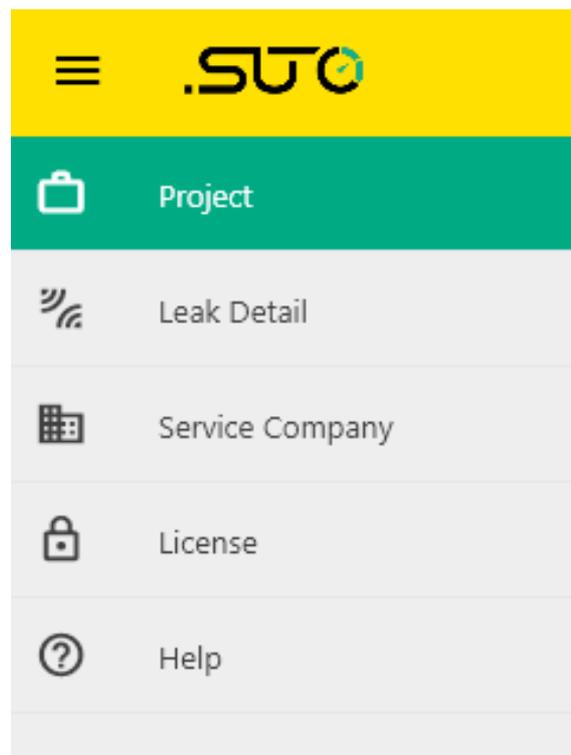


## Instruction and operation manual

# LMS

## Leak Management Software



Dear Customer,

Thank you for choosing our product.

Please read the manual in full before you start up the device and carefully observe the instructions stated. The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or non-compliance with this manual.

Should the device be tampered with in any manner other than a procedure which is described and specified in the manual, the warranty is void and the manufacturer is exempt from liability.

The device is destined exclusively for the described application.

SUTO offers no guarantee for the suitability for any other purpose. SUTO is also not liable for consequential damage resulting from the delivery, capability or use of this device.

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## 1 Registered trademarks

Trademark	Trademark owner
SUTO®	SUTO ITEC

## 2 Overview

SUTO LMS (Leak Management Software) is designed to work with the S531 Ultrasonic Leak Detector to provide management on leak survey and quantification of leaks, which helps prioritization of repair activities, statistics of leaks and savings.

With the LMS, the leak management service providers can edit, classify, generate quantitative data on customers' leak situation, and finally generate leak reports. The report gives customers an all-round view of leaks in their gas system so that they can take measures to resolve leak issues in their gas system quickly and effectively.

The features and functions of the LMS are as follows:

- Flat interaction design, simplify the operation steps
- Easy to import  
All leak records are presented as a project, each of which contains the leak data as well as images and sound files. You can simply select the project directory and all the leaks are imported.
- The measurement unit can be re-configured as your needs.
- The estimated leak losses and costs can be re-calculated.
- Supports for generating personalized report by editing service provider information and uploading its logo.
- Local installation  
The LMS is installed on a local computer of the service provider and can be used by those with access to that computer.
- One-time payment of the license for permanent use. One license is bound to a local PC.

This manual guides you through performing daily leak management activities using the LMS.

### 2.1 LMS User Interface

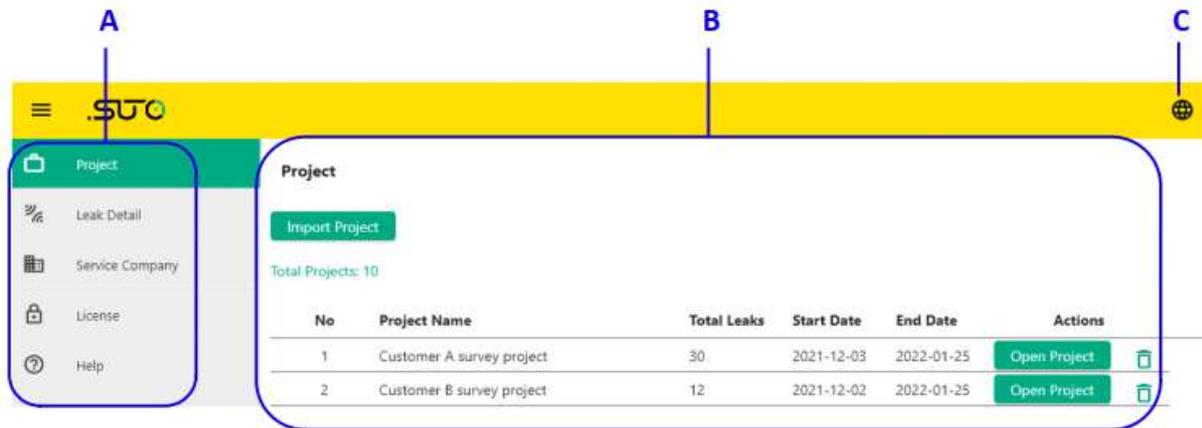
Before using the LMS, get yourself familiarized with the LMS user interface.

This topic contains:

- Main Screen
- Operation Menus

### 2.1.1 Main Screen

After you start the LMS, the LMS main screen appears as shown below. This topic describes the main parts of this screen and their usages.



Area	Description
A	Navigation bar, including operation menus used to manage project, service company, and license. For more information, see Operation Menus.
B	The LMS operation area when you click a menu from the navigation menus.
C	Click to switch language.

### 2.1.2 Operation Menus

The left navigation bar contains the following operation menus. See details in the following table.

Menu name	Description
Project	To view and manage the projects, customers' information and leak records.
Leak Detail	To edit project, customer' information and leak records. This menu is available only when clicking on <b>Open Project</b> on a specific project.
Service Company	To enter information and logo of the company that purchased the LMS.
License	To register by using the LMS license to acquire permanent use.

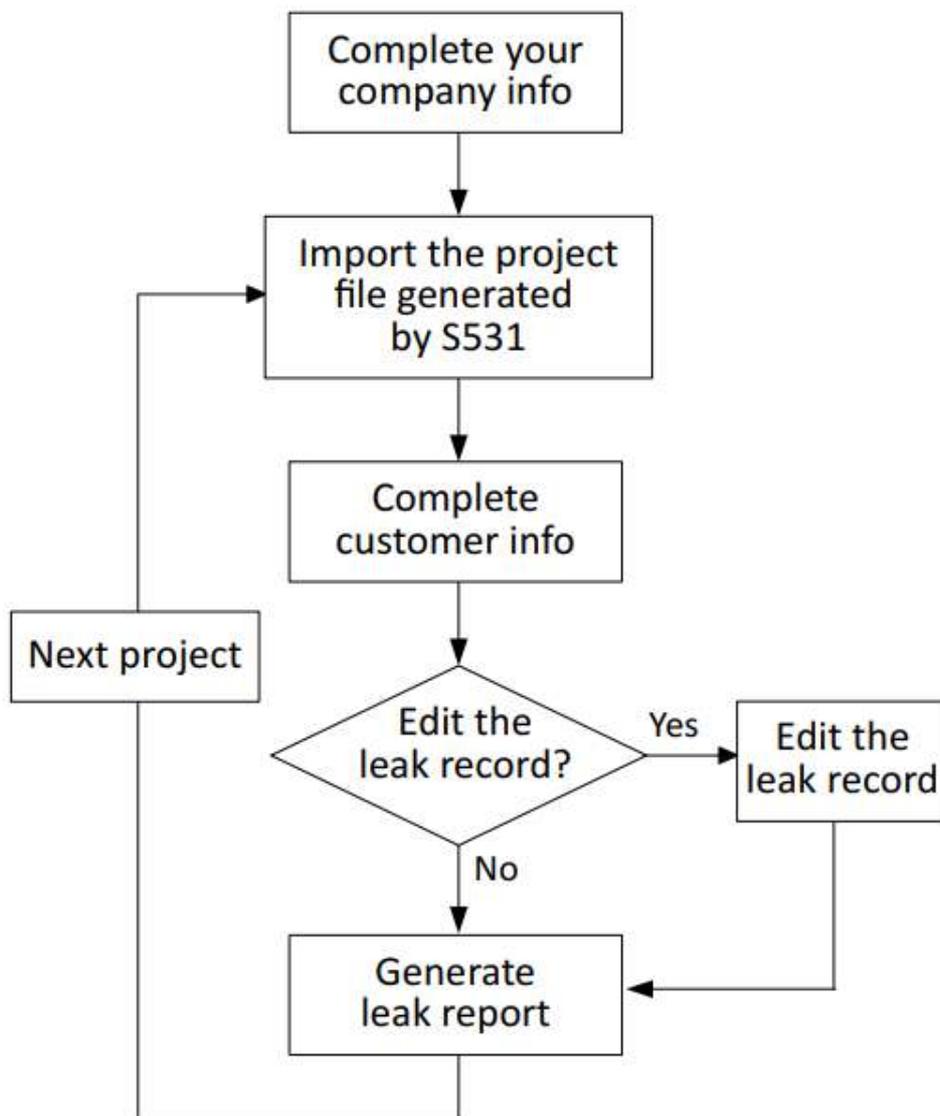
## 2.2 View the Online Help

View instructions for the LMS daily operations:

1. Start the LMS application by double clicking the LMS shortcut icon on your desktop.
2. Select **Help** from the navigation menu.
3. Click on **Open help in browser**, then the online help opens in a browser.

## 2.3 Procedures of Conducting a Project

The following diagram illustrates how to use LMS to conduct a leak project.



1. Before handling a project, complete your company information. The operations include:
  - a. Enter Service Company Information
  - b. Upload or Delete Service Company Logo
2. Import the project generated by the S531.  
The leaks are managed by project. A project includes leak data, pictures, and voice recordings. See Import a Project for the operation.
3. Complete customer information.  
The project file imported from the S531 does not contains customer information, which can be added in the LMS. See Complete Customer Information for the operation.
4. Edit the leak record.  
You can edit the leak record by Modify Project Information and Edit Leak Records.
5. When the above tasks are done, you can create a leak report. See Generate Leak Report for more details.

### **3 Complete Service Company Information**

The service company indicates the company that purchases the LMS and provides leak management for customers. The service company information is not included in the leak project generated by S531. Its information can be entered, and its logo can be added in the LMS. With the information, you can provide a personalized report for your customer.

The topic includes:

- Enter Service Company Information
- Upload or Delete Service Company Logo

### 3.1 Enter Service Company Information

Enter the service provider's name, address, contacts and more.

The service company information will be present on the leak report so that the customers know who provides the leak management service company information.

**Entry:** Service Company

**Steps:**

1. Enter company information required on this web page, such as Company Name, Address, Contact phone, and so on.
2. Click **Save** to save the company information, or click any menu in the navigation area to clean the inputs.

**Notes:** The fields marked with an asterisk must be filled in.

### 3.2 Upload or Delete Service Company Logo

Upload the service company logo to the LMS. The uploaded logo will be displayed on the lower right of the LMS interface and leak reports that the LMS generates.

**Entry:** Service Company

**To upload a logo:**

1. Click **Upload** in the **Company Logo** area.
2. In the pop-up dialog box, select the logo file to upload.
3. Click **Upload**.

After the logo file is uploaded successfully, it appears on the lower right of the LMS interface.

**To delete a logo:**

1. Select the logo to be deleted.
2. Click **Delete**.

## 4 Import a Project

Before managing the leak records in LMS, import the project that contains the leak data, images, and voice recordings.

The project files can be imported from local PC, the S531, or a USB drive. For how to export the project files to your PC, the S531, or a USB drive, see *S531 Instruction and Operation Manual*.

**Entry:** Project

**Prerequisite:** make sure the project files have been available in your PC, the S531, or a USB drive.

### Steps:

1. Click **Import Project**.
2. Select the path that the projects are in to import the project to the LMS.

### Notes:

- A project includes leak data, photos, and voice memos. All of them are imported.
- After a project is imported into the LMS, once one or more leak records in this project are updated in the S531, if you import the project again, whether the records in the LMS are overwritten is determined by the time stamp. The records with the new time stamps will overwrite the old ones.

## 5 Complete Customer Information

A leak report must contains customer information. The customer information is not included in the leak project generated by S531. With the LMS, you can complete the customer information, including its name, address, and more. The customer information will be present in the **Project Info** section in the PDF report.

**Entry:** Project

### Steps:

1. Click on the **Open Project** on a specific project to enter into **Leak Detail** page.
2. In the **Customer Info** area, add the customer name, address, notes, and so on.

**Note:** The fields marked with an asterisk must be filled in.

## 6 Manage Project

The project information and the leak records imported from the S531 can be edited in the LMS.

You can edit the project information, modify the calculation parameters and measurement units, then the LMS re-calculates the leak losses, costs, flow and pressure values. Also you can replay the voice memos, edit each leak record, add more details about the leak. Finally the leak report can be created. The more details are described in the following topics:

- Modify Project Information
- Edit Leak Records
- Generate Leak Report

### 6.1 Modify Project Information

Modify the project information, including project name, the data for calculating losses and costs, and the measurement units.

**Entry:** Project

**Steps:**

1. Click on **Open Project** on a specific project to enter into **Leak Detail** page.
2. In the **Project Info** area, modify the following information or data:
  - Project name
  - Cost/1000m<sup>3</sup>, Currency, Operating hours/year

These parameters can be modified in the LMS. After they are modified, the LMS will re-calculate the leak losses and costs accordingly. The result will be present on the Project Summary section of both the LMS page and the leak report.

- Flow unit, Pressure unit

These measurement units can be changed in the LMS by clicking the  icon. After the units are changed, the values of the flow and pressure will be converted to match the units.

- Notes / Additional Info

You can summarize the leak issues based on the leak records and provide your comments, such as which parts are not used properly and which parts need to be replaced in this field. The description will be present at the end of the leak report.

## 6.2 Edit Leak Records

Edit the leak record, including basic information, notes, pictures, and voice memos, to improve and refine the leak information.

**Entry:** Project > edit page

On this page, you can perform the following operations on the leak records:

- Edit the leak information and click **Save** to save the changes. The following fields can be edited:
  - Location: indicates where the leak occurs. The location is a sort criterion. Making the location accurate will help you to classify the leaks.
  - Group: the group can be a name of production line or component of compression system, such as compressor, pipeline, and filter. The group is also a sort criterion, and helpful for further analysis.
  - Notes: you can add more details about the leak in this field.

**Note:** The real measurements such as distance, pressure, leakage grade cannot be modified.

- Delete a leak record by clicking **Delete** under the record.

**Note:** The deleted records cannot be retrieved.

- Play a voice memo by clicking the  icon.

Replaying the voice memo helps you determine whether to modify the leak information. In addition, because the voice memo cannot be included in the leak report, you can add the related content to Notes field of the leak based on the voice memo.

- Save all the modifications by clicking **Save all changes**.
- Unselect a record by clicking the  icon before it. By default all records are selected.

The unselected records will not be shown up in the leak report.

- Unselect all records by clicking the  icon before the **Select to print (all leaks)**.

### 6.3 Generate Leak Report

After completing the service company information, having edited the project information, including project, customer info, and leak record, you can generate a report in PDF format for your customer.

To generate the project report:

**Entry:** Project > edit page

**Step:**

Click **Generate PDF** to generate the report.

There is a **Generate PDF** icon after each leak tag number, clicking any of this icon can generate the report.

The generated report is in PDF format with the same name as the project plus project start time. For example, the project name is abc, start time is November 18, 2021, 11:15:20, the file name will be the *report\_abc\_2021-11-18 11\_15\_20.pdf*. By default, the report file is stored in the *Documents* folder of your PC.

A leak report usually includes the following content.

<b>Section</b>	<b>Description</b>
Project Info	Includes project name, customer name and address, the start date and the end date of the project.
Service Company	Includes the name, address, and contacts of the service company. The logo of the service company displays on the header of each page.
Project Summary	Includes the total number of leaks, total estimated losses, total estimated costs, operating hours per year and the costs per 1000 m <sup>3</sup> .
Leak Statistics	Three kinds of the statistics are provided: the statistics based on location, the statistics based on group, and the statistics based on leak grade.
List of Leakages	Includes the leaks selected in the LMS. The information of each leak includes: leak number, location, group, leak grade, distance, and the notes. The leak order in the PDF report is the same as the sequence displaying on the LMS.
Notes / Additional Info	Includes the summary, comments, and recommends, etc.

## 7 Register

The LMS can be used for 30 days for free. After that you have to purchase a license if you want to use it. Contact SUTO Service Team or your sales for purchasing the license.

After receiving the license, follow the steps below to register for a permanent use:

**Entry:** License

1. Fill your license into the **License key** field.
2. Click **Register** to complete the registration.

**Note:** The registration must be done online.

Once the registration is completed, you can use the software all the time.

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