

SPECIFICATIONS

Measurement Range:
0–100 VSW%

Accuracy: 1 VSW% after calibration to a specific soil type, or 5 VSW% using the supplied soil calibration

Response Time: Less than 0.5 seconds

Stabilization Time: 3 seconds approximately from power-up

Environment: Designed for permanent burial

Interface:

Input requirements:
7–18 V DC unregulated

Power consumption: 18 mA typical, 20 mA max

Output signal: 0–1200mV for 0–100 VSW%

Mechanical:

Total length: 215 mm

Needle length: 60 mm

Needle separation: 14 mm

Needles: Stainless Steel

Exterior: ABS Plastic

Cable: 4.5 m Standard

Related Products:

SL5: Smart Logger

SMD4-P: Smart Interface (4 x Channel), Output as VSW%

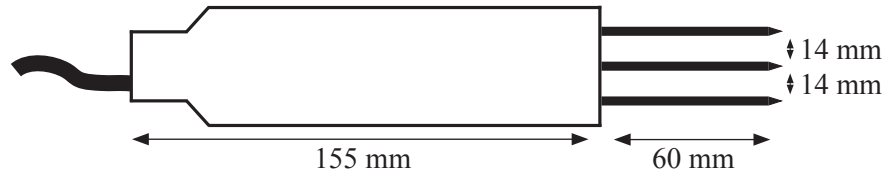
SMD4-V: Smart Interface (4 x Channel), Output as mVolt.

MP406 Moisture Probe

The MP406 can be used to measure soil moisture for scientific research or irrigation management. In either situation the MP406 can:

- rapidly measure soil moisture by pushing the needles of the sensor into the soil surface or soil profile. (MPKit)
- make measurements over time by permanently burying the MP406 and connecting it to a data logger. (FieldStation logging system)
- control irrigation by permanently burying the MP406 and connecting it into an irrigation controller. (MP406C-12V or MP406C-24V)

The MP406 Moisture Probe can also be used to measure the moisture content in many materials such as soil, food and materials used in roadway and building construction.



Ordering Information

MP406	Connection to SMD4-P or SMD4-V interface, 4.5 m cable
MP406/W	Bare wire cable end, 4.5 m cable



Up to 4 MP406 probes connect through each SMD4-P Smart Interface.

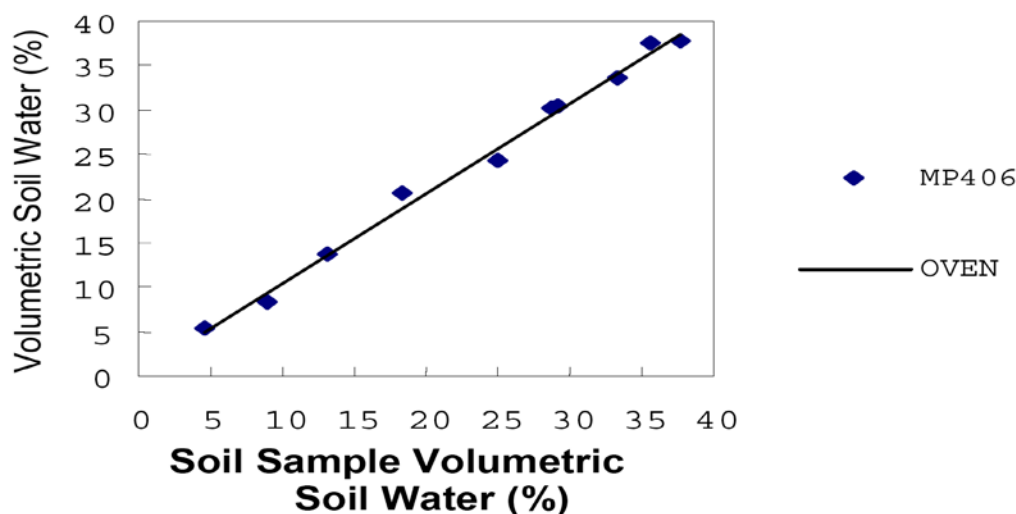
Theory of operation

The MP406 has a high frequency moisture detector, which uses the standing wave principle to indicate the ratio of two or more substances forming a body of material, each substance having a different electric constant (Ka).

The moisture measurement of the material is based upon the fact that in a water:soil:air matrix, the dielectric constant is dominated by the amount of water present. Then the soil water content can be measured exactly because changes in water content of the soil result in changes in the dielectric constant of the soil.

The material that can be measured by the MP406 is often soil but can be any composition of non-metallic powdered, liquid or solid substance into which the needles are inserted.

MP406 Measurement of VSW% Using Soil Samples as a Standard



$$\text{MP406} = 1.0136x + 0.4298$$

$$R^2 = 0.9931$$

Results

The results from measurement of absolute volumetric soil water percent (VSW%) from prepared soil samples using the MP406 are given above. This result is typical of the results obtained from comparative testing of the MP406 in prepared soil samples, for a wide range of agricultural soils.

Typical installations

Teaching: Sampling soil water percent (VSW%) in soil pits, greenhouse pots and trays and surface soil.

Crop water use and forest hydrology: Frequently MP406 are connected in groups of 4 via a SMD4-V or SMD4-P Smart Interface to the Smart Logger, enabling four depths to be measured continuously in the soil profile.

Road building: MP406 probes can be permanently installed in the soil profile to monitor soil water movement.

Slope Monitoring: MP406 are commonly installed on slopes with tensiometers as a soil moisture and suction-logging system.



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