ONSET

HOBO®
Data Logging Solutions
Australia - New Zealand

HOBO® RXW-T11-xxx Sensor

HOBOnet TEROS 11 Soil Moisture/Temp Sensor

The HOBOnet TEROS 11 is a wireless sensor that works with the HOBOnet system to not only measure soil moisture (volumetric water content) with better accuracy and precision, but also provide soil temperature measurements. Designed to withstand harsh environmental conditions, these durable sensors last up to 10 years, so you can leave them in the field for extended periods of time. Sharpened stainless-steel probes make installation easy, even in hard soil, and a large volume of influence provides better results and a more accurate view of soil moisture.

The HOBOnet system is a cost-effective and scalable wireless sensor network 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 and Soil Temperature

Key Advantages:

- Soil moisture (volumetric water content) and soil temperature measurements with one device
- Sensor lasts up to 10 years in the field
- Largest volume of influence (1010 mL) relative to sensor size, resulting in more accurate soil moisture measurements
- Easy installation with sharpened stainless-steel probes that are more resistant to damage/deterioration
- Less sensor-to-sensor variability

HOBO RXW-T11-xxx Sensor Specifications

Soil Moisture: Volumetric Water Content (VWC)	
Measurement Range*	0.00 to 0.70 m /m in mineral soils
Accuracy	±0.030 m /m (±3%) typical from 0 to 50°C (32 to 122°F); ±0.020 m /m (±2%) with soil specific calibration
Resolution	0.001 m /m
Dielectric Measurement Frequency	70 MHz
Temperature**	
Measurement Range	-40 to 60°C (-40 to 140°F)
Accuracy	±1.0°C (1.8°F) from -40 to 0°C (-40 to 32°F) ±0.5°C (0.9°F) from 0 to 60°C (32 to 140°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-T11-900: 904–924 MHz RXW-T11-868: 866.5 MHz RXW-T11-921: 921 MHz RXW-T11-922: 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: 7.47 x 9.4 x 2.39 cm (2.94 x 3.7 x 0.94 inches) Sensor needle length: 5.4 cm (2.13 inches) Sensor needle diameter: 0.32 cm (0.13 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-T11-xxx sensor and cable: 245 g (8.64 oz) Mote: 223 g (7.87 oz)
Materials	Sensor: ASA plastic body with polyurethane epoxy filling and stainless steel pins 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 data can be post-calibrated if necessary (e.g. the sensor is used in non-mineral soil types or higher than

standard accuracy is required). Users can apply a calibration equation to the data exported from HOBOlink. The VWC range will depend on the calibration equation.

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