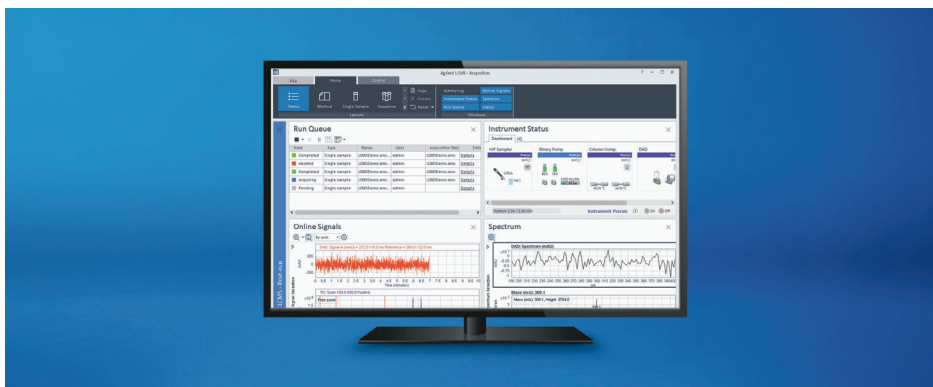


Bidirectional LIMS and OpenLab CDS Integration with Agilent Sample Scheduler



Abstract

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Day-to-day lab operations involve working with multiple informatics solutions that must work together. Examples are LIMS (laboratory information management systems) that manage samples and generate certificates of analysis and chromatography data systems (CDS) that control HPLCs and GCs to generate results. Information from both LIMS and CDS are required, such as analysis request numbers (LIMS IDs), sample identifiers, and results from CDS. Exporting or manually transcribing these data is often the only way labs can get work completed. This is not only time consuming; it can introduce errors and gaps in a lab's data integrity strategy.

This technical overview presents how a bidirectional LIMS and Agilent OpenLab CDS integration using Agilent Sample Scheduler for OpenLab can save time, reduce operating costs, and increase return on investment, and eliminate unnecessary printouts.

The challenge: How to increase lab efficiency and reduce errors

Labs often transcribe their information manually, a time-consuming, labor-intensive, error-prone process. For example, the samples that are registered in LIMS are tagged with a LIMS IDs. These LIMS IDs are manually transcribed to CDS systems either in the form of sequences or single runs. The results are then manually transcribed to LIMS to be reported on the certificate of analysis.

Manually processing samples and their associated information may take up to 30 minutes per sample. Correctness of data entry must also then be verified manually; by a second analyst, and this leads to loss of lab efficiency and productivity.

Sequence

#	State	Sample name	LIMS ID1	Acq. method	Proc. method	Vial	Sample type
1	Waiting	Analyte00000050	93654dff-432f-4530-bc10-b8061e48dfd4	Acq_Meth.amx	Proc_Meth.pmx	1	Sample
2	Waiting	Analyte00000051	d44cd6c7-9cf4-4558-8bb8-cb92b6292745	Acq_Meth.amx	Proc_Meth.pmx	2	Sample
3	Waiting	Analyte00000052	ab3a6207-cfd5-4fb3-baf0-91c65fa31a21	Acq_Meth.amx	Proc_Meth.pmx	3	Sample

Figure 1. Example sequence with LIMS ID.

The solution: A bidirectional integration between LIMS and OpenLab CDS

A bidirectional OpenLab CDS and LIMS integration ensures that information is transferred electronically from LIMS to OpenLab CDS and then back to LIMS in a seamless and error-free process. This integration ensures that the LIMS IDs are automatically transcribed to sequences. Once OpenLab CDS runs these sequences and generates desired results, the results are sent back to LIMS after an optional review process to avoid any unapproved data being sent to LIMS.

The solution consists of three components, OpenLab CDS, Sample Scheduler for OpenLab, and any LIMS.

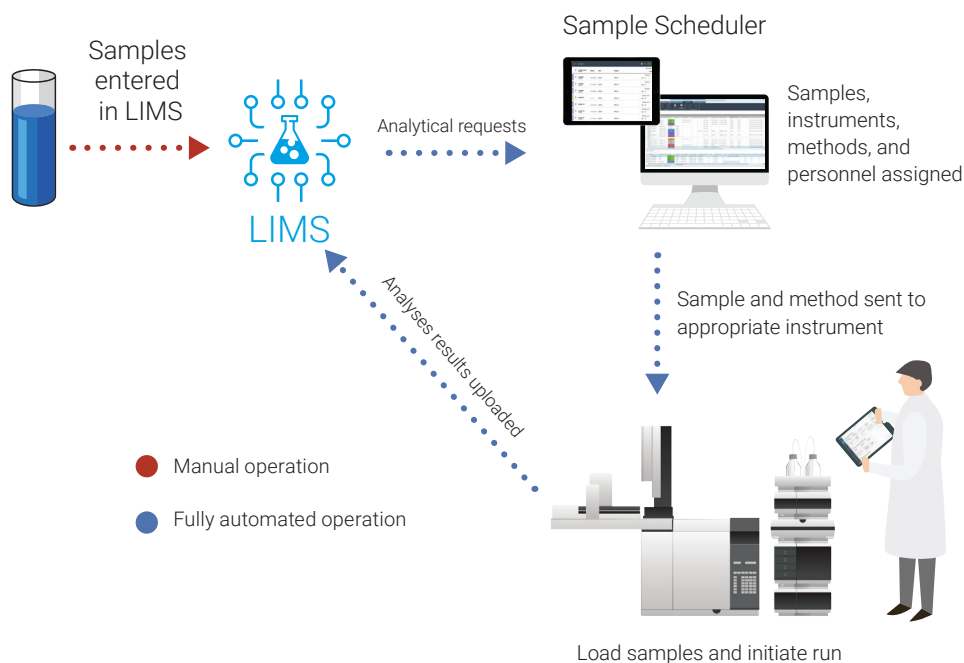


Figure 2. Schematic diagram of the solution.

The solution: How the integration works

The workflow begins with sample test request entered in LIMS and ends with the release of the approved results back to the LIMS from OpenLab CDS.

1. Samples are registered in LIMS with a unique LIMS ID and assigned with tests to be done using OpenLab CDS.
2. LIMS is either configured or queries OpenLab CDS to get vital information like projects, methods, or users.
3. LIMS creates sequences using the above information and sends it to Sample Scheduler.
4. Sample Scheduler validates the sequence sent by LIMS and initiates it in OpenLab CDS.
5. OpenLab CDS runs the sequence and generates the data.
6. The data are processed, and results are calculated by the built-in calculation engine.
7. The results are received by Sample scheduler and, after a review process, are sent to LIMS.
8. LIMS receives the results and generates a certificate of analysis.

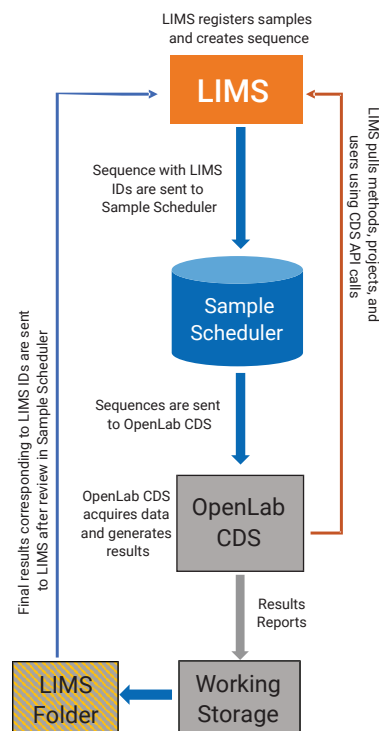


Figure 3. Integration workflow.

Solution benefits

- Streamlines sample test workflows from sample receipt to report generation
- Creates a faster operation with automated sample worklist assignment and scheduling
- Ensures results contain no transcription errors for reliable results attribution in the LIMS
- Produces reliable results suitable for automated upload by the LIMS.
- Achieves greater accuracy with optional supervisor review using the **Review & Submit** function
- Provides technical controls to support compliant environments

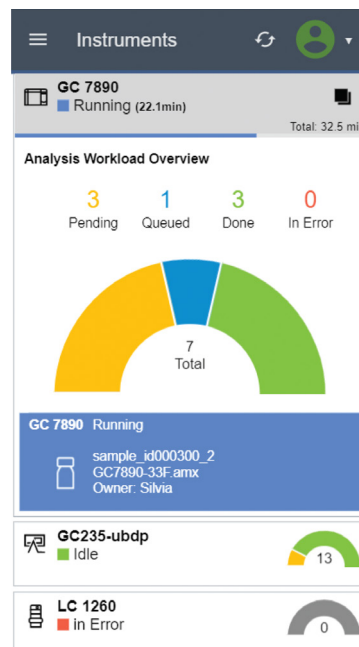


Figure 4. Using a mobile device, review the instrument state and details on how many samples are assigned to each system. Click on an instrument tile to reveal more: the name of the running sample, the acquisition method, and the current user in charge of the analysis.

Conclusion

For labs, managing sample analysis workflows manually, OpenLab CDS integrated to LIMS using Sample Scheduler for OpenLab provides a more efficient solution. This technical overview demonstrates how Sample Scheduler can integrate with any laboratory information management system to ultimately save time, reduce operating costs, increase return on investment, and eliminate unnecessary printouts.

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