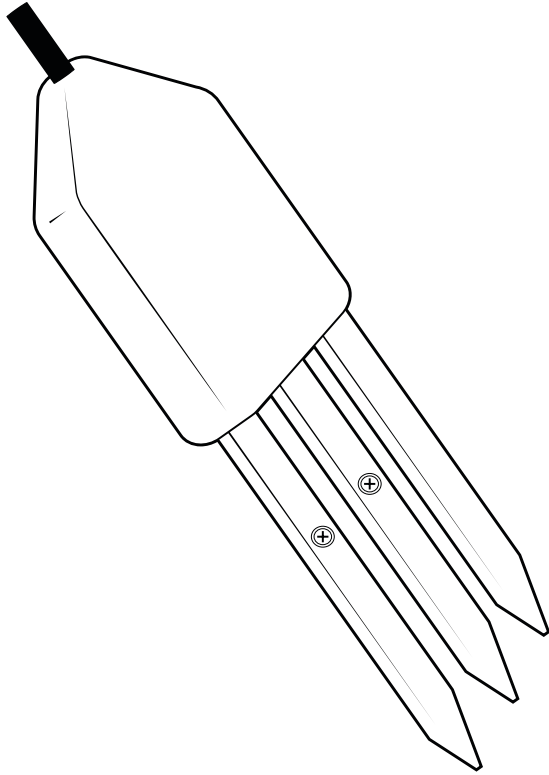




METER

5TE

Datasheet



3. SYSTEM

This section describes the 5TE sensor.

3.1 SPECIFICATIONS

MEASUREMENT SPECIFICATIONS

Volumetric Water Content (VWC)

Range	
Mineral soil calibration	0.0–1.0 m ³ /m ³
Soilless media calibration	0.0–1.0 m ³ /m ³
Apparent dielectric permittivity (ϵ_a)	1 (air) to 80 (water)
Resolution	0.0008 m ³ /m ³ from 0%–50% VWC
Accuracy	
Generic calibration	± 0.03 m ³ /m ³ typical
Medium-specific calibration	±0.02 m ³ /m ³
Apparent dielectric permittivity (ϵ_a)	1–40 (soil range), ±1 ϵ_a (unitless) 40–80, 15% measurement

Temperature

Range	–40 to +60 °C
Resolution	0.1 °C
Accuracy	±1 °C

Bulk Electrical Conductivity (EC)

Range	0–23 $\mu\text{S}/\text{m}$ (bulk)
Resolution	0.01 $\mu\text{S}/\text{m}$ from 0–7 $\mu\text{S}/\text{m}$ 0.05 $\mu\text{S}/\text{m}$ from 7–23 $\mu\text{S}/\text{m}$
Accuracy	±10% from 0–7 $\mu\text{S}/\text{m}$ User calibration required from 7–23 $\mu\text{S}/\text{m}$

COMMUNICATION SPECIFICATIONS

Output

DDI serial or SDI-12 communication protocol

Data Logger Compatibility

Data acquisition systems capable of 3.6- to 15.0-VDC power and serial or SDI-12 communication

PHYSICAL SPECIFICATIONS

Dimensions

Length 10.9 cm (4.3 in)

Width 3.4 cm (1.3 in)

Height 1.0 cm (0.4 in)

Prong Length

5.0 cm (1.9 in)

Operating Temperature Range

Minimum -40 °C

Typical NA

Maximum +60 °C

NOTE: Sensors may be used at higher temperatures under certain conditions; contact [Customer Support](#) for assistance.

Cable Length

5 m (standard)

75 m (maximum custom cable length)

NOTE: Contact [Customer Support](#) if a nonstandard cable length is needed.

Connector Types

3.5-mm stereo plug connector or stripped and tinned wires

ELECTRICAL AND TIMING CHARACTERISTICS

Supply Voltage (VCC to GND)

Minimum 3.6 VDC

Typical NA

Maximum 15.0 VDC

Digital Input Voltage (logic high)

Minimum 2.8 V

Typical 3.0 V

Maximum 3.9 V

Digital Input Voltage (logic low)

Minimum -0.3 V

Typical 0.0 V

Maximum 0.8 V

Power Line Slew Rate

Minimum 1.0 V/ms

Typical NA

Maximum NA

Current Drain (during measurement)

Minimum 0.5 mA

Typical 3.0 mA

Maximum 10.0 mA

Current Drain (while asleep)

Minimum NA

Typical 0.03 mA

Maximum NA

Power-Up Time (DDI serial)

Minimum NA

Typical NA

Maximum 100 ms

Power-Up Time (SDI-12)

Minimum 100 ms

Typical 150 ms

Maximum 200 ms

Measurement Duration	
Minimum	NA
Typical	150 ms
Maximum	200 ms

COMPLIANCE

Manufactured under ISO 9001:2015

EM ISO/IEC 17050:2010 (CE Mark)

3.2 ABOUT 5TE

The 5TE is designed to measure the water content, EC, and temperature of soil (Figure 5). The 5TE uses an oscillator running at 70 MHz to measure the dielectric permittivity of soil to determine the water content. A thermistor in thermal contact with the sensor prongs provides the soil temperature, while the screws on the surface of the sensor form a two-sensor electrical array to measure EC. The polyurethane coating on the 5TE circuit board protects the components from water damage and gives the sensor a longer life span.

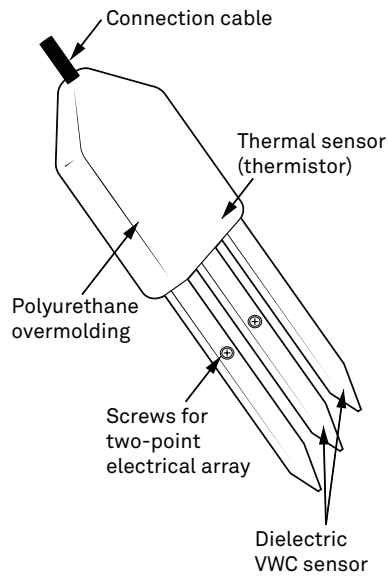


Figure 5 5TE components

