RECON BLOCKAGE+™

OPERATOR'S GUIDE

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IntelligentAg

Recon Blockage Plus™ Operator's Guide

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Related Documentation

Document Number	Document Title
600820-000044	Recon Blockage Plus™ Quick Reference Guide
600820-000045	Recon Blockage Plus™ Troubleshooting Guide
600840-000069	Recon Blockage Plus™ Installation Manual

1. Introduction

1.1 About Recon Blockage Plus™

Intelligent Ag's Recon Blockage Plus is an acoustic-based monitoring system that quickly and accurately notifies operators of blockages anywhere in their implement. Operators interact with the system via an iPad® app in the tractor cab.

For instructions to install the system, see the Recon Blockage Plus Installation Manual from the Recon Blockage Monitor app's Guides screen.

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

1.2 Using an iPad

Recon Blockage Plus interfaces with the system using the Recon Blockage Monitor app on an iPad.

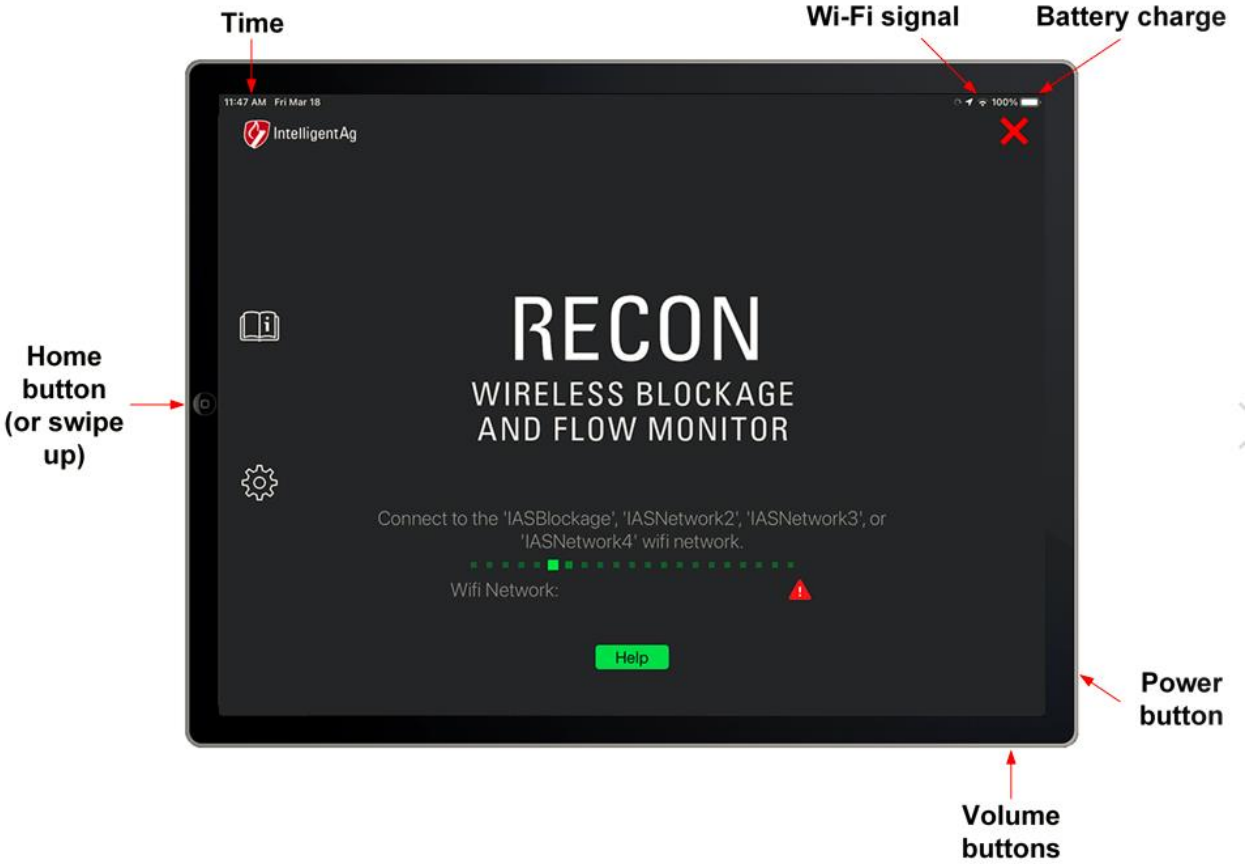

Figure 1: Using the iPad

Powering on/powering off the iPad

To power on the iPad, press and hold the power button (shown in Figure 1) for 3 to 5 seconds.

When the iPad is powered on, 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:

- **iPads with a home button:** Press and hold the power button for 3 to 5 seconds. Then, drag the slider that appears on the screen.
- **iPads without a home button:** Press and hold the power button and one of the volume buttons for 3 to 5 seconds. Then, drag the slider that appears on the screen.

Viewing the iPad Home screen

If you have an app open, press the iPad's Home button to return to the Home screen. If you don't have Home button, swipe up from the bottom of the screen.

Opening the Recon Blockage Monitor 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 IASBlockage network.

Tap the Recon Blockage Monitor app on the iPad Home screen to open it.

If you haven't downloaded the app yet, search *Intelligent Ag* in the App Store and download the Recon Blockage Monitor app. Refer to the download instructions in the Recon Blockage Plus™ Installation Manual for more information.

Closing the app

Tap the X in the upper right corner to close the app.

Adjusting iPad volume

Press the top or bottom iPad volume button (shown in Figure 1) to adjust the iPad volume.

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

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. Getting Started

2.1 Connecting the iPad to the wireless network

The iPad must be in close range of the gateway and connected to the gateway's wireless network to communicate with Recon Blockage Plus™.

Make sure that your iPad is connected to the wireless network at the beginning of every planting session. This is especially important if your iPad is connected to another network, such as a home wireless network, between sessions.

To connect the iPad to the wireless network:

1. Power on the tractor and iPad.
2. Tap the **Settings** icon on the iPad's Home screen.
3. Tap **Wi-Fi** on the left side of the screen.
4. Make sure that the **Wi-Fi** switch is enabled.
5. Tap **IASBlockage** from the Networks list. A checkmark will display to the left of the network name when the iPad is connected to the network.

   NOTE: If the network does not appear, wait a few minutes to give the iPad time to search for the network. If it does not appear after several minutes, verify that the LED on the back of the gateway is green.

2.2 Setting up Recon Blockage Plus

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 wireless network.

1. Tap the **Blockage Monitor** icon on your iPad's Home screen to open the app.
2. Tap the settings ⚙ icon on the left side of the screen. Then, tap **Setup Wizard** in the bottom right corner.

3. Select your monitoring view type. Tap the next arrow →.
   - **Manifold view** displays the implement ports and manifolds in a circle. Manifolds using Product A have white lettering and manifolds using Product B have blue lettering.
   - **Row view** displays the implement ports and sections in columns. Manifolds using Product A are displayed on the top half of the screen and manifolds using Product B are displayed on the bottom half of the screen.

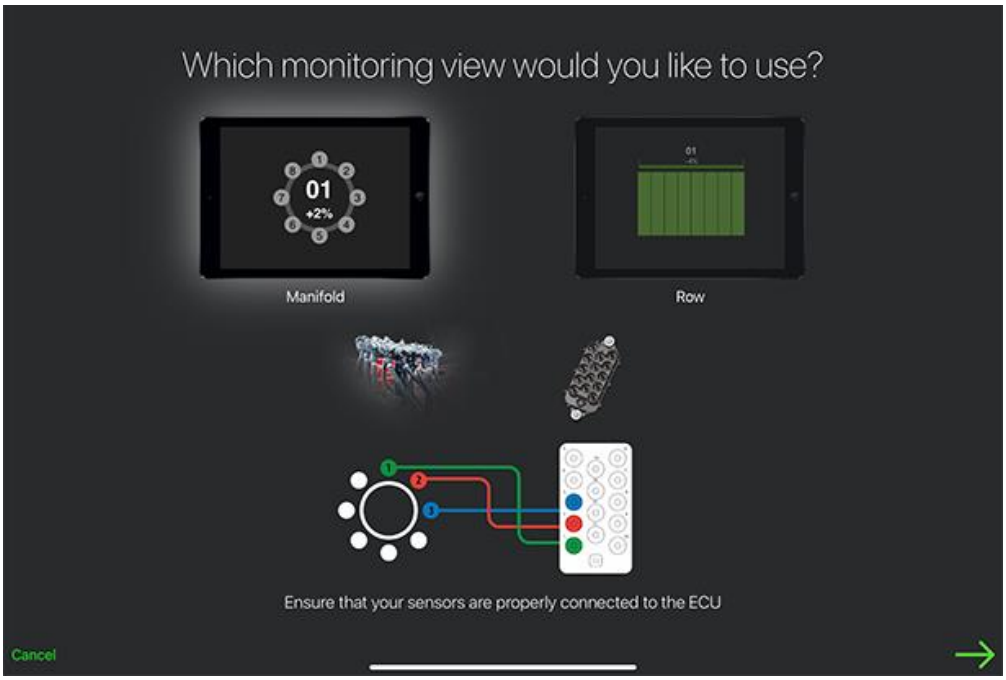

Figure 2: Configuration – View Options

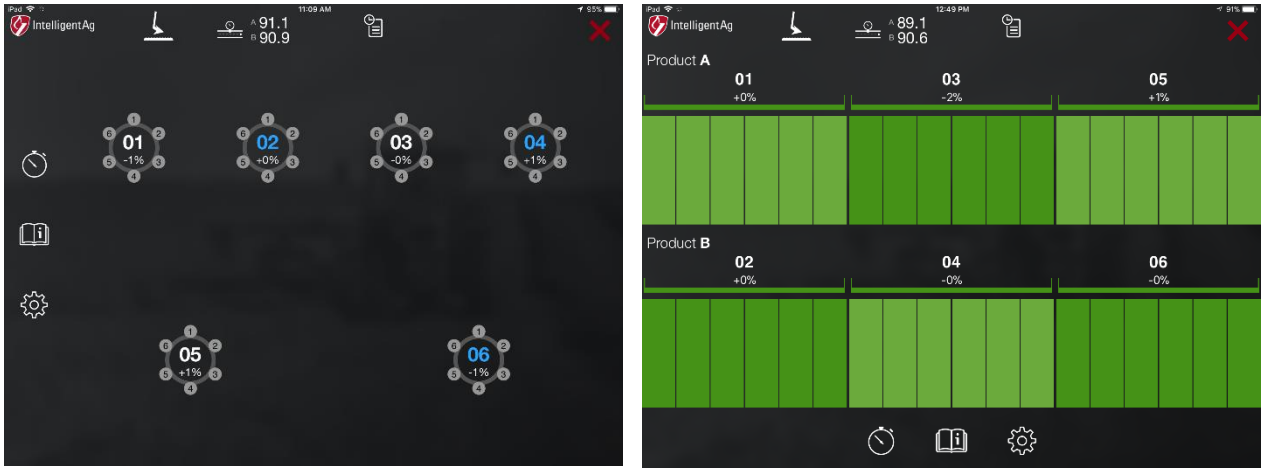

Figure 3: Blockage screen in manifold view (left) and row view (right)

4. Select the number of ECUs on your system. Tap the next arrow →.

   NOTE: If the ECU search does not find your ECUs, try following the troubleshooting steps in the on-screen help.

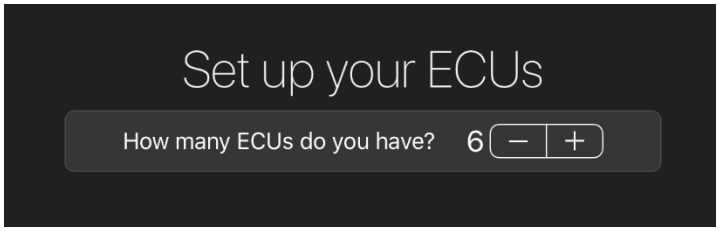

Figure 4: Configuration – ECU Setup

5. Configure your product and section setup.

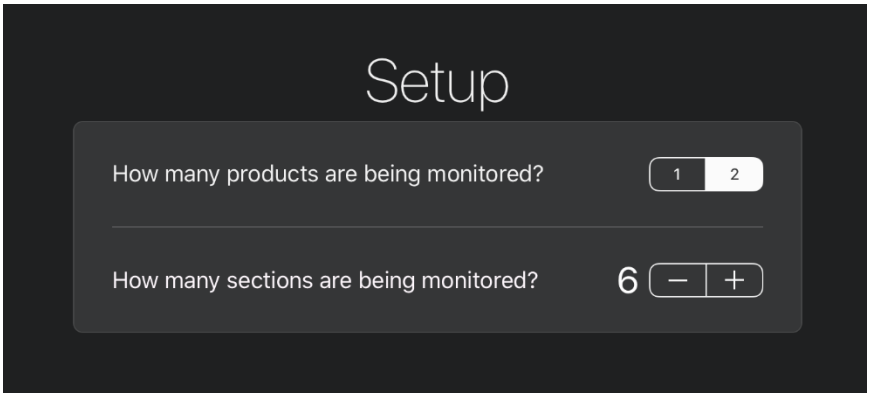

Figure 5: Configuration – Product and Section Setup

   a. Select the number of products you are monitoring.
      - Select **1** if you are only monitoring 1 product, or if you have two products flowing through the same air stream (single shoot).
      - Select **2** if you are dual shooting – two products (e.g. seed and fertilizer pellets) simultaneously flowing through the implement via different air streams.

   b. Select how many sections (manifolds) you're monitoring. By default, this is the same as the number of ECUs installed.

      EXAMPLE: Select **20** sections for a 10-section dual-product drill.

      NOTE: The minimum number of sections is half of the number of ECUs, and the maximum number of sections is double the number of ECUs.

   c. Tap the next arrow →.

6. Configure each section.

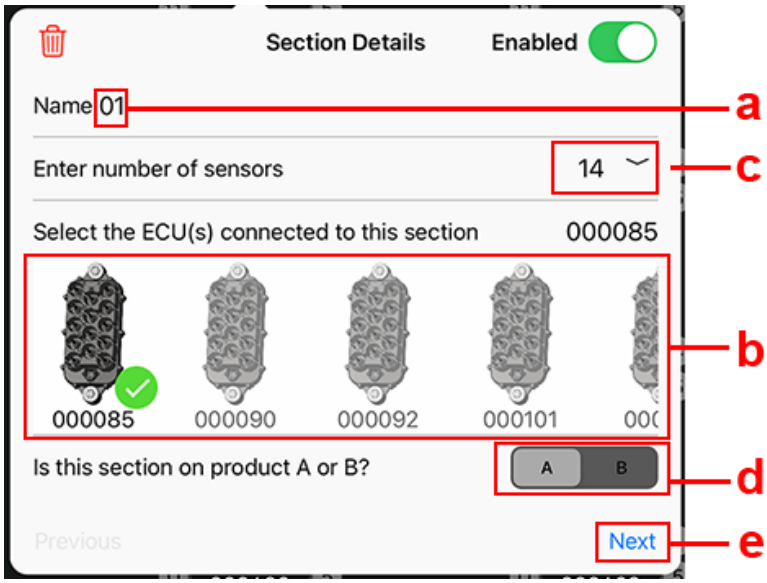

Figure 6: Configuration – Section Details

a. **OPTIONAL:** Tap the manifold number or name to rename the section. Sections display in alphanumeric order based on name.

   EXAMPLE:
   - Seed tower names: S1, S2, S3, etc.
   - Fertilizer tower names: F1, F2, F3, etc.

b. Tap the ECU or ECUs that are connected to the section. The ECU serial number is located on the back of the ECU.

   NOTE: If you split a manifold's runs across two ECUs or joined two manifolds on one ECU, refer to the instructions below when assigning ECUs:

   - **Splitting:** Select the two ECUs that your manifold is connected to.
   - **Joining:** Select the same ECU for two different manifolds.

c. Select the number of sensors connected to the ECU.

d. If you are running two different products via two different airstreams, decide which product will be product A and which will be product B. Select which product this section is running.

   NOTE: Make sure that you assign product types consistently. For example, if Sections 01 and 03 are running seed and Sections 02 and 04 are running fertilizer pellets, you should assign Product A to Sections 01 and 03 and Product B to Sections 02 and 04.

e. Tap the blue **Next** button to continue to the next section.

   NOTE: To permanently delete a section, tap the red trash icon in the upper left corner. To temporarily disable a section, toggle the **Enabled** switch in the upper right corner.

f. When you're done configuring all sections, tap **Done**. Then, tap the next arrow → in the bottom right corner of the screen.

7. Configure each ECU's ports.

Figure 7: Configuration – Port Configuration

NOTE: If you connected your sensors in counterclockwise order instead of in clockwise order, you do not need to re-arrange your runs here. Refer to Section 4 to change your run direction.

a. Tap each ECU and verify that the run configuration in the app matches how your runs are connected to the ECUs. If the app doesn't match your system setup:

- Drag a run number to the correct port on the ECU diagram.
- Toggle the switch next to a port number to disable or enable a port.
- Tap **Reset** to revert the changes back to the original configuration.
- Tap **Apply** to save the changes.

b. Tap the next arrow →.

8. Set up your work switch.

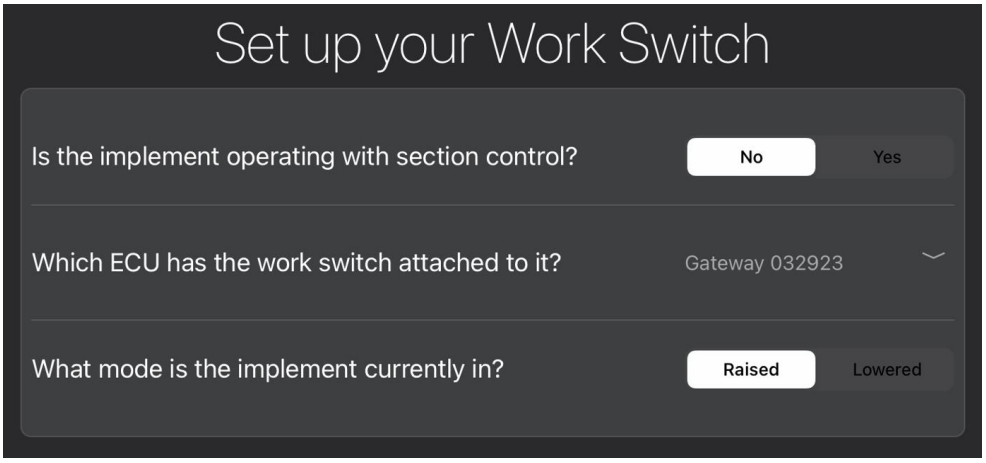

Figure 8: Configuration – Work Switch Setup

a. Select if your implement is operating with section control.

b. Select the gateway serial number next to "Which ECU has the work switch attached to it".

c. Select the current mode of your implement (raised or lowered). This determines the configuration of your work switch. To verify your work switch setup after configuration, refer to Section 2.3.

d. Tap the next arrow →.

9. Set up alarm delay and volume.

NOTE: To view other alarm settings after configuration, see Section 2.6.

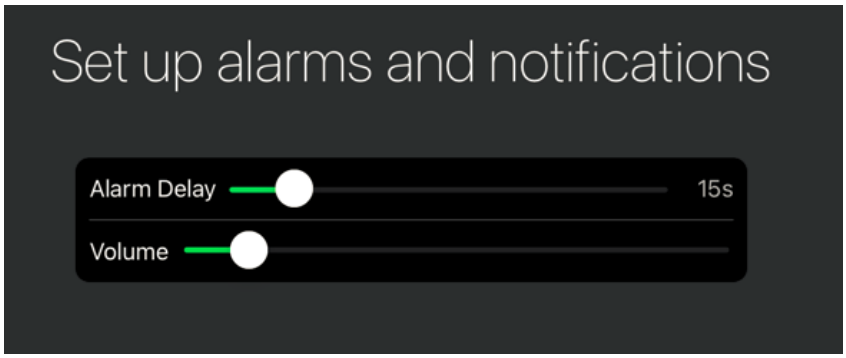

Figure 9: Configuration – Set Up Alarms and Notifications

a. Drag the slider to select a delay before alarms sound.

b. Drag the slider to select the volume of the alarms (unless the volume is controlled by your device's side switch).

c. Tap the checkbox

2.3 Verifying work switch installation

Follow the instructions below to verify that the work switch has been correctly installed and is communicating with the app.

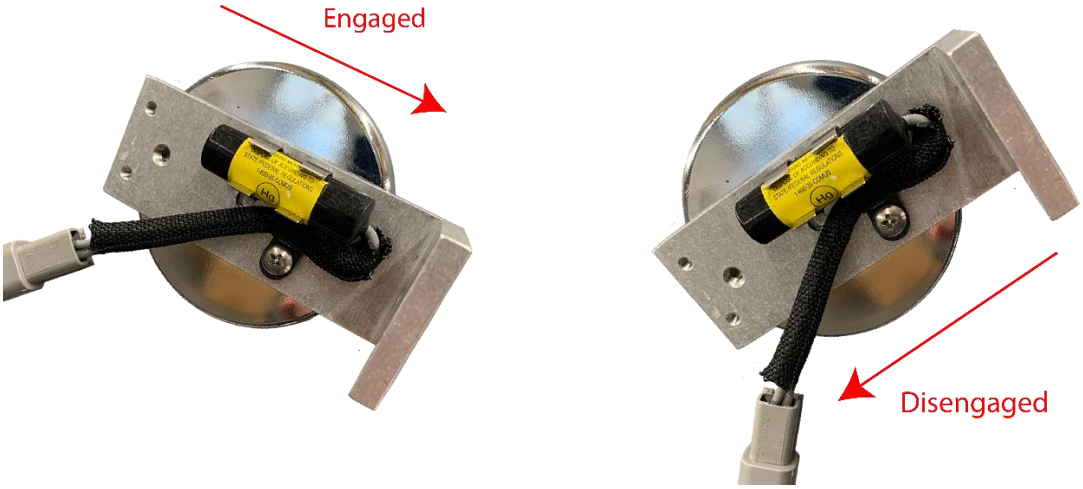

Figure 10: Work switch functionality

1. Determine your work switch method.
   - **Default method**
     - The work switch is **tilted toward the wires** when the implement is **in the ground**.
     - The work switch is **tilted away from the wires** when the implement is **out of the ground**.
   - **Inverted method**
     - The work switch is **tilted away from the wires** when the implement is **in the ground**.
     - The work switch is **tilted toward the wires** when the implement is **out of the ground**.
2. Verify that the work switch indicator functions correctly in the app.
   a. Navigate to the main blockage screen in the app.
   b. Lower the implement and verify that the work switch indicator turns green .
   c. Raise the implement and verify that the work switch indicator turns white .
   d. Lower the implement again and verify that the work switch indicator turns green .

   If the work switch indicator is not the correct color as noted in the instructions above, toggle the **Work Switch Inverted** switch in the Settings page. If it does not change when you adjust the implement's hydraulic system, contact your dealer for assistance.

2.4 Editing configuration

To edit or add manifolds and runs that were not included during the initial configuration of Recon Blockage Plus™, follow the instructions below.

TIP: To go through the full initial setup again, tap the settings ⚙ icon on the main Blockage screen, then tap **Setup Wizard** at the bottom of the screen.

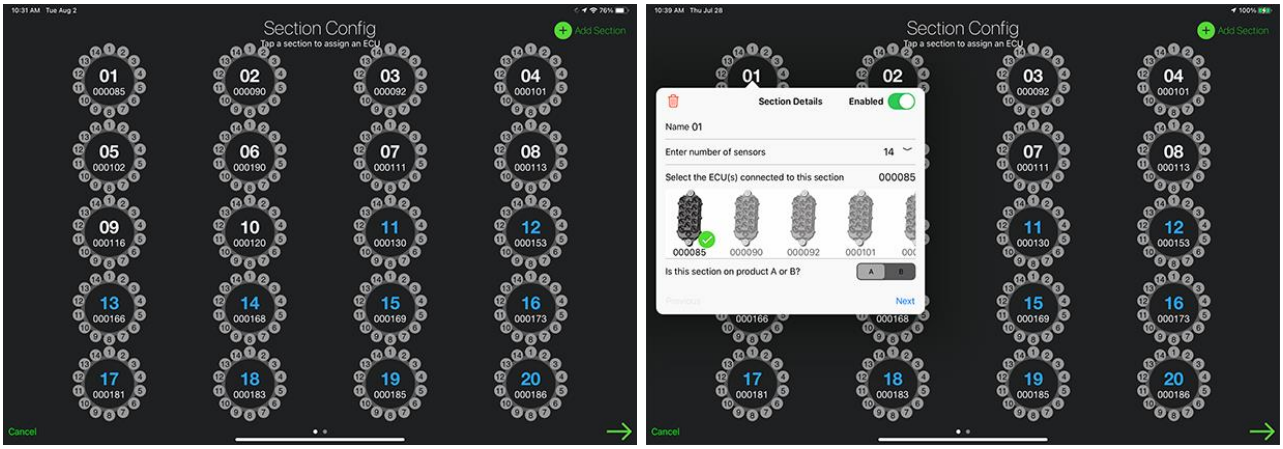

Figure 11: Edit Section Configuration

2.4.1 Edit section settings

1. Tap the settings ⚙ icon on the main Blockage screen.
2. Tap **Edit Config** at the bottom of the screen.
   - **Delete a section:** Tap the section you want to edit. Then, tap the trash 🗑 icon.
   - **Disable a section:** Tap the section you want to edit. Then, disable the **Enabled** switch.
   - **Add a section:** Tap **Add Section** in the upper right corner of the Section Config screen. Tap the new section that appears and configure its settings. Refer to Section 2.2, step 6 for more information about Section Details configuration.

2.4.2 Edit port settings

1. Tap the settings ⚙ icon on the main Blockage screen.
2. Tap **Edit Config** at the bottom of the screen.
   - **Add or remove a port on a manifold:** Tap the section that you want to change the ports on. Change the number next to **Enter number of sensors** to the correct number of ports.
   - **Edit port order:** Tap the green **Next** button in the bottom right corner of the Section Config page. Tap the ECU that you want to edit, and drag its runs to re-order the ports. Refer to Section 2.2, step 7 for more information about the Port Config page.
   - **Disable a port:** Tap the green **Next** button in the bottom right corner of the Section Config page. Toggle the switch next to the port number.

2.5 OPTIONAL: Enabling High Fan Noise

Once you've used the system, if flow is detected on your runs when no product is running, configure your system to use the High Fan Noise feature. This is especially prevalent on machines with on-board tanks.

NOTE: Re-calibrate the high fan noise setting whenever product, product rate, tractor RPM, or fan speed is changed.

1. Set the tractor engine to the RPM that will be used while seeding.
2. Engage the hydraulics to the fan and set the fan to the RPM that will be used while seeding.
3. Allow the fan to stabilize for one minute. This ensures that the fan and airflow are at the operating speed.
4. Tap the settings ⚙ icon on the main Blockage screen.
5. Without product running, enable the **High Flow Noise** switch under Flow Rate.

   If you have Low or Very Low flow selected, your flow rate will be reset to Normal when High Fan Noise is enabled.
6. Return to the Blockage screen. Tap **Start Calibration** when it appears.

Figure 12: High Fan Noise Calibration Screen

7. Tap **Done** when Calibration Ready appears. Calibration is complete.

2.6 Setting alarms

Configure system alarms on the Settings page. To navigate to the Settings screen, tap the settings icon ⚙ on the Blockage screen.

NOTE: See section 4 for details about non-alarm settings.

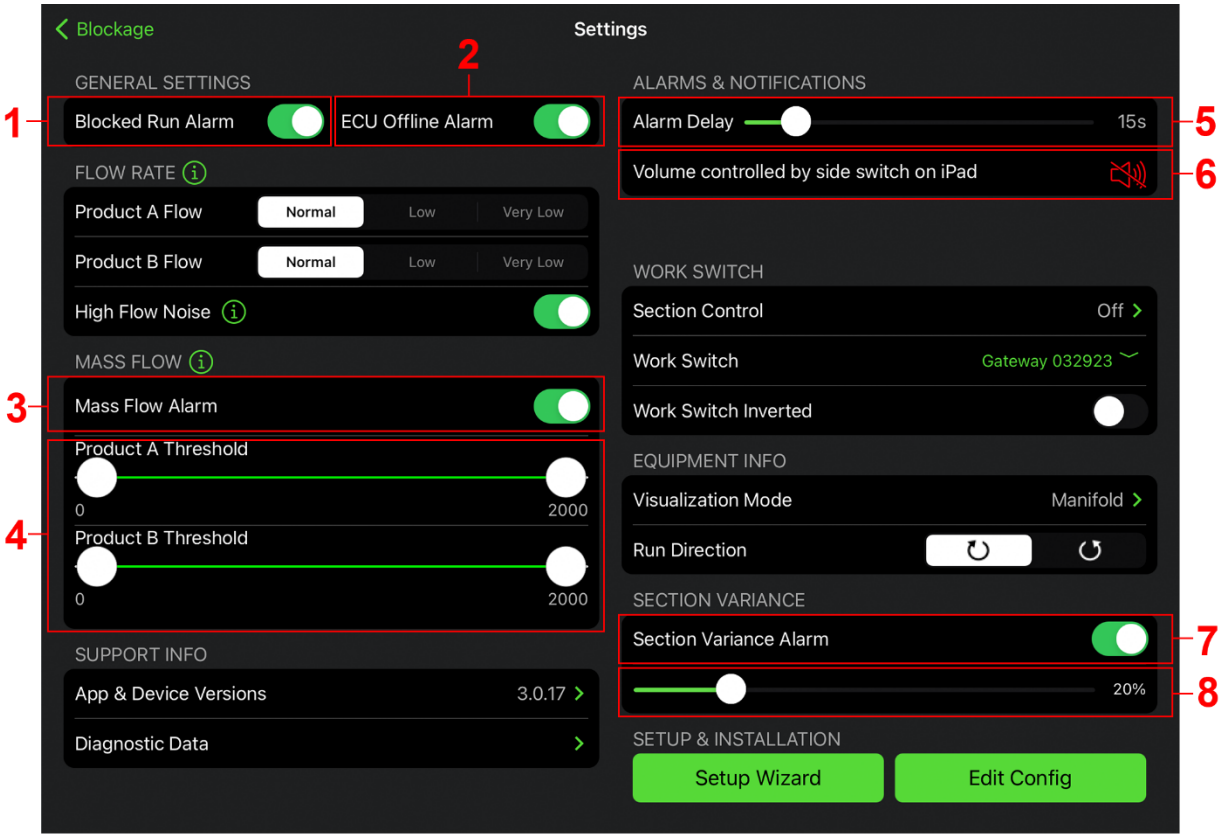

Figure 13: Settings screen - alarms

1. **Enable and disable the blocked run alarm.** Toggle the **Blocked Run Alarm** switch.
2. **Enable and disable the ECU offline alarm.** Enable the **ECU Offline Alarm** switch to sound an alarm when the app has not received data from an ECU for more than 15 seconds.
3. **Enable and disable the mass flow alarm.** Enable the **Mass Flow Alarm** switch to sound an alarm when the total product flow is outside of the thresholds set on the slider below.
4. **Set the mass flow threshold.** Drag the sliders to set the alarm threshold for each product. Flows above or below these ranges will trigger an alarm.
   - Drag the leftmost slider to the minimum acceptable flow rate for the product.
   - Drag the rightmost slider to the maximum acceptable flow rate for the product.

   NOTE: Wait to set this alarm until you are familiar with the normal range for the product's mass flow averages. The mass flow rate is an arbitrary number and does not correspond to a specific unit of measurement.

5. **Set alarm delays.** Drag the **Alarm Delay** slider to adjust the number of seconds between when the system detects a blockage and when the alarm sounds.
6. **Change alarm volume.** Drag the **Volume** slider to adjust the volume of alarms (unless the volume is controlled by your device's side switch).
7. **Enable and disable the section variance alarm.** Toggle the **Section Variance Alarm** switch to be notified of flow outside of your selected threshold for each section.
8. **Set the section variance threshold.** Drag the **Variance Threshold** slider to the percentage difference at which you want to hear an alarm for individual sections.

3. Monitoring for blockages

3.1 Viewing the Blockage screen

Use the main Blockage screen to monitor for blockages while seeding.

*Optional, appears if High Fan Noise setting is on

Figure 14: Viewing the Blockage screen

3.2 Viewing a blocked run or manifold

When a blockage is displayed on the Blockage screen of the app, an audio alarm will sound (if enabled) and the blocked run will turn red.

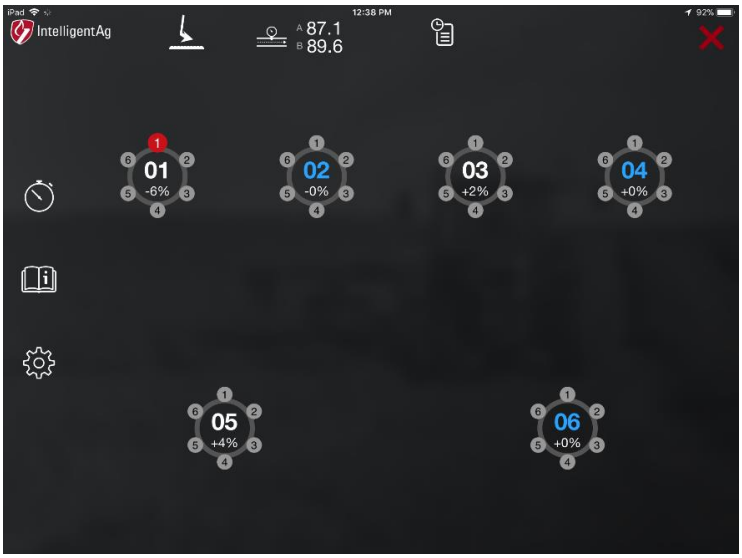

Figure 15: Blockage screen with a blocked run

If you configured your ECUs in order from left to right, Figure 16 shows how your system is displayed in the app. If you haven't already, we recommend marking the ECU port number connected to the sensor on a location easily visible on each hose. This makes it easier to identify which run is blocked.

Figure 16: Viewing blockages

Top: Tractor connected to a six manifold implement.
Left: Blockage screen representing that implement in manifold view.
Right: Blockage screen representing that implement in row view.

NOTE: When the implement is out of the ground, the app might display that all runs are blocked (because no material is flowing through the runs), but the audio alarm will not sound. Residual seed or other product can cause the flow and blockage readings to fluctuate for a few minutes after stopping seeding.

3.2.1 Silencing the audio alarm

When the blocked run alarm is sounding, silence it by tapping anywhere on the Blockage screen. It will stay silent until another blockage is detected.

3.2.2 Viewing blockage history

View all recently detected blockages from the Blockage History list. To view blockage history, tap the history icon on the Blockage screen. For example, in manifold view, a blockage on Manifold 2, Run 5 will appear as "02 - R 5." In row view, a blockage will display with the run number. Blockages that are currently active are in black text.

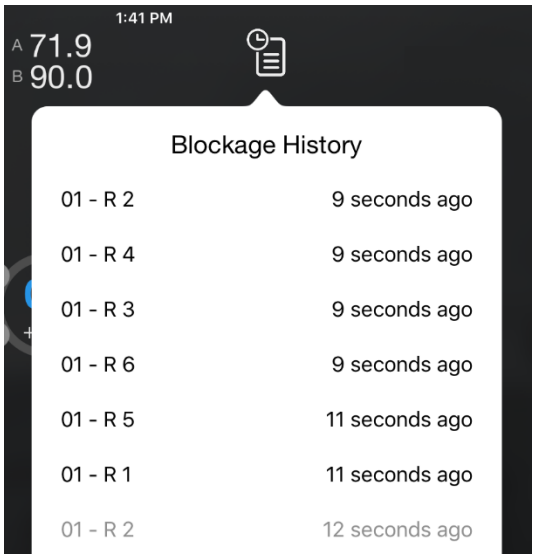

Figure 17: Blockage History screen

3.2.3 Adjusting flow rate settings

If you are applying product at a low application rate, you can adjust your flow rate settings to prevent the flow alarm from falsely triggering.

To adjust the flow level settings:

1. Tap the settings icon on the main Blockage screen.
2. Under Flow Rate, select **Normal**, **Low**, or **Very Low**.
   - **Normal:** Use when applying seed at a rate greater than 7 pounds/acre. Used for most products.
   - **Low:** Use when applying seed at a rate between 5 to 7 pounds/acre. Often used with canola, flax, alfalfa, and grass.
   - **Very Low:** Use when applying seed at a rate less than 5 pounds/acre. Often used with canola and sunflowers.

3.2.4 Monitoring with section control

If your implement has a section control system and you indicated that you were using section control during initial configuration, the manifolds that are not seeding due to section control will appear dimmed.

NOTE: All sections will appear dimmed if the work switch is disengaged while section control is enabled.

Figure 18: Blockage screen showing a manifold not seeding due to section control

Adjusting Section Control Sense settings

1. Tap the settings ⚙ icon on the main Blockage screen. Then, tap **Section Control**.
2. Adjust the alarm thresholds for Product A and Product B (if applicable).
   - The higher the percentage on the red slider, the longer it will take for a section alarm to shut off when runs become blocked.
   - The higher the percentage on the green slider, the longer it will take for a section alarm to sound when blocked runs become unblocked.

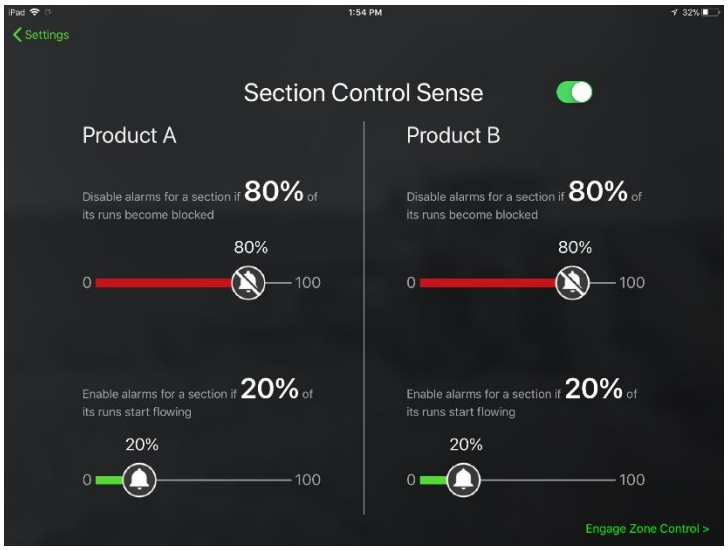

Figure 19: Section Control Sense settings

3.3 Monitoring manifold variance

In addition to alerting operators to blocked runs or manifolds, Recon Blockage Plus™ also monitors the variance between all manifolds on the implement.

The variance of a manifold is a percentage of flow in relation to the flow of the other manifolds on the implement that are running the same product type.

- **0% variance:** all manifolds have equal flow levels.
- **Positive variance:** manifold has above average flow level.
- **Negative variance:** manifold has below average flow level. May indicate poor product flow or low product levels.

The variance for each manifold appears directly below the manifold's name on the Blockage screen of the app. The manifold's variance is given in real time and will continuously update.

Manifolds that are outside the variance threshold will change from gray to orange. For more information about the variance threshold, see Section 2.6.

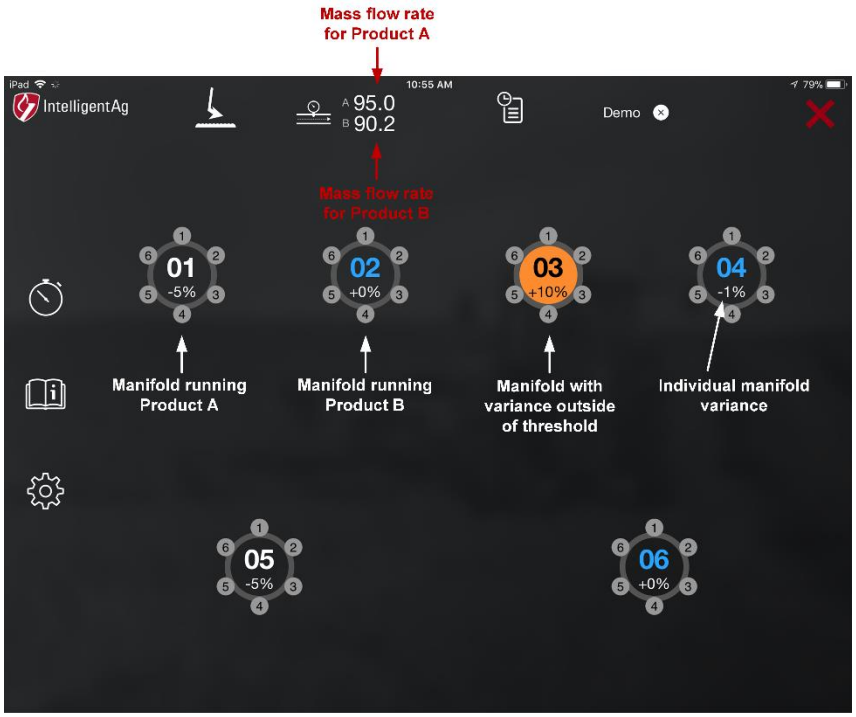

Figure 20: Understanding variance – manifold view

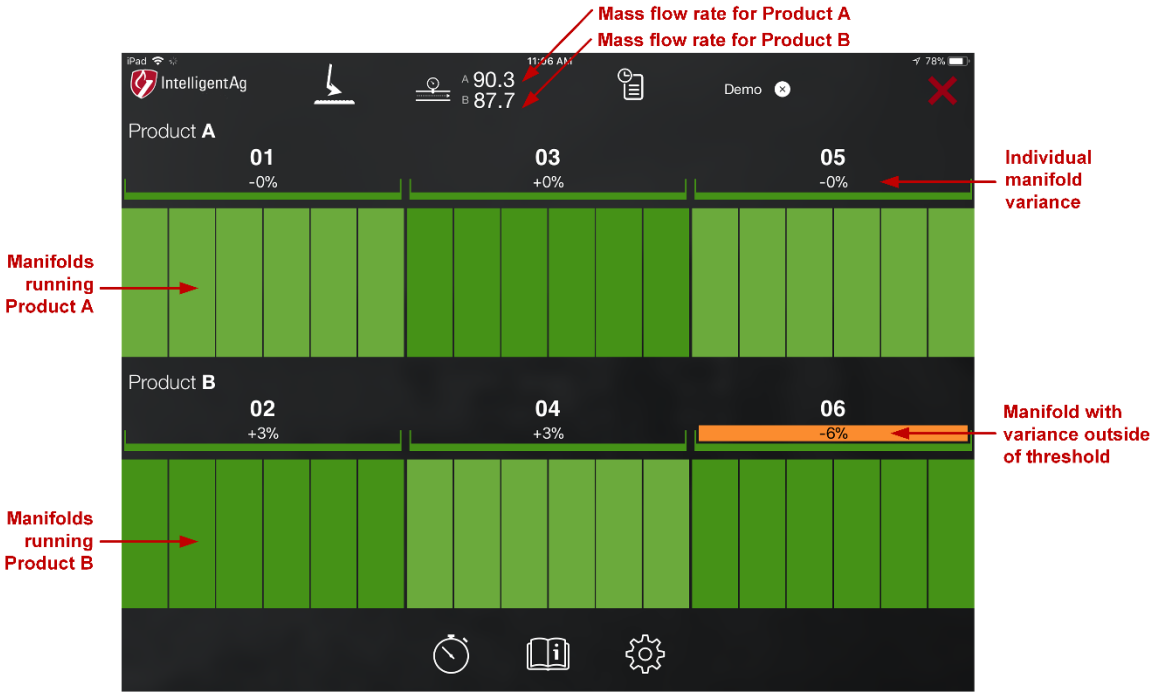

Figure 21: Understanding variance – row view

3.3.1 Monitoring more than one product type

If you are monitoring more than one product type with Recon Blockage Plus™, variance averages for manifolds are based on the variance of manifolds running the same product type.

EXAMPLE: If you are monitoring the flow of seed and fertilizer pellets that are simultaneously flowing through the implement in separate manifolds, the variance of a manifold running fertilizer pellets will only be compared to the flow of other manifolds that are also running fertilizer pellets, and the variance of a manifold running seed will only be compared to the flow of other manifolds that are also running seed.

NOTE: If two different product types are running through your implement, verify that you have correctly assigned each manifold to a product type. Refer to Section 2.2 for instructions for how to assign product types to manifolds. If you do not correctly assign them, the variance will be inaccurate and incorrect blockage notices can occur.

3.3.2 Recording average variance and mass flow rate

The record feature allows you to see the average variance for each manifold on your implement and a total average for all manifolds monitoring a product type over one minute.

Figure 22: Viewing manifolds' flow averages

To record the average variance and mass flow rate:

1. Tap the capture icon on the main Blockage screen.
2. Tap **Start Capture**. The flow average capture will run for one minute. During this time, you can navigate to the Blockage screen to continue to monitor for any blockages or low flow rates on your implement. Once the flow average capture is complete, a message will display.

Once the flow average rate is captured, a new line will appear on the Record screen.

3.4 Monitoring mass flow rate

The total flow rate for all manifolds of each product type appears on the top of the Blockage screen in the app, as shown in Figure 20 and Figure 21. If the app is monitoring only one product type, the flow rate for Product B will not display.

The mass flow rate is arbitrary and does not correspond to a specific unit of measurement. As you become more familiar with the mass flow rate, you will be able to determine what range of mass flow numbers indicates good product flow. Once you have determined this range, you may want to set an alarm based on these parameters. See Section 2.6 for more information about this alarm.

Mass flow can fluctuate with changes in product type, application rate, ground speed, and fan speed. An abnormal mass flow number could indicate any of the following:

- Open or leaking cart lid
- Product bridging in bin
- Meter roll buildup
- Leaking or blocked primary

3.5 Monitoring the ECU status LED

A status LED is located on the front of the ECU, as shown in Figure 23. Multiple built-in-tests (BITs) periodically check the status of the ECUs. Refer to the LED status meanings below.

Figure 23: ECU status LED location

LED Status	Meaning
Flashing green	Normal operation
Flashing purple/blue	ECU is starting up
Flashing blue	ECU is reprogramming
Light off	No power to ECU

4. Adjusting settings

This section describes how to change non-alarm settings. For instructions to change alarm settings, see Section 2.6.

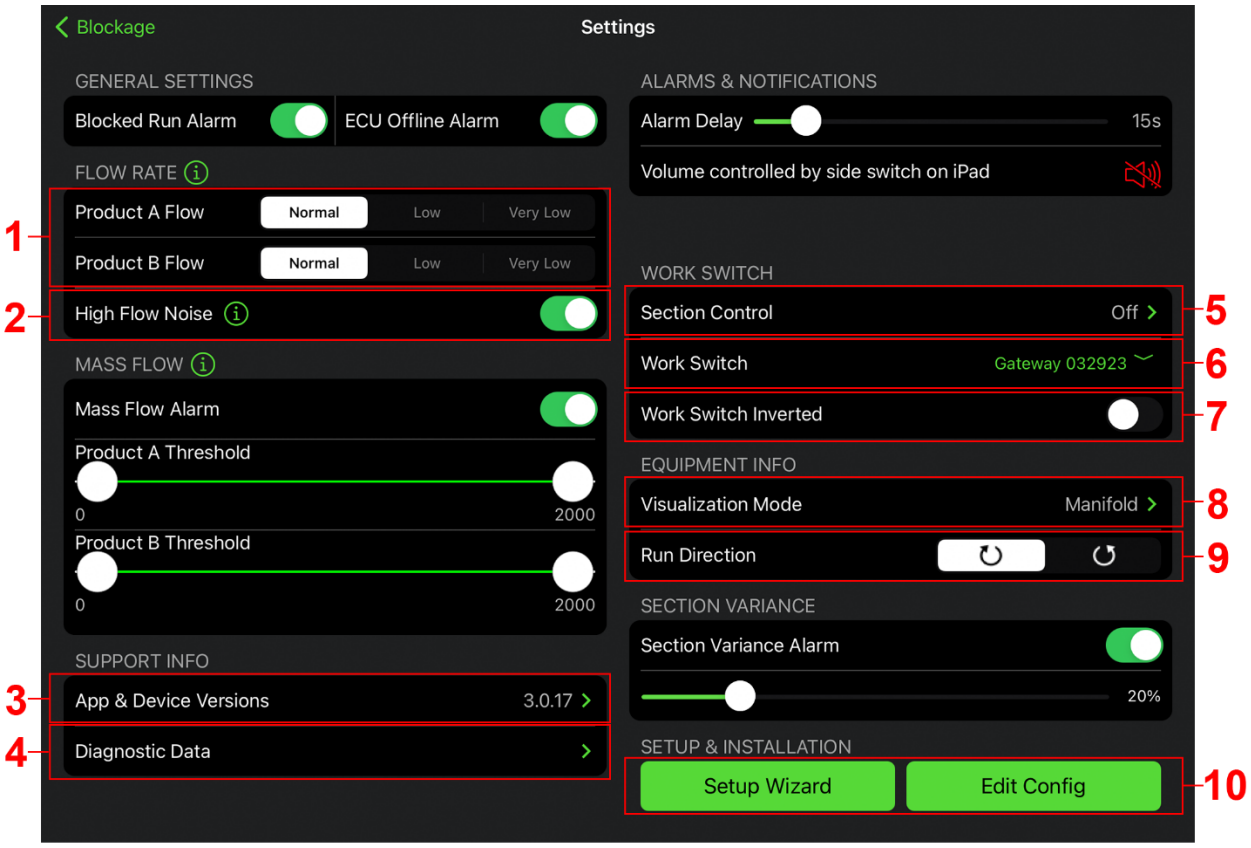

Figure 24: Adjusting settings

1. **Adjust flow rate.** If you are applying product at a low application rate, adjust your flow settings to prevent the flow alarm from falsely triggering. See Section 3.2.3 for more information on the three flow rates.
2. **Enable High Fan Noise.** If flow is detected on your runs when no product is running, configure your system to have high fan noise. For more information on configuring high fan noise, see Section 2.5.
3. **View version information.** Tap **App & Device Versions** to view app, hardware, and ECU information when troubleshooting.
4. **Send diagnostic data.** Tap **Diagnostic Data** to upload a problem report to Intelligent Ag. Type a case number (if applicable), a problem description, and select a log date. Tap **Upload Logs**.
5. **Enable and disable section control.** Tap **Section Control** to navigate to the Section Control Sense settings or enable Engage Zone Control. Refer to Section 3.2.4 for more information about these settings.

6. **Change gateway serial number.** Tap the gateway serial number next to Work Switch. Then, select the new gateway serial number.
7. **Re-configure the work switch method.** Implement work switches use either the default or inverted method. Toggle the **Work Switch Inverted** switch to change the method. Refer to Section 2.3 for more information on these two methods.

   NOTE: If you selected **Raised** for **What mode is the implement currently in?** during initial setup, the work switch will automatically be configured for the inverted method.
8. **Change the manifold view type.** Tap **Visualization Mode** to change between manifold view and row view.
9. **Change run direction.** In manifold view, ports are displayed by default in clockwise order around the manifold, as shown in Figure 25. If you installed the sensors in counterclockwise order around the manifold, you can change the way the ports are displayed in the app. Next to Run Direction, tap the clockwise ↻ or counterclockwise ↺ symbol to change the run direction.

   NOTE: Run direction cannot be changed for row view.

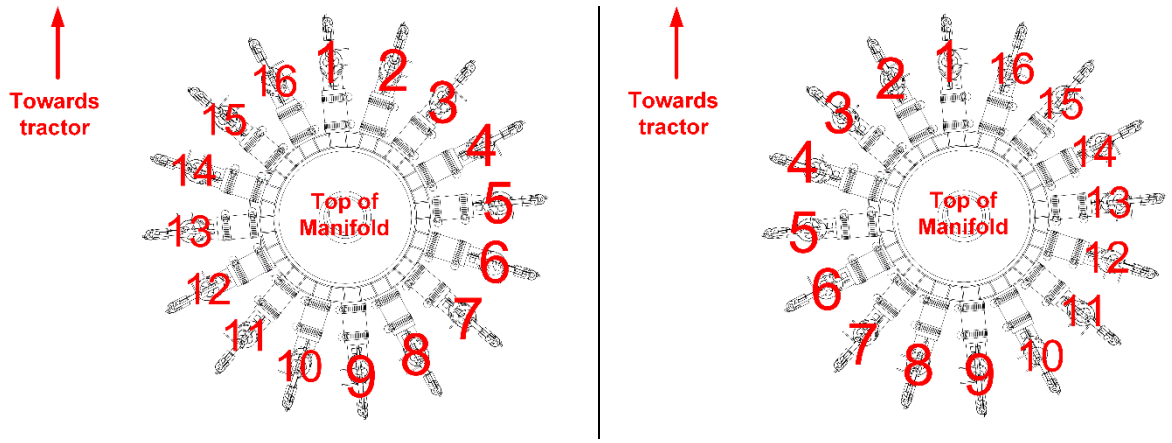

Figure 25: Default/clockwise order (left); counterclockwise order (right)

10. **Re-configure the system or edit individual sections.**
    - Tap **Setup Wizard** to re-configure the system from the beginning.
    - Tap **Edit Config** to edit the configuration of individual sections.