



## RXW-GPx-xxx

### HOBOnet Multi-Depth Soil Moisture Sensor

The award-winning HOBOnet Multi-Depth Soil Moisture Sensor is a wireless sensor that works with the HOBOnet system to measure soil moisture and soil temperature at multiple depths with a single probe, for fast and easy installation. This durable sensor is available in three probe lengths for measurements from 45 cm (18 in) to 90 cm (35 in) deep.

Featuring GroPoint's TDT5 technology with patented antenna design, these sensors measure soil moisture along the entire length of each probe segment, resulting in the largest volume of influence per measurement section. A high frequency of pulses per measurement provides precise and consistent soil moisture data.

We recommend using the optional pilot rod and slide hammer for quick and easy installation. Onset offers two options for the pilot rod, the PILOT-ROD4 (28") for use with the three- and four-segment sensors (RXW-GP3 and RXW-GP4), and the PILOT-ROD6 (40") for use with the six-segment sensor (RXW-GP6).

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. Sensors are easily linked to the network, and data can be accessed through HOBOLink®, Onset's innovative cloud-based software platform.

#### Product Numbers:

RXW-GP3-900  
RXW-GP3-922  
RXW-GP3-868  
RXW-GP3-921  
RXW-GP4-900  
RXW-GP4-922  
RXW-GP4-868  
RXW-GP4-921  
RXW-GP6-900  
RXW-GP6-922  
RXW-GP6-868  
RXW-GP6-921

#### Key Advantages:

#### Sensor Features



- Soil moisture measurements over entire probe segment lengths
- Soil temperature measurements at multiple points
- Largest volume of influence per measurement (2 L volume of influence per 15 cm segment)
- Advanced filtering of 400,000 pulses per measurement eliminates outlying readings and provides precise, repeatable soil moisture data
- Polycarbonate housing and epoxy-sealed circuit board protect vital components during installation and throughout deployment
- Easy installation with minimal soil disturbance, and no digging required when using the optional pilot rod and slide hammer

### 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 one 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

### HOBO RXW-GPx-xxx Sensor Specifications

#### Soil Moisture: Volumetric Water Content (VWC)

Measurement Range In soil: 0 to 0.550 m /m (volumetric water content)

Accuracy  $\pm 0.02$  m /m ( $\pm 2\%$ ) in most soils typical from 0° to 50°C (32° to 122°F)\*

Resolution 0.001 m /m

#### Temperature

Measurement Range -20° to 70°C (-4° to 158°F)

Accuracy  $\pm 0.5$ °C (0.9°F)

Resolution 0.1°C (0.18°F)

#### Depths Measured (see below)

RXW-GP3-xxx 45 cm (18 inches) total; three soil moisture zones, six temperature depths

RXW-GP4-xxx 60 cm (24 inches) total; four soil moisture zones, seven temperature depths

RXW-GP6-xxx 90 cm (35 inches) total; six soil moisture zones, eleven temperature depths

#### Wireless Mote

Operating Temperature Range Sensor: -20° to 70°C (-4° to 158°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-GPx-900: 904–924 MHz  
RXW-GPx-868: 866.5 MHz  
RXW-GPx-921: 921 MHz  
RXW-GPx-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	<p>Maximum logging interval: 18 hours Recommended minimum logging interval:</p> <table border="1"> <thead> <tr> <th></th> <th>Using Solar Power with Rechargeable Batteries</th> <th>Using Non-Rechargeable Lithium Batteries</th> </tr> </thead> <tbody> <tr> <td>RXW-GP3-xxx:</td> <td>5 minutes year round</td> <td>10 minutes</td> </tr> <tr> <td>RXW-GP4-xxx:</td> <td>5 minutes summer, 10 minutes winter</td> <td>15 minutes</td> </tr> <tr> <td>RXW-GP6-xxx:</td> <td>5 minutes summer, 10 minutes winter</td> <td>15 minutes</td> </tr> </tbody> </table> <p>See Battery Life specification for more details.</p>		Using Solar Power with Rechargeable Batteries	Using Non-Rechargeable Lithium Batteries	RXW-GP3-xxx:	5 minutes year round	10 minutes	RXW-GP4-xxx:	5 minutes summer, 10 minutes winter	15 minutes	RXW-GP6-xxx:	5 minutes summer, 10 minutes winter	15 minutes
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RXW-GP6-xxx:	5 minutes summer, 10 minutes winter	15 minutes											
Number of Data Channels	<p>RXW-GP3-xxx: 10 RXW-GP4-xxx: 12 RXW-GP6-xxx: 18</p>												
Battery Type/ Power Source	Two AA 1.2V rechargeable NiMH batteries, powered by built-in solar panel or two AA 1.5 V non-rechargeable lithium batteries for operating conditions of -40 to 70°C (-40 to 158°F)												
Battery Life	<p>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 non-rechargeable lithium batteries: RXW-GP3-xxx: 1 year with a 10-minute logging interval RXW-GP4-xxx: 1 year with a 15-minute logging interval RXW-GP6-xxx: 7 months with a 15-minute logging interval</p>												
Memory	16 MB												
Dimensions	<p>RXW-GP3-xxx sensor length: 53.2 cm (20.9 inches) RXW-GP4-xxx sensor length: 68.2 cm (26.9 inches) RXW-GP6-xxx sensor length: 98.2 cm (38.7 inches) Sensor diameter: 3 cm (1.2 inches) Cable length: 3 m (9.8 ft) Mote: 16.2 x 8.59 x 4.14 cm (6.38 x 3.38 x 1.63 inches)</p>												
Weight	<p>RXW-GP3-xxx sensor: 351 g (12.4 oz) RXW-GP4-xxx sensor: 408 g (14.4 oz) RXW-GP6-xxx sensor: 526 g (18.6 oz) Cable: 190 g (6.7 oz) Mote: 223 g (7.87 oz)</p>												
Materials	<p>Sensor: Polycarbonate housing encasing epoxy sealed circuit board Cable: Polyurethane Mote: PCPBT, silicone rubber seal</p>												
Environmental Rating	Mote: IP67, NEMA 6												
Compliance Marks*													

\*Soil-specific calibration requires user post-processing in a spreadsheet program such as Microsoft® Excel® or a utility and connector as recommend by RioT Technology Corp., manufacturer of GroPoint sensors. Refer to Performing a Soil-Specific Calibration in the manual for details.