

HOBOTM RXW-T21-xxx Sensor

HOBOnet TERS 21 Soil Water Potential/Temp Sensor

The HOBOnet TERS 21 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 TERS 21 Sensor is designed to withstand harsh environmental conditions, and it doesn't require calibration for different soil types or salinity.

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.

Supported Measurements:




Soil Moisture, Soil Temperature and Soil Water Potential

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.