

RECON

WIRELESS BLOCKAGE AND FLOW MONITOR

INSTALLATION MANUAL

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Recon Wireless Blockage and Flow Monitor Installation Manual

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Related Documentation	
Document Number	Document Title
600820-000028	Recon Wireless Blockage and Flow Monitor Quick Reference Guide
600820-000012	Recon Wireless Blockage and Flow Monitor Troubleshooting Guide
600890-000062	Recon Wireless Blockage and Flow Monitor Operator's Guide

1 Introduction

1.1 How to use this manual

This manual will guide you through the process of installing the Recon Wireless Blockage and Flow Monitor (WBFM) on your implement.

- **Section 2:** Instructions for installing all of the components of the WBFM in the order they should be installed.
- **Appendix A:** Diagrams with instructions for how to install wiring harnesses for various implement configurations.
- **Appendix B:** Installing the WBFM for use with a virtual terminal.
- **Appendix C:** System configuration table.

NOTE: For instructions about how to use the WBFM after installation, see the Recon Wireless Blockage and Flow Monitor Operator's Manual (Intelligent Ag document number 600890-000062).

For installation videos, current WBFM documentation and other resources, visit www.intelligentag.com/support.

1.2 Tools Required

You will need the following tools to install the WBFM:

- Standard wrench and socket sets
- Pliers
- Measuring tape
- Cutting tool, such as a box cutter or shears
- Cordless drill and/or flathead screwdriver (optional)
- Paint pen or other permanent marking tool (optional)

2 Installation Instructions

2.1 Overview Checklist

- Install the ECUs.
- Install the flow sensors.
- Connect the flow sensors to the ECUs.
- Install the wiring harnesses.
- Install the work switch.
- Install the access point.
- Install the iPad mounting bracket.
- Download the Intelligent Ag Pro app.

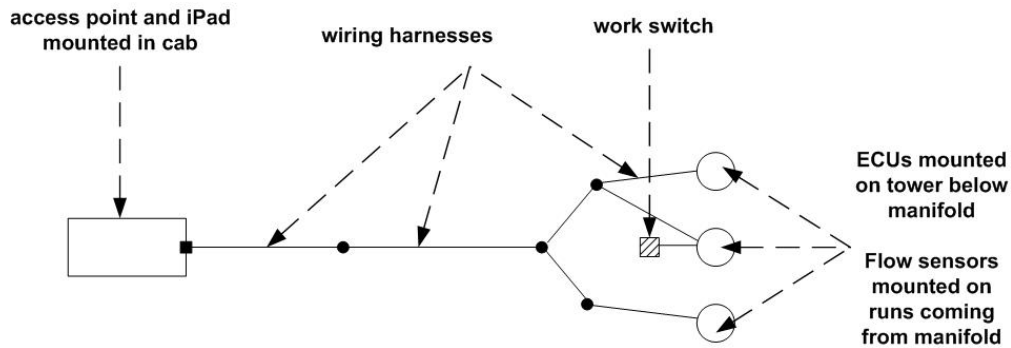


Figure 1: Installation location overview

The wiring harness in the figure above is specific to a three-manifold implement. For more wiring harness diagrams, refer to Appendix A of this document.

2.2 Installing the ECUs

About the ECU

The Electronic Control Unit (ECU) communicates the flow measurement data recorded by the flow sensors to the WBFM.



Figure 2: The back (left) and front (right) sides of the ECU

Part Name	Part Number	Quantity needed	Contained within
ECU	150505-000012	1/manifold (for standard setup)	ECU kit
ECU mounting bracket	351050-000012	1/ECU	ECU kit (attached to ECU)
2" diameter U-bolt <i>or</i> 2.5" diameter U-bolt <i>or</i> 3" diameter U-bolt <i>or</i> 4" diameter U-bolt	352013-000006 <i>or</i> 352013-000007 <i>or</i> 352013-000008 <i>or</i> 352013-000009	2/ECU	Packaged individually

Table 1: Parts needed to install the ECU

Tools needed

- Standard socket set

Number of times to perform procedure

Once per manifold

Installation location

ECUs should be installed directly underneath each manifold of the implement. Intelligent Ag recommends installing the bracket so that the LED indicator on the ECU faces toward the tractor.

NOTE: ECUs can be mounted in any order; however, installing the ECUs in alphanumeric order from left to right (when facing the back of the tractor) based on the ECU's serial number is an easy way to remember which ECU is on each tower. The serial number is located on the front of the ECU. Use the table in Appendix C to record your system setup.

EXAMPLE: When installing in alphanumeric order, numbers are ordered before letters. After that, letters are ordered in alphabetical order.

Manifold	ECU
1	WBM-G15V
2	WBM-G1CO
3	WBM-G1D3
4	WBM-G1DA
5	WBM-GA4D
6	WBM-GAV5

Table 2: Example: Installing ECUs in alphanumeric order



Figure 3: Installing the ECUs from left to right

Installing the ECU mounting bracket

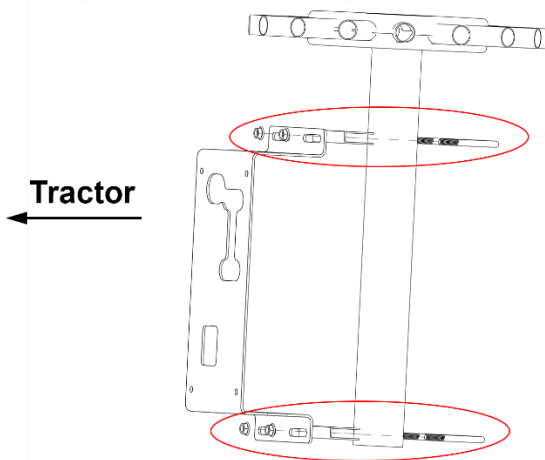


Figure 4: Mounting an ECU bracket to a tower



Figure 5: ECU installed on a tower

NOTE: If necessary, ECUs can be mounted horizontally on the tower. Contact your dealer for an adapter to mount horizontally.

1. Remove the nuts and saddle clamp from the ends of two u-bolts (352013-000006, 352013-000007, 352013-000008 or 352013-000009).
2. Place one of the u-bolts around the manifold post, immediately under the manifold.
3. Place an ECU mounting bracket (351050-000012) so that the ends of the u-bolt go through the top two holes of the ECU mounting bracket, as seen in the top circle in Figure 4.
4. Replace the saddle clamp and nuts onto the u-bolt.
5. Place another u-bolt around the manifold post and through the bottom holes of the ECU mounting bracket, as seen in the bottom circle in Figure 4.
6. Replace the saddle clamp and nuts onto the second u-bolt.

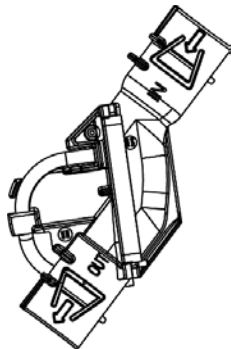
2.3 Installing flow sensors

About flow sensors

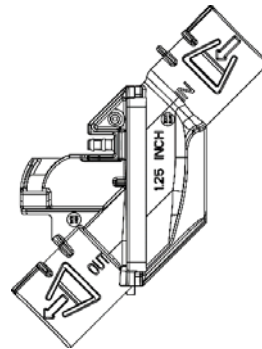
Flow sensors directly connect to the implement's final runs. They detect when seed or other material such as fertiliser is flowing through the run due to the energy that is produced when the material strikes against the sensor membrane. When no energy is recorded by the flow sensor and the implement is in the ground, the Intelligent Ag Pro app will notify the operator of a potentially blocked run via an audio alarm (if enabled) and by displaying the blocked runs or manifolds.

Flow sensor sizes and adapters

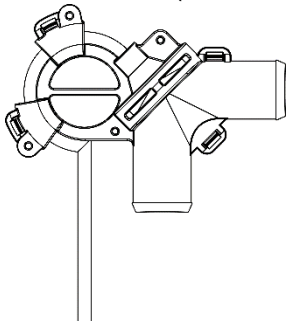
The WBFM uses either 1-inch, 90-degree or 1.25-inch flow sensors (and adapters, if needed) based on your implement and blockage and flow monitoring preferences. Identify your sensor type and part number by looking at your pack slip or the images below.



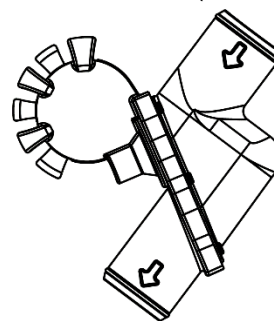
Streamline 1" sensor (153510-000022)



Streamline 1.25" sensor (153510-000066)



90-degree sensor (153570-000015)



1.25" inline sensor (153570-000016)

Figure 6: Sensor types

Tools needed

- 5/16 inch socket, 5/16 inch nut driver on a cordless drill or a flathead screwdriver
- Measuring tape
- Cutting tool, such as a box cutter or shears

Number of times to perform procedure

Once per run

Installation location

Install flow sensors at the beginning of every run on the implement manifold.

2.3.1 Installing 1-inch and 1.25-inch flow sensors (153510-000022 and 153510-000066)

NOTE: Skip this step if you do not have Streamline 1-inch or 1.25-inch flow sensors with part number 153510-000022 or 153510-000066. Refer to Figure 6 to identify your sensor.

Part Name	Part Number	Quantity needed	Contained within
Streamline 1-inch flow sensor <i>or</i> Streamline 1.25-inch flow sensor	153510-000022 <i>or</i> 153510-000066	1/run	Packaged individually
Adapter (optional)	353070-000038 <i>or</i> 353070-000112 <i>or</i> 353070-000113	2/run	Packaged individually
Hose clamp	356060-000025	2/run	Packaged individually

Table 3: Parts needed to install Streamline 1-inch and 1.25-inch flow sensors

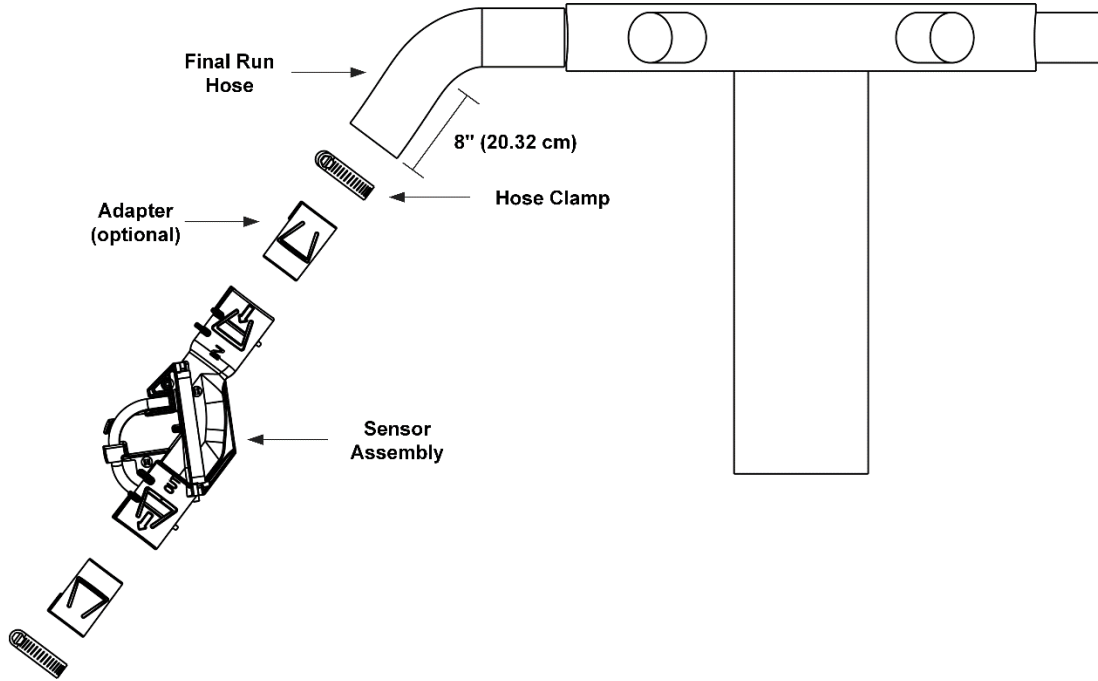
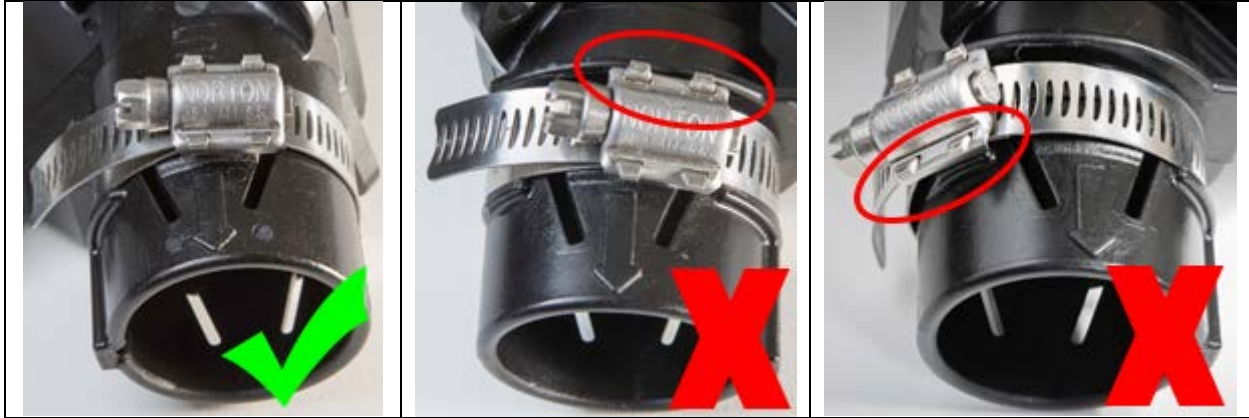


Figure 7: Installing 1-inch and 1.25-inch flow sensors on a manifold

1. If you are using adapters, snap them into the sensor as shown in Figure 7.
2. Detach the final run hose from the manifold and cut it to 8 inches (20.32 cm) or other length that allows for a downward flow and appropriate fit. Re-attach the hose piece to the manifold.

3. Slide the sensor assembly on the final run hose piece until the hose piece hits the backstop inside of the sensor assembly. Try to keep the sensor mounted vertically.
4. Secure using a hose clamp between the two ridges on the end of the sensor assembly, ensuring that the hose clamp lays flat and the head (worm drive) does not hit the sensor ridge.

NOTE: The arrows printed near the top opening of the sensor assembly represent the flow of material and should point away from the manifold.



5. Slide the remaining final hose piece into the lower end of the sensor assembly until the hose piece hits the backstop inside of the sensor assembly. Secure using a hose clamp between the two ridges on the end of the sensor assembly, ensuring that the hose clamp lays flat and the head (worm drive) does not hit the sensor ridge.

2.3.2 Installing 90-degree flow sensors (153570-000015)

NOTE: Skip this step if you do not have 90-degree flow sensors.

Part Name	Part Number	Quantity needed	Contained within
90-degree flow sensor	153570-000015	1/run	Packaged individually
Adapter (optional)	351060-000008	1/run	Packaged individually
Hose clamp	352013-000010	2-4/run	Packaged individually

Table 4: Parts needed to install 90-degree flow sensors

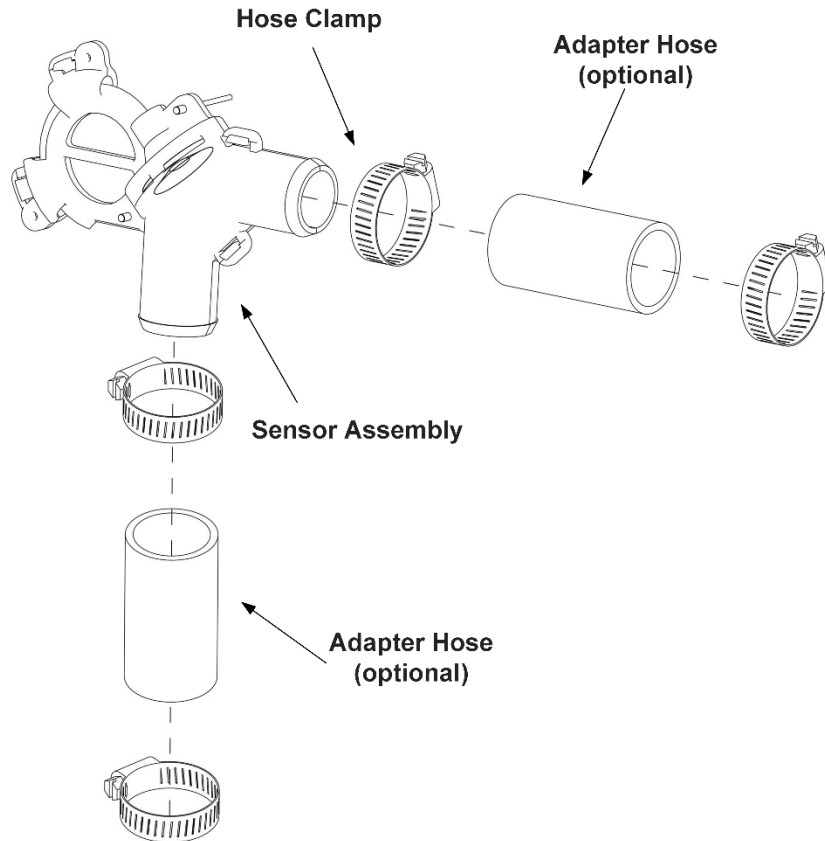


Figure 8: Installing 90-degree flow sensors on a manifold

1. If you are using adapters, slide them onto the flow sensor as shown in Figure 8. Secure using hose clamps.
2. Detach the final run hose from the manifold and slide the sensor assembly into the manifold. If it does not fit, cut a 2-inch piece of the final hose run and attach it to the manifold, then attach the sensor to the 2-inch hose piece.

NOTE: If the seed hose connected to the sensor does not have enough space to point downward, turn the sensors so that the hoses are parallel to the ground, as shown in Figure 10.



Figure 9: 90-degree flow sensors installed on a manifold

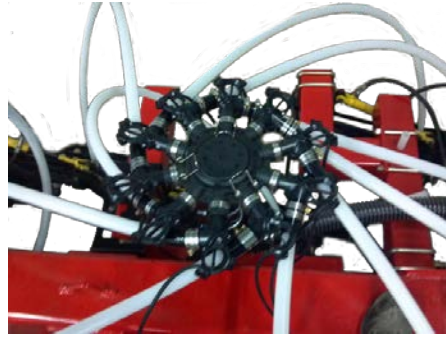


Figure 10: 90-degree flow sensors installed on a manifold (alternate installation)

3. Slide the remaining final run hose piece into the bottom of the sensor assembly and secure using hose clamps.

2.3.3 Installing the 1.25-inch flow sensors (153570-000016)

NOTE: Skip this step if you do not have 1.25-inch flow sensors with part number 153570-000016. Refer to Figure 6 to identify your sensor.

Part Name	Part Number	Quantity needed	Contained within
1.25-inch flow sensor	153570-000016	1/run	Packaged individually
Adapter	353070-000029 <i>or</i> 353070-000031 <i>or</i> 353070-000022 <i>or</i> 353070-000030 <i>or</i> 353070-000032	2/run	Packaged individually (optional)
Hose clamp	352013-000010 <i>or</i> 356060-000025	2-4/run	Packaged individually

Table 5: Parts needed to install 1.25-inch flow sensors

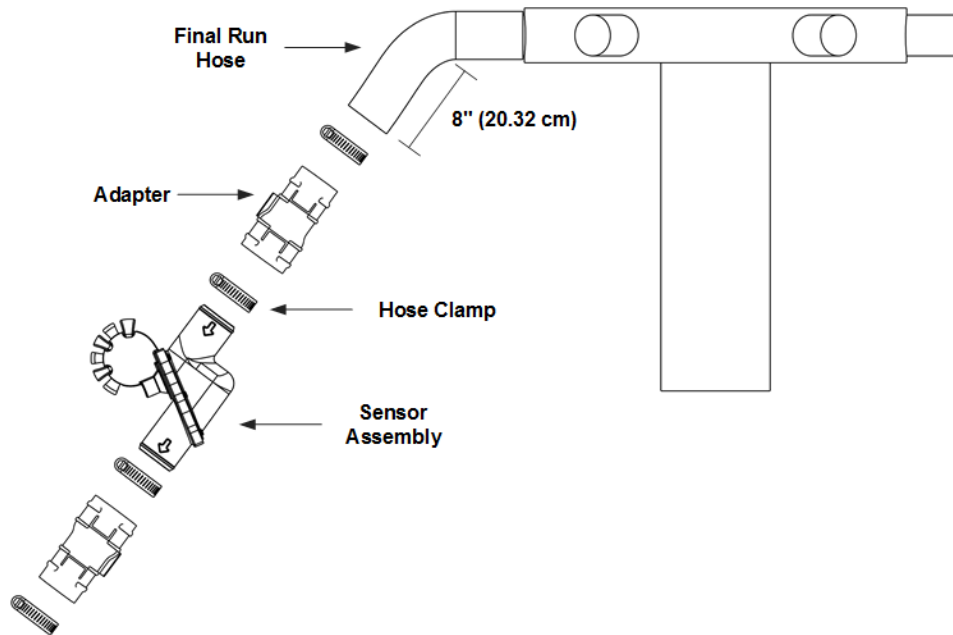


Figure 11: Installing 1.25-inch flow sensors on a manifold

1. Bend each adapter in half until the centre seam holding the two halves together snaps. Align the two halves to make a cylinder.

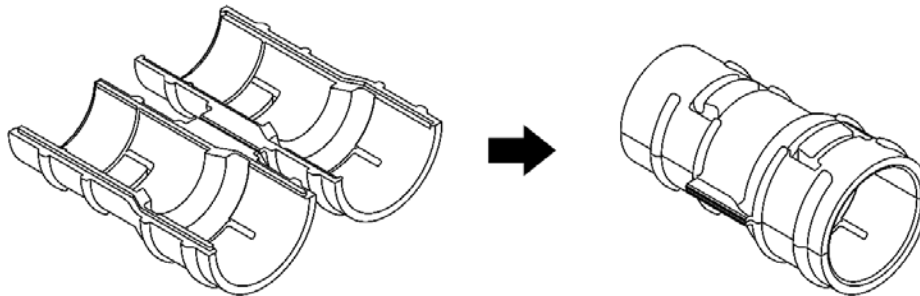


Figure 12: Preparing the adapters

2. Place the adapters on the sensor as shown in Figure 11 and secure using hose clamps.
3. Detach the final run hose from the manifold and cut it to 8 inches (20.32 cm) or other length that allows for a downward flow and appropriate fit. Re-attach the hose piece to the manifold.
4. Place the upper adapter on the final run hose piece, making sure that the hose is pushed into the adapter past the retaining ring and locking tabs until it hits the backstop (about 2 inches), as shown in Figure 13. Try to keep the sensor mounted vertically. Secure using a hose clamp.

NOTE: The arrows printed near the top opening of the sensor assembly represent the flow of material and should point away from the manifold.

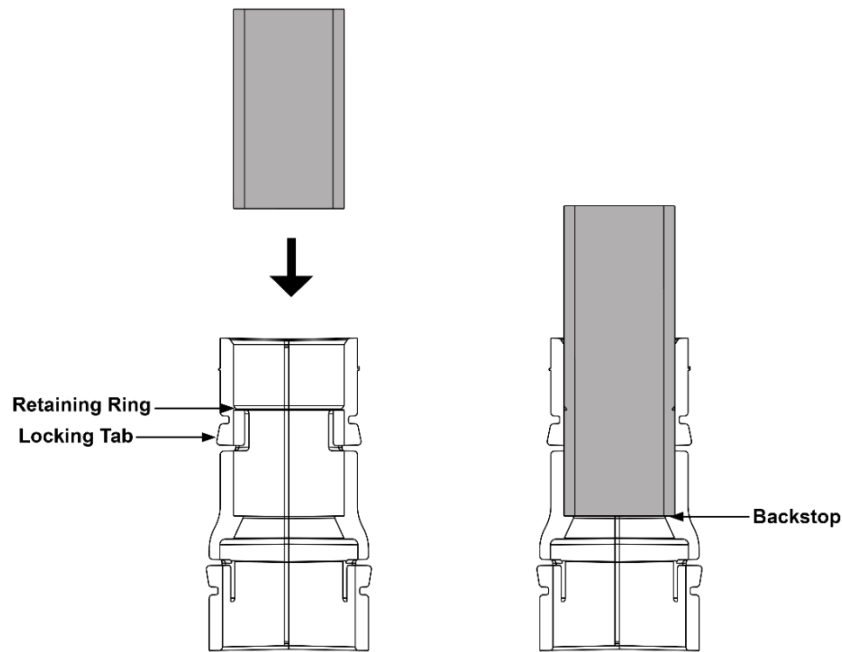


Figure 13: Securing hose pieces into adapter

5. Slide the remaining final hose piece into the lower adapter and secure using a hose clamp.

2.4 Connecting flow sensors to the ECU

About connecting flow sensors to the ECU

Connect flow sensors to the ECU to communicate flow measurements to the Intelligent Ag Pro app.

Tools needed

- Pliers
- Paint pen or other permanent marking tool (optional)

Number of times to perform procedure

Once per manifold

Connecting flow sensors to the ECU

1. Remove the caps from the ECU ports that you will be using. Leave the caps on the unused connectors to prevent dirt from entering the ECU.

EXAMPLE: If the manifold has 16 runs, remove caps from ports 1 through 16 and leave the caps on ports 17 through 24.

2. Remove and discard the cap at the end of the auditory hose of the run that is closest to the tractor when facing the back of the tractor. This run is labelled “1” in Figure 14).

NOTE: Some sensor types do not have an auditory hose cap.

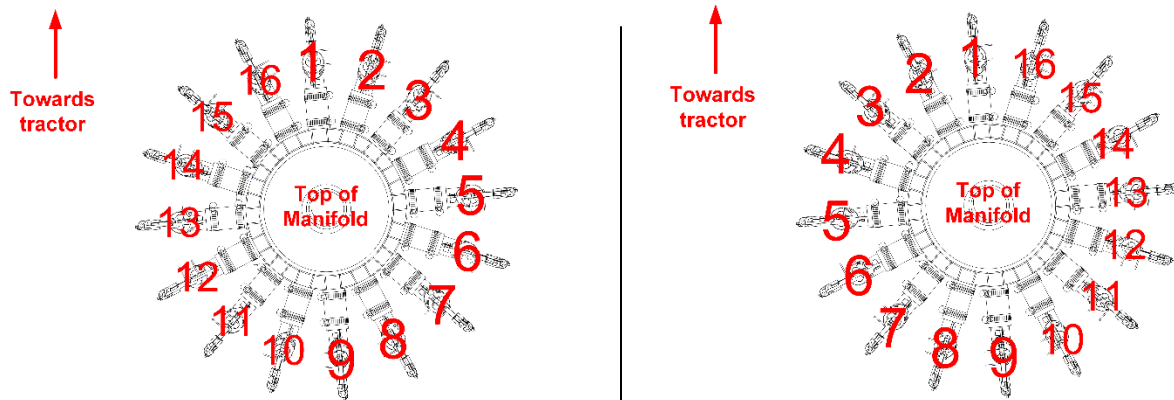


Figure 14: Order to connect flow sensors to ECU

Default order on left (clockwise), Reverse order on right (anticlockwise)

3. Route the auditory hose through the hole on the top of the ECU mounting bracket (351050-000012).
4. Attach the auditory hose to the port labelled “1” on the ECU.

CAUTION: Verify that the auditory hose is not kinked, especially where the tube comes through the top of the ECU bracket and where the tube is secured to the ECU. Otherwise, the ECU will be unable to receive any blockage measurement readings from that run.

5. **Optional:** Mark the ECU port number that the sensor is attached to (Example: 1) with a paint pen or other marking tool somewhere easily visible on the flow sensor hose.

NOTE: When the WBFM detects that a run is blocked, the Intelligent Ag Pro app will display the ECU port number that that run is attached to. Marking the ECU port number on the flow sensor will allow you to easily identify a blocked run while troubleshooting.

6. Continue removing the caps from the ends of the auditory hoses, running them through the top of the ECU bracket and attaching them to the proper ECU port, working clockwise around the manifold as shown in Figure 14.

NOTE: If you connect the ports in the reverse order, you must change the run direction after configuring the app. Refer to the Recon Wireless Blockage and Flow Monitor Operator's Manual for instructions to change the run direction.

NOTE: If your dealer advised you to split one manifold across two different ECUs or join two different manifolds to the same ECU, refer to the instructions below when connecting auditory hoses.

- **Splitting:** Runs contained on the same manifold are connected to two different ECUs. For example, connect 18 runs of a 36 run manifold to one ECU and connect the remaining 18 to a different ECU. Splitting is necessary on manifolds that contain a large number of runs because each ECU can only support 24 runs.
- **Joining:** Runs contained on two or more manifolds are connected to the same ECU. For example, connect all runs on one manifold to one ECU and connect all runs on another manifold to the same ECU. Joining is possible on implements with manifolds that are very close together or when the total of two manifolds' runs is 24 or less.

2.5 Installing the wiring harnesses

About the wiring harnesses

The wiring harnesses provide power from the tractor to the WBFM. There are four wiring harness types: 1) tractor, 2) intermediary, 3) ECU and 4) work switch ECU. The number of intermediary and ECU harnesses needed for each installation varies based on the number of manifolds on the implement, as shown in Appendix A.

Part Name	Part Number	Quantity needed	Contained within
Deutsch sealing plug	153560-000015	Varies	Tractor kit
10 ft (3 m) Intermediary harness	355020-000016	See Appendix A	Intermediary Harness kit
7 ft (2.1 m) ECU harness	355020-000017	See Appendix A	Packaged individually
27 ft (8.2 m) Intermediary harness	355020-000019	See Appendix A. If you have a tow-between cart, an additional intermediary harness is required.	Tractor kit
22 ft (6.7 m) ECU harness	355020-000020	See Appendix A	Packaged individually
Tractor harness	355020-000021	One	Tractor kit
3-way DTM splitter	355030-000002	Varies	Intermediary Harness kit
Cable Tie	355032-000004	Approximately 100	Tractor kit

Table 6: Parts needed to install wiring harnesses

Tools needed

- Pliers (optional)

Number of times to perform procedure

- Tractor harness installation procedure: Once
- Intermediary harness installation procedure:
 - Once for implements with two manifolds
 - Two for implements with three manifolds
 - Three less than the number of manifolds for implements with four or more manifolds
- ECU harness installation procedure: Once per manifold (minus one due to the installation of the work switch ECU harness)
- Work switch ECU harness installation procedure: Once

Installation location

Intelligent Ag recommends installing the wiring harnesses on top of existing wiring harnesses or hydraulic hose on the implement when possible or running the intermediary harness through the yoke of the implement. Doing so reduces the chance of wiring harnesses becoming pinched during the operation or transportation of the implement.

Harnessing tips

- Refer to the wiring diagrams in Appendix A for wiring diagrams based on the number of manifolds on your implement.
- Before connecting any harnessing, lay the harnessing on the ground and map out how it will be connected. Once you have all the harnessing mapped out, connect it to your system.
- When using three way splitters, grey connectors are plugged into the grey port of the splitter and black connectors are plugged into the black ends of the splitter.



Figure 15: Three-way splitter diagram

Connecting a tractor harness to a tractor

1. Connect the tractor harness (355020-000021) to the tractor's three-pin power outlet in the tractor cab.

NOTE: If your tractor does not have a three-pin power outlet, contact your dealer for assistance.

2. Route the tractor harness to the hitch of the implement. Connect the other end of the tractor harness to the grey receptacle of a three-way splitter (355030-000002).

Connecting a 27' intermediary harness to a tractor harness

1. Connect the black end of the 27' intermediary harness (355020-000019) into the black receptacle of the three-way splitter at the end of the tractor harness.
2. Route the intermediary harness over the implement. Connect the other end of the intermediary harness to the grey receptacle of a three-way splitter (355030-000002).

If you need additional harnessing to reach the implement, connect an additional 27' intermediary harness (kit number 153025-000018) to the first intermediary harness using a three-way splitter. Plug the grey end of one harness into the grey receptacle of the splitter and plug the black end of the other harness into the black receptacle of the splitter.

NOTE: A maximum of two 27' intermediary harnesses can be attached to one tractor harness.

Connecting a 10' intermediary harness to a 27' intermediary harness

NOTE: A maximum of two 10' intermediary harnesses can be connected to another intermediary harness.

1. Connect the black end of a 10' intermediary harness (355020-000016) into the black receptacle of the three-way splitter at the end of the 27' intermediary harness.
2. If your implement has more than 2 manifolds, connect the black end of another 10' intermediary harness into the other black receptacle of the three-way splitter.

Route the 10' intermediary harnesses over the implement. Connect the other end of the 10' intermediary harnesses to the grey receptacle of a three-way splitter (355030-000002).

Connecting an ECU harness to an intermediary harness

NOTE: A maximum of two ECU harnesses can be connected to one intermediary harness.

1. Connect the black end of an ECU harness (355020-000020 or 355020-000017) to the black receptacle of a three-way splitter of an intermediary harness (355020-000019 or 355020-000016).

Route the ECU harness so that it reaches an implement tower. Plug the four pin, grey and orange connector of the ECU harness (355020-000020 or 355020-000017) into the white, four-pin receptacle on the back of an ECU.

NOTE: Do not connect an ECU harness to the ECU that is closest to where the work switch will be installed. Refer to Section 2.6.

2. Repeat for each ECU harness. Refer to Appendix A for the number of ECU harnesses for your system setup.

Securing loose harnessing and capping unused splitter ports

1. Coil any loose harnessing around a hydraulic line or electrical wire. Secure all harnessing to the tractor and/or implement using cable ties (355032-000004)
2. Insert a Deutsch sealing plug assembly (153560-000015) into any unused three-way splitter receptacles to prevent dirt from entering the splitter.

2.6 Installing the work switch

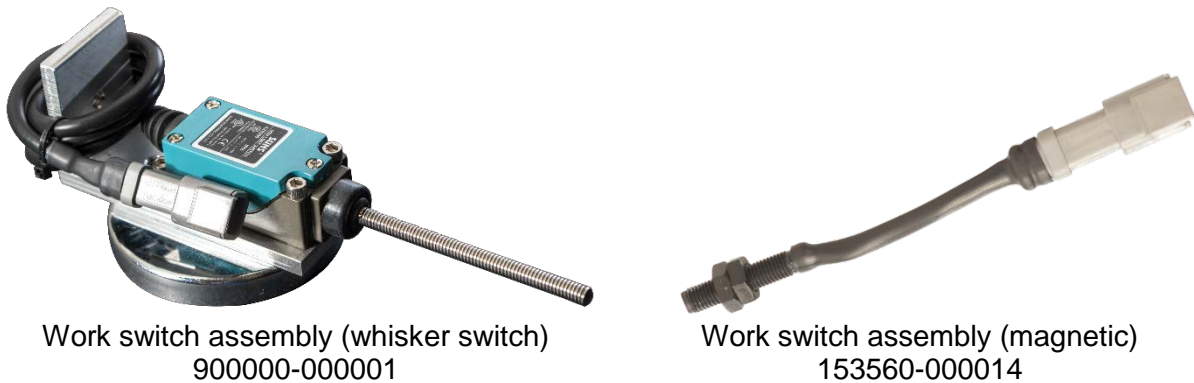
About the work switch

The work switch signals to the Intelligent Ag Pro app when the implement is in or out of the ground. The audible alarms that would typically signal when air flow in a run is blocked will automatically be silenced when the work switch detects that the implement is out of the ground.

NOTE: When the implement is out of the ground, the Intelligent Ag Pro 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.

Types of work switches

Intelligent Ag sells two different types of work switches: the whisker switch and the magnetic work switch. Identify your work switch type and part number by looking at your pack slip or the images below.



Work switch assembly (whisker switch)
900000-000001

Work switch assembly (magnetic)
153560-000014

Figure 16: Wireless Blockage and Flow Monitor work switch assemblies

Tools needed

- Standard wrench set

Number of times procedure is performed

Once

Installation location

Next to the implement's existing work switch, if one exists. The existing work switch is typically found towards the centre of the implement's frame on a hydraulic cylinder. If the implement does not have an existing work switch, find a location on the hydraulic cylinders that are used to lift the implement in and out of the ground at the end of rows.

2.6.1 Installing the work switch (900000-000001)

NOTE: Skip this step and follow the instructions in Section 2.6.2 if you are using the magnetic work switch with part number 153560-000014. Refer to Figure 16 to identify your work switch.

Part Name	Part Number	Quantity needed	Contained within
Work switch ECU harness	355020-000018	1	Tractor kit
Work switch assembly	900000-000001	1	Packaged individually

Table 7: Parts needed to install work switch (900000-000001)

TIP: You can mount the work switch (900000-000001) onto an existing work switch bracket, if one exists. Otherwise, find a mounting location where the work switch is triggered when the toolbar is in the lowered position.

NOTE: You can unscrew the work switch magnet from the bracket and reattach it to the other end of the bracket to allow for other mounting orientations.

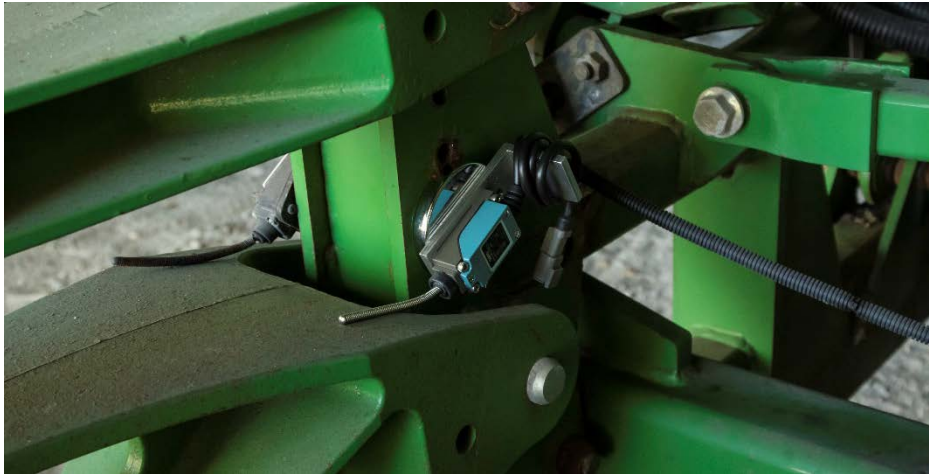


Figure 17: Mounting location for work switch (900000-000001)

About work switch methods

The work switch uses one of two methods to determine when the implement is in the ground:

- **Default method:** the work switch is engaged (the work switch is triggered by the height sensor) when the implement is in the ground. Likewise, the work switch is disengaged (the work switch is not triggered) when the implement is out of the ground.
- **Inverted method:** the work switch is disengaged (the work switch is not triggered) when the implement is in the ground. Likewise, the work switch is engaged (the work switch is triggered by the height sensor) when the implement is out of the ground.

Your work switch method will be configured during auto-configuration. See the Recon Wireless Blockage and Flow Monitor Operator's Manual (Intelligent Ag document number 600890-000062) for more information about configuring the work switch.

2.6.2 Installing the work switch (153560-000014)

Part Name	Part Number	Quantity needed	Contained within
Work switch assembly	153560-000014	1	Tractor kit
Work switch bracket	351050-000016	1	Tractor kit
¼"-20 x ¾" steel bolt	352010-000084	2	Tractor kit
¼"-20 steel locknut	352011-000040	2	Tractor kit
¼" steel washer	352012-000024	4	Tractor kit
Work switch ECU harness	355020-000018	1	Tractor kit
Ceramic work switch magnet	359035-000001	1	Tractor kit

Table 8: Parts needed to install work switch (153560-000014)

1. Slide a ¼" steel washer (352012-000024) onto the end of each ¼"-20 x ¾" steel bolt (352010-000084). Then, insert the bolts into the work switch bracket (351050-000016).
2. Position the work switch bracket onto the existing work switch bracket, if one exists. Otherwise, find a mounting location where the work switch and magnet will be moved apart when the implement is out of the ground, as shown in Figure 18.

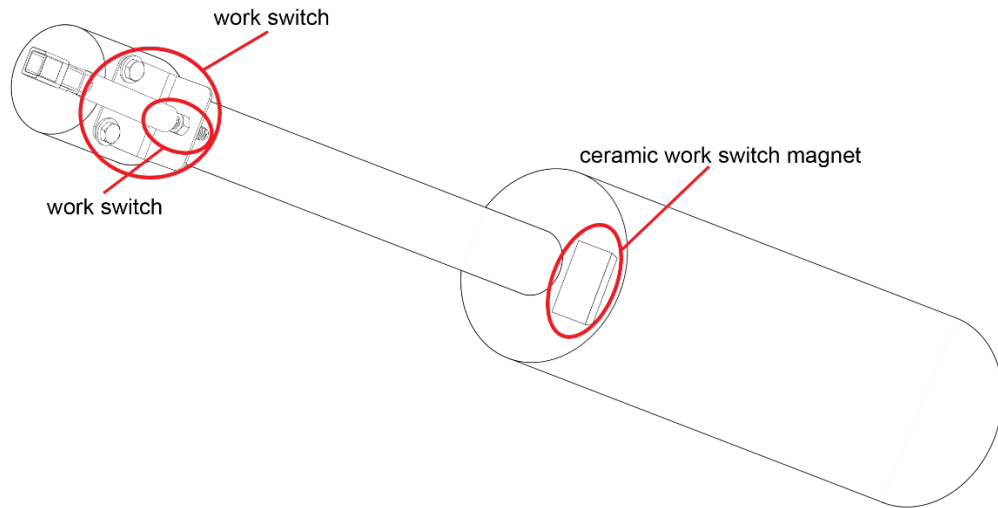


Figure 18: A work switch installed on an implement where no bracket previously existed

3. Secure the work switch bracket to the existing bracket or implement by threading one steel washer and one ¼"-20 steel locknut (352011-000040) onto the ends of each bolt. If an existing work switch was not present, you might need to drill into the implement frame for the work switch bracket bolts or zip-tie the work switch bracket onto the hydraulic cylinder.
4. Remove the front locknut from the work switch assembly (153560-000014) and insert the end of the work switch assembly into the work switch bracket. Replace the locknut onto the work switch assembly.
5. Place the ceramic work switch magnet (359035-000001) onto the implement's frame, near the implement's existing work switch magnet, if one exists.

6. Adjust the position of the locknuts on the work switch assembly so that the work switch is within a few inches of the work switch magnet when the work switch is engaged, as shown in Figure 19.
 - Moving the locknuts closer to the end of the work switch moves the work switch farther from the magnet.
 - Moving the locknuts away from the end of the work switch moves the work switch closer to the magnet.

CAUTION: The work switch may be able to detect the magnet up to four inches away. Consider your implement's range of motion to verify that the switch and magnet will not touch.

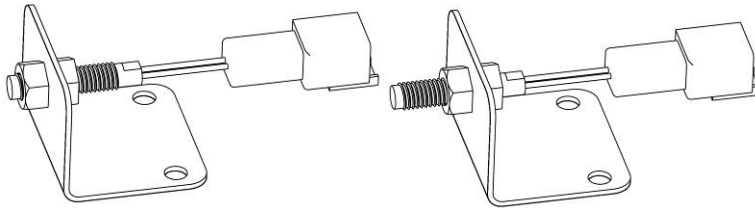


Figure 19: Adjusting the work switch length

About work switch methods

The work switch uses one of two methods to determine when the implement is in the ground:

- **Default method:** the work switch is engaged (magnet is close to the work switch) when the implement is in the ground. Likewise, the work switch is disengaged (magnet and work switch are apart) when the implement is out of the ground.
- **Inverted method:** the work switch is disengaged (magnet is pulled away from the work switch) when the implement is in the ground. Likewise, the work switch is engaged when the implement is out of the ground.

Your work switch method will be configured during auto-configuration. See the Recon Wireless Blockage and Flow Monitor Operator's Manual (Intelligent Ag document number 600890-000062) for more information about configuring the work switch.

2.6.3 Connecting a work switch ECU harness to an intermediary harness and the work switch

1. Connect the black end of the work switch ECU harness (355020-000018) to the black receptacle of a three-way splitter of an intermediary harness (355020-000019 or 355020-000016).
2. Route the work switch ECU harness so that it reaches the work switch ECU implement tower (the tower closest to the work switch).
3. Plug the four pin, grey and orange connector of the ECU harness (355020-000018) into the white, four-pin receptacle on the back of the ECU.
4. Connect the two pin, grey connector (with two white wires) at the end of the work switch ECU harness to the two pin, grey receptacle at the end of the work switch assembly (900000-000001 or 153560-000014).
5. Secure the work switch ECU harness to the implement using cable ties (355032-00004).

2.6.4 Verifying that the work switch was correctly installed

Refer to Section 2.3 of the Operator's Guide for instructions to verify that the work switch was correctly installed and configured.

2.7 Installing the access point

About the access point

The access point allows the Intelligent Ag Pro app to communicate with the ECUs. The access point and supplied power converter must be powered on for the Intelligent Ag Pro app to communicate any run blockages to the operator.

CAUTION: Do not reset the access point to its default factory settings. The access point requires special configuration to work with the WBFM. If the access point is reset, it must be returned to Intelligent Ag to be reconfigured.

NOTE: If you are interfacing with the WBFM through a Gateway 300 and virtual terminal, skip Sections 2.7 through 2.9. Refer to Appendix B for more information.



Figure 20: Wireless Blockage and Flow Monitor access point

Part Name	Part Number	Quantity needed	Contained within
Access point	153510-000080	1	Tractor kit
Ethernet cable	253030-000005	1	Tractor kit
Power converter	254040-000007	1	Tractor kit
Wire guide	355005-000004	Varies	Tractor kit
Alcohol wipes	359060-000003	1	Tractor kit
Oil-resistant cork/rubber gasket (included with the access point)	351521-000004	2	Tractor kit
RAM ball mount	352004-000005	1	Tractor kit
RAM suction cup base	352004-000006	2	Tractor kit
iPad	Not included with the WBFM	1	Not included with the WBFM

Table 9: Parts needed to install access point

NOTE: Cable ties are included in the packaging of the access point assembly. If these cable ties are misplaced, you can use the cable ties from the Tractor kit.

Tools needed

Wiring tools such as a wire cutter and wire stripper (optional)

Number of times procedure is performed

Once

Installation location

Access point: Intelligent Ag recommends installing the access point on the tractor cab’s mounting bar (if available), directly behind where the iPad mounting bracket is installed. Otherwise, you can install the access point on the exterior of the cab, on the implement itself or on the cart. For optimal performance, the access point should be facing the ECUs with a direct line of sight.

Power converter: Place the power converter in any location inside the tractor cab.

Connecting the access point

1. Slide the cover off of the back of the access point assembly (153510-000080).
2. Connect the Ethernet cable (253030-000005) to the port labelled **LAN0** on the back of the access point assembly. Connect the other end of the cable to the **POE** port of the black TP Link power supply.

NOTE: If your access point will be mounted on an air cart, you might need to source a longer Ethernet cable.



Figure 21: Access point Ethernet connection

3. Connect the access point power cable to the back of the black TP Link power supply. Connect the other end of the cable to the red power converter (254040-000007).
4. Connect power using either the cigarette lighter adapter or by hard wiring the power converter (follow the instructions under “Hard wiring” below).

- **Cigarette lighter adapter:** Plug the power converter’s power cable into the tractor cab’s cigarette lighter. Power on the power converter.

NOTE: The access point will only receive power when it is plugged into the cigarette lighter and the cigarette lighter is providing power. This might require the tractor key to be in the “on” position.

- **Hard wiring:**



WARNING! RISK OF ELECTRICAL SHOCK: Verify that the tractor and power converter are completely powered off before completing these steps. Intelligent Ag is not responsible for any damage that results from modifying WBFM components.

- a. Cut the power converter's power cord immediately before the cigarette lighter adapter and discard the adapter.
 - b. Separate the two wires and strip about ½ inch of the wire.
 - c. Connect the power converter wires to a power source—the wire with white text on it is positive and the wire without text is negative. You may crimp or solder the wires, depending on your preference.
 - d. Power on the power converter.
5. Replace the access point's back cover. The power cable should rest in the notch between the access point assembly and the cover.

Mounting using the suction cup window mount kit

NOTE: To mount the access point without using the suction cup window mount, see “Mounting to a mounting bar” below.

1. Secure a suction cup base (352004-000006) to each end of the ball mount (352004-000005) using the provided screws.
2. Thread cable ties through the holes on the access point feet and secure the access point to the arm of the mount, as shown in Figure 22.
3. Position the mount inside a tractor cab window and twist the lock switch on the suction cups to secure it.



Figure 22: Assembling the access point window mount

Mounting to a mounting bar

1. Remove the paper backing from the oil-resistant cork/rubber gaskets (351521-000004) and place the adhesive side onto the curved feet of the access point assembly, as shown in Figure 23.
2. Secure the access point to the tractor cab's mounting bar (or another rigid surface in the cab) using the cable ties included with the access point assembly or with the cable ties (355032-000004) included in the Tractor kit.



Figure 23: Applying the gaskets to the feet of the access point

Installing wiring guides

OPTIONAL: You can install wire guides to secure the access point power cable to a place in the tractor cab, such as the dash. This reduces the chance of the cable becoming tangled or unplugged.

1. Clean the area where you will be placing the wire guides (355005-000004) with the alcohol wipes (359060-000003).
2. Remove and discard the paper backing from the wire guides. Place the adhesive side of the wire guides onto the desired location in the tractor cab, next to the access point power cable.
3. Place the access point power cable into the hook of the wire guide.

Connecting the iPad to the wireless network

1. Power on the tractor and the iPad, then connect the access point power cable to the tractor's cigarette lighter, if you have not done so already.
2. Tap the **Settings** icon on the iPad's Home screen.
3. Tap **Wi-Fi** on the left side of the screen.
4. Verify that Wi-Fi capabilities are enabled.
5. Tap **IASBlockage** or **IASNetwork2** under the "Choose a Network..." list. A checkmark will display to the left of the network when the iPad is connected to the network.

NOTE: If the network name does not appear on the "Choose a Network..." list, wait a few minutes to give the iPad time to search for the network. If the network does not appear after several minutes, verify that the LEDs in Figure 24 are illuminated. If the network still does not appear, contact your dealer for assistance.



Figure 24: Access point LEDs

IMPORTANT: Do not reset the access point to its default factory settings. The access point requires a special configuration to work with the WBFM. If the access point is reset, it must be returned to your dealer to be reconfigured.

2.8 Installing the iPad mounting bracket

About the iPad mounting bracket

The iPad mounting bracket is a safe place to rest the iPad during seeding and also allows the operator to view the Intelligent Ag Pro app at a glance. The mounting bracket is ruggedised, meaning that it will absorb some of the bumps and jolts typical during air seeding. The iPad mounting bracket is compatible with iPad Air and iPad Air 2.

Part Name	Part Number	Quantity needed	Contained within
USB charger (for iPad)	254040-000002	1	Tractor kit
Tablet mount arm	352004-000003	1	Tractor kit
Rail attachment for Tablet mount	352004-000004	1	Tractor kit
Wire guide (optional)	355005-000004	Varies	Tractor kit
iPad Air mount	356070-000004	1	Tractor kit
Alcohol wipes (optional)	359060-000003	1	Tractor kit
iPad	Not included with the WBFM	1	Not included with the WBFM

Table 10: Parts needed to install the iPad mounting bracket

Tools needed

- 7/16 inch socket

Number of times procedure is performed

Once

Installation location

Intelligent Ag recommends installing the iPad mounting bracket onto the mounting bar in the tractor cab, if one is available. However, it may be installed anywhere in the tractor cab where it is easily visible and within reach of the operator while seeding.

Installing the iPad mounting bracket

1. Insert the ball of the tablet mount arm (352004-000003) into the back of the iPad mount (356070-000004).
2. Connect the rail attachment (352004-000004) to the bottom of the mount arm.
3. Connect the rail attachment to the tractor's mounting bar or other desired installation location.
4. Plug the USB charger (254040-000002) into the tractor's cigarette lighter receptacle.
5. Plug the iPad charging cord into the USB charger and into the iPad.

OPTIONAL: You can install wire guides to secure the iPad charging cord to a place in the tractor cab, such as the dash. This may reduce the chance of the cord becoming tangled or unplugged.

1. Clean the area where you will be placing the wire guides (355005-000004) with alcohol wipes (359060-000003).
2. Remove and discard the paper backing from the wire guides. Place the adhesive side of the wire guides onto the desired location in the tractor cab, next to the iPad charging cord.
3. Place the iPad charging cord into the hook of the wire guides.

2.9 Downloading the Intelligent Ag Pro app

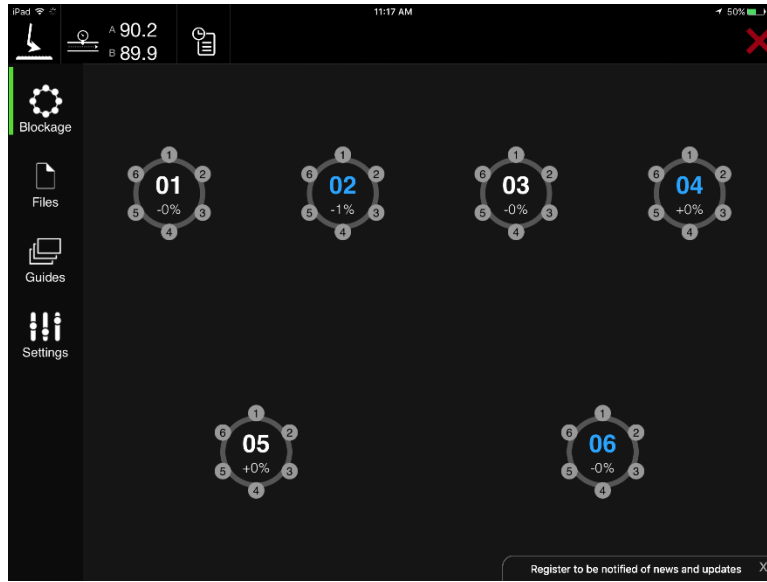


Figure 25: Intelligent Ag Pro app

About the Intelligent Ag Pro app

The Intelligent Ag Pro app is a free software application (app) that can be downloaded onto your iPad® for free from the App StoreSM. The Intelligent Ag Pro app notifies operators of run blockages and also allows for configuration of the WBFM.

Part Name	Part Number	Quantity needed	Contained within
iPad	Not included with the WBFM	1	Not included with the WBFM

Table 11: Parts needed to download Intelligent Ag Pro app

Tools needed

None

Number of times procedure is performed

Once

About Apple IDs

An Apple ID is required for downloading apps from the App Store. You can use the same Apple ID on multiple Apple devices, such as an iPad and an iPod®. If you have an existing Apple ID, you can use it to download the Intelligent Ag Pro app.

For instructions for how to create an Apple ID, refer to Apple’s support website or contact your dealer for assistance.

NOTE: Since the Intelligent Ag Pro app is a free app, you may select *None* in the credit card type field during the account setup if you do not wish to enter a credit card number.

Downloading the Intelligent Ag Pro app

1. Connect the iPad to the internet.
2. Tap the **App Store** icon from the iPad's home screen.
3. Type *Intelligent Ag Pro* in the search field and tap **Search**.
4. Tap the Intelligent Ag Pro app when it appears in your search results.
5. Tap the **Get** button and tap **Install**. Enter your Apple ID and password, if prompted. A progress bar will appear over the app's icon while it is downloading.






Configuring the Intelligent Ag Pro app

For instructions to configure and use the WBFM after installation, see the Recon Wireless Blockage and Flow Monitor Operator's Manual (Intelligent Ag document number 600890-000062).

Appendix A: Wiring harness diagrams per implement configuration

The diagrams in this appendix are suggestions for ways wiring harnesses may be installed. Each graphic is specific to the number of manifolds on an implement. Please note that due to factors such as difference in manifold spacing, wiring harness setup may differ from that shown in these diagrams.

Two and Three Manifold Wiring Harness Diagrams

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
<u>355020-000016 (10 ft)</u> <u>355020-000019 (27 ft)</u>	Intermediary harness
<u>355020-000017 (7 ft)</u> <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

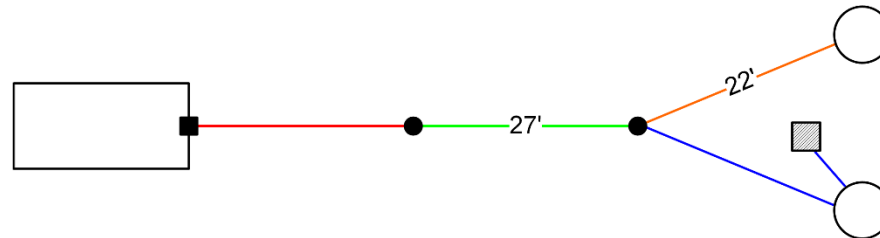


Figure 26: Two (2) manifold wiring harness

1 Tractor harness, 1 Intermediary harness (27 ft/8.2 m), 1 ECU harness (22 ft/6.7 m), 1 Work Switch ECU harness

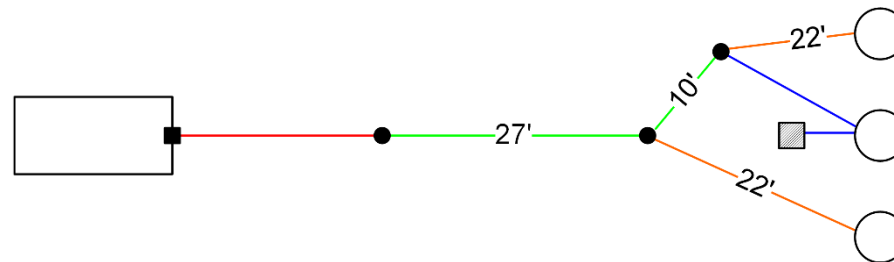







Figure 27: Three (3) manifold wiring harness

1 Tractor harness, 2 Intermediary harnesses (one 27 ft/8.2 m, one 10 foot), 2 ECU harnesses (two 22 ft/6.7 m), 1 Work Switch ECU harness

Four and Five Manifold Harness Diagrams

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
<u>355020-000016 (10 ft)</u> <u>355020-000019 (27 ft)</u>	Intermediary harness
<u>355020-000017 (7 ft)</u> <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

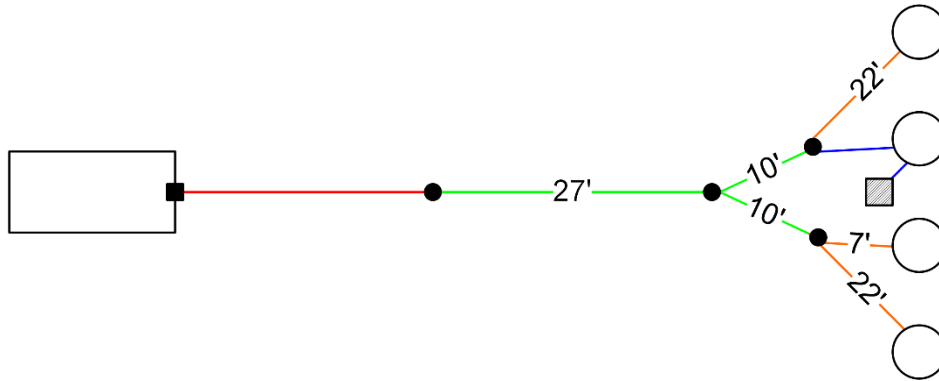


Figure 28: Four (4) manifold wiring harness

1 Tractor harness, 3 Intermediary harnesses (one 27 ft/8.2 m, two 10 ft/3 m), 3 ECU harnesses (two 22 ft/6.7 m, one 7 ft/2.1 m), 1 Work Switch ECU harness

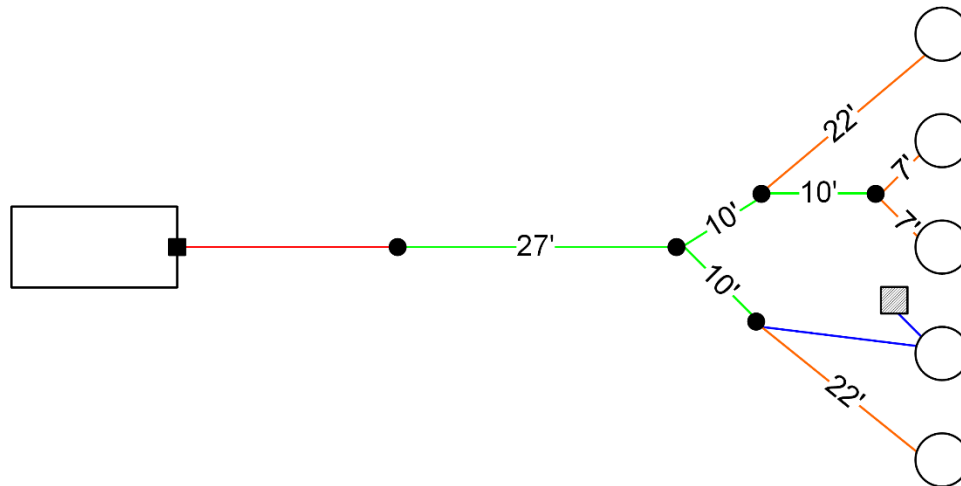







Figure 29: Five (5) manifold wiring harness

1 Tractor harness, 4 Intermediary harnesses (one 27 ft/8.3 m, three 10 foot), 4 ECU harnesses (two 22 ft/6.7 m, two 7 ft/2.1 m), 1 Work Switch ECU harness

Six and Seven Manifold Harness Diagram

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
355020-000016 (10 ft) <u>355020-000019 (27 ft)</u>	Intermediary harness
355020-000017 (7 ft) <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

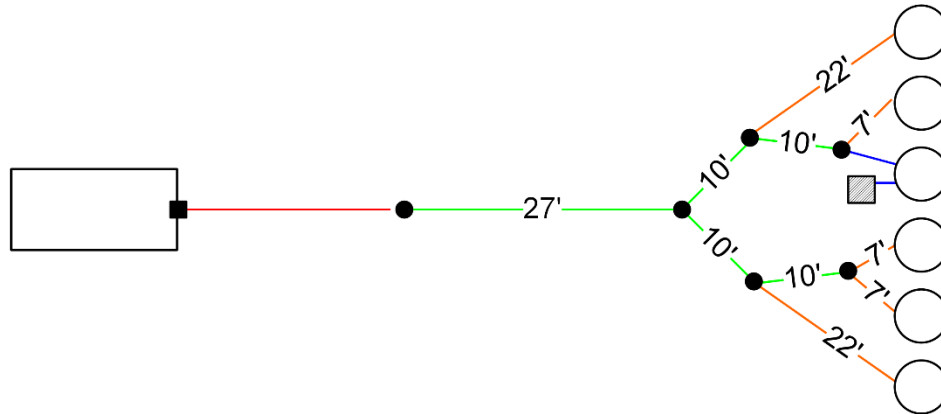


Figure 30: Six (6) manifold wiring harness

1 Tractor harness, 5 Intermediary harnesses (one 27 ft/8.2 m, four 10 ft/3 m), 5 ECU harnesses (two 22 ft/6.7 m, three 7 ft/2.1), 1 Work Switch ECU harness

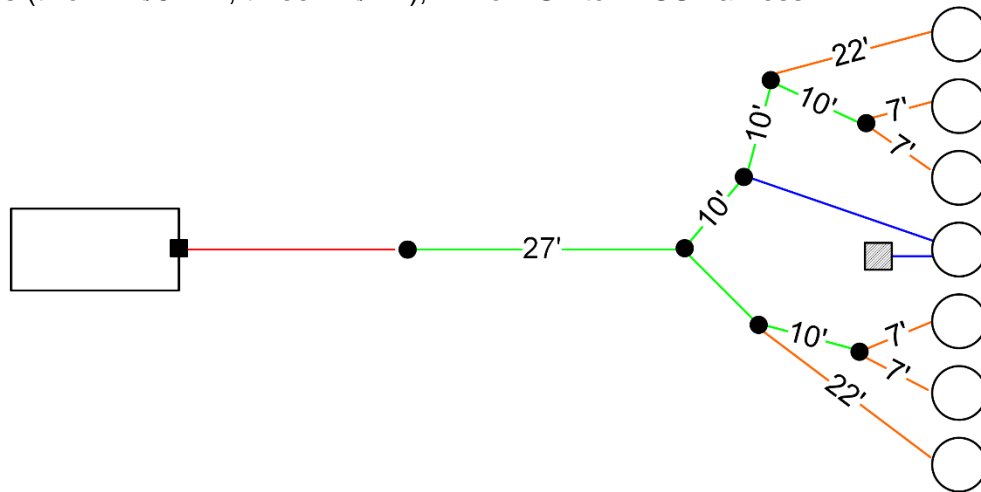







Figure 31: Seven (7) manifold wiring harness

1 Tractor harness, 6 Intermediary harnesses (one 27 ft/8.2 m, five 10 ft/3 m), 6 ECU harnesses (two 22 ft/6.7 m, four 7 ft/2.1 m), 1 Work Switch ECU harness

Eight Manifold Wiring Harness Diagram

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
355020-000016 (10 ft) <u>355020-000019 (27 ft)</u>	Intermediary harness
355020-000017 (7 ft) <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

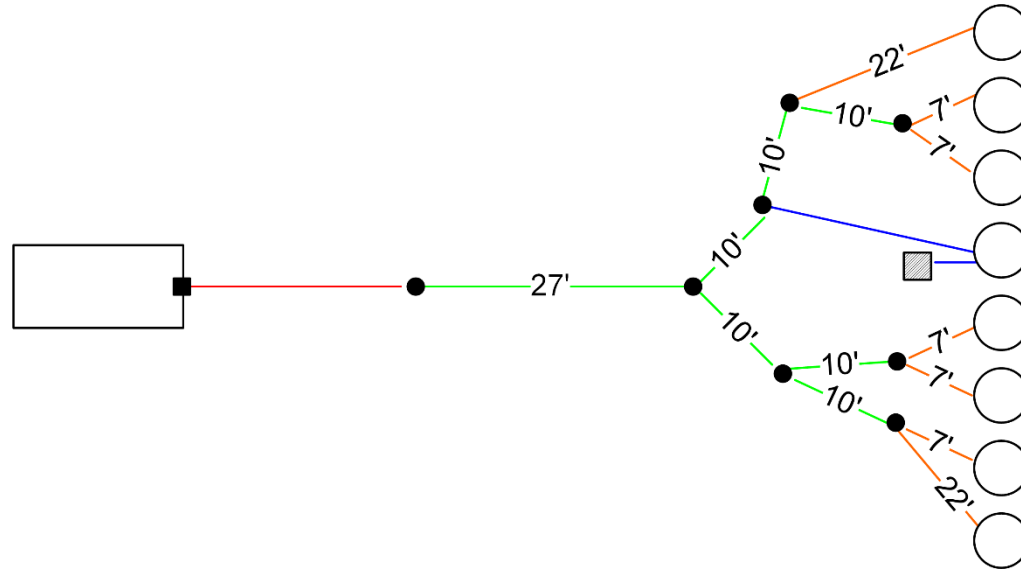







Figure 32: Eight (8) manifold wiring harness

1 Tractor harness, 7 Intermediary harnesses (one 27 ft/8.2 m, six 10 ft/3 m), 7 ECU harnesses (two 22 ft/6.7 m, five 7 ft/2.1 m), 1 Work Switch ECU harness

Nine Manifold Wiring Harness Diagram

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
355020-000016 (10 ft) <u>355020-000019 (27 ft)</u>	Intermediary harness
355020-000017 (7 ft) <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

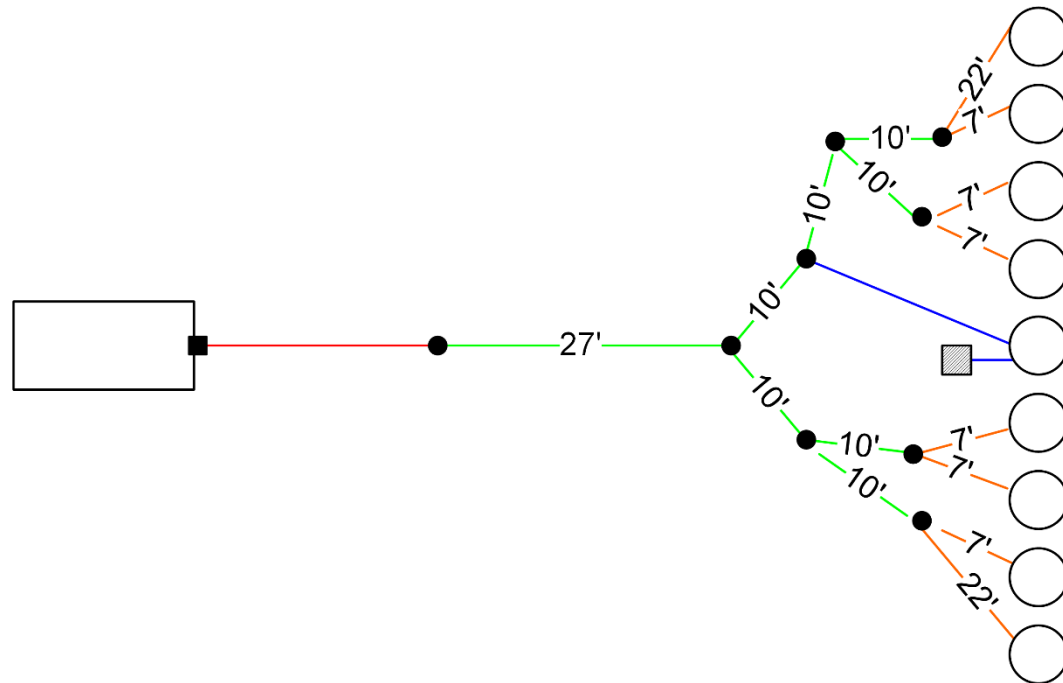







Figure 33: Nine (9) manifold wiring harness

1 Tractor harness, 8 Intermediary harnesses (one 27 ft/8.2 m, seven 10 ft/3 m), 8 ECU harnesses (two 22 ft/6.7m, six 7 ft/2.1 m), 1 Work Switch ECU harness

Ten Manifold Wiring Harness Diagram

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
355020-000016 (10 ft) <u>355020-000019 (27 ft)</u>	Intermediary harness
355020-000017 (7 ft) <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

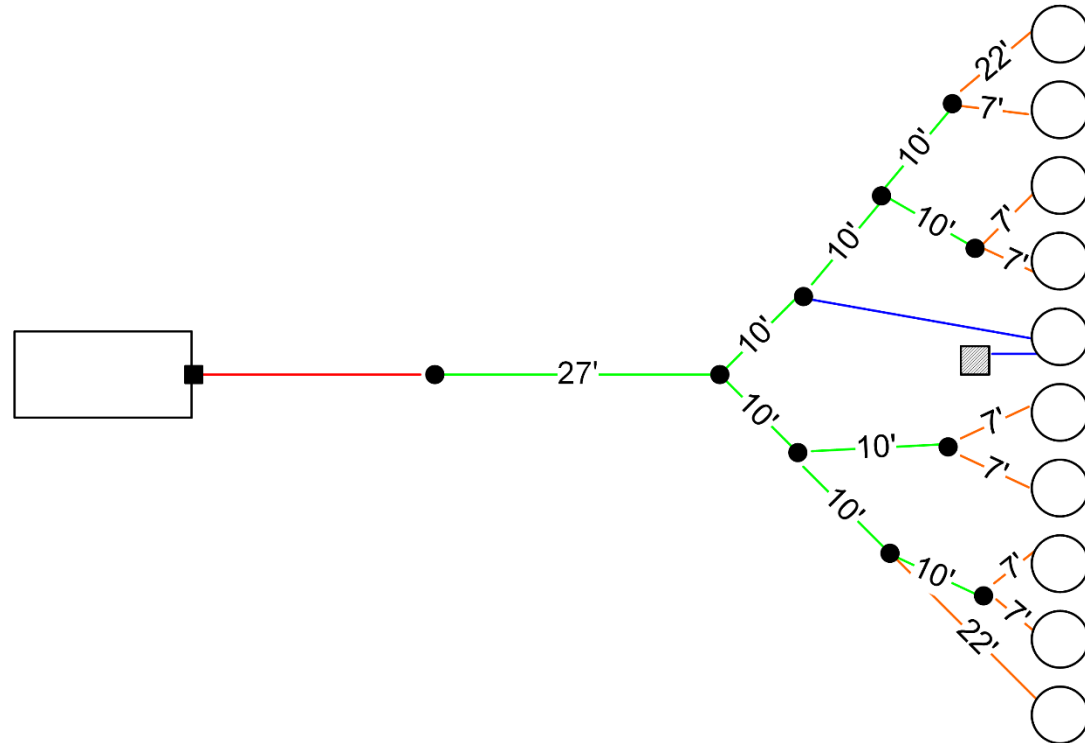







Figure 34: Ten (10) manifold wiring harness

1 Tractor harness, 9 Intermediary harnesses (one 27 ft/8.2 m, eight 10 ft/3 m), 9 ECU harnesses (two 22 ft/6.7 m, seven 7 ft/2.1 m), 1 Work Switch ECU harness

Twelve Manifold Wiring Harness Diagram

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
<u>355020-000016 (10 ft)</u> <u>355020-000019 (27 ft)</u>	Intermediary harness
<u>355020-000017 (7 ft)</u> <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

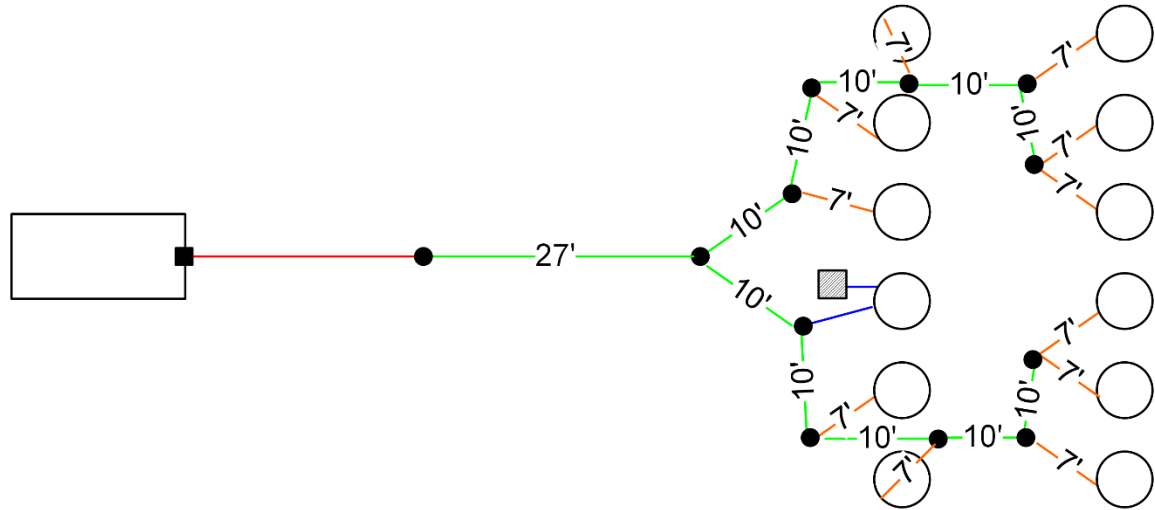







Figure 35: Twelve (12) manifold wiring harness

1 Tractor harness, 11 Intermediary harnesses (ten 10 ft/3 m, one 27 ft/8.2 m), 11 ECU harnesses (all 7 ft/2.1m), 1 Work Switch ECU harness

Sixteen Manifold Wiring Harness Diagram

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
355020-000016 (10 ft) <u>355020-000019 (27 ft)</u>	Intermediary harness
355020-000017 (7 ft) <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

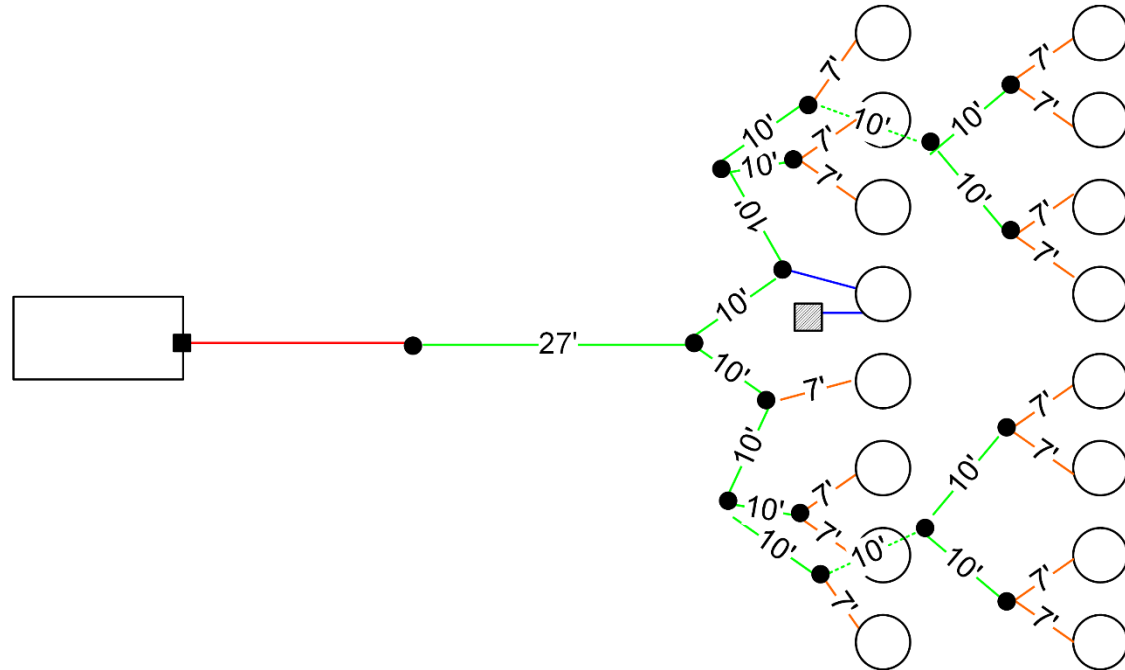







Figure 36: Sixteen (16) manifold wiring harness

1 Tractor harness, 15 Intermediary harnesses (fourteen 10 ft/3 m, one 27 ft/8.2 m), 15 ECU harnesses (all 7 ft/2.1 m), 1 Work Switch ECU harness

Twenty Manifold Wiring Harness Diagram

GUIDE	
	Tractor
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
355020-000016 (10 ft) <u>355020-000019 (27 ft)</u>	Intermediary harness
355020-000017 (7 ft) <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

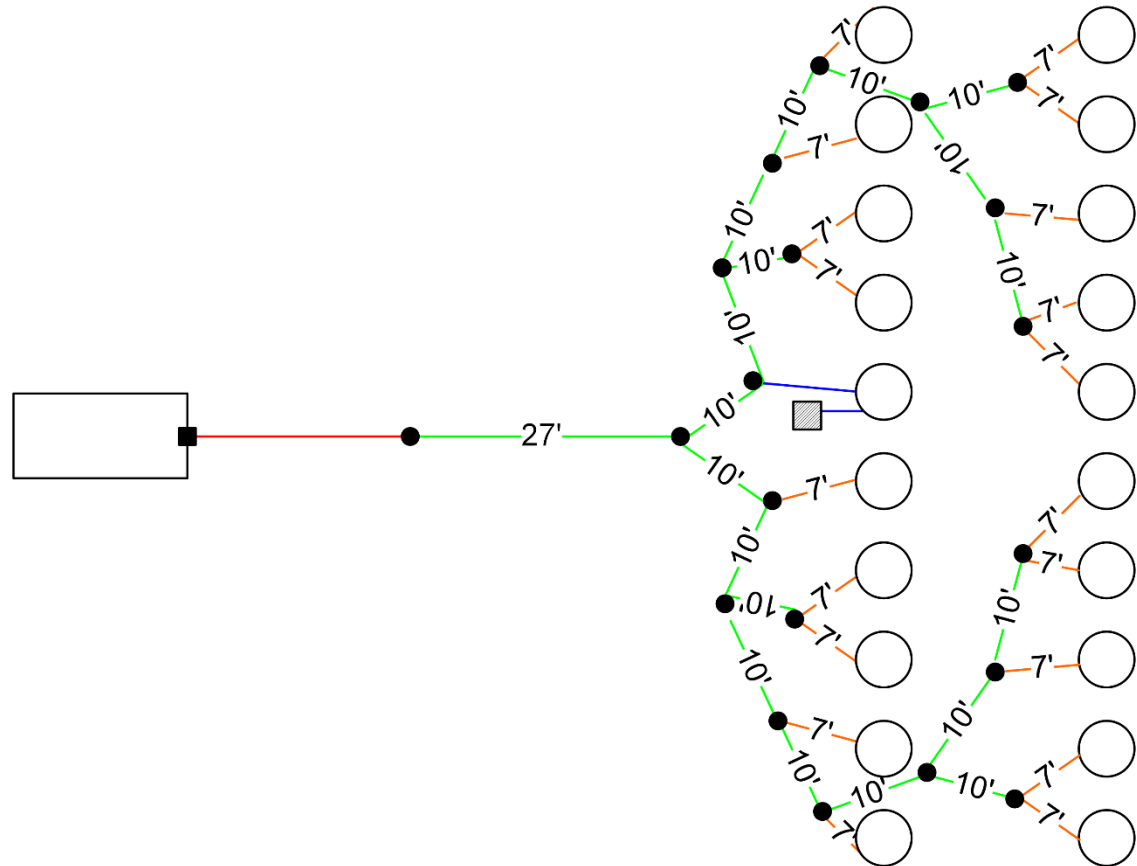








Figure 37: Twenty (20) manifold wiring harness

1 Tractor harness, 19 Intermediary harnesses (eighteen 10 ft/3 m, one 27ft/8.2 m), 19 ECU harnesses (all 7 ft/2.1 m), 1 Work Switch ECU harness

Wiring Harness Diagram with Tow-Between Air Cart

GUIDE	
	Tractor
	Seed Cart
	Manifold (ECU)
	Work switch
	3-amp outlet
	3-way splitter
<u>355020-000021</u>	Tractor harness
<u>355020-000016 (10 ft)</u> <u>355020-000019 (27 ft)</u>	Intermediary harness
<u>355020-000017 (7 ft)</u> <u>355020-000020 (22 ft)</u>	ECU harness
<u>355020-000018</u>	Work Switch ECU harness

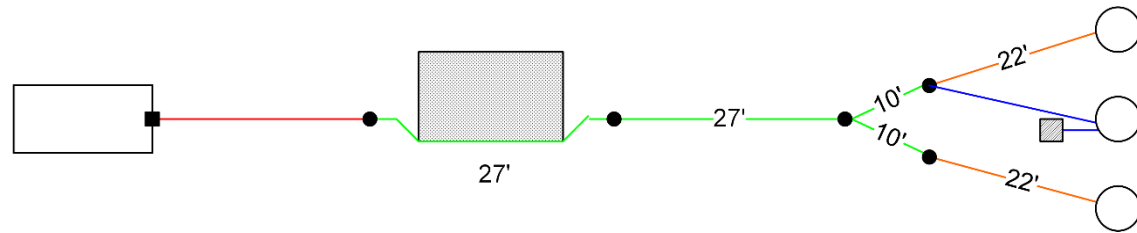


Figure 38: Wiring Harness Diagram with Tow-Between Air Cart

One additional 27 ft (8.2 m) intermediary harnesses will be needed if an air cart is attached between the tractor and the implement.

Appendix B: Installation with Virtual Terminal

This appendix is for customers that are using virtual terminal displays instead of iPads to view blockage and flow information from their Recon Wireless Blockage and Flow Monitor system. This appendix details the differences in installing a system with a virtual terminal display instead of an iPad.

Installing a Wireless Blockage and Flow Monitor system for use with a virtual terminal requires the additional parts listed below. You must also have a virtual terminal installed in your tractor cab that is ISO 11783 compatible with a 480 x 480 screen resolution.

About the Gateway 300

The Gateway 300 is a computing platform that enables communication from the WBFM to your tractor’s virtual terminal display. Using a gateway with the WBFM system replaces the need for the access point and iPad. Therefore, you do not need to install the access point or iPad mount. You should follow the rest of the instructions in this document as they are given.

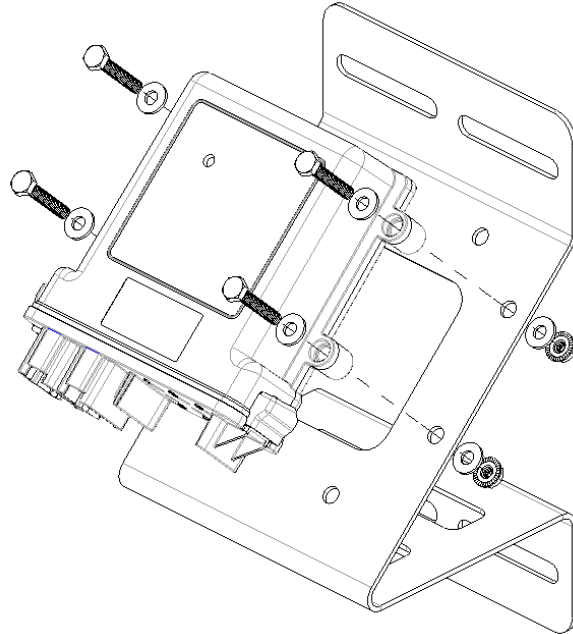
Part Name	Part Number	Quantity needed	Contained within
Gateway 300	153010-000042	1	Gateway kit
SMA cap	251015-000139	3	Gateway kit
Wi-Fi-antenna	252005-000010	1	Gateway kit
1/4" flat washer	352012-000002	8	Gateway kit
U-bolt and mounting hardware (Gateway)	352013-000007	2	Gateway kit
ISO harness	353050-000006	1	Packaged individually
Gateway 300 bracket	353070-000079	1	Gateway kit
Antenna bracket	353070-000083	1	Gateway kit
1/4"-20 x 1 1/2" Screw	356060-000033	4	Gateway kit
1/4"-20 nut	356060-000075	4	Gateway kit
U-bolt and mounting hardware (Wi-Fi antenna)	356060-000137 <i>or</i> 356060-000149	1	Packaged individually

Table 12: Parts required for VT installation

Installing the Gateway 300

Mounting location

The gateway can be installed on either the tractor or on the implement itself somewhere with a flat surface large enough to attach the gateway that is within reach of the tractor’s ISO outlet (the harness is 15 feet/4.6 meters long). The mounting location must be at least 8 inches (20 cm) away from the operator.



1. Position the Gateway 300 (153010-000042) on the mounting bracket (353070-000079). The gateway can be mounted on the bracket in any direction, but the connectors should not face up when the bracket is mounted on the air cart.
2. Secure the gateway to the mounting bracket using the provided screws (356060-000033), washers (352012-000002) and nuts (356060-000075) as shown in the image above.
3. Mount the gateway in the desired mounting location using the provided u-bolts and mounting hardware (352013-000007).

Installing the Wi-Fi antenna

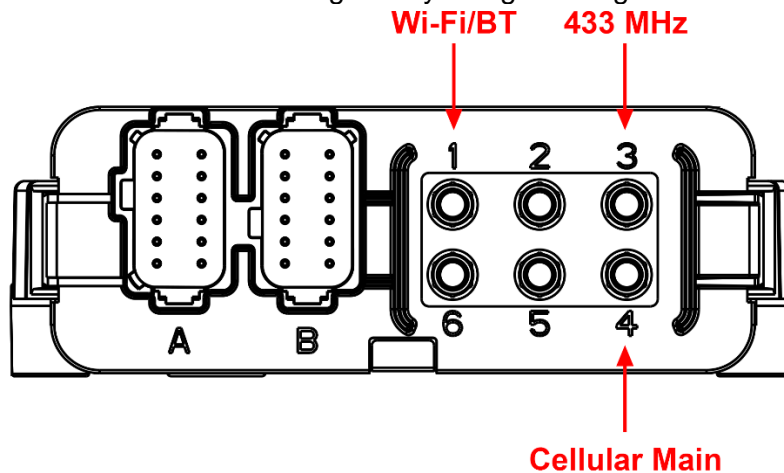
Mounting location

Mounted on the air cart frame or railing, at least 2 feet (60 cm) away from the operator and at least 8 inches (20 cm) from the Gateway 300 to ensure safe operation.

1. Thread the Wi-Fi antenna (252005-000010) cables through the hole in the mounting bracket (353070-000083) and through the nut. Tighten the nut to secure the antenna to the bracket.
2. **Pull-behind cart:** Mount the bracket on the air cart frame near the Gateway 300 using the u-bolts and mounting hardware (356060-000137).

Pull-between cart: Mount the bracket on the air cart railing using the u-bolts and mounting hardware (356060-000149).

3. Connect the antenna cables to the gateway using the diagram in the image below.



4. Cover connectors 2, 5 and 6 with the provided caps (251015-000139).

Connecting the ISO harness to a tractor

1. Connect the ISO harness into the tractor's ISO outlet. This outlet is usually located on the back of the tractor.
2. Route the harness toward the gateway's installation location. Connect the connectors on the opposite end of the ISO harness into ports A and B of the gateway.
3. Secure the harness to the tractor or implement using cable ties (not included with the gateway).
4. Confirm the gateway's connection with the virtual terminal by ensuring that the Wireless Blockage and Flow software is shown on the virtual terminal display. Reference the Wireless Blockage and Flow Monitor Operator's Guide VT Supplement (Intelligent Ag document number 600890-000051) for more information about the virtual terminal display software.

Appendix C: System Configuration Table

Use the following table to record notes about your system configuration. To view your current configuration in the Intelligent Ag Pro app, tap **Settings > Blockage > Edit ECUs Configuration** and then tap a Primary or Section.

Primary or Section #	ECU Serial #	# of Runs	Product	Notes on Ports Out of Sequence (i.e. "Run 5 on Port 12")
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
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	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	
	WBM-		A or B	