

Digital TDT[®] Sensor SDI-12

Digital TDT[®] Sensor Technology: Highly Accurate and Ultra-Stable Moisture Readings Results from the Analysis of Digitized Waveforms Propagated through the Soil.



The Acclima Digital TDT[®] Soil Moisture Sensor represents a revolutionary contribution to the irrigation industry. It operates on the same principle as Time Domain Reflectometry but with two important differences: (1) the Transmissometer Architecture results in higher signal-to-noise ratio and hence higher immunity to soil EC, and (2) the received signal is digitized with 5ps resolution and the captured waveform is then digitally analyzed to extract the precise propagation time - independent of wave form distortion caused by soil ionic material content. The spectral content of the propagated waveform is in the gigahertz range resulting in high immunity to complex permittivity responses from clay soils. The transmission line structure results in high waveform penetration thus providing good immunity to surface sensitivity problems found in capacitive type sensors. This patented process also analyzes the received waveform distortion from which soil EC is calculated and reported. Permittivity is directly calculated from propagation time using first principles of the physics of electromagnetic wave propagation. Soil Moisture is calculated from permittivity using a proprietary adaptation of dielectric mixing model. Soil moisture derivations are temperature compensated.

Features:

- Measures and reports:
 - Received Waveform Risetime in mv/ns
 - Waveform Propagation Time in ps
 - Soil Permittivity
 - Soil Temperature in degrees C
 - Absolute Volumetric Water Content in percent
 - Soil EC in dS/m
- 1% Stable VWC Readings over the following conditions:
 - 0 to 50 degrees C (non frozen soil)
 - 0 to 4 dS/m in-soil EC (up to 35 dS/m saturated paste extraction from coarser soils)
- Large 100 ml sampling volume (decreases in high EC soils)
- Robust, Long Life Materials and Construction
- Industry Standard SDI-12 Interface
- Connects to a PC through an RS-232 Serial Port
- Low Power Operation:
 - 6-12 volts DC
 - 10 ua typical standby mode
 - 80 ma moisture read mode (requires 0.5 seconds)

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