Instruction manual

Leakage detector with camera

1 Table of Content

2 Foreword

Dear Customer,

thank you for purchasing our leak meter with camera.
The new leak meter with integrated camera and leakage calculation are ideal measuring instruments which help to find and document even smallest leakages (0.1 l/min corresponds to approx. 1 € p. a.) easily even in far distances.

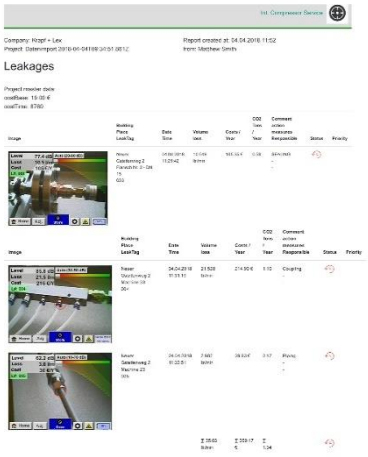
It is the worldwide first leak meter with an additional freely assignable sensor input. In addition to the leakage measurement and detection also all necessary measurements concerning dew point, flow, pressure, and temperature ... can be carried out.

Main functions:

- **Tracking and location of leaks**
  - compressed air, gas, steam and vacuum systems
  - condensate drain
  - seals
  - refrigeration systems

- **Documentation / storage of leaks with**
  - Image of the leak position
  - Date / Time
  - Description of the leakage position with indication of company / department or hall / machine
  - Size of the leak in litres / min (units adjustable)
  - Leakage costs per year in € (currency freely definable)

Remark: By means of the additional software
detailed reports with summary totals, subtotals (departments / warehouses etc.)
as well as history reports (for temporal / continuous improvements) could be created.



3 Safety instructions

3.1 About this document

- Read carefully this documentation and familiarize yourself with the product before putting it to use. Pay particular attention to the safety warnings to prevent injury and product damage.
- Keep this documentation to hand for easy reference when needed.
- Pass on this documentation to any subsequent users of the product.

3.2 Ensuring safety

- Only use the product as intended and within the parameters specified in the technical data. Do not use force for operating. Never measure with the device at or near live/energized parts!
  During leak detection on electrical systems, please maintain a sufficient safety distance to avoid dangerous electric shocks!
- Avoid any direct contact with hot and/or rotating parts.
- 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.
- Never point the laser directly into the eyes! Absolutely avoid a direct irradiation of the eyes of humans and animals!
  Laser module: corresponds to DIN EN 60825-1: 2015-07 Class 2 (<1mW)
- Observe the prescribed storage and operating temperatures.
- Improper handling or violence will void the warranty.
- Any kind of interventions on the device, as far as they do not correspond to the intended and described procedures, lead to the warranty expiration and to the disclaimer.
- The device is intended solely for the described purpose.

3.3 Environmental protection

- Disposal of faulty rechargeable batteries / empty batteries in accordance with applicable legal regulations
- Lead back the product after the end of the period of use to the separate collection for electric and electronic devices (observe local regulations) or return the product to ipf electronic gmbh for disposal.

ipf electronic gmbh 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.

4 General function description

When gases escape from leaks in piping systems (leaking screw connections, corrosion, etc.), noises are generated in the ultrasonic range. With the leakage detector even the smallest leaks, which are inaudible to the human ear and not visible due to their size, can be located several meters away.

The inaudible ultrasound is converted to audible frequencies in addition to the display emission level shown in the display. With the convenient, sound-proof headphones, these sounds can be heard even in noisy environments.

In addition, the new device calculates the costs associated with leaks, providing additional transparency about the state of the system under test or the potential cost savings.
The loss is displayed in l / min as well as in a freely selectable currency. The cost per litre or per cubic meter of compressed air can be stored in the device.

The professional measuring instrument finds typical application in leak detection in compressed air systems and leak testing of pressure less systems.

With the help of an integrated laser pointer, which serves as a targeting, the leak can be pinpointed.

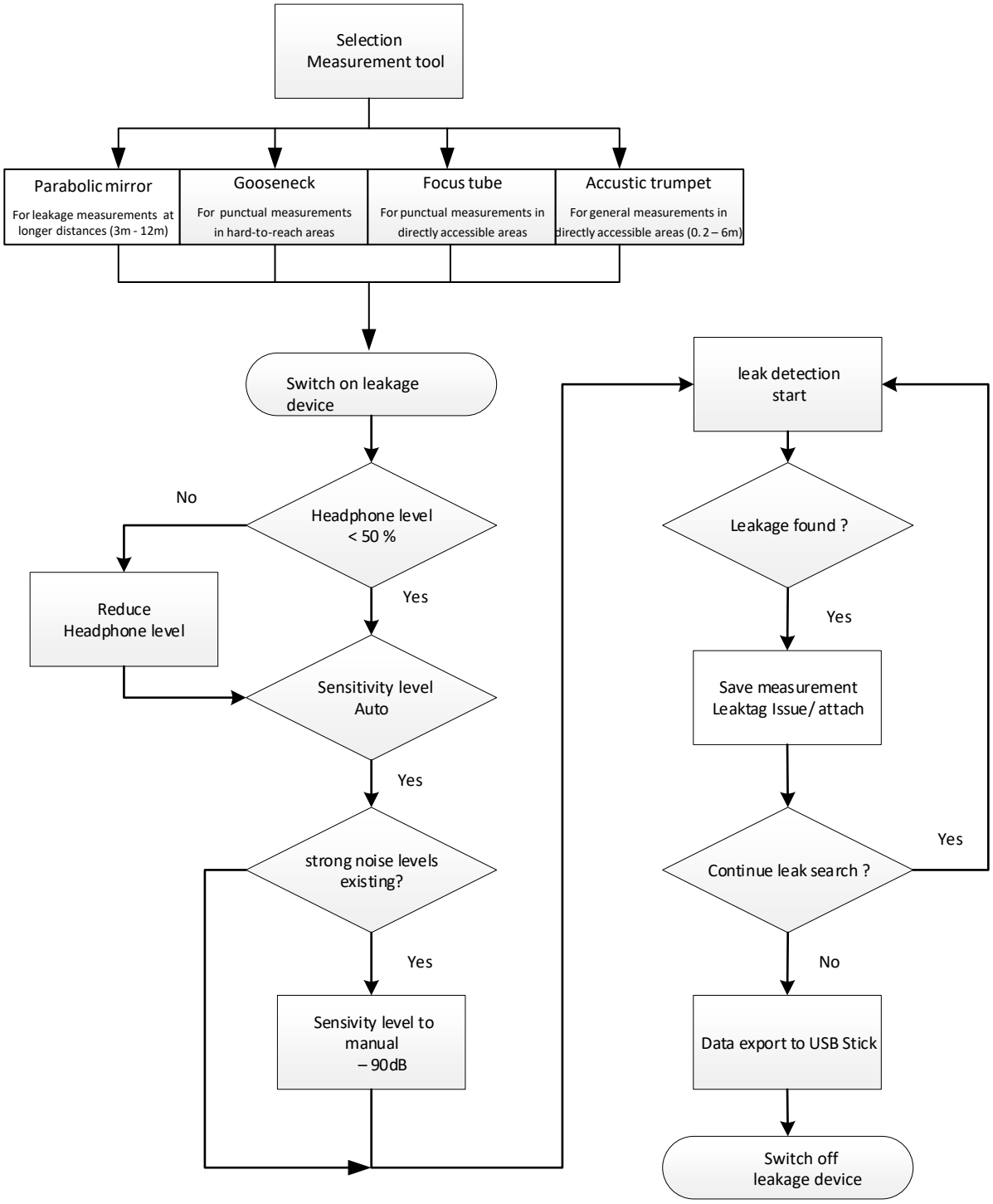
Depending on the leakage, the appropriate accessories may be used to increase the sensitivity of the device to use, available accessories are:

- Acoustic trumpet — For general measurements (0.2 - 6m) in directly accessible areas
- Focus tube with focus tip — For punctual measurements in directly accessible areas
- Gooseneck — For punctual measurements in hard-to-reach areas
- Parabolic mirror — For leakage measurements (3m - 12m) at longer distances

5 Technical data

Dimensions	263 x 96 x 280 mm (incl. PreAmp module and acoustic trumpet)
Weight	0.55 kg incl. PreAmp module and acoustic trumpet , complete set with transportation case ca.3.5 kg
Frequency range	40kHz (+/- 2kHz)
Power supply	Internal 7.4 V lithium-ion battery
Operating time	> 9 h (continuous operation)
Operating temperature	-5°C to +40°C
Charging	Ext. battery charger (included in the scope of delivery)
Charging time	approx. 1.5 h
Storage temperature	-20°C to +50°C
Laser	Wavelength 645-660nm, output < 1mW (Laser class 2)
Connections	3.5mm jack for headphones, power jack for connecting an external charger USB Connection
Display	3.5“-Touchpanel TFT transmissiv
Interface	USB for data export / -import, SW update etc.
Datalogger	4 GB-Memory card (Micro SD Class 4)
Sensitivity	min: 0.1l/min at 6bar / 5m Distance

6 Procedure leak detection / measurement



7 Device components and controls

7.1 Basic device UY000001

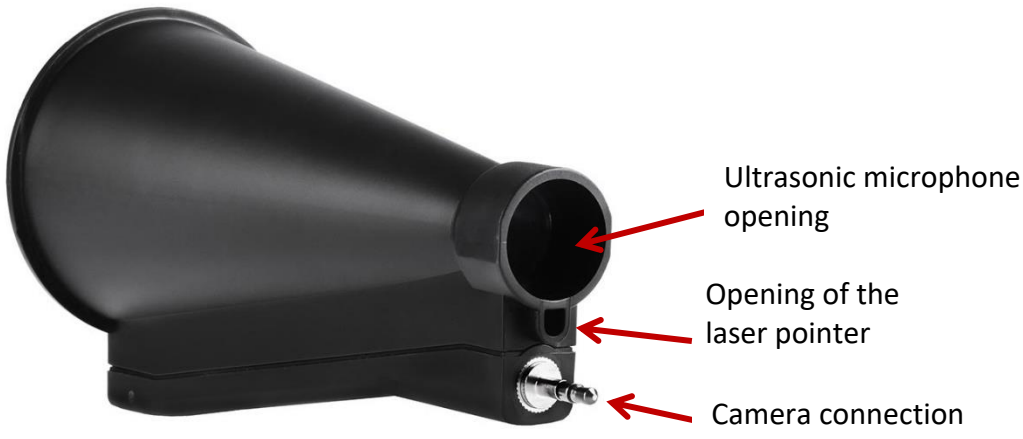
Picture 1

Picture 2

7.2 Pre Amplifier module

Picture 3

7.3 Acoustic trumpet with camera



Picture 4

7.4 Focus tube AU000021

Picture 5

7.5 Gooseneck (Optional)

VY000020: Length 600mm
VY000021: Length 1500mm

Picture 6

7.6 Parabolic mirror (Optional)

Picture 7

7.7 Assembly with acoustic trumpet

The acoustic trumpet allows acoustic amplification by bundling the sound waves and specifies the location of the leak. Due to the special construction of the integrated laser pointer is still usable. The camera is integrated on the bottom of the acoustic trumpet and is electrically connected to the preamplifier module via the jack plug.
Assembling is done by plugging the individual components until easy locking audible (plug in to the stop).
The components are removed in the reverse order; for unlocking the preamplifier module, the release button must also be pressed.

Picture 8

7.8 Assembly with focus tube with focus tip

The focus tube with focus tip is used to detect very small leaks, to accurately locate them.
Just like the acoustic trumpet, the tube can be plugged into the preamplifier with ultrasonic receiver.
The use of the camera is **no longer** possible.

The components are removed in the reverse order; for unlocking the preamplifier module, the release button must also be pressed.

Picture 9

7.9 Assembly with Gosseneck

Due to its flexibility, the gooseneck tool is used for punctual measurements in hard-to-reach areas. Connection to the leakage device is possible via the supplied spiral cable, see Figure 10.

It is **no longe**r possible to use the camera.

To remove the component, remove the connection cable by pressing the release button on both sides and pulling off the cable.

Picture 10

7.10 Assembly with Parabolic mirror

The parabolic mirror is used for measurements at greater distances as well as for high requirements regarding selectivity and location of leakage positions.
Connection to the leakage detector is via the supplied spiral cable, see Figure 11.

To remove the component, remove the connection cable by pressing the release button on both sides and pulling off the cable.

Picture 11

Note: To use the parabolic mirror and gooseneck, these components must be activated in the leakage detector during initial commissioning in order to save the component-specific adjustment parameters. If this has not already been done ex-works, the data for this is supplied via USB stick. For the activation (parameter import), see chapter "Export / Import".

8 Commissioning / Application

⚠	Please first observe the safety instructions in section 3

8.1 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

8.2 Headphone Volume Loud / Volume Down

The volume keys increase or decrease the volume in the headphone in 16 levels.
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.**

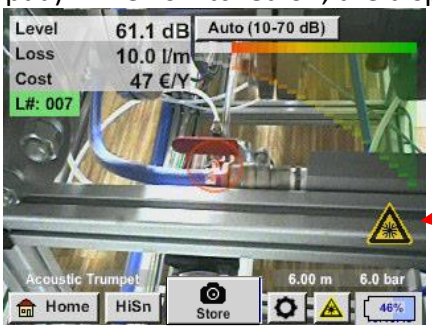
8.3 Sensitivity level

When starting a leak detection or after switching on the sensitivity level "Auto" should be selected. In the case of strong noise levels from the environment it can be switched to a manually adjustable gain level, see „Setting of Sensitivity level“.

Automatic sensitivity level at measurement start: 10 – 70dB

8.4 Laser On/Off

The laser pointer can only be switched on or off via the laser on / off button in the display (not via the membrane keypad). When switched on, the display shows a laser warning symbol.



Laser „On“ Icon

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

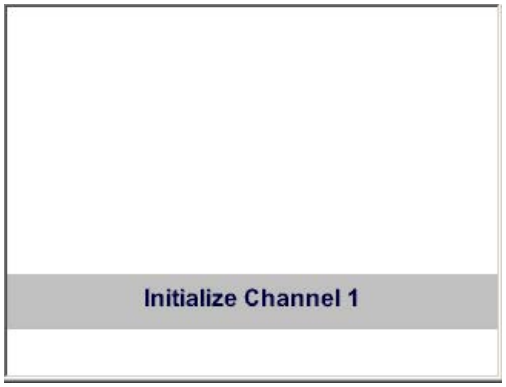
9 Operation

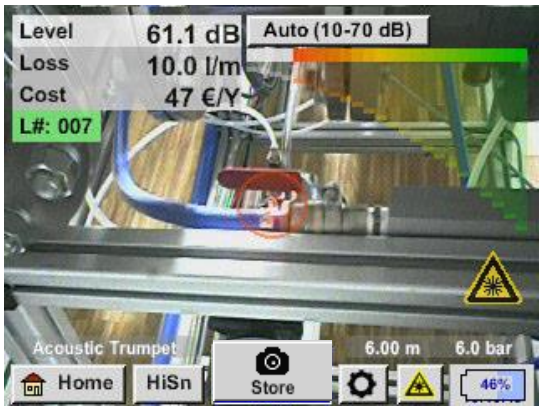
The operation is largely self-explanatory and menu-driven via the touch panel.
The selection of the respective menu items occur via short "tapping" with the finger or a soft round pen.

<u>Attention</u>: Please use no pens or other objects with sharp edges!
The foil can be damaged!

Inputs or changes can be made with all white deposit fields

9.1 Initialization

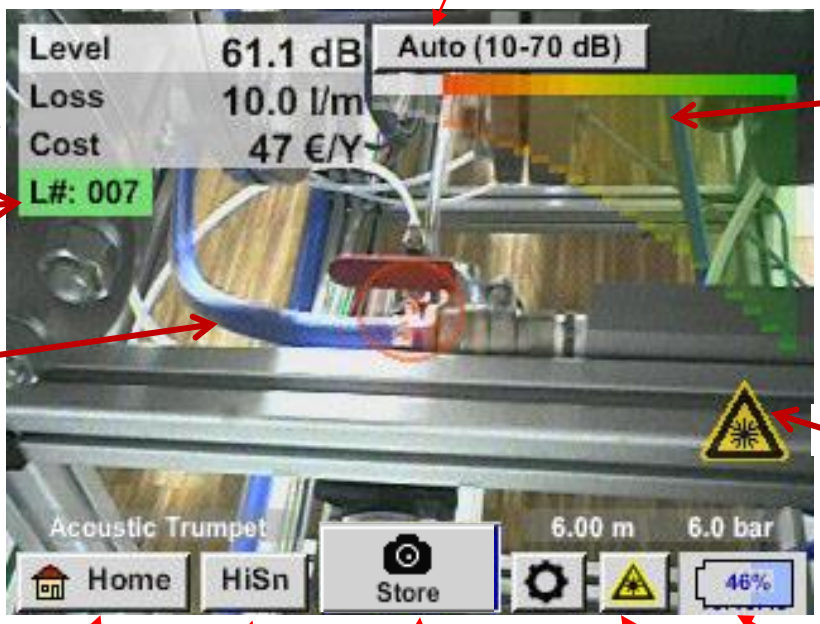




After switching on the leakage device, the initialization takes place and then switch to leakage display

9.2 Screen Leckage

The following picture shows and describes the display elements.



Sensivity level button

Displayed values for:

- Signal-Level in dB
- Leakage size
- Leakage costs per year

Bar graph of Signal level

LeakTag number

Actual camera image

Laser „On“ Icon

Home Menu button

Mode switch button Auto or manual (HiSn)

Store button for Measurement

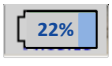
Setting button

Laser „On/Off“ button

Date/ Time and battery condition indicator

Date / Time:

Battery condtion indicator

Battery condition: 

Power supply connected and battery is charging: 

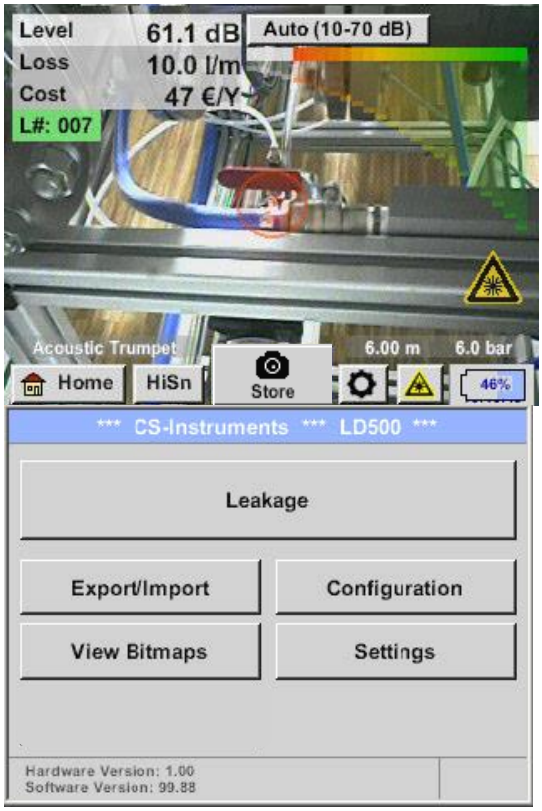
9.3 Home menu

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.

<u>Attention</u>: 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 "Home" button. The following figure shows the Home "Menu".

Home 

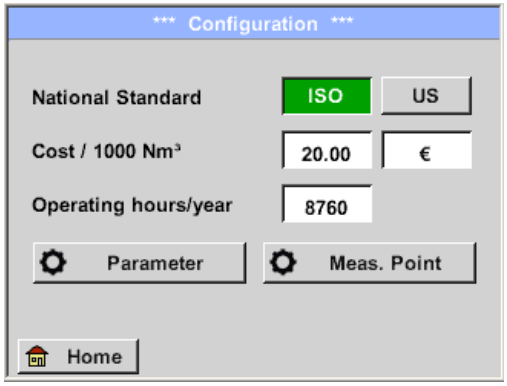


With the button ***„Home“*** you access the basic menu.

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

9.3.1 Configuration

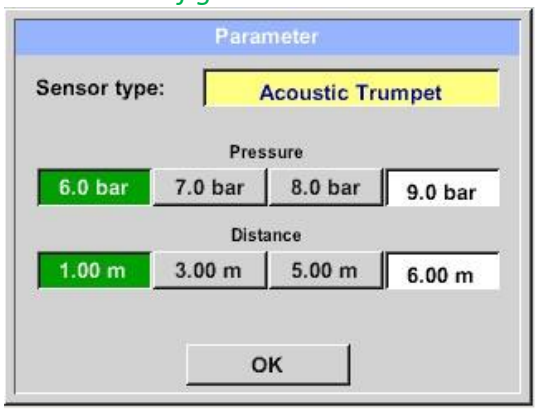
Home ➔ Configuration

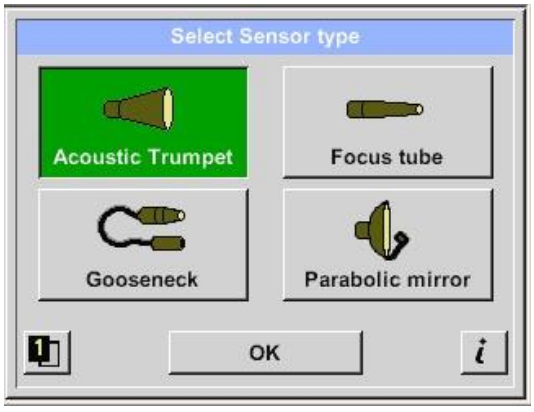


In the configuration settings the the unit system can be selected and the required parameters entered, this to calculate the leakage costs per year.

- ➔ Selection of ISO or US unit system
- ➔ Enter cost per 1000 volume units & Enter currency
  Default: 2 € / 1 m³
- ➔ Enter working hours per year

Home ➔ Configuration ➔ Parameter





➔ Sensor type

Selection of the sensor type according to the application and ambient conditions, see therefor chapter 6.

➔ Pressure (line pressure in bar)

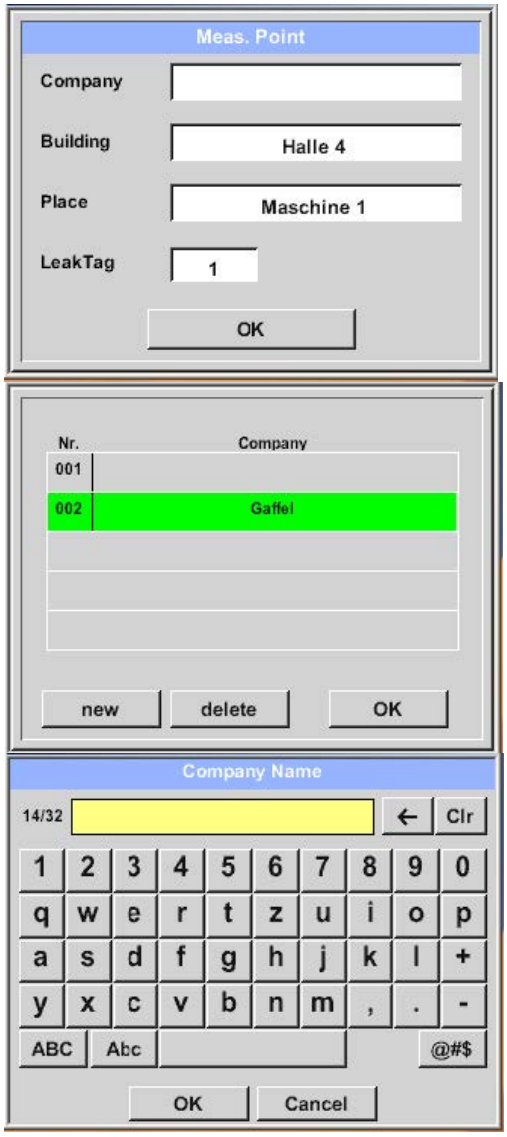
➔ Distance (distance to leakage in m)

Depending on the selected sensor type, there are up to 4 pre-defined pressure and distance values that can be selected directly as well as two fields (white) in which values for the pressure and the distance are freely selected..

The **pressure** can be set variably between 1 - 10 bar.

For the **different sensor types** different **minimum and maximum distances** from the leakage detector to the leakage are defined to calculate valid leakage loss and costs per year. These distances must be strictly adhered to.

Home ➔ Configuration ➔ Meas.Point



The measuring point is stored for each leakage in its journal data. These can be seen later in the leakage report in the software.

➔ LeakTag: will be automatically increased by one after storing a measurement.

All information about the measuring point can be changed by selecting the corresponding text field or the stored measuring points can be loaded from the internal database.

Then a menu opens with the available / saved entries. When selecting a saved value, select it (highlighted in green) and then take over with ***„OK“***.

If a new entry is necessary, the input menu opens after pressing the ***„new“*** button.

Input is accepted via ***„OK“***.

This procedure is analogous to enter the information for company, building and location.

Using the ***„delete“*** button, individual entries can be deleted too.

9.3.1.1 Sensortype selection (Measuring tool)

In order to simplify the leak detection for the user, various tools for different measuring conditions have been developed .
The distances mentioned for quantifying the leakage always refer to the front of the respective tool.

If the parabolic mirror / gooseneck has been ordered separatley, the application data for the devices must be loaded into the leakage detector first. Data is supplied via USB stick.
Import:
Home →Export/Import → Import new Tool → Parabolic Mirror / Gooseneck Serial Number

Overview and application description of the different sensor types

Acoustic trumpet (standard tool)

The acoustic trumpet incident ultrasonic waves and thus increases the range of the device. This behavior makes it ideal for medium distances.
The leakage can be heard from large distances, but for precise detection the user must approach the leakage and constantly follow the "loudest" point..

Quantification distance → 1 - 6 m

Use of acoustic trumpet:

- average distance to pipe/component 0.2 - 6 m
- low noise levels
- leakage freely accessible
- use at distances of up to 6 metres, if no parabolic mirror is available

Focus tube

The focus tube allows only very few ultrasonic waves to pass in the direction of the ultrasonic transducer, allowing leakages to be located very precisely.
Due to the constriction, use is recommended only for small distances.

Quantification distance: 0… 0.2 m

Use of focus tube:

- Short distance to pipe/ component 0.05 m
- Pipe / component freely accessible
- the pipes and components to be checked are very close to each other
- use when no gooseneck available

Gooseneck

The gooseneck should be used when the pipes and components to be inspected are very close. In addition, the shape of the gooseneck can be flexibly adapted to inspect hard-to-reach pipes and components.
The sensitivity of the gooseneck has been reduced to " suppress " noise. This makes it ideal for targeted, local testing of compressed air components at high noise levels.

Quantification distance → 0 … 0.05 m

Use of gooseneck:

- small distance to line / component 0.05
- leakage not freely accessible
- ultrasound interference noise

Parabolic mirror

The parabolic mirror bundles horizontally incident ultrasound in its focal point. On the one hand, this leads to a considerable amplification of the measured ultrasound and, on the other hand, to a very precise directional behavior, since ultrasound that does not incident horizontally is reflected away from the reflector.
The combination of these two characteristics enables the parabolic reflector to precisely locate leaks at large distances.

Quantification distance → 3 – 12 m

Use of parabolic mirror:

- long distance to pipe/component 3 - 12 m
- interfering noises
- leakage not freely accessible
- near leaks (superimposition)

9.3.2 Sensitivity levels

The ultrasonic levels can be understood as a " loudness " of the leakage.
With the "Sensitivity level button" the sensitivity of the UY000001 can be adjusted to the environment, which strongly influences the acoustic behavior of the device and increases or decreases the valid value range.

Sensitivity levels

0 - 60 dB	Highest sensitivity level of the device (use with small leaks and without noise), selection by "HiSn Button" or "Sensitivity level button".
10- 70 dB	Leakage small
20 – 80 dB	Leakage medium
30 – 90 dB	Leaks large
40 – 100 dB	Most insensitive stage (very large leaks, many noises - heavy-duty application)

By default, the UY000001 is set to the Auto level and will automatically change levels (10-70 dB to 40-100 dB) depending on the leakage size (ultrasonic level).
The highest sensitivity level 0-60 dB of the unit can be set using the "HiSn" button or the "Sensitivity setting button" and is not part of the Auto function. This mode should be used if the smallest leaks are to be found in a quiet environment.

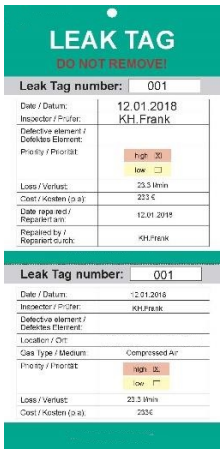
9.3.3 Storing of the measurement

To store the measurements please press either the button **„Store“** on the foil keypad, see chapter Device components and controls , or by button **„Store“** 

in the display.

All data are stored on to the internal SD card.
The measurement data, the measurement point and the image of the measurement point are saved as a journal, which can be exported later and a report can be created.

After pressing one of the two **„Store“** keys, the corresponding information for the measuring point must be completed. The measuring point information of the last stored storage (company, building and location) is displayed, the numbering of the leaking tag is increased by 1.
e.g .:



If necessary, fill out the Leak Tag-form and attach it to the measuring location.

Please use correct Leak Tag-number.

9.3.3.1 Parameter / Meas. Point (Re-Check)

Store ➔ Parameter
Store ➔ Meas. Point

At this point, it is again possible to check and correct the parameters „Pressure" and „Distance" and the measuring point.

Changing the parameters gives new values for leakage and cost.
Execution of the corrections see description chapter "configuration".

9.3.3.2 Comment

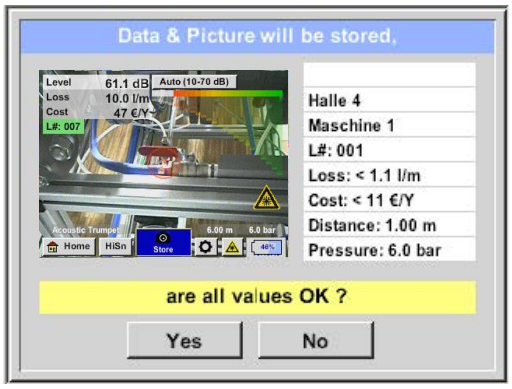
Store ➔ Textfield Comment

In addition to the details of the measuring point with company, building and location, it is possible to enter a comment (up to 32 characters).

To do this, select the text field ***„Comment“*** and enter the comment.

9.3.3.3 Storing measurement data to internal SD-card

Store ➔ store



Before final storage of the measurement on the internal SD card, a summary is created and the correctness is queried once more for safety.

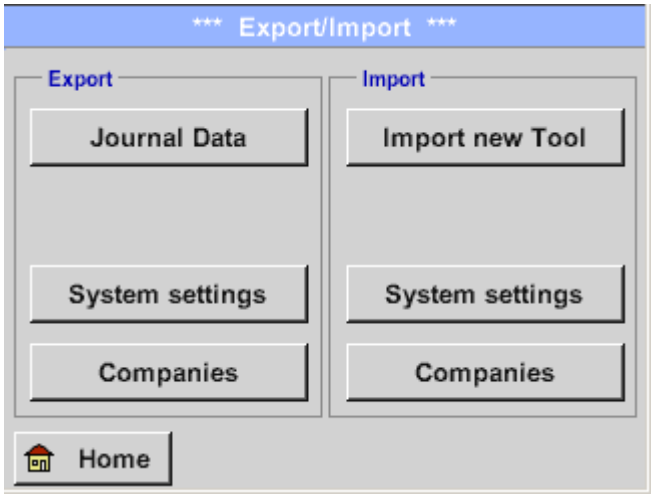
Storage is done with the ***„Yes“*** key.

The ***„No“*** key returns to the previous menu.

9.4 Export/Import

With *Export / Import*,

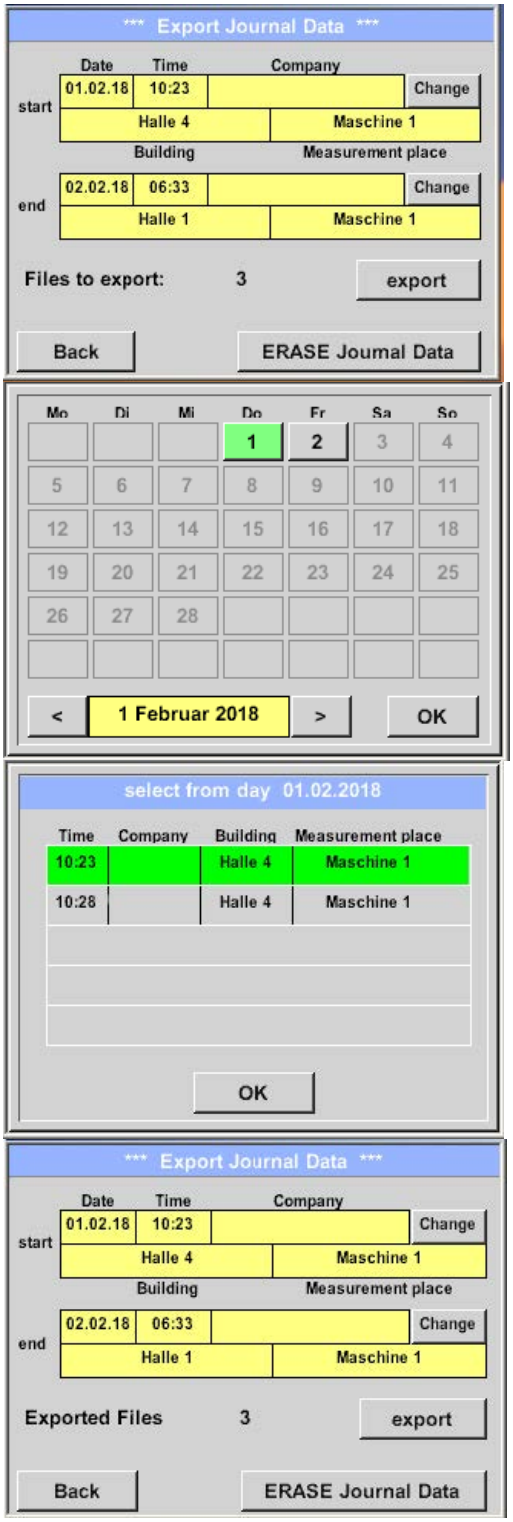
- recorded "journal data" can be transferred to a USB stick
- system settings can be exported as well as imported
- measuring points (company, building and location data) can be exported as well as imported.
- Non-activated optional measurement tools can be activated/loaded.



9.4.1 Export

9.4.1.1 Export „Journal Data“

Export / Import → Export → Journal Data



With the help of the ***„Change*** -button you can set a period between ***„Start“*** and ***„End“***.

Stored measurement data that lies within this period will be exported.

The selected date is always highlighted in green and the dates of the Sundays are - as in the calendar - red.

For days on which measurement data was recorded, the date numbers are visually exalted.

If several measurements have been recorded on a date, they will appear after the date selection.
Now you can easily select the desired recording.
With ***„OK“***. the start or end time is taken over.

Press the ***„Export“***- button to transfer the selected data to the USB stick
In the example given, 3 measurements are exported.

With ***„ERASE Journal Data“*** the Journal Database is deleted.
For verification is still a security question.

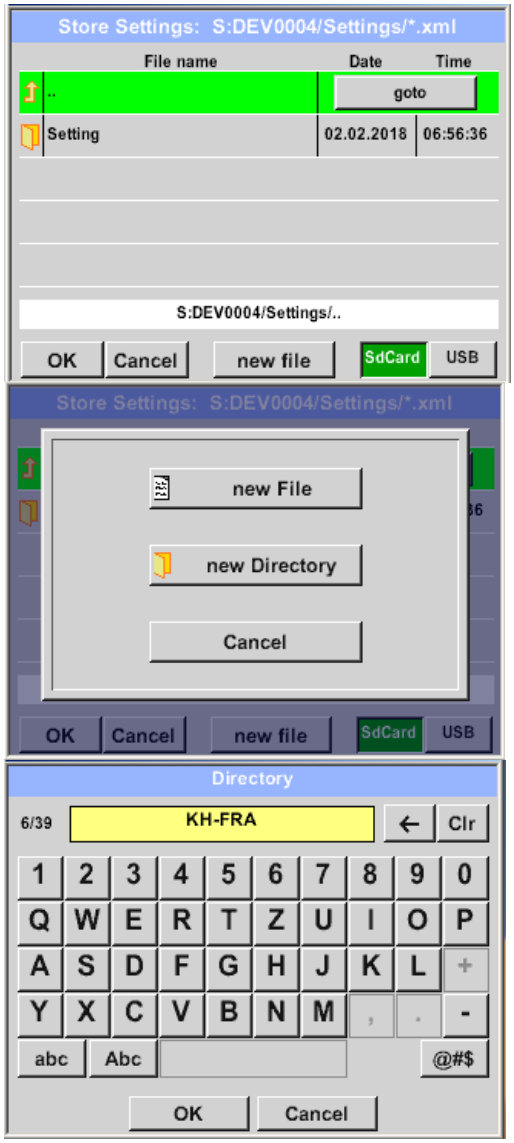
With ***„Back“*** you return to the main menu.

Attention: With ***„ERASE Journal Data“*** all journal data are deleted.

9.4.1.2 Export of System settings

This feature is especially relevant to the bigger version, here for storing the external sensor settings as well as e.g. display option for charts, sensor value etc.

Export / Import →Export →System settings



Here the definition of the storage location takes place.
Selection for internal SD card with activation of key ***„SdCard“*** or on USB stick with key ***„USB“***.
The selection of the desired folder is made by selecting and activating with ***„goto“*** button.

If a new directory is required, this is done by pressing ***„new File“***, this can be created by selecting ***„ new Directory“***

Saving a system file with a new name takes place analogously, then the key ***„new File“*** must be pressed

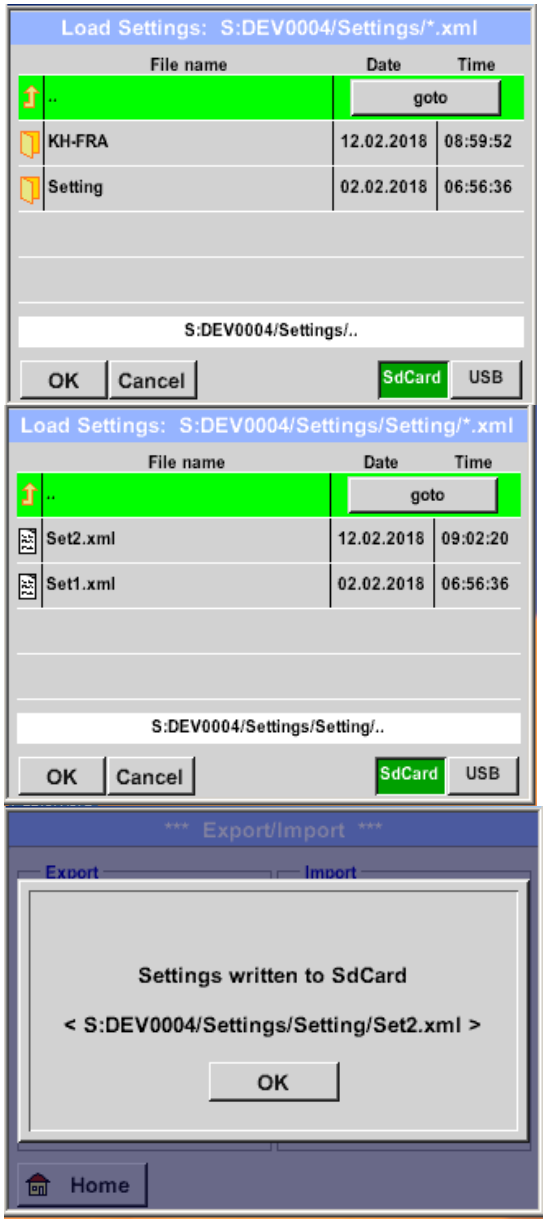
Entries are to be confirmed with ***„OK“.***

With ***„Cancel“*** you return to the previous menu.

9.4.2 Import

9.4.2.1 Import of system settings

Export / Import → Import → System settings



Sequence of directory and file selection is analogous to file export.
Selection of internal SD card with activation of key ***„SdCard“*** or on USB stick with key ***„USB“***.

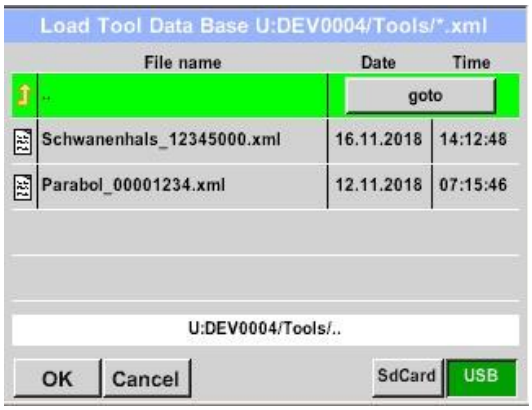
The selection of the desired folder is made by selecting and activating with the ***„goto“*** button, then select corresponding system file.

Selection to be confirmed with ***„OK“.***

Since system-relevant changes are made here, a confirmation prompt is issued, which must be confirmed with ***„OK“***.

9.4.2.2 Import new measurement tool

Export / Import → Import → Import new Tool



The directory and file selection process is the same as for export e.g. system settings Selection of internal SD card with activation of button ***"SdCard"*** or of USB stick withbutton ***"USB".***

Select the desired folder by pressing the ***"goto"*** key and then the corresponding system file.

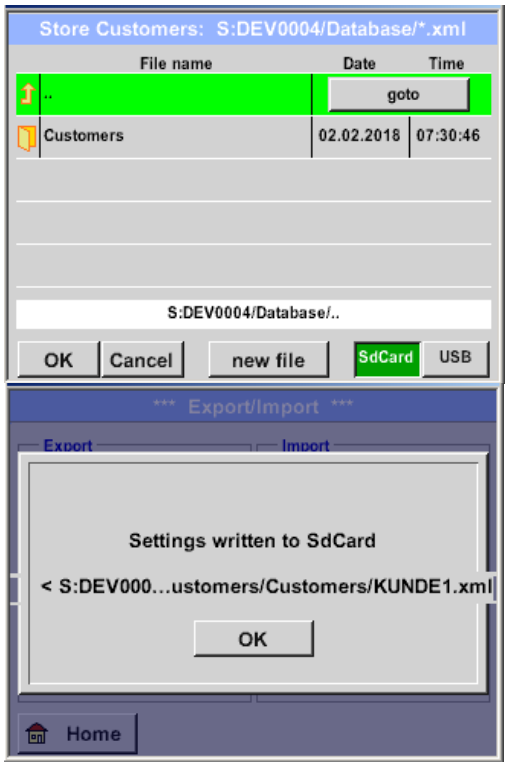
Confirm your entries witht ***„OK“***.

Since system relevant changes are made here, a security query is made which must be confirmed with ***"Yes".***

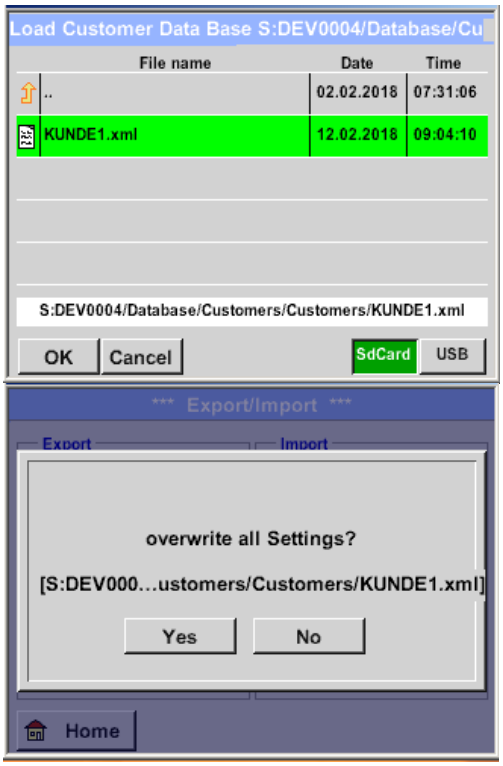
9.4.3 Export / Import Customer database

These functions allow the stored measuring point descriptions (companies, buildings and location) to be exported as an XML file or to be imported from another leakage device exported database.
That means it is also possible to create and import the database externally, but the prerequisite is the correct format of the XML file.

Export / Import → Export → Customers



Export / Import → Import → Customers

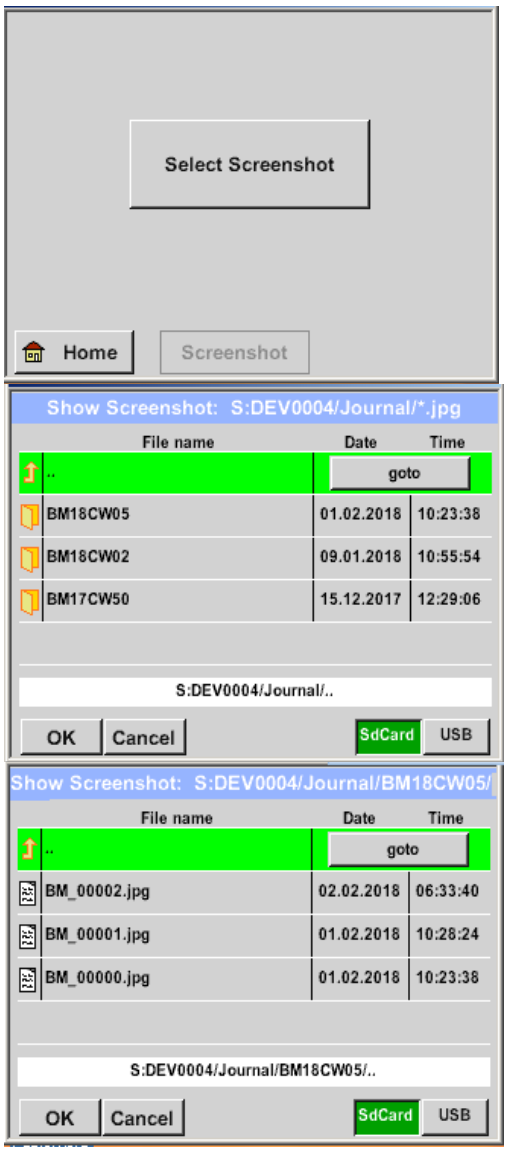


As data changes are made during importing, a confirmation question needs to be confirmed with "***„Yes“***.

Remark: Customer data will be exported to folder \\DEV0004/Database .
Data to be imported (XML files) must be stored in the directory \\DEV0004/Database as well.

9.5 View bitmaps

View Bitmaps → Select Screenshoot



This allows the stored pictures (measurement pictures) on the SD-Card or USB Stick to load and shown in the display again.

Please press button „Select Screenshot“ and select the required picture (bitmap).

The pictures are stored and organized in different directories

The directory structure is year / calendar week

Designation: BMyyCWxx
yy = Year xx = calendar week

The selection of the desired folder is made by selecting and activating with the ***„goto“*** button.

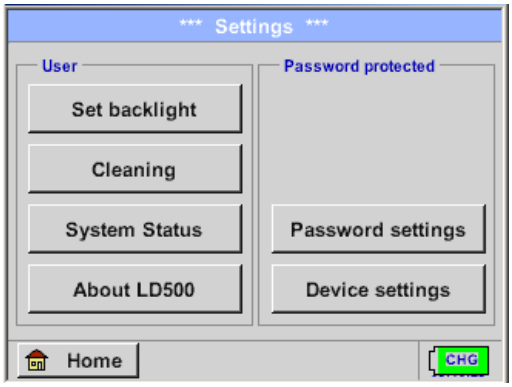
Select the desired image and then display with ***„OK“***.

9.6 Device Settings

The settings are all protected by a password!

Settings or changes are generally confirmed with OK!

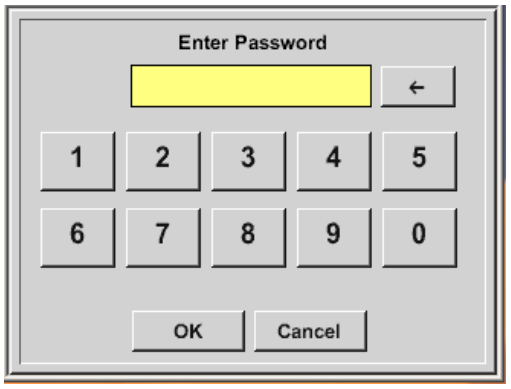
Remark:
If you go back to main menu and then again one of the setting menus is called, you must enter the password again.



Overview of the *Settings*

9.6.1 Passwort-Einstellung

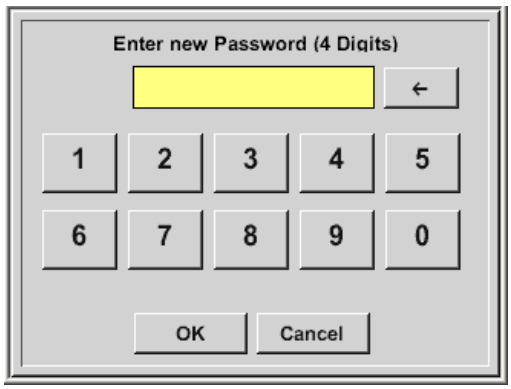
Settings ➔ Passwort Settings



Factory settings for password at the time of delivery: 0000 (4 times zero).

If required, the password can be changed in the *Password settings*.

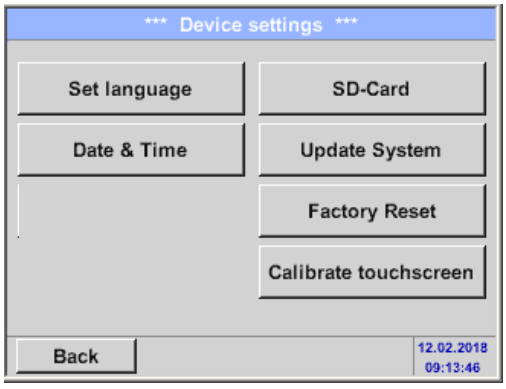
The new password must be entered two times in a row and in each case confirmed with *OK*



If an incorrect password is entered there appears *Enter password* or *New password repeat* in red font.
If you can't remember the password, please use Master password in order to enter a new password.
Remark:
The master password is supplied together with the instrument's documentation.

9.6.2 Device Settings

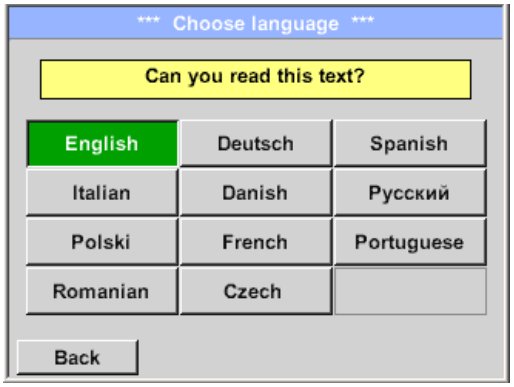
Settings ➔ Device settings



Overview of *Device settings*

9.6.2.1 Language

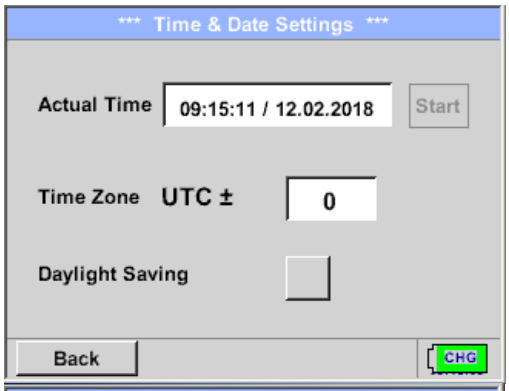
Settings ➔ Device settings ➔ Set language



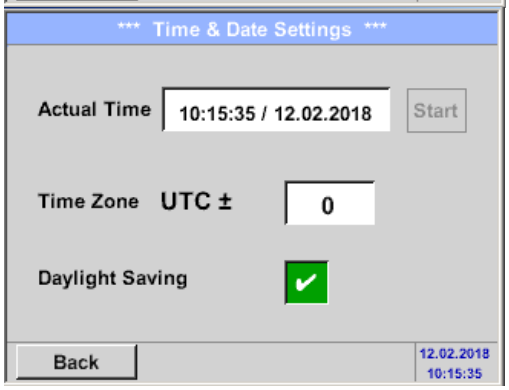
Here you can select one of 11 languages for the leakage device.

9.6.2.2 Date & Time

Settings ➔ Device settings ➔ Date & Time



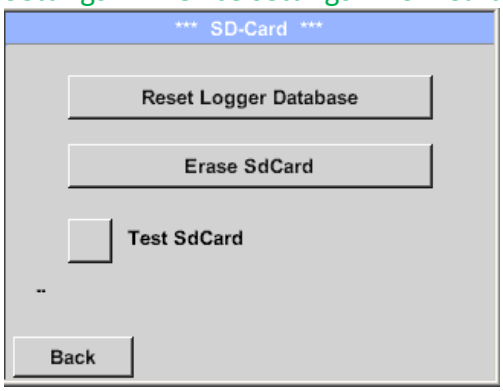
By pushing the *Time Zone* description field and enter the correct *UTC*, you can set the correct time all over the world.



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

9.6.2.3 SD-Card

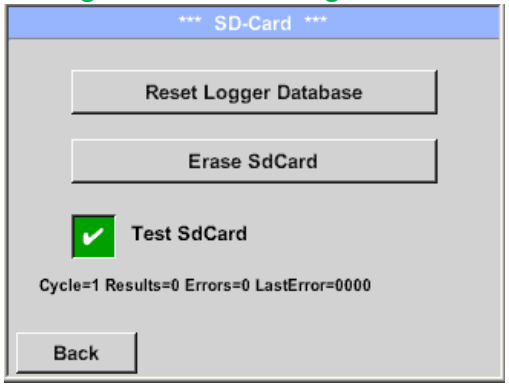
Settings ➔ Device settings ➔ SD-Card ➔ Reset Logger Database
Settings ➔ Device settings ➔ SD-Card ➔ Erase SdCard



By pressing *Reset Logger Database* all current stored data on SD-Card will be blocked for use in the leakage device. Nevertheless all data are still stored and available for external use only.

By pressing *Erase SdCard* all Data on the SD-Card will be deleted.

Settings ➔ Device settings ➔ SD-Card ➔ Test SdCard



With activation of *Test SdCard* data are written and read to and from the SD-card.

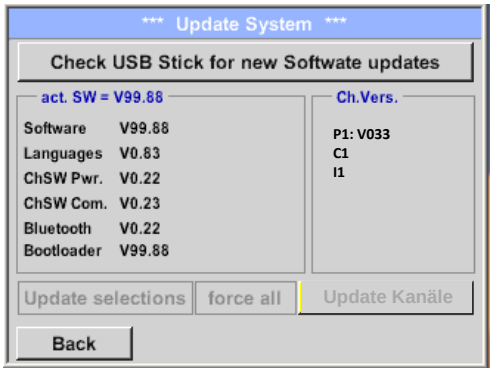
The number of test cycles, as well as possible errors and error codes are display in the status line.

Press the *Back* button to returns to the device settings menu.

9.6.2.4 System update

If required, there is the possibility for the leakage device to download a firmware update to the device via the USB stick. The latest software is available on the ipf electronic homepage.
The received file must then be stored on the USB stick and transferred to your device as described below.

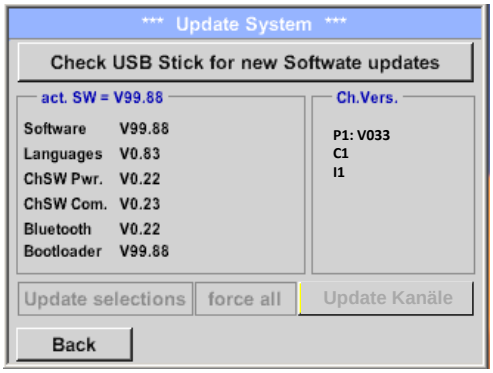
Settings ➔ Device settings ➔ System-Update



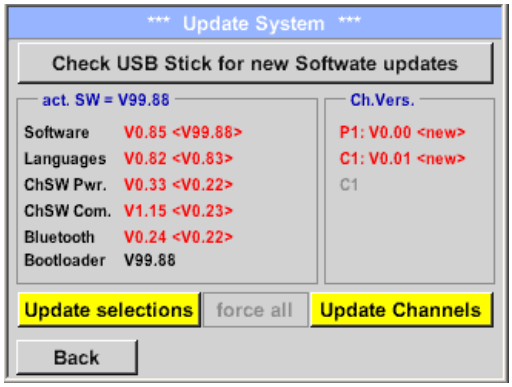
Overview of *System-Update*-Functions.

9.6.2.4.1 Check for Updates

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, the leakage device is not properly connected to the USB flash drive or there are no files available.



If the leakage device is correctly connected to the USB stick and there are new versions of the individual SW Parts, the new versions are marked in red.

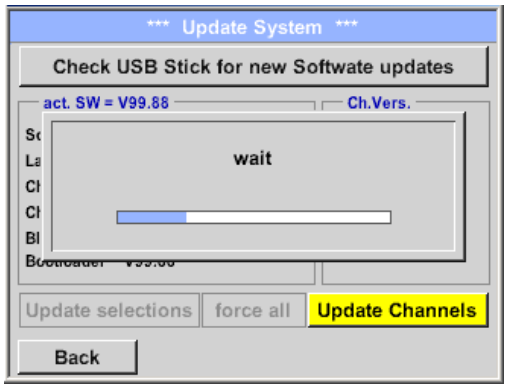
The update is started by pressing the „***Update selections"*** button.

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

9.6.2.4.2 Update Channels

Settings ➔ Device settings ➔ System-Update ➔ Update-Channels

If there is an update either for the internal and external channel (bigger version only), it must be started separately.



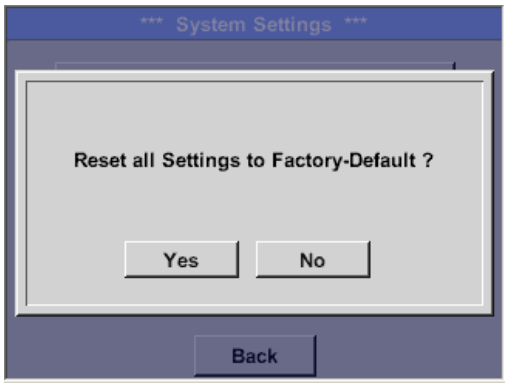
Update for Channels (bigger version).

Important:
If the *Reboot system* button appears after the update, it must be pushed to restart the leakage device.

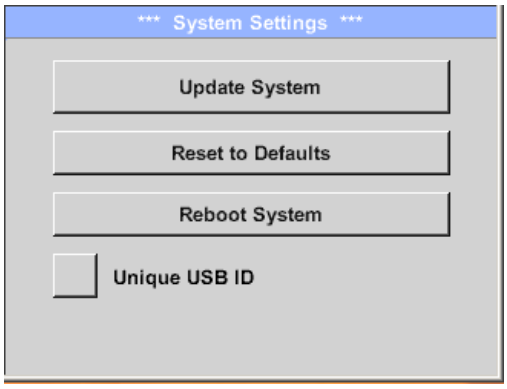
9.6.2.5 Factory Reset

9.6.2.5.1 Reset to default settings

Settings ➔ Device 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“***.



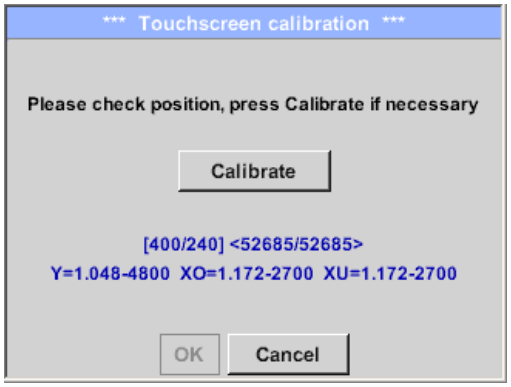
If needed with ***„Reboot System“*** the leakage device could be started (reboot) here.

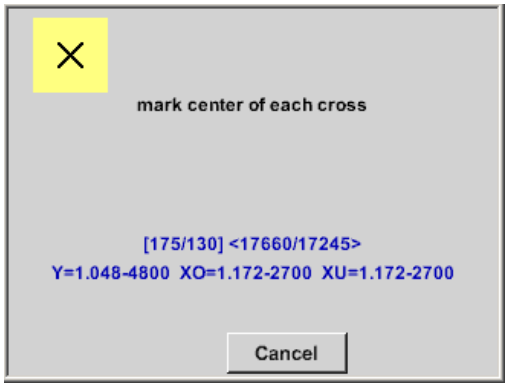
9.6.2.5.2 Unique USB ID

For connections with the PC, a status and therefore a unique USB ID can be defined here. Relevant for simultaneous connection of several USB devices to the PC.

9.6.2.6 Calibration of touchpanel

Settings ➔ Device settings ➔ calibrate touchscreen





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

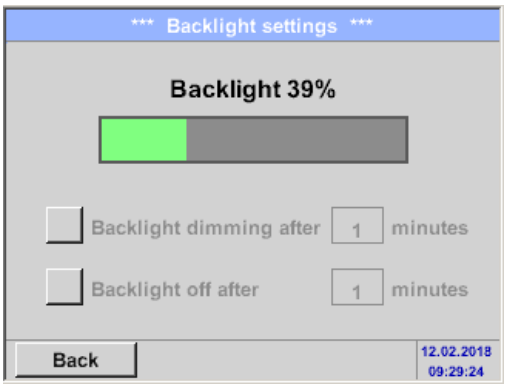
Push *Calibrate* and it appears, 1. left above,2. bottom right, 3. bottom left, 4.right above and 5. in the middle, a calibration cross that must be pushed consecutively.

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* buttons.

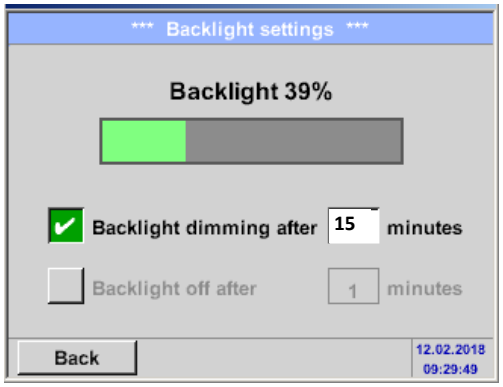
9.6.3 Set backlight brightness

Settings ➔ Set backlight



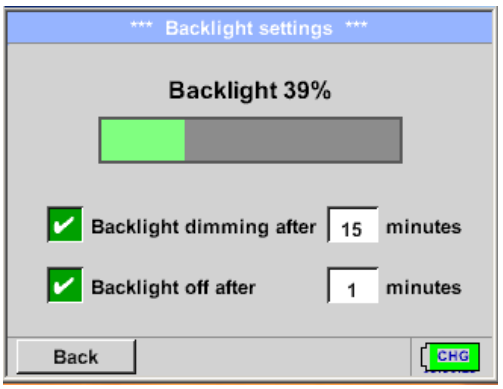
Here you adjust the desired *Backlight* (15-100%) of the display directly.

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.

<u>Important</u>:

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

9.6.4 Cleaning

Settings ➔ Cleaning

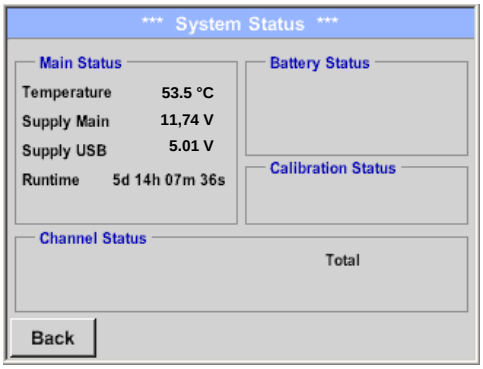
This function can be used for cleaning the touch panel during running measurements.

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.

9.6.5 System-Status

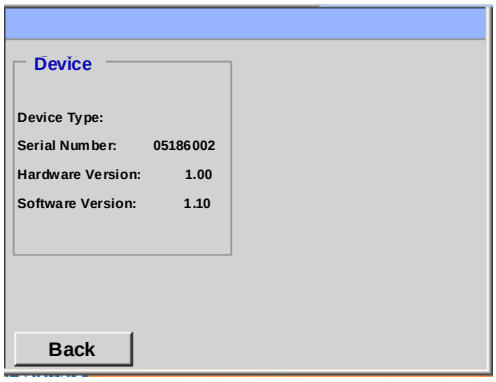
E Settings ➔ System-Status



The menu item ***"System status"*** provides information about the power supply voltages and an operating hour counter.

9.6.6 About

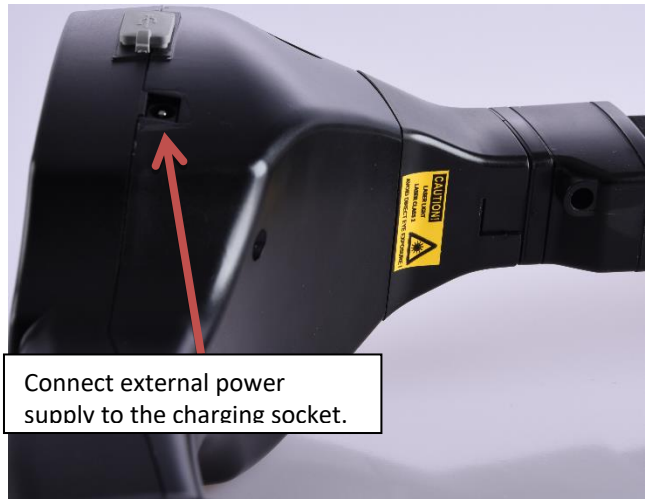
Settings ➔ about

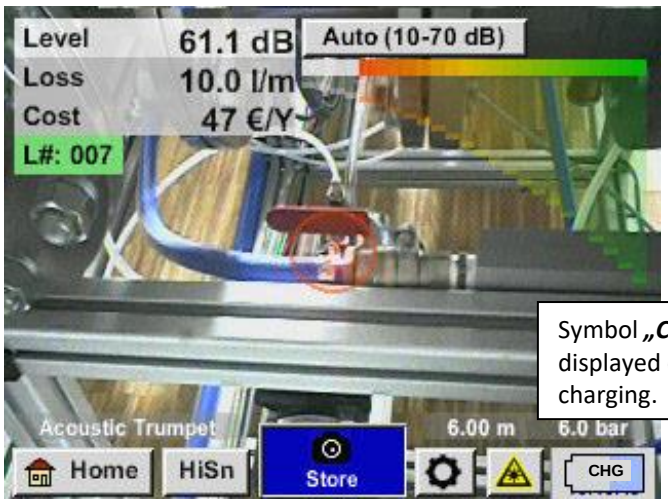


Brief description of the Hardware and Software Version, as well as the Serial Number of the leakage device.

10 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 leakage device and the 230V socket.





The leakage device 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.

12 Scope of delivery

The leakage device 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

Ultrasonic detector set consisting of:

Leak detector (UY000001) with acoustic trumpet, and integrated camera, 100 leak tags for marking the leakages on site

Sound-proof headset (VY000023)

Focus tube with focus tip (AU000021)

Battery charger (AC adapter plug) (NY000005)

Transportation case (AU000022)

Helix cable for connecting the ultrasonic sound sensor (VY000022)	2m length (extended)
Gooseneck for leak detection in hard-to-reach areas (optional)	
Parabolic mirror for leak detection at long distances (optional)	