



## Data Sheet

# Digital TDT SDI-12 Soil Water-Temperature-BEC Sensor



**Model # ACC-SEN-SDI**

### Description:

The Acclima Digital TDT® soil moisture sensor represents a revolutionary advance in the irrigation industry. It is the first soil moisture sensor to incorporate the accuracy of digitized Time Domain Transmissometry in a low-cost instrument providing highly accurate absolute readings of soil moisture under all conditions of temperature and soil chemistry where crops will grow. No other TDT sensor on the market matches its accuracy and stability. Independent test data from leading soil physicists verifies this extraordinary claim and are available upon request. This Digital TDT sensor incorporates a modified SDI interface capable of connecting directly to Acclima data loggers or any other third-party SDI version 1.4 compliant device. The Acclima modified SDI interface also is capable of auto-detection and address collision repair with Acclima data loggers.

### Features:

- Works in all soils
- Highly stable under a wide range of soil conductivity and temperature
- Range of 0 -100% volumetric water content
- Made with durable inert materials
- Very low-power, battery operable
- SDI-12 version 1.4 compliant
- Low cost

### Physical Characteristics:

- Dimensions (without cable): 20 cm x 5.33 cm x 1.5 cm.
- Weight (with 5-meter cable): 299 grams
- Composition: Type 304 stainless steel, crystalline-epoxy
- PVC (insulation) Cable: 3 conductor, 22 ga PVC sheath, 5 meters



#### Environmental Characteristics:

- Operating Temp Range: 1°C to 50°C for VWC (no ice), -20°C to 50°C for the other data
- Storage Temp Range: 20°C to 75°C
- Lightning & Surge Protection: 6 kV @ 3 kA, 8/50  $\mu$ s

#### Operating Characteristics:

- Volumetric Water Content: 0 to 100%
- Resolution: 0.06% VWC
- Absolute VWC Accuracy:  $\pm 2\%$  typical
- VWC Soil EC Stability:  $\pm 1\%$  of full scale 0 to 5 dS/m BEC
- Temp Reporting Accuracy:  $\pm 2^\circ\text{C}$  from  $+1^\circ\text{C}$  to  $+50^\circ\text{C}$
- EC Reporting Accuracy:  $\pm 0.2$  dS/m 0 to 5 dS/m BEC

#### Architectural Characteristics:

- Technology: Waveform Digitizing Time Domain Transmissometer
- Effective Acquisition Bandwidth: 200 Giga-sample/second
- Propagation Time Resolution: ps
- Waveform Propagation Resolution: 1.5 mm in air, 0.16 mm in water
- Waveguide Length: 30 cm
- Permittivity to VWC Calculation: Modified Dielectric Mixing Model
- Propagation Waveform Bandwidth:  $>2$  GHz

#### Communications Characteristics:

- Communication Protocol: SDI-12 Revision 1.4
- Maximum Cable Length: 60 meters

#### Power Characteristics:

- Operating Voltage Range: 6–15 VDC
- Listening/Sleep Mode Current: 60  $\mu$ A at 50°C
- Communications Current: 6 mA typical, 8 mA max
- Read Moisture Comm Time: 425 ms total for each read cycle
- Moisture Sense Current: 84 mA at 12VDC input, 98 mA at 8 VDC input, 110 mA at 6 VDC input
- Moisture Sense Time: 450 ms each sensing operation

