

Links for LIMS v5

Instrument interfacing and LIMS integration software

Why Links for LIMS?

Instrument based techniques are used to perform the vast majority of analysis in laboratories. The challenge faced in laboratories today is to maximize their (often considerable) instrument investment. The major issue in achieving this goal is that of integrating the instrument and its ancillary equipment efficiently into the lab setting. The aim is to allow analysts to easily use the instrument to follow the laboratory SOP's, to check its performance, as well as to feed it with samples and report results quickly, so that it is ready for the next run. Links for LIMS is a software package designed to bridge the gap between the instruments own software and laboratory systems to maximize each instruments' potential.

Links for LIMS design

CSols Links for LIMS is based on an XML technology platform. The client software is typically installed on the instrument workstation and interacts with users via a graphical user interface. Its main role is to help analysts carry out their tasks quickly and efficiently and to ensure that quality results are produced. Particular attention is paid to automating many actions and keeping keyboard and mouse interaction to a bare minimum. A backend LabCache™ MS SQL Server® or Oracle® database securely stores audited and user / time-stamped information for regulatory compliance. The software includes:

- an *IN* or SETUP program which interacts with LIMS to obtain a list of work and so easily set up an instrument Run electronically
- an *OUT* or Result Review program which reads the completed instrument result file(s), provides user review and then allows results to be fed back to LIMS

Drivers

The routine operation of **Links for LIMS** software programs is usually identical for all LIMS, instruments and application areas. This is achieved by using unique CSols **Links for LIMS Drivers** which handle the differences in operation, file types and databases between various instruments, LIMS or other IT systems. User interaction is then common across all laboratory instruments and networks. This helps to help reduce training costs and improve productivity.

Drivers are modular software communications components and can be substituted at any time, should the LIMS / Data System or instrument and/or its software change, without affecting routine operation.

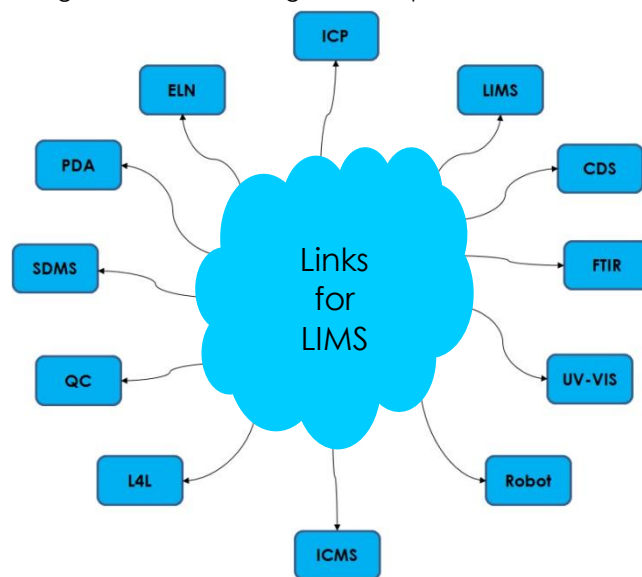


Figure 1: Links for LIMS (L4L) overall design showing bi-directional interfacing Drivers connecting laboratory resources

Parsing, conversion & intelligent data control

Instrument and LIMS Drivers may combine a number of roles, these are:

- parsing – the extracting of data from files of different formats
- conversion – taking data after processing and producing data files in different formats for

onward transmission, sometimes in industry standard formats

- intelligent data control – conducting conversations with the instrument and LIMS/SDMS/ELN/MES IT systems so that data flows between systems in a timely and secure manner.
- Real time or silent data transfer if the instrument and it's software is capable of supporting this.

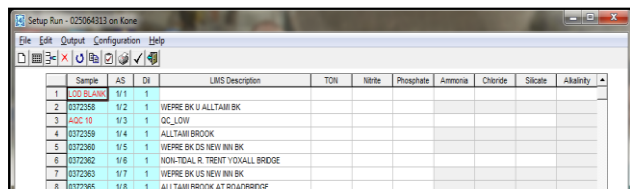
In combination these capabilities make **Links for LIMS** unique and allow it to work even with the most difficult combinations.

Helping the Analyst

In a typical bidirectional application the Setup and Result Review programs help with the following tasks:

Setup

- Extract sample information for outstanding analyses
- Create an instrument pre-run list with relevant calibration samples and QC's inserted in the correct run positions
- Allow the user to review the list, to insert or delay specific samples or QCs, add weights or adjust dilutions
- Create/Setup an instrument electronic run list which can be opened directly by the instrument software so that the instrument can be run without further manual interaction



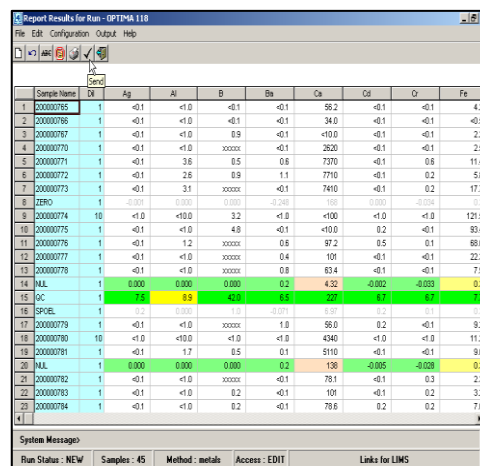
Sample	AS	DI	LIMS Description	TON	Nitrite	Phosphate	Ammonia	Chloride	Silicate	Alkalinity
1	000 BLANK	1/1	1							
2	0372358	1/2	1	WERRE BK U ALLTAM BK						
3	AGC 10	1/3	1	QC_LOW						
4	0372359	1/4	1	ALLTAM BROOK						
5	0372360	1/5	1	WERRE BK CS NEW BIN BK						
6	0372362	1/6	1	NON-TQAL R TRENT YOYALL BRDGE						
7	0372363	1/7	1	WERRE BK US NEW BIN BK						
8	0372365	1/8	1	ALLTAM BROOK AT ROADBRIDGE						

Figure 2: Setting up a run.
The analyst's view is configurable

Results Review

- Extract the instrument results data
- Align the results to the sample information

- Check and flag QC results against their target values
- Compare sample results with any pre-set limits
- Run any cross measurement or sample calculation
- Display results in a matrix with colour coding to aid interpretation
- Provide user interaction to hold or rework samples
- Electronic submission to LIMS once the user has agreed results meet requirements
- AQC Charting (via optional AqcTools module)



Sample Name	DI	Ag	Al	B	Ba	Ca	Cl	Cr	Fe
1 200000765	1	<0.1	<1.0	<0.1	<0.1	96.2	<0.1	<0.1	4.2
2 200000769	1	<0.1	<1.0	<0.1	<0.1	34.0	<0.1	<0.1	<0.5
3 200000767	1	<0.1	<1.0	0.9	<0.1	<10.0	<0.1	<0.1	2.2
4 200000770	1	<0.1	<1.0	>>>>>	<0.1	26.0	<0.1	<0.1	2.5
5 200000771	1	<0.1	3.6	0.5	0.6	7370	<0.1	0.6	11.4
6 200000772	1	<0.1	2.6	0.9	1.1	7710	<0.1	0.2	5.8
7 200000773	1	<0.1	3.1	>>>>>	<0.1	7410	<0.1	0.2	17.7
8 ZERO	1	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>
9 200000774	10	<1.0	<10.0	3.2	<1.0	<100	<1.0	<1.0	121.5
10 200000775	1	<0.1	<1.0	4.8	<0.1	<10.0	0.2	<0.1	93.4
11 200000776	1	<0.1	1.2	>>>>>	0.6	97.2	0.5	0.1	86.0
12 200000777	1	<0.1	<1.0	>>>>>	0.4	101	<0.1	<0.1	22.3
13 200000778	1	<0.1	<1.0	>>>>>	0.8	83.4	<0.1	<0.1	7.9
14 MAL	1	0.000	0.000	0.000	0.2	4.32	-0.002	-0.003	0.9
15 QC	1	7.9	9.9	94.0	6.4	2270	9.1	9.1	7.9
16 SPOEL	1	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>	>>>>>
17 200000779	1	<0.1	<1.0	>>>>>	1.0	95.0	0.2	<0.1	9.2
18 200000780	10	<1.0	<10.0	<1.0	<1.0	4340	<1.0	<1.0	11.2
19 200000781	1	<0.1	1.7	0.5	0.1	5110	<0.1	<0.1	9.0
20 MAL	1	0.000	0.000	0.000	0.2	136	-0.005	-0.008	0.9
21 200000782	1	<0.1	<1.0	>>>>>	<0.1	78.1	<0.1	0.3	2.9
22 200000783	1	<0.1	<1.0	0.2	<0.1	101	<0.1	0.2	3.3
23 200000784	1	<0.1	<1.0	0.2	<0.1	78.6	0.2	0.2	7.0

Figure 3: Colour coded results for review by an analyst or peer reviewer

Summary

Links for LIMS provides a powerful modular conduit between all types of instruments and LIMS systems. The software is routinely used on hundreds of instruments worldwide and releases analysts from the administration burden and many time consuming tasks. In addition a significant reduction in transcription errors improves the quality of results transferred to LIMS and subsequently released by the laboratory.

Further Information

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