

Tempcon Instrumentation Ford Lane Business Park Ford West Sussex BN18 OUZ, UK www.tempcon.co.uk



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 HOBO 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 HOBO RX3000 Remote Monitoring Station, a HOBOnet Wireless Manager, and a HOBOnet Wireless Sensor, OR one HOBO 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

the calibration equation.			
Spring properties Part Secure S			
Land Vestioner's Vision Content (VINC) Measurement integral* Established Accounty			
Machine Mach	rypical applications	Soil Moisture: Volumetric Water Content (WWC)	
Accuracy			
Mischard Carbon Mischard C		Measurement Range*	
Delaction Measurement Request A Delaction A Delact		Accuracy	
Temporature Farge Accounts for page Accounts for		Resolution	0.001 m ³ /m ³
Measurement Range		Dielectric Measurement Frequency	70 MHz
Accusary stab CVC CART Stab CVC (ALE Stab CVC CART Sta		Temperature**	
Repair to ADT CLEAR Ply brand to a Ch' (CLE to 140P) Built Electrical Conductively (EC) Mascuremore Range Accusage Accusag		_	
Bulk Electrical Conductivity (EC) Measurement Range Accusing Ac		Accuracy	
Measurement Ramps 0 to 20 distin (build 150 distin (build		Resolution	0.1°C (0.18°F)
Actuality Resolution Resolut		Bulk Electrical Conductivity (EC)	
Resolution 0.001 eS/m 10 to 20 dS/m Wireless Mote		Measurement Range	
Wareless Mote Operating Temperature Ranges Semons 40 to 60°C (40 to 1 40°F) Motes 20°C to 60°C (10°C to 1 40°F) Motes 20°C to 60°C (10°C to 1 40°F) Motes 20°C to 60°C (10°C to 1 40°F) Motes 20°C to 60°C (10°C to 1 40°F) Motes 20°C to 2 °C to 1 40°F) Motes 20°C to 2 °C to 1 40°F) Motes 20°C to 2 °C to		Accuracy	
Semicon Altino DEC (14 bits 145%)		Resolution	0.001 dS/m
Radio Power Radio Radio Power Radio		Wireless Mote	
Transmission Range Wireless Data Standard Wireless Data Standard Radio Operating Frequencies Row 112,000 504-1204 MHz Row		Operating Temperature Range	Mote: -25° to 60°C (-13° to 140°F) with rechargeable batteries
Reliable connection to 900 6 m (2,000 ft) line of sight at 3 m (10 ft) high Wireless Data Standard Radio Operating Frequencies ROW-T1-2009 904-924 MHz		Radio Power	12.6 mW (+11 dBm) non-adjustable
Explanation Expla		Transmission Range	
Explanation Modulation Employed Modulat		Wireless Data Standard	IEEE 802.15.4
Modulation Employed OQPSK (Offset Quadrature Phase Shifk Keying)	Evolunation	Radio Operating Frequencies	RXW-T12-868: 866.5 MHz RXW-T12-921: 921 MHz
Duty Cycle 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 1,5 Vilinium batteries for operating conditions of -40 to 70°C (-40 to 158°F) Battery Life With Marki batteries, Typical 3-5 years when operated in the temperature range -20° to 40°C (-47° to 160°C) and postioned toward the sun tice beginner 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 2.30 cm (2.94 x 2.75 x 0.94 inches) Sensor needle demanter -0.32 cm (0.13 inches) Sensor needle demanter -0.32 cm (0.13 inches) Cable lemptris -5 m (16.4 ft) Mote: 16.2 x 5.59 x 4.14 cm (6.38 x 3.38 x 1.63 inches) Weight BOWT-12-xox sensor and cable: 245 grams (8.64 oz) Mote: 223 g (7.87 oz) Mote: 223 g (7.87 oz) Materials Environmental Rating Mote: PCP, N.EMA 6 Compliance Marks RW-172-868	Lapidiadon	Modulation Employed	OQPSK (Offset Quadrature Phase Shift Keying)
Maximum Number of Motes Logging Rate 1 minute to 18 hours Number of Channels 4 Battery Type/ Power Source 1,5 V lithium batteries: Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 158°F) Battery Life With NIMH batteries: Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 164°F) and positioned toward the sun (see Deployment and With Inhium batteries; Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 164°F) and positioned toward the sun (see Deployment and With Inhium batteries; Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 164°F) and positioned toward the sun (see Deployment and With Inhium batteries; Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 164°F) and positioned toward the sun (see Deployment and With Inhium batteries; Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 164°F) and positioned toward the sun (see Deployment and With Inhium batteries; Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 164°F) and positioned toward the sun (see Deployment and With Inhium batteries; Typical 3-5 years when operated in the temperature range 20° to 40°C (-40° to 164°F) and positioned toward the sun (see Deployment and with Inhium batteries; Typical 3-7 years and 10°C (-40° to 164°F) and 10°C (-40°C (-40°C to 164°C to 1		Data Rate	Up to 250 kbps, non-adjustable
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 1,5V lithium batteries for operating conditions of 4d to 70°C (4d to 158°T) Battery Life With NIMH batteries. Typical 3-5 years when operated in the temperature range 20° to 40°C (4d*Te 10 164°T) 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 2.30 cm (2.94 x 3.7 x 0.94 inches) Sensor needle length: 5 x m (2.94 x 3.7 x 0.94 inches) Sensor needle length: 5.7 x m (2.13 inches) Cable length: 5 m (16.4 ft) Mote: 16.2 x 8.59 x 4.1 cm (6.83 x 3.38 x 1.63 inches) Weight RW-112-xxx sensor and cable: 245 grams (8.64 oz) Mote: 22.2 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: PCPT, Sillicone rubber seal Environmental Rating Mote: 1967, NEMA 6 Compliance Marks RW-112-308 RW-112-308 RW-112-308 RW-112-309 R		Duty Cycle	<1%
Number of Channels 4 Battery Type/ Power Source 1.5 Virbium batteries for operating conditions of 40 to 70°C (40 to 158°F) Battery Life Wish NMIS hatteries: Typical 2-5 years when operation is can be a superating conditions of 40 to 70°C (40 to 158°F) Battery Life Wish NMIS hatteries: Typical 2-5 years when operation in temperature range 20° to 40°C (44°F to 148°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) Cable length: 5.4 cm (2.13 inches) Cable length: 5.7 m (16.4 k) 2.5 years with product of the condition of the con		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 1.5V lithium batteries for operating conditions of -41 to 70°C (-40 to 158°F) Battery Life With Inhibitateries. Typical 3–5 years when operated in the temperature range -20° to 40°C (-48° 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: 747 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 length: 5.4 cm (2.13 inches) Sensor needle length: 5.4 cm (2.13 inches) Cable length: 5.4 cm (2.13 inches) Sensor needle length: 5.4 cm (2.13 inches) Sensor needle length: 5.4 cm (2.13 inches) Sensor needle sensor: 8.4 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: PF07, Illicone rubber seal Environmental Rating Mote: IP67, NEMA 6 RXW-T12-808 RXW-T12-809 RXW-T12-809 RXW-T12-829 RXW-T12-921 RX		Logging Rate	1 minute to 18 hours
Power Source 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 94 x 2.39 cm (2.04 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: 5.7 cm (6.4 ft) Mote: 16.2 x 6.59 x 4.14 cm (6.38 x 3.38 x 1.63 inches) Weight RXW-T12-xox 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. U resistant and rodent repellent Mote: PPGT, silcone rubber seal Environmental Rating Mote: IPGT, NEMA 6 Compliance Marks RXW-T12-868 RXW-T12-868 RXW-T12-868 RXW-T12-901 RXW-T12-921 RXW-T12-921 RXW-T12-921 RXW-T12-921 and plastic body with polyurethane and place		Number of Channels	4
## ROWN 10 A C 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			
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 length: 5.5 cm (2.13 inches) Sensor needle diameter: 0.32 cm (0.13 inches) Sensor needle diameter: 0.32 cm (0.13 inches) Cable length: 5.7 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-xxxx 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 RXW-T12-900 RRW-T12-900 RRW-T12-921 RRW-T12-922 * 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.		Battery Life	-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
Sensor needle lelangth: 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 Environmental Rating Mote: IP67, NEMA 6 Compliance Marks RXW-T12-900 ** RXW-T12-901 ** RXW-T12-921 ** 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.		Memory	16 MB
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-T12-900 RXW-T12-900 RXW-T12-968 RXW-T12-922 * 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 WWC 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.		Dimensions	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)
Cable: PVC, Uv resistant and rodent repellent Mote: PCPBT, silicone rubber seal Environmental Rating Mote: IP67, NEMA 6 Compliance Marks RXW-T12-906 * RXW-T12-868 * RXW-T12-921 * 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 WWC 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.		Weight	
Compliance Marks X		Materials	Cable: PVC, UV resistant and rodent repellent
Compliance Marks X XXW-T12-868 XXW-T12-921 XXW-T12-921 XXW-T12-922 XXW-T1		Environmental Rating	Mote: IP67, NEMA 6
* 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.		Compliance Marks	RXW-T12-868 RXW-T12-921
Ideal For Professional, Agronomy		* 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,	
	Ideal For	Professional, Agronomy	