DATA SHEET

Soil moisture and soil temperature sensor

Feldfühler Walter

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Overview:

Walter is a LoRaWAN soil moisture and soil temperature sensor for professional agriculture. It can be used to accurately measure soil moisture and soil temperature and to send the information to the Feldfühler app via the wireless LoRaWAN protocol.

Walter has a Watermark sensor and a PRT Class A temperature probe. With this combination, the Watermark sensor can be calibrated automatically regardless of location, for highly accurate readings. The Watermark sensor from the manufacturer Irrometer is a proven, cost-effective and very reliable method for measuring soil moisture. In doing so, the Watermark sensor measures the so-called matric potential (soil water tension), which indicates how much effort a plant needs to extract the available water from the soil.

Willi is powered by an 8500-mAh Li-SOCl2 battery, which is ideally suited to the harsh conditions in agriculture and is designed for long-term use of up to 5 years. (Battery life depends on the usage environment and the update interval).

Features:

- Extremely low power consumption
- Replaceable battery
- 3 meter cable
- Moisture & temperature alarm
- 30 minute interval
- Waterproof housing to IP66
- Maintenance-free for approx. 5 years

Sensor specification:

Soil temperature:

- Type: PT1000 IEC 60751 Class A
- Material: Stainless steel
- Measuring range: -20°C - 100°C
- Accuracy: 0,15°C @ 0-90 °C±
- Resolution: 0,1°C
- Drift: 0,03 °C /year<
- **Measuring principle: RTD (Resistance Temperature Detector)**

Soil moisture:

- Sensor: Irrometer Watermark sensor
- Range: 0 – 200 kPa
- Accuracy: 5%
- Size: 2,2 cm diameter x 5cm length
- Service life: approx. 5 years

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Watermark sensor:

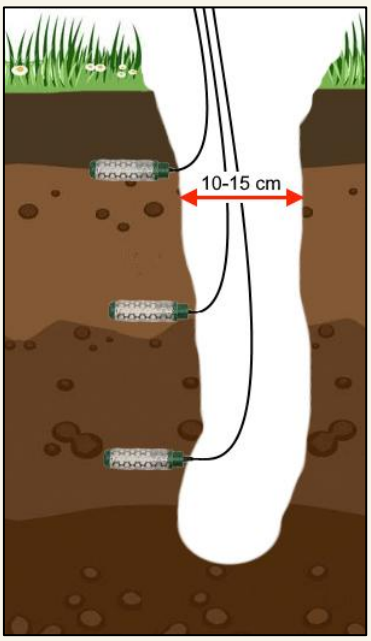
Over the last four decades, the Watermark soil moisture sensor has been the preferred choice of farmers, irrigation experts and researchers to provide the most cost-effective, simplest and most reliable measurement of available soil water.

The Watermark soil moisture sensor acts as an artificial root that, like a plant, exchanges water with the surrounding soil. This exchange makes it possible to measure how much effort (matric potential (soil water tension) or soil water tension) is needed by a plant to extract available water from the soil, and not just how high the moisture percentage of the soil may be. Measuring this soil water tension provides reliable data for irrigation planning without the need for complicated calibrations for individual locations and different soils.

The readings of the Watermark sensor are expressed in kilopascal (kPa). A higher value means that the soil is dry and the plants therefore have to work harder to extract water from the soil. The values in the adjacent table can serve as a general guideline. For optimal decision support, use the Feldfühler app!

After 5 years, the Watermark sensor should be replaced. Let us know, we'll take care of it!

0 – 10 kPa	Saturated soil, too wet
10 – 30 kPa	The soil is sufficiently moist (except coarse sand, which begins to lose water)
30 – 60 kPa	Usual range for irrigation of most soils
60 – 100 kPa	Usual range for irrigation in heavy clay
100 – 200 kPa	The soil becomes dangerously dry for maximum production



Installation:

Always install the sensor wet!

1. Soak the sensor in water the day before installation.
2. **Alternatively: To achieve an even better result, place the sensor halfway in water in the morning for 30 minutes and let it dry until the evening. Place it halfway in water again for 30 minutes and let it dry overnight. The next morning, place it halfway in water again for 30 minutes and let it dry until the evening. Then place it completely in water overnight.**
3. Open a 10 – 15 cm wide hole to the desired depth. As a rule, the sensor should be installed in the root zone, which in apple cultivation, for example, is between 25 – 30 cm.
4. Create mud with the soil from the hole
5. Drill an opening with a diameter of approx. 3 cm into the side of your hole
6. Fill the side opening with the mud and install the Watermark sensor into the opening and make sure that the Watermark sensor is firmly seated and completely surrounded by soil or mud
7. Close the hole and route the cable so that it is not damaged by any soil cultivation.

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