HOBO® RXW-T21-xxx Sensor
HOBOnet T21 Soil Water Potential/Temp Sensor

The HOBOnet T21 is a wireless sensor that works with the HOBOnet system to measure both soil temperature and soil water potential, a more accurate way to measure how much water is available to plants. The HOBOnet T21 Sensor is designed to withstand harsh environmental conditions, and it does not require calibration for different soil types or salinity. The HOBOnet T21 features the METER TEROS 21 sensor, which is calibrated in a chamber system that allows the TEROS 21 set calibration points from -10KPa to -80KPa. With its durable epoxy coating, you can be confident these sensors can be deployed in the ground for long periods, while providing data you can trust.

The HOBOnet system is a cost-effective and scalable option for web-enabled monitoring of field conditions for applications such as crop management, research, and greenhouse operations. And because it's wireless, you can deploy a network of sensors to easily monitor multiple points with a single system, while avoiding the risk of long cables that can interfere with field operations and are potentially vulnerable to nearby lightning strikes.

Sensors are easily linked to the network, and data can be accessed through HOBOlink®, Onset's innovative cloud-based software platform.

Key Advantages:
- Soil water potential and soil temperature measurements with one device
- A more accurate picture of the amount of water available to plants than volumetric water content sensors
- No calibration required for soil type or salinity
- Long-lasting and maintenance-free with durable epoxy construction
- Wide measurement range: -9 to -2000 kPa
HOBO RXW-T21-xxx Sensor Specifications

**Water Potential**
- **Measurement Range**: -2,000 to -9 kPa in soils up to 10 dS/m
- **Accuracy**: ±10% of reading + 2 kPa from -100 to -9 kPa
- **Resolution**: 0.1 kPa

**Dielectric Measurement Frequency**: 70 MHz

**Temperature**
- **Measurement Range**: -40 to 60°C (-40 to 140°F)
- **Accuracy**: ±1°C (1.8°F)
- **Resolution**: 0.1°C (0.18°F)

**Wireless Mote**
- **Operating Temperature Range**: Sensor: -40 to 60°C (-40 to 140°F), Mote: -25° to 60°C (-13° to 140°F) with rechargeable batteries, -40 to 70°C (-40 to 158°F) with lithium batteries

**Radio Power**: 12.6 mW (+11 dBm) non-adjustable
- **Transmission Range**: Reliable connection to 457.2 m (1,500 ft) line of sight at 1.8 m (6 ft) high, Reliable connection to 609.6 m (2,000 ft) line of sight at 3 m (10 ft) high

**Wireless Data Standard**: IEEE 802.15.4

**Radio Operating Frequencies**
- RXW-T21-900: 904–924 MHz
- RXW-T21-868: 866.5 MHz
- RXW-T21-921: 921 MHz
- RXW-T21-922: 916–924 MHz

**Modulation Employed**: OQPSK (Offset Quadrature Phase Shift Keying)

**Data Rate**: Up to 250 kbps, non-adjustable

**Duty Cycle**: <1%

**Maximum Number of Motes**: 50 motes per one HOBOnet Wireless Sensor Network

**Battery Type/Power Source**: Two AA 1.2V rechargeable NiMH batteries, powered by built-in solar panel or two AA 1.5 V lithium batteries for operating conditions of -40 to 70°C (-40 to 158°F)

**Battery Life**: With NiMH batteries: Typical 3–5 years when operated in the temperature range -20° to 40°C (-4°F to 104°F) and positioned toward the sun (see Mounting and Positioning the Mote), operation outside this range will reduce the battery service life
With lithium batteries: 1 year, typical use

**Memory**: 16 MB

**Dimensions**
- Sensor: 9.6 x 3.5 x 1.5 cm (3.8 x 1.4 x 0.6 inches)
- Sensor diameter: 3.2 cm (1.3 inches)
- Cable length: 5 m (16.4 ft)
- Mote: 16.2 x 8.59 x 4.14 cm (6.38 x 3.38 x 1.63 inches)

**Weight**
- RXW-T21-xxx sensor and cable: 103 g (3.65 oz)
- Mote: 223 g (7.87 oz)

**Materials**
- Sensor: Vinyl body with polyurethane resin, stainless steel and ceramic sensor head
- Cable: PVC, UV resistant and rodent repellent
- Mote: PCPBT, silicone rubber seal

**Environmental Rating**: Mote: IP67, NEMA 6

**Compliance Marks**
- RXW-T11-900
- RXW-T11-868
- RXW-T11-921
- RXW-T11-922

* The sensor is not well calibrated beyond -100 kPa. For more information on using the sensor beyond this range, see Sensor Accuracy and Calibration.

** Temperature measurement, for applicable sensors, may not be accurate if sensor is not fully immersed in medium of...
interest, due to longer equilibration time.

Contact Us

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Technical Support (8am to 6pm ET, Monday through Friday)
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