

INDUSTRIAL PRODUCT DATASHEET

RS485 Mini Soil Moisture, Temperature and EC Sensor: Modbus RTU, Soil and Substrate Monitoring, Bulk EC, Pore EC

RS485 Mini Soil Moisture, Temperature and EC Sensor: Modbus RTU, multi-parameter measurement, IP68, wide voltage, for smart agriculture and research.

SKU

100076252

UPDATED

2026-07-24 11:27:55

PRICE

\$89.00(Excl. VAT)



Overview



The RS485 Mini Soil Moisture, Temperature and EC Sensor measures soil/substrate volumetric water content, temperature, bulk EC, pore EC, and apparent dielectric permittivity with RS485 Modbus RTU output, and features an IP68 sealed design, low-power 3.0–28 V DC operation, and reverse/TVS/ESD protection. It is ideal for field irrigation management, greenhouse substrate monitoring, multi-substrate monitoring, and research plot soil balance applications.

Key Features

The RS485 Mini Soil Moisture, Temperature and EC Sensor measures soil/substrate volumetric water content, temperature, bulk EC, pore EC, and apparent dielectric permittivity, with support for RS485 Modbus RTU communication. Its IP68 resin-sealed body, durable sensing rods, low-power 3.0–28 V DC operation, reverse power protection, and built-in TVS/ESD protection make it suitable for smart agriculture, greenhouse monitoring, irrigation control, hydroponics, horticulture, and soil research applications.

This sensor is available with an RS485 Modbus RTU interface. It is compatible with the [SenseCAP S2100 LoRaWAN® Data Logger](#), enabling low-power, long-range data transmission over LoRaWAN® networks.

- **Multi-Parameter Soil/Substrate Measurement:** Measures volumetric water content, temperature, bulk EC, pore EC, and apparent dielectric permittivity in soil or soilless substrates. This allows users to monitor moisture status, salinity/fertilizer concentration, and substrate condition with one compact sensor.
- **RS485 Modbus RTU Output:** Provides a digital RS485 interface with Modbus RTU protocol for stable data transmission and easy integration with data loggers, gateways, controllers, and agricultural monitoring systems. The sensor supports standard Modbus register access for reading measurement values and configuring communication parameters.
- **Wide Measurement Ranges:** Supports 0–100% volumetric water content, -40 to 80°C substrate temperature, and 0–20 dS/m bulk EC measurement. It also provides pore EC data through Modbus registers, making it suitable for soil moisture monitoring, irrigation control, and nutrient/salinity management.
- **Low-Power, Wide-Voltage Operation:** Operates from a 3.0–28 V DC power supply with low current consumption. The low-power design makes it suitable for battery-powered data loggers, remote field stations, and long-term agricultural monitoring deployments.
- **IP68 Field Protection:** Built with an IP68 resin-sealed plastic body and robust epoxyencapsulation, the sensor is designed for wet, humid soil/substrate environments and long-term stable field measurement. Reverse power protection and built-in TVS/ESD protection help improve reliability during installation and protect against wiring mistakes, static discharge, and transient electrical interference.

Recommendation for S2100 Data Logger

SenseCAP S2100 Data Logger can connect to MODBUS RS485/Analog/GPIO industrial sensors including the [Grow Your Idea](#) and transmit data from sensors to the LoRaWAN network. Benefiting from its high robustness and waterproof and dustproof enclosure, the S2100 data logger can work under harsh environments such as high UV exposure, heavy rain, dusty conditions, etc. which is ideal for outdoor use. Based on LoRaWAN, it can cover a long transmission range of 2km in urban scenes and 10km in line-of-sight while keeping lower power consumption. Equipped with built-in Bluetooth and app service for OTA configuration and remote management, it enables quick setup and update. It can be battery-powered or connected to a 12V external power supply. When the 12V power supply is connected, the replaceable built-in battery is set to be used as the backup power supply.

Attention:

If you need to connect sensors or an external power supply for the S2100, please refer to the wiring diagram below. Please note that the sensor supply voltage range is 3-28 V, while the external power supply for the S2100 must be a stable 12 V supply.

Seeed also provides the [SenseCAP Portal](#) and [SenseCraft](#) to help users better manage and check data remotely.

Product Gallery



Specification

General Parameters	
Product Model	S-Temp&VWC&EC-05A
Sensor Description	RS485 Mini Soil Moisture, Temperature and EC Sensor
Output Interface	RS485
Protocol	Modbus-RTU
Current Consumption	Measuring: 10 mA typical, 15 mA max @ 3-28 VDC Standby: 300 μ A typical, 800 μ A max @ 3-28 VDC
Power Supply	3.0-28V DC
IP Rating	IP68
Cable Length	2 meters
Operating Temperature	-40-80°C
Dimensions	20*11*95 mm
Sealing Encapsulation	Resin packaged plastic body; Robust epoxy encapsulation;
Installation	Rods fully inserted into the substrate; Ensure good substrate contact;

Substrate Temperature Measurement	
Range	-40-80°C
Accuracy	±0.5°C (0-50°C), ±1.0°C (-40-80°C)
Resolution	0.1°C

Substrate Moisture Measurement	
Volumetric Water Content (VWC) Range	0-100% (air - water)
Volumetric Water Content (VWC) Accuracy	±3% (0%-50%), ±5% (50%-100%)
Volumetric Water Content (VWC) Resolution	0%-50%: 0.1%; 50%-100%: 0.5%

Substrate dielectric constant measurement	
Apparent Dielectric Permittivity Range	1-81 (air - water)
Apparent Dielectric Permittivity Accuracy	±1 (1.00-40.00); ±3 (40.00-81.00)
Apparent Dielectric Permittivity Resolution	1.00-40.00: ±0.1; 40.00-81.00: ±0.5

Substrate EC Measurement	
Range	0-20 dS/m(0-20000us/cm)
Accuracy	±5% (0-5 dS/m), ±10% (5-20 dS/m)
Resolution	0-5 dS/m: 0.01 dS/m; 5-20 dS/m: 0.1 dS/m
Temperature Compensation	0-50°C

Applications

- **Field Irrigation Management**
- **Greenhouse Substrate Monitoring**
- **Multi-Substrate Monitoring**
- **Research Plot Soil Balance**

Part List

Mini Soil Moisture&Temp&EC Sensor	x1
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Compliance & Logistics

HSCODE	9027899090
USHSCODE	9027894590
UPC	
EUHSCODE	9027109000
COO	CHINA

Resource Links

- <https://www.seeedstudio.com/RS485-Mini-Soil-Moisture-Temperature-and-EC-Sensor-p-6927.html>
- [Datasheet](#)

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