



TURF GUARD®

Wireless Soil Monitoring System



Get the essential soil information you need, when you need it. Stay up to date on your current soil conditions no matter where you are. Get the information you need to make important decisions in real time. Turf Guard sensors instantly track soil moisture, salinity, and temperature, saving you time. Repeaters mount easily inside all Toro® Network VP®, Network LTC® Plus and E-OSMAC® satellite pedestals.

Features & Benefits

Reduce Water Usage and Improve Playability

Monitor moisture levels and adjust irrigation without risking turf quality. Promote root growth by avoiding over watering. Detect dry areas before it impacts the turf's health.

100% Wireless Network

No wires between the repeaters and the sensors, or the sensor and the probes means that sensors can be installed anywhere on the course without disrupting play. Install sensors without having to trench or pull wires.

Take the Guesswork out of Managing Salinity

Track salt build-up and schedule flushing as needed. Get positive confirmation that your flushing reduced soil salts. Know when and how much water to flush with.



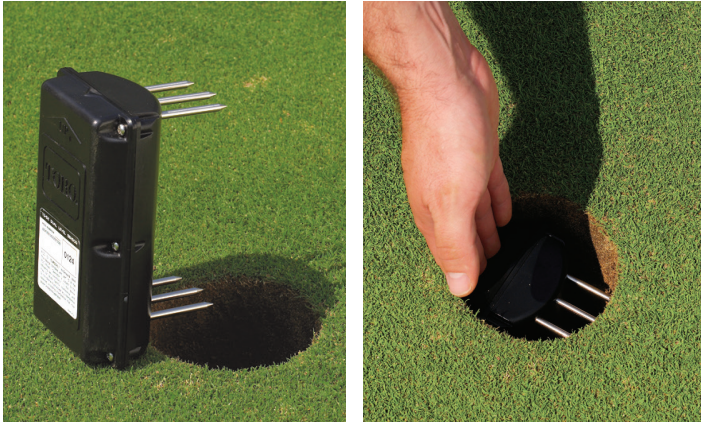
Web-based or Stand-alone Interface

Graphical course overview displays sensor data at-a-glance. Plus with Toro Lynx® Control System integration you can check course moisture, salinity and temperature readings right from your irrigation control software.



Turf Guard® Wireless Soil Monitoring System

How it works:



- Three to five sensors buried in each green at critical root zone levels
- Additional sensors buried in fairways, tee boxes and planters
- Above-ground relays installed on or in existing irrigation pedestals
- Wireless MESH networking links all sensors to central control system.
- Moisture, Temperature and Salinity readings displayed in your office



SPECIFICATIONS

Operational

- Two distinct depths in the soil profile – critical root zone level and a second 5" lower. Independent measurements from each depth.
- MESH routing technology offers complete coverage even in remote canyon courses.
- Repeater mounts in most Toro irrigation satellite pedestals. An external repeater is available for other models including non-Toro pedestals.
- Supports up to 500 sensors per course
- Expected sensor battery life of 3 years, field replaceable.
- Sensor reading sent every 5 minutes.
- Automatic network configuration and failure recovery.
- Plots trends and compares historical and current readings.
- Lynx® Control System integration

Electrical

Input Power:

- Repeater: <.02A @ 6 VDC
- Base Station: <.1A @ 120 VAC, 50/60 Hz
- Station output power: 24 V ac; 3.0 amps (72 VA) total
- UL and CE approved

Dimensions:

- Body: 2" x 3" x 5"
- Spikes: 2.5" x 3/16"
- Installation Hole Diameter: 4.25"

Temperature:

- Operating: 32° F to 140° F
- Storage: -22° F to 180° F

Sensing:

- 0.1°F temperature resolution
- 0.1 % volumetric soil moisture content resolution
- 0.1 dS/m soil conductivity resolution (salinity)

Communication:

- Repeater Range: 2,000' line-of-sight
- Buried Sensor Range: 500' line-of-sight
- 900 MHz ISM Band FHSS communication
- Additional licensing not required

Specifying Information—Turf Guard

Model	Description
TG-S2-R	Turf Guard Sensor With Rreplaceable Battery
TG-R-INT	Repeater-Internal Mount
TG-R-EXT	Repeater-External Mount
TG-B	Base Station
TG-S2-BAT	Battery Kit