Welcome!

It’s our mission to enhance the work you do by bringing you products that solve your problems and simplify managing the crops you grow.

Since 1987, we have been committed to meeting your needs. That commitment encompasses many things. We listen to you and your needs by constantly developing innovative solutions. Add to that our comprehensive range of customer support services, and you’ll find a unique partner willing to develop actionable and cost effective plant measurement solutions used around the world.

As an innovator, Spectrum has developed a broad line of professional, quality products in the area of crop environmental monitoring, nutrient management, soil moisture measurement/irrigation scheduling and pest management.

This could not have occurred without the input from our valued customers and the talents of a passionate team of employees. Thank you for your support and commitment to innovation!

Best Regards,

Mike Thurow
CEO & Founder
Spectrum Technologies, Inc.
The AE50 Award recognizes products ranked highest in innovation, significant engineering advancement, and impact on the market served.

Award Winning Products

Since 1987, Spectrum Technologies has received 23 AE50 Awards from the American Society of Agricultural and Biological Engineers, which demonstrates our deep commitment to innovation and quality.

2015  SpecConnect™ Web Portal
      WatchDog® Retriever & Pups Wireless Network

2013  FieldScout® GreenIndex+® Smartphone App
      WatchDog® Cellular Alert Stations

2012  WaterScout® SMEC 300 Soil Moisture/EC/Temp Sensor

2011  WatchDog® 1000 Series Micro Station
      LightScout® DLI 100 Light Meter

2008  WatchDog® Sprayer Station
      SpecMaps™ Web Mapping Utility Software

2007  WatchDog® 2000 Series Mini Weather Station

2005  SpecWare™ Software

2004  FieldScout® Direct Soil EC Probe
      FieldScout® TCM 500 Turf Color Meter
      WeatherTracker Greenhouse Growth Tracker

2003  WatchDog® WeatherTracker
      FieldScout® SC 900 Soil Compaction Meter

2002  WatchDog® Weather Station
      FieldScout® TDR 300 Soil Moisture Meter

2001  FieldScout® CM 1000 Chlorophyll Meter

2000  WatchDog® Data Logger

1999  StarLogger Data Logger
      Investigator Soil Compaction Meter
      WatchDog® Leaf Wetness/Temperature Logger

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COMPANY OVERVIEW

Spectrum Technologies, Inc. manufactures affordable, leading-edge measurement information technology to the agricultural market throughout the world.

We develop peak plant performance tools for better field output. Using the most advanced plant measurement technology, we provide growers with actionable plant health data that translates into more profitable decisions.

INDUSTRY FUTURE

With consumers demanding higher quality food and environmental conditions, the need for measurement and monitoring technology will continue to grow. The need to conserve resources such as soil and water will drive the need to CREATE more measurement information technology.

PRODUCTS

1  WEATHER
Temperature, Light, Wind, Rain, Relative Humidity and Leaf Wetness Monitoring

2  INTEGRATED PEST MANAGEMENT (IPM) TOOLS
Insect and Disease Models, IPM Scopes

3  SOIL MOISTURE & QUALITY MEASUREMENT
Soil Moisture, Soil Compaction and Water Quality Meters

4  NUTRIENT MANAGEMENT
Nutrient, Chlorophyll, pH, EC and Nitrogen Meters

CUTTING EDGE TECHNOLOGY

We are constantly developing exciting new products while offering our customers an amazing, award winning array of products.

Imagine a meter that can measure light as it hits your plant, or receivers that send information about soil moisture so your crops can be managed on the fly.

We're innovating for you.
SPECCONNECT - DEVICE TO CLOUD CONNECTIVITY

SPECCONNECT - FAST ACTIONABLE DATA

SPECTRUM TO YOU.
What will you see when using our SpecConnect software to monitor your system?

- Customized Alerts
- Current Conditions
- Multi-Sensor Station Report
- Equipment Inventory & Activity
- Area Map with Sensor Placement

DEVICE TO CLOUD. SPECTRUM TO YOU.
**Disease & Insect Forecast Model Packages**

**1-YR SUBSCRIPTIONS**

Become more proactive in your management of diseases and insects by adding forecast models to your SpecConnect subscription

- Each package uses field-tested and validated algorithms along with your data to forecast the potential for the appearance of your crop’s most notorious enemies
- Save money by spraying only when necessary
- Quickly produce the documentation needed to support your IPM decisions
- 1-yr subscriptions

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</tr>
<tr>
<td>API Service (additional fee)</td>
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**Required Sensors:**

- SpecConnect Apple/Pear Alert Package
  - Required Sensors: Leaf wetness and temperature
  - Models Included:
    - Apple Scab (Modified Mills, Cornell, UC Davis California)
    - Fire Blight (Maryblyt, Cougarblight)
    - Sooty Blotch/Flyspeck
    - Insect Models

- SpecConnect Cherry Alert Package
  - Required Sensors: Leaf wetness and temperature
  - Models Included:
    - Leaf Spot
    - Insect Models

- SpecConnect Grape Alert Package
  - Required Sensors: Leaf wetness, relative humidity, and temperature
  - Models Included:
    - Powdery Mildew (Thomas-Gubler)
    - Black Rot (Spotts)
    - Botrytis
    - Phomopsis Cane Leaf Spot
    - Insect Models

- SpecConnect Potato Alert Package
  - Required Sensors: Temperature, relative humidity, and rain
  - Models Included:
    - Early Blight
    - Late Blight (BliteCast)
    - Insect Models

- SpecConnect Tomato Alert Package
  - Required Sensors: Leaf wetness and temperature
  - Models Included:
    - Insect Models

- SpecConnect Turf Alert Package
  - Required Sensors: Air and soil temperature, relative humidity, and rain
  - Models Included:
    - Brown Patch (Schumann)
    - Pythium (Nutter, Schein)
    - Dollar Spot (Hall, Mills/Rockwell)
    - Insect Model

- SpecConnect Nut Alert Package
  - Required Sensors: Temperature, leaf wetness, relative humidity, rain
  - Models Included:
    - Almond Alternaria Leaf Spot
    - Almond Anthracnose
    - Pecan Scab
    - Pistachio Panicle and Shoot Blight
    - Walnut Blight
    - Insect Models

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- Each package uses field-tested and validated algorithms along with your data to forecast the potential for the appearance of your crop’s most notorious enemies
- Save money by spraying only when necessary
- Quickly produce the documentation needed to support your IPM decisions
- 1-yr subscriptions
THE RETRIEVER & PUPS SYSTEM.
LET YOUR PLANTS TALK TO YOU.

GROWERS, WINEMAKERS, FARMERS
AND RESEARCHERS USE IT TO EXPERTLY
MONITOR THEIR FIELDS, GREENHOUSES AND
ORCHARDS WHEN THEY AREN’T AROUND.

Our Retriever & Pups System brings real time data
to your mobile device anywhere you can access the
internet.

Smarter decisions just got easier.

Each Retriever can support up to 16 Pups.
Each Pup can hold four different sensors.
And, you can send threshold alerts!

Our sensors measure everything from moisture to
light, wind, rain, humidity, temperature and more.
We can customize your setup, even add weather
stations, to bring data from every nook and cranny
of your property directly to you.

With SpecConnect Wireless Pups & Retrievers,
send data to your personal dashboard and view
the measurements instantly. Trust the data and
eliminate the guesswork.

INNOVATIVE AGRONOMY

SPECCONNECT INTEGRATED
WIRELESS SOLUTION
In-Field Applications

**VINEYARDS & ORCHARDS**
Easily spot frost and be alerted of conditions in your crops, monitor and note site-specific conditions for insect and disease pressures, and monitor soil moisture remotely.

**IRRIGATION SOLUTIONS**
Flexibly monitor both soil moisture and EC in a variety of soil textures for better irrigation decisions.

Connect WatchDog Weather Stations to the network using a Station Pup.

**RESEARCH PLOTS/ FARM & GREENHOUSE STUDIES**
Capture site-specific conditions remotely for insect and disease pressures, soil moisture monitoring, weather conditions, light and more.

**GREENHOUSES & NURSERIES**
Measure DLI (Daily Light Integral) and intensity for consistently better plant quality across greenhouse and high-tunnel structures. For outdoor growing, monitor soil moisture, temperature and EC for more efficient irrigation practices.
### WatchDog Pups

**Multiple Pups with a variety of sensors to choose from give you unlimited measurement options within a single network.**

#### 3 models

- **Sensor Pups**
  - Connect up to 4 external sensors via 2.5mm stereo plug
  - Can monitor high, low, current, and average values for each sensor during each logging period - up to 16 parameters

- **Station Pups**
  - Connect to a WatchDog 2000 Series (Full or Mini) Weather Station
  - Adds your Weather Station sensor data to your Retriever network
  - No external sensors

- **Repeater Pups**
  - Provide added range to WatchDog Retriever networks
  - Serves as a "signal booster" around buildings or obstacles, or over high sections of your fields

#### Which type?

**Sensor Pups**
- Connect up to 4 sensors per Pup
- Includes 6 standard non-rechargeable AA batteries (solar-power option below)
- Available as Pre-Packaged Pup Stations, includes sensors

**Station Pups**
- Connects to WatchDog 2000 Series Weather Stations and transmits all station sensor data to the network
- Includes 6 standard non-rechargeable AA batteries (solar-power option below)

**Repeater Pups**
- Serves as a "signal booster" to help provide a path for the transmission signal around obstacles or to extend range; no sensor inputs of its own
- Includes 6 standard non-rechargeable AA batteries (solar-power option below)

#### Which model?

**WatchDog Sensor Pup**
- Connects to Sensor Pups and has limited range
- Includes 6 standard non-rechargeable AA batteries (solar-power option below)

**WatchDog Station Pup**
- Connects to Station Pups
- Adds Weather Station sensor data to Retriever network
- No external sensors

**WatchDog Repeater Pup**
- Provides added range to WatchDog Retriever network
- Serves as a "signal booster" around buildings or obstacles, or over high sections of your fields

#### Most Popular Sensors

<table>
<thead>
<tr>
<th>Sensor Code</th>
<th>Sensor Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3613ARS</td>
<td>Temperature/RH Sensor with Aspirated Radiation Shield</td>
</tr>
<tr>
<td>3613THS</td>
<td>Temperature/RH Sensor with Passive Radiation Shield</td>
</tr>
<tr>
<td>3665RD</td>
<td>Digital Rain Collector</td>
</tr>
<tr>
<td>3305ADD</td>
<td>Digital Anemometer</td>
</tr>
<tr>
<td>6470-20</td>
<td>WaterScout SMEC 300 Sensor with 20 ft (6.1 m) Cable</td>
</tr>
<tr>
<td>6460-20</td>
<td>WaterScout SM 100 Sensor with 20 ft (6.1 m) Cable</td>
</tr>
<tr>
<td>6450WD20</td>
<td>Watermark Sensor with 25 ft (7.6 m) Cable</td>
</tr>
<tr>
<td>3667</td>
<td>External (Soil) Temperature Sensor with 6 ft (1.8 m) Cable</td>
</tr>
<tr>
<td>3666</td>
<td>Leaf Wetness Sensor</td>
</tr>
<tr>
<td>3670I</td>
<td>LightScout Silicon Pyranometer</td>
</tr>
<tr>
<td>3668I</td>
<td>LightScout Quantum Light Sensor</td>
</tr>
</tbody>
</table>

#### Retriever

**COLLECT THE DATA**

**WatchDog Retriever**
- Receives all data from Pup network, each Retriever supports up to 16 Pups
- Includes USB Flash Drive and USB data cable
- Includes 6 standard non-rechargeable batteries. Can also be powered by DataScout modem, Direct-Connect cable or Solar Power Package

**WatchDog Retriever**
- Includes 5W solar panel and 6V 4.5Ah rechargeable battery
Sensor Pup Stations

- The most common Sensor Pups and sensors have been bundled together to simplify ordering
- Pup Stations are built on a unique mounting bracket to allow for simple installation
- Pup Stations (except ET Pup) have available sensor ports, allowing for additional/future expansion

WatchDog Plant Disease Pup Station
- Includes Pup and these sensors:
  - Rainfall
  - Temperature/RH
  - Leaf Wetness
- One available sensor port

WatchDog ET Pup Station
- Includes Pup and sensors:
  - Rainfall
  - Temperature/RH
  - Solar Light
  - Wind Speed/Direction
- No available sensor ports

WatchDog Plant Growth Pup Station
- Includes Pup and these sensors:
  - PAR Light
  - Temperature/RH with Aspirated Radiation Shield and solar charging system
- Two available sensor ports

WatchDog Weather Station
- Includes Pup and sensors:
  - Rainfall
  - Temperature/RH
  - Wind Speed/Direction
- One available sensor port

WatchDog Plant Disease Pup Station
- Includes Pup and these sensors:
  - Rainfall
  - Temperature/RH
  - Leaf Wetness
- One available sensor port
Sensor Pup Options

100% Customizable

LightScout UV / Solar Radiation / PAR Light Sensors
LightScout Quantum Sensor Bars
WaterScout SM 100 Soil Moisture Sensor
WaterScout SMEC 300 Soil Moisture, EC, and Temperature Sensor
Watermark Soil Moisture Sensor
Leaf Wetness Sensor
Digital Temperature / Humidity Sensor with Passive Radiation Shield
Digital Temperature / Humidity Sensor with Aspirated Radiation Shield
External (Soil) Temperature Sensor
Barometric Pressure Sensor
CO2 Sensor
Irrigation On/Off Sensor
Digital Rain Collector
Digital Anemometer

Sensor Specifications on Pages 22-23
## WatchDog ® Weather Stations & Data Loggers Comparison Chart

### 2000 Series Weather Stations

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### Retriever & Pups Wireless Sensor Network - All Frequencies

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### 1000 Series Micro Stations

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### A-Series Loggers

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### Sprayer Station

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</table>
Retriever logs sensor data from its network of Pups - up to 16 Pups per network.

- Single button operation: switch modes, download data, upload configuration, and check battery status
- Tri-colored LEDs indicate mode, battery level, data communication status, and configuration status
- Non-volatile memory preserves your logged data, even when the batteries are removed
- Transfer data or configure the system via flash drive, direct PC connection, or

Datascout Modem (see next page)
- Internal flash memory on the Retriever will hold approximately 6 months of data (for a 10-Pup network using 15 minute logging intervals)
- Spectrum-supplied USB flash drive will hold several years of data at the Retriever (for a 10-Pup network using 15 minute logging intervals)
- 3.5mm stereo port for computer connection USB cable (included)
- AUX port for wireless communication and power connection (DataScout Cellular or WiFi modem)
- Includes six non-rechargeable AA batteries (up to 8 months typical life)
- DC port for optional AC/DC power adapter (Max 17VDC)
- Optional solar power package includes 5W solar panel and 6V 4.5Ah rechargeable battery
- Retriever & Pups Launch Utility software included on USB flash drive

Optional Accessories

3999 Solar Power Package
Includes 5W solar panel and 6V 4.5Ah rechargeable battery

3396TPS Tripod Mount with Stakes
Includes Mounting Bracket and Hardware - For Retrievers or Pups

3910 WatchDog Retriever 900 MHz
3911 WatchDog Retriever 2.4 GHz
3912 WatchDog Retriever 868 MHz
XXXX WatchDog Retriever 900 MHz (AU/NZ)

Optional Accessories

SpecWare Software
- SpecWare Pro software version 9.6 or later may be used to view Pup data on PC
- If using the SpecConnect Web Portal, then all data can be viewed online (SpecWare software not required)

3654P9 Spec 9 Pro Software
Modems

- Communicate data to the web using either a Cellular or Wi-Fi signal
- Single button operation: test communications, pair with station, and check battery status
- Tri-colored LEDs indicate battery level, data communication, and wireless signal/connection status
- Power options: Choose between Solar power package which includes rechargeable battery and 5W solar panel, or the AC/DC power adapter (Max 17VDC)
- Required for connection to SpecConnect, sold separately
- Provides power to attached Watchdog Stations and Retrievers

Compatibility Requirements:
- WatchDog Retriever - Item 3910 WatchDog Retriever (with non-rechargeable batteries). The DataScout Modem and the Retriever will share the power from the solar power package
- Use with WatchDog 2000 Series Weather Stations - the station must be running firmware version 7.6 or above. Contact for details
- Partner with WatchDog 2000 Series Mini Stations - The station must be running firmware version 4.1 or above. Contact for details

Cellular Modems

3923M 3G HSPA+ Cellular Modem
GSM 3G HSPA+ Cellular (Canadian, US and Mexico customers). Requires power selection from options below

3924M 3G HSPA+ Cellular Modem
GSM 3G HSPA+ Cellular (for all other international markets). Requires power selection from options below

Wi-Fi Modems

3920 Wi-Fi Modem - AC/DC Powered
Includes AC/DC Power Cord

Power Options

3999 Solar Power Package
Includes 5W solar panel and 6V 4.5Ah rechargeable battery

3926 AC/DC Power Cord

What Do You Want To Measure?
You can customize your WatchDog network, using different sensors based on the data you want to collect and analyze for better output performance. See WatchDog Sensors and Accessories, pages 12, 22-23
Our award winner for Innovation in Technology. Manage your crop based on YOUR weather, not the airport’s.

Model 2900 ET
- The most powerful package for optimizing your irrigation and IPM decisions
- Measures wind direction, wind speed, air temperature, relative humidity, dew point, rainfall, solar radiation, evapotranspiration, with 5 available external sensor ports
3350WD2 WatchDog® 2900ET Weather Station

Model 2550
- Ideal for fast, on-demand deployment without measuring rainfall
- Measures wind direction, wind speed, air temperature, relative humidity, dew point, with 6 available external sensor ports
3320WD2 WatchDog® 2550 Weather Station

Model 2800
- Ideal where multiple sensor measurements are required for temperature, soil moisture, crop canopy light, or leaf wetness data
- Plug in up to 8 external sensors, plus 1 optional rainfall sensor
3345WD2 WatchDog® 2800 Weather Station

2000 Series Weather Stations

WatchDog 2000 Series Weather Station Features

<table>
<thead>
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<th>Specifications</th>
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Available ports for SMEC 300 Sensors: 1, 2, 2, 2
Operating temperature range: -22 to 130°F (-30 to 55°C)
2000 Series Mini Stations

Monitor microclimates with up to 4 external sensor channels.
- Same power, flexibility, and accuracy as the 2000 Series Weather Stations
- Measure temperature, humidity, quantum light, and more (varies by model). Also monitors degree day models and chill hour data
- Customize your Mini Station with 1 to 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 198 days of data with a 30 minute interval). Capacity is 89 days when using WaterScout SMEC 300 sensors
- 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
- Use the optional alarms to warn if a sensor exceeds high and low limits
- Communicate via wireless, cellular, shuttle, or direct connect also compatible with the new WatchDog® Station Pups, DataScout™ Modems
- 12-month battery power source (four AA alkaline batteries included)
- Requires SpecWare™ Basic or Pro software, or DataScout™ Modem and SpecConnect

Model 2475 Plant Growth Station
- Ideal for greenhouses - includes sensors for quantum (PAR) light, air temperature, relative humidity, with 1 available external sensor port
- Computes and displays Daily Light Integral (DLI), dew point and degree days; live display of current light and cumulative light over the day
- 3686WD Model 2475 WatchDog® Weather Station

Model 2400 External Sensor Station
- Ideal where multiple sensor measurements are required for temperature, soil moisture, crop canopy light, or leaf wetness data
- Plug in up to 4 external sensors
- 3685WD Model 2400 WatchDog® Weather Station

Model 2425 Temperature Station
- Measures air temperature with 3 available external sensor ports
- Plug in up to 3 external sensors
- 3683WD Model 2425 WatchDog® Weather Station

Model 2450 Temperature/RH Station
- Measures air temperature, relative humidity, with 2 available external sensor ports
- Computes and displays dew point.
- 3684WD Model 2450 WatchDog® Weather Station

Model 2475 Plant Growth Station

Model 2400 External Sensor Station

Model 2425 Temperature Station

Model 2450 Temperature/RH Station

WATCHDOG® 2000 SERIES MINI WEATHER STATION FEATURES

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What Do You Want To Measure?

You can customize your WatchDog network, using different sensors based on the data you want to collect and analyze for better output performance.
Pre-Packaged Stations

WatchDog® 2000 Series Plant Disease Station
- Includes WatchDog Mini Station Model 2450, leaf wetness sensor and rainfall sensor
- View current conditions on LCD screen, as well as track severity indicators from onboard plant disease models
- Requires SpecWare™ Basic or Pro software or a DataScout Modem and SpecConnect
- University published disease models (sold separately) can be added to Specware or SpecConnect (Pro version required) for more accurate disease and pest monitoring
- Optional Wireless communication allows you to receive real-time conditions and send condition alarms to your PC

3684WDPD WatchDog 2000 Series Plant Disease Station

WatchDog® 1000 Series Plant Disease Micro Station
- Data log current conditions and historical plant disease severity indicators
- Includes Watchdog Model 1450 Micro Station, leaf wetness sensor, tipping bucket rain gauge, and radiation shield
- Requires SpecWare™ Basic or Pro software
- University published disease models (sold separately—requires SpecWare 9 Pro) can be added for more accurate disease and insect monitoring

3684PD1 WatchDog® Plant Disease Micro Station

Plant Growth Micro Stations
Monitor conditions crucial to growing high quality plants
- Includes a WatchDog Model 1450 Micro Station, Quantum/PAR light sensor and radiation shield
- Requires SpecWare 9 Basic or Pro software

3684PAR1 WatchDog® Plant Growth Micro Station

TIP:
WatchDog Irrigation Stations can be found on page 40.
WatchDog® 1000 Series Micro Stations

Micro Stations offer a cost-effective way to record multiple environmental conditions.

- Internal sensors can include temperature and humidity (radiation shield recommended)
- With up to 4 external sensor ports, you choose the sensors you need
- Up to 8 sensor values with the Model 1650 using the WaterScout® SMEC 300 Soil Moisture/EC/Temperature Sensor
- LCD displays current sensor readings and battery level
- Select measurement intervals from 1 to 60 minutes
- Log 10,584 (8,064 with SMEC 300) intervals (220 days at 30 minute intervals)
- Data is stored in fail-safe non-volatile memory
- Water-resistant case (radiation shield or enclosure recommended for outdoor use)
- 12-month battery life (CR2450, included)
- Transfer data with a pc cable (supplied with SpecWare) or Data Shuttle
- Requires SpecWare™ 9 Basic or Pro software

Operating temperature range:
-4 to 130°F (-20 to 55°C)
Temperature range: -40 to 185°F (-40 to 85°C)
Accuracy: ±1°F (±0.5°C) at -4 to 122°F (-20 to 50°C), else ±2.2°F (±1.2°C)
RH range: 0 - 100%, Accuracy: ±3% at 77°F (25°C, 10 - 90%), else ±5%

### 1120 Data-Logging Rain Gauge

High accuracy, low-maintenance tipping bucket rain collector
- Meets NWS guidelines with an 8 in (20.5 cm) diameter collector
- The included data logger can log up to 10,584 intervals
- Select intervals from 1 to 60 minutes [maximum 10.23 in (26.0 cm) per interval]
- Rain collector mounting bracket and hardware included
- Record rainfall in either metric (mm) or US (in) units
- Accuracy: ±2% at < 2 in (5 cm) per hour
- Requires SpecWare 9 Basic or Pro

**SMARTGROWTH™**
**WatchDog® A-Series and B-Series Data Loggers**

**A-Series Data Loggers**

The most affordable way to track environmental conditions for analysis.

- Measure temperature, humidity, leaf wetness and CO₂
- LCD display confirms logger operation and displays last sensor readings
- Select measurement intervals from 1 to 120 minutes
- Log 4,000 to 8,000 intervals in fail-safe EEPROM data memory
- Water-resistant case (IP65 for A150 and A110, IP54 for A125 and A130); A160 is for indoor use only and must be protected from moisture
- Removable soft caps keep ports clear of debris

- Includes CR2 battery, 12-month life (except A160, which requires A/C; international adapter included)
- SpecWare™ 9 Basic or Pro (Page 24) and the A-Series PC Connection Cable are required (see below)

Operating temperature range: -22 to 140°F (-30 to 60°C); A160: 32 to 122°F (0 to 50°C)

Temperature range: -40 to 185°F (-40 to 85°C); A160: 14 to 140°F (-10 to 60°C)

Accuracy: ±1.1°F (±0.6°C) at 4 to 122°F (-15 to 50°C), else ±2.2°F (±1.2°C); A160: ±1.0°F (±0.6°C)

RH range: 0 to 100%, Accuracy: ±3% from 10-90% at 77°F (25°C), else ±5%

CO₂ range: 0 to 9999 ppm, Accuracy: ±50 ppm ±5% of reading (0 to 2000 ppm), else unspecified

**B-Series Data Loggers**

Space efficient and inexpensive logging technology.

- Ideal for shipping containers or situations where multiple areas need to be monitored
- Choose from temperature-only or temperature/humidity models
- Water resistant (IP56) stainless steel case
- Select measurement intervals from 1 to 120 minutes
- Log 2,000 to 8,000 intervals
- Integral non-replaceable battery
- SpecWare Basic or Pro software and the B-Series Docking Station are required

**WATCHDOG® A-SERIES AND B-SERIES DATA LOGGERS**

**DESCRIPTION**

**INTERNAL SENSOR**

**INTERVALS**

**LCD DISPLAY**

---

**MODEL A160**

3611A AIR TEMPERATURE RH, CO₂ 5,333 INDOOR USE ONLY (NO SHIELD AVAILABLE)

**MODEL A150**

3612A AIR TEMPERATURE RELATIVE HUMIDITY 5,333 OPTIONAL

**MODEL A130**

3610A AIR TEMPERATURE EXTERNAL LEAF WETNESS 4,000 INCLUDED

**MODEL A125**

3617A AIR TEMPERATURE EXTERNAL TEMPERATURE 4,000 RECOMMENDED

**MODEL A110**

3618A AIR TEMPERATURE 8,000 OPTIONAL

---

3661A WatchDog A-Series PC Connection Cable - USB

3663A Radiation Shield (needed for outdoor use)

---

**DESCRIPTION**

**INTERNAL SENSOR**

**INTERVALS**

**LCD DISPLAY**

---

**MODEL B102 TRH**

3621WD TEMPERATURE RELATIVE HUMIDITY 4000 NO

Temp Range: -4 to 185°F (-20 to 85°C)
Temp Accuracy: ±1.1°F from 5 to 149°F (±0.6°C from -15 to 85°C)
Humidity: 0 to 100%, ±5%

**MODEL B101 8K**

3620WD TEMPERATURE 8000 NO

Range: -40 to 185°F (-40 to 85°C)
Accuracy: ±1.1°F from 5 to 149°F (±0.6°C from -15 to 85°C)

**MODEL B100 2K**

3619WD TEMPERATURE 2000 NO

Range: -40 to 185°F (-40 to 85°C)
Accuracy: ±1.8°F from -22 to 158°F (±1.0°C from -30 to 70°C)

*Use included plastic bag when measuring soil temperature*

**Docking Station**

3655K1 WatchDog B-Series Docking Station - USB

---

Ideal for soil temperature
**WatchDog® Accessories & Communication Options**

### Accessories

- **Tripod Mount**
  - Rugged galvanized steel folding tripod and 3 ft (1 m) pole
  - 3396TPS

- **Radiation Shield**
  - Protect your Micro Station or logger from rain and measurement-distorting solar radiation. Compatible with 1000 Series Micro Stations and A-Series Data Loggers
  - 3663A

- **Sliding Enclosure**
  - Water resistant - mounts to pole or post. Compatible with 1000 Series Micro Stations
  - 3658A

- **Waterproof Enclosure**
  - Clamshell enclosure. Compatible with 1000 Series Micro Stations (Models 1400 or 1200, plus soil sensors)
  - 3659WD1

- **Alarm Output Module**
  - Triggers an external device based on a sensor reading. Compatible with WatchDog 2000 Series Stations (Full and Mini)
  - 3672

### Communication Options

- **Satellite Communications**
  - Sends your weather data to the web – anywhere there’s sky. Ideal for extremely remote locations with limited or no cellular signal. Includes satellite modem and solar panel with mounting brackets. Fully-charged power supply can operate 28 days without recharge. Option to power weather station with modem solar panel power supply. Iridium or Orbcomm data subscription required
  - 3388SI

- **Mid Range Wireless Communications - up to 2 mi (3 km)**
  - Experience the advantages of real-time weather information by connecting your 2000 Series Remote Weather Stations to a PC up to 2 mi (3 km) away (requires line of sight from Station to Base. Base station features a weatherproof case and 50 ft (15 m) cable (terminating in a 9-pin serial connection) to allow high mounting for the greatest range. Remotes include whip antenna, solar panel, and rechargeable batteries. 900 MHz
  - 3393B
  - 3393W

### Cables & Adapters

- **Short Range Modem Pair**
  - Use short-range modems to maintain signal on wired connections up to 4,000 ft (1.2 km). Has 9-pin serial connection on PC end.
  - 3365WD2

- **Direct Connect Cables for Weather Stations**
  - Connect your WatchDog Weather Station directly to your PC with a 75 ft (22.8 m) cable. Has 9-pin serial connection on PC end, may require USB adapter (Item 3661USB).
  - 3660-75SP

- **USB-to-3.5mm-Stereo-Plug Adapter**
  - Connect WatchDog and FieldScout® devices directly to your computer’s USB port
  - 3661U

- **USB-to-9-Pin-Serial Adapter**
  - Connect 9-pin Serial cables (such as Item 3661) directly to your computer’s USB port
  - 3661USB
WaterScout® SMEC 300 Soil Moisture/EC/Temperature Sensor

Measures soil moisture (Volumetric Water Content), EC, and temperature. Range: VWC: 0 to saturation (typically 50%), Accuracy: ±3%; EC: 0 to 10 mS/cm, Accuracy: ±2%. May require WaterScout Calibration Device. See page 41 for more information. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 6470-6 WaterScout SMEC 300 Sensor with 6 ft (1.8 m) Cable
- 6470-20 WaterScout SMEC 300 Sensor with 20 ft (6.1 m) Cable
- 6470CAL3V WaterScout Calibration Device
- 2251 Conductivity Standard, 1.41 mS/cm, 250 mL

WaterScout® SM 100 Soil Moisture Sensor

Measures soil moisture (Volumetric Water Content) with little or no disturbance to the root zone. Range: 0 to saturation (typically 50%), Accuracy: ±3%. Optional WaterScout Calibration Device. See page 40 for more information. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 6460 WaterScout SM 100 Sensor with 6 ft (1.8 m) Cable
- 6460-20 WaterScout SM 100 Sensor with 20 ft (6.1 m) Cable
- 6470CAL3V WaterScout Calibration Device

Watermark Soil Moisture Sensor

Measures soil moisture tension from 0 to 200 centibars. May require Watermark Adapter to connect original Watermarks to stations. See page 43 for more information. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 6450WD Watermark Sensor with 11 ft (3.3 m) Cable
- 6450WD20 Watermark Sensor with 25 ft (7.6 m) Cable

External (Soil) Temperature Sensor

Measure soil, air, or water temperature with a resistance-based sensor. Range: -25 to 212°F (-32 to 100°C). Accuracy: ± 1°F (±0.5°C). Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 3667 External (Soil) Temperature Sensor with 6 ft (1.8 m) Cable
- 3667-20 External (Soil) Temperature Sensor with 20 ft (6.1 m) Cable

Pressure Transducer

Adapts to Irrometer tensiometers and utilizes the dial gauge for measurements. See page 43 for more information. Accuracy: ±2%. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 3669 Pressure Transducer

Irrigation On/Off Sensor

Record and analyze relationships between irrigation periods and soil moisture. Does not control irrigation system, but monitors on/off periods. Range: On at 5psi. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 6451 Irrigation On/Off Sensor

LightScout® Silicon Pyranometer

Measure solar radiation between 300 and 1100 nanometers. Range: 2000 Series & Pups: 0 to 1500 W/m², Accuracy: ±5%; Micro Stations: 0 to 1250 W/m², Accuracy: ±5%. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 3670I LightScout Silicon Pyranometer

LightScout® UV Light Sensor

Measure UV radiation between 250 and 400 nanometers. Range: 0 to 200 µmol m⁻² s⁻¹, Accuracy: ±5%. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 3676I LightScout UV Light Sensor

LightScout® Quantum Light Sensors

Measure PAR light between 400 and 700 nanometers. Sensor bars average PAR light readings to minimize the effects of small shadows. Sensor bars are 19 in long and include mounting brackets. Range: 2000 Series & Pups: 0 to 3000 umol m⁻² s⁻¹, Accuracy: ±5%; Micro Stations: 0 to 2500 umol m⁻² s⁻¹, Accuracy: ±5%. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups

- 3668I LightScout Quantum Light Sensor
- 3668I3 LightScout Quantum 3 Light Sensor Bar
- 3668I6 LightScout Quantum 6 Light Sensor Bar
**Temperature (Micro) Sensor**
Measure surface temperature of leaves, buds, and other tiny mediums. Range: -25 to 212°F (-32 to 100°C). Accuracy: ±1°F (±0.5°C). Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups.

3667S  Temperature (Micro) Sensor

**Tipping Bucket Rain Collector**
Measure rainfall in 1/100 inch increments. Self-emptying and freeze resistant. Range: 0.01", 0.25 mm, Accuracy: ±2% at < 2 in (5 cm) per hour. Compatible with WatchDog 2000 Series Stations (Full and Mini) and 1000 Series Micro Stations.

3665R  Tipping Bucket Rain Collector

**Leaf Wetness Sensor**
Measure leaf wetness with a resistance-based sensor designed to replicate a leaf. Range: 0 (dry) to 15 (wet). Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups.

3666  Leaf Wetness Sensor

**Barometric Pressure Sensor**
Measure atmospheric pressure. Range: Standard Sensor: 26 to 32 inHg, 880-1080 hPa, Accuracy: ±0.05 inHg, ±1.7 hPa; High Altitude Sensor: 18.75 to 33.1 inHg, 635-1121 hPa, Accuracy: ±0.057 inHg, ±1.9 hPa. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups.

3671  Barometric Pressure Sensor - Standard
3671M  Barometric Pressure Sensor - High Altitude

**CO₂ Sensor**
Measure CO₂ levels in ppm using NDIR technology. Requires AC power. Not waterproof. Range: 0 to 4000 ppm, Accuracy: ±5% or 50 ppm. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups.

2655  CO₂ Sensor
2655X  CO₂ Sensor - International, with 110/220 VAC adapter

**Sensor Extension Cable**
20 ft (6 m) extension for all sensors (except digital sensors), connect up to 3 cables per sensor.

3664  Sensor Extension Cable

**General Input Cables**
Connect non-WatchDog sensors to your WatchDog Station. (Item 3673) Range: 0 to 3v, Accuracy: ±0.005V. (Item 3674) Range: 0 to 20.1 mA, Accuracy: ±1%. Compatible with WatchDog 2000 Series Stations (Full and Mini), 1000 Series Micro Stations, and Pups.

3673  0-3V Input Cable
3674  4-20mA Input Cable

**Digital Temperature/RH Sensor with Aspirated Radiation Shield**
Digital temperature and RH sensor with 6 ft (2 m) cable, includes solar charging system to power internal fan. Range: -40 to 212°F (-40 to 100°C), 0 to 100% RH, Accuracy: ±0.54°F from 50 to 131°F (0.3°C from 10 to 55°C), ±2.5% RH. Compatible with WatchDog Pups only. Operating temperature 14 to 140°F (-10 to 60°C).

3613ARS  Temperature/RH Sensor with Aspirated Radiation Shield

**Digital Temperature/RH Sensor with Passive Radiation Shield**
Digital temperature and RH sensor with 6 ft (2 m) cable. Range: -40 to 212°F (-40 to 100°C), 0 to 100% RH, Accuracy: ±0.54°F from 50 to 131°F (0.3°C from 10 to 55°C), ±2.5% RH. Compatible with WatchDog Pups only.

3613THS  Temperature/RH Sensor with Passive Radiation Shield

**Digital Rain Collector**
Measure rainfall in 1/100 inch increments. Self-emptying and freeze resistant. Range: 0.01", 0.25 mm, Accuracy: ±2% at < 2 in (5 cm) per hour. 6 ft cable. Compatible with WatchDog Pups only.

3665RD  Digital Rain Collector
3665DC  Digital Cable - 6 ft

**Digital Anemometer**
Measure wind speed and direction. 40 ft cable. Range: 0 - 359°, Accuracy: ±3°, Range: 0, 1 to 200 mph (0, 1 to 322 km/h, Accuracy: ±2 mph (±3 km/h), ±5%. Compatible with WatchDog Pups only.

3305ADD  Digital Anemometer
SpecConnect

- Monitor your crops from wherever you are with the SpecConnect cloud solution
- See real-time conditions on your computer, smart phone, or tablet
- View current conditions with a mapped view of your stations
- Set custom thresholds to send alerts via text message and/or email
- Configure your equipment network from your computer
- Choose among a wide selection of standard reports for your weather data
- Create your own customized reports (Pro subscription required)
- Proactively manage disease and insects using forecast models (optional subscription)
- Easily export data and reports to share or import to other applications

SpecWare 9 Basic

- Easily download, analyze, and produce basic reports from the weather data collected on your WatchDog® Micro Stations and data loggers
- Eliminate valuable time exporting the data and performing calculations in tedious spreadsheet programs
- Spec 9 Basic automatically assigns each WatchDog Data Logger Station to its own “logger location” directory, which is appended every time you download new data
- Includes USB cable and manual
- Download the software from specmeters.com (activation required)

Spec 9 Basic does not support disease models or the 2000 Series Full or Mini Weather Stations, or Retriever & Pups

3654B9 Spec 9 Basic Software
3654B9X Spec 9 Basic Extra User License
3654B9U Spec 9 Basic Upgrade*
3661U USB-to-3.5mm-Stereo-Plug Adapter

* Does not include USB cable

SpecWare 9 Pro

Powerful analysis tools that are easy to use.
- Graph on-the-fly with an interactive graphing window
- Build, customize, and save your most important report formats or choose from 15 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 phone at frost temperatures or other sensor conditions
- Automatic 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
- Import data files from other applications
- International features include handling date, time, and numbers with regional formats and Metric or US measurements
- Includes USB cable and manual
- Download the software from specmeters.com (activation required)

3654P9 Spec 9 Pro Software
3654P9X Spec 9 Pro Extra User License
3654P9U Spec 9 Pro Upgrade*
3661U USB-to-3.5mm-Stereo-Plug Adapter

* Does not include USB cable

BASIC VS. PRO
COMPARING SPEC 9 BASIC TO SPEC 9 PRO

<table>
<thead>
<tr>
<th></th>
<th>Basic</th>
<th>Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-demand graphing</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manage Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibration adjustment</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Automatic data append</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Single file per logger</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>International data format</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Reports</td>
<td></td>
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<tr>
<td>Standard reports</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Custom reports</td>
<td></td>
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</tr>
<tr>
<td>Disease &amp; Insect models</td>
<td>OPT</td>
<td>OPT</td>
</tr>
<tr>
<td>“Pest Alert” report models</td>
<td>OPT</td>
<td>OPT</td>
</tr>
<tr>
<td>Communications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct connect or modem</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Wireless capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular or wi-fi modem</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Auto download</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

SpecWare™ 9 software is compatible with Windows XP and later.

GO TO SPECMETERS.COM/UPDATES TO ENSURE YOUR SOFTWARE VERSION IS COMPATIBLE WITH OUR NEWEST WATCHDOG MODELS.
Disease & Insect Models

Become more proactive in your management of disease and insects by adding forecast modules to your Spec 9 Pro software.

Each package uses field-tested and validated algorithms along with your data to forecast the potential for the appearance of your crop’s most notorious enemies.

Quickly produce the documentation needed to support your IPM decisions.

Forecast Model Packages for SpecWare Pro

<table>
<thead>
<tr>
<th>Package Code</th>
<th>Package Name</th>
<th>Required Sensors</th>
<th>Models Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>3656AP</td>
<td>Apple/Pear Alert Package</td>
<td>Leaf wetness and temperature</td>
<td>Apple Scab* (Modified Mills, Cornell, Washington State)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fire Blight (Maryblyt, Cougarblight)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sooty Blotch/Flyspeck*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Insect Models</td>
</tr>
<tr>
<td>3656CH</td>
<td>Cherry Alert Package</td>
<td>Leaf wetness and temperature</td>
<td>Leaf Spot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Insect Models</td>
</tr>
<tr>
<td>3656GA</td>
<td>Grape Alert Package</td>
<td>Leaf wetness, relative humidity, and temperature</td>
<td>Powdery Mildew* (Thomas-Gubler)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Black Rot* (Spots)</td>
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<td></td>
<td>Downey Mildew</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Botrytis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Phomopsis Cane Leaf Spot</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Insect Models</td>
</tr>
<tr>
<td>3656PO</td>
<td>Potato Alert Package</td>
<td>Temperature, relative humidity, and rain</td>
<td>Early Blight</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Late Blight (BliteCast)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Insect Models</td>
</tr>
<tr>
<td>3656TU</td>
<td>Tomato Alert Package</td>
<td>Leaf wetness and temperature</td>
<td>Tomcast*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Insect Models</td>
</tr>
<tr>
<td>3656TU</td>
<td>Turf Alert Package</td>
<td>Air and soil temperature, relative humidity, and rain</td>
<td>Brown Patch (Schumann)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pythium (Nutter, Schein)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dollar Spot (Hall, Mills/Rockwell)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Insect Models</td>
</tr>
</tbody>
</table>

*Can be displayed on WatchDog® 2000 Series Mini Stations
GO-TO STRATEGY
KEEP SPRAY WHERE IT BELONGS FOR SAFE, PRECISE CHEMICAL APPLICATION

Reduce pesticide drift complaints and monitor your current weather conditions. Mount it right on your equipment or vehicle!

Pesticide drift is increasingly important to commercial applicators. Now you can monitor wind speed and direction and log weather conditions with the ultrasonic WatchDog® Sprayer Station. Accurate data helps pesticide applicators make important decisions regarding weather conditions that affect safety, drift, and proper pesticide application. User controlled data logging of weather conditions provides evidence of suitable conditions for pesticide application.

Weather will never be an issue for you with this tool.

- This all-in-one weather station measures air temperature, humidity, dew point, wind chill, barometric pressure and apparent wind speed and direction
- Station uses an internal compass and GPS to adjust the wind sensor values by subtracting the vehicle speed and direction to compute the true values
- Field replaceable humidity sensor
- Handles adverse conditions with a UV-stabilized, compact housing that is fully waterproof and resistant to chemicals
- Reliability is enhanced by eliminating moving parts: the traditional wind vane and cups have been replaced with ultrasonic transducers
- Continuously log your weather parameters at a user-selectable rate or hit the snapshot button to capture current conditions at a specific moment

Integrates with Raven Envizio Pro, Viper Pro and Viper 4

Sprayer Station

3349SSCH  WatchDog® Sprayer Station with Console
Save by purchasing the Station and Console together

3349SSH  WatchDog® Sprayer Station
Includes sensor unit with magnetic base, 21 ft (7 m) cable with vehicle power and 9-pin serial connectors, and display/logging program for Windows Mobile PDA or Windows Laptop

3349CN  WatchDog® Sprayer Station Console
Includes console with built-in data logger, USB-to-3.5mm stereo cable, and software CD

349H  Replacement Humidity Sensor
3661USB  USB-to-9-Pin-Serial Adapter

SPECIFICATIONS FOR SPRAYER STATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Resolution - Speed</td>
<td>0.1 mph (0.2 km/h); Direction 1°</td>
</tr>
<tr>
<td>Wind Speed Range</td>
<td>0 to 90 mph (0 to 145 km/h)</td>
</tr>
<tr>
<td>Wind Speed Accuracy</td>
<td>&lt;12 mph (19 km/h): ±1.1 mph (1.7 km/h) ±1%; &gt;12 mph (19 km/h): ±2.3 mph (3.7 km/h) or ±5%</td>
</tr>
<tr>
<td>Wind Direction Accuracy</td>
<td>4 to 11 mph (6 to 18 km/h): ±5°; &gt;12 mph (19 km/h): ±2°</td>
</tr>
<tr>
<td>Wind Accuracy Temperature Range</td>
<td>32° to 131°F (0° to 55°C)</td>
</tr>
<tr>
<td>Temperature Accuracy</td>
<td>±1.8°F (±1°C) with wind above 4.6 mph (7.4 km/h)</td>
</tr>
<tr>
<td>Relative Humidity Range</td>
<td>10 to 95%</td>
</tr>
<tr>
<td>Relative Humidity Accuracy</td>
<td>±5% with wind above 4.6 mph (7.4 km/h)</td>
</tr>
<tr>
<td>Barometric Pressure Range</td>
<td>24 to 33 in-Hg (800 to 1100 hPa)</td>
</tr>
<tr>
<td>Barometric Pressure Accuracy</td>
<td>±0.029 in-Hg (±1 hPa)</td>
</tr>
<tr>
<td>Power Supply Voltage</td>
<td>9 to 40 VDC; Current: &lt;90 mA</td>
</tr>
</tbody>
</table>
WeatherTrackers

Monitor weather conditions without the need for a computer.

- Record and display conditions in your orchard, vineyard or greenhouse that can alert you to insect and plant disease pressure
- Values are calculated based on sensor readings taken every 15 minutes

Degree days:
- Program up to three degree-day memories and one chill-hour memory
- Solar radiation shield and 15-minute degree-day data point intervals result in exceptionally accurate degree-day calculations

Built-in Data Logger:
- Store your events in fail-safe, non-volatile memory
- Replace the batteries without losing valuable weather data
- More than enough memory for a complete growing season

LCD display:
- Displays the current conditions in addition to the daily high/low temperature readings, degree days, leaf wetness hours*, disease pressure*, DLI/DIF (Daily Light Integral and day/night temperature difference)
- Recall the last 30 days of detail data, as well as 12 months of summaries
- Current readings are updated every 15 seconds
* on applicable models

Battery powered:
- 8-month battery power source (9V battery included) means no solar panels to purchase or maintain

SPECIFICATIONS FOR WEATHERTRACKERS

<table>
<thead>
<tr>
<th>Item #</th>
<th>Model #</th>
<th>Temp</th>
<th>Quantum</th>
<th>Leaf</th>
<th>Wetness</th>
<th>Disease</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse Growth Tracker 3501PAR</td>
<td>305</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Degree Day Tracker 3500</td>
<td>300</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>Apple/Pear Pest Alert 3504</td>
<td>320</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Sooty Blotch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grape Pest Alert 3512</td>
<td>330</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Powdery Mildew Black Rot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Greenhouse Growth Tracker
Monitor both current and cumulative light levels

Apple/Pear Pest Alert
Built-in disease models allow you to make adjustments as soon as it is needed.
Multi-Parameter U-50 Series Meters

Simultaneously monitor, collect, and store up to 11 water quality parameters with these high-performance meters. Measured parameters include pH, ORP, dissolved oxygen, salinity, TDS, seawater specific gravity, temperature, turbidity, and water depth. The waterproof control unit is designed to be both rugged and easy to operate, making it a perfect match for fieldwork – ideal for sampling rivers, groundwater, wells, lakes, runoff / drainage, and a myriad of other ecological and agricultural applications. Refer to the chart below to help decide which model best fits your needs.

Control Unit Features:

- Easy to read, backlit display
- Display up to 11 parameters simultaneously
- Auto-calibration feature for pH, dissolved oxygen, turbidity, and depth provides hassle-free calibration
- One-hand operation
- Quick-connect connector (cable to control unit)
- Shock resistant cover

Sensor Probe Unit Features:

- Ultra-sensitive turbidity sensor
- Minimum dissolved oxygen sensor maintenance with screw-on type membrane cap
- Chemical resistant construction materials
- Field replaceable sensors

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2195-2</td>
<td>U51-2 Meter with 2m Cable</td>
</tr>
<tr>
<td>2195-10</td>
<td>U51-10 Meter with 10m Cable</td>
</tr>
<tr>
<td>2196-2</td>
<td>U52-2 Meter with 2m Cable</td>
</tr>
<tr>
<td>2196-10</td>
<td>U52-10 Meter with 10m Cable</td>
</tr>
<tr>
<td>2196-30</td>
<td>U52-30 Meter with 30m Cable</td>
</tr>
<tr>
<td>2197-2</td>
<td>U52G-2 Meter with 2m Cable</td>
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<tr>
<td>2197-10</td>
<td>U52G-10 Meter with 10m Cable</td>
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<tr>
<td>2197-30</td>
<td>U52G-30 Meter with 30m Cable</td>
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<tr>
<td>2198-2</td>
<td>U53-2 Meter with 2m Cable</td>
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<td>2198-10</td>
<td>U53-10 Meter with 10m Cable</td>
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<td>2198-30</td>
<td>U53-30 Meter with 30m Cable</td>
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<td>2199-2</td>
<td>U53G-2 Meter with 2m Cable</td>
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<td>2199-10</td>
<td>U53G-10 Meter with 10m Cable</td>
</tr>
<tr>
<td>2199-30</td>
<td>U53G-30 Meter with 30m Cable</td>
</tr>
</tbody>
</table>

Water quality monitor displays 11 parameters simultaneously.
Frost Alerts

Visual Frost Alert

Spot frost conditions easily in your vineyard or orchard.

- When temperatures approach freezing, the high-powered LED light (visible from about two miles) changes flash frequency and pattern to indicate temperature conditions at a glance
- Sensor cable is 6 ft (1.8 m) long for ease of placement
- Requires 3 AAA lithium batteries (not included)

Go to www.specmeters.com for more options and models for humidity, flood irrigation, and power monitoring

Temperature range: -22 to 130°F (-30 to 55°C)
Accuracy: ±1.1°F (±0.6°C) at -4 to 122°F (-20 to 50°C), else ±2.2°F (±1.2°C)

<table>
<thead>
<tr>
<th>Temperature Range</th>
<th>Interval</th>
<th>Flashes per Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 37°F (3°C)</td>
<td>30 Seconds</td>
<td>1</td>
</tr>
<tr>
<td>34 to 37°F (1 to 3°C)</td>
<td>30 Seconds</td>
<td>2</td>
</tr>
<tr>
<td>32 to 34°F (0 to 1°C)</td>
<td>15 Seconds</td>
<td>3</td>
</tr>
<tr>
<td>30 to 32°F (-1 to 0°C)</td>
<td>5 Seconds</td>
<td>4</td>
</tr>
<tr>
<td>Below 30°F (-1°C)</td>
<td>1 Second</td>
<td>1</td>
</tr>
</tbody>
</table>

Color Frost Alert

Protect your high-value crops.

- Easy visual signal for helicopter pilots or distance viewing
- When temperatures approach freezing, the high-powered LED light (visible from about two miles) changes color and flash frequency to indicate temperature conditions at-a-glance
- Shuts off above 37°F (2.8°C) to conserve power
- Requires 6V lantern battery (not included)

Color Frost Alert Warning Colors

- Green – Above 34°F (1°C)
- White – 32° to 34°F (0-1°C)
- Red – Below 32°F (0°C)
- Flashing Red – Below 30°F (-1°C)
Digital Microscopes & Macroscopes

IPM Scope

Portable digital microscope at an affordable price.

The IPM Scope combines a digital camera, precision optics, and LED lighting into a powerful handheld microscope that connects to your computer via USB:

- 40x and 140x magnification
- View magnified image right on your computer screen
- Included software allows you to customize your images with labels, markers, time stamps, and measurement scales
- Archive still images or send files via e-mail
- Requires computer connection to operate, includes software
- Video software upgrade provides the ability to capture live videos and time lapse sequences of insect movement

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

Go to www.specmeters.com for more models and accessories

IPM Scope CAM2

View images in the field with a portable camera/scope. The 2 megapixel IPM Scope CAM2 allows you to capture high resolution pictures and videos in the field. View pictures instantly on the built-in LCD display and then transfer them via USB cable to a PC, includes software:

- LED lighted unit features 10x and 40x optical zoom and up to 200x digital zoom
- Battery life of up to 5 hours
- Includes an adjustable-height stand
- 2.8 inch LCD display
- 2GB internal flash memory
- Easy to use touch screen controls
- 4 built in white-light LEDs with brightness control
- Rechargeable lithium ion battery included

2862       IPM Scope CAM2

Macroscopes

Identify pests and diseases up close.

- Macrooscope 25 provides 25X magnification over a wide 5 mm (3/16 in) field of view
- Macrooscope 45 provides 45X magnification over a wide 3 mm (2/16 in) field of view
- Positionally correct image includes an interchangeable scale
- Incorporates a measuring scale providing measurements in inches or millimeters
- Can be used for distance viewing when close-up lens is removed

2851       Macroscope 25 with hard carrying case
2852       Macroscope 45 with hard carrying case
**Sunlight** > How much or how little?

Put as many as you like anywhere you like to find out exactly what light is available in that precise location. A simple way to measure how much sunlight even a shaded area really gets. Stick it in a pot, in your turf or anywhere!

Growers can position the meters throughout the greenhouse, as well as outside, to compare differences in light levels and the effect on plant growth and quality.

Works Everywhere!

**LightScout® DLI 100 Light Meters**

Greenhouse and Turf Models

Measure the light “falling” on your plants.

- Measures PAR light (Photosynthetically Active Radiation)
- Meter runs for 24 hours to calculate the Daily Light Integral (DLI)
- Real-time intensity levels are shown in µmol·m⁻²·s⁻¹ every 4 seconds
- Greenhouse and Turf models available - each model provides greater resolution where it’s needed most
- Helps you make decisions to increase plant growth and quality
- Simultaneously compare light between multiple locations
- Simple, one button operation
- Affordable, first step in measuring light
- Battery included

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3405G3</td>
<td>LightScout® DLI 100 Meter - Greenhouse (set of 3)</td>
<td></td>
</tr>
<tr>
<td>3405G</td>
<td>LightScout® DLI 100 Meter - Greenhouse (1 unit)</td>
<td></td>
</tr>
<tr>
<td>3405T3</td>
<td>LightScout® DLI 100 Meter - Turf (set of 3)</td>
<td></td>
</tr>
<tr>
<td>3405T</td>
<td>LightScout® DLI 100 Meter - Turf (1 unit)</td>
<td></td>
</tr>
</tbody>
</table>

**BUY TWO GET ONE FREE**

“Measuring DLI inside the greenhouse can be very revealing, since growers usually rely on their eyes to determine the light levels and the human eye is a terrible light sensor because it is so effective at adjusting to different light environments.”

James E. Faust  
Associate Professor of Horticulture  
Clemson University

**GENERALIZED PLANT RESPONSES TO DIFFERENT LIGHT LEVELS**

<table>
<thead>
<tr>
<th>Relative Light Level</th>
<th>DLI* - Daily Light Integral</th>
<th>Light Intensity** at Noon</th>
<th>Generalized Plant Growth Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>2 to 5</td>
<td>100 to 200</td>
<td>Poor quality</td>
</tr>
<tr>
<td>Low</td>
<td>5 to 10</td>
<td>200 to 400</td>
<td>Minimum acceptable</td>
</tr>
<tr>
<td>Medium</td>
<td>10 to 20</td>
<td>400 to 800</td>
<td>Good quality</td>
</tr>
<tr>
<td>High</td>
<td>20 to 30</td>
<td>800 to 1,200</td>
<td>Excellent quality</td>
</tr>
<tr>
<td>Very High</td>
<td>30 to 60</td>
<td>1,200 to 2,000</td>
<td>Excellent quality</td>
</tr>
</tbody>
</table>

* Moles  
** Micromoles (µmol/m²·s)

**LighTscout® Red/Far-Red Meter**

Red/Far-Red light ratio helps plants determine their proximity to each other, which affects how tall or full they grow.

- Cost-effective Red/Far-Red measurement
- Displays the Red/Far-Red ratio on the LCD screen
- Press a button to display 660 nm and 730 nm readings
- Includes soft-sided case (also available separately as Item 7500)

**3412** LightScout® Red/Far-Red Meter

---

**LighTscout® UV Meter**

Handheld meter monitors critical UV radiation (250-400 nm).

- Determine UV filtering capacity of greenhouse shades and glass barriers
- Range is 0 to 200.0 µmol·m⁻²·s⁻¹ (full sunlight)

**3414F** LightScout® UV Meter
**7500** Soft-Sided Carrying Case

---

**LighTscout® Quantum/PAR Meters**

Measure the light used for plant growth - PAR is a more valuable measurement than foot-candles, as it measures only the light used by plants for photosynthesis.

- Measures photosynthetically active radiation (PAR) from 400 to 700 nm
- Range of 0 to 2,000 µmol·m⁻²·s⁻¹
- Available in a variety of configurations for your convenience

**3415F** LightScout® Quantum Meter
**3415FSE** LightScout® Dual Solar/Electric Quantum Meter
**3415FXSE** LightScout® Dual Solar/Electric Quantum Meter - External Sensor
**3415FQF** LightScout® Quantum and Foot-Candle Meter
**7500** Soft-Sided Carrying Case
Sold separately

---

**Foot-Candle Meter**

Displays immediate light level in units of foot-candles.

- An affordable light measurement solution
- Precision photodiode with cosine correction

**3413F** LightScout® Foot-Candle Meter
**7500** Soft-Sided Carrying Case
Sold separately
External Light Sensor Reader

Reads any of Spectrum’s external light sensors.

- Plug in a sensor, choose it on the LCD, and start measuring UV, Quantum Light, or Solar Radiation
- Sensors can also be used with WatchDog® Weather, Mini, and Micro Stations
- LightScout® External Light Sensor Reader includes soft-sided case (also available separately as Item 7500)

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3415FX</td>
<td>LightScout® External Light Sensor Reader</td>
</tr>
<tr>
<td>3668I</td>
<td>LightScout® Quantum Light Sensor (PAR Light)</td>
</tr>
<tr>
<td>3668I3</td>
<td>LightScout® Quantum Light 3 Sensor Bar</td>
</tr>
<tr>
<td>3668I6</td>
<td>LightScout® Quantum Light 6 Sensor Bar</td>
</tr>
<tr>
<td>3670I</td>
<td>LightScout® Silicon Pyranometer Sensor (Solar Radiation)</td>
</tr>
<tr>
<td>3676I</td>
<td>LightScout® UV Sensor</td>
</tr>
</tbody>
</table>

WatchDog® Model 2475 Plant Growth Station

Ideal for Greenhouses - monitor microclimates with four sensor channels.

- Computes and displays Daily Light Integral (DLI), current light levels, dew point, degree day models, and chill hours
- Computes and displays DIF – Average day/night temperature difference
- Computes and displays VPD – Vapor Pressure Deficit
- Monitor and record temperature, humidity and light conditions, plus 1 additional sensor port
- Easily check current conditions and up to 12 months of historical data on the LCD display
- Calculate DLI and compare to research guidelines (from your extension office or at www.specmeters.com/articles)
- Requires SpecWare™ software

WatchDog® WeatherTracker Model 305

Greenhouse Growth Tracker

Keep tabs on the conditions affecting your plants on the LCD display.

- Temperature sensor tracks degree-days without a computer
- Quantum light sensor measures your plants’ light exposure over time (in moles/day) - displays current and cumulative DLI (Daily Light Integral)
- Computes and displays DIF – average day/night temperature difference
- Comprehensive tool to assess physiological maturity of your plants
- Stand-alone device – all information is shown on the LCD display
- One-button review of 30 days of values and 12 months of summaries
- LCD (updates every 15 seconds) with easy-to-use keypad
- 9V battery with 8-month life; memory protection in case of power loss
FieldScout® TDR 100 & TDR 300 Soil Moisture Meter

**Water > How much or how little?**

**Soil Moisture Meters**
Keep everything healthy by eliminating standing water or dry spots.

**FIELDSCOUT® TDR 100**
Obtain soil moisture readings at the press of a button
- Instantaneous readings of root zone soil moisture
- Ideal for measuring containers on benches
- Probe block comes with a 5 ft (1.5 m) cable
- Configure meter with FieldScout® software (free web download)
- USB-to 3.5 mm Stereo Plug Cable included
- Variable length rods sold separately (see next page)

6440FS  FieldScout® TDR 100 Soil Moisture Meter
         Includes hard-sided carrying case
6440FSS  Replacement TDR 100 Probe Block
         (with cable)
6440CASE TDR 100 Carrying Case

**FIELDSCOUT® TDR 300**
Portable soil moisture meter to help manage water evenly and responsibly and reduce operating expenses.
- Instantaneous readings of root zone soil moisture
- FieldScout Bluetooth Device connects to the FieldScout Mobile App, instantly see your data on your smart phone or tablet
- Compatible with SpecMaps™ online web-mapping application, create 2-dimensional maps of your data (see website for details)
- Connects to a GPS receiver that has a serial output option (GPS required with SpecMaps*), we recommend the Garmin 73 GPS unit (see below)
- Equipped with internal data logger and RS-232 port
- Configure and download meter with FieldScout® software (free web download)
- USB -to-3.5mm Stereo Plug Cable included
- TDR Rods required and sold separately (see next page)

* GPS interface requires two cables. The GPS/DGPS cable (item 2950CV5) and the PC serial interface cable for the GPS unit (Item 7072CABLE for the Garmin 73).

6430FS  FieldScout® TDR 300 Soil Moisture Meter
         Includes soft-sided carrying case
6453BT  FieldScout® Bluetooth Device
2950CVS GPS/DGPS Cable
7250    GPS Unit Mounting Bracket
6430CASE Replacement TDR 300 Carrying Case
TDR Rods required (see next page)

**SPECIFICATIONS FOR TDR SOIL MOISTURE METERS**
- Measurement Principle: Time-domain measurement methods
- Measurement Units: Percent volumetric water content
- Resolution: 0.1% volumetric water content
- Accuracy: ±3.0% volumetric water content with electrical conductivity < 2 mS/cm
- Range: 0% to saturation (Saturation typically around 50% volumetric water)
- Battery/Life: 4 AAA alkaline batteries; approximately 12-month battery life
- Data Logger: (TDR 300) 2,320 measurements without GPS; 1160 with GPS/DGPS

TDR 300 LCD display shows current measurement, rod length, number of readings, and running average.
Install the FieldScout Mobile App to capture and analyze measurements on your turf using Bluetooth wireless technology on a FieldScout® TDR 300 Soil Moisture Meter or the FieldScout® TruFirm Turf Firmness Meter. Works on iOS and Android devices. TDR 300 requires the FieldScout® Bluetooth Device for connection.

- On-the-go means of collecting data
- Collects data from FieldScout® TDR 300 Soil Moisture Meter (Bluetooth device required) and FieldScout® TruFirm Turf Firmness Meter using Bluetooth Smart connection
- Uses your smart phone for time-stamping and geo-referencing the data (Pro features)
- Upload to SpecConnect Web Portal and view your entire course's data at once and export for further analysis (Pro features)
- Color-coded to represent a scale of turf firmness or moisture
- Eliminates the need for hooking up to a GPS or computer
- Visualize readings in real time
- E-mail relevant information
- FieldScout® TDR 300 requires FieldScout® Bluetooth Device
- Compatible with iOS and Android smart phones and tablets, device requires Bluetooth Smart Ready
- Free download from App Store or Google Play,
- Use all the Basic functions free. Unlock the Pro features with a SpecConnect FieldScout® subscription

FieldScout Mobile App

**FREE**

- 6453BT FieldScout® Bluetooth Device for TDR 300
- 3035 SpecConnect FieldScout® Pro Subscription (1-yr)
- 3060 SpecConnect Additional FieldScout® Device (1-yr)

**TDR Rods**

Multiple depth options for varying root zones.
- Sturdy stainless-steel construction
- Field replaceable
- Rods must be fully inserted for valid measurements

- 6428FS4 Two 1.5 inch (3.8 cm) Rods
- 6429FS4 Two 3 inch (7.5 cm) Rods
- 6431FS4 Two 4.8 inch (12 cm) Rods
- 6432FS Two 8 inch (20 cm) Rods
- 6430PH Pilot Hole Maker for TDR Meters
  Includes two 3 inch (7.5 cm) rods

**FIELDSCOUT MOBILE APP BASIC vs. PRO**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic</th>
<th>Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Grid of Zones</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Change Number of Zones</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Customizable Google Map Image</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Saves the Average Measurement by Zone</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Email the Map/Results View</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Freeform Notes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Freeform Mode</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Guided Mode (Auto-Advancing through Zones)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SpecConnect Data Sharing</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Auto-Upload to SpecConnect</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Add User Note or Comment to Individual Reading or Zone</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

SpecConnect Web Portal showing TDR 300 data
Based on technology developed by the United States Golf Association (USGA), the FieldScout® TruFirm® offers a quick, easy, and affordable method to measure the firmness of turf, bunker sands, and other playing surfaces. Data acquired from the device allows researchers and turf management professionals to measure the relationship between the compaction of the soil and the moisture level, in order to quantify playing conditions.

- View measurement on LCD Display
- Evaluate trends and monitor sections of turf relative to one another
- With FieldScout® Mobile App, instantly see your data on your smart phone or tablet
- The lower the value, the firmer the turf or surface
- Logged data can be sent via Bluetooth to a iOS or Android device for plotting specific greens or other surfaces
- Lightweight design results in an easily portable device without the need for extra parts
- Includes soft-sided carrying case

**6490S**  
FieldScout® TruFirm Turf Firmness Meter with Bluetooth 4.0

**6490**  
FieldScout® TruFirm Turf Firmness Meter Base model without Bluetooth

**6491S**  
Bluetooth 4.0 Upgrade for TruFirm

### SPECIFICATIONS FOR TRUFIRM

<table>
<thead>
<tr>
<th>Power: 2 AA batteries (included)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight: 4.3 lb (1.95 kg)</td>
</tr>
<tr>
<td>Height: 27 in (69 cm)</td>
</tr>
<tr>
<td>Diameter of Hammer: 1.68 in (4.45 cm)</td>
</tr>
<tr>
<td>Measurement Units: Depth of travel (inches)</td>
</tr>
<tr>
<td>Range: 0.1 in - 1.5 in (2.54 mm - 38.1 mm)</td>
</tr>
<tr>
<td>Resolution: 0.01 in at 1.00 in - 1.50 in (0.25 mm at 25.4 mm - 38.1 mm)</td>
</tr>
<tr>
<td>0.003 in at 0.00 in - 0.999 in (0.076 mm at 0 mm - 25.4 mm)</td>
</tr>
<tr>
<td>Display: LCD with backlight</td>
</tr>
</tbody>
</table>

**Watch the TruFirm in action. Scan code & watch our YouTube video**

- **VALIDATE YOUR CULTURAL PRACTICES**
- **QUICK & EASY 1 PIECE DIGITAL TOOL**
- **HANDS-FREE DATA COLLECTION WITH BLUETOOTH**
- **MONITOR ALL KEY PLAYING SURFACES**
- **FOR IMPROVED PERFORMANCE ON GOLF COURSES, ATHLETIC FIELDS AND MORE**
Help make decisions regarding areas of the field that require tillage, changes to crop rotation, and planting of cover crops.

- Includes 1/2 in and 3/4 in cone tip
- Takes compaction readings every inch from 0 to 18 in (45 cm)
- 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 that has a serial output option*
- Equipped with internal data logger and RS-232 port
- Configure and download meter with FieldScout® software (included)**
- Compatible with SpecMaps™ online web-mapping application, create 2-dimensional maps of your data (see website for details)
- Includes USB cable, carrying case, and depth target

* 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.

** PC cable connects to a computer USB port. See our website for other cable connection options.

### SPECIFICATIONS FOR FIELDSCOUT SC 900

<table>
<thead>
<tr>
<th>Measurement Units:</th>
<th>Cone Index (PSI or kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution:</td>
<td>1 in (2.5 cm), 5 PSI (35 kPa)</td>
</tr>
<tr>
<td>Accuracy:</td>
<td>±0.5 in (1.25 cm) Depth, ±15 PSI (103 kPa) Pressure</td>
</tr>
<tr>
<td>Range:</td>
<td>0 to 18 in (0 to 45 cm), 0 to 1,000 PSI (0 to 7,000 kPa)</td>
</tr>
<tr>
<td>Battery/Life:</td>
<td>4 AAA alkaline batteries; approximately 12-month life</td>
</tr>
<tr>
<td>Data Logger Capacity:</td>
<td>772 profiles without GPS; 579 profiles with GPS</td>
</tr>
</tbody>
</table>

### Soil Compaction Tester

Economical way to measure soil compaction with analog read out.

- Large and small tip included with convenient storage in tester housing
- 24 in stainless steel rod with adjustable shock collar to prevent damage to the gauge during transport or storage
- Easy to read, color-coded, stainless steel dial that is liquid filled to reduce shock
- Durable molded housing with rubber grip handles
- Penetration Depth: Up to 24 in (60 cm) in 3 in (7.6 cm) increments

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6106</td>
<td>1/2 in Replacement Tip (Fine Soils)</td>
</tr>
<tr>
<td>6107</td>
<td>3/4 in Replacement Tip (Coarse Soils)</td>
</tr>
</tbody>
</table>
SM 100 Soil Moisture Sensor

Place at multiple depths to help determine both when and how much to water.

- Measures Volumetric Water Content (VWC) of soil
- Capacitance-type sensor responds immediately to changes in soil moisture content for better irrigation decisions
- Calibrated for mineral soils or soilless media
- Installs easily into 3/4 in (1.9 cm) hole
- Install permanently or use to take spot measurements
- Can be read with the FieldScout® Soil Sensor Reader (Item 6466) or WatchDog® 2000, 1000 Series Stations, and WatchDog Pups
- Connect up to 8 sensors to one station
- WaterScout Calibration Device can be used to reset the baseline reading

6460       WaterScout® SM 100 Sensor - 6 ft (1.8 m)
6460-20     WaterScout SM 100 Sensor - 20 ft (6 m)
6470CAL3V   WaterScout Calibration Device

SPECIFICATIONS FOR WATERSCOUT SM 100 SENSOR

| Standard Interface: WatchDog weather station, Pups, and FieldScout soil moisture reader |
| Range: 0% VWC to saturation |
| Power Requirements: 3 to 5V @ 6 to 10 mA |
| Output: Analog voltage 0.5 - 1.5V for a 3V excitation (ratiometric for other excitation voltages) |
| Resolution: 0.1% VWC |
| Cable Length: 6 ft (1.8 m) and 20 ft (6 m) standard, extendable up to 50 ft (15 m) |
| Accuracy: 3% VWC @ EC < 8 mS/cm |
| Sensing Area: 2.4 in (6 cm) x 0.8 in (2 cm) |

Water Holding Capacity By Soil Type

- Saturation
- Field Capacity
- Wilting Point

Watch SM 100 Installation Tips
Scan code & watch our YouTube video

Shown measuring in soilless media mode to gather immediate data
SMEC 300 Soil Moisture/EC/Temperature Sensor

Identify situations where soil salinity is an issue or where certain moisture and temperature conditions facilitate soil-borne diseases.

- Capacitance-type soil moisture sensor
- Carbon ink electrodes provide large measuring surface for electrical conductivity (EC)
- Easy, 1-step EC calibration process
- Can be read with the FieldScout® Soil Sensor Reader (Item 6466) or WatchDog® 2000, 1000 Series Stations, and WatchDog Pups
- Connect up to 4 sensors per station
- Recommended placement of sensors is 10 feet separation to prevent EC interference when in the same medium
- WaterScout® Calibration Device required unless using Soil Sensor Reader (Item 6466)

WatchDog Stations sold prior to 2012 must be upgraded (Contact for support)

6470-6 WaterScout SMEC 300 Sensor - 6 ft (1.8 m)
6470-20 WaterScout SMEC 300 Sensor - 20 ft (6 m)
6470CAL3V WaterScout Calibration Device
2251 Conductivity Standard, 1.41 mS/cm, 250 mL

SPECIFICATIONS FOR WATERSCOUT SMEC 300

- Standard Interface: WatchDog weather station, Pups, and FieldScout soil moisture reader
- Range: VWC: 0% VWC to saturation, EC: 0 to 10 mS/cm, Temp: 33 - 175°F (0.5 - 80°C)
- Resolution: VWC: 0.1%, EC: 0.01 mS/cm, Temp: 0.1°F (0.1°C)
- Accuracy: VWC: 3%, EC: ±2%, Temp: ±1°F (0.6°C)
- Cable Length: 6 ft (1.8 m) and 20 ft (6 m) standard, extendable up to 50 ft (15 m)
- Power Requirements: 3V @ 6 to 10 mA
- Output: Analog voltage, time division multiplexed
- Sensing Area: 2.25 in. x 0.75 in. (5.7 x 2 cm)

FIELDSCOUT® Soil Sensor Reader

Spot-check WaterScout SM 100 and SMEC 300 sensors in the field.
- Also reads Watermark sensors (page 41) (requires separate adapter)
- Includes soft-sided case (also available separately)

6466 FieldScout® Soil Sensor Reader
6450FSADPT Watermark Adapter for Soil Sensor Reader
7500 Soft-Sided Carrying Case*

* Item 7500 will also fit the WatchDog 1000/2000 Series Data Shuttle (Item 3679WD), LightScout Red/Far-Red Meter (Item 3412), LightScout Quantum Light Meters (four models) and the LightScout External Light Sensor Reader (Item 3415FX)
WatchDog® Irrigation Stations with WaterScout® Sensors and Watermark Sensors

Affordably monitor, compare and evaluate soil moisture levels from two, three, or four user-defined soil depths.
- Includes WatchDog® Station and WaterScout® Sensors with 20 ft (6 m) cables - save money when purchased as a system
- Micro Stations also include the Protective Sliding Enclosure
- Watermark Stations include Watermark Soil Moisture Sensors with 11 ft (3.3 m) cables
- Add soil moisture sensors to your WatchDog Pup network and see your data on SpecConnect.net
- Add a WaterScout® SMEC 300 Soil Moisture/EC/Temp Sensor (Item 6470-20) and monitor soil temperature and EC levels
- Requires SpecConnect, or SpecWare 9 Basic or Pro software

| Soil Moisture Sensors | MODEL 1200 MICRO STATION | MODEL 1400 MICRO STATION | SENSOR PUP* IRRIGATION STATION (900 MHZ) *
|-----------------------|--------------------------|--------------------------|--------------------------------------
| 2 WaterScout SM 100   | 3680SM12                 | 3685SM12                 | 3900SM12                             |
| Soil Moisture Sensors | 3 Watermark Soil         | 3685WM12                 | 3900WM12                             |
|                       | Moisture Sensors         |                          |                                      |
| 4 WaterScout SM 100   | 3685SM14                 | 3900SM14                 |                                      |
| Soil Moisture Sensors | 4 Watermark Soil         |                          |                                      |
|                       | Moisture Sensors         |                          |                                      |

* AVAILABLE IN OTHER FREQUENCIES
Watermark Soil Moisture Sensor
Economical way to measure soil moisture tension.
- Works with FieldScout® Soil Sensor Reader (Item 6466, page 39)
- Reads moisture tension from 0 (saturated) to 200 (dry) centibars

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6450</td>
<td>Watermark Sensor with 5 ft (1.5 m) cable</td>
</tr>
<tr>
<td>6450FSADPT</td>
<td>Watermark Adapter for Soil Sensor Reader</td>
</tr>
</tbody>
</table>

Watermark Sensors for WatchDog® Weather Stations

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6450WD</td>
<td>Watermark Sensor for WatchDog® Stations &amp; Pups with 11 ft (3.3 m) cable</td>
</tr>
<tr>
<td>6450WD20</td>
<td>Watermark Sensor for WatchDog® Stations &amp; Pups with 25 ft (7.6 m) cable</td>
</tr>
<tr>
<td>6450AH</td>
<td>Watermark Adapter for WatchDog® Stations &amp; Pups</td>
</tr>
</tbody>
</table>

Irrometer Tensiometers
Schedule irrigation based on how hard plant roots are working to draw water from the soil.

- “R” models (items 6419 thru 6423) are for general use with field or tree crops
- Low Tension (LT) models (see www.specmeters.com) are for coarse soils or soilless media
- Portable models for specialized applications (see www.specmeters.com)
- Can be connected to WatchDog Data Loggers and Stations with Pressure Transducer (Item 3669)
- Pressure gauge has a quarter inch pipe thread
- Service kit required (Item 6425)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6425</td>
<td>Service Kit - Required</td>
</tr>
<tr>
<td>6419</td>
<td>R Model 6 in (15 cm) Depth</td>
</tr>
<tr>
<td>6420</td>
<td>R Model 12 in (30 cm) Depth</td>
</tr>
<tr>
<td>6421</td>
<td>R Model 18 in (45 cm) Depth</td>
</tr>
<tr>
<td>6422</td>
<td>R Model 24 in (60 cm) Depth</td>
</tr>
<tr>
<td>6423</td>
<td>R Model 36 in (90 cm) Depth</td>
</tr>
</tbody>
</table>

- Connect your “R” model (Items 6419 thru 6423) tensiometer to your weather station. The Pressure Transducer adapts to Irrometer tensiometers and allows use of the dial gauge for in-field measurements

3669 Pressure Transducer

Economy Soil Moisture Tester
Analog soil moisture meter measures any type of soil with just one calibration.
- Resistance-type sensor located at the tip of the shaft
- Provides instant results ranging from 0 (dry) to 10 (saturated)
- 3-month warranty

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6400</td>
<td>9 in (22 cm) Soil Moisture Tester</td>
</tr>
<tr>
<td>6405</td>
<td>24 in (60 cm) Soil Moisture Tester</td>
</tr>
</tbody>
</table>
LAQUA Twin Meters

Put the power of a laboratory right in your hands.

• Professional grade meters
• Measure samples in nutrient solutions, water, soils, and tissue sap (Two plant sap press options available on page 44)
• Waterproof pocket-sized meter with digital calibration
• Sensors store dry and are field replaceable
• Accuracy correlates well with laboratory analysis
• Unique flat sensor allows you to conveniently and accurately measure samples as small as 0.3 ml
• Automatic temperature compensation, waterproof, auto power-off
• Includes two CR2032 batteries, case and calibration standards

LAQUA Twin pH Meter
Ideal for testing irrigation water, leachate, pesticides, or dairy rumen pH.

Item 2103AL  LAQUA Twin pH meter  Includes case, batteries, and pH 4 & 7 standards
2110       Refill Solutions - pH 4 and 7, 60 mL ea.
2143L      LAQUA Twin pH Replacement Sensor
2135L      Sampling Sheets - 100 pieces

LAQUA Twin EC Meter
Ideal for water quality and greenhouse applications.

Item 2205L  LAQUA Twin EC Meter  Includes case, batteries, and calibration standards
2210L      Conductivity Standard, 1.41 mS/cm (6 - 14 mL bottles)
2242L      Replacement Sensor
**Measurement Principle:**
- **pH:** Glass electrode method
- **Conductivity (EC):** 2 AC bipolar
- **Sodium:** Ion electrode method
- **Potassium:** Ion electrode method
- **Nitrate:** Ion electrode method
- **Calcium:** Ion electrode method

**Sample Volume Required:**
- **pH:** 0.1 mL to 2.0 mL
- **Conductivity:** 0.12 mL to 2.0 mL
- **Sodium:** 0.3 mL to 2.0 mL
- **Potassium:** 0.3 mL to 2.0 mL
- **Nitrate:** 0.3 mL to 2.0 mL
- **Calcium:** 0.3 mL to 2.0 mL

**Measurement Range:**
- **pH:** 2 to 12 pH
- **Conductivity:** 0 to 19.9 mS/cm
- **Sodium:** 23 to 2300 ppm
- **Potassium:** 39 to 3900 ppm
- **Nitrate:** 62 to 6200 ppm
- **Calcium:** 40 to 4,000 ppm

**Calibration:**
- **pH:** pH 4 and pH 7
- **Conductivity:** 1.41 mS/cm
- **Sodium:** 150 ppm and 2000 ppm
- **Potassium:** 150 ppm and 2000 ppm
- **Nitrate:** 34 ppm and 450 ppm
- **Calcium:** 150 ppm and 2000 ppm

**Reproducibility:**
- **pH:** ± 0.1 pH
- **Conductivity:** ± 2%
- **Sodium:** ± 10% or ± 10 ppm
- **Potassium:** ± 10% or ± 10 ppm
- **Nitrate:** ± 10% or ± 10 ppm
- **Calcium:** ± 20% or ± 20 ppm

**Display:**
- 4-digit digital LCD display

**Power:**
- CR2032 coin batteries (x2)

**Battery Life:**
- 400 hours continuous operation

**Operating Range:**
- 40°F (5°C) to 105°F (40°C), 85% relative humidity

**Dimensions:**
- 164mm x 29mm x 20mm

---

**LAQUA Twin Sodium (Na⁺) Meter**
- **Model:** 2500GL
  - Includes case, batteries, and calibration standards
- **Model:** 2540L
  - Replacement Sodium Sensor
- **Model:** 2514L
  - 150 ppm Na⁺ Standard, 6 - 14 mL bottles
- **Model:** 2518L
  - 2000 ppm Na⁺ Standard, 6 - 14 mL bottles
- **Model:** 2535
  - Na⁺ Soil Test Kit w/30 Samples
    - Includes filter paper, cups, and soil scoop
- **Model:** 2135L
  - Sampling Sheets - 100 pieces

**LAQUA Twin Potassium (K⁺) Meter**
- **Model:** 2400GL
  - Includes case, batteries, and calibration standards
- **Model:** 2440L
  - Replacement Potassium Sensor
- **Model:** 2414L
  - 150 ppm K⁺ DI Standard, 6 - 14 mL bottles
- **Model:** 2418L
  - 2,000 ppm K⁺ DI Standard, 6 - 14 mL bottles
- **Model:** 2434
  - K⁺ Soil Test Kit w/30 Samples
    - Includes solutions, filter paper, cups, and soil scoop
- **Model:** 2135L
  - Sampling Sheets - 100 pieces

**LAQUA Twin Nitrate (NO₃⁻) Meter**
- **Model:** 2305GL
  - Includes case, batteries, and calibration standards
- **Model:** 2345L
  - Replacement Nitrate Sensor
- **Model:** 2311
  - 450 ppm NO₃⁻-N Standard, 6 - 14 mL bottles
- **Model:** 2312
  - 34 ppm NO₃⁻-N Standard, 6 - 14 mL bottles
- **Model:** 2330
  - NO₃⁻ Soil Test Kit w/30 Samples
    - Includes solutions, filter paper, cups, and soil scoop
- **Model:** 2135L
  - Sampling Sheets - 100 pieces

**LAQUA Twin Calcium (Ca²⁺) Meter**
- **Model:** 2450L
  - Includes case, batteries, and calibration standards
- **Model:** 2455L
  - Replacement Calcium Sensor
- **Model:** 2460L
  - 150 ppm Ca²⁺ Standard, 6 - 14 mL bottles
- **Model:** 2461L
  - 2000 ppm Ca²⁺ Standard, 6 - 14 mL bottles
- **Model:** 2135L
  - Sampling Sheets - 100 pieces
Handheld Plant Sap Press

- Use with LAQUA Twin meters or Brix meters (see below) for on-site testing
- Made of high quality, non-corrosive metal
- Includes cleaning device

Hydraulic Plant Sap Press

- Speed up collection of large or less succulent samples
- Hydraulic press extracts sap into a collection vial
- Includes plunger, grate, cylinder, expeller rod and six collection vials

Digital Refractometer

Easy and convenient way to measure Brix.
- Small sensor area allows measurement of minute samples
- Measures Brix from 0 to 53.0% (Accuracy ±0.2%)
- Automatic temperature compensation
- Large digital display of Brix and temperature
- Operates on two AAA batteries (included)

Handheld Refractometers

Compact meter ideal for field or lab use.
- Measures Brix from 0 to 32.0% (Accuracy ±0.2%)
- Place a couple drops of sample on the scale and read the results in Brix through the shaded area on the eyepiece
- Available with or without automatic temperature compensation
- Includes case and instructions
FieldScout® SoilStik pH Meter

Easy to use and cost-efficient 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 - eliminates guesswork
- CAL alert tells you it’s time to recalibrate to ensure 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
- Water resistant design (IP57) floats in water and protects the meter in wet environments
- Includes protective sensor cap, rinse bottle, two CR2032 batteries, pH 4 & 7 standard solutions, and soft case

2105  FieldScout® SoilStik pH Meter
2106  Flat Sensor, Replacement
2110  Refill Solutions - pH 4 and 7, 60 mL ea.

SPECIFICATIONS FOR SOILSTIK pH METER

- pH: 0.00 to 14.00 pH
- Temperature: 23°F to 194°F (-5°C to 90°C)
- Resolution: 0.01 pH, 0.1°
- Accuracy: ±0.01 pH, ±1.8°F/±1°C
- Dimensions: 1.4 x 6.8 x 1.6 in (35.6 x 172.7 x 40.6mm)
- Weight: 3.8 oz (110 g)
pH 400 and 600 Meters
Fast, easy and accurate “direct” soil pH measurement.

Modern User Interface
• The FieldScout pH 400 & 600 Meters have a modern, intuitive, and user friendly interface that allows users to quickly access the meter’s advanced features and settings.
• Temperature and pH data remain visible, so monitoring does not stop when settings are changed or options are selected.
• Large backlit 3.2” LCD color display ensures measurement values and menu options are easy to read.

Rugged and Ergonomic Design
• Both the FieldScout pH 400 & 600 Meters are lightweight, and their compact design makes them highly suitable for field use and handheld applications.
• Temperature and pH data remain visible, so monitoring does not stop when settings are changed or options are selected.
• The USB port is protected by a tightly sealed cover and the casing and battery door are fitted with rubber seals.
• 1 year warranty on meter.

ISFET (Ion Sensitive Field Effect Transistor) Probes
Glass Free and Durable Probe - 2 Options to Fit Your Needs
• Unlike glass electrodes, the FieldScout 400 and 600 pH Meters feature ISFET pH electrodes that will not shatter. Neither model requires wet storage.
• Both come with a 6-month warranty.
• Spectrum ISFET probes are made of high quality materials such as PEEK, ABS, and PVC.
• Sample directly in plug trays, pots, containers, solutions, and soilless media.

ISFET Probes
• Pin Point Tip ISFET Probe: Uses patented non-glass ISFET technology for the smallest pH measurement.
• Blunt Tip ISFET Probe: Sharp and to the point for pH measurement of materials that need to be penetrated.
• Eliminates clogging from dirty samples or semi-solids.

Robust probe design makes it easy to go from sample to sample.

2107 FieldScout pH 400 Meter
   Meter includes case, batteries, AC adapter, brush, and pH 4 & 7 standards
   Excludes pH Probe - order separately

2108 FieldScout pH 600 Meter
   Meter includes case, batteries, AC adapter, brush, and pH 4 & 7 standards
   Excludes pH Probe - order separately

2127 FieldScout pH Meter Blunt Tip ISFET Probe

2128 FieldScout pH Meter Pin Point Tip ISFET Probe

2110 Refill Solutions - pH 4 and 7, 60 mL each

pH 400
• Professional grade quality.
• Intelligent calibration wizard simplifies the calibration process.
• Supports 1-and 2-point calibration.
• Powered by 3 rechargeable AA-batteries (AC adapter included).

pH 600
• Includes all features of the FieldScout pH 400 Meter, plus...
• Internal storage of measured data points, up to 65,000 measurements.
• Ability to query both momentary pH value and temperature.
• Supports up to 5-point calibration.
Direct Soil EC Meter

Instant and accurate direct EC and temperature measurements.

- Professional-grade meter
- No need to prepare samples - simply sample through the profile
- Patented paired sensor tip provides maximum soil-sensor contact and higher accuracy
- Sample directly in plug trays, pots, containers, solutions, or ground soils
- 0 to 19.9 mS/cm (Accuracy ±1%, resolution 0.01 mS/cm)
- Automatic temperature compensation, long lasting, and waterproof
- Includes battery and EC calibration standard

8 in (20 cm) Probe Option

2265FS  FieldScout® Direct Soil EC Meter w/ 8 in Probe
2265PROBE  Includes Carrying Case and 2.76 Standard
2254  Conductivity Standard, 2.76 mS/cm, 250 mL
2251  Conductivity Standard, 1.41 mS/cm, 250 mL

24 in (60 cm) Probe Option

2265FSTP  FieldScout Direct Soil EC Meter w/ 24 in T-Handle Probe and Replaceable Tip
2265FST24P  FieldScout T-Handle EC 24 in Probe w/ Replaceable Tip
2266  Replaceable Tip For T-Handle EC Probe
2254  Conductivity Standard, 2.76 mS/cm, 250 mL
2251  Conductivity Standard, 1.41 mS/cm, 250 mL

pH 450 Meter

pH measurements with built-in data logger.

- Intuitive, user-friendly icons-electrode status displays pH slope
- Memory for up to 500 data sets with USB and RS-232 output for transfer to a PC
- 500 hours battery life or optional universal power adapter
- Built-in stand with wall-mount option allows for easy benchtop measurement and storage
- IP67-rated waterproof housing, making it ideal for field testing and laboratory
- Large, backlit LCD lets you view the main measurement simultaneously with temperature
- Autocal feature permits one calibration point per measurement range
- Automatic temperature compensation (ATC) ensures measurement accuracy even in fluctuating temperatures
- Meter features include ready (stability) indicator, smart averaging, user selectable °C/°F units, hold function, calibration alarm, battery life-indicator, and electrode status
- Connects to any GPS receiver that has a serial output option
- Accuracy: (pH) ±1%, (temp) ±0.05°C (temp)
- Measurement ranges: (pH) -2.00 to 16.00, (Temp) -10 to 110°C (17 to 230°F)

2120WP  FieldScout pH 450 Meter
2121WP  Combination pH/Temp Electrode
2124FE  Flat End pH Electrode
2950CV5  GPS/DGPS Cable
2110  Refill Solutions - pH 4 and 7, 60 mL ea.
Waterproof EC Meter
Economic meter for measuring salinity.
• Measures four parameters: conductivity, TDS, salinity, and temperature
• 6 units of measurement: µS/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: ±2%
• Automatic temperature compensation
• Measurement ranges:
  – Conductivity: 0.00 to 199 µS/cm, 200 to 1,999 µS/cm, or 2.00 to 19.99 mS/cm
  – TDS: 0 to 99.9 mg/L, 100 to 999 mg/L, or 1.00 to 9.99 g/L
  – Salinity (fixed ratio of 0.5): 0 to 99.9 ppm, 100 to 999 ppm, or 1.00 to 9.99 ppt
  – Temperature: 32 to 194ºF (0.0 to 90.0ºC)
• 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

2246   Waterproof EC Meter
2246SENSOR   Replacement Sensor
2251   Conductivity Standard, 1.41 mS/cm, 250 mL

Economy pH/EC Meter
Affordable way to monitor pH and EC levels in any liquid.
• Combination pH and electrical conductivity (EC) probe
• 150-hour battery life
• Automatic temperature compensation
• 0.68 TDS ratio calculation
• Accuracy: ±0.2 pH and 2% EC scale
• Range: 0 - 6 mS/cm
• Includes handheld meter, probe, calibration solutions, and carrying case

2182A   Economy pH/EC Meter
2183A   Replacement pH/EC Probe
2110   Refill Solutions - pH 4 and 7, 60 mL ea.
2251   Conductivity Standard, 1.41 mS/cm, 250 mL

EC450
EC measurements with built-in data logger.
• Intuitive, user-friendly icons—electrode status displays cell constant
• USB and RS-232 output for transfer to a PC
• 500 hours battery life or optional universal power adapter
• Built-in stand with wall-mount option allows for easy benchtop measurement and storage
• IP67-rated waterproof housing, making it ideal for field testing and laboratory
• Large, backlit LCD lets you view the main measurement simultaneously with temperature
• Autocal feature permits one calibration point per measurement range
• Automatic temperature compensation (ATC) ensures measurement accuracy even in fluctuating temperatures.
• Meter features include ready (stability) indicator, smart averaging, user selectable °C/°F units, hold function, calibration alarm, battery life-indicator, and electrode status
• Connects to any GPS receiver that has a serial output option*
• Accuracy: (conductivity) ±1%, (temp) ±0.5°C (0.9ºC), (salinity) ±1%
• Measurement ranges: (Conductivity) 0 to 200 mS/cm, (Temp) -10 to 110°C (17 to 230°F), (Salinity) 0 to 50 ppt

2220WP   EC450 Meter
Soil EC Probe sold separately
2251   Conductivity Standard, 1.41 mS/cm, 250 mL
2950CV5   GPS/DGPS Cable

Soil EC Probe Options
2220FS   8 in (20 cm) FieldScout EC Probe
2225FSP   24 in (60 cm) FieldScout T-Handle EC Probe
w/ Replaceable Tip
2266   Replaceable Tip For T-Handle EC Probe

*GPS interface requires 2 cables. The GPS/DGPS cable 2950CV5 is available from Spectrum.
A PC serial interface cable supplied by the manufacturer of the GPS receiver is also required.
Green = Nitrogen

Chlorophyll Meters

Research supports the correlation between SPAD measurements and the nitrogen in your leaf. Support and defend the health of your plants.

SPAD 502 Plus Chlorophyll Meter

Quantifies the health of your crops.

- Instantly measures chlorophyll content or “greenness” of your plants on a scale of -9.9 to 199
- Non-invasive, non-destructive measurement
- Trend graph stores and displays up to 30 measurements
- Water resistant design (IPX4)
- Compare in-field SPAD readings to university guidelines
- Research shows a strong correlation between SPAD measurements and leaf N content
- Available with or without a built-in data logger
- Includes hard carrying case and batteries

Data-Logging Model (2900PDL)

- Connects to any GPS receiver that has a serial output option*
- Equipped with internal data logger and RS-232 port
- Records 4,096 measurements (1,488 with added GPS/DGPS option)
- Configure and download meter with FieldScout® software (included)**
- Compatible with SpecMaps™ online web-mapping application, create 2-dimensional maps of your data (see website for details)

* 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.
** PC cable connects to a computer USB port. See our website for other cable connection options.

2900PDL  Minolta SPAD 502DL Plus Chlorophyll Meter with RS-232 Data Port and Built-In Data Logger (includes software and USB pc cable)

2900P   Minolta SPAD 502 Plus Chlorophyll Meter Basic version, no Data Logger

2950CV5   GPS/DGPS Cable
2900CASE  Hard Carrying Case

SPECIFICATIONS FOR SPAD 502 PLUS

- Optical Density Difference at two wavelengths: 650 nm and 940 nm
- Measurement Area: 2 mm x 3 mm (Approximately 3/32 in x 1/8 in)
- Light Source: 2 LEDs
- Receptor: Silicon Photodiode
- Power Source: 2 AA alkaline batteries (1.5V)
- Repeatability: Within ±0.3 SPAD unit
- SPAD Value: Index of relative chlorophyll content; -9.9 to 199

Non-invasive measurement with readings in less than 2 seconds
**CM 1000 Chlorophyll Meter**

“Point-and-shoot” technology to instantly measure relative chlorophyll content.

- Detects stress earlier than visual monitoring
- Technology based on an exclusive patent license from NASA
- Laser guides outline the edges of the measured sample area
- Calculates and displays a running average for multiple readings
- Connects to any GPS receiver that has a serial output option*
- 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 (not included)**
- Compatible with SpecMaps™ online web-mapping application, create 2-dimensional maps of your data (see website for details)
- Includes hard carrying case and batteries

* 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.

** PC cable connects to a computer USB port. See our website for other cable connection options.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>2950</td>
<td>FieldScout CM 1000 Chlorophyll Meter</td>
</tr>
<tr>
<td>2950S</td>
<td>Software To Activate Data Logger</td>
</tr>
<tr>
<td>(includes PC cable)</td>
<td></td>
</tr>
<tr>
<td>2950CV5</td>
<td>GPS/DGPS Cable</td>
</tr>
</tbody>
</table>

**CM 1000 NDVI Meter**

“Point-and-shoot” technology to instantly measure red (660 nm) and near infrared (840 nm) spectral bands.

- Detects stress earlier than visual monitoring
- Computes Normalized Difference Vegetative Index (NDVI)
- Laser guides outline the edges of the measured sample area
- Calculates and displays a running average for multiple readings
- Connects to any GPS receiver that has a serial output option*
- 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, create 2-dimensional maps of your data (see website for details)
- Includes hard carrying case and batteries

* 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.

** PC cable connects to a computer USB port. See our website for other cable connection options.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>2953</td>
<td>FieldScout CM 1000 NDVI Meter</td>
</tr>
<tr>
<td>2950CV5</td>
<td>GPS/DGPS Cable</td>
</tr>
</tbody>
</table>
TCM 500 NDVI Turf Color Meter

Helps diagnose plant health based on color.

- Measures reflected light from approximately a 3 inch (7.6 cm) diameter section of turfgrass
- Uses an 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
- Displays result as NDVI, percent reflectance, or as a user-adjustable grass index from 1 to 9
- Connects to any GPS receiver that has a serial output option* 
- 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, create 2-dimensional maps of your data (see website for details)
- Includes hard carrying case, batteries, and TCM 500 T-Handle (item 2975H)

* 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.
** PC cable connects to a computer USB port. See our website for other cable connection options.

2975NDVI
FieldScout TCM 500 NDVI Turf Color Meter
Includes TCM 500 T-Handle

2975H
FieldScout TCM 500 Replacement T-Handle

2950CV5
GPS/DGPS Cable

SPECIFICATIONS FOR TCM 500
Measurement Sample: Turf grass canopy
Measurement System: Reflectance of red (660 nm) and NIR (850 nm) light
Measurement Area: Approx. 3.0 in (7.6 cm)
Measurement Units: Percent reflectance (0.0 to 99.9) of Red and NIR
NDVI (0.000 to 1.000)
Grass Index (1.00 to 9.00)
Power Source: 1 9 V alkaline battery (included); approx. 3,000 measurements
Repeatability: ± 5% of measurement

VISIT SPECMETERS.COM
FOR MORE INFORMATION ON OUR
LATEST AND BEST PRODUCTS!
YOUR PLANTS ARE TALKING.
ARE YOU LISTENING?