



HydraProbe

Steven's Water Soil Sensor



Long term data without calibration

Soil moisture, salinity, and temperature

Overview

HydraProbe is a rugged soil sensor with patented technology that provides continual, consistent accuracy measuring the

three most significant soil parameters simultaneously—moisture, salinity and temperature.

Benefits and Features

- ▶ Patented technology that accurately measures moisture and electrical conductivity permits more accurate optimization of watering and fertilization than with just moisture
- ▶ Continual, long-term data without calibration
- ▶ Durable stainless steel tines, fully potted components, compact sealed design and a 5-year warranty
- ▶ Digital sensor using the SDI-12 protocol—no setup, just connect to data logger. Compatible with any SDI-12 capable data logger

Specifications

Real Dielectric Permittivity	Accuracy: $\pm 1.5\%$ or 0.2 whichever is typically greater. Range: 1 to 80 where 1 = air, 80 = distilled water.
Soil Moisture	Accuracy: ± 0.01 WFV for most soils ± 0.03 max for fine textured soils*. Range: From completely dry to fully saturated. *Accuracy may vary with some soil textures.
Bulk Electrical Conductivity	Accuracy: $\pm 2.0\%$ or 0.02 S/m whichever is typically greater. Range: 0.01 to 1.5 S/m.
Temperature Accuracy	$\pm 0.3^\circ\text{C}$

Temperature Range	-10°C to $+60^\circ\text{C}$ *Extended temperature range sensor (-30°C to $+60^\circ\text{C}$) available.
Inter-Sensor Variability	± 0.012 WFV (θ m ³ m ⁻³)
Power Supply	SDI-12: 9-20 VDC. RS-485: 9-20 VDC.
Power Consumption:	SDI-12: <1 mA idle / 10 mA active. RS-485: <10 mA idle / 30 mA active.
Max Cable Length	SDI-12: 60 m (197 ft.). RS-485: 1,219 m (4,000 ft.) Non-spliced: 304.8 m (1,000 ft.)
Baud Rate	SDI-12: 1200. RS-485: 9600



Communication Protocol	SDI-12: standard v.1.2. RS-485: custom or open spec
Addressing	Serial; allows multiple sensors to be connected to any RS485 or SDI-12 data logger via a single cable.
Operating Temperature Range in Soils	Freezing to +60°C
Standard Temperature Probe Range	-10°C to +60°C
Extended Temperature Probe Range	-40°C to +65°C *"Extended Temperature Range" version available, which can measure down to -40°C for research, cold-climate, high-altitude, arctic applications or any other measurement situation where there will be significant below-freezing ground temperatures.
Storage Temperature Range -40°C to +65°C	
Water Resistance	Tolerates continuous full immersion
Cable	» 18 gauge (20 gauge for RS-485 and analog versions), UV resistant, direct burial » SDI-12: 3-wire: power, ground, data. RS-485: 4-wire: power, ground, com+, com-

Vibration & Shock Resistance	Excellent; potted components in PVC housing and 304 grade stainless steel tines
Length	4.9" (124 mm)
Diameter	1.6" (42 mm) *Optional slim housing version available: 1.4" (35.8 mm)
Weight	7 oz. (200 g) *Optional slim housing version available: 6.5 oz. (184 g)
Cable Weight	0.86 oz/ft (80g/m)
Sensing Volume	Length: 2.2" (5.7 cm) Diameter: 1.2" (3.0 cm)
Sensors	Not interchangeable
Measurements Made	Real Dielectric Permittivity (isolated), volumetric water content for inorganic & mineral soil, bulk electrical conductivity, soil temperature
Water Content Accuracy	± 0.01 WFV for most soils ± 0.03 max for fine textured soils
Required Equipment	Measurement System
Soil Suitability	Short rods are easy to install in hard soil. Suitable for soils with higher electrical conductivity.
Rods	Replaceable

For comprehensive details, visit: www.campbellsci.ca/hydraprobe 



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