

MULTI-PARAMETER SOIL SENSING / DATA SHEET

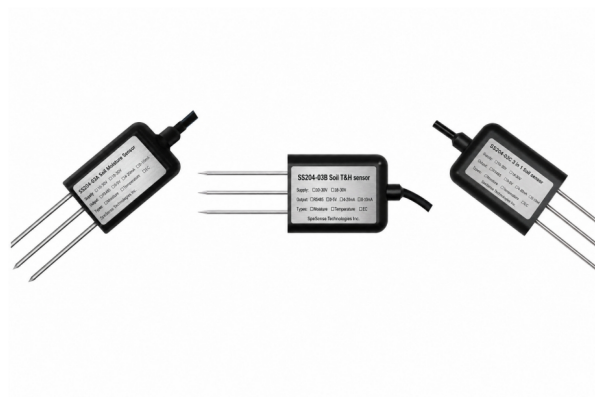
SS204-03

Soil Moisture Sensor

Multi-parameter soil sensor for moisture, soil temperature and electrical-conductivity monitoring, with configurable RS485 or analog output.

Overview

- Measures soil volumetric moisture, soil temperature and electrical conductivity.
- Low-power wake/sleep operation supports battery, adapter or solar-powered field deployments.
- Fully sealed insertion probe supports long-term dynamic monitoring in soil or water.



Moisture Range 0–100%	EC Range 0–20,000 μ S/cm	Supply Options 4.5–30 V / 3.6–30 V	Protection Level IP68
Key Advantages • High accuracy, fast response and good interchangeability. • Special alloy electrodes resist external impact and corrosion. • Fully sealed construction can be buried in soil or placed directly in water. • Standard and low-power supply variants support field deployment. • RS485 and analog output options are defined in the source selection table.		Application Scenarios • Soil moisture monitoring. • Scientific experiments. • Water-saving irrigation. • Greenhouses, flowers and vegetables. • Grassland, pasture and precision agriculture. • Soil rapid testing and plant cultivation. • Wastewater treatment.	

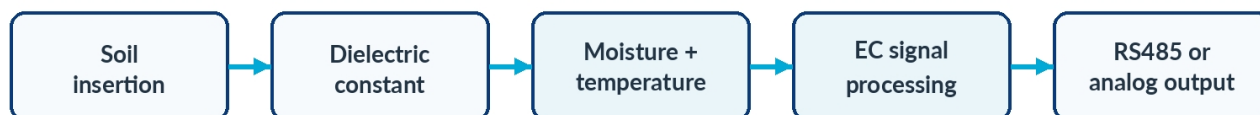
SENSING PRINCIPLE

Measurement Principle

DIELECTRIC-CONSTANT SOIL MOISTURE MEASUREMENT

The source describes soil moisture measurement based on the change in soil dielectric constant, which directly reflects volumetric water content. The insertion probe also measures soil temperature and electrical conductivity, with built-in temperature compensation for the EC channel. The supplied source does not provide a detailed sensing equation; this section therefore presents the stated measurement workflow only.

Soil multi-parameter measurement path



Measurement characteristics



Principle reconstructed from the supplied source description; no additional sensing equation is inferred.

SYSTEM DATA

Technical Specifications

Item	Specification
Moisture Measurement Range	0–100% volumetric moisture
Moisture Resolution	0.1%
Moisture Accuracy	±2% from 0–50%; ±3% from 50–100% (brown soil, specified moisture and 25 °C)
Electrical Conductivity Range	0–20,000 μ S/cm
Electrical Conductivity Resolution	10 μ S/cm
Electrical Conductivity Accuracy	±3% FS from 0–10,000 μ S/cm; ±5% FS from 10,000–20,000 μ S/cm (brown soil, 60%, 25 °C)
Soil Temperature Measurement Range	–40 to +80 °C
Soil Temperature Resolution	0.1 °C
Soil Temperature Accuracy	±0.5 °C (@25 °C)
Operating Temperature	–40 to +60 °C
Core Chip Temperature Rating	85 °C
Power Supply	DC 4.5–30 V (standard); DC 3.6–30 V (low-power)
Power Consumption	Standard RS485: 0.7 W @24 V DC; current output: 0.4 W @12 V DC; voltage output: 0.3 W @12 V DC
Low-power Current	Sleep: 21 μ A; operating: 20 mA; average: 55 μ A (1-minute sampling period)
EC Temperature Compensation	Built-in temperature compensation sensor; compensation range 0–50 °C
Protection Level	IP68
Probe Material	Special corrosion-resistant electrodes
Sealing Material	Black flame-retardant epoxy resin

Item	Specification
Default Cable Length	2 m; customizable as required
Dimensions	45 × 15 × 123 mm
Output Signal	RS485 (Modbus protocol); 4–20 mA; 0–5 V / 0–10 V

Output and Communication

The source lists RS485 with Modbus-RTU, 4–20 mA current output, and 0–5 V / 0–10 V voltage output. Supply requirements vary by configuration: the RS485 version accepts 4.5–30 V DC, the low-power version accepts 3.6–30 V DC, 4–20 mA and 0–5 V versions use 10–30 V DC, and the 0–10 V version requires 18–30 V DC.

Output	Description	Power Supply
RS485	Modbus-RTU protocol	DC 4.5–30 V; low-power DC 3.6–30 V
4–20 mA	Current output	DC 10–30 V
0–5 V	Voltage output	DC 10–30 V
0–10 V	Voltage output	DC 18–30 V

ORDERING INFORMATION

Product Selection

Code	Description
SS204-03	Model
A	Soil moisture transmitter
B	Soil temperature and moisture transmitter
C	Combined electrical conductivity, temperature and moisture transmitter (not available for analog versions)
N01-	RS485 (Modbus-RTU protocol)
I20-	4–20 mA current output
V05-	0–5 V voltage output
V10-	0–10 V voltage output
TR-1	Soil measurement enclosure
TR-1L	Low-power soil version (RS485 only)

SELECTION NOTE

Configuration code elements are transcribed from the supplied source. Confirm the final code before ordering.

MECHANICAL DATA

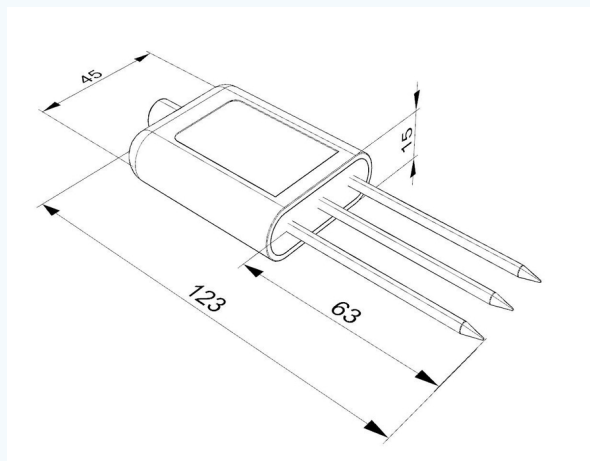
Mechanical Dimensions & Structure

The supplied mechanical drawing shows the transmitter housing and three special-alloy insertion electrodes. Dimension figures 45, 15, 123 and 63 mm are reproduced from the source drawing; the technical specification table gives the overall size as 45 × 15 × 123 mm.

Product view


Multi-parameter soil sensor with three alloy insertion electrodes and transmitter housing.

Supplied product appearance retained; the product view contains no third-party branding.

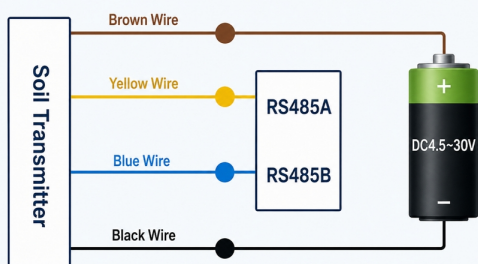
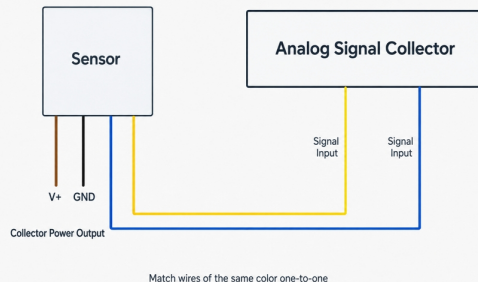
Mechanical dimensions


Source dimension drawing retained; dimension figures are listed below.

Source dimension figures: 45, 15, 123 and 63 mm, as shown in the supplied drawing.

ELECTRICAL CONNECTION
Wiring Instructions

The source provides separate RS485 and analog wiring examples. RS485 uses brown, black, yellow and blue wires for power and A/B communication. The analog table assigns the blue and yellow wires to EC and soil-moisture signal outputs; use the arrangement that matches the ordered output configuration.

RS485 wiring example

Analog output wiring example

RS485 Wiring

Signal / Power	Wire Color	Definition
Power positive	Brown	4.5–30 V DC
Power negative	Black	GND
RS485 A	Yellow	485-A
RS485 B	Blue	485-B

RS485 WIRING NOTE

The source specifies brown for power positive, black for power negative, yellow for 485-A and blue for 485-B. Do not reverse the A/B lines or duplicate device addresses on the bus.

Analog Wiring

Signal / Power	Wire Color	Definition
Power positive	Brown	Power supply; follow the output-specific voltage range
Power / EC / moisture negative	Black	GND / signal negative
EC signal positive	Blue	Electrical-conductivity signal output
Moisture signal positive	Yellow	Soil-moisture signal output

ANALOG WIRING NOTE

The supplied source shows a generic analog connection example for the selected 4–20 mA, 0–5 V or 0–10 V output. Use the 3-wire or 4-wire arrangement matching the ordered configuration; do not treat the example as a universal wiring diagram.

INSTALLATION & OPERATION

Installation Notes

- Insert the three alloy electrodes into the soil for measurement; the sealed sensor may also be placed directly in water as described in the source.
- Select the supply range and signal wiring that match the ordered RS485 or analog configuration; the 0–10 V version requires 18–30 V DC.
- For low-power field use, wake the sensor for sampling and upload, then return it to sleep mode as required by the application.
- Keep RS485 A/B polarity correct and ensure that device addresses on the same bus do not conflict.



Measurement & Configuration Summary

- The source describes a combined soil moisture, soil temperature and electrical-conductivity sensor; its overview also mentions pH and soil salinity collection.
- Low-power operation is provided for field deployments using battery, adapter or solar power.
- The detailed specification table lists 0–100% volumetric moisture and 0–20,000 $\mu\text{S/cm}$ electrical conductivity.
- RS485 with Modbus-RTU and analog output configurations are listed in the source.

CONTACT / SUPPORT

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