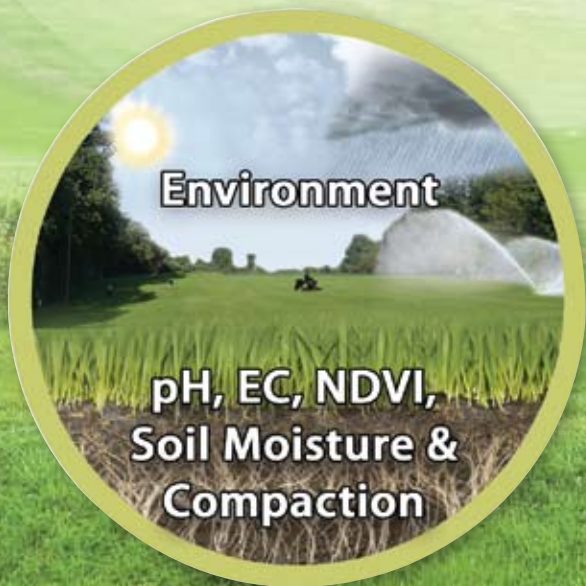


# **Turf Products**

**Temperature**  
**Dew Point**  
**Humidity**  
**Evapotranspiration**  
**Light**  
**Soil Moisture**  
**Soil Compaction**  
**EC**  
**pH**  
**NDVI**





## Weather Stations

Weather affects nearly every aspect of turf and landscape management. Knowing how a site responds to weather conditions can influence future management practices. Using environmental monitoring technology on your site can provide site-specific real-time and historical weather information. On-site weather stations allow the collection of data in microclimates, which are areas where the weather is significantly different. Some examples of microclimates include the highest elevation point on a golf course, the lowest elevation point, a green surrounded by trees and a tee in the open. By collecting data on microclimates, a golf course superintendent can make informed management decisions that will better fit that specific environment.

## WatchDog<sup>®</sup> Model 2900ET Weather Stations

- Full-featured weather stations measure temperature, humidity, rain, wind, evapotranspiration and solar radiation
- Capture soil moisture readings for irrigation planning
- Customize your station with plug-in sensors to meet your needs
- Accurate, real-time weather information directly from your golf course
- Monitor, record and analyze over a dozen important growing conditions
- Log your data in fail-safe, non-volatile memory
- Choose measurement intervals from 1 to 60 minutes (holds 183 days of data with a 30 minute interval)
- Multiple PCs can access the station without impacting a master data collection plan
- Use the LCD Display to check current and daily high/low readings without a PC
- 12-month battery power source (four AA alkaline batteries included)
- Communicate via wireless, cellular, shuttle, or direct connect
- **Requires SpecWare Pro software**



Item 3350WD2 WatchDog 2900ET Weather Station

## Spec 9 Pro Software

- Download data from SpectrumWeather.com
- Graph on-the-fly with an interactive graphing window
- Build, customize and save your most important report formats or choose from thirteen standard reports
- Add optional insect and disease models to forecast pest pressures and reduce pesticide costs. Produce reports with graphs for each pest
- Set a frost alarm that will call your mobile phone or pager at frost temperatures or other sensor conditions
- Automate logger downloads with wireless or directly connected stations. Generate scheduled log files for data-to-web applications or create an XML file that can be posted on the web
- Find and use data easily with an open file management system. All logger data is stored in one file per month, simplifying data sharing and exporting



Item 3654P9 Spec 9 Pro Software

Connect WatchDog Stations and Loggers to PCs or laptops lacking a serial port

Item 3661USB USB-to-Serial Adapter

## Turf Alert Forecast Package

- Become more proactive in the fight against disease and insects by adding a disease and insect forecast module to your Spec 9 Pro software
- Quickly produce the documentation needed to support your IPM decisions
- Each package uses field-tested and validated algorithms along with your data to forecast the potential for the appearance of your turf's most notorious enemies
- Models include Brown Patch (Schumann), Pythium (Nutter, Schein), Dollar Spot (Hall, Mills/Rockwell), and Insect Models
- Required sensors: Air and soil temperature, relative humidity and rain



Item 3656TU Turf Alert Package



**WatchDog<sup>®</sup> 2000 Series Mini Stations**

- Same power, flexibility, and accuracy as the 2000 Series Weather Stations
- Measure temperature, humidity, quantum light and more (varies by model); ideal for monitoring golf course micro climates
- Customize your mini station with 1-4 plug-in sensors to meet your needs
- Accurate, real-time weather information directly from where you grow
- Log your data in fail-safe, non-volatile memory
- Choose measurement intervals from 1 to 60 minutes (holds 183 days of data with a 30 minute interval)
- Reliable NEMA-4 type IP 66 enclosure and weatherproof connectors
- Use the LCD display to check current and daily high/low readings without a PC
- Run disease models on the station, providing field viewing of disease severity indicators
- Alarms: send a warning if a sensor exceeds high and low limits
- 12-month battery power source (four AA alkaline batteries included)
- Communicate via wireless, cellular, shuttle, or direct connect
- Model 2475 measures PAR light intensity, Daily Light Integral, day/night average temperatures and degree days
- **Requires SpecWare Pro software**



**Model 2475**

Item 3686WD WatchDog 2475 Weather Station

WATCHDOG WEATHER STATION FEATURES						
Sensors	2475	2450	2425	2400	Specifications	Accuracy
Air Temperature	✓	✓	✓	OPT	-25° to 212°F (-32° to 100°C)	±1°F (±0.6°C)
Relative Humidity	✓	✓	✓	N/A	10% to 100% @ 5° to 50°C	±3%
Dew Point	✓	✓	✓	N/A	-99° to 140°F (-73° to 60°C)	±4°F (±2°C)
Quantum Light (PAR)	✓	OPT	OPT	OPT	0 to 12500 μMol·m <sup>-2</sup> ·s <sup>-1</sup>	±5°
External Sensor Ports	1	2	3	4		

**Light Meters**

Light is extremely important to turfgrass health. Light sensors provide information on how much light a location receives at a point in time, as well as whether that location receives enough light over a period of time (day, week). Place near several golf greens to determine the light quantity difference in tree shade, partial sun, and full sun. Make decisions regarding tree pruning, seed varieties, and turf disease prevention based on this information.

**LIGHTSCOUT<sup>™</sup> DLI 100 Light Meter**

- An affordable, first step in measuring light
- Simple, one button operation
- Displays light intensity levels every 4 seconds for 24 hours
- Displays PAR light (Photosynthetically Active Radiation)
- Calculates your Daily Light Integral (DLI), or accumulated PAR light, so that DLI information can be compared at multiple locations at the same time
- Real-time intensity levels are shown every 4 seconds in μmol m<sup>-2</sup> s<sup>-1</sup> (or footcandles)
- Packaged in sets of 3 light meters
- Battery included; water resistant

**New!**



Item 3405 LightScout DLI 100 Meter (set of 3)



## Soil Moisture Meters

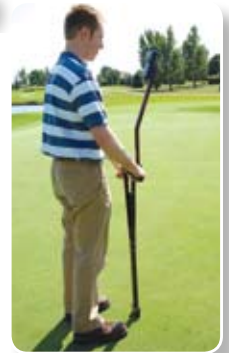
Soil moisture plays a key role in the life of the plant. Nutrients in the soil solution provide the plant with the food it needs to grow. Water is also essential for regulating plant temperature through the process of transpiration. Plant root systems are better developed when growing in moist soil. Excessive levels of soil moisture, however, can lead to anaerobic conditions that can promote the growth of plant and soil pathogens.

### FIELDSCOUT<sup>®</sup> TDR 300

- Instantaneous readings of root zone soil moisture
- Equipped with internal data logger and RS-232 port
- Records 3,250 measurements (1,350 with added GPS/DGPS option\*)
- Connects to any GPS receiver with serial output\*\*
- Configure and download meter with FieldScout software (included)
- Compatible with SpecMaps ProTurf online web-mapping application (see next page)
- Rods sold separately



Works with  
**SpecMaps**



\* Spectrum's PC cables connect to a 9-pin serial port. USB-Serial adapter (item 3661USB) required for connection to computers with only USB ports.  
\*\* GPS interface requires two cables. The GPS/DGPS cable (item 2950CV5) is available from Spectrum. A PC serial interface cable supplied by the manufacturer of the GPS receiver is also required.

- |               |                             |
|---------------|-----------------------------|
| Item 6430FS   | TDR 300 Soil Moisture Meter |
| Item 2950CV5  | GPS/DGPS Cable              |
| Item 7250     | GPS Unit Mounting Bracket   |
| Item 3661USB  | USB-to-Serial Adapter       |
| Item 6430CASE | TDR 300 Carrying Case       |



### FIELDSCOUT<sup>®</sup> TDR 100

- Instantaneous readings of root zone soil moisture
- Probe block comes with a 5 ft (1.5 m) cable
- Configure meter with FieldScout software (included)
- Rods sold separately

- |              |   |
|--------------|---|
| Item 6440FS  | TDR 100 Soil Moisture Meter             |
| Item 6440FSS | Replacement TDR 100 Soil Moisture Probe |



## TDR Rods

- Sturdy stainless-steel construction
- Field replaceable

- |             |                            |
|-------------|----------------------------|
| Item 6428FS | Two 1.5 inch (3.8 cm) Rods |
| Item 6429FS | Two 3 inch (7.5 cm) Rods   |
| Item 6431FS | Two 4.8 inch (12 cm) Rods  |

- |             |                                 |
|-------------|---------------------------------|
| Item 6430PH | Pilot Hole Maker for TDR Meters |
|-------------|---------------------------------|



Pilot Hole Maker for  
TDR Meters



## Soil Compaction Meters

The soil is the plant's reservoir of water, nutrients and oxygen. Compacted soil has less pore space to store what the plant needs. Soil compaction prevents moisture penetration, reduces fertilizer and chemical uptake, creates conditions for anaerobic microbes to build up, and hinders plant root growth. In some cases, yield losses can run as high as 30% due to compaction alone.

### FIELDSCOUT<sup>®</sup> SC 900 Soil Compaction Meter

- Records compaction readings to a depth of 18 in (45 cm)
- Equipped with internal data logger and RS-232 port
- Exclusive ultrasonic depth sensor captures readings in 1 in (2.5 cm) increments
- Penetration resistance measured by internal load cell
- Compaction data is displayed in PSI or kPa (1 psi = 6.9 kPa)
- Connects to any GPS receiver with serial output\*\*
- Data logs 772 measurements (579 with added GPS/DGPS option\*)
- Configure and download meter with FieldScout software (included)
- Compatible with SpecMaps online web-mapping application

\* Spectrum's PC cables connect to a 9-pin serial port. USB-Serial adapter (item 3661USB) required for connection to computers with only USB ports.

\*\* GPS interface requires two cables. The GPS/DGPS cable (item 2950CV5) is available from Spectrum. A PC serial interface cable supplied by the manufacturer of the GPS receiver is also required.

- Item 6110FS FieldScout SC 900 Soil Compaction Meter
- Item 2950CV5 GPS/DGPS Cable
- Item 7250 GPS Unit Mounting Bracket
- Item 3661USB USB-to-Serial Adapter
- Item 6110FST Replacement Depth Target
- Item 6106 Replacement Tip



### SpecMaps<sup>™</sup>

- Create 2-dimensional color charts of geo-referenced data
- Generate interpolated contour plots or maps of individual data points
- Includes data point summary and histogram
- Nothing to install - load data to and view maps directly on any PC with internet access
- Get maximum value out of your portable FieldScout meters

#### SpecMaps ProTurf Additional Features:

- Map sprinkler head locations and plot radius of throw
- Automatically computes lower quartile distribution uniformity (DU<sub>lq</sub>)

- Item 3652 SpecMaps Web Mapping Utility (1-Year Subscription)
- Item 3652PT SpecMaps ProTurf Web Mapping Utility (1-Year Subscription)



## Spectrum Soil Compaction Meter

- Economical and versatile, analog soil compaction tester
- Takes compaction readings to a depth of 18 inch (45 cm)
- Easy-to-read display and durable design
- Stainless steel rod marked at depths of 3, 6, 9, 12, 15 and 18 inch (7.6, 15.2, 22.9, 30.5, 38.1 and 45.7 cm)

- Item 6101 Spectrum Soil Compaction Tester
- Item 6106 Replacement Tip





## pH Meters

Measuring and maintaining the optimal pH is important for determining nutrient availability, efficacy of pesticides, and potential disease pressure. Nutrients such as calcium, magnesium, and molybdenum become more available as pH increases. In contrast, availability of iron, manganese, and copper increases with decreasing pH. High pH can also contribute to conditions favorable for various root diseases.

### FIELDSCOUT<sup>®</sup> SoilStik pH Meter

- Flat surface electrode measures pH in soils, semi-solids, solids, and liquids - no more electrode breakage or clogged junctions
- RENEW indicator tells you when it's time to replace your electrode.
- CAL alert tells you it's time to recalibrate. Ensures accuracy
- Memory records and recalls 15 sequentially tagged readings allowing detection of changes over time
- 1- or 2-point calibration: automatically recognizes buffer solutions
- Automatic temperature compensation
- Simultaneous display of pH and temperature
- Display indicates when the reading has stabilized
- Data Hold, auto power off and low battery indication
- Waterproof design (IP57) floats in water and protects the meter in wet environment
- Includes flat surface pH electrode, protective sensor cap, rinse bottle, two CR2032 batteries, 4 & 7 pH standard solutions and soft case



- |           |  |
|-----------|--|
| Item 2105 | FieldScout SoilStik pH Meter                 |
| Item 2106 | Flat Sensor, Replacement                     |
| Item 2110 | Refill Solutions - pH 4 and 7, (2) 30 mL ea. |

## Turf Color Meters

NDVI is one indicator of plant stress and is measured based upon light absorption and reflectance. Since chlorophyll absorbs red light, low reflectance in this band indicates a healthy plant. Conversely, the cellular structure of healthy plants reflects light in the near infrared band. When plants are under stress, red band reflectance increases and near infrared band reflectance decreases. The Normalized Difference Vegetation Index (NDVI) is a unit of measure designed to factor both red and near infrared reflectance. NDVI measurements can range from -1 to 1, with higher values indicating greater plant health.

### FIELDSCOUT<sup>®</sup> TCM 500 NDVI Turf Color Meter

- Measures reflected light from approximately a 3 in diameter section of turfgrass
- Uses internal light source to negate the effect of sunny versus cloudy conditions
- Measures reflectance in the red (660 nm) and near infrared (850 nm) spectral bands
- Measurement diameter of 3 in (7.6 cm)
- Displays result as NDVI, percent reflectance, or as a user-adjustable grass index from 1 to 9
- Connects to any GPS receiver with serial output\*
- Equipped with internal data logger and RS-232 port
- Records 3,250 measurements (1,350 with added GPS/DGPS option\*\*)
- Configure and download meter with FieldScout software (included)
- Compatible with SpecMaps online web-mapping application



\* Spectrum's PC cables connect to a 9-pin serial port. USB-Serial adapter (item 3661USB) required for connection to computers with only USB ports.  
\*\* GPS interface requires two cables. The GPS/DGPS cable (item 2950CV5) is available from Spectrum.  
A PC serial interface cable supplied by the manufacturer of the GPS receiver is also required.

- |               |  |
|---------------|--|
| Item 2975NDVI | FieldScout TCM 500 NDVI Turf Color Meter |
| Item 2975H    | FieldScout TCM 500 T-Handle              |
| Item 2950CV5  | GPS/DGPS Cable                           |
| Item 3661USB  | USB-to-Serial Adapter                    |



## EC Meters

The salinity of the soil, irrigation water or fertilizer solution is an important parameter affecting the root zone environment of your plants. Any of these factors can have a significant effect on turf growth and quality. The presence of high salt levels is your warning sign to make adjustments. Low-salt levels could lead to nutrient deficiencies. Don't wait for trouble, forecast before the damage shows in your turf.

### FIELDSCOUT® Direct Soil EC Meter

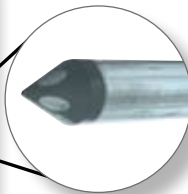
- Patented paired sensor tip provides maximum soil-sensor contact and higher accuracy
- Sample directly in turf root zone, containers, and in solutions
- 0 - 19.9 mS/cm (Accuracy ± 2%, resolution 0.01 mS/cm)
- Automatic temperature compensation
- Includes case, battery and 2.76 mS/cm calibration standard

#### 8 in (20 cm) Probe Option

- Item 2265FS FieldScout Direct Soil EC Meter w/ 8 in Probe
- Item 2265PROBE FieldScout EC 8 in Probe (Replacement)
- Item 2254 Conductivity Standard 2.76 mS/cm

#### 24 in (60 cm) Probe Option

- Item 2265FSTP FieldScout Direct Soil EC Meter w/ 24 in T-Handle Probe and Replaceable Tip
- Item 2265FST24P FieldScout T-Handle EC 24 in Probe w/ Replaceable Tip
- Item 2266 Replaceable Tip For T-Handle EC Probe
- Item 2254 Conductivity Standard 2.76 mS/cm



Exclusive Paired Sensor

## Waterproof EC Meter

- Measures four parameters; Conductivity, TDS, Salinity and Temperature
- 6 units of measure:  $\mu\text{S/cm}$ , mS/cm, ppm, ppt, mg/L and g/L
- Internal memory stores up to 15 labeled readings for easy recall
- Adjustable conductivity-to-TDS ratio factor (0.4 to 1.0)
- Accuracy:  $\pm 2\%$
- Measurement ranges
  - Conductivity: 0.00 - 199  $\mu\text{S/cm}$ , 200 - 1,999  $\mu\text{S/cm}$  or 2.00 - 19.99 mS/cm
  - TDS: 0 - 99.9 mg/L, 100 - 999 mg/L or 1.00 - 9.99 g/L
  - Salinity (fixed ratio of 0.5): 0 - 99.9 ppm, 100 - 999 ppm or 1.00 - 9.99 ppt
  - Temperature: 32 - 194°F (0.0 - 90.0°C)
- Includes conductivity cell, protective sensor cap, sample cup with cap, four SR44W button batteries and 48 in (1.2 m) neckstrap
- Calibration standard sold separately

- Item 2246 Waterproof EC Meter
- Item 2251 Conductivity Standard, 1.41 mS/cm, 230 mL



## IPM Scope

*Portable digital microscope solution at an affordable price*

- Combines a digital camera, precision optics and LED lighting into a powerful handheld microscope
- Connects to your computer's USB port
- 40X and 140X magnification
- View magnified image right on your computer screen
- Includes software required to capture and archive your still images
- Software allows you to customize your images with labels, markers, time stamps and measurement scale
- Archive still images or send files via e-mail
- Video software upgrade provides the ability to capture live videos and time lapse sequences of insect movement

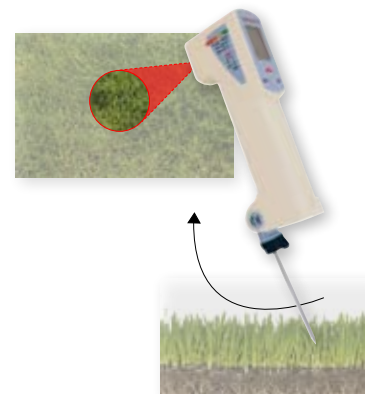
Item 2860	IPM Scope
Item 2860V	Video Software Upgrade
Item 2860UV	IPM Scope-Ultra Violet
Item 2860MP	IPM Scope-Mega Pixel
Item 2860HS	Plastic Horseshoe-3D images



IPM Scope shown with optional Plastic Horseshoe to view 3D images

## IR Crop Temp/External Soil Temp Meter

- One lightweight handheld device easily measures both leaf and soil temperatures
- Backlit LCD display
- Includes 9V battery, wrist strap and case
- Distance to Target Ratio: 3:1
- Fixed emissivity: 0.97
- IR Temperature: -40 to 149°F (-40 to 65°C), Accuracy: ±2°F (±1°C)
- Probe Temperature: 23 to 149°F (-5 to 65°C), Accuracy: ±1°F (±0.5°C); -40 to 23°F (-40 to -5°C), Accuracy: ±2°F (±1°C)



Item 2958	IR Temp/External Temp Meter
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## Cardy Twin Nitrate Meter

*Put the power of a laboratory right in your hands*

- Measure nutrient solutions, soils, greenhouse soilless media, water samples and tissue sap
- Waterproof pocket-sized meter
- Sensor stores dry and is field replaceable
- Measures from 14 to 1,400 ppm
- Accuracy correlates well with laboratory analysis
- Includes two CR2032 batteries, case and calibration standards



Item 2305G	Cardy Nitrate NO <sub>3</sub> (Meter Only)
Item 2345	Replacement Nitrate Sensor
Item 2311	450 ppm NO <sub>3</sub> -N Standard (6 - 14 mL bottles)
Item 2312	34 ppm NO <sub>3</sub> -N Standard (6 - 14 mL bottles)
Item 2330	Soil NO <sub>3</sub> Kit w/30 Samples

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