLSS Server
Security Options: Set Sharing and security model for local accounts to Classic	●	●	●	●
Network: Disable Power Management options for Network Adapter	●	●	●	●

Table 31: System checks

	Workstation Workstation Plus	Client CM Services	AIC	OpenLab Server ECM XT OLSS Server
CPU	●	●	●	●
Minimum Memory	●	●	●	●
OS Compatibility	●	●	●	●
OS Minimum Version	●	●	●	
OS Architecture (64 bit)	●	●	●	
Screen Resolution	●	●	●	●
Language Compatibility	●	●	●	●
Network Availability - Verify active network adapter	●	●	●	●
Ports - configuration	●	●	●	●

Table 32: Recommended settings

	Workstation Workstation Plus	Client CM Services	AIC	OpenLab Server ECM XT OLSS Server
System - Startup and recovery settings	●	●	●	
System - Turn off system protection (restore points) for all drives	●	●	●	
Indexing options - Disable indexing options for all drives and locations			●	

	Workstation Workstation Plus	Client CM Services	AIC	OpenLab Server ECM XT OLSS Server
Offline Maps - Disable metered connections and map updates	●	●	●	
Windows Update - Disable windows update service	●	●	●	●
Tablet mode: Enable desktop mode [33]	●	●	●	
Windows Explorer - Enable navigation panel	●	●	●	
Personalization - Disable transparency effects	●	●	●	
Personalization - Disable advertising info	●	●	●	
Personalization - Combine taskbar buttons	●	●	●	
Personalization - Disable advertising info	●	●	●	

Table 33: Actions Required section of the SPT report (check settings and update manually)

	Workstation Workstation Plus	Client CM Services	AIC	OpenLab Server ECM XT OLSS Server
Windows Update - Apply pending updates	●	●	●	●
Windows activation	●	●	●	●
System domain membership	●	●	●	●
Region - Change system locale	●	●	●	●
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	●	●	●	

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Instrument Drivers

Table 34 on page 60 list the Agilent instrument drivers that are provided with the OpenLab CDS 2.8 software. Selected instrument drivers are installed by default by the OpenLab installer.

Drivers that are not automatically installed can be found on the media under Setup\Packages\Add-ons. To install these drivers see section *Install or Upgrade Driver Software* in your installation guide.

Table 34: Agilent driver packages shipped with OpenLab CDS 2.8

RC .Net Instrument Driver	Driver Software Revision	Installed by default
Agilent LC and CE	3.7.xxx	●
Agilent LC/MS SQ	3.0.xx	●
Agilent ELSD	1.8	
Agilent GC	4.0	●
Agilent 7697A-8697 Headspace	4.0	
Agilent GC/MS SQ	1.5.xx	●
Agilent Micro GC	2.4.x	
Agilent Gas Analyzer	2.8	
Agilent G1888 Headspace	1.09	
35900E A/D Converter	2.4	●
Agilent SS420X A/D Converter	1.2	●
Agilent Data Player	2.5	●
Agilent PAL 3 (GC only)	2.7	
Agilent PAL-xt / CTC PAL	1.08	

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 networked 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 2.8 supports various Non-Agilent instruments. See Non-Agilent Instruments on page 84, or 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, SFC, and CE Instrument Support

Recommended firmware

OpenLab CDS 2.8 is shipped with Agilent LC and CE Drivers 3.7. 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.07.34 or later
Agilent 1200 Infinity Hosted Modules	C.07.30 or later
Agilent 1260/1290 Infinity II Modules	D.07.34 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 https://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 is available in the **Docs/EN** folder of the OpenLab CDS media.

Supported LC modules

Most Agilent LC modules can be controlled with the current version of OpenLab CDS. LC & CE driver release 3.7 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. The tables below list 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.

Manual Samplers such as G1313 and manual injections are supported, not all models may be listed below.

Table 35: Agilent LC - Sampling Systems

Product Number	Module Name	Compatibility Statement
G1328C	1260 Manual Injector	supported, without driver
G1328D	1260 Infinity II Manual Preparative Injector	supported, without driver
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
G3167A	1260 Infinity II Prime Online Sample Manager 5067-6680 3-Position/6-Port 800 bar Valve is required	supported as part of solutions with G2954-64000 Online LC Monitoring SW: G3167AA or G3167BA Sets respectively.
G3167B	1290 Infinity II Bio Online Sample Manager 5320-0003 3-Position/6-Port 800 bar Valve is required	
G4226A	1290 Infinity Autosampler	supported
G5667A	1260 Infinity Bio-inert Multisampler	supported
G5668A	1260 Infinity II Bio-inert Multisampler	supported
G7129A	1260 Infinity II Vialsampler	supported

Product Number	Module Name	Compatibility Statement
G7129B	1290 Infinity II Vialsampler	supported
G7129C	1260 Infinty II Vialsampler (Prime LC, 800bar)	supported
G7137A	1290 Infinity II Bio Multisampler	supported
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 (Prime LC, 800bar)	supported Use legacy addressing scheme (P1-A1)
G7167B	1290 Infinity II Multisampler	
G7167C	1260 Infinity II Hybrid Multisampler	supported, as a part of 1260 Infinity II Prime LC System

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 [34]	supported

34 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.

Product Number	Module Name	Compatibility Statement
G1311B	1260 Infinity Quaternary Pump [34]	supported
G1311C	1260 Infinity Quaternary Pump VL [34]	supported
G1312A	1260 Infinity Binary Pump [34]	supported
G1312B	1260 Infinity Binary Pump SL [34]	supported
G1312C	1260 Infinity Binary Pump VL [34]	supported
G1361A	1260 Infinity Preparative Pump [34]	supported
G1376A	1200 Micro Capillary Pump	not supported
G2226A	1200 Micro Nano Pump	not supported
G4204A	1290 Infinity Quaternary Pump [34]	supported
G4220A	1290 Infinity Binary Pump [34]	supported
G4220B	1290 Infinity Binary Pump [34]	supported
G5611A	1260 Infinity Bio-inert Quaternary Pump [34]	supported
G5654A	1260 Infinity II Bio-inert Quaternary Pump [34]	supported
G7104A	1290 Infinity II Flexible Pump [34]	supported
G7104C	1260 Infinity II Flexible Pump [34] (Prime LC, 800bar)	supported
G7110B	1260 Infinity II Isocratic Pump [34]	supported
G7111A	1260 Infinity II Quaternary Pump VL [34]	supported
G7111B	1260 Infinity II Quaternary Pump [34]	supported
G7112B	1260 Infinity II Binary Pump [34]	supported
G7120A	1290 Infinity II High Speed Pump [34]	supported
G7131A	1290 Infinity II Bio Flexible Pump	supported
G7131C	1260 Infinity II Bio Flexible Pump	supported
G7132A	1290 Infinity II Bio High-Speed Pump	supported
G7161A	1260 Infinity II Preparative Binary Pump	supported
G7161B	1290 Infinity II Preparative Binary Pump	supported

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
G4761A	InfinityLab Sample Thermostat	supported with G7129X and G7167X
G7116A	1260 Infinity II Multicolumn Thermostat	supported
G7116B	1290 Infinity II Multicolumn Thermostat	supported with host-module B.06.75/D.06.75
G7130A	InfinityLab Integrated Column Compartment	supported as option for G7129A/B
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

Product Number	Module Name	Compatibility Statement
G1315D	1260 Infinity Diode Array Detector VL	supported
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
G7800A	1260 Infinity II Multi Detector Suite	not supported
G4260A	380-ELSD	supported
G4260B	1260 Infinity II Evaporative Light Scattering Detector	supported
G4261A	385-ELSD	supported

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 [35]

Product Number	Module Name	Compatibility Statement
G1156A	1200 Series 6-Position/7-Port Valve (400 bar)	part of purge kit; 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	not supported
G1163A	1200 Series 2-Position/10-Port Micro Valve	not 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	
G4223A	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	
G4234C	5067-4273 6-Position/14-Port selector Valve head 1300 bar	supported
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

35 In general all Agilent valve configurations are supported. This table lists selected valves, valve drives and clusters. Please refer to the LC&CE Driver Release Note of your driver version for a complete list of supported Agilent valves.

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	1260 Infinity Micro-Scale Fraction Collector/Spotter	not 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
G7169B	1290 Infinity II Open-bed Sampler/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 LC and LC/MSD 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
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 LC System Isocratic, Man. Inj., VWD, 600 bar
G4286C	1220 Infinity LC System VL [36]
G4287A	1120 Compact LC, Isocratic with Oven and ALS
G4287B	1220 Infinity LC System Isocratic, ALS, VWD and Oven 600 bar
G4287C	1220 Infinity LC System VL [36]
G4288A	1120 Compact LC, Gradient
G4288B	1220 Infinity LC Gradient, Man. Inj., VWD, 600 bar
G4288C	1220 Infinity LC System VL, Gradient, Man. Inj. VWD, 400 bar
G4289A	1120 Compact LC, Gradient with Oven
G4289B	1220 Infinity LC Gradient, Man. Inj., VWD and Oven 600 bar
G4289C	1220 Infinity LC System VL, Gradient, Man. Inj. VWD, 400 bar
G4290A	1120 Compact LC, Gradient with oven and ALS
G4290B	1220 Infinity LC Gradient, ALS, TCC, VWD, 600 bar
G4290C	1220 Infinity LC System VL, Gradient, ALS, TCC, VWD, 400 bar
G4291B	1220 Infinity LC System Isocratic, Man. Inj., VWD and Oven 600 bar
G4291C	1220 Infinity LC System VL [36]
G4292B	1220 Infinity LC System Isocratic, ALS, VWD, 600 bar
G4292C	1220 Infinity LC System VL [36]
G4293B	1220 Infinity LC Gradient, ALS, VWD, 600 bar
G4293C	1220 Infinity LC System VL, Gradient, ALS, VWD, 400 bar
G4294B	1220 Infinity LC Gradient, ALS, TCC, DAD, 600 bar

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

36 Manual module, without a driver. Supported within a 1200 LC instrument.

Agilent 2D-LC Solution

OpenLab CDS 2.8 supports 2D-LC solutions. Together with *2D-LC Software 1.2 for Data Analysis*, OpenLab CDS supports 2D-LC acquisition, method setup, data analysis, custom calculations and reporting. Activating the 2D-LC system driver requires a separate dongle-based license.

Agilent Supercritical Fluid Chromatography (SFC) Modules

Table 44: Agilent SFC Modules

Product Number	Module Name	Compatibility Statement
G4301A	1260 Infinity II SFC Control Module	supported
G4302A	1260 Infinity SFC Binary Pump	supported
G4303A	1260 Infinity SFC Standard Autosampler	supported
G4767A	1260 Infinity II SFC Multisampler	supported
G4782A	1260 Infinity II SFC Binary Pump	supported

Capillary Electrophoresis (CE) instruments

OpenLab CDS supports control of CE as well as CE/MSD instruments.

Starting with OpenLab CDS v2.7 in connection with LC&CE Driver 3.5, the following workflows are supported:

- Configure the 7100 Agilent CE or CE/MSD instruments using instrument type Agilent LC & LC/MS.
- Connect to the CE instrument, create methods, and run analyses using CE specific soft configuration options.
- Review CE analytic data with same feature set as for LC.
- Create reports from CE data with same feature set as for LC.
- Capillary Zone Electrophoresis (CZE) workflow (with or without corrected area and CE specific calculations).
- Data Analysis allows for scaled responses using various options.

- Audit trail is supported with CE.

In addition automation is available for method developments, including user vials/sequence overwrite.

Table 45: Configurable Agilent Capillary Electrophoresis (CE) instruments

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 46: 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 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 47: 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

Table 48: 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

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 49: 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 50: 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 51: 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 52: Sampling Accessories

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

Table 53: 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 54: 7697A Headspace Sampler

Product Number	Description	Support Statement
G4556A	12 Vial	supported 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 55: 8697 Headspace Sampler

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

Table 56: G1888 Headspace

Product Number	Description	Support Statement
G1888A	70 vial G1888 Headspace	supported

Installs of Headspace driver version 3.x will uninstall B.01.09 or earlier headspace drivers. Any instrument with a G1888 configured will encounter an error message that the G1888 driver is not installed and the G1888 will be removed from the configuration. In this case, install the Agilent OpenLab CDS – Agilent G1888 Headspace driver from the media and reconfigure the instrument with the G1888.

Agilent CTC Sampler support

Support statements for Agilent CTC / PAL samplers with OpenLab CDS rev. 2.8

Table 57: Agilent PAL-xt CTC Sampler with Agilent GC

Product Number	Description	Support Statement
G6500-CTC	Combi-PAL for Liquid and Headspace Injection	Support on 8890, 8860, 7890, 7820, 6890 and 6850 GC FW can go up to 2.6.8 using driver B.01.08.1 or greater Not compatible with any GC ALS.
G6501-CTC	Combi-PAL for Liquid Injection	
G6509-CTC	Combi-PAL for Liquid Injection	
G6502-CTC	GC-PAL for Liquid Injection	
G6501B	Agilent GC Sampler 80 for Liquid Injection	Support on 8890, 8860, 7890, 7820, 6890 and 6850 GC systems. FW 4.3.0 using driver B.01.08.1 or greater Not compatible with any GC ALS.
G6502B	Agilent GC Injector 80 for Liquid Injection	
G6509B	Agilent GC Sampler 120 for Liquid Injection	

Table 58: Agilent CTC PAL-3 Autosampler with Agilent GC

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

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 CDS2.8.

For GCs supported as part of a GC/MS system - see Agilent GC System and Sampler support on page 75.

For Autosamplers, CTC Samplers and Headspace supported as part of a GC/MS system - see Agilent GC Autosampler support on page 76, Agilent Headspace Sampler support on page 78, or Agilent CTC Sampler support on page 79 respectively.

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
5975T	Integrated GC/MS	not supported

Model number / series	Description	Compatibility Statement
5977A 5977B 5977E	MS System	supported CI added with GC/MS Driver A.01.02
5977C	MS System	supported Expanded mass range (0.6-1091) requires GC/MS driver version 1.5 or higher

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.

A list of supported instruments is available at https://www.agilent.com/en/support/software-informatics/openlab-software-suite/chromatography-data-systems/faq-what-instruments-are-supported-in-openlab-cds .

On www.agilent.com search for *"FAQ: What instruments are supported in OpenLab CDS? "*

NOTE The support matrix for non-Agilent drivers is subject to frequent changes. Check the *Compatibility Matrix non-Agilent Drivers OpenLab CDS* available in PDF format from https://agilent.subscribenet.com - access via OpenLab > OpenLab AddOns.

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

OpenLab CDS VL Instruments

OpenLab CDS VL Workstation and OpenLab CDS VL Workstation Plus licenses include one instrument connection, and provide a limited support for Agilent instruments. The listed subset of Agilent Chromatography instruments is configurable with a *OpenLab CDS VL Workstation* or *OpenLab CDS VL Workstation Plus*. Listed 1100 series LC modules that are predecessors of 1260 Infinity LC series modules are supported on best effort basis.

Table 62: 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
G1314A	1100/1200 Variable Wavelength Detector
G1314B	1260 infinity Variable Wavelength Detector VL
G1314C	1260 Infinity Variable Wavelength Detector VL+
G1314F	1260 Infinity Variable Wavelength Detector
G1315C	1260 Infinity Diode-Array Detector VL+
G1315D	1260 Infinity Diode-Array Detector VL
G1316A	1260 Infinity Thermostatted Column Compartment
G1321B	1260 Infinity Fluorescence Detector Spectra
G1321C	1260 Infinity Fluorescence Detector
G1328C	1260 Manual Injector
G1329A	1100 Series Standard Autosampler
G1329B	1260 Infinity Standard Autosampler
G1362A	1260 Infinity Refractive Index Detector
G1365C	1260 Infinity Multiple Wavelength Detector
G1365D	1260 Infinity Multiple Wavelength Detector VL
G1390B	1200 Infinity Series Universal Interface Box II
G4212B	1260 Infinity Diode-Array Detector

Table 63: VL-configurable 1260 Infinity II LC series modules

Product number	Module Name
G7110B	1260 Infinity II Isocratic Pump
G7111A/B	1260 Infinity II Quaternary Pump
G7114A	1260 Infinity II Variable Wavelength Detector
G7115A	1260 Infinity II Diode Array Detector WR
G7116A	1260 Infinity II Multicolumn Thermostat
G7117C	1260 Infinity II Diode Array Detector HS
G7121A	1260 Infinity II Fluorescence Detector
G7121B	1260 Infinity II Fluorescence Detector Spectra
G7129A	1260 Infinity II Vialsampler (includes G7130A ICC [37] as option)
G7162A	1260 Infinity II Refractive Index Detector
G7165A	1260 Infinity II Multiple Wavelength Detector

Table 64: Configurable Agilent Combined LC Systems

Product Number	System Name
G4286A	1120 Compact LC, Isocratic
G4286B	1220 Infinity LC System Isocratic, Man. Inj., VWD, 600 bar
G4286C	1220 Infinity LC System VL [36]
G4287A	1120 Compact LC, Isocratic with Oven and ALS
G4287B	1220 Infinity LC System Isocratic, ALS, VWD and Oven 600 bar
G4287C	1220 Infinity LC System VL [36]
G4288A	1120 Compact LC, Gradient
G4288B	1220 Infinity LC Gradient, Man. Inj., VWD, 600 bar
G4288C	1220 Infinity LC System VL, Gradient, Man. Inj. VWD, 400 bar
G4289A	1120 Compact LC, Gradient with Oven
G4289B	1220 Infinity LC Gradient, Man. Inj., VWD and Oven 600 ba
G4289C	1220 Infinity LC System VL, Gradient, Man. Inj. VWD, 400 bar
G4290A	1120 Compact LC, Gradient with oven and ALS

37 Agilent InfinityLab Integrated Column Compartment

Product Number	System Name
G4290B	1220 Infinity LC Gradient, ALS, TCC, VWD, 600 bar
G4290C	1220 Infinity LC System VL, Gradient, ALS, TCC, VWD, 400 bar
G4291B	1220 Infinity LC System Isocratic, Man. Inj., VWD and Oven 600 bar
G4291C	1220 Infinity LC System VL [36]
G4292B	1220 Infinity LC System Isocratic, ALS, VWD, 600 bar
G4292C	1220 Infinity LC System VL [36]
G4293B	1220 Infinity LC Gradient, ALS, VWD, 600 bar
G4293C	1220 Infinity LC System VL, Gradient, ALS, VWD, 400 bar
G4294B	1220 Infinity LC Gradient, ALS, TCC, DAD, 600 bar

Table 65: VL-configurable Agilent GC systems

Product Number	System Name [38]
G4350A	7820A GC System
G6589AA, G6590AA M8417AA [39]	7820A VL GC System
G2790	8860 GC System
G3581A	490 Micro GC System
G3588A	990 Micro GC System

38 Instrument add-ons, like Headspace and RTL, are supported per the availability of that feature on the associated instrument.

39 Bundle with OpenLab CDS VL Workstation

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OpenLab CDS System Compatibility

Table 66: OpenLab CDS System Compatibility

Component	Supported Revisions	Comments
OpenLab Server	all 2.8 configurations	supported
OpenLab ECM XT	all 2.8 configurations	supported
OpenLab CDS	2.5, 2.6, 2.7	supported during an upgrade
	2.8	supported for steady state usage
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.
Shared Services server	3.7	for OpenLab CDS with OpenLab ECM configurations only. Standalone Deployment of OpenLab Shared Services Server without a content management solution (aka distributed Workstations) with OpenLab CDS is not supported.
Agilent Framework	1.8	includes Shared Services 3.7, Data Repository, Storage Abstraction, Reverse Proxy, Activity log search index, and services
SLIMS	6.7, 6.9, (7.0)	requires Sample Scheduler for OpenLab

OpenLab ELN is not supported with OpenLab CDS.

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

Table 67: Content management configurations available for OpenLab CDS

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

See OpenLab ECM XT/ OpenLab Server Documentation for list of supported server configurations.

Mixed configurations

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

OpenLab Server/ OpenLab ECM XT

Mixed configurations are supported with OpenLab CDS and OpenLab ChemStation connect to the same OpenLab Server/OpenLab ECM XT version. OpenLab EZChrom is not compatible with OpenLab CDS 2.8

See Agilent white-paper *Mixed Environment Support in OpenLab CDS* for details on the Mixed Environment design.

Check with your Agilent contact for details on the CDS versions supported in mixed configurations. At time of release the following versions can be connected with OpenLab CDS in mixed configurations, per compatibility of ChemStation with OpenLab Server/ECM XT:

- OpenLab ChemStation C.01.09
- OpenLab ChemStation C.01.10
- OpenLab ChemStation LTS 01.11

OpenLab ECM

OpenLab CDS can be configured with OpenLab ECM v3.x via an Agilent OpenLab Shared Services server to operate in an environment containing different data systems. OpenLab ChemStation or OpenLab EZChrom may be connected to OpenLab ECM via a separate Shared Services server.

For more details, refer to *Configuring OpenLab CDS with OpenLab ECM (CDS_v2.8_configure-with-ECM_en.pdf, D0028024)*.

Standalone deployment of OpenLab Shared Services Server without a content management solution is not supported with OpenLab CDS.

Compatible Libraries and Databases

The libraries and databases listed below are compatible with version 2.8 of OpenLab CDS.

NOTE

For distributed environments, MS Search and NIST library versions should be consistent on every client and AIC.

NIST MS Search/ NIST Library

Supported:

- 3.0 / NIST23

  This library ships with NIST MS Search

Backwards compatibility to

- 2.4 / NIST20
- 2.3 / NIST17

  2.3 / NIST17 Demo

- 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 releases are:

- W23/NIST23
- W12/NIST20
- W11/NIST17

Supported Agilent Software Add-Ons

In general Agilent Add-on Software is supported to be co-resident with OpenLab CDS components. For details consult the respective product information.

7 Sales and Support Assistance

Local Contact

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

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

Agilent Community

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.

https://community.agilent.com/

In This Book

This document details the minimum hardware and software requirements that need to be met to run OpenLab CDS. It is valid for Workstation, Workstation Plus, client, or analytical Instrument Controller (AIC) components. It also provides information on supported Agilent- and Non-Agilent instruments.

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