

Soil Moisture Sensor (6440) & Stainless Steel Temperature Probe (6470)

Installation Instructions

The Soil Moisture Sensor and the Stainless Steel Temperature Probe are for use with the EnviroMonitor Node (#6810) or the Vantage Pro2™ Wireless Leaf & Soil Moisture/Temperature Station, (#6345).

The temperature sensor can be used in air, soil or water. If used to measure air temperature, it should be shielded from direct sunlight and other sources of reflected or radiated heat. We recommend the use of the radiation shield (#7714) for this purpose.

The soil moisture sensor uses electrical resistance to measure the moisture level of the soil. The sensor data is converted into a calibrated reading of centibars of soil water suction with a range from 0 (wettest) to 200 (driest) centibars.

Please refer to your EnviroMonitor Gateway and Node or Wireless Leaf & Soil Moisture/Temperature Station manual for more information on how to install and use the sensors. The manuals can be found in the Support section of www.davisinstruments.com.

Before “Planting” the Soil Moisture Sensor

- Always “plant” a wet soil moisture sensor. For best results, soak the soil moisture sensors before “planting,” at least overnight.
- If time permits, wet the soil moisture sensor for 30 minutes in the morning and let dry until evening, wet for 30 minutes and let dry overnight, wet again for 30 minutes the next morning and let dry again until evening. Soak over the next night and install wet. This will improve sensor response during the first few irrigations or waterings.

“Planting” the Soil Moisture Sensor

It is important that the sensor is snugly planted. If you dig a large hole, the disturbed soil will be less packed than the surrounding soil and will not accurately reflect its condition. However, if the hole is too tight, the sensor can be damaged during planting. Therefore, it is best to create a hole that matches the sensor’s dimensions as closely as possible.

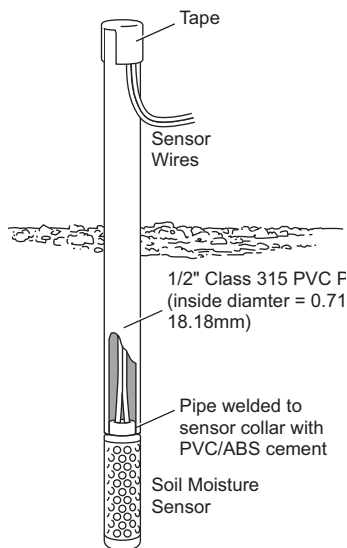
1. Make sensor access holes to the depth required with a 7/8”- 1” (2.2 - 2.5 cm) diameter rod. (The ideal way to do this would be with a stepped tool with 2.5” of 7/8” diameter rod at the end of a 1.25” diameter rod. This would make an oversize hole with an exact sized hole at the bottom where the sensor is located.)

Note: For very coarse or gravelly soils, an oversize hole of 1” to 1 1/4” may be needed to prevent abrasion damage to the soil moisture sensor membrane. In this case, you will need to “grout in” the sensor with a slurry made from the sample soil to get a snug fit in the soil. In gravelly soils and with deeper sensors, use extra caution to install the sensor without damaging the membrane.

2. Always install sensors in the active root system of the crop with a snug fit in the soil.
3. Fill the hole with water and push the sensor down into the hole so it bottoms out.

Tip:

A length of 1/2” Class 315 PVC pipe (pipe inside diameter = 0.716”, 18.18mm) fits snugly over the sensor collar and can be used to push the sensor. You can solvent weld the 1/2” Class 315 PVC pipe to the sensor collar for easier installation and removal. Use a PVC/ABS cement (IPS Weld-on #794 or equivalent).



-
4. Carefully backfill the access hole with soil to eliminate any air pockets which could allow water to channel down to the sensor.

Note: Soil moisture sensors will provide better accuracy after one or two irrigation cycles, during which time they “break-in” and acclimate to the soil conditions.

“Planting” the Soil Moisture Sensor in Turf or Lawns

1. Cut a slightly “V” shaped trench about 5” wide at the top, and about 6” deep into the turf, and about 6” long.
2. Lift out the turf plug piece you just cut.
3. Press the sensors into the soil at about a 45 degree angle into the side of the trench to set the sensors about 3”-5” below the soil surface. Make sure they are set snugly in the soil.
4. Replace the plug removed from the trench and compact it back into place. It will repair itself in short order.
5. If you withhold irrigation for several days and allow the soil to dry down a bit, you should see the soil moisture readings start to creep upward. [Values go from wettest (0 cb) to driest (200 cb).]

Note: In turf or lawns, you will not usually need to water turf until the soil moisture reading is around 25-40 centibars at the recommended 3”-5” depth.
In agricultural installations, you will usually not need to water crops until the soil moisture reading is around 30-60 centibars for most soil types. For heavy clay, the usual range for irrigation is 60-100 centibars.

Extending Sensor Cables

Sensors come with a 15’ (4.6 m) cable.

- If more length is required, up to 800’ (244 m) of additional wire can be spliced onto the sensor wire.
- The additional wire must be fully waterproof.
- We recommend using #18 gauge wire with UF insulation, and using a 3M Scotchpak or Duraseal heat shrink splice connector.

Note: Avoid long wire runs near power cables. The transient currents can affect the small current used to read the sensors.

Removing the Sensor

1. When removing sensor prior to harvest in annual crops, it’s a good idea to do this just after the last irrigation when the soil is moist.
2. Do not pull the sensor out by the wires. You may have to dig out, at least partially, any sensors more than 12” deep or any sensors in dry soil. Careful removal prevents sensor and sensor membrane damage.
3. When the sensor is removed for winter storage, rinse it in water to clean it, let it dry, then store the sensor in a clean, dry location.

Contacting Davis Technical Support

For questions about installing or operating your sensor, please contact Davis Technical Support. We'll be glad to help.

Online **www.davisinstruments.com**

See the Weather Support section for copies of user manuals, product specifications, application notes, software updates, and more.

E-mail **support@davisinstruments.com**

Telephone (510) 732-7814
Monday - Friday, 7:00 a.m. - 5:30 p.m. Pacific Time.

Soil Moisture Sensor & Stainless Steel Temperature Probe

Product Numbers: 6440, 6470

07395.158 Rev. G (1/21/2020)

This product complies with the essential protection requirements of the EC EMC Directive 2004/108/EC.

©2020 Davis Instruments Corp. All rights reserved. Vantage Pro2 is a trademark of Davis Instruments Corp, Hayward CA. Information in this document subject to change without notice. Davis Instruments Quality Management System is ISO 9001 certified..



3465 Diablo Avenue, Hayward, CA 94545-2778 U.S.A.

510-732-9229 • Fax: 510-732-9188

info@davisinstruments.com • www.davisinstruments.com