

## Features

- High accuracy sensor
- Fast response time
- Simple soil insertion (vertical or horizontal orientation)
- Programmable start time and date
- Miniature size
- User calibration through MadgeTech software
- Weatherproof enclosure
- Probe is powered from data recorder's battery. No external power required.

## Applications

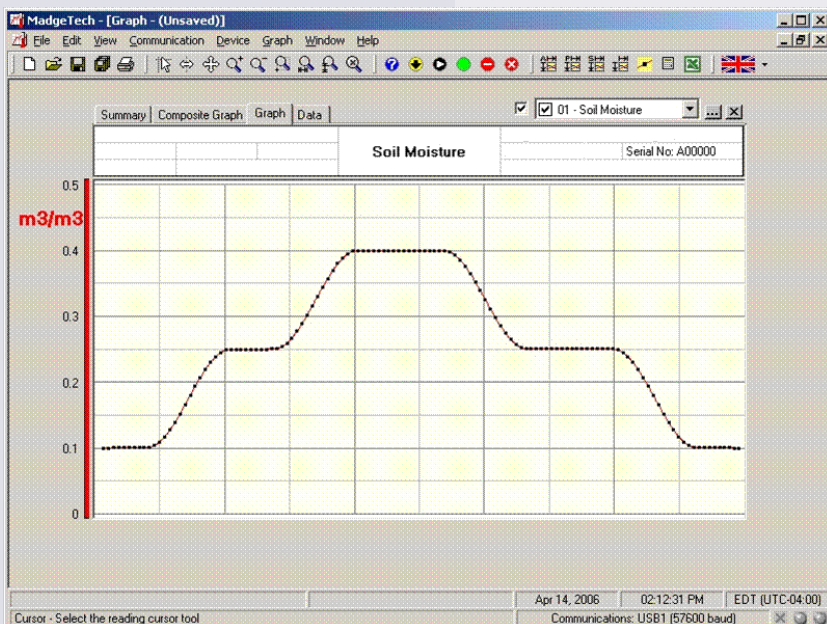
- Irrigation Management
- Potted plant and greenhouse monitoring
- Soil moisture trends
- Plant growth studies
- Peat Moss and organic soil studies

The SMR110 is a small, battery powered, soil moisture data recorder in a weatherproof enclosure. It provides accurate volumetric water content measurements over a complete range from dry to saturated. The SMR110 features a 10-year battery

for long-term deployments and soil studies, over multiple seasons. With its built-in memory, the data recorder can monitor and record over 32,767 soil moisture measurements. The EC-5, a high accuracy soil moisture probe (pictured above), has a response time of 10ms and can be placed in any type of soil. The EC-20\* probe (below) is designed for use in medium-textured soils. For easy soil moisture analysis and trend information, MadgeTech software provides a time and date stamped graph. This data may be viewed, printed or exported to third-party programs (Excel, etc...) for more detailed analysis and irrigation management. Soil moisture data is essential in determining and scheduling irrigation for proper plant growth, care and research. This data is also useful in determining the health of the soil and plant root systems.



The \*EC-20 Soil Moisture probe (pictured below) is also available for use with the SMR110



## Data Recorder Software

displays water per soil content data in an easy to use graph.

The Windows®-based software package allows the user to effortlessly collect, display and analyze data. A variety of powerful tools allow you to examine, export, and print professional looking data with just a click of the mouse.

# SOIL MOISTURE RECORDER SPECIFICATIONS

## Data Recorder

**Measurement Range:** +/- 1200mV  
**Accuracy:** +/-0.01% FSR

**Input range:** 0 to 2.5V DC  
**Memory:** 32,767 readings; software configurable memory wrap

**Reading Rate:** 1 reading every 2 seconds to 1 every 12 hours

**Input Connection:** Removable screw terminal plug  
**Operating Environment:** -40 to +80°C (-40 to +176°F), 0-95% RH, non-condensing

**Battery Type:** 3.6V Lithium Battery included; **user replaceable**

**Battery Life:** 10 years typical @ 15 min reading rate

**Dimensions:** 0.8"x1.7"x2.7" (21mmx44mmx69mm)  
**Weight:** 2 oz. (56 g)

**Weatherproof Enclosure:** Anodized aluminum case w/mounting flange. Communications port plug 3.5"x2.9"x1.1" (87mmx73mmx27mm) 7 oz. (198 g)

## Soil Moisture Probes

**Measurement Range:** (EC-5) 0 to 100% VWC saturation  
 (EC-20) 0 to 40% VWC saturation  
**Measurement Type:** VWC (Volumetric Water Content)

**Measurement Accuracy:** (EC-5) +/- 3% typical, ALL soils  
 (EC-20) +/- 4% typical on low EC and medium textured soils  
 (Both models) +/-1% with soil specific calibration

**Calibration:** Digital calibration through software  
**Calibration Date:** Automatically recorded within device

**Life Expectancy (probes):** 3-5 years

**Measurement Time:** 10ms  
**Measurement Resolution:** 0.002m<sup>3</sup>/m<sup>3</sup>

**Operating Environment:** -40 to +60 degC (-40 to +140 degF), 0-100% RH (EC-5 and EC-20 models)

**Power Requirement (probes):** Powered from data recorder's internal battery. No external power required.

**Dimensions (probes):** (EC-5) 2.1"x0.6"x0.06" (55mm x 15mm x 1.5mm) Cable length) - 16' (5 m), (tinned, wire leads)  
 (EC-20) 10"x1.25"x0.06" (255mmx32mm x1.5mm) Cable length) - 16' (5 m), (tinned, wire leads)

## SOFTWARE FEATURES

**Multiple Graphs:** Simultaneously analyze data from several units or deployments; easily switch to a single data series

**Real-Time Recording:** Collect and display data in real-time while continuing to log

**Data Table:** Instantly access tabular view for detailed dates, times, values, and annotations

**Scaling Options:** Autoscale function fits data to the screen, or allows user to manually enter their own values

**Printing:** Automatically print graphical or tabular data

**Statistics:** Calculate averages, min, max and standard deviation

**Export Data:** Export data in a variety of common formats, or switch to Excel® with a single click

**Calibration:** Automatically calculate and store calibration parameters

**Logger Configuration:** Easy set up and launch of data loggers with immediate or delayed start, preferred sample rate, and device ID

**Communications:** Automatic or user-enabled communications port configuration (Baud rate, COM port selection)

## ORDERING INFORMATION

Model	Description
SMR110-5	Soil Moisture recorder w/EC-5 probe, weatherproof enclosure (Software NOT included)
SMR110-20	Soil moisture recorder w/EC-20 probe, weatherproof enclosure (Software NOT included)
EC-5	Soil moisture probe, ONLY
EC-20	Soil moisture probe, ONLY
IFC110	Software, manual and serial interface cable
IFC200	Software, manual and USB interface cable
LTC-7PN	Replacement battery for data recorder

BATTERY WARNING: FIRE, EXPLOSION, AND SEVERE BURN HAZARD. DO NOT RECHARGE, DISASSEMBLE, HEAT ABOVE 212°F, INCINERATE OR EXPOSE CONTENTS TO WATER.

### ASK ABOUT OUR OTHER DATA RECORDERS

Temperature	Pulse/Event/State
Humidity	Low Level Current
Pressure	Low Level Voltage
pH	RF Transmitters
Level	Intrinsically Safe
Shock	Spectral Vibration

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