



**METER**  
ENVIRONMENT

# SOIL MOISTURE





## ZL6

The ZL6 data logger has six ports, so you can monitor different parameters, such as weather, soil moisture, and soil water potential, all at the same time. It has integrated barometric pressure and GPS and is solar powered, so there's hardly any power maintenance required.

With an IP56-rated enclosure, we engineered the ZL6 to be extremely robust and low maintenance.

### KEY FEATURES

- Ultra-rugged and durable construction
- Plug and play with METER sensors
- Six sensor ports
- Real-time data with ZENTRA Cloud
- Integrated GPS and barometric pressure measurement
- Simple setup
- Firmware-over-the-air updates
- Built-in solar panel
- Rechargeable nickel-metal hydride (NiMH) batteries
- Stores 40,000 to 80,000+ records, depending on sensor configuration

### SPECIFICATIONS

- Sensor input ports: 6 (supports METER analog, digital, or pulse sensors)
- Sensor port type: 3.5-mm stereo plug connector
- Data storage
  - ZL6 Basic: 2 MB (20,000 to 30,000 records depending on configuration)
- Battery capacity
  - ZL6 and ZL6 Pro: 6 AA NiMH or alkaline batteries
- Battery life
  - Alkaline: 3–12 months depending on configuration
  - NiMH: 3+ years with unobstructed view of sun. Charging through solar energy harvesting or USB
- Operating temperature range:  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$



## TEROS 11 + 12

The TEROS 12 soil moisture/temp/electrical conductivity sensor and TEROS 11 soil moisture/temp sensors make your life easier with a large volume of influence, reduced sensor-to-sensor variability, and rugged form factor with a 3-year warranty. These innovations, along with our well-published capacitance technology and accuracy verification standard have combined to generate our most accurate, easy-to-use, highly durable—yet still economical—soil moisture sensor.

### KEY FEATURES

- Increased volume of influence (1010 mL)
- Robust, long-life sensor
- Reduced sensor-to-sensor variability
- 3-year long-life guarantee
- Repeatability can be checked with an accuracy verification standard
- Minimized salinity and textural effects by using 70 MHz frequency capacitance technology
- Steel needles cut through the soil for better soil-sensor contact

- SDI-12 communication for non-METER data loggers
- Ferrite core eliminates cable noise

### SPECIFICATIONS

- VWC Range: Mineral soil calibration: 0–70% VWC, Soilless media calibration: 0–100% VWC
- Apparent dielectric permittivity ( $\epsilon_a$ ): 1 (air) to 80 (water)
- Resolution: 0.1% VWC
- VWC Accuracy: Generic calibration:  $\pm 3.00\%$ , ( $\pm 1\text{--}2\%$  VWC with soil-specific calibration)
- Dielectric measurement frequency: 70 MHz
- **Temperature**  
 Range:  $-40$  to  $60$  °C  
 Resolution:  $\pm 0.1$  °C  
 Accuracy:  $\pm 0.5$  °C from  $-40$  to  $0$  °C  
 $\pm 0.3$  °C from  $0$  to  $+60$  °C
- **Bulk electrical conductivity (EC<sub>b</sub>) (TEROS 12 only)**  
 Range: 0 to 20 dS/m (bulk)  
 Resolution: 0.001 dS/m  
 Accuracy:  $\pm 5\%$  ( $\pm 0.01$  dS/m) from 0 to 10 dS/m  
 $\pm 8\%$  from 10 to 20 dS/m



## TEROS 10

The TEROS 10 is a ruggedized version of our basic, no-frills soil moisture sensor. Its 70-MHz frequency minimizes salinity and textural effects, making it accurate in most soil or soilless media. With a tough, epoxy body, the TEROS 10 is designed to withstand some of the harshest field conditions, which means problem-free measurements over the longevity of your research. It also has a 430 mL volume of influence, allowing you to measure a larger volume of soil in the field.

## KEY FEATURES

- Low-cost, ruggedized soil moisture sensor
- 430 mL volume of influence
- Sharp stainless steel needles are securely fastened and reduce breakage
- 3-year long-life guarantee
- Measure VWC in a harsh environment
- Robust epoxy body means it lasts for 10+ years in the field
- Plug and play with METER data loggers
- Ferrite core eliminates cable noise
- Easy integration with third-party systems

## SPECIFICATIONS

- VWC Range: Mineral soil calibration: 0–64% VWC; Soilless media calibration: 0–70% VWC
- Apparent dielectric permittivity ( $\epsilon_a$ ): 1 (air) to 80 (water)
- Dielectric measurement frequency: 70 MHz
- Supply voltage (VIN to GND): 3.0-15.0 VDC
- Output : 1,000 to 2,500 mV
- Operating temperature range: –40 to +60°C



## TEROS 21

The TEROS 21 is the world's first full-range (-5 to -100,000 kPa) water potential sensor with legendary high accuracy, low cost, and no maintenance.. Each sensor is individually calibrated, giving you a long-term monitoring solution you can trust. The TEROS 21 provides an even more accurate soil moisture picture than measuring water content alone. A water content sensor only shows the percentage of water in the soil, but with a TEROS 21 water potential sensor, you'll know if that water is available to plants and where it will move. Plus, unlike water content, matric potential isn't dependent on soil type, so you can compare moisture between different sites.

### KEY FEATURES

- Easy to use
- Improved accuracy from six-point factory calibration
- Tough, long-lasting body
- No recalibration
- Low salt sensitivity
- Affordability

- Excellent range (sensitivity from -5 kPa all the way to air dry [-100,000 kPa])
- Onboard temperature measurement
- SDI-12 compatible

### SPECIFICATIONS

- Range: -5 to -100,000 kPa (1.70 to 6.00 pF)
- Resolution: 0.1 kPa
- Accuracy:  $\pm(10\%$  of reading + 2 kPa) from -100 to -5 kPa
- Temperature range: -40 to +60 °C,  $\pm 1$  °C
- Temp. Resolution: 0.1 °C
- Operating temperature range: -40 °C to +60 °C
- Output : RS-232 (TTL) with 3.6-V or SDI-12 communication protocol



## ZSC BLUETOOTH SENSOR INTERFACE

During sensor installations, the ZSC lets you monitor a sensor reading as it is installed. Get real-time, wireless readings via Bluetooth on your smartphone with the push of a single button. Readout values are displayed in ZENTRA Utility Mobile to help you detect installation problems (poor sensor-to-soil contact, air pockets, rocks, etc.) before you repack the hole or trench. The ZSC is often used to spot-check soil moisture, but it can also instantaneously read any other environmental sensor. And it's powered by only two AA alkaline batteries.

## KEY FEATURES

- Reads all analog, pulse, and digital sensors supported by the ZENTRA system
- Wirelessly pairs with any iOS or Android mobile device using Bluetooth
- ZENTRA Utility Mobile displays the current sensor reading to evaluate if the sensor is working correctly
- Helps update sensor firmware when needed
- Displays sensor metadata for METER digital sensors (firmware version, serial number, etc.)
- Change the sensor's SDI-12 address (only applies to third-party loggers with a sensor bus)

**NOTE: The ZSC is used for easy spot-checking and does not log/store data or monitor measurements over time (for data logging, see the ZL6 data logger)**