

# Instruction manual

## Leak detector LD 450



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## 2 Safety instructions



### About this document

- Read this documentation carefully and familiarize yourself with the product before using it. Pay particular attention to the safety and warning instructions to prevent injury and product damage.
- Keep this documentation handy for future reference.
- Share this documentation with future users of the product.

### 2.1 General safety instruction

	<ul style="list-style-type: none"> <li>• The product is to be used only in accordance with the intended purpose and within the parameters specified in the technical data. Do not use force for operation.</li> <li>• Never measure with the device at or near live/energized parts!</li> <li>• During leak detection on electrical systems, please maintain a sufficient safety distance to avoid dangerous electric shocks!</li> <li>• Avoid any direct contact with hot and/or rotating parts.</li> <li>• Always switch on the device before putting on the headphones! At high signal levels (bar graph headphones in the red area), the volume can be correspondingly large. The sensitivity setting can be used to reduce the volume.</li> <li>• Observe the prescribed storage and operating temperatures.</li> <li>• In case of improper handling or violence, the warranty claims are lost.</li> <li>• Interventions on the device of any kind, unless they correspond to the intended and described procedures, lead to the expiration of warranty and to the disclaimer.</li> <li>• The device is intended solely for the described purpose.</li> </ul>
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### 2.2 Using of class 2 laser

	<ul style="list-style-type: none"> <li>• Never point the laser directly towards persons!</li> <li>• Absolutely avoid a direct irradiation of the eyes of humans and animals!</li> <li>• If a person's eyes are exposed to class 2 laser radiation, they should shut their eyes and immediately move away from the beam</li> <li>• Do not stare into the beam</li> <li>• Laser module: corresponds to DIN EN 60825-1: 2014 Class 2 (&lt;math&gt;&lt;1\text{mW}&lt;/math&gt; / 635nm)</li> <li>• Laser output point trumpet and parabolic mirror:</li> </ul>
	
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p><b>Laseraustrittsstelle</b> <b>Laser output point</b></p> </div>

### 3 Service and maintenance

Service and maintenance work must only be carried out by authorized personnel.

### 4 Environmental protection



- Disposal of defective batteries / dead batteries according to the valid legal regulations.
- After the end of the useful life, take the product to the separate collection for electrical and electronic equipment (observe local regulations) or return the product to CS Instruments GmbH & Co.KG for disposal.

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 device.

#### **The following accumulator is contained in this electrical appliance**

Battery type	Chemical system
Akkumulator	LiIon 2S1P

#### **Information on the safe removal of the batteries or accumulators**

- Warning: Make sure that the battery is completely empty.
- Removing the battery



Removing the battery cover



Disconnecting the connector



Carefully pull out the battery

- Carefully remove the accumulator
- The accumulator and the appliance can now be disposed of separately

### 5 Intended use

The LD 450 is a leak detector for quick and reliable leak detection in/on compressed air systems.

It is solely designed and constructed for the intended use described here and may only be used for this purpose.

The user must verify that the device is suitable for the intended use. The technical data listed in this datasheet are binding.

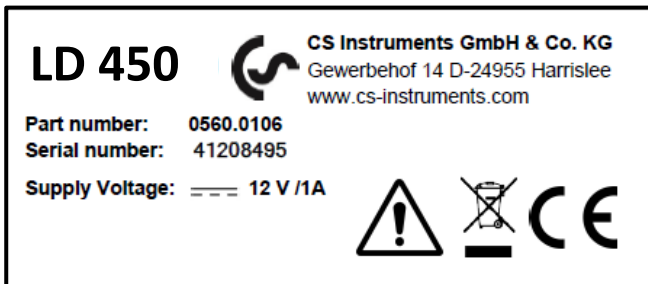
Improper handling or operation outside the technical specifications is not permitted. Claims of any kind for damages arising from improper use are excluded.

**6 Technical data LD 450**

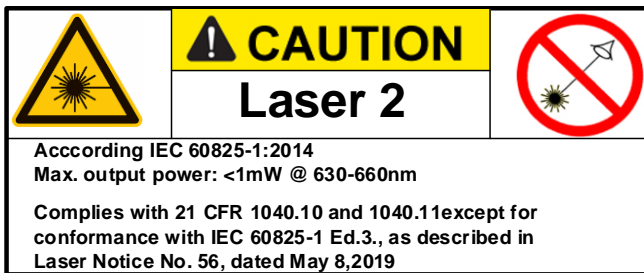
Dimensions hand-held housing	263 x 96 x 280 mm (with preamp module and acoustic trumpet)
Weight	0.55 kg with preamp module and acoustic trumpet, complete set in case approx. 3.0 kg
Operating frequency	40 kHz (+/-2 kHz)
Power supply	Internal 7.4 V lithium-ion battery
Operating time	> 9 h (continuous operation)
Charging	ext. battery charger (included in scope of delivery)
Charging time	max.4 h
Laser	Wavelength 630–660nm, output power < 1mW (laser class 2)
Connections	3.5 mm stereo jack for headset, Power supply socket for connecting an external charger USB connection
Colour screen	3.5" touch panel TFT transmissive
Interface	USB for SW update.
Application Area	Indoor use
Operating temperaturer	-5 °C bis +50 °C
Storage temperature	-20 °C to +60 °C
Altitude	Up to 4000m above sea level
Max. Humidity	<95% rH, without condensation
Pollution degree	2
Protection class	IP20

## 7 Identification

### 7.1 Name plate



### 7.2 Laser warning label

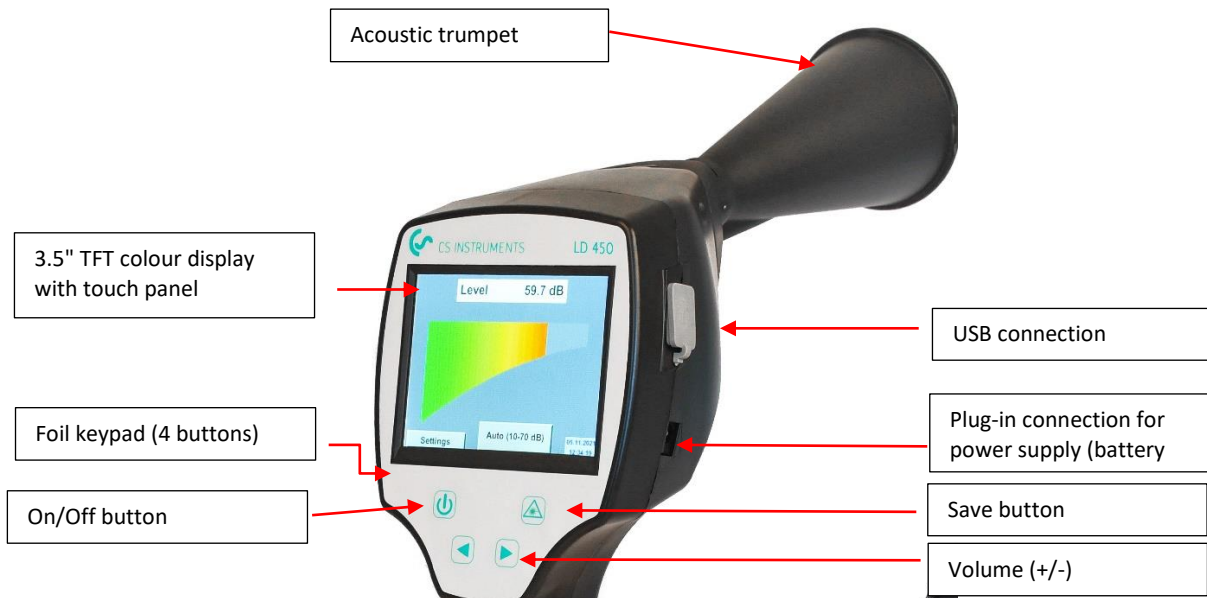


### 7.3 Label positions





## 8 Device components and controls

### 8.1 The LD 450



## 9 Overview and application description of the different sensor types

Acoustic trumpet (standard tool)	Straightening tube
 <p>The acoustic trumpet bundles incident ultrasonic waves, thereby extending the range of the device. This behaviour makes it ideal for medium distances. The leakage can be heard from large distances, for precise detection, the user must approach the leakage and consistently follow the "loudest" point. Individual compressed air components are then checked for precise detection. Quantification distance (distance) □ 1 – 6 m</p> <p><b>Use of acoustic trumpet:</b></p> <ul style="list-style-type: none"> <li>• Average distance to pipe/component 0.2 - 6 m</li> <li>• Low interfering noise</li> <li>• Leakage freely accessible</li> </ul>	 <p>The straightening tube permits only very few ultrasonic waves to pass in the direction of the ultrasonic transducer, allowing leakages to be located very precisely.</p> <p>For this reason, the use of the straightening tube is recommended for small distances, for the precise detection of the corresponding leakage.</p> <p><b>Quantification distance:</b> 0...0,2 m</p> <p><b>Use of focus tube:</b></p> <ul style="list-style-type: none"> <li>• Short distance to pipe/component 0.05 m</li> <li>• Pipe/component freely accessible</li> <li>• Pipes and components to be inspected are very close together</li> </ul>



## 10 Start-up // Application LD 450



Please first observe the safety instructions in Chapter 2

### 10.1 Switch on

Hold down the power button for about 1 second, the power will turn on, and a start-up sequence will appear on the display. Pressing the button again switches the device off again.

On-Off button, see [device components and controls](#)

### 10.2 Headphone Volume Up / Volume Down

The volume up and volume down buttons in the headset can be increased or decreased in 16 steps. Continuously pressing the button automatically increases / decreases the value.

Volume up / down buttons for headphone volume, see [device components and controls](#)



Please make sure the headphone level is <50% before putting on the headphones.

### 10.3 Sensitivity level

Ultrasound levels can be understood as a "loudness" of the leakage.

With the "Sensitivity" button, the sensitivity of the LD 450 can be adjusted to the environment, which strongly influences the acoustic behaviour of the device and increases or decreases the valid value range. A reduction in sensitivity reduces the range of the leakage .

#### Sensitivity levels

**0 – 60 dB** = Highest sensitivity level of the device (use with small leaks and no noise), selection with the "*HiSn*" button or the "*Sensitivity*" button

**10 – 70 dB** = Leakages and noises get "less noisy", the range is reduced.

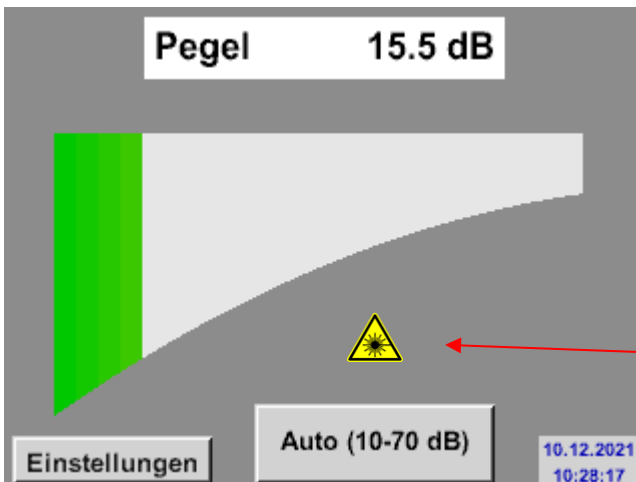
**20 – 80 dB** = Leakages and noises get "less noisy", the range is reduced.

**30 – 90 dB** = Leakages and noises get "less noisy", the range is reduced.

**40 – 100 dB** = Most insensitive stage (large leaks, many noises → for heavy-duty application)

### 10.4 Laser On/Off

The laser pointer can only be switched on by pressing the laser on / off button. When switched on, the display shows a laser warning symbol.



**Please note the warnings for laser operation!**  
**Avoid direct / indirect (via reflexion) irradiation of the eyes in humans and animals!**

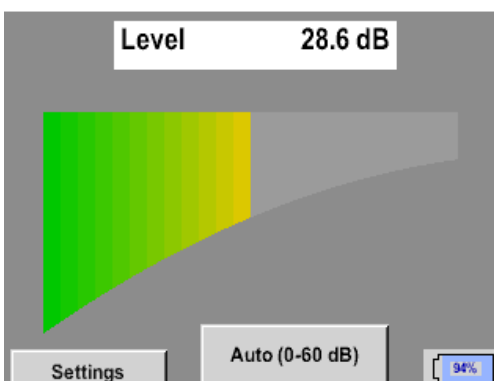
Laser „On“  
Icon

## 11 Operation

The operation is largely self-explanatory and menu-driven via the touch panel. The selection of the respective menu items occur via short "tapping" with the finger or a soft round pen.

**Attention: Please use no pens or other objects with sharp edges!**  
**The foil can be damaged!**

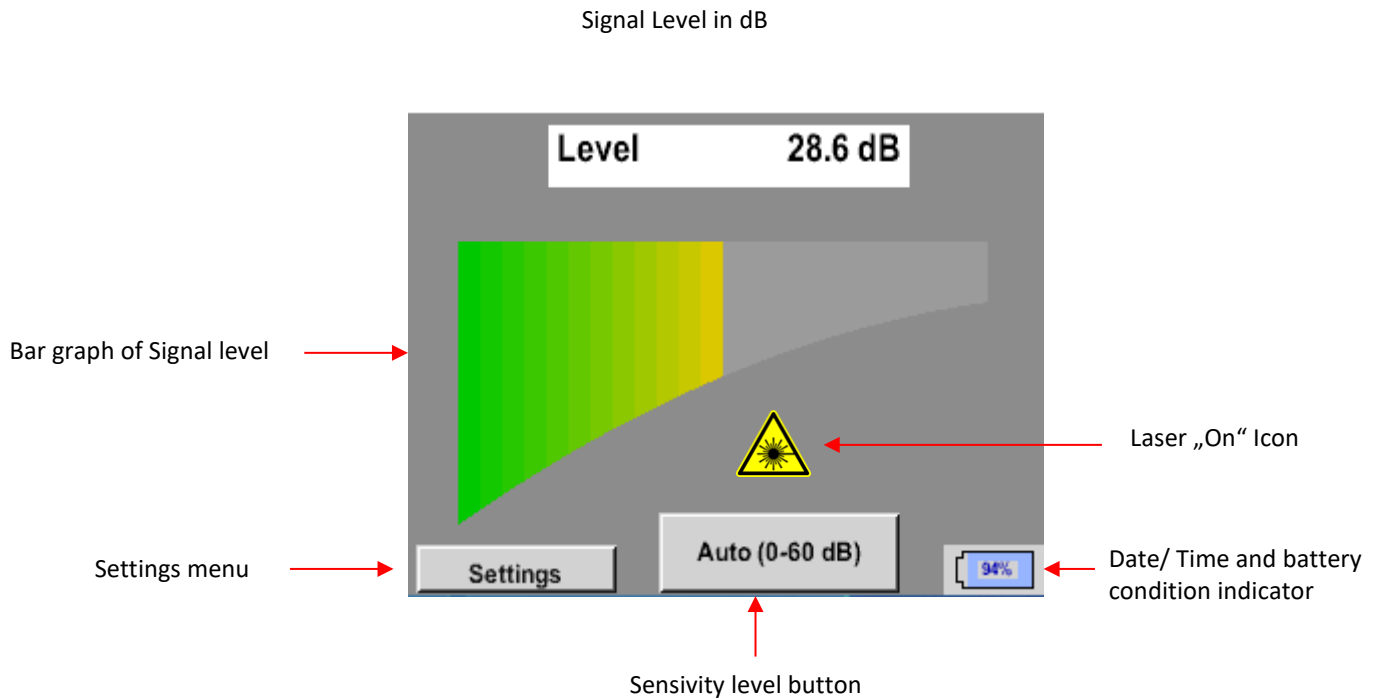
### 11.1 Initialization



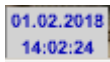
After switching on the LD 450, the initialization takes place and then switch to leakage display

### 11.2 Screen Leakage

The following picture shows and describes the display elements.

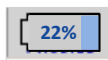


#### Date / Time:



#### Battery condition indicator

Battery condition:



Power supply connected and battery is charging:

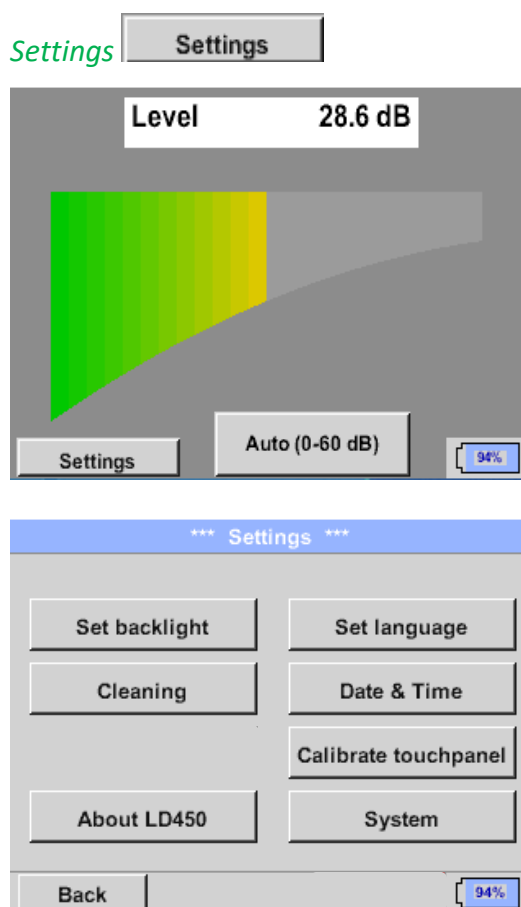


### 11.3 ^Settings menu LD 450

The operation is largely self-explanatory and menu-driven via the touch panel. The selection of the respective menu items occur via short "tapping" with the finger or a soft round pen.

**Attention:** Please use no pens or other objects with sharp edges!  
The foil can be damaged!

Before the leakage search is started, the device must be configured. The user can access the menu by clicking the "Settings" button. The following figure shows the Settings "Menu".



With the button „**Settings**“ you access the basic menu of the LD 450.


Return to measurement by pressing „**Back**“ –button.

### 11.3.1 Language

Settings → → Set language

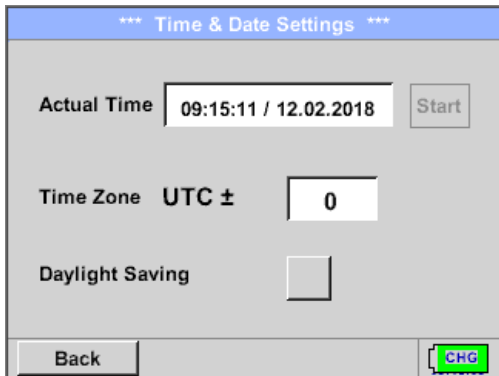


Here you can select one of 13 languages for the LD 450.

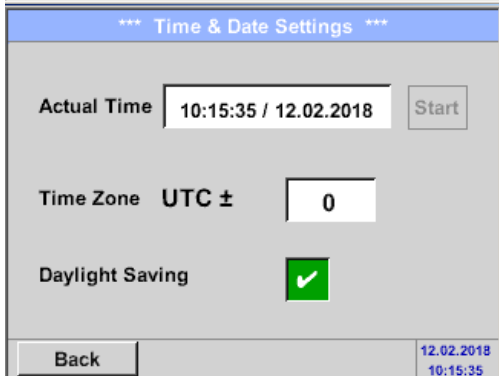
For languages on page 2 please press  Page

### 11.3.2 Date & Time

Home → Settings → Device settings → Date & Time



By pushing the *Time Zone* description field and enter the correct *UTC*, you can set the correct time all over the world.



The summer and wintertime switchover is realized by pushing the *Daylight Saving* button.

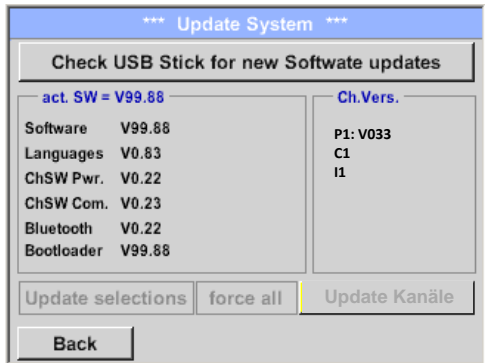
### 11.3.3 System settings

#### 11.3.3.1 System update

If required, there is the possibility for the LD 450 to download a firmware update to the device via the USB stick. The latest software is available on the CS Instruments GmbH homepage

The received file must then be stored on the USB stick and transferred to your device as described below.

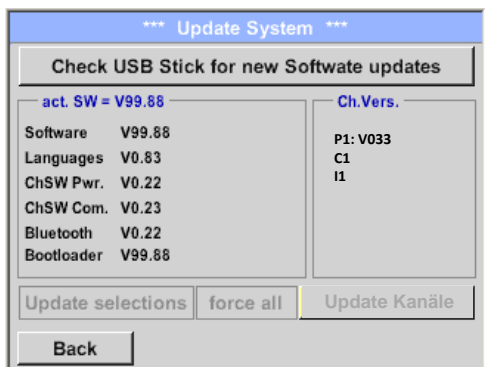
Settings → System → System-Update



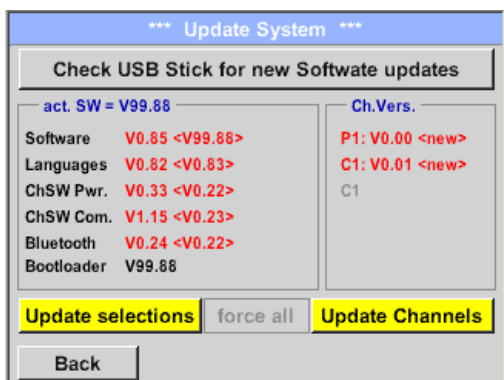
Overview of *System-Update*-Functions.

##### 11.3.3.1.1 Check for Updates

Home → Settings → Device settings → System-Update → check USB-Stick for new Updates



If after pressing the button *“Check USB Stick for new Software updates”* the following messages appear in the window, is the LD 450 is not properly connected to the USB flash drive or there are no files available.

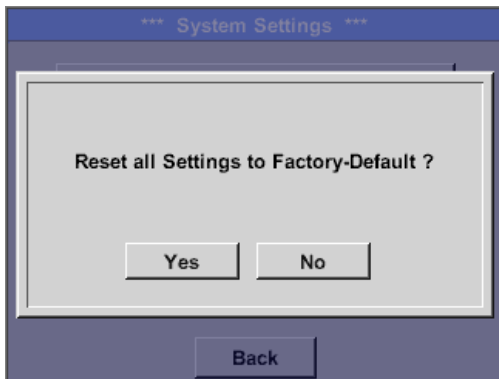


If the LD 450 is correctly connected to the USB stick and there are new versions of the individual SW Parts, the new versions are marked in red. The update is started by pressing the *„Update selections“* button.

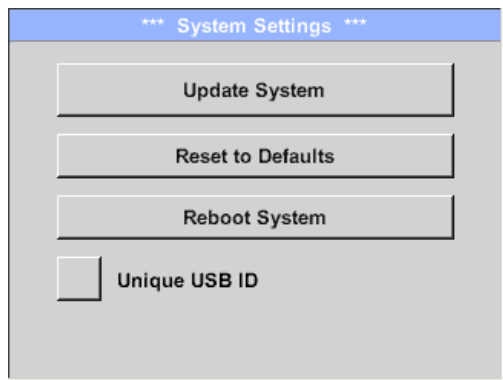
If it is required to install an older software version, you have press the button *„Force all“*

### 11.3.3.2 Reset to default settings

Settings → System → Reset to Defaults



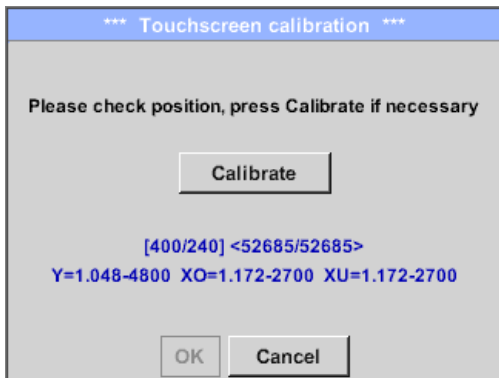
Bevor the settings are changed to the production default settings a safety prompt is displayed and must be confirmed by pressing the button „**Yes**“.



If needed with „**Reboot System**“ the LD 450 could be started(reboot) here.

### 11.3.4 Calibration of touchpanel

Home → Settings → Device settings → calibrate touchscreen

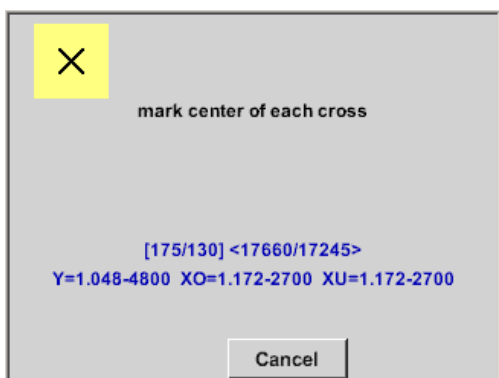


If necessary, the touch-screen calibration can be changed here.

Push **Calibrate** and it appears, 1. left above, 2. bottom right, 3. bottom left, 4. right above and 5. in the middle, a calibration cross that must be pushed consecutively.

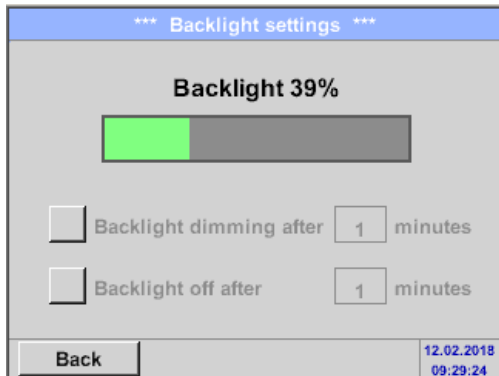
If the calibration finished positive a message "**Calibration successful**" appears and have to be confirmed with **OK**.

Is this not the case, so you can repeat the calibration with the help of the **Cancel** and **Calibrate** button.



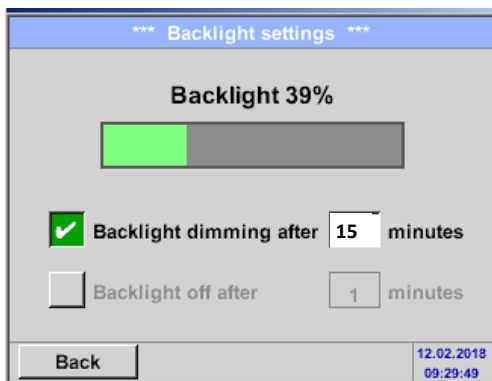
### 11.3.5 Set backlight brightness

Home → Settings → Set backlight



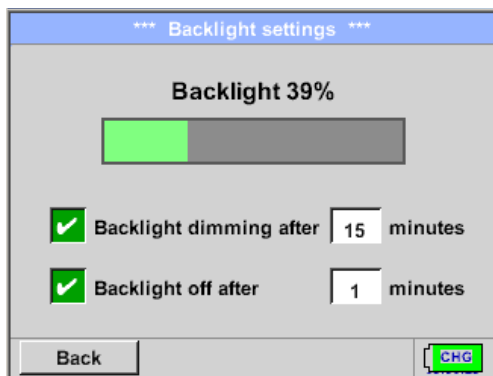
Here you adjust the desired *Backlight* (15-100%) of the display directly.

E.g. *Backlight* to 39 %



With the help of the *Backlight dimming after* button, after a definable time interval (here after 15 minutes), the *Backlight* can be reduced to the minimum.

As soon as the dimmed screen is operated again, the *Backlight* is committed automatically on the last set value before dimming.



To reduce the energy consumption (device runtime), you can switch off the display backlight by setting "*Backlight off after*".

#### Remark:

At the first touch, the *Backlight* in our example is reset to 39%, after that a "normal" function operation is possible.

#### Important:

If the *Backlight dimming after* button is not activated, then the *Backlight* stays permanently on, in the currently set brightness.



### 11.3.6 Cleaning

Home → Settings → Cleaning



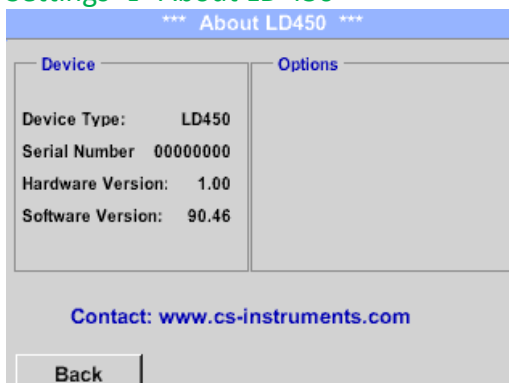
This function can be used for cleaning the touch panel during running measurements.

If one minute is not enough time to clean, the process can be repeated at any time.

Is the cleaning faster finished, then you can push the *to abort press long* button (for one or two seconds) to cancel.

### 11.3.7 About LD 450

Settings → About LD 450

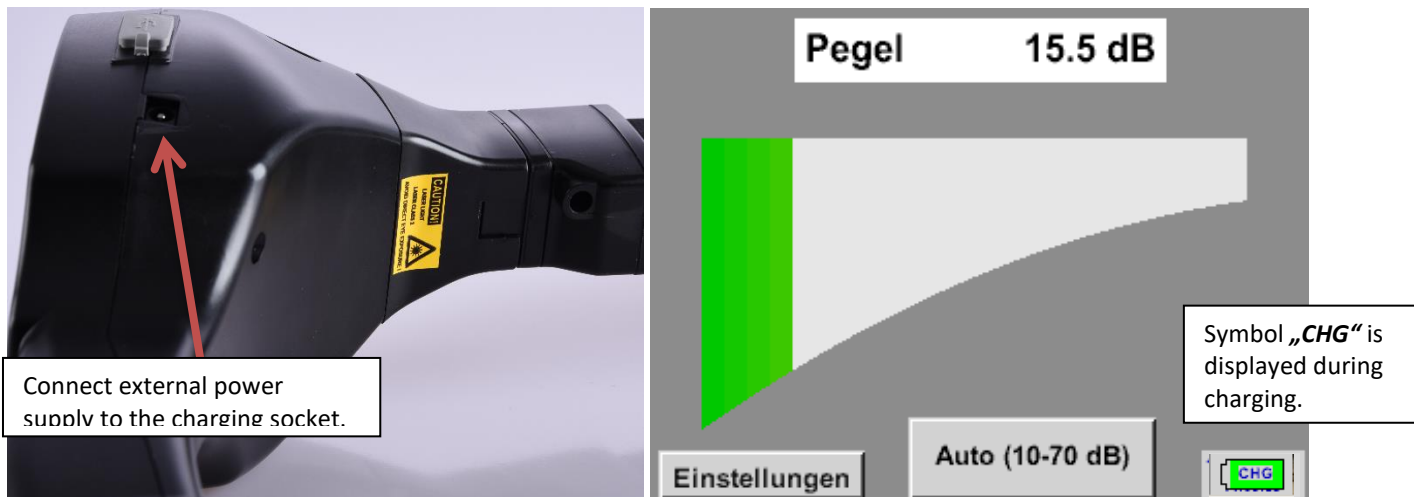


Brief description of the **Hardware** and **Software Version**, as well as the **Serial Number** of the LD 450.

Under options, you can buy four additional, different functions, if you have not done this by ordering.

## 12 Charging the batteries

The battery is charged within the device. For this, the supplied plug-in power supply is connected to the built-in charging socket of the LD 450 and the 230V socket.



The LD 450 checks the charging status of the battery and starts the charging process automatically if necessary.

To protect the Li-ION accumulator of exhaustive discharge the device is switching off automatically if a cell voltage of 6,4V will be reached.

### 13 Scope of delivery

LD 450 is available either as a single unit or in a set. The set contains all the components and accessories that are protected in a rugged and shock-resistant transport case.



The following table lists the components with their order numbers.

Description	Order No.
<b>Set LD 450 consisting of:</b>	<b>0601 0204</b>
LD 450 leak detector with acoustic trumpet, and integrated camera, 100 leak tags for marking the leakages on site	0560 0204
Sound-proof headset	0554 0104
Focus tube with focus tip	0530 0104
Accustic trumpet	0530 0109
Battery charger(AC adapter plug)	0554 0009
Transportation case	0554 0106

## 14 Appendix

In the appendix on the following pages you will find the Declaration of Conformity for the electromagnetic compatibility and the Test Report of the Li-ion batteries used.

### 14.1 Report UN 38.1



#### Lithium cells or batteries test summary according to UN38.3

<b>Battery Manufacturer:</b> Jauch Quartz GmbH In der Lache 24 D-78056 Villingen-Schwenningen Germany +49 7720 945-0 <a href="http://www.jauch.com">www.jauch.com</a> - <a href="mailto:info@jauch.com">info@jauch.com</a>	<b>UN38.3 Test Lab:</b> Waitek Testing Group (Shenzhen) Co., Ltd. Liuxian 2 <sup>nd</sup> Road, Block 70, Bao'an District, Shenzhen, China Tel: +86-0755-33663308 <a href="http://www.waitek.com.cn">www.waitek.com.cn</a> <a href="mailto:sem@waitek.com.cn">sem@waitek.com.cn</a>																																				
<b>Description of cell or battery:</b> Cell/battery type: <input type="checkbox"/> Lithium metal <input checked="" type="checkbox"/> Lithium-Ion Cell or battery: <input type="checkbox"/> cell <input type="checkbox"/> single-cell-battery <input checked="" type="checkbox"/> battery Model name: LI18650JE 2s1p Physical Description: round cell battery stacked with wires and connector Part-no.: 249611 Voltage: 7.2V Capacity: 2550mAh Energy: 18.36Wh Lithium content: / Weight of cell/battery: Approx. 100g	<b>Test report-no.:</b> WTX21X06061626B  <b>Date of test report:</b> Aug. 06, 2021																																				
<b>List of tests (result: pass/fail):</b> <table border="1" data-bbox="312 1341 999 1572"> <thead> <tr> <th>Test number</th> <th>Test item</th> <th>Result</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>T-1</td> <td>Altitude</td> <td>pass</td> <td></td> </tr> <tr> <td>T-2</td> <td>Thermal cycling</td> <td>pass</td> <td></td> </tr> <tr> <td>T-3</td> <td>Vibration</td> <td>pass</td> <td></td> </tr> <tr> <td>T-4</td> <td>Shock</td> <td>pass</td> <td></td> </tr> <tr> <td>T-5</td> <td>External short circuit</td> <td>pass</td> <td></td> </tr> <tr> <td>T-6</td> <td>Impact /Crush</td> <td>pass</td> <td>for cell only</td> </tr> <tr> <td>T-7</td> <td>Overcharge</td> <td>pass</td> <td></td> </tr> <tr> <td>T-8</td> <td>Forced Discharge</td> <td>pass</td> <td>for cell only</td> </tr> </tbody> </table>	Test number	Test item	Result	Remarks	T-1	Altitude	pass		T-2	Thermal cycling	pass		T-3	Vibration	pass		T-4	Shock	pass		T-5	External short circuit	pass		T-6	Impact /Crush	pass	for cell only	T-7	Overcharge	pass		T-8	Forced Discharge	pass	for cell only	<b>For air transportation only:</b>  State of charge <input checked="" type="checkbox"/> max. 30% <input type="checkbox"/> not applicable
Test number	Test item	Result	Remarks																																		
T-1	Altitude	pass																																			
T-2	Thermal cycling	pass																																			
T-3	Vibration	pass																																			
T-4	Shock	pass																																			
T-5	External short circuit	pass																																			
T-6	Impact /Crush	pass	for cell only																																		
T-7	Overcharge	pass																																			
T-8	Forced Discharge	pass	for cell only																																		

Test results in accordance with the UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Test and Criteria ST/SG/AC.10/11 Rev.6, Amend. 1, 38.3. Cell manufacturing as well as battery assembly is done under the quality assurance program of ISO9001.

This document remains valid as long as no changes, modifications or additions are made to the model(s) described in this document. The model(s) has (have) been classified according to the applicable transport regulation and the UN Manual of Test and Criteria as of the date of the certification. The model(s) must be packed, labelled and documented according to country and other international regulations for transportation.

Name / Title of Signatory / Date    Sönke Zacher / Head of Project Management    Aug. 31, 2021

Headquarters: Jauch Quartz GmbH · In der Lache 24 · 78056 Villingen-Schwenningen · Germany  
 Registry court: Freiburg HRB 802574, Managing Director: Thomas Jauch

## 14.2 Report IEC62133-2

	<p>Ref. Certif. No.</p> <p><b>SG ITS-26038</b></p>
<p><b>IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME</b></p>	
<p><b>CB TEST CERTIFICATE</b></p>	
<p><b>Product</b></p> <p><b>Name and address of the applicant</b></p> <p><b>Name and address of the manufacturer</b></p> <p><b>Name and address of the factory</b> <i>Note: When more than one factory, please report on page 2</i></p> <p><b>Ratings and principal characteristics</b></p> <p><b>Trademark (if any)</b></p> <p><b>Customer's Testing Facility (CTF) Stage used</b></p> <p><b>Model / Type Ref.</b></p> <p><b>Additional information (if necessary may also be reported on page 2)</b></p> <p><b>A sample of the product was tested and found to be in conformity with</b></p> <p><b>As shown in the Test Report Ref. No. which forms part of this Certificate</b></p>	<p>Rechargeable Li-Ion Battery</p> <p>Jauch Quartz GmbH In der Lache 24, 78056 Villingen-Schwenningen, Germany</p> <p>Jauch Quartz GmbH In der Lache 24, 78056 Villingen-Schwenningen, Germany</p> <p>Jauch Quartz GmbH In der Lache 24, 78056 Villingen-Schwenningen, Germany <input checked="" type="checkbox"/> Additional Information on page 2</p> <p>7.2V, 2550mAh, 18.36Wh</p> <p> www.jauch.com</p> <p>-</p> <p>LI18650JE 2S1P</p> <p>-</p> <p>IEC 62133-2:2017</p> <p>210721010GZU-001</p>
<p>This CB Test Certificate is issued by the National Certification Body</p>	
<p>Intertek Testing Services (Singapore) Pte Ltd 5, Pereira Road, #06-01 Asiawide Industrial Building Singapore 368025</p> <p>Date: 30 August 2021</p>	<p></p> <p>Signature:  Ong Keng Chuan</p>

**14.3 CE Conformity****KONFORMITÄTSERKLÄRUNG**

## DECLARATION OF CONFORMITY

Wir CS Instruments GmbH & Co.KG  
 We Gewerbehof 14, 24955 Harrislee

Erklären in alleiniger Verantwortung, dass das Produkt

Declare under our sole responsibility that the product

**Leckage-Suchgerät LD 450**

Leak meter LD 450

den Anforderungen folgender Richtlinien entsprechen:

We hereby declare that above mentioned components comply with requirements of the following EU directives:

<b>Elektromagnetische Verträglichkeit</b> Electromagnetic compatibility	2014/30/EU 2014/30/EC
<b>RoHS</b> (Restriction of certain Hazardous Substances)	2011/65/EC & 2015/863/EU 2011/65/EC & 2015/863/EC

Angewandte harmonisierte Normen:

Harmonised standards applied:

<b>EMV-Anforderungen</b> EMC requirements	<b>EN 55011: 2016 +A1:2017</b> <b>EN 61326-1: 2013-07</b>
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Das Produkt ist mit dem abgebildeten Zeichen gekennzeichnet.  
 The product is labelled with the indicated mark.



Harrislee, den 18.02.2022

Wolfgang Blessing Geschäftsführer

Diese Erklärung beinhaltet keine Zusicherung von Eigenschaften.  
 Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

## SALES OFFICE NORD



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## SALES OFFICE SOUTH



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