Instruction manual

Parabolic mirror

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2 Safety instructions

About this document

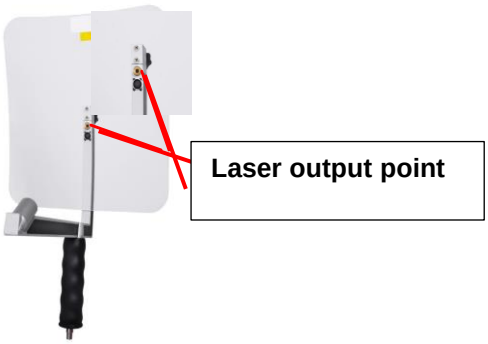
- Read this documentation carefully and familiarize yourself with the product before using it. Pay particular attention to the safety instructions and warnings to prevent injuries and product damage.
- Keep this documentation handy for reference when needed.
- Pass this documentation on to subsequent users of the product.

2.1 General safety instructions

- Only use the product properly and for its intended purpose and within the parameters specified in the technical data. Do not use force.
- Never measure with the device on or near live parts!
  During the inspection of electrical systems, please keep a sufficient safety distance to avoid dangerous electric shocks!
- Avoid any direct contact with hot -, rotating parts.
- Always switch on the device **before** putting on the headphones! If the signal levels are high (bar graph headphones in the red area), the volume can also be correspondingly high. Use the arrow keys to reduce the volume.
- Observe the specified storage and operating temperatures.
- Improper handling or use of force will void the warranty.
- Tampering with the device in any way, unless it is in accordance with the intended and described procedures, will void the warranty and exclude liability.
- The device is intended exclusively for the purpose described.

2.2 Handling class 2 laser

- Never point the integrated laser directly at people!
- Avoid direct irradiation of the eyes of humans and animals at all costs!
- If Class 2 laser radiation hits the eye, consciously close the eyes and immediately move the head out of the beam.
- Do not look into the direct or reflected beam.
- Laser output point of the parabolic mirrors:



3 Service and maintenance

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

4 Protect environment

- At the end of its service life, take the product to 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 the suitability for any particular purpose and assumes no liability for errors printed in these operating instructions. Nor for consequential damages in connection with the delivery, performance or use of this device.

5 Intended use

The LD 500 is a leak detector for fast and reliable leak detection in/on compressed air systems. The LD500 leak detector evaluates the ultrasonic waves generated by the leak as a function of distance and pressure.

It is designed and constructed exclusively for the intended use described here and may only be used accordingly.
A check whether the device is suitable for the selected application must be carried out by the user. The technical data listed in the data sheet are binding.

Improper handling or operation outside the technical specifications is not permitted. Claims of any kind due to improper use are excluded.

6 Technical data of the parabolic mirror

Dimensions	300 mm x 460 x 270 mm
Weight	737 Gr.
Working frequency	40kHz (+/- 2kHz)
Operating time	> 9 h (continuous operation)
Laser	Wavelength 645-660nm, output power < 1mW (laser class 2)
Connections	Connector - for use of the parabolic mirror with the LD 500 / LD 510 by means of the spiral cable
Application Area	Interior
Operating temperature	-5 °C to +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

7 Identification

7.1 Nameplate

Parabolic mirror without automatic tool detection→ see: 6.3 Importing the new attachment:

Parabolic mirror 2.0 has the Automatic detection and does NOT need to be taught.

Parabolic mirror 3.0 has the Automatic detection and does NOT need to be taught. In addition, this has a laser distance measurement.

7.2 Laser warning label

7.3 Label positioning parabolic mirror

8 Use of the parabolic mirror

The parabolic mirror focuses horizontally incident ultrasound at its focal point, where the ultrasonic transducer is located. On the one hand, this leads to a considerable amplification of the measured ultrasound (high range) and, on the other hand, to a very precise directivity, since non-horizontally incident ultrasound is reflected from the mirror.

The combination of these two characteristics allows the parabolic mirror to precisely locate leaks at long distances.

Quantification distance→ 3 - 12 m

Use parabolic mirrors:

- High distance to the line/component 3 - 12 m
- Noise
- Leakage not freely accessible

8.1 Mechanical connection to the LD 5X0 via the spiral cable

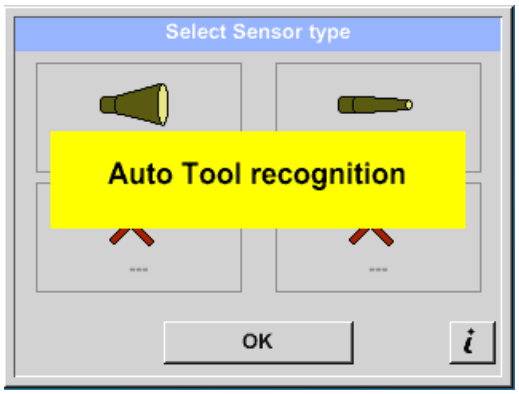
Before the parabolic mirror can be connected by means of the spiral cable, the funnel must be removed.

Please make sure that the mirror is mounted by means of the screw according to the curve of the base body, so that the holes in the mirror sit above the camera and the laser.

The parabolic mirror is removed by disconnecting the connection cable. To do this, press the release button on both sides and pull off the cable.

8.2 Auto Tool Recognition

If a parabolic mirror V2 or a parabolic mirror V3.0 with laser distance measurement is connected to an intelligent LD 500 / LD 510, it is automatically detected.



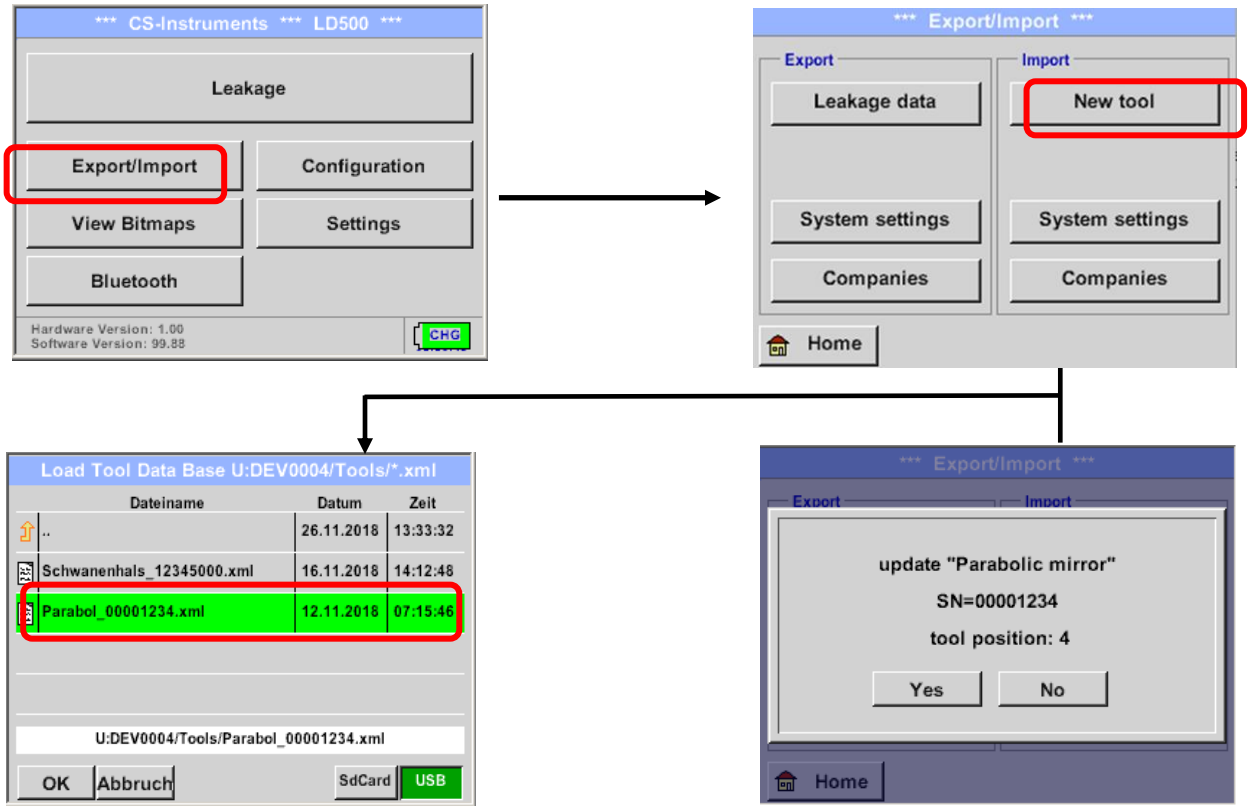
8.3 Import of the new Tool

If you use a parabolic mirror V1.0 or the parabolic mirror was reordered and the LD 500 has an "intelligence" - the application data for the parabolic mirror must first be loaded into the LD500.

The XML file for the tool import is delivered via USB stick and is stored in the directory \DEV0004/Tools/ as XML file.

The tools are integrated via the "Import new Tool" menu.

- Home→ Export/Import→ "Import new Tool".
- Selection of the "USB" storage location
- Depending on the tool, one of the following files must be selected
  - ➔ Parabol_xxxxxx.xml
  - ➔ Gooseneck_xxxxxx.xml
- Confirm with "OK" and then with "Yes".



Import:
Home→ Export/Import → Import new Tool → Parabolic mirror/gooseneck serial number

8.4 Automatic distance measurement

The new parabolic mirror is equipped with an integrated distance measurement module. To use the functionalities, the following requirements must be met:

- The main board must be "intelligent" to allow communication between the main body of the LD 500 and the tool.
- The firmware of the LD 500 must be at least V3.02.

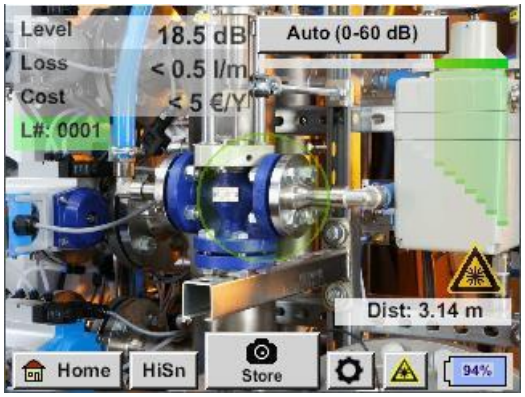
If these requirements are met, the LD 500 automatically detects that a tool with automatic distance measurement is connected.

Description - Functionality

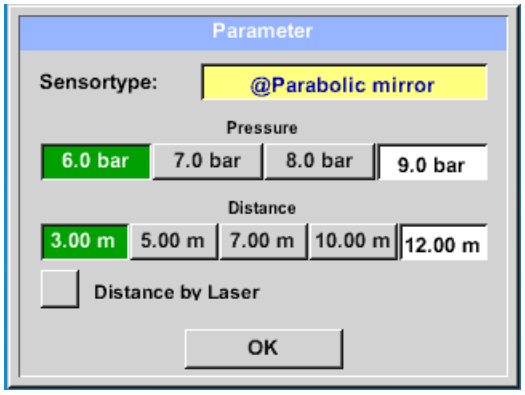
- To activate the distance measurement, the laser must be started, as with all other tools.
- The LD 500 then shows the measured distance on the display.

8.5 Description - Functionality

- The laser must be started as with all other tools to activate the distance measurement.
- The LD 500 then shows the measured distance on the display. In this case, it is 3.14 meters or 124".



To use the measured distance for cost quantification, "Distance by laser" must be activated under "Parameters".



Note: Before "Distance by laser" can be activated, the laser must be switched on. Otherwise, the symbol flashes yellow and red.

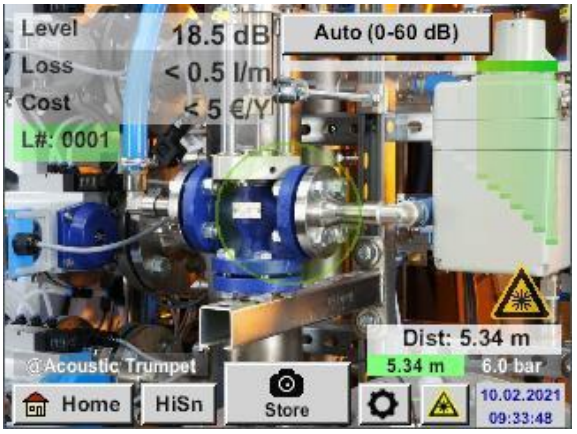
Note: For the parabolic mirror, the valid distance range is 3 - 12 meters or 118.11" - 472.441".

The LD 500 now automatically updates the distance. The current measured distance is displayed in the gray bar "Dist:". The distance used for costing is displayed in the small bar at the bottom left of the print.

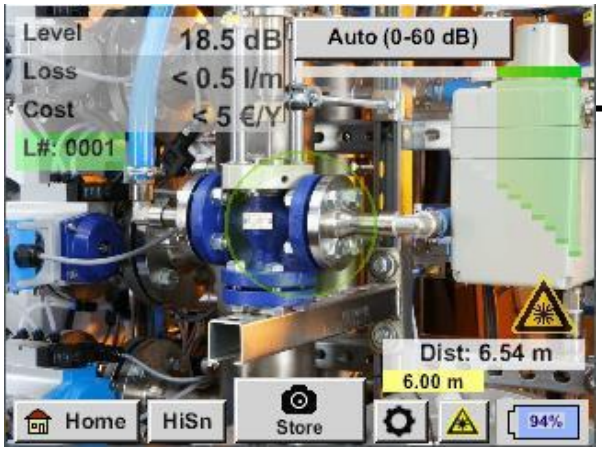
State	**Current distance measurement**	**Used distance Parameter internal:**	**Probability that the distance is measured correctly**
Best case	White	Green	High
Assess plausibility of the measurement	Yellow	Yellow	Medium
Move to the valid distance range	White	Yellow	High, but distance outside the valid range
Aim at another surface near the leak until "Best case" occurs and the measurement is robust	Red	Empty	Low:

Attention: On black surfaces or in very bright environments, measuring the distance can be problematic. Therefore, it is still possible to enter distances manually. "Distance by laser" must be deactivated, then manual distances can be entered.

States :



"Dist:" is green, the distance module measurement is robust, and the distance used is in the valid range.



Out of range:
Distance measurement = robust, but out of range!

➔ Please move within the valid distance range!

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