

# Spectrum Technologies, Inc.

"To Measure Is To Know"

X3m  
golf  
www.x3mgolf.dk



Proudly  
Celebrating

# 33

Years of Service

## AGRONOMIC SMART SOLUTIONS

2021 PRODUCT CATALOG

# Spectrum<sup>®</sup> Technologies, Inc.

At Spectrum Technologies, we pride ourselves on helping our valued customers transform plant measurements into more profitable growing decisions. Since 1987, we have manufactured and distributed affordable, leading-edge plant measurement technology to agricultural, horticultural, environmental, and turf markets throughout the world, serving more than 14,000 customers in over 80 countries.

We proudly work alongside researchers, growers, golf course superintendents, and industry suppliers to provide a broad line of innovative devices and software for better crop environmental monitoring, nutrient management, soil moisture measurement, irrigation scheduling, and pest management.

Our products will positively impact the way you grow your crops; therefore, we stand behind every product with our 100% Satisfaction Guarantee. Our friendly and knowledgeable product support team is available to answer any questions you may have, whether you are a new customer or have worked with us for years.

Thank you for your support and commitment to innovation. We look forward to partnering with you to help you continue to grow.

Sincerely,

*Mike Thurow*

Mike Thurow  
CEO & Founder  
Spectrum Technologies, Inc.



## CONTACT US

Online	<a href="http://www.specmeters.com">www.specmeters.com</a>
E-mail	<a href="mailto:info@specmeters.com">info@specmeters.com</a>
Phone	1 (800) 248-8873 (Toll Free U.S. & Canada) 1 (815) 436-4440
Fax	1 (815) 436-4460 3600 Thayer Court Aurora, IL 60504 USA



## COMPANY OVERVIEW

Spectrum Technologies, Inc. manufactures affordable, leading-edge measurement information technology for agricultural, horticultural, environmental, and turf markets worldwide.

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 continues to grow. The need to conserve resources such as soil and water will drive the need to create more measurement information technology.

## PRODUCTS

### WEATHER

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



### INTEGRATED PEST MANAGEMENT (IPM) TOOLS

Insect and Disease Models, IPM Scopes



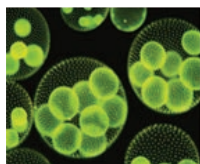
### SOIL MOISTURE & QUALITY MEASUREMENT

Soil Moisture, Soil Compaction, and Water Quality Meters



### NUTRIENT MANAGEMENT

NO<sub>3</sub><sup>-</sup>, K<sup>+</sup>, Ca<sup>++</sup>, Chlorophyll, pH, EC and NDVI Meters



## Award Winning Innovations

Since 1987, Spectrum Technologies has received 25 AE50 Awards from the American Society of Agricultural and Biological Engineers, which demonstrates our deep commitment to innovation and quality. Look for our award-winning products throughout our catalog.

Visit our website for a complete list of awards.

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\*Award Winning Innovation







# INTRODUCING THE **NEW** 3000 SERIES WIRELESS WEATHER STATIONS

Your Crops. Your Data. Better Decision\$.

The award-winning third generation of WatchDog Weather Stations offers integrated cellular modems that send essential crop data to the SpecConnect cloud. Use your PC or WatchDog Mobile app (free) to view current conditions on your smartphone. Station set-up is easy, and configuration is simple with the WatchDog app.

With the SpecConnect cloud, you can easily view reports for degree-days, chill hours, disease and insect pressure, monthly weather reports, soil moisture trends, and more. Frost/temp alerts are sent to your smartphone so you can respond quickly and reduce crop damage.

Now, you will have the real-time data you need to respond to changing weather conditions and make timely, smart decisions. To measure is to know.



 SpecConnect  
Cloud\*



## 3250 Wireless ET Weather Station

Monitor evapotranspiration (ET) data to know how much water your crops are using.

*Measure wind speed/direction, temperature, relative humidity, rainfall, solar radiation, plus one available sensor port.*

**3250MU** WatchDog 3250 Wireless ET Station  
LTE-M Modem

**3250WF** WatchDog 3250 Wireless ET Station  
Wi-Fi Modem

**3250HU** WatchDog 3250 Wireless ET Station  
3G/HSPA+ Modem

**NEW**

\*3000 Series Weather Stations require a SpecConnect Pro subscription



## 3240 Wireless Weather Station

Monitor weather conditions for more profitable crop and field activities.

Measure wind speed/direction, temperature, relative humidity, rainfall, plus two available sensor ports.

**3240MU** WatchDog 3240 Wireless Weather Station LTE-M Modem

**3240WF** WatchDog 3240 Wireless Weather Station Wi-Fi Modem

**3240HU** WatchDog 3240 Wireless Weather Station 3G/HSPA+ Modem



## 3220 Wireless Rain Station

Monitor rainfall data for more effective irrigation scheduling and to adjust field activities to avoid soil compaction. Monitor and note site-specific conditions for disease and insect pressure.

Measure temperature, relative humidity, rainfall, plus two available sensor ports.

**3220MU** WatchDog 3220 Wireless Rain Station LTE-M Modem

**3220WF** WatchDog 3220 Wireless Rain Station Wi-Fi Modem

**3220HU** WatchDog 3220 Wireless Rain Station 3G/HSPA+ Modem



## 3210 Wireless Temp/RH Station

Prevent frost damage with temperature alerts sent directly to your smartphone. Monitor site-specific conditions for insect pressure.

Measure temperature, relative humidity, plus two available sensor ports.

**3210MU** WatchDog 3210 Wireless Temp/RH Station LTE-M Modem

**3210WF** WatchDog 3210 Wireless Temp/RH Station Wi-Fi Modem

**3210HU** WatchDog 3210 Wireless Temp/RH Station 3G/HSPA+ Modem



	3210 Temp/RH Station	3220 Rain Station	3240 Weather Station	3250 ET Weather Station	Range	Accuracy
Air Temperature	✓	✓	✓	✓	-40° to 257°F (-40° to 125°C)	±0.54°F (-40° to 194°F)
Relative Humidity	✓	✓	✓	✓	0 to 100%	±2% @ 77°F (25°C)
Rainfall	Optional	✓	✓	✓	0.01" (0.254mm) resolution	±2% at <2" (5 cm)/hr
Wind Speed	Optional	✗	✓	✓	0, 1 to 200 mph (0, 1 to 322 km/h)	±2 mph (±3 km/h), ±5%
Wind Direction	Optional	✗	✓	✓	1-359°, 1° increments	±3°
Solar Radiation	Opt. (ext. port)	Opt. (ext. port)	Opt. (ext. port)	✓	0 to 1500 W/m <sup>2</sup>	±5%
Available External Sensor Ports	2	2	2	1		



## Retriever & Pups

Our Retriever & Pups+ Network sends real time data to your laptop, tablet or smartphone - anywhere you can access the internet. Trust the data and eliminate the guesswork! Each Retriever can support up to 12 Pups. Each Pup can support four different sensors and you can receive customized threshold alerts. Our sensors measure everything from soil moisture to light, wind, rain, humidity and more.

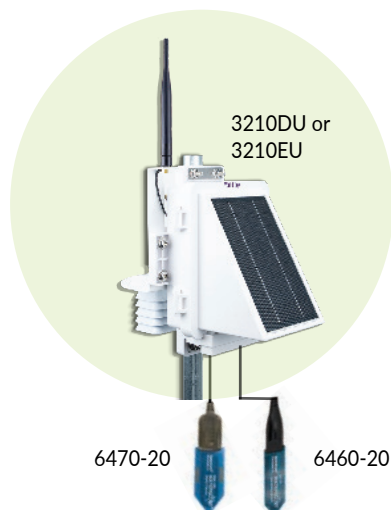
Expand your network by adding weather stations to bring data from every corner of your property directly to you.

## NEW 3000 Series Pup Stations

The 3000 Series Wireless Stations are available with wireless mesh radios to fully participate in Retriever and Pup networks. Setup is easy due to the modular design that includes the integral solar panel and rechargeable battery for reliable power. Customize your stations with additional sensors that meet your needs - see examples on the facing page.

See page 5 for sensor specifications and available ports for each model.

3250DU	WatchDog Wireless ET Station Pup, 900Mhz
3250EU	WatchDog Wireless ET Station Pup, 868Mhz
3240DU	WatchDog Wireless Weather Station Pup, 900Mhz
3240EU	WatchDog Wireless Weather Station Pup, 868Mhz
3220DU	WatchDog Wireless Rain Station Pup, 900Mhz
3220EU	WatchDog Wireless Rain Station Pup, 868Mhz
3210DU	WatchDog Wireless Temp/RH Station Pup, 900Mhz
3210EU	WatchDog Wireless Temp/RH Station Pup, 868Mhz



## 3210 Temp/RH Station Pup + Soil Moisture/EC/ Temperature Sensor + Soil Moisture Sensor

Easily detect frost and be alerted to conditions in your crops. Monitor and note site-specific conditions for insect pressure. Remotely monitor soil moisture at two depths.



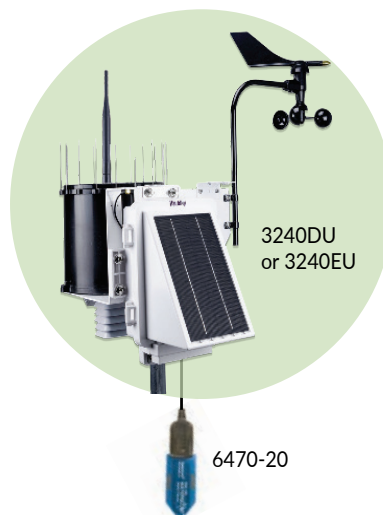
## 3250 ET Station Pup

Monitor evapotranspiration (ET) to effectively manage irrigation with respect to soil moisture loss.



## 3220 Rain Station Pup + Leaf Wetness Sensor

Monitor rainfall for more effective irrigation scheduling and to adjust field activities to avoid soil compaction. Monitor and note site-specific conditions for disease and insect pressures.



## 3240 Weather Station Pup + Soil Moisture/EC/ Temperature Sensor

Monitor weather above and soil moisture below ground to effectively manage irrigation, plan spray applications, and schedule field activities.



## Plant Growth Pup Station

Measure DLI (Daily Light Integral), light duration and intensity for consistently better plant quality across greenhouse and high-tunnel structures. For outdoor growing, monitor soil moisture, temperature, and EC for efficient irrigation practices.



## Irrigation Pup Station

Flexibly monitor both soil moisture and/or EC in a variety of soil textures for better irrigation decisions.





## STEP 1

### CHOOSE YOUR PUPS

#### HOW MANY?

#### ARE YOU CONNECTING TO OTHER WEATHER STATIONS?

#### DO YOU HAVE OBSTACLES, LIKE TREES OR BUILDINGS, HIGH/ LOW SPOTS THAT MIGHT INHIBIT TRANSMISSION?

# Pups

## SET UP A NETWORK

Multiple Pups with a variety of sensors to choose from for unlimited measurement options within a single network. Set up in 5 easy steps.

### WatchDog Sensor Pup

- Connect up to 4 external sensor inputs per Pup
- Transmits data to Retriever (directly or via other Pups)
- Includes 6 lithium AA batteries (solar-power option below)
- Single button operation: check battery status, signal strength, and join sensor network
- Tri-colored LEDs indicate battery level, signal strength, and data communication status

900Mhz  
3900

868Mhz  
3930

WatchDog Sensor Pup

### 3000 Series Pup Stations

900Mhz  
3250DU  
3240DU  
3220DU  
3210DU

868Mhz  
3250EU  
3240EU  
3220EU  
3210EU

WatchDog Wireless ET Station Pup  
WatchDog Wireless Weather Station Pup  
WatchDog Wireless Rain Station Pup  
WatchDog Wireless Temp/RH Station Pup

### WatchDog Repeater Pup

- Serves as "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 lithium AA batteries (solar-power option below)

900Mhz  
3902

868Mhz  
3932

WatchDog Repeater Pup

### Additional Pup Information

- Communication range of 2,500 ft (about 1/2 mile), line-of-sight installation between devices
- Pups act as repeaters to get data to the Retriever

### Most Popular Sensors

Choose sensors for what you will measure. Choose up to 4 per Sensor Pup, and up to 2 for 3000 Series Pup Stations.

3613ARS  
3613THS  
3665RD  
3305ADD  
6470-20  
6460-20  
6450WD20  
3667  
3666  
3670I  
3668I

Temperature/RH Sensor with Aspirated Radiation Shield  
Temperature/RH Sensor with Passive Radiation Shield  
Digital Rain Collector with Bird Guard (Sensor Pup Only)  
Digital Anemometer (Sensor Pup Only)  
WaterScout SMEC 300 Sensor with 20 ft (6.1 m) Cable  
WaterScout SM 100 Sensor with 20 ft (6.1 m) Cable  
Watermark Sensor with 25 ft (7.6 m) Cable  
External (Soil) Temperature Sensor with 6 ft (1.8 m) Cable  
Leaf Wetness Sensor  
LightScout Silicon Pyranometer  
LightScout Quantum Light Sensor

### Optional Accessories

3999

Solar Power Package for Pups & Retrievers  
Includes 5W solar panel and 6V 4.5Ah rechargeable battery



100% Customizable



Pressure Transducer



CO2 Sensor



Anemometer



Irrigation On/Off Sensor



Rain Collector



Barometric Pressure Sensor



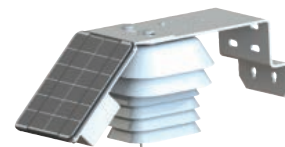
External (Soil) Temperature Sensor



Temperature (Micro) Sensor



Digital Temperature / Humidity Sensor with Aspirated Radiation Shield



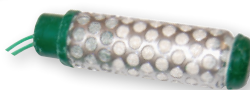
Digital Temperature / Humidity Sensor with Passive Radiation Shield



Leaf Wetness Sensor



Watermark Soil Moisture Sensor



WaterScout SMEC 300 Soil Moisture, EC, and Temperature Sensor



WaterScout SM 100 Soil Moisture Sensor



LightScout Quantum Sensor Bars



LightScout UV / Solar Radiation / PAR Light Sensors





## Retriever

GATHER THE DATA

### STEP 3

CHOOSE YOUR  
RETRIEVER

#### WatchDog Retriever

- Receives all data from Pup network, each Retriever supports up to 12 Pups
- Includes USB Flash Drive and USB data cable
- Includes 6 lithium AA batteries. Can also be powered by DataScout modem, Direct-Connect cable, or Solar Power Package
- 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

3910 WatchDog Retriever, 900 Mhz

3912 WatchDog Retriever, 868 Mhz



#### Optional Accessories

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

3396TPS Tripod Mount with Stakes

3925 Antenna Extension Cable - 10 ft (3 m)  
Includes Mounting Bracket and Hardware

3388USB Replacement/additional USB Flash Drive

3927C75 PC Direct Connection Cable - 75 ft  
Connect your Retriever directly to your PC. Includes power and data cables, AC/DC power adapter, and DC plug adapter  
Has 9-pin serial connection on PC end, may require USB adapter (Item 366IU9)

3926 AC/DC Power Adapter



### STEP 4

CHOOSE  
ADDITIONAL  
ACCESSORIES

TRIPOD?  
BATTERY POWERED?  
SOLAR POWER  
PACKAGE?  
FLASH DRIVE?  
CABLE?  
ADAPTER?

#### 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 all data can be viewed online (SpecWare software not required)

3654P9 Spec 9 Pro Software





## STEP 5

CHOOSE YOUR  
MODEM  
TO SEND DATA  
ONLINE

WI-FI OR CELLULAR?



3928M DataScout cellular Modem  
mounted with a WatchDog  
Retriever

## DATAScout 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 (with non-rechargeable batteries)  
DataScout Modem and the Retriever can share the power from the solar power package.
- 2000 Series Full Weather Stations -  
- Station must be running firmware version 7.6 or above
- WatchDog 2000 Series Mini Stations -  
- Station must be running firmware version 4.1 or above



3928M DataScout  
Cellular Modem

### Cellular Modems

**3928M LTE CAT-M Modem**

**3924M GSM 3G HSPA+ Modem**

**3999 Solar Power Package**

Includes 5W solar panel and 6V 4.5Ah rechargeable battery

**3926 AC/DC Power Adapter**

### Wi-Fi Modems

**3920 Wi-Fi Modem - AC/DC Powered**

Includes 3926 AC/DC Power Cord

**3920S WiFi Modem - Solar Powered**

Includes solar panel and rechargeable battery pack



Use this powerful tool as a central point for viewing and evaluating real-time data instantaneously for better decisions. SpecConnect can help improve yield and quality, conserve resources, increase profits and decrease risk by viewing current weather conditions and factors.

- Configure your network from your computer, smartphone, or tablet
- Easy and simple to navigate
- 100% customizable dashboard
- Supports multiple user logins
- Send customized alerts via text message or email
- Download your data for offline analysis
- Create custom reports and charts for full analyses of your data
- Map view allows you to see all station locations and current conditions
- Optional plant disease and insect models



## SpecConnect Reporting Features

- Daily/Hourly
- Multi Station/Sensor
- Equipment Inventory & Activity
- Rainfall and Soil Moisture (product specific)
- And More!

## SpecConnect Compatible Items

- WatchDog® Retriever & Pups
- WatchDog® 3000 Series Weather Stations
- WatchDog® 2000 Series Weather Stations
- WatchDog® 2000 Series Mini Stations
- FieldScout® TDR 350/150
- FieldScout® TruFirm® Turf Firmness Meter
- Data file uploads supported for:  
SC900, TDR300, SPAD, CM1000, TCM500

## Current Conditions At Your Fingertips

### Example WatchDog Station Pup Dashboard

#### Current Conditions

Equipment: WatchDog Station Pup



**WatchDog Station Pup**  
WatchDog ET Station

Last upload: 3 minutes ago  
Monday, October 15, 2018 1:30 PM



A: 6in (WaterScout SM 100) 22.9 %VWC  
B: 12in (WaterScout SM 100) 14.1 %VWC  
C: 18in (WaterScout SM 100) 28.9 %VWC  
D: Leaf Wetness 0.0 Wetness

F: Solar Radiation Light 679 W/m<sup>2</sup>  
G: Relative Humidity 47.3 %  
H: Temperature 45.0 F  
I: Rainfall - 24-hour 0.24 inches

24 hours

J: Wind Direction 279 degrees  
K: Wind Gust 16 mph  
L: Wind Speed 5 mph  
Dew Point 26.1 F  
VPD 0.54 kPa  
Wet Bulb 36.9 F  
Delta T 8.1 F  
Heat Index 41.42 F





- Web Portal connection requires a WatchDog Retriever & Pup network or any 3000 or 2000 Series Weather Station to collect and log data, and DataScout Modem to send data to the internet
- FieldScout subscriptions require a TDR or TruFirm Meter and the free FieldScout Mobile App

### Pro WatchDog Subscriptions (includes one device)

3010US	SpecConnect Pro 1-yr Subscription - Cellular, US/Canada For WatchDog devices, includes cellular plan
3030	SpecConnect Pro 1-yr Subscription - WiFi
3000	SpecConnect Initial Set Up Fee

### Additional Devices and Services

3045US	Additional WatchDog Pup Device - Cellular (1-yr) Needed per Pup or Pup Station, includes cellular plan
3046	Additional WatchDog Device - Low-Cellular (1-yr) (15-60 minute, interval mean sensor values only)
3055	Additional WatchDog Device - WiFi (1-yr) Needed per Pup or Station
3040	Additional Login (1-yr) Limit of three users per subscription
3070	Alerts Function (1-yr) Up to 4 phone numbers and emails Needed per Pup or station
3065	API Service (one-time charge)

### Pro FieldScout Subscriptions (includes one device)

3035A	SpecConnect FieldScout Pro (1-yr) 1-3 devices
3035B	SpecConnect FieldScout Pro (1-yr) 4-7 devices
3035C	SpecConnect FieldScout Pro (1-yr) 8 or more devices

#### SpecConnect WATCHDOG SUBSCRIPTION FEATURES

Customizable Dashboard	✓
Current Conditions	✓
Basic Wind Speed/Direction & Temp Gauges	✓
Advanced Wind Rose	✓
Data Storage	✓
Mapping	✓
Calibration Adjustment	✓
Disease Models Reports (additional fee)	✓
Basic Reporting	✓
Custom Reporting	✓
Evapotranspiration (ET) Reports	✓
Degree Days Reports	✓
Daily Light Integral (DLI) Reports	✓
Chill Hours/Units/Portions Reports	✓
Alerts (additional fee)	✓
API Service (one-time charge)	✓

## Disease & Insect Forecast Model Packages

### 1-YEAR SUBSCRIPTIONS

Be 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-year subscriptions

#### 3095APP SpecConnect Apple/Pear Alert Package

<b>Required Sensors:</b>	Leaf wetness and temperature
<b>Models Included:</b>	Apple Scab (Modified Mills, Cornell, UC Davis California) Fire Blight (Maryblyt, Cougarblight) Sooty Blotch/Flyspeck Insect Models

#### 3095CHP SpecConnect Cherry Alert Package

<b>Required Sensors:</b>	Leaf wetness and temperature
<b>Models Included:</b>	Leaf Spot Insect Models

#### 3095GAP SpecConnect Grape Alert Package

<b>Required Sensors:</b>	Leaf wetness, relative humidity, and temperature
<b>Models Included:</b>	Powdery Mildew (Thomas-Gubler) Black Rot (Spotts) Downey Mildew Botrytis Phomopsis Cane Leaf Spot Insect Models

#### 3095POP SpecConnect Potato Alert Package

<b>Required Sensors:</b>	Temperature, relative humidity, and rain
<b>Models Included:</b>	Early Blight Late Blight (BliteCast) Insect Models

#### 3095TOP SpecConnect Tomato Alert Package

<b>Required Sensors:</b>	Leaf wetness and temperature
<b>Models Included:</b>	Tomcast Insect Models

#### 3095TUP SpecConnect Turf Alert Package

<b>Required Sensors:</b>	Air and soil temperature, relative humidity, and rain
<b>Models Included:</b>	Brown Patch (Schumann) Pythium (Nutter, Schein) Dollar Spot (Hall, Mills/Rockwell) Insect Models

#### 3095NUP SpecConnect Nut Alert Package

<b>Required Sensors:</b>	Temperature, leaf wetness, relative humidity, rain
<b>Models Included:</b>	Almond Alternaria Leaf Spot Almond Anthracnose Pecan Scab Pistachio Panicle and Shoot Blight Walnut Blight Insect Models



## Daily Report

- Track the key growing factors of temperature, humidity, and rainfall
- Generate formal reports for permanent records
- Flexible date selection for reports you need: week, month, or growing season

### Daily Report

Date Range: 12/22/2020 to 01/21/2021

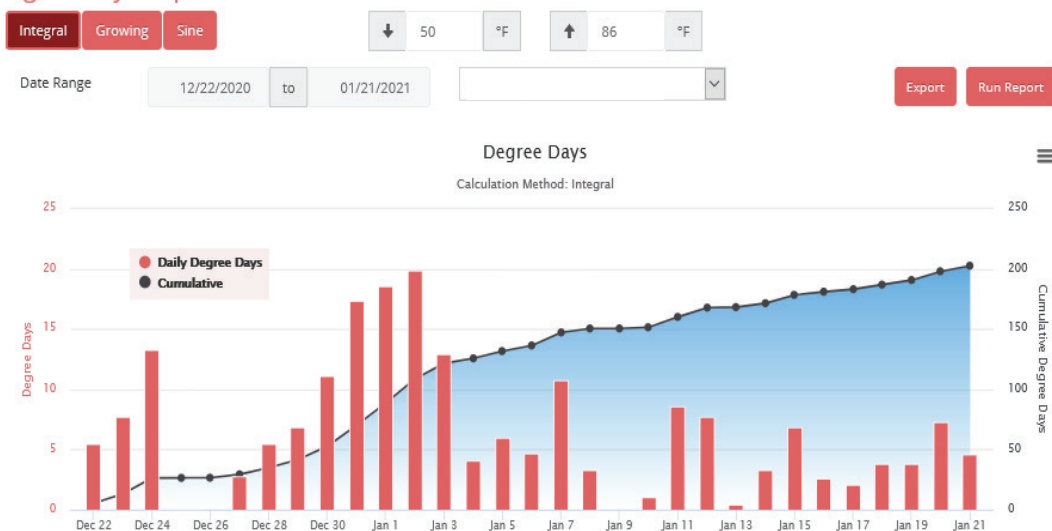
[Export](#) [Run Report](#)

Date	Temp High	Time @ Temp High	Temp Low	Time @ Temp Low	Temp Avg.	RH High	RH Low	RH Avg.	Daily Rainfall	Rainfall Cumulative
2021-01-21	78.2	2:00:00 pm	47.8	12:05:00 am	57.68	88.4	43	74.54	0	0.88
2021-01-20	74	2:50:00 pm	35.6	2:25:00 am	52.59	92.3	30.6	68.46	0	0.88
2021-01-19	65.1	1:20:00 pm	31.7	5:15:00 am	45.43	91.4	43.1	73.55	0	0.88
2021-01-18	66.3	2:35:00 pm	34	11:50:00 pm	48.2	89.8	27.7	63.49	0	0.88
2021-01-17	61.3	1:25:00 pm	29.9	6:40:00 am	44.28	91.8	39.3	70.46	0	0.88
2021-01-16	60.5	1:35:00 pm	33.1	11:55:00 pm	47.28	90.7	35.4	65.05	0.01	0.88
2021-01-15	72.5	2:30:00 pm	36.6	4:15:00 am	53.54	91.3	48.2	78.86	0.08	0.87
2021-01-14	64.8	3:20:00 pm	35.4	7:10:00 am	48.45	91.4	37	70.96	0	0.79
2021-01-13	53.9	2:10:00 pm	45.3	7:05:00 am	48.22	85.3	64.8	78.43	0	0.79
2021-01-12	62.8	10:30:00 am	49.2	11:50:00 pm	57.7	84.1	72.2	78.67	0	0.79
2021-01-11	71	1:50:00 pm	41.6	2:10:00 am	56.75	91.4	62.8	81.82	0	0.79

## Degree Days Report

- Track plant growth stage through the growing season
- Use degree days for pest management decisions, not the calendar
- Time the application of pesticide spray more effectively with degree day information
- Aids growers and researchers in tracking the development of plants and pests
- Project the growth and development of plants and insects during the growing season

### Degree Days Report



### Disease Model Instance: Apple Scab

[Export](#)

Model: Apple Scab

Equipment: Watchdog 2700

Dates: 7/8/2020 to 11/30/2020

Timestamp	Spore Mature Percent	Cornell Risk	Mills Risk	Calif Risk	Degree Day Sum	Mean Wet Temperature	Low Temperature	High Temperature	Degree Days	Leaf Wetness Hours
2020-07-08	1	Infected			42	67.42	63.00	85.80	42.10	10.50
2020-07-09	2	Infected			87	67.47	65.40	87.70	44.87	6.50
2020-07-10	4	Infected			126	69.30	62.50	76.50	39.24	8.25
2020-07-11	6	None	None	None	166		59.50	79.20	40.04	0.00
2020-07-12	9	None	None	None	200	57.22	55.60	72.80	33.80	2.75
2020-07-13	12	Infected	Light	Infected	233	54.23	51.30	76.00	32.59	10.00
2020-07-14	18	Infected	Medium	Infected	268	52.95	50.60	78.70	35.26	7.00
2020-07-15	24	Infected	Heavy	Infected	306	65.26	64.00	75.90	38.22	5.75
2020-07-16	31	Infected	Heavy	Infected	343	62.25	58.00	78.50	36.49	7.00
2020-07-17	38	None	None	None	383		56.80	81.20	40.34	0.00

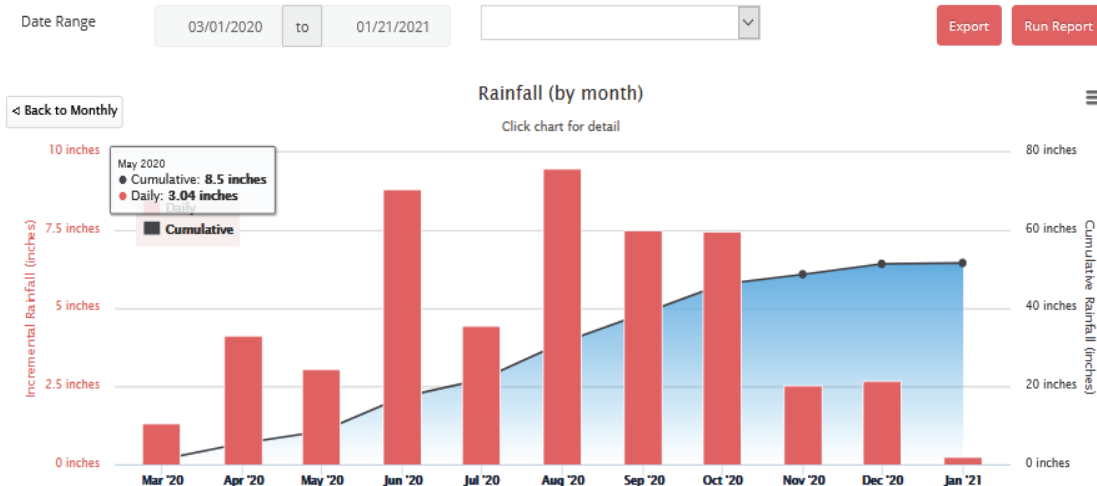
## Disease Models

- Monitor disease pressure based on field-tested and validated algorithms along with data collected by sensors on your field
- Reduce the number of pesticide applications when disease risk is low
- Models available for Apple, Pear, Grape, Cherry, Potato, Tomato, Nut, and Turf diseases

## Rainfall Report

- Monitor rainfall throughout the growing season
- See the monthly rainfalls superimposed on the cumulative total in one place
- Click on Monthly bars to see daily rain events
- Then click on Daily bars to see more detail

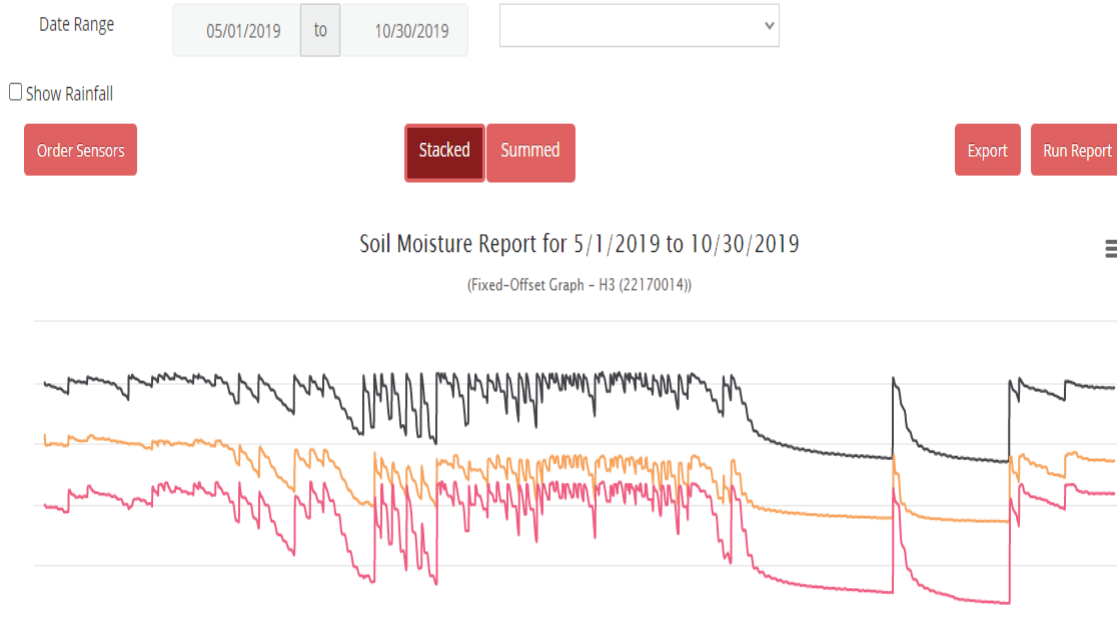
### Rainfall Report



## Soil Moisture Graph Report

- Maintain optimal levels of soilwater content in the root zone
- Avoid flushing nutrients beyond the bottom of the root zone
- Anticipate water stress by estimating water deficit
- Set the desired moisture thresholds based on your field needs and improve your irrigation efficiency

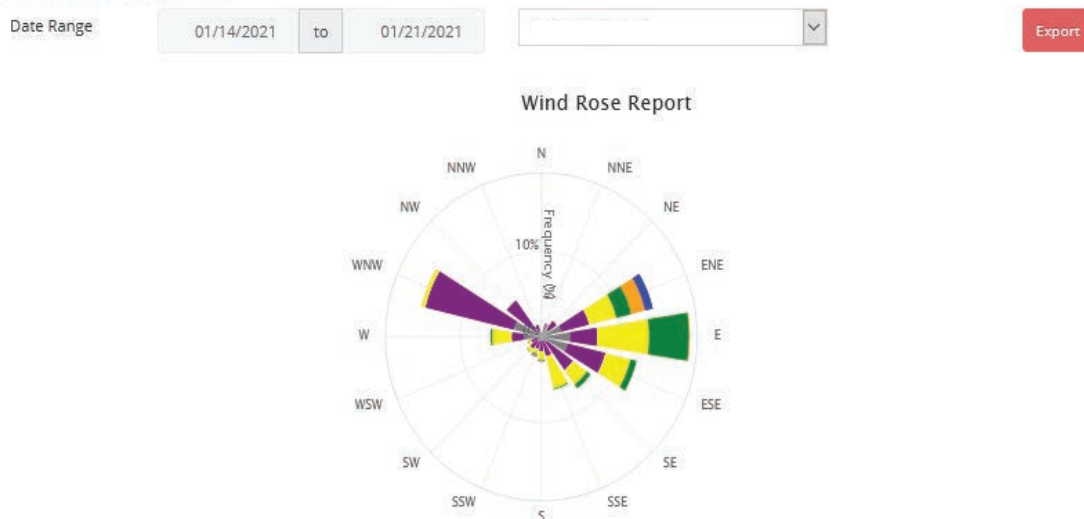
### Soil Moisture Graph Report



## Wind Rose Report

- Analyze and display distributions of wind speeds and directions at your locations
- Protect your plants from wind damage
- Anticipate soil erosion or deposition caused by intense and heavy wind
- Manage pesticide drift risk

### Wind Rose Report





## INTRODUCING THE NEW 3000 SERIES DATA LOGGERS

Collect the measurements that matter to you!

The NEW WatchDog® Data Loggers are ideal for those who do not need to send data to the Internet. Data can still be transferred from the internal logger to a USB flash drive and processed with SpecWare\*.

The 3000 Series Data Loggers offer all-in-one simple setup. With Bluetooth connectivity and the free WatchDog mobile app, receive weather notifications direct to your smartphone. Perfect for fields, orchards, vineyards, and golf courses.

**SpecWare Pro**  
Software\*



### 3250 ET Station Data Recorder

Collect evapotranspiration (ET) data to know how much water your crops are using.

*Measure wind speed/direction, temperature, relative humidity, rainfall, and solar radiation, plus one additional sensor port.*

3250DR WatchDog 3250 ET Station Data Recorder

**NEW**

\*Requires SpecWare Pro software version 9.70 or later to process 3000 Series data.



## 3240 Weather Station Data Recorder

Monitor weather conditions for more profitable crop decisions.

*Measure wind speed/direction, temperature, relative humidity, and rainfall, plus two additional sensor ports.*

3240DR WatchDog 3240 Weather Station Data Recorder



## 3220 Rain Station Data Recorder

Collect rainfall data for more effective irrigation scheduling. Collect site-specific weather conditions at research plots.

*Measure temperature, relative humidity, and rainfall, plus two additional sensor ports.*

3220DR WatchDog 3220 Rain Station Data Recorder



## 3210 Temp/RH Station Data Recorder

Collect temperature and humidity data at remote sites.

*Measure temperature, and relative humidity, plus two additional sensor ports.*

3210DR WatchDog 3210 Temp/RH Station Data Recorder



	3210 Temp/RH Data Recorder	3220 Rain Data Recorder	3240 Weather Data Recorder	3250 ET Data Recorder	Range	Accuracy
Air Temperature	✓	✓	✓	✓	-40° to 257°F (-40° to 125°C)	±0.54°F (-40° to 194°F)
Relative Humidity	✓	✓	✓	✓	0 to 100%	±2% @ 77°F (25°C)
Rainfall	Optional	✓	✓	✓	0.01" (0.254mm) resolution	±2% at <2" (5 cm)/hr
Wind Speed	Optional	✗	✓	✓	0, 1 to 200 mph (0, 1 to 322 km/h)	±2 mph (±3 km/h), ±5%
Wind Direction	Optional	✗	✓	✓	1-359°, 1° increments	±3°
Solar Radiation	Opt. (ext. port)	Opt. (ext. port)	Opt. (ext. port)	✓	0 to 1500 W/m <sup>2</sup>	±5%
Available External Sensor Ports	2	2	2	1		



Monitor, record and analyze over a dozen environmental parameters directly from your field, orchard, vineyard or golf course.

## 2000 Series Mini Stations

Monitor microclimates with up to 4 external sensor ports. You can customize your WatchDog network, using different sensors based on the data you want to collect and analyze for optimal system performance.

- Measure temperature, humidity, quantum light, and more (varies by model)
- Customize with 1-4 plug-in sensors
- Custom measurement intervals
- Reliable NEMA-4 type IP 66 enclosure and weatherproof connectors
- 12-month battery power (4 AA batteries included)

## How do you access the data?

- 1. SpecConnect:** Wireless or Cellular Communication: Access real time data from your PC, tablet or smart phone
- 2. Direct Connect:** Download from the station to your PC. Requires SpecWare Basic or Pro
- 3. Data Shuttle:** Transport data from your station to your PC. Requires SpecWare Basic or Pro



### Model 2475 Plant Growth Station

- Ideal for greenhouses - includes sensors for quantum (PAR) light, air temperature, dew point, 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
- Computes and displays DIF - Average day/night temperatures differences
- Computes and displays VPD - Vapor Pressure Deficit

3686WD Model 2475  
WatchDog® Weather Station

### Model 2450 Temperature/RH Station

- Measures air temperature, relative humidity, dew point, with 2 available external sensor ports
- Computes and displays dew point

3684WD Model 2450  
WatchDog® Weather Station



2400

### 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



2800

### 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

## WATCHDOG® 2000 SERIES MINI WEATHER STATION FEATURES

Sensors	2475	2450	2425	2400	2800	Specifications	Accuracy
Air Temperature	✓	✓	✓	OPT	OPT	-40° to 257°F (-40° to 125°C)	±0.54°F at -40° to 185°F(±0.3°C at -40° to 85°C)
Relative Humidity	✓	✓				0% to 100%	±2% at 32° to 176°F(0° to 80°C)
Dew Point	✓	✓				-99° to 140°F (-73° to 60°C)	±4°F (±2°C)
Quantum Light (PAR)	✓	OPT	OPT	OPT	OPT	0 to 2500 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$	±5%
External Sensor Ports	1	2	3	4	8		
Available ports for SMEC 300 Sensors	1	2	3	4	2		
Operating temperature range: -22 to 130°F (-30 to 55°C)							



## 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 required)
- Up to 4 external sensor ports
- Up to 8 sensor values with the Model 1650 using up to two WaterScout SMEC 300 Soil Moisture/EC/Temperature Sensors
- LCD displays 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)
- Water-resistant case (radiation shield or enclosure recommended for outdoor use)
- 12-month battery life (CR2450, included)



## How do you access the data?

- 1. Direct Connect:** Download from the station to your PC. Requires SpecWare Basic or Pro
- 2. Data Shuttle:** Transport data from your station to your PC. Requires SpecWare Basic or Pro

DESCRIPTION	INTERNAL SENSOR	EXTERNAL PORTS	MAX. NUMBER OF SMEC 300 SENSORS
MODEL 1650 Item 3688WD1	TEMPERATURE RELATIVE HUMIDITY	4	2
MODEL 1525 Item 3687WD1	TEMPERATURE	4	2
MODEL 1450 Item 3684WD1	TEMPERATURE RELATIVE HUMIDITY	2	1
MODEL 1425 Item 3683WD1	TEMPERATURE	3	1
MODEL 1400 Item 3685WD1	NONE (EXTERNAL ONLY)	4	2
MODEL 1250 Item 3682WD1	TEMPERATURE RELATIVE HUMIDITY	NONE	0
MODEL 1225 Item 3681WD1	TEMPERATURE	1	0
MODEL 1200 Item 3680WD1	NONE (EXTERNAL ONLY)	2	1
MODEL 1120 Item 3554WD1	RAINFALL (SEE BELOW FOR DETAILS)	NONE	0
MODEL 1115 Item 3635WD1	REQUIRES EXTERNAL RAINFALL (SEE WEBSITE FOR DETAILS)	1	0

## 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:  $\pm 2\%$  at  $< 2$  in (5 cm) per hour
- Requires SpecWare 9 Basic or Pro
- Includes Bird Guard to reduce maintenance

3554WD1

Data-Logging Rain Gauge





## Soil Sensors



6470-6



6460



6450WD



3667



3669



6451

### 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:  $\pm 3\%$ ; EC: 0 to 10 mS/cm, Accuracy:  $\pm 2\%$ . Requires WaterScout Calibration Device. Compatible with WatchDog 3000, 2000, and 1000 Series 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:  $\pm 3\%$ . Compatible with WatchDog 3000, 2000, and 1000 Series 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

### Watermark Soil Moisture Sensor

Measures soil moisture tension from 0 to 200 centibars. Compatible with WatchDog 3000, 2000, and 1000 Series 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  $212^{\circ}\text{F}$  ( $-32$  to  $100^{\circ}\text{C}$ ). Accuracy:  $\pm 1^{\circ}\text{F}$  ( $\pm 0.5^{\circ}\text{C}$ ). Compatible with WatchDog 3000, 2000, and 1000 Series 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

Connects to Irrrometer tensiometers and utilizes the dial gauge for measurements. Accuracy:  $\pm 2\%$ . Compatible with WatchDog 3000, 2000, and 1000 Series 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 3000, 2000, and 1000 Series Stations and Pups.

- 6451 Irrigation On/Off Sensor

### LightScout® Silicon Pyranometer

Measure solar radiation between 300 and 1100 nanometers. 1000 Series Micro Stations Range: 0 to  $1250 \text{ W/m}^2$ , Accuracy:  $\pm 5\%$ . All other Series & Pups Range: 0 to  $1500 \text{ W/m}^2$ , Accuracy:  $\pm 5\%$ . Compatible with WatchDog 3000, 2000, and 1000 Series Stations and Pups.

- 36701 LightScout Silicon Pyranometer

### LightScout® UV Light Sensor

Measure UV radiation between 250 and 400 nanometers. Range: 0 to  $200 \mu\text{mol m}^{-2} \text{ s}^{-1}$ , Accuracy:  $\pm 5\%$ . Compatible with WatchDog 3000, 2000, and 1000 Series Stations and Pups.

- 36761 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 (48 cm) long and include mounting brackets. 1000 Series Micro Stations Range: 0 to  $2500 \mu\text{mol m}^{-2} \text{ s}^{-1}$ , Accuracy:  $\pm 5\%$ . All other Series & Pups Range: 0 to  $3000 \mu\text{mol m}^{-2} \text{ s}^{-1}$ , Accuracy:  $\pm 5\%$ . Compatible with WatchDog 3000, 2000, and 1000 Series Stations and Pups.

- 36681 LightScout Quantum Light Sensor
- 366813 LightScout Quantum Light 3 Sensor Bar
- 366816 LightScout Quantum Light 6 Sensor Bar

## Light Sensors



36681 / 36761



366816

## Environmental Sensors



3667S



3665R



3666



3671



2655

### Temperature (Micro) Sensor

Measure surface temperature of leaves, buds, and other tiny mediums.

Range: -25 to 212°F (-32 to 100°C). Accuracy:  $\pm 1^\circ\text{F}$  ( $\pm 0.5^\circ\text{C}$ ). Compatible with WatchDog 3000, 2000, and 1000 Series 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:  $\pm 2\%$  at  $< 2$  in (5 cm) per hour. Compatible with WatchDog 3210, 2800, 2400 Series, 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 3000, 2000, and 1000 Series Stations and Pups.

3666

Leaf Wetness Sensor

### Barometric Pressure Sensor

Measure atmospheric pressure. Standard Sensor: Range: 26 to 32 inHg, 880-1080 hPa, Accuracy:  $\pm 0.05$  inHg,  $\pm 1.7$  hPa; High Altitude Sensor: 18.75 to 33.1 inHg, 635-1121 hPa, Accuracy:  $\pm 0.057$  inHg,  $\pm 1.9$  hPa. Compatible with WatchDog 3000, 2000, and 1000 Series Stations and Pups.

3671

Barometric Pressure Sensor - Standard

3671M

Barometric Pressure Sensor - High Altitude

### CO<sub>2</sub> Sensor

Measure CO<sub>2</sub> levels in ppm using NDIR technology. Requires AC power. Not waterproof. Range: 0 to 4000 ppm, Accuracy:  $\pm 5\%$  or 50 ppm. Compatible with WatchDog 3000, 2000, and 1000 Series Stations and Pups.

2655

CO2 Sensor

### 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:  $\pm 0.005\text{V}$ . (Item 3674) Range: 0 to 20.1 mA, Accuracy:  $\pm 1\%$ . Compatible with WatchDog 3000, 2000, and 1000 Series 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:  $\pm 0.54^\circ\text{F}$  from 50 to 131°F (0.3°C from 10 to 55°C),  $\pm 2.5\%$  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:  $\pm 0.54^\circ\text{F}$  from 50 to 131°F (0.3°C from 10 to 55°C),  $\pm 2.5\%$  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:  $\pm 2\%$  at  $< 2$  in (5 cm) per hour. 6 ft cable. Compatible with WatchDog Pups only.

3665RD

Digital Rain Collector

3665DC

Digital Cable - 6 ft

Cable with tinned wire termination - for Pup connection to existing rain collectors only

### Digital Anemometer

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

3305ADD

Digital Anemometer

## Miscellaneous Cables

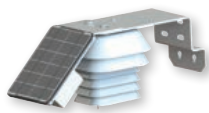


3664



3673

## Digital Sensors (for Pups only)



3613ARS



3613THS



3665RD



3305ADD

## Accessories



### Tripod Mount

Rugged galvanized steel folding tripod and 3 ft (1 m) pole

**3396TPS**

**Tripod Mount with Ground Stakes**

**3396TP**

**Tripod Mount without Ground Stakes**

### Bird Guard

Reduce debris and maintenance. Improve accuracy. Adjustable to fit 8" diameter rain collectors

**3665BG**

**Bird Guard**

### 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**

**Radiation Shield**

### Sliding Enclosure

Water resistant - mounts to pole or post. Compatible with 1000 Series Micro Stations

**3658A**

**Sliding Enclosure**

### Waterproof Enclosure

Clamshell enclosure. Compatible with 1000 Series Micro Stations (Models 1400 or 1200, plus soil sensors)

**3659WD1**

**Waterproof Enclosure**

### Alarm Output Module

Triggers an external device based on a sensor reading. Compatible with WatchDog 2000 Series Stations (Full and Mini)

**3672**

**Alarm Output Module**

## Communication Options



**3679WD1**

### 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**

**Mid Range Wireless Base Station**

**3393W**

**Mid Range Wireless for Remote Station**

Optional Yagi antennas increase line of sight range to 7 mi (11 km); see website for details

### WatchDog® 1000/2000 Series Data Shuttle

Transport weather data from your 2000 Series Stations or 1000 Series Micro Stations to your host PC. Holds data for multiple stations (up to 5 Full, 10 Mini, or 12 Micro Stations). Includes soft-sided case (also available separately as Item 7500). Requires SpecWare 9 Basic or Pro.

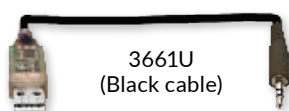
**3679WD1**

**WatchDog 1000/2000 Data Shuttle**

## Cables & Adapters



**3660-75SP**



**3661U**  
(Black cable)



**3661U9**  
(White cable)

### 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**

**Short Range Modem Pair**

### 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 3661U9)

**3660-75SP**

**75 ft (22.8 m) Direct Connect Cable**

**Includes surge protectors for both ends of the cable connection**

**3660DP**

**75 ft (22.8 m) Powered Direct Connect Cable**

**Includes AC adapter; no surge protectors**

### USB-to-3.5mm-Stereo-Plug Adapter

Connect WatchDog and FieldScout® devices directly to your computer's USB port

**3661U**

**USB-to-3.5mm-Stereo-Plug Adapter**

### USB-to-9-Pin-Serial Adapter

Connect 9-pin Serial cables (such as Item 3660-75SP) directly to your computer's USB port

**3661U9**

**USB-to-9-Pin-Serial Adapter**





## A-Series Data Loggers

The most affordable way to track environmental conditions for analysis.

- 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 AC power; international adapter included)

## How do you access the data?

- LCD display confirms logger operation and displays last sensor readings
- Hook up A-Series Loggers to your computer with PC Connection cable (see below), requires SpecWare Basic or Pro
- Select measurement intervals from 1 to 120 minutes
- Direct connect requires SpecWare Basic or Pro plus A-Series PC Cable (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 (-20 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%  
 CO<sub>2</sub> range: 0 to 9999 ppm, Accuracy: ±50 ppm ±5% of reading (0 to 2000 ppm), else unspecified



3611A



3612A



3617A

DESCRIPTION	INTERNAL SENSOR	INTERVALS	RADIATION SHIELD
MODEL A160 3611A	AIR TEMPERATURE RH, CO <sub>2</sub>	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 Port  
 (required to download data)

3663A Radiation Shield (needed for outdoor use)

## 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

## How do you access the data?

- Snap the B-Series Data Loggers into the Docking Station and connect it to your PC to see data. Requires SpecWare Basic or Pro

DESCRIPTION	INTERNAL SENSOR	INTERVALS	LCD DISPLAY
MODEL B102 T/RH 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 65°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 65°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 Port  
 (required to download data)



## 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
- SpecWare 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)
- Only one activation per purchase

SpecWare 9 Basic does not support disease models, 2000 Series Full 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
- Automate logger downloads with wireless or directly connected stations
- Generate scheduled log files for data-to-web applications or create an XML file that can be posted on the web
- Find and use data easily with an open file management system - all logger data is stored in one file per month, simplifying data sharing and exporting
- 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)
- Only one activation per purchase

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

\* Does not include USB adapter cable

## Disease & Insect Forecast Model Packages

3656AP	SpecWare Apple/Pear Alert Package
3656CH	SpecWare Cherry Alert Package
3656GA	SpecWare Grape Alert Package
3656PO	SpecWare Potato Alert Package
3656TO	SpecWare Tomato Alert Package
3356TU	SpecWare Turf Alert Package

For more information, please visit our website.



## BASIC VS. PRO

COMPARING SPEC 9 BASIC TO SPEC 9 PRO

	Basic	Pro
<b>View Data</b>		
On-demand graphing	✓	✓
<b>Manage Data</b>		
Calibration adjustment	✓	✓
Automatic data append	✓	✓
Single file per logger	✓	✓
International data format	✓	✓
<b>Reports</b>		
Standard reports	✓	✓
Custom reports		✓
Disease & Insect models		OPT
"Pest Alert" report models		OPT
<b>Communications</b>		
Direct connect or modem	✓	✓
Wireless capability		✓
Cellular or wi-fi modem		✓
Auto download		✓
<b>Supported Products</b>		
3000 Series Stations		✓
2000 Series Full Stations		✓
2000 Series Mini Stations		✓
Retriever & Pups		✓
1000 Series Micro Stations	✓	✓
A-Series & B-Series	✓	✓

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

Visit [specmeters.com/updates](http://specmeters.com/updates) to ensure your software version is compatible with our newest WatchDog models.

## Daily Report

- Track the key growing factors of temperature, humidity, and rainfall
- Generate formal reports for permanent records
- Flexible date selection for reports you need: week, month or growing season

SpecWare Reports - NOAA Month Report

Select Report | Where and When | Options | Forecast | View Report

Date	Temperature				Degree Days	Solar Rad	RH Mean	Rain-Fall	Wind		
	Mean	High	Time	Low					Time	Speed	Gust
04/14	43.4	54.8	12:20a	38.4	09:05p	0.4	191.0	74	0.00	12.9	29.0
04/15	41.0	45.9	02:05p	35.0	05:50a	0.0	99.3	77	0.46	17.2	39.0
04/16	39.4	44.0	08:05a	33.5	03:05p	0.0	39.7	95	0.11	5.6	20.0
04/17	41.8	53.5	03:50p	33.2	05:05a	0.4	299.6	68	0.00	6.0	24.0
04/18	35.1	42.6	12:05a	31.5	07:05a	0.0	129.5	92	0.49	7.9	18.0
04/19	34.4	37.0	07:50a	32.7	12:35a	0.0	22.5	95	0.68	13.6	38.0
04/20	36.4	42.5	01:50p	30.3	11:35p	0.0	84.7	91	0.14	4.9	16.0
04/21	39.8	53.0	02:50p	25.9	06:05a	0.2	253.1	71	0.05	3.8	20.0
04/22	40.6	43.1	11:50p	38.9	11:50a	0.0	27.9	98	0.38	8.7	26.0
04/23	50.4	59.5	12:35p	43.0	12:35a	2.8	255.9	81	0.01	6.9	29.0
04/24	50.1	59.6	03:05p	42.1	06:05a	2.4	237.1	70	0.00	3.6	13.0
04/25	50.1	58.3	03:20p	42.2	05:35a	2.2	130.5	70	0.06	6.7	24.0
04/26	55.4	65.1	02:20p	47.7	04:35a	5.3	135.0	87	0.50	14.5	38.0
04/27	47.5	51.5	04:05p	41.5	11:50p	0.2	75.0	86	0.16	2.3	11.0
04/28	41.3	43.0	06:20p	39.6	09:20a	0.0	109.0	86	0.04	6.2	20.0

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## Degree Days Report

- Track plant growth stage through the growing season
- Use degree-days for pest management decisions, not the calendar
- Time the application of pesticide spray more effectively with degree day information
- Aids growers and researchers in tracking the development of plants and pests
- Project the growth and development of plants and insects during the growing season

SpecWare Reports - Degree Days

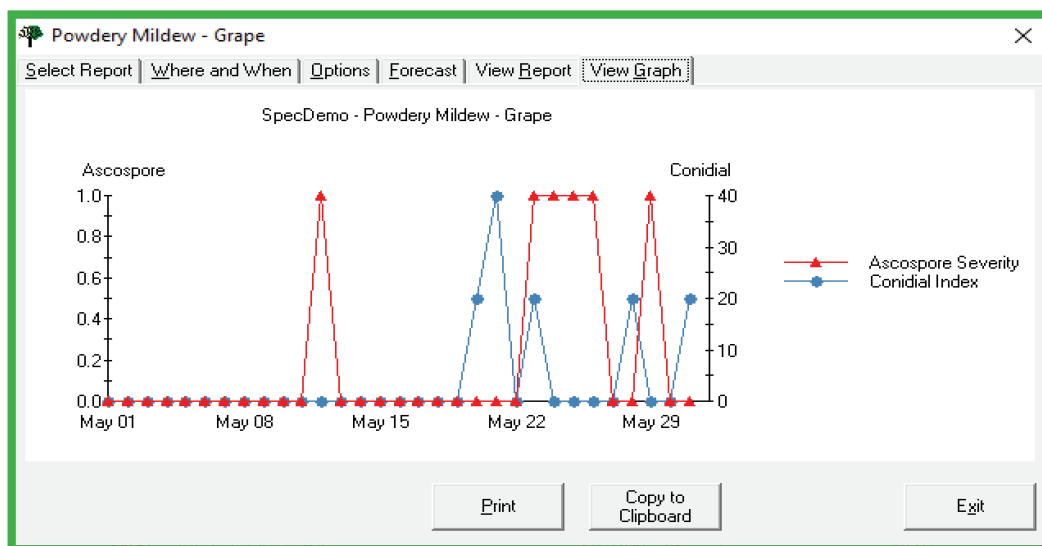
Select Report | Where and When | Options | Forecast | View Report

Date	GDD	Cum	Sng-Sine	Cum	Integral	Cum
04/14	2.4	81.3	1.1	61.6	0.4	52.1
04/15	0.0	81.3	0.0	61.6	0.0	52.1
04/16	0.0	81.3	0.0	61.6	0.0	52.1
04/17	1.8	83.0	0.6	62.2	0.4	52.4
04/18	0.0	83.0	0.0	62.2	0.0	52.4
04/19	0.0	83.0	0.0	62.2	0.0	52.4
04/20	0.0	83.0	0.0	62.2	0.0	52.4
04/21	1.5	84.5	0.4	62.7	0.2	52.6
04/22	0.0	84.5	0.0	62.7	0.0	52.6
04/23	4.8	89.3	3.3	65.9	2.8	55.4
04/24	4.8	94.1	3.2	69.2	2.4	57.8
04/25	4.2	98.2	2.7	71.9	2.2	60.0
04/26	7.5	105.8	6.8	78.6	5.3	65.2
04/27	0.8	106.5	0.3	78.9	0.2	65.4
04/28	0.0	106.5	0.0	78.9	0.0	65.4

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## Disease Models

- Monitor disease pressure based on field-tested and validated algorithms along with data collected by sensors on your field
- Reduce the number of pesticide applications when disease risk is low
- Models available for Apple, Pear, Grape, Cherry, Potato, Tomato, Nut, and Turf diseases





# WatchDog® Weather Stations & Data Loggers Comparison Chart



Item # Model

## 3000 Series Stations

Item #	Model	SpecConnect Compatible	LCD Display	Wireless	Evapotranspiration	Alarm Output-Ready	Air Temperature Sensor	Relative Humidity Sensor	Dew Point	Wind Speed & Direction	Tipping Bucket Rain Collector	Solar Radiation Sensor	Available Sensor Ports	Quantum Light Sensor	Ext. (Soil) Temperature Sensor	Leaf Wetness Sensor	WaterScout Soil Moisture Sensor	WaterScout Soil Moisture/EC/ Temperature Sensor	Digital Sensor Compatible	Radiation Shield (P=Passive or A=Aspirated)
<b>3250xx</b>	3250 ET Station	✓		✓			✓	✓	✓	✓	✓	✓	1	Opt	Opt	Opt	Opt	Opt		P
<b>3240xx</b>	3240 Weather Station	✓		✓			✓	✓	✓	✓	✓	Opt	2	Opt	Opt	Opt	Opt	Opt		
<b>3220xx</b>	3220 Rain Station	✓		✓			✓	✓	✓		✓	Opt	2	Opt	Opt	Opt	Opt	Opt		P
<b>3210xx</b>	3210 Temp/RH Station	✓		✓			✓	✓	✓	Opt	Opt	Opt	2	Opt	Opt	Opt	Opt	Opt		P

## 2000 Series Mini Stations

Item #	Model	SpecConnect Compatible	LCD Display	Wireless	Evapotranspiration	Alarm Output-Ready	Air Temperature Sensor	Relative Humidity Sensor	Dew Point	Wind Speed & Direction	Tipping Bucket Rain Collector	Solar Radiation Sensor	Available Sensor Ports	Quantum Light Sensor	Ext. (Soil) Temperature Sensor	Leaf Wetness Sensor	WaterScout Soil Moisture Sensor	WaterScout Soil Moisture/EC/ Temperature Sensor	Digital Sensor Compatible	Radiation Shield (P=Passive or A=Aspirated)
<b>3684WDPD</b>	Plant Disease Station	✓	✓	Opt		✓	✓	✓	✓		✓		0			✓				P
<b>3686WD</b>	2475 TEMP/RH/PAR + 1 PORT	✓	✓	Opt		✓	✓	✓	✓		Opt	Opt	1	✓	Opt	Opt	Opt	Opt		P
<b>3684WD</b>	2450 TEMP/RH + 3 PORTS	✓	✓	Opt		✓	✓	✓	✓		Opt	Opt	2	Opt	Opt	Opt	Opt	Opt		P
<b>3683WD</b>	2425 TEMP +3 PORTS	✓	✓	Opt		✓	✓				Opt	Opt	3	Opt	Opt	Opt	Opt	Opt		P
<b>3685WD</b>	2400 4 PORTS	✓	✓	Opt		✓					Opt	Opt	4	Opt	Opt	Opt	Opt	Opt		
<b>3345WD2</b>	2800 8 PORTS+OPT RAIN	✓	✓	Opt		✓					Opt	Opt	9	Opt	Opt	Opt	Opt	Opt		

## Retriever & Pups Wireless Sensor Network

Item #	Model	SpecConnect Compatible	LCD Display	Wireless	Evapotranspiration	Alarm Output-Ready	Air Temperature Sensor	Relative Humidity Sensor	Dew Point	Wind Speed & Direction	Tipping Bucket Rain Collector	Solar Radiation Sensor	Available Sensor Ports	Quantum Light Sensor	Ext. (Soil) Temperature Sensor	Leaf Wetness Sensor	WaterScout Soil Moisture Sensor	WaterScout Soil Moisture/EC/ Temperature Sensor	Digital Sensor Compatible	Radiation Shield (P=Passive or A=Aspirated)
<b>3250DU</b>	3250 ET Station Pup	✓		✓	✓		✓	✓	✓	✓	✓	✓	1						✓	P
<b>3240DU</b>	3240 Weather Station Pup	✓		✓			✓	✓	✓	✓	✓	Opt	2	Opt	Opt	Opt	Opt	Opt	✓	P
<b>3220DU</b>	3220 Rain Station Pup	✓		✓			✓	✓	✓		✓	Opt	2	Opt	Opt	✓	Opt	Opt	✓	P
<b>3900PG</b>	Plant Growth Pup Station	✓		✓			✓	✓		Opt	Opt	Opt	2	✓	Opt	Opt	Opt	Opt	✓	A
<b>3900</b>	Sensor Pup	✓		✓			Opt	Opt		Opt	Opt	Opt	4	Opt	Opt	Opt	Opt	Opt	✓	P
<b>3901</b>	Station Pup	✓		✓									0							
<b>3902</b>	Repeater Pup	✓		✓									0							

## 1000 Series Micro Stations

Item #	Model	SpecConnect Compatible	LCD Display	Wireless	Evapotranspiration	Alarm Output-Ready	Air Temperature Sensor	Relative Humidity Sensor	Dew Point	Wind Speed & Direction	Tipping Bucket Rain Collector	Solar Radiation Sensor	Available Sensor Ports	Quantum Light Sensor	Ext. (Soil) Temperature Sensor	Leaf Wetness Sensor	WaterScout Soil Moisture Sensor	WaterScout Soil Moisture/EC/ Temperature Sensor	Digital Sensor Compatible	Radiation Shield (P=Passive or A=Aspirated)
<b>3685SM14</b>	Irrigation Station		✓										0			✓ (4)				
<b>3685SM13</b>	Irrigation Station		✓								Opt	Opt	1	Opt	Opt	Opt	✓ (3)	Opt		
<b>3684PD1</b>	Plant Disease Station		✓				✓	✓			✓		0			✓				P
<b>3684PAR1</b>	Plant Growth Station		✓				✓	✓					1	✓	Opt	Opt	Opt	Opt		P
<b>3688WD1</b>	1650 TEMP/RH+ 4 PORTS		✓				✓	✓			Opt	Opt	4	Opt	Opt	Opt	Opt	Opt		
<b>3687WD1</b>	1525 TEMP+ 4 PORTS		✓				✓				Opt	Opt	4	Opt	Opt	Opt	Opt	Opt		
<b>3684WD1</b>	1450 TEMP/RH+ 2 PORTS		✓				✓	✓			Opt	Opt	2	Opt	Opt	Opt	Opt	Opt		
<b>3683WD1</b>	1425 TEMP+ 3 PORTS		✓				✓				Opt	Opt	3	Opt	Opt	Opt	Opt	Opt		
<b>3685WD1</b>	1400 4 PORTS		✓								Opt	Opt	4	Opt	Opt	Opt	Opt	Opt		
<b>3682WD1</b>	1250 TEMP/RH		✓				✓	✓					0							
<b>3681WD1</b>	1225 TEMP+ 1 PORT		✓				✓				Opt	Opt	1	Opt	Opt	Opt	Opt			
<b>3680WD1</b>	1200 2 PORTS		✓								Opt	Opt	2	Opt	Opt	Opt	Opt	Opt		

## A-Series Loggers

Item #	Model	SpecConnect Compatible	LCD Display	Wireless	Evapotranspiration	Alarm Output-Ready	Air Temperature Sensor	Relative Humidity Sensor	Dew Point	Wind Speed & Direction	Tipping Bucket Rain Collector	Solar Radiation Sensor	Available Sensor Ports	Quantum Light Sensor	Ext. (Soil) Temperature Sensor	Leaf Wetness Sensor	WaterScout Soil Moisture Sensor	WaterScout Soil Moisture/EC/ Temperature Sensor	Digital Sensor Compatible	Radiation Shield (P=Passive or A=Aspirated)
<b>3611A</b>	A160 Temp/RH/CO <sub>2</sub>		✓				✓	✓					0					+CO <sub>2</sub>		
<b>3612A</b>	A150 Temp/RH		✓				✓	✓					0							
<b>3610A</b>	A130 Leaf Wetness/Temp		✓				✓						0			✓				
<b>3617ARS</b>	A125 Soil/Air Temp Station		✓				✓						0		✓					P
<b>3617A</b>	A125 Soil/Air Temp		✓				✓						0		✓					
<b>3618A</b>	A110 Temperature		✓				✓						0							

## Sprayer Station

Item #	Model	SpecConnect Compatible	LCD Display	Wireless	Evapotranspiration	Alarm Output-Ready	Air Temperature Sensor	Relative Humidity Sensor	Dew Point	Wind Speed & Direction	Tipping Bucket Rain Collector	Solar Radiation Sensor	Available Sensor Ports	Quantum Light Sensor	Ext. (Soil) Temperature Sensor	Leaf Wetness Sensor	WaterScout Soil Moisture Sensor	WaterScout Soil Moisture/EC/ Temperature Sensor	Digital Sensor Compatible	Radiation Shield (P=Passive or A=Aspirated)
<b>3349SSCH</b>	Sprayer Station with Console	✓					✓	✓	✓	✓			0							

## REFERENCE:

✓ STANDARD Opt OPTIONAL BLANK NOT AVAILABLE



## 1000 Series Micro & 2000 Series Weather Station Recertification Program

Our products are designed to provide the highest level of accuracy, reliability and ruggedness you deserve. We make every effort to produce the most durable and long-lasting products available today. Over time, certain components are subject to wear and tear. Lightning, rain, snow, salt spray and extreme temperatures all take their toll. Because of this, and because we know how important accurate data is to you, we offer a Recertification Program for weather stations. Our Recertification Program enables you to send your hardware to our Aurora, Illinois facility where it undergoes a complete diagnostic check-up.

### Diagnostic Check-Up

Each check-up includes an inspection of the complete module and wiring, updates to the latest firmware and accuracy checks on all stations. You will receive a Weather Station Functionality Report detailing our testing. If any components of the weather station are found not to be within the published specifications, you will be notified for recommended replacement\*. After authorization for replacement is received, each component will be calibrated and tested.

### One-Year Warranty & Turnaround Time

After the station has been recertified, a one-year warranty will apply to all parts replaced during the recertification process. The turnaround time for recertification of a weather station is estimated at 14 days from the time we receive it.

### Pricing

<b>3300C</b>	<b>Weather Station Recertification 2000 Series</b>
<b>3600C</b>	<b>Weather Station Recertification 2000 Series Mini</b>
<b>3680C</b>	<b>Weather Station Recertification 1000 Series</b>

\* The fee for recertification does not include the cost for any recommended replacement parts or sensors, or shipping to return.

## 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.

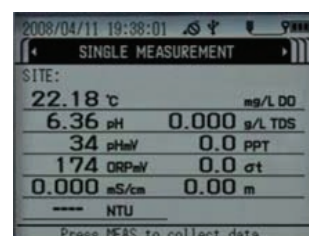
### Control Unit Features:

- 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

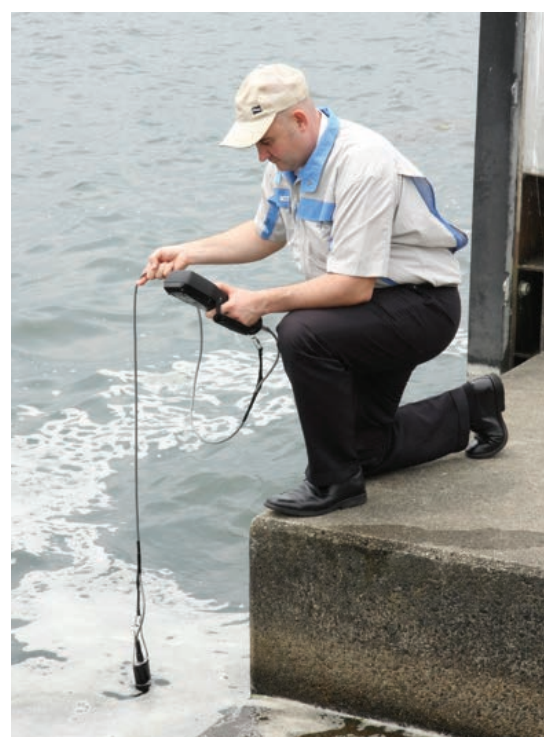
Item 2195-2	U51-2 Meter with 2m Cable
Item 2195-10	U51-10 Meter with 10m Cable
Item 2196-2	U52-2 Meter with 2m Cable
Item 2196-10	U52-10 Meter with 10m Cable
Item 2196-30	U52-30 Meter with 30m Cable
Item 2197-2	U52G-2 Meter with 2m Cable
Item 2197-10	U52G-10 Meter with 10m Cable
Item 2197-30	U52G-30 Meter with 30m Cable
Item 2198-2	U53-2 Meter with 2m Cable
Item 2198-10	U53-10 Meter with 10m Cable
Item 2198-30	U53-30 Meter with 30m Cable
Item 2199-2	U53G-2 Meter with 2m Cable
Item 2199-10	U53G-10 Meter with 10m Cable
Item 2199-30	U53G-30 Meter with 30m Cable



Water quality monitor displays 11 parameters simultaneously

### U-50 SERIES COMPARISON

	U-51	U-52	U52G	U-53	U-53G
pH	✓	✓	✓	✓	✓
ORP (Oxidation Reduction Potential)	✓	✓	✓	✓	✓
Dissolved Oxygen	✓	✓	✓	✓	✓
Conductivity	✓	✓	✓	✓	✓
Salinity	✓	✓	✓	✓	✓
TDS (Total Dissolved Solids)	✓	✓	✓	✓	✓
Seawater Specific Gravity	✓	✓	✓	✓	✓
Temperature	✓	✓	✓	✓	✓
Turbidity (LED)		✓	✓		
Turbidity (Tungsten lamp)				✓	✓
Water Depth			✓	✓	✓
GPS			✓		✓







## Avoid Drift Complaints

Don't let misapplication of herbicides cost you. Let our sprayer station with ultrasonic anemometer help you put pesticides where they belong and nowhere else.

Pesticide drift is increasingly important to commercial applicators. Accurate data helps pesticide applicators make important decisions regarding weather conditions that affect safety, drift and proper application. With the WatchDog® Sprayer Station you can provide evidence of suitable conditions for pesticide application by logging your data. Mount the station directly on your equipment to monitor and log weather conditions on-the-go.

### All-in-One Weather Station Measures:

- Wind Speed/Direction & Chill
- Air Temperature
- Barometric Pressure
- Humidity
- Dew Point
- Computes True Wind Speed

### Additional Information

- Continuously log your weather parameters at a user-selectable rate or hit the snapshot button to capture current conditions at a specific moment
- 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
- Handles adverse conditions with a UV-stabilized, compact housing that is fully waterproof and resistant to chemicals

#### SPECIFICATIONS FOR SPRAYER STATION

Wind Resolution - Speed: 0.1 mph (0.2 km/h); Direction 1°  
 Wind Speed Range: 0 to 90 mph (0 to 145 km/h)  
 Wind Speed Accuracy: <12 mph (19 km/h): ±1.1 mph (1.7 km/h) ±10%;  
 >12 mph (19 km/h): ±2.3 mph (3.7 km/h) or ±5%  
 Wind Direction Accuracy: 4 to 11 mph (6 to 18 km/h): ±5°; >12 mph (19 km/h): ±2°  
 Wind Accuracy Temperature Range: 32° to 131°F (0° to 55°C)  
 Operating Temperature: -13° to 131°F (-25° to 55°C)  
 Temperature Accuracy: ±2°F (±1.1°C) with wind above 4.6 mph (7.4 km/h)  
 Relative Humidity Range: 10 to 95%  
 Relative Humidity Accuracy: ±5% with wind above 4.6 mph (7.4 km/h)  
 Barometric Pressure Range: 24 to 33 in-Hg (800 to 1100 hPa)  
 Barometric Pressure Accuracy: ±0.029 in-Hg (±1 hPa)  
 Power Supply Voltage: 9 to 40 VDC; Current: <90 mA@12VDC

### Choose Your Console:



WatchDog® Sprayer Station Console



Raven Viper 4, ViperPro or Envizio Pro (not available through Spectrum)



AGCO Accu Terminal (not available through Spectrum)

2.75 in (7 cm)



WatchDog® Sprayer Station

12.75 in (33 cm)

## Sprayer Station

3349SSCH

#### WatchDog® Sprayer Station with Console

Buy as a Package & Save! See data on the display and/or download directly from console (requires SpecWare Mobile for WatchDog® Sprayer Station)

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  
 Integrates Raven & AGCO

3349CN

#### WatchDog® Sprayer Station Console

Includes console with built-in data logger, USB-to-3.5mm stereo cable, and software CD

3349H  
3661U9

#### Replacement Humidity Sensor USB-to-9-Pin-Serial Adapter

## Sunlight Consistent plant quality starts with light.

Why measure light? Improve growth and quality of your plants. Shade cloths and hanging baskets reduce plant light more than you know!

Position the meters throughout your greenhouse to compare light levels and the effect those changes have on plant quality. You can also use multiple meters simultaneously to compare light levels and the impact on turf health, quality and aesthetics.



### Quantum PAR/DLI Light Meter

Grow healthier, greener plants by measuring their precise light intake.

- Provides accurate PAR light readings from ANY light source:
  - Full sun to full shade indoors or outdoors
  - Artificial light sources (LED, High-Pressure Sodium, Metal Halide, Fluorescent, Halogen, etc.)
- Three modes of operation:
  - Instant Spot Measurement mode for PAR light readings
  - Scan mode for quickly averaging PAR over an area
  - DLI mode shows Daily Light Integral on the LCD (no computer needed)
- Integral mounting plate for: stand, stake, lanyard & hanger hole, and magnet mounts
- 1/4-20 threaded hole for mounting on camera tripods & stands
- Includes sensor cover & soft carrying case

3415A

LightScout® Quantum PAR/DLI Light Meter



#### GENERALIZED PLANT RESPONSES TO DIFFERENT LIGHT LEVELS

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

\* Moles  
\*\* Micromoles ( $\mu\text{mol}/\text{m}^2\cdot\text{s}$ )

Note: It is not possible to make a direct conversion between an instantaneous light measurement and the Daily Light Integral. Also, temperature is a key factor in plant quality and growth. Source: Hamrick, Debbie, ed. *Ball Red Book*. Batavia, IL: Ball Publishing, 2003.

## LIGHTSCOUT® DLI 100 Light Meter

Light is one of the most important factors in plant and turf quality. The best way to quantify light for growing plants is to measure photosynthetically active radiation (PAR) light between 400 and 700 - the range that promotes photosynthesis. The daily light integral (DLI) measures the total amount of PAR within a 24-hour period.

- Affordable & simple, one button operation
- Meter runs for 24 hours to calculate DLI
- Real-time intensity levels are shown in  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$  every 4 seconds daily
- Battery included
- Greenhouse & Turf models available

3405G3 LightScout® DLI 100 Meter - Greenhouse (set of 3)

3405G LightScout DLI 100 Meter - Greenhouse (1 unit)

3405T3 LightScout® DLI 100 Meter - Turf (set of 3)

3405T LightScout DLI 100 Meter - Turf (1 unit)



For the best results place one meter in the sun, one in partial shade and one in full shade.



3412

## LIGHTSCOUT® Red/Far-Red Meter

Red/Far-Red light ratio helps plants determine proximity to each other, affecting 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



3414F

## 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  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$  (full sunlight)

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



3415FXSE

## 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  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
- 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 7500 LightScout® Quantum and Foot-Candle Meter  
Soft-Sided Carrying Case

## LIGHTSCOUT® Foot-Candle Meter

- Displays immediate light level in units of foot-candles
- An affordable light measurement solution, with precision photodiode with cosine correction

3413F 7500 LightScout® Foot-Candle Meter  
Soft-Sided Carrying Case

## LIGHTSCOUT® External Light Sensor Reader

- Plug in a sensor, choose it on the LCD, and measure UV, Quantum Light, or Solar Radiation
- Reads any of Spectrum's external light sensors



3415FX

3415FX LightScout® External Light Sensor Reader  
Compatible light sensors sold separately:  
3668I LightScout® Quantum Light Sensor (PAR Light)  
3668I3 LightScout® Quantum Light 3 Sensor Bar  
3668I6 LightScout® Quantum Light 6 Sensor Bar  
3670I LightScout® Silicon Pyranometer Sensor (Solar Radiation)  
3676I LightScout® UV Sensor



## TDR 350 Soil Moisture Meter

Backed with proven time-domain measurement technology, the TDR 350 accurately measures soil moisture across a full range of soil conditions. An ergonomic design and built-in display provides quick and easy measurements for water management.

### What does it measure?

Soil moisture (Volumetric Water Content %), salts (electrical conductivity) and surface temperature, plus optional Infrared Temperature sensor

### Common Applications

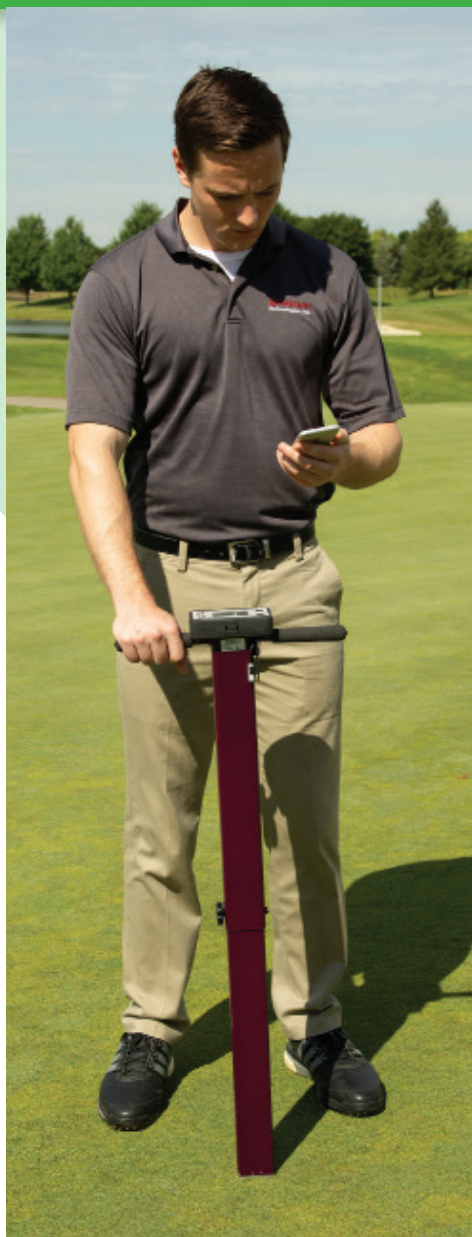
- Reliable portable meter for instant, accurate and actionable root zone moisture and soil EC readings average of rod length
- Irrigation scheduling, syringing practices, and soil flushes
- Track and trend data from day to day, month to month and season to season to optimize turf Health and Conditioning

### Features & Benefits

- Backlit Display - Easy to see on early mornings and bright sunny days
- Improved Layout & Larger Digits - Clearly view readings, settings and icons
- Integrated Bluetooth & GPS - Greater accuracy with onboard components
- Internal Data Logger - Records approximately 50,000 measurements with GPS coordinates
- Optional TDR 300 Mode

### How do you access the data?

- Manual - download the data with a USB flash drive, no special software or cable required
- Hands free - instantly view data on your smartphone or tablet via FieldScout Mobile App
- Cloud - SpecConnect FieldScout Pro subscription automatically uploads data to your personal web portal to view enhanced mapping and reporting features



SpecConnect Web Portal  
showing TDR 350 data



# INTRODUCING THE NEW **FIELDSCOUT®**

## TDR 250 ECONOMY SOIL MOISTURE METER

IF YOU DON'T MEASURE IT, YOU CAN'T MANAGE IT EFFECTIVELY

**NEW**

The TDR 250 offers the same proven time-domain measurement technology as the other TDR meters, but with a 20% less investment. The TDR 250 is a simplified portable soil-moisture meter that captures measurements in the root zone.

### What does it measure?

Soil moisture (Volumetric Water Content %)

### Common Applications

- Reliable portable meter for instant, accurate and actionable root zone moisture readings
- Irrigation scheduling, syringing practices, and soil flushes
- Ideal for daily-fee/municipal golf courses, sports turf fields, and row crop farmers

### Features

- Displays VWC% (with running average)
- Operates in TDR 300 mode or salinity-corrected (TDR 350) mode
- Soil measurements in less than a second
- Internal data logging up to 124,000 measurements
- USB port for a flash drive data download
- High-contrast display with backlight for easy viewing
- Interchangeable soil probes (varying options) - sold separately

### SPECIFICATIONS FOR TDR 250 SOIL MOISTURE METER

VWC Range: 0% to saturation, Resolution: 0.1%, Accuracy:  $\pm 3.0\%$  VWC

**6250 TDR 250 Soil Moisture Meter**  
Rods required and sold separately. See page 35.  
**Note: Rods are required for TDRs to function**  
Carrying case sold separately.

**6430CASE TDR 250/350 Carrying Case**





## TDR 150 Soil Moisture Meter

An affordable alternative to the TDR 350, the TDR 150 is a compact meter that allows you to obtain readings on-the-go. Ideal for measuring containers on benches, variable rod length options provide soil moisture measurements for your ideal root depth.

### What does it measure?

Soil moisture, (Volumetric Water Content %), salts (electrical conductivity) and temperature (surface thermistor)

### Features & Benefits

- Backlit Display – Easy to see on early mornings and bright sunny days
- Easy-to-read Layout & Large Digits – Clearly view readings, settings and icons
- Integrated Bluetooth & GPS – Greater accuracy with onboard components
- Internal Data Logger – Records approximately 50,000 measurements with GPS coordinates

### How do you access the data?

- Manual – download the data with a USB flash drive, no special software or cable required
- With optional GPS and Bluetooth upgrade
- Hands free – instantly view data on your smartphone or tablet via FieldScout Mobile App
- Cloud – SpecConnect FieldScout Pro subscription automatically uploads data to your personal web portal to view enhanced mapping and reporting features



**6445 TDR 150 Soil Moisture Meter**  
Includes carrying case. Rods sold separately. See page 35.

**6445TS Infrared Temperature Sensor-TDR 150**

## SMARTIRRIGATION: Maximize Irrigation Audits with TDR

### SPECIFICATIONS FOR TDR 150/350 SOIL MOISTURE METERS

VWC Range: 0% to saturation, Resolution: 0.1%, Accuracy:  $\pm 3.0\%$  VWC

EC Range: 0 to 5 mS/cm, Resolution: 0.01 mS/cm, Accuracy:  $\pm 0.1$  mS/cm

Temperature Range: -22° to 140°F (-30° to 60°C), Resolution: 0.1°, Accuracy:  $\pm 1.8^\circ\text{F}$  (1°C)

IR Temperature Range: 32° to 140°F (0° to 60°C), Resolution: 0.2°F (0.1°C), Accuracy:  $\pm 0.2^\circ\text{F}$  (0.1°C)





## TDR Rods

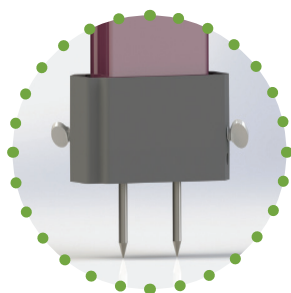
Multiple length options for varying root zones.

6428FS4	Two 1.5 inch (3.8 cm) Rods
6429FS4	Two 3 inch (7.6 cm) Rods
6431FS4	Two 4.8 inch (12 cm) Rods
6432FS4	Two 8 inch (20 cm) Rods
6430PH	Pilot Hole Maker for TDR Meters Includes two 3 inch (7.5 cm) rods



## TDR Spacers

- For use in TDR 300 Mode
- Using 1.5" (3.9 cm) rods, easily measure 0.5" and 1" depths
- Easily attach and detach from any FieldScout TDR meters



6435SP Rod Spacer

## Infrared Temperature Sensor

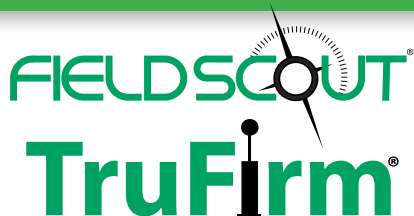
- Predict turf wilt with higher accuracy
- Easily correct a moisture deficit earlier and reduce heat stress
- Quickly and accurately measure surface temperatures
- Use IR temperature real-time - instantaneous readings
- Easy installation to our FieldScout TDR 350 and TDR 150

6435TS	Infrared Temperature Sensor for TDR 350
6445TS	Infrared Temperature Sensor for TDR 150



## TDR Model Comparison

FEATURES	TDR 150	TDR 250	TDR 350
Measure Volumetric Water Content	✓	✓	✓
Displays EC + Surface Temperature	✓	N/A	✓
Interchangeable soil probes	✓	✓	✓
Backlit Display	✓	✓	✓
T-Handle	N/A	✓	Telescoping
Infrared Temperature Sensor	Optional	N/A	Optional
GPS/GNSS + Bluetooth	Optional	N/A	✓
Carrying Case	✓	Optional	✓
FieldScout Mobile/SpecConnect Capability	✓	N/A	✓



Based on USGA technology, 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 turf management professionals to measure the relationship between the compaction of the soil and the moisture level to quantify safety and performance of playing conditions.

## What does it measure?

Surface Firmness/Hardness (depth of impact in inches)

## Common Applications

- All-in-one portable meter for evaluating impacts of cultural practices, play and environmental conditions on putting greens and other athletic surfaces
- Golf course greens, approaches, bunker sands and fairway landing areas for achievement of optimal surface performance and consistency
- Natural and artificial turf playing surfaces, infield dirt, turf and clay tennis courts, cricket pitches, bowling greens, racing tracks, etc.
- Track and trend data over time to better understand effects of turf inputs and optimize conditioning, playability and safety

## Features & Benefits

- Built-in Display – immediate digital results on a conveniently located screen
- Easy to Use – simply raise and drop the hammer in one motion
- Objective Values – analyze & compare impact of environment and maintenance inputs on play
- Versatile Tool – perfect for golf courses and sports fields at schools, parks, etc.
- Self-Contained – one complete unit, no small pieces to keep track of or lose
- Very Affordable – designed to make measurement possible for every facility
- Bluetooth – wireless data collection with the FieldScout Mobile App and add satellite mapping with automatic cloud upload with SpecConnect FieldScout Pro

## How do you access the data?

- Hands free – instantly view data on your smartphone or tablet via FieldScout Mobile App
- Cloud – SpecConnect FieldScout Pro subscription automatically uploads data to your personal web portal to view enhanced mapping and reporting features



## SPECIFICATIONS FOR TRUFIRM

Range: 0.1 in - 1.5 in (2.54 mm - 38.1 mm)

Resolution: 0.01 in at 1.00 in - 1.50 in (0.25 mm at 25.4 mm - 38.1 mm)

0.003 in at 0.00 in - 0.999 in (0.076 mm at 0 mm - 25.4 mm)

Diameter of Hammer: 1.68 in (4.45 cm)

Height: 27 in (69 cm)

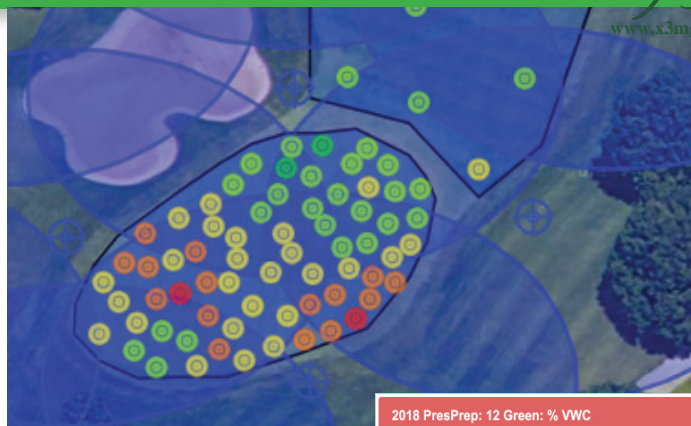
Weight: 4.3 lb (1.95 kg)

Measurement Units: Depth of travel (inches)

Power: 2 AA batteries (included)

6490S FieldScout® TruFirm® Turf Firmness Meter  
with Bluetooth Low Energy





## FieldScout® Mobile App

Data at your fingertips! We've made it easier for you to send data from the field to your smartphone.

### Basic Features

Free Mobile App download from Apple App Store or Android Google Play.

Basic App capabilities include:

- Hands-free data collection
- Visualize in-field, real time readings on a smartphone or tablet
- Color coded to represent a scale of moisture, EC, surface temperature or turf firmness
- E-mail relevant information to communicate results to others

### Pro Features

Collect data, evaluate trends, log and analyze multiple data points. Wireless data can be sent via Bluetooth to an IOS or Android device and saved to the Cloud. Pull together soil moisture and EC data from your TDR meter and firmness data from your TruFirm to fine-tune agronomic and cultural practices for specific greens or other surfaces.

FieldScout Pro Mode requires purchase of 1-year SpecConnect FieldScout subscription.

Pro Mobile App capabilities include:

- Hands-free data collection
- Google Maps dynamic satellite image shows readings data overlaid on your property on mobile device and web portal
- Freeform Mode plots a point for each reading, and stores its data independently
- Automatic wireless upload to SpecConnect for further analysis from your personal web portal
- SpecConnect provides complete data overview at once, overlaid on a satellite map
- Color Gradient Mapping of data points within custom selected areas or groupings
- Map locations of sprinkler heads, pin locations and more

### FieldScout® Mobile Compatible Items

- TDR 350 Soil Moisture Meter
- TruFirm Turf Firmness Meter
- TDR 150 Soil Moisture Meter (with optional GPS/Bluetooth upgrade)
- TDR 300 Soil Moisture Meter (with optional Bluetooth device)

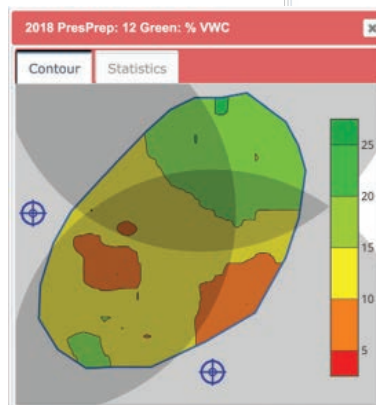
## FieldScout Mobile App

FREE

- 3035A SpecConnect FieldScout Pro Subscription (1-yr) 1-3 Devices
- 3035B SpecConnect FieldScout Pro Subscription (1-yr) 4-7 Devices
- 3035C SpecConnect FieldScout Pro Subscription (1-yr) 8+ Devices
- 6453BT FieldScout Bluetooth Device for TDR 300



2018 PresPrep: 12 Green: % VWC	
Contour	Statistics
<b>Statistics</b>	
Number of points:	67
Minimum value:	4.9
Maximum value:	21.3
Average value:	13.07
Standard deviation:	3.98
Distribution uniformity:	0.60
Time span:	17 minutes



### FIELDSCOUT MOBILE APP BASIC vs. PRO

	Basic	Pro
Basic Grid Map	✓	✓
Change Number of Grid Zones	✓	✓
Customizable Google Map Image		✓
Saves the Average Measurement by Zone	✓	✓
Email the Map/Results View	✓	✓
Freeform Notes		✓
Freeform Mode		✓
Guided Mode (Auto-Advancing through Zones)		✓
SpecConnect Data Sharing		✓
Auto-Upload to SpecConnect		✓
Add User Note or Comment to Individual Reading or Zone		✓
Irrigation/Soil Moisture Audit		✓



## WATERSCOUT® 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
- Install permanently or use to take spot measurements
- Can be read with the FieldScout® Soil Sensor Reader, WatchDog® 3000, 2000, 1000 Series Stations, and Pups

6460  
6460-20

WaterScout® SM 100 Sensor - 6 ft (1.8 m)  
WaterScout SM 100 Sensor - 20 ft (6 m)

### SPECIFICATIONS FOR WATERSCOUT SM 100

Accuracy: 3% VWC @ EC < 8 mS/cm; 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)

Sensing Area: 2.4 in (6 cm) x 0.8 in (2 cm)

## WATERSCOUT® 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)
- Can be read with the FieldScout® Soil Sensor Reader, WatchDog® 3000, 2000, 1000 Series Stations, and Pups
- 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

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

Accuracy: VWC: 3%, EC: ±2%, Temp: ±1°F (0.6°C); 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)

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.

- Reads Watermark sensors (requires separate adapter)
- Includes soft-sided case (also available separately)

6466

FieldScout® Soil Sensor Reader

6450FSADPT

Watermark Adapter for Soil Sensor Reader

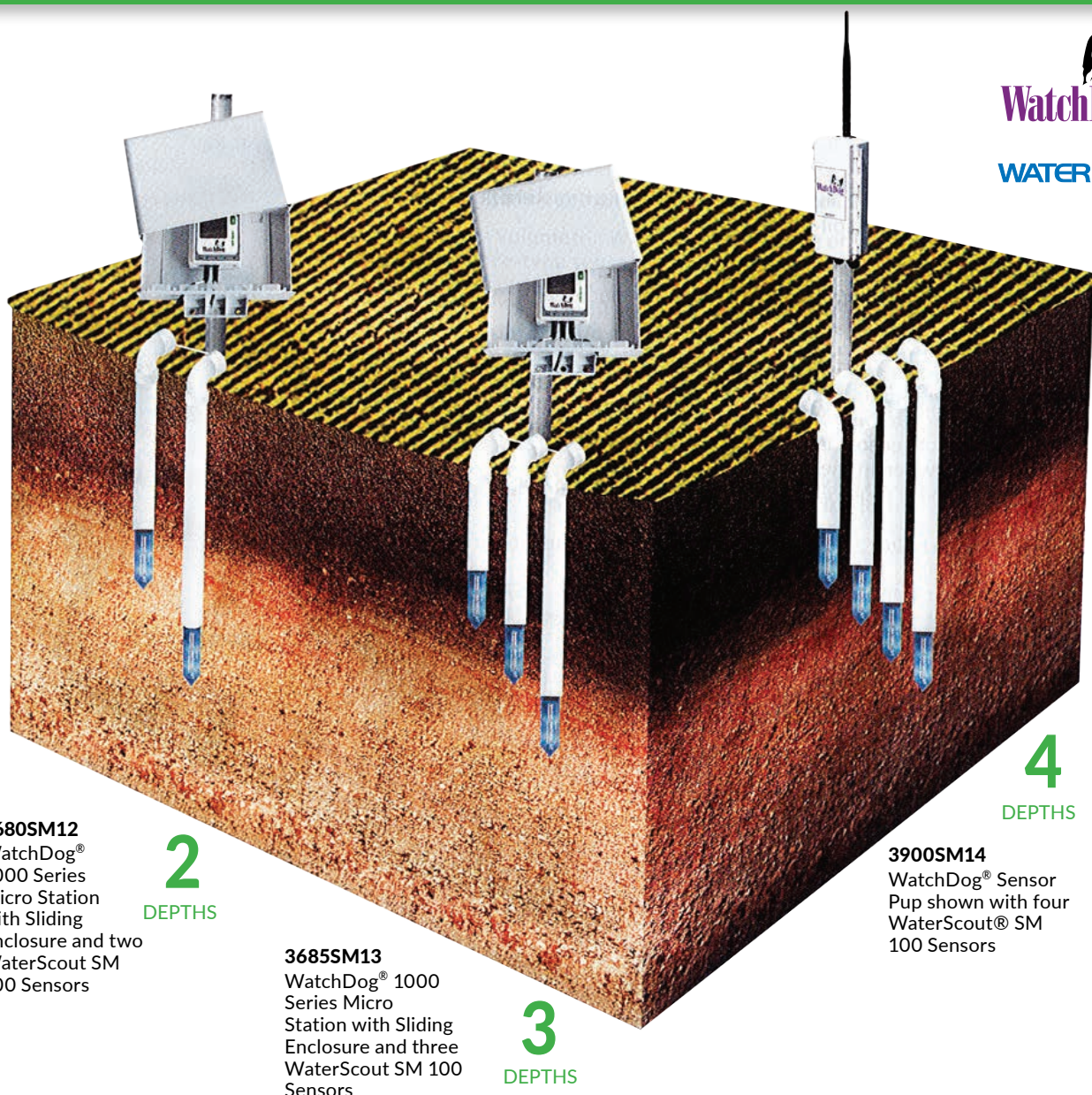
7500

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)

Shown measuring in soilless media mode to gather immediate data.





**3680SM12**  
WatchDog®  
1000 Series  
Micro Station  
with Sliding  
Enclosure and two  
WaterScout SM  
100 Sensors

**2**  
DEPTHS

**3685SM13**  
WatchDog® 1000  
Series Micro  
Station with Sliding  
Enclosure and three  
WaterScout SM 100  
Sensors

**3**  
DEPTHS

**3900SM14**  
WatchDog® Sensor  
Pup shown with four  
WaterScout® SM  
100 Sensors

**4**  
DEPTHS

## 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, SpecWare 9 Basic or Pro software.

	MODEL 1200 MICRO STATION	MODEL 1400 MICRO STATION	SENSOR PUP IRRIGATION STATION
2 WaterScout SM 100 Soil Moisture Sensors	3680SM12	3685SM12	3900SM12
3 WaterScout SM 100 Soil Moisture Sensors		3685SM13	3900SM13
4 WaterScout SM 100 Soil Moisture Sensors		3685SM14	3900SM14

	MODEL 1200 MICRO STATION	MODEL 1400 MICRO STATION
2 Watermark Soil Moisture Sensors	3680WM12	3685WM12
3 Watermark Soil Moisture Sensors		3685WM13
4 Watermark Soil Moisture Sensors		3685WM14



6450

## Watermark Soil Moisture Sensor

Economical way to measure soil moisture tension.

- Works with FieldScout Soil Sensor Reader and WatchDog Weather Stations
- Reads moisture tension from 0 (saturated) to 200 (dry) centibars

6450	Watermark Sensor with 5 ft (1.5 m) cable
6450FSADPT	Watermark Adapter for Soil Sensor Reader
6450WD	Watermark Sensor for WatchDog® Stations & Pups with 11 ft (3.3 m) cable
6450WD20	Watermark Sensor for WatchDog® Stations & Pups with 25 ft (7.6 m) cable
6450AH	Watermark Adapter for WatchDog® Stations & Pups



6421

## Irrrometer Tensiometers

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

- “SR” models (items 6419 thru 6423) are for general use with field or tree crops
- Low Tension (LT) models (see [www.specmeters.com](http://www.specmeters.com)) are for coarse soils or soilless media
- Portable models for specialized applications (see [www.specmeters.com](http://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)

6425	Service Kit - Required
6419	SR Model 6 in (15 cm) Depth
6420	SR Model 12 in (30 cm) Depth
6421	SR Model 18 in (45 cm) Depth
6422	SR Model 24 in (60 cm) Depth
6423	SR Model 36 in (90 cm) Depth
9917	Replacement tip for SR models

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

3669	Pressure Transducer
------	---------------------



6400

## 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

6400	9 in (22 cm) Soil Moisture Tester
6405	24 in (60 cm) Soil Moisture Tester



## FIELDSCOUT® SC 900 Soil Compaction Meter

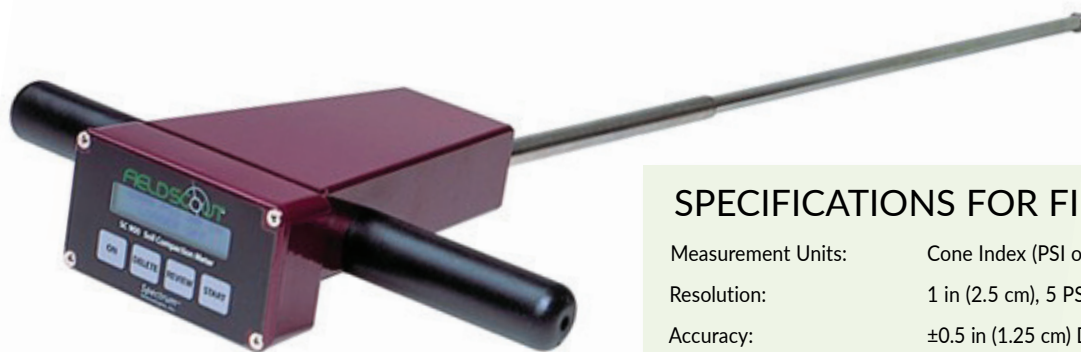
Help make decisions regarding areas of the field that require tillage, changes to crop rotation, and planting of cover crops.

- 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)\*\*
- Upload your data to SpecConnect for maps of compaction by depth, or depth to hard pan layer
- 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.

6110FS	FieldScout® SC 900 Soil Compaction Meter
2950CV5	GPS/DGPS Cable
7250	GPS Unit Mounting Bracket
6110FST	Replacement Depth Target
6106	1/2 in Replacement Tip (Fine soils)
6107	3/4 in Replacement Tip (Coarse soils)



FieldScout SC 900

### SPECIFICATIONS FOR FIELDSCOUT SC 900

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

## Soil Compaction Tester

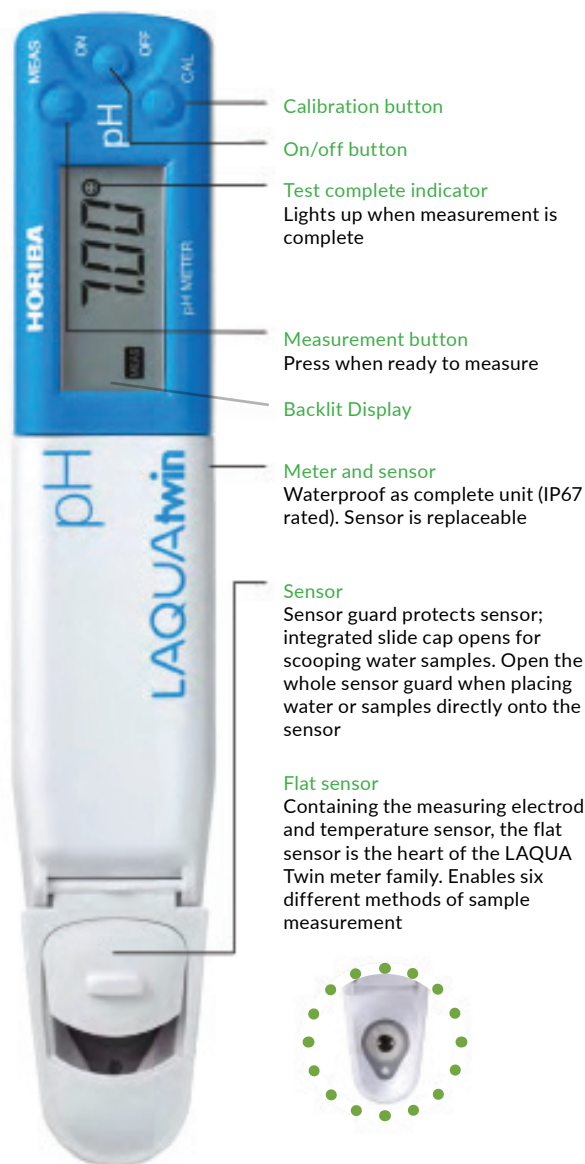
Economical way to measure soil compaction with analog read out.

- 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

6120	Soil Compaction Tester
6121	1/2 in Replacement Tip (Fine Soils)
6122	3/4 in Replacement Tip (Coarse Soils)



## LAQUA twin



### Put the power of a laboratory right in your hands.

- Professional grade meters
- Measure samples in nutrient solutions, water, soils, and tissue sap
- 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.

2103ALP

**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.

2205LP

**LAQUA Twin EC Meter**

Includes case, batteries, and calibration standards

2210L

**Conductivity Standard, 1.41 mS/cm**

(6 - 14 mL bottles)

2242L

**Replacement Sensor**

**pH****Conductivity (EC)****Sodium****Potassium****Nitrate****Calcium**

Measurement Principle:	Glass electrode method	2 AC bipolar	Ion electrode method	Ion electrode method	Ion electrode method	Ion electrode method
Sample Volume Required:	0.1 mL to 2.0 mL	0.12 mL to 2.0 mL	0.3 mL to 2.0 mL	0.3 mL to 2.0 mL	0.3 mL to 2.0 mL	0.3 mL to 2.0 mL
Measurement Range:	0 to 14 pH	0 to 199.9 mS/cm	2 to 9900 ppm	4 to 9900 ppm	6 to 9900 ppm	4 to 9900 ppm
Calibration:	pH 4 and pH 7	1.41 mS/cm	150 ppm and 2000 ppm*	150 ppm and 2000 ppm*	34 ppm and 450 ppm*	150 ppm and 2000 ppm*
Reproducibility:	± 0.1 pH	± 2%	± 10% or ± 10 ppm	± 10% or ± 10 ppm	± 10% or ± 10 ppm	± 20% or ± 20 ppm
Display:	4-digit digital LCD display with Backlight (New)					
Power:	CR2032 coin batteries (x2)					
Battery Life:	400 hours continuous operation with Backlight Off (New)					
Operating Range:	40°F (5°C) to 105°F (40°C), 85% relative humidity					
Dimensions:	164mm x 29mm x 20mm					

\* High and low calibration points can be changed (customer must provide custom solutions)

**LAQUA Twin Sodium Na<sup>+</sup>**

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

**LAQUA Twin Potassium K<sup>+</sup>**

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

**LAQUA Twin Nitrate NO<sub>3</sub><sup>-</sup>**

- 2305GL** LAQUA Twin Nitrate (NO<sub>3</sub><sup>-</sup>) Meter  
Includes case, batteries, and calibration standards
- 2345L** Replacement Nitrate Sensor
- 2311** 450 ppm NO<sub>3</sub><sup>-</sup>-N Standard, 6 - 14 mL bottles
- 2312** 34 ppm NO<sub>3</sub><sup>-</sup>-N Standard, 6 - 14 mL bottles
- 2330** NO<sub>3</sub><sup>-</sup> Soil Test Kit w/30 Samples  
Includes solutions, filter paper, cups, and soil scoop
- 2135L** Sampling Sheets - 100 pieces

**LAQUA Twin Calcium Ca<sup>2+</sup>**

- 2450L** LAQUA Twin Calcium (Ca<sup>2+</sup>) Meter
- 2455L** Replacement Calcium Sensor
- 2460L** 150 ppm Ca<sup>2+</sup> Standard, 6-14 mL bottles
- 2460L** 2000 ppm Ca<sup>2+</sup> Standard, 6-14 mL bottles
- 2135L** Sampling Sheets - 100 pieces





## 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
- Dust and splash resistant – IP65 rating
- Meters are fitted with a rubber boot to help absorb shock
- The USB port is protected by a tightly sealed cover and the casing and battery door are fitted with rubber seals
- 1 year meter warranty

### ISFET (Ion Sensitive Field Effect Transistor) Probes

Glass Free and Durable Probe - 2 Options  
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

- 2107 FieldScout pH 400 Meter**  
Meter includes case, batteries, AC adapter, brush, and pH 4 & 7 standards  
(Does not include pH Probe - order separately below)
- 2108 FieldScout pH 600 Meter**  
Meter includes case, batteries, AC adapter, brush, and pH 4 & 7 standards  
(Does not include pH Probe - order separately below)
- 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**



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



### 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

### Pin Point Tip ISFET Probe



- Uses patented non-glass ISFET technology for the smallest pH measurement
- Sharp and to the point for pH measurement of materials that need to be penetrated
- Eliminates clogging from dirty samples or semi-solids



### Blunt Tip ISFET Probe

- Uses patented non-glass ISFET technology for general purpose pH measurement
- Ideal for liquids, hydroponics, and soilless media



## Direct Soil EC Meter

Instant and accurate direct EC and temperature measurements.

- Professional-grade meter - Patented
- 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  $\pm 1\%$ , resolution 0.01 mS/cm)
- Automatic temperature compensation, long lasting, and waterproof
- Includes battery and EC calibration standard

### 8 in (20 cm) Probe Option

2266FS	FieldScout® Direct Soil EC Meter w/ 8 in Probe Includes Carrying Case and 2.76 Standard
2266PROBE	FieldScout EC 8 in Probe (Replacement)
2251	Conductivity Standard, 1.41 mS/cm, 250 mL

### 24 in (60 cm) Probe Option

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

See website for replacement probes for previous models 2265FS and 2265FSTP.

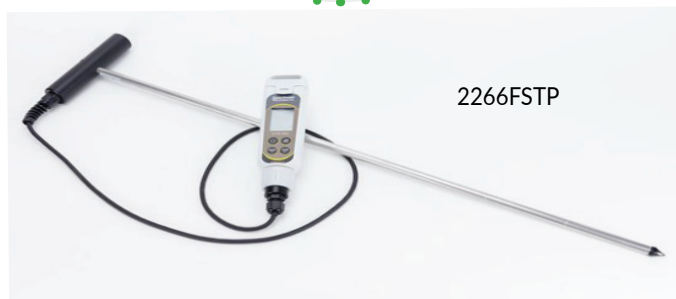
NEW



2266FS



2266FSTP



FieldScout Direct Soil EC Meter with 24 in (60 cm) T-Handle



Exclusive Patented Paired Sensor





Technology based on an exclusive patent license from NASA

## FIELDSCOUT<sup>®</sup> CM 1000 Chlorophyll Meter

- "Point-and-shoot" technology to instantly measure red (700nm) and NIR (840m)
- 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\*
- Internal data logger/RS-232 port (requires software); records 3,250 measurements (1,350 with GPS/DGPS)
- Configure and download meter with FieldScout<sup>®</sup> software (not included)\*\*
- Includes hard carrying case and batteries

**2950** FieldScout CM 1000 Chlorophyll Meter  
**2950S** Software To Activate Data Logger  
 (includes PC cable)  
**2950CV5** GPS/DGPS Cable



## FIELDSCOUT<sup>®</sup> 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 GPS/DGPS)
- Configure and download meter with FieldScout<sup>®</sup> software (included)\*\*
- Includes hard carrying case and batteries

**2953** FieldScout CM 1000 NDVI Meter  
**2950CV5** GPS/DGPS Cable

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

- 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 vs. 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\*
- Internal data logger and RS-232 port; records 3,250 measurements (1,350 with added GPS/DGPS)
- Configure and download meter with FieldScout<sup>®</sup> software (included)\*\*
- Includes hard carrying case, batteries, and TCM 500 T-Handle (item 2975H)

**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 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

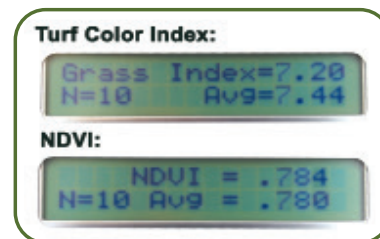
Repeatability: ± 5% of measurement

\* 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.

Georeferenced data can be uploaded to SpecConnect for mapping.



TCM 500 LCD Display





# 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 (2900P)

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 Nitrogen content
- Available with or without a built-in data logger
- Includes hard carrying case and batteries

#### 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  $\pm 0.3$  SPAD unit

SPAD Value: Index of relative chlorophyll content; -9.9 to 199



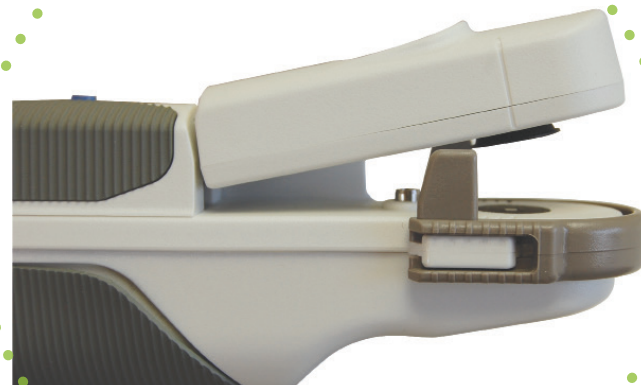
### SPAD Data-Logging Model (2900PDL)

All the features of the 2900P, plus:

- 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)\*\*

\* 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. Georeferenced data can be uploaded to SpecConnect for mapping.



Non-invasive measurement with readings in less than 2 seconds

**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** Replacement Hard Carrying Case

**Spectrum<sup>®</sup>**  
**Technologies, Inc.**

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Distributed by:

3600 Thayer Court  
Aurora, Illinois 60504 USA

Toll Free: 800-248-8873  
Phone: 815-436-4440  
Fax: 815-436-4460

info@specmeters.com  
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