INTELLIGENT
Agricultural Solutions

WIRELESS BLOCKAGE MONITOR INSTALLATION MANUAL

Revision 1.1

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Wireless Blockage Monitor Installation Manual

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Record of Revision

Revision Number	Change Description	Revision Date	Inserted By
1.0	Initial release	10/27/2011	CJW
1.1	Modified Downloading the Wireless Blockage Monitor app section. Added About the inclusion of the iPad with the Wireless Blockage Monitor system and To sign out of a default app store account instructions within that section	12/13/2011	CJW

Related Documentation

Document Number	Document Title
600890-000015	Wireless Blockage Monitoring Operator's Guide

Glossary		
Abbreviation	**Term**	**Definition**
	Access Point	In the Wireless Blockage Monitor, the access point is the equipment that broadcasts the local wireless network's signal
App	Software application	A computer program, especially one designed for a mobile device
BIT	Built-in-Test	A mechanism built in to the Wireless Blockage Monitor that allows that equipment to test itself for, and alert the operator of, any possible problems
ECU	Electronic Control Unit	A component of the Wireless Blockage Monitor that allows for the communication of the flow sensors to the iPad software app via a WiFi connection
LED	Light Emitting Diode	A semiconductor diode that converts applied voltage to light. In the Wireless Blockage Monitor, an LED is used to signify if the ECU is receiving power and functioning properly
WiFi	Wireless Fidelity	A local area network that uses high frequency radio signals to transmit and receive data over short distances
	Work Switch	A component of the air seeder equipment that signifies when the equipment is enabled (in the ground) or disabled (out of the ground). When the work switch is signals that the air seeder is out of the ground, the audio alarm that would normally alert the operator to blockage of flow in the equipment's run will automatically be silenced

1 Introduction

1.1 How to use this manual

This manual will guide you through the entire process of installing the Wireless Blockage Monitor on your air seeder implement.

- Section 2 includes instructions for installing all of the components of the Wireless Blockage Monitor in the order they are to be installed.
    - Each subsection within Section 2 includes instructions for one procedure of the installation. In addition to the actual instructions for the procedure, the subsections includes a short introduction about the component being installed, the parts and tools needed for that procedure, steps that must be completed prior, and other related procedures.
- The appendix of this document includes information that, while not vital to the installation process, allows for a deeper understanding about that specific topic

1.2 Wireless Blockage Monitor parts list

The following components are required for installation of the Wireless Blockage Monitor. The number of each component that is needed for installation will vary based on your air seeder configuration, as noted in the Quantity Needed column.

Kit Name	Part Number	Quantity Needed
Standard Sensor Kit (See Table 2) or Nonstandard Sensor Kit (See Table 3)	153025-000015	1 per final run
Ubolts with Saddle Clamp Options (for ECU mounting bracket) Diameter of manifold tower determines size of U-bolt needed	2” diameter U-bolt: 352013-000006 2.5” diameter U-bolt: 352013-000007 3” diameter U-bolt: 352013-000008 4” diameter U-bolt: 352013-000009	2 per manifold
Tractor Kit (See Table 4)	153025-000016	1 per system
Master ECU Kit (See Table 5)	153025-000019	1 per system
ECU Kit (See Table 6)	153025-000017	1 per manifold, minus 1 due to ECU master kit

(Table 1: Kit list for installation, cont’d on next page)

Intermediary Harness Kit (See Table 7)	153025-000018	Air seeders with 4 or more manifolds: 3 less than 1 per manifold Not required for air seeders with less than 3 manifolds
Deutsch Sealing Plug	153560-000015	Air seeders with less than 4 manifolds:1 Air seeders with less than 4 manifolds with seed cart between: 2 Air seeders with more than 4 manifolds: None needed Air seeders with more than 4 manifolds with seed cart between: 1
Access Point Window Mount Kit (See Table 8)	153025-000022	1 per system (optional)
iPad with WBM App Installed	153025-000024	1 per system (optional)

Table 1: Kit list for installation

Part Name	Part Number	Quantity included per Kit
1.25” Hose Clamp	352013-000005	2
Adaptor Hose	351060-000008	1
Sensor Assembly	153570-000015	1

Table 2: Standard Sensor Kit Subcomponents (for 1.25” hoses)

Part Name	Part Number	Quantity included per Kit
1.25” Hose Clamp	352013-000005	4
Adapter Hose	351060-000008	2
Sensor Assembly	153570-000015	1

Table 3: Nonstandard Sensor Kit Subcomponents (for 1” hoses)

Part Name	Part Number	Quantity included per Kit
Tractor Harness	355020-000021	1
Access Point	150570-000002	1
Access Point Power Cable	355020-000031	1
Car charger (for iPad)	154005-000002	1
Tablet (iPad) mount	352004-000002	1
3.5” Tablet (iPad) Mount Arm	352004-000003	1
Rail attachment for tablet (iPad) mount	352004-000004	1
Wire Guide	355005-000004	6
Alcohol Wipes	359060-000003	2
Three-Way Cigarette Lighter Adaptor	154005-000004	1
Oil-resistant cork/ rubber gasket (included with the Access Point)	351521-000004	2

Table 4: Tractor Kit Subcomponents

Part Name	Part Number	Quantity included per Kit
Wireless Blockage Monitor Module	150505-000001	1
ECU Mounting Bracket	351050-000012	1
ECU Bracket Shield	351050-000015	2
¼ 20 Steel Locknut	352011-000040	8
Miniature Cable Tie	355032-000003	25
Workswitch Bracket	351050-000016	1
Cotter Pin, 3/32” diameter	352015-000011	4
Workswitch	153560-000014	1
Cable Tie, 7.9”	355032-000004	100
Ceramic Workswitch Magnet	359035-000001	1
¼” Steel Washer	352012-000024	10
¼” 20x½” Steel Bolt	352010-000084	2
3 Way DTM Splitter	355030-000002	2
27 foot Intermediary Harness	355020-000019	1
22 foot ECU Harness – Work Switch	355020-000018	1

Table 5: Master ECU Kit subcomponents

Part Name	Part Number	Quantity included per Kit
Wireless Blockage Monitor Module	150505-000001	1
ECU Mounting Bracket	351050-000012	1
ECU Bracket Shield	351050-000015	2
¼ 20 Steel Locknut	352011-000040	6
Miniature Cable Tie	355032-000003	25
¼" Steel Washer	352012-000024	6
Cotter Pin, 3/32" diameter	352015-000011	4
22 foot ECU Harness	355020-000020	1

Table 6: ECU Kit Subcomponents

Part Name	Part Number	Quantity included per kit
3 Way DTM Splitter	355030-000002	1
27 foot Intermediary Harness	355020-000019	1

Table 7: Intermediary Harness Kit Subcomponents

Part Name	Part Number	Quantity included per kit
Ball Mount with Long Arm & 2/Diamond Bases	352004-000005	1
Suction Cup Base with Twist Lock	352004-000006	2

Table 8: Access Point Window Mounting Kit (optional)

1.3 Tools Required

In addition to the parts included in the installation kit, you will need the following tools for the installation of the Wireless Blockage System:

- Standard wrench and socket sets
- Pliers
- Cordless drill and/or flathead screwdriver (optional)
- Paint pen or other permanent marking tool (optional)

1.4 Technical Assistance

If you require support during any step of the Wireless Blockage Monitor Installation process, please contact IAS using the information below. IAS technical support is available from 8 a.m. to 5 p.m. Central Time Monday through Friday. During planting season (April through June), these hours are expanded to 7:00 a.m. to 12:00 midnight Central Time, Sunday through Saturday. IAS is closed during some federal United States holidays.

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2 Installation Instructions

2.1 Overview Checklist

The Wireless Blockage Monitor installation is accomplished in the following steps:

- ☐ Download the Wireless Blockage Monitor app
- ☐ Install the iPad mounting bracket
- ☐ Install the access point
- ☐ Install the work switch
- ☐ Install the wiring harness
- ☐ Install the ECU
- ☐ Install the flow sensors
- ☐ Connect the flow sensors to the ECUs
- ☐ Configure the Wireless Blockage Monitor
- ☐ Configure the work switch
- ☐ Rename the ECUs in the Wireless Blockage Monitor app

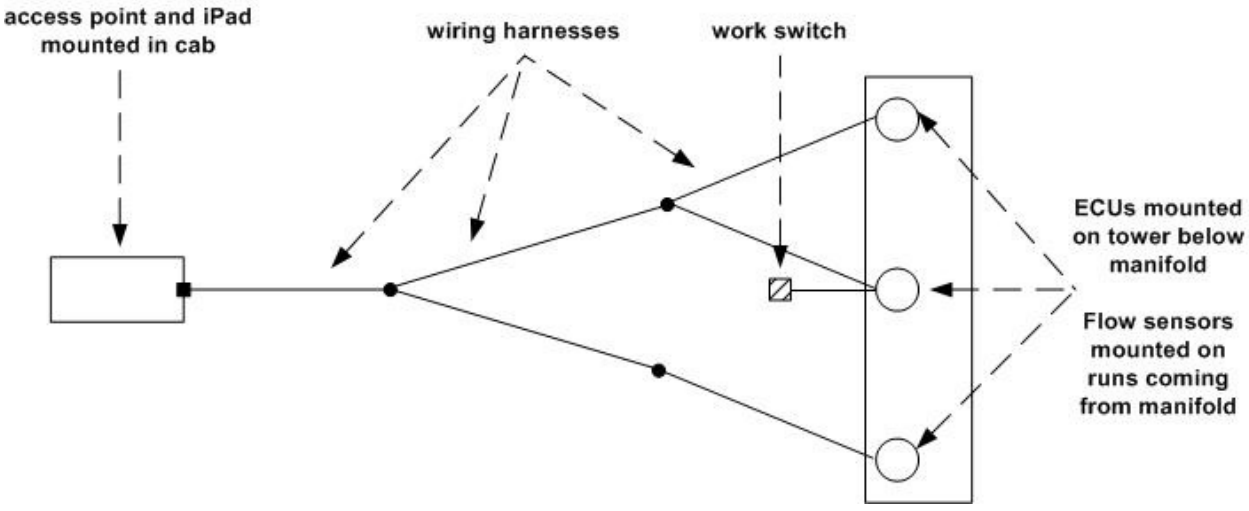


Figure 1: Installation location overview

The wiring harness in this figure is specific for a three-manifold air seeder. For more wiring harness diagrams, refer to Appendix A of this document.

2.2 Downloading the Wireless Blockage Monitor app

Figure 2: A screenshot from the Wireless Blockage Monitor app

About the Wireless Blockage Monitor App
The Wireless Blockage Monitor app is a free software application that may be downloaded onto your iPad from Apple's iTunes App Store. The Wireless Blockage Monitor app communicates any run blockages to the operator and allows the operator to configure the system.

Part Name	Part Number	Quantity needed	Contained within
iPad	153025-000024 (if included with the Wireless Blockage Monitor system)	1	May not be included with the Wireless Blockage Monitor system

Table 9: Parts needed to download Wireless Blockage Monitor app

About the inclusion of the iPad with the Wireless Blockage Monitor system
There are two methods that customers obtain the iPad that they will use with the Wireless Blockage Monitor: purchased from IAS as part of the Wireless Blockage Monitor system, or purchased elsewhere. iPads that are included in with the Wireless Blockage Monitor will come preconfigured, that is installed with the Wireless Blockage Monitor app and signed into a default Apple ID. For more information about Apple IDs, reference "Creating an Apple ID." If you wish to download additional apps onto a preconfigured iPad, reference "To download additional free apps on a preconfigured iPad" and "To download non-free apps on a preconfigured iPad."

Tools needed to download Wireless Blockage Monitor app
None

Number of times procedure is performed
If required, each step will only need to be performed once

Steps that must be completed prior to this procedure
For iPads not included with the Wireless Blockage Monitor:

- Obtaining an iPad
- Creation an Apple ID (see "Creating an Apple ID)

For preconfigured iPads:

- None

Other related procedures

- Installing the access point (Section 2.4)
- Configuring the Wireless Blockage Monitor (Section 2.10)
- Configuring the work switch (2.11)
- Renaming the ECUs in the Wireless Blockage Monitor app (Section 2.12)

Installation location

Not applicable

Creating an Apple ID

NOTE: This step is only required for users whose iPads were not included with the Wireless Blockage Monitor and who do not already have an Apple ID, or users whose received a preconfigured iPad but wish to download non-free apps onto the iPad (see "To download non-free apps on a preconfigured iPad" for more information)

An Apple ID is required for downloading items such as apps from the App Store or songs from iTunes. You may use the same Apple ID on different Apple devices, such as an iPad and an iPod. If you have an existing Apple ID, you may use it to download the Wireless Blockage Monitor – you are not required to create a new Apple ID.

For instructions on how to create an Apple ID, refer to Apple's support website or contact your dealership for assistance.

NOTE: Since the Wireless Blockage Monitor 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

To download the Wireless Blockage Monitor app

NOTE: This step is only required if your iPad was not included with the Wireless Blockage Monitor, or if you have signed out of the default Apple ID on a preconfigured iPad and signed in with a different Apple ID

1. Connect the iPad to a WiFi network
    a. **NOTE:** The Wireless Blockage Monitor access point does not provide access to the Web, so therefore you must be connected to a different internet connection, such as a home WiFi network. Please contact IAS for assistance if you do not have access to a WiFi network
2. On the iPad's home screen, press the App Store icon
    a. **NOTE:** You may need to press the iPad's home button to view the screen with the App Store icon
3. Press the **Search** field in the top right corner of the App Store screen. An on-screen keyboard will appear
4. Type *wireless blockage monitor* and press the **Search** button
5. When you see the IAS Wireless Blockage Monitor app, press it
6. Press the **+Free** button
7. Press **INSTALL APP**
8. Follow the on-screen instructions to finish downloading the app

To download additional free apps on a preconfigured iPad
NOTE: These instructions only apply to users who wish to download additional free apps – other than the Wireless Blockage Monitor app – onto their preconfigured iPad. These instructions do not apply to users with preconfigured iPads who have signed out of the default account or who have changed the password of the default account

1. Select the free app you'd like to download from the app store on the iPad
    a. To access the app store, press the **App Store** icon on the iPad's home screen
2. Press the **+Free** button and press **Install App**
3. You will be prompted to provide a password. Ensure that the e-mail that is displayed is *ias+*[iPad serial number]*@intelligentaguser.com*. This is the e-mail associated with the default account and should automatically appear
4. Type *Pswd1234* into the password field and press **OK**. Once it has finished downloading, the app will appear on the iPad's home screen

To download non-free apps on a preconfigured iPad
NOTE: These instructions only apply to users who wish to download non-free apps onto their preconfigured iPad. These instructions do not apply to users who have already signed out of the default account and signed in with their own Apple ID

1. Since the preconfigured default account does not allow for the download of non-free apps, you must sign out of the account. To sign out:
    a. From the iPad's home screen, press the **Settings** icon
    b. Press **Store** from the left column
    c. Press **Sign Out**
2. Sign into the iPad with an existing Apple ID or create a new Apple ID
    a. Refer to "Creating an Apple ID" instructions above
3. Download the non-free app you wish to install onto the iPad from the app store
    a. To access the app store, press the **App Store** icon on the iPad's home screen

WARNING: Since downloaded apps are retained to an Apple ID, the Wireless Blockage Monitor and any other free apps that you may have downloaded while signed in with the preconfigured Wireless Blockage Monitor default account will not carry over when you sign into the iPad with a different Apple ID. For information on how to download the Wireless Blockage Monitor app while signed into the different Apple ID, refer to the "To download the Wireless Blockage Monitor app

2.3 Installing the iPad mounting bracket

About the iPad mounting bracket
The iPad mounting bracket serves as a safe place to rest the iPad during air seeding and also allows the operator to view the Wireless Blockage Monitor app at a glance. The mounting bracket is ruggedized, meaning that it will absorb some of the bumps and jolts typical during air seeding.

Figure 3: An iPad mount attached to a tractor's mounting bar

Part Name	Part Number	Quantity needed	Contained within
Tablet (iPad) Mount	352004-000002	1	Tractor kit
3.5" Tablet (iPad) Mount Arm	352004-000003	1	Tractor Kit
Rail attachment for Tablet (iPad) mount	352004-000004	1	Tractor kit
Car charger (for iPad)	154005-000002	1	Tractor kit
Three-way cigarette lighter adaptor	154005-000004	1	Tractor kit
Wire guides (optional)	355005-000004	Varies (6 included with kit)	Tractor kit
Alcohol Wipes (optional)	359060-000003	1	Tractor kit
iPad	153025-000024 (if included with the Wireless Blockage Monitor system)	1	May not be included with the Wireless Blockage Monitor system

Table 10: Parts needed to install the iPad mounting bracket

Tools needed to install the iPad mounting bracket
7/16" socket

Number of times procedure is performed
Once per Wireless Blockage Monitor system

Steps that must be completed prior to this procedure
None

Other related procedures

- Downloading the Wireless Blockage Monitor app on the iPad

Installation location

IAS suggests installing the iPad mounting bracket onto the mounting bar (as shown in Figure 3) in the tractor cab, if one is available. The iPad mounting bracket; however, may be installed anywhere in the tractor cab where it would be easily visible and within reach of the operator during air seeder operation.

To install the iPad mounting bracket

1. Insert the ball of the 3.5" tablet (iPad) mount arm into the back of the tablet (iPad) mount (352004-000002)
2. Connect the rail attachment for tablet (iPad) mount (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 three-way cigarette lighter adaptor (154005-00004) into the tractor's cigarette lighter
5. Plug the car charger (for iPad) (154005-000002) into the cigarette lighter adaptor and into the iPad
    a. **NOTE:** A battery charge indicator is displayed at the top left corner of the iPad. If you desire, the iPad may be connected to the charger at all times
    b. **NOTE:** Steps 6 through 8 are optional steps that describe how to install the wire guides. Wire guides may be used to help secure the iPad charger cord to the tractor cab (such as to the dash). Installing the wire guides for the iPad charger cord reduces the chance of the cord becoming tangled or becoming caught by e.g. the operator's hands
6. Clean the area where you will be placing the wire guides (355005-000004) with the alcohol wipes (359060-000003)
7. Remove and discard the paper backing from the wire guides. Place the adhesive side of the wire guides onto the desired location on the tractor cab, next to the iPad charger cord
8. Place the iPad charger cord into the hook of the wire guide

2.4 Installing the access point

About the access point
The access point allows the Wireless Blockage Monitor app to communicate with the ECUs. The access point must be powered on in order for the Wireless Blockage Monitor app to communicate any run blockages to the operator. Depending on how your tractor's cigarette lighter operates, i.e. if the cigarette lighter only powers on devices when the tractor is on, this may require your tractor key to be in the "on" position in order for the access point to transmit.

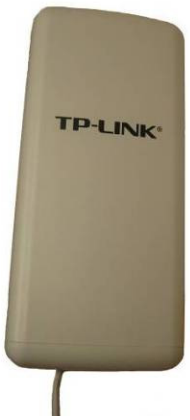


Figure 4: Wireless Blockage Monitor Access Point

Part Name	Part Number	Quantity needed	Contained within
Access Point	150570-000002	1	Tractor kit
Access Point Power Cable	355020-000031	1	Tractor kit
Three-Way Cigarette Lighter Adaptor	154005-000004	1	Tractor kit
Wire Guides	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
iPad	153025-000024 (if included with the Wireless Blockage Monitor system)	1	May not be included with the Wireless Blockage Monitor system

Table 11: Parts needed to install access point

NOTE: Two cable ties are included in the packaging of the access point assembly. If these cable ties become lost or misplaced, you may use some of the 7.9" cable ties in the Master ECU kit

Tools need to install access point
None

Number of times procedure is performed
Once per Wireless Blockage Monitor system

Steps that must be completed prior to this procedure
- Wireless Blockage Monitor app must be downloaded to the iPad
    - In order to ensure that the access point is operating correctly after installation of the access point, you must have the app downloaded to the iPad

Other related procedures
- Downloading the Wireless Blockage Monitor app on the iPad
    - The access point must be installed prior to the Wireless Blockage Monitor app being able to communicate with the rest of the Wireless Blockage Monitor system

Installation location
The access point should be installed in the tractor cab so that it is protected from foreign material such as dust and dirt. IAS recommends installing the access point on the tractor cab's mounting bar (if available), directly behind where the iPad mounting bracket is installed. If this is not possible, chose an installation location that would not hinder the operator's daily activities within the cab and where the access point would not be likely to become damaged.
NOTE: Window mounting kits are available. Contact IAS for purchase details or for more information.

To install the access point
1. Remove the cover from the back of the access point assembly (150570-000002) by pushing the tab up and sliding the cover off
2. Plug the three-way cigarette lighter adaptor (154005-000004) into the tractor's cigarette lighter, if you have not done so already
3. Connect the access point power cable (355020-000031) to the port labeled "LAN" on the back of the access point assembly and the cigarette lighter adaptor

Figure 5: Access Point LAN connection

    a. **NOTE:** The access point will only receive power when it is plugged into the cigarette lighter and the cigarette lighter is providing power. This may require the tractor key to be in the "on" position
4. Replace the access point's back cover by sliding the cover on and pushing the tab down. The power cable should rest in the notches in the access point and cover
5. 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, called out in Figure 6

6. 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 packaging of the access point assembly, or with the 7.9" cable ties (355032-000004) included in the Master ECU kit
   NOTE: Steps 7 through 9 are optional steps that describe how to install the wire guides. Wire guides may be used to help secure the access point power cable to the tractor cab (such as to the dash). Installing the wire guides for the access point power cable reduces the chance of the cable becoming tangled or becoming caught by e.g. the operator's hands
7. Clean the area where you will be placing the wire guides (355005-000004) with the alcohol wipes (359060-000003)
8. Remove and discard the paper backing from the wire guides. Place the adhesive side of the wire guides onto the desired location on the tractor cab, next to the access point power cable
9. Place the access point power cable into the hook of the wire guide

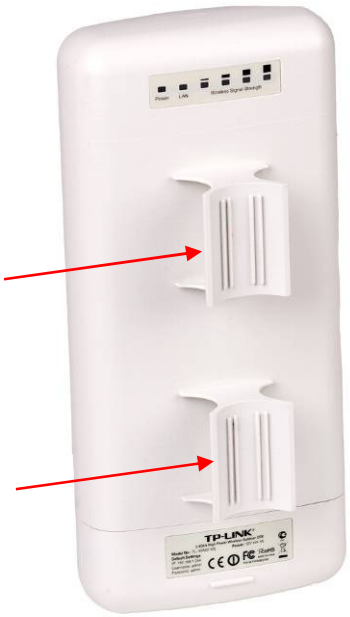


Figure 6: Apply the gasket to the feet of the access point

To connect the iPad to the access point network

1. Power on the tractor, power on the iPad, and connect the access point power cable to the tractor's cigarette lighter, if you have not done so already
2. Press the **Settings** icon on the iPad's home page
3. Press the **Wi-Fi** icon on the top left corner of the screen
4. Ensure that Wi-Fi capabilities are on (the gray bar to the right of Wi-Fi will display *ON*)
5. Press **IASBlockage** under *Choose a Network…*list
   a. **NOTE:** If *IASBlockage* does not appear on the *Choose a Network…*list, wait a few minutes to give the iPad time to search for the network. If, after several minutes, the network does not appear, contact IAS for assistance
6. A checkmark will appear to the left of the IASBlockage network and the network name will turn blue on the *Choose a Network…* list when the iPad is connected to the network.

2.5 Installing the work switch

About the work switch
The work switch serves as a signal to the Wireless Blockage Monitor app when the air seeder 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 is disengaged (i.e. out of the ground).

NOTE: When the air seeder is out of the ground, the Wireless Blockage Monitor app will display that all runs are blocked (as no air or material is flowing through the runs), but the audio alarm will not sound

Figure 7: Wireless Blockage Monitor work switch assembly

About work switch methods
Air seeder work switches use one of two methods to determine when the implement is in the ground (engaged):
1) Default method: the work switch is engaged (magnet is close to the work switch) when the air seeder is in the ground. Likewise, the work switch is disengaged (magnet and work switch are apart) when the air seeder is out of the ground
2) Non-default method: the work switch is disengaged when the air seeder is in the ground. Likewise, the work switch is engaged when the air seeder is out of the ground

You may want to install the Wireless Blockage Monitor work switch near the air seeder's existing work switch (if one exists).

If the work switch is installed using the second (non-default) method, follow the steps in "To reverse the work switch option in the Wireless Blockage Monitor app" after you have configured the Wireless Blockage Monitor.

To reverse the work switch option in the Wireless Blockage Monitor app

NOTE: This procedure only has to be performed if the work switch uses the non-default method, as described in the "About work switch methods" section above

1. Open the Wireless Blockage Monitor app on your iPad by pressing the icon on your iPad's home screen (if the app is not already open)
2. Press the **Configure** icon, located in the left column of the screen
3. Press **Configure**
4. On the Edit Current Configuration screen, drag the gray box next to **Work Switch Reversed** (on the bottom of the screen) to the right so that *ON* is shown. The change will automatically be saved

Part Name	Part Number	Quantity needed	Contained within
Ceramic Work Switch Magnet	359035-000001	1	Master ECU kit
¼" 20x½" Steel Bolt	352010-000084	2	Master ECU kit
¼" Steel Washer	352012-000024	4	Master ECU kit
¼" 20 Steel Locknut	352011-000040	2	Master ECU kit
Work Switch Bracket	351050-000016	1	Master ECU kit
Work Switch Assembly	153560-000014	1	Master ECU kit

Table 12: Parts needed to install work switch

Tools needed to install work switch

- Standard wrench set

Number of times procedure is performed

Once per Wireless Blockage Monitor system

Steps that must be completed prior to this procedure

- Download the Wireless Blockage Monitor app on the iPad (Section 2.2)
- Installation of the access point (Section 2.4)
  - **NOTE:** Access point must be powered
- iPad connected to Wireless Blockage Monitor WLAN (Section 2.4)
- Determine if there is an existing work switch and if so, where it is located. The Wireless Blockage Monitor work switch should be installed as close to the existing work switch as possible (if one exists)
- Determine what method is used by the air seeder's existing work switch (see "About work switch methods" on previous page). The method considered default by IAS is when the work switch and magnet are close when the air seeder is in the ground

Other related procedures

- Installing the Master ECU harness (see Section 2.6)
  - The work switch will be connected to the Master ECU after installation is completed
- Configuring the work switch (see Section 2.11)
  - After installation, the work switch must be configured using the Wireless Blockage Monitor app

Installation Location

The Wireless Blockage Monitor work switch should be installed as close as possible to the air seeder's existing work switch (if one exists). The existing work switch is typically found towards the center of the air seeder's frame on a hydraulic cylinder.

If there is not an existing work switch on the air seeder, refer to the "To install a work switch on an air seeder if not existing work switch is present" instructions to help determine where the Wireless Blockage Monitor work switch should be installed.

To install a work switch on an air seeder

NOTE: These instructions are for installing a work switch on an air seeder in which a work switch was already present. If your air seeder does not have an existing work switch, follow the "To install a work switch on an air seeder if no existing work switch is present" instructions below

1. Slide one ¼" steel washer (352012-000024) onto the end of a ¼" 20 x ½" steel bolt (352010-000084). Insert the bolt into the work switch bracket (351050-000016). The washer should rest against the bolt head and the work switch bracket.
2. Repeat Step 1 with the remaining bolt
3. Install the work switch bracket to the air seeder. If possible, install onto the existing work switch bracket. If this is not possible, refer to the "To install a work switch on an air seeder if not existing work switch is present" instructions
4. To secure the work switch bracket to the existing bracket or air seeder, thread in order one steel washer and one ¼" 20 steel locknut (352011-000040) onto the ends of each bolt (refer to Figure 8)
5. Remove the front locknut from the work switch assembly (153560-000014) and insert it into the work switch bracket
6. Place the ceramic work switch magnet (359035-000001) onto the air seeder's frame, near the air seeder's existing work switch magnet
7. Replace the locknut onto the work switch assembly (refer to Figure 9)
8. Adjust the locknuts on the work switch assembly so that the work switch is within one-forth inch (1/4") of the work switch magnet when the work switch is engaged (refer to Figure 10). Refer to the "To adjust work switch length" instructions for specific detail on this step
    a. **CAUTION:** The work switch should not touch the magnet. If the work switch touches the magnet, it make cause damage to the Wireless Blockage Monitor switch

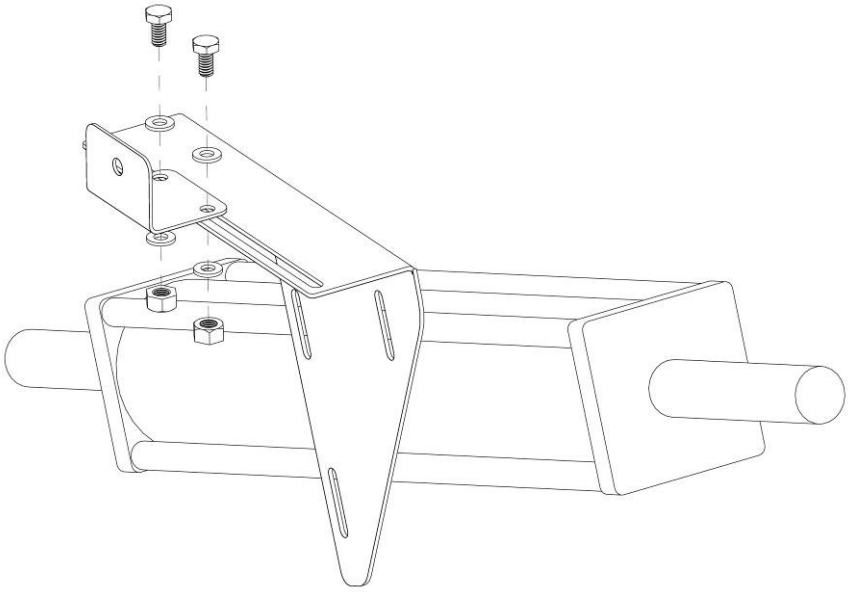


Figure 8: Installing the work switch bracket on top of an existing work switch bracket
Existing work switch bracket is shown attached to a hydraulic cylinder.

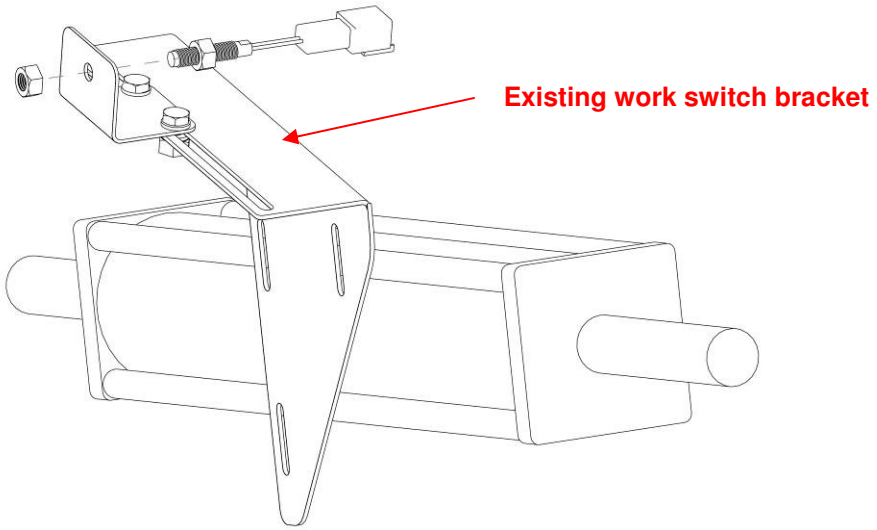


Figure 9: Installing the work switch onto the bracket

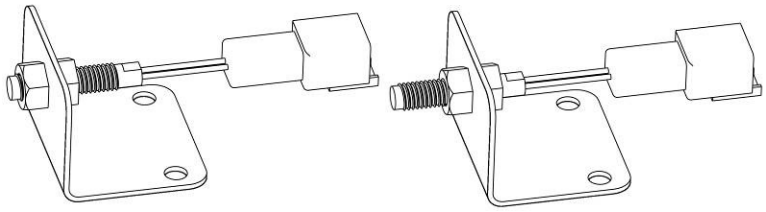


Figure 10: Adjusting the work switch length

In order to get the work switch the correct distance from the magnet, you must adjust the length the work switch sticks out of the work switch bracket. The left image shows the work switch with a short length sticking out of the work switch bracket. The right image shows a longer length sticking out of the work switch bracket.

To adjust the length the work switch bracket:

1. Remove the nut from the work switch bolt that is in front of the work switch bracket
2. Screw the remaining nut on the work switch into the correct position (further from or closer to the bracket)
3. Adjust the work switch bolt until it is the correct distance from the work switch magnet (the work switch should be approximately ¼" from the magnet, but should not touch it)
4. Replace the nut removed in Step 1 so that the work switch is secured to the bracket

To install a work switch on an air seeder if no existing work switch is present
NOTE: These instructions are for installing a work switch on an air seeder where no work switch was previously installed on the implement. If you have difficulty determining where the work switch should be installed, please contact IAS for assistance

1. Determine the location of the hydraulic cylinders that are used to lift the air seeder implement in and out of the ground at the end of the rows
2. Determine a location where the work switch and magnet may be mounted so that they will be moved apart on the hydraulic cylinder when the air seeder is out of the ground
3. Follow Steps 1 through 7 of the "To install a work switch on an air seeder" instructions. Since no work switch was previously present, you may need to drill into the air seeder frame for the work switch bracket bolts or zip-tie the work switch bracket onto the hydraulic cylinder
4. Follow the instructions given in Section 2.11 to ensure that the work switch has been properly installed

Figure 11: A work switch installed on an air seeder where no bracket previously existed
In the figure above, the air seeder is out of the ground and the hydraulic cylinder is moved apart

2.6 Installing the wiring harnesses

About the wiring harnesses
The wiring harness provides power from the tractor to the Wireless Blockage Monitor system. There are four different wiring harness types: 1.) tractor, 2.) intermediary, 3) ECU, and 4) Master ECU. The number of intermediary and ECU harnesses needed for each installation varies based on the number of manifolds on the air seeder, as noted in Table 13.

Installing a wiring harness on when a seed cart is between the tractor and air seeder
If a seed cart is connected between the tractor and the air seeder, an extra intermediary harness is needed. If using this setup, run the intermediary harness that is directly connected to the tractor harness along the side of the seed cart and secure the harness to the hydraulic line of the seed cart. Insert a Deutsch sealing plug assembly (153560-000015) into the unused receptacle of the three-way splitter to prevent foreign materials from entering the three-way splitter. From the end of this intermediary harness, resume the normal wiring harness setup.

Part Name	Part Number	Quantity needed	Contained within
Tractor harness	355020-0000021	1	Tractor kit
27 foot Intermediary Harness	355020-000019	For air seeders with two manifolds: 1 For air seeders with three manifolds: 2 For air seeders with four or more manifolds: Two less than the number of manifolds	Master ECU kit and/or Intermediary Harness kit
22 foot ECU Harness	355020-000020	One less than 1/manifold (due to Master ECU harness)	ECU kits
22 foot ECU Harness – Work switch	355020-000018	One per system	Master ECU kit
7.9” Cable Tie	355032-000004	Approximately 100	Master ECU
Deutsch Sealing Plug	153560-000015	Varies depending on air seeder configuration	Deutsch Sealing Plug

Table 13: Parts needed for installing the wiring harnesses

Tools needed

- Pliers (optional)

Number of times procedure performed

- Tractor harness installation procedure: once per Wireless Blockage Monitor system
- Intermediary harness installation procedure:
  - Once for air seeders with two manifolds
  - Two for air seeders with three manifolds
  - Two less than the number of manifolds for air seeders with four or more manifolds
- ECU harness installation procedure: Once per manifold (minus one due to the installation of the Master ECU harness)
- Master ECU harness installation procedure: Once per system

Steps that must be completed prior to this procedure

- Tractor must be connected to the air seeder during installation of the tractor wiring harness
- Installation of the work switch (Section 2.5)

Other related procedures

- Installation of the ECUs (Section 2.7)

Installation location

IAS recommends installing the wiring harness on top of an existing wiring harness or hydraulic hose on the air seeder when possible, or running the intermediary harness through the yoke of the air seeder. Doing so reduces the chance of the wiring harness becoming pinched during operation or transportation of the air seeder.

To connect a tractor harness to a tractor

1. Connect the tractor harness (355020-000021) to the tractor's three-pin power outlet. This outlet is located in the tractor cab. If you are unsure of the location of the three-pin power outlet in your cab, consult your tractor's owner's manual
   a. **NOTE:** If your tractor does not have a three-pin power outlet, please contact IAS for assistance
2. Extend the tractor harness until it reaches the hitch of the air seeder
   a. **NOTE:** If the tractor harness does not need to be fully extended to reach the air seeder hitch, coil the harness around a hydraulic line or electrical wire
3. Using 7.9" cable ties (355032-000004), secure the tractor harness to the tractor and/or air seeder to prevent the wiring harness from becoming snagged on the tractor tires

To connect an intermediary harness to a tractor harness
NOTE: Only two intermediary harnesses may be attached to the tractor harness
NOTE: If an air cart is attached between the tractor and the air seeder, skip to the "To connect an intermediary harness to a tractor harness when air cart is in-between" instructions below

1. Connect the black end of the intermediary harness (355020-000019) into the three-way splitter at the end of the tractor harness
    a. **NOTE:** If only one intermediary harness will be connected to the tractor harness, insert a Deutsch sealing plug assembly (153060-000015) into the remaining receptacle of the three-way splitter to prevent foreign material from entering the three-way splitter. Refer to the appropriate figures in Appendix A to determine if two intermediary harnesses will be connected to the tractor harness's three-way splitter
2. Extend the intermediary harness over the air seeder. Use the appropriate figures in Appendix A to help guide the placement of the intermediary harness
    a. **NOTE:** If the intermediary harness does not need to be fully extended to reach where it must connect, coil the extra length of the harness around a hydraulic line or electrical wire
3. Using 7.9" cable ties (355032-000004), secure the intermediary harness to the air seeder

To connect an intermediary harness to a tractor harness when air cart is in-between
NOTE: This step only needs to be performed if an air cart is attached between the tractor and the air seeder

1. Connect the black end of the intermediary harness (355020-000019) into the three-way splitter at the end of the tractor harness
2. Insert a Deutsch sealing plug assembly (153060-000015) into the remaining receptacle of the three-way splitter to prevent foreign material from entering the three-way splitter.
3. Extend the intermediary harness around the side of the air cart and to the air seeder's hitch. If the intermediary harness does not need to be fully extended to reach the air seeder's hitch, coil the extra length of the harness around a hydraulic line or electrical wire
4. Using 7.9" cable ties (355032-00004), secure the intermediary harness to the air cart

To connect an intermediary harness to an intermediary harness
NOTE: This step does not have to be performed for air seeders with less than five manifolds
NOTE: Up to two intermediary harnesses may be connected to the end of another intermediary harness

1. Connect the black end of the intermediary harness (355020-000019) into the three-way splitter at the end of the already installed intermediary harness
    a. **NOTE:** If only one wiring harness (intermediary, ECU, or Master ECU) will be connected to the three-way splitter of the intermediary harness, insert a Deutsch sealing plug assembly (153060-000015) into the remaining receptacle of the three-way splitter to prevent foreign material from entering the three-way splitter. Refer to the appropriate figures in Appendix A to determine if two wiring harnesses will be connected to the intermediary harness's three-way splitter
2. Extend the intermediary harness over the air seeder. Use the appropriate figures in Appendix A to help guide the placement of the intermediary harness
    a. **NOTE:** If the intermediary harness does not need to be fully extended to reach where it must connect, coil the harness around a hydraulic line or electrical wire
3. Using 7.9" cable ties (355032-000004), secure the intermediary harness to the hitch

To connect an ECU harness to an intermediary harness

NOTE: Only two ECU harnesses may be connected to each intermediary harness

1. Connect the black connector at the end of the ECU harness (355020-000020) to a three-way splitter of an intermediary harness (355020-000019)
    a. **NOTE:** If only one wiring harness (intermediary, ECU, or Master ECU) will be connected to the three-way splitter of the intermediary harness, insert a Deutsch sealing plug (153560-000015) into the remaining receptacle of the three-way splitter to prevent foreign material from entering the three-way splitter. Refer to the appropriate figures in Appendix A to determine if two wiring harnesses will be connected to the intermediary harness's three-way splitter
2. Extend the ECU harness so that it reaches an air seeder tower. Use the appropriate figures in Appendix A to help guide the placement of the ECU harness
    a. **NOTE:** If the ECU harness does not need to be fully extended to reach the ECU, coil the harness around a hydraulic line or electrical wire before securing to the air seeder using the 7.9" cable ties
3. Using 7.9" cable ties (355032-000004), secure the ECU harness to the air seeder

To connect a Master ECU harness to an intermediary harness

NOTE: The ECU that is deemed as the "Master ECU" is the one closest to the work switch installation location. Typically, this is near or in the middle of the air seeder implement. Refer to the appropriate graphic in Appendix A to help you determine which ECU on your air seeder would be considered the Master ECU.

NOTE: This procedure may only be performed after the ECU deemed as the Master ECU is installed. See Section 2.7

1. Follow Steps 1 and 2 of the "To connect an ECU harness to an intermediary harness" instructions
2. Plug the 2-pin gray and orange connector of the work switch's (153560-000014) harness into the 2 pin receptacle of the ECU (150505-000001) you have designated as the master ECU
3. Using 7.9" cable ties (355032-000004), secure the Master ECU harness to the air seeder

2.7 Installing ECUs

About the ECU
The Electronic Control Unit (ECU) allows for the flow measurement data recorded by the flow sensors to be communicated with the Wireless Blockage Monitor.

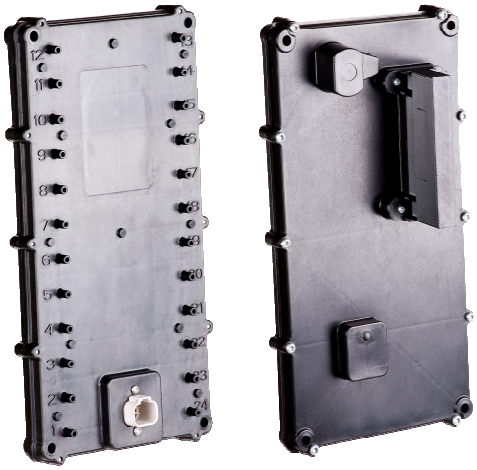


Figure 12: The back (left) and front (right) sides of the ECU

Part Name	Part Number	Quantity needed	Contained within
ECU	150505-000001	1/manifold	Master ECU and ECU kits
ECU Mounting Bracket	351050-000012	1/manifold	Master ECU and ECU kits
¼" 20 Steel Locknut	352011-000040	4/manifold	Master ECU and ECU kits
¼" Steel Washer	352012-000024	4/manifold	Master ECU and ECU kits
Ubolts with Saddle Clamp Options (for ECU mounting bracket) Size of manifold determines size of U-bolt needed	2" diameter U-bolt: 352013-000006 2.5" diameter U-bolt: 352013-000007 3" diameter U-bolt: 352013-000008 4" diameter U-bolt: 352013-000009	2/manifold	Ubolts with Saddle Clamp (not packaged with a kit due to variance in size)

Table 14: Parts needed to install the ECU

Tools needed
Standard socket set

Number of times procedure performed
Once per manifold

Steps that must be completed prior to this procedure

- Installing the work switch (Section 2.5)
- Installing the wiring harness (Section 2.6)

Other related procedures

- Downloading the Wireless Blockage App (Section 2.2)
- Installing the access point (Section 2.4)
- Installing the flow sensors (Section 2.8)
- Connecting the flow sensors to the ECU (Section 2.9)
- Renaming the ECUs in the Wireless Blockage Monitor app (Section 2.12)
    - Operators may changes how a ECU is labeled in the Wireless Blockage Monitor app so that it may be more easily identified when troubleshooting a run or total manifold blockage

Installation location

An ECU should be installed directly underneath each manifold of the air seeder. IAS recommends installing the bracket so that the ECUs will face towards the tractor

To install the ECU mounting bracket

1. Remove the nuts and saddle clamp from the ends of the u-bolt (352013-00006, 352013-000007, 352013-000008, or 352013-000009)
2. Place the u-bolt around the manifold post, immediately under the manifold
3. Place a ECU mounting bracket (351050-000012) so that the ends of the u-bolt are going through the top two holes of the ECU mounting bracket, as shown in the top circle of Figure 13
4. Replace the saddle clamp and nuts onto the u-bolt
5. Remove the nuts and saddle clamp from another u-bolt
6. Place another u-bolt around the manifold post and through the bottom holes of the ECU mounting bracket, as shown in the bottom circle of Figure 13
7. Replace the saddle clamp and nuts onto the second u-bolt

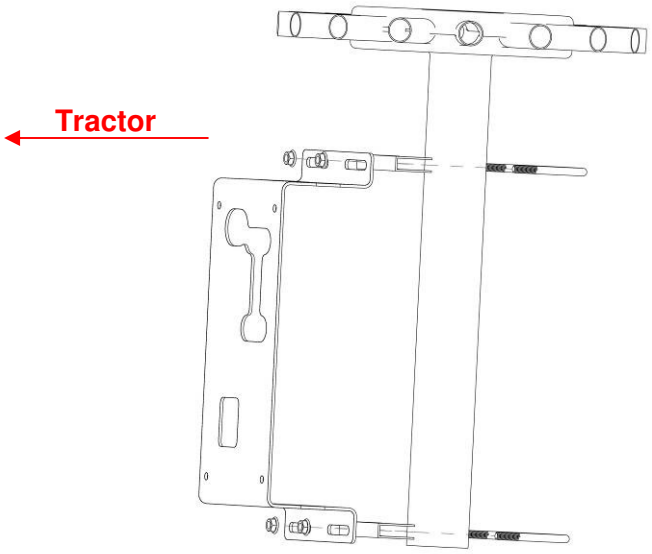


Figure 13: Mounting a ECU bracket to the air seeder tower

To install the ECU

1. Place and hold the ECU assembly (150505-000001) onto the front of ECU mounting bracket (351050-000012)
    a. **NOTE:** Do not remove the locknuts currently on the ECU assembly
2. Secure the ECU assembly to the mounting bracket by placing four ¼" 20 steel locknuts (352011-000040) and four ¼" steel washers (352012-000024) to the back of the existing bolts on the ECU

Figure 14: ECU installed on an air seeder tower

NOTE: ECUs are displayed in alphabetical/numeric order on the Blockage screen of the Wireless Blockage Monitor app. By default, the ECUs will be labeled with their serial numbers. Serial number labels are located on the back of the ECUs (the same side as the flow sensor ports). Refer to Section 2.12 for instructions on how to rename the ECUs in the Wireless Blockage Monitor app so that they may be easily identified when troubleshooting a blockage

2.8 Installing flow sensors

About flow sensors
Flow sensors directly connect to the air seeder's runs. They are able to detect when seed or other material such as fertilizer is flowing through the run due to the sound that is produced when the material when the material strikes against the flow sensor. When no sound is recorded by the flow sensor, and the air seeder is in the ground, the Wireless Blockage Monitor app will notify the operator of a potentially blocked run via an audio alarm and by displaying the blocked runs or manifolds on the Blockage screen.

NOTE: The flow sensors have been designed to be attached to a 1.25" diameter final run hose. If your air seeder has 1" diameter run hoses, follow the "To install flow sensors on 1" diameter final run hoses" instructions.

Figure 15: Flow sensors installed on a manifold

Part Name	Part Number	Quantity needed	Contained within
1.25" Hose Clamp	352013-000005	2/run	Standard sensor kit
Adaptor Hose	351060-000008	1/run	Standard sensor kit
Sensor	153570-000015	1/run	Standard sensor kit

Table 15: Parts needed to install flow sensors on standard (1.25") diameter final runs

Tools needed
5/16" socket, 5/16" nut driver on a cordless drill, or a flathead screwdriver

Number of times procedure performed
Once per run

Steps that must be completed prior to the procedure
None

Other related procedures
- Installing the ECU (Section 2.7)
- Connecting flow sensors to the ECU (Section 2.9)
- Configuring the Wireless Blockage Monitor (Section 2.10)

Installation location
Flow sensors are to be installed at beginning of every run of the air seeder, next to the manifold.

To install the flow sensor on standard (1.25") diameter final run hoses

1. Attach the adapter hose (351060-000008) to the sensor assembly (153570-000015)
2. Slide a 1.25" hose clamp (352013-000005) onto each end of the adapter hose
    a. **NOTE:** IAS recommends placing the sides of the hose clamp containing the fastening screw on the same side in order to reduce the amount of space taken up by the system. This is especially true for air seeder systems where final runs are very close together
3. Tighten the hose clamp that attaches the adapter hose and the sensor assembly using a 5/16" socket, a 5/16" nut driver on a cordless drill, or a flathead screw driver. Leave the hose clamp that will eventually face the manifold loose at this point
4. Detach the final run hose from the manifold
5. Place the flow sensor onto the manifold where the final run hose previously attached
6. Tighten the hose clamp facing the manifold using a socket, cordless drill, or a flathead screwdriver so that the adaptor hose is secured on the manifold
7. Attach the final run hose to the bottom of the sensor assembly
    a. **NOTE:** For a better fit, you may want to cut off approximately 2 inches from the hose length before reattaching to manifold
8. Tighten the hose clamp that attaches the sensor assembly to the final run hose using a 5/16" socket, a 5/16" nut driver on a cordless drill, or a flathead screw driver
    a. **NOTE:** This hose clamp should be original to the air seeder implement and is not included in the Wireless Blockage Monitor installation kit. If you need additional hose clamps, please contact IAS for purchase information
9. Repeat this step for every final run on your air seeder. Once all of the flow sensors have been installed on a manifold, you may proceed to the instructions in Section 2.9: Connecting flow sensors to the ECU. A picture showing flow sensors installed on all of the final runs of an air seeder is shown in Figure 15

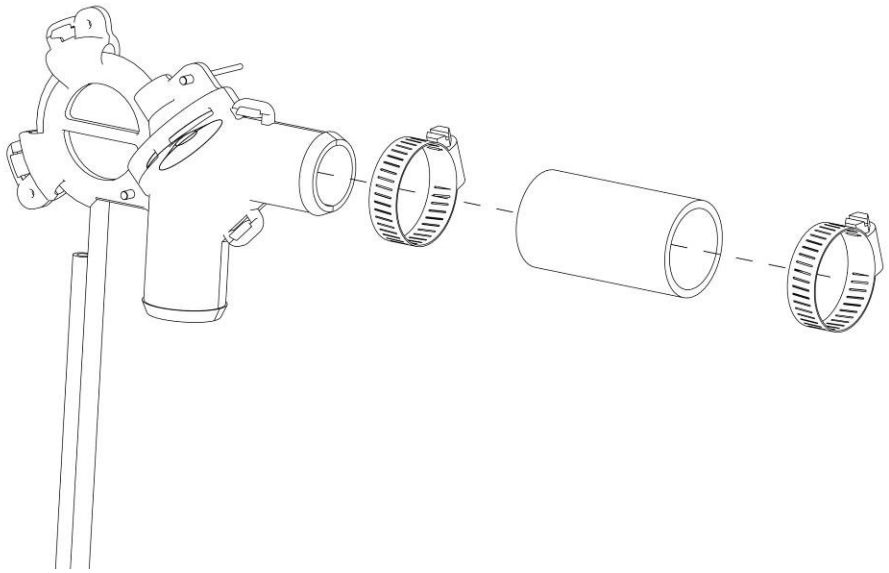


Figure 16: Installing a flow sensor

To install air flow sensors on 1" diameter final run hoses

If your air seeder final run hoses have a 1" diameter instead of the 1.25" diameter, you must complete the following steps in order to install the flow sensors.

Part Name	Part Number	Quantity needed	Contained within
1.25" Hose Clamp	352013-000005	4/run	Nonstandard sensor kit
Adaptor Hose	351060-000008	2/run	Nonstandard sensor kit
Sensor	153570-000015	1/run	Nonstandard sensor kit

Table 16: Parts needed to install flow sensors on nonstandard (1") diameter final runs

1. Complete Steps 1 through 3 of the "To install the flow sensor" instructions
2. Cut an approximately 2 inch piece from the end of the final run hose
3. Place the 2 inch hose piece back onto the manifold
4. Attach the adapter hose (351060-000008) to the 2 inch hose piece
5. Tighten the hose clamp that connects the adapter hose to the 2 inch hose piece using a 5/16" socket, a 5/16" nut driver on a cordless drill, or a flathead screw driver
6. Attach an additional 1.25" hose piece onto the bottom of the sensor assembly (1530570-000015). While the length of this piece may vary, a 3 inch piece would suffice
7. Slide the additional 1.25" hose clamp onto the 1.25" hose piece
8. Place the final run hose into the 1.25" hose piece. Tighten the hose clamp using a 5/16" socket, a 5/16" nut driver on a cordless drill, or a flathead screwdriver

2.9 Connecting flow sensors to the ECU and installing ECU shield brackets

About connecting flow sensors to the ECU
Flow sensors must be connected to the ECU in order for the flow measurements to be communicated to the iPad software app.

About ECU shield brackets
ECU shields help to prevent the flow sensor tubes from becoming disconnected from the ECU ports during operation, transportation, or storage of the air seeder. ECU shield brackets should not be installed until after the flow sensors have been connected to the ECU

Part Name	Part Number	Quantity needed	Contained within
ECU Bracket Shield	351050-000012	2/manifold	Master ECU and ECU kits
Cotter Pin, 3/32" diameter	352015-000011	4/manifold	Master ECU and ECU kits
Miniature Cable Tie	355032-000003	1/run	Master ECU kit

Table 17: Parts needed to connect flow sensors to the ECU

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

Number of times procedure performed
Once per manifold

Steps that must be completed prior to procedure
- Installing the ECUs (Section 2.7)
- Installing the flow sensors (Section 2.8)

Other related procedures
- Configuring the Wireless Blockage Monitor (Section
- Renaming the ECUs

Installation location
The flow sensor tubes (located on each run) will be connected to the ECU installed on tower (installed directly underneath the manifold)

To connect flow sensors to the ECU

1. Remove the same number of caps from ECU for the number of runs on the manifold. Leave the caps on the unused connectors to prevent foreign material from entering the ECU
    a. **EXAMPLE:** If the manifold contains 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 flow sensor tube of the run that is immediately left of the manifold post (when facing the tractor) (run labeled "1" in Figure 17).
3. Run that flow sensor tube through the hole on the top of the ECU mounting bracket (351050-000012)
4. Attach the flow sensor tube to the port labeled "1" on the ECU
5. Secure the flow sensor tube to the ECU port by placing a miniature cable tie (355032-000003) around the bottom of where the flow sensor tube and ECU port connect and tighten the miniature cable tie
    a. **CAUTION:** Ensure that the flow sensor tube is not kinked, especially where the tube comes through the top of the ECU bracket and where the tube is secured to the ECU with the miniature cable tie. If a flow sensor tube becomes kinked, the ECU will be unable to receive any blockage measurement readings from that run
6. **Optional:** Mark the number of the port the flow sensor hose is attached to (Example: *1*) somewhere easily visible on the flow sensor hose using a paint pen or other marking tool
    a. **NOTE:** When the Wireless Blockage Monitor detects that a run is blocked, the Wireless Blockage Monitor app will display the number of the ECU port that that run is attached to. Marking the number of the port the flow sensor is attached to will allow you to easily identify a blocked run during troubleshooting
7. Continue removing the caps from the ends of the flow sensor tubes, running them through the top of the ECU bracket, and attaching them to the proper ECU port, continuing to work counterclockwise around the manifold, as shown in Figure 17
8. Secure the ECU caps to all of the unused ports using the miniatures cable ties
    a. **IMPORTANT**: If the caps are removed from unused ports or if the caps are not secured to the port, the Wireless Blockage Monitor app may incorrectly read that a flow sensor is attached to the port during the automatic configuration process

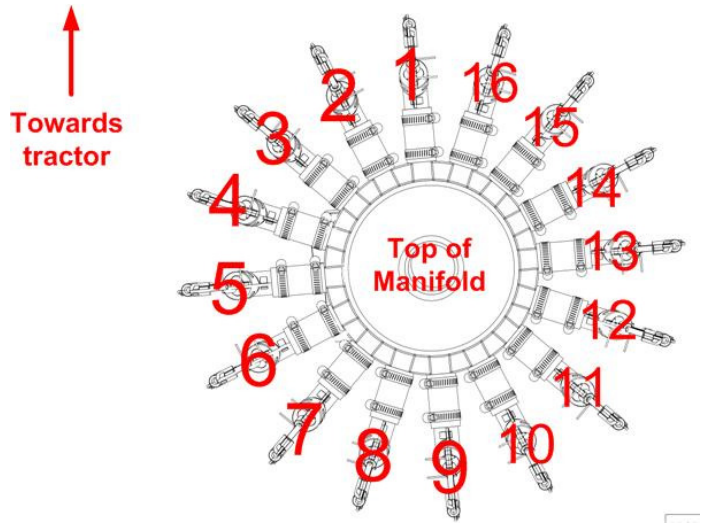


Figure 17: Order to connect flow sensors to ECU

To install ECU shields

1. Press a ECU bracket shield (351050-000012) into one of the side of the ECU mounting bracket (351050-000012)
2. Secure the ECU bracket shield to the mounting bracket with two cotter pins (352015-000011), one on the top of the bracket and one on the bottom of the bracket
3. Press a ECU bracket shield onto the other side of the ECU mounting bracket
4. Secure the ECU bracket shield to the mounting bracket with two cotter pins. Using a pliers, blend the cotter pins down

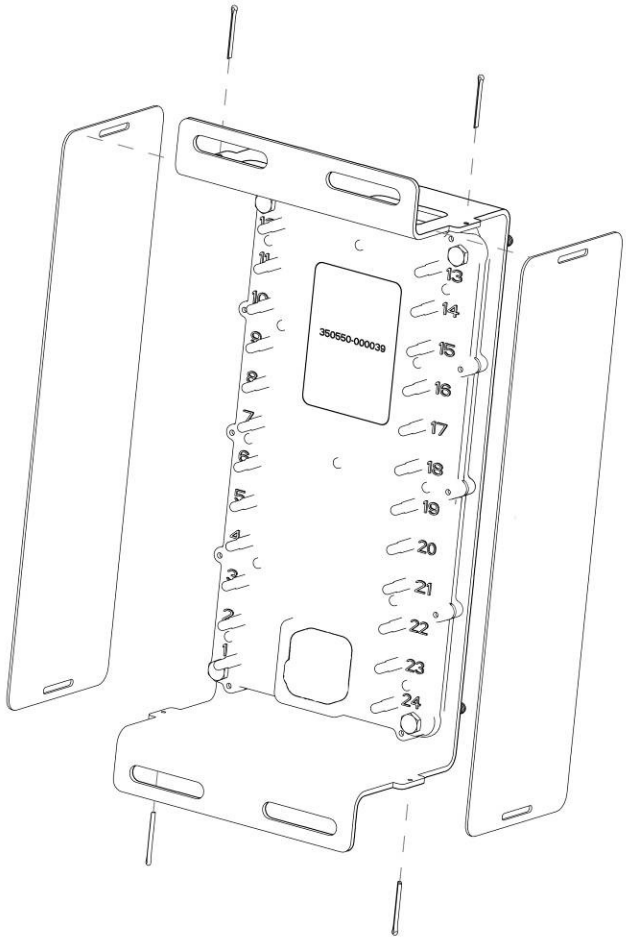


Figure 18: Installing the ECU shields

2.10 Configuring the Wireless Blockage Monitor

About configuring the Wireless Blockage Monitor

Configuring the Wireless Blockage Monitor system allows for the Wireless Blockage Monitor app to detect the newly installed ECUs. The Wireless Blockage Monitor must be configured after installation of the Wireless Blockage Monitor system and also configuration of the runs have changed, e.g. from using all runs for seeding to blocking every other run.

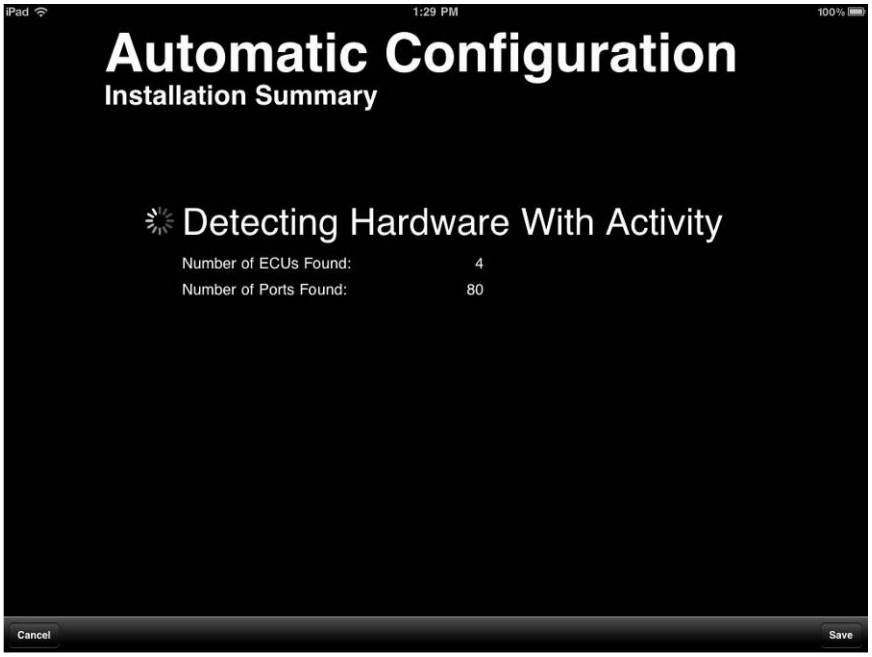


Figure 19: Automatic Configuration screen

Part Name	Part Number	Quantity needed	Contained within
iPad	153025-000024 (if included with the Wireless Blockage Monitor system)	1	May not be included with the Wireless Blockage Monitor system

Table 18: Parts needed to configure the Wireless Blockage Monitor system

Tools Needed

None

Number of times procedure performed

Once per Wireless Blockage Monitor system

Steps that must be completed prior to this procedure

- Download of the Wireless Blockage Monitor app to the iPad (Section 2.2)
- Installation of the access point (Section 2.4)
- Installation of the work switch (Section 2.5)
- Installation of the wiring harness (Section 2.6)
- Installation of the ECUs (Section 2.7)
- Installation of the flow sensors (Section 2.8)
- Connection of the flow sensors to the ECU (Section 2.9)
- Tractor must be powered on
- Tractor must be connected to the air seeder

Other related procedures

- Configuring the work switch (Section 2.11)
    - After the overall Wireless Blockage Monitor system has been configured, the work switch must also be configured to ensure that it has been correctly installed and to ensure that it is communicating correctly with the Wireless Blockage Monitor app
- Renaming the ECUs in the Wireless Blockage Monitor app (Section 2.12)

Installation location

Not applicable

To auto-configure the Wireless Blockage Monitor

1. Ensure iPad is connected to the Wireless Blockage Monitor WLAN. Open the Wireless Blockage Monitor app on the iPad
2. Power on the tractor and connect the air seeder, if you have not done so already
3. Press the **Configure** icon on the left side of the Wireless Blockage Monitor app screen
4. Press **Auto-Configure**
5. Ensure the correct number of ECUs have been detected by the Wireless Blockage Monitor app. If the correct number of ECUs have not been detected, refer to the "To manually add an ECU" instructions
6. Allow seed to run through the air seeder while monitoring the Automatic Configuration screen on the iPad for a few seconds. The sound produced by the seed hitting the flow sensors will allow the Wireless Blockage Monitor app to automatically detect them
7. The number of ECUs and runs (ports) detected by the Wireless Blockage Monitor will appear. If the number does not correctly match the total number of manifolds and runs on your air seeder, follow the "To manually configure the Wireless Blockage Monitor" instructions below.
    a. **NOTE:** You must follow the "To change which ECU is labeled 'Master ECU" instructions given later in this section as the Master ECU is not automatically recognized during the auto-configure process

To manually configure the Wireless Blockage Monitor

If the Wireless Blockage Monitor app was not able to detect all of the flow sensors or ECU, or it detected too many ECUs or flow sensors, you may manually enter or delete them in the Wireless Blockage Monitor app.

To manually add an ECU

1. Press the **Configure** icon on the Wireless Blockage Monitor app's home screen
2. Press **Configure** on the Configuration Summary screen
3. Press the **+** button, located on the upper right corner of the gray box in the middle of the Edit Current Configuration screen (shown in Figure 20)
4. Perform the following steps while on the Edit a Manifold screen
    a. *Rename the Manifold* (optional). Press the Manifold Name field. An on-screen keyboard will appear. Using the on-screen keyboard, type the desired manifold name. For guidance on this topic, refer to Section 2.12
    b. *Enter the ECU's serial number*. Press the Serial Name field. An on-screen keyboard will appear. Using the on-screen keyboard, type the ECU's serial number. The ECU's serial number is listed on a sticker on the ECU
        i. **NOTE:** To access the numeral keys, press the **.?123** button on the on-screen keyboard
    c. *Add flow sensors to the manifold*. Using the drop-down menu, select which ECU port the respective run's sensor flow hose is connected to. Refer to Figure 17 to determine how the runs are numbered
        i. Repeat this step for each run contained on that manifold
        ii. **EXAMPLE:** If you are adding Run 4 onto an ECU with the serial number 0000-00001, and that run is connected to the port labeled *4* on that ECU, select **0000-00001 Port 4** from the drop-down menu
5. Press **Save** when you have finished adding the ECU and its flow sensors

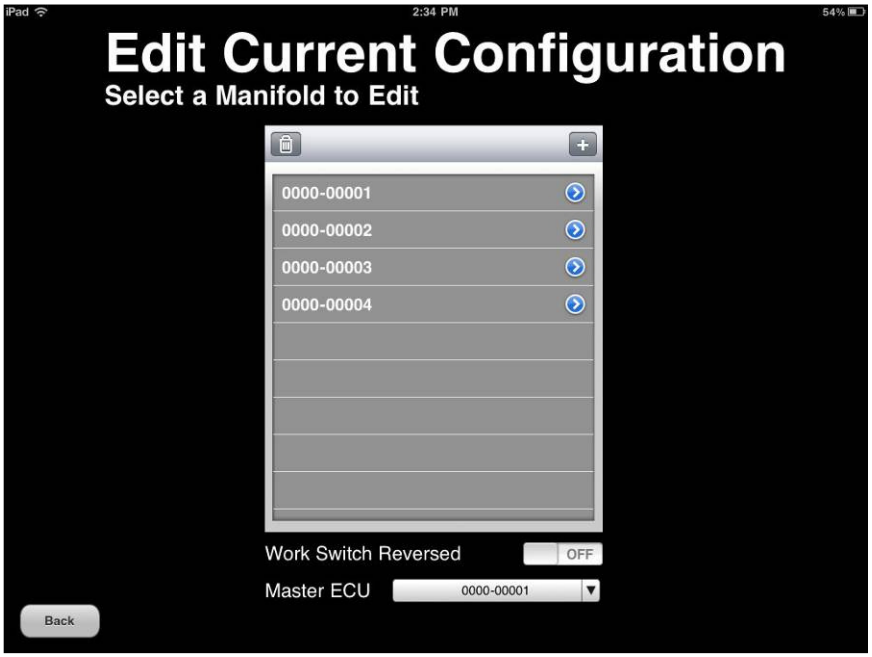


Figure 20: Edit Current Configuration screen

To manually add a flow sensor

1. Press the **Configure** icon on the Wireless Blockage Monitor app's home screen
2. Press **Configure** on the Configuration Summary screen
3. Press the name of that that run's flow sensor hose is connected to on the Edit Current Configuration screen
4. From the Edit a Manifold screen (shown in Figure 21), use the drop-down menu to select which ECU port the respective run's sensor flow hose is connected to. Refer to Figure 17 to determine how the runs are numbered
    a. **EXAMPLE:** If you are adding Run 4 onto an ECU with the serial number 0000-00001, and that run is connected to the port labeled *4* on that ECU, select **0000-00001 Port 4** from the drop-down menu
5. Press **Save** when you have finished making changes

IMPORTANT: If the flow sensors or ECUs that were manually entered into the Wireless Blockage Monitor app continuously appear to be blocked on the Wireless Blockage Monitor app, the equipment may have been installed incorrectly. Check the equipment and ensure that it has been installed correctly. If you continue to have problems, contact IAS for assistance

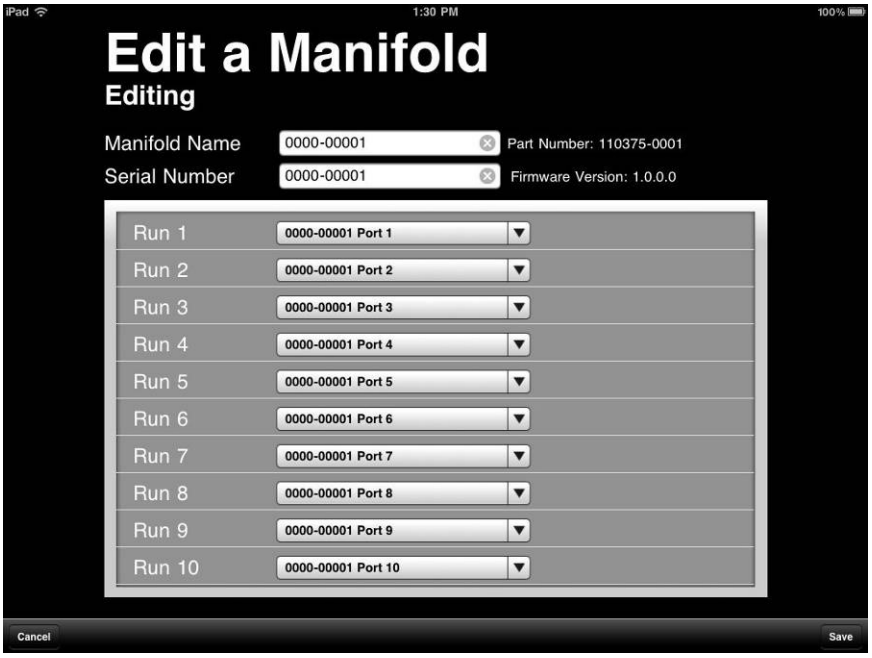


Figure 21: Edit a Manifold screen

To manually delete an ECU

1. Press the **Configure** icon on the Wireless Blockage Monitor app's home screen
2. Press **Configure** on the Configuration Summary screen
3. Press the trash can icon, located on the upper left corner of the gray box in the middle of the screen
4. Press the name of the manifold (ECU) you would like to delete on the Edit Current Configuration screen

To manually delete a flow sensor

1. Press the **Configure** icon on the Wireless Blockage Monitor app's home screen
2. Press **Configure** on the Configuration Summary screen
3. Press the name of the manifold (ECU) where the extra flow sensor(s) are located on the Edit Current Configuration screen
4. Using the drop-down menu immediately to the right of the flow sensor you wish to delete, select *Select a port*
    a. Check that the remaining flow sensors are connected to the correct port, i.e. Run 1 is attached to port 1 of that ECU
5. Press **Save** when you have finished deleting the flow sensors from that ECU
   EXAMPLE: If your air seeder has a 16 run per manifold set up, but one manifold displays 17 runs, select Select a port from the drop-down menu immediately to the right of Run 17. Ensure that Runs 1 through 16 are displaying as being connected to the correct ports of the ECU (ports 1 through 16)

To change which ECU is labeled "Master ECU"

1. Press the **Configure** icon on the Wireless Blockage Monitor app's home screen
2. Press **Configure** on the Configuration Summary screen
3. Using the Master ECU drop-down list located at the bottom of the Edit Current Configuration screen, select the name of the ECU that is the master ECU
4. Press **Save**
    a. If you have not yet renamed the ECUs (see Section 2.12), the ECUs will be labeled with their serial numbers

2.11 Configuring the work switch

About configuring the work switch
In order to ensure the Wireless Blockage Monitor work switch has been correctly installed and is correctly communicating with the Wireless Blockage Monitor app, you must follow the instructions given in this section.

Part Name	Part Number	Quantity Needed	Contained within
iPad	153025-000024 (if included with the Wireless Blockage Monitor system)	1	May not be included with the Wireless Blockage Monitor system

Table 19: Parts needed to configure the work switch

Tools Needed
None

Number of times procedure performed
Once per Wireless Blockage Monitor system

Steps that must be completed prior to this procedure
- Download the Wireless Blockage Monitor app on the iPad (Section 2.2)
- Install the access point (Section 2.4)
- Install the work switch (Section 2.5)
- Install the wiring harness (Section 2.6)
- Configure the Wireless Blockage Monitor (Section 2.10)
    - Change which ECU is labeled the Master ECU (Section 2.10)
- Determine what method the existing work switch on your air seeder uses (refer to “About work switch methods” in Section 2.5)
    - Follow the respective instructions below based on which method the air seeder uses
- For air seeders using the non-default method only: Reverse the work switch option in the Wireless Blockage Monitor app (included in Section 2.6)

Other related procedures
None

Installation location
Not applicable (See Section 2.6 for information about the work switch’s installation location)

To ensure work switch has been correctly installed (default method)

NOTE: The default and non-default work switch methods are described in Section 2.5

1. Ensure the iPad is connected to the Wireless Blockage Monitor WLAN. Open the Wireless Blockage Monitor app on the iPad
2. Power on the tractor and connect the air seeder, if you have not already done so. Adjust the air seeder's hydraulic system so that the implement is in the ground
3. Press the **Blockage** icon on the Wireless Blockage Monitor app's home screen
4. Note the color of the circle next to *Work Switch* on the top left corner of the Blockage screen (henceforth referred to as the "Work Switch circle"). The Work Switch circle should be green at this time
5. Adjust the air seeder's hydraulic system so that the implement is out of the ground. Note the color of the Work Switch circle. It should have changed to gray
6. Adjust the air seeder's hydraulic system so that the implement is in the ground again. The Work Switch circle should have changed to green
    a. If the Work Switch circle is not the correct color, or does not change when you adjust the air seeder's hydraulic system, contact IAS for assistance

To ensure work switch has been correctly installed (non-default method)

NOTE: The default and non-default work switch methods are described in Section 2.5

1. Ensure the iPad is connected to the Wireless Blockage Monitor WLAN> Open the Wireless Blockage Monitor app on the iPad
2. Power on the tractor and connect the air seeder, if you have not already done so. Adjust the air seeder's hydraulic system so that the implement is out of the ground
3. Press the **Blockage** icon on the Wireless Blockage Monitor app's home screen
4. Note the color of the circle next to the Work Switch on the top left corner of the Blockage screen (henceforth referred to as the "Work Switch circle"). The Work Switch circle should be green at this time
5. Adjust the air seeder's hydraulic system so the implement is in the ground. Note the color of the Work Switch circle. It should have changed to gray
6. Adjust the air seeder's hydraulic system so that the implement is out of the ground again. The Work Switch circle should have changed to green
    a. If the Work Switch circle is not the correct color, or does not change when you adjust the air seeder's hydraulic system, contact IAS for assistance

2.12 Renaming the ECUs in the Wireless Blockage Monitor app

About renaming the ECUs in the Wireless Blockage Monitor app

This optional procedure will label the ECUs in the Wireless Blockage Monitor app in a manner that will allow them to be more easily identified, especially when troubleshooting a run or total manifold blockage. By default, the ECU will be labeled with its twelve digit serial number in the Wireless Blockage Monitor app.

NOTE: ECUs are listed in alphabetical/numeric order on the Blockage screen in the Wireless Blockage Monitor app. If you desire that the ECUs be displayed in the order that they are installed, ensure that you have named the ECUs in alphabetical/numeric order (see Figure 24 for an illustrated example).

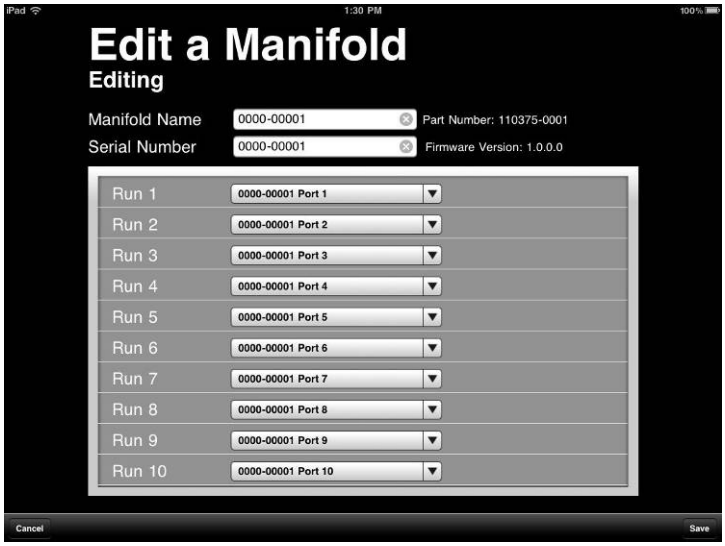


Figure 22: The Edit a Manifold screen

Part Name	Part Number	Quantity Needed	Contained within
iPad	153025-000024 (if included with the Wireless Blockage Monitor system)	1	May not be included with the Wireless Blockage Monitor system

Table 20: Parts needed to rename the ECUs in the Wireless Blockage Monitor app

Tools Needed

None

Number of times procedure performed

Once per manifold

Steps that must be completed prior to procedure

- Download the Wireless Blockage Monitor app (Section 2.2)
- Install the access point (Section 2.4)
- Install the wiring harnesses (Section 2.6)
- Install the ECUs (Section 2.7)
- Configure the Wireless Blockage Monitor (Section 2.10)

Other related procedures

None

Installation location

Not applicable

To rename an ECU

1. Press the **Configure** icon on the Wireless Blockage Monitor app home screen
2. Press **Configure** on the Configuration Summary screen
3. Press the first manifold name on the list on the Edit Current Configuration screen
4. Press the **Manifold Name** field (which is currently the ECU's serial number) on the Edit a Manifold screen. An on-screen keyboard will display
5. Using the on-screen keyboard, type the desired ECU name. IAS recommends naming the ECU *1* or *Manifold 1*. Press **Save**
    a. **NOTE:** To access the numeral keys, press the **.?123** button on the on-screen keyboard
6. Repeats Steps 4 through 6 for all of the ECUs installed on the system, naming the manifolds respectively (i.e. name the second manifold on the list *2* or *Manifold 2*)

    EXAMPLE: If an air seeder contains four manifolds and the operator has renamed the manifolds folding the procedure above, the manifolds will display on the Blockage screen of the Wireless Blockage Monitor app with *Manifold 1* on the far left of the screen and *Manifold 4* on the far right of the screen. When viewing these manifolds in real life while facing the tractor, the numbers will correspond with the Blockage Monitor screen, with the manifold labeled "1" being located on the far left of the air seeder, and the manifold labeled "6" being located on the far right of the air seeder. This example is illustrated in Figure 24.

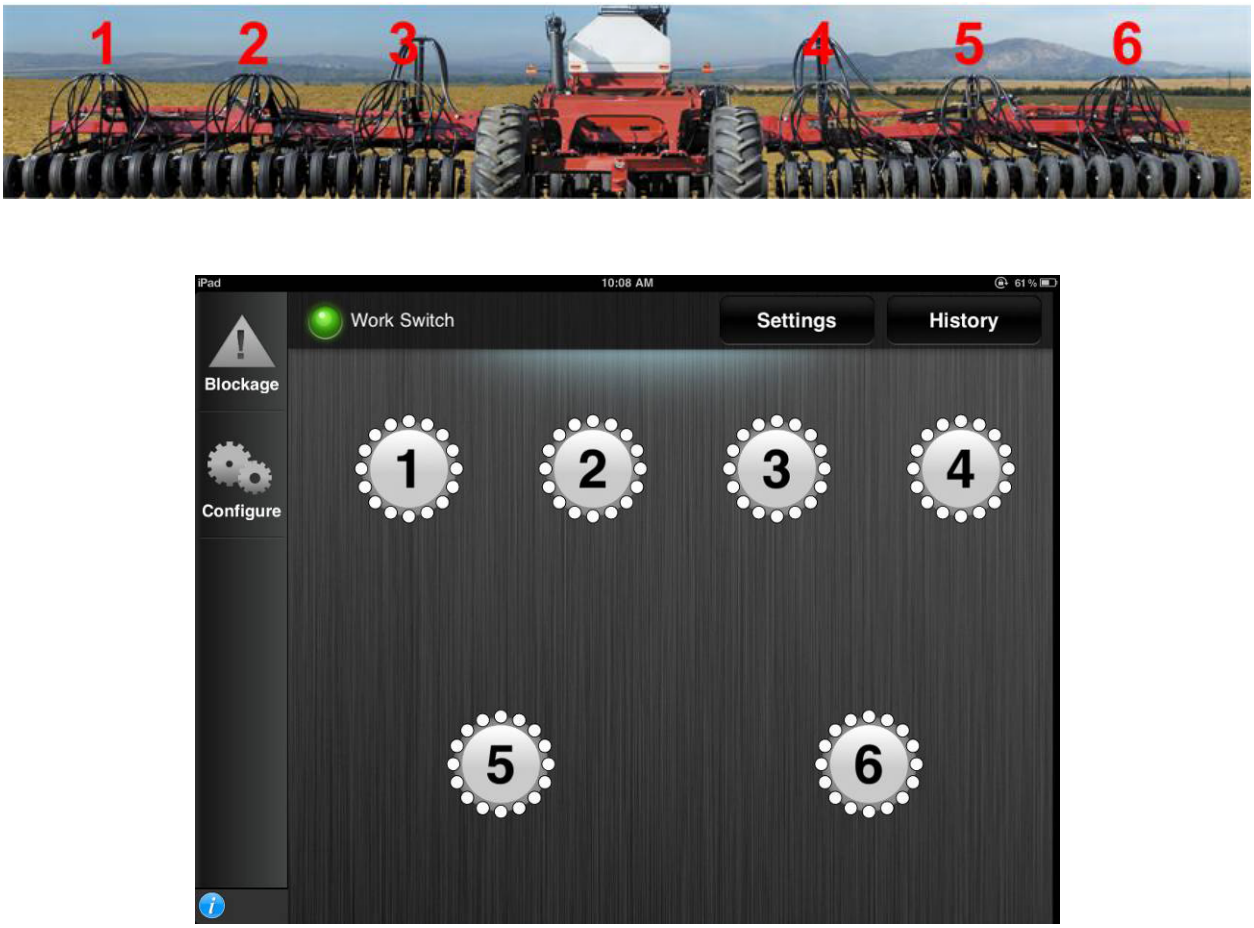
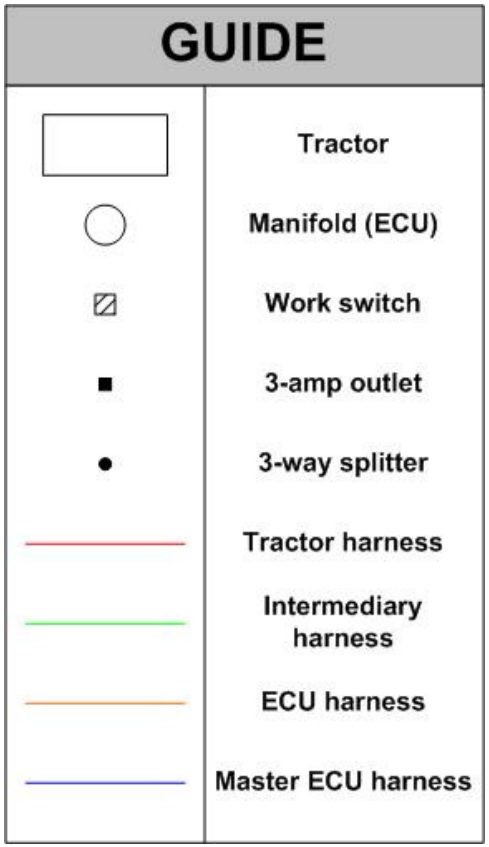


Figure 23: Renaming the ECUs example
Top: Tractor connected to a six manifold air seeder,
Bottom: Blockage screen representing that air seeder

Appendix A: Wiring harness diagrams per air seeder configuration

The graphics on this and the following pages are suggestions for ways wiring harnesses may be installed. Each graphic is specific to the number of manifolds on an air seeder. Please note that due factors such as difference in manifold spacing wiring harness set-up may differ from that shown in these diagrams.

Two and Three Manifold Wiring Harness Diagrams



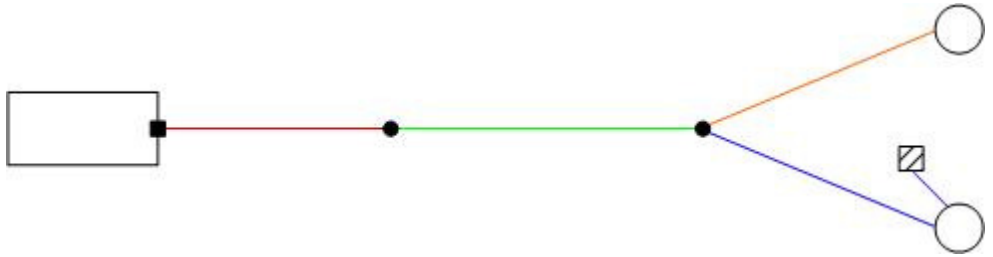


Figure 24: Two (2) manifold wiring harness

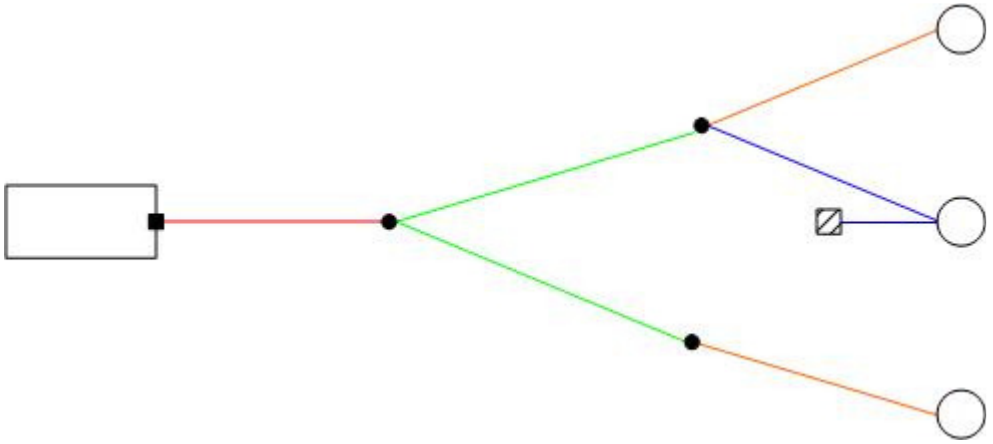
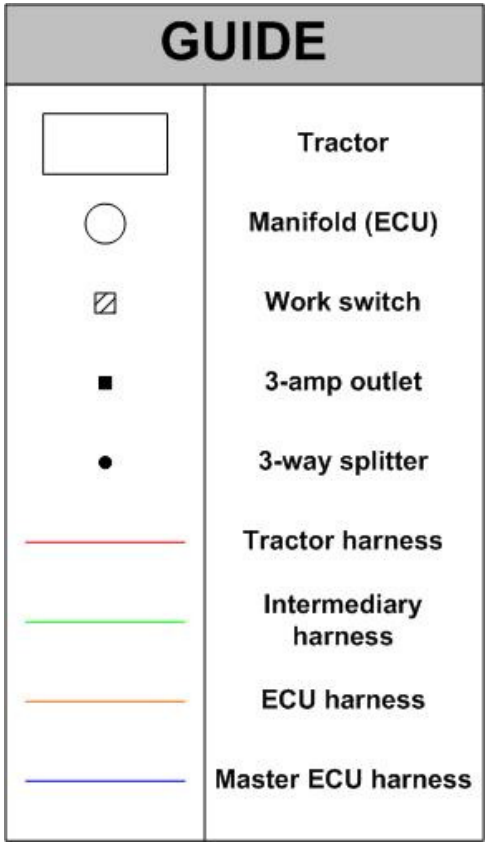


Figure 25: Three (3) manifold wiring harness

Four and Five Manifold Harness Diagrams



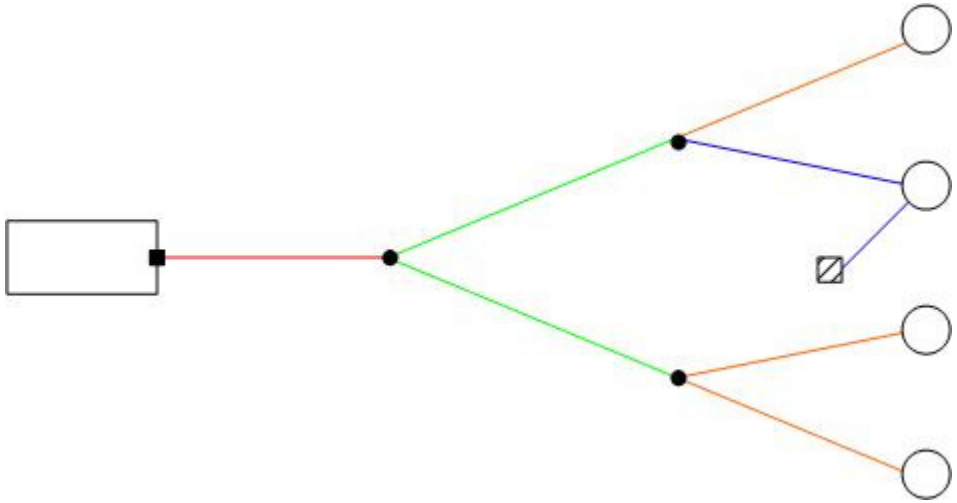


Figure 26: Four (4) manifold wiring harness

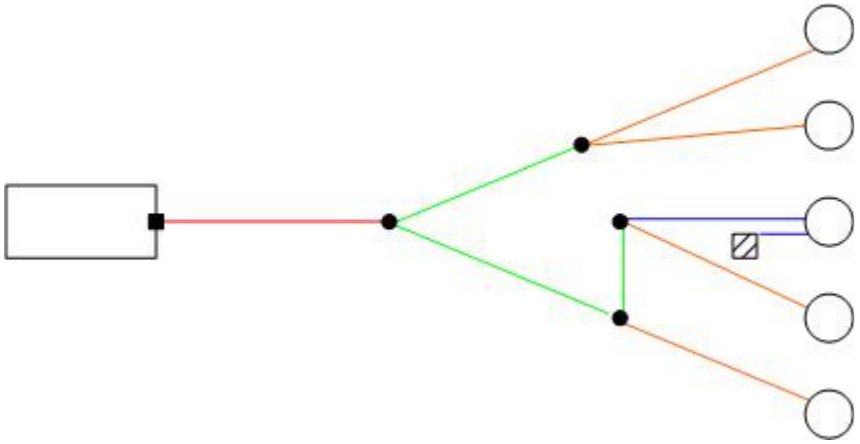
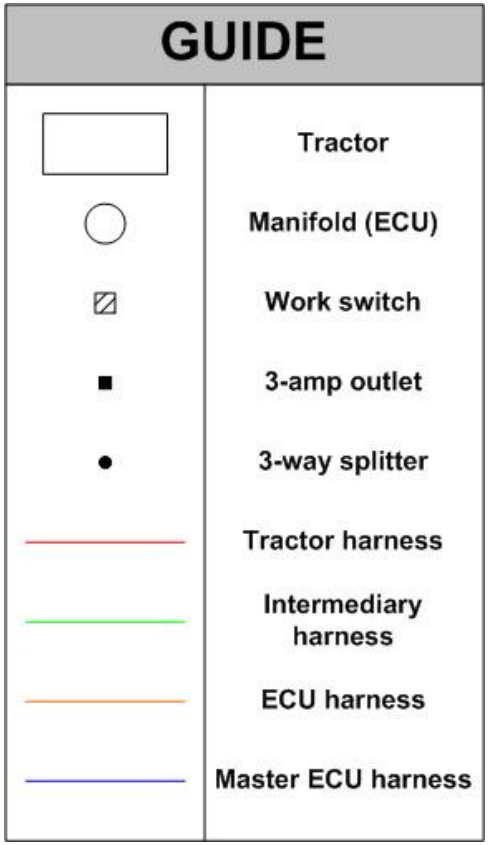


Figure 27: Five (5) manifold wiring harness

Six and Seven Manifold Harness Diagram



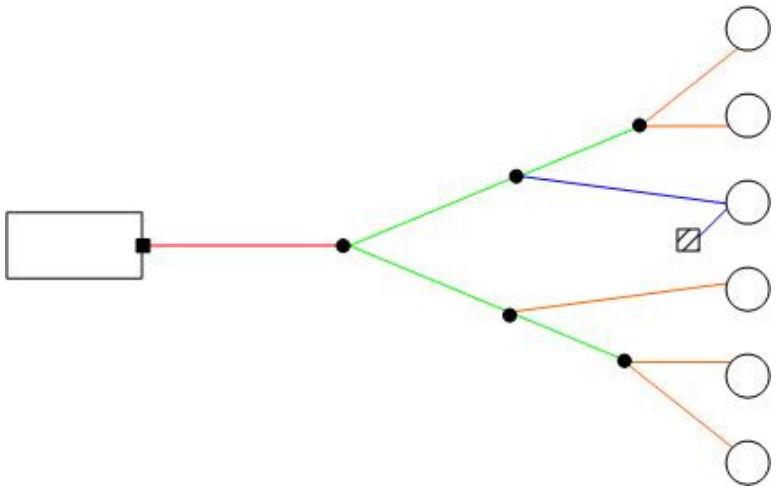


Figure 28: Six (6) manifold wiring harness

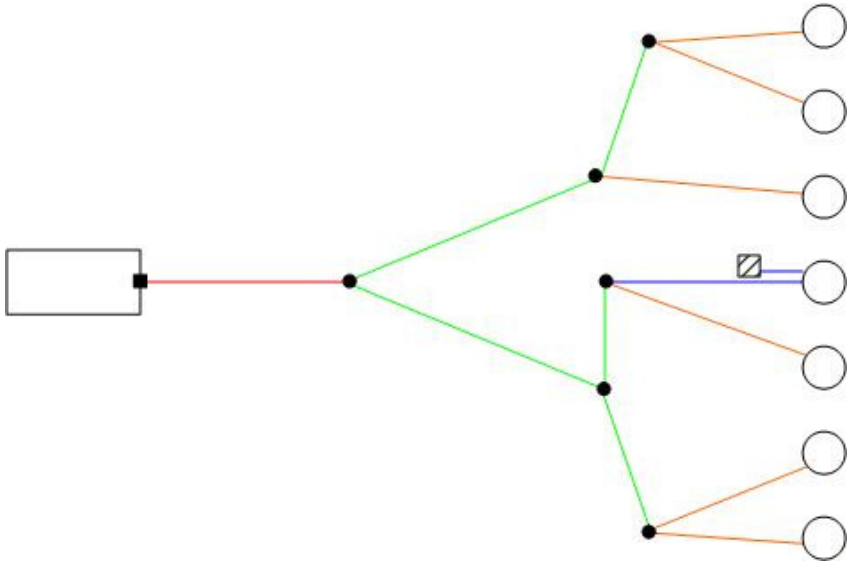


Figure 29: Seven (7) manifold wiring harness

Eight Manifold Wiring Harness Diagram

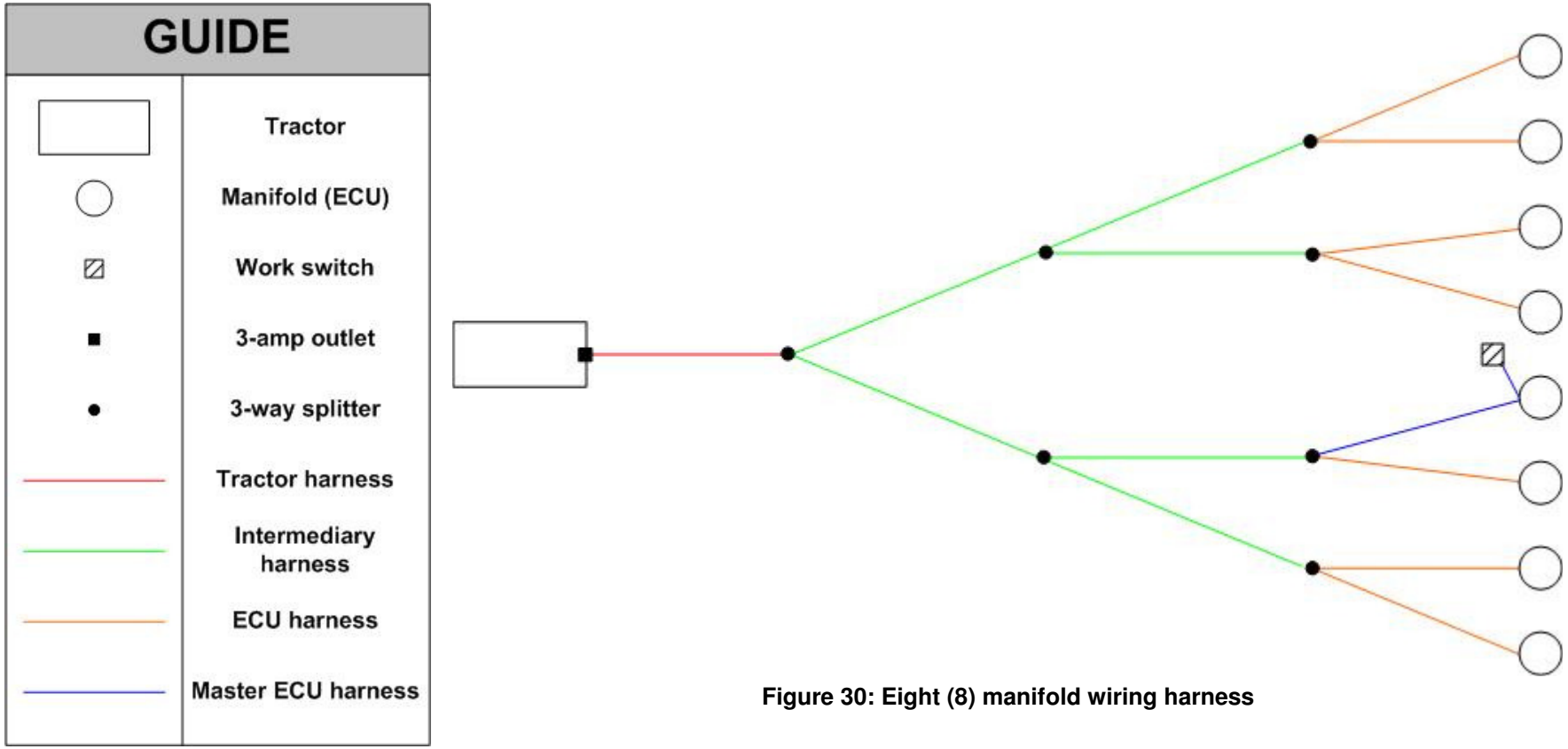


Figure 30: Eight (8) manifold wiring harness

Nine Manifold Wiring Harness Diagram

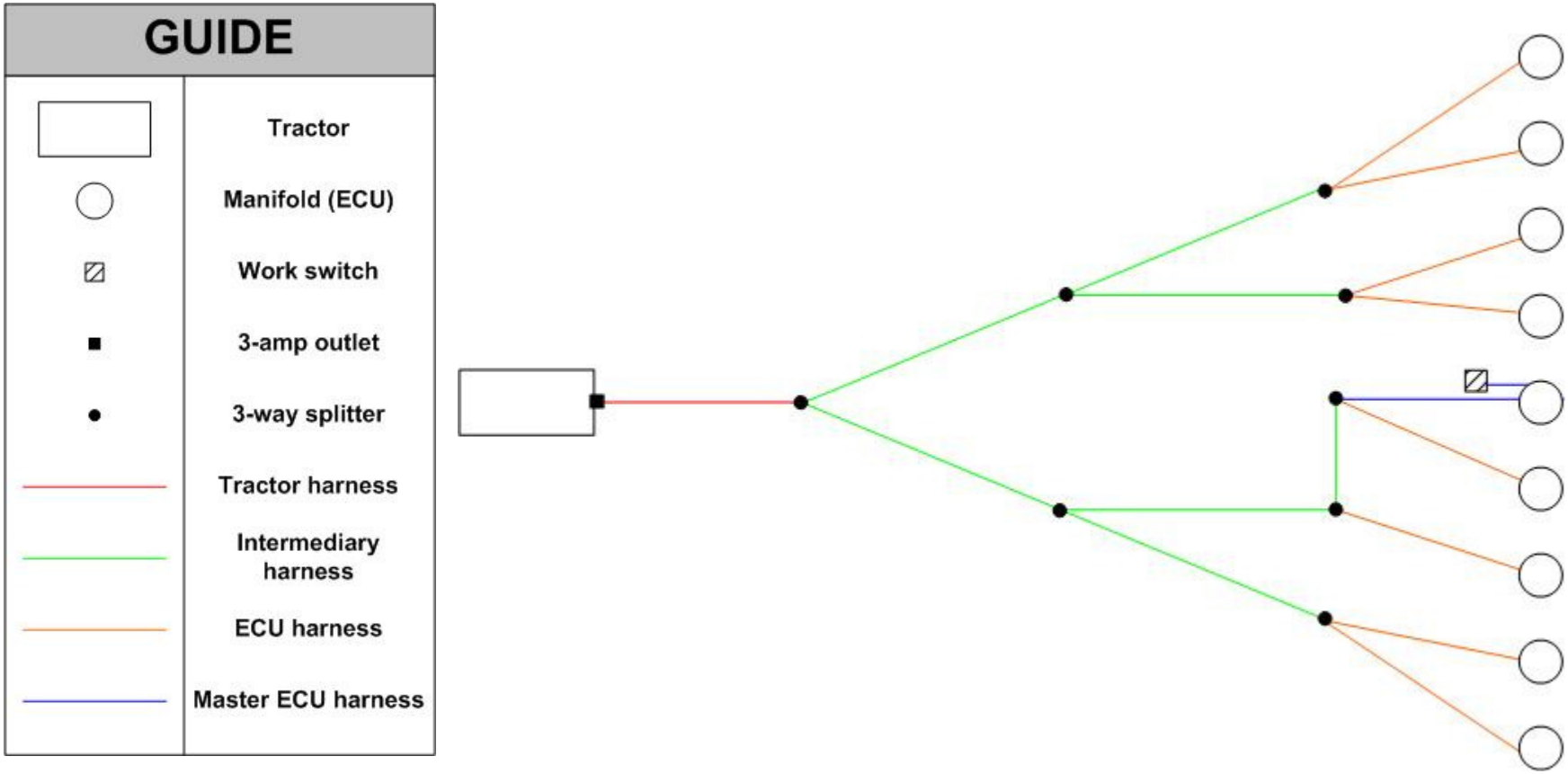


Figure 31: Nine (9) manifold wiring harness

Ten Manifold Wiring Harness Diagram

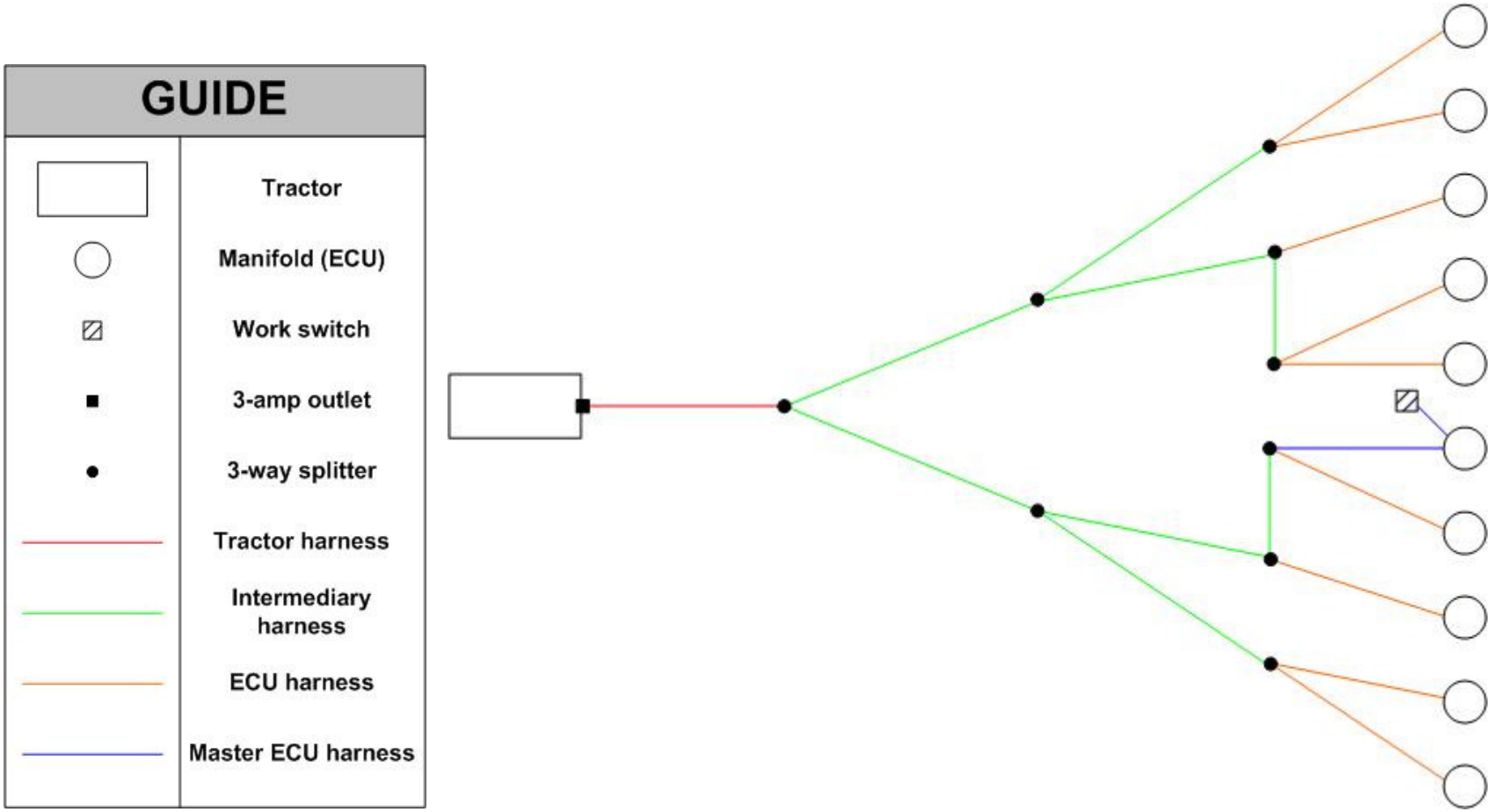
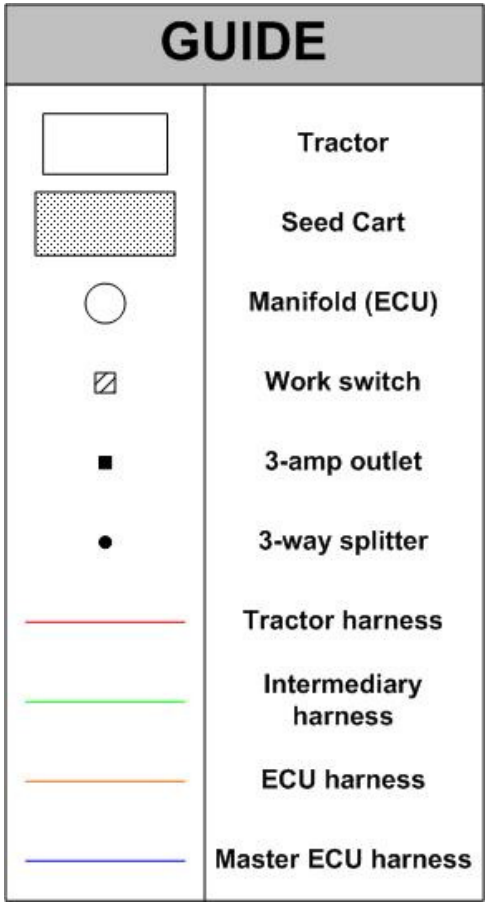


Figure 32: Ten (10) manifold wiring harness

Wiring Harness Diagram with Seed Cart



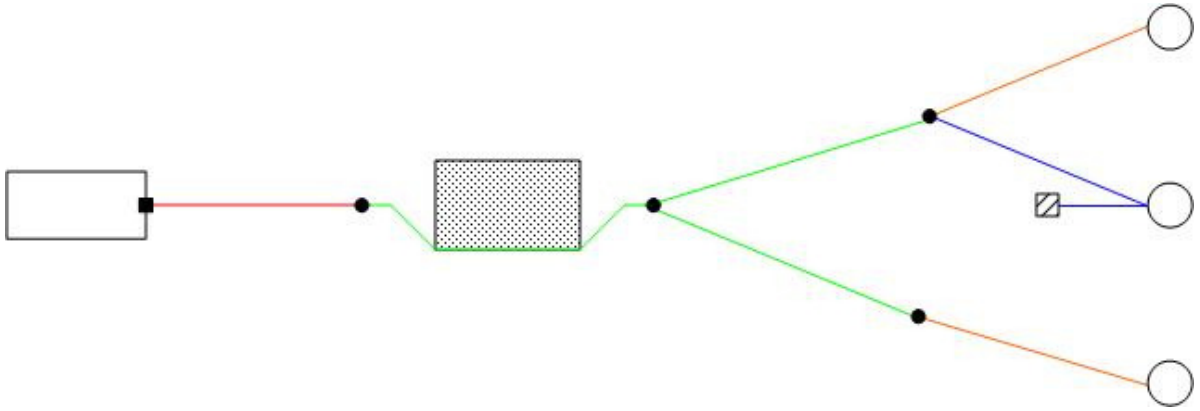


Figure 33: Wiring Harness Diagram with Seed Cart