TEROS 12: ADVANCED SOIL MOISTURE SENSING

Electrical conductivity added

DESCRIPTION

TEROS 12 soil moisture, temperature, and electrical conductivity sensor makes your life easier with a large volume of influence, reduced sensor-to-sensor variability, and a near-bulletproof form factor—which lasts up to 10 years in the field. These innovations, along with our well-published capacitance technology, an accuracy verification standard, and a blazing fast installation tool have combined to generate our most accurate, easy-to-use, highly durable—yet still economical—soil moisture sensor. In fact, we're so confident about the long life of our TEROS sensor line, we've increased our standard warranty from one to three years.

TEROS 12

FEATURES

- Increased volume of influence (1010 mL)
- Easy installation with borehole installation tool (minimizes air gaps for cleaner readings)
- Dependable, long-life sensor
- Reduced sensor-to-sensor variability
- 3-year long-life guarantee
- Track solute and fertilizer movement with accurate EC measurement
- Check installation or troubleshoot with the ZSC Bluetooth sensor interface
- Repeatability can be checked with an accuracy verification standard
- Robust, epoxy body for tough field conditions
- Minimizes salinity and textural effects by using 70 MHz frequency capacitance technology
- Steel needles cut through the soil for better soil-sensor contact
- Easy-to-use SDI-12 communication for non-METER data loggers
- Ferrite core eliminates cable noise.

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TEROS 12 combines METER's trademark 70 MHz circuitry with an extremely ruggedized epoxy fill and securely attached, sharpened stainless steel needles that easily slip into the soil and are resistant to salts, so you can worry less about sensor deterioration. Very low power consumption and a high resolution provide increased precision over a longer period of time.

TEROS 12 uses a completely new calibration procedure that maximizes accuracy and minimizes sensor-to-sensor variability while keeping the cost reasonable. Every sensor you install is going to read exactly like the next one. Unlike other sensors on the market which spec an unverifiable ±1.0% VWC

Contact info

SPECIFICATIONS

MEASUREMENT SPECIFICATIONS	
Volumetric water content (VWC)	**Range:** Mineral soil calibration: 0.00–0.70 m^3/m^3 Soilless media calibration: 0.0–1.0 m^3/m^3 Apparent dielectric permittivity (ε_a): 1 (air) to 80 (water) **NOTE: The VWC range is dependent on the media the sensor is calibrated to. A custom calibration will accommodate the necessary ranges for most substrates.** **Resolution:** 0.001 m^3/m^3. **Accuracy:** Generic calibration: ±0.03 m^3/m^3 (±3.00% VWC) typical in mineral soils that have solution EC <8 dS/m. Medium specific calibration: ±0.01–0.02 m^3/m^3 (±1–2% VWC) in any porous medium. Apparent dielectric permittivity (ε_a): 1–40 (soil range) , ±1 ε_a (unitless) 40–80, 15% of measurement
Dielectric measurement frequency	70 MHz
Temperature	Range: −40 to 60 °C. Resolution: 0.1 °C. Accuracy: ±0.5 °C from −40 to 0 °C. ±0.3 °C from 0 to +60 °C
Bulk electrical conductivity (EC_b)	Range: 0 to 20 dS/m (bulk). Resolution: 0.001 dS/m Accuracy: +/- (5% +0.01 dS/m) from 0 to 10 dS/m +/- 8% from 10 to 20 dS/m
Measurement volume	See comparison article
COMMUNICATION SPECIFICATIONS	
Output	DDI serial or SDI-12 communications protocol
Data logger compatibility	METER ZL6, EM60, and Em50 data loggers or any data acquisition system capable of 4.0- to 15-VDC power and serial or SDI-12 communication (see compatibility chart)
PHYSICAL SPECIFICATIONS	
Dimensions	Length: 9.4 cm (3.70 in). Width: 2.4 cm (0.95 in). Height: 7.5 cm (2.95 in)
Needle length	5.5 cm (2.17 in)
Cable length	5 m (standard). 75 m (maximum custom cable length) **NOTE: Contact Customer Support if a nonstandard cable length is needed.**
Connector types	3.5-mm stereo plug connector or stripped and tinned wires
ELECTRICAL AND TIMING CHARACTERISTICS	
Supply voltage (VCC) to GND	Minimum: 4.0 VDC. Typical: NA. Maximum: 15.0 VDC
Digital input voltage (logic high)	Minimum: 2.8 V. Typical: 3.6 V. Maximum: 3.9 V
Digital input voltage (logic low)	Minimum: –0.3 V. Typical: 0.0 V. Maximum: 0.8 V
Digital output voltage (logic high)	Minimum NA. Typical 3.6 V. Maximum NA
Power line slew rate	Minimum: 1.0 V/ms. Typical: NA. Maximum: NA
Current drain (during 25-ms measurement)	Minimum: 3.0 mA. Typical: 3.6 mA. Maximum: 16.0 mA
Current drain (while asleep)	Minimum: NA. Typical: 0.03 mA. Maximum: NA
Operating temperature range	Minimum: –40 °C. Typical: NA. Maximum: +60 °C **NOTE: Sensors may be used at higher temperatures under certain conditions; Contact Customer Support for assistance.**
Power up time (DDI serial)	Minimum: 80 ms. Typical: NA. Maximum: 100 ms
Power up time (SDI-12)	Minimum: NA. Typical: 245 ms. Maximum: NA
Measurement duration	Minimum: 25 ms. Typical: NA. Maximum: 150 ms
COMPLIANCE	Manufactured under ISO 9001:2015. EM ISO/IEC 17050:2010 (CE Mark). 2014/30/EU and 2011/65/EU. EN61326-1:2013 and EN55022/CISPR 22

This Instrument is manufactured by our principle company

METER Environment - USA