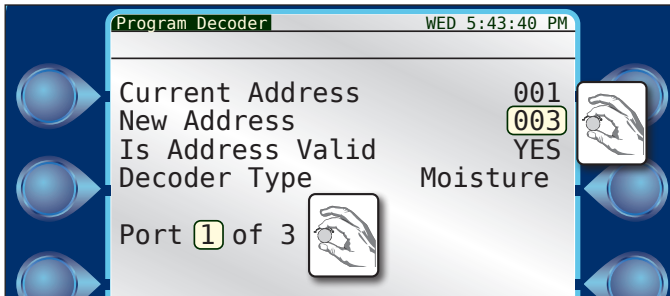
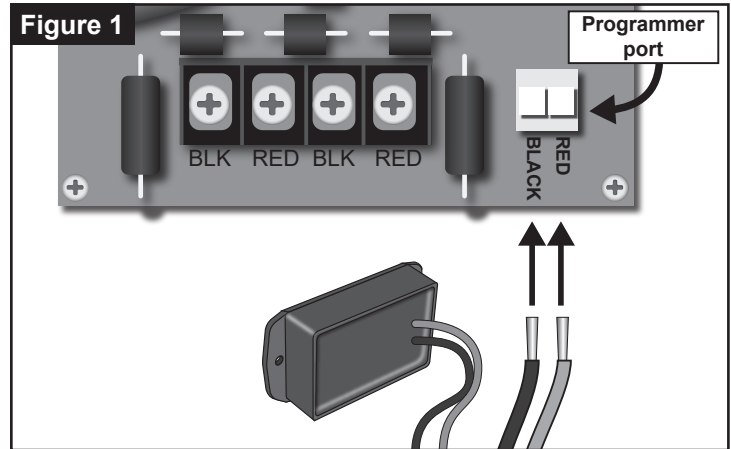


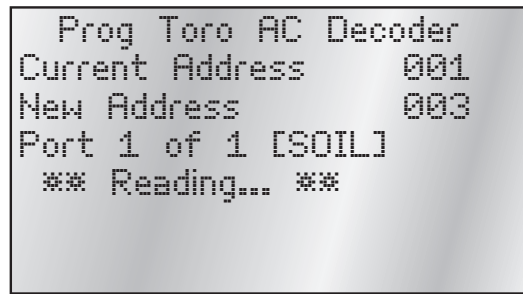
### Configuring the Sensor

Before installing the TW-DAC-SOIL sensor (hereafter referred to as 'SOIL') into the field, we must assign an address to the sensor so that communication between the sensor and controller works. To assign an address to the sensor:

- At the controller, connect the sensor physically to the programmer port on the output board.
  - Decoder output board must be FW version 2.5 or higher to program flow and moisture decoders.
- Go to the Program Decoder screen.
  - for the **DX3**: select Setup --> Page 2 --> Program Decoder.
  - for the **Sentinel**: press the Option button, scroll to Prog Toro AC Decoder, hit Enter.



DX3 screen



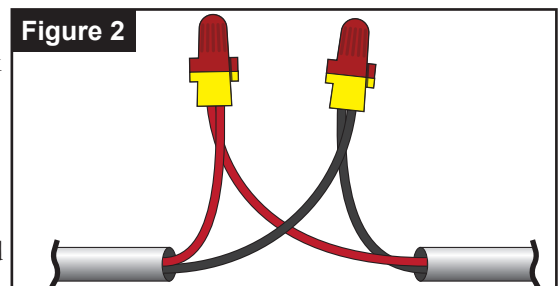
Sentinel screen

- Assign an address to the sensor in the New Address field, from 1 - 16.
- Disconnect the decoder and mark it with the new address. It is now ready to install in the field.

**Pro Tip:** Station, flow and moisture decoders can also be programmed using the second generation field programmer TW-PROG-2.


### Connecting the Sensor to the Irrigation Systems

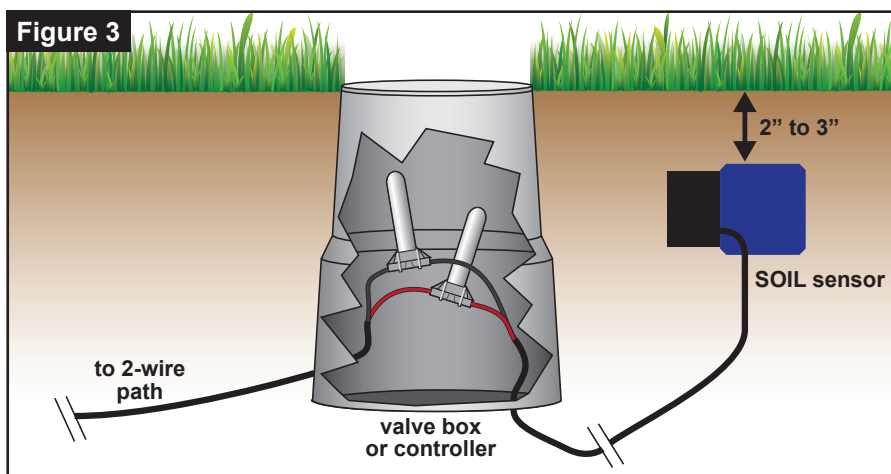
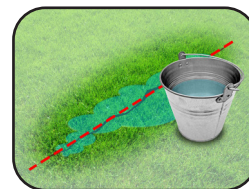
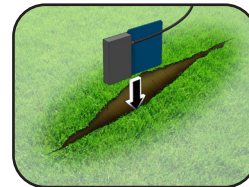
- Power off the two-wire when installing devices.
- The soil sensor comes with 50ft of wire. If additional length is needed, use TW-CAB-14 or similar polyethylene double-jacketed or UF-B UL PVC double-jacketed, two-conductor solid core designed for direct burial systems.
- Strip the outer insulation from the two-wire and the sensor wire 1½”.
- Strip the red and black wires on the two-wire and the sensor wire ½”.
- Fasten the two red wires together with the wire nut, then the two black wires with a wire nut (**Figure 2**), ensuring that polarity is maintained.
- Verify communications with the controller before proceeding. Refer to **Testing the Soil Sensor**, page 3.
- Complete the installation of the 3M™ DBR/Y-6 moisture-resistant connectors by positioning each wire, with the wire nut, into the gel and firmly snapping the connector closed (**Figure 3, next page**).



## Burying the Soil Sensor

The TW-DAC-SOIL sensor must be installed into the ground.

1. If the growing media at the installation site is loose, you can push the SOIL sensor into position; however, if the growing media is compacted, use a trowel or a small shovel to cut a slit for the sensor. Widen the slit with a shovel using a back and forth motion.
  2. Place the sensor in the slit so that it will not collect or pool water (aka, not flat).
    - Depending on the depth of the growing media, position the top of the sensor 2" to 3" deep.
    - Position the sensor in the top third of the plants' root zone.
  3. Remove any rocks or gravel touching the sensor to ensure there are no air pockets. Firmly repack the soil around the sensor.
-  The perlite found in growing media does not affect the sensor.
4. Using a bucket of water, saturate the soil surrounding the sensor. Also, make sure that the soil around the sensor is firmly compacted.




### SOIL Sensor Placement Tips

- The sensor needs to be placed in the effective root zone of the plant it is monitoring. Usually the sensor will be making the irrigation decision for many plants or even multiple zones of plants with similar water needs, so it should be placed in the effective root zone of a representative plant.
- Always install the sensor vertically or at an angle. If it is flat, water can pool on the sensor blade and this will cause inaccurate readings.
- Place the sensor in an average to slightly dry area.
- Place the sensor midway between two emitters.
- Do not bury the soil sensor too deep. 2" - 3" max.
- If adjustments or repairs are made, make sure they do not affect the proper application of water to the sensor.
- Poor distribution of water will cause brown spots or wet spots. Sensor-based watering does not compensate for uneven water distribution.

## Testing the Soil Sensor


After the soil sensor is installed in the field, it is prudent to test the sensor from the controller to ensure that it is communicating. After you have saturated the soil surrounding the sensor, test the sensor again to verify moisture readings.

 For the DX3 and Sentinel test procedures (below) to work, the firmware and software versions must be met or exceeded.

### DX3 Test Procedure

- **DX3 firmware: 4.0.71 or higher**
- **Laguna software: 768 or higher**

1. Assign the sensor to an irrigation program.  
From the DX3 main screen, select Program.  
Select the Program to modify.

 Moisture sensor number must correspond to the program number. Sensor 3, for example, must be assigned to Program 3.

Select OPT IN's.

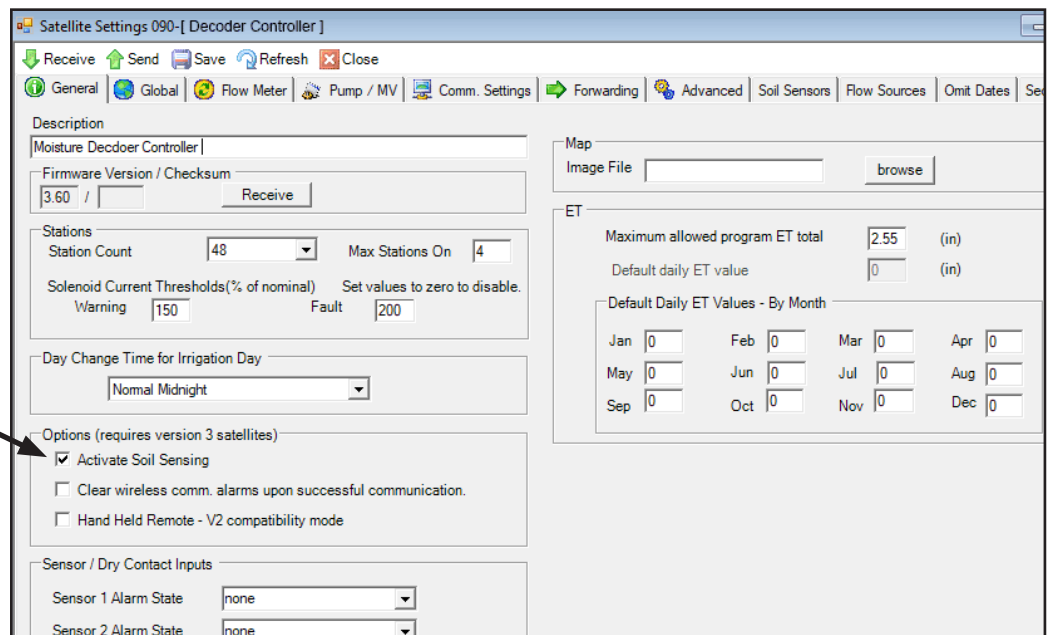
Set Moisture Sensing to Yes.

2. The controller will immediately generate an alert. Assuming the soil sensor is a) wired correctly, b) addressed properly, and c) has been added to the irrigation program, the alert will disappear within one minute. The soil sensor has been identified, is sending readings to the controller, and is working correctly.

### Sentinel Test Procedure

- **Sentinel firmware: 3.60.14 or higher**
- **Sentinel software: 3.3.4.8 or higher**

1. Using WMS central software, setup the moisture sensor for use with the Sentinel controller.  
See screen shots below.
2. At the controller, enter the **DIAGNOSTICS & ALARMS** menu.  
Scroll to **Show Moisture Data**.
3. Scroll to the correct Node or Address number (3).  
Press <ENTER> knob.
4. The date and time of last moisture reading will be visible. Press <ENTER> knob.
5. The moisture level of that reading will be displayed.
6. Saturate the soil surrounding the sensor with water then test the sensor again to verify moisture readings.



Satellite Settings 090 - [Decoder Controller]

Receive Send Save Refresh Close

General Global Flow Meter Pump / MV Comm. Settings Forwarding Advanced Soil Sensors Flow Sources Omit Dates

Description: Moisture Decoder Controller

Firmware Version / Checksum: 3.60 / [ ] Receive

Stations: Station Count 48 Max Stations On 4

Solenoid Current Thresholds(% of nominal): Warning 150 Fault 200

Day Change Time for Irrigation Day: Normal Midnight

Options (requires version 3 satellites):

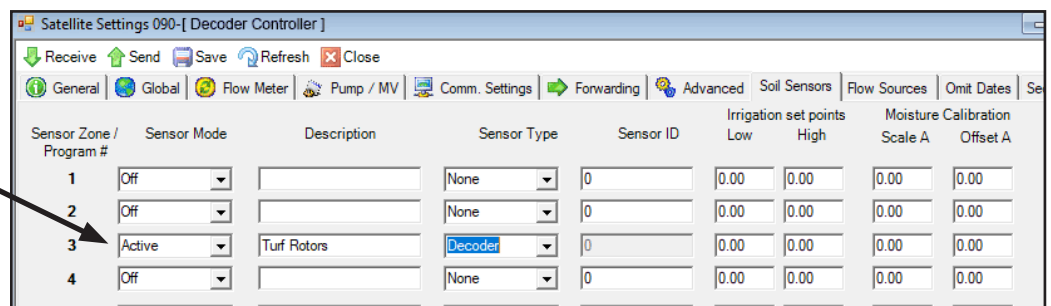
- Activate Soil Sensing
- Clear wireless comm. alarms upon successful communication.
- Hand Held Remote - V2 compatibility mode

Sensor / Dry Contact Inputs:

Sensor 1 Alarm State: none

Sensor 2 Alarm State: none

2. Set the sensor mode to Active and sensor type to Decoder.



Satellite Settings 090 - [Decoder Controller]

Receive Send Save Refresh Close

General Global Flow Meter Pump / MV Comm. Settings Forwarding Advanced Soil Sensors Flow Sources Omit Dates

Sensor Zone / Program #	Sensor Mode	Description	Sensor Type	Sensor ID	Irrigation set points Low	Irrigation set points High	Moisture Calibration Scale A	Moisture Calibration Offset A
1	Off		None	0	0.00	0.00	0.00	0.00
2	Off		None	0	0.00	0.00	0.00	0.00
3	Active	Turf Rotors	Decoder	0	0.00	0.00	0.00	0.00
4	Off		None	0	0.00	0.00	0.00	0.00



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