

Recon**Blockage**[™]

for Strip-Till

Troubleshooting Guide

ReconBlockage™ for Strip-Till Troubleshooting Guide

© 2024 Precision Planting LLC. All Rights Reserved.

ReconBlockage for Strip-Till Troubleshooting Guide. All content within is copyrighted by Precision Planting LLC and may not be reprinted without permission.

The content of this manual is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Precision Planting LLC. Precision Planting LLC assumes no responsibility or liability for any errors or inaccuracies that may appear in the content contained in this guide.

Recon and ReconBlockage are trademarks or registered trademarks of Precision Planting LLC. Precision Planting and the Precision Planting logo are trademarks or registered trademarks of Precision Planting LLC. iPad is a registered trademark of Apple Inc., registered in the U.S. and other countries. App Store is a service mark of Apple Inc. All other trademarks are property of their respective owner.

Precision Planting LLC, 23207 Townline Rd, Tremont, IL 61568 USA.

Visit us online at precisionplanting.com
Questions? E-mail us at support@precisionplanting.com

Table of Contents

Before you Begin	6
Gateway	7
I can't communicate with the system.	7
The gateway doesn't power down.	7
I can see the Wi-Fi network, but I can't connect to it.	7
Where is the Gateway LED?	8
What does the Gateway LED mean?	8
ECU	9
What is an ECU?.....	9
The ECUs will not update.	9
Why is there a Wi-Fi symbol or disconnected plug symbol over an ECU in the app?.....	9
I cannot see all of my ECUs when configuring the system.....	10
ECUs were damaged during storage and now the ECU will not read flow.	10
The ECUs are not connecting.	10
There is power at the 8-pin plug going into the ECU, but the ECU will not turn on.....	11
What is the ECU harness (353050 000025 or 353050 000027) pinout for S3?.....	11
What is the gateway harness (353050-000113) pinout for S3 and S4?	12
How much current does each ECU use?.....	13
What does the LED on the ECU indicate?	13
App	14
Why am I experiencing section variance?	14
What is the mass flow number?	14
What do I do if the mass flow number is abnormal?	14
Why can't I see mass flow or individual flow levels?	15
Why am I seeing false blockages?	16
How do I add additional sensors (runs) to an existing system?	17
The mass flow does not change in the app.....	17
The work switch status in the app is green when the drill is in the air and red when it is in the ground.	17
The alarms are not making any noise.....	17
How do I update the ReconHub app?	18
Why are there no audible alarms when a blocked run is displayed?	18
My port configuration isn't saving.....	19
I have the Intelligent Ag™ or Recon Blockage Monitor app. How do I get the ReconHub app?.....	19

Sensors20

- I have fertilizer buildup on my sensors.....20
- How do I mount my sensors?20
- Why are my sensors wearing out?20
- Can I shorten or lengthen the auditory tubes?.....20
- What is the maximum distance that a sensor can be mounted from the tower?21
- My sensors are not showing flow.....21
- Can I replace parts of a sensor?21
- Can I replace the auditory tubes?.....21
- My hoses are loose in the sensor. Do I need adapters?21

Harness.....22

- Do I need to run power to the cab of the tractor?.....22
- How do I check if the CAN network is working properly?.....22

Work Switch23

- The work switch is not working.23
- The work switch is a mercury switch, meaning the switch is engaged when the mercury inside is tilted toward the wires and it contacts the electrical leads.23

Appendix A: System Configuration Table.....24

Record of Revisions

Revision Number	Change Description	Revision Date	Inserted By
1.0	Initial release	August 26, 2024	AAL




TIP: If you don't see your problem listed or your problem is not resolved after completing all troubleshooting steps, contact your Precision Planting® dealer for assistance.

Before you Begin

Before you begin troubleshooting, make sure that you complete the following items.

iPad and app checks

1. Make sure that your iPad has the latest iOS software installed.
2. Make sure that you have the latest version of the ReconHub app.
3. Make sure that you have the ReconHub app, not the Intelligent Ag app or the Recon Blockage Monitor app.

ReconHub app	
Recon Blockage Monitor app	
Intelligent Ag app	

4. If you are using more than one Recon product in the app (such as SpreadSense), make sure that you are in the ReconBlockage product.
5. Plug in your iPad and make sure that it's charging.
6. Force-restart (hard reboot) your iPad. Refer to Apple's website for instructions based on your iPad type: support.apple.com/guide/ipad/force-restart-ipad-ipad9955c007/ipados.
7. Close all apps except for the ReconHub app.

Hardware checks

1. Make sure that the tractor is running.
2. Make sure that the gateway is powered on.
3. Make sure that your iPad is connected to the PrP-XXXXXX Wi-Fi network in the iPad settings.
4. Make sure that the ECUs are powered on.
5. Make sure that the ECU LED is blinking once per second.
6. Make sure that all other electronics in the cab are powered down.

Gateway

I can't communicate with the system.

1. Verify that you are connected to the PrP-XXXXXX Wi-Fi network in the iPad's Settings page.
2. Check for app updates in the App Store. You must be connected to a home Wi-Fi network (not the PrP-XXXXXX network). If an update is available, download it.
3. Verify that you have power to your ECUs and that the green LED is blinking about once per second.
4. Verify that your gateway has power and that the LED is green.
5. Check for possible Wi-Fi interference. "Forget" any networks that the iPad has been connected to in the past that appear in the My Networks network list.
6. If you have any of the following devices connected, disconnect them:
 - Wireless camera (disconnect both the cab display and camera on implement)
 - Wi-Fi booster/relay station
 - 2-way radio
7. Go to a "quiet" location. If you're in the farmyard, drive out to a field away from the yard's electrical interference and any other interference.
8. Shut off all other electronics except for your blockage and flow monitor components.

The gateway doesn't power down.

Open the ReconHub app. If it prompts you to update the gateway, perform the update. If the update is successful, your wireless network will be named PrP-XXXXXX and the gateway will recognize the key switch (blue wire) to power off the gateway with key power.

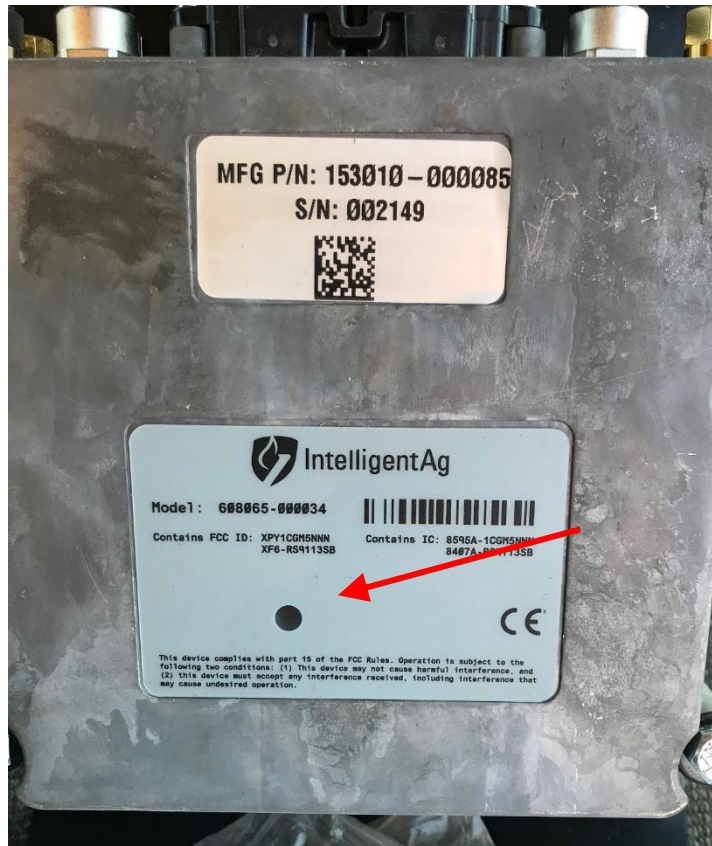
I can see the Wi-Fi network, but I can't connect to it.

If you've recently gotten a new gateway, the system may be trying to connect to the old one. "Forget" and re-connect to the PrP-XXXXXX network.

1. Tap the **Settings** icon on the iPad home screen.
2. Tap **Wi-Fi**, then tap the network name.
3. Tap **Forget This Network**.
4. Re-connect to the network.

Where is the Gateway LED?

The LED is located on the model number label.



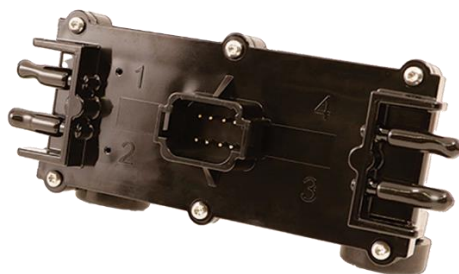
What does the Gateway LED mean?

LED Color	LED State	Description
Yellow	Solid	Base SDK (Software Development Kit)
White	Solid	Startup – Powered Pre-Boot
Purple/Blue	Flashing	Startup – Booting
Green	Solid	Normal Operation
Green	Flashing	Performing Safe Shutdown Sequence
Red	Solid	Recovery Mode – Boot Error
Red	Flashing	BIT Error
Blue	Flashing	Reprogramming Mode

ECU

What is an ECU?

The Electronic Control Unit (ECU) communicates the flow measurement data recorded by the flow sensors to ReconBlockage™ for Strip-Till.



The ECUs will not update.

Refer to the steps in *Before you Begin* on page 6.

Why is there a Wi-Fi symbol or disconnected plug symbol over an ECU in the app?

If you see a disconnected plug symbol , you have lost connection to that ECU.

1. Close and re-open the app.
2. Ensure that the ECU Power LED is illuminated. If it isn't:
 - a. Ensure that the ECU is plugged in to tractor power. If it is on key power, the key has to be on.
 - b. Ensure that the connectors are not damaged and that the leads are properly seated.
 - c. Check if any wiring has been pinched or cut by folding the implement wings. This may be the problem if the system was working before moving to another field.
 - d. Connect the ECU wiring harness to a different ECU and see if it powers on.
 - e. Use a multimeter to verify that the ECU power is 11 to 14 volts.

I cannot see all of my ECUs when configuring the system.

1. Verify that you are connected to the PrP-XXXXXX Wi-Fi network in the iPad’s Settings page.
2. Check for app updates in the App Store. You must be connected to a home Wi Fi network (not the PrP-XXXXXX network). If an update is available, download it.
3. Verify that you have power to your ECUs and that the green LED is blinking about once per second.
4. Verify that your gateway has power and that the gateway LED is green.
5. Shut off all other electronics except for your blockage and flow monitor components.
6. Complete all other steps in *Before you Begin* on page 6.


ECUs were damaged during storage and now the ECU will not read flow.

If the ECUs were damaged during storage, it is likely that moisture or dust got into the microphone and has damaged it. Swap the auditory hose to an unused port and see if the new port works.

- If it works, navigate to Machine Setup in the app settings and re-assign the port.
- If it still does not work, verify that the sensor has been replaced with a new one and that the auditory tube is not kinked or pinched anywhere.

The ECUs are not connecting.

1. Refer to the table below to understand the ECU’s LED status.

	LED Status	Meaning
	Flashing (1 flash per second)	Normal operation
	Fast flashing (2 flashes per second)	ECU is starting up
	Fast flashing (4 flashes per second)	ECU is reprogramming
	Light off	No power to ECU

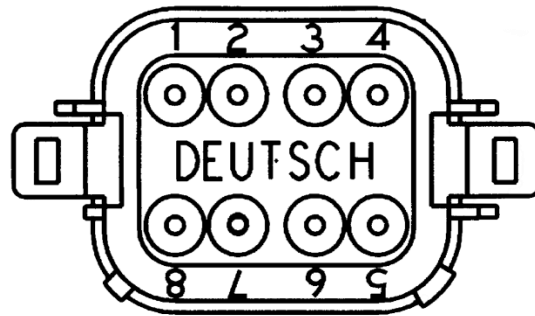
2. Refer to the steps in *Before you Begin* on page 6.
3. Check for voltage starting at the ECU closest to the center Y of the harness and record measurement observed. ECUs require a minimum of 10 VDC but may experience disconnects when below 12 VDC. If low voltage is found, trace the issue back to the closest ECU that had 12 VDC and begin checking all connections from that point on for corroded pins, debris in the connectors or damaged harness. Replace components as required.

There is power at the 8-pin plug going into the ECU, but the ECU will not turn on.

1. Check to make sure the pins are seated in the 8-pin plug.
2. Thoroughly clean the plug and make sure there is no debris or corrosion in or on the pins.
3. If the ECU still will not turn on, replace the ECU.

What is the ECU harness (353050 000025 or 353050 000027) pinout for S3?

Refer to the pinout information below to troubleshoot ECU harness issues.



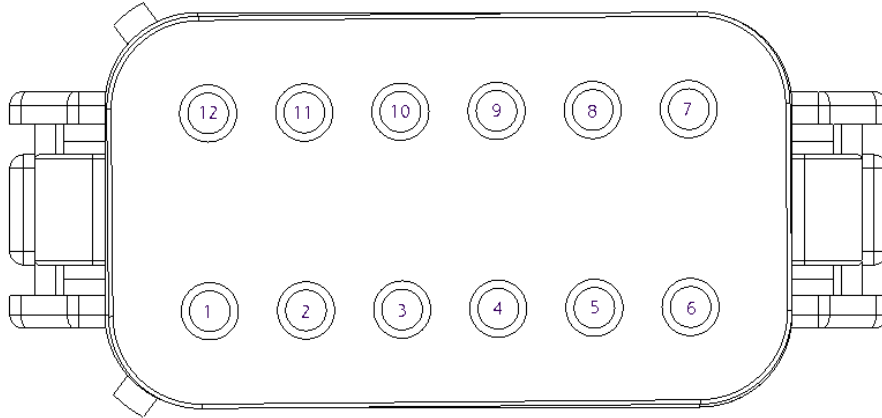
Pin	Color	Circuit Name
1	n/a	Plug
2	n/a	Plug
3	n/a	Plug
4	n/a	Plug
5	Black	Ground
6	Yellow	CAN High
7	Green	CAN Low
8	Red	Power

What is the gateway harness (353050-000113) pinout for S3 and S4?

Refer to the pinout information below to troubleshoot gateway harness issues.

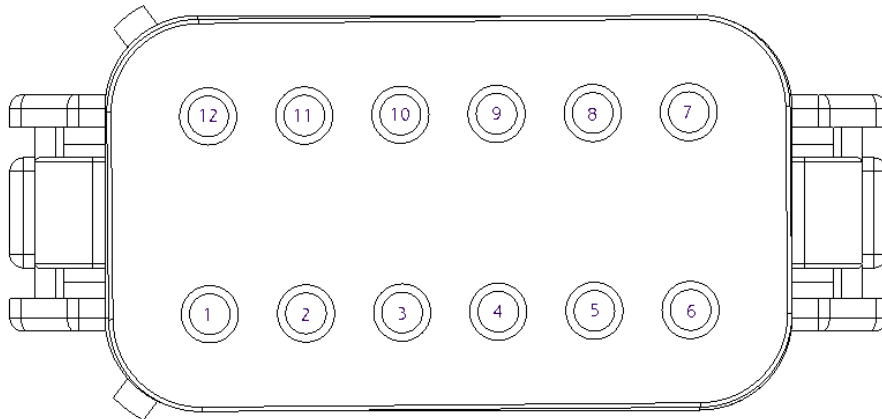
IMPORTANT: Damage could occur, and your warranty will be voided if harnessing is wired incorrectly.

S3 Pinout



Pin	Color	Circuit Name
1	Blue	Battery
2	Black	Ground
3	n/a	Plugged
4	White	Work Switch Positive
5	n/a	Plugged
6	n/a	Plugged
7	n/a	Plugged
8	n/a	Plugged
9	White/Black Stripe	Work Switch Ground
10	n/a	Plugged
11	n/a	Plugged
12	Red	Key Switch

S4 Pinout

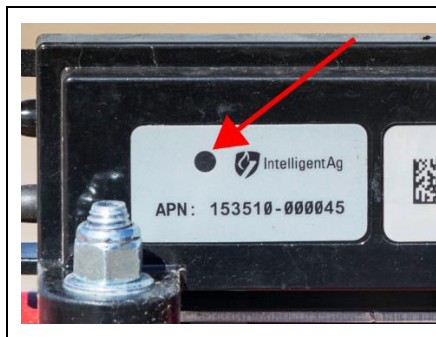


Pin	Color	Circuit Name
1	n/a	Plugged
2	n/a	Plugged
3	n/a	Plugged
4	n/a	Plugged
5	Yellow	CAN 4 High
6	Orange	CAN 3 High
7	Purple	CAN 3 Low
8	Green	CAN 4 Low
9	n/a	Plugged
10	n/a	Plugged
11	n/a	Plugged
12	n/a	Plugged

How much current does each ECU use?

Each ECU draws .088 Amps at 12 VDC.

What does the LED on the ECU indicate?

	LED Status	Meaning
	Flashing (1 flash per second)	Normal operation
	Fast flashing (2 flashes per second)	ECU is starting up
	Fast flashing (4 flashes per second)	ECU is reprogramming
	Light off	No power to ECU

App

Why am I experiencing section variance?

Section flow variances of up to 10% are common. On large implements, outer sections may consistently vary by more than 10%.

1. Verify that primary runs are clear of obstructions and buildup.
2. Ensure that the product hose is routed smoothly from the meter to the chute without any significant dips or bends that might slow product down.
3. Run your fan to clear any debris.
4. Check for obstructions and buildup at the cart's meter roll.
5. Check for obstructions and buildup at the bottom of the bin.
6. Do a bag test.
7. Slow down the tractor while there is product flow and see if the variance levels out.

If your machine is outside of the ranges above, there could be more air going to that section. The only way to verify this is to measure the air velocity at each chute with an anemometer.

What is the mass flow number?

ReconBlockage™ for Strip-Till provides a mass flow number to help you ensure consistent product application. Mass flow can alert you to equipment issues that are disrupting flow such as open bin lids, product bridging, meter buildup, and primary blockage.

It is a relative number and shouldn't be confused with product rate or population. The mass flow number is affected by changes in ground speed, fan speed, product type, and application rate. Be wary of claims made by other monitoring systems pertaining to seed counting accuracy. The best way to ensure your desired application rate is being met is by obtaining a seeds per pound figure from your seed supplier.

What do I do if the mass flow number is abnormal?

If there has been a recent change in rate, fan speed, or product, a different mass flow number is normal. If there hasn't, try the following steps.

1. Verify that there is product left in your bins. Flow will be reduced if a bin runs empty.
2. See if there is product bridging over the metering roll.
3. Verify that bin lids are securely latched. Verify that all primary hoses are securely attached.

Why can't I see mass flow or individual flow levels?

1. Refer to the steps in *Before you Begin* on page 6.
2. Restart the app.
 - a. Double-click the Home button (if you have one) or swipe up and right from the bottom of the screen.
 - b. Swipe left or right until you have located the ReconHub app.
 - c. Swipe up on the app's preview to close it.
 - d. Press the Home button (if you have one) or swipe up from the bottom of the screen to return to your home screen. Re-open the app.
3. Check for app updates in the App Store. You must be connected to a home Wi Fi network (not the PrP-XXXXXX network). If an update is available, download it.
4. If you have a dual product system but can only see one mass flow number, make sure that the system is configured to monitor two products and that Airstream A and Airstream B sections are correctly assigned.

Why am I seeing false blockages?

1. Run the meter temporarily to ensure that product flows from each opener.
2. On strip-till toolbars, ensure that you can feel air flow beneath the opener.
3. Navigate to the Machine Setup screen in the app settings. Tap **Next** to navigate to the **ECUs** page, and verify that each primary or section has the correct ECU serial number assigned to it.
4. Navigate to the Machine Setup screen in the app settings. Tap **Next** twice to navigate to the **Ports** page, then verify that ECU ports are correctly mapped.
5. Verify that you are checking the right hose. Before shutting off product flow, take a screenshot of the Dashboard. The screenshot will be stored in your iPad's photos.
6. Verify that the auditory hose is not kinked or pinched.
7. Verify that the auditory hose is attached to the correct ECU port.
8. Verify that the auditory hose is securely attached to the ECU by pushing the hose onto the ECU port.
9. Move the auditory hose to a new port on the ECU to assess if the problem is a port on the ECU not functioning correctly. Ensure that you re-assign that run to the new ECU port in the app by pressing and holding until it "lifts" and then dragging it and dropping it on the new port.
10. Verify that sensors are not installed backwards or upside down. The arrow on the sensor should point downward.
11. Check if the sensor is clogged or has buildup on the membrane. Use the sensor cleaning tool included with the system to clean the sensor.
12. Ensure that the product hose is routed smoothly from the meter to the chute. Significant dips or bends can slow product down. This can initially cause false blockage and lead to delayed product placement or plugged runs. Fix this by cutting or rerouting the product hose to create an easier product flow path.
13. Slow down the tractor while there is product flow to see if the false blockage goes away. If it does, this likely means that you are on the verge of a real blockage, and your fan is barely pushing the product through. If you slow down, the fan will be able to push each run more uniformly.

How do I add additional sensors (runs) to an existing system?

1. Verify that the sensors you have are the same size and style as the currently installed sensors.
2. Verify that you have enough available and working ports to accept the new sensors on the ECUs.
3. Install the sensors in the same manner as the other sensors. Make note of what section, ECU serial number, run, and ECU port the sensors are connected to.
4. Open the app. Tap the **Settings** icon, then tap **Machine Setup**. Change the number of runs accordingly in each section.
5. Navigate to the Ports setup page. Edit each ECU to make the layout on screen match the actual layout on the implement by dragging and dropping runs. When you're done, apply changes.
6. Navigate to the Dashboard screen and verify that the new sensors were added.

The mass flow does not change in the app.

1. Verify that the work switch position is correct in the Settings page.
2. Verify that the work switch status in the app is green during application.

The work switch status in the app is green when the drill is in the air and red when it is in the ground.

Navigate to the **Settings** page in the app and change the work switch position.


The alarms are not making any noise.

1. Verify that the iPad is not muted with the side switch (if you have one).
2. Adjust the alarm volume in the Alarms settings.
3. Verify that the work switch status in the app is green.
4. Make sure that the iPad is not connected to any other audio devices via Bluetooth.
5. Force-restart the iPad. Refer to Apple's website for instructions based on your iPad type: support.apple.com/guide/ipad/force-restart-ipad-ipad9955c007/ipados.

How do I update the ReconHub app?

1. Download updates from the App Store.
 - a. Connect the iPad to an internet-enabled network.
 - b. Open the App Store and search for *ReconHub*. If there is an update available, tap **Update**.
 - c. Keep the iPad connected to the internet until the app is downloaded.
2. Take the iPad to the machine and connect to the PrP-XXXXXX network. Check the following:
 - a. Verify that the tractor is running.
 - b. Verify that the iPad is fully charged and connected to a charging cable.
 - c. Verify that the ECUs all have a minimum of 12 VDC.
 - d. Verify that the gateway has power.
3. Open the app. The first time you open the app, it will automatically update your gateway, then your ECUs.

Why are there no audible alarms when a blocked run is displayed?

1. Verify that the iPad is not muted with the side switch (if applicable) or that the volume is not turned all the way down. Swipe down from the top right corner of the iPad screen and make sure that the mute  icon does not appear.
2. Adjust the alarm volume in the Alarms settings.
3. Verify that audible alarms are enabled in the app's settings.
4. Make sure that the iPad is not connected to any other audio devices via Bluetooth.
5. Verify that the alarm delay in the app's settings isn't set too high.
6. If you are dual or triple shooting, ensure that the app is configured for multiple products.
 - a. Tap **Settings**.
 - b. Tap **Machine Setup**.
 - c. Make sure that **Double** or **Triple** is selected in the top right corner. Reconfigure the system if necessary.
7. Lift and lower the implement and verify that the work switch indicator in the app changes.
8. Restart the app.
 - a. Double-click the Home button (if you have one) or swipe up and right from the bottom of the screen.
 - b. Swipe right until you have located the ReconHub app.
 - c. Swipe up on the app's preview to close it.
 - d. Press the Home button (if you have one) or swipe up from the bottom of the screen to return back to your home screen.
 - e. Re-open the app.

My port configuration isn't saving.

Make sure that you tap **Apply Changes** in the upper right corner to save your configuration.

I have the Intelligent Ag™ or Recon Blockage Monitor app. How do I get the ReconHub app?

NOTE: For the ReconHub app to pull in your existing configuration, make sure that you have at least version 3.4 of the Recon Blockage Monitor app.

1. Download the ReconHub app from the App Store.
 - a. Connect the iPad to the internet.
 - b. Tap the App Store icon from the iPad's home screen.
 - c. Type *ReconHub* in the search field and tap **Search**.
 - d. Tap **Get** next to the ReconHub app when it appears in your search results and install the app.
2. Delete the old app.

Sensors

I have fertilizer buildup on my sensors.

Cleaning Buildup

Fertilizer buildup on sensors can cause false blockages in the app. Gently scrape off buildup with a screwdriver. Or, use a garden hose with a nozzle. If you use water to clean the sensor, make sure the system is completely dry before running product through it.

Preventing Buildup

Fertilizer build-up issues often depend on the quality of the product supplied to you. Dusty products combined with high humidity can coat many components throughout the toolbar. The blockage sensor is oftentimes the first indication of poor-quality fertilizer, and without it, you may be caught unaware when this muck plugs a hose or metering roll. If you have encountered this issue, we recommend adding one or more of the following:

- Soy or canola oil additives: thecombineforum.com/threads/anyone-applied-soy-canola-oil-to-fertilizer.201322/
- Nitrogen Stabilizer (Agrotain): kochagronomicservices.com/agrotain
- Substitute sulfate products with Mezz or 40 Rock
 - Mezz (12-40-0-10s-1zn)
 - 40 rock (12-40-0-7s-1zn) (least dusty)
- Blockage Prevention System: The BPS is a hydraulic oil cooler that significantly reduces humidity. More info: airguardproducts.com/Store/Airguard-Blockage-Prevention
Detailed results: thecombineforum.com/threads/airguard-blockage-prevention-system.199930/

How do I mount my sensors?

Refer to the section called *Installing Flow Sensors* in the ReconBlockage™ for Strip-Till Installation Manual at cloud.precisionplanting.com/product-resources.

Why are my sensors wearing out?

It is normal for sensors to start to wear out after 5-7 years in regular conditions.

Can I shorten or lengthen the auditory tubes?

No, all of the auditory tubes need to be the same length so that the same amount of sound is coming from each sensor.

What is the maximum distance that a sensor can be mounted from the tower?

There is no maximum as long as all of the sensors on the machine can be mounted at equal distances from the diffuser (if applicable) or primary splitter on the air hose. They must also be mounted so that the exit end of the sensor is lower than any other portion of the hose between the diffuser or primary splitter and sensor. We recommend a minimum of 8” from the diffuser or primary splitter.

My sensors are not showing flow.

1. Swap sensor locations to a different section. It is possible the sensor is on a part of the implement that does not have as much product running through it as the other runs, thus giving a lower acoustic signal.
2. Checked for a kinked acoustic hose.
3. Take off the sensor and look to see if there is build-up on the plate.
4. Swap the acoustic hose with another sensor that is working and see if it moves to the other sensor.
 - If it moves to the other sensor, then the sensor is damaged.
 - If it stays on the same port, then the microphone in the ECU is damaged.
5. Check for unusual wear in the poly around the metal plate in the sensor.
6. Check for cracked gaskets.
7. Check for dented plates.

Can I replace parts of a sensor?

No, the sensors are not repairable components.

Can I replace the auditory tubes?

Yes, order the 100” auditory tube from your dealer (part number 353070-000564).

My hoses are loose in the sensor. Do I need adapters?

Yes, refer to the table below. Call your dealer to order adapters.

Adapter Measurement	Part Number
1.75” hose to 2-inch sensor adapter	353070-000563

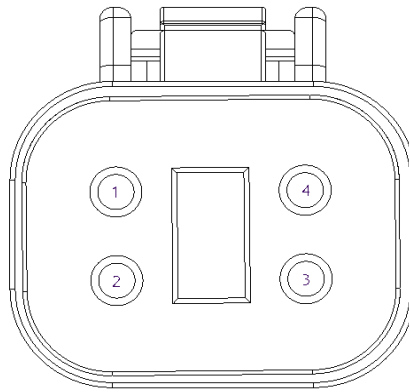
Harness

Do I need to run power to the cab of the tractor?

Yes, the gateway and ECUs require clean 12-volt power and key switch power.

How do I check if the CAN network is working properly?

Use a multimeter to check the resistance across the ECU harness (353050-000025 or 353050-000027) S1 or S2 CAN High and CAN Low wires. When the CAN network is terminated properly, it should be approximately 60 ohms.



Pin	Color	Circuit Name
1	Red	Power
2	Ground	Black
3	Yellow	CAN High
4	Green	CAN Low

Work Switch

The work switch is not working.

The work switch is a mercury switch, meaning the switch is engaged when the mercury inside is tilted toward the wires and it contacts the electrical leads.

Mount the work switch (353070-000534) in a location where the work switch tilts from one end to the other when the toolbar is changing from raised to lowered positions.

