Spectrum® Technologies, Inc.

"To Measure Is To Know"

FIELDSCOUT®

FieldScout® Wireless ISFET pH and pH/EC/ORP Probes

Item 2127WE, 2128WE, 2127W, 2128W

Fieldscout MPM 260   10%

pH	**7.02**
Temp	**23.9** °C
EC	**6.924** mS/cm
ORP	**267.5** mV

Last pH calibration:
Jun 26 - 8:59 with 2 points: pH 4.0

Home   Sample   Interval   History   Settings
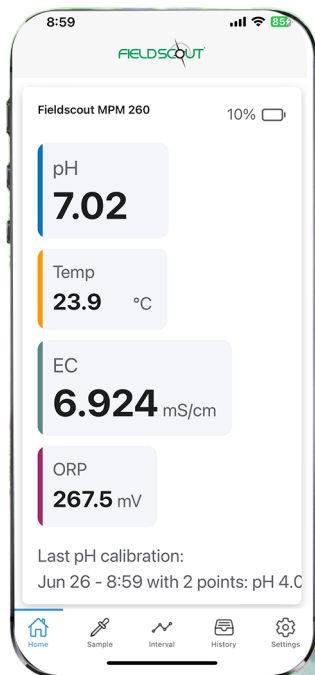
Wireless ISFE pH Probe

Wireless ISFE pH/EC/ORP Probe

"To Measure Is To Know"

info@specmeters.com   **www.specmeters.com**   **800. 248.8873**

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PRODUCT SPECIFICATIONS

CHARACTERISTIC	DESCRIPTION
pH Measurement Range	0.00 to 14.00
Accuracy	± 0.02
Default Unit	pH/EC/ORP
Resolution	0.02
Drift	<0.14pH/24 hr
Status	RGB LED for status update and recognition to cloud-based application
Calibration	1-, 2-, 3- and 5- point calibration
Connection	BLE (Bluetooth Low Energy) wireless connection to mobile device
ATC *(Auto Temperature Correction)*	Yes
Dimentions	8.8" x 1.0" x 0.8" (224mm x 24.2mm x 20mm)
Probe Material	ABS/PEEK/Stainless Steel
Probe Length	5.0" (128mm)
Data Storage	Transmitter stores data when mobile device is dicsonnected
Operating/Storage Temperature	32°F to 176°F (0°C to 80°) and 30% to 80% RH
Battery	Wireless Chargeable Battery
Battery Operation Time	2 - 3 Weeks
Battery	2 Hours

This manual will familiarize you with the features and operation of your new FieldScout Wireless ISFET pH Probes. Please read this manual thoroughly before launching the units.

For customer support or to place an order, call Spectrum Technologies, Inc. at 800-248-8873 or 815-436-4440, FAX at 815-436-4460, or e-mail at info@specmeters.com.

www.specmeters.com
Spectrum Technologies, Inc.
3600 Thayer Court
Aurora, IL 60504

UNPACK THE BOX

Replaceable Probe

Ring

Transmitter
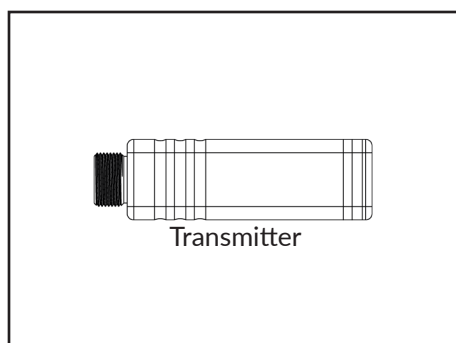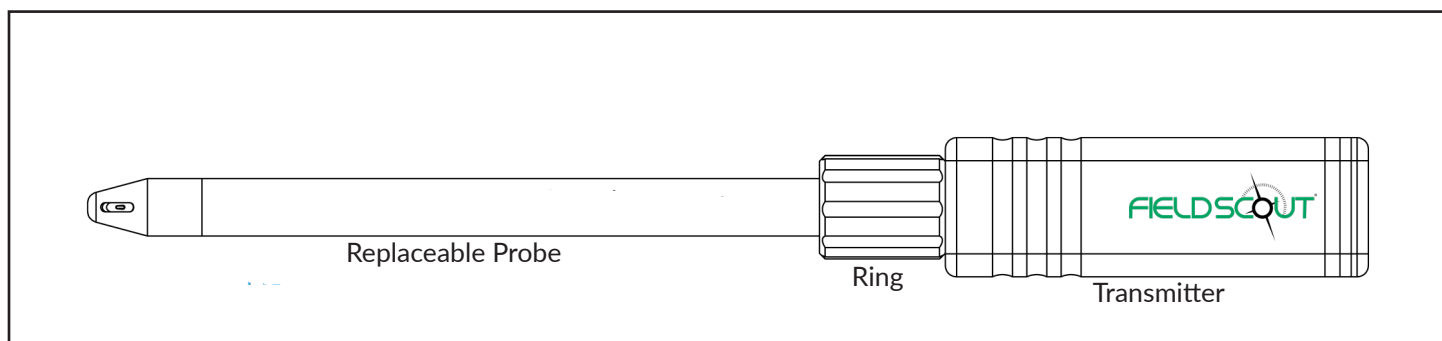
Transmitter
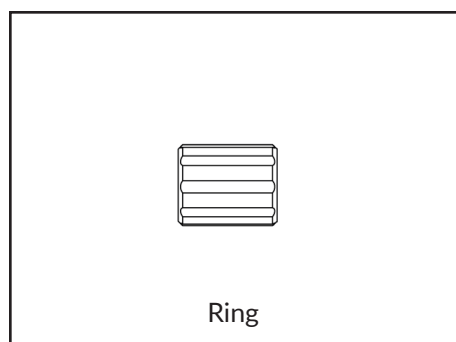
The transmitter includes the battery, memory for measurement values and recognizes the probe type.


S

R
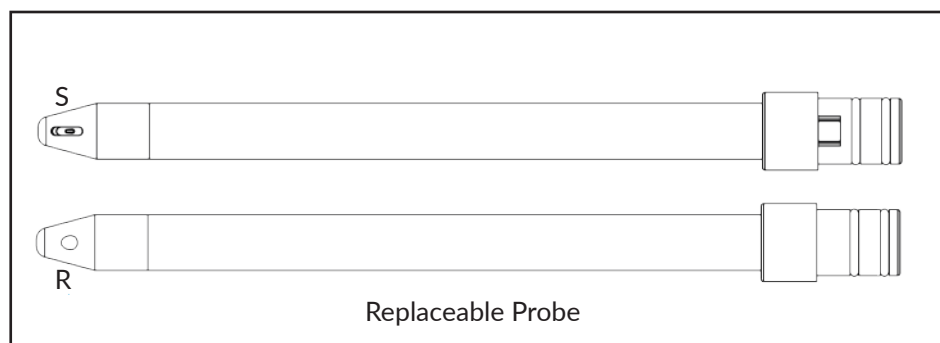
Replaceable Probe

The replaceable probe includes the sensor and reference electrode. It is covered with a protective cap.

The sensor is the metallic spot at the tip of the probe (S). The diaphragm of the gel-filled reference electrode is the white spot in the tip (R).

Ring

The ring is used to to connect the transmitter and the probe. Slide the ring onto the sensor end of the probe and thread it onto the transmitter.

Charger with USB Cable
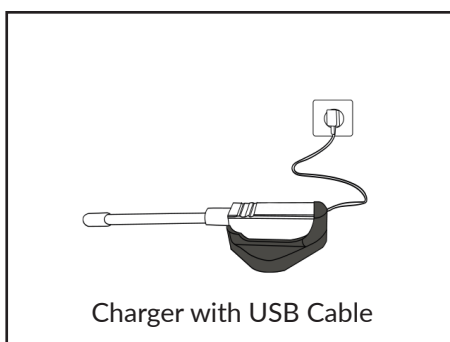
The charger with USB cable charges the probe wirelessly. The logo side of the transmitter must be facing up.
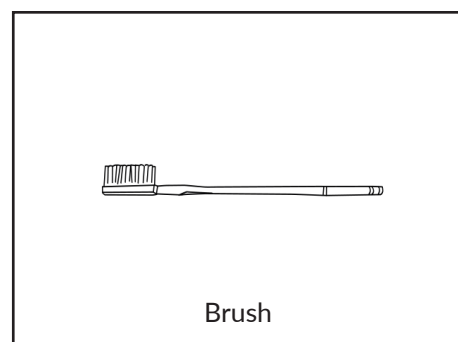
Brush

The brush is used to clean the probe.

GATHER COMPONENTS

ITEM		USAGE
Mobile Device		An iOS/Android smartphone or tablet with Bluetooth 5.0 or higher can be used for pH measurements.
Calibration Buffers		Use either the provided calibration buffers, DIN pH buffers, NIST pH buffers or JIS pH buffers.
Distilled Water		Distilled (deionized water) is recommended for flushing the probe between buffers and samples.
Labware		Beakers, tissues and a siphon with demineralized water for flushing the probe tip are handy and recommended labware, especially for the calibration of the pH probes.
USB Charger Adapter		A USB charger adapter is required to connect USB cable of the charger to the socket or 12V plug in.
Internet		Access to internet (WiFi or mobile internet) is required to download the FieldScout pH app. After installation, the app works offline, unless you want to export your data to the cloud
Bluetooth		Bluetooth is required to connect to the probe. After starting an interval, the connection can be disconnected.

ASSEMBLE THE PROBE

Step 1   Step 2   Step 3

Step 4   Step 5
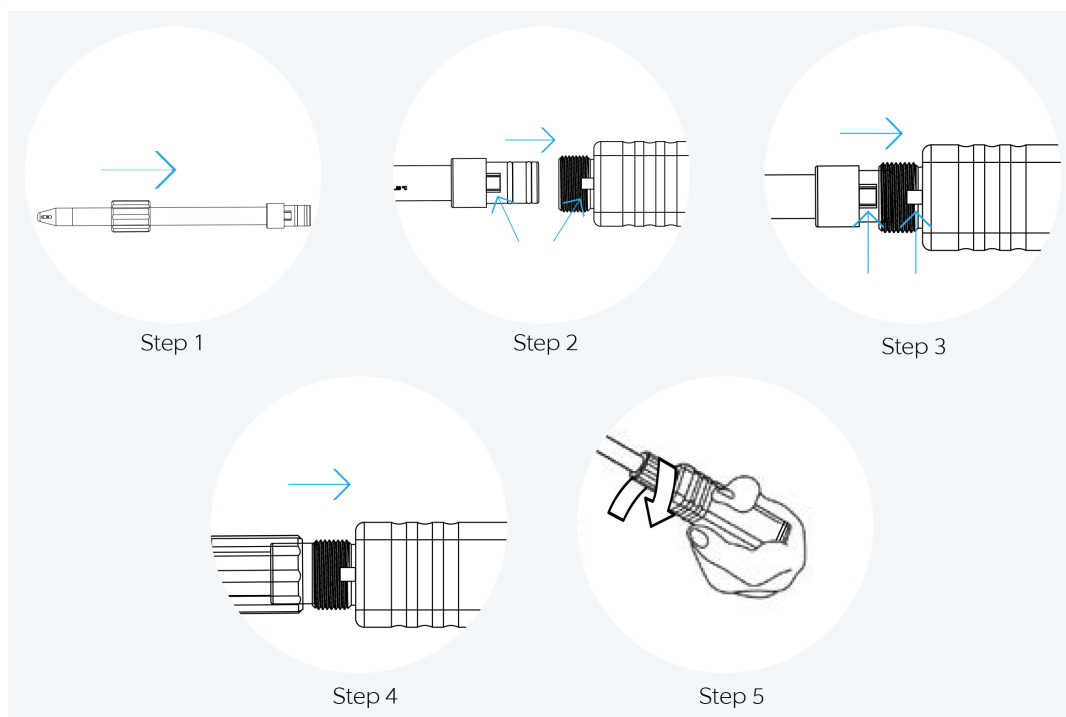
Place the ring on the probe (Step 1). Align probe and transmitter before plugging the probe completely into the transmitter (Steps 2 - 4) Both 0-rings should fit into the transmitter (Steps 2 -3). Turn the ring to fasten it (Step 5). Do not detach the probe during the experiment (including calibration).

CHARGE THE PROBE

Place the probe onto the adapter with the logo facing up. It can take up to 30 seconds before the LED of the probe indicates the status. It shows a red, pulsating light when charging up to 80%. The light changes to pulsating green when the battery level is >80%. When the probe is removed from the charger, the LED will turn off.
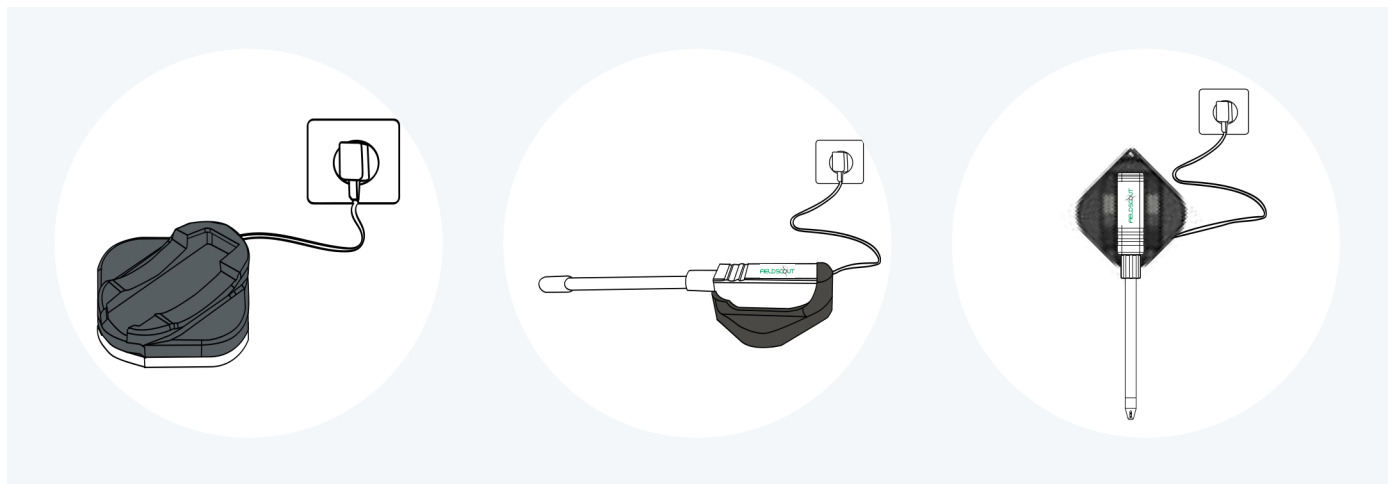
PROBE DESCRIPTION

FieldScout Wireless ISFET Blunt Tip pH/EC/ORP Probe (Item #2127WE)
FieldScout Wireless ISFET Pinpoint Tip pH/EC/ORP Probe (Item #2128WE)

FieldScout Wireless ISFET Blunt Tip pH Probe (Item #2127W)
FieldScout Wireless ISFET Pinpoint Tip pH Probe (Item #2128W)

- Thee probes are used to monitor either pH only or pH/EC/ORP in soil.
- The sensor is prone to scratches in this application
- Use the predrill stick included to make a pilot hole in the soil you are testing
- If the soil is dry, fill the hole with distilled water
- When using the probe with semi-solids, insert the probe to the desired depth then rotate left and right several times and tilt to ensure the sensor and diaphragm are in good contact with the sample

GENERAL MAINTENANCE

Preparing for Use
- Unpack the probe and remove the dust cap. Flush the probe with distilled water. The probe is now ready for calibration. When the probe has been stored for longer time, clean the probe as described below.

Cleaning
- Place the probe in warm tap water (around 60°C / 140°F) with a mild detergent for 5 minutes. Stir periodically. Soaking the probe first helps prevent scratching. Scrub the probe tip with a soft brush and water with a mild detergent. After scrubbing, rinse with distilled water.

Revitalizing the Probe
- When the probe shows slow response or low slope values, a revitalization of the reference should be performed. Place the probe (still warm from cleaning) in a saturated KCl solution for 20 minutes at room temperature.

Storage
   Short Term
- Rinse the probe in distilled water, do not dry the probe. Place the probe in a clean beaker with fresh pH7 buffer to prevent pollution of the probe after cleaning.
   Long Term
- Rinse the probe in distilled water, do not dry the probe. Place one drop of pH7 buffer in the dust cap and place the cap over the probe tip. Store the probe in a safe place.
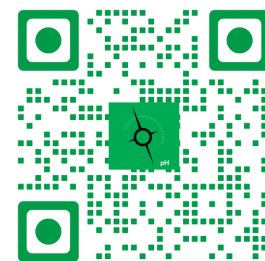
GET STARTED

Download the FieldScout pH/EC/ORP App
Scan the QR code or search for the FieldScout pH/EC/ORP app in your app store.
You may need to activate location access for the app to record the location of each reading.

Home Menu
- *Home* - Start screen with a list of available probes
- *Sample* - Used for single measurements
- *Interval* - Used for continuous measurements in specified intervals
- *History* - Review your data
- *Settings* - Select to choose Advanced Mode, Adjust Language, Units, Drift Warning Notice

Advanced Mode displays pH and mV, allows temperature calibration and during pH calibration, the standard deviation is indicated

Activate Your Probe
- Open the FieldScout pH/EC/ORP app.
- The LED on the probe is off when the probe is not yet registered and in standby mode.
- To activate your device, tap the **ON/OFF** button on the top of the probe. The LED will turn blue when searching for a connection.
- With the app open, click the **+ Add Device** button
- Click the **Search for Probes** button
- Select your probe and the LED on the probe will turn green
- Follow the prompts to initiate the calibration process then click the **Save** button. The app will return to the Home page.

Standby Mode
When the probe is not in use and no interval measurement is running, the probe will go into standby mode. The LED will turn off.

Registered Probes
- If the probe is active, the app will recognize it and connect automatically
- If the probe is in standby mode, it will be listed under "Disconnected Devices". Select your probe and click "Reconnect".
- Once connected, the LED on the probe will turn green.

Battery Status of Probes
In the app, the battery status is shown as a percentage per probe. When the battery is running low during measurement, the LED will flash red 5 times at each data point to warn you.

Add/Delete Probes
- Click the **+ Add Device** button - up to 6 probes can be connected
- Swipe left on the probe(s) you want to delete. The LED will turn blue on the deleted probe.

Reset Your Probe
- Press and hold the **ON/OFF** button on the top of the probe until the LED turns purple and then turns off. The LED will either be green or blue.
- Greed LED indicates the probe is connected and ready to use
- Blue LED indicates the probe is disconnected and must be connected by clicking the **+ Add Device** button

Restart Your Probe
- Press and hold the **ON/OFF** button on the top of the probe until the LED turns white and then turns off. All connection is reset. Calibration information remains.

CALIBRATE YOUR PROBE(S)

Calibration Status of Devices
One of the two following messages will appear when you connect your probe:
1. Last Calibration (Date/Time): The last calibration is still valid. The probe is ready for use. The date/time stamp of the last calibration are indicated. Depending on the number of calibration points, the number of decimals is adapted for the value.
2. Calibration Required (pH): The probe needs calibration: A. If it has never been calibrated
                                                              B. The pH calibration is not valid any longer

- We recommend using pH buffers for the calibration of the probes
- Always use fresh and uncontaminated buffers when performing a calibration
- Buffers can be polluted due to exposure to open-air or (UV) light, close the cap on the bottle as soon as possible

pH Calibration
- Select your probe in the app.
- Scroll down to "Calibration Information"
- Select "New pH Calibration" and follow the instructions
- During measurements, both the sensor and the reference diaphragm must be in the buffer. When the calibration is successful, the remark at the probe in the app will change to "Last Calibration (Date/Time)"
- The pH calibration can be done with a single point (1 buffer) or multi-point (2, 3 or 5 buffers). The more points taken for calibration, the more accurate the pH reading. The greater the difference in pH of samples, the more points recommended to calibrate.

- 1 point calibration   1 decimal accuracy   For quick pH measurements spanning 1-2pH values

- 2 point calibration*   2 decimal accuracy   For accurate pH measurements spanning <3pH values and quick measurements spanning 3-6pH values.
                                                 *Recommended for agricultural use with the provided pH 4 and 7 solutions

- 3 point calibration   2 decimal accuracy   Recommended for accurate pH measurements spanning 3-6pH values and quick measurements spanning >6pH values

- 5 point calibration   2 decimal accuracy   Recommended for accurate pH measurements spanning >6pH values

When the calibration is successful, the slope between two points of the calibration is provided as a percentage. Select the % to see which slope it refers to. Normal slope percentages should be between 105% and 95%. Slopes outside these values indicate that the measured pH may be less accurate. In that situation, it is strongly advised to revitalize or replace the probe.

24 hours after the last calibration, the number of decimals are reduced to a maximum of one. Perform a new multi-point calibration to resume 2-3 decimal accuracy. This number can be adjusted under *Settings - Hours before a drift warning is shown.*

The FieldScout pH/EC/ORP probes are Automatic Temperature Compensated (ATC).

Temperature Calibration
- Temperature calibration is not required. To calibrate, select *Settings* and toggle *Advanced Mode* to the "ON" position.
- Press the Home button and select your probe from registered devices.
- Scroll down to "Calibration Information". Select "New Temperature Calibration" and follow the directions.
- The average temperature is calculated between the manual temperature and the temperature reading on probe.

EC Calibration
- EC calibration is not required. To calibrate, select *Settings* and toggle *Advanced Mode* to the "ON" position.
- Press the Home button and select your probe from registered devices.
- Scroll down to "Calibration Information". Select "New EC Calibration" and follow the directions.

TAKING MEASUREMENTS

MEASURMENT TYPES

Sample
- A sample measurement is used to take measurements manually. Several data points can be taken for one sample.
- The information on the data point(s) including time stamp, pH/EC/ORP values, temperature and probe name are listed.

Interval
- An interval measurement is meant for taking measurements automatically with a fixed logging time period in between data points.
- Data points can be taken from every second up to every 100 days
- The information on the data point(s) including time stamp, pH/EC/ORP values, temperature and probe name are listed.

Prepare to Take Measurements

Step 1   Step 2   Step 3
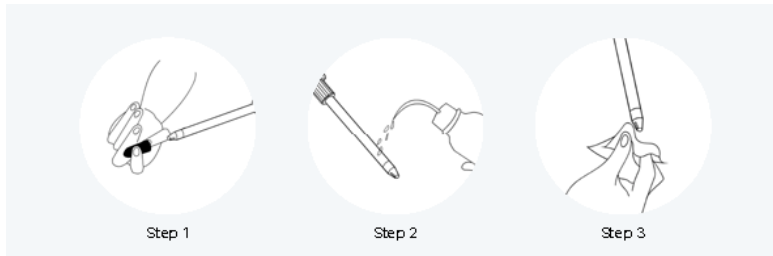
- Remove the protective cap from the probe tip (Step 1), keep for covering the probe when not in use
- Rinse the probe tip with distilled water before use or when switching between samples or buffers (Step 2)
- Remove any drops from the tip (Step 3)

TAKING MANUAL SAMPLE MEASUREMENTS

When only using one probe:
- Select **+ Take Sample** to take a single measurement (Figure 1)

When using multiple probes:
- Select **Sample** from the Home screen (Figure 2)
- Select which probes you want to use for the sample, click **Take Sample** (Figure 3)

Figure 1

Figure 2   Figure 3

When using either probe:
- Use the predrill stick included to make a pilot hole in the soil being tested if it is not soft
- If the soil is dry, fill the hole with distilled water
- When using either probe with semi-solids, insert the probe to the desired depth then rotate left and right several times and tilt to ensure the sensor and diaphragm are in good contact with the sample
- Choose the parameters you want to visualize in the graph by clicking the **°F/pH** just above the graph (Figure 4)
- The Sample Set can be renamed by clicking the X and type the desired name (Figure 5)
- Select **+Take Reading** to take additional measurements to be included in the same Sample Set (Figure 5)
- Select **Save Sample Set -** the screen will show the sample date, number of data points, measurement values and geo-referenced location of the samples taken (Figure 5/Figure 6)
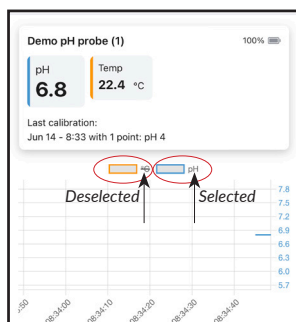- Select **Export Sample Set** to export data into a .csv file that can be saved or emailed (Figure 6/Figure 7)
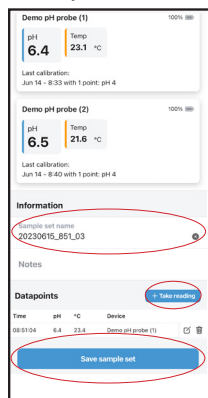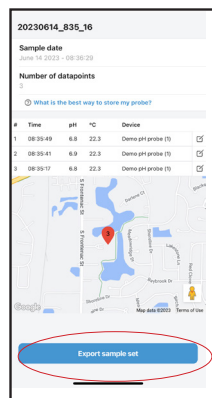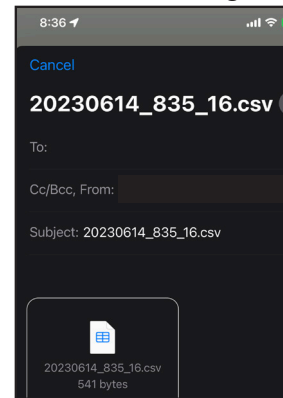

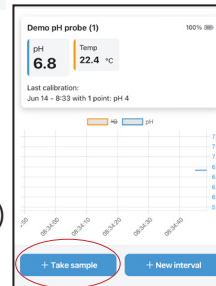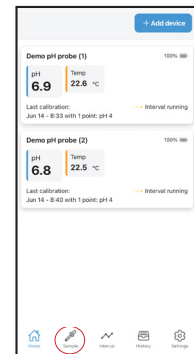Figure 4   Figure 5   Figure 6   Figure 7
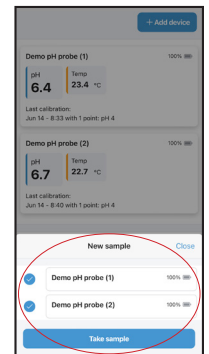
NOTE: The values of the pH, EC, ORP, and temperature are the current values and refresh continuously.

The LED of the probe will flash green at each measurement.

The LED is off between measurements.

TAKING INTERVAL SAMPLE MEASUREMENTS

When only using 1 probe
- Select **+ New Interval** to take a single measurement (Figure 1)

When using multiple probes:
- Select **Interval** from the Home screen (Figure 2)
- Select which probes you want to use for the interval, click **Next** (Figure 3)

Figure 1

Figure 2

Figure 3

When using either probe:
- Use the predrill stick included to make a pilot hole in the soil you are testing.
- If the soil is dry, fill the hole with demineralized water
- When using either probe with semi-solids, insert the probe to the desired depth then rotate left and right several times and tilt to ensure the sensor and diaphragm are in good contact with the sample
- Choose the parameters you want to visualize in the graph by clicking the **°F/pH** just above the graph (Figure 4)
- Rename the Interval under **Interval Name** by clicking the X and typing the desired name (Figure 5)
- Change interval time under **Log Every** to the desired interval (Figure 5)
- Click **Start Interval** (Figure 5)
- Exit the app - intervals will continue to be recorded until you click **Stop Interval**
- Open the app when ready to stop the interval, probe(s) will show **....Interval Running** (Figure 6)
- Click on a probe that is running the interval (Figure 6)
- Click **Interval Running** (Figure 7)
- Click **Stop Interval** (Figure 8)
- A pop up screen will appear asking if you are sure you want to stop the interval, click **Stop** (Figure 7)
- The screen will show the probe(s) used in the interval, the interval time, start and end time of the interval and the number of data points (Figure 8)
- Select **Export Interval** to export data into a .csv file that can be saved or emailed (Figure 8/Figure 9)
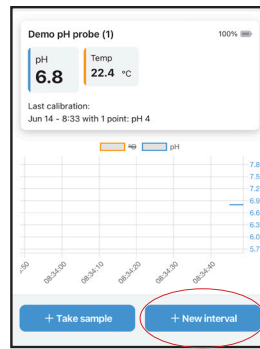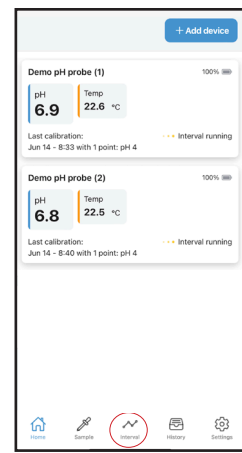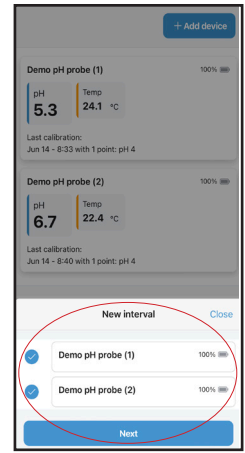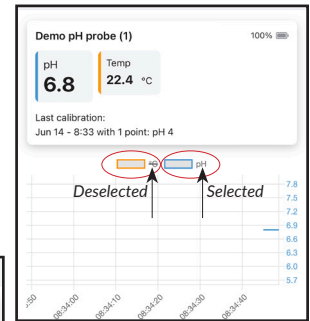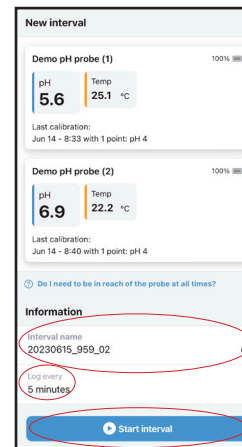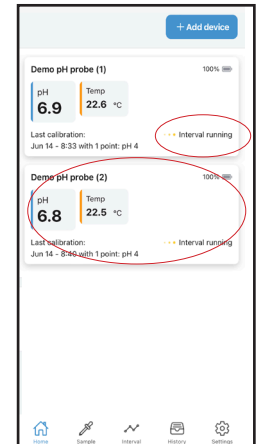

Figure 4
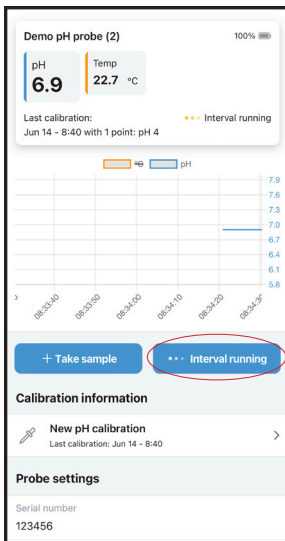
Figure 5
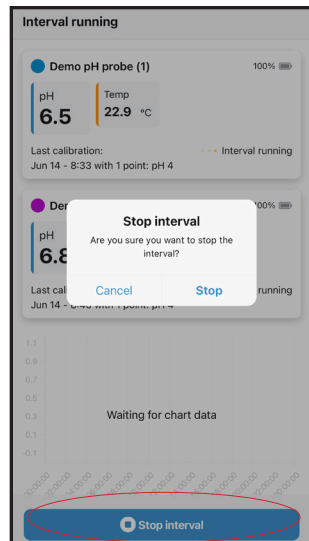
Figure 6
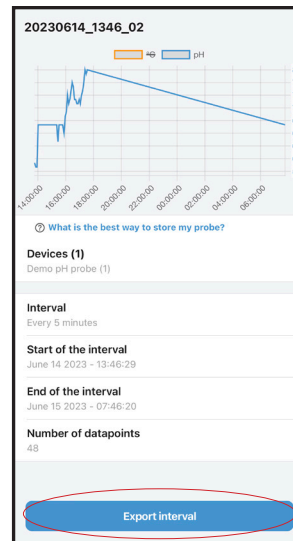
Figure 7

Figure 7

Figure 8
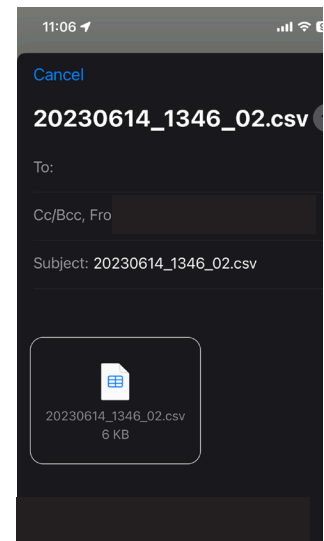
Figure 9

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PROBE LED COLOR INDICATORS

LED is off	Probe is in standby mode
LED is pulsating red	Probe is charging but battery is <80%
LED flashes red every 10 seconds during measurements	Probe needs to be charged (battery is <10%)
LED is pulsating green	Probe is charging and battery is between 80%-100%
LED is flashing fast blue	Probe is searching for communication with the FieldScout pH app but is not connected
LED is flashing slow blue	Probe is searching for communication with the FieldScout pH app but is connected
LED is flashing green	Probe is connected to FieldScout pH app and is connected
LED is flashing once green	Probe is taking a measurement during the specified interval The LED is off in between measurements
LED is flashing fast purple	Probe is resetting itself after the purple light turns off
LED is white	Probe is restarting itself after the white light turns off
LED is pulsating orange	Something is wrong in the app or with the probe itself ie - sensor is detached from the app

WARRANTY

The Transmitter is warranted for one year and the Probe is warranted for six months from the date of purchase to be free from defects in material or workmanship. During the warranty period Spectrum will, at its option, either repair or replace products that prove to be defective. This warranty does not cover damage due to improper installation or use, lightning, negligence, accident, unauthorized modifications, or to incidental or consequential damages beyond the Spectrum product. Before returning a failed unit, you must obtain a Returned Materials Authorization (RMA) from Spectrum. Spectrum is not responsible for any package that is returned without a valid RMA number or for the loss of the package by any shipping company.