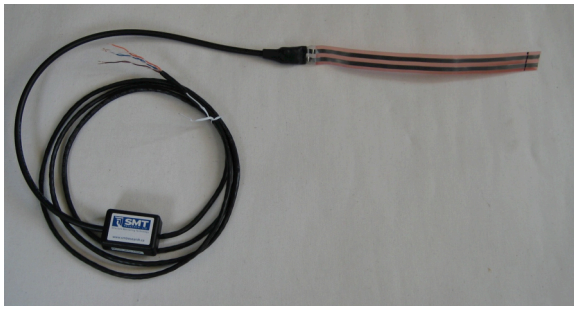
REVISIONS

REV	DESCRIPTION	DATE	APPROVAL
01	Initial Revision	Aug 31, 14	Not Approved
02	Update using control wire	May 1, 15	GM

SMT RESEARCH, LTD.
Structure Monitoring Technology

Dielectric Moisture Sensor (DMS) Datasheet

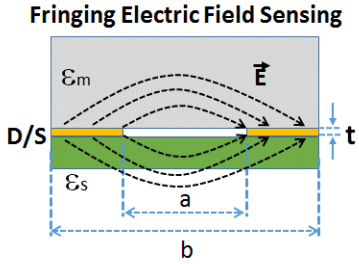
DOC. NO.: RS-1117	**SHEET 1 OF 3 REVISION: 2**



Dielectric Moisture Sensor Datasheet

General Description

The Dielectric Moisture Sensor is a capacitance based sensor designed to measure moisture content in masonry or concrete.



Capacitance sensing derives moisture content from sensing the fringe capacitance from an electric field that penetrates into the masonry material.

Moisture content using probes embedded in masonry is error prone due to the difficulty in achieving intimate contact with the material under test. Similarly, Embedded Moisture Sensors (EMS) not only rely on physical contact but also require additional time for moisture to reach equilibrium with the masonry material.

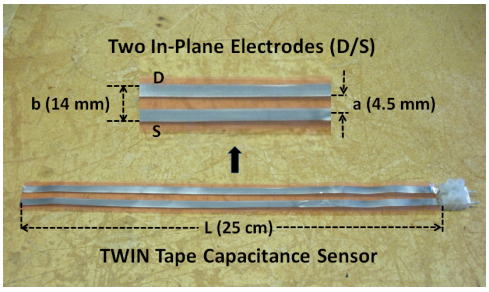
The Dielectric Moisture Sensor (DMS) uses a dielectric technique tuned to operate at 5MHz in order to measure MC in masonry systems. The external sensor circuitry is designed to interface to SMT's wireless dataloggers and deliver data to Analytics where conversion formulas are applied.

Applications

- Brick, Stone and Mortar Moisture Monitoring
- Concrete Moisture Analysis

Features

- Works with SMT wireless A3 dataloggers.
- Moisture Content conversions and temperature compensation applied in online Analytics software.
- Integrated control capacitor used to negate error in data acquisition measurements.
- Circuitry tuned to work at 5 MHz in order to capture presence of water and not residual ions.
- Uses Flexible Stainless Steel electrodes suitable for installation on, under or inside any masonry material.



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Website: www.smtresearch.ca Email: info@smtresearch.ca RS-1160 Rev 2

Structure Monitoring Technology

Dielectric Moisture Sensor (DMS)

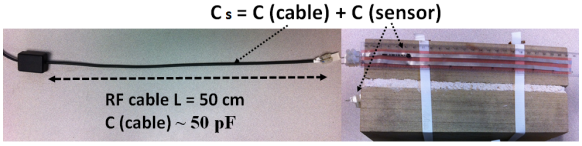
Performance/Functional Specifications

Electrical Performance	
Voltage Supply	5VDC
Current Draw	Typical 5mA
Frequency	5 MHz

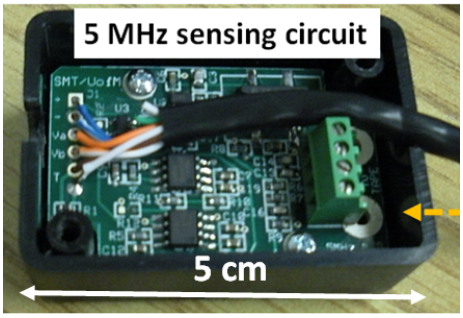
Environmental	
Operating Temperature	0° to 70°C°
Storage Temperature	-25° to 70°C
Humidity	5% to 90% RH non-condensing
Electrostatic Discharge (ESD)	8kVdc air, 4 kVDC contact (exposed inputs)

Safety	
Safety Requirements	SELV Separated Extra Low Voltage

Mechanical	
Enclosure Dimensions	
Size	50mm (L) x 35mm (W) x 20mm (H)
Weight	15g
RF Cable	
Length	50 cm
Capacitance	50 pF
Tape Length	
Length	250 mm (L) x 14 mm (W)
Type	Stainless Steel



Connectivity



Connections		
RJ45 Connector	**Control Wire**	**Function**
Blue	Red	Power (5VDC)
White/Blue	Black	Ground
Orange	White	Vref
White/Orange	Green	Vb
Brown Pair	NC	Temperature

Wire colour codes may differ depending on the type of cable used.

The Dielectric Moisture Sensor can be used to measure moisture in most brick, stone, mortar and concrete materials. Calibration constants in Analytics were derived using the following materials: Berea sandstone, St. Canut sandstone and St. Marc limestone. Other materials can be used, however moisture content results may not reflect the gravimetric results unless a custom calibration is performed.

Ordering Information	
DMS-001-006	DMS sensor with 6 foot lead
DMS-001-030	DMS sensor with 30 foot lead

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Application

An example installation of the Dielectric Moisture Sensor is as follows:

Step 1 – Prepare Location

a) Sensor can be installed by cutting a slit in the masonry or by placing it in the mortar joints. This example places the sensor in the mortar joints.

Step 2 – Route Sensors

a) Sensing circuit box should be placed inside the building

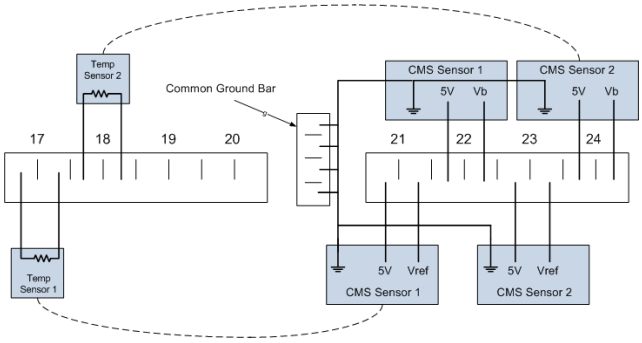
Step 3 – Position Sensor

a) Place tape sensor on stone with conductors facing towards the stone.

b) Do NOT change the lengths of the RF cable or Sensor Tape. If it is changed, the results will be relative and not referenced to the calibrated stones pre-programmed in Analytics.

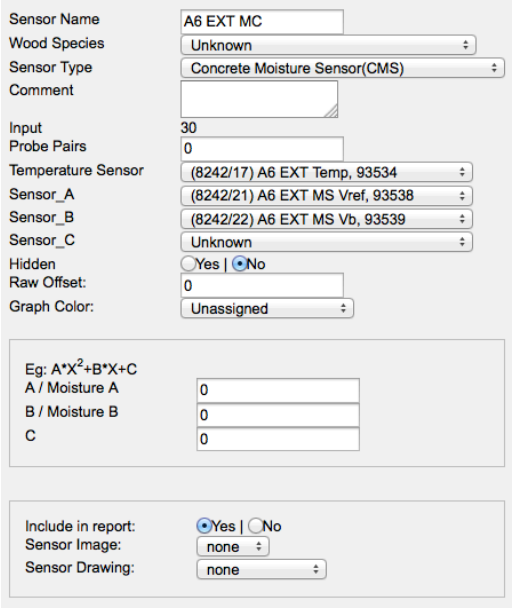
c) Route thermistor on separate cable to location near tape. Refer to the temperature datasheet for additional information.

Step 4 – Connect to A3 Datalogger



a) Connect temperature sensor to resistance ports.
b) Connect Vref and Vb to voltage ports.

Step 4 – Configure Analytics



a) In Analytics, configure temperature sensors and voltage sensors (Vref and Vb).

b) Create an MC *virtual sensor:*
   a. Select: Sensor List
   b. Select Add Sensor
   c. Choose CMS sensor
   d. Enter new input number (typically 30 or 31)
   e. Configure sensors as shown above