

# WATERMARK Soil Moisture Sensor with Voltage Output – MODEL 200SS-V

## IRROMETER®

The WATERMARK with voltage output sensor is our patented WATERMARK soil moisture sensor with an integral electronic adapter that provides a linear voltage output. This makes the sensor very easy to read by most dataloggers or devices that can read a voltage signal. The voltage output signal is directly proportional to the soil water tension measurement and automatically temperature compensated.

In use since 1978, the patented WATERMARK sensor is a solid state electrical resistance-sensing device that is used to measure soil water tension. As the tension changes with water content the resistance changes as well. That resistance can be measured using the WATERMARK Sensor.

The sensor consists of a pair of highly corrosion resistant electrodes that are imbedded within a granular matrix. A current is applied to the WATERMARK to obtain a resistance value. The WATERMARK Meter or Monitor correlates the resistance to centibars (kilopascals) of soil water tension.



#### OPERATING PRINCIPLE:

The WATERMARK sensor is a resistive device that responds to changes in soil moisture. Once planted in the soil, it exchanges water with the surrounding soil thus staying in equilibrium with it. As the soil dries, water is removed from the sensor and the resistance measurement increases. When the soil is rewetted, the resistance lowers, since soil water is an electrical conductor, providing a relative indication of the soil water status. The WATERMARK is unique in that it takes its resistive measurement within a defined and consistent internal matrix material, rather than using the surrounding soil as the measurement medium. This unique feature allows the WATERMARK to have a stable consistent calibration that does not need to be established for every installation. The ohm of resistance to centibars (kPa) of soil water tension relationship is constant and built into the reading devices that are used to interrogate the sensor. The WATERMARK is calibrated to report soil water tension, or matric potential, since that is the best reference of how readily available soil water is to a plant. The WATERMARK consists of stainless steel electrodes embedded in a defined and consistent internal granular matrix material that acts like a soil in the way it moves water. This matrix is encased in a hydrophilic material that establishes good hydraulic conductivity with the surrounding soil and is held in place by a durable stainless steel perforated shell with plastic end caps.

The WATERMARK is designed to be a permanent sensor, placed in the soil to be monitored and “read” as often as necessary with a portable or stationary device. Internally installed gypsum provides some buffering for the effect of salinity levels normally found in irrigated agricultural crops and landscapes.

#### Features:

- Proven stable calibration
- Inexpensive, easy to install and use
- Fully solid state
- Will not dissolve in soil
- Not affected by freezing temperatures
- Internally compensated for commonly found salinity levels
- Compatible with voltage reading devices
- Range of measurement from 0 to 239 centibars (kilopascals)
- Does not require the reading device to have a custom electronic circuit to read the WATERMARK sensor
- NO maintenance required

#### APPLICATIONS INCLUDE –

- Irrigation Scheduling • Water Table Monitoring
- Leak Detection • Agronomy Research • Environmental Monitoring
- Anywhere you need to know when or if the soil moisture level is changing

#### Model 200SS-V WATERMARK Sensor with Voltage Output Specifications –

MATERIALS: Electronic Adapter is housed inside 1/2 in. PVC pipe and pre-mounted on the WATERMARK Sensor which has ABS plastic caps with stainless steel body over a hydrophilic fabric covered granular matrix.

DIMENSIONS – DIAMETER: .875 in. (22 mm)  
LENGTH: 7.25 in. (18.5 cm)

WIRE LEADS: 10 ft. (3 m), 3 conductor cable

ELECTRICAL: 5 volt, 1.5 mA input / 0-3 volt output, linear / 0-239 centibars = 0 to 2.8 volts linear / 2.9 volts = frozen fault code / 3.0 volts = open circuit fault code, meaning resistance is so high it is off the calibration scale.

- Soil moisture readings will automatically be temperature compensated.
- When power is applied, a reading will be supplied within 500 ms.
- If power is left applied, a new reading will be provided every second.
- Once power is removed, a minimum off time of 30 seconds is required before power can be re-applied.

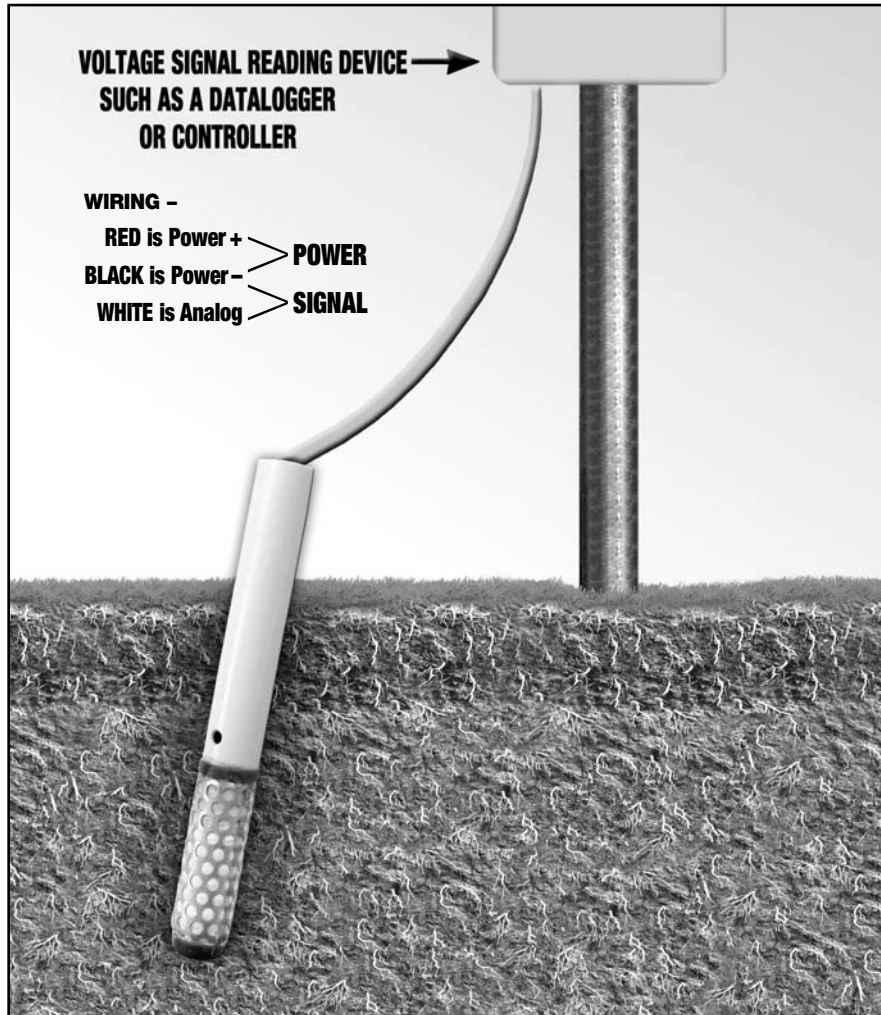
ORDERING INFORMATION: Catalog #200SS-V – WATERMARK Soil Moisture Sensor with Voltage Output

WARRANTY: One year

SPECIFICATION INFORMATION: The soil moisture measurement device, or sensor, shall represent soil moisture status in units of soil water tension or matric potential, registering in centibars (kPa) when read with a compatible device using a linear voltage scale. It shall require no on-site calibration or routine maintenance and be of granular matrix type construction. It shall be durable, long-lasting, not subject to dissolving in a wet soil environment with an outer surface of stainless steel and ABS plastic. It shall be the WATERMARK sensor as manufactured by The Irrrometer Company of Riverside, California.

WATERMARK

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**IRROMETER®**

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ASSOCIATION™  
Bronze Member