
Soil Water Potential Sensors

Models 253 and 257

The Watermark 200 (CSI models 253 and 257) provides a convenient method of estimating soil water potential between 0 and -2 bars (typically wetter, or irrigated soils) with a Campbell Scientific datalogger. The 257 connects directly to our dataloggers. The 253 connects to our AM16/32B multiplexer; please note that the CR200-series and CR510 dataloggers are not compatible with multiplexers.

The Watermark probes estimate soil water potential. If agricultural practices allow, the sensor can be left in the soil all year, eliminating the need to remove the sensor during fallow periods.

Operation

When the amount of water in the soil surrounding the Watermark changes, a difference in water potential between the soil and the sensor material is established. This gradient in potential causes a water flux between the two materials. For example, an irrigation or precipitation event results in movement of soil water into the Watermark until equilibrium in water potential between the sensor and the soil occurs. An increase in the amount of water in the Watermark reduces the electrical resistance between the sensor electrodes. An ac half-bridge datalogger instruction is used to measure the resistance between electrodes. Algebraic datalogger instructions are then used to transform the resistance value to soil water potential using calibration values supplied with the sensor.

Construction

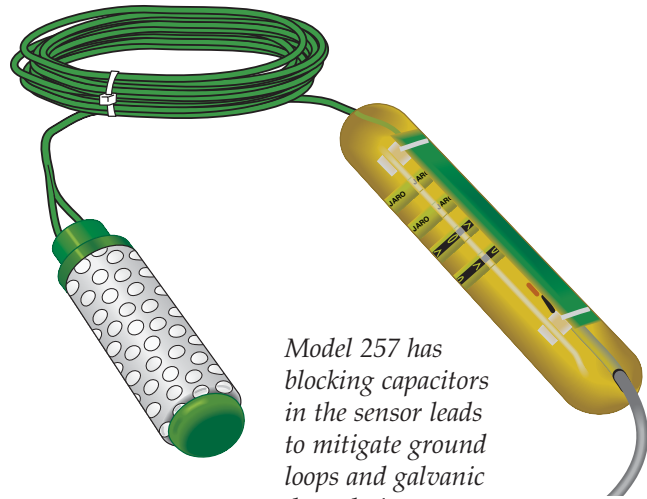
The Watermark consists of two concentric electrodes embedded in a reference matrix material. The matrix material is surrounded by a synthetic membrane for protection against deterioration. An internal gypsum tablet buffers against the salinity levels found in irrigated soils. The outer jacket of the cable is Santoprene rubber which is resistant to temperature extremes, water, and UV degradation.

Ordering Information

- 253-L Soil Water block for AM16/32B with a user-specified lead length (enter length in feet after L)
- 257-L Watermark Soil Water block with blocking capacitors with a user-specified lead length (enter length in feet after L)

Specifications

- Range: 0 to -2 bars
- Dimensions: 3.25" (8.26 cm) long with a 0.75" (1.91 cm) diameter
- Weight: 0.8 lbs. (362.9 g)



Model 257 has blocking capacitors in the sensor leads to mitigate ground loops and galvanic degradation.



Model 253 is designed for use with our analog multiplexers.

