Optical Membrane Soil Moisture Sensor Technology Demonstrator Version 1.0 Data Sheet

Physical

Sensor Body Length	3” (76 mm)
Sensor Body Width	1.85” (47 mm)
Sensor Body Height	1.22” (31 mm)
Cable Length	10 ft. (3m)
Cable Diameter	0.16” (4 mm)
Weight (including cable)	0.46 lbs. (221g)
Operating Temperature Range	32 - 130°F

Note: Dimensions are approximate.

Performance - Moisture

Moisture Range	0 - 100%
Calibration Reference	Dry = 0%, Water immersion = 100%
High-Sensitivity Range	5% - 95%
Wetting time to 95% *	~1-10 min *(Depending on fine particulate load)*
Drying time to 5% **	~30 min

* In cases where the sensor has remained dry for several days and is heavily particulate-loaded, moisture readings may plateau near 85% before gradually rising to full saturation.

** Fastest drying response time. Tested with a clean sensor, membrane wings blotted dry, and under forced air in ambient conditions.

Performance – Temperature

Cooling response time	~30 min (ambient to ice-bath)
Warming response time	~20 min (ice-bath to ambient)
Accuracy	±2°F (1.1°C)

Note: Temperature response times measured within the stated operating range.

Electrical

Voltage	5 Volts DC (USB) ±5%
Current	26 milliamps
Power Consumption	0.13 Watts
Power Connection	USB-A

Com Port Settings

Baud	115200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Line Termination	LF

Communication

Output Type	ASCII String
Example String – Standard Reading	[Sensor_ID=Custom Name,Moisture_pct=100.00,Temperature_F=64.6]
Auto-read Time Range	0 (continuous reading) – 9999 minutes
Recommended Read Frequency	6 minutes
Time to Complete a Reading	2.5 Seconds (command to response)

Note: Auto-read interval of 0 produces continuous streaming at the sensor's internal update rate.

Command List

Help	Prints this list of commands
Sensor_ID="YourCustomNameHere"	Use to set the sensor ID. Char limit = 32
Auto-read_On	Enable auto-read
Auto-read_Off	Disable auto-read
Auto-read_Time=XXXX	Set auto-read minutes
Read_All	Get a moisture and temp reading
***IDN?**	Get the sensor serial number
Reboot	Reboot the sensor

Note: All settings are stored in non-volatile memory and will be maintained after a reboot/power loss.

Other Information

Year First Available	2025
Website	https://trilliumti.com/optical-membrane-soil-moisture-sensor-tech-demo
Email for questions or support	sensorinfo@trilliumti.com

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