

Operating Manual



HYDROMETTE[®]

CH 17



EN



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0.1 Publication Statement

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GANN Mess- u. Regeltechnik GmbH, Gerlingen, Germany, 31/08/2018



0.2 WEEE Directive 2012/19/EU law on waste electrical and electronic equipment

- Disposal of packaging, battery and device must be performed in accordance with the legal requirements at a recycling centre.
- The device was manufactured after 01/09/2018.



0.3 General Notes

This measuring instrument fulfils the requirements of the applicable European and national directives (2004/108/EC) and standards (EN61010). Appropriate declarations and documentation are held by the manufacturer. To ensure trouble-free operation of the measuring instrument and operational reliability, the user must carefully read the operating instructions. The measuring instrument may only be operated under the specified climatic conditions. These conditions can be found in the chapter 17.1 "Technical Data of the Hydromette". This measuring instrument may only be used under the conditions and for the purposes for which it has been designed. Operational reliability and functionality are no longer ensured if the device is modified or converted. The company Gann Mess- u. Regeltechnik GmbH shall not be liable for any damage resulting from this. The risk is borne solely by the user.

The measuring instrument and any accessories may only be properly used as described in these instructions. Keep the device and accessories out of the reach of children!

The device must not be stored or operated in air that is corrosive or contains solvents!

Static charge must be taken into account when measuring resistance: At low humidity, aided by external circumstances (friction during material transport, high insulation value of the surrounding area), static electricity can build up with high voltage, which can cause strong fluctuations in measured values or negative values. The operator of the measuring instrument can also unintentionally contribute to the build-up of static charge due to his clothing. A significant improvement can be achieved by ensuring the operator and the measuring instrument remain completely still during the measurement process and by earthing (by touching conducting metal, water or heating pipes, etc.).

Frozen wood cannot be measured.

The notes and tables in these instructions regarding permitted or normal humidity conditions in practice and the general definitions of terms have been taken from the specialist literature. No responsibility can therefore be taken by the manufacturer for the correctness of this information. The conclusions to be drawn from the measurement results are related to the individual conditions and the knowledge gained from professional experience for each user.

The measuring instrument may be used in the residential and commercial sectors.

Wood or other materials should not be measured on conductive surfaces.

Gann Mess- u. Regeltechnik GmbH accepts no liability for damage resulting from non-compliance with the operating instructions or from not taking proper care during transport, storage and handling of the device during operation, even if this duty of care is not specifically addressed in this operating manual.



0.4 Safety Information



WARNING: There is a risk of injury from the measuring pins of the electrodes for resistance-based moisture measurement. Before inserting the electrode pins into wooden panels or similar, use suitable methods to ensure that there are no electrical wires, water pipes or other supply lines at this point.



CAUTION: Accessories such as TF-IR BL and IR 40 BL use a laser in laser class 2 according to IEC 60825-1. People can be dazzled by the laser. The laser must never be directed at people or animals. Do not look directly into the laser beam and avoid reflections on reflective surfaces.



1 Introduction

1.1 Description

The Hydromette CH 17 is a universal measuring instrument with 3.5" display and capacitive touch input. Among other things, the measuring ranges of wood moisture, building moisture, temperature, air humidity, air pressure and air velocity can be covered by connecting a whole range of probes & TF Sticks with high-quality sensor technology.

The Hydromette CH 17 has a mini USB interface, which can be used, among other things, to transfer measurement data to a PC or to send predefined projects on a PC to the device. It is possible to use both an internal memory as well as a micro SD card for data storage. Various operating states are indicated by 4 LEDs. An ambient light sensor, which adjusts the display brightness to the ambient light if required, is integrated in the device. There is also a sensor in the device for measuring the absolute air pressure. The silicone buttons give good haptic feedback for important functions. The Hydromette CH 17 has a loudspeaker for the audible feedback of touch inputs and to indicate when limit values have been exceeded. There is a BNC socket on the end face for resistance measurement to determine wood or building moisture. Probes of the BL series can be connected using the 3.5 mm jack socket. TF Sticks can be connected using the 2.5 mm jack socket. An air velocity sensor can be connected to the 8-pin push-pull socket.

The Hydromette CH 17 provides a variety of measuring methods for different applications. It is possible to select between basic measurement, list measurement, grid measurement, average measurement, a long-term data logger or a graphical recording for shorter measurements. Each of these measuring methods has its advantages and so the appropriate solution can be individually selected for the existing task.

The following BL probes & TF Sticks can be used with the Hydromette CH 17:

Material Moisture Probe B 55 BL

For non-destructive measurement and indication of moisture in ceilings, walls, floors and other building materials

Climate probe RF-T 28 BL

For air humidity and air temperature measurement

Climate probe RH-T 37 BL

For air humidity and air temperature measurement; as well as for moisture measurement in boreholes via sorption isotherm

Climate probe TF Stick 16 K-21, TF Stick 16 K-25, TF Stick 16 K-25 M, TF Stick 16 K-25 P

For air humidity and air temperature measurement

Climate and surface temperature probe TF-IR BL



For air humidity and air temperature measurement, as well as for the measurement of infra-red surface temperature

Material temperature probe ET 10 BL

Push-in temperature sensor

Surface temperature probe OT 100 BL

Surface temperature sensor

Gas temperature probe TT 40 BL

Immersion and flue gas temperature sensor

Surface temperature probe IR 40 BL

For measurement of the infra-red surface temperature

Air velocity probe LG-25 BL

Anemometer for air velocity measurement

All mentioned probes and TF Sticks are listed and described in detail in the chapter 19. The respective relevant operating manuals should be read for information about the handling of probes and accessories, as well as information about measuring ranges and accuracy.

1.2 Device layout and button assignment



Figure 1-1: Front view of the Hydromette CH 17

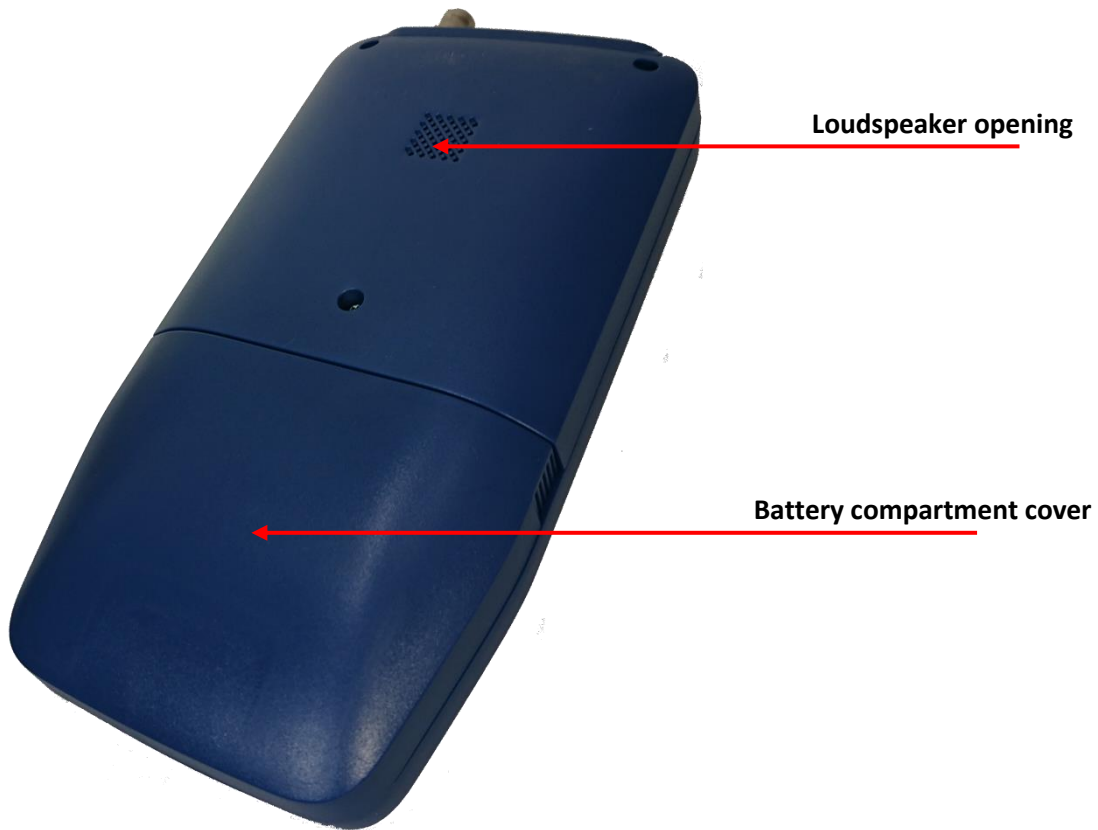


Figure 1-2: Rear view of the Hydromette CH 17

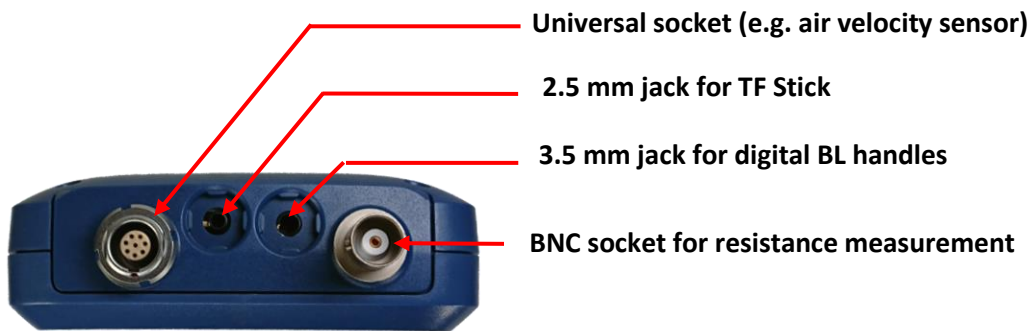


Figure 1-3: End face of the Hydromette CH 17 with sensor connectors



Figure 1-4: Mini-USB port on underside of Hydromette CH 17

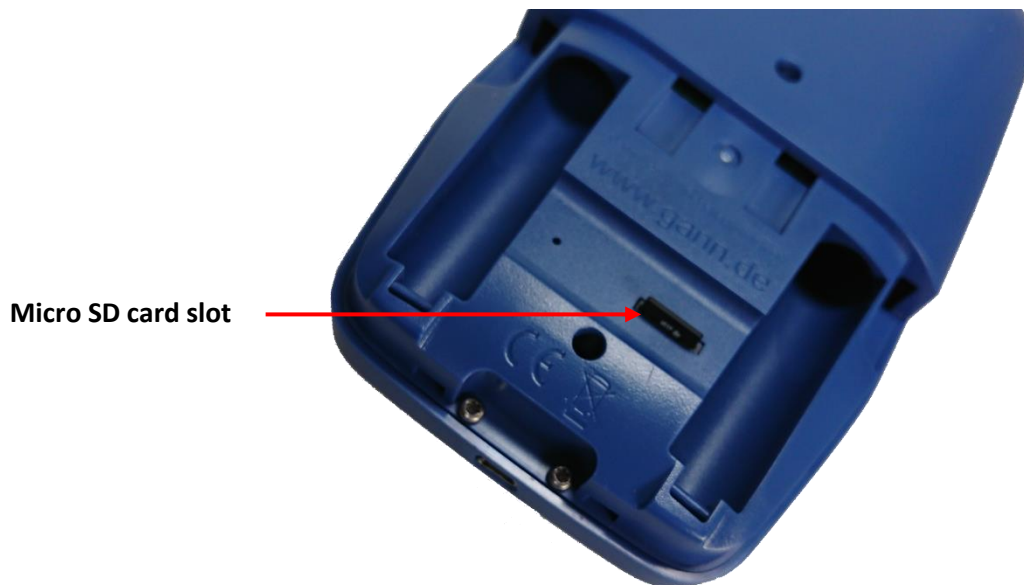


Figure 1-5: Battery compartment with micro SD card slot

1.2.1 Real-time clock

The device has a real-time clock. This is powered by an internal CR2032 3V battery cell. If the time or the date is not correct, this is an indication that the battery cell is discharged. As the device must be unscrewed to replace the battery cell, we recommend that you return the device and arrange for the battery cell to be replaced.



2 Basic Functions

2.1 Switching the device on and off

Press the On/Off button to switch on the device. Press and hold the On/Off button for two seconds to switch off the device again.

2.2 Boot Screen

While the device is booting, the current firmware version and the current supply voltage of the device, among other things, are displayed on the boot screen.

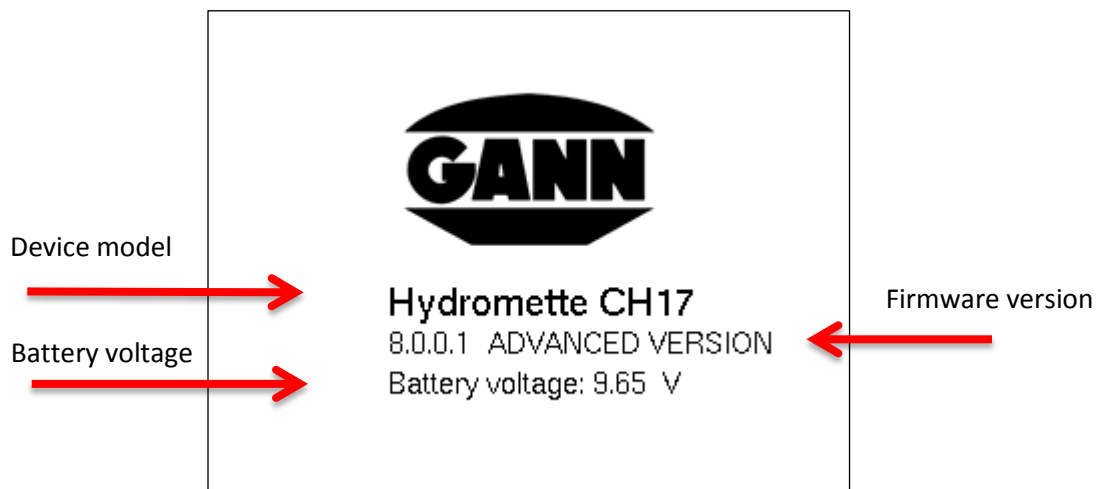


Figure 2-1: Boot screen

2.3 Main Menu

The main menu is displayed after the first start-up. When in submenus, this main menu can be returned to by pressing the "Home" button. Different measurement modes, project data and device settings can be accessed from here. The selection is made using the touch input of the display. Different functions can be available depending on the firmware licence.

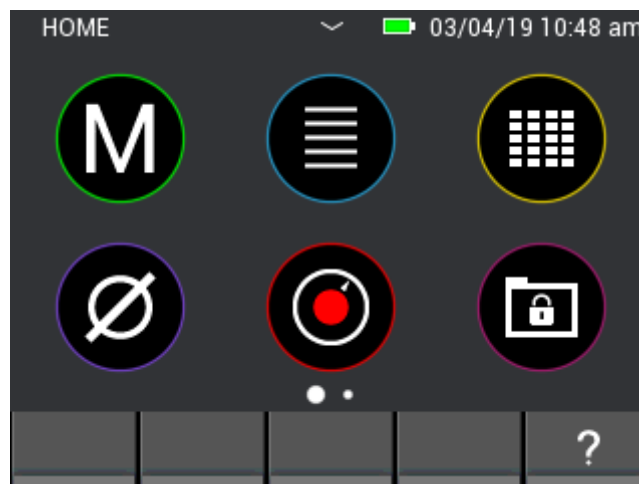


Figure 2-2: Main Menu Screen

2.4 Application Bars

The application bars accompany the user through the menu guidance and are explained here.

2.4.1 Upper Bar

The upper bar is used to display information.



Figure 2-3: Upper bar with information about the current status

Description for Figure 2-3:

1. Designation of the opened menu
2. The small down arrow signals that the Project Menu can be opened (see chapter 6: Project Structure).
3. Battery condition
4. Date and time

	Full batteries, operating time >50 h for normal use
	Batteries have been slightly used. Logs are possible without limitations.
	Batteries are still good to use. For very long logs, batteries may have to be replaced or rechargeable batteries recharged.
	Battery voltage very low. Batteries should be replaced as soon as possible. Batteries are no longer suitable for long logs.
	The device is powered via the USB port using an external power supply unit.

Table 2-1: Battery symbol in the upper bar

2.4.2 Lower Bar

The lower bar provides functions adapted to the menu and contains corresponding buttons.



Figure 2-4: Lower bar with menu-specific buttons

Some buttons in the lower bar are frequently and/or always used, and are therefore only described here once. Buttons that occur less frequently are explained separately in the individual chapters.



2.4.2.1 "Back" button



Figure 2-5: "Back" button

Tapping the "Back" button exits the currently opened menu and takes you to the previous menu. Any entered changes are discarded if necessary.

2.4.2.2 "Confirm" Button



Figure 2-6: "Confirm" Button

The current setting is confirmed by tapping the "Confirm" button.

2.5 Help Window

Tapping the Help button opens an appropriate help window for the currently opened context. The help window can be closed by tapping the "X" button.

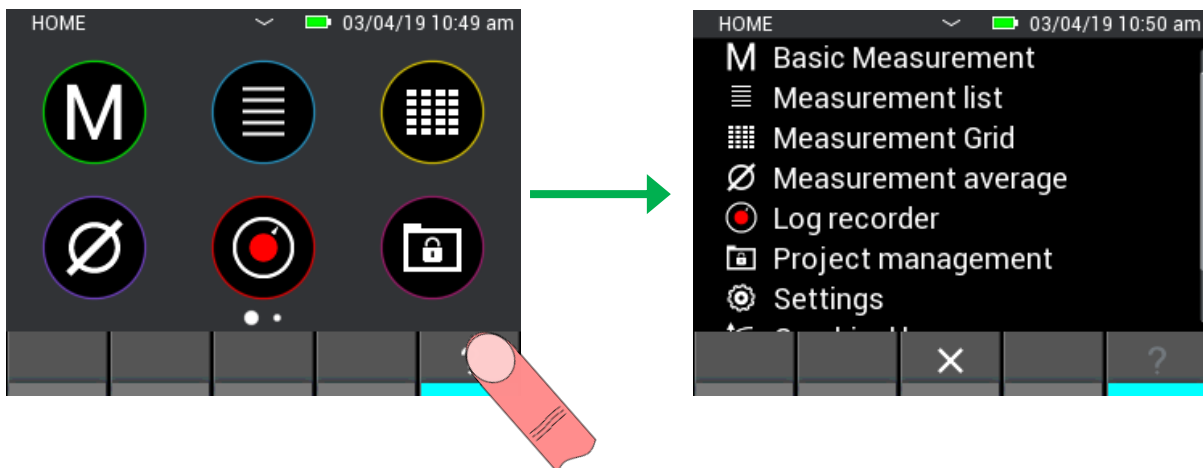


Figure 2-7: Display of the help window

2.6 Function: Move Window

It is possible in several menus to move the current window and obtain further information or functions on another window. If this function is available, this is indicated by dots above the lower bar. The number of dots indicates the available number of windows. The current selection is highlighted.

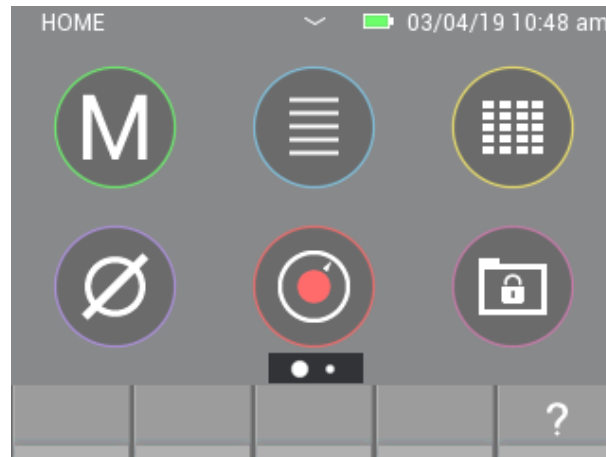


Figure 2-8: Availability of other windows

To access another window, place your finger on the screen and move it in the direction you would like to move the screen content.

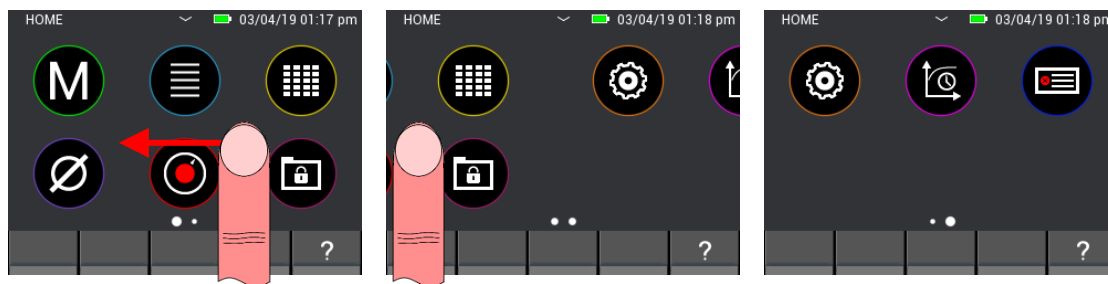


Figure 2-9: Swipe function for moving windows

2.7 Function: Scroll List

Some menus contain lists with too many selection options to display these completely on one screen. In this case, a scroll bar is located on the right side of the screen. The displayed list content can be moved by placing your finger in the middle of the screen and then swiping it up or down. In the case of large lists, it is possible to scroll through the list more quickly by placing your finger on the right side of the screen and moving the scroll bar directly.

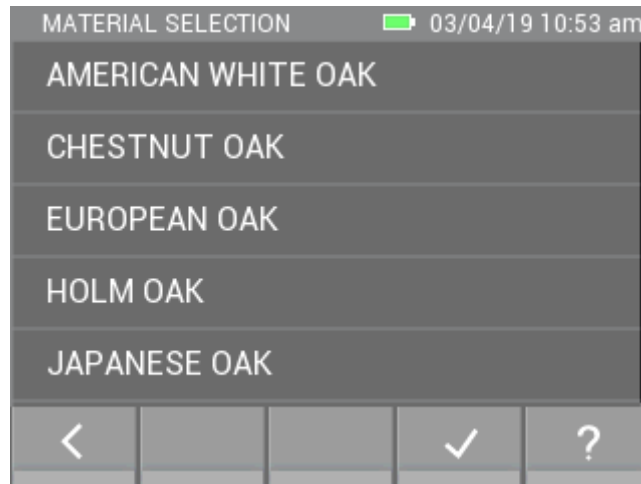


Figure 2-10: Scroll function for lists

2.8 Screenshots (available only with software version "Advanced")

A micro SD card must be present in the device and activated in order to make a screenshot of the current screen content. The screenshot function is activated by pressing and holding the "Save" button and then simultaneously pressing the "Home" button. The screen content is saved as a bitmap file in the directory path "0:\APP\IMAGES" of the micro SD card. The display is temporarily deactivated during the screenshot process and the blue LED indicates the write process on the micro SD card. The display is reactivated after completion of the process. Creating a screenshot can take a few seconds.

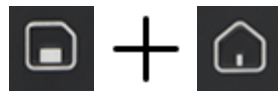


Figure 2-11: Button combination for creating a screenshot

3 Settings



Figure 3-1: Icon for the device settings

The parameters of the device and the application can be adjusted in the settings. The individual menus are explained below. The settings are reached via the gear symbol in the main menu.

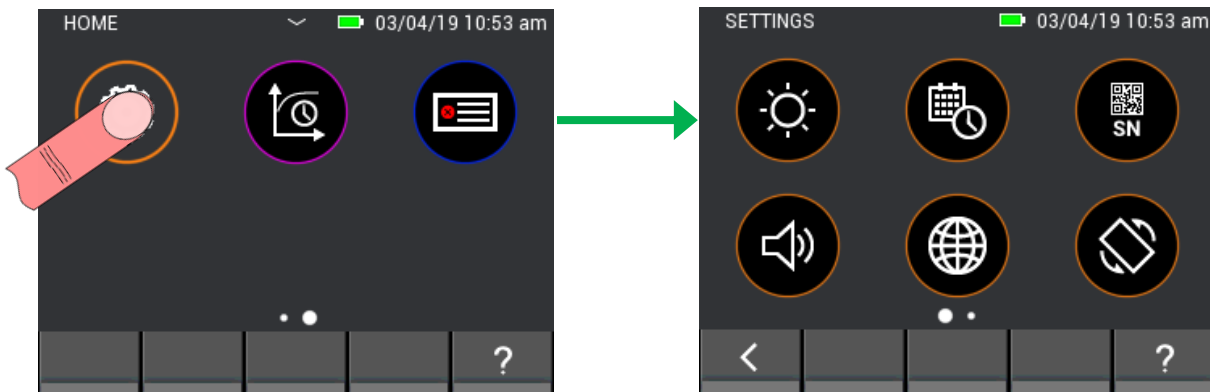


Figure 3-2: Settings submenu

3.1 Brightness



Figure 3-3: Icon for the brightness setting

The display brightness can be increased or decreased in the brightness setting. Automatic brightness adjustment can also be activated. If this is activated, the display brightness is adjusted to the ambient light. Please note that the battery life decreases with increasing display brightness. Tap the "Confirm" button to confirm the input and apply the changes. Tap the "Back" button if you would like to exit from the menu and discard changes. In this case, the setting is reset to the previous value.

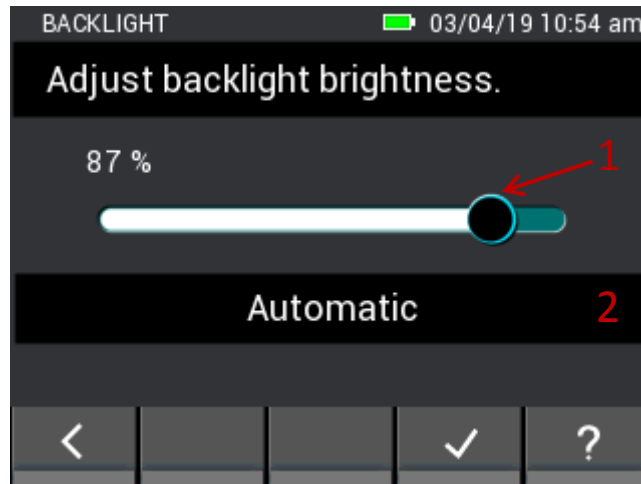


Figure 3-4: Menu for setting the display brightness

1. The display brightness can be adjusted by horizontal swipe gestures over the slider.
2. Button activates / deactivates the automatic brightness adjustment via the integrated ambient light sensor.

3.2 Time and date



Figure 3-5: Icon for the time / date setting

Time and date can be set in this menu. The values are adjusted using vertical swipe gestures.

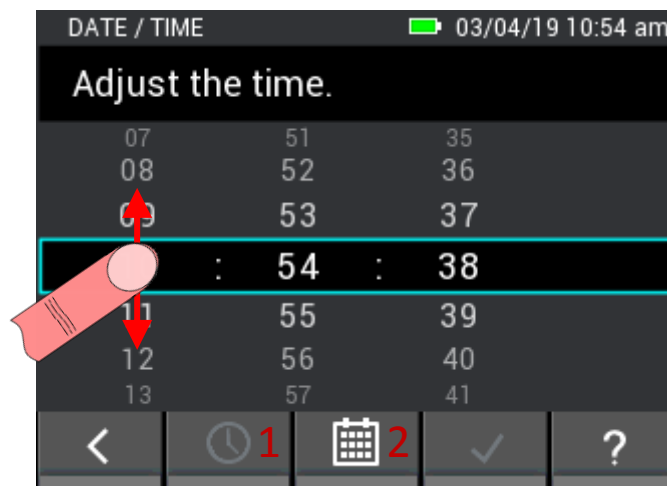


Figure 3-6: Menu for setting the time

Description for Figure 3-6:

1. Button leads to the time setting.
2. Button leads to the date setting.

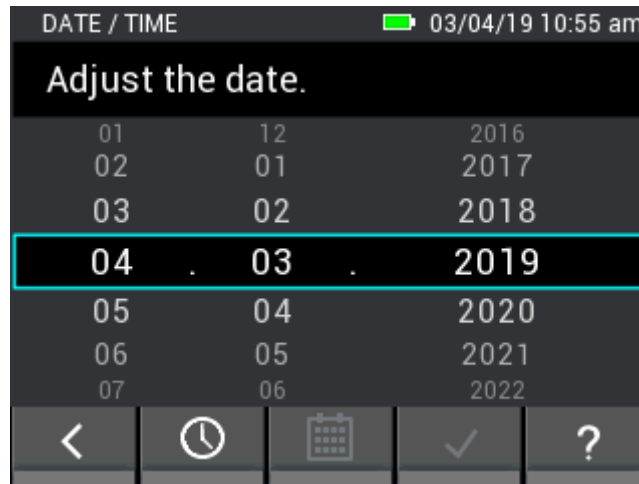


Figure 3-7: Menu for setting the date

3.3 Serial Number



Figure 3-8: Icon for the display of the device serial number

In this menu, the serial number of the device can be read in the form of ASCII characters and in the form of a QR code. This serial number should be stated for support requests, as it can be used to directly identify the installed hardware as well as the available software version.



Figure 3-9: Menu for display of the device serial number



3.4 Volume



Figure 3-10: Icon for the volume setting

This menu is used for setting the volume. The volume can be reduced or increased by vertical swipe gestures over the slider. The speaker emits a "click" sound at the appropriate volume when the slider is released.

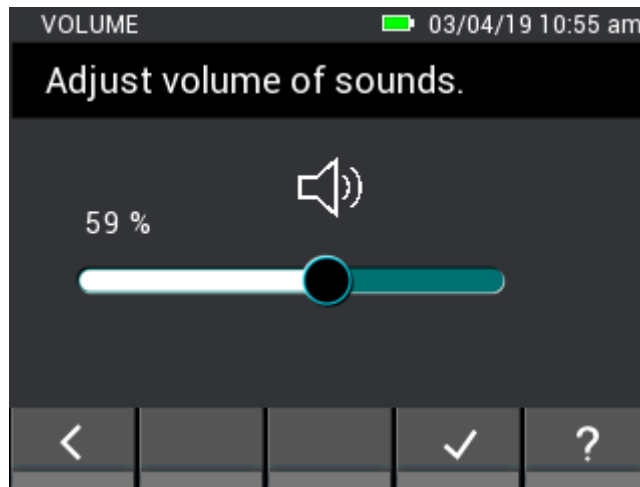


Figure 3-11: Menu for setting the volume

3.5 Language



Figure 3-12: Icon for the language setting

Various languages can be selected in the Language menu. The displayed texts are shown in the selected language.

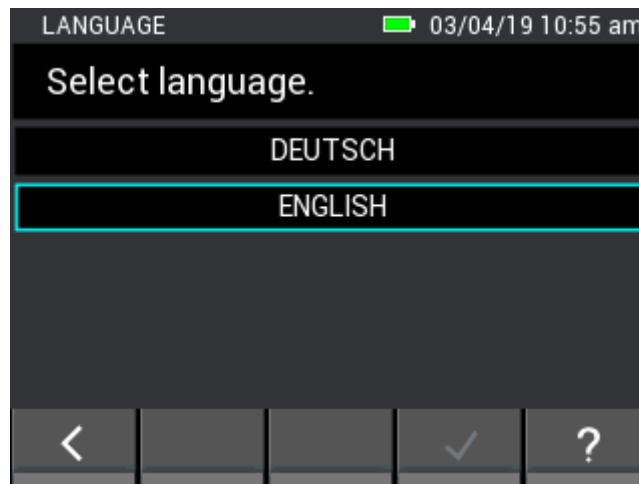


Figure 3-13: Menu for language setting

3.6 Display orientation



Figure 3-14: Icon for the display orientation

The display orientation can be set in this menu. The display can be rotated by 180°. Automatic display orientation can also be set, whereby the orientation is based on the position of the measuring instrument. Only rotations of the display by 180° are possible.

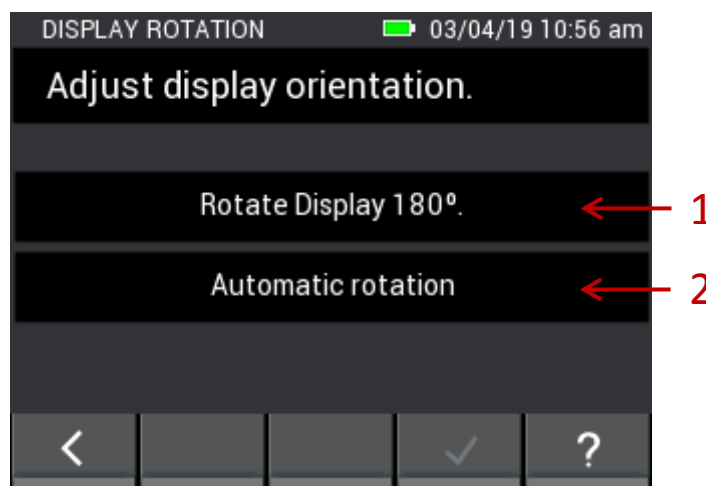


Figure 3-15: Menu for setting the display orientation

1. Rotate display by 180°.
2. Activate automatic display rotation.



3.7 Micro SD card (available only with software version "Advanced")



Figure 3-16: Icon for micro SD card options

This menu provides functions for using the micro SD card. It is recommended to only remove or add the micro SD card when the device is switched off. If the micro SD card should be removed during operation, it must previously be safely removed using this menu. If a micro SD card is inserted during operation, the contents must be loaded using the import function. **Data can be lost or corrupted in the case of incorrect handling.**

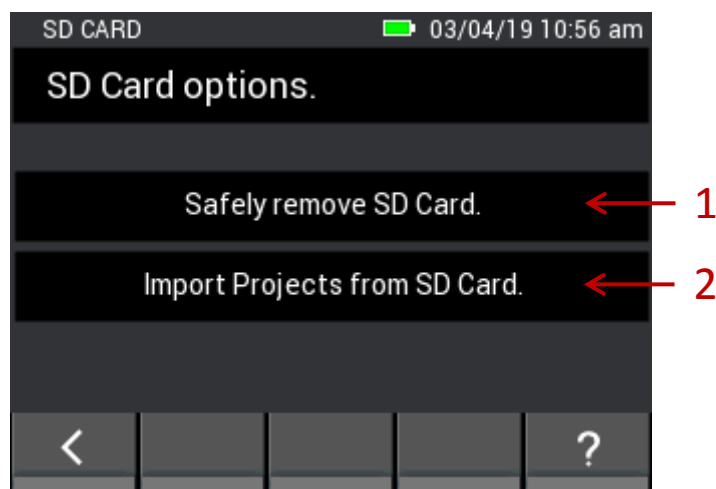


Figure 3-17: Menu for adding or removing a micro SD card

Description for Figure 3-17:

1. By tapping this button, the micro SD card is safely removed and can then be removed from the device.
2. If a micro SD card has been inserted during operation, it can be activated by tapping this button. Furthermore, the projects located on the micro SD card are imported.

Data on the micro SD card in the "APP" directory must not be modified by other devices with software other than Gann Dialog Pro, otherwise data loss or problems with Hydromette CH 17 functions can occur.

3.8 Battery Type



Figure 3-18: Icon for the battery type selection

By setting the battery type, it can be specified whether normal batteries or rechargeable batteries are present in the device. If "NiMH rechargeable batteries" is selected, the device is switched off before the batteries are deeply discharged.

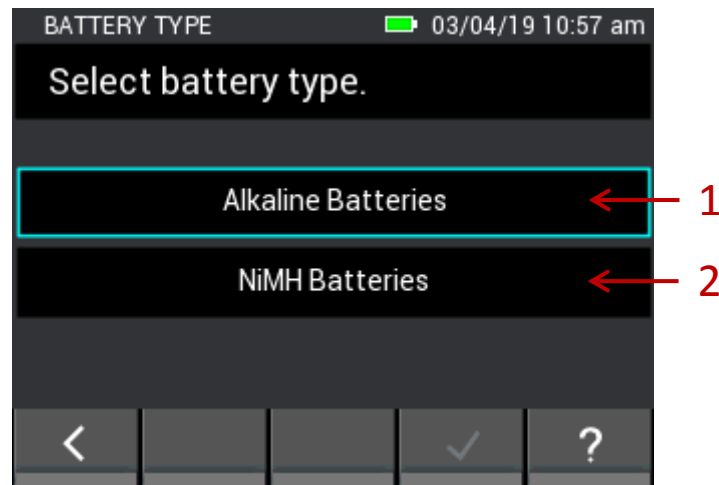


Figure 3-19: Menu for selection of the battery type

1. Selection of conventional batteries.
2. Selection of rechargeable batteries

3.9 Unit System



Figure 3-20: Icon for setting the unit system

This menu is used to select whether to work with metric or imperial units.

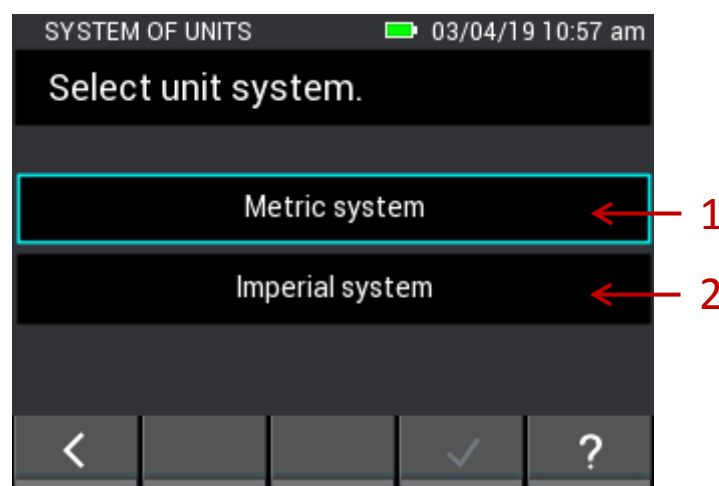


Figure 3-21: Menu for setting the unit system

Description for Figure 3-21:

1. Metric units system (°C, m, kg, ...)
2. Imperial units system (°F, ft, lb, ...)

3.10 Limits



Figure 3-22: Icon for limits

Limits can be set in this menu. These are checked during the basic and list measurement. If a maximum is exceeded or a minimum is undercut, a warning signal sounds and the yellow LED starts flashing. The respective limit values can be set for each measurement. The lower limit value cannot be set above the upper limit value, nor can the upper limit value be set below the lower limit value.

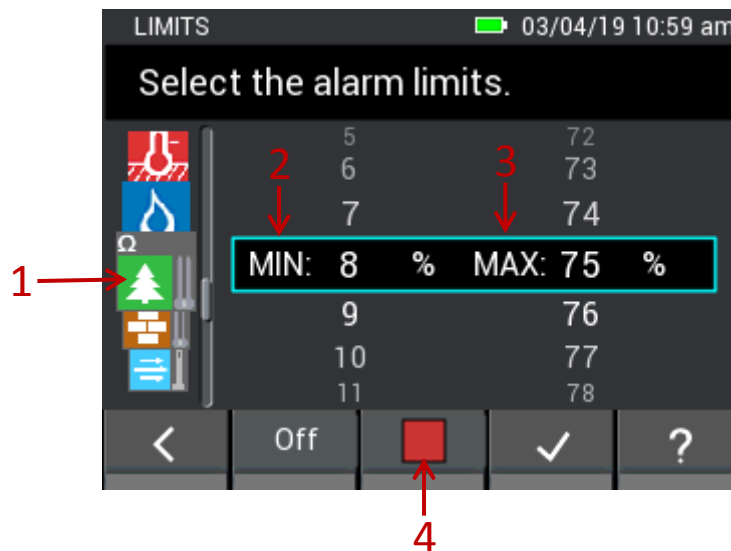


Figure 3-23: Menu for setting limit values and activation of the audible alarm function

Description for Figure 3-23:

1. The measurements for which the minimum and maximum should be set can be selected by vertical swipe gestures over the sensor icons. Possible measurements are:
 - air temperature (TF Stick, RH-T37 BL, RF-T28 BL, TF-IR BL)
 - surface temperature (IR 40 BL, TF-IR BL)
 - material temperature (Pt100, for example ET 10 BL)
 - air humidity (TF Stick, RH-T37 BL, RF-T28 BL, TF-IR BL)
 - resistance-based wood moisture
 - resistance-based moisture content of building materials
 - air velocity (LG-25 BL)
 - material moisture (B 55 BL)
2. The minimum is set using vertical swipe gestures.
3. The maximum is set using vertical swipe gestures.
4. The limit monitoring for the selected measurement is activated and deactivated by tapping the button. The button is green when limit monitoring is activated.

The limit value setting for the B 55 BL probe differs from the other measurements. Only a maximum value can be set, but it can be set separately for all selectable materials.

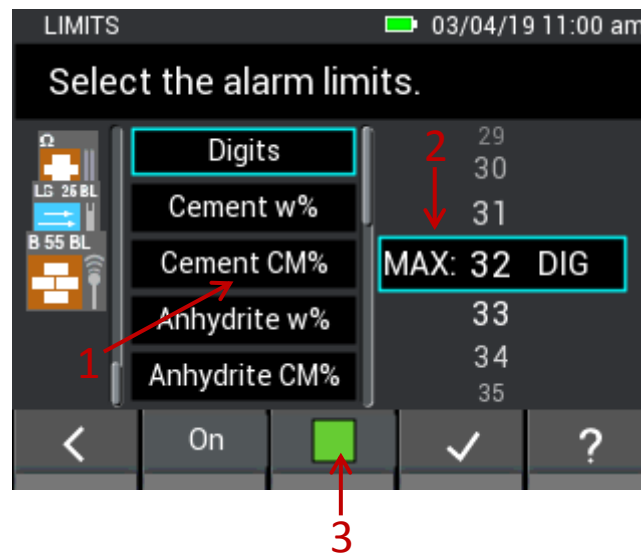


Figure 3-24: Menu for setting limit values for different materials when using the B55 BL probe

Description for Figure 3-24:

1. The list contains the available materials for capacitive building moisture measurement with the B 55 BL for which an upper limit value can be set. Vertical swipe gestures can be used to scroll in this menu.
2. The upper limit is set using vertical swipe gestures.
3. The activation of the alarm for the B 55 BL probe affects all materials.

3.11 Standby Time



Figure 3-25: Icon for the standby setting

The display is switched off in standby mode to conserve battery power. The device can be woken up using a swipe gesture on the screen or by pressing any button. The time which elapses without any input after which the device goes into standby mode can be set in this menu in the range between 5 and 30 minutes. If the device then remains in standby mode for another 15 minutes without any input being made, it switches itself off automatically.

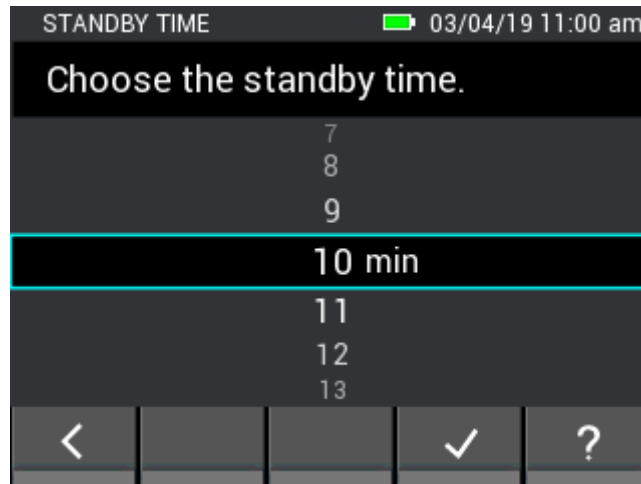


Figure 3-26: Menu for setting the standby time

3.12 Screen Lock



Figure 3-27: Icon for the screen lock

The screen can be locked to prevent unauthorised access. Any four-digit code can be selected in this menu and the screen lock can be activated. After each start of the device or after waking up from standby mode, the four-digit code is requested to access the device functions. The default password is set to "1111" and the screen lock is deactivated.

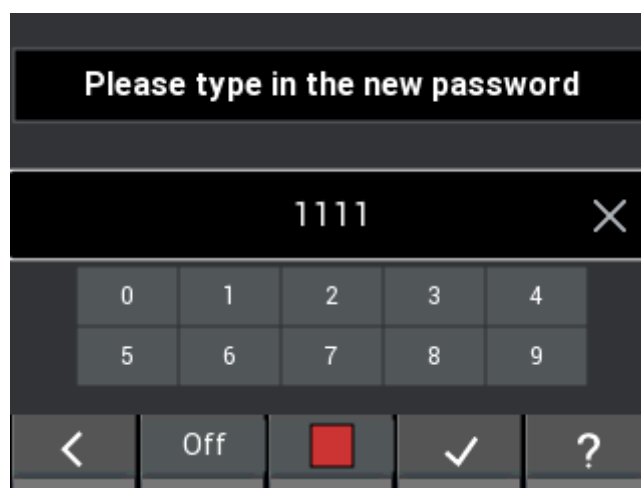


Figure 3-28: Menu for setting and activating the screen lock

4 Basic Measurement



Figure 4-1: Symbol of the basic measurement

The basic measurement provides a pure measurement function without the possibility of storing measured values in the device. It is intended for quick measurements that do not need any documentation of the results. Up to two sensors can be selected for simultaneous measurement. If limit values are exceeded or undercut, an audible alarm is output via the loudspeaker.

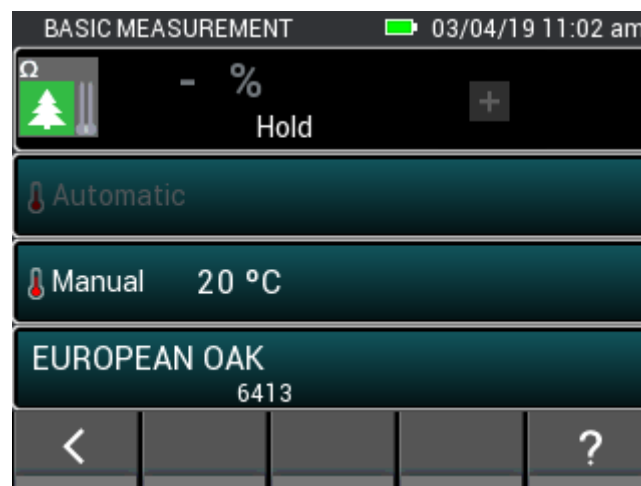


Figure 4-2: Basic measurement window

4.1 Sensor Selection

If one sensor is currently selected, tap on the "+" symbol to reach the Sensor Selection screen. If two sensors are selected, the entire panel is active as a button and can be tapped on to reach the sensor selection.

Sensors connected to the device are highlighted and can be selected. Unavailable sensors are greyed out. The BNC socket for resistance-based moisture measurement is always available as standard; therefore, resistance-based wood moisture or building moisture measurement can always be selected. It should be noted that resistance-based wood moisture and building moisture measurement cannot be performed at the same time and that the other measurement is greyed out when one is selected. The other symbol only becomes active again when the first one has been deselected.

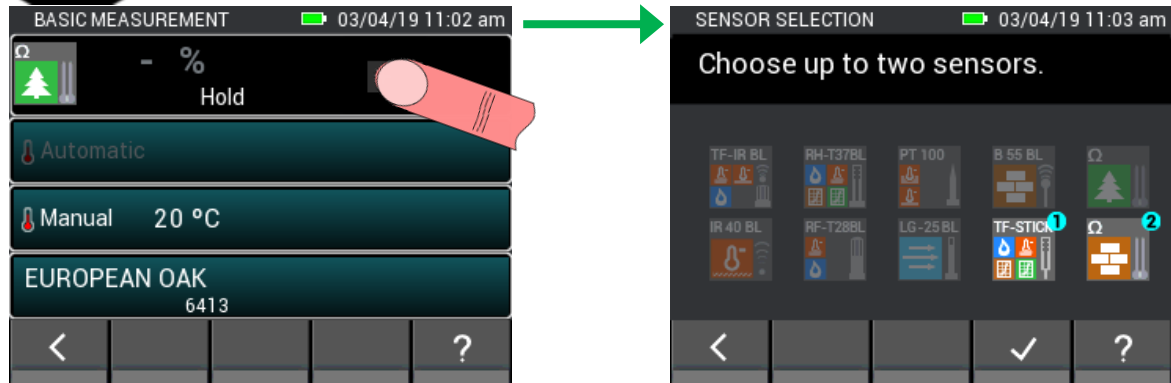


Figure 4-3: Sensor selection for the basic measurement

4.2 Sensor Settings

Framed fields have a button function. These result in selection menus for setting sensor parameters or for selecting alternative measurements. Options and setting options for the individual sensors are described in detail in the following chapter 5: Sensors

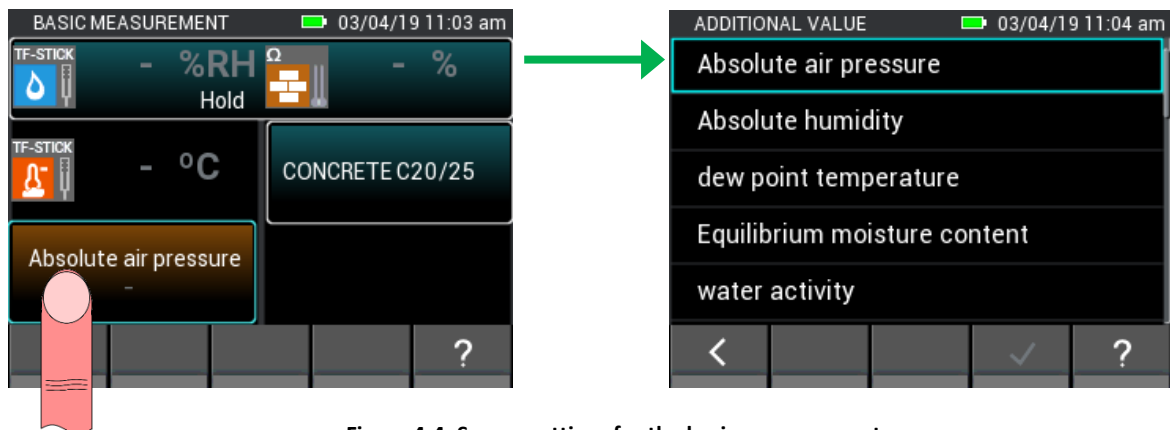


Figure 4-4: Sensor settings for the basic measurement

4.3 Measurement Process

A measurement process is started by pressing the "Measure" button. The measured values are updated while the button is kept pressed. The "Hold" symbol in the display disappears. When the "Measure" button is released, the last measured values remain on the display and the "Hold" symbol is displayed again.



Figure 4-5: Measurement process of the basic measurement

5 Sensors

The measured values and the possible settings of the available sensors are explained in this chapter.

5.1 Resistance-based wood moisture measurement

5.1.1 Measurements

1. Wood moisture [%] in relation to absolutely dry wood (ATRO).



Figure 5-1: Symbol for the resistance-based wood moisture measurement

5.1.2 Settings

1. Compensation temperature [°C]



Figure 5-2: Symbol of the wood temperature for the compensation

5.1.2.1 Automatic Temperature Compensation

The compensation temperature can be determined automatically with a temperature sensor connected to the device. The temperature sensor can be selected from a menu as shown in the following figure. Available sensors in this menu are highlighted; unavailable sensors are greyed out and cannot be selected.

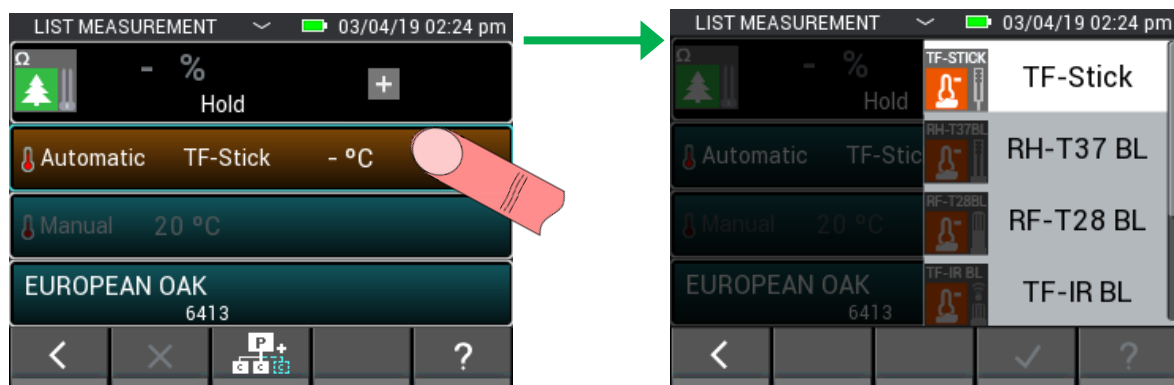


Figure 5-3: Menu for selection of the sensor used for the temperature compensation

5.1.2.2 Manual Temperature Compensation

Alternatively to the automatic compensation temperature, the moisture measurement can also be performed using a manual compensation temperature that is entered by the user. The input must be between -10 °C and 100 °C (14 °F ... 212 °F).

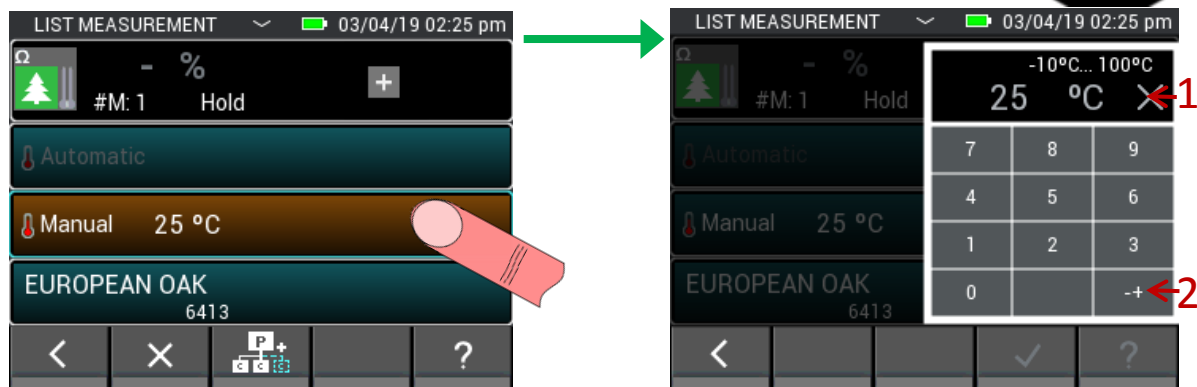


Figure 5-4: Menu for setting of the manual temperature compensation

Description for Figure 5-4:

1. Clears the input when tapped.
2. Toggles the sign of the input.

5.1.2.3 Wood type

The type of wood can be selected from the wood type selection screen. The already visible wood types in the selection are saved favourites and can be selected directly. With button (1) in Figure 5-5, the functions of the lower bar can be changed; button (2) is used to display the complete list of wood types.

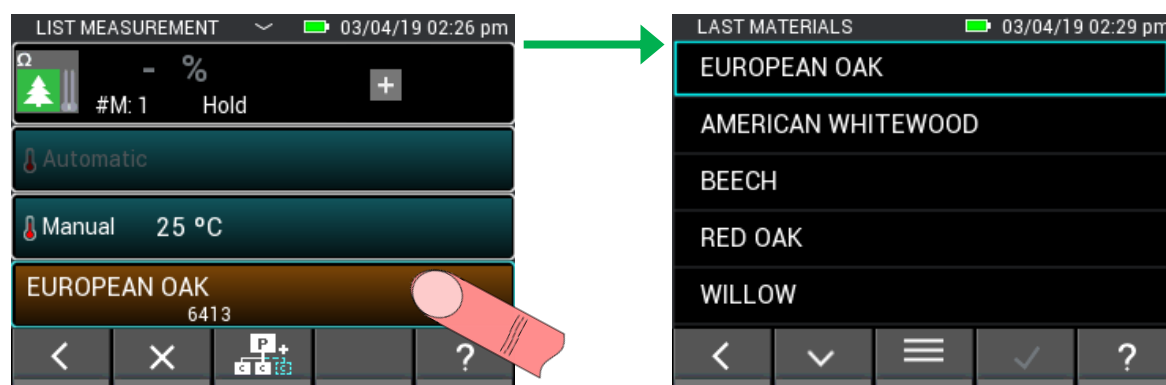


Figure 5-5: Wood type selection

The complete list of wood types is in alphabetical order. The desired type can be selected and confirmed here. Slow scrolling is possible using vertical swipe gestures over the middle. The scroll bar on the right side is used for fast scrolling (see Figure 5-6: Complete list of wood types (1))

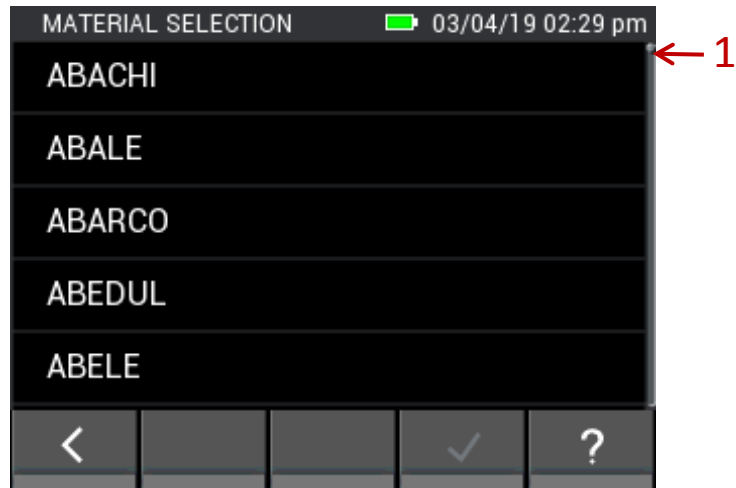


Figure 5-6: Complete list of wood types

If the functions of the lower bar are changed in the wood type selection (Figure 5-5), buttons are displayed with the option (1) for keyword search and option (2) for editing the wood favourites list.

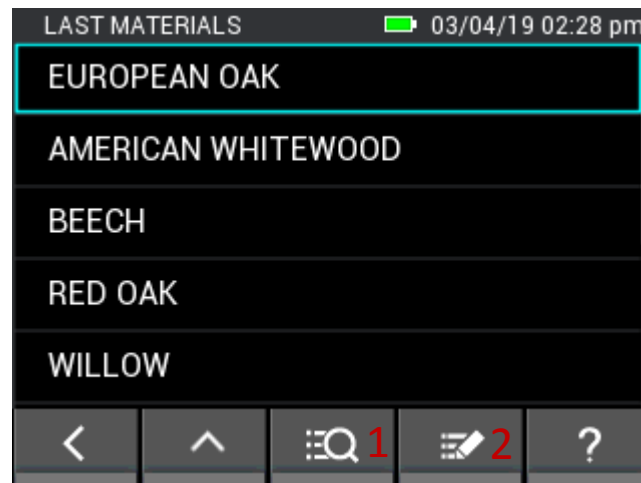


Figure 5-7: Selection of wood types with further options

In the wood type search, the complete name of a wood type or only any part of it can be entered before the search is started. Button (1) in Figure 5-8 clears the entire input; button (2) deletes the last character of the input.

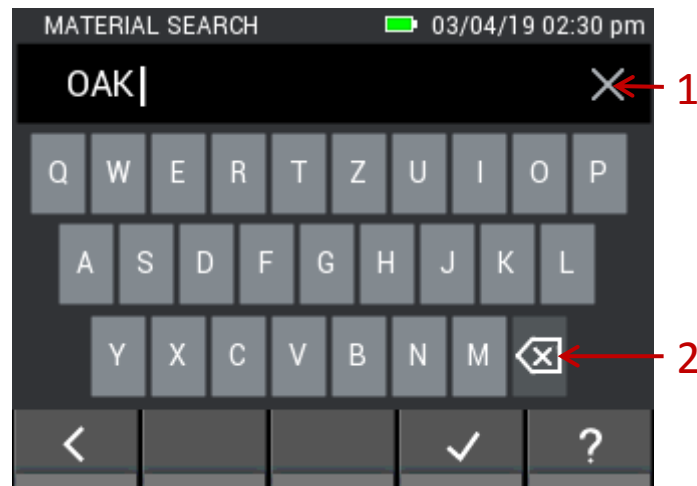


Figure 5-8: Keyboard input for the wood search

When editing the wood favourites, you arrive at the following menu (Figure 5-9). It is possible here to add new favourites and remove existing ones. With button (1), a search for a wood type can be performed again. With button (2), the wood favourites list can be sorted alphabetically. Button (3) enables deletion of entries from the wood favourites list. By tapping and holding a material button in the favourites list, this can be moved up and down in the list by swiping.

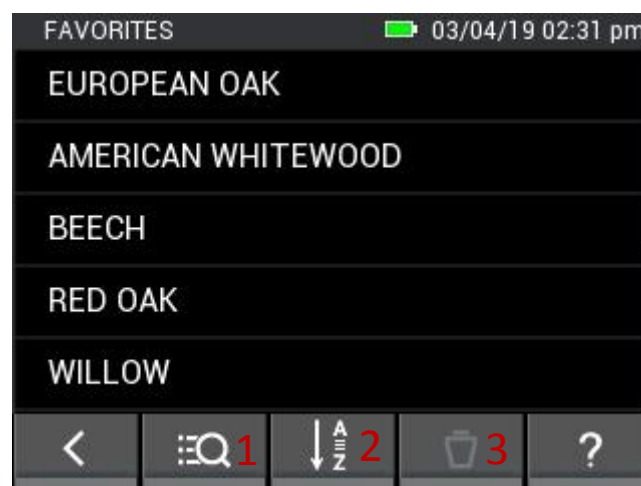


Figure 5-9: Editable list of wood favourites

5.2 Resistance-based measurement of moisture content of building materials

5.2.1 Measurements

1. Building material moisture [%]



Figure 5-10: Symbol for the resistance-based building material moisture measurement

5.2.2 Settings

1. Building material

The building material can be selected from the building material selection screen. The already visible building materials in the building material selection are saved favourites and can be selected directly. With button (1) in Figure 5-11, the functions of the lower bar can be changed; button (2) is used to display the complete list of building materials.

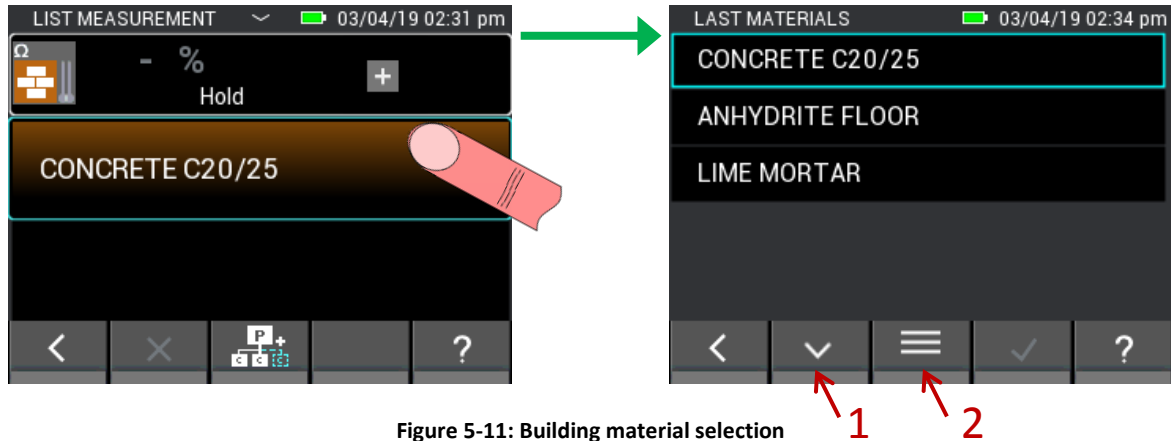


Figure 5-11: Building material selection

The complete list of building materials is in alphabetical order. The desired type can be selected and confirmed here. Slow scrolling is possible using vertical swipe gestures over the middle. The scroll bar on the right side is used for fast scrolling (see Figure 3-6 (1))



Figure 5-12: Complete building material selection list

If the functions of the lower bar are changed in the building material selection (Figure 5-11), buttons are displayed with the option (1) for keyword search and option (2) for editing the building material Favourites list.

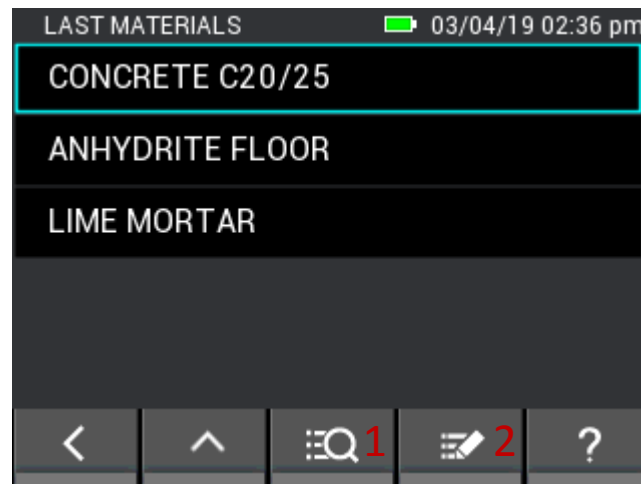


Figure 5-13: Selection of building material with further options

In the building material search, the complete name of a building material or only any part of it can be entered before the search is started. Button (1) in Figure 5-14 clears the entire input; button (2) deletes the last character of the input.

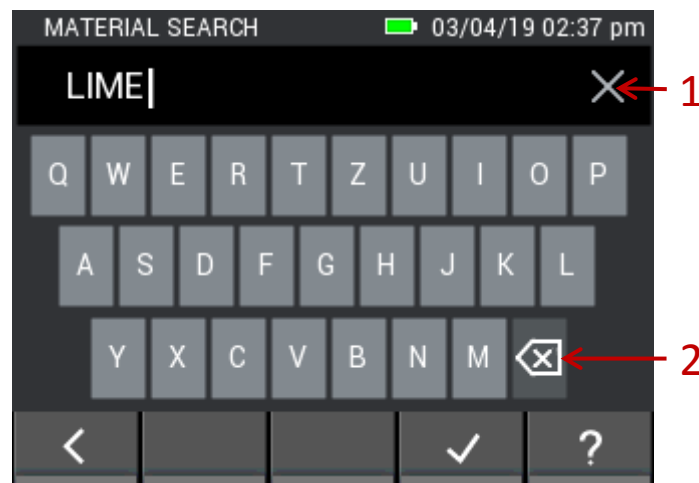


Figure 5-14: Keyboard input for the building material search

When editing the building material favourites, you arrive at the following menu (Figure 5-15). It is possible here to add new building material favourites and remove existing ones. With button (1), a search for a building material can be performed again. Button (2) sorts the building material Favourites list alphabetically. Button (3) enables deletion of entries from the Favourites list. By tapping and holding a material button in the favourites list, this can be moved up and down in the list by swiping.



Figure 5-15: Editable list of building material favourites

5.3 Temperature ET 10 BL / OT 100 BL / TT 40 BL

The respective sensors are suitable for measuring the material temperature, surface temperature or gas temperature with a Pt100 sensor: ET 10 BL / OT 100 BL / TT 40 BL

5.3.1 Measured values

1. Temperature [°C]



Figure 5-16: Symbol for the temperature at the probes

5.4 Relative air humidity and temperature probes

The following probes are suitable for the measurement of the relative air humidity and the temperature:

TF Stick / RH-T37 BL / RF-T28 BL

5.4.1 Measurements

1. Relative air humidity [%]



Figure 5-17: Symbol for the relative air humidity of the probes

2. Air temperature [°C]



Figure 5-18: Symbol for the air temperature of the probes

5.4.2 Settings

1. Additional measured values

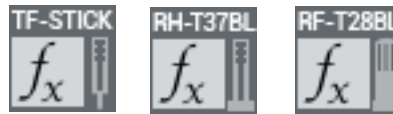


Figure 5-19: Additional or calculated value of the probes

An additional measurement is displayed in various measurement modes. This can be selected from a list in a menu.



Figure 5-20: Displayable measurements for temperature / humidity sensors

List of additional measurements

The following measurements are available for the TF Stick, RH-T37 BL, RF-T28 BL and TF-IR BL sensors.

- absolute air pressure [mbar]
- absolute air humidity [g/m^3]
- dew point temperature [$^{\circ}\text{C}$]
- wood equilibrium moisture content [%]
- water activity
- wet bulb temperature [$^{\circ}\text{C}$]
- enthalpy [kJ]
- mixing ratio [g/kg]

The following sorption isotherms of materials are only available for the **TF Stick** and **RH-T37 BL** sensors.

- cement screed [%]
- anhydrite screed [%]
- concrete [%]
- cement mortar [%]
- gypsum plaster [%]
- lime sand brick [%]



- lime cement mortar [%]
- insulation wood fibre insulating boards [%]
- mineral wool insulation [%]
- brick [%]
- hardwood beech [%]
- softwood pine [%]

5.5 Relative air humidity, temperature and surface temperature probe TF-IR BL

5.5.1 Measured values

1. Relative air humidity [%]



Figure 5-21: Symbol for the relative air humidity of the TF-IR BL

2. Air temperature [°C]



Figure 5-22: Symbol for the air temperature of the TF-IR BL

3. Surface temperature [°C]



Figure 5-23: Symbol for the surface temperature of the TF-IR BL

5.5.2 Settings

1. Surface emission factor and laser activation



Figure 5-24: Symbol for options of the TF-IR BL for the emission factor and for the

In the menu shown, the surface emission factor can be set by user input, and the laser for measuring point acquisition can be activated and deactivated. The laser is not needed to measure the surface temperature; it is only used to determine the position of the measuring point on the surface. The emission value depends on the material to be measured and the condition of the surface. Some emission values can be taken from the literature. For unknown emission values of the object to be measured, GANN provides a **matt black sticker IR 30/E 95 (order no. 5833)** which can be applied to a surface whose emission factor is unknown in order to determine the surface temperature with a setting of **0.95** as the emission factor.

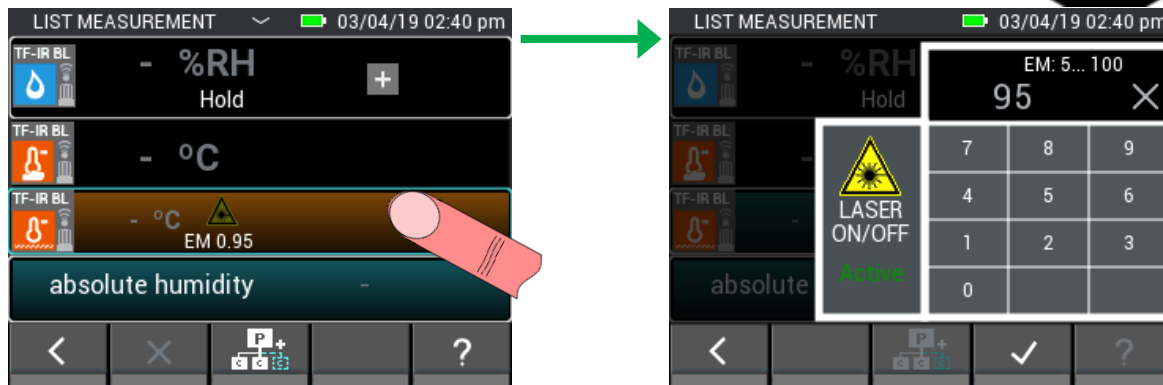


Figure 5-25: Menu for setting the emission factor and for activation of the laser for the TF-IR BL

Description for Figure 5-25:

- 1.1 Button for clearing the input.
- 1.2 Button for activating and deactivating the laser on the measuring instrument.

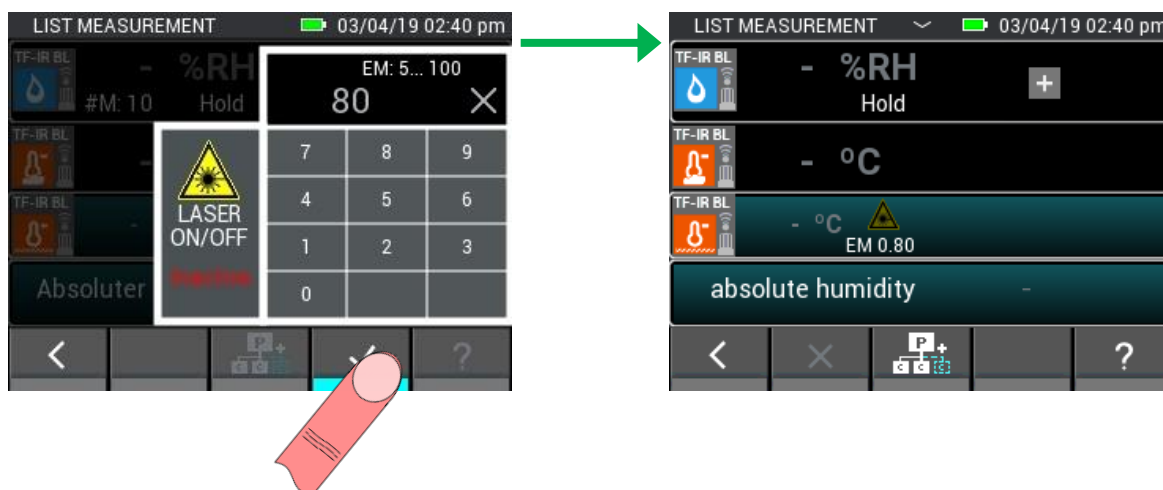


Figure 5-26: Change of the emission factor and deactivation of the laser

2. Additional measured values

See chapter 3.1.2



Figure 5-27: Additional or calculated value of the TF-IR BL

5.6 Surface temperature probe IR 40 BL

5.6.1 Measured values

1. Surface temperature [°C]



Figure 5-28: Symbol for the surface temperature for the IR 40 BL

5.6.2 Settings

1. Surface emission factor and laser activation



Figure 5-29: Symbol for options of the IR 40 BL for the emission factor and for the

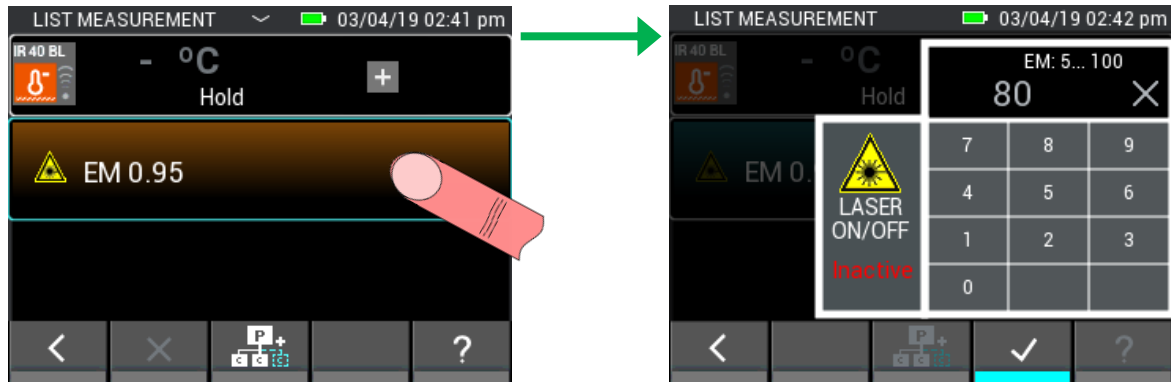


Figure 5-30: Menu for setting the emission factor and for activation of the laser for the IR 40 BL

5.7 Air velocity probe LG-25 BL

5.7.1 Measured values

1. Air velocity [m/s]



Figure 5-31: Symbol for the air velocity for the LG-25 BL

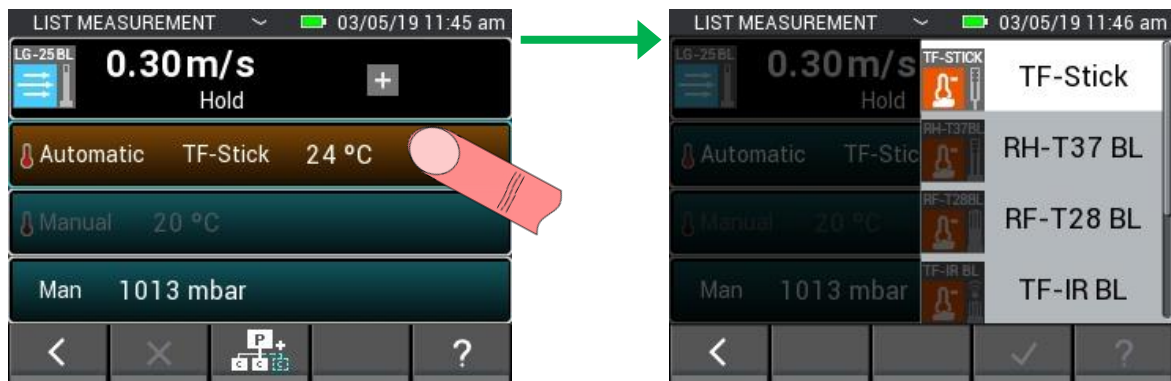


Figure 5-32: Sensor selection for the automatic temperature compensation

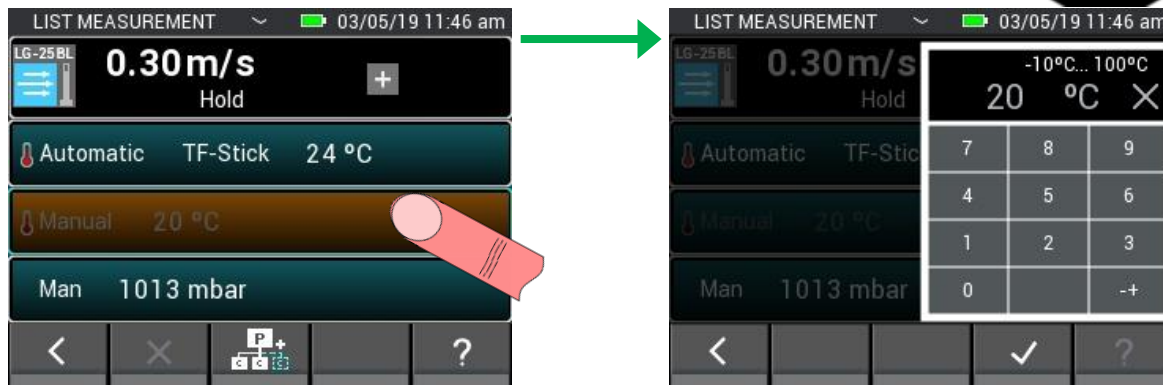


Figure 5-33: Setting for the manual temperature compensation

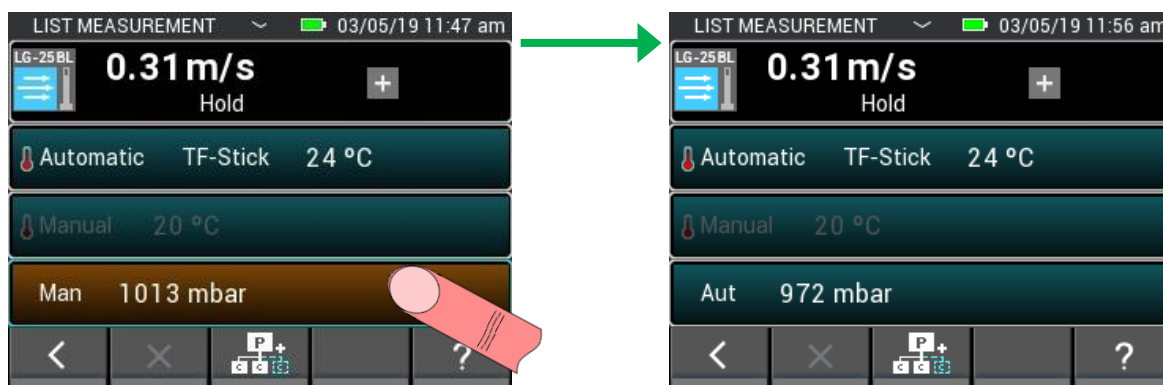


Figure 5-34: Change to automatic pressure compensation

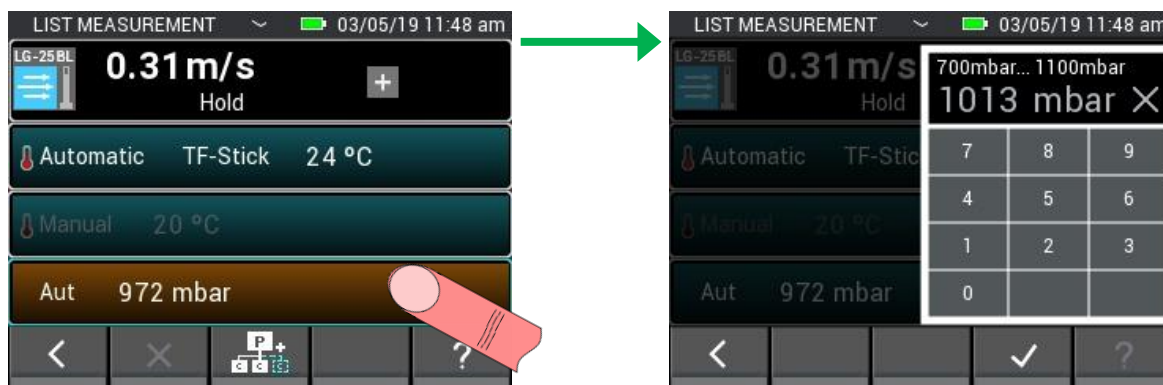


Figure 5-35: Change to manual pressure compensation and setting of the pressure value

The thermal anemometer measures the standard velocity in relation to the standard temperature and standard pressure. Therefore, the measured value must be converted to the real velocity.

$$w_R = \frac{w_N}{T_N} * \frac{T_R}{T_N} * w_N$$



w_R – real air velocity

p_N – standard pressure 1013.25 mbar

T_N – standard temperature 20 °C

T_R – real temperature (this is read out via the TF Stick; if this is not plugged in, the value is set to 20 °C)

p_R – real pressure (this is read out via the internal pressure sensor)

5.8 Capacitive building moisture sensor B 55 BL

5.8.1 Measured values

1. Material moisture [% / digits]



Figure 5-36: Symbol for the capacitive building moisture sensor

5.8.2 Settings

1. Material

The material to be measured for a measurement with the B 55 BL can be selected from a list in a menu as shown in the following Figure 5-37.

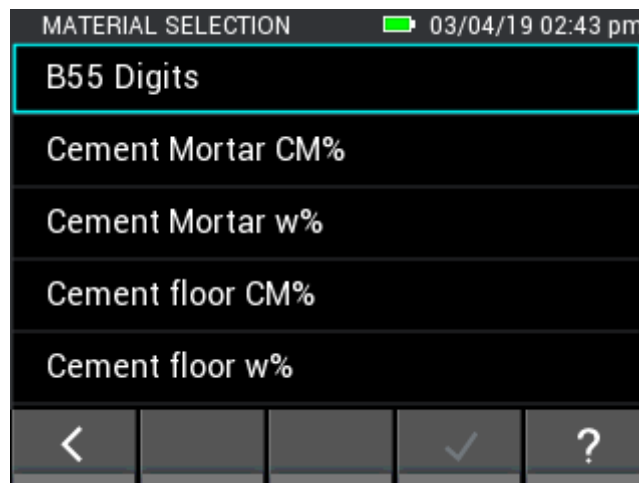


Figure 5-37: Menu for selection of the building material for the capacitive building moisture sensor

5.9 Integrated pressure sensor

The Hydromette CH 17 has sensor that measures the absolute air pressure. The measuring range of the sensor is 300...1100 mbar with a typical accuracy of ± 1 mbar. The measured pressure value can

be used in combination with other sensors for the pressure compensation of the measured values or for the calculation of other factors.

5.9.1 Measured values

1. Absolute air pressure [mbar]



Figure 5-38: Symbol for the internal air pressure sensor of the Hydromette CH 17

6 Project Structure

The measured values for the list and grid measurements are saved in batches, which in turn are contained in projects. The number of projects depends on the available software licence. The user always has 20 batches available in the internal memory of the device. The batches can be distributed to any number of projects. 100 measurements per batch can be stored. A maximum of 10 rows and 10 columns can be selected for the grid measurement to obtain a 10x10 grid.

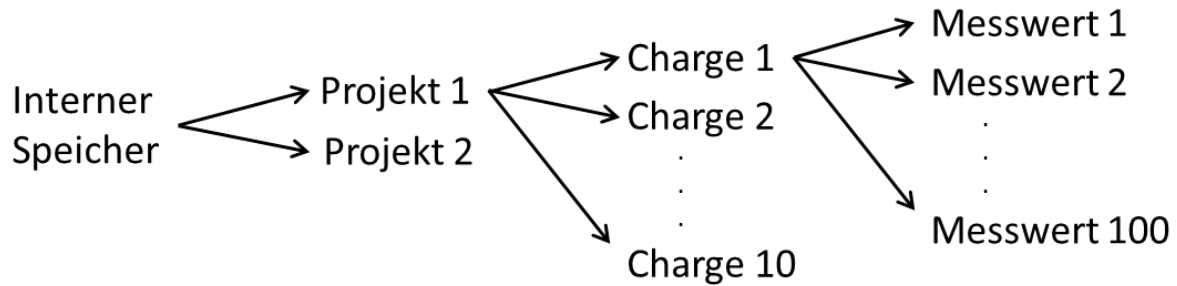


Figure 6-1: Example structure of a project with ten batches

If a micro SD card is also used in the device and an appropriate software licence is available, another 100 batches can be created on the micro SD card.

Projects and batches are numbered consecutively by default and receive the next possible free number when a new element is created. When deleting, its number is released and can be used again for a newly created element. Individual names can be allocated so that projects and batches can be assigned to appropriate measurement tasks more easily.

6.1 Project Menu

The Project menu is available to the user to manage projects and batches or to select a project and a batch for a measurement. This can be opened in the main menu and during a list or grid measurement. If the Project menu can be opened, this is indicated by a white arrow in the middle of the upper bar.



Indicates that the Project menu can be opened

Figure 6-2: Indication of the availability of the Project menu in the upper bar

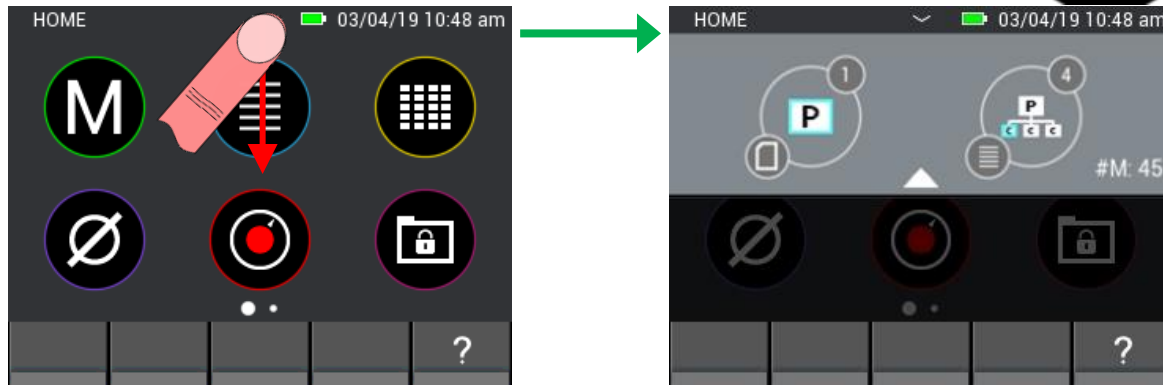


Figure 6-3: Project menu display

A swipe gesture from top to bottom over the white arrow in the upper bar opens the Project menu.

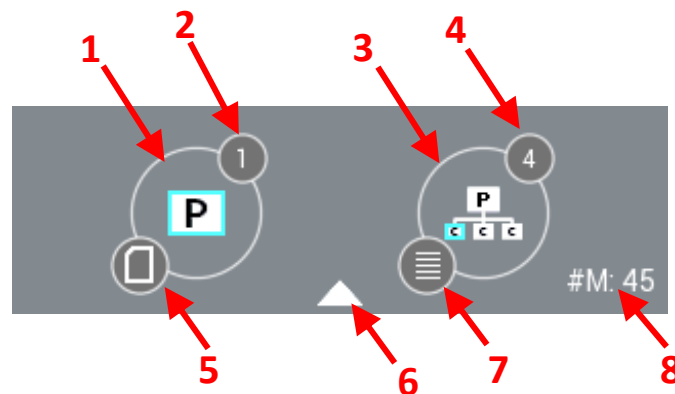


Figure 6-4: Description of the Project menu

Description of the Project menu in Figure 6-4:

1. Button which opens the project selection window
2. Index of the currently selected project
3. Button which opens the batch selection window
4. Index of the currently selected batch
5. Icon shows the currently used storage
6. The Project menu can be closed using a vertical swipe gesture over this arrow
7. Shows the measurement mode of the currently selected batch for a list or grid measurement. This icon is not displayed if no measurement mode has been defined yet.
8. Shows the matrix dimensions used for a grid measurement and the number of saved values for a list measurement. Nothing is displayed here if no measurement mode has been defined yet.

6.2 Project Selection

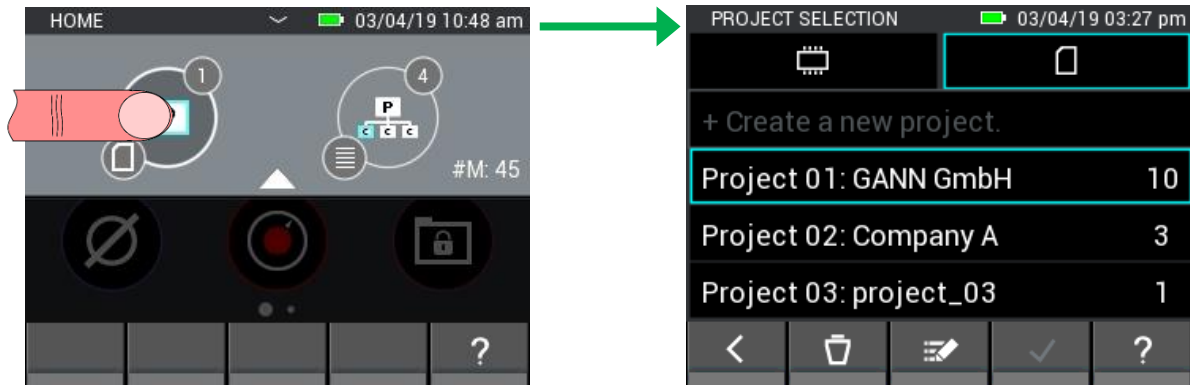


Figure 6-5: Project Selection

The Project Selection can be reached by tapping the left button in the Project menu. It is possible here to switch between the internal memory and the micro SD card, and to select the desired project and use it with the "Confirm" button. It is also possible to create new projects, rename existing projects or delete them.

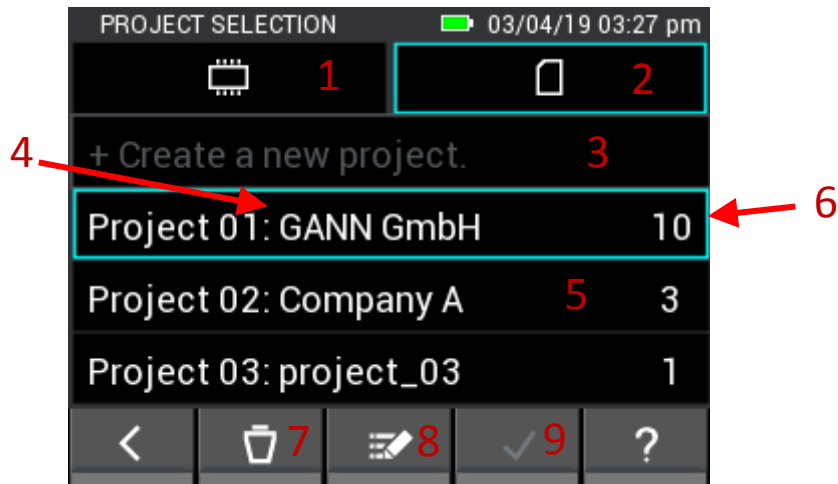


Figure 6-6: Project selection on the micro SD card

Description for Figure 6-6:

1. Tab which allows project selection in the internal storage.
2. Tab which allows project selection on the micro SD card
3. Button for creating a new project
4. Designation of the project
5. Button for selecting the project
6. Number of batches contained in the project
7. The currently selected project can be deleted by tapping the "Delete" button

Attention: Deleting a project also deletes all batches it contains!

8. The name of the currently selected project can be edited by tapping the "Edit" button
9. The "Confirm" button confirms the selected project as the current project and exits the menu

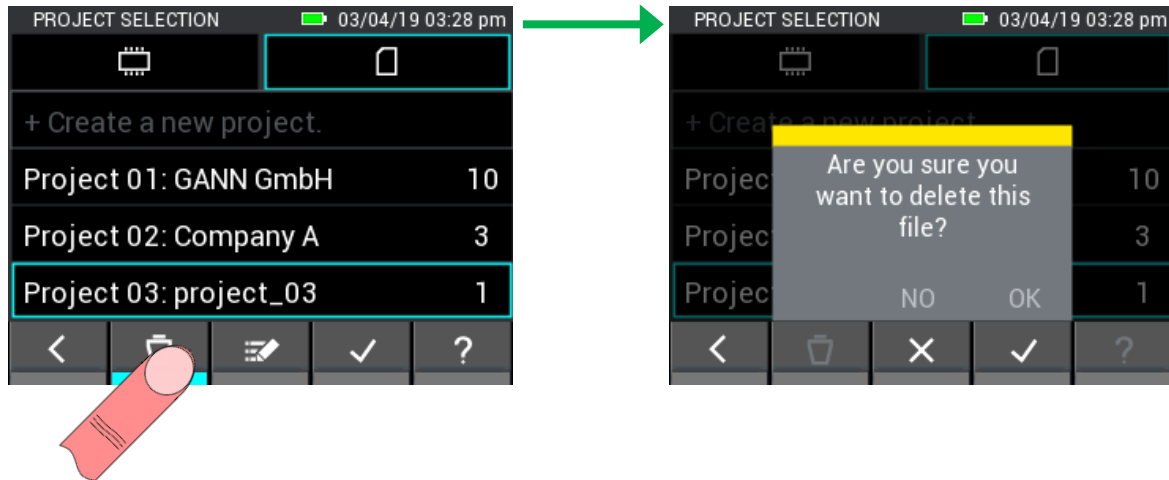


Figure 6-7: Deletion of projects

The project selection in the internal storage is equivalent to that of the micro SD card.

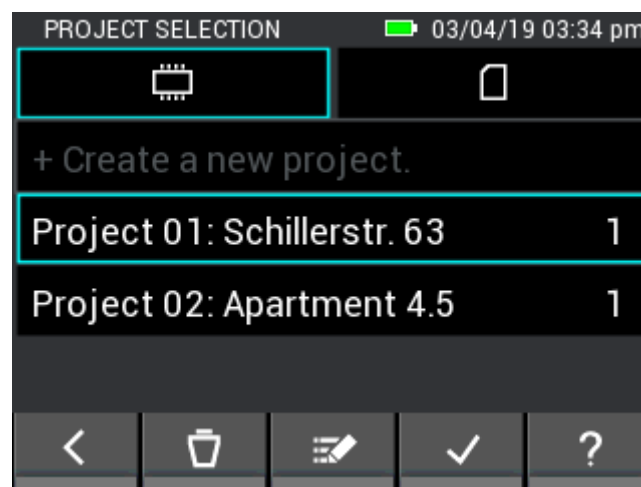


Figure 6-8: Project selection in the internal storage

6.3 Batch Selection

Tap on the right button in the Project menu to reach the Batch Selection screen. The required batch can be selected here and used with the "Confirm" button. It is also possible to create new batches, rename existing batches or delete them.

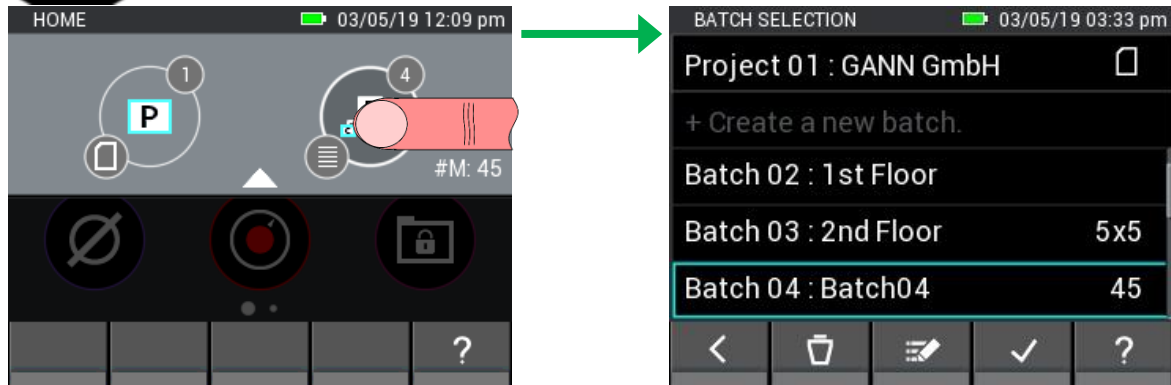


Figure 6-9: Batch selection

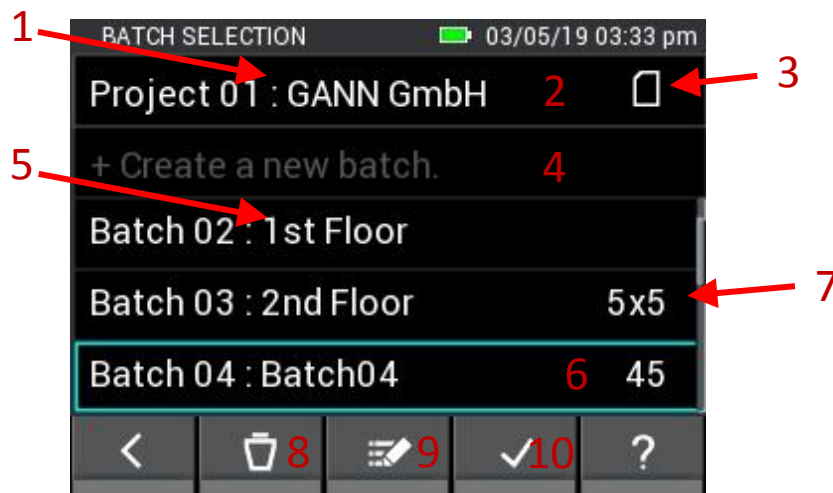


Figure 6-10: Project selection on the micro SD card

Description for Figure 6-10

1. Designation of the currently selected project
2. Button which opens the project selection window
3. Symbol that indicates which storage you are currently using
4. Button for creating a new batch
5. Designation of the respective batch
6. Button for selection of the batch
7. Shows the matrix dimensions used for a grid measurement and the number of saved values for a list measurement. Nothing is displayed here if no measurement mode has been defined yet.
8. The currently selected batch can be deleted by tapping the Delete button.
9. The name of the currently selected batch can be edited by tapping the "Edit" button
10. The "Confirm" button confirms the selected batch as the current batch and exits the menu

7 List Measurement



Figure 7-1: Symbol for the list measurement

List measurement is used for recording the measured values in list form. Values of up to two sensors can be saved in one batch with a time stamp (for selection of the batch, see chapter 6 Project Structure). Furthermore, the set limit values (see chapter 3.10 Limits) are monitored during the list measurement and an audible alarm is signalled if the limit values are exceeded or undercut.

If you tap on the List Measurement icon in the main menu, the last batch used can be opened by confirming this in the prompt. If you would like to start a new project or a new batch instead, you reject the continuation. If no appropriate batch has been created yet or if the last used batch has been deleted, you are automatically forwarded to the creation of a new batch or a new project.

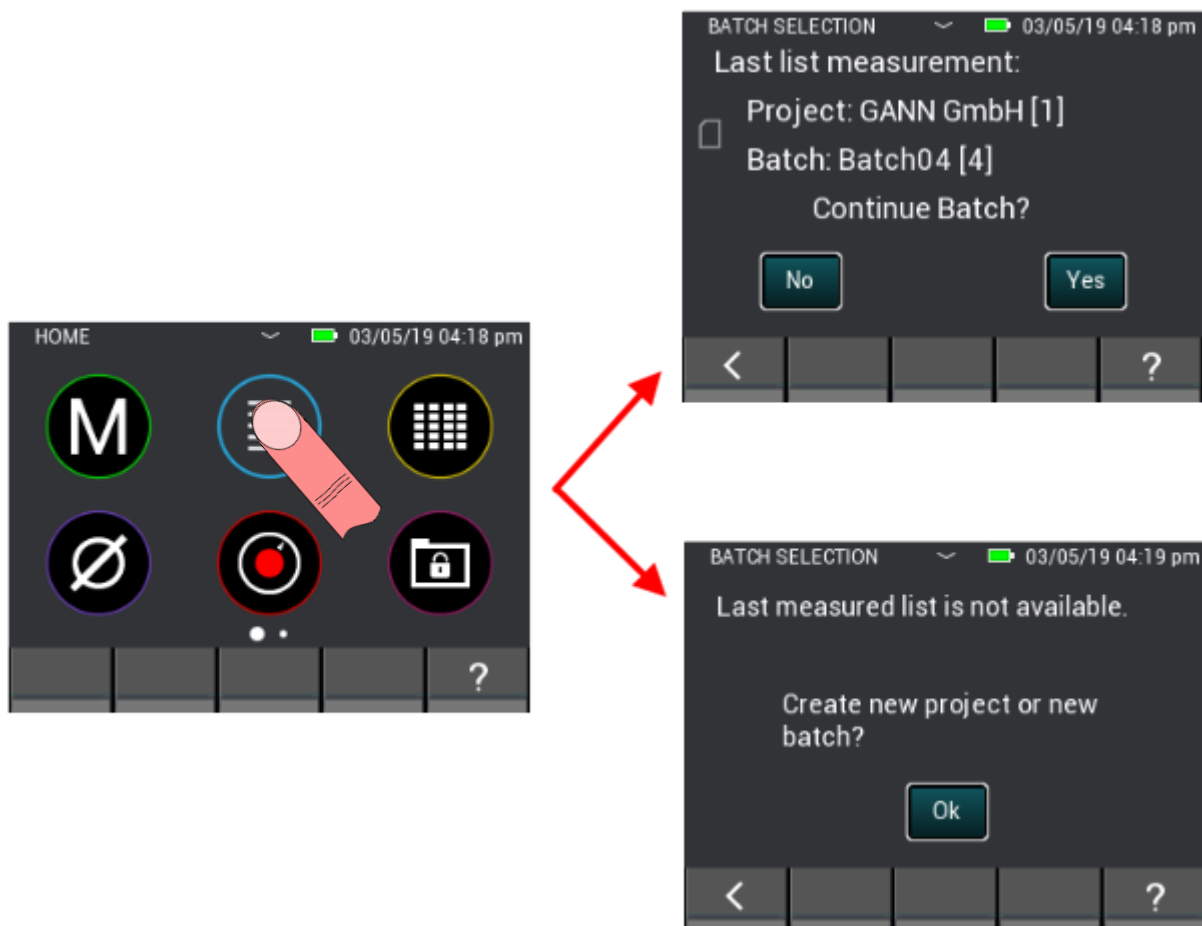


Figure 7-2: Selection to continue last list measurement or to create a new project or batch



If a new batch is created at the start of the list measurement, this is created in the last selected project.

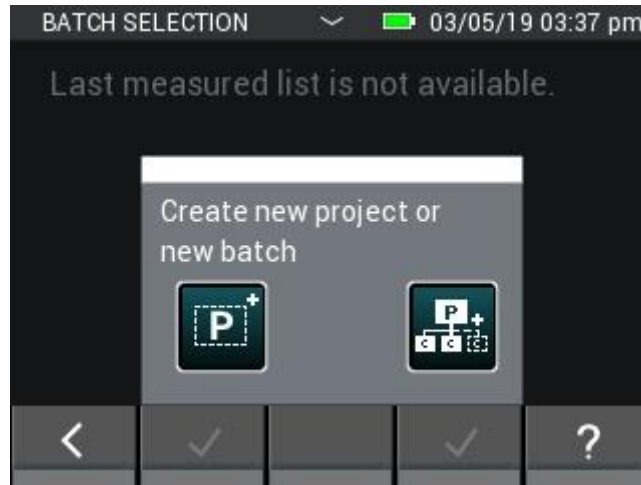


Figure 7-3: Selection of new batch or new project to start list measurement

7.1 Sensor Selection

At least one or up to two sensors must be selected to start the list measurement. If no sensor is selected yet, the "+" button must be tapped to reach the Sensor Selection screen. If a sensor is already selected, the "+" button can be used to add another sensor or select a new sensor. However, this is only possible if no measured values have been saved in the list yet.

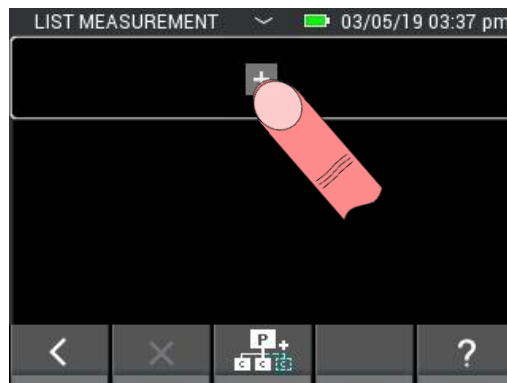


Figure 7-4: List measurement menu without selected sensor

If two sensors have already been selected, the upper button takes you to the Sensor Selection screen. In this case, however, the Sensor Selection screen can also only be reached if no measured values have yet been saved in the selected batch.



Figure 7-5: Upper button which takes you to the Sensor Selection screen for already selected sensors.

Up to two sensors can be selected in the Sensor Selection screen by tapping on the corresponding sensor icon. However, this only functions with sensors that are plugged in to the device. These are indicated by the bright lighting of the corresponding sensor icon. The correct selection of a sensor is indicated by the index at the top right of the sensor icon. All sensors are available for the list measurement.

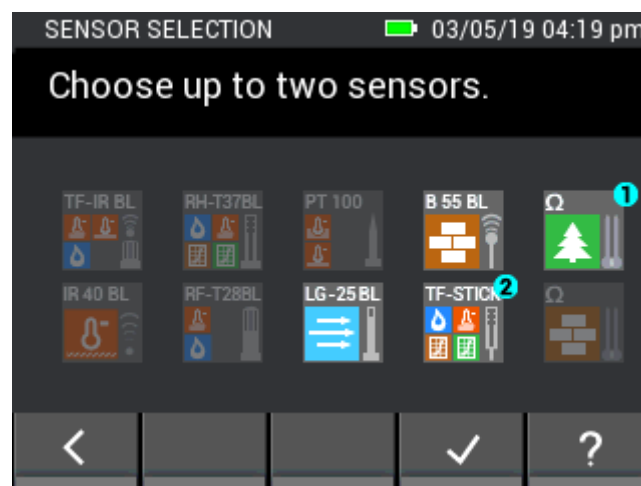


Figure 7-6: Sensor selection of the list measurement

7.2 Quick creation of a new batch in the list measurement

If you would like to create a new batch for the list measurement without ending the list measurement, this is possible using the middle button in the lower bar. Tap this button to create a new batch in the current project. It is now again possible to select up to two sensors and save up to 100 measurements.



Figure 7-7: Symbol for the creation of a new batch in the List Measurement menu

7.3 Deletion of the last saved value

If a measurement has been saved inadvertently, the last saved measurement can be deleted from the list using the "X" button in the lower bar.

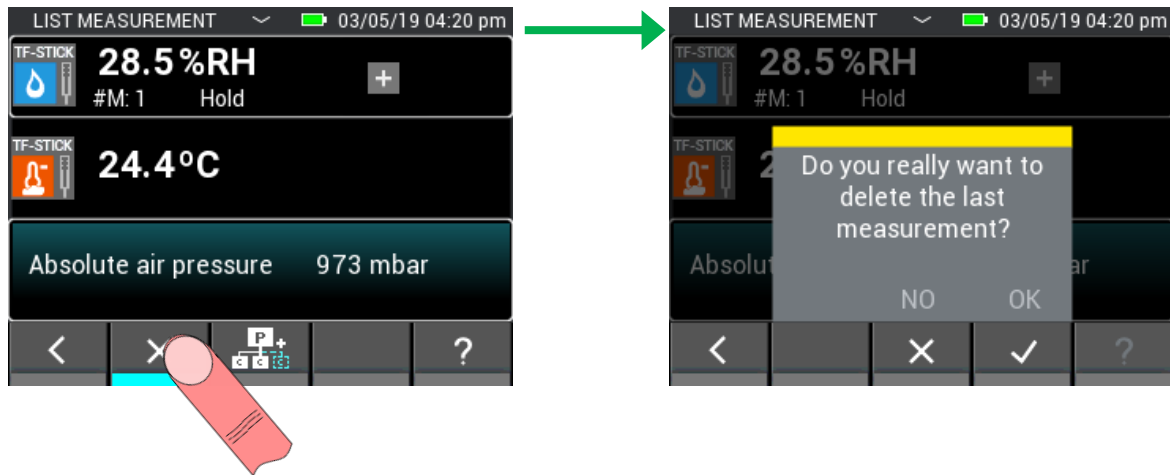


Figure 7-8: Deletion of the last saved measurement for the list measurement

7.4 Measurement

Once the required sensors have been selected, the measurement can be started immediately. A measurement process is started by pressing the "Measure" button. The measured values are updated while the button is kept pressed. The "Hold" symbol in the display disappears. When the "Measure" button is released, the last measured values remain on the display and the "Hold" symbol is displayed again. Press the Save button to add the current measured values to the list with a time stamp. If no measurement is performed before the data are saved, and the measured values are still marked as a dash, an initial value is saved to identify this case in the further processing of the data.

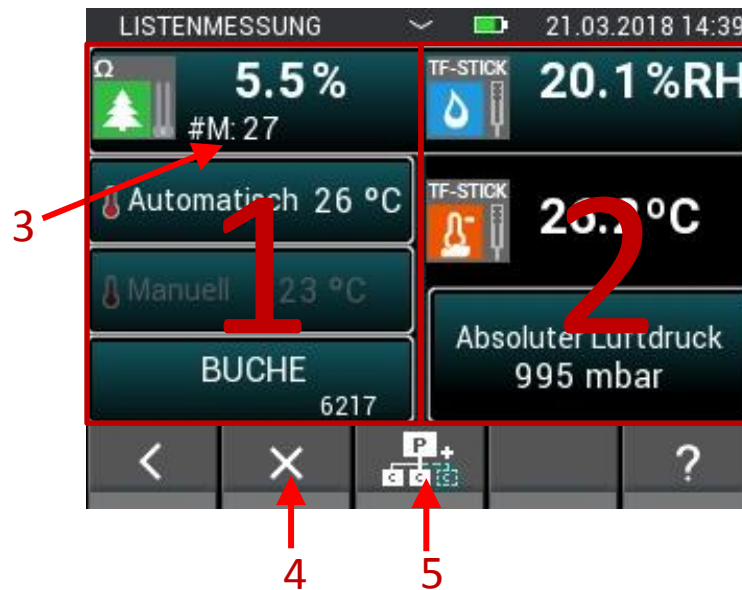


Figure 7-9: Measurement screen of the list measurement

1. The left measurement screen contains the configuration of Sensor 1.
2. The right measurement screen contains the configuration of Sensor 2.
3. Shows the number of measured values already written to the list. This is not displayed if no measured values have been recorded yet.
4. For deletion of the last saved measurement
5. When this button is tapped, a new batch is created directly in the current project and opened in list measurement mode.

7.5 Sensor Settings

The individual fields of the sensors for the list measurement are described below.

7.5.1 TF Stick / RH-T37 BL / RF-T28 BL

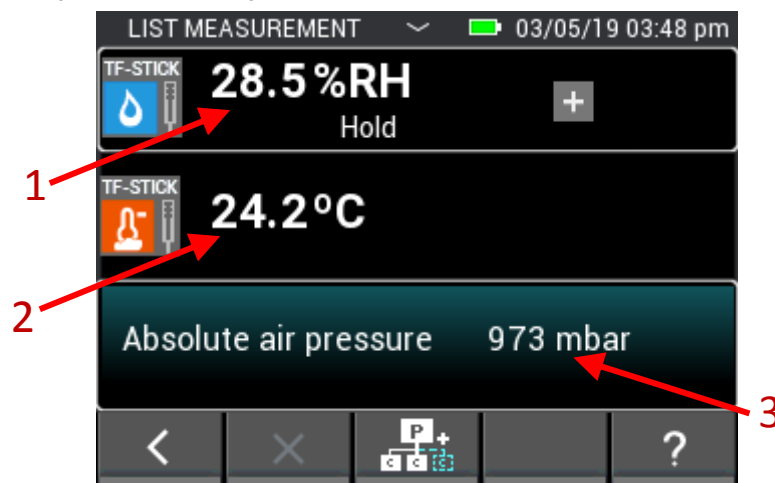


Figure 7-10: Measurement screen of the list measurement with a TF Stick

1. Relative air humidity in %.
2. Air temperature in °C.
3. This field shows the additional value. At the same time, this field is used as a button to open the configuration for setting the variable.

7.5.2 Resistance-based wood moisture

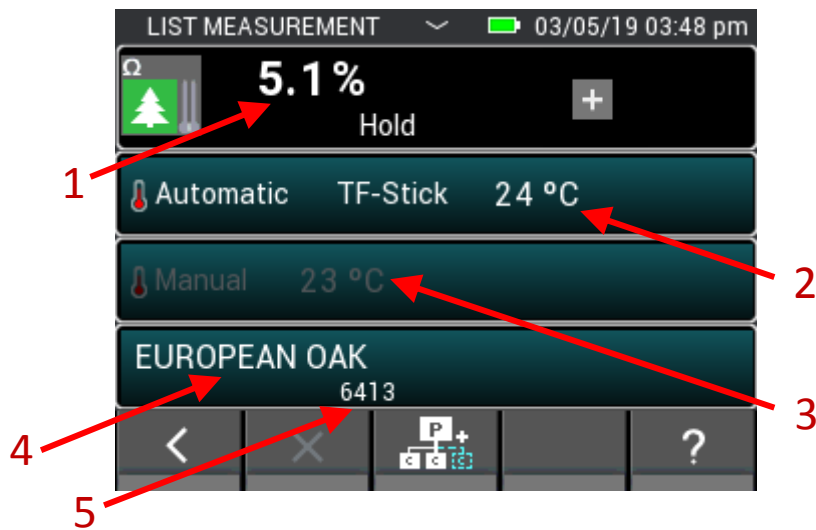


Figure 7-11: Measurement screen of the list measurement with resistance-based wood moisture measurement

1. Wood moisture in %.
2. Automatic compensation temperature. The manual temperature compensation is active if this field is greyed out. Tapping on this field opens the menu in which the sensor used can be selected.
3. Manual compensation temperature. The automatic temperature compensation is active if this field is greyed out. Tapping on this field opens the menu in which the user can input the compensation temperature.
4. This field contains the type of wood used. Tapping on this field opens the Wood Type Selection screen.
5. Shows the material ID of the wood type.

7.5.3 Resistance-based moisture content of building materials



Figure 7-12: Measurement screen of the list measurement with resistance-based moisture content of building materials

1. Building material moisture, depending on the set material, in digits or in percent by weight (% wt).

- This field contains the building material used. Tapping on this field opens the Building Material Selection screen.

7.5.4 ET 10 BL / OT 100 BL / TT 40 BL

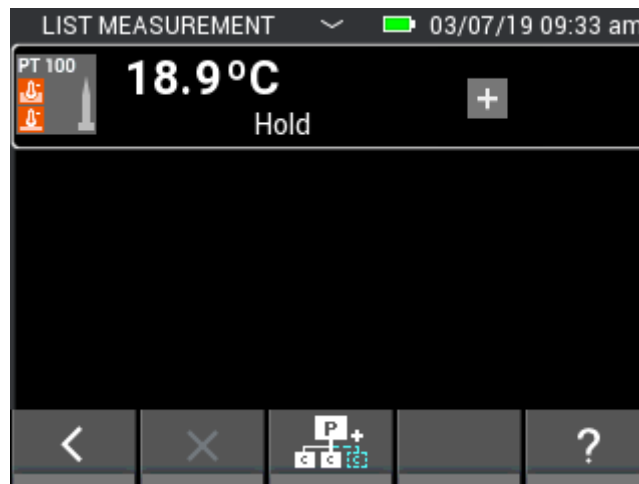


Figure 7-13: Measurement screen of the list measurement with a PT100 temperature sensor

7.5.5 TF-IR BL

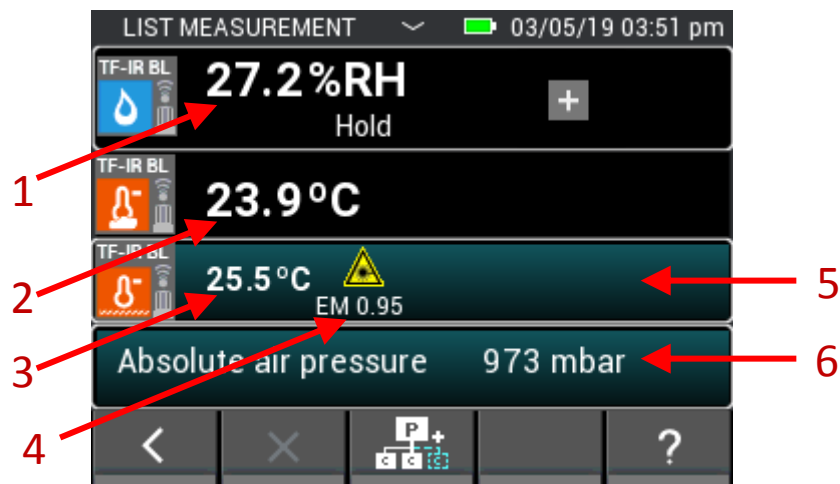


Figure 7-14: Measurement screen of the list measurement with a TF-IR BL

- Relative air humidity in %
- Air temperature in °C
- Infra-red temperature in °C
- Emission factor
- Button that opens the menu for the emission factor and the laser setting
- This field shows the additional value. At the same time, it functions as a button that opens the configuration for this variable.



7.5.6 LG-25 BL



Figure 7-15: Measurement screen of the list measurement with a LG-25 BL air velocity

1. Air velocity in m/s
2. Value for the automatic temperature compensation
3. Value for the manual temperature compensation
4. Value for the air pressure compensation

7.5.7 B 55 BL

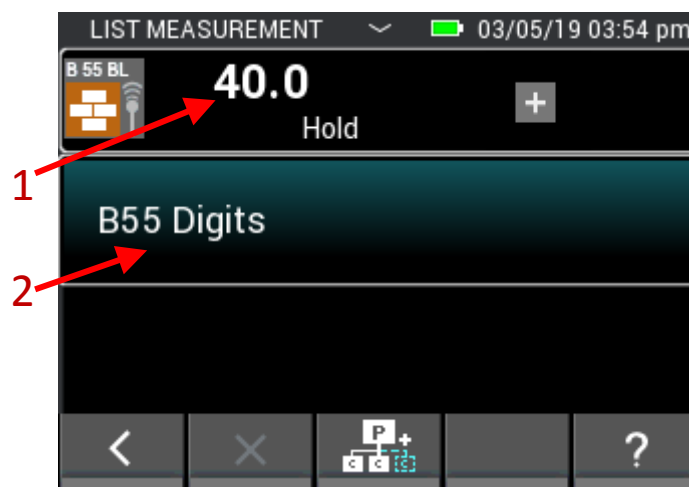


Figure 7-16: Measurement screen of the list measurement with capacitive building moisture measurement with a B 55 BL

1. Material moisture, depending on the setting in digits or %. If the measured value is preceded by a < or > character, this means that the limit value for this material has been undercut or exceeded.
2. This field shows the material used and has a button function that opens the Material Selection screen.

8 Grid Measurement (available only with software version "Advanced")



Figure 8-1: Icon of the grid measurement

The grid measurement provides the possibility to record measured values in a grid with one or two sensors at the same time and to save them in a batch (for selection of the batch, see chapter Project Structure).

If you tap on the Grid Measurement icon in the main menu, the last batch used can be opened by confirming this in the prompt. If you would like to start a new project or a new batch instead, you reject the continuation. If no appropriate batch has been created yet or if the last used batch has been deleted, you are automatically forwarded to the creation of a new batch or a new project.

If an existing grid measurement is continued, the existing settings are loaded from the storage.

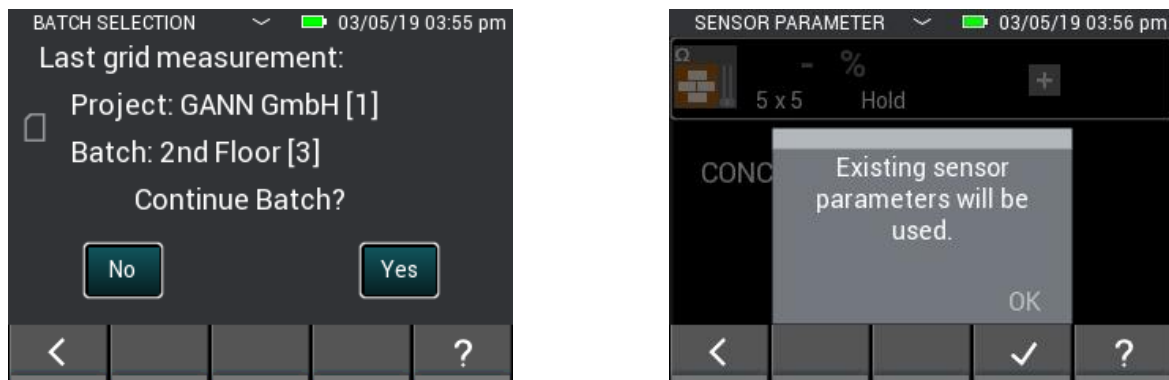


Figure 8-2: Parameters are adopted for the continuation of an existing grid measurement

In the case of a new grid measurement, settings must be made before the measurement.

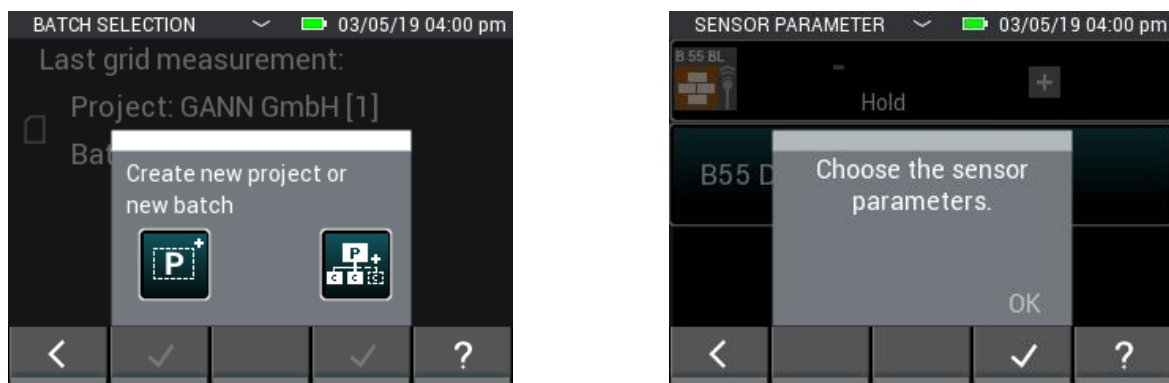


Figure 8-3: Notification for a new grid measurement that parameters for the measurement must be set



8.1 Sensor Selection

At least one or up to two sensors must be selected to start the grid measurement. If no sensor is selected yet, tap on the "+" symbol to reach the Sensor Selection screen.



Figure 8-4: No sensors have been selected yet before a grid measurement

If a sensor is already selected, the "+" button can be used to add another sensor or select a new sensor. However, this is only possible if no measured values have been saved in the list yet.

If two sensors have already been selected, the upper button takes you to the Sensor Selection screen. In this case, however, the Sensor Selection screen can also only be reached if no measured values have yet been saved in the selected batch.



Figure 8-5: Selected sensors before a grid measurement

Up to two sensors can be selected in the Sensor Selection screen by tapping on the corresponding sensor icon. However, this only functions with sensors that are plugged in to the device. These are indicated by the bright lighting of the corresponding sensor icon. The correct selection of a sensor is indicated by the index at the top right of the sensor icon. All sensors are available for the grid measurement.

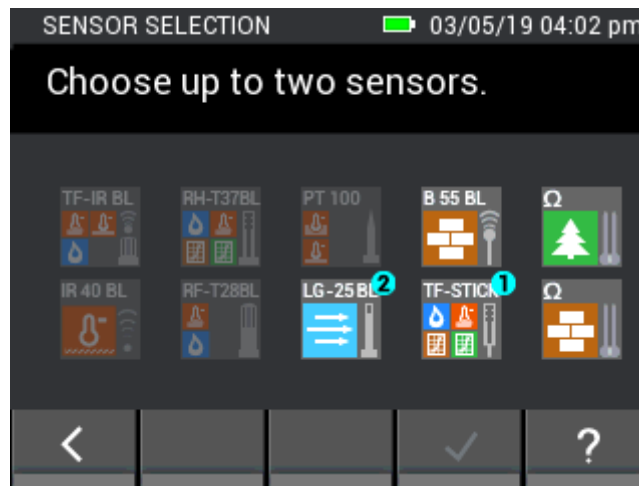


Figure 8-6: Sensor selection for a grid measurement

8.2 Sensor configuration

The sensor settings that can be made before the grid measurement are shown below.

8.2.1 TF Stick / RH-T37 BL / RF-T28 BL



Figure 8-7: Measurement screen of the grid measurement for a TF Stick

1. Tapping on this field opens the configuration for other displayable variables. However, this selected variable can still also be changed during the grid measurement.

8.2.2 Wood Moisture

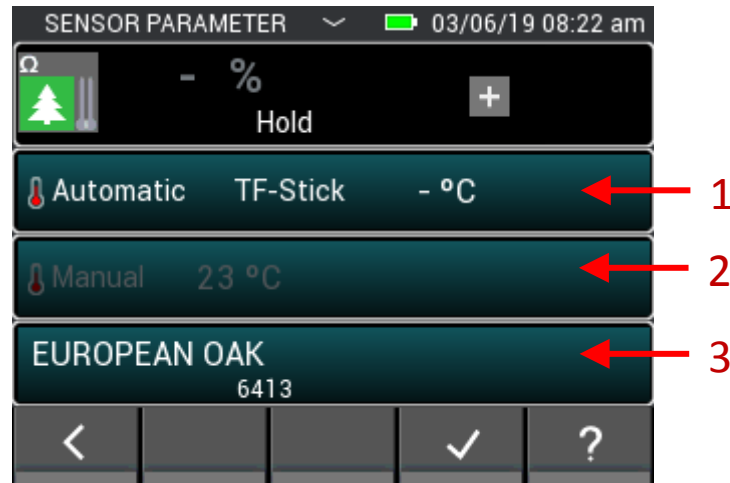


Figure 8-8: Parameters of the grid measurement for a resistance-based wood moisture measurement

1. Tapping on this field opens the menu in which the sensor used for the automatic compensation temperature can be selected. The manual temperature compensation is active if this field is greyed out. This value cannot be changed during the grid measurement.
2. Tapping on this field opens the menu in which the user can input the manual compensation temperature. The automatic temperature compensation is active if this field is greyed out. This value cannot be changed during the grid measurement.
3. Tapping on this field opens the Wood Type Selection screen. The wood type can only be changed if no measured value has been saved yet. This can also not be changed during the grid measurement.

8.2.3 Building material moisture

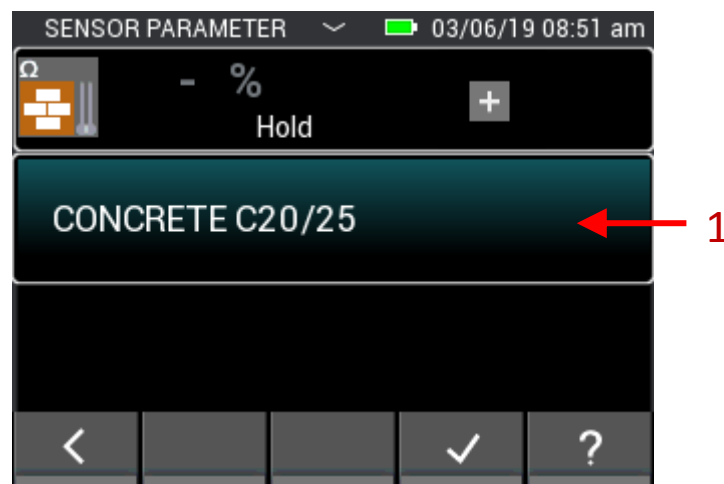


Figure 8-9: Parameters of the grid measurement for a resistance-based building moisture measurement

1. Tapping on this field opens the selection menu for the building material. The building material can only be changed if no measured values have been saved yet. The building material cannot be changed during the grid measurement.

8.2.4 TF-IR BL



Figure 8-10: Parameters of the grid measurement for a TF-IR BL

1. Button that opens the screen for selection of the emission factor and the laser setting. These settings can also not be changed during the grid measurement.
2. Tapping on this field opens the screen for the selection of other displayable variables. This value can also still be changed during the grid measurement.

8.2.5 IR 40 BL



Figure 8-11: Parameters of the grid measurement for an IR 40 BL

1. Button that opens the screen for selection of the emission factor and the laser setting. These settings can also not be changed during the grid measurement.



8.2.6 ET 10 BL / OT 100 BL / TT 40 BL

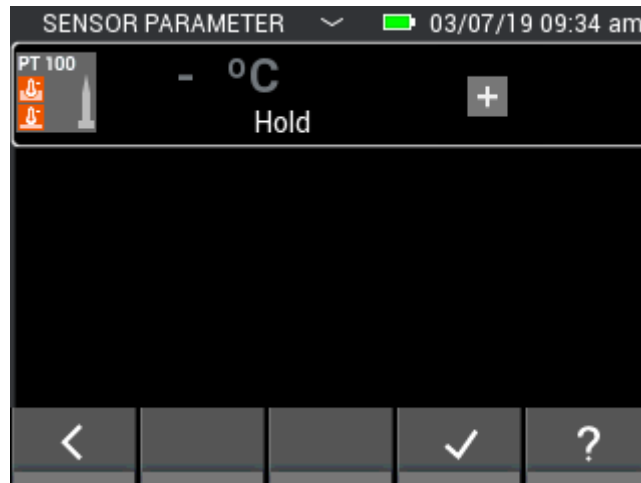


Figure 8-12: Parameters for the grid measurement of a Pt100 sensor

No settings can be made for a Pt100 sensor

8.2.7 LG-25 BL

Before the air velocity sensor LG-25 BL can be used for grid measurement, it must first be determined whether the temperature and pressure compensation of the air velocity should be performed automatically via sensors or whether manually defined values should be used for the compensation.

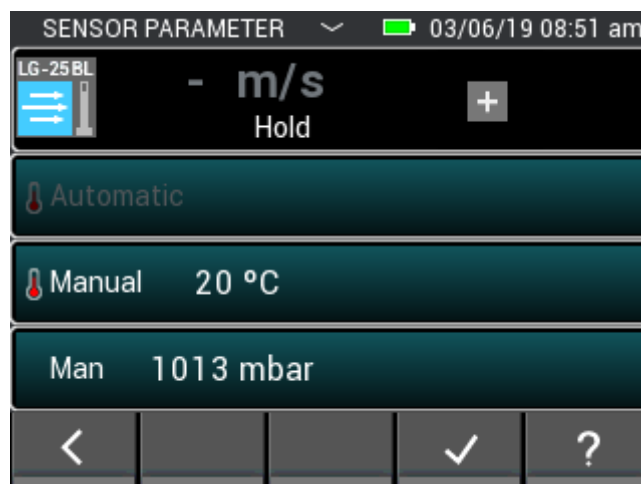


Figure 8-13: Parameters of the grid measurement for an LG-25 BL

8.2.8 B 55 BL

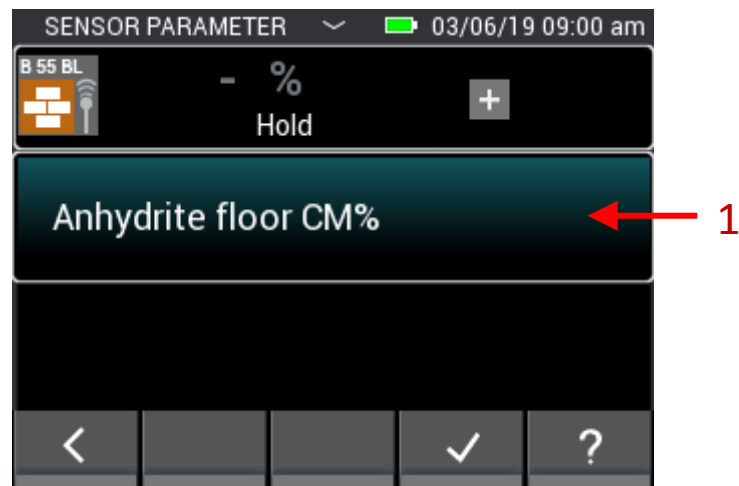


Figure 8-14: Parameters of the grid measurement for a capacitive building moisture measurement

1. Tapping on this button opens the screen for selection of the material. The material cannot be changed during the grid measurement.

8.3 Grid dimension

If measured values have not already been saved in the batch used, the dimension of the measuring grid must be set in the next step. The values can be adjusted using vertical swipe gestures. The left side is for the number of rows and the right side for the number of columns. Minimum value for both settings is two; the maximum is ten. The number of columns and rows can be increased later, but cannot be reduced later in the process.

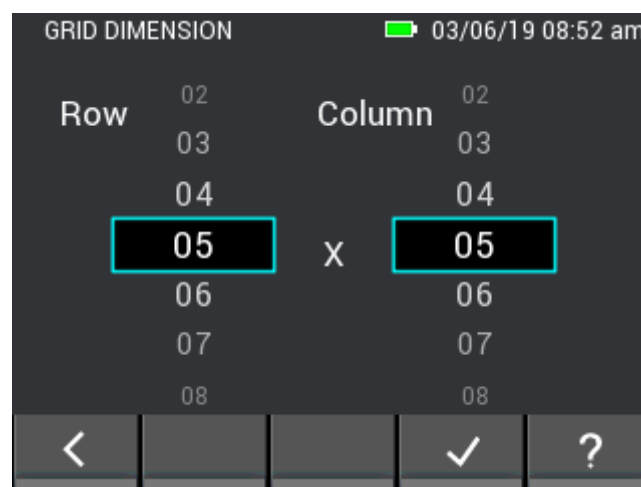


Figure 8-15: Selection of the grid dimension

8.4 Colours of the measurement fields for grid measurements

The minimum value in the grid has a deep blue background. The maximum value is marked with deep red. If values deviate by half a standard deviation from the mean value of the measurements, these are highlighted accordingly with a dark colour. If the value is half a standard deviation below the mean value, it is marked dark blue; if it is half a standard deviation above the mean value, it is marked dark red.

8.5 Measurement

If the grid dimensions have been set, the measurement screen opens as shown in the following figure and the user can start the measurement. Each field of the grid can now be filled with a measured value. To do this, the user can navigate between the fields by pressing the Save button on the device, thereby moving the field marking forward one field at a time. Alternatively, the fields can also be tapped on directly to select them. If the dimension of the grid is larger than 5x5, the concealed fields can be reached using swipe gestures over the grid. If the required field is selected, the measured value in this field can be updated by pressing the Measure button. The selected field is framed red while the measurement is running. It is not possible to change the field in this time.

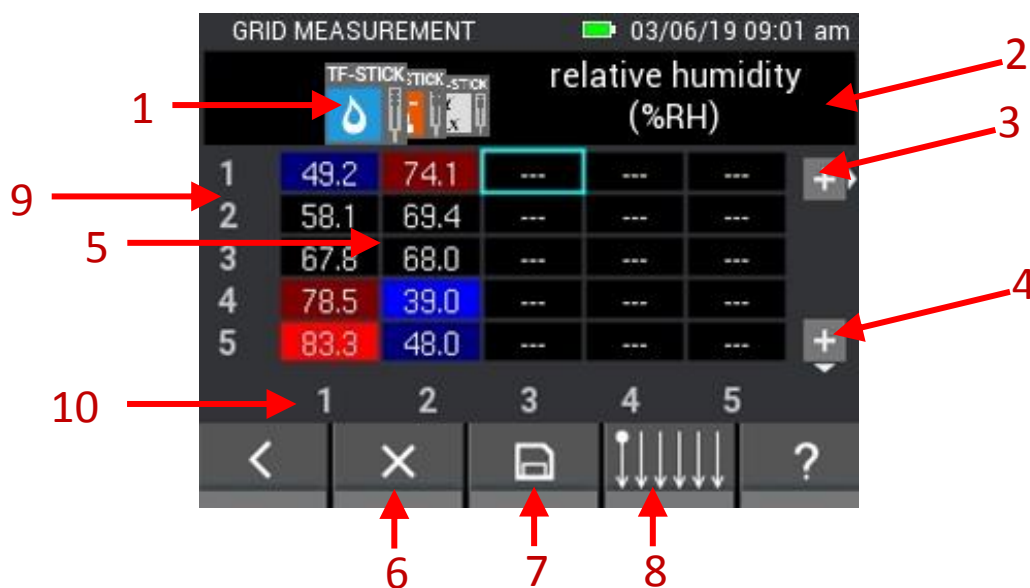


Figure 8-16: Description of the elements for the grid measurement

1. Each measured value is selected via a tab; these can be moved using swipe gestures over the tabs.
2. The respective designation of the currently selected measured value is shown here. If the currently selected value is a modifiable value, this field functions as a button that opens the corresponding menu for the setting.
3. Tapping on this button adds a column to the grid. The button disappears if the batch already contains 10 columns.

4. Tapping on this button adds a row to the grid. The button disappears if the batch already contains 10 rows.
5. The grid contains the individual fields and shows the associated measured values depending on the selected tab. The colours of the fields depend on the type of the measured value. The colours vary depending on the measurement type; the brightness is oriented to the maximum of the measured values in the field, and increases with the magnitude of the measured value.
6. The Delete button deletes the measured value in the currently selected field.
7. The current grid is saved using the Save button.
8. This button opens a menu in which the direction of the grid measurement can be set.
9. Numbers show the row number.
10. Numbers show the column number.

A maximum of 5 columns and 5 rows can be displayed for the grid measurement. The scroll bars (1) and (2) in Figure 8-17 indicate that further measuring fields are available which can be reached using swipe gestures.

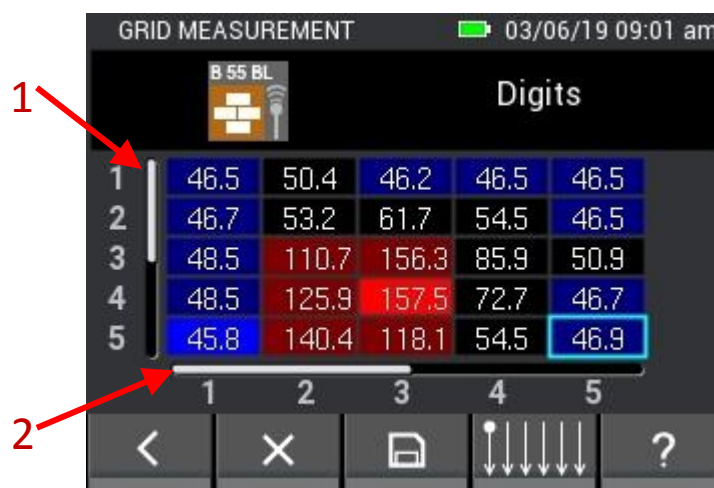


Figure 8-17: Display of a grid with more than 5 columns or 5 rows

8.6 Saving a grid measurement

For the grid measurement, the "Save" button on the device is only used for jumping to the next field. Tapping on the "Save" button in the lower bar saves the entire grid.

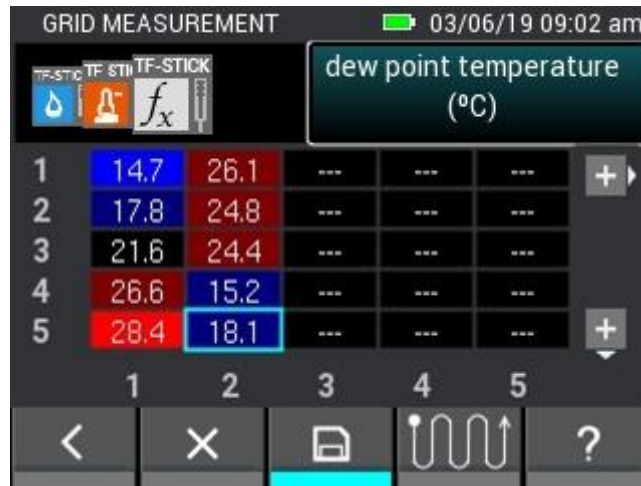


Figure 8-18: Saving of grid measurements

8.7 General notes for operation for a grid measurement

The displayed measurements can be selected by swiping over the sensor symbols. The current selection is displayed in the foreground and any further options on the side in the background.

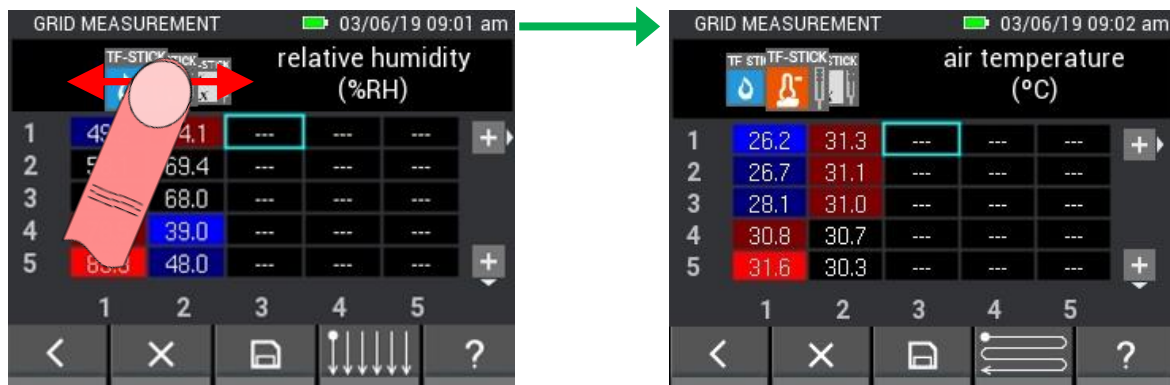


Figure 8-19: Selection of the displayed measurements in the grid using swipe movement

If no further measured variables are available before or after the current selection, this is indicated by a bar on the relevant page during swiping.

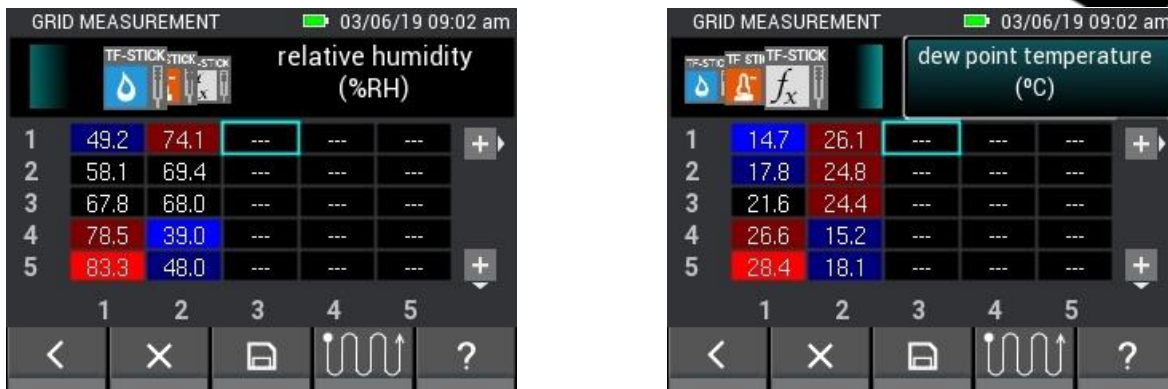


Figure 8-20: Left and right limit stop during swiping for selection of the displayed measurements

If a parameter can be adjusted and/or other calculated variables can be selected, this is indicated by a button. Tapping on the button opens a screen for selection of the possible options.

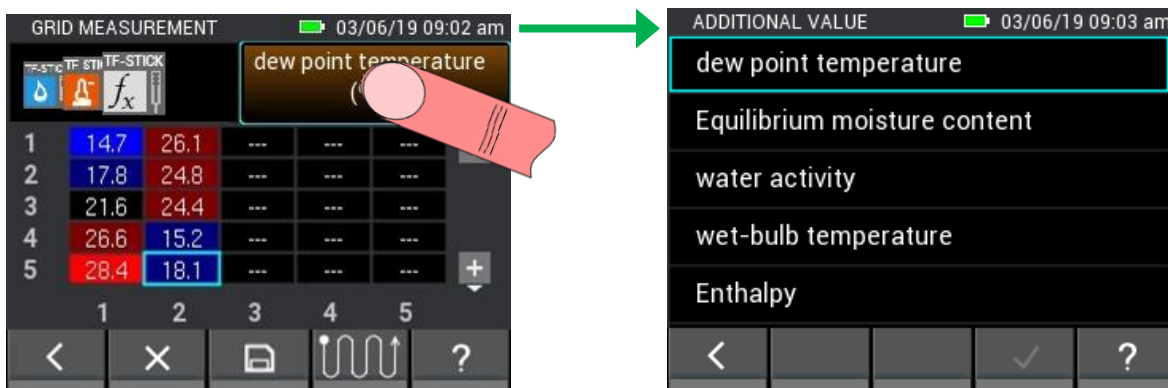


Figure 8-21: Selection of a calculated value for the grid measurement

A grid measurement starts at the top left by default and then goes column by column from top to bottom. If a different procedure for scanning the object is required, this can be set in the following menu. By pressing the "Save" button on the device, the selected field then jumps in the corresponding direction.

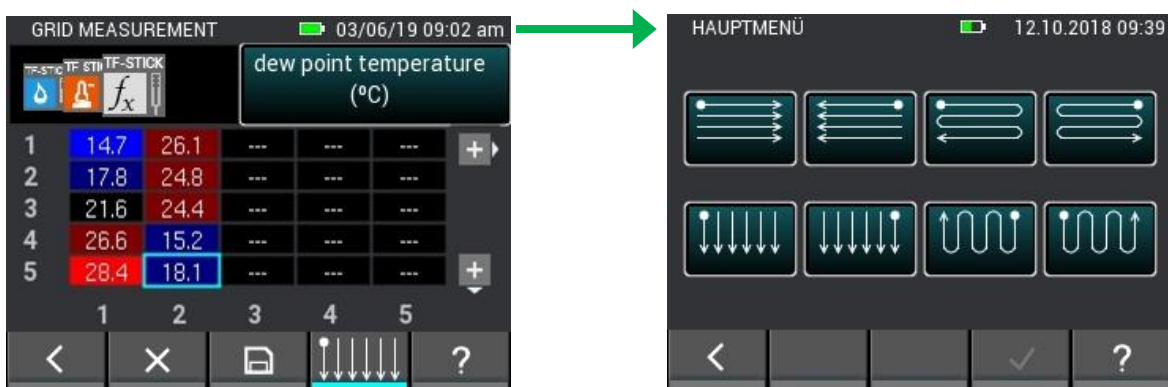


Figure 8-22: Change of direction for the grid measurement

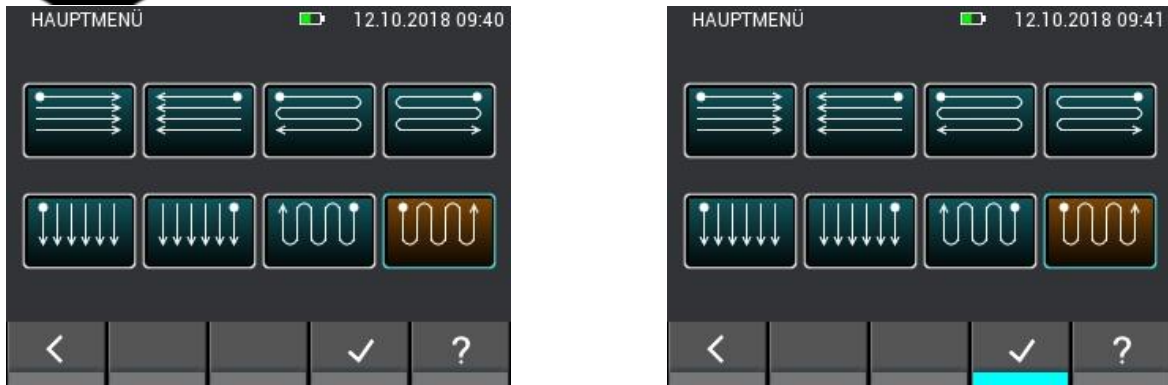


Figure 8-23: Selection of the direction for the grid measurement

If you are in a field in which there is already a measured value and start a new measurement or tap the "x" button, a window with several selection options opens. If you do not want to change the current value, select "No" at the "Overwrite existing value?" prompt. If you only want to change the value in this field and if necessary, receive another prompt, select "OK". Select "Always" if values in this case should always be overwritten or deleted. In this case, it is not prompted again whether fields with measured values should be edited until the grid measurement is closed and opened again.

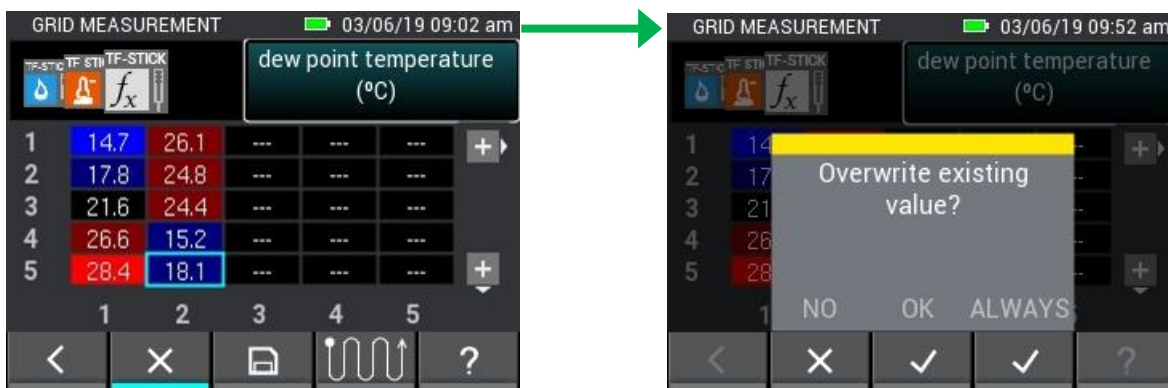


Figure 8-24: Deleting or changing values in cells

If you would like to exit the grid measurement by tapping on the "Back" button or pressing the "Home" button, a prompt for whether the not yet saved values in the grid should be saved is displayed.

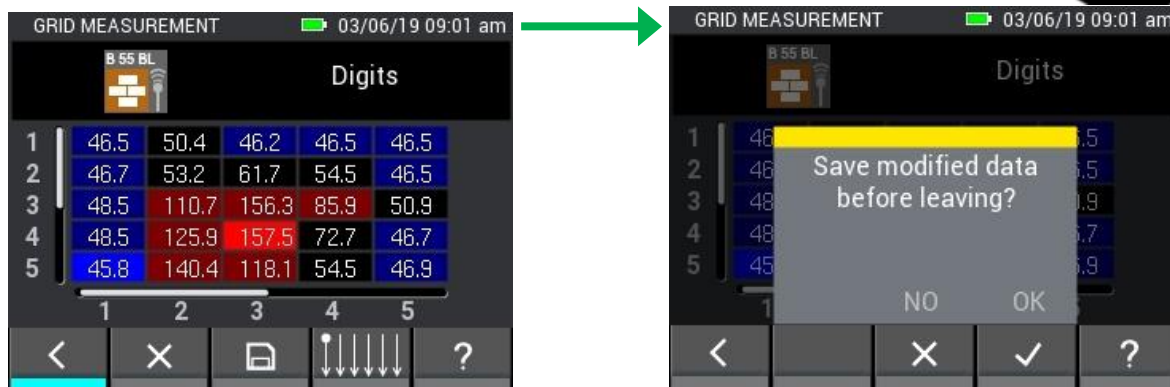


Figure 8-25: Prompt for whether changes should be saved before exiting from the grid measurement

8.8 Condensation limit special function for the TF-IR BL

In the case of a grid measurement with TF-IR BL, it is possible to display a grid showing the difference between the measured surface temperature and the dew point temperature. Fields where the surface temperature is at least 3.0 °C above the dew point have a green background, fields where the distance is smaller or where the surface temperature is even below the dew point have a red background. The menu can be reached by displaying the tab with the surface temperature and tapping on the corresponding button of the lower bar, as shown in the following Figure 8-26.

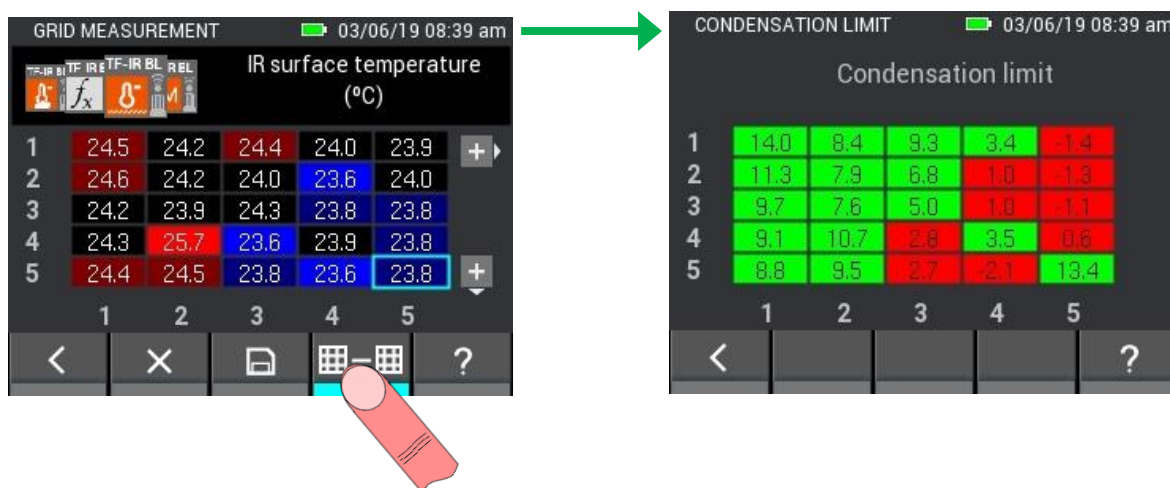


Figure 8-26: Special function of the TF-IR BL shows difference between surface temperature and dew point temperature

9 Project Archive



Figure 9-1: Icon of the project archive



The project archive contains all projects already created with the included batches. Statistical data for batches such as mean values, minimum and maximum values can be retrieved here. Batches can also be opened to display the already saved values and to add further measurements to a batch.

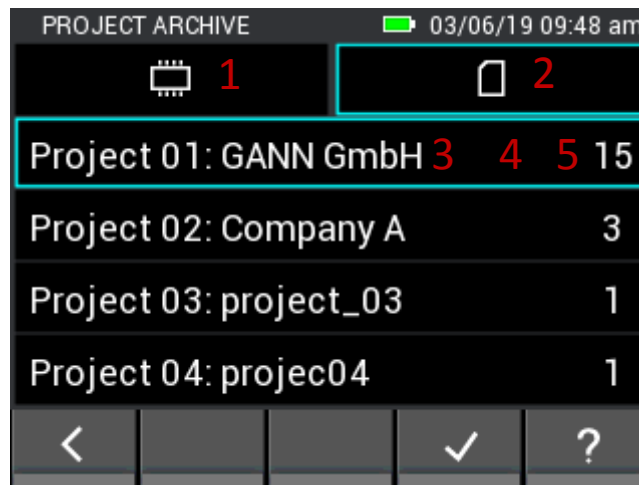


Figure 9-2: Projects in the archive

1. Tab displays projects in the internal storage.
2. Tab displays projects on the micro SD card.
3. Project name.
4. Project is selected by tapping on it.
5. Number of batches in the project.

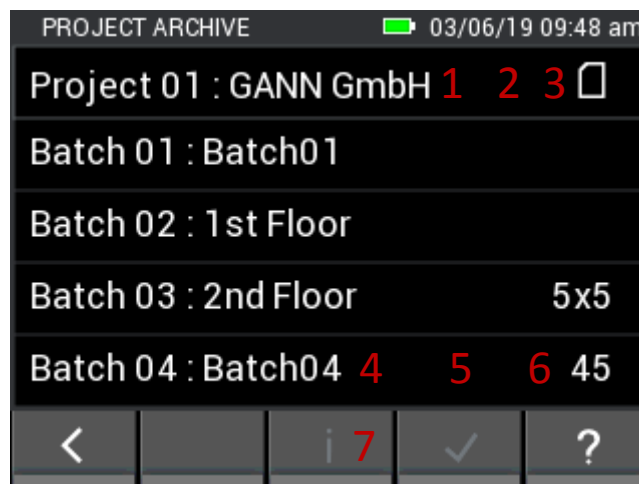


Figure 9-3: Batches in the archive

1. Project name
2. Tapping on the button returns to the Project Selection screen
3. Icon shows the currently used storage.
4. Batch name
5. Batch is selected by tapping on it.
6. Grid dimension if the batch is a grid measurement. If it is a list measurement, the number of measured values is displayed here.
7. Tapping on the button opens the Information window of the batch.

9.1 Information about the configuration and the contents of a batch

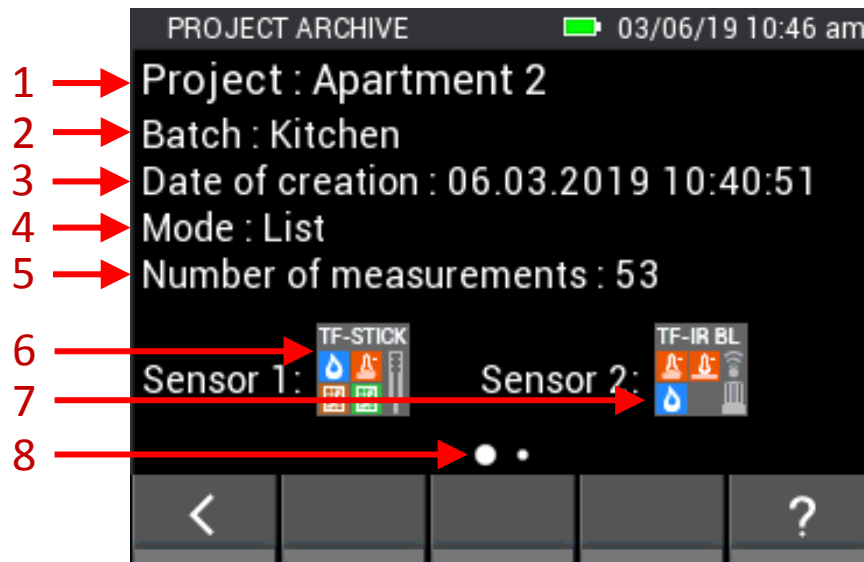


Figure 9-4: Information about the configuration of a batch in the project archive

1. Project name
2. Batch name
3. Time stamp for the time of creation of the batch.
4. Measurement mode (Grid = grid measurement, List = list measurement).
5. Grid dimension for grid measurement and number of measured values for list measurement.
6. Sensor 1
7. Sensor 2
8. Indicates that a swipe gesture to the left will take you to the next information page. This is the case if measured values have already been saved in the batch.

9.2 Statistical values of a batch

If you switch to the next page, an information page is displayed containing the respective statistical values for the sensors used.

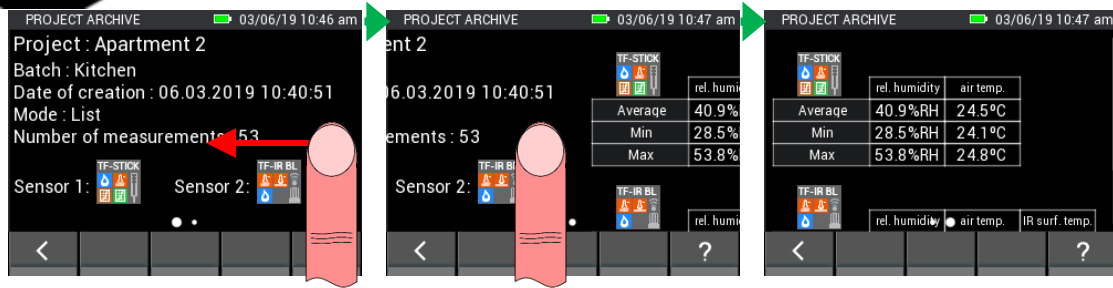


Figure 9-5: Display of the statistical values of a batch

The values of the second sensor can be displayed on the screen using a vertical swipe gesture on the second page (see Figure 9-6).

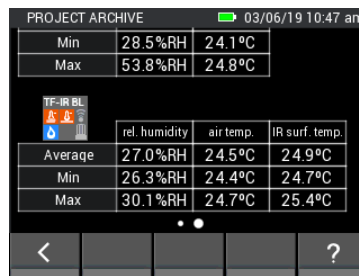


Figure 9-6: Statistical values of the second sensor

9.3 Opening a list measurement

The available measured values are displayed in a table when a list measurement is opened in the menu. The first column contains the time stamp of the measurement. The other columns contain the measured values of the sensors. The measured values can be scrolled using vertical swipe gestures. You can change between the sensors and the measured values using horizontal swipe gestures.

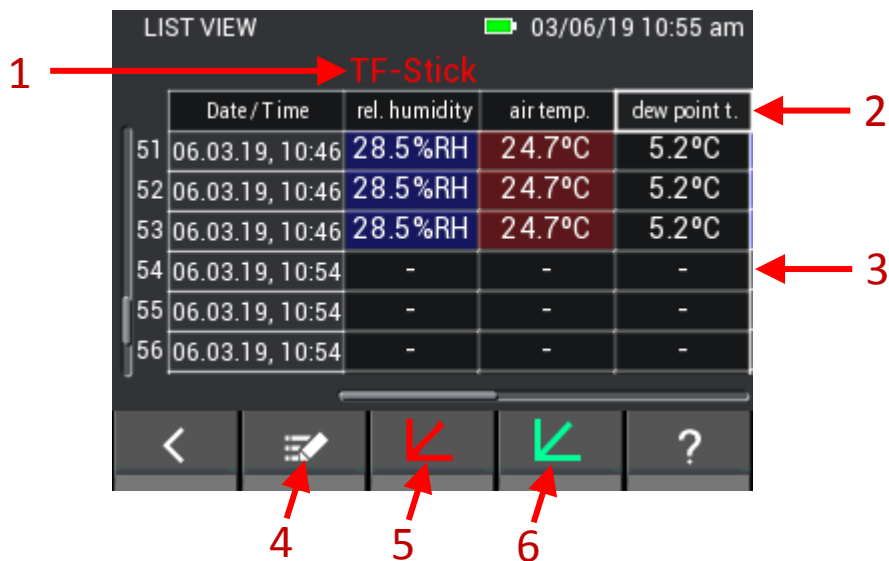


Figure 9-7: Display of the already saved measured values of a list measurement

1. Sensor designation.
2. If it is possible to display other (usually calculated) variables in a column, the tab has a thicker white frame. An appropriate selection screen is displayed by tapping on the tab.

3. Initial values that have been saved are displayed as dash.
4. Opens the measurement mode of the batch.
5. Opens graph of Sensor 1 (this option is only available for sensors that measure air temperature and humidity, and for the anemometer), if 10 measured values have already been recorded in the list.

9.3.1 Display of values of a list measurement as graphs

A list measurement can only be displayed as a graph on the device if at least 10 measured values have been stored in the batch and is only available for measured values of the following sensors: TF Stick, RH-T37 BL, RF-T28 BL, TF-IR BL and LG-25 BL.

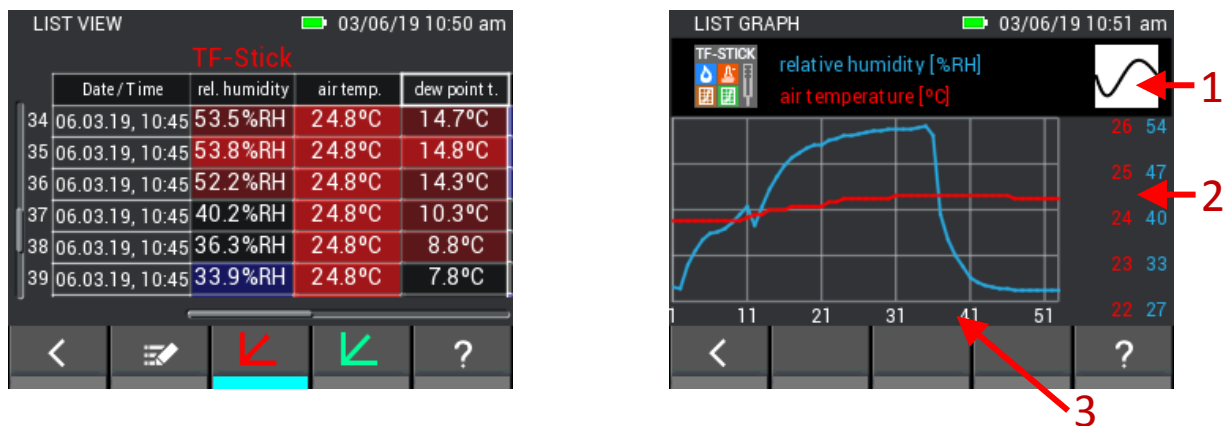


Figure 9-8: Graphical display of the list measurement values

1. Curves can be shown or hidden by tapping the button.
2. The y-axes of the graph are displayed as a function of the measured values.
3. The x-axis of the graph shows the measure value numbers.

The graph can be zoomed in the x-direction by swiping with two fingers simultaneously. If there are values to the left or right of the displayed area, these can be moved into the visible area by horizontal swipe gestures.

If initial values have been saved in the list, these are displayed as gaps in the graph as shown in the following figure.

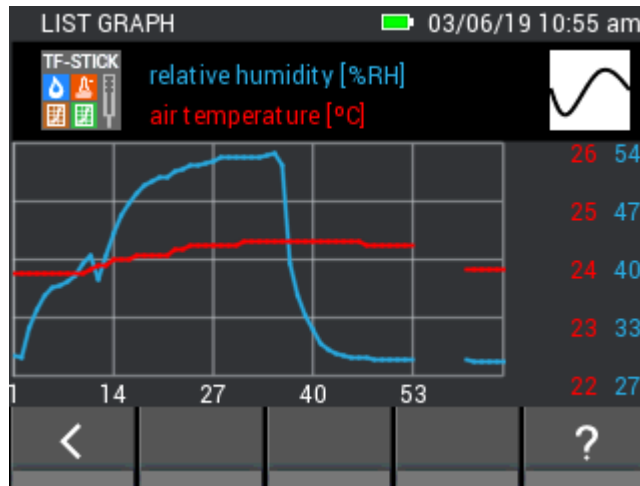


Figure 9-9: Graphical display of the list measurement values with hidden initial values

The minimum value in the list has a deep blue background. The maximum value is marked with deep red. If values deviate by half a standard deviation from the mean value of the measurements, these are highlighted accordingly with a dark colour. If the value is half a standard deviation below the mean value, it is marked dark blue; if it is half a standard deviation above the mean value, it is marked dark red. Amongst other things, these colour grades can be seen in Figure 9-7.

The additional value for sensors that measure humidity and temperature can be changed in the list view. Figure 9-10 shows how this functions.

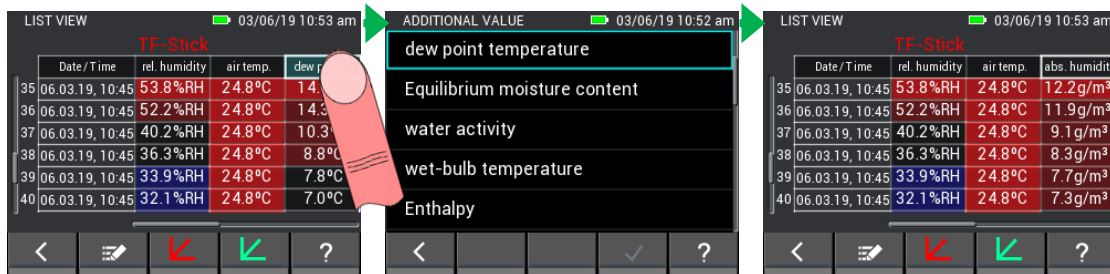


Figure 9-10: Switching to display of the additional value in the list view

9.4 Opening a grid measurement

If a grid measurement is opened in the menu, this is displayed in the grid view similar to the measurement mode, with the difference that the measured values cannot be edited in this view.



Figure 9-11: Display of the already saved measured values of a grid measurement

1. The displayed measured value can be changed using horizontal swipe gestures over the sensor tabs.
2. Contains the designation of the selected measured value. If this is a variable measured value, this field can be tapped on and opens the relevant menu.
3. The grid shows the saved measured values. By using vertical and horizontal swipe gestures you can scroll through the grid if it is larger than 5x5. This is indicated by a scroll bar on the left side or under the grid.
4. Button is used open edit mode.

10 Mean Value Measurement



Figure 10-1: Icon of the mean value measurement

The mean value measurement provides the possibility to record up to 10 values in a grid with one sensor and to immediately display the mean value of the recorded values. The acquired values cannot be saved. Therefore this measuring method is suitable to provide a quick overview and to acquire measured values transiently.

10.1 Sensor Selection

At least one sensor must be selected to start the mean value measurement. If no sensor is selected yet, the "select sensor" button must be tapped to reach the Sensor Selection screen.



Figure 10-2: Mean value measurement menu without selected sensor

If a sensor is already selected, the sensor selection is reached by tapping on the upper button in the Measurement menu.



Figure 10-3: Upper button which takes you to the Sensor Selection screen for already selected sensors.

A sensor can be selected in the Sensor Selection screen by tapping on the corresponding sensor icon. However, this only functions with sensors that are plugged in to the device. These are indicated by the bright lighting of the corresponding sensor icon. The correct selection of a sensor is indicated by the index at the top right of the sensor icon.

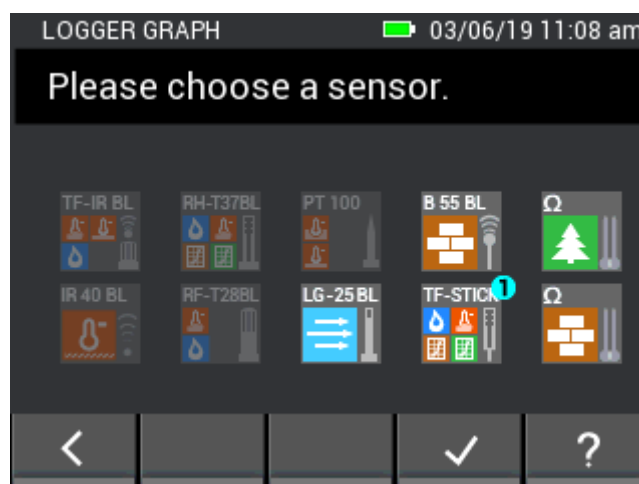


Figure 10-4: Sensor selection for the mean value measurement

10.2 Measurement

If a sensor has been selected, the Measurement screen opens as shown in the following figure and the user can start the measurement. Each field of the grid can now be filled with a measured value. To do this, the user can navigate between the fields by pressing the Save button on the device, thereby moving the field marking forward one field at a time. Alternatively, the fields can also be tapped on directly to select them. If the required field is selected, the measured value in this field can be updated by pressing the Measure button. The selected field is framed red while the measurement is running. The field cannot be changed in this time.

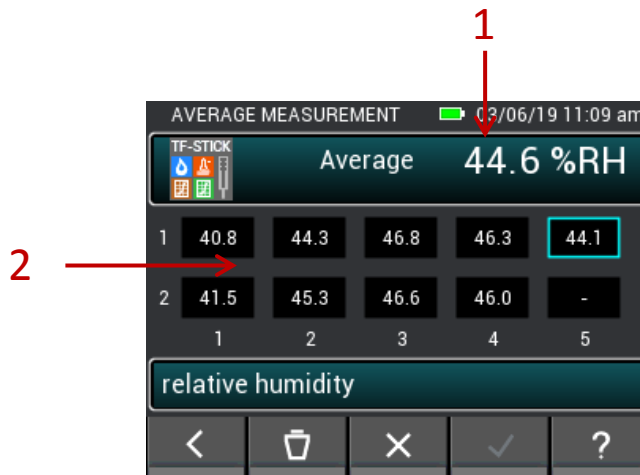


Figure 10-5: Mean value measurement window

1. Mean value, calculated from the available values in the box.
2. Acquired measured values.

10.3 Sensor Settings

The individual fields of the sensors for the mean value measurement are described below.

10.3.1 TF Stick / RH-T37BL / RF-T28BL



Figure 10-6: Select displayed value

The button which displays the measured value opens a menu in which further measured or calculated values can be selected.



Figure 10-7: Deletion of individual values for the mean value measurement

It is possible to delete individual measurements or to discard all measured values. In this way, incorrect measurements can be corrected or another measurement can be quickly performed on a new test object.



Figure 10-8: Deletion of all values for the mean value measurement

The measurements are discarded when leaving the mean value measurement. Exiting the measurement should only be confirmed if the measured values are no longer required.



Figure 10-9: End mean value measurement

10.3.2 Mean value measurement with the resistance-based wood moisture

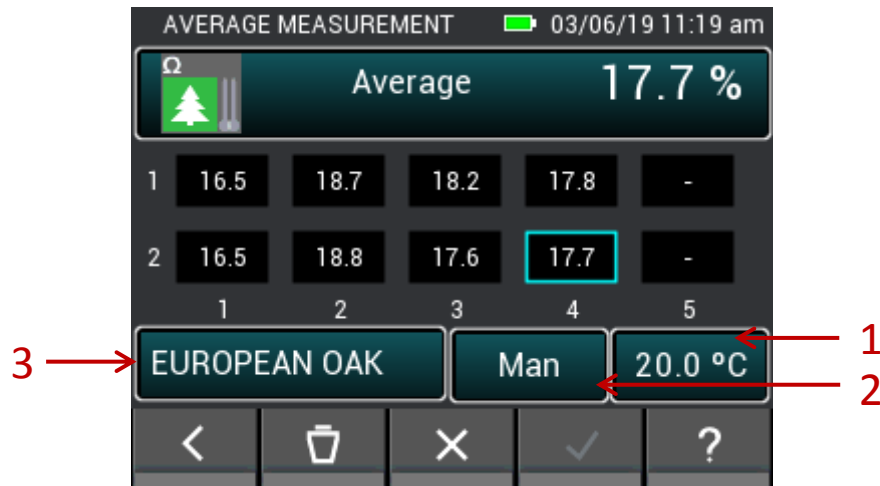


Figure 10-10: Mean value of the resistance-based wood moisture

1. This button is used to set the manual temperature compensation or to select the sensor for the automatic compensation temperature.
2. This button toggles between the manual and the automatic temperature compensation.
3. This button opens the selection menu for the wood type.

10.3.3 Mean value measurement with the resistance-based building material moisture

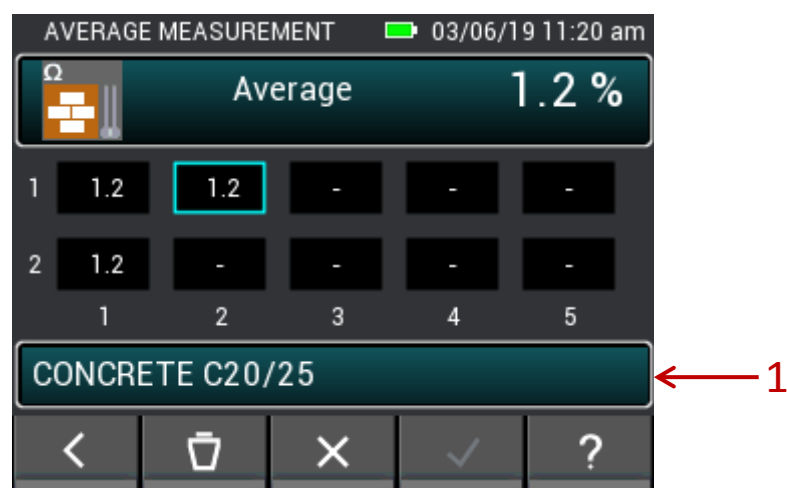


Figure 10-11: Mean value of the resistance-based building moisture

1. This button opens the selection menu for the building material.

10.3.4 Mean value measurement with ET 10 BL / OT 100 BL / TT 40 BL

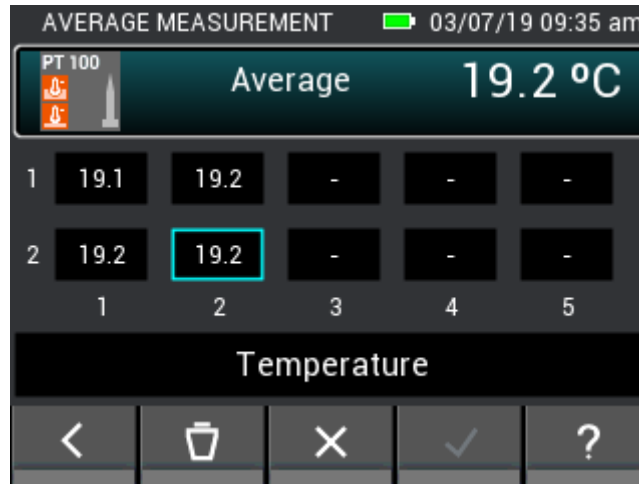


Figure 10-12: Mean value of the temperature

10.3.5 Mean value measurement with the TF-IR BL

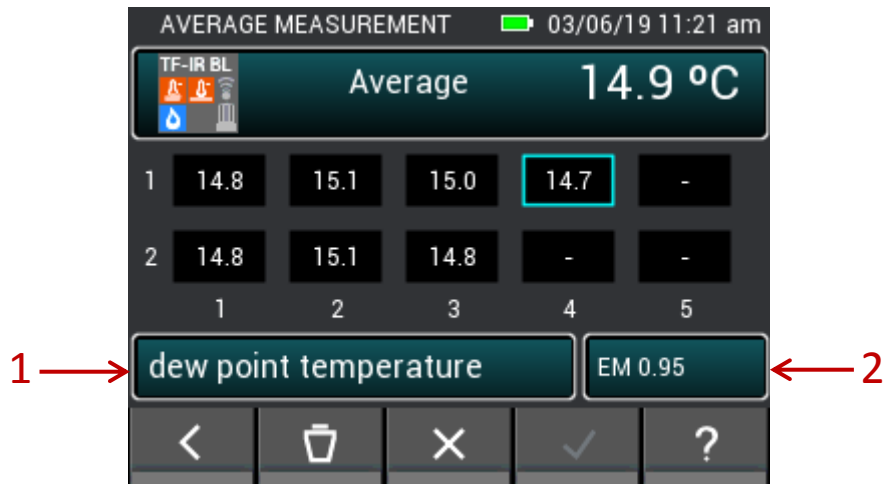


Figure 10-13: Mean value of the TF-IR BL

1. This button opens the menu for air temperature, relative air humidity and the factors calculated from these values.
2. This button opens the menu for input of the emission factor value and for activation or deactivation of the laser.

10.3.6 Mean value measurement with the B 55 BL

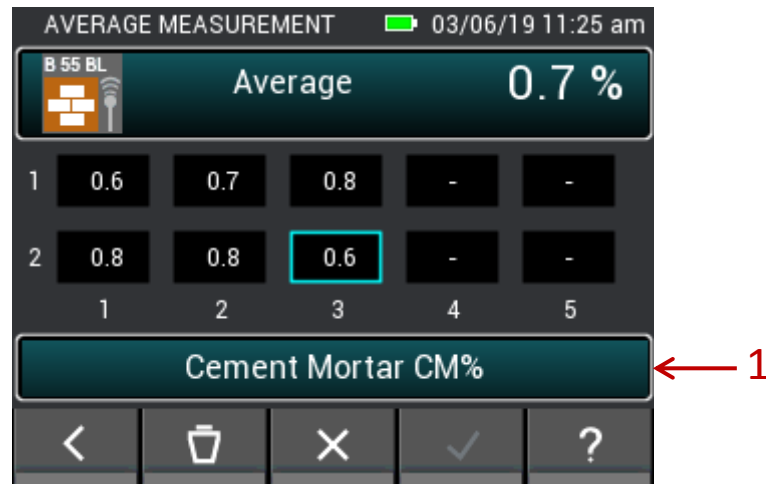


Figure 10-14: Mean value of the capacitive building moisture

1. This button opens the screen for material selection.

10.3.7 Mean value measurement with the LG-25 BL

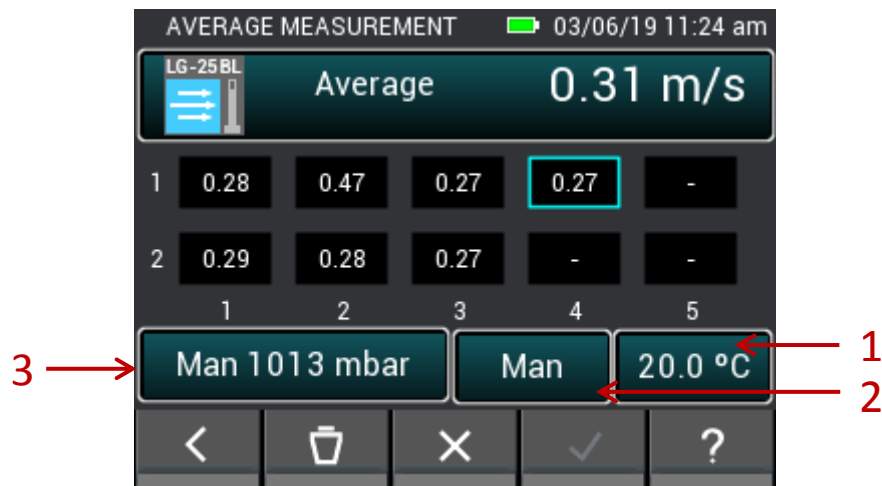


Figure 10-15: Mean value of the air velocity

1. This button is used to set the manual temperature compensation or to select the sensor for the automatic compensation temperature.
2. This button toggles between the manual and the automatic temperature compensation.
3. This button toggles between automatic and manual temperature compensation. Opens menu for manual setting of the air pressure.



11 Data Logger (available only with software version "Advanced")



Figure 11-1: Icon of the data logger

It is possible with the data logger to acquire and store measured values over a prolonged period of time in a power-saving mode. Thereby the device remains continuously switched off and only switches on for a short time when a measurement is made. In the sleep mode, the yellow LED indicates that the data log is still active. If the device is active for a measurement, the green LED lights instead. The display is deactivated during the entire logging process in order to achieve the longest possible time span with very low power consumption. The "Home" button can be used to interrupt the logging process at any time to view the measured values of the last six measurements and to obtain a status of the log history. The display is activated again for this. The user now has the choice to end or continue the log. The maximum number of log files is limited to 20. The log data are stored on the micro SD card; therefore this function can only be used with an available micro SD card. The limit for the maximum number of values per log is 15,000 values. The minimum interval for resistance-based moisture measurement is 10 minutes. The minimum measuring interval for air humidity and temperature sensors is 20 seconds. The limit for the maximum duration of a data log is 31 days.

11.1 Recording a log session

Tap on the "New Data Log" button in the menu to create a new log session.

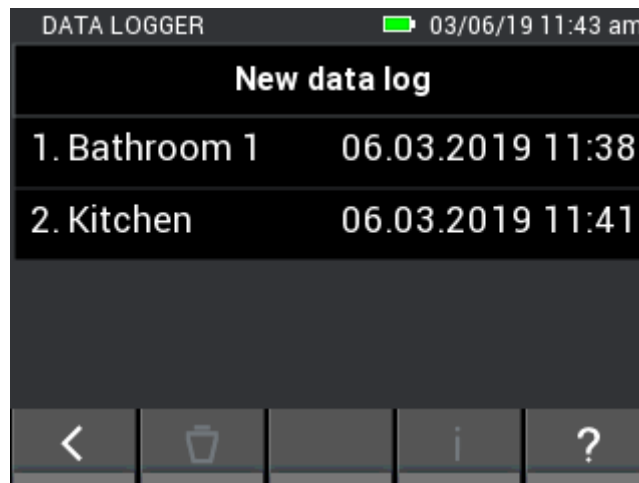


Figure 11-2: Data Logger menu

If you would like to start a new data log, you first receive a notification to check the battery level. If the battery level is low, it is possible that a data log does not run completely and the measurement is therefore incomplete. In this case, the values recorded up to this point are retained.

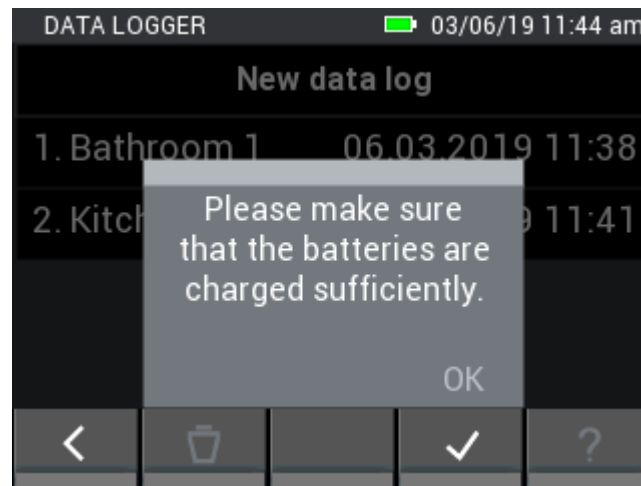


Figure 11-3: User notification about the battery level

It is possible to give the data log a name so that it can be easily identified and assigned later.



Figure 11-4: Assign data log name

Up to two sensors can be selected in the Sensor Selection screen by tapping on the corresponding sensor symbol. However, this only functions with sensors that are connected to the device. Connected sensors are identified by the bright lighting of the corresponding sensor symbol. The correct selection of a sensor is indicated by the index at the top right of the sensor symbol. The following sensors or measurement methods are available for the data logger:

- Resistance-based wood moisture measurement
- Resistance-based building measurement
- RH-T37 BL
- RF-T28 BL
- TF Stick

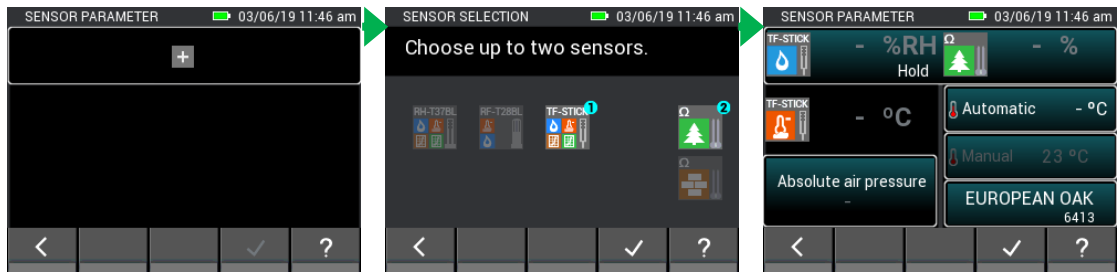


Figure 11-5: Sensor selection for the data logger

The duration of the logging process can be set in the next window. Days, hours and minutes can be adjusted using swipe gestures over the black bar. The measurement duration and the interval duration are dependent on each other; for example, the interval duration must always be shorter than the measurement duration.

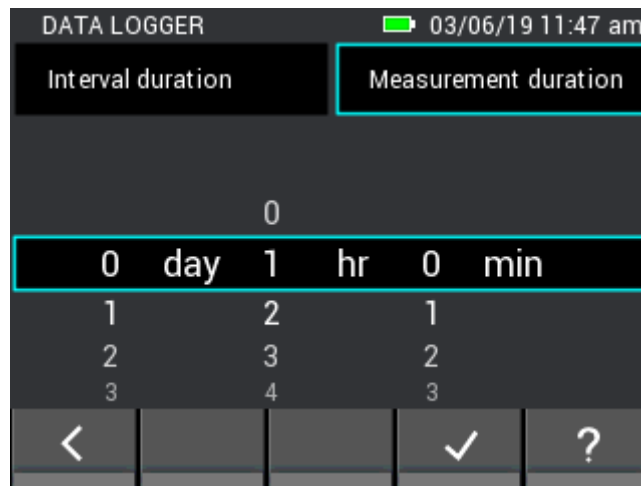


Figure 11-6: Setting the measurement duration for the data log

If the upper tab is changed, the interval duration can be adjusted by swipe gestures over the black bar.

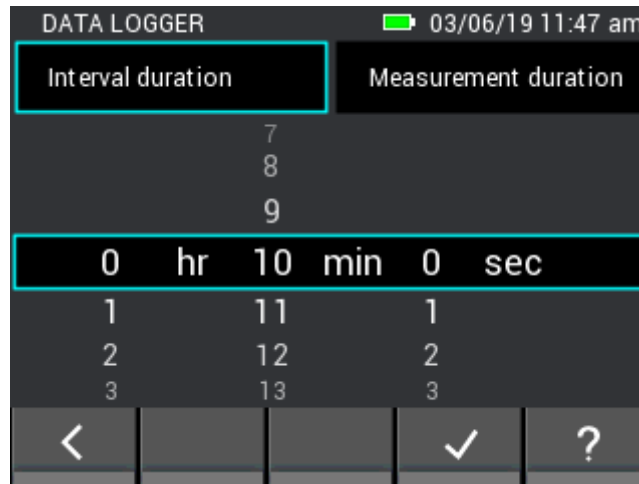


Figure 11-7: Setting the measuring interval for the data logger

It is possible to set the start time of the logger in the next step. The start can thus be delayed by up to one day. By pressing the "Home" button, the device can be woken up during this time to start the logger immediately.

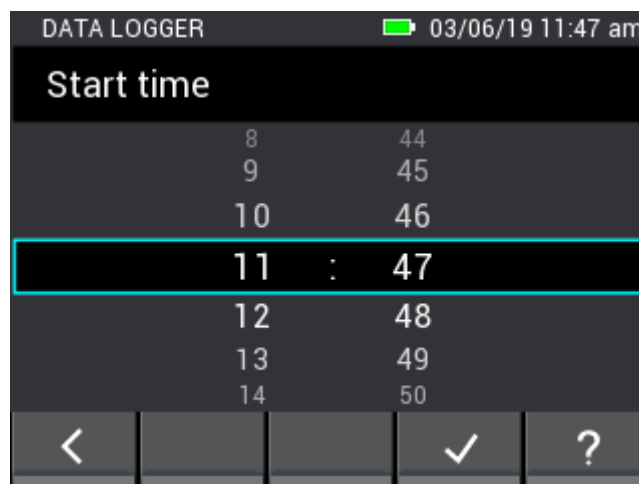


Figure 11-8: Setting a start delay of the data logger

If the log session is paused by pressing the "Home" button, the following window in Figure 11-9 opens.

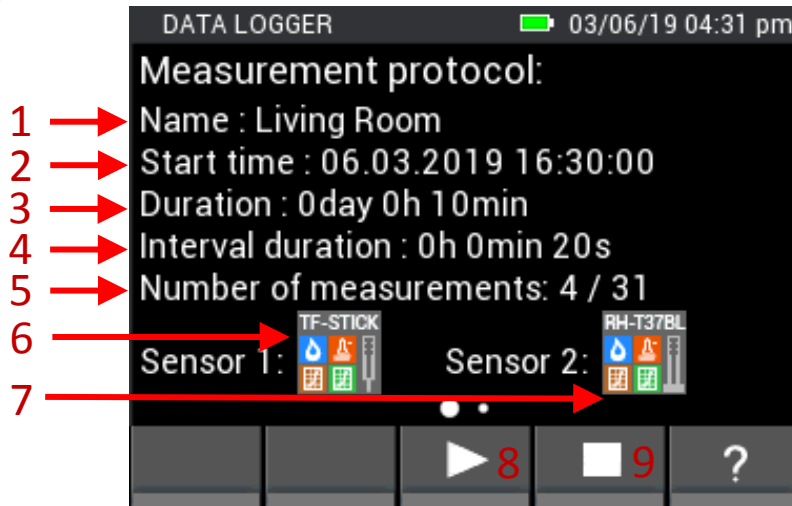


Figure 11-9: Window of the paused log

1. Name of the log session
2. Start time of the log session
3. Running time of the log session
4. Interval duration between two measurements
5. Number of already recorded measured values and total number of the measured values in this log session
6. Sensor 1
7. Sensor 2
8. Button for continuing the log session
9. Button for cancelling the log session

The following view is opened by swiping from right to left. The last six measured values are displayed here in a table.

Sensor 1			
Date/Time	rel. humidity	air temp.	dew point t.
06.03.19, 16:30	25.3%RH	25.5°C	4.2°C
06.03.19, 16:30	25.3%RH	25.5°C	4.2°C
06.03.19, 16:30	25.4%RH	25.4°C	4.2°C
06.03.19, 16:31	25.4%RH	25.4°C	4.2°C

Figure 11-10: Table with the last six measurements before pausing the log process

1. Time stamp of the measured value
2. Relative air humidity
3. Air temperature
4. Absolute air pressure

If this is active, the relevant table for the second sensor can be opened by swiping from bottom to top.

11.2 Saved log sessions

The saved log sessions are displayed in the Start menu. These can be selected by tapping on them, and information about the log session can be displayed by tapping on the "i" button.

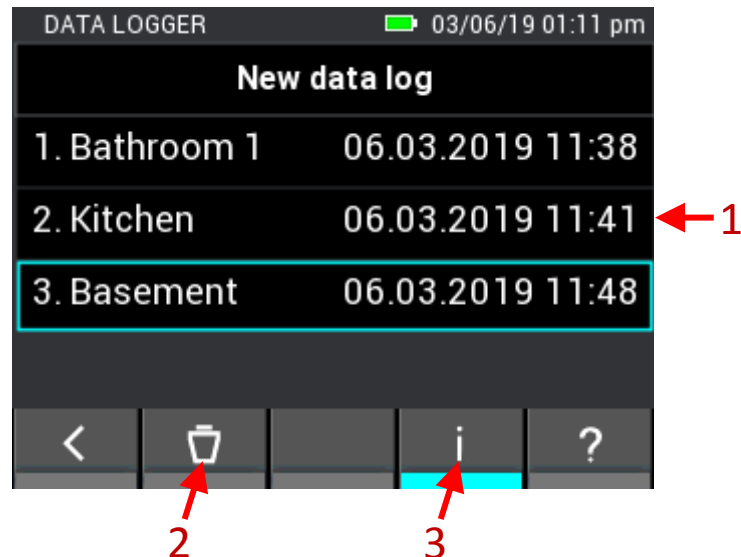


Figure 11-11: Description of the menu with the already saved log sessions

1. Saved log sessions can be selected by tapping on them
2. When confirmed, this button deletes the selected log session
3. This button opens a window with statistical information about the selected log

An overview with all associated information is displayed when a log session is opened.

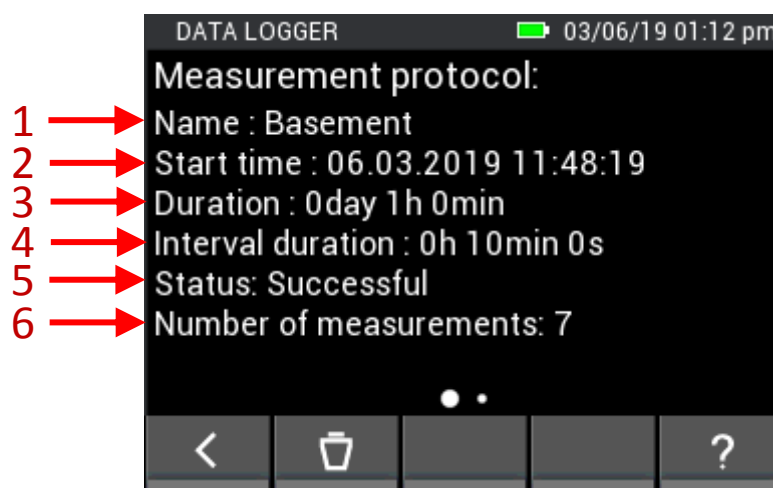


Figure 11-12: Information about the data of the saved log

1. Name of the log session
2. Time stamp for the start of the log session
3. Duration of the log session
4. Interval duration between two measurements



5. Status of the log session
6. Number of recorded measured values

The maximum and minimum values of the log session are opened by a swipe gesture to the left.

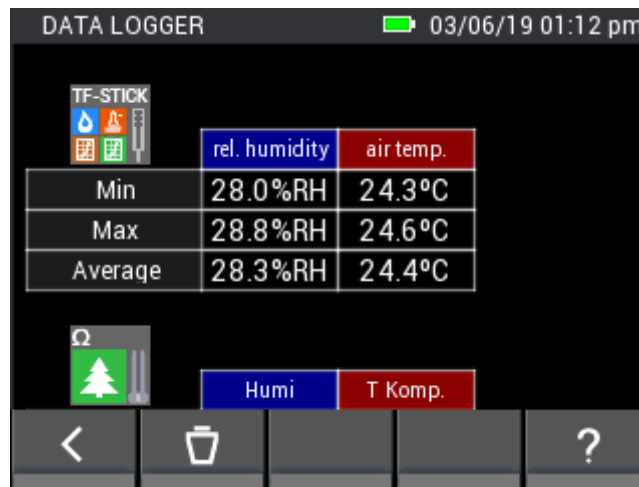
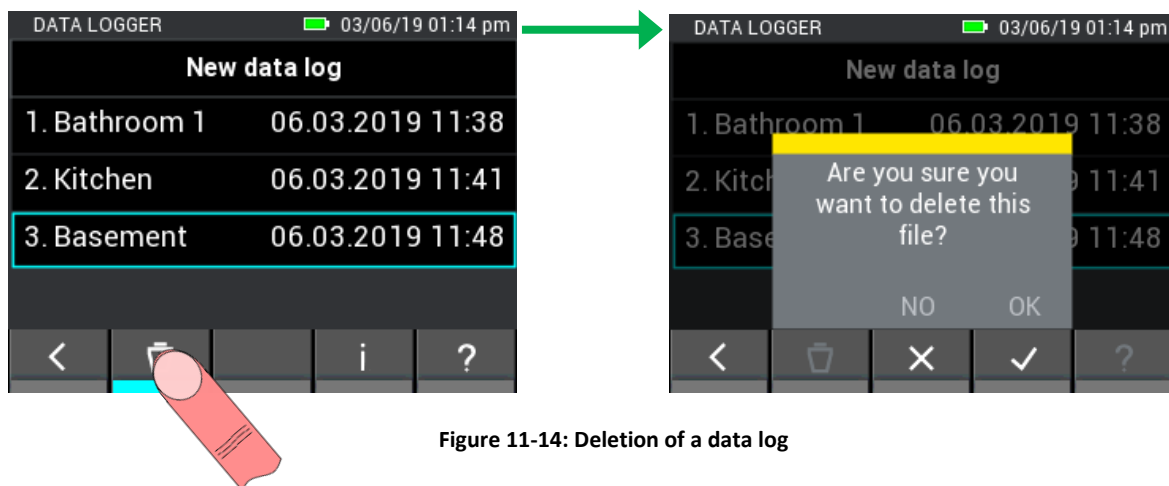


Figure 11-13: Statistical values for the respective sensors for the data logger



12 Graphical logger (available only with software version "Advanced")



Figure 12-1: Icon of the graphical logger

In comparison with the data logger, the graphical logger is intended for shorter measurements in which the curve of the measured values can be observed. A micro SD card is required for the graphical logger. The measured values are recorded automatically in an interval of approx. one second. The maximum number of measuring point is 7,201 which corresponds to a duration of two hours. The y-axes of the graphs are automatically adjusted to the measured values in the visible area. The x-axis can be gradually adjusted manually. It is possible to move the graph to view previous measured values. It is possible to hide some individual curves to get a better overview. Already existing files can no longer be edited or extended; however, these can be opened on the device.

Graphical logger files that already contained measured values are marked with a padlock in the selection list.

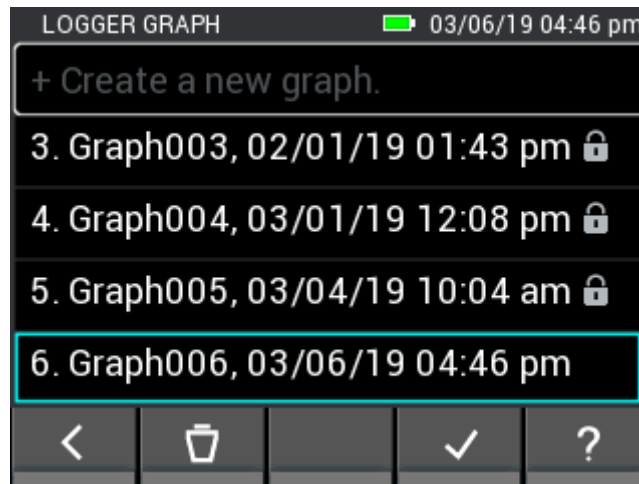


Figure 12-2: List of created files for the graphical logger

A new file is created by tapping on the "Create new graphical log" field. If a file without padlock is selected and the selection is subsequently confirmed, the sensor selection screen opens where a sensor can be selected for the log process. The graphical log is started by confirming the selection. If a file should be deleted, select it and then tap the "Delete" button. The subsequent prompt must then still be confirmed afterwards.

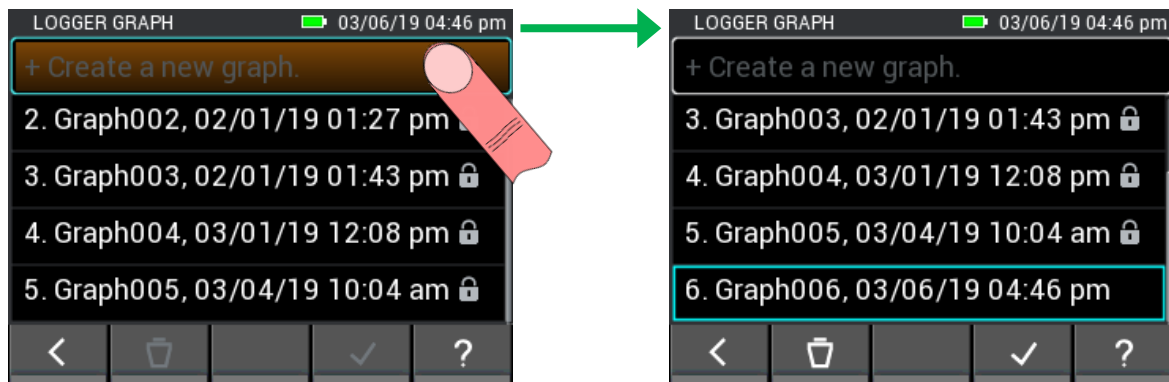


Figure 12-3: Creation of a new file for the graphical logger

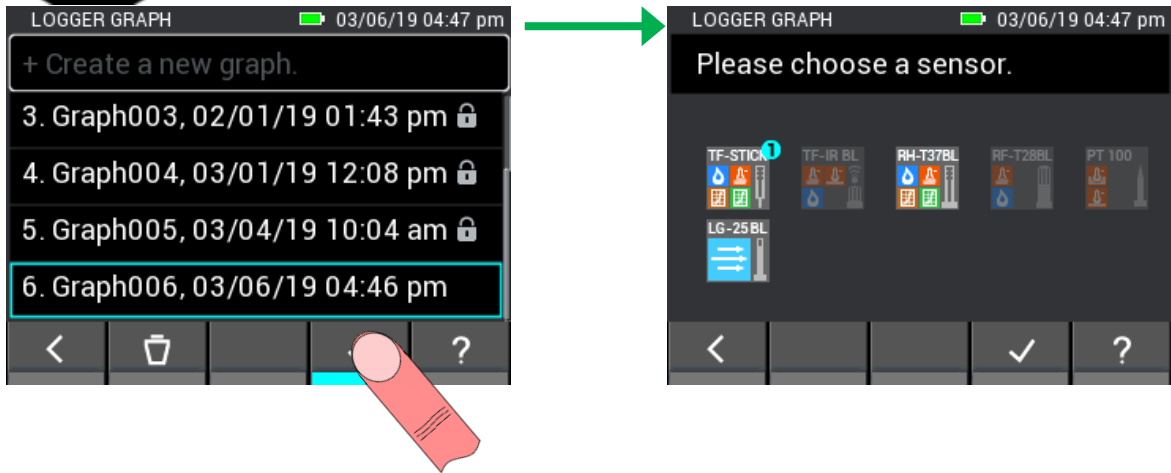


Figure 12-4: Sensor selection for the graphical logger

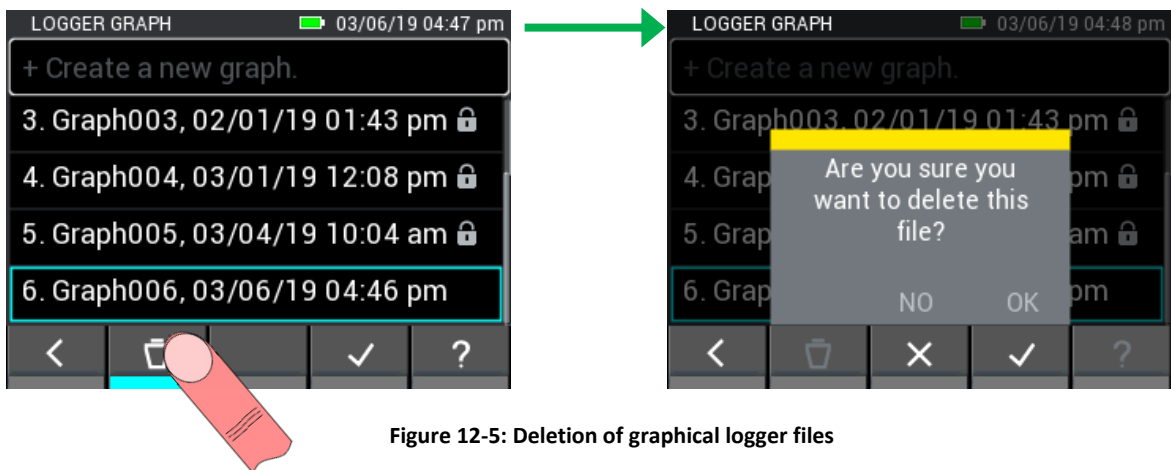


Figure 12-5: Deletion of graphical logger files

12.1 Graphical log with TF Stick / RH-T37 BL / RF-T28 BL

If a TF Stick, a RH-T37 BL or a RF-T28 BL is selected, air humidity, temperature and pressure are logged. A y-axis is used for each of the three measured variables. Instead of the air pressure, it is also possible to display a value calculated from the measured values. The current values are displayed above the graph.

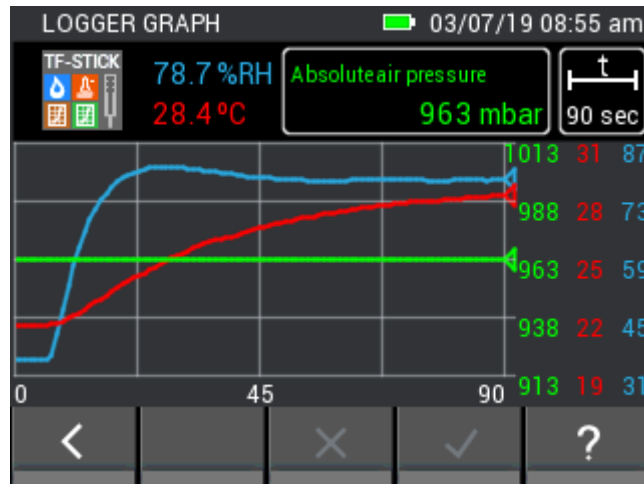


Figure 12-6: Graphical logger measurement with a TF Stick

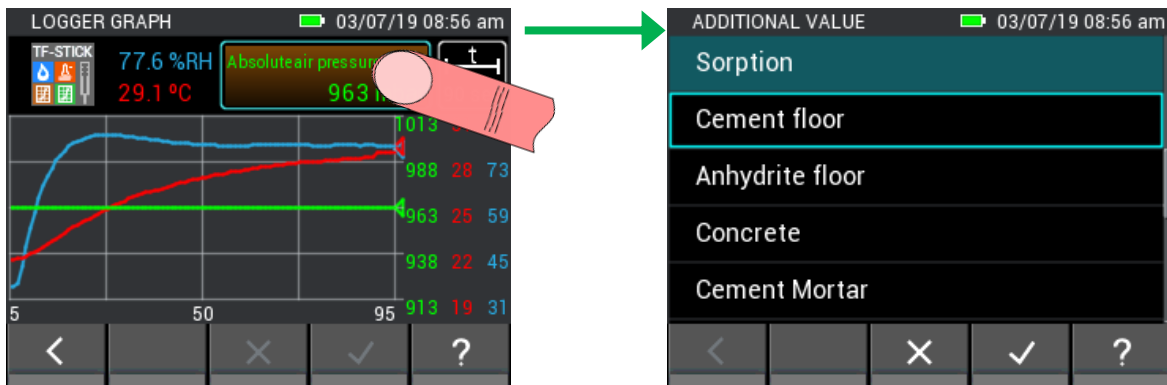


Figure 12-7: Changing sensor parameters for the graphical logger

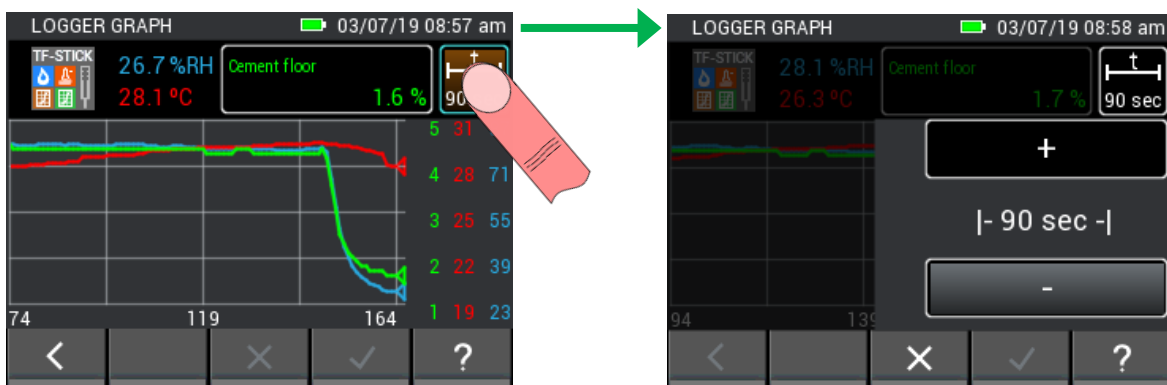


Figure 12-8: Opening the window for setting the X-axis for the graphical logger

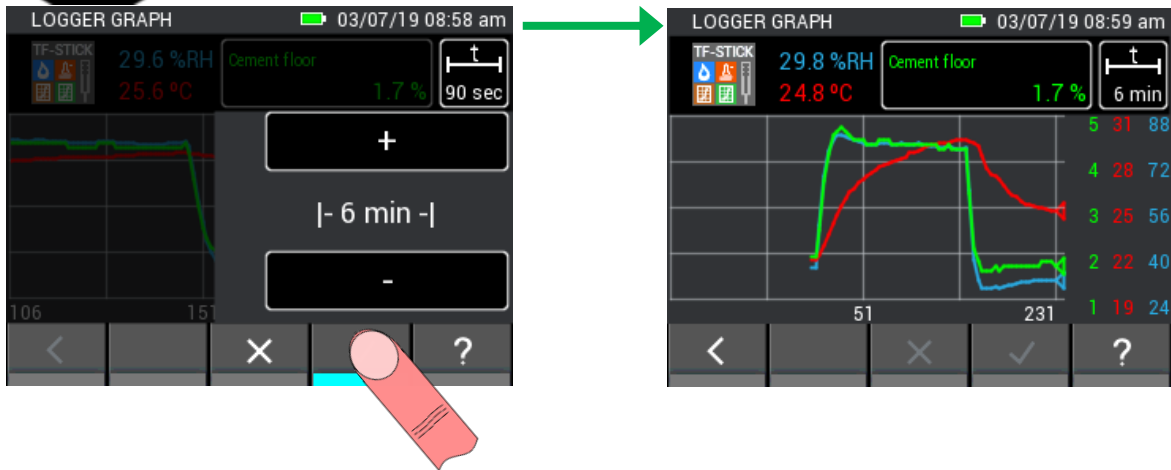


Figure 12-9: Changing the X-axis for the graphical logger

If you would like to end the graphic log, you can do so by tapping the "Back" button or pressing the "Home" button. In this case, you will be prompted whether the measurement should actually be ended.

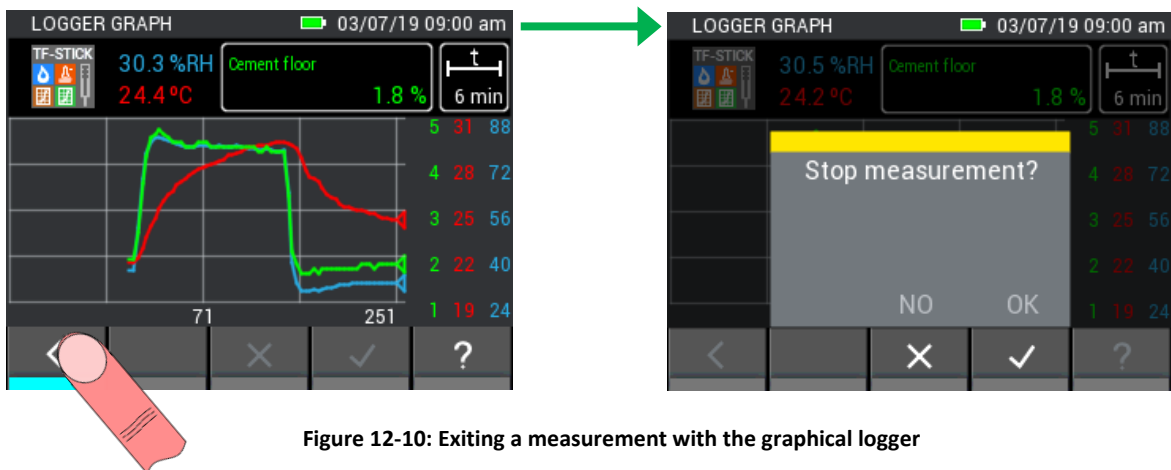


Figure 12-10: Exiting a measurement with the graphical logger

12.2 Graphical log with TF-IR BL

The current measured values of relative humidity, temperature and surface temperature (IR) are displayed in the graphical log with the TF-IR BL. The calculated dew point (DP) is also displayed. There are two y-axes; one for the temperature and one for the relative air humidity. The curves of the individual values can be hidden or displayed by tapping on the buttons with the current values. There is a dotted line at 3.0 °C above the dew point curve which represents the dew point alarm limit. If the surface temperature falls below this alarm limit, an audible alarm is output by the loudspeaker.

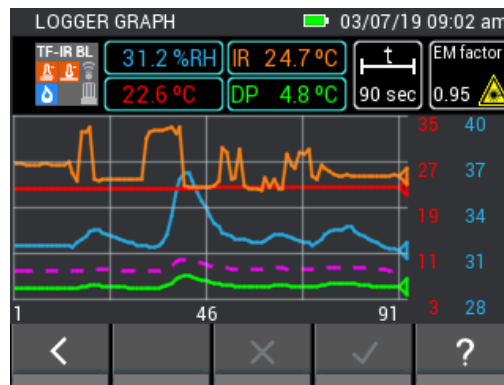


Figure 12-11: Graphical logger measurement with a TF-IR BL probe

A legend for the graph, which assigns the corresponding values to the colours, is available via the help in the menu. This can be seen in Figure 12-12.

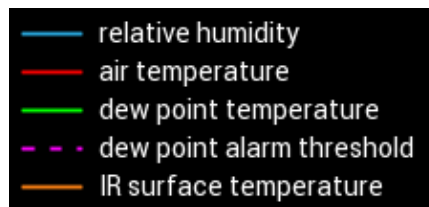


Figure 12-12: Legend for the graph

It is possible to change the emission factor during the measurement and to switch the laser of the probe on or off. The procedure is described in Figure 12-13.

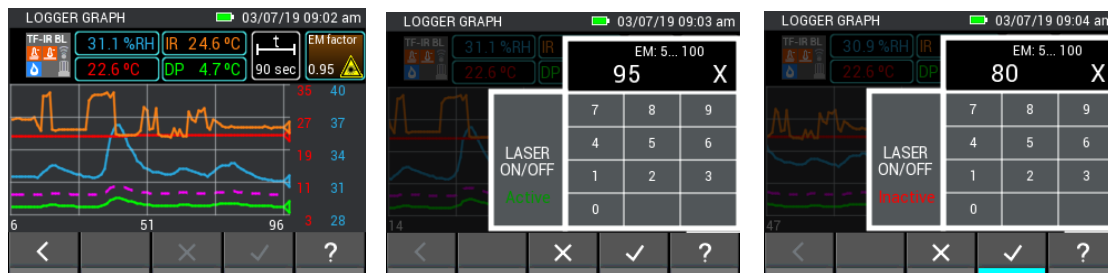


Figure 12-13: Change of sensor parameters for the TF-IR BL

The clarity of a graph in which only the IR surface temperature is displayed can be seen in Figure 12-14. This is particularly helpful if only one value is important for the measurement task.

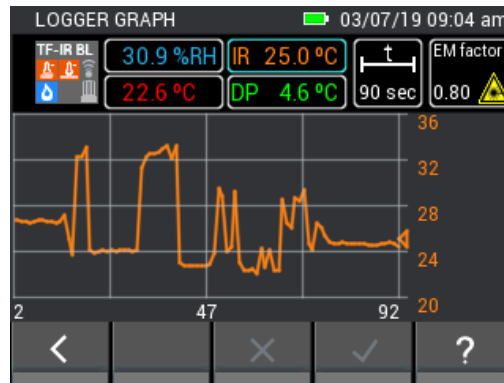


Figure 12-14: Hidden curves for the graphical logger with the TF-IR BL probe

12.3 Graphical log with an ET 10 BL / OT 100 BL / TT 40 BL

In the case of Pt100 sensors, the temperature is displayed in the graphical log. Other measurements or settings are not available.

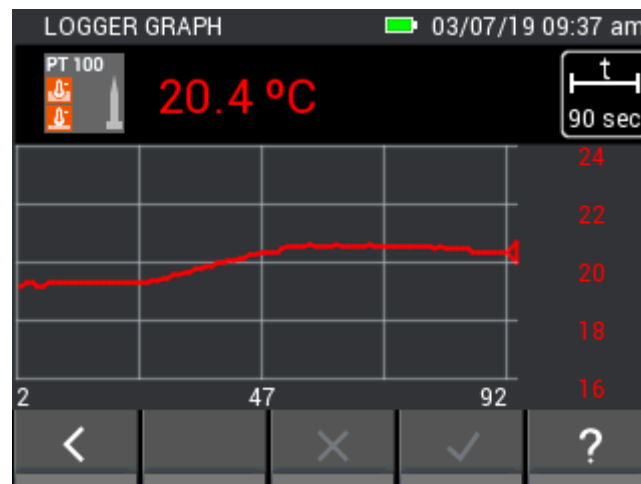


Figure 12-15: Graphical logger measurement with a PT100 BL probe

12.4 Graphical log with LG-25 BL

If the sensor LG-25 BL is selected for the graphical log, it must first be selected whether the temperature and pressure compensation of the air velocity should be performed automatically via sensors or whether manually defined values should be used for the compensation.

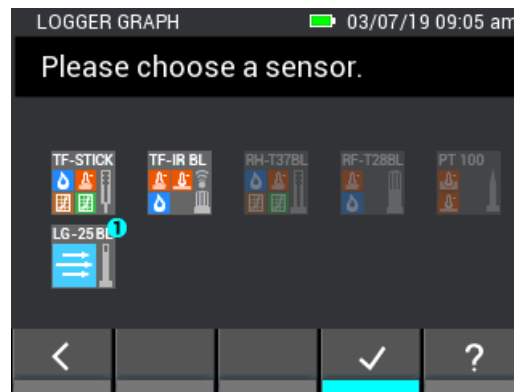


Figure 12-16: Selection of the air velocity sensor LG-25 BL for the graphical log

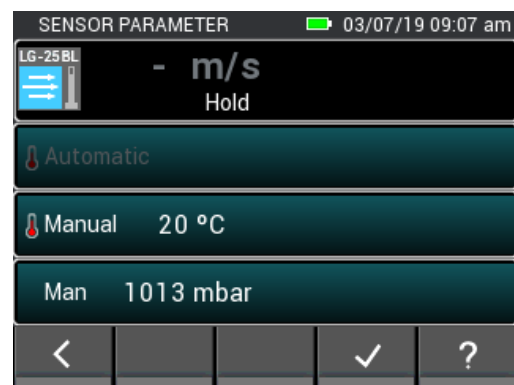
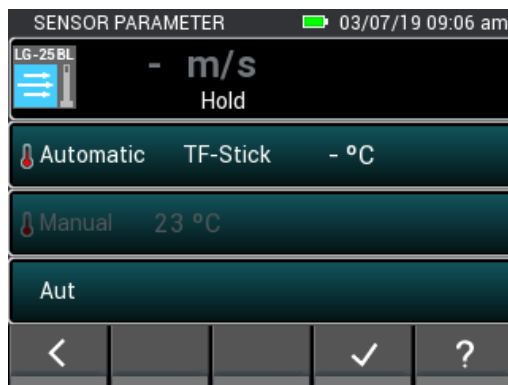


Figure 12-17: Setting menu of the LG-25 BL before the log process

During the log process, either the current measured values for air velocity, absolute air pressure and temperature or the current air velocity and the manually set values are displayed.



Figure 12-18: Graphical logger measurement with an LG-25 BL sensor



13 Error log

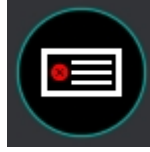


Figure 13-1: Icon of the error log

If problems occur with the device, the error log helps for quick cause analysis. If runtime overruns, checksum errors and other errors occur, an entry is made in the error log. The device stores up to 9 errors. If the memory already contains 9 errors and a new one is added, the oldest error is deleted. The following figure shows an example of an error log.

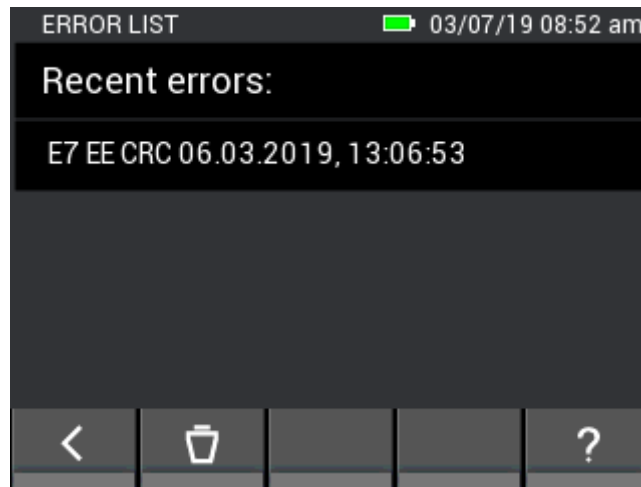


Figure 13-2: List of the last errors that occurred

The contents of the error log list can be deleted.

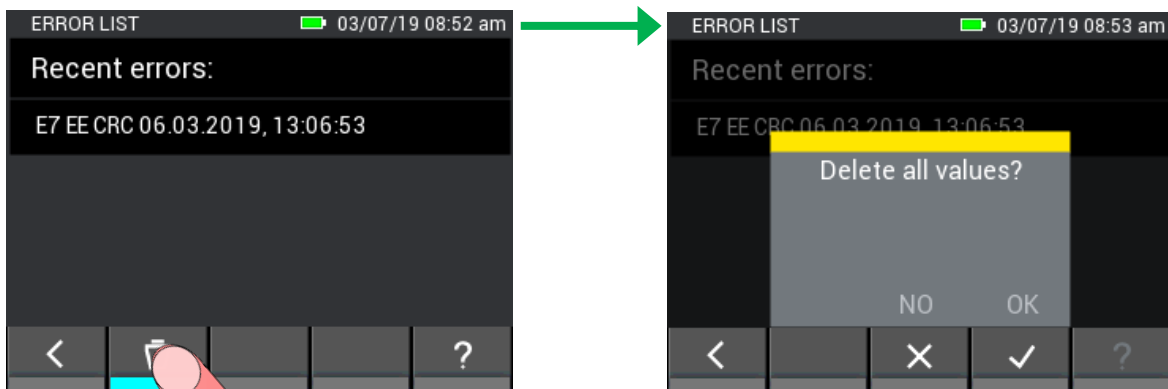


Figure 13-3: Deletion of the error log on the device

14 External power supply via a USB power supply

It is possible to operate the Hydromette CH17 with a 5 V USB power supply. The device boots after connecting the power supply to the mini-USB port. A USB connection is detected automatically and the device is supplied with power. The battery symbol in the upper bar disappears and is replaced with a "lightning" symbol.

An important note here is that the Hydromette CH 17 does not have a charging circuit and therefore batteries cannot be charged in the device.

If NiMH rechargeable batteries are used, they must be recharged in a separate charger. If a USB cable is connected and you are in the main menu, a window opens which provides the option of data transfer to a PC. If "USB power supply" is selected, this disappears and the device can be operated as usual. A new prompt is not displayed until after disconnecting and reconnecting the USB cable.

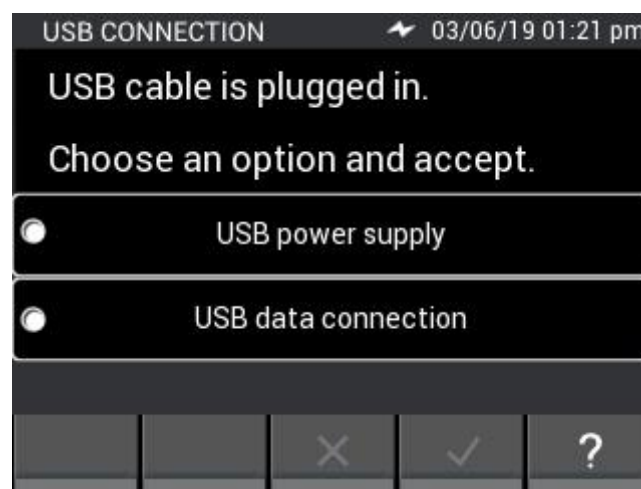


Figure 14-1: Window with function prompt for USB interface

15 Installation of the PC software GANN Dialog Pro

The system requirements for the PC software GANN Dialog Pro are the following:

- Operating system Windows 7 / Windows 8 / Windows 10
- 2 GB free hard disk space
- 4 GB RAM memory
- USB port
- Minimum screen resolution 1280 x 800 (1920 x 1080 is recommended)
- Internet connection for software downloads, updates and upgrades

The PC software GANN Dialog Pro is available for download at the following link:

<http://download.ota.gann.de/dlg>

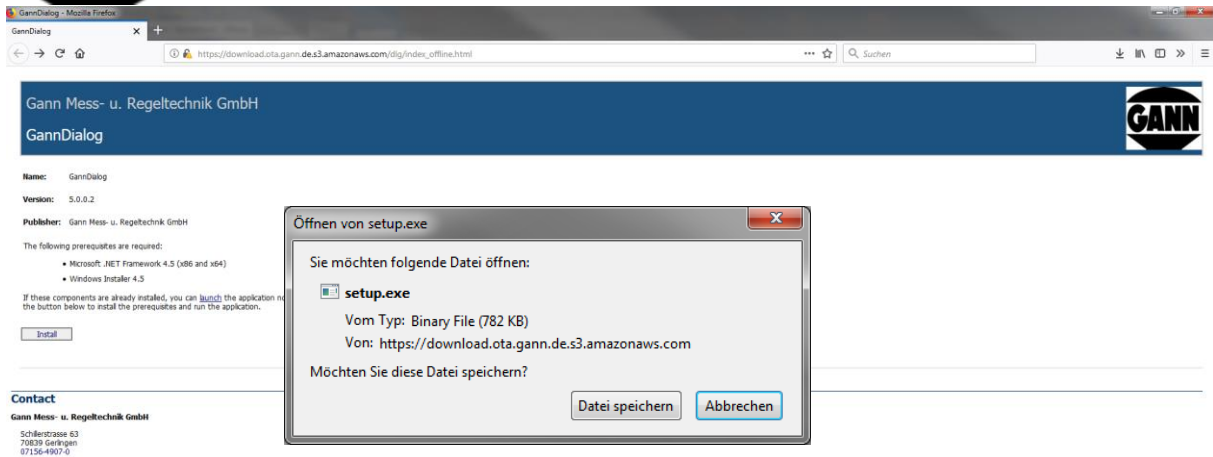


Figure 15-1: Download of the PC software GANN Dialog Pro

If you click on the "Install" button, you will be asked if you want to download the software. Confirm this with "Save file" to start the download. Perform the installation steps of setup.exe.

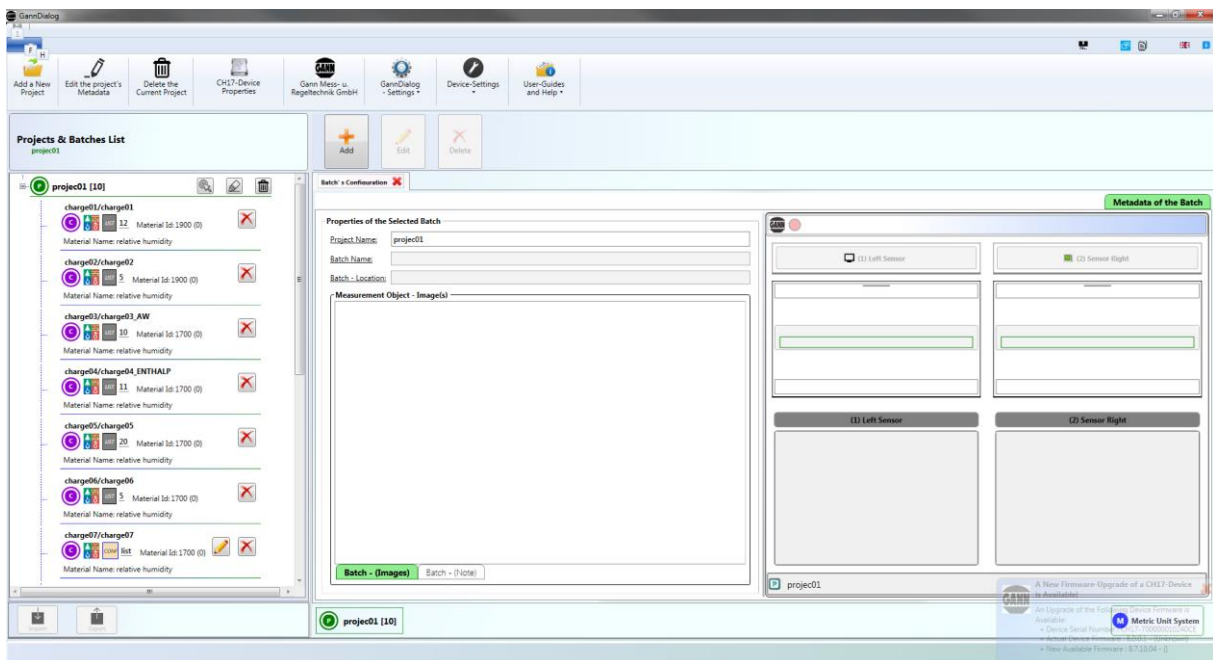


Figure 15-2: Screen of the PC software GANN Dialog Pro

GANN Dialog Pro has its own user manual. This can be found in the program's Help menu as a PDF file.

16 USB communication with a PC

If you connect the Hydromette CH 17 to a PC with Windows operating system, you will be asked if you only want to use the USB cable for power supply or if you also want to transfer data. A connection to the PC is established if data transfer is selected. No measurements can be performed during the communication with the PC. Among other things, measured values, screenshots and data of projects can now be transferred using the GANN Dialog Pro PC software. Furthermore, GANN Dialog Pro provides the possibility to update the firmware of the Hydromette via the Internet and also to activate additionally purchased licences for functions on the device.

The USB connection must not be disconnected during the communication with the PC!

If the connection is disconnected during a firmware update, the Hydromette CH 17 can no longer be started. In this case, the problem can be solved by reconnecting and installing the firmware. If it is not possible to install firmware on the device after several attempts, GANN Support should be contacted.

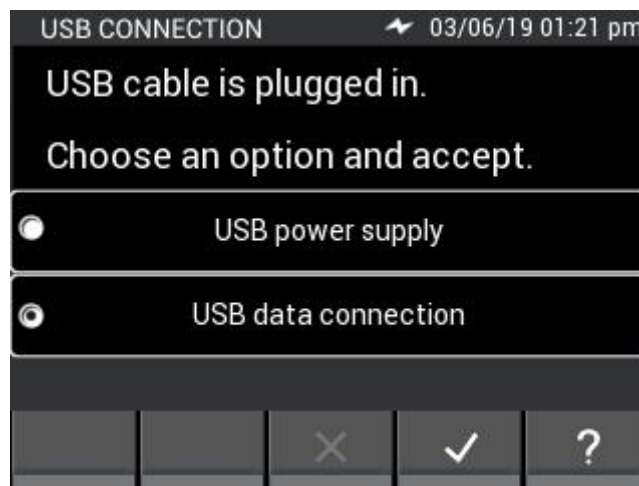


Figure 16-1: USB data transfer selection

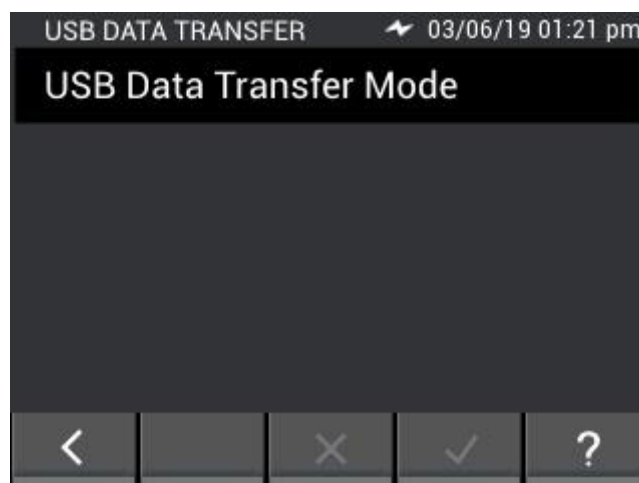


Figure 16-2: USB data transfer window



17 Specifications

17.1 Technical Data of the Hydromette

Display:	3.5" TFT display with capacitive touch
Display resolution:	0.1%
Response time:	< 2 s
Storage conditions:	+ 5 to + 40 °C - 10 to + 60 °C (short-term)
Operating conditions:	0 to + 50 °C - 10 to + 60 °C (short-term) < 85% relative humidity, non-condensing
Power supply:	6 AA batteries
Types that can be used:	type LR6 and type HR6
Dimensions:	205 x 98 x 35 (L x W x H) mm
Weight:	approx. 600 g
Protection class:	II
Protection rating:	IP20
Power supply of the real-time clock:	CR2032 3 V lithium cell

17.2 Prohibited Environmental Conditions

- Condensation, air humidity continuously too high (> 85 %RH) and wetness
- Permanent presence of dust and combustible gases, vapours or solvents
- Ambient temperatures continuously too high (> +50 °C)
- Ambient temperatures continuously too low (< 0 °C)

17.3 Measuring ranges of the resistance measurement

Measuring ranges:

Wood moisture:

5 to 70% (type and temperature dependent)

Compensation temperature:

- Manual compensation in steps of 1 °C:

-10 °C to 100 °C

17.4 Transport & Storage Conditions

The Hydromette CH 17 may only be stored in the packaging that is provided by us or available from us as accessory. We shall not accept any liability or warranty for damage that may occur to the device or the sensor system as a result of non-compliance. In particular, it is important to avoid storing the devices in foams not supplied by us as these could damage the sensors due to possible outgassing and falsify the measured values.



18 Application Notes

18.1 Notes for wood moisture measurement

The measurement of wood moisture is carried out with the Hydromette CH 17 using resistance measurement. The wood moisture is displayed in percent by weight in relation to absolutely dry wood (ATRO).

18.1.1 Notes for resistance measurement

For resistance measurement, the Hydromette CH 17 works according to the method of electrical resistance and conductivity measurement which has been known for years. This process is based on the fact that electrical resistance is highly dependent on the amount of moisture in the wood. The conductivity of kiln-dried wood is very low or the resistance so high that no noteworthy current can flow. The more water that is present, the greater the conductivity of the wood, or the lower the electrical resistance.

To achieve the qualitatively best possible measurement results, the wood used for the sample should be measured at multiple points. For this purpose, the electrodes must be pressed in crosswise to the grain direction up to at least $1/4$ and at most $1/3$ of the total wood thickness. To prevent measurement errors and breakage of the electrodes, the hexagon nuts must always be well tightened and the area between the tip holders kept clean.

The measurement of frozen wood is not possible.

18.1.1.1 Drive-in probe M 20

The probe is driven into the wood to be measured with the needles across the grain direction (the probe body is made of impact resistant plastic). When removing, light lever movements can be used at right angles to the grain to loosen the needles.

To determine the core moisture content, the electrodes must reach to between $1/4$ and $1/3$ of the overall wood thickness.

On delivery of the measuring instrument with probe M 20, 10 replacement electrodes each of 16 and 23 mm length are included. These are suitable for measurement of wood thicknesses up to 30 and 50 mm respectively.

It is recommended to use the ram probe M 18 for thicker or particularly hard wood.

If possible, the hexagon nuts should be tightened with a spanner or pliers before beginning a series of measurements. Loose electrodes break off easily.

18.1.1.2 Surface measuring caps M 20-OF 15

Surface measurements should only be made with wood moisture levels under 30%. For surface measurements on workpieces that have already been machined, or for measuring veneers, both hexagon nuts on the M 20 probe are unscrewed and replaced with the surface measuring caps. For the measurement, both contact surfaces are pressed onto the workpiece to be measured or onto the veneer at right angles to the grain direction. The measurement depth is approx. 3 mm, therefore



multiple sheets of veneer must be laid on top of each other for the measurement. Do not measure on metal surfaces! When measuring stacks of veneer, ensure that the veneer is lifted off and not pulled over the remaining stack (avoid friction: electrostatic charge) to expose the measuring point. Wood particles adhering to the measuring surface must be regularly removed. If the elastic, plastic measurement sensors are damaged, they can be reordered (no. 4316) and glued on using commercially available cyanate-based instant adhesive.

18.1.1.3 Stick-in probe pair M 20-HW 200/300

If the hexagon nuts with standard electrodes on the M 20 probe are removed, they can be replaced with the M 20-HW electrodes. These must be fastened tightly!

For measurement in chips and wood wool, it is advisable to compact the material to be measured slightly. To do so, sawdust should be pressed together with a weight of approx. 5 kg. No compression is necessary for balls of wood wool.

18.1.1.4 Ram probe M 18

The two needles of the ram probe must be driven to the required measurement depth crosswise to the grain direction with a slide hammer. To be able to determine the core moisture content, the electrodes must penetrate to between 1/4 and 1/3 of the overall wood thickness.

Pulling out the needles is also done with the slide hammer with the impact direction upwards. If possible, the hexagon nuts should be tightened with a spanner or pliers before beginning a series of measurements. Loose electrodes break easily.

Attention:

Do not completely drive in the electrodes. There should be approx. 4 - 5 mm space between the wood surface and the hexagon nut. This particularly applies when using Teflon-insulated electrodes.

If woods with very different moisture distribution (e.g. water pockets) are used for measurement, we recommend the use of Teflon-insulated electrodes, which enable very precise measurement of zones and layers. They are available in packets of 10 in lengths of 45 mm (order no. 4450) and 60 mm (order no. 4500).

18.1.2 Test adapter for resistance-based wood moisture measurement

The test adapter available with order no. 6070 for checking the wood moisture measuring part can be used to check the functionality of the device, the measuring cable MK 8 and the probes M 18 and M 20.

To do this, connect the device with the MK 8 measuring cable and plug the 4 mm plugs of the cable into the sockets of the test adapter.

The device must be set to wood type 4 and manual temperature compensation set to 20 °C. No active sensor may be connected. The display should show 21% at the top right in the first line. A difference of +/- 0.5% is permitted.



18.1.3 Wood equilibrium moisture content

If wood is stored in a particular climate for a prolonged time, it absorbs the moisture matching this climate, which is termed equilibrium moisture content or wood equilibrium moisture content.

On reaching the equilibrium moisture content, the wood no longer loses moisture if the surrounding conditions remain the same and also does not absorb any moisture.

The wood equilibrium moisture content is between approx. 6.0 and 7.5% wood moisture (corresponds to 30–40% relative humidity and 20-25 °C) in the winter months, and between approx. 10.5 and 13.0% (corresponding to 60–70% relative humidity and 25 °C) in the summer months. Further values and tables can be found on the World Wide Web.

18.1.4 Growth ranges of fungi

Dry rot 18 - 22 °C, 20 - 28% wood moisture

Wet rot 22 - 26 °C, > 55% wood moisture

White rot 25 - 28 °C, 40 - 50% wood moisture

Spruce gill polypore 35 - 45% wood moisture

Scaly lentinus 40 - 60% wood moisture

Blue stain fungi > 25% wood moisture

18.1.5 Swelling and shrinkage of the wood

Wood shrinks if it transfers moisture to the surrounding air below the fibre saturation level. On the other hand, wood swells if it takes up moisture from the surrounding air below the fibre saturation level. This is a very complex process. If you are interested, we recommend finding the relevant information on the World Wide Web.

19 Accessories



Drive-in probe M 20 (order no. 3300)

For surface and depth measurements up to approx. 50 mm for sawn timber, veneer, chipboard and wood fibre boards, equipped with electrodes:

- 16 mm long (order no. 4610) with 10 mm penetration depth
- 23 mm long (order no. 4620) with 17 mm penetration depth



Ram probe M 18 (order no. 3500)

For depth measurements in thick wood up to 180 mm thick, available for this:

Electrodes without insulation

- 40 mm long (order no. 4640) with 34 mm penetration depth
- 60 mm long (order no. 4660) with 54 mm penetration depth

or

Electrodes with insulated shaft

- 45 mm long (order no. 4550) with 25 mm penetration depth
- 60 mm long (order no. 4500) with 40 mm penetration depth



Measuring cable MK8 – Length: 1 m (order no. 6210)

For connection of electrodes for resistance measurement



Wood moisture test adapter (order no. 6070)



Test adapter for wood moisture, for check of wood moisture measuring instruments with accessories.

Surface measuring caps M 20-OF 15 (order no. 4315)

For moisture measurements on surfaces without damaging the material to be measured, to be used in combination with the M 20 probe.

Brush electrode pair M 25-100 (order no. 3740)

Brush electrode pair M 25-300 (order no. 3743)

Measurements up to 10 or 30 cm depth are possible. Electrodes can be easily turned in and out due to the shape of the brush head. Brushes consist of robust V2A steel



Plug-in electrode pair (M 6 order no. 3700)

The plug-in electrode pair M 6 can be used directly for building moisture measurement and is also used as a basic system for various other electrode pairs. For measuring hard set building materials (e.g. concrete or screed)

Flat electrode pair M 6-Bi 200 (order no. 3702)

The flat electrode pair is used for moisture determination in screed and insulating materials, especially in edge and floating joints. The electrodes are insulated on the shaft so that they do not influence the measurement result. An electrode pair M6 is required to be able to use them correctly.

Building moisture test adapter (order no. 6071)



Test adapter for building moisture, for check of building moisture measuring instruments with accessories.

Measuring cable MK26 – Length: 1.80 m (order no. 16920)



For data transfer between the Hydromette CH 17 and a PC.



Material temperature probe ET 10 BL (order no. 13165)

The plug-in temperature sensor ET 10 BL is a sensor for measuring temperatures in liquids and semi-solid materials (e.g. frozen goods) as well as for measuring core temperatures in a borehole.

Surface temperature probe OT 100 BL (order no. 13170)

The OT 100 BL is a sensor for the measurement of surface temperatures.

Gas temperature probe TT 40 BL (order no. 13180)

The immersion sensor TT 40 BL is a sensor for measuring temperatures in liquids, in a borehole, as well as in smoke. The length of the sensor tube is 480 mm.



Material moisture probe B 55 BL (order no. 13755)

Electronic building moisture indicator according to the dielectric constant / high frequency measuring principle.

It has a flexible ball probe for non-destructive detection of moisture in building materials of all kinds and for detection of moisture distribution in walls, ceilings and floors.

An ideal pre-tester for all CM measurements.

Telescopic extension BL-EL (order no. 6040)

Telescopic extension for the moisture measurement with the probe B 55 BL. The B 55 BL is snapped into the provided holder. The telescopic extension can be extended from 70 cm to a total length of 160 cm.

Climate probe RF-T 28 BL (order no. 13155)

The air temperature and the relative air humidity can be measured with the probe RF-T 28 BL. It is suitable for many applications, e.g. residential monitoring, air conditioning technology, printing plants, warehouses, etc.

Climate probe RH-T 37 BL (order nos. 13140, 13141, 13142, 13143)

The RH-T 37 BL probe is suitable for measuring relative air humidity and air temperature, both in air and in boreholes in wood or building materials. Sorption isotherms can be used to determine the moisture content of various building and insulating materials as well as hardwoods and softwoods in weight and mass percentages.



The "flex" model also has a flexible sensor tube and is therefore suitable for measurements in places that are difficult to access.

The RH-T 37 BL is particularly suitable for moisture analyses, damage appraisals, building drying and for testing the readiness for laying floor and wall coverings.



Climate probe TF Stick 16 K-21, TF Stick 16 K-25, TF Stick 16 K-25 M, TF Stick 16 K-25 P

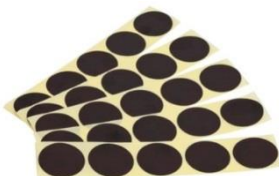
The TF Sticks are used for the measurement of the air humidity and the air temperature. Several probes (pluggable TF sticks) can also be attached to different measuring points and these can be interrogated quickly one after the other, avoiding prolonged adjustment times. An overview of the various TF sticks can be seen in the table below. The TF Sticks 16 K-25, 16 K-25 M and 16 K-25 P differ in the different filters for protection against dust and moisture.

	TF Stick 16 K-21	TF Stick 16 K-25	TF Stick 16 K-25 M	TF Stick 16 K-25 P
Article number	31003260	31003262	31003264	31003266
Air Humidity	0 to 100% RH	0 to 100% RH	0 to 100% RH	0 to 100% RH
Sensor Accuracy	± 3% RH (20 to 80% RH)	± 1.8% RH (10 to 90% RH)	± 1.8% RH (10 to 90% RH)	± 1.8% RH (10 to 90% RH)
Air temperature	-20 to +80 °C	-20 to +80 °C	-20 to +80 °C	-20 to +80 °C
Sensor Accuracy	± 0.5 °C (0 to +60 °C)	± 0.2 °C (10 to +60 °C)	± 0.2 °C (10 to +60 °C)	± 0.2 °C (10 to +60 °C)
Filter	PTFE filter	without filter	Metal filter	PTFE filter

Climate and surface temperature probe TF-IR BL (order no. 13100)

The active probe TF-IR BL combines two sensors to simultaneously perform climate measurements (air humidity and air temperature) and infra-red surface temperature measurements.

This combination of the different measuring techniques enables the TF-IR BL to be used for quickly and reliably assessing dew point undercuts and determining borderline conditions on surfaces such as walls, ceilings, floors as well as on window and door lintels.



Matt black sticker IR 30/E 95 (order no. 5833)

The matt black sticker IR 30/E 95 is used as measuring point for the infra-red measurement of surfaces with unknown emission factor. It has a diameter of 30 mm and an emission factor of 0.95.

Connection cables MK 16 & MK 18 (order no. 16710 & order no. 16720)



The connection cable MK 16 is used for the extension of an active probe BL to a Hydromette CH 17.



The connection cable MK 18 is used for the extension of a TF Stick to a Hydromette CH 17.

Air velocity probe LG-25 BL (order no. 13200)



The LG-25 BL is a high-precision anemometer. Even very low air flows can be reliably measured.

The probe has a telescopic handle that enables reaching places that are difficult to access. In addition, the measuring probe can be mounted on a standard camera tripod to monitor an air flow over a prolonged period of time.

The LG-25 BL can be used for many applications, e.g. residential surveillance, air conditioning, blower door tests, laminar flow control, etc.

Telescopic extension with ball joint (LG BL) (order no. 6030)

Telescopic extension for the air velocity probe LG-25 BL. The LG-25 BL is inserted into the provided holder and screwed tight. The telescopic extension can be extended from 70 cm to a total length of 160 cm. Advantages in comparison with the standard telescopic handle are a larger range, a more robust telescopic holder with a large handle and variable positioning of the sensor using the ball joint.



20 General Concluding Remarks

The conclusions to be drawn from the measurement results are related to the individual conditions and the knowledge from professional experience for each user.

Warranty conditions

Gann Mess- u. Regeltechnik GmbH shall rectify material or manufacturing defects that occur within six months of purchase or one year of shipment from the factory, whichever period ends first. at no cost by repair or replacement of the defective parts at its discretion Neither the replacement nor the repair of a part constitutes a new warranty or an extension of the original warranty term.

Batteries and other parts subject to wear such as cables or filter fabric are excluded from the warranty.

When claiming under the warranty, the device must be sent postage-free to Gann Mess- u. Regeltechnik GmbH or the supplier with details of the claim and accompanied by proof of purchase. The warranty is void if repair attempts or other manipulations have been carried out by the owner or third parties.

Gann Mess- u. Regeltechnik GmbH shall not accept any responsibility for damage or malfunctions caused by non-intended use or incorrect handling or storage of the device. Gann Mess- u. Regeltechnik GmbH shall not accept liability for damage, lost profit, lost usage or other consequential damage that arise from the use of the product or the inability to use it.



-Subject to technical changes-



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