Networked Agilent OpenLAB Chromatography Data Systems (CDS), Reporting and Data Management Solutions:

INCREASING YOUR LABORATORY PRODUCTIVITY

Whitepaper

Introduction

Today’s laboratories seek to increase productivity and lower costs. These imperatives apply to every aspect of lab operations from sample analysis and data processing, to data and asset management, and compliance. The chromatography data system (CDS) used to control instruments, acquire, process and report data is fundamental to laboratory work and plays an important role in laboratory efficiency.

Many laboratories have isolated workstations that require more time to support and manage than a networked system. Networking the workstations and storing laboratory information centrally can greatly improve laboratory operations. Data and methods can be shared across the lab, across the company and across the world. Access any networked instrument from anywhere and reprocess data outside your laboratory. OpenLAB CDS, when networked, can offer these productivity enhancements. This overview provides the basics for going beyond a workstation.
The solution: networked OpenLAB CDS with OpenLAB data management software

A networked OpenLAB CDS solution is one of the best ways to address the challenges associated with managing isolated analytical workstations and the data they produce. Beyond putting instruments on the network for remote access and central data storage, it enables the lab manager to monitor and control all of its key elements—administration, methods, sequences, reporting and data storage—centrally.

When a lab-wide operational change needs to be made such as changing user permissions, it can be carried out once over the network, rather than multiple times on every chromatography workstation.

OpenLAB CDS is scalable from an individual workstation to a fully distributed system. It is available in two versions—OpenLAB CDS ChemStation and OpenLAB CDS EZChrom Editions—both of which integrate seamlessly with the other components of the OpenLAB software suite to provide a complete laboratory informatics solution. OpenLAB CDS EZChrom Edition provides more comprehensive multi-vendor chromatography instrument control, while OpenLAB CDS ChemStation Edition handles a broader range of Agilent instruments including GC, LC, CE, SFC, LC/MS, and CE/MS. Both have in common shared components for instrument management, system administration, reporting, and support for Waters Acquity.

OpenLAB data management software—either OpenLAB ECM or OpenLAB Data Store—integrates with OpenLAB CDS and enables laboratories to capture and manage laboratory information easily and efficiently. In addition to organizing data, methods and sequences, and providing fast searching and retrieval of information, these software solutions also deliver all the capabilities necessary to have control of your data — helping you achieve compliance to regulations such as 21 CFR Part11, Annex 11 GxP, CLIA, SQF, ISO17025 and many others.

Benefits of an OpenLAB CDS networked solution:

• Centralized management of users and their access privileges, and storage of methods and sequence templates for easier enforcement of SOPs

• Lab-at-a-glance view of instrument status, and remote instrument access and control in a distributed architecture

• Comprehensive data security, audit trails, versioning and e-signature authorization

• Easy searching, retrieving and sharing data, reducing duplication of work

• Efficient data storage with features to support 21 CFR Part 11 and EU Annex 11 compliance

• Future-facing, scalable to grow with your lab

Straightforward upgrade

If you use ChemStation or EZChrom Elite today, OpenLAB CDS is a straightforward upgrade, offering the shortest path to implementation of a networked solution with full backwards compatibility for raw data, methods, workflows and results. As it is the next generation of ChemStation and EZChrom Elite, OpenLAB CDS retains a familiar look and feel but provides users with significant improvements and new features.
Scalable in administration, instrument management and data storage

The OpenLAB architecture provides the option to have all key functional elements—administration, data storage, and instrument access—either locally or centrally over the network. The OpenLAB architectural flexibility allows you to combine these options in many ways, giving you more choices to map OpenLAB to the specific needs of your lab. The most common networked OpenLAB CDS configurations are shown in Figures 1 and 2.

Figure 1. Networked OpenLAB CDS Workstations with Central Data Storage

Figure 2. Distributed OpenLAB CDS System with Central Data Storage

Figure 1. Networked OpenLAB CDS workstations with central data storage. This solution provides local instrument control only, central system administration and a lab-wide view of all connected instruments. Data management software, either OpenLAB Data Store or ECM, delivers the added benefits of central method, sequence and data storage for enhanced security and fast retrieval from anywhere over the network (ChemStation Edition).

Figure 2. Distributed OpenLAB CDS system with central data storage in a file share (EZChrom Edition), OpenLAB Data Store or ECM (both EZChrom and ChemStation Editions). In addition to the benefits of centralized system administration, and method, sequence and data management, this configuration includes Agilent Instrument Controllers (AICs) which enable remote instrument control from any OpenLAB CDS client on the network. Given appropriate user privileges, you can monitor instrument operation in real time, and perform data acquisition and post-run data processing from any connected OpenLAB CDS client.
Central system administration streamlines laboratory management

The OpenLAB Control Panel (Figure 3) centralizes system administration and instrument management, saving valuable time. You can access the OpenLAB Control Panel from any location with an internet connection. This eliminates the need to make changes or to check a system status at individual workstations.

The OpenLAB Control Panel provides one, intuitive user interface to perform administration tasks and to view the status of the laboratory.

- View the settings of the logged-in user
- View and edit the local configuration
- View and edit the system configuration
- Set up and manage roles, permissions and privileges for users and user groups
- View and manage licenses, for example to add new licenses and to monitor their use
- Create links to preferred websites
- View and manage connected instrument controllers and instruments
- Manage system printers (EZChrom Edition)
- List all actions performed in the control panel and of instrument activity
- Create administrative reports about the system
- Troubleshoot problems with access to all configuration and log files
Central management of users and their access privileges

As shown in Figure 4, roles and privileges are easy to manage using the OpenLAB Control panel. In a single software window, the OpenLAB CDS Administrator can create, edit or delete users, and assign roles and privileges to specific users and user groups. Roles and privileges define what users are allowed to view, or do, in the Control Panel as well as the CDS. The software includes preconfigured roles, such as a Lab Manager, Administrator, Analyst or Operator and allows the configuration of custom user roles with up to 39 different privileges.

Figure 4.
**Single point instrument management and control**

An Agilent OpenLAB networked solution will help you get the most from your instruments. Using either a networked or a distributed system, you get a lab-wide view of all installed instruments including the instrument name, location and run status. Using a distributed system, you can also control, configure, monitor or launch your instruments from any OpenLAB CDS client (Figures 5 and 6). These capabilities can be accessed from any location with an internet connection. This helps you run your lab with the highest possible efficiency and uptime.

Create, configure, edit and delete instruments and their locations in the hierarchy.

Launch an instrument, online or offline.

Edit privileges for instruments:
- Control which users or groups have access to a location or instrument.
- Send email notifications to a user, group, or role when one or more events occur within a location or instrument, for example to send a notification at the start of a sequence (EZChrom Edition).

OpenLAB CDS displays ongoing bi-directional instrument control in a real-time display.
OpenLAB CDS Intelligent Reporting

Fully integrated into the OpenLAB CDS software, Intelligent Reporting allows users to create state-of-the-art reports. Intelligent reports can include standard or advanced result calculations, making it easy to create reports for typical pharmaceutical and chemical applications, such as system suitability, impurity profiling, BTU or content uniformity. It allows you to include limit checks, automatically flag outliers by pass/fail criteria, sort results to show the most relevant information at the top of a table and to include graphical visualization of results in trend charts. Both single injection and sequence summary reports can be created. Once created, reports can be viewed on-line, printed or saved to a PDF or Microsoft Excel file. These features make report review faster and more efficient and can be part of a paperless workflow.

A single injection report can include one or multiple chromatograms.

OpenLAB CDS Intelligent Reporting comes with a number of pre-defined report templates that can be used as-is, or serve as a starting point for reports tailored to specific needs. A flexible, yet easy-to-use report template editor allows you to create report templates using a simple drag-and-drop approach.

In the WYSIWYG design pane edit the report items, add calculations, edit the report title or add a logo.
Lab-wide reporting using OpenLAB ECM Intelligent Reporter

When OpenLAB ECM is used for central storage, OpenLAB ECM Intelligent Reporter can be added to your system. OpenLAB ECM Intelligent Reporter uses query-based reporting, enabling you to report on data acquired over weeks or months (Figure 9). OpenLAB ECM Intelligent Reporter also allows you to create instrument utilization reports or column usage reports.

OpenLAB ECM Intelligent Reporter shares the same components and report templates as OpenLAB CDS Intelligent Reporting. Report templates created using OpenLAB CDS Intelligent Reporting can be used in OpenLAB ECM Intelligent Reporter. Users familiar with OpenLAB CDS Intelligent Reporting will be able to use OpenLAB ECM Intelligent Reporter, immediately with no additional training required.

Figure 9.

OpenLAB ECM Intelligent Reporter provides database-based reporting for your OpenLAB CDS networked solution. This report shows LC instrument utilization.
Capture, secure and share information easily and efficiently

Agilent OpenLAB Data Store and ECM easily integrate with OpenLAB CDS to provide a central storage solution. Central storage of methods and sequence templates helps to ensure that the correct method is always used, the master method, facilitating adherence to SOPs. Central data storage also allows users to readily search, retrieve and share data with colleagues, reducing duplication of work. Data management tasks that can be performed more efficiently using OpenLAB Data Store or ECM include:

- Securing master methods and data with audit trails and e-signatures
- Storing and retrieving methods, sequence templates and data
- Backing up data from a single server rather than individual workstations to save time
- Complying with US FDA 21 CFR Part 11 and EU Annex 11 requirements

OpenLAB Data Store

Designed for smaller deployments of no more than fifteen instruments, OpenLAB Data Store is an affordable solution for the central storage of OpenLAB CDS data, methods and sequence templates. It also includes tools to streamline management of laboratory operations and assets. OpenLAB Data Store is designed for common laboratory workflows and is focused on the essential tasks that make it easy to deploy and use—right out of the box.

When OpenLAB CDS files are uploaded to Data Store, the software automatically extracts and indexes relevant information, such as sample name, peak name, and operator, to expedite future data retrieval. Data transfer settings enable automatic file uploads after acquisition, reprocessing, or any other modification. Because searches are powered by a state-of-the-art search engine, results retrieval is instantaneous (Figure 10).

Figure 10.

OpenLAB Data Store searching provides results quickly with a powerful search engine and simple-to-use interface.
OpenLAB ECM

OpenLAB ECM is a secure central content management solution that scales from a small workgroup to a large enterprise-wide deployment. It is unique in its ability to manage raw data and human readable documents of any data, in any form, from any supplier (Figure 11). By bringing together analytical workstations and their data, as well as enterprise-level software, such as LIMS and ELN, a networked OpenLAB CDS solution with OpenLAB ECM dramatically simplifies software connectivity within the laboratory and across the enterprise.

As a central data repository, OpenLAB ECM ensures the integrity and security of electronic records. OpenLAB ECM provides the data security, audit trails and compliance capabilities needed to conform to workflow needs, enterprise policies, and regulatory requirements. It is the Agilent solution for multi-vendor laboratories.

Like OpenLAB Data Store, OpenLAB ECM centralizes data storage for easy access and retrieval. The software also provides automated file indexing and powerful search capabilities. In addition, OpenLAB Business Process Manager can be added to support the automation of procedures in the lab including automated review and approval workflows.

OpenLAB ECM provides a number of ways to gather data from multi-vendor systems: 1) Data can be added via a simple web-based interface, 2) Any file can be printed to OpenLAB ECM Print Services and captured as a PDF file, 3) Schedulers can be configured to automate the data upload of any data, and 4) the OpenLAB ECM API allows for programmatic integrations.

OpenLAB CDS is integrated with OpenLAB ECM via the ECM API, thus allowing seamless data transfer. Data files from OpenLAB CDS are opened from and saved to OpenLAB ECM in the same way they would be with a local directory. The integration of OpenLAB CDS with ECM allows users to download any result set or run from ECM to the CDS, where the downloaded data can then be reviewed or reprocessed.

Once complete, the updated data automatically saves back to ECM with a revision and a request for reason and signature. Additionally, the Agilent MSD Productivity ChemStation, UV-Vis ChemStation, and Agilent MassHunter are integrated with OpenLAB ECM. OpenLAB ECM provides a secure, central repository for all analytical data in the lab.

OpenLAB ECM also provides the option to extract and store the data in Technology Neutral Formats (TNF), which are kept along with the original data for long term archiving. The preserved data is accessible with existing systems and is stored in a format that allows future access after the original application has been retired.

OpenLAB ECM searching provides results quickly with a powerful search engine and simple-to-use interface.

Figure 11.
Conclusion

A networked OpenLAB CDS system is a fully integrated solution to connect and manage users, processes and data. This solution addresses the challenges of managing isolated analytical workstations by enabling the CDS administrator to administer the system centrally using OpenLAB Shared Services and the OpenLAB Control Panel.

Compared to ChemStation and EZChrom Elite, OpenLAB CDS provides major enhancements designed to boost laboratory productivity. These improvements include faster, more flexible result review, reprocessing and reporting, and centralized system administration.

Adding OpenLAB ECM or Data Store allows an organization to capture and manage laboratory information easily and efficiently. In addition to organizing data, methods and sequences, and providing fast searching and retrieval of information, these software solutions deliver all the capabilities necessary for achieving regulatory compliance.

If you use Agilent’s ChemStation or EZChrom Elite solutions today, OpenLAB CDS is a straightforward upgrade that brings your data and methods forward into the future with little disruption. Agilent ChemStation or EZChrom Elite customers upgrading to an OpenLAB CDS networked solution avoid the need to re-create or revalidate methods, compound lists and modify institutionalized workflows. Because Agilent’s proven integration and quantitation algorithms are always moved forward to the next software revision, results obtained yesterday can be compared to those obtained today. And because Agilent systems are found in most laboratories around the world, when you choose an OpenLAB networked solution, chances are you are choosing a system your staff or new hires already know.

Adopt a networked environment and increase your laboratory productivity. To learn more about how you can reduce the complexity of managing chromatography workflows and regulatory compliance, contact Agilent today.

www.agilent.com/chem/openlab

Find an Agilent customer center
www.agilent.com/chem/contactus

U.S. and Canada
1-800-227-9770
agilent_inquiries@agilent.com

Europe
info_agilent@agilent.com

Asia Pacific
inquiry_lsca@agilent.com

This information is subject to change without notice.

© Agilent Technologies, Inc. 2013
Printed in the USA, November 1, 2013
5991-2279EN