

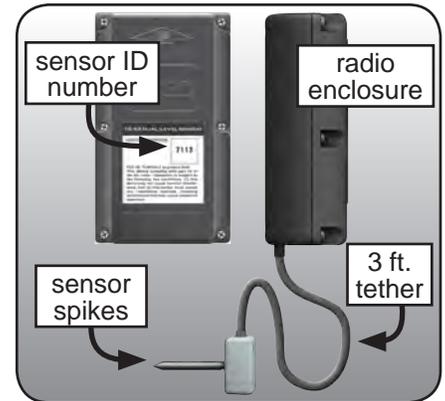
# Toro Pro Series Soil Sensor: Installation Guide

## Pro Series Soil Sensor Overview

Thank you for purchasing the Toro Pro Series Soil Sensor. The Pro Series sensor works with sensor ready Sentinel systems to deliver accurate soil moisture data for precise irrigation control. The sensor comes with a three-foot tether which allows for great installation flexibility.

This installation sheet shows three possible installations:

1. A deep installation where the sensor's spikes need to reach well into a plant's root zone; a tree, for example.
2. The typical installation where the sensor's spikes are at the root level of turf.
3. An installation in a valve box, which greatly facilitates locating the sensor again after installation.

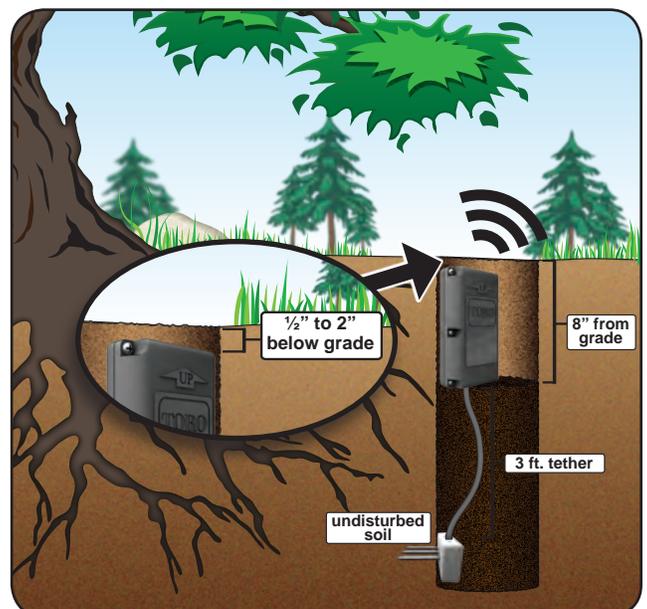


## Important Notes for Proper Sensor Installation

- Sensor location should represent the overall plant material condition including health/disease, salinity build-up, wet/dry spots and foot traffic.
- Record the sensor's exact installation site using fixed landmarks or GPS coordinates (if available). If necessary, a metal detector can also be used to locate buried sensors. Also note the sensor ID number on the Pro Series Soil Sensor placard.
- Before installation, verify adequate signal strength. The sensor should be no more than 500' from the nearest receiver or repeater. Installing the sensor into a valve box (instead of soil) can increase range as well.
- If performing a "soil" installation, insert the steel sensor "spikes" all the way into undisturbed soil (see illustration below). If inserted only partially or into backfilled or tampered soil, the moisture readings may be unrepresentative of the surrounding native soil.
- Install the sensor with the "Up" arrow up. This ensures the radio transmitter is as close to grade as possible for better transmission range. Installing the sensor upside down can greatly impair signal or prevent wireless communication altogether.
- The sensor can be buried from 1/2" to 2" below grade to the top of the radio enclosure. Keep in mind that the shallower the burial depth, the greater the transmission range.
- When backfilling installation holes or trenches, use the soil that was removed. Replacing it with other material may impact the accuracy of the moisture readings.

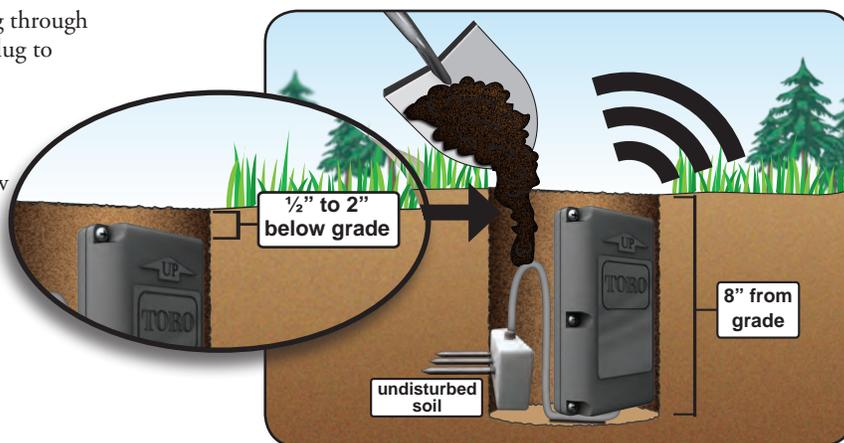
## Option 1: Deep Root Installation for Trees or Shrubs

1. Using a post-hole digger, remove a turf plug (if digging through turf) and soil to the desired depth. Retain the turf plug to replace over the installed sensor.
2. With the sensor oriented correctly, place it carefully into the hole to prevent scraping or disrupting the soil compaction.
3. Press the spikes laterally against the side of the hole, inserting the probes completely into the soil up to 3' below the radio enclosure as shown in the diagram.
4. Once the probe has been installed, backfill the hole stopping roughly 8" from grade in order to leave enough space for the radio enclosure.
5. Place the radio enclosure in the hole with the UP arrow facing up.
6. Carefully back fill and compact soil around and under the sensor to prevent voids and/or movement of the sensor. Keep the top of the sensor between 1/2" and 2" below grade.
7. Replace the turf plug, blending the seam with the surrounding turf.



## Option 2: Shallow Root Installation for Turf or Ground Cover

1. Using a post-hole digger, remove a turf plug (if digging through turf) and soil to a depth of about 8". Retain the turf plug to replace over the installed sensor.
2. Insert the spikes on the probe at the end of the tether into the side wall of the hole at desired depth.
3. Place the radio enclosure in the hole with the UP arrow facing up and "scrunch" the tether if necessary to fit inside the hole.
4. Backfill the rest of the hole with the top of the sensor being between 1/2" and 2" below grade.



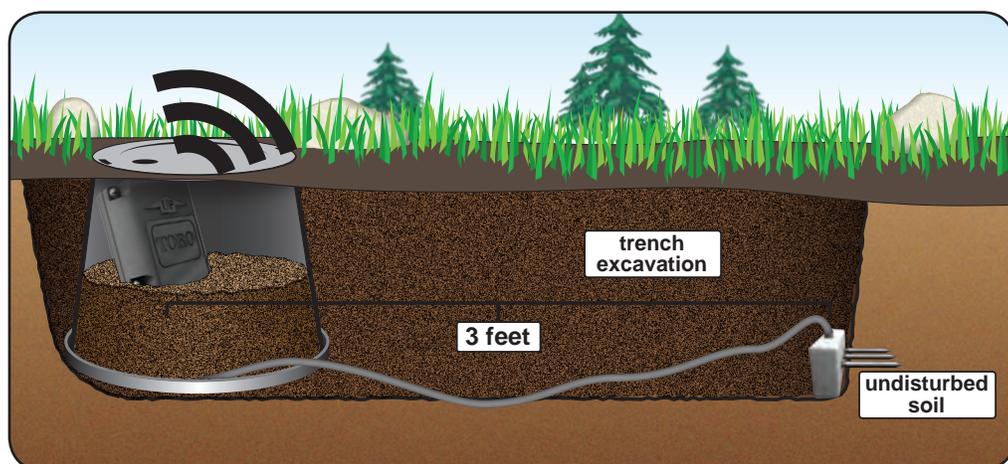
## Option 3: Valve Box Installation for Easier Servicing

1. Dig hole for the valve box and trench for the tether.
5. Backfill the trench to cover the tether and sensor spikes.

2. Install the valve box and sensor, making sure to run the tether under and outside the valve box wall or, if present, through the hole or notch in the valve box wall.
3. Extend sensor to the farthest part of the trench possible, up to 3' away from the radio transmitter. Some slack can be left in the tether inside the valve box to allow for easier servicing of the radio enclosure and battery pack.

4. Place the radio enclosure in the valve box with the UP arrow facing up. To ensure the radio enclosure faces up at all times, partially backfill the valve box to keep the sensor upright as illustrated below.

Do not cover the top of the sensor. If being installed in a box with irrigation valves, a cable tie can be used to secure the sensor to the pipe. If necessary, a piece of rebar (not included) can be used to "stake" the sensor to the ground with the cable tie.



The valve box installation can also be used in a similar manner for the "Deep Root Installation" on page 1.

 The tether should be extended as far as possible from the valve box, especially if it is a larger box shared with valves. This minimizes any impact runoff from the box cover or leaking valves will have on the surrounding soil's moisture content.

## FCC Notice

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does harmful

interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How To Identify and Resolve Radio-TV Interference Problems."  
This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, stock # 004-000-00345-4.

This Class B digital apparatus complies with Canadian ICES-003.  
International: This is a CISPR 22 Class B product.