Sensor IoT LoRa

Monitoring-System

Manual

Version 2.19

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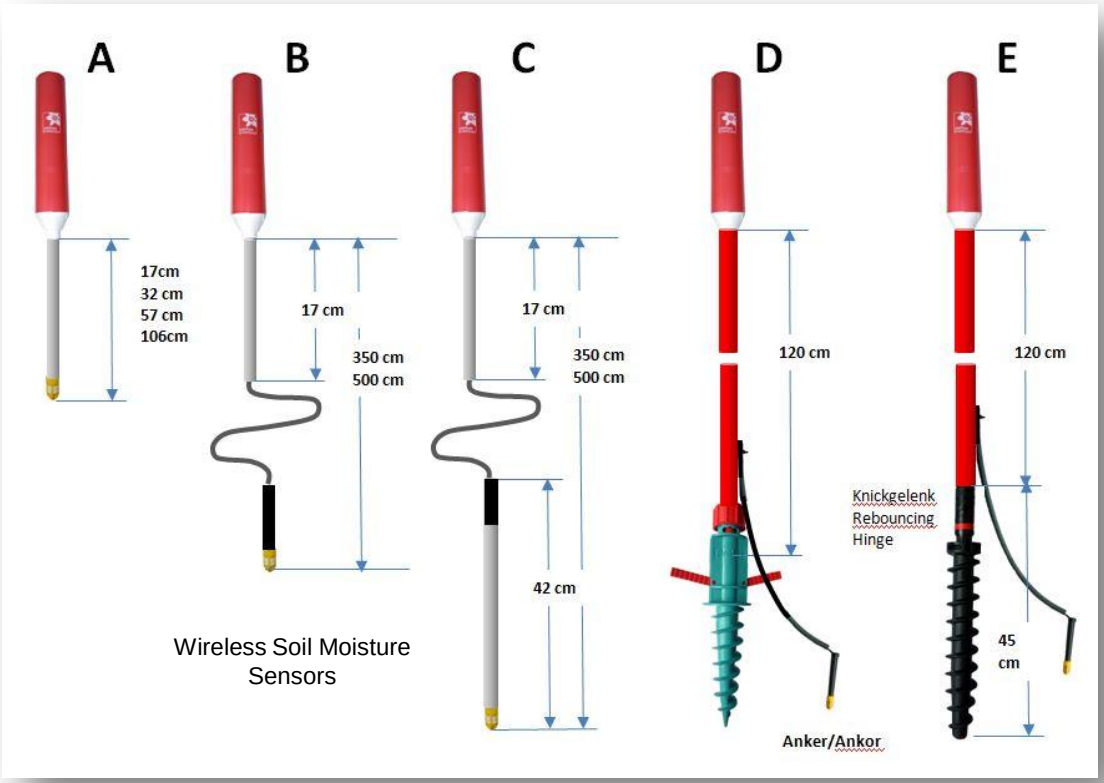
1. Introduction

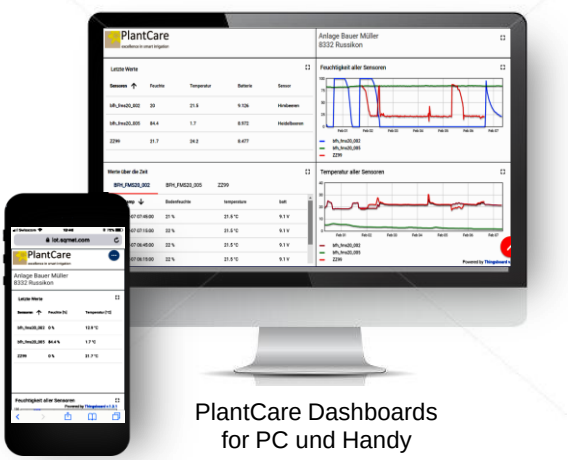
Please read these operating instructions carefully before putting the Soil Moisture Sensor into operation.

Delivery

- Wireless Soil Moisture Sensors (number and version according to order)
- Gateway for establishing a private network (if necessary)



Wireless Soil Moisture Sensors



PlantCare Dashboards for PC und Handy

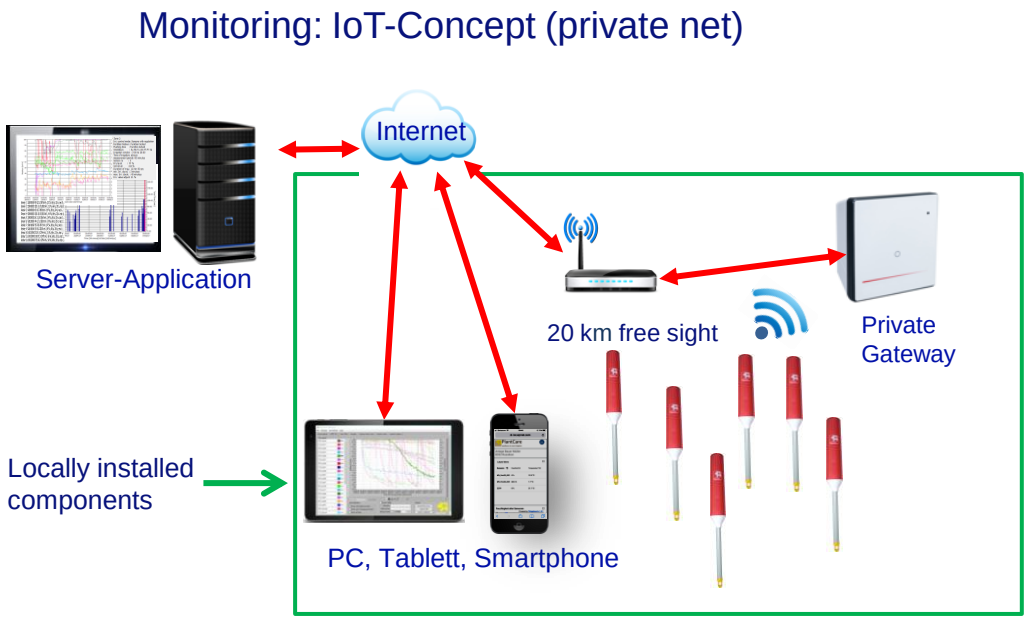
Gateway for Private Network

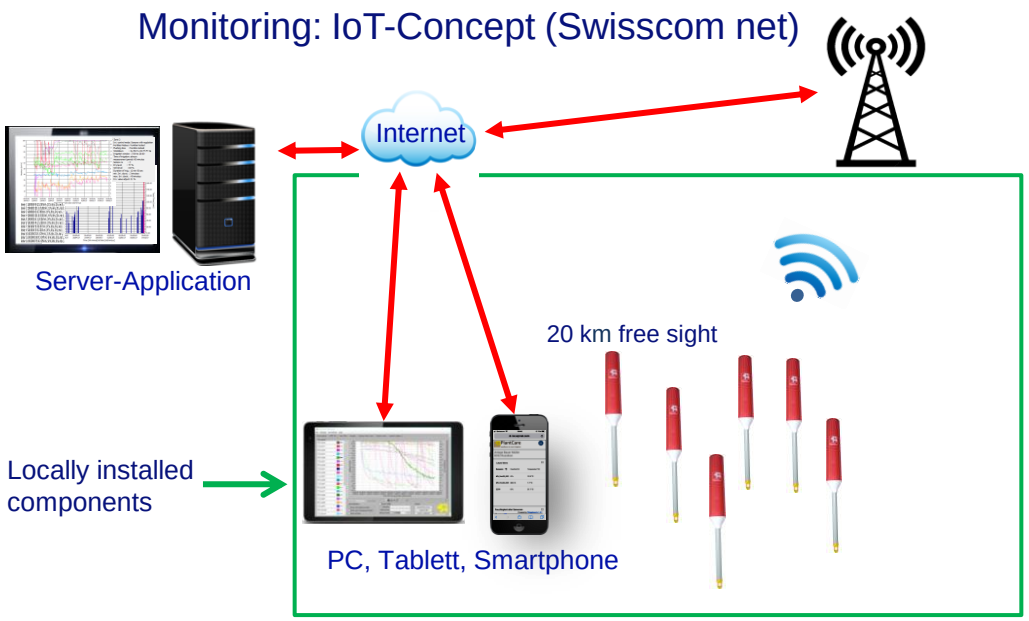
General Information

The IOT Lora sensors are a monitoring system with soil moisture sensors. The completely maintenance-free sensors measure the soil moisture and temperature and transmit the measured values to a database in the cloud.

The worldwide patented PlantCare sensor technology is based on a micro-thermal measuring method of soil moisture. A specially developed felt material that is in moisture balance with the soil serves as a standardized interconnect element between the soil and the sensor. For moisture measurement, the sensor is heated for a short time and then determines the cooling time, which varies depending on the soil moisture. The cooling time of the sensor thus provides a reliable statement about the water content in the soil. The sensors require no maintenance and have no corrosion-prone parts.

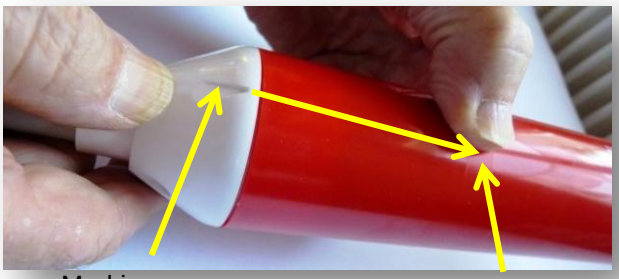
The data are transmitted via LoRa wireless technology either over a commercial or over a private network.



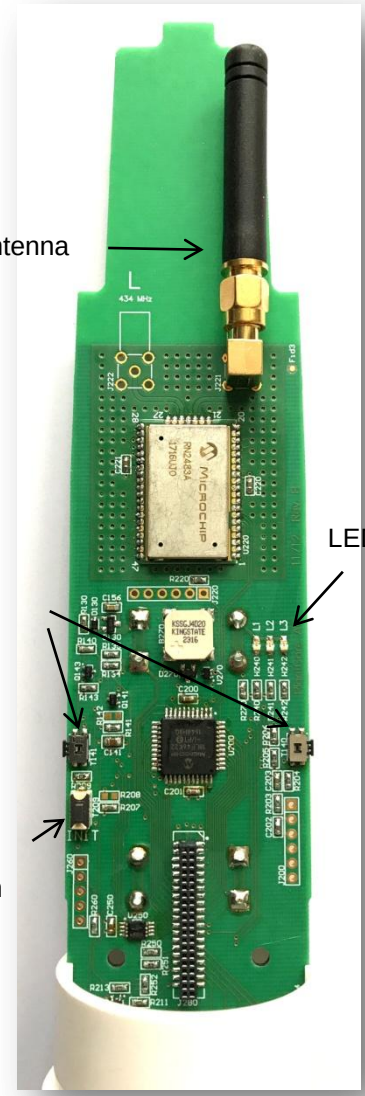


2. Operating Sensor

- **General**
- The sensor is equipped with an LED and a beeper, which give the user hints. This allows the sensor to be switched on and off even when closed.
- The following terms are used in the following:
  - Short beep = the LED flashes 1x briefly and the beeper simultaneously beeps once
  - Long Beep = the LED flashes 1x long and the beeper simultaneously beeps once
  - Beep-Tic = A long beep and then a short tic
  - Beep-beep-beep = 3 short signals in a row
- If necessary, the red hood can be removed with slight pressure
- By pressing in the right place, the ON / OFF buttons can be operated even with the hood on.



- **Switch on / off / test reception**
- Switch on WITH acknowledgment of receipt: Briefly press the ON / OFF button > Long beep and a little later a beep-tic.
- Switching on WITHOUT reception: Briefly press the ON / OFF button > Long beep and a little later Beep-Beeb-Tic (the sensor has no reception).
- To turn off: Press and hold the ON / OFF button until the beep stops. Then release the button. All LEDs light up briefly.
- Check if switched on: Press ON / OFF key. If a short beep, then the sensor was off and is now on. He was already on during a long beep.
- Test reception:? Switch sensor on? Beep-Tic = Reception OK Beep-Beep-Tic = No reception
- Special beep pattern:
- Beep-beep-beep. The sensor is currently measuring. Wait approximately10 sec.

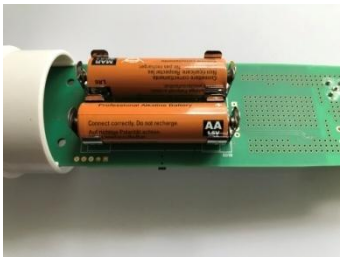


Insert/replace batteries

1. Remove the red cover.

2 . Remove the old batteries

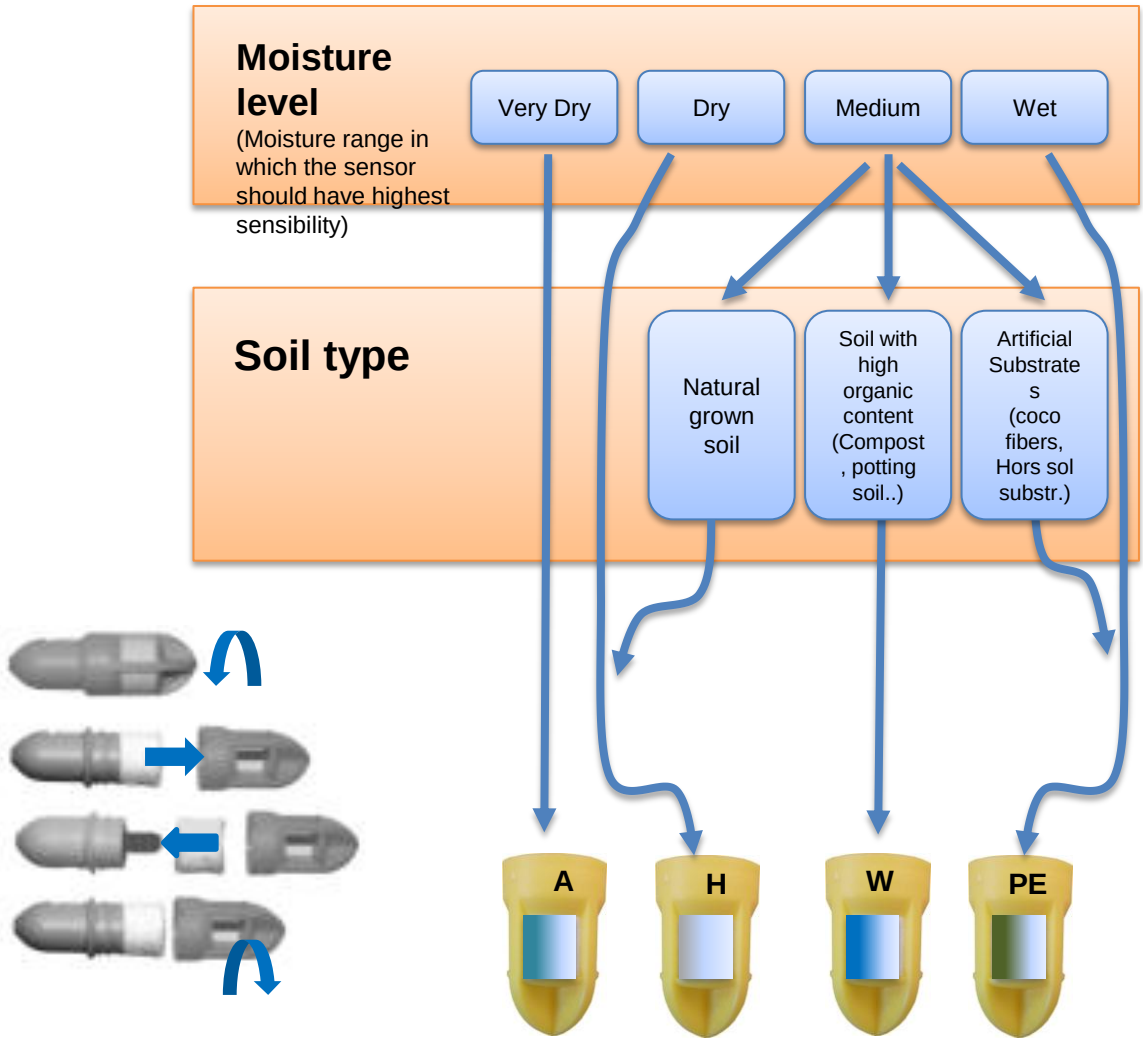
3. Insert 2 new AA batteries. Pay attention to the correct polarity.



4. Turn on the sensor. Provided that the sensor has already been initialized once, all settings remain saved and it is immediately ready for use again.

5. Slide the cover back onto the sensor.

Felt Selection



Attention:

The sensors were calibrated to the appropriate felt type before delivery.
If you **do not** replace the felt with an identical one, different thresholds must be programmed in the sensor.
You can get instructions from PlantCare on request.

3. Installation Gateway

Commission private gateway (if ordered, otherwise skip)

Unpack the Lorix Gateway and mount it in the highest possible location. It is waterproof and can be placed outside.

- The gateway can be attached with the enclosed clip.
- Screw antenna into place.
- Connect network cable
- If the gateway is far away from the nearest router, the route can easily be extended with a network cable.
- With a powerline adapter, the network can also be routed via the existing power installation cables.

The Lorix Gateway is preconfigured and will be automatically connected with TTN (The Things Network).
The blue light is flashing.

Connection Test

Switch on sensor:

- After 5 seconds, 1 long beep –Tic > sensor has contact with the network and is connected.

-After 10 seconds Beep-Beep-Tic > Sensor did not get in touch with the network

Insert sensor into earth - Quick Guide

1. Select the correct location of the soil moisture sensor:
   - The sensor must be placed in a location in the irrigation area where it is exposed to the same climatic conditions (sun, wind, rain, etc.) as the plants.
   - In order to rule out incorrect measurements that may be caused by water logging, the soil moisture sensor must not be placed in soil sinks.
   - For sprinkler systems it must be ensured that the discharged water can be detected by the sensor tip. For drip systems, a dropper must be placed near the sensor.
   - The higher the electronics housing of the sensor is installed from the earth's surface, the higher the radio quality. The radio antenna of the sensor should be as vertical as possible to the earth's surface.
2. Dip the sensor tip with felt in water for about 30 seconds (the felt must be wet).
3. Place the sensor tip in a position where the sensor should measure the humidity. This is usually in the root area. It is advisable to pre-drill a suitable hole (drill diameter 16mm) into which the sensor can be pushed. The sensor tip should touch the ground on all sides.
4. Avoid or prevent the formation of a preferential water path along the sensor channel.

The correct placement of the sensors

The sensors should measure where the plants absorb the water, namely in the root area (Fig.1a, b). In the case of drip irrigation, care must also be taken to ensure that the sensors are placed in the humidified earth area (Fig.1c). If the size of the root ball changes strongly in the course of the growth, then you can position the sensors deeper after the first growth phase.

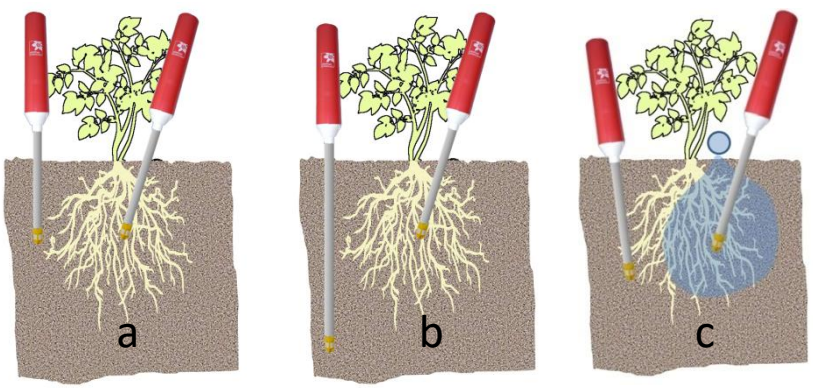
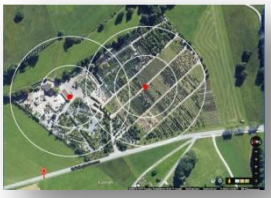
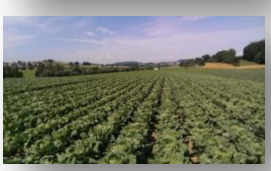


Fig. 1





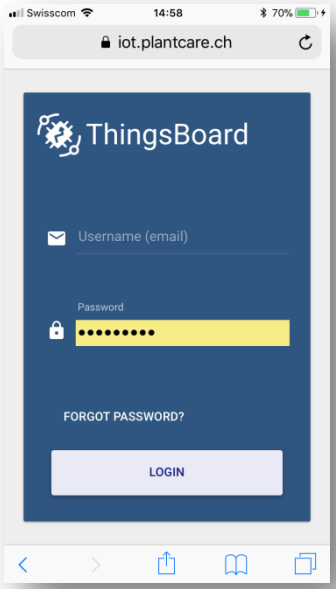



4. Analysis

Sign in Dashboard

Go to a web browser on your mobile phone or PC and enter **iot.plantcare.ch**.



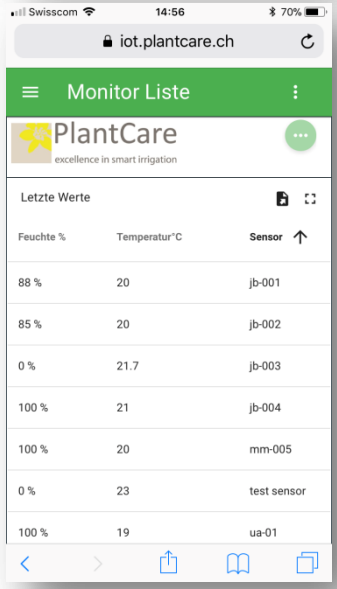
In the reception screen, enter the registered user name and password.

Username:_____

Passwort:_____

Summary Screen

On this screen you will see an up-to-date overview of your sensors.



If you want to see the details of a sensor, click on the corresponding line.

Detail Screen

In the detail screen you can see the graph of humidity and temperature over the last few days.

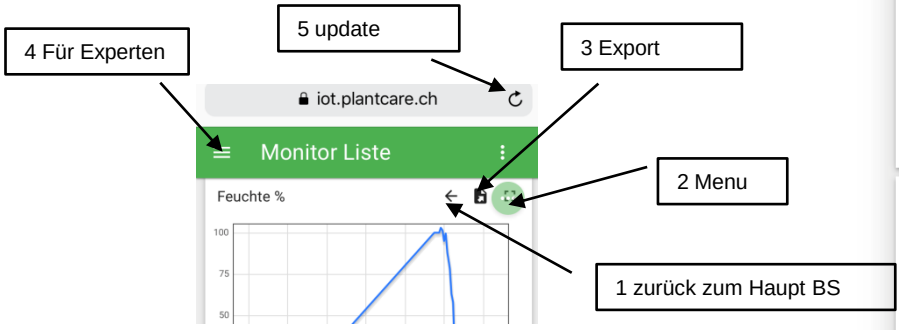
With the arrow symbol 1 you come back to the main page.

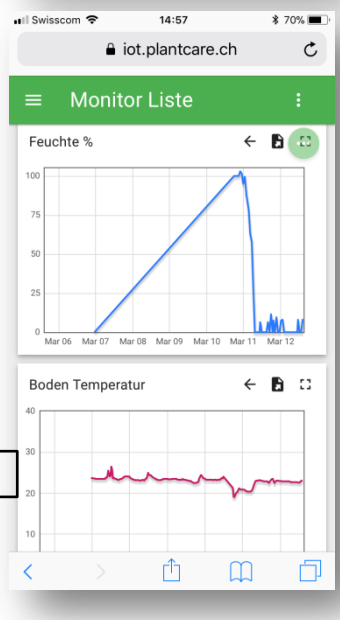
When you press symbol 2, you will be taken to a setting menu in which you can select the time period between two measurements.

Symbol 3 exports the data to Excel or csv.

Symbol 4 is for experts

Icon 5 makes an update to the page





5. Warranty

Your dealer will issue a two year warranty for this product (from date of purchase). This warranty covers all substantial defects of the unit that are demonstrably attributable to material or manufacturing faults. It will be implemented either by replacement with a unit in perfect condition or by repair (free of charge) of the returned unit at our discretion if the following conditions are met:

- The unit was treated properly and in accordance with the recommendations in the operating instructions.
- Neither the buyer nor any third party has attempted to repair the unit themselves.

6. Disclaimer

No liability is accepted for damage resulting from incorrect handling or a product malfunction.

7. Support

If you have any questions, please contact us by e-mail:

- support@plant-care.ch

8. Technical Spezifications

Sensors
Can be used in all types of soil or substrates
Range radio connection : 20km
Power supply: 2 AA 1.5 V mono cells
Battery life approx. 1 year depending on the measuring cycle time
Dimensions: 5 x 5 x 40 cm (shortest version)
Available lengths: Various variants see page 3

Display of soil moisture:
In relative% units
Measuring range soil moisture (at a soil temperature of 2 ° C to + 37 ° C):
Relative% units: 0 - 100%
Measuring range soil temperature: -20 ° C to + 60 ° C

Accuracy:
Soil moisture: +/- 3%
Soil temperature: +/- 0.3 ° C

Reading accuracy:
Soil moisture in relative%: 1%
Soil temperature: 0.1 ° C