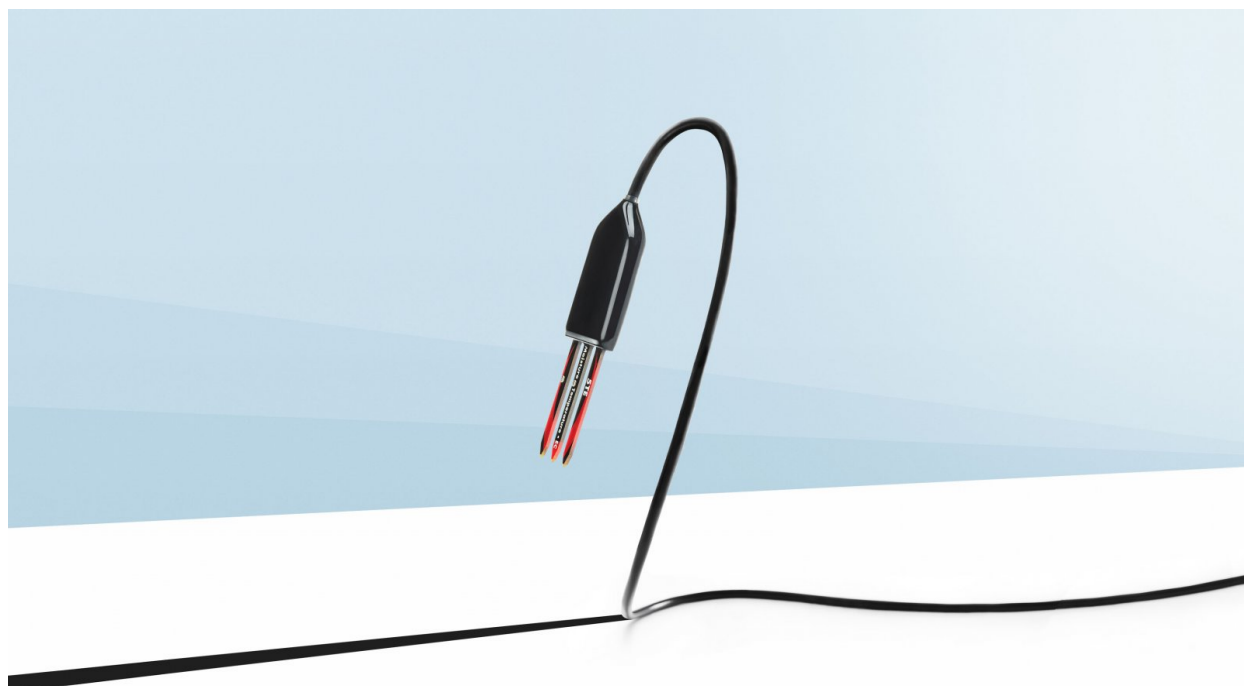


Soil Moisture, Temperature, and Electrical Conductivity

[metergroup.com/environment/products/ech2o-5te-electrical-conductivity/](https://www.metergroup.com/environment/products/ech2o-5te-electrical-conductivity/)



Engineered for accuracy

ECH₂O 5TE

Soil moisture, temperature, and electrical conductivity

The 5TE monitors bulk electrical conductivity (EC), in addition to volumetric water content (VWC) and soil temperature.

Monitor salt levels

The 5TE enables users to measure the EC response to salts and fertilizers in the soil. EC Measurements require good contact between the stainless steel electrodes on the sensor, and the soil. In potting soil and soilless medias, we recommend using the GS3 to maintain good soil contact and compensate for air gaps in the substrate.

Engineered for accuracy

The 5TE determines VWC by measuring the dielectric constant of the media using capacitance/frequency domain technology. The sensor uses a 70 MHz frequency, which minimizes salinity and textural effects, making the 5TE accurate in most soils. The 5TE measures temperature with an onboard thermistor, and electrical conductivity using a stainless steel electrode array. VWC in mineral soils is calculated using the Topp equation; other calibrations are provided on request. Temperature and electrical conductivity are factory calibrated for all soil types.

Easy installation

The 5TE's small size makes it easy to install in the field and the greenhouse. This robust sensor should be pushed directly into undisturbed soil to ensure good accuracy.

Easy integration

Each 5TE comes standard with serial and SDI-12 communication options, meaning easy integration with systems manufactured by other companies.

Advantages of the 5TE

- Measures VWC, EC, and temperature
- Monitoring salts
- SDI-12 compatible

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[Features](#) [Specifications](#) [Accessories](#) [Support / Downloads](#)

Features

- Three measurements in one
- Plug and play capability
- Use with the [EM60G](#) to collect data remotely
- Easy installation
- 70 MHz frequency minimizes salinity and textural effects
- Measures VWC, EC, and temperature
- Salt-monitoring capabilities
- SDI-12 compatible

Specifications

Accuracy	Apparent dielectric permittivity (ϵ_a): $\pm 1 \epsilon_a$ (unitless) from 1 - 40 (soil range), $\pm 15\%$ from 40 - 80 Soil Volumetric Water Content (VWC): using Topp equation: $\pm 0.03 \text{ m}^3/\text{m}^3$ ($\pm 3\%$ VWC) typical in mineral soils that have solution electrical conductivity $< 10 \text{ dS/m}$; using medium specific calibration, $\pm 0.01 - 0.02 \text{ m}^3/\text{m}^3$ ($\pm 1 - 2\%$ VWC) in any porous medium Electrical conductivity (EC): $\pm 10\%$ from 0 to 7 dS/m, user calibration required above 7 dS/m Temperature: $\pm 1 \text{ }^\circ\text{C}$
Resolution	ϵ_a : $0.1 \epsilon_a$ (unitless) from 1 - 20, $< 0.75 \epsilon_a$ (unitless) from 20 - 80 VWC: $0.0008 \text{ m}^3/\text{m}^3$ (0.08% VWC) from 0 to 50% VWC EC: 0.01 dS/m from 0 to 7 dS/m, 0.05 dS/m from 7 to 23.1 dS/m Temperature: $0.1 \text{ }^\circ\text{C}$

Range	<p>ϵ_a: 1 (air) to 80 (water)</p> <p>EC: 0 - 23 dS/m (bulk)</p> <p>Temperature: -40 to 60 °C*</p> <p>*Sensors can be used at higher temperatures under some conditions</p>
Measurement time	150 ms
Sensor type	<p>VWC: frequency domain</p> <p>EC: two-probe design</p> <p>Temperature: thermistor</p>
Output	RS232 (TTL), or SDI-12
Operating environment	<p>40 to 60 °C*</p> <p>*Sensors can be used at higher temperatures under some conditions. Contact METER for more details.</p>
Power requirements	3.6 - 15 VDC, 0.3 mA quiescent, 10 mA during 150 ms measurement
Cable length	Sensors come standard with 5 m cable. Custom cable lengths available. Maximum cable length of 75 m. Please contact METER if you need longer cable lengths.
Cable connector types	3.5 mm "stereo" plug or stripped and tinned lead wires (3)
Dimensions	10 cm x 3.2 cm x 0.7 cm
Data logger compatibility (not exclusive)	METER Em50/50G , EM60/60G , ProCheck , Campbell Scientific
Measurement volume	See comparison article
Warranty	One year, parts and labor

Accessories



Splice Kit



Probe Adaptor Pigtail for CSI Data Loggers



Pigtail-to-Stereo Adaptor



EM60

SOLAR-POWERED DATA LOGGING



EM60G

CELLULAR DATA LOGGING



50 Foot Extension Cable



10 Foot Extension Cable

Support

Have a question or problem? Our support team can help.

We manufacture, test, calibrate, and repair every instrument in house. Our scientists and technicians use the instruments every day in our product testing lab. No matter what your question is, we have someone who can help you answer it.

Email: support.environment@metergroup.com

Phone US: +1 509-332-5600

Phone Europe: +49 89 12 66 52 0

Downloads

5TE Firmware Updater EXE / 1.29 MB

[5TE Integration guide PDF / 782.92 KB](#)

[ECH₂O 5TE manual PDF / 1.33 MB](#)

[ECH₂O CSI – SCWin \(shortcut\) ZIP / 92.91 KB](#)

[ECH₂O Sensor Quick Start PDF / 7.99 MB](#)

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