



Bio Instruments S.R.L.

SENSORS AND SYSTEMS
FOR MONITORING GROWING PLANTS

SMS-5P

Soil Moisture Sensor



Introduction

The SMS-5P sensor measures the dielectric constant of the soil in order to find its volumetric water content. The SMS-5P operates at a high frequency (70 MHz) that allows it to be used in any soil type and in soils with varying degrees of EC (up to 8 dS/m). Its typical accuracy in all soil types without calibration is $\pm 3\%$. With calibration, it is 1–2%.

The SMS-5P sensor has three factory calibrations for Mineral Soil, Potting Soil, and for Rock Wool.

The sensor is supplied with the standard 5-m cable and the IP67 plug at the end.

Connection

Plug the sensor into any analog input of the PM-11 Phytomonitor or the PTM-48A Photosynthesis Monitor. In the PC program, specify the input number where the sensor is connected to.

If you use the sensor for the first time, please make the appropriate record in the Sensors Database as described on page 5 of the PM-11 Phytomonitor Terminal Emulator software Guide or on page 11 of the PTM-48A Photosynthesis Monitor User's Guide.

Sensor data

Type: SMS-5P/MS

ID: #xxxx

Description: Mineral Soil

Units: %VWC

Format: #.#

Measurement mode: Normal

Measurement ranges

Minimum: 0.0 %VWC

Maximum: 55.0 %VWC

Max Volts: 1.0 V

Coefficients

Standard

#	Coefficient
C0	-4.01052e+001
C1	1.19007e+002
C2	0.00000e+000
C3	0.00000e+000
C4	0.00000e+000
C5	0.00000e+000

Edit

Defaults

Mineral Soil. Sensors Database Window in PM-11 / PTM-48A

Sensor data

Type: SMS-5P/PS

ID: #xxxx

Description: Potting Soil

Units: %VWC

Format: ##

Measurement mode: Normal

Measurement ranges

Minimum: 0.0 %VWC

Maximum: 60.0 %VWC

Max Volts: 1.0 V

Coefficients

Standard

#	Coefficient
C0	-3.36090e+001
C1	1.02957e+002
C2	0.00000e+000
C3	0.00000e+000
C4	0.00000e+000
C5	0.00000e+000

Edit

Defaults

Potting Soil. Sensors Database Window in PM-11 / PTM-48A

Sensor data

Type: SMS-5P/RW

ID: #xxxx

Description: Rock Wool

Units: %VWC

Format: ##

Measurement mode: Normal

Measurement ranges

Minimum: 0.0 %VWC

Maximum: 100.0 %VWC

Max Volts: 1.0 V

Coefficients

Standard

#	Coefficient
C0	-3.93533e+000
C1	-5.06590e+001
C2	2.62932e+002
C3	0.00000e+000
C4	0.00000e+000
C5	0.00000e+000

Edit

Defaults

Rock Wool. Sensors Database Window in PM-11 / PTM-48A

Installation

When installing the sensor's probe, it is important to avoid air gaps or extremely compact soil around the probe, which can skew readings. Do not install the probe next to large metal objects, which can attenuate the probe's electromagnetic field and distort output readings. Because the probe have gaps between their prongs, it is also important to consider the size of the media you are inserting the probe into. It is possible to get sticks, bark, roots or other material stuck between the probe prongs, which will adversely affect readings. Finally, be careful when inserting the probes into dense soil, as the prongs will break if excessive force is used when pushing them in.

The sensor can be inserted directly into growing media or soil. The probe needs to be completely covered by soil. If you have difficulty inserting the probe, try loosening the soil somewhat or wetting the soil. Never pound the probe in. The probes can be oriented in any direction.

Removing the Probes

When removing either probe, do not pull it by the cable! This could break the internal wires and cause the probe to malfunction or not function at all.

Specifications

Measurement	Volumetric Water Content (VWC)
Range	0 to 100% VWC
Sensor length	89 mm
Accuracy	$\pm 3\%$ VWC
Resolution	0.1% VWC
Factory calibrations	Mineral Soil, Rockwool, and Potting Soil
Output cable length	5 m



Phyto-Sensor Group

Bio Instruments S.R.L.

26/1 Padurii St., Chisinau MD-2002

REPUBLIC OF MOLDOVA

Tel./Fax: +373-22-550026

info@phyto-sensor.com

www.phyto-sensor.com