

TEROS-11

volumetric water content & temperature

overview



The TEROS-11 soil water content and temperature sensor, formally known as the Decagon 5TM sensor, delivers temperature, measured by an onboard thermistor, along with accurate volumetric water content.

The TEROS-11, which has replaced the older 5TM model, determines volumetric water content (VWC) by measuring the dielectric constant of the soil (or other media) using capacitance/frequency domain technology. Signal filtering minimizes salinity and textural effects, making the TEROS-11 accurate in most soils and soilless media. Factory calibrations are included for mineral soils, potting soils, rockwool, and perlite.

The TEROS-11's small size makes it easy to install in the field and the greenhouse. This robust sensor can be pushed directly into undisturbed soil to ensure good accuracy.

plug and read

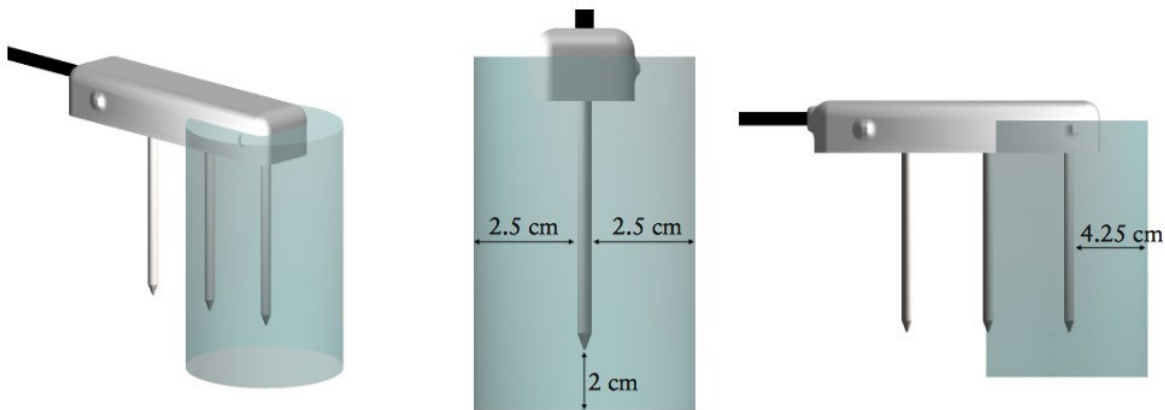
Get straight to the data with an ZL6-series data logger. Just install the TEROS-11, plug it into the ZL6, set the clock and measurement intervals, and start logging data. No programming required.

The TEROS-11 comes standard with both serial and SDI-12 communication options, meaning easy integration with systems manufactured by other companies.

advantages of the TEROS-11

- Measures VWC and temperature
- SDI-12 compatible
- 715 mL volume of influence

sensor measurement zone dimensions



the grape monitor

In 2017, the New South Wales Department of Primary Industries commissioned

Edaphic Scientific to install a phyto-monitoring system on various varieties of grapevines.

Known as The Grape Monitor, the phyto-systems are measuring stem growth (dendrometers), sap flow, soil moisture, canopy temperature, and more parameters.

Data is uploaded to the internet via the Edaphic Scientific telemetry system. These data can be viewed at anytime.

For more information, [visit The Grape Monitor](#).

whole system monitoring solutions



Edaphic Scientific is a one-stop shop for a whole system monitoring solution. We provide plant and soil monitoring systems for researchers and growers including [a LoRa WAN option](#).

Our systems not only support dendrometers, but related sensors such as sap flow, soil moisture, weather parameters, and more.

At Edaphic Scientific we want to work with you from the start of your project through to its completion. We can provide:

- Assistance with project and experimental design
- Procurement of all monitoring equipment, including sensors, data loggers and data management software. Edaphic Scientific is a one-stop shop where we can

source and find any necessary equipment for your project from our preferred suppliers or third party suppliers

- Installation and training
- On-going assistance with data interpretation and equipment maintenance
- Data correction and analysis, including statistical analysis with the R-package
- Report and publication preparation including tables, figures, graphs, and manuscript writing

advanced data collection and management solutions



Edaphic Scientific recognises the need for flexible and adaptable sensor and [data logging solutions](#) for experimental or environmental monitoring projects.

Data can be downloaded directly in the field from data loggers. A direct connection between the data loggers and your computer, via a USB cable, can be used for manual downloading of data.

Alternatively, data can be [downloaded over the internet](#) on your iPhone, iPad or desktop computer with the Eagle cloud-based, data management software solutions. Through this remote based downloading capabilities, you can download, view and manage your data, and system, anywhere in the world and at anytime.

specifications

feature	specification
accuracy	Apparent Dielectric Permittivity (ϵ_a): $\pm 1 \epsilon_a$ from 1 - 40 (soil range); $\pm 15\%$ from 40 - 80 Soil Volumetric Water Content (VWC): Using Topp equation: $\pm 0.03 \text{ m}^3/\text{m}^3$ ($\pm 3\%$ VWC) typical in mineral soils that have solution electrical conductivity $< 10 \text{ dS/m}$; using medium specific calibration, $\pm 0.02 \text{ m}^3/\text{m}^3$ ($\pm 2\%$ VWC) in any porous medium
Soil Moisture	
Temperature	Temperature: $\pm 1^\circ\text{C}$ Note: Temperature measurement may not be accurate if sensor is not fully immersed in the medium of interest, due to excessively long equilibration time.
resolution	
Soil Moisture	ϵ_a : $0.1 \epsilon_a$ from 1-20, $< 0.75 \epsilon_a$ from 20-80 VWC: 0.0008 m^3/m^3 (0.08% VWC) from 0 to 50% VWC
Temperature	0.1 $^\circ\text{C}$
range	
Soil Moisture	ϵ_a : 1 (air) to 80 (water) VWC: 0% to saturation
Temperature	-40 to 60 $^\circ\text{C}$
sensor type	
Soil Moisture	Frequency domain / capacitance
Temperature	Thermistor
general	
Measurement Speed	150 ms (milliseconds)
Output	SDI-12
Operating Environment	-40 $^\circ\text{C}$ to 60 $^\circ\text{C}$
Power Requirements	3.6 - 15 VDC, 0.3 mA quiescent, 10 mA during 150 ms measurement
Cable Length	Sensors come standard with 5 m cable. Custom cable lengths available. Maximum cable length of 75 m.
Cable Connectors	3.5 mm "stereo" plug, or stripped and tinned lead wires (3)
Sensor Size	10 cm x 3.2 cm x 0.7cm
Data Logger Compatibility	Decagon Em50 Series, ProCheck, SDI-12 data loggers



feature

specification

Warranty

One year, parts and labor

manual & docs

- [TEROS-11 Manual](#)
- [TEROS-11 Integrator Guide](#)
- [How to calibrate soil moisture sensors](#)
- [What is a capacitance sensor?](#)
- [5 common mistakes when measuring soil moisture](#)
- [The Soil Water Compendium](#)

related products

- [Data loggers and monitoring systems](#)
- [ProCheck portable, handheld meter](#)
- [Soil moisture sensors, probes and meters](#)
- [Soil water potential sensors](#)
- [Pore water samplers](#)
- [Soil CO2 concentration](#)
- [Soil nutrient analyzer](#)
- [Soil pH meter](#)
- [Sap flow sensors](#)
- [Weather stations](#)