T670

EN

INSTRUCTIONS
MOISTURE MEASURING DEVICE

TROTEC

TRT-BA-T670-TC25TTRT10119-001-EN

Table of contents

Information on the use of these instructions

Symbols

Warning
This signal word indicates a hazard with an average risk level which, if not avoided, can result in serious injury or death.

Warning of electrical voltage
This symbol indicates dangers to the life and health of persons due to electrical voltage.

Caution
This signal word indicates a hazard with a low risk level which, if not avoided, can result in minor or moderate injury.

Notice
This signal word indicates important information (e.g. material damage), but does not indicate hazards.

Info
Information marked with this symbol helps you to carry out your tasks quickly and safely.

Follow the manual
Information marked with this symbol indicates that the instructions must be observed.

You can download the current version of these instructions via the following link:

T670

https://hub.trotec.com/?id=47707

Safety

Read this manual carefully before starting or using the device. Always store the manual in the immediate vicinity of the device or its site of use!

Warning
Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury. **Save all warnings and instructions for future reference.**

- Do not use the device in potentially explosive rooms or areas and do not install it there.
- Do not use the device in an aggressive atmosphere.
- Do not immerse the device in water. Do not allow liquids to penetrate into the device.
- The device may only be used in dry surroundings and must not be used in the rain or at a relative humidity exceeding the operating conditions.
- Protect the device from permanent direct sunlight.
- Do not expose the device to strong vibrations.
- Do not open the device.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Use batteries of type LR06 (AA).
- Never charge batteries that cannot be recharged.
- Different types of batteries and new and used batteries must not be used together.
- Insert the batteries into the battery compartment according to the correct polarity.
- Remove discharged batteries. Batteries contain materials hazardous to the environment. Dispose of the batteries according to the national regulations.
- Remove the batteries from the device if you will not be using the device for a longer period of time.
- Never short-circuit the terminals of batteries!

- Do not swallow batteries! If a battery is swallowed, it can cause severe internal burns within 2 hours! These burns can lead to death!
- If you think batteries might have been swallowed or otherwise entered the body, seek medical attention immediately!
- Keep new and used batteries and an open battery compartment away from children.
- Observe the storage and operating conditions (see Technical data).

Intended use

Only use the device for the moisture measurement of building materials. Observe and comply with the technical data.

Any use other than the intended use is regarded as misuse.

Reasonably foreseeable misuse

Do not use the device in potentially explosive atmospheres, for measurements in liquids or at live parts.

Any unauthorised changes, modifications or alterations to the device are forbidden.

Personnel qualification

People who use this device must:

- have read and understood the instructions, especially the Safety chapter.

Residual risks

Warning of electrical voltage

There is a risk of a short-circuit due to liquids penetrating the housing!
Do not immerse the device and the accessories in water. Make sure that no water or other liquids can enter the housing.

Warning of electrical voltage

Work on the electrical components must only be carried out by an authorised specialist company!

Warning

There is a danger of suffocation for children due to packaging material! Keep packaging films and parts away from children. There is a risk of death due to suffocation.

Warning

The device is not a toy and does not belong in the hands of children.

Warning

Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way! Observe the personnel qualifications!

Caution

Keep a sufficient distance from heat sources.

Notice

To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.

Notice

Do not use abrasive cleaners or solvents to clean the device.

Information about the device

Device description

The material moisture measuring device T670 is a dielectric moisture indicator, which can be used for the quick and non-destructive localization of humidity or moisture distributions.

The device enables the detection of near-surface moisture in walls or flooring. The measured values will be displayed in real time.

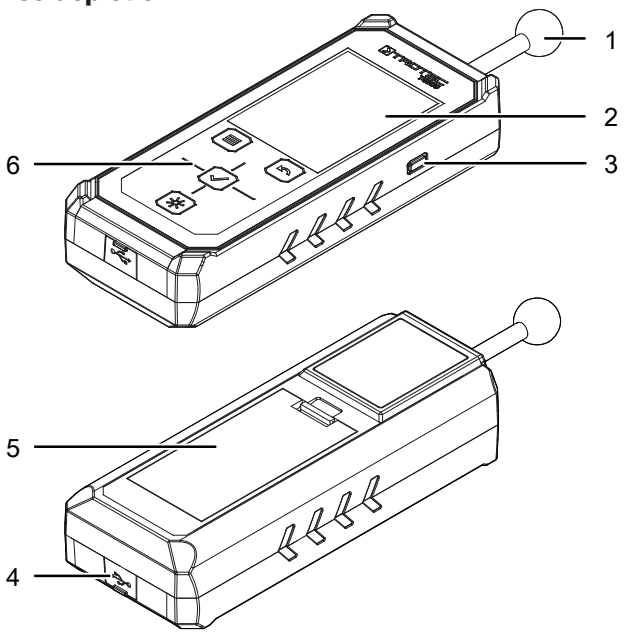
A minimum, maximum and average function is available for the direct analysis of the measured data. Besides, the currently measured value can be recorded via the hold function.

The device further features an alarm function. Once the preset limit value is exceeded, the device alerts the user through emitting an acoustic signal.

The device is suited for the preliminary check of the building materials' readiness for covering for subsequent measurements according to the calcium carbide method (CM measurement). The moisture indication allows the localization of the most significant measuring spots to extract material for the CM measurement.

Using the Bluetooth function, you can connect the device to a mobile terminal device and read and analyse your measurement results with the optional MultiMeasure Mobile application.

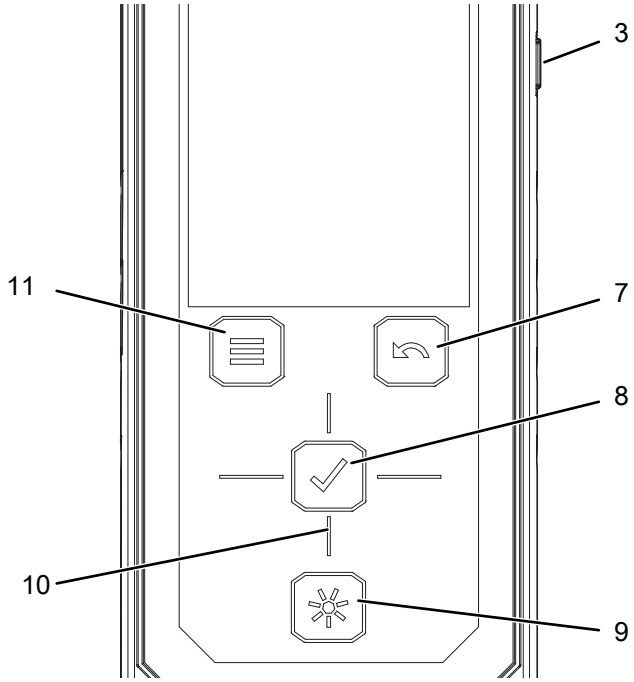
Device depiction



No.	Designation
1	Measuring sensor
2	Display
3	*Power* button
4	USB interface
5	Battery compartment with cover
6	Operating elements

Operating elements

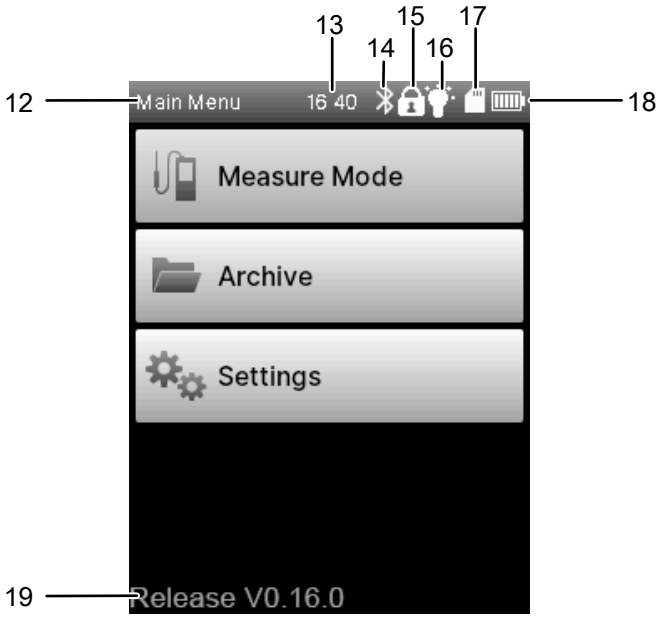
The device can be operated both using these operating elements and the touchscreen display.



No.	Operating element	Function
3	*Power* button	Switching on the device: press for approx. 2 s
		Activating or deactivating large print: press for approx. 1 s
		Activating or deactivation key lock: press for approx. 2 s
		Switching the device off: press for approx. 5 s
7	*Back* button	Opening the previous menu
8	*Confirm* button	Opening the submenu
		Confirming settings
9	*Illumination* button	Adjusting the display brightness: press briefly
		Taking a screenshot: press and hold
10	Cross control with *Up*, *Down*, *Left*, *Right* buttons	Navigating through menus
		Setting values
11	*Main menu* button	Opening the main menu

For safety reasons, some options can only be selected and configured by using the cross control and the *Confirm* button (8) (e.g. date and time in the *Settings* menu).

Display



No.	Indication	Meaning
12	*Title*	Name of the current screen or connected sensor type
13	*Time*	Current time
14	*Bluetooth*	Bluetooth enabled
15	*Padlock*	Key lock activated
16	*Lamp*	Additional display illumination activated
17	*Memory card*	microSD card inserted
18	*Battery*	Battery charge level
19	*Footer*	Software version number

Technical data

Parameter	Value
Model	T670
Material moisture	
Measuring range	1 to 200 digits or 0 % to 7.6 %
Accuracy	0.1 digits or ± 0.1 %
Resolution	0.1 digits
Penetration depth (non-destructive)	max. 40 mm
General technical data	
Measuring method	Capacitive
Display	LCD
Interface	USB-C
Operating conditions	0 °C to 50 °C with < 95 % RH (non-condensing)
Storage conditions	-10 °C to 60 °C with < 95 % RH (non-condensing)
Power supply	4 x 1.5 V, AA batteries
Weight	approx. 285 g
Dimensions (length x width x height)	209 mm x 63 mm x 35 mm
Bluetooth	
Frequency	2.4 GHz
Max. transmission power	-24 dBm

Scope of delivery

- 1 x Device T670
- 1 x Factory test certificate
- 1 x MultiMeasure Mobile app for download, see Operation chapter
- 1 x Quick guide

Transport and storage

Notice

If you store or transport the device improperly, the device may be damaged.
Note the information regarding transport and storage of the device.

Transport

When transporting the device, ensure dry conditions and and protect the device from external influences e.g. by using a suitable bag.

Storage

When the device is not being used, observe the following storage conditions:

- dry and protected from frost and heat
- protected from dust and direct sunlight
- at the temperature specified in the technical data
- Batteries are removed from the device

Operation

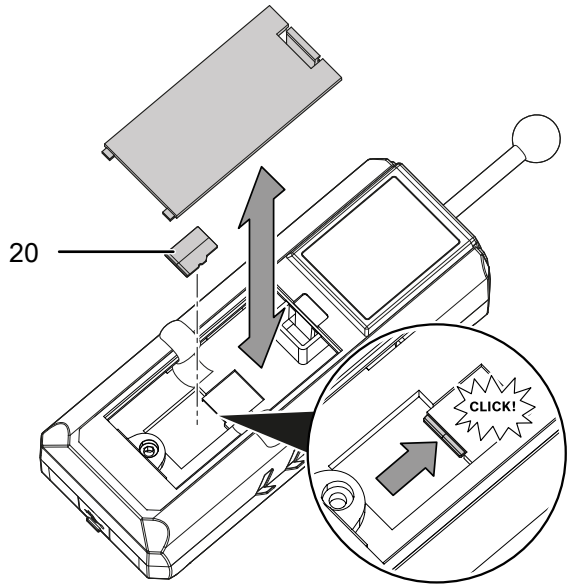
Inserting a microSD card (optional)

A microSD card can be inserted into the device to expand the internal measured value memory and transfer measured values to a computer. Please proceed as follows:

Caution

Make sure that the surface of the device is dry and the device is switched off.

1. Open the cover of the battery compartment (5).



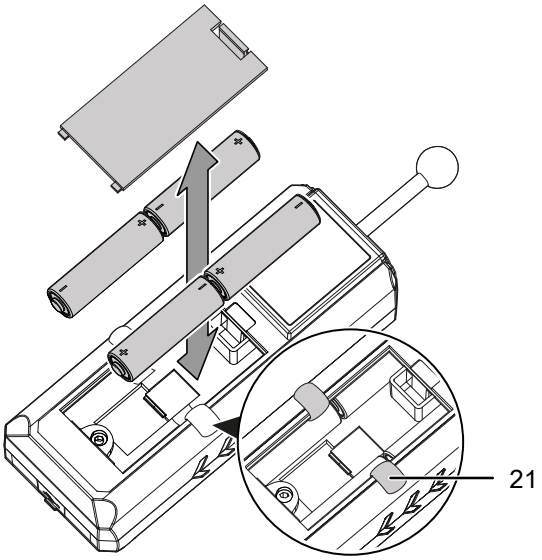
2. Insert the microSD card (20) into the slot provided as shown.
   ⇨ You will hear a clicking sound and feel the microSD card click into place.
3. Refit the battery compartment cover or continue with inserting the batteries if required.

Inserting the batteries

Insert the batteries into the device before first use.

Caution
Make sure that the surface of the device is dry and the device is switched off.

1. Open the cover of the battery compartment (5).



2. When inserting the batteries, make sure that the integrated pull tab (21) is positioned as shown.
   ⇨ It makes it easier to remove the batteries.
3. Insert the batteries with correct polarity.
4. Insert the cover of the battery compartment.
   ⇨ The device can now be switched on.

Switching the device on

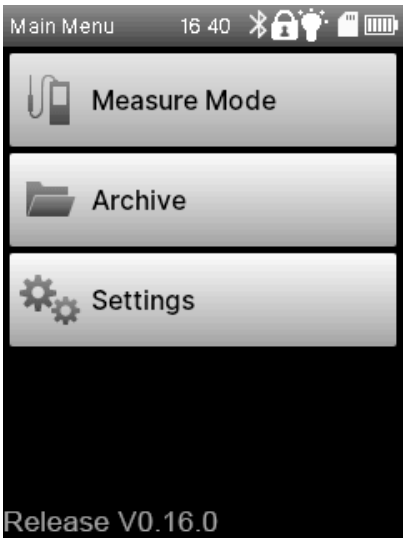
1. Hold the device pointing into clear space.
   – The device should point away from the body and not at or near material surfaces. When failing to observe the above instructions, the following calibration will be corrupt.
2. Press and hold the *Power* button (3) for approx. 2 seconds.
   ⇨ An acoustic confirmation signal is emitted.
   ⇨ After approx. 3 seconds, the colour display will be switched on.
   ⇨ The main menu will be displayed.
   ⇨ The device is automatically calibrated.
   ⇨ Several acoustic signals are emitted during calibration.
3. Once calibration is complete, the device is ready for use, see section *Carrying out a measurement*.

Key lock

1. Press the *Power* button (3) for approx. 1 second during operation.
   ⇨ Key lock is activated.
   ⇨ The *Padlock* indication (15) is shown on the display.
2. Press the *Power* button (3) for approx. 1 second again.
   ⇨ Key lock is no longer activated.
   ⇨ The *Padlock* indication (15) disappears.

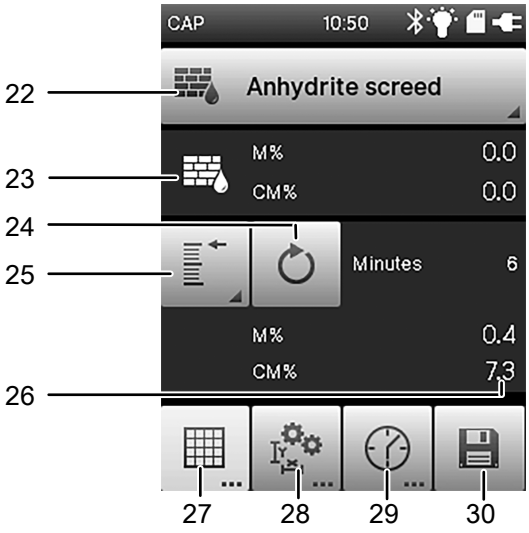
Main menu

You can open the following submenus from the main menu:



Submenu	Function
Measure Mode	Carry out measurements
Archive	Open archived measured values
Settings	Make device settings

Measurement value display



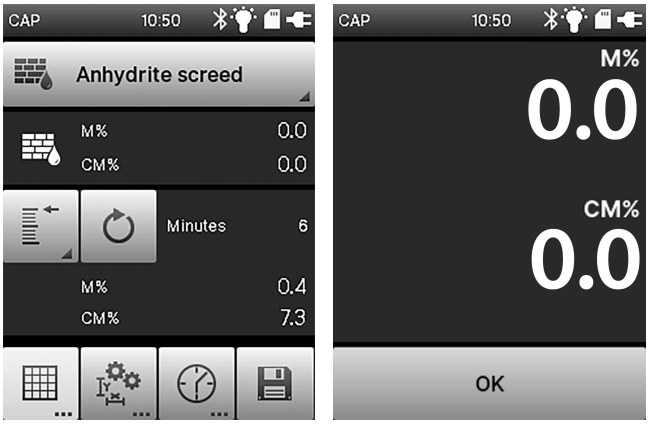
Item	Designation	Function
22	*Construction material selection*	Opens the menu for selecting the construction material: Without material: A non-destructive, indicative (*digit*) measurement is carried out. Anhydrite floor: A building moisture measurement is carried out for anhydrite floor. The measurement results (indicative) in M% and CM% are calculated with an equation which is suitable for this material. Cement floor: Building moisture measurement for cementitious screed. The measurement results (indicative) in M% and CM% are calculated with an equation which is suitable for this material.
23	*Building moisture*	Indicates the building moisture: digits: dimensionless display of the measured value (without material selection) M%: measured value as a mass percentage CM%: measured value according to the calcium carbide method
24	*Reset*	Resets the measured values displayed in (26) to zero.

Item	Designation	Function
25	*MAX/MIN*	Opens the menu for selecting the indication of measured values. Minimum: Indicates the smallest detected measured value from a measuring period. Maximum: Indicates the largest detected measured value from a measuring period. Average: Indicates the average value of all detected measured values from a measuring period. Hold: Pauses the current detected measured value and shows it continually (when this option is selected). Off: Switches off the indication of measured values in (26).
26	*Building moisture reference values*	Measured value indication according to selection in (25): Minute: Duration of the measured interval M%: measured value (e.g. as average value) as a mass percentage CM%: measured value (e.g. as average value) according to the calcium carbide method
27	*Grid measurement*	Opens the menu for carrying out a grid measurement (see section *Building moisture – Grid measurement*).
28	*Measuring range*	Opens the menu for setting the measuring range in height x width (edge lengths) and their activation/ deactivation as well as the specified alarm value (see section *Setting the measuring range*).
29	*Recording*	Opens the menu for setting a fixed recording duration for an automatic measurement (see section *Measuring mode building moisture – Automatic measurement*).
30	*Save*	Saves the measured values in the archive.

Activating large print

The current measured values shown in the upper half of the display can also be displayed in large print.

1. With the measurement display open, briefly press the *Power* button (3).



2. To exit the large print display, press the *Power* button (3) once again.

Info

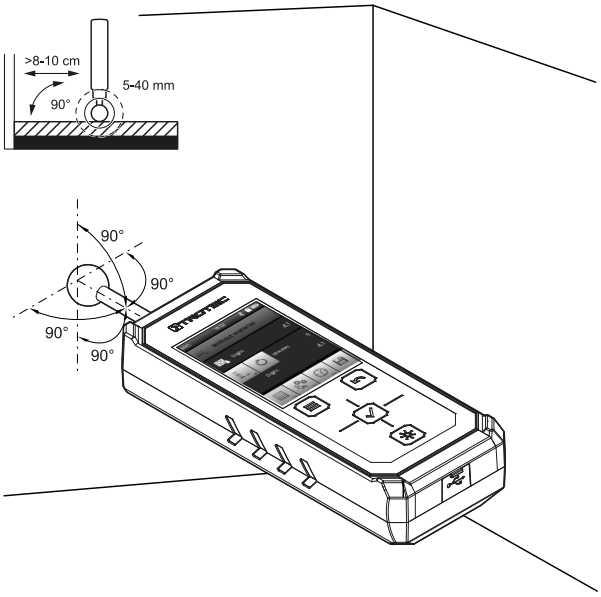
When the key lock is enabled, large print cannot be activated or deactivated.

Carrying out a measurement

Notice

Note that moving from a cold area to a warm area can lead to condensation forming on the device's circuit board. This physical and unavoidable effect can falsify the measurement. In this case, the display shows either no measured values or they are incorrect. Wait a few minutes until the device has become adjusted to the changed conditions before carrying out a measurement.

Please observe the information regarding the measurement principle.



1. Wait until the calibration is completed before starting a measurement.
   ⇨ During calibration, the *Building moisture* (23) and *Building moisture reference values* (26) indications show "Sens. Init.".
   ⇨ As soon as the *Building moisture* (23) and *Building moisture reference values* (26) indications show measured values, the device is ready for operation.
2. Hold the measuring device at the black rubber surfaces and maintain this position, for otherwise the measurement results might be falsified.
3. Firmly place the measuring head in a vertical position on the good to be measured.
4. Observe a minimum distance of 8 to 10 cm to corners.
   ⇨ The measured values are displayed in the *Building moisture* (23) and *Building moisture reference values* (26) indications.

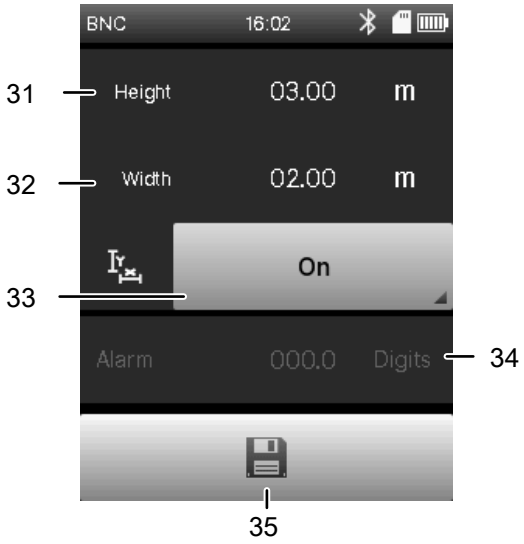
Carrying out a comparative measurement

1. Look for a preferably dry spot at the component.
2. Perform a measurement as previously described.
   ⇨ The thus determined measured value will be the reference value for *dry*.
3. Look for a preferably damp or wet spot at the component, if any.
4. Perform a measurement as previously described.
   ⇨ With regard to the present conditions, the thus determined measured value will be the reference value for *damp/wet*.
5. Carry out further measurements at the component.

Higher measured values usually signify a higher moisture content in the near-surface area of the material to be measured.

Setting the measuring range

You can define the dimensions of the measuring range before performing a grid measurement.



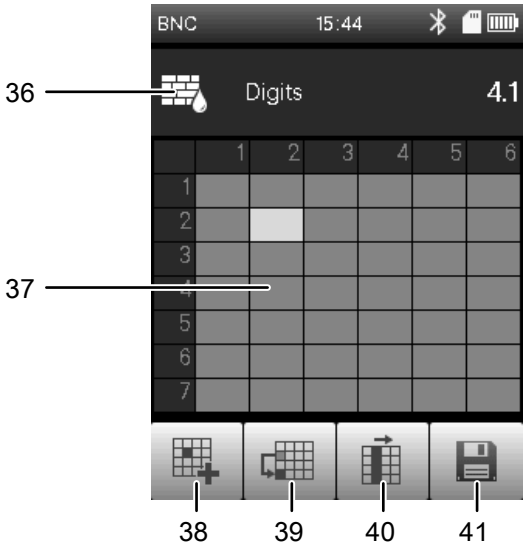
Item	Designation	Function
31	*Height of measuring range*	Total height of the grid area to be measured
32	*Width of measuring range*	Total width of the grid area to be measured
33	*Activate measuring range*	Activating ("On") or deactivating ("Off") the set measuring range during grid measurement When deactivated, you must specify the corresponding edge lengths of the grid area in the MultiMeasure app after grid measurement.
34	*Alarm*	Limit value for the alarm signal of the dimensionless measuring unit "digits"
35	*Save*	Saves the settings.

To adjust the grid area dimensions, please proceed as follows:

1. Use the cross control (10) or touch function to select the setting for the height or width of the grid.
2. Open the setting by pressing the *Confirm* button (8).
3. Use the *Up* and *Down* buttons of the cross control (10) to adjust the value.
4. Use the *Left* and *Right* buttons of the cross control to switch between the digits to be set.
5. Save the setting by pressing the *Confirm* button (8).
6. In the *Activate measuring range* selection menu, select whether the dimensions of the area should be used during grid measurement ("On") or not ("Off").

Carrying out a grid measurement

Use the grid measurement function to carry out a grid measurement (e.g. of a wall). The grid measurement can be carried out either with height and length details or without a measuring range (only using the grid).



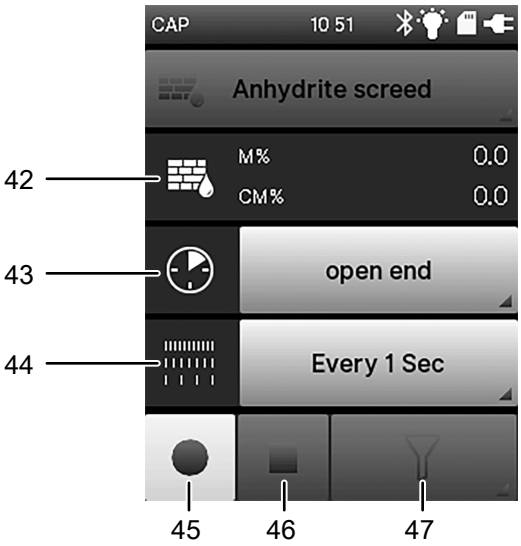
Item	Designation	Function
36	*Measured value*	dimensionless display of the measured value in digits: The lower the measured electric resistance, the higher the moisture content in the material and thus the digit value.
37	*Measuring grid*	Divides the measuring surface into a grid. The colour distribution from white (dry) to light blue (low moisture) and dark blue (wet) graphically shows the moisture distribution in the measured object.
38	*Enter measurement*	Enters the current measured value to the marked grid measuring spot. Afterwards, the grid measuring spot below will be selected.
39	*Skip*	Skips the grid measuring spot below the currently selected grid measuring spot and selects the grid measuring spot that follows afterwards. Use this function if no measurement can be made at this position because of a power cabinet or a window etc.
40	*Next column*	Skips to the start of the next column.
41	*Save*	Saves the grid measurement in the archive.

Please proceed as follows for grid measurement:

1. Press the *Confirm* button (8) to select the grid.
2. Use the cross control buttons (10) to select the grid measuring spot.
3. Press the *Confirm* button to confirm the selected grid measuring spot.
   ⇨ The dimensionless measured value is recorded.
4. Use the cross control buttons to select the next grid measuring spot and repeat the process.

Carrying out a continuous measurement

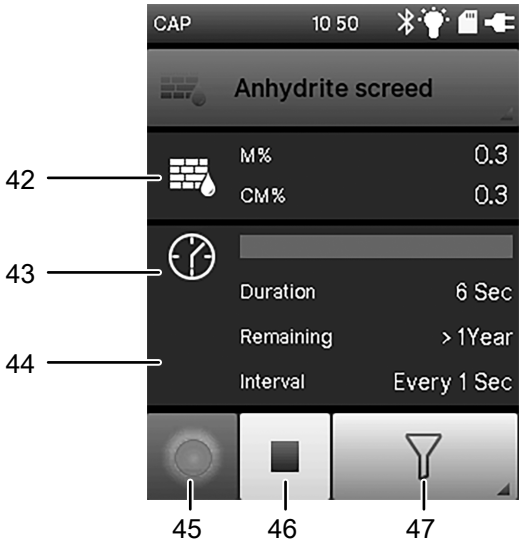
The recording function allows you to automatically record measured values at regular intervals over a desired period of time.



Item	Designation	Function
42	*Current measured values*	Indication of the current measured values
43	*Recording duration*	Opens a submenu with options for the duration of the recording.
44	*Recording interval*	Opens a submenu with options for the interval of the measured values to be saved.
45	*Start recording*	Starts recording.
46	*Stop recording*	Recording is stopped and the measured values are saved.
47	*Filter*	Opens a submenu for selecting the values to be displayed during recording.

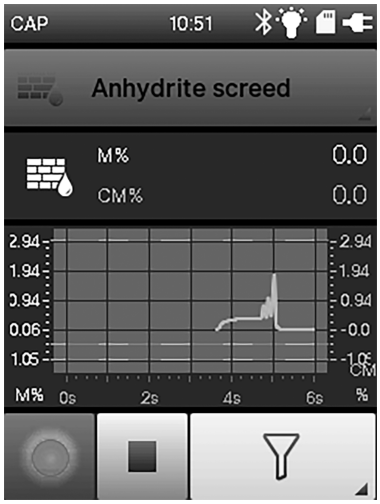
Please proceed as follows to perform a continuous measurement:

1. Open the *Continuous measurement* submenu (29).
2. Open the *Recording duration* submenu (43) and select the desired recording period.
   ⇨ The selected period is applied.
3. Open the *Recording interval* submenu (44) and select the desired time interval between the measured values to be saved.
4. The selected interval is applied.
5. Press the *Start recording* button (45) to start recording.
   ⇨ Recording begins.
   ⇨ The recording symbol (45) is displayed in red.
   ⇨ The screen for ongoing recordings opens.
   ⇨ The elapsed and remaining time as well as the selected interval are displayed.



6. Open the *Filter* submenu (47) to change the view.
   ⇨ A selection menu opens, allowing you to choose between time display and a graph showing the measured values. Up to two parameters can be selected simultaneously.

7. Select the desired display options.
   ⇨ When you select one or more measured values, the graph view opens, displaying the selected measured values as a function of time.

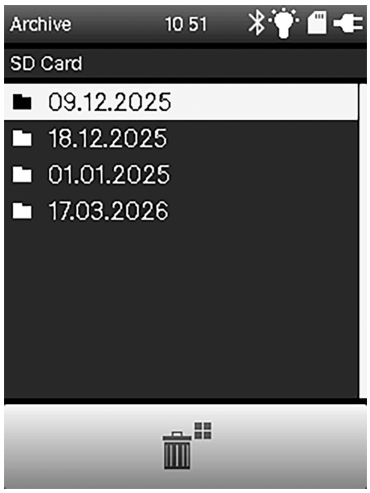


8. Tap the *Stop recording* button (46) in any of the views to end the recording.
   ⇨ Recording will stop before the set time has elapsed and the collected data will be saved to the SD card.

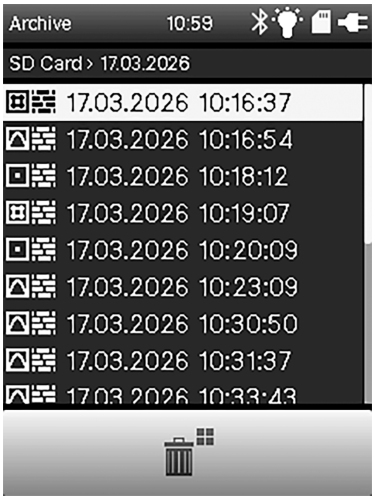
Opening measurement data from the archive

Individual measured values and the results of continuous measurements can be viewed and deleted in the archive. To do so, please proceed as follows:

1. Open the *Archive* submenu.
   ⇨ A list of folders is displayed in which the measured data is sorted by date of collection.

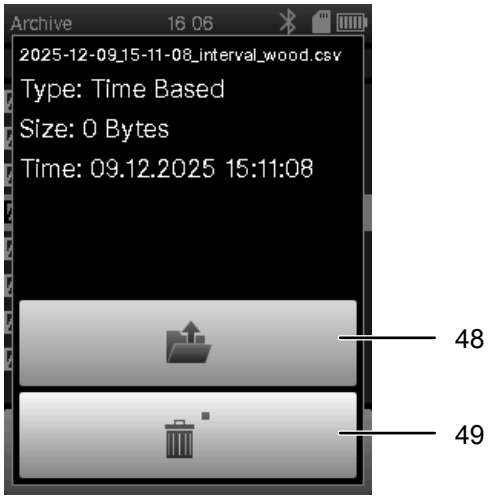


2. Open the folder with the desired date.
   ⇨ All recordings from the selected date are displayed in the form of a list.



   ⇨ The icons next to the saved measuring projects show each measuring mode. The meaning is as follows:
   - building moisture measurement
   - grid measurement
   - individual spot measurement
   - continuous measurement

3. Open the desired recording.
   ⇨ A selection menu for the desired recording is displayed.
   ⇨ You have the option to delete (49) or open (48) the file.

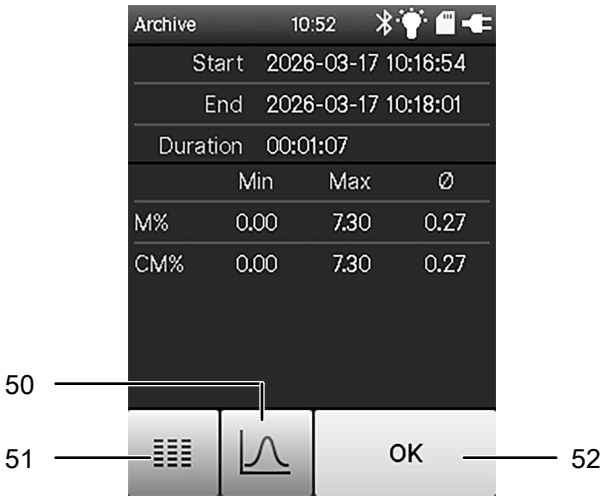


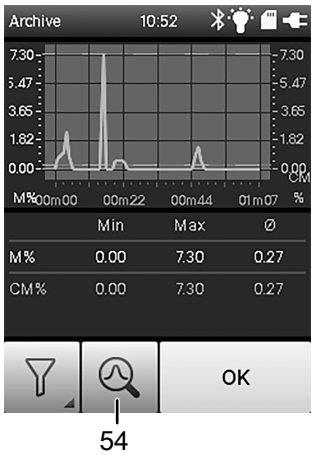
4. Open the file to view the details of the measured values.
   ⇨ The detailed view of the recording opens.

Notice

Several consecutive individual spot measurements are combined and saved using the date and time of the first individual spot measurement. They can also be displayed as a graph.

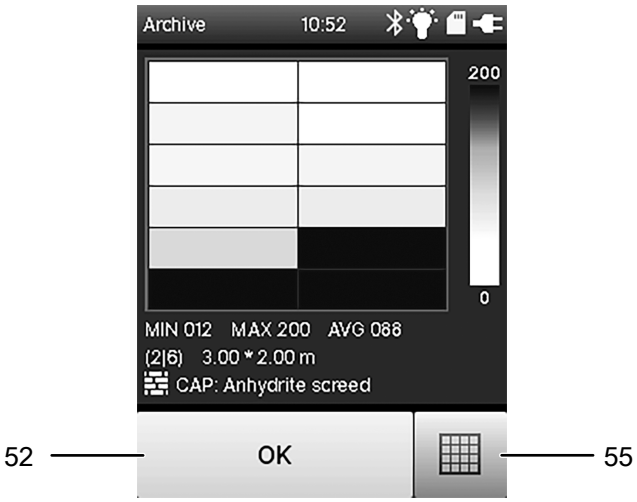
The detailed view for continuous and individual spot measurements offers the following options:





Item	Designation	Function
50	*Graph view*	Opens a graph showing the measured values over time.
51	*List view*	Opens a list of the individual measured values.
52	*OK*	Closes the detailed view of the archive entry.
53	*Filter*	Opens the menu for filtering the view by parameters.
54	*Magnifying glass*	Zooms in on the selected section of the graph.

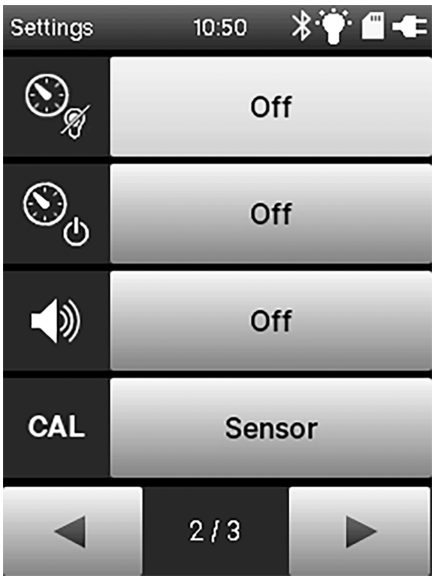
The detailed view for matrix measurements offers the following options:

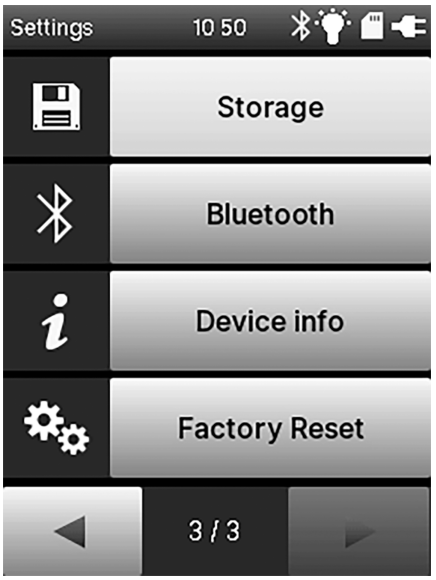


Item	Designation	Function
52	*OK*	Closes the detailed view of the archive entry.
55	*Resume measurement*	Opens the grid measurement again so that you can continue measuring.

Device settings

In the *Settings* submenu, you can configure the following device settings:





Icon	Submenu	Function	Icon	Submenu	Function
	Language	Setting the device language		*Sounds*	Setting the signal sounds
	Units	Switching between metric and imperial units	CAL	*CAL*	Sensor calibration/offset adjustment
	Brightness	Adjusting the display brightness		*Memory*	Changing the storage location to either internal memory or microSD card
	Date and time setting	Setting the date and time		*Bluetooth*	Switching Bluetooth on or off
	Screen saver	Setting the timer for the screen saver		*Device info*	Information about the device and software version
	Automatic switch-off	Setting the timer for automatic switch-off of the device		*Reset*	Restoring the factory settings

Setting the language

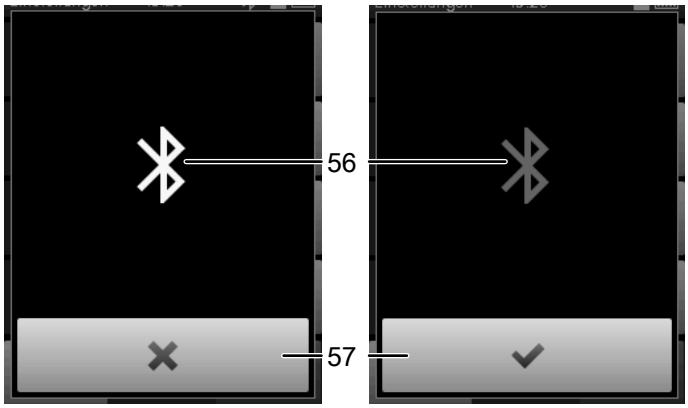
1. From the main menu, select the *Settings* submenu.
2. Open the *Language* submenu.
3. Select the desired language in the following screen.
   ⇨ The selected screen language is activated immediately.

4. Press the *Main menu* button (11) to return to the main menu.

Switching on Bluetooth

To use the MultiMeasure Mobile app, Bluetooth must first be turned on. The Bluetooth function is activated when the *Bluetooth* indication (14) is visible on the display. Please proceed as follows to activate the Bluetooth connection:

1. Open the *Settings* submenu.
2. Scroll to page 3.
3. Open the *Bluetooth* submenu.
   ⇨ The window for setting up the Bluetooth connection opens.



   ⇨ The Bluetooth icon (56) is white and the button (57) shows an "X" when Bluetooth is turned on.
   ⇨ The Bluetooth icon (56) is greyed out and the button (57) shows a tick when Bluetooth is turned off.
4. Tap the button (57) to switch to the other setting.

Calibrating the sensor

The sensor is calibrated via the *Sensor* submenu in the *Settings*. From this menu, a single-point calibration (zero offset) can be carried out. The sensor is already factory-calibrated and has a corresponding characteristic calibration curve. By specifying a calibration value (offset), a global shift of the calibration curve is performed for the single-point calibration, which has an effect on the entire measuring range.
The offset to be entered is the value by which the calibration curve will be shifted.

Example:
The displayed value is always 5 increments too high.
=> Change the offset value for this measurement channel by -5.
The offset value is set to 0.0 at the factory for most sensor types. Changing the offset value brings about an automatic reset of the measured values.

The offset value range depends on the respective sensor type and the unit to be measured. When entering values outside of the respective value range, a fault message stating the setting limits will be emitted. The shift will be saved and therefore also be considered for future measurements.

Performing firmware updates

Firmware updates can be carried out for the T670. To do so, please proceed as follows:

1. Establish a Bluetooth connection between the T670 and the terminal device on which the MultiMeasure Mobile app is installed.
2. Open the MultiMeasure Mobile app.
   ⇨ A notification window will open, informing you that a firmware update is available.
   ⇨ You have the option to run the update now or postpone it until later.
3. Select the option to perform the update.
   ⇨ The new firmware version is being installed.

Info
The update can also be downloaded from the Trotec website and transferred using the microSD card. This process is faster than wireless transmission via Bluetooth. To do this, please visit the product website or contact the customer service.

MultiMeasure Mobile app

Install the Trotec MultiMeasure Mobile app on the terminal device you want to use in combination with the device.

Info
Some of the app's functions require access to your location and an active Internet connection.

The app is available for download in the Google Play Store as well as in Apple's app store and via the following link:

https://hub.trotec.com/?id=43083

Switching the device off

1. Press and hold the *Power* button (3) until the colour display turns off.
   ⇨ The device is switched off.

MultiMeasure Mobile app

The T670 can also be used with the MultiMeasure Mobile app. To do so, connect it to your terminal device via Bluetooth.

Connecting a measuring device

Proceed as follows to connect the measuring device to the terminal device:

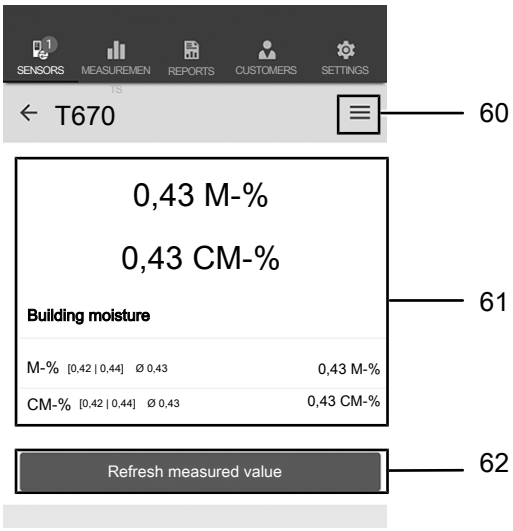
- ✓ The Trotec MultiMeasure Mobile app is installed on your terminal device.
- ✓ The Bluetooth function on your terminal device is activated.
- ✓ The T670 is switched on.
- ✓ Bluetooth is enabled on the T670.

1. Start the Trotec MultiMeasure Mobile app on the terminal device.
2. Press the *Sensors* button (57) on the terminal device.
   ⇨ The sensors overview opens.
3. Press the *Refresh* button (58).
   ⇨ If scan mode was not active before, the colour of the *Refresh* button (58) will change from grey to black. The terminal device will now search for all available sensors.
4. Press the *Connect* button (59) to connect the T670 to the terminal device.
   ⇨ The measurement value display opens.

No.	Designation	Meaning
57	*Sensors* button	Opens the sensors overview.
58	*Refresh* button	Refreshes the list of sensors near the terminal device.
59	*Connect* button	Connects the displayed sensor to the terminal device.

Measurement value display

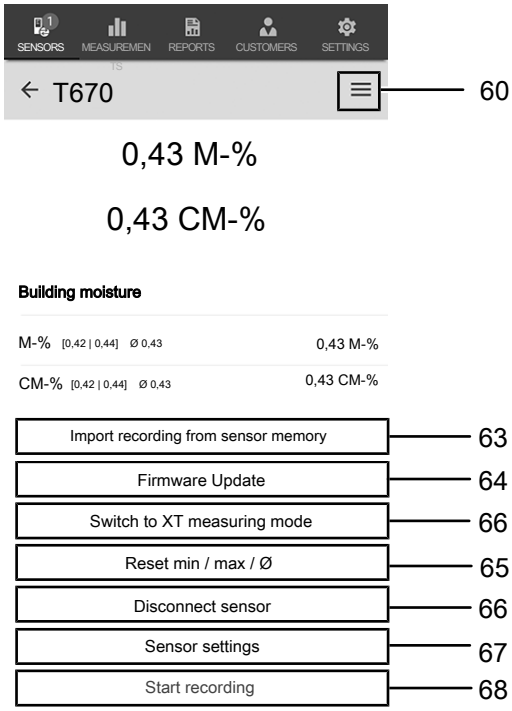
After selecting the sensor, the measurement value display opens.



No.	Designation	Meaning
60	*Menu* button	Opens the menu for making settings for the current measurement.
61	Numeric *value* display	Displays the measured values collected by the connected sensor as well as average, maximum and minimum values.
62	*Refresh measured value* button	Performs an individual measurement and refreshes the displayed values.

Measurement settings

The *Menu* button (60) opens options for adjusting the measurement settings.



No.	Designation	Meaning
60	*Menu* button	Opens the menu for making settings for the current measurement.
63	*Import recording* button	Imports recordings from the device's memory.
64	*Firmware update* button	Performs a firmware update on the device.
65	*Reset min / max / Ø* button	Deletes the determined values in (61).
66	*X/T measurement* button	Switches between continuous measurement and individual measurement.
66	*Disconnect sensor* button	Disconnects the T670 from the terminal device.
67	*Sensor settings* button	Opens the settings menu for the connected device.
68	*Start recording* button	Starts a recording of the determined measured values for later evaluation.

Recording measured values

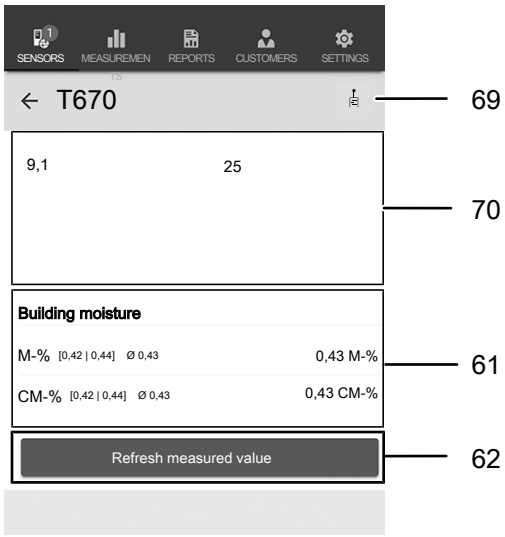
Proceed as follows to record measured values for later evaluation:

1. Press the *Menu* button (60).
   ⇨ The context menu opens.
2. Press the *Start recording* button (68).
   ⇨ A menu with various measurement methods is displayed:
   - individual spot measurement without image
   - individual spot measurement with image
   - matrix measurement without background image
   - matrix measurement with background image
3. Select one of the measurement methods by tapping the respective button on the terminal device.
   ⇨ Recording begins.
   ⇨ The *Menu* button (60) changes to the sensor icon and flashes while recording is in progress.

Performing an individual spot measurement without image

The individual spot measurement without image allows you to record several individual measuring points. To do so, please proceed as follows:

1. Repeatedly press the *Refresh measured value* button (62) until you have recorded all the required measured values.



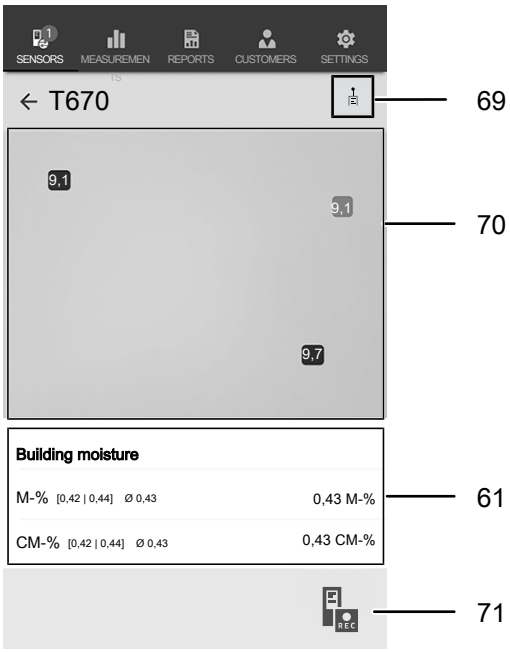
No.	Designation	Meaning
69	*REC* button	Opens the context menu for sensors.
70	*Measurement series* indication	Indicates the measured values in rows.
61	Numeric *value* display	Displays the measured values collected by the connected sensor as well as average, maximum and minimum values.
62	*Refresh measured value button*	Performs an individual measurement and refreshes the displayed values.

Performing an individual spot measurement with image

If you have selected individual spot measurement with image, you will be prompted to choose whether you want to use a photo already saved in the mobile device's gallery or take a new one directly in the app. Choose an image section that best matches the measuring surface.

For measured value data logging please proceed as follows:

1. Tap the screen at the exact measuring location. The measured value will be displayed at this location.
   ⇨ The measured value will be displayed in a specified grid on the background image. Pressing the *Shift measuring point* button (71) allows you to adjust the position of the measuring points. By pressing the *Shift measuring point* button (71) once more you can return to the measuring mode.

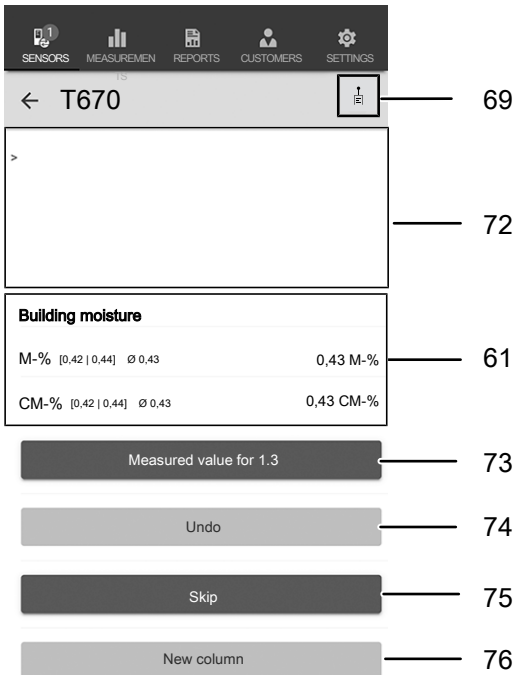


No.	Designation	Meaning
69	*REC* button	Opens the context menu for sensors.
70	*Measurement series* indication	Indicates the measured values in rows.
61	Numeric *value* display	Displays the measured values collected by the connected sensor as well as average, maximum and minimum values.
71	*Shift measuring point* button	Stops the measured value data logging and allows you to relocate the measuring points on the background image.

Performing a matrix measurement without background image

In case of a matrix measurement an entire series of measuring points is captured using a grid the size of which has to be selected.

1. Always start a matrix measurement in the top left corner (1st row, 1st column).
   ⇨ The grid field to be measured flashes.
2. Perform the measurement in the flashing grid field.
3. Confirm the measured value by pressing the *Measured value data logging* button (73). You can reset a logged value by pressing *UNDO* (74). You can skip the indicated grid field and continue with the measurement in the next by pressing the *SKIP* button (75).
   ⇨ The displayed measurement grid (72) moves on to the next line.
4. Perform the next measurement at the given point.
5. Press *NEW COLUMN* (76) when you have completed the measurements of all lines in one column so as to move on to the next.

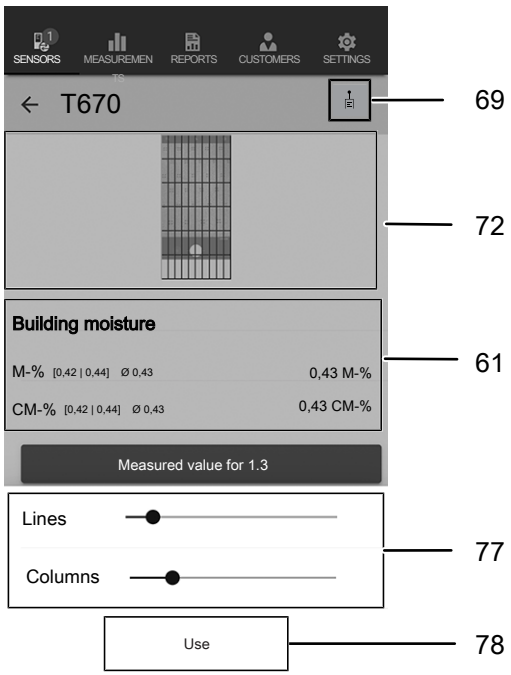


No.	Designation	Meaning
61	Numeric *value* display	Displays the measured values collected by the connected sensor as well as average, maximum and minimum values.
69	*REC* button	Opens the context menu for sensors.
72	Measuring field with grid	Indicates the measurement grid of the measuring field (grid field to be measured flashes red).
73	*Measured value data logging* button	Saves the measured value for the flashing grid field.
74	*UNDO* button	Deletes the saved measured value for the respective grid field.
75	*SKIP* button	Skips the grid field flashing red and moves on to the next grid field.
76	*NEW COLUMN* button	Starts a new column.

Performing a matrix measurement with background image

If you select a matrix measurement with background image, you will be prompted to choose whether you want to use a photo already saved in the mobile device's gallery or take a new one directly in the app. Choose an image section that best matches the measuring surface. You will then reach the settings menu for the measurement grid.

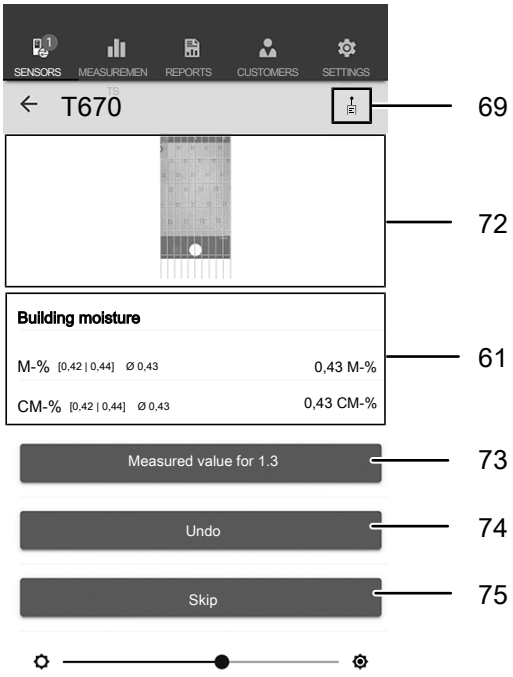
1. Adjust the grid's number of columns and lines by use of the slider (77).
2. Confirm the settings for the grid by pressing *Use* (78).



No.	Designation	Meaning
61	Numeric *value* display	Displays the measured values collected by the connected sensor as well as average, maximum and minimum values.
69	*REC* button	Opens the context menu for sensors.
72	Measuring field with grid	Indicates the measurement grid of the measuring field (with or without background image).
77	Slider	Changes the grid's number of columns and lines.
78	*Use* button	Confirms the settings and leads to the measurement menu.

Then start to carry out the measurements:

1. Always start a matrix measurement in the top left corner (1st row, 1st column).
   ⇨ The grid field to be measured flashes.
2. Perform the measurement in the flashing grid field.
3. Confirm the measured value by pressing the *Measured value data logging* button (73). You can reset a logged value by pressing *UNDO* (74). You can skip the indicated grid field and continue with the measurement in the next by pressing the *SKIP* button (75).
   ⇨ The displayed measurement grid (72) moves on to the next line.
4. Perform the next measurement at the given point.



Info

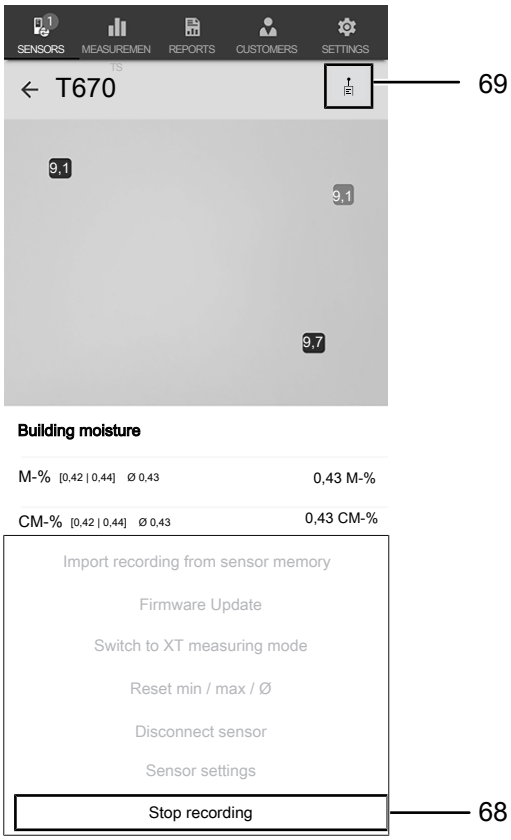
By use of the slider you can optionally bring out either the background image or the grid.

No.	Designation	Meaning
61	Numeric *value* display	Displays the measured values collected by the connected sensor as well as average, maximum and minimum values.
69	*REC* button	Opens the context menu for sensors.
72	Measuring field with grid	Indicates the measurement grid of the measuring field (grid field to be measured flashes red).
73	*Measured value data logging* button	Saves the measured value for the flashing grid field.
74	*UNDO* button	Deletes the saved measured value for the respective grid field.
75	*SKIP* button	Skips the grid field flashing red and moves on to the next grid field.

Stopping a recording

Proceed as follows to stop recording the measured values:

1. Press the *REC* button (69).
   ⇨ The context menu for sensors opens.
2. Press the *Stop recording* button (79).
   ⇨ The context menu for saving the recording opens.
3. You can optionally save, discard or resume the measurement.

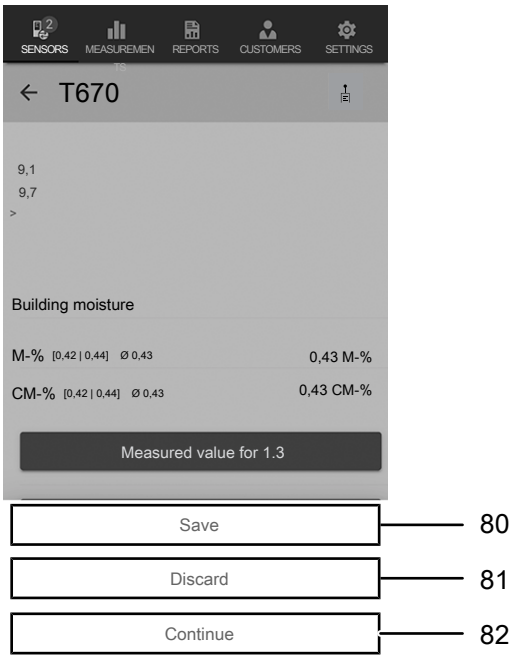


No.	Designation	Meaning
69	*REC* button	Opens the sensor settings menu.
79	*Stop recording* button	Stops the current recording of measured values and opens the submenu for saving recordings.

Saving a recording

Proceed as follows to save the recorded measured values:

1. Press the *Save* button (80) to save the recorded measured values on the terminal device.
   ⇨ The input mask for logging the recorded data opens.
2. Enter all the data relevant for an unambiguous assignment, then save the recording.
   ⇨ The recording will be saved on the terminal device.

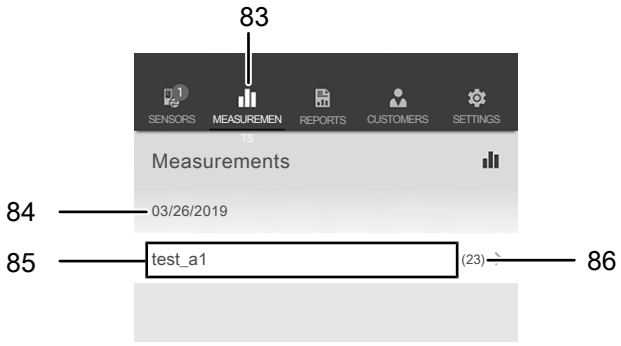


No.	Designation	Meaning
80	*Save* button	Stops the current recording of measured values and opens the input mask for logging recording data.
81	*Discard* button	Stops the current recording of measured values and discards the recorded measured values.
82	*Continue* button	Resumes the recording of the measured values without saving.

Analysing measurements

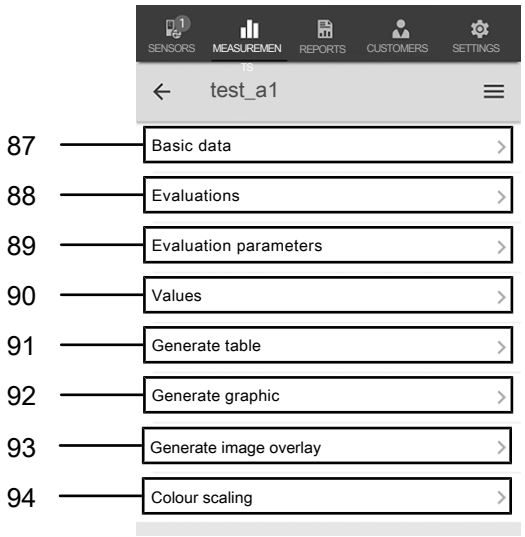
Proceed as follows to call up the saved measurements:

1. Press the *MEASUREMENTS* button (83).
   ⇨ An overview of already saved measurements will be displayed.
2. Press the *Display measurement* button (85) for the desired measurement to be indicated.
   ⇨ A context menu for the selected measurement opens.



No.	Designation	Meaning
83	*MEASUREMENTS* button	Opens the overview of saved measurements.
84	Indication of the *date of the measurement*	Indicates the date on which the measurement was recorded.
85	*Display measurement* button	Opens the context menu for the selected measurement.
86	Indication of the *number of measured values*	Indicates the number of individual measured values constituting the saved measurement.

The following functions can be called up in the context menu of the selected measurement:

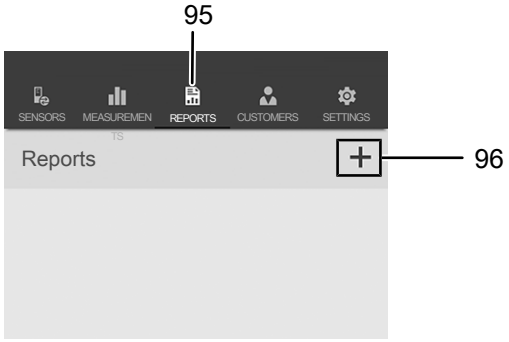


No.	Designation	Meaning
87	*Basic data* button	Opens an overview of the data saved for the measurement.
88	*Evaluations* button	Opens an overview of the evaluations generated for the measurement (graphics and tables).
89	*Evaluation parameters* button	Opens a menu to select and deselect individual evaluation parameters.
90	*Values* button	Opens a tabular overview of all the values logged for the measurement..
91	*Generate table* button	Creates a table containing the logged values of the measurement and saves it as a *.CSV file.
92	*Generate graphic* button	Creates a graphic representation of the logged values and saves it as a *.PNG file.
93	*Generate image overlay* button	Combines a background image with the coloured representation of the measured moisture values.
94	*Colour scaling* button	Allows you to adjust the colour display of the measured moisture values.

Generating a report

The reports generated in the MultiMeasure Mobile app are short reports providing a fast and simple documentation. Proceed as follows to generate a new report:

1. Press the *REPORTS* button (95).
   ⇨ The reports overview opens.
2. Press the *New report* button (96) to create a new report.
   ⇨ An input mask for entering all the relevant information opens.
3. Enter the information via the input mask and save the data.



No.	Designation	Meaning
95	*REPORTS* button	Opens the overview of saved reports.
96	*New report* button	Creates a new report and opens the input mask.

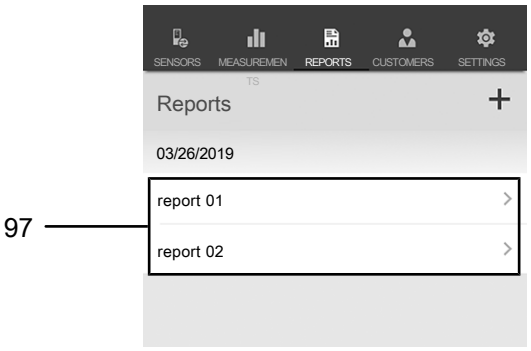
Info

The customer can acknowledge the report directly in the integrated signature field.

Calling up a report

Proceed as follows to call up a created report:

1. Press the *REPORTS* button (95).
   ⇨ The reports overview opens.
2. Press the corresponding button (97) to display the desired report.
   ⇨ An input mask opens in which you can view and edit all the information.

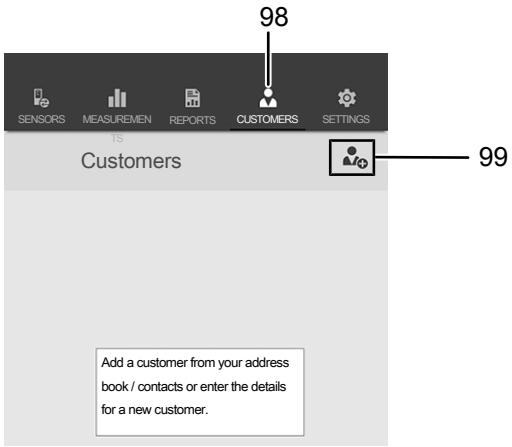


No.	Designation	Meaning
97	*Display REPORT* button	Opens the selected report.

Creating a new customer

Proceed as follows to create a new customer:

1. Press the *Customers* button (98).
2. Press the *New customer* button (99).
   ⇨ An input mask for entering all the relevant information opens.
3. Enter the information via the input mask and save the data.
4. Alternatively, you can also import existing contacts from the phone book of the terminal device.

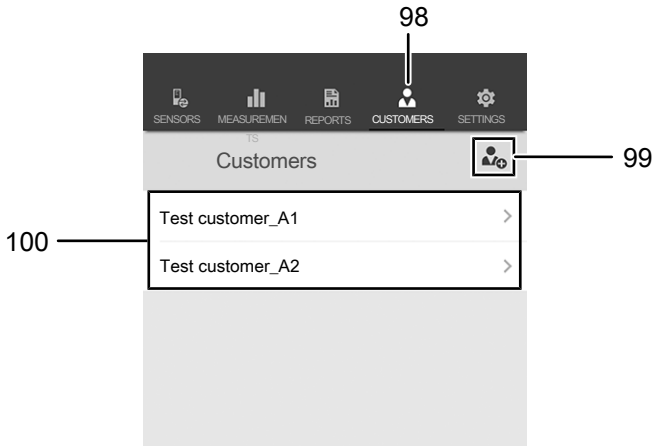


No.	Designation	Meaning
98	*CUSTOMERS* button	Opens the overview of saved customers.
99	*Add customer* button	Creates a new customer and opens the input mask.

Calling up customers

Proceed as follows to call up an already created customer:

1. Press the *Customers* button (98).
   ⇨ A list of the customers created so far opens.
2. Press the *Customer X* button (100).
   ⇨ An input mask opens in which you can view and edit all the information for the selected customer as well as directly start a new measurement.
   ⇨ The *New customer* button (99) changes. In this menu it can be used to delete the selected customer data record.

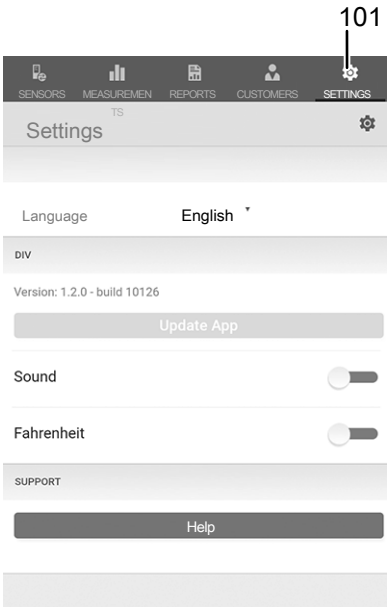


No.	Designation	Meaning
98	*CUSTOMERS* button	Opens the overview of saved customers.
99	*Add customer* button	Creates a new customer and opens the input mask. Allows deletion whilst the input mask is open.
100	*Customer X* button	Opens the input mask for reading and changing the information for a saved customer.

App settings

Proceed as follows to make settings in the Trotec MultiMeasure Mobile app:

1. Press the *SETTINGS* button (101).
   ⇨ The settings menu opens.
2. Adjust the settings as required.



No.	Designation	Meaning
101	*SETTINGS* button	Opens the overview for the app settings and information.

Disconnecting the measuring device

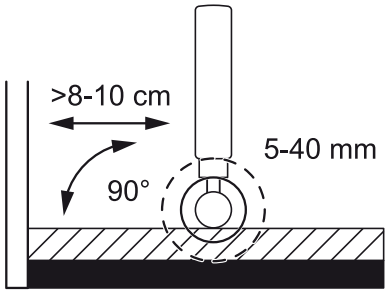
Proceed as follows to disconnect the T670 from the terminal device:

1. Press the *Sensors* button (57).
   ⇨ A list of connected and available sensors will be displayed.
2. Swipe left on the device you want to disconnect until the *Disconnect sensor* button appears.
3. Press the *Disconnect sensor* button.
   ⇨ The T670 is now disconnected from the terminal device and can be switched off.

Measuring principle

The measurement is effected according to the dielectric measuring principle.

Notes regarding the measurement principle



- The measurement results are only to be used as reference for a rough orientation.
- An important variable influencing the measured value is the bulk density of the good to be measured. The higher the bulk density, the higher the measured value.
- Before measuring, the measuring point is to be cleared of any impurities (e.g. paint residues, dust).
- If the material to be measured contains metal (e.g. nails, screws, lines, pipes, etc.) and is situated within the sensor's measuring field, the measured value skyrockets. In that event the measurement is not conclusive.
- When the ball head is held to corners (e.g. window frames), the measured value is generally higher, because there is more matter in the measuring head's stray field. Toward a corner a distance of more than 8 to 10 cm has to be observed.
- During the measurement always hold the measuring head (6) in a vertical position to the measured material, press it to the surface and do not tilt it.
- Rough surfaces will always result in a too low measured value.
- Depending on the material's bulk density, the device's impact depth amounts to 20 to 40 mm. Conclusions regarding zones located at a lower level cannot be drawn.
- With material thicknesses of less than 20 mm there is a danger of humidity values from adjacent material layers affecting the measured value.
- The dielectric measurement method's main area of use consists in comparative measurements at the same construction material or similar components. Therefore, this method is well suited for the examination of water damage, leak detection and the localization of moisture zones for the purpose of marking the measuring spot for CM measurements.

Measured value assessment for wood

The measurement result is either in the dry or the saturated area.

Saturated means that in addition to the water bound within the wood there is further liquid. If there is, hence, a measured value of more than 80, the wood is most like soaked.

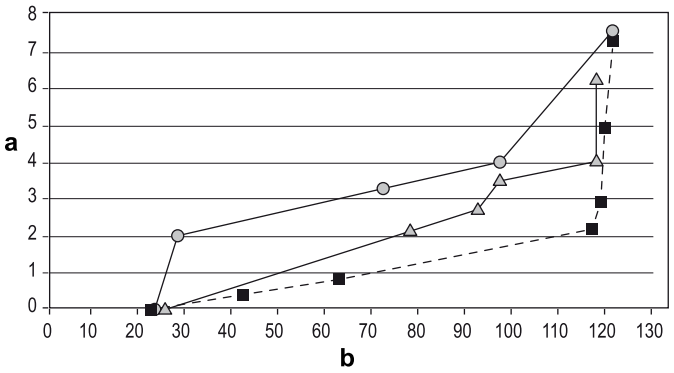
Display [digit]	Wood moisture zone
< 50 digits	dry
> 80 digits	limit to the saturated range

Since the measurement value displays of the dielectric measurement method – depending on marginal conditions – are subject to great fluctuations, a resistance measurement is always preferable, in particular for the determination of wood moisture.

Measured value assessment for building material

For building materials the measurement results of the dielectric measuring method can only be used as reference for a rough orientation. Conclusions with respect to absolute humidity in mass % (M%) can only be drawn for measurements, performed with the exact same marginal conditions and compositions of the building material as indicated for the test set-up in the chart below.

This graph was created in collaboration with the Institute of Building Materials Research of the RWTH Aachen (IBAC) and illustrates the correlation between the measured value and the mass-related moisture content of the examined building materials.



Key	
a	Moisture content (M%)
b	Measured value (digits)
·■·	Anhydrite floating screed (conversion: M% = CM%)
—○—	Cementitious screed (conversion: CM% = M% -1.5 to 2)
—△—	C 30/37 concrete (conversion not possible)

The spread of the achieved measurement results for the dielectric measuring method is clearly higher than for the resistance measuring method. The dielectric measuring method is not suited for the quantitative, but only for the qualitative moisture measurement in near-surface areas.

The indicated measured values are not the result of a qualified moisture measurement as per VOB (German Construction Contract Procedures) or relevant specialist regulations.

The measured values are only to be interpreted as indicators (dry, damp, wet).

For building materials the measurement results of the dielectric measuring method can only be used as reference for a rough orientation.

Display [digit]	Building moisture zone
< 40 digits	dry
40 – 80 digits	damp
> 80 digits	wet

Maintenance and repair

Battery change

Replace the batteries when the *Battery* indication (18) shows an empty battery and a warning signal is emitted, see section Inserting the batteries.

If the battery charge is completely depleted during operation, a warning message appears and a warning signal is emitted. In that case the device switches off after 5 seconds.

Cleaning

Clean the device with a soft, damp and lint-free cloth. Make sure that no moisture enters the housing. Do not use any sprays, solvents, alcohol-based cleaning agents or abrasive cleaners, but only clean water to moisten the cloth.

Repair

Do not modify the device or install any spare parts. For repairs or device testing, contact the manufacturer.

Errors and faults

The device has been checked for proper functioning several times during production. If malfunctions occur nonetheless, check the device according to the following list.

The device does not switch on:

- Check the charging status of the batteries. Change the batteries, if required.
- Check that the batteries are properly positioned. Check the polarity is correct.
- Never carry out an electrical check yourself; instead, contact the manufacturer's customer service service.

Display segments are only faintly visible or flicker:

- Check the charging status of the battery. Change the battery, if required (see chapter Inserting the battery).
- Make sure that the battery is properly positioned. Check the polarity is correct.

The device displays implausible measured values:

- Check the charging status of the battery. Change the battery, if required (see chapter Inserting the battery).
- Make sure that the battery is properly positioned. Check the polarity is correct.
- The sensor is defective or soiled. Clean the device as described in the Cleaning chapter.

The device runs but no measured values are shown:

- Check the room temperature and the relative humidity. Observe the device's permissible operating range according to the technical data.
- Check whether the device responds to touching the colour display. If it shows no reaction despite an enabled colour display and sufficient battery power, then the device firmware may have crashed. Restart the device. To do so, remove a battery and reinsert it.

Bluetooth connection is terminated or interrupted

- Check whether the *Bluetooth* indication is displayed. If so, switch the T670 off and back on. Establish a new connection to the terminal device.
- Check the charging status of the batteries. Change them if required, see section Inserting the batteries.
- Does the distance between the T670 and the terminal device exceed the radio range of the T670(see chapter *Technical data*) or are there any solid building parts (walls, pillars etc.) situated between the T670 and the terminal device? Shorten the distance between the two devices and ensure a direct line of sight.

The device cannot be connected to the terminal device although it is displayed there.

- Check the Bluetooth settings of your terminal device. A possible reason for this could be special, manufacturer-specific settings relating to an improved location accuracy. Enable these settings, then try to establish a connection to the device again.

Further information and assistance regarding the used sensor type will be provided in the MultiMeasure Mobile app via the menu item Settings => *Help*. Selecting the menu item *Help* opens a link to the app's help page. You can open a drop-down menu with numerous support entries from the *Table of contents*. Optionally, you can also scroll through the entire help page and thoroughly acquaint yourself with the individual help topics.

Your device still does not operate correctly after these checks?

Please contact the customer service.

Disposal

Always dispose of packing materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations.

The icon with the crossed-out wheeled bin indicates that this device and any associated components (e.g. remote controls) must not be disposed of with household waste at the end of their life, in accordance with the Waste Electrical and Electronic Equipment Directive (2012/19/EU) and national laws.

You will find collection points for free return of waste electrical and electronic equipment in your vicinity. The addresses can be obtained from your municipality or local administration. You can also find out about other return options that apply for many EU countries on the website https://hub.trotec.com/?id=45090. Otherwise, please contact an official recycling centre for electronic and electrical equipment authorised for your country.

The separate collection of waste electrical and electronic equipment aims to enable the re-use, recycling and other forms of recovery of waste equipment as well as to prevent negative effects for the environment and human health caused by the disposal of hazardous substances potentially contained in the equipment.

This icon with the crossed-out wheeled bin indicates that batteries or accumulators must not be disposed of with household waste at the end of their life. If the device contains batteries or accumulators that contain mercury, cadmium or lead, the respective chemical symbol (Hg, Cd or Pb) is shown below the icon of the crossed-out wheeled bin. To prevent environmental pollution, do not carelessly leave batteries or electrical and electronic equipment containing batteries in public areas. In the European Union, batteries and accumulators must be returned to a designated collection point in accordance with REGULATION (EU) 2023/1542 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 July 2023 concerning batteries and waste batteries. Remove batteries/accumulators and dispose of them separately according to the relevant legal requirements.

Only for United Kingdom

According to Waste Electrical and Electronic Equipment Regulations 2013 (SI 2013/3113) (as amended) and the Waste Batteries and Accumulators Regulations 2009 (SI 2009/890) (as amended), devices that are no longer usable must be collected separately and disposed of in an environmentally friendly manner.

Declaration of conformity

We – Trotec GmbH – declare in sole responsibility that the product designated below was developed, constructed and produced in compliance with all relevant provisions of the EU Radio Equipment Directive in the version 2014/53/EU.

Product model / Product:	T670
Product type:	moisture measuring device
Year of manufacture as of:	2026

The product also complies with all relevant provisions of the following directives/regulations:

- 2011/65/EU
- 2014/30/EU

Other EU legal acts applied:

- 2012/19/EU

Applied harmonised standards:

- EN 300 328 V2.2.2
- EN 301 489-1 V2.2.3:2019-11
- EN 301 489-17 V3.3.1:2024-09
- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019

Applied national standards and technical specifications:

- EN 55032:2015 + AC:2016 + A11:2020 + A1:2020
- EN 61000-4-29:2000
- EN 61000-4-8:2010
- EN 61326-2-1:2013
- EN IEC 61000-4-11:2020
- EN IEC 61000-6-2:2019

Manufacturer and name of the authorised representative of the technical documentation:

Trotec GmbH

Grebbener Straße 7, D-52525 Heinsberg

Phone: +49 2452 962-0

E-mail: online@trotec.com

Place and date of issue:

Heinsberg, 01.01.2026

Joachim Ludwig, Managing Director

Trotec GmbH

Grebbener Str. 7
52525 Heinsberg
Germany
+49 2452 962-0
+49 2452 962-200

online@trotec.com
www.trotec.com