



## INTRODUCTION

## Laboratory Information Management System

MudCats LIMS is a complete calibration laboratory management system. It maintains the customer and asset database, tracks the progress of every calibrated asset, records technician's time job by job, generates calibration certificates, invoices and shipping documents, issues a variety of automatic reports, and helps maintain adherence to even the most rigid Quality Program. With secured accesses levels, it offers enough flexibility to satisfy the database needs of each person involved in the calibration process, from shipping and receiving clerks, to technicians, to senior engineers, to laboratory managers. Yet it is secure enough to maintain system integrity, and provide for compliance to quality accrediting programs. MudCats LIMS combines all the elements necessary for running a successful and secure calibration lab, and is designed to make the process both effective and effortless.

### Objectives

MudCats LIMS is designed to comprehensively address the administrative requirements of metrology laboratories, while maintaining quality control and industry accreditations. Each of the following features serves an important administrative function, and each has tiered security levels so that the program is useful and accessible as appropriate to the function performed by each individual:

### Management Tools

- **Master Setup**  
Create and maintain secured database of customers, asset classes, makes and models, and personnel.
- **Reports**  
Generate Recall Reports, Turn-Around Time and Margin Reports and a variety of Calibration Standard Hour Reports.
- **Production Information Tracking System**  
Assign and track all assets from initial receipt to completion, providing detailed notes and status at each point.
- **Complaint and Idea Logs**  
Record, review, respond to and track customer complaints and internal recommendations for process improvement.

## Administrative Tools

- **Receiving**  
Receive and record all information specific to each asset, and generate associated traveler.
- **Shipping**  
Prepare and record shipping documents and date shipped.
- **Vendor**  
Record and track vendor calibration/repair information and instructions.
- **Administrative**  
Review, edit and/or amend Receiving, Calibration and Vendor data as authorized.
- **Billing System**  
Generate invoices and track accounting.

## Engineering Tools

- **Standard Usage**  
Review historical usage and traceability of each laboratory Calibration Standard.
- **Engineering Request**  
Record, communicate, respond to and store intra-lab engineering requests.

## Calibration Tools

- **Calibration**  
Record all administrative calibration information for the generation of a Calibration Certificate.
- **Procedure Tracking**  
Track Calibration Procedures and Revisions, Locations and Authors.

## Key Features

### Master Setup

Master Setup is used to create and maintain primary information in the following areas:

- **Customer Account Information**
  - Addresses
  - Contacts
  - Special Instructions
  - Default parameters

Note that all of these fields are configured to enable the storage of multiple contacts, addresses, etc.

- **Asset Master Setup**
  - Manufacturer
  - Make/Model
  - Calibration Procedure
  - Interval
  - Equipment Category Type
- **Security**
  - Login ID
  - Security Access
  - Technician ID

All of this information is stored in a historical database, maintaining information on all customers, users, technicians, and asset type and function. This data is input in the owner's pre-approved format, thus eliminating duplications and inconsistencies. This helps streamline the receiving, calibration, shipping and billing for each calibration performed.

## REPORTS

MudCats LIMS automatically generates four powerful reports: Recall Reports, Turn-Around Time Reports, Margin Reports, and Calibration Hours Reports.

### Calibration Recall Reports

Knowing exactly what assets are coming due for re-calibration, and when, is an invaluable tool. A simple drop-down menu allows the user to select customers, labs or departments for the Recall Report, and to select the relevant time period. Not only is the report available in printed format, but an instant email function is also available. All relevant parties are made instantly aware of calibrations coming due, reducing costly production downtime.

### Turn Around Time and Margin Reports

MudCats LIMS tracks turn around time for the calibration of each asset, sortable by lab, customer, and time-period. It reports number and percent of calibrations completed on time, and number and percentage of calibrations shipped on time. By maintaining this historical database, laboratories can quantitatively define how their processes are working, and adjust them accordingly. Reports can also be provided to customers and users, so that they can better schedule their own production.

Margin Reports list the number of calibrations performed in each lab or discipline, and provides calibration costs, calibration revenues, and profit margins over any given time period. Every lab manager will have a clear picture of each lab's profitability.

### Calibration Hours Report

This reports maintains historical tracking of hours spent by each technician on any asset during any given time period. This provides a quantitative report of employee productivity and laboratory efficiency, giving management valuable information needed for assigning work and production. By performing an automated statistical analysis based on the data collected in MudCats LIMS, and comparing ideal standard hours with expected standard hours and then again with actual calibration time, assessing productivity is made simple. With this analysis, work loads, production and personnel can all be optimally assigned.

### Production Information Tracking System

Perhaps one of the most powerful tools of LIMS, the Production Information Tracking System (PITS) provides a real-time record of all activities associated with each asset in the laboratory. Driven by the information recorded in Master Setup, Receiving, Calibration and Billing, PITS is an incomparable tool for tracking laboratory activities. PITS provides the following information on each asset received for calibration:

- Priority Level
- Laboratory/Discipline
- Date Received
- # Of days elapsed since receipt
- Work Status (in work, awaiting parts, etc.)
- Technician I.D.
- Make/Model/Description
- Test Number
- ID Number
- Customer Name
- ETA
- Technician/Administrative Notes
- Vendor Information (as required)

PITS allows the administrating lab manager to assign work, change statuses, make inquiries, check work loads by technician and by laboratory, communicate management, process and error notes, generate status reports by customer, email status reports, review vendor information, assign priorities, and make inquiries. Information requests can be queried by lab, customer, status, test number, make, model, description, error record, and action items. All of these functions are easily accessed through the use of simple drop-down menus and scroll bars. MudCats LIMS Production Information Tracking System provides every piece of administrative information necessary to run a calibration laboratory, all on one screen.

## Receiving

All assets sent to the Calibration Laboratory are received into MudCats LIMS. Upon receipt, a Traveler can be generated to accompany the asset throughout the laboratory and calibration process. Virtually all the information necessary for maintaining management, calibration and industry accreditation controls is recorded and archived. This includes the following information, which is captured during the receiving process:

- Customer Name
- Shipping Instructions
- Batch Number
- Charge Number
- Purchase Order
- Shipping Instructions
- Customer Requirements
- Date Received
- Promise Date
- Asset Number
- Manufacturer
- Model
- Description
- Serial Number
- Calibration Interval
- Calibration Requirements
- Accessories
- Laboratory Assignment

## Calibration

Once an asset is received into the lab, the technician can record the following for each calibration performed:

- Calibration Interval
- Calibration Requirements
- Accessories
- Laboratory Assignment
- Calibration Procedure Number
- Revision Information
- Technician / Inspector
- Job Status
- Previous Special Calibration/Limitation
- Calibration Due Date
- Temperature
- Humidity
- Condition Received
- Condition Returned
- Standards Used
- Calibration and Repair Time
- Error Correction Instructions
- Remarks sections for:  
Calibration  
Management

This information will appear on the Calibration Certificate (with the exception of *Management* and *Error Correction* remarks). In addition to generating a certificate, MudCats LIMS will also store this information in the database, providing for a permanent historical record of each calibration performed. This makes for complete electronic audit trails, and the ability to review past calibration information for a recurring asset. In fact, once an instrument has been identified in MudCats LIMS, all of its attendant data will be appear each time a test record is opened for it. Further, the standards and procedures used, and the time spent to perform the calibrations will be recorded, allowing for comprehensive statistical reporting (see *Reports* later in this paper).

## Vendor Information

Occasionally, an asset must be sent to a vendor, or sub-contractor, for calibration and/or repair. In addition to recording in-house calibration details, MudCats LIMS allows for tracking and documenting vendor repair and calibration activities. Again, this helps maintain audit and chain-of-custody trails, and increases the amount of control that can be maintained for any asset no longer in the lab's custody. And,

since there is now a permanent record of the vendor's activities associated with the asset, factors such as billing, shipping and calibration errors can be reported and analyzed. For calibration performed by a vendor, there is the facility of issuing an in-house calibration certificate after appropriate review of the vendor's report. All of the following information can be tracked by the Vendor function:

- |                      |                    |                                |
|----------------------|--------------------|--------------------------------|
| ▪ Vendor Information | ▪ Job Status       | ▪ Physical Damage              |
| ▪ Vendor Cost        | ▪ Calibration Date | ▪ Previous Special Calibration |
| ▪ Billing Price      | ▪ Due Date         | ▪ Condition Received           |
| ▪ Ship Date          | ▪ Comments         | ▪ Condition Returned           |
| ▪ Promised Date      | ▪ Temperature      | ▪ Purchase Order Information   |
| ▪ Received Date      | ▪ Humidity         |                                |

## **Administration**

The Administration function allows for approved individuals to edit, amend and manipulate non-measurement related data. Changes to model numbers, changes in identification numbers, test record deletion, and a variety of comments are just a few of the revisions that can be made in this screen. Authority to make such changes is strictly controlled by access codes, helping to maintain database integrity and security. All of the functions listed can be assigned for access together or separately, adding another barrier to data inaccuracies.

## **Standards Usage**

MudCats LIMS tracks each Calibration Standard and each asset upon which that Standard was used. This is particularly useful for tracking interval changes, both forward and reverse traceability, lapses and/or changes in calibration intervals, and all assets that might be affected by a Standard failure. This is, in many ways, the bedrock of any calibration laboratory management system – the ability to quickly and accurately review the status and history of Standards and the asset upon which they were used. Audit trails are thus easily established, and failure resolution is easily rendered. Functions such as these in MudCats LIMS facilitate the acquisition and maintenance of industry accreditations.

## **Complaint Log**

Communicating problems when they occur is critical to maintaining any quality program. MudCats LIMS provides the facility to record problems in detail, suggest resolution, record final corrective action taken, and perform follow-up actions. A simple drop-down menu lists problem categories to assist in tracking complaint trends. This allows not only for the ability to immediately address and correct problems, but to track and improve related processes. This fulfills a critical requirement of most quality programs.

## **Procedure Tracking**

This system tracks and manages calibration procedures used throughout the laboratory. This helps ensure that the calibration procedures being used have been reviewed and approved, and are the most recent and up-to-date. If the lab has electronic copies of the associated procedure, ProcTrack will retrieve them automatically. The program tracks the following information:

- Procedure number
- Title
- Current approved version (including revisions/ changes)
- Location of distributed copies
- Current status
- Status of procedures under development

## **Process Improvement Log**

The Process Improvement function enhances your continual process improvement commitment. Acting as an electronic “Suggestion Box”, the LIMS users can record their ideas for software, procedural, technical and administrative process improvements. There is also the ability to send LIMS-related ideas directly to the MudCats Development Team. This allows for a synergistic partnership between the users and the designers, intended to bring even greater power to your Laboratory Management tasks.

## **Release Notes**

As the MudCats development team continues to design and implement more and more value-added functions, new Releases will be issued. This provides an archival history of LIMS Release notes, allowing users to keep up to date on all LIMS enhancements as they become available.

## **SUMMARY**

MudCats Laboratory Information Management System is a comprehensive software program designed to address every administrative need of a calibration lab. It performs as an archival database, a production tracking database, an accounts receivable database, a calibration certificate generator, a business and status report generator, and a shipping database. All of the business needs of any calibration lab are met with one simple, secure and user-friendly program.

As a complement to the Laboratory Information Management System, The MudCats Calibration Process Manager addresses and automates all calibration processes and measurements. Please see the MudCats CPM White Paper for details. For a quick overview, please see the MudCats CPM White Paper.