



HOBOnet T12 Soil Moisture, Temperature & EC Sensor

Product Images



Description

The HOBOnet T12 is a wireless sensor that works with the HOBOnet system to not only provide advanced soil moisture measurements (volumetric water content) with better accuracy and precision, but also measure soil temperature and electrical conductivity. 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 probe tips make installation easy, even in hard soil, and a large volume of influence provides more accurate results. Featuring the METER TEROS 12 soil moisture and temperature sensor, the HOBOnet T12 is backed by over 20 years of soil-moisture research and leverages METER's trademark 70MHz frequency capacitance technology, minimizing salinity and textural effects.

Sensors are easily linked to the [HOBOnet](#) network, and data can be accessed through [HOBOLink](#), Onset's

innovative cloud-based software platform.

We suggest using a [TEROS Verification Clip](#), which provides a convenient way to confirm the operation and soil moisture accuracy of the sensor. Attaching this clip to a TEROS sensor provides a known soil moisture level for verifying measurement accuracy, without having to test the sensor in actual soils, which normally requires weighing soil samples and drying them in an oven.

Sensor Features

- Soil moisture (volumetric water content), soil temperature, and electrical conductivity 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.

Wireless Features

- 900 MHz wireless mesh self-healing technology
- 450 to 600 metre (1,500 to 2,000 feet) wireless range and up to five hops
- Up to 50 wireless sensors or 336 data channels per HOBOnet RX station
- Simple button-push to join the HOBOnet wireless network
- Onboard memory to ensure no data loss
- Powered by rechargeable AA batteries and built-in solar panel.

Note: A complete [HOBOnet](#) system requires at least one [HOBOnet RX3000](#) Remote Monitoring Station, a [HOBOnet Wireless Manager](#), and a [HOBOnet Wireless Sensor](#), OR one [HOBOnet MicroRX Station](#) (which has an integrated HOBOnet Wireless Manager) and a [HOBOnet Wireless Sensor](#). [HOBOnet Wireless Repeaters](#) can be added to extend the range.

Additional Information

Country of Manufacture	United States		
Brand	Onset HOBO		
Measurements	Soil Electrical Conductivity (EC), Soil Moisture, Soil Temperature		
Typical applications	Environmental (Outdoor), Field Research		
Explanation	Soil Moisture: Volumetric Water Content (VWC)		
	Measurement Range*	0.00 to 0.70 m³/m³ in mineral soils	
	Accuracy	±0.030 m³/m³ (±3%) typical from 0 to 50°C (32 to 122°F); ±0.020 m³/m³ (±2%) with soil specific calibration	
	Resolution	0.001 m³/m³	
	Dielectric Measurement Frequency	70 MHz	
	Temperature**		
	Measurement Range	-40 to 60°C (-40 to 140°F)	
	Accuracy	±0.5°C (0.9°F) from -40 to 0°C (-40 to 32°F) ±0.3°C (0.54°F) from 0 to 60°C (32 to 140°F)	
	Resolution	0.1°C (0.18°F)	
	Bulk Electrical Conductivity (EC)		
	Measurement Range	0 to 20 dS/m (bulk)	
	Accuracy	±5% of reading + 0.01 dS/m from 0 to 10 dS/m ±8% of reading from 10 to 20 dS/m	
	Resolution	0.001 dS/m	
	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-T12-900: 904–924 MHz RXW-T12-868: 866.5 MHz RXW-T12-921: 921 MHz RXW-T12-922: 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	
	Logging Rate	1 minute to 18 hours	
	Number of Channels	4	
	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 Deployment and Mounting), 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-T12-xxx sensor and cable: 245 grams (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	<div><div><div>✗</div><div>RXW-T12-900</div></div><div><div>✗</div><div>RXW-T12-868</div></div><div><div>✗</div><div>RXW-T12-921</div></div><div><div>✗</div><div>RXW-T12-922</div></div></div>	
	* 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.		
	Ideal For	Professional, Agronomy	