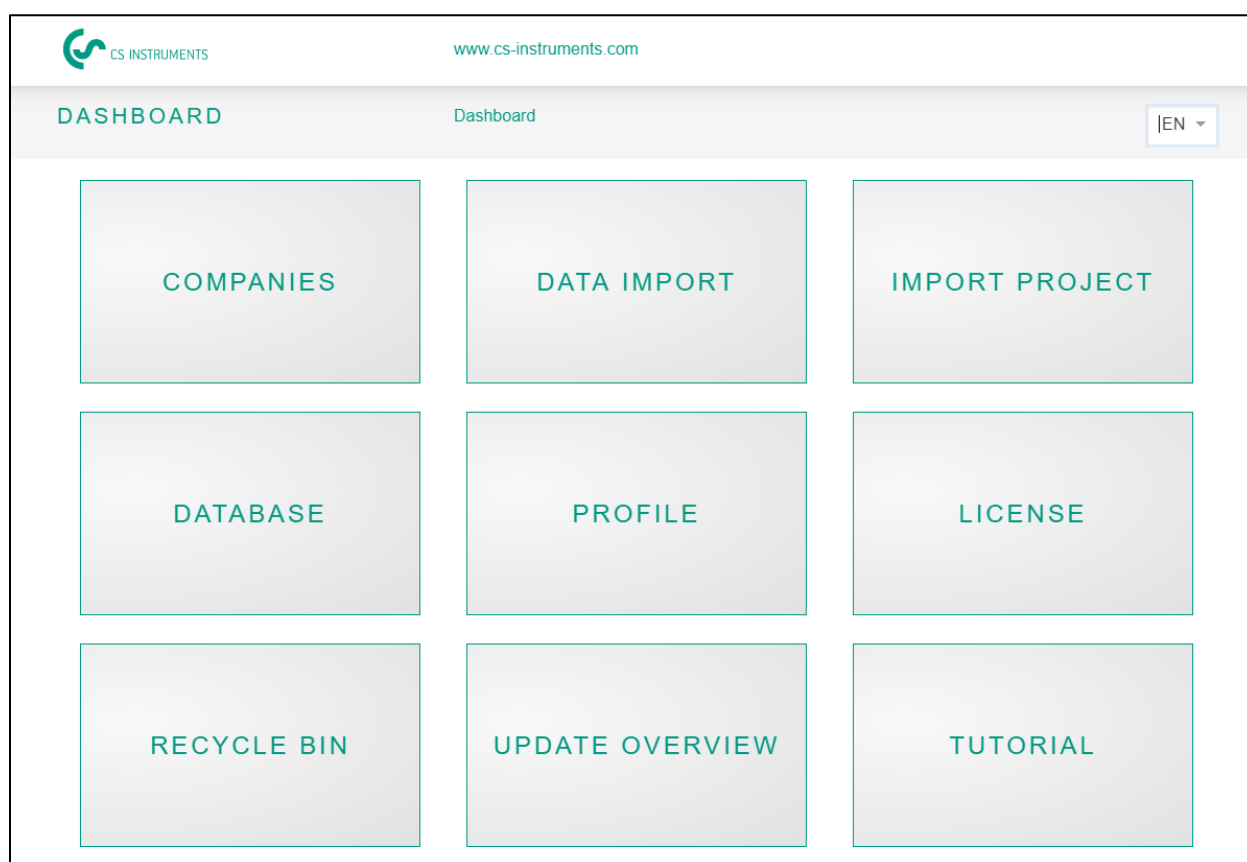


Instruction manual

CS Leak Reporter for the Leak Detector LD 500 / LD 510



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2 Foreword

Dear customer,

If you have a leak detector **LD 500 / LD 510**, the measurements can be exported from the device and then evaluated within the software **CS Leak Reporter**.

The data transfer via the USB stick makes the creation of the report very easy. The created measurements can be converted into a report. The data can be easily managed and supplemented.

Main functions:

- **Manage companies / Building / Projects / Measurements**
 - Amend company data
 - Manage projects
 - Manage measurements

- **Documentation / reports with**
 - Picture of the leakage site
 - Date / time
 - Description of the leakage position including the company, location, and place
 - Size of the leakage in liters/min (units can be adjusted)
 - Costs of the leakage per year in € (currency freely definable)
 - Information on how to fix the leak (defective element, measure, spare part)
 - Summation, significance, CO2 value per year, etc.

3 Notes

3.1 About this document

- Read this documentation carefully
- Keep this documentation handy for future reference
- Share this documentation with future users of the product

CS Instruments GmbH & Co.KG makes no warranty as to its suitability for any particular purpose and assumes no liability for any errors contained in this manual, nor for consequential damages in connection with the delivery, performance, or use of this software

4 General functional description

The software CS Leak Reporter is used for the management and evaluation of the leak detector LD 500 / LD 510.

The leakage data can be imported into the software using a USB stick. The images from the device are imported by default from the USB stick. There is an option to change the imported default images with your own images from other cameras/devices. Furthermore, the measurements can be described in more detail in the software and can also be specified initially for the project.

In the report, the desired measuring points can be evaluated and converted into a report. In this case, cumulative values, information on leakage costs, and CO2 emissions/year are presented.

5 System requirements

Hardware PC	from Win 7x64 / Mac onwards
Main memory requirement	min. 4 GB RAM
Disk space	min. 10 GB

6 Installation

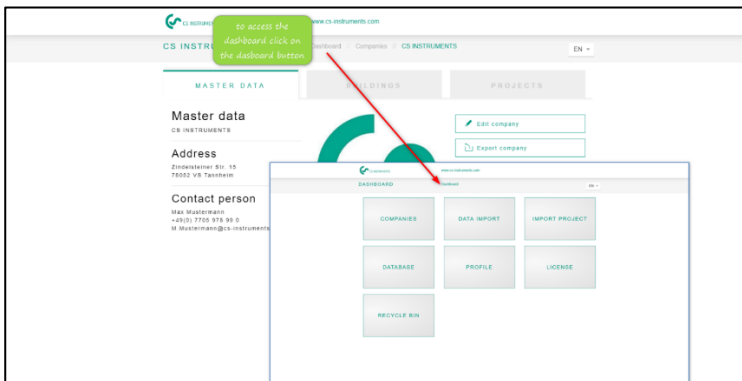
Start the "Setup.exe" to install the software and follow the installation instructions. The software will be installed automatically.

7 Operation

The operation is mostly self-explanatory and menu-driven via a central home screen.

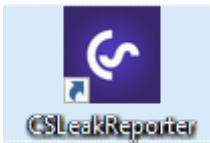
Entries or changes can be made for all white fields.

The navigation is done via the buttons on the home screen or via the menu bar in the middle:

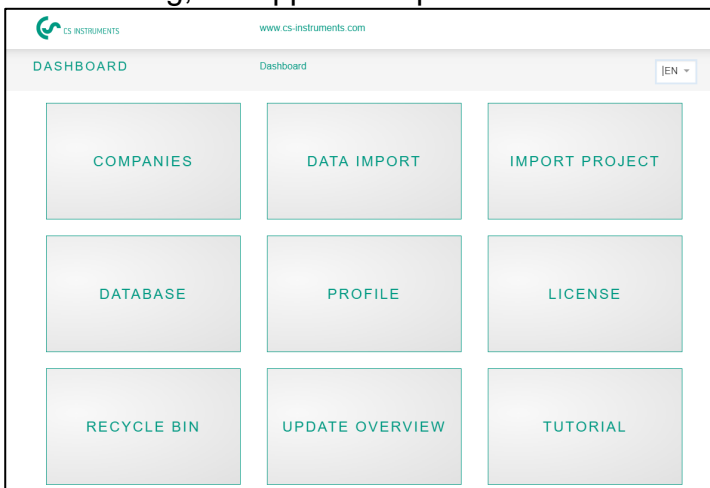



7.1 Starting the program

The application is started with the installed shortcut:

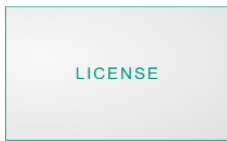


After starting, the application presents itself as follows:



Button  for language selection.

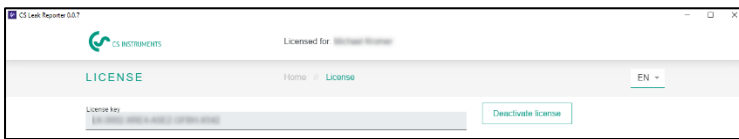
7.2 Licensing



The software can be used for 30 days without a license. The software can be activated twice.

Licensing: With the License button, the license number can be entered, and the software can be activated. The mandatory fields are marked with a “*”.

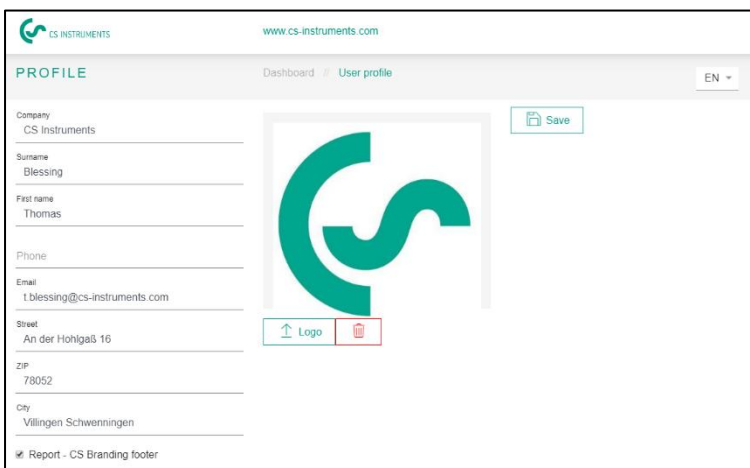
If the software is to be used on another PC, you must first perform a data transfer via a database export (see below). Then the license key should be noted. Subsequently, the license can be deactivated under this menu item.



Afterward, the software must be installed with the installation medium or via our homepage and re-licensed as described above.

Tip: For activating the software, you need an internet connection to the IP 195.201.86.230 via the TCP port 443! If there are problems, please check the firewall with your internal IT department.

7.3 Edit user profile



The company master data is to be stored in the profile.

A company logo can be added or changed by clicking on the **Logo button**.

Changes in the company name and logo on the report are updated accordingly then.

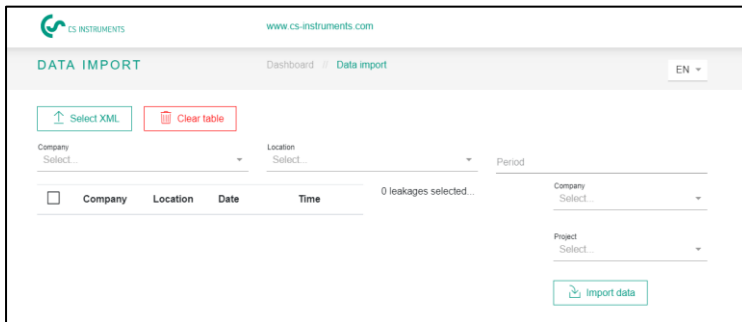
The **update button**



saves the data.

The footer can be deactivated under the item **"Report - CS Branding footer"**.

7.4 Data import Measurements



The takeover of the exported data from the LD5xx leak detector takes place via the menu item Data import.

The data is transferred there via a USB stick / USB data medium.

The  button starts the selection of the journal file.

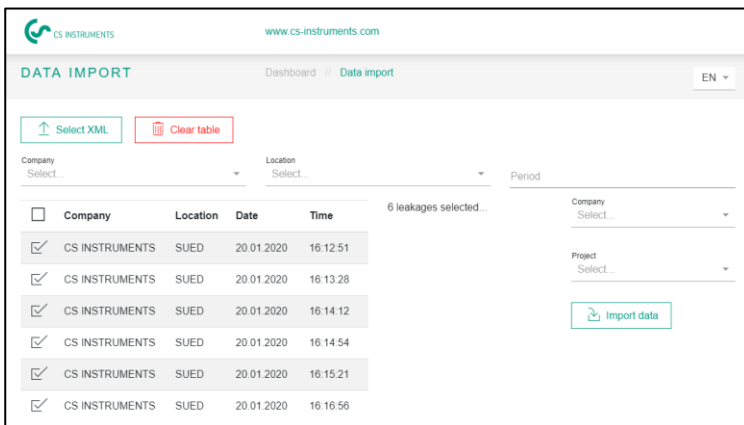


Then there should be a file Jnl...XML on the disk in the directory <Drive_Disk:>\DEV0004\00000000\Journal.

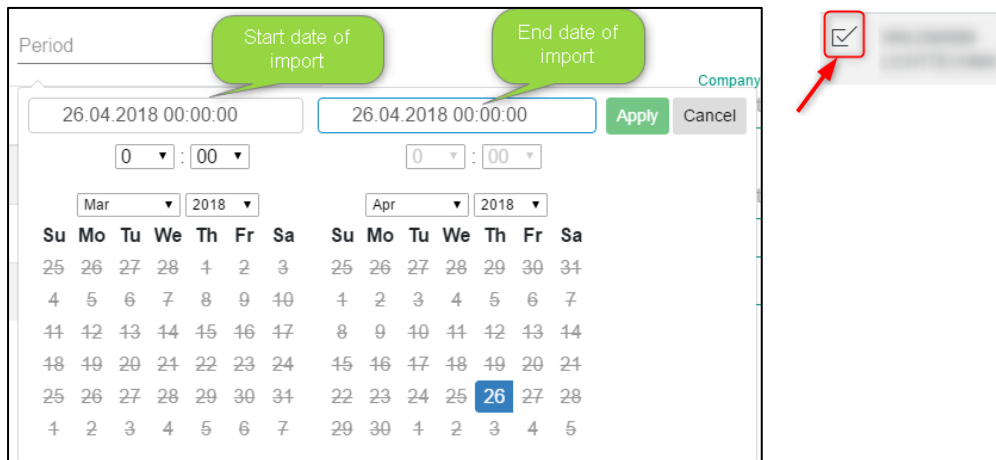
After selecting the file as shown the above picture, confirm the dialog with the button



Then the measurements will be displayed in this journal file:

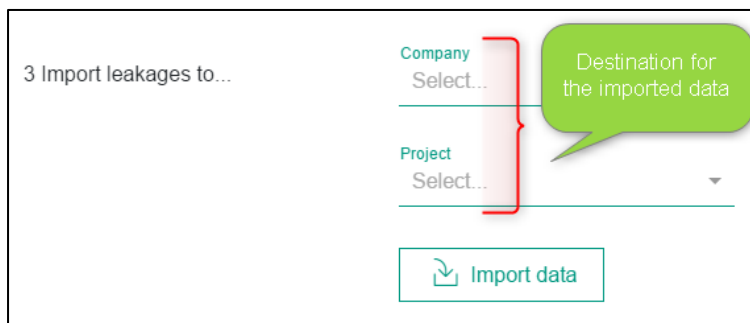


After selecting this file, the data can be filtered: according to the company, location, or according to a period.



Note: Without a filter option, all data will be imported.

A company and a project can be selected as the target for the import. The leaks will then be added to the specific project of the chosen company, and the buildings of the imported leakages are used from the data import.

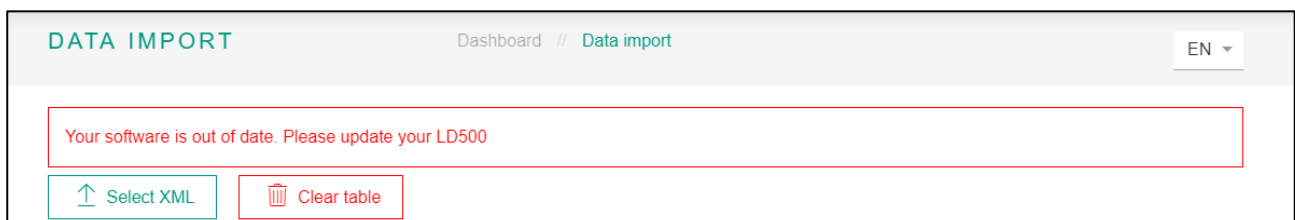


On the right, a company and a project can be chosen as the destination for the import.

With the button **Import data**, the selection will be imported.

To keep the LD 500's Firmware up to date, we strongly recommend that you update the device. The XML journal is checked during the data import and the firmware used at the time of the export is saved.

If the firmware used is out of date at the time of the export, this is indicated as follows:



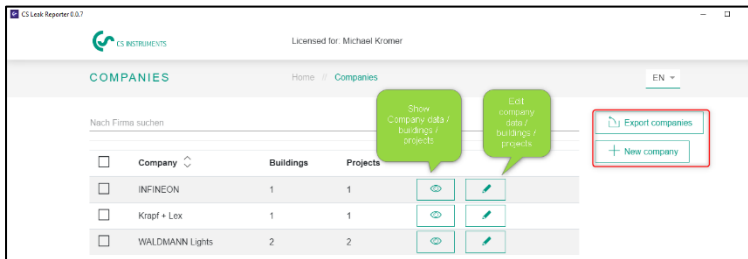
The current firmware can be downloaded from the following link:

<https://www.cs-instruments.com/downloads/software/firmware-leak-detectors>

8 Manage companies

The imported companies are shown in the following menu. There the companies can be managed and edited.

8.1 Show company




Likewise, a company list can be exported on this display, and then the database on the LD device can be replaced with this data.

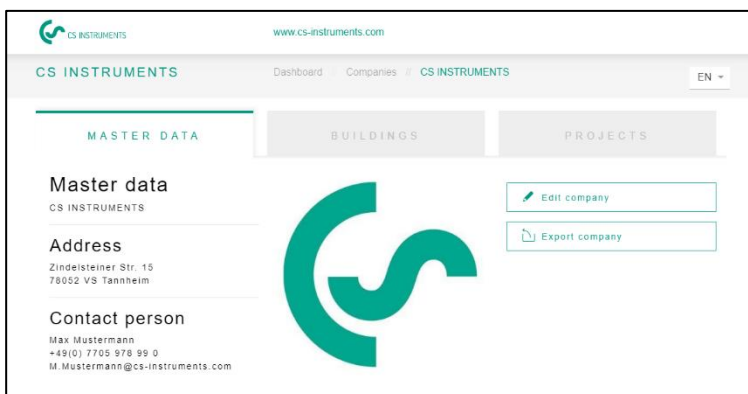
The data needs to be exported onto a USB stick and then imported into the LD500.

The file needs to be put into the following folder “DEV0004”. For doing this, please have a look into the instruction manual of the LD500.

Note: If the import is made, all data will be deleted there and overwritten with the newly imported data.

A new company is created, as shown above, with the  button.

8.2 Company Master data – Building



If the project is being edited, the buildings can also be amended or deleted.

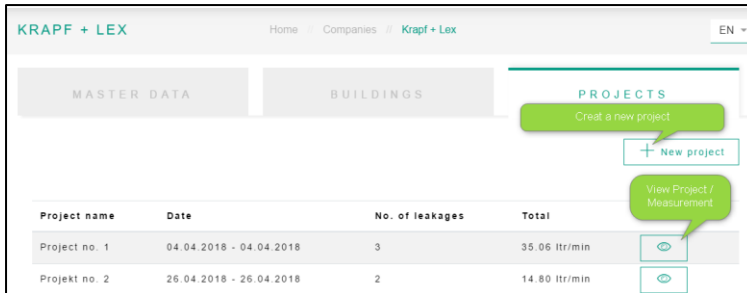
To do this, select the tab Buildings and then select or click on the building you want to delete, then the delete button will appear at the bottom right.



The plus button enables to add a new building.

8.3 Companies – Projects

On the Projects tab, data of existing (created/imported) projects are displayed.



Selecting the display button branches to the project.

The project master data (saved measurements and project master data) are displayed there.

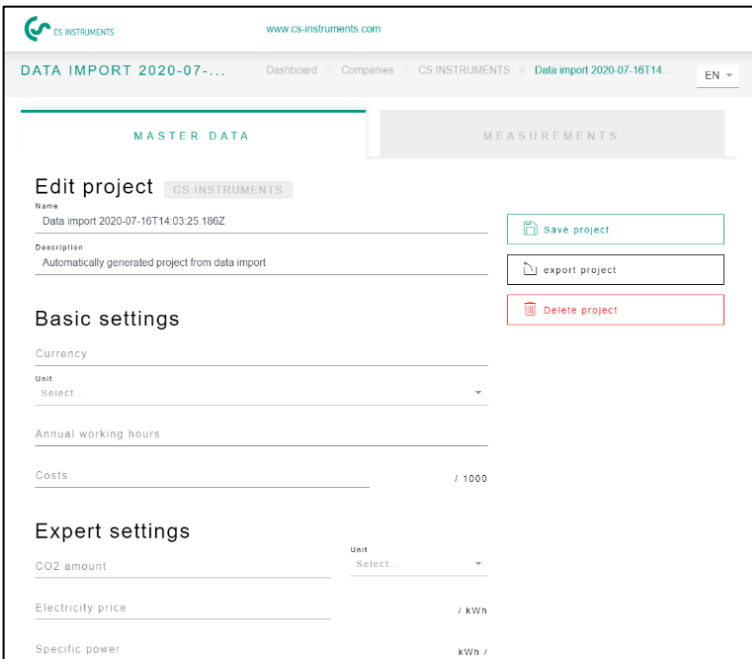
8.3.1 Project Master data

For each project, the parameters made in LD500 are used initially. The settings can be changed then globally for the entire project in project master data.

The project data is defined as follows:

Name	Project name (is also printed on the report)
Description	Project description
Currency	National currency
Unit	Volume Flow unit in (m³/h or cfm)
Operating hours	Operating hours of the plant per year (e.g., 8760 for 24/7 operation)
Costs	Costs for 1000 Nm³ or CF air in the currency to the right Note: gets automatically calculated if the "Electricity price" and the "Specific power" in the expert menu have been entered
CO2 emissions	Default value of 0.527 kg / kWh is used
Electricity price	Unit: currency / kWh
Specific power	Efficiency parameter of the compressed air system in (kWh / m³ or kWh / CF)
Cost basis	It can be chosen between energy costs [70%] and the total costs [100%]

Cost calculation basis:



Edit project CS INSTRUMENTS

Name
Data import 2020-07-16T14:03:25.196Z

Description
Automatically generated project from data import

Basic settings

Currency
Unit
Select ...

Annual working hours

Costs / 1000

Expert settings

CO2 amount Unit
Select ...

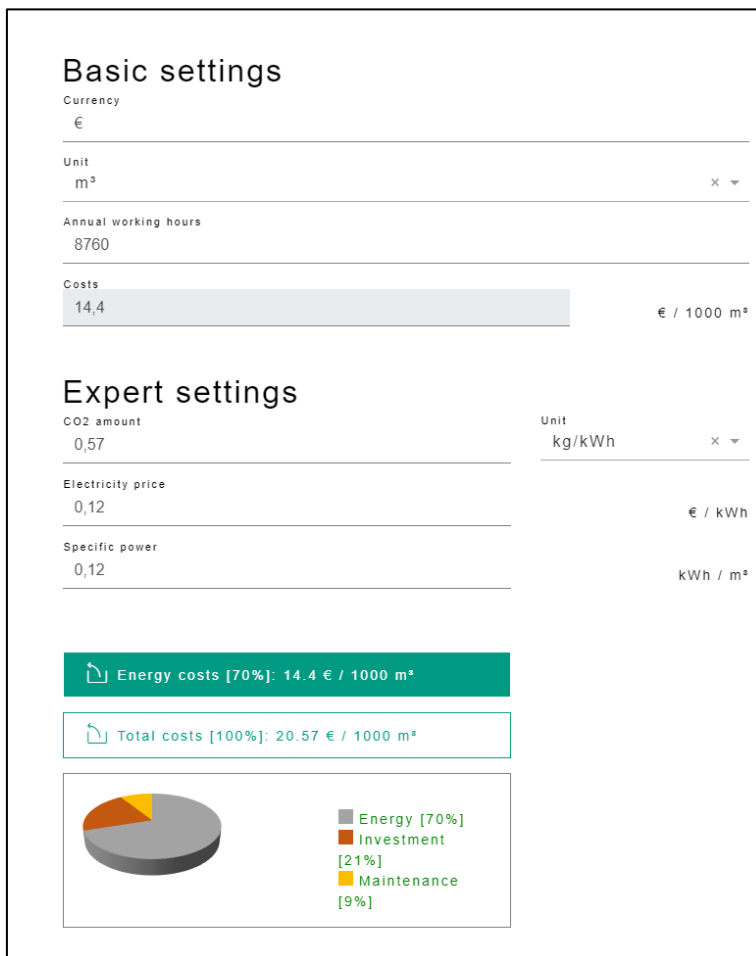
Electricity price / kWh

Specific power kWh /

If the electricity price and specific power were filled in the expert menu, the electrical costs of the compressed air system get calculated automatically.

Typically, this corresponds to 70% of the total costs, which consist of energy costs [70%], investment costs [21%], and maintenance costs [9%].

Here, the user has the possibility to choose between both cost categories. The selected cost element is then applied for the whole project.



Basic settings

Currency
€

Unit
m³

Annual working hours
8760

Costs
14,4 € / 1000 m³

Expert settings

CO2 amount Unit
0,57 kg/kWh

Electricity price
0,12 € / kWh

Specific power
0,12 kWh / m³

Energy costs [70%]: 14.4 € / 1000 m³

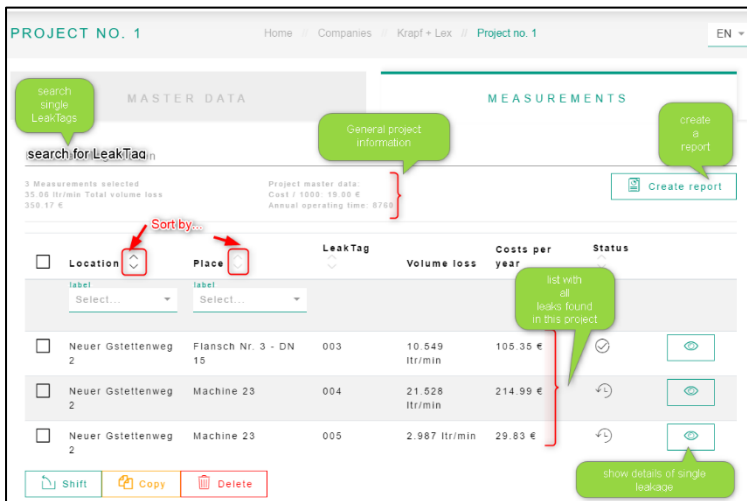
Total costs [100%]: 20.57 € / 1000 m³

Cost Breakdown:

- Energy [70%]
- Investment [21%]
- Maintenance [9%]

8.3.2 Edit measurement data

The Measurements tab shows the measurements for the selected project.




From left to right, the columns contain information for each leakage via its:

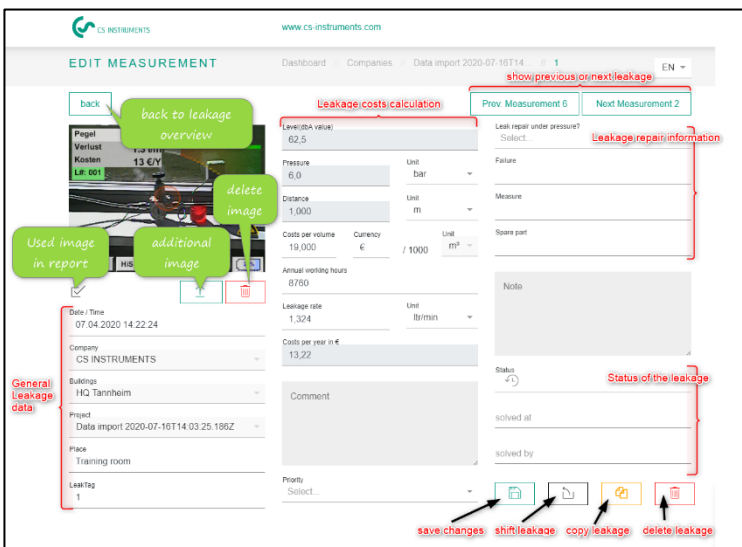
- Location
- Place
- LeakTag
- Volume loss
- Costs per year
- Status of the measurement (open, fixed)

The formula for the leakage cost is as follows:

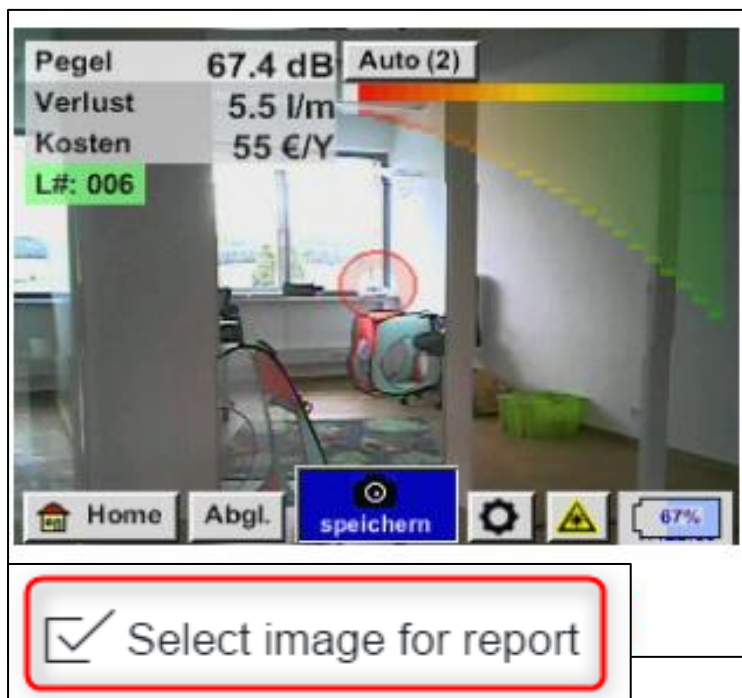
Leakage costs per year = Volume loss in l/min *60min/1000l*Annual operation hours*costs compressed air generation per 1000Nm³ in €

=5,95 l/min *60min * (1m³/1000l) *(8760h/year) *25€/1000Nm³ = 78,18 € leakage costs

With the button  next to the measurement, the measurement detail data are displayed for editing.



The measurements can be changed here in this mask. Actions, comments, the priority, the status, and the person who has removed the leak can be saved here.



If there is any additional image from another device/camera available, this can be added to the existing picture. Using the checkbox below, the original leak detector image could be replaced with the selected picture and marked for printing it in the report for the specific leak.

Project master data filled out:

Project master data

Price: 19.00

Currency: €

Annual operating time: 8760

Price	19,00	Currency	€
Annual operating time	8760		
Loss value	21,528	Unit	ltr/min
Loss costs in €	214,99		

This figure shows the data with which the system calculates the costs. The yellow block displays the parameters of the project master data, and they cannot be changed during local measurement.





The fixed parameter values are highlighted in grey fields for a better visibility.

If the unit of a measurement is changed from ltr / min to cfm, an automatic conversion is performed and vice versa.

Project master data empty:

Costs per volume	Currency	Unit
20,000	€	m ³
/ 1000		
Annual working hours		
8760		
Leakage rate	Unit	
3,144	ltr/min	
Costs per year in €		
33,05		
Comment		

If no project master data is entered, then new values for the respective fields can be entered, and the costs is calculated accordingly.

Using the buttons , the marked measurements can be shifted, copied, or deleted.

During shifting, the following dialogue box is displayed:

Shift

Project no. 1

Project

Place 2

Building

Krapf + Lex

Company

Shift

Shift leakages

All three fields need to be filled with appropriate selections from the pulldown menu, then the Shift button turns active (turns green from grey). After using the shift function, the leaks can be found in the chosen “Company”, “Building” and “Project”.

The copying operation also takes the same three fields like the shifting as displayed for the input:

Copy leakages

Copy?

Company

Krapf + Lex

Building

Place 2

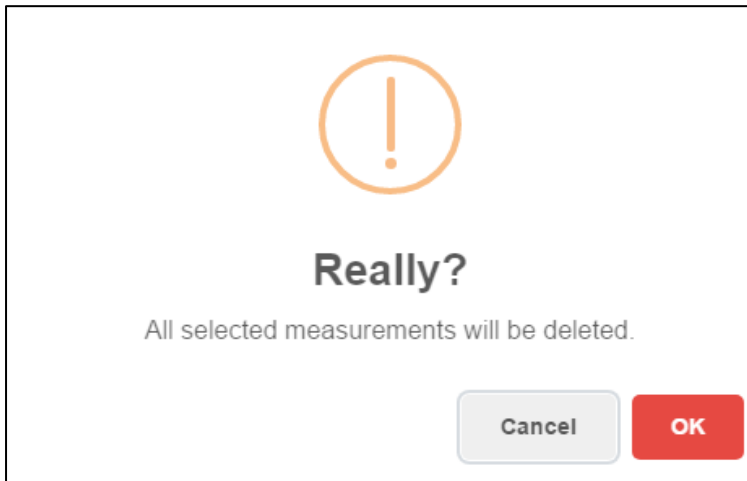
Project

Project no. 1

Copy

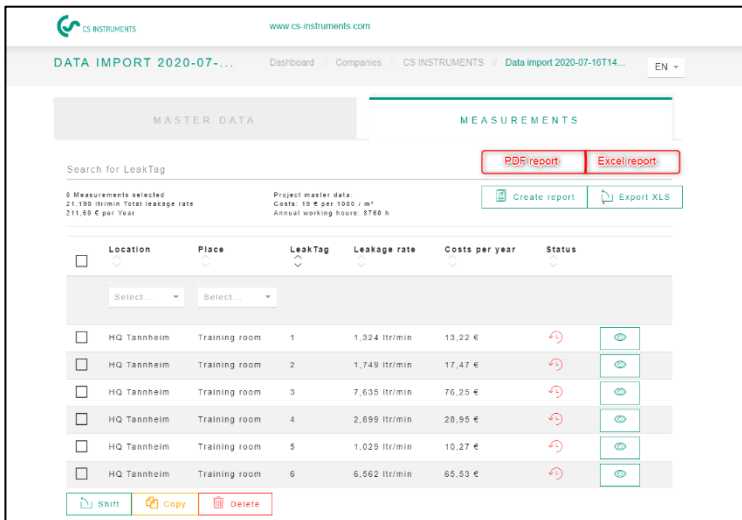
After using the copy function the leaks can be found in both companies.

Before the final deletion of measurements, a warning message is shown:



Note: If a leak has been deleted by mistake, it can be restored from the recycling bin.

8.3.3 Print report



Search for LeakTag

0 Measurements selected
21,195 ltr/min Total leakage rate
211,69 € per Year

Project master data:
Costs: 10 € per 1000 l m³
Annual working hours: 8760 h

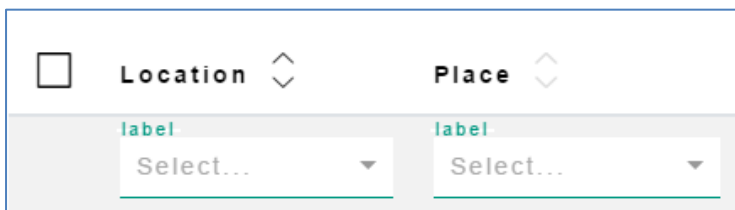
<input type="checkbox"/>	Location	Place	LeakTag	Leakage rate	Costs per year	Status
<input type="checkbox"/>	HQ Tannheim	Training room	1	1,324 ltr/min	13,22 €	
<input type="checkbox"/>	HQ Tannheim	Training room	2	1,749 ltr/min	17,47 €	
<input type="checkbox"/>	HQ Tannheim	Training room	3	7,635 ltr/min	76,25 €	
<input type="checkbox"/>	HQ Tannheim	Training room	4	2,899 ltr/min	28,95 €	
<input type="checkbox"/>	HQ Tannheim	Training room	5	1,029 ltr/min	10,27 €	
<input type="checkbox"/>	HQ Tannheim	Training room	6	6,562 ltr/min	65,53 €	

Buttons: Shift, Copy, Delete

A report can be created in the “measurements” list for each available project.

The filtered leaks or all measurements are then included in the report applying the selected sorting.

To evaluate the leakages of an individual Locations, a filter is available:



☐ **Location**

label

Select...

Place


label

Select...

This allows specific locations to be filtered in summary.

Sample report




Cover sheet:

Leak report	Start: 07.04.2020	End: 07.04.2020	Duration: 1 day(s)
Contact details: Company: CS INSTRUMENTS Address: Zindelsteiner Str. 15 78052 VS Tannheim Contact person: Max Mustermann Email: M.Mustermann@cs-instruments.com Phone: +49(0) 7705 978 99 0 Logo: 			
Project master data Import date: 16.07.2020 CO2 emissions: 0.527 kg/kWh Cost calculation basis: Specific power: 0.12 kWh / m³ Compressed air costs: 19 € / 1000 m³ Electricity price: € / kWh Annual working hours: 8760 h			
Result: No. of leakages: 6 Total leakage rate: 21,198 ltr/min Total costs per Year: 211,89 € Total CO2 emissions per Year: 0.7 tons			
Improvements: No. of leakages fixed: 1 Reduced leakage rate: 1,324 ltr/min Reduced costs per Year: 13,22 € Reduced CO2 emissions per Year: 0.04 tons			
Percentage: 16.67 % 6.25 %			

The PDF report consists of a cover sheet with information about

- the customer, auditor
- Project master data
- Results of the measurement

List of leaks:

LeakTag:	1	2	3
			
Building - Place: HQ Tannheim - Training room Date Time: 07.04.2020 14:22:24 Leakage rate: 1,324 ltr/min Costs per Year: 13,22 € Total CO2 emissions per Year: 0,04 tons Priority: high Comment:	Building - Place: HQ Tannheim - Training room Date Time: 07.04.2020 14:24:20 Leakage rate: 1,749 ltr/min Costs per Year: 17,47 € Total CO2 emissions per Year: 0,06 tons Priority: Comment:	Building - Place: HQ Tannheim - Training room Date Time: 07.04.2020 14:25:20 Leakage rate: 7,035 ltr/min Costs per Year: 76,25 € Total CO2 emissions per Year: 0,25 tons Priority: Comment:	Leak repair under pressure? Yes Failure: Pressure regulator Spare part: 16 bar Measure: replace element Note: Status: solved at: 16.08.2020 solved by: Thomas Blessing

Example of the final page in the sum line:

Result:	Improvements:	Percentage:
No. of leakages: 6	No. of leakages fixed: 1	16.67 %
Total leakage rate: 21,198 ltr/min	Reduced leakage rate: 1,324 ltr/min	6.25 %
Total costs per Year: 211,89 €	Reduced costs per Year: 13,22 €	
Total CO2 emissions per Year: 0.7 tons	Reduced CO2 emissions per Year: 0.04 tons	


Note:

All reports are saved on the computer locally in the user directory \Documents\CS Leak Reporter. This directory is in the control of the user and, therefore, should be updated from time to time.

Excel Report:

This report consists of the same information as the PDF report.

Cover sheet:

	A	B	C	D	E
1	Leak report	Start: 07.04.2020	End: 07.04.2020	Duration: 1 day(s)	
2					
3	Contact details:	Customer:	Auditor:		
4	Company:	CS INSTRUMENTS	CS Instruments		
5	Address:	Zindelsteiner Str. 15 7802 Zindelsteiner Str. 15 78052 Tannheim			
6	Contact person:	Max Mustermann	Thomas Blessing		
7	Email:	M.Mustermann@cs-instr	t.blessing@cs-instruments.com		
8	Phone:	+49(0) 7705 978 99 0			
9	Logo:				
10					
11					
12					
13					
14	Project master data				
15	Import date:	16.07.2020	CO2 emissions:	0.527 kg/kWh	
16	Cost calculation basis:		Specific power:	0.12 kWh / m³	
17	Compressed air costs:	19 € / 1000 m³	Electricity price:	€ / kWh	
18	Annual working hours:	8760 h			
19					
20	Result:		Improvements:	Percentage:	
21	No. of leakages:		No. of leakages fixed:	1 16.67 %	
22	Total leakage rate:	21,198 ltr/min	Reduced leakage rate:	1,324 ltr/min	6.25 %
23	Total costs per Year:	211,69 €	Reduced costs per Year:	13,22 €	
24	Total CO2 emissions per Year:	0,7 tons	Reduced CO2 emissions per Year:	0,04 tons	

List of leakages:

1	Pegel	62.5 dB	Auto (19-70 dB)	LeakTag:	1	Building - Place:	HQ Tannheim - Training room	Leak repair under pressure?	Yes
2	Verlust	1.3 ltr/min		Date Time:	07.04.2020 14:22:24	Failure:	Pressure regulator		
3	Kosten	13 €/Y		Leakage rate:	1,324 ltr/min	Spare part:	16 bar		
4	LF: 001			Costs per Year:	13,22 €	Measure:	replace element		
5				Total CO2 emissions per Year:	0,04 tons	Note:			
6				Priority:	high	Status:	DONE		
7				Comment:		solved at:	18.08.2020		
8						solved by:	Thomas Blessing		
9									
10									
11									
12									
13									
14									
15	Pegel	65.1 dB	Auto (19-70 dB)	LeakTag:	2	Building - Place:	HQ Tannheim - Training room	Leak repair under pressure?	
16	Verlust	1.7 ltr/min		Date Time:	07.04.2020 14:24:26	Failure:			
17	Kosten	17 €/Y		Leakage rate:	1,749 ltr/min	Spare part:			
18	LF: 002			Costs per Year:	17,47 €	Measure:			
19				Total CO2 emissions per Year:	0,06 tons	Note:			
20				Priority:		Status:	REMAINING		
21				Comment:		solved at:			
22						solved by:			
23									
24									
25									
26									
27									
28									
29	Pegel	79.5 dB	Auto (29-80 dB)	LeakTag:	3	Building - Place:	HQ Tannheim - Training room	Leak repair under pressure?	
30	Verlust	7.6 ltr/min		Date Time:	07.04.2020 14:26:20	Failure:			
31	Kosten	76 €/Y		Leakage rate:	7,635 ltr/min	Spare part:			
32	LF: 003			Costs per Year:	76,25 €	Measure:			
33				Total CO2 emissions per Year:	0,25 tons	Note:			
34				Priority:		Status:	REMAINING		
35				Comment:		solved at:			
36									

Results:

	A	B	C	D	E
1	Result:		Improvements:		Percentage:
2	No. of leakages:		No. of leakages fixed:		1 16.67 %
3	Total leakage rate:	21,198 ltr/min	Reduced leakage rate:	1,324 ltr/min	6.25 %
4	Total costs per Year:	211,69 €	Reduced costs per Year:	13,22 €	
5	Total CO2 emissions per Year:	0,7 tons	Reduced CO2 emissions per Year:	0,04 tons	
6					

Note:

All reports are saved on the computer locally in the user directory \Documents\CS Leak Reporter.

This directory is in the control of the user and, therefore, should be updated from time to time.

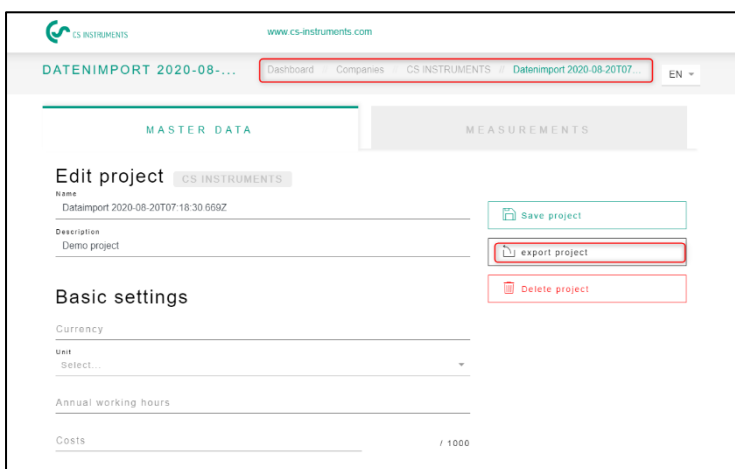
9 Project import

To save or exchange data, the CS Leak Reporter has a "project import" function which can be reached via the home menu.

This function imports a project, including all buildings and leaks stored in it. If there exists a company with the same name, a new project is added to its projects.

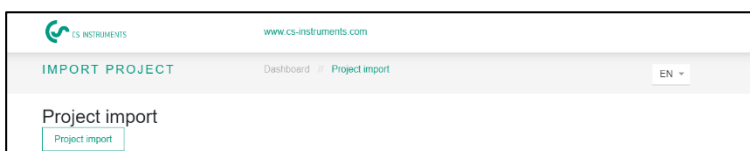
If there is no company with the same name yet, the corresponding company is created with the project.

9.1 Product export



The project is saved using the "Export project" button. Following this procedure, projects can be comfortably copied back and forth between different users.

9.2 Project import



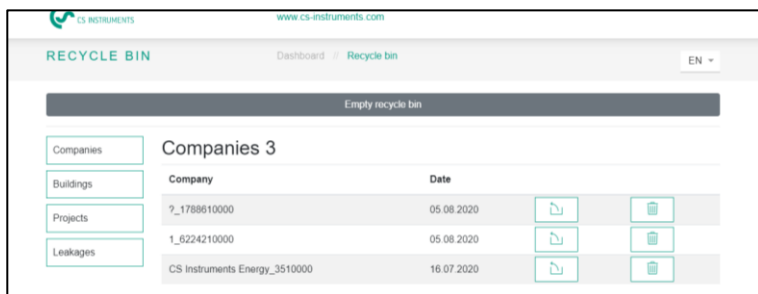
To import the project, please use the following menu.

10 Recycling bin

Deleted objects are temporarily stored in the recycle bin. This applies to:

- Companies
- Building
- Projects
- Leaks

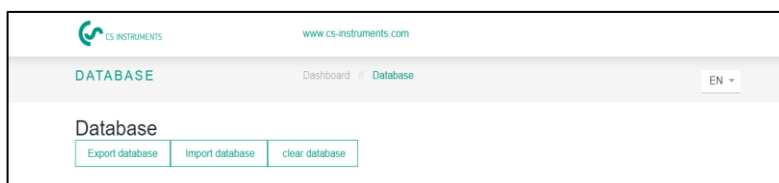
If an object has been deleted by mistake, it can be restored by clicking on the "Shift" button. The original filename is given a random number after restoring so that there is no conflict with any existing filename. After restoring, the filename can be renamed as per convenience without any random number.



If you click on the "empty Recycle Bin" Button, the entire recycle bin gets deleted, but individual items can also be removed for each category (companies, buildings, projects, and leaks).

11 Database

It is recommended to make regular backups and get them saved on a different storage media.



With the "**Export database**" a .ZIP file is created that contains the current data of the CS Leak reporter Software.

This database can be imported with the button "**Import database**". Warning: the current database.

Data is overwritten in the process by the backup. "**Clear database**" can be used to delete all the data within the CS Leak Reporter.

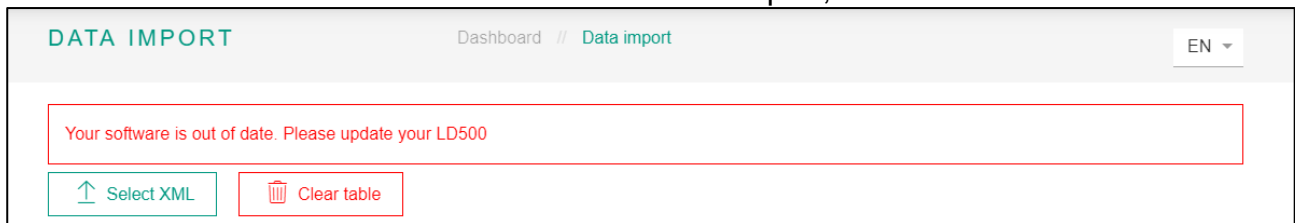
Note: This process can't be undone, and all data will be deleted!

12 Update Overview

CS Instruments is continuously working on the firmware of the leak detector - therefore new firmware versions are published regularly.

To keep the LD 500's Firmware up to date, we strongly recommend that you update the device. The XML journal is checked during the data import and the firmware used at the time of the export is saved.

If the firmware used is out of date at the time of the export, this is indicated as follows:

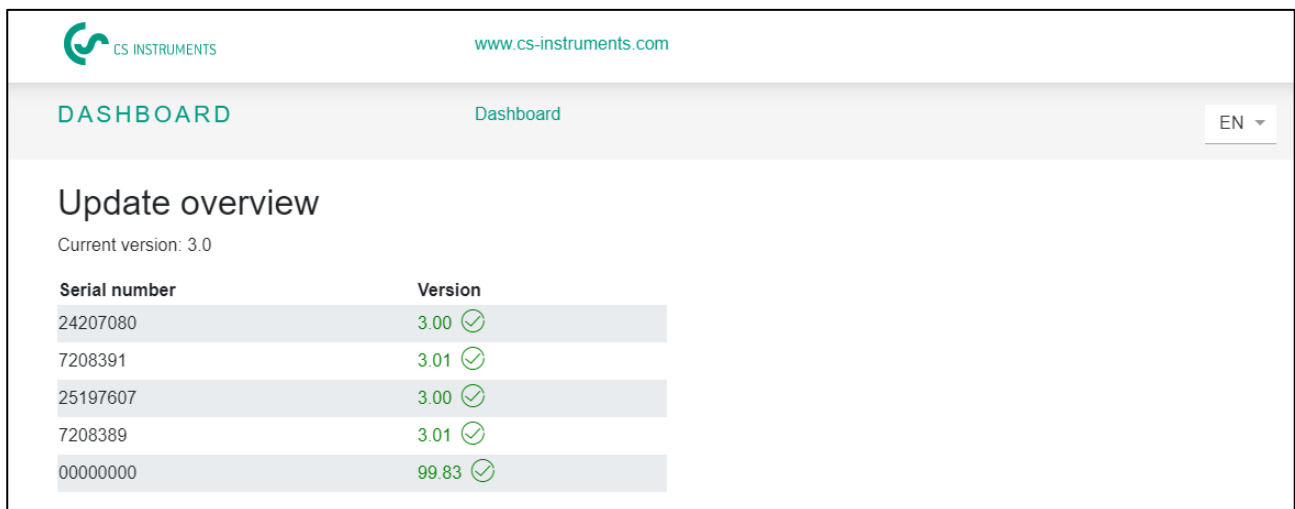


DATA IMPORT Dashboard // Data import EN ▾

Your software is out of date. Please update your LD500

↑ Select XML 🗑 Clear table

The following overview shows the current firmware version (3.0) and the versions of the corresponding serial numbers used.



DASHBOARD Dashboard EN ▾

Update overview

Current version: 3.0

Serial number	Version
24207080	3.00 ✓
7208391	3.01 ✓
25197607	3.00 ✓
7208389	3.01 ✓
00000000	99.83 ✓

The current firmware can be downloaded from the following link:

<https://www.cs-instruments.com/downloads/software/firmware-leak-detectors>

13 Tutorials

The “Tutorials” Label in the dashboard takes you to the CS Instruments homepage.

There you will find all relevant information about the LD 500 and the CS Leak Reporter briefly.

The following link is called:

<https://www.cs-instruments.com/downloads/tutorials/professional-compressed-air-leak-detection>