MSC-LIMS™ Insights

The source for news and tips of interest to users of MSC-LIMS,
an affordable laboratory information management system for small labs.

Welcome

Welcome to **MSC-LIMS** *Insights*.

This newsletter will help current MSC-LIMS users get the most out of their software, and will complement the product literature and downloadable demo that prospective users can find on our web site at www.msc-lims.com.

Join our mailing list for more information. Sign up at www.msc-lims.com/lims/maillist.html.

This newsletter is for and about MSC-LIMS users. We welcome your comments, and your suggestions for topics you would like to see addressed in upcoming issues. Please send your thoughts to newsletter@msc-lims.com.

Changing or Disabling High, Low, and BDL Result Formats

When formatting results for reports, MSC-LIMS will append a space and "H" for high or "L" for low if a result value is above or below the warning limits configured for the analysis. If the value is below the detection limit "BDL" will be listed. You should normally configure the analysis' result minimum specification to prevent entering values below the detection limit.

This analysis result formatting is MSC-LIMS' default behavior. You can disable result formatting completely or you can change the character added for high, low, and below detection limit conditions.

All changes to result formatting are made using options on the System Configuration screen. To disable high, low, and BDL formatting, first add a new record to the Options tab of the System Configuration screen, enter "gbFormatAnalysisResult" in the Option field, and enter a zero in the Value field. A Value of zero disables and -1 enables formatting.

To change the characters appended for a high and low warning, add a record with Option "gsFormatAnalysisResultHigh" and "gsFormatAnalysisResultLow" and enter the characters to append in the Data field leaving the Value field blank. To change the characters displayed for values below their detection limit, add a record with Option "gsFormatAnalysisResultBDL" and enter the characters in the Data field.

See more information about these and other System Configuration options in file MSC-LIMS SysCfg Options.doc available in the File Library.

In this Issue

MSC-LIMS™ *Insights*

From the Developer

Recently, I purchased a replacement for my six-year-old laptop. As I inventoried six year's worth of installed software I began to dread the task of reinstalling all the software necessary to recreate my environment. To avoid product activation issues and having to reinstall early versions in order to install update versions, I decided to buy a "new" retail version of Office XP Pro. As some Full System licensees have commented, buying Office XP is no longer easy. I did find an unopened retail Office XP on eBay but that effort highlighted Office XP's age.

Access 2002, the version in Office XP, has been a sound platform for MSC-LIMS 3.x beginning with version 3.0 in June 2004. Looking ahead, we expect MSC-LIMS version 3.3 to be the last Access 2002 version. Microsoft has made significant changes to Access 2007 including the removal of user level security, which is the basis for MSC-LIMS' security roles. That will make our job more difficult but we are evaluating Access 2007 and watching the development of Access 2010, one of which will likely be the platform for MSC-LIMS version 4.0. Stay tuned.

Whichever Access version we select you can be assured that we will provide an upgrade path. As we did with the upgrades from MSC-LIMS version 1.x to 2.0 and 2.x to 3.0, we will provide the necessary tools to convert your existing version 3.x database to the new version while preserving all existing data.

Rick Collard is the founder of Mountain States Consulting and the principal developer of the MSC-LIMS software. You can reach Rick by email at rcollard@msc-lims.com.

Create Electronic Data Deliverables

With MSC-LIMS, it is easy to send electronic data to your customers using an Excel-based final report. Our Final Report Templates are good examples. When your customer needs to import analytical results into their own information system, an Excel final report may not be the best solution. Your final reports may look great in Excel and when printed, but their layout is designed for human use. Loading the report's results into another information system may require significant parsing or reformatting to enable the transfer.

When you need to send electronic data destined for your customer's information system, consider creating your own electronic data deliverables (EDD). There are many EDD formats in use. However, with MSC-LIMS data the simplest format is a tabular style with one row of data for each sample and a header row with field names. Each sample data row may include sample characteristics (e.g. sample ID, location, sample type, collected date, etc.) and analytical results. Your customer may dictate the format needed or you can develop your own generic EDD format.

You can easily create your own EDD templates by modifying one of our example templates. To follow the examples below and on the following page, download the EDD Templates from the File Library. Extract the contents of the zip file to your Excel export templates folder. If you are not sure where your templates are located, open the Workstation Configuration screen on the Admin menu and review the settings on the Folders tab. If your Excel export templates folder has not been configured, use the [Browse] button and select folder C:\MSC-LIMS\Examples\Excel Export Templates where the MSC-LIMS examples are installed and extract the EDD templates to this folder.

Let's begin with an example that includes all analyses for the samples exported in the EDD file. Use the Sample Summary report in MSC-LIMS to query several samples and preview the report. In the preview window use File | Export to MS Excel Template then select the "EDD Example - All Analytes" template. You will see a workbook like the example below with one row of data for each sample you queried.
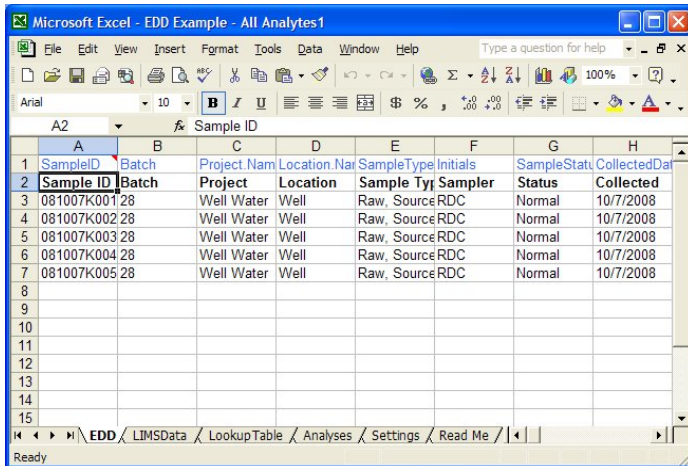
Row one, which you can hide, contains MSC-LIMS field names and analyte names used by formulas in the data rows beginning at row three.

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Row two contains user-defined labels for the data columns. If you scroll to the right you will see that following the columns that list sample characteristics are columns with analytical results.

In its current form, the workbook above is not entirely suitable for sending to your customer. Only the first worksheet is needed and what if you need to send a comma separated values (CSV) text file rather than an Excel workbook? Open the template file in Excel and review the options on the Settings sheet shown below for these solutions.

Enable the Remove Infrastructure option on the Settings worksheet in the template to automatically remove all infrastructure worksheets after exporting LIMS data, which will leave only the first worksheet. When the infrastructure sheets are removed, all macros are also removed leaving a workbook that will not produce a macro security warning when opened by your customers.
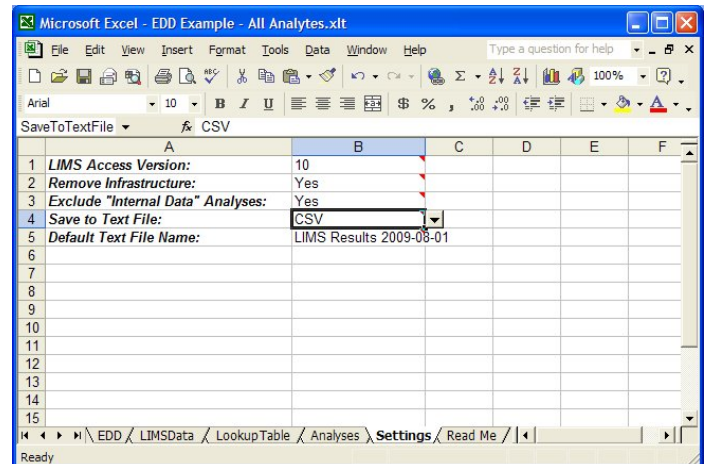
Use the Save to Text File option to automatically save the first worksheet's data to a CSV, tab, or pipe delimited text file. When saving to a text file, add a file name or formula in the Default Text File Name option to name the text file.

Select the EDD worksheet and you will notice that most sample characteristic fields are already listed. Simply delete any unneeded columns and reorder the columns as necessary. The formulas that retrieve analysis results use the sample ID in column A so you should leave that column intact. Hide row one when you are finished.

Note that the row three formulas use the field or analyte name in row one to display the column's data. The template's AfterTransferFromLIMS macro automatically copies the row three formulas to rows below once for each sample exported.

Save the template and export the Sample Summary report again to view the results. Only the EDD sheet should remain. If you enabled a Save to Text File option, a file save dialog will automatically appear.

Note that the "EDD Example - All Analytes" template appends one column for each analyte in the samples exported. The columns are appended in your analysis sort order. This format may be acceptable. However, if your customer needs analysis results in specific columns create your template from the "EDD Example - Specific Analytes" template. With this template you will need to enter your exact LIMS analyte name in a column one cell then copy the lengthy VLOOKUP formula to the column's row three cell.

In both of these example EDD templates a single generic formula is used to retrieve sample characteristics and another displays analysis results. Both formulas use either the field name or analyte name in the column's row one cell. When copying a row three formula, be sure to use the correct formula for the column's contents.

Experiment with these example EDD templates and you will quickly learn how simple it is to create your own electronic data deliverables. Customers who need electronic data will appreciate the simplicity of data import with your custom EDD format. You may also find an EDD template helpful to transfer data within your own organization. ▲▲

MSC-LIMS™ Insights

Exporting to the Generic Template

The data behind any MSC-LIMS report can be exported to Excel by previewing the report, using File | Export to MS Excel template (or the equivalent toolbar button) and selecting the Excel template from the list of available templates. Every template used in this manner must include a LIMSData worksheet and the worksheet must include macros BeforeTransferFromLIMS and AfterTransferFromLIMS.

Because the data behind each report has its own structure, all Excel templates used with MSC-LIMS must be designed for a specific report. That is, the AfterTransferFromLIMS macro, which will be manipulating the data in some manner, expects a predictable structure to the exported data. However, there is one template that is an exception to this rule.

The "MSC-LIMS Export Template.xlt" template, which is installed with other example export templates in folder C:\MSC-LIMS\Examples\Excel Export Templates, can be used with any MSC-LIMS report. The MSC-LIMS Export Template includes a single LIMSData worksheet but its BeforeTransferFromLIMS and AfterTransferFromLIMS macros are completely empty save a comment line. With empty macros, the data behind the LIMS report will be written to the LIMSData worksheet but the macros will do nothing with the data.

Consider this most basic of templates a *generic* template since it can be used with any report. Use this template to explore the data behind any LIMS report when you are contemplating your own templates. And use the template for all ad hoc data exports. For example, imagine you have been asked to produce electronic data for all the results for one or more analyses for a specific product or facility location for the past year. Simply use the Analyte Comparison report for this task. Select the analyte(s), enter your query criteria, query, preview the report then export to the MSC-LIMS Export template (see below).

As with all template exports, the first row of the LIMSData sheet will contain LIMS field names. You should be able to discern which column has the data of interest using either the field name in row one or by comparing the data to the previewed report. In the case of the Analyte Comparison report's data shown above, the column with label "1" has the report's first analyte, column "2" the second, etc.

When exploring data exported to the MSC-LIMS Export Template, you may notice that not all of the report's underlying data is exported. For example, when exporting the Sample Summary report you will not see analysis results. This behavior is due to the specific report's architecture. When a report includes one or more subreports, which model a database relationship (e.g. one sample has many analyses), only the main report's data is exported to the LIMSData sheet. Templates designed for the Sample Summary report normally query the analysis results and add the data to a separate worksheet.

While subreport data is not automatically exported, you will still find many uses for the generic template. For example, export reports on the Setup menu to get lists of analyses, customers, outside labs, locations, etc. To use the MSC-LIMS Export Template, be sure to copy it from the examples folder to your export templates folder. ◿◣

Notes from Technical Support

Adding a Label Number to labels

Recently, an MSC-LIMS user submitted this technical support question:

Is it possible to label each sample container with a unique number? For example, a water sample submitted to the laboratory is submitted in six 40-mL vials. In the past, I simply had LIMS print six identical labels. However, the EPA wants each bottle uniquely identified, i.e. 090425P001-A or some other means. Currently we are printing six identical labels and then hand labeling them with A-F. It doesn't have to be alphabetic. Any means is fine.

The answer to this question is "Yes." When printing multiple quantities of a container label, MSC-LIMS internally assigns a sequential label number starting with one to each label. We can use this internal LabelID value in a label field expression to add label numbers or letters to the printed label.

To add a label number, use the System Configuration screen's Labels tab to update a label style and add an expression to a label field that uses the internal LabelID field. Since LabelID is a sequential number that identifies the label number, when you print quantity six of the same label, LabelID will vary from one to six. Here are some example expressions:

```
Expression                 Description
=[LabelID]                 Just the label number

="Label " & [LabelID]      Text "Label " followed
                              by label number
="Label " & Chr(Asc("A")
  + [LabelID] - 1)         Uses A, B, C, etc.
                              instead of label number
=[SampleID] & "-" &
  Chr(Asc("A")
  + [LabelID] - 1)         SampleID, dash, and
                              label letter
=[SampleID] & "-"
  & [LabelID]              SampleID, dash, and
                              label number
```

The upper case letters in the expressions are used for readability but they aren't necessary. If you prefer, you can use the lowercase "labelid" to avoid lowercase L and capital i confusion. If you have a Full System license and you have added custom label styles, you can add one of these expressions to a text box control in your style's report design.

Importing formatted analysis results from Excel

When importing formatted analysis results such as "< 0.1" and "ND" from Excel it is not uncommon to encounter an "Invalid result" status. Formatted analysis results can be imported from Excel. However, it is important to review how MSC-LIMS converts such results into the separate Result Type and Result Value fields in the LIMS.

When an Excel analysis result cell is not entirely numeric, MSC-LIMS will first scan the cell's contents looking for a number. If a number is found, it is temporarily replaced by the number sign "#". For example, "< 0.1" becomes "< #", while "ND" remains "ND". Next, MSC-LIMS searches the Report Format column of your defined Result Types looking for an exact match for the temporary placeholder. If a match is found, the LIMS sets the Result Type field and adds any number to the Result Value field. If no match is found the result can not be imported, which produces the "Invalid result" status.

Many invalid results are caused by missing or extraneous spaces. For example, if the Report Format field for your "less than" result type in the LIMS does not include a space between the "<" and "#", Excel cells that include a space will produce an invalid result because "<#" (no space) is not equal to "< #" (with space). When you encounter an invalid result when importing formatted analysis results from Excel, review your Result Type's Report Format field and you may quickly find the solution.

MSC-LIMS™ *Insights*

For Customers Only

This section of *MSC-LIMS Insights* is devoted to current users of MSC-LIMS. Here we briefly introduce only the most recent additions to MSC-LIMS.com Customers Only pages. Use your login name and password to log on to the Customers Only section of our website.

File Library
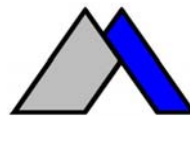
EDD Templates

If your customers need LIMS results electronically to import into their own information systems, consider creating electronic data deliverables (EDD). With these example EDD templates you can create your own templates to supply electronic data in Excel, comma separated values (CSV), tab or pipe delimited formats. See this issue's feature article "Create Electronic Data Deliverables" for more information.

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