



## Introduction

The 30KTCD-NL Meter is a handheld, battery powered, portable device for reading 200SS WATERMARK Soil Moisture Sensors. A cable with quick-connect clips is connected to the sensor wires to read the sensor and provide the current soil moisture status. For detailed instructions on installation and site selection for WATERMARK 200SS sensors:

[irrometer.com/basics.html#install](http://irrometer.com/basics.html#install)



## Basic Operation

Attach the cable leads to the sensor wires with the alligator clips, being sure the leads are not touching each other.

Press **READ** to wake up the meter, you will see "-- --" in the display.

Press **READ** again while "-- --" is showing. The soil moisture reading will display, remaining for 5 seconds

The reading will be a value between 0 and 199 representing soil water tension in kPa or centibars.

## Advanced Operation

### Soil Temperature Setting

Watermark sensor readings are affected by soil temperature by 1% for each degree F. By default, the meter will assume a soil temperature of 75°F (24°C). If additional information about soil temperature at the installed sensor depths is available, the meter can be configured to use a different temperature setting:

To check the temperature settings, press **READ** to get the "-- --" and then press **TEMP**. The temperature setting and the scale (°F or °C) will alternate in the display.

To change the temperature scale, press and hold **READ**, then press **TEMP** to change the scale. Each press of **TEMP** will swap the scale, release the buttons when the correct scale is displayed.

To change the temperature setting, press and hold TEMP then press READ (while still holding TEMP) to change the setting. The temperature setting will begin to increase one degree at a time. When the desired temp is reached, release the buttons.

The full scale of temperature setting is 41°F (5°C) to 105°F (40°C). Once the temperature scrolls up to 105°F, it will go to 41°F and begin scrolling upwards again. You can reverse the direction of scrolling at any time by releasing the **READ** button and depressing it again (while continuing to hold **TEMP**).

## Maintenance

Battery:

The meter uses a 9V battery that should be replaced each growing season. When the battery is low, a warning of **LO** will be displayed when attempting to read a sensor. Replace the battery by removing the four screws from the back to open the case and expose the battery.

Cable:

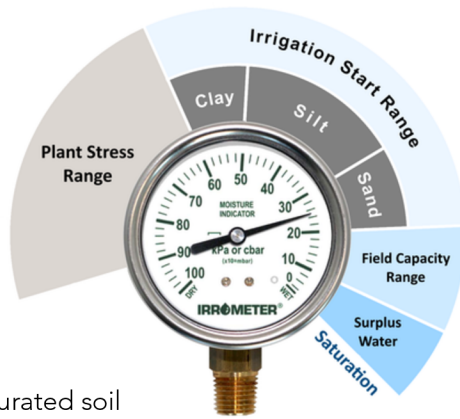
The cable is a replaceable item which can be damaged over time. To avoid damage, do not carry the meter by the cable or excessively fold or manipulate the cable. A quick test of the cable can be performed as follows:

- Connect the two clips together, and read - this should read 0
- Disconnect the two clips (not connected to anything) - this should read 199

Any failure of these two steps indicates cable failure and a replacement should be purchased.

## Interpretation

WATERMARK sensors read soil water tension similarly to a tensiometer, which measures the force roots must overcome to extract water from the soil. A 0 reading is fully wet, or no tension. As the soil dries the tension will increase. The information below provides general guidelines for different soil types:



**0-10 Centibars:** Saturated soil

**10-30 Centibars:** Most soil is adequately wet. Coarse sands and potting media are drying and in the range for irrigation.

**30-60 Centibars:** Typical range of irrigation for most soils.

**60-100 Centibars:** Usual range for irrigation in heavy clay.

**100-200 Centibars:** Soil is becoming very dry.

The chart sheets included with the Meter can be used to manually plot readings over time and analyze trends. The rate of change can be a key indicator of when to irrigate, and having the history of each cycle can help identify under or over irrigation.

#### Warranty

The IRROMETER Company warrants its products against defective workmanship or materials under normal use for one year from the date of purchase.

Defective parts will be replaced at no charge for either labor or parts if returned to the manufacturer during the warranty period. The seller's or manufacturer's only obligation shall be to replace the defective part and neither seller nor manufacturer shall be liable for any injury, loss, or damage, direct or consequential, arising out of the use of or inability to use the product.

This warranty does not protect against abuse, shipping damage, neglect, tampering or vandalism, freezing or other damage whether intentionally or inadvertently caused by the user.

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