

HydraProbe

Soil moisture, salinity, and temperature sensor

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.



The HydraProbe’s “dielectric impedance” measurement principle differs from TDR, capacitance, and frequency soil sensors by taking into account the energy storage and energy loss across the soil area using a 50 MHz radio frequency wave.

Unlike other soil sensors, this unique, patented method separates the energy storage (real dielectric permittivity) from the energy losses (imaginary dielectric permittivity). The HydraProbe’s detailed mathematical and signal characterization of the dielectric spectrum helps factor out errors in the soil moisture measurement such as temperature effects, errors due to salinity, and soil type.

Patented Sensor Technology

HydraProbe uses unique “Coaxial Impedance Dielectric Reflectometry” to provide consistent long-term accuracy of moisture, bulk EC and temperature in any soil type.



Soil moisture with
±0.5 % accuracy



Built-in temperature
measurement



Compact sealed
design



Zero maintenance
required



Spatial and temporal
measurement
consistency

HydraProbe to Go

HydraGO and HydraGO FLEX represents the most advanced portable soil sensor system. The HydraGO is a HydraProbe mounted to a shaft and the FLEX is a HydraProbe on a cable.

Simply insert the probe into the soil, and tap on the “Sample” button in the HydraGO app. The HydraGO and HydraGO FLEX communicate wirelessly with your smartphone or tablet using Bluetooth. See all the data in the HydraGO App view screen. Export the soil readings, Timestamp and GPS, locations and site notes all to a csv file.



HydraGO

HydraGO flex

Technical specifications

Measurement	Accuracy	Range	Resolution
Real dielectric permittivity (isolated)	< ± 0.5% or ± 0.2 dielectric units	1 to 80 where 1 = air, 80 = distilled water	0.001
Soil moisture for inorganic & mineral soil	± 0.01 WFV for most soils ± ≤0.03 max for fine textured soils*	From completely dry to fully saturated (from 0 % to 100 % of saturation)	0.001
Bulk electrical conductivity	± 2.0 % or 0.02 S/m whichever is typically greater*	0 to 1.5 S/m	0.001
Pore water EC	N/A	Must have > 0.10 wfv	0.001
Temperature**	± 0.3 °C	-40 °C to 75 °C	0.1 °C
Inter-sensor variability	± 0.012 WFV ($\theta \text{ m}^3 \text{ m}^{-3}$)	N/A	

*Accuracy may vary with some soil textures

**Temperature Test Certificate from -40 °C to 75 °C available

Electrical and communication	SDI-12	RS-485	Modbus
Power supply	9 - 16 V DC	9 - 16 V DC	9 - 16 V DC
Power consumption	1 mA idle / 25 mA active	2.5 mA idle / 25 mA active	2.5 mA idle / 25 mA active
Cable	3-wire: power, ground, data	4-wire: power, ground, com+, com-	4-wire: power, ground, A, B
Max. cable length	60 m (197 ft.)	1,219 m (4000 ft.) Non-spliced: 304.8 m (1000 ft.)	1,219 m (4000 ft.) Non-spliced: 304.8 m (1000 ft.)
Baud rate	1200	9600	1200-115200. 9600 (default)
Communication protocol	SDI-12	Custom or open spec	Modbus RTU

Environmental

Operating temperature	-40 °C to 75 °C
Storage temperature	-40 °C to 75 °C
Water resistance	Tolerates continuous full immersion
Cable	18 gauge (20 gauge for RS-485/Modbus), UV resistant, direct burial
Vibration and shock resistance	Excellent; potted components in PVC housing and 304 grade stainless steel tines

Physical

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 (80 g/m ²)
Sensing volume (cylindrical region)	Length: 2.2" (5.7 cm) Diameter: 1.2" (3.0 cm)

Ordering options and accessories

- HydraProbe (Professional) with 25' (7.62 m) cable, SDI-12 / RS-485 / Modbus
- HydraProbe (Professional) with 50' (15.24 m) of cable, SDI-12 / RS-485 / Modbus
- HydraProbe (Professional) with 100' (30.48 m) of cable, SDI-12 / RS-485 / Modbus
- Temperature Test Certificate
- HydraGO
- HydraGO Flex



ISO Quality Certified Company

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