FIELDSCOUT®

Soil Sensor Reader

PRODUCT MANUAL

Item # 6466

Spectrum®
Technologies, Inc.

CONTENTS

This manual will familiarize you with the features and operation of your new Field Scout™ Soil Sensor Reader. Please read this manual thoroughly before using your instrument.

For customer support, or to place an order, contact Spectrum Technologies, Inc. at:

(800) 248-8873 or (815) 436-4440
between 7:30 am and 5:30 p.m. CST
FAX (815) 436-4460
e-mail: info@specmeters.com
www.specmeters.com

Basic Operation

Power up/down

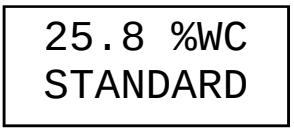
The soil moisture sensor reader is powered on and off with the **ON/OFF** button. The meter will initially display the battery level and firmware version. It will then transition to sensor reading mode. The initial mode displayed will be the mode that was active when the meter was powered off.

Sensor Reader Modes

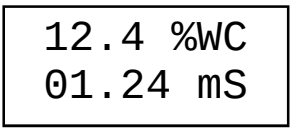
Press the **SET** button to advance the meter to the desired mode.

The available mode settings are listed below. The first four modes are data measurement modes. The fifth mode is the meter's raw electronic (A/D) reading. The reader converts the raw electronic reading to measurement units using internal calibration constants. The sixth mode is for calibrating the EC circuit of the SMEC300 or the soil moisture reading for an SM100 (see pp. 6-7)

1. Spectrum Standard: For the SM100 and SMEC300, the volumetric water content for a mineral soil will be displayed on the first line. For the SMEC300, the EC will be displayed on the second line.
2. Spectrum Soilless: Similar to the Spectrum Standard mode except the VWC displayed is for soilless media. Sphagnum peat moss was used to develop the calibration constants for this mode.



Sample SM100
LCD screen

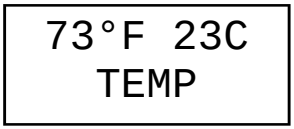


Sample SMEC300
LCD screen

3. Watermark: Displays the soil moisture tension in kPa. Reader must be connected to a WatchDog compatible Watermark sensor (see **Watermark Sensors**, p 5).

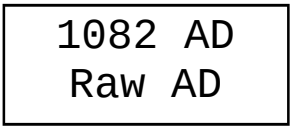
Sample Watermark
LCD Screen

4. Temperature: This mode is valid when a temperature sensor or an SMEC300 sensor is connected to the reader.



Sample Temperature
LCD Screen

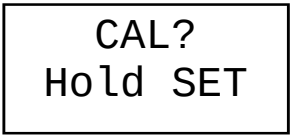
5. Raw AD: Raw electronic reading.



Sample Raw AD
LCD Screen

6. Calibration: Initiate EC calibration for an SMEC300 or soil moisture calibration for an SM100. Although readers with firmware v 4.4 will display CAL EC? on this screen, they can also calibrate the soil moisture circuit of an SM100.

EC Calibration Initiation
Calibration Initiation
LCD Screen (FW v4.4)



LCD Screen (current)

Taking readings

The display is dynamic and will be continually updated as conditions surrounding the sensor change. Because the meter automatically refreshes itself, occasionally you will notice that the LCD will spontaneously restart and display the initial power-up screen. This happens if a sensor is being inserted or withdrawn at the precise moment when the meter is taking a reading. This is normal and will not affect subsequent readings.

Connecting Sensors

WaterScout SM100 and SMEC300 Sensors

Insert the 2.5mm stereo pin into the socket at the top of the meter.

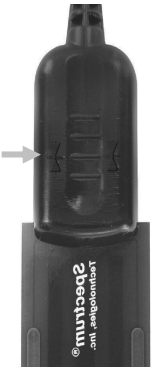
WaterMark Sensors

If the sensor is a WatchDog-compatible model of the sensor (item numbers 6450WD or 6450WD20), the sensor can be plugged directly into the meter like a WaterScout sensor. If the sensor terminates in 2 green wires with circular leads, the sensor must be connected to a Watermark Adapter (item 6450ADPT). The adapter has a 2.5mm stereo pin which can then be connected to the meter.

Note: Only one adapter per Soil Sensor Reader is necessary.

Calibrating the SMEC 300 EC Sensor

The EC sensor of the SMEC300 sensor has an internal constant that can be adjusted by the user to correct for sensor drift. To calibrate the sensor, you will need a container wide enough to accommodate the sensor and tall enough so the sensor can be immersed to the midway point of the sensor molding.



Sensor Preparation

Before starting the calibration procedure, the following preliminary steps are necessary to ensure the sensor is properly calibrated.

1. Because residual oils on the EC sensor pads, including oil from your fingers, will reduce the accuracy of the sensor, clean the sensor with rubbing alcohol. After cleaning the sensor, do not touch the pads with your fingers.
2. Allow the calibration solution to come to room temperature. You must calibrate with a solution with an EC of 1.41 mS/cm. It is important for the sensor and solution to be at the same temperature.

Calibration Procedure

1. Pour clean calibration solution into the container.
2. Plug the sensor into the reader.
3. Immerse the sensor in the calibrating solution up to second mark on the molding. This ensures the sensor's internal thermistor is below the liquid level. Take care that the EC sensor pads are not touching the side of the container.
4. Set reader to **CAL** mode (see p.4).
5. Press and hold the **SET** button for 5 seconds. The LCD will count down the time. When the calibration is complete, the sensor will transition to Standard Spectrum mode (see p.3). If the **SET** button is released before the

calibration is complete, the internal sensor constant will not be modified and this step should be repeated.
6. Disconnect the sensor plug.
7. Rinse and dry the sensor. Take care not to touch the EC sensor pads with your fingers.
8. Store the sensor in plastic bag until you are ready to install it in the field.

Calibrating the SM100

SM100 sensors with the "3/14" code printed on the front can be re-calibrated to the factory setting. The calibration procedure is nearly identical to that used to calibrate the SMEC300 EC circuit. The calibration is done with distilled water. The SM100 does not have an internal thermistor. So, when performing the soil moisture calibration, the sensor molding does not have to be immersed. For soil sensor readers with firmware version 4.4, the calibration screen will read "CAL EC?". The calibration procedure for the SM100 will still work as designed.

Note: The soil moisture circuit of an SMEC300 can not be calibrated to the factory setting.

Changing the Battery

The Field Scout Soil Sensor Reader uses a standard 9V battery. To change the battery:

1. Slide open the door on the back of the meter.
2. Remove the old battery from the compartment, and insert the new battery. Be sure to orient the battery to match the image on the bottom of the compartment.
3. Place the battery cover on the case and slide it closed.

DECLARATION OF CONFORMITY

Spectrum Technologies, Inc.
3600 Thayer Court
Aurora, IL 60504 USA

Model Numbers:	6466
Description:	Soil Moisture Sensor Reader
Type:	Electrical Equipment for Measurement, Control, and Laboratory Use

The undersigned hereby declares, on behalf of Spectrum Technologies, Inc. of Aurora, Illinois, USA, that the above referenced product, to which this declaration relates, is in conformity with the provisions of:

Directive:	2004/108/EC
Standards:	EN 61326-1:2006
	EN 61000-4-2:1995, including A1:1998 and A2:2001
	EN 61000-4-3:2002
	EN 55011:2007

Michael J. Dunning
Director of Product Technology September 18, 2012

Warranty

This product is warranted to be free from defects in material or workmanship for one year from the date of purchase. During the warranty period Spectrum will, at its option, either repair or replace products that prove to be defective. This warranty does not cover damage due to improper installation or use, lightning, negligence, accident, or unauthorized modifications, or to incidental or consequential damages beyond the Spectrum product. Before returning a failed unit, you must obtain a Returned Materials Authorization (RMA) from Spectrum. Spectrum is not responsible for any package that is returned without a valid RMA number or for the loss of the package by any shipping company.

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