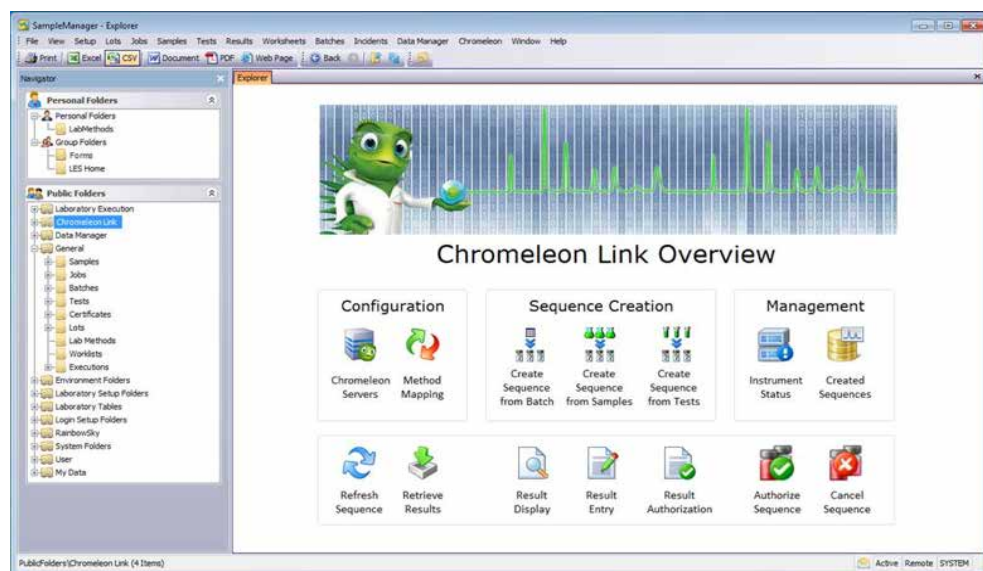


Thermo Scientific™ SampleManager LIMS™ and Thermo Scientific™ Chromeleon™ CDS Link

Key Words

Integrated LIMS and CDS, Secure & Compliant Interface, Workflows to Drive the Lab Process, Multi-Vendor Instrument Support, Centralized Chromatography & Mass Spectroscopy Data Processing & Management, Sophisticated Data Visualization, Paperless Lab



The Chromeleon link options are available from the top menu bar on the home page, as well as via a convenient Explorer Cabinet where all Chromeleon Link-related data and options can be found.

SampleManager LIMS delivers the most complete Informatics solution available, including functionality for method execution, laboratory and scientific data management. Built into the latest version of SampleManager and unique to Thermo Fisher Scientific, are LIMS, SDMS and LES functionality on one platform, saving lab managers the time and expense of purchasing and maintaining software from multiple suppliers. SampleManager LIMS is also fully integrated with Chromeleon CDS, providing a seamless CDS link within the LIMS to streamline the lab process and eliminate manual steps related to sample testing and results capture and analysis. The integration of SampleManager LIMS with Chromeleon CDS gives users access to all LC, GC, IC and MS data within the same platform and user environment, simplifying training of personnel and reducing operating costs.

Both SampleManager LIMS and Chromeleon CDS deliver workflow capabilities so the system is simple to manage and maintain without relying on external IT or programming resources.

Unique to the SampleManager LIMS and Chromeleon CDS link, users will have full capability to monitor queue status and instrument health from the LIMS, giving users the ability to assign work more effectively and allow for instrument maintenance as required. The instrument notifies users of impending service, allowing the lab to schedule workload more effectively and improve instrument utilization. The instrument notifies users of potential wear part failure, allowing the lab to schedule instrument maintenance at the most convenient time and improving instrument uptime. Information is stored in the instrument firmware, ensuring

Find out more at thermofisher.com/LIMS

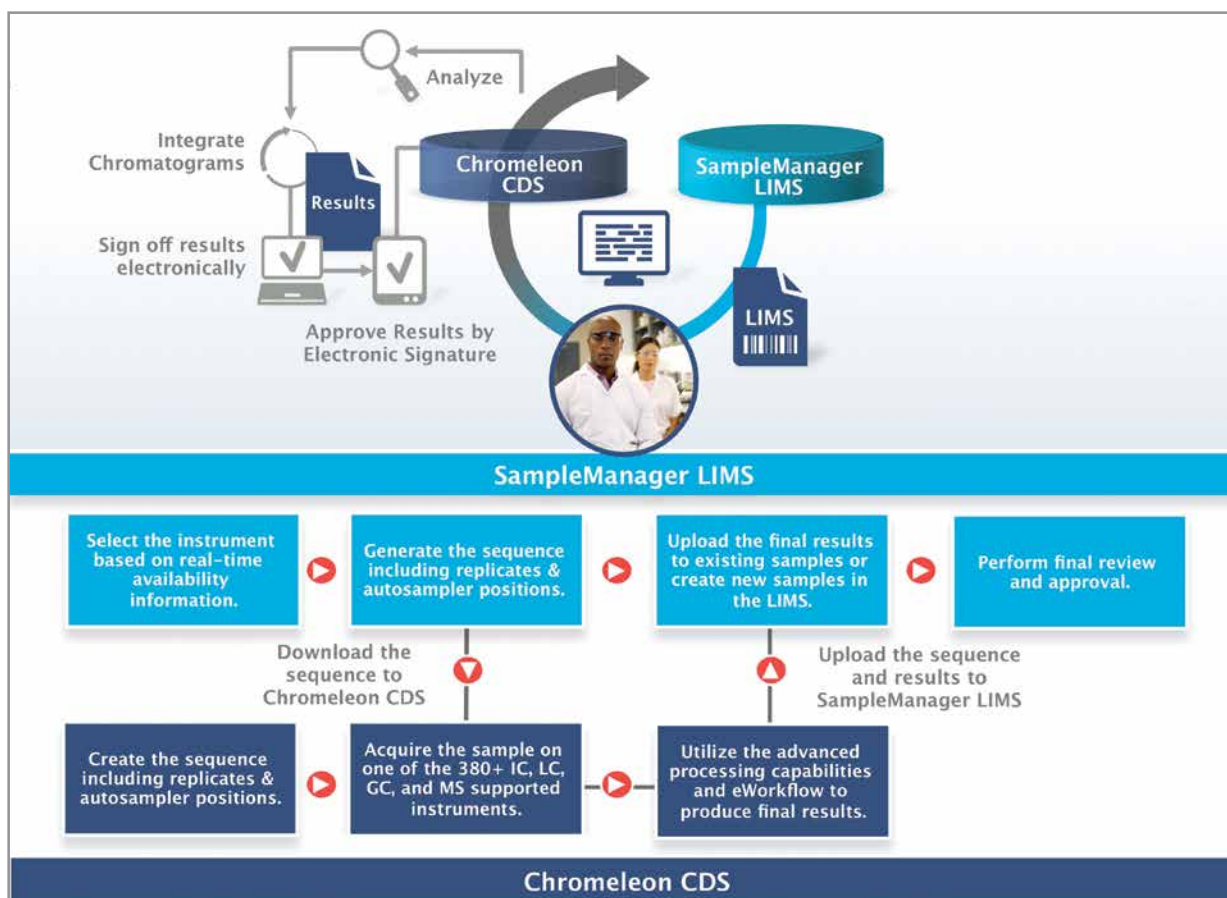
data is recorded and maintained at all times, even if a module is moved/exchanged. The SampleManager LIMS and Chromeleon CDS link gives users an out-of-the-box interface supported by one company that combines workflows that drive the lab process all the way from sample reception through to reporting.

Chromeleon CDS is the leader in chromatography data systems software, unifying workflows for chromatography and routine quantitative MS analysis, providing full integration of Thermo Scientific gas chromatography (GC)-MS/MS and liquid chromatography (LC)-MS/MS instruments. Chromeleon CDS allows you to run your analyses in an enterprise environment – from method creation to quantitation and library-based compound identification and offers industry-leading multi-vendor control, supporting over 400 different instrument modules from over 15 manufacturers.

With the SampleManager LIMS and Chromeleon CDS link built onto one platform, users will have complete control of all chromatography and/or mass spec instruments, combining two of the most common analytical techniques into a single system. SampleManager LIMS then allows you to turn that data into actionable knowledge by providing sophisticated data processing, visualization, search and data mining capabilities.

Thermo Scientific Chromeleon CDS is a leading chromatography data system, unifying workflows for chromatography and routine quantitative MS analysis

Integration = data integrity, quality and productivity



A typical lab will utilize multiple systems, such as LIMS, CDS, LES, SDMS, spreadsheets and some paper-based methods. In this non-integrated environment, multiple steps must be taken to accomplish any given task, from pulling a sample, entering sample lists and analysis in the lab notebook, updating the CDS log, manually transferring results to a spreadsheet to do further calculations, approving those calculations and re-entering them in a lab notebook or into the LIMS.

Chromeleon CDS is particularly good at preparing calculations, something most CDS systems are incapable of doing. Once Chromeleon CDS is validated, the automated calculations engine gives you validated results. No spreadsheet is necessary, saving time entering and approving results manually into a spreadsheet. And because results calculation is available and validated within either SampleManager LIMS or Chromeleon CDS, your workflow is optimally automated and secure, giving your lab more opportunities to save time and money, and generate secure and reliable data.

Integrating LIMS and CDS allows the lab to effectively remove eight manual processes, giving you one streamlined automated process – leaving only one manual process – putting the sample into the instrument and hitting the “GO” button.

Workflows to drive the laboratory process

Together, the workflows in SampleManager and Chromeleon automate the entire process

The image displays two software interfaces. The top interface is SampleManager, showing a workflow tree for 'eWorkflows' and a 'Release' table with columns for Name, Type, Level, Position, Volume (µL), Thimposca, Sample, Status, and Run. The bottom interface is Chromeleon, showing a 'Chromleon Console' with a list of instrument names and their statuses, and a 'Data Manager' window displaying a chromatogram with peaks and a table of associated items.

Security & Compliance
 Workflow
 Instrument Control
 Centralized Data Management
 Business Intelligence

Both SampleManager and Chromeleon leverage workflow capabilities to provide a simple system to manage and maintain without relying on external IT or programming resources. Workflows give end users an easy way to step through their process, ensuring quality processes are followed. Workflow capabilities include passing information to and from other systems acting as a bridge between SampleManager and Chromeleon at user decision points. The end user decides when data is ready to pass from one system to the next either by manually triggering the handover or, more often, by defining the handover points in the workflow.

Comprehensive multi-vendor instrument support

- All instruments are automatically found by the Discovery Server
- Control of Thermo Scientific instruments
- Control of instruments from other vendors
- Intuitive ePanels

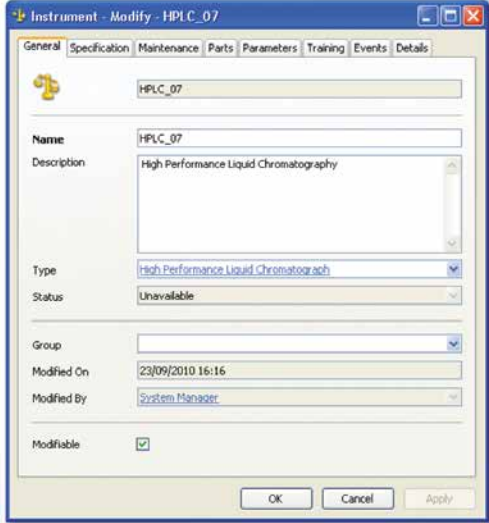
The image shows the Chromeleon software interface. On the left, a list of instruments is displayed under categories like 'CH_BVC', 'CAMS-CM7', and 'CAMS DEMO2'. The main panel shows 'Module Status' (Connected), 'Retention Time' (0.269), and 'Module Connect' (Connect). A 'Signals' section shows UV1, UV2, UV3, and UV4 channels. The 'On-line Plot' shows a chromatogram with peaks and a legend for UV_VIS_1, UV_VIS_2, UV_VIS_3, and UV_VIS_4.

Security & Compliance
 Workflow
 Instrument Control
 Centralized Data Management
 Business Intelligence

In a Chromeleon installation, over 400 instruments from 15 vendors are automatically found in the network. Chromeleon controls Thermo Scientific Instruments, like ICs, LCs and the ASE-350, as well as LCs and GCs from other vendors like Agilent, Waters, Perkin Elmer and Shimadzu, using the intuitive ePanel sets.

Comprehensive multi-vendor instrument support

- Chromeleon instruments including parts can be reflected in SampleManager
- Calibration and maintenance records can be maintained in SampleManager
- Users will be notified if they attempt to run on an uncalibrated instrument directly in SampleManager

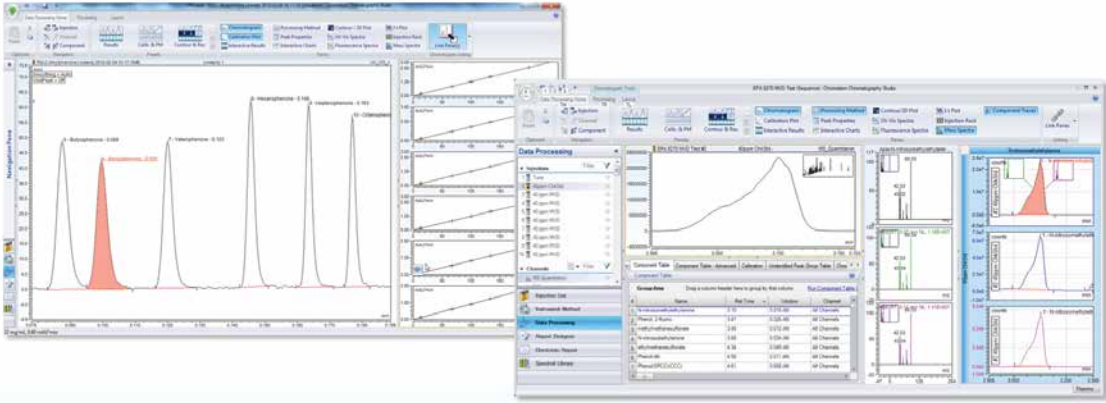


Security & Compliance Workflow **Instrument Control** Centralized Data Management Business Intelligence

SampleManager LIMS can do more than just submit runs and receive those results from Chromeleon CDS. The LIMS can also access and manage information like instrument calibration and maintenance schedules, preventing users from accessing instruments that are out of calibration and potentially wasting time and valuable samples.

Centralized Data Management

One solution for LC, GC, IC, and MS data acquisition, control, processing and management

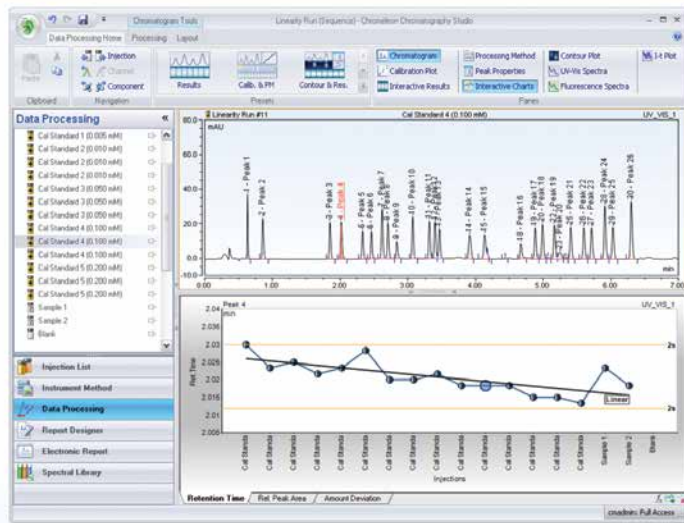


Security & Compliance Workflow Instrument Control **Centralized Data Management** Business Intelligence

One of the key advantages of Chromeleon 7.2 is that it allows users to access LC, GC, IC, and MS data all within the same platform and user environment. Mass Spectrometry provides enormous qualitative and quantitative information about samples and it is becoming commonplace in quality control testing. Managing all of the chromatography and mass spectroscopy instrumentation in a single solution simplifies training and support and reduces operating costs.

Interactive charts for data review

- Interactive charts allow you to view your data and makes processing easier
- The sample name, peak, and point on the calibration curve are all highlighted



Security & Compliance

Workflow

Instrument Control

Centralized Data Management

Business Intelligence

Chromleon 7.2 enables users to manage samples and perform trend analysis by instrument, by operator, or by lab for a user defined period of time.

Advanced search & data mining: SDMS

Compare all samples from a lot across multiple runs as if they were from the same sequence

XML Conversion

Data Management

Seamless Data Access

Security & Compliance

Workflow

Instrument Control

Centralized Data Management

Business Intelligence

Comprehensive data mining tools allow each user to search for specific sample or compound information across runs. When linked to SampleManager LIMS, users can search on the batch or lot information to return all samples, across any instrument throughout the workflow. Because SDMS functionality is built into SampleManager LIMS, all instrument results are available within the LIMS - whether it's chromatography or FTIR data, equipment files or unstructured data like XML, Text or PDF files - SampleManager LIMS with built in SDMS functionality can give you access to any data at any time. Once that data is found, it can be stacked, overlaid, reported and visualized in 3D, giving users rapidly configured sophisticated, paperless review and approval procedures.

Advanced search & data mining

Dashboards provide a quick view of anything from stocks, to sample delivery, or trends at a particular location

The image displays several overlapping dashboard windows from the SampleManager LIMS. One window shows 'Stock Details' with a tree view of stock items and a table of 'Recent Remaining' quantities. Another window shows 'Percent Remaining by Batch' with a bar chart. A third window displays 'On Time' and 'Sample Status' with pie charts and a table of 'On Time' percentages. A fourth window shows a 'Log Date' table with columns for 'Log Date' and 'Status'. At the bottom, five icons represent 'Security & Compliance', 'Workflow', 'Instrument Control', 'Centralized Data Management', and 'Business Intelligence'.

Once the data is returned to the LIMS, SampleManager has sophisticated data mining tools to review the chromatography and mass spectroscopy data in the context of all of the product, batch or lot, and sample information, giving the lab a complete overview and showing when processes are drifting towards nonconformance. Interactive dashboards allow lab managers to drill down and discover root causes of any issues that do occur and optimize their process to prevent future issues.

Monitoring instrument health

Charting column performance throughout a sequence, over multiple sequences or for period of time

The image shows four line charts arranged in a 2x2 grid, each tracking a different instrument performance metric over a sequence of samples. The top-left chart, 'Theoretical Plates', shows values fluctuating between 1900 and 2400. The top-right chart, 'Resolution', shows values between 2.25 and 2.55. The bottom-left chart, 'Signal to Noise', shows values between -2000 and 13000. The bottom-right chart, 'Asymmetry', shows values between 1.2 and 1.5. Each chart includes a 'Linear' trend line and '2s' control limits. At the bottom, five icons represent 'Security & Compliance', 'Workflow', 'Instrument Control', 'Centralized Data Management', and 'Business Intelligence'.

Unique to SampleManager LIMS and the Chromeleon CDS link, users now have full capability to monitor queue status and instrument health from the LIMS, enabling you to manage workflow more effectively and allow for instrument maintenance or service as required. It is important to know when a column needs to be replaced before it results in failed separation or poor peak formation.

The instrument notifies users of impending service, allowing users to schedule workload more effectively, and improve instrument utilization. The instrument notifies user of potential wear part failure, allowing the user to schedule instrument maintenance at most convenient time and improving instrument uptime. Information is stored in instrument firmware ensuring that data is recorded and maintained at all times, even if module is moved/exchanged, which ensures compliance.

SampleManager LIMS and Chromeleon CDS

The new SampleManager LIMS and Chromeleon CDS link gives users an out-of-the-box interface supported by one company that combines workflows that drive the lab process all the way from sample reception through to reporting. Chromeleon CDS is the leader in chromatography data systems software, unifying workflows for chromatography and routine quantitative MS analysis, providing full integration of Thermo Scientific gas chromatography (GC)-MS/MS and liquid chromatography (LC)-MS/MS instruments. Chromeleon CDS allows you to run your analyses in an enterprise environment – from method creation to quantitation and library-based compound identification and offers industry-leading multi-vendor control, supporting over 400 different instrument modules from over 15 manufacturers. Now that Chromeleon CDS is linked to SampleManager LIMS, users have complete control of all chromatography and mass spec instruments, combining two of the most common analytical techniques into a single system. SampleManager LIMS then allows you to turn that data into actionable knowledge by providing sophisticated data processing, visualization, search and data mining capabilities.

Integrating the Lab for Efficiency, Productivity and Compliance

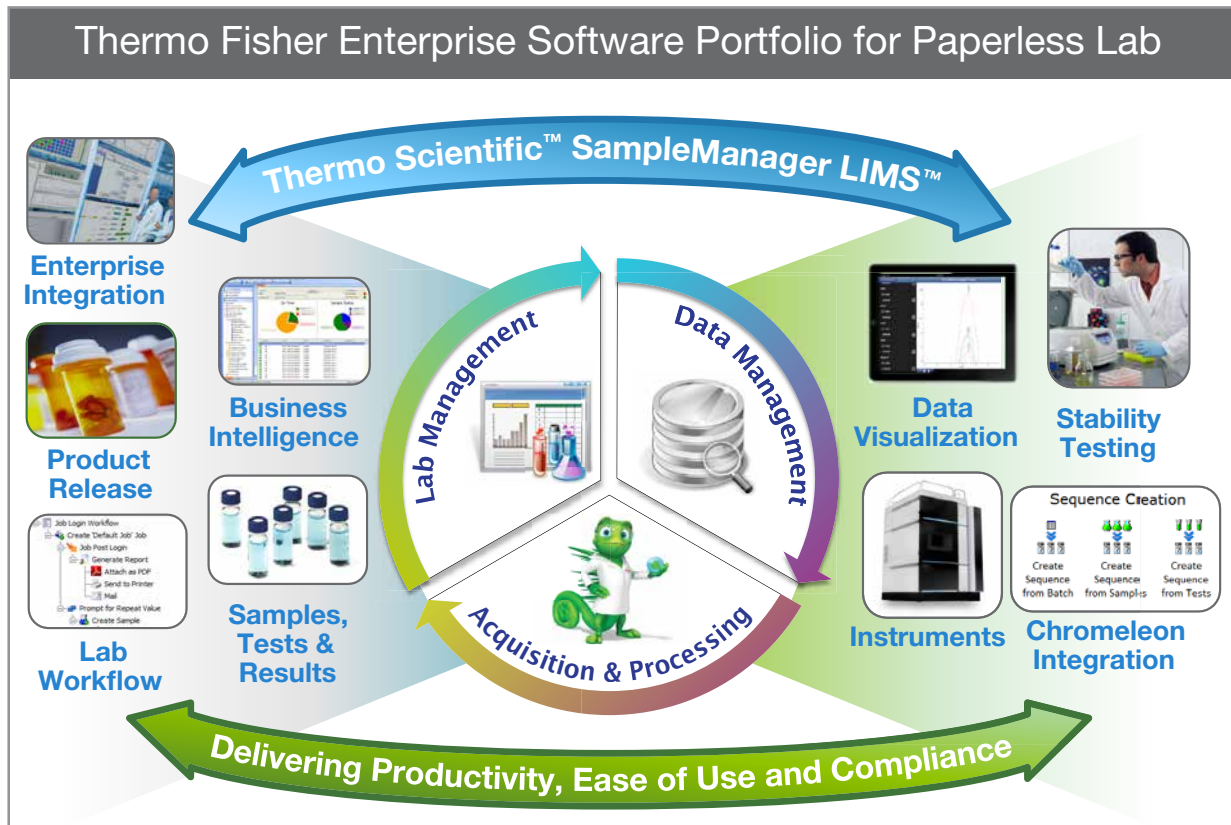
CONNECTS for the Paperless Lab delivers the methodology, technology and services necessary to transform today's laboratories into tightly integrated paperless environments,

while leveraging existing investments in software systems, databases and laboratory instrumentation from a wide variety of commercial vendors.

By bridging the islands of data generated in the lab and transforming that data into information that can be used across the enterprise, organizations will reap the benefits of improved access to real-time information, regulatory compliance, data integrity, as well as time and cost savings by automating processes and reducing manual data handling.

CONNECTS for the Paperless Lab is comprised of three unique components – *methodology*, *technology* and *services* – that combined deliver seamless and continuous data flows from the lab into the enterprise, improving results analysis, enabling faster decision making and improving productivity.

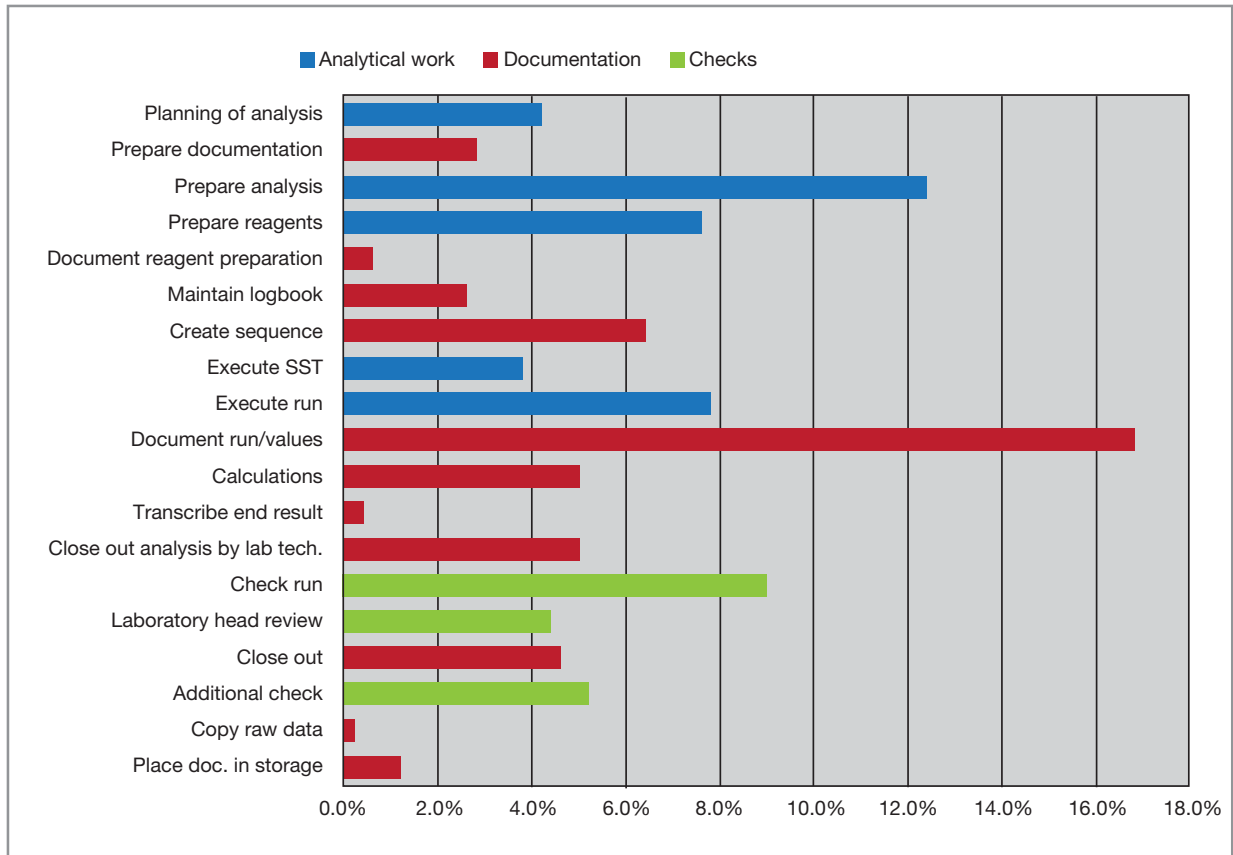
Building on a history of informatics innovations, CONNECTS provides access to all instrument data via a single interface and allows real-time analysis and investigation of results. The technology converts raw data to a vendor independent XML storage format to ensure future proof data archiving and facilitate data and information sharing across the organization, without having to rely on access to the original application. CONNECTS technology acts as a 'translator' of all the individual languages of the lab's disparate instruments and is able to deliver and accept data in the format appropriate for each instrument.



A Paperless Lab has taken advantage of opportunities to integrate the laboratory with the enterprise and automates systems by eliminating paper-based, manual and error-prone processes. While most companies have invested in many instruments and software solutions in the laboratory, manufacturing and the enterprise to improve operations, these systems are not seamlessly integrated, creating data silos, or standalone information repositories that do not communicate with one another. By automating operations and integrating these individual solutions, organizations can reduce paperwork, increase efficiency and throughput, automate regulatory compliance, reduce costs, foster collaboration and make faster, better informed business decisions.

Just how costly are your current operations?

This chart illustrates how much time is spent on analysis vs. administrative tasks in a typical laboratory. Reducing the amount of time spent on manual or paper-based reporting and documentation can save time and money for your lab operations. By automating the laboratory, your organization can improve efficiency, productivity, quality and reduce costs. The goal is to spend more time doing Analytical Work and less in Documentation and Checks. What would you do with the time saved?



Find out more at thermofisher.com/LIMS

Austria: +43 (0)800 20 88 40 **Belgium:** +32 (0)056 260 260 **Denmark:** +45 70 27 99 20
Germany: +49 2304 932-5 **Ireland:** +353 (0)1 885 5854 **Italy:** +39 02 950 59 478
Finland: +358 (0)9 8027 6280 **France:** +33 (0)3 88 67 14 14 **Netherlands:** +31 (0)20 487 70 00
Norway: +47 22 95 59 59 **Portugal:** +351 21 425 33 50 **Spain:** +34 902 239 303
Sweden: +46 31 352 32 00 **Switzerland:** +41 (0)56 618 41 11 **UK:** +44 (0)1509 555 500

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