

RECON

SPRAYSENSE™

OPERATOR'S GUIDE

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Recon SpraySense™ Operator's Guide

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Intelligent Agricultural Solutions, 1810 NDSU Research Circle North, Fargo, ND 58102 USA.

Visit us online at intelligentag.com
Questions? E-mail us at info@intelligentag.com

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Record of Revision			
Revision Number	Change Description	Revision Date	Inserted By
1.0	Initial release	3/09/22	AAL

1. Getting started

1.1 About Recon SpraySense™

Recon SpraySense is a spray quality monitoring system for agricultural sprayers. It actively measures the pressure and flow rate at each nozzle. Using the machine's speed, and a pre-compiled database of spray nozzles, SpraySense also provides the application rate and droplet size of each nozzle. The system has user-configured thresholds to notify the operator when any spray nozzle is operating outside the desired threshold for pressure, flow, droplet size, or rate.

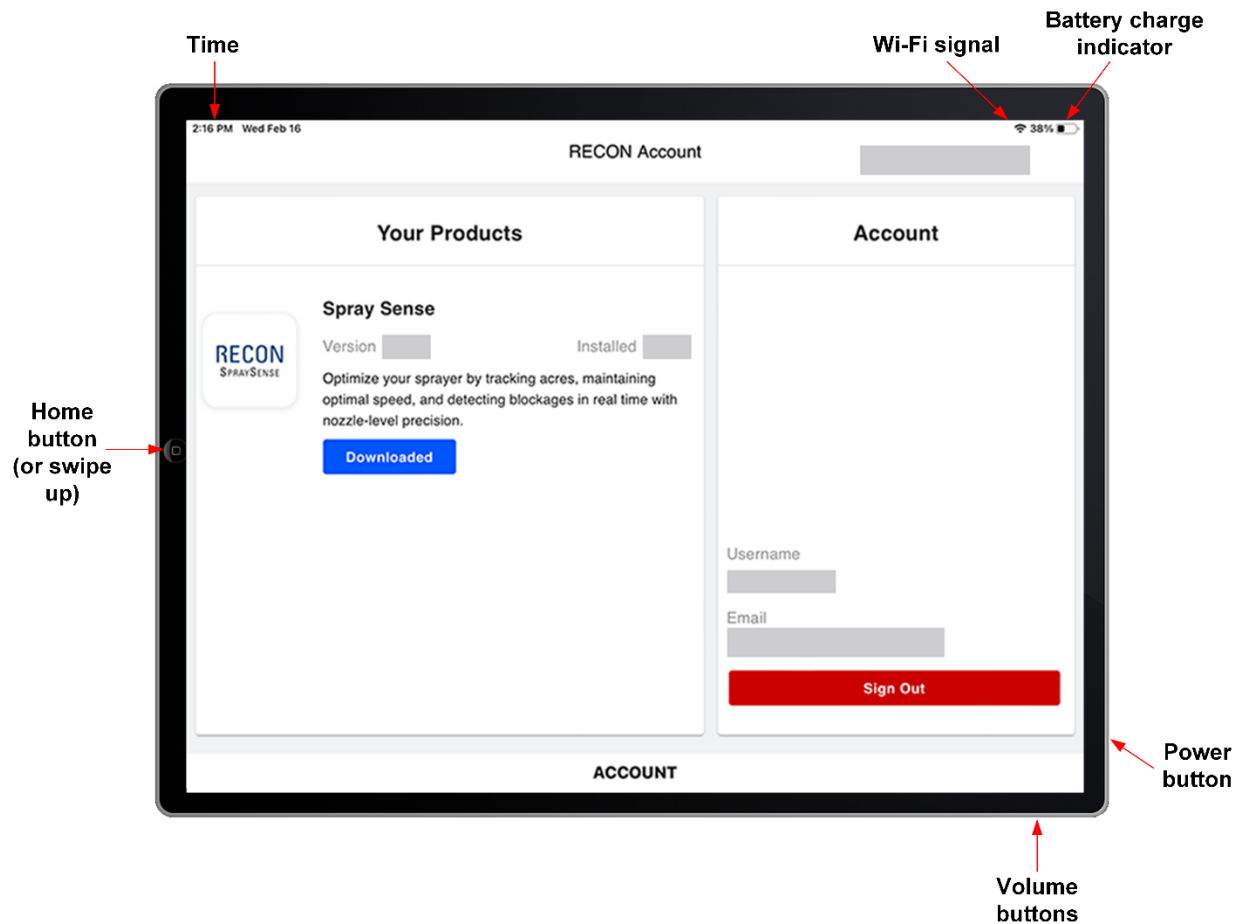
Recon SpraySense also provides a Spray Quality Score. This single value is a comprehensive calculation of the overall performance of each spray nozzle. The Spray Quality Score provides the operator with a single number that illustrates how much of the spraying performed is On-Target.

For instructions to install Recon SpraySense, see the Recon SpraySense Installation Guide (Intelligent Ag document number 600840-000066).

For current SpraySense documentation and iPad and software requirements, visit intelligentag.com/support.

1.2 Using an iPad

Recon SpraySense™ interacts with the system using the Intelligent Ag Universal Mobile App on an iPad.



Powering on/powering off the iPad

To power on the iPad, press and hold the power button for 3 to 5 seconds.

When the iPad is powered on, you can press the power button to turn the screen off and put it in sleep mode. Press the power button again to exit sleep mode.

To power off the iPad, press and hold the power button for 3 to 5 seconds. Then, slide the icon that appears on the screen.

Adjusting iPad volume

To adjust the iPad volume, press the top or bottom iPad volume button (shown in the diagram at the beginning of this section).

NOTE: If your iPad has a side switch that is configured to mute the iPad, ensure that the switch is enabled (the iPad is not muted).

Opening the Intelligent Ag Universal Mobile App

IMPORTANT: If you are prompted to enable location services, select **Only While Using the App** or **Always Allow**. If you select **Don't Allow**, this will prevent the iPad from connecting to the SpraySense™ network.

Once you have powered on the iPad, tap the Intelligent Ag Universal Mobile App icon located on the iPad Home screen to open the app. If you haven't downloaded the app yet, search *Intelligent Ag Universal Mobile App* in the App Store and download it. Refer to the download instructions in the Recon SpraySense Installation Manual for more information.

NOTE: Intelligent Ag recommends leaving your iPad connected to the charger the entire time you are using the app.

Viewing the iPad Home screen

Press the iPad's Home button, or if you don't have Home button, swipe up from the bottom of the screen.

Closing the SpraySense app

1. Press the Home button twice or, if you don't have a Home button, swipe up from the bottom of the screen and pause in the middle of the screen.
2. Swipe up on the app's preview to close the app.

Changing iPad language

1. Tap **Settings** on the iPad Home screen.
2. Tap **General** on the left navigation pane.
3. Tap **Language & Region**.
4. Select the new language.

2. Configuring Recon SpraySense™

2.1 Connecting the iPad to the wireless network

In order to communicate with the SpraySense system, the iPad must be connected to the SpraySense wireless network, which is broadcast by the gateway.





Make sure that your iPad is connected to the SpraySense wireless network at the beginning of every application session. This is especially important if your iPad is connected to another network, such as a home wireless network, between sessions. Tap the **Settings** icon on the iPad Home screen to see what wireless network it is connected to.

To connect the iPad to the SpraySense wireless network:

1. Make sure that you have power to the gateway. The gateway's LED is green when it's done booting.
2. Tap the **Settings** icon on the iPad's home screen.
3. Tap **Wi-Fi**. Then, connect to the **SpraySense-XXXXXX** network.
"XXXXXX" represents your gateway serial number.
4. Press the iPad's Home button or swipe up and open the Intelligent Ag Universal Mobile App.

2.2 Viewing Wi-Fi and Gateway status

The upper right corner of the Intelligent Ag Universal Mobile app shows the Wi-Fi and gateway status. Use the table below to determine what you can do when you're connected to Wi-Fi and what you can do when you're connected to the gateway.

Status	Meaning	What you can do
 DATA	Wi-Fi connected	<ul style="list-style-type: none"> • Configure iPad settings • Download or update the app • Download the SpraySense product within the app • Upload diagnostic logs
 GATEWAY	Gateway disconnected	
 DATA	Wi-Fi disconnected	<ul style="list-style-type: none"> • Install gateway firmware updates • Index sensors • Use the system (monitor for pressure and flow issues)
 GATEWAY	Gateway connected	

2.3 Configuring Sensors

Set up or edit your sensors on the Settings page.

MACHINE SETUPALERTSUNITSAccount & AboutDIAGNOSTIC

OF SECTIONS

-5+UNIT

OF NOZZLES

-32+UNIT

NOZZLE SPACING

-20+IN

NOZZLES ASSIGNED

TOTAL32

WITH SENSOR30

WITHOUT SENSOR2

STOP EDITING

UNASSIGNED SENSOR6

000008
ONLINE

000006
ONLINE

000004
ONLINE

000003
ONLINE

000005
ONLINE

000007
ONLINE

SECTION 2

-6+NOZZLES

1005045
ONLINE

2005042
ONLINE

3005046
ONLINE

4005047
ONLINE

5005041
ONLINE

6005038
ONLINE

SECTION 3

-7+NOZZLES

7005055
ONLINE

8005025
ONLINE

9EMPTY NOZZLE 0
EMPTY

10005030
ONLINE

11005035
ONLINE

12005283
ONLINE

13005284
ONLINE

DASHBOARDMONITORINGALARMSTARGETSETTINGS

600890-000073, rev 1.0

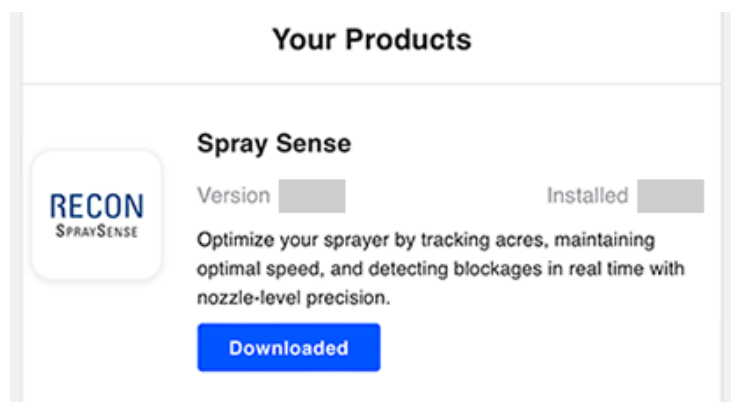
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Indexing Sensors

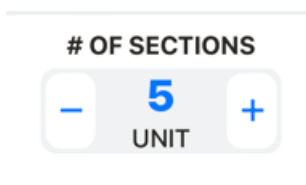
If this is your first time configuring the system, or you need to re-configure your system, follow the instructions below to index your sensors in the app with the magnet tool included with your system.

IMPORTANT: If you are prompted to enable location services, select **Only While Using the App** or **Always Allow**. If you select **Don't Allow**, this will prevent the iPad from connecting to the SpraySense™ network.

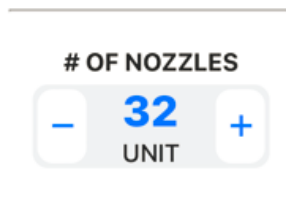
1. Open the Intelligent Ag Universal Mobile app and sign in or register for a new account.
2. If it's your first time using the system, connect to an internet Wi-Fi network and download the SpraySense product within the Intelligent Ag Universal Mobile app.



3. Connect to the SpraySense gateway. The SpraySense product will load in the app.
NOTE: If you're prompted to update the gateway, perform the update and power cycle the gateway once it is complete.
4. Tap **Settings** in the lower right corner and make sure you're on the **Machine Setup** tab.
5. Tap **Index** in the lower left corner. The LEDs on sensors will begin blinking.
6. Select the number of sections on your machine.



7. Select the number of nozzles on your machine. Verify that the number of nozzles assigned to each section in the columns to the right is accurate.

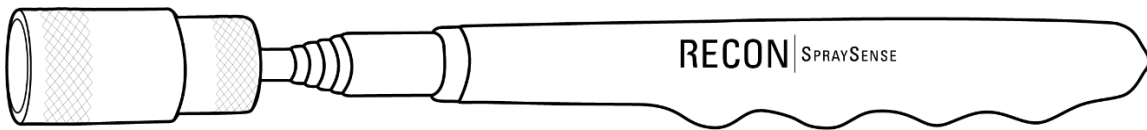


- Select your nozzle spacing.



- Starting with the left side of the machine, use the magnet tool included with the system (shown below) to touch each sensor. The LED will stop flashing and the sensor's serial number in the app will move from the Unassigned Sensor list to a section once it is indexed. Don't skip over nozzles without a sensor; assign it by tapping **Nozzle w/o Sensor**.

If you miss a nozzle, you need to start the indexing procedure over. Follow the two steps below, then start indexing again.



- When you're done, tap **Stop Indexing**.
- Cycle key power or unplug the tractor harness from the convenience outlet to reboot the system.

IMPORTANT: Your configuration will not save if you don't reboot the system.

Viewing Sensor Status

View sensor status on the Machine Setup page.

- Tap **Settings** on the bottom navigation, then make sure that you're on the **Machine Setup** tab.
- View the sensor status under the sensor serial number.

Status	Meaning
Online	Sensor is functioning normally.
Offline	System can't communicate with the sensor. <ul style="list-style-type: none"> Make sure harnessing connected to the sensor is secure and not damaged Refer to the next section for instructions to replace sensors.
Disabled	Sensor is disabled. Refer to the next section for instructions to enable sensors.

Editing Sensor Configuration

To replace or disable a sensor, follow the instructions below.

Replacing a sensor

1. Tap **Settings** on the bottom navigation, then tap **Edit** in the lower left corner.
2. Find the serial number of the sensor that you want to replace, then tap the 3 dots to the right of it.
3. Tap **Replace**, then select the sensor that will replace the old sensor. Tap **Done**. Other sensors will start blinking, but you do not need to re-index them.
4. Cycle key power or unplug the tractor harness from the convenience outlet to reboot the system.

IMPORTANT: Your configuration will not save if you don't reboot the system.

Disabling a sensor

1. Tap **Settings** on the bottom navigation, then tap **Edit** in the lower left corner.
2. Find the serial number of the sensor that you want to disable, then tap the 3 dots to the right of it. Tap **Disable**.

*Re-enable the sensor by following the same steps above and tapping **Enable**.*

2.4 Setting Targets

Configure your target pressure and alert thresholds on the Targets page.

FAVORITE NOZZLE [EDIT](#)

● **XR11008**
VALUE TO SET [ACTIVE](#) ✓

PRESSURE TARGET **42** PSI **OFF TARGET WARNING** **5** PSI **OFF TARGET ALERT** **9** PSI

33 36 42 47 51

RATE TARGET **14** GPA **OFF TARGET WARNING** **4** GPA **OFF TARGET ALERT** **5** GPA


9 10 14 18 19

DROPLET SIZE TARGET ● **MEDIUM** 40 - 60 PSI **SPEED TARGET** **17.4 MPH** **FLOW TARGET** **.82 GPM**


Tap a nozzle to set it as active or tap Edit to add and remove nozzles from your favorites.

Droplet Size, Speed, and Flow targets are calculated based on Active Nozzle, Pressure Target, and Rate Target. GPA: Gallons per Acre. GPM: Gallons per minute.

[DASHBOARD](#) [MONITORING](#) [ALARMS](#) **[TARGETS](#)** [SETTINGS](#)

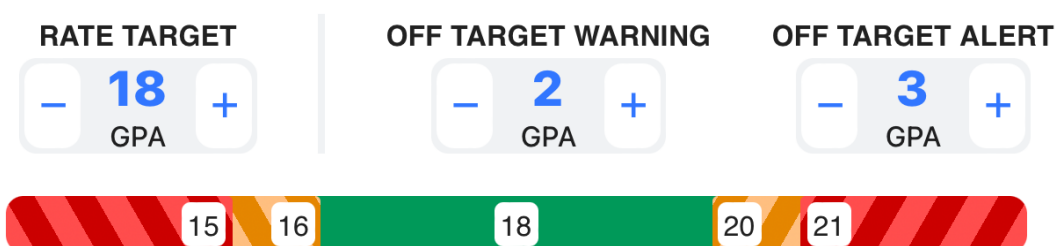
1. Tap **Targets** on the bottom navigation.
2. If you've already added nozzles, select the one you want to configure. Otherwise, add a nozzle.
 - a. Tap **Edit** next to Favorite Nozzle.
 - b. Type the name of your nozzle in the search bar, then select it from the All Nozzles list when it appears. Tap the add  button, then tap **Done**.

If your nozzle isn't listed, tap **Create Custom** and input the specifications of that nozzle. Tap **Done**.

To delete a nozzle, tap the remove  button.

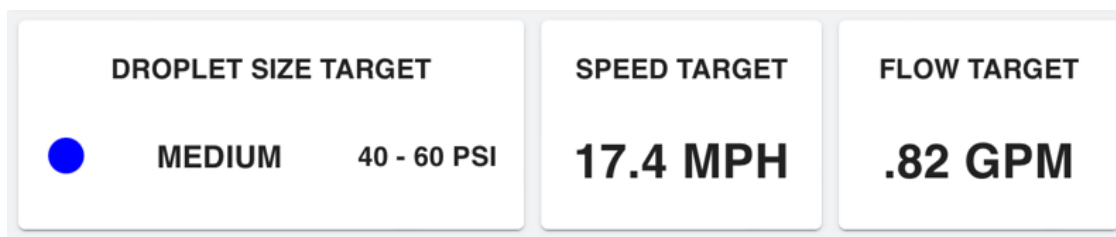
3. Change your target pressure, rate, and alert thresholds.
 - a. **Pressure or Rate Target:** Target spray pressure (PSI) or application rate (GPA).
 - b. **Off Target Warning:** If the measured pressure or flow goes above or below the target by this number, a **warning** ⚠️ will appear and an alarm will sound (if enabled).
 - c. **Off Target Alert:** If the measured pressure or flow goes above or below the target by this number, an **alert** 🚨 will appear and an alarm will sound (if enabled).

EXAMPLE: In the screenshot below, a warning will appear at 16 GPA and 20 GPA. An alert will appear at 15 GPA or lower and 21 GPA or higher.



After you've input your targets, the droplet size, speed, and flow targets will populate based on the information you've entered.

EXAMPLE: Using the targets above, to obtain a target rate of 18 GPA, a travel speed of 17.4 mph and operating pressure of 42 psi is required. This will result in a flow rate of .82 GPM per nozzle.

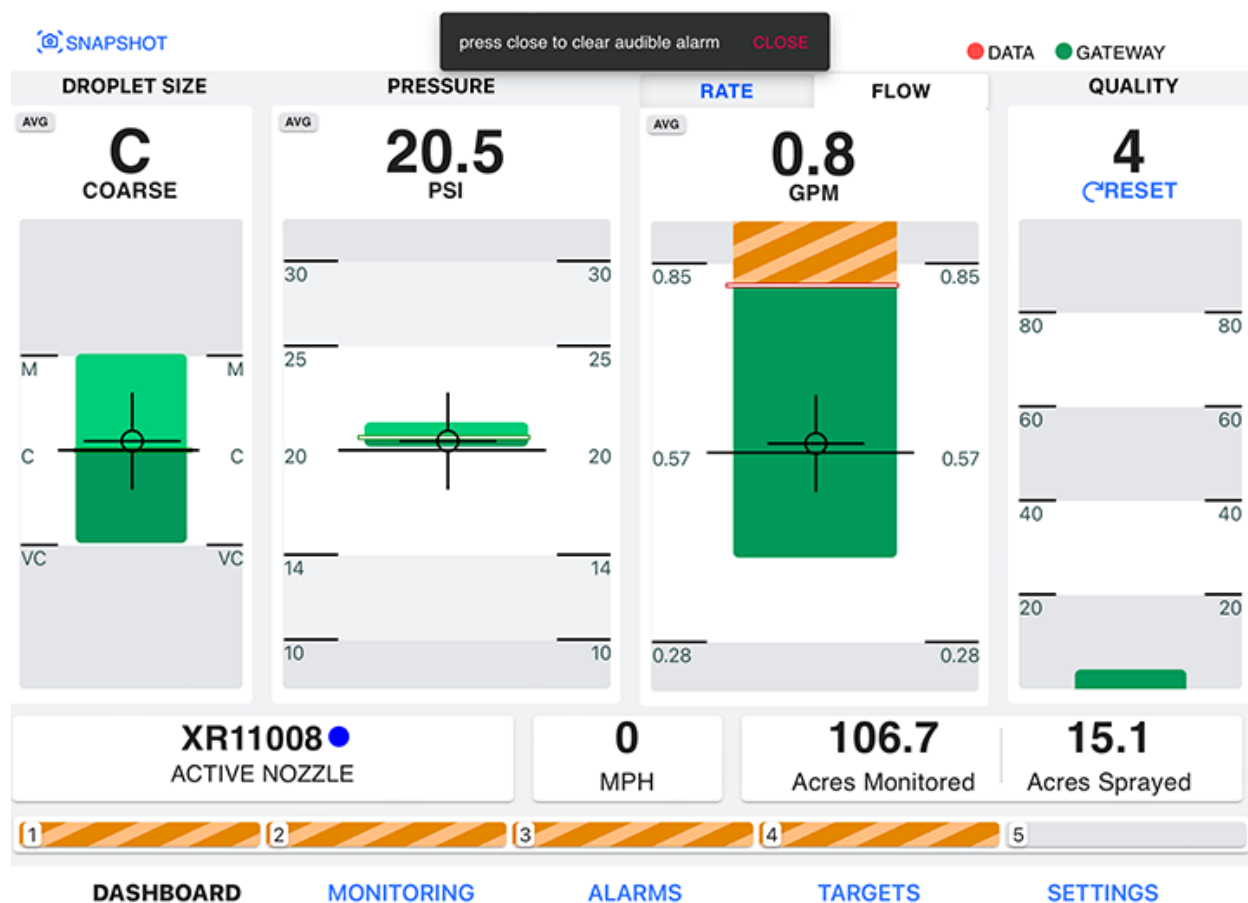


3. Monitoring Pressure and Flow

TIP: Tap **Snapshot** in the upper left corner to take a screenshot of your spray performance. When prompted, make sure you give the app permission to add to your photos.

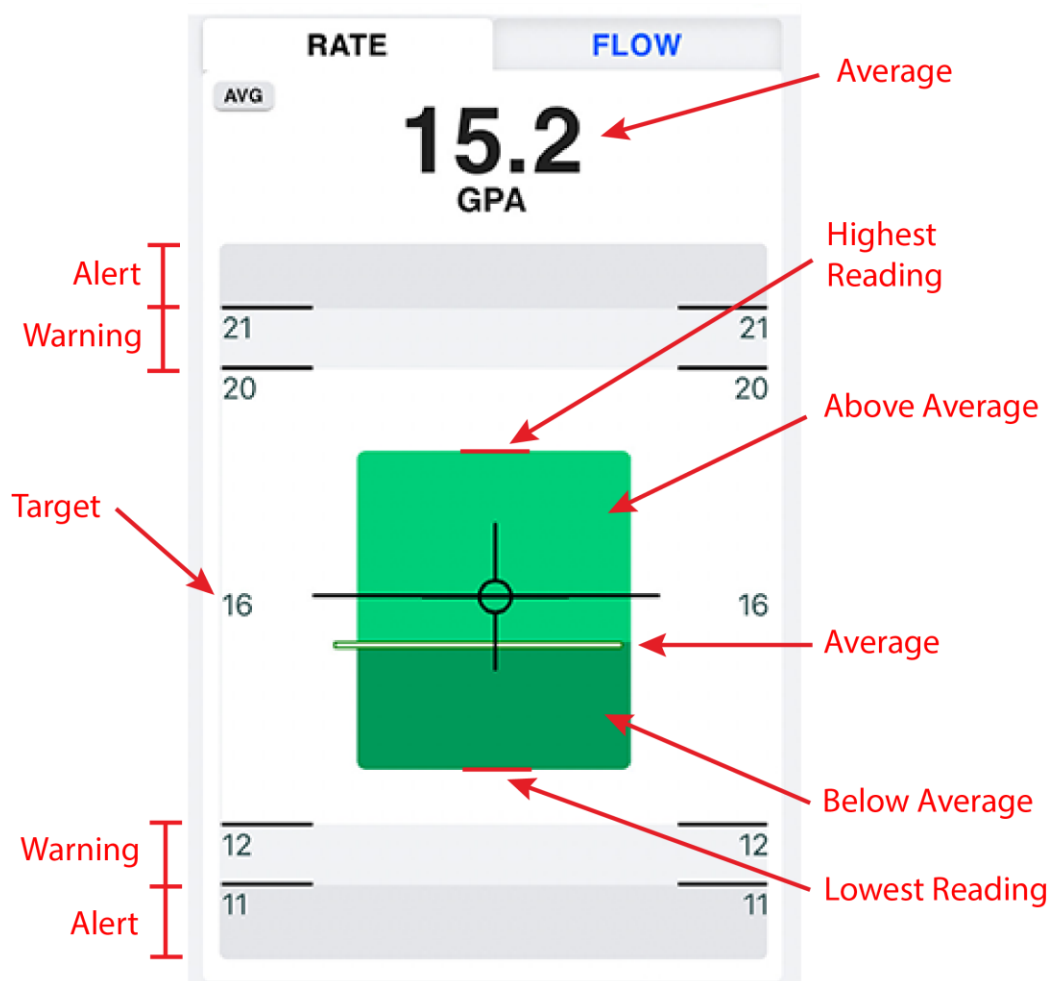
3.1 Viewing the Dashboard

Use the Dashboard tab to see an overview of spray performance.



Reading Sensor Bars

In general, if your bars are green, toward the middle, and short, you are spraying on target. Use the diagram below to read the sensor bars.



Color Meanings

The color of the bars indicate the severity of the readings based on the thresholds you set in the target settings (pressure and rate) or thresholds based on nozzle type (droplet size and flow). Tap the warning ⚠ or alert 🚨 symbol to see more information about the issue.

Color	Meaning
Green	Values are within target thresholds.
Flashing green / orange	Warning ⚠ – values are off target within warning thresholds.
Hashed orange / red	Alert 🚨 – values are off target within alert thresholds.

Defining Thresholds

Droplet Size

The droplet size bar shows your target, one droplet size bigger, and one droplet size smaller. Droplet size thresholds are based on nozzle type and target pressure. They are not defined in the target settings.

Droplet size abbreviations shown are based on the table below.

Abbreviation	Droplet Size
XF	Extremely Fine
VF	Very Fine
F	Fine
M	Medium
C	Coarse
VC	Very Coarse
EC	Extremely Coarse
UC	Ultra Coarse

Pressure and Rate

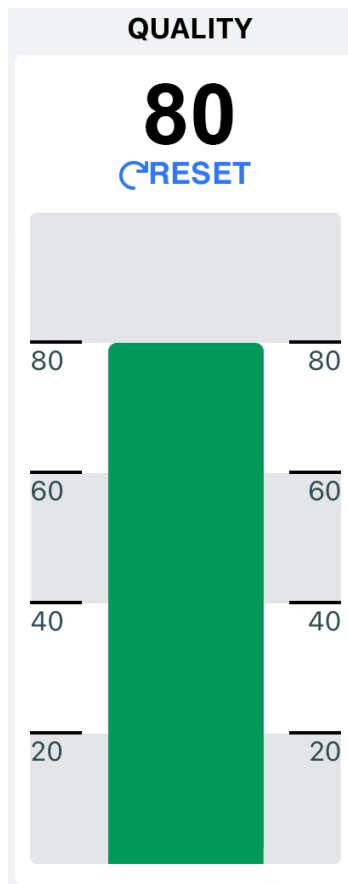
Pressure and rate thresholds are defined in the target settings.

Flow

Flow thresholds are based on application rate and pressure tolerances. Flow thresholds are not defined in the target settings.

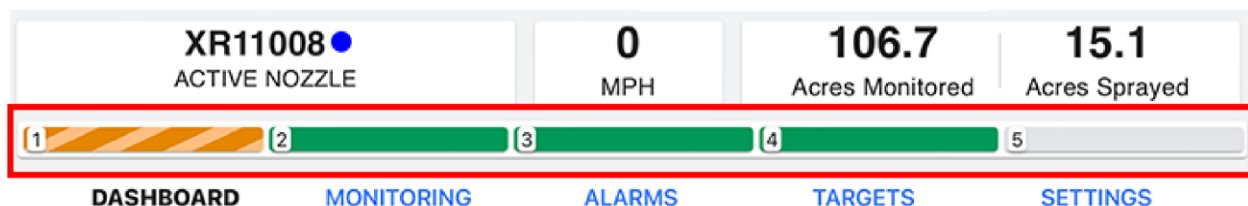
Reading Spray Quality Overview

The right side of the screen shows a spray quality percentage from 0% to 100% based on how often spraying targets are met. For a breakdown of the percentage, switch to the Monitoring tab. Refer to *Reading Spray Quality Score* on page 22 for more information on your spray quality score.



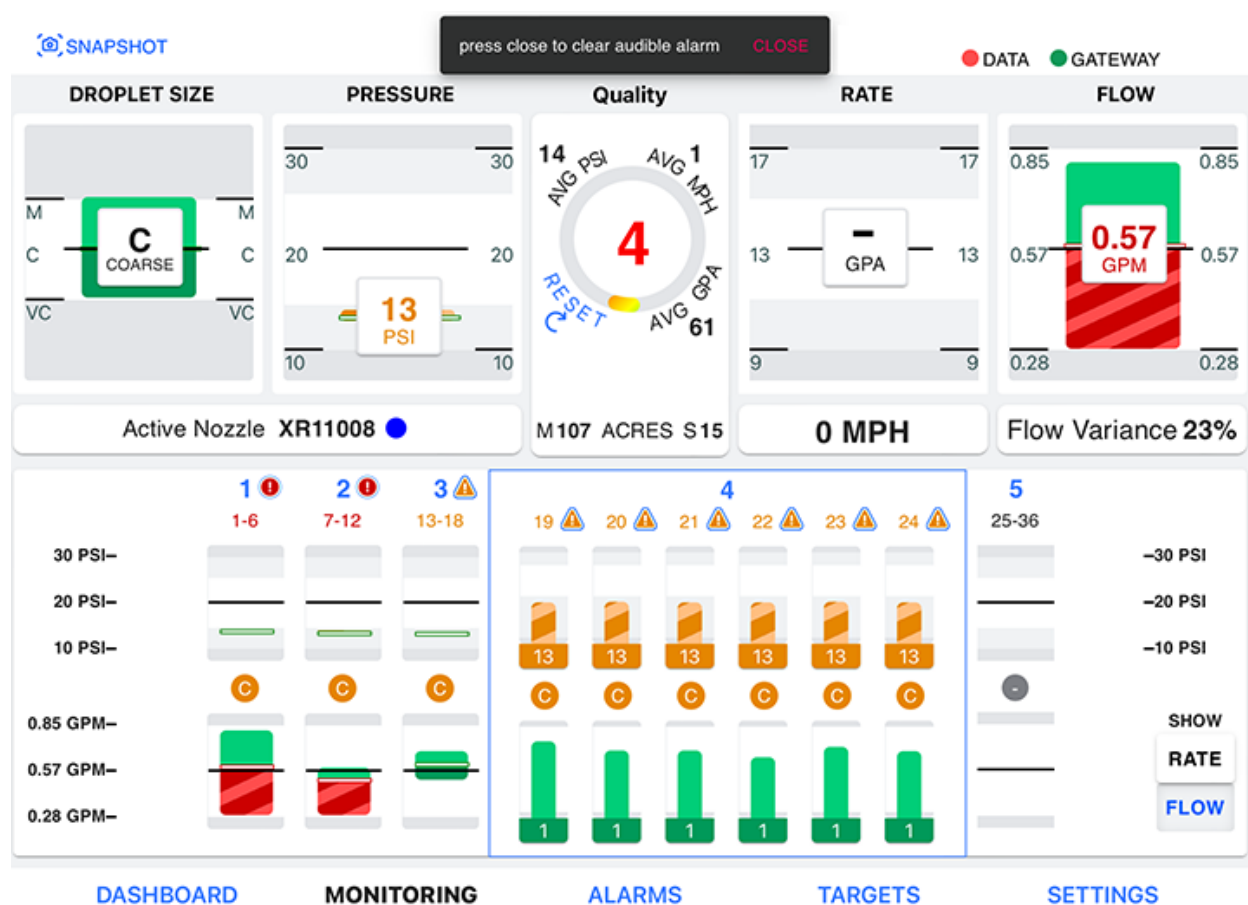
Viewing Section Overview

The bars at the bottom of the screen show a color overview of each section. Refer to the *Color Meanings* section on page 16 for more information on color coding. Switch to the Monitoring tab for more information on each section.



3.2 Monitoring individual sensors

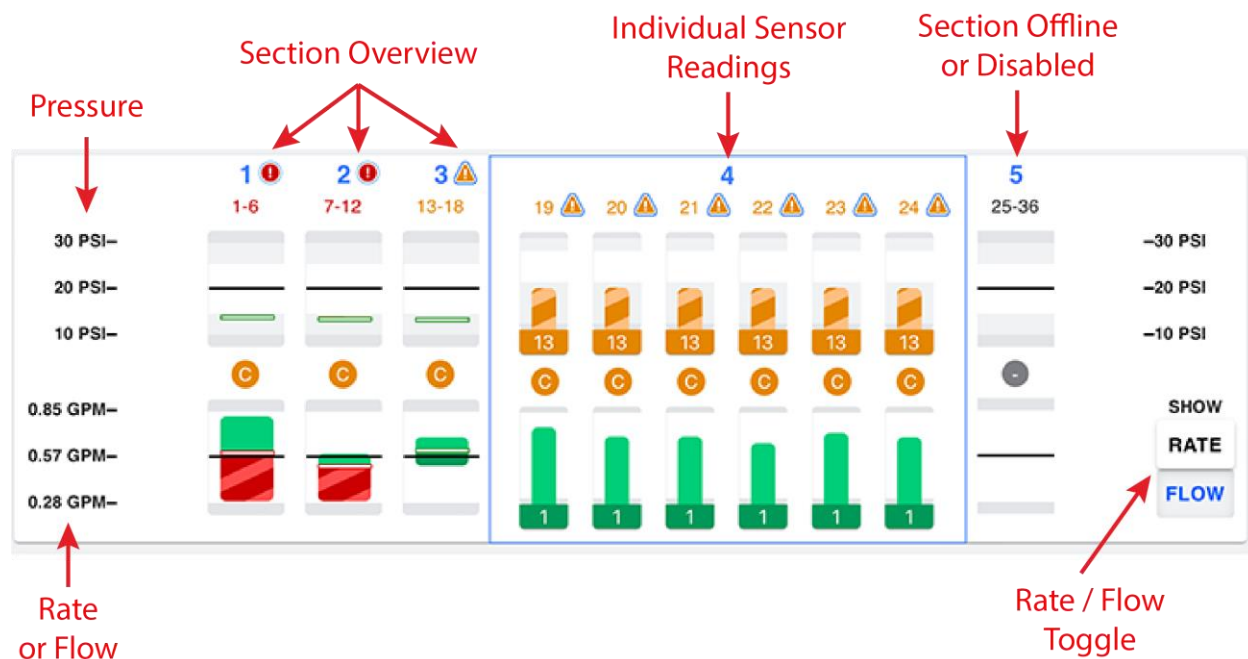
Use the Monitoring tab to view individual section or sensor performance.



Monitoring Section Performance

The top half of the screen shows the same information as the Dashboard, except for the addition of flow variance. Refer to the *Monitoring Flow Variance* section on page 22 for more information.

The bottom half of the screen shows an overview of each section.



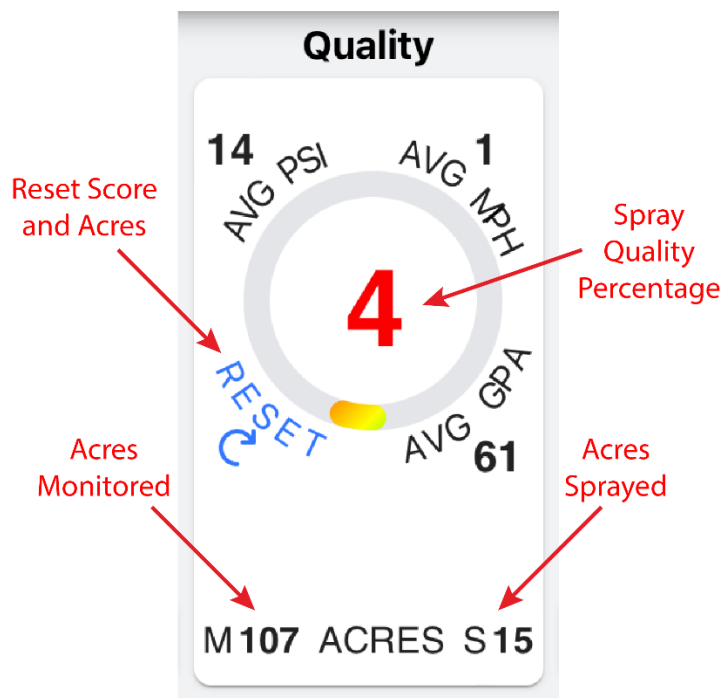
Monitoring Individual Sensor Performance

Tap a section to see the performance of an individual sensor. Tap the section again to close it.



Reading Spray Quality Score

The middle of the screen shows an overall spray quality percentage based on how often spraying targets are met. It also shows the acres monitored and acres sprayed.



The percentages correspond with warning and alert statuses.

Percent	Meaning
80% – 100%	On Target
60% – 79%	Warning
59% and below	Alert

Monitoring Flow Variance

Flow variance is shown below the Flow bar. It is a percentage of flow in relation to the flow of the other nozzles.

- 0% variance: all nozzles have equal flow levels.
- Positive variance: nozzles have above average flow level.

3.3 Viewing Alert History

View alert history on the Alarms page.

1. Tap **Alarms** on the bottom navigation.
2. To view all alerts, tap the **All Alerts** tab on the top. Otherwise, click the type of alert you want to view.

4. Customizing Settings

Customize settings in the Settings page.

4.1 Enabling Alarms

1. Tap **Settings** on the bottom navigation, then tap **Alerts** on the top navigation.
2. In the Alarms section, enable or disable alarms.
 - To sound an alarm if the gateway or a sensor is offline, enable the **Gateway or sensor offline alarm** switch.
 - To play a sound when there is an alert or warning, enable the **Play sound on alert** or **Play sound on warning** switch.
 - To set alarm delays, drag the slider at the bottom of the screen to adjust the number of seconds between when the system detects a problem and when the alarm sounds.

4.2 Changing Alarm Settings

1. Tap **Settings** on the bottom navigation, then tap **Alerts** on the top navigation.
2. Swipe up to the Alarm Settings section and change your alarm settings.
 - To change the alarm volume, drag the **Alarm volume** slider.

4.3 Enabling Section Sense

If your sprayer has a section control system, use Section Sense to omit nozzles that are not spraying due to section control. These sections will appear gray in the app.

1. Tap **Settings** on the bottom navigation, then tap **Alerts** on the top navigation.
2. In the Section Sense section, enable the **Is your machine operating with Section Sense?** switch.
3. Use the sliders to adjust Section Sense alarm thresholds.
 - **Disable alarms slider:** The higher the percentage, the longer it will take for an alarm to shut off when nozzles become disabled due to section control.
 - **Enable alarms slider:** The higher the percentage, the longer it will take for an alarm to sound when nozzles start spraying.

4.4 Changing Units

To change the unit that data is shown in, tap **Settings** on the bottom navigation, then tap **Units** on the top navigation. Swipe up to see all options.

5. Viewing Support Information

Use support information while troubleshooting or to upload diagnostic files.

If you're looking for support documentation such as installation manuals, user guides, and troubleshooting guides, visit intelligentag.com/support.

5.1 Viewing System Information

To view app, iPad, gateway, and sensor information, tap **Settings** on the bottom navigation, then tap **Account & About** on the top navigation. This information is typically used for troubleshooting an issue.

5.2 Viewing Diagnostic Logs

Use the Diagnostic tab to upload diagnostic files to Intelligent Ag.

1. Tap **Settings** on the bottom navigation, then tap **Diagnostic** on the top navigation.
2. Select the box next to the date(s) of the log you want to submit. Logs will save to your iPad once the box is selected.

Next time your iPad is connected to Wi-Fi, the logs will automatically upload to Intelligent Ag.