RXW-SMC-900 • RXW-SMC-868 • RXW-SMC-922 • RXW-SMC-921

HOBOnet Soil Moisture EC-5 Sensor

Integrates the field-proven ECH2O™ EC5 Sensor and provides readings directly in volumetric water content; wirelessly communicates data to the HOBO RX3000 or the HOBO MicroRX station.

Important Information
A complete 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 (RXW-RPTR-xxx or RXW-RPTR-B-xxx) can be added to extend the range.

Supported Measurements

Electrical Conductivity (soil), Soil Moisture

Features

Sensor Features

- ±3% accuracy in typical soil conditions, and ±2% accuracy with soil-specific calibration
- Measures a 0.3-liter volume of soil for taking readings at a specific depth or in a container
- High-frequency (70 MHz) circuit provides good accuracy even in high-salinity and sandy soils

Wireless Features

- 900 MHz wireless mesh self-healing technology
- 450 to 600 meter (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

Contact Us

Sales (8am to 5pm ET, Monday through Friday)

- Email sales@onsetcomp.com
- Call 1-508-759-9500
- In U.S. toll free 1-800-564-4377
- Fax 1-508-759-9100

Technical Support (8am to 5pm ET, Monday through Friday)

- Contact Product Support www.onsetcomp.com/support/contact
- Call 1-508-759-9500
- In U.S. toll free 1-877-564-4377

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HOBOnet Soil Moisture EC-5 Sensor (RXW-SMC-xxx) Specifications

	RXW-SMC-xxx	RXW-SMD-xxx
Measurement Range	In soil: 0 to 0.550 m^3/m^3 (volumetric water content)	In soil: 0 to 0.570 m^3/m^3 (volumetric water content)
Extended Range	-0.401 to 2.574 m^3/m^3; see Note 1	-0.659 to 0.6026 m^3/m^3; see Note 1
Accuracy	±0.031 m^3/m^3 (±3.1%) typical 0 to 50°C (32° to 122°F) for mineral soils up to 8 dS/m and ±0.020 m^3/m^3 (±2%) with soil specific calibration; see Notes 2 and 3	±0.033 m^3/m^3 (±3.3%) typical 0 to 50°C (32° to 122°F) for mineral soils up to 10 dS/m and ±0.020 m^3/m^3 (±2%) with soil specific calibration; see Notes 4 and 5
Resolution	0.0007 m^3/m^3 (0.07%)	0.0008 m^3/m^3 (0.08%)
Volume of Influence	0.3 liters (10.14 oz)	1 liter (33.81 oz)
Sensor Frequency	70 MHz	70 MHz
METER ECH2O Probe Part No.	EC-5	10HS
Sensor Operating Temperature Range	0° to 50°C (32° to 122°F). Although the sensor probe and cable can safely operate at below-freezing temperatures (to -40°C/F), the soil moisture data collected at these extreme temperatures is outside of the sensor's accurate measurement range.	0° to 50°C (32° to 122°F). Although the sensor probe and cable can safely operate at below-freezing temperatures (to -40°C/F), the soil moisture data collected at these extreme temperatures is outside of the sensor's accurate measurement range. Extended temperatures above 50°C (122°F) will decrease mote battery life.

Wireless Mote

Operating Temperature Range	-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-SMC-900 and RXW-SMD-900: 904-924 MHz RXW-SMC-868 and RXW-SMD-868: 866.5 MHz RXW-SMC-921 and RXW-SMD-921: 921 MHz RXW-SMC-922 and RXW-SMD-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	Up to 50 wireless sensors or 336 data channels per one HOBO RX station
Logging Rate	1 minute to 18 hours
Number of Data Channels	2
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	RXW-SMC-xxx soil probe: 89 x 15 x 1.5 mm (3.5 x 0.62 x 0.06 in.) RXW-SMD-xxx soil probe: 160 x 32 x 2 mm (6.5 x 1.25 x 0.08 in.) 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-SMC-xxx sensor and cable: 180 grams (6.3 oz) RXW-SMD-xxx sensor and cable: 190 grams (6.7 oz) Mote: 223 g (7.87 oz)
Materials	Sensor: Weatherproof Mote: PCPBT, silicone rubber seal
Environmental Rating	Mote: IP67, NEMA 6

Notices

	Note 1: (RXW-SMC-xxx and RXW-SMD-xxx) The sensor is capable of providing readings outside the standard volumetric water content range. This is helpful in diagnosing sensor operation and installation. See the Sensor Operation section for more details.
	Note 2: (RXW-SMC-xxx) This is a system level accuracy specification and is comprised of the probe's accuracy of ±0.03 m^3/m^3 typical (±0.02 m^3/m^3 soil specific) plus the mote accuracy of ±0.001 m^3/m^3 at 25°C (77°F). There are additional temperature accuracy deviations of ±0.003 m^3/m^3 / °C maximum for the probe across operating temperature environment, typical <0.001 m^3/m^3 / °C. (The temperature dependence of the mote is negligible.)
	Note 3: (RXW-SMC-xxx) Given the nature of the sensor design and sensor operating frequency, the system has inherent susceptibilities to Radio Frequency signals. The accuracy specification when subjected to certain RFI environments, such as those outlined in IEC 61000-4-3 and IEC 61000-4-6, is reduced to 0.061 m^3/m^3. The system level accuracy will be particularly affected when placed in an electric field of 3 V/m or greater in the 70 MHz range. RFI mitigation practices and physical deployment changes may reduce the systems susceptibility.
	Note 4: (RXW-SMD-xxx) This is a system level accuracy specification and is comprised of the probe's accuracy of ±0.03 m^3/m^3 typical (±0.02 m^3/m^3 soil specific) plus the mote accuracy of ±0.003 m^3/m^3 at 25°C (77°F). There are additional temperature accuracy deviations of ±0.003 m^3/m^3 / °C maximum for the probe across operating temperature environment, typical <0.001 m^3/m^3 / °C. (The temperature dependence of the mote is negligible.)
	Note 5: (RXW-SMD-xxx): Given the nature of the sensor design and sensor operating frequency, the system has inherent susceptibilities to Radio Frequency signals. The accuracy specification when subjected to certain RFI environments, such as those outlined in IEC 61000-4-3 and IEC 61000-4-6, may be significantly reduced. The system level accuracy will be particularly affected when placed in an electric field of 3 V/m or greater in the 150 KHz to 1000 MHz range. RFI mitigation practices and physical deployment changes may reduce the systems susceptibility, however will yield reduced system