

**John Deere R, RT, and RX Series,
Tier IV Steering Ready 2011-2015
SmarTrax™ Installation Manual**

P/N 016-5034-010 Rev. B

10/15

E26297

Disclaimer

While every effort has been made to ensure the accuracy of this document, Raven Industries assumes no responsibility for omissions and errors. Nor is any liability assumed for damages resulting from the use of information contained herein.

Raven Industries shall not be responsible or liable for incidental or consequential damages or a loss of anticipated benefits or profits, work stoppage or loss, or impairment of data arising out of the use, or inability to use, this system or any of its components. Raven Industries shall not be held responsible for any modifications or repairs made outside our facilities, nor damages resulting from inadequate maintenance of this system.

As with all wireless and satellite signals, several factors may affect the availability and accuracy of wireless and satellite navigation and correction services (e.g. GPS, GNSS, SBAS, etc.). Therefore, Raven Industries cannot guarantee the accuracy, integrity, continuity, or availability of these services and cannot guarantee the ability to use Raven systems, or products used as components of systems, which rely upon the reception of these signals or availability of these services. Raven Industries accepts no responsibility for the use of any of these signals or services for other than the stated purpose.

Chapter 1	<i>Important Safety Information</i>	1
Chapter 2	<i>Introduction</i>	3
	Preparing for Installation	3
	Recommendations	4
	Point of Reference	4
	Updates	5
	Kit Contents	5
Chapter 3	<i>System Installation</i>	7
	Install the SmarTrax Node and Node Harness	7
	6R Series	7
	7R, 8R, 8RT, 9R, and 9RT Series	8
	Node Mounting Locations	10
	Install the Power Adapter Cable - SmarTrax-Only Systems	11
	Connect SmarTrax to an Existing Chassis Cable (If Applicable)	11
	System Diagram	12
Chapter 4	<i>Startup Procedures</i>	13
	Activate the SmarTrax System	13
	Generation 4 CommandCenter	13
	Generation 3 CommandCenter - Models 2014 & Older	15
	Disable the Precision Ag Applications Setting	17
	Remove the GreenStar 2 or GreenStar 3 2630 Display	18
	Turn Off the Precision Ag Applications Setting	18
	Calibrate the SmarTrax System	21

CHAPTER

1

*Important Safety
Information*

NOTICE

Read this manual and the operation and safety instructions included with your implement and/or controller carefully before installing the SmarTrax system.

- Follow all safety information presented within this manual.
- Follow all safety labels affixed to the SmarTrax system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact your local Raven dealer.
- If you require assistance with any portion of the installation or service of your Raven equipment, contact your local Raven dealer for support.

When operating the machine after installing the SmarTrax system, observe the following safety measures”

- Be alert and aware of surroundings.
- Do not operate the SmarTrax system or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator’s position in the machine at all times when the SmarTrax system is engaged.
- Disable the SmarTrax system when exiting the operator’s seat and machine.
- Do not drive the machine with the SmarTrax system enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling the SmarTrax system when the safe working distance has been diminished.
- Ensure the SmarTrax system is disabled prior to beginning any maintenance work on the SmarTrax system or the machine.

WARNING

- When starting the machine for the first time after installing the SmarTrax system, be sure that all persons are standing clear of the machine in case a wheel moves unexpectedly.
- Read all safety requirements and precautions in the machine's operation manual prior to operating a machine equipped with the SmarTrax system feature. Failure to follow safety precautions may lead to damage to the equipment, personal injury, or death.
- To prevent accidental engagement of steering and loss of vehicle control, turn the road switch on when driving down the road.

CAUTION

- The GPS steering system does not detect obstacles in the vehicle's path. The operator must observe the path being driven to avoid obstacles.
- When engaged, the GPS steering system controls only the steering of the vehicle. The operator must control the speed of the vehicle.

CHAPTER

2

Introduction

Congratulations on your purchase of the Raven SmarTrax system! This system is designed to provide cutting-edge, hands-free steering of your machine via Global Positioning System (GPS) coordinates.

This manual applies to the following machines:

MAKE: John Deere, Tier IV - Steering Ready

MODEL: 6R Series, 7R Series, 8R Series, 8RT Series, 9R Series, 9RT Series and 9RX Series

YEAR: 2011 - 2015

FIGURE 1. John Deere 8310R



Preparing for Installation

Before installing the SmarTrax system, park the machine where the ground is level, clean, and dry. Turn off the machine and leave it turned off for the duration of the installation process. Bleed pressure from the hydraulic system by loosening the hydraulic fittings slowly, where applicable.

During the installation process, follow good safety practices. Be sure to carefully read the instructions in this manual as you complete the installation process.

Recommendations

Raven Industries recommends the following best practices when installing or operating the SmarTrax system for the first time, at the start of the season, or when moving the SmarTrax system to another machine:

- Install the GPS antenna in the recommended location. Refer to the following table for the machine-specific antenna mounting location.

Note: *If your machine is not listed, install the antenna on the front-center of the cab.*

Machine Preset	Antenna X Position (left to right)	Antenna Y Position (from the rear wheel axle to the antenna position on the cab)	Antenna Z Position (ground to top of antenna)
John Deere 6R/7R ISO	Centered	5.33 ft./1.63 m	9.67 ft./2.95 m
John Deere 8R ISO	Centered	5.0 ft./1.52 m	9.67 ft./2.95 m
John Deere 9R ISO	Centered	10.25 ft. /3.12 m	12.25 ft./3.73 m

- Ensure the machine's hydraulic filters have been recently changed and there are no issues with the machine's hydraulic system (e.g., pump issues, faulty hydraulic motors, fine metal deposits in the hydraulic hoses, etc.).
- Ensure the machine's hydraulic system is using fresh oil and debris is flushed from the hydraulic hoses, valves, and filters.

Raven Industries recommends the following best practices when installing the SmarTrax system:

- Use part numbers to identify the parts.
- Do not remove the plastic wrap from a part until it is necessary for installation.
- Do not remove plastic caps from a part until it is necessary for installation.

Point of Reference

The instructions in this manual assume that you are standing behind the machine, looking toward the cab.

Updates

Software and manual updates are available on the Raven Applied Technology website:

<http://www.ravenhelp.com>

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

techwriting@ravenind.com

-John Deere R, RT, and RX Series, Tier IV Steering Ready 2011-2015 SmarTrax™ Installation Manual

-P/N 016-5034-010 Rev. B

-Any comments or feedback (include chapter or page numbers if applicable).

-Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

Kit Contents

This section contains a list of the components that are included in the SmarTrax kit. Before beginning installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your local Raven dealer.

TABLE 1. John Deere R-Series Tier IV SmarTrax Installation Kit (P/N 117-5034-010)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - SmarTrax and SmartSteer Calibration & Operation	016-0171-277	1
Not Pictured	Manual - John Deere R-Series Tier IV Steering Ready Installation	016-5034-010	1
	Node - SmarTrax RTK	063-0173-228	1

TABLE 1. John Deere R-Series Tier IV SmarTrax Installation Kit (P/N 117-5034-010)

Picture	Item Description	Part Number	Qty.
	Cable - John Deere Tier IV SmarTrax Node	115-4001-118	1
	Cable - Power Adapter	115-4001-119	1

TABLE 2. John Deere Tier IV Node Mount Installation Kit (P/N 117-0197-102)

Picture	Item Description	Part Number	Qty.
	Bracket - John Deere Tier IV Node Mounting	107-0172-055	1
	Bolt - M10 x 1.5 x 16 Hex Head	311-0070-036	2
	Nut - 3/8"-16 Nylon Insert Hex	312-4001-109	3
	Bolt - M10 x 1.5 x 25 Hex Head	311-0070-008	1
	Spacer - .750 OD x .385 ID x .500 Long	107-0172-099	1
	Tape - 3.5" Double-Sided	332-0000-019	6

*Install the SmarTrax Node and Node Harness**6R Series***FIGURE 1. SmarTrax Node Installed**

1. Install the node (P/N 063-0173-228) on the node mounting bracket (P/N 107-0172-055) using three 3/8"-16 nylon insert lock nuts (P/N 312-4001-109).
2. Insert the two large, rectangular connectors of the node harness (P/N 115-4001-118) into the correct ports of the node.
3. Tighten the bolts on the harness connectors to secure the connections.
4. Clear the area on the floor to the right of the operator's seat.
5. Apply six strips of 3.5" double-sided tape (P/N 332-0000-019) to the back of the node mounting bracket.
6. Remove the backing from the double-sided tape.
7. Orient the node mounting bracket so that direction arrow #1 is pointing forward and #3 is pointing straight back to the rear of the cab.
8. Secure the node mounting bracket to the floor.
9. Connect the 9-pin CAN connector from the node cable into the 9-pin CAN connection of the platform, to the right of the operator's seat.

7R, 8R, 8RT, 9R, and 9RT Series

FIGURE 2. Node Mounting Location



1. Remove two plugs from either set of bolt holes the right-rear post in the machine's cab.

FIGURE 3. Node Mounting Bracket Installed



2. Install the node mounting bracket (P/N 107-0172-055) vertically (with 0° tilt) to the post as shown in the figure above using two M10 x 1.5 x 16 hex head bolts (P/N 311-0070-036).

Note: A spacer (P/N 107-0172-099) is provided for machines that do not contain a vertical mounting post. If this is the case, mount the node mounting bracket to the post using the spacer, one M10 x 1.5 x 16 hex head bolt, and one M10 x 1.5 x 25 hex head bolt (P/N 311-0070-008).

FIGURE 4. Node Cable Installed on Node

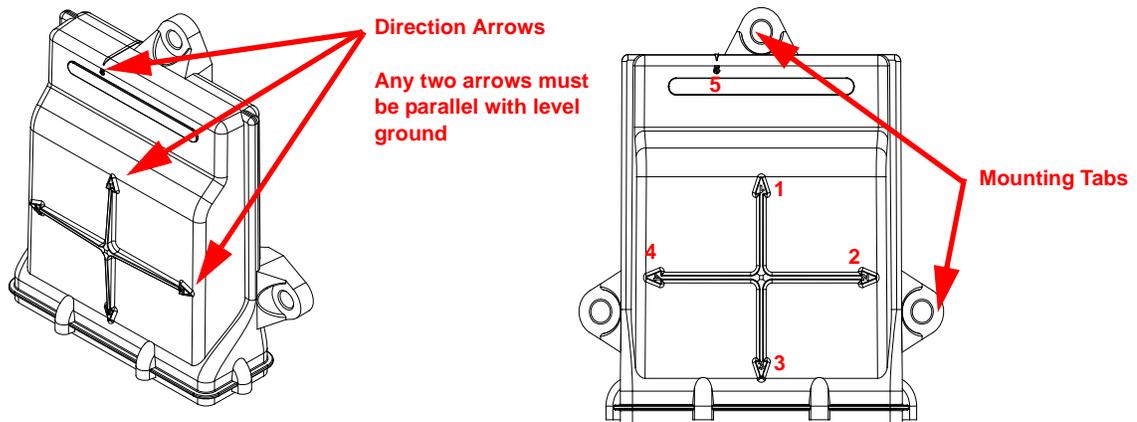
3. Insert the two large, rectangular connectors of the node cable (P/N 115-4001-118) into the correct ports of the node.
4. Tighten the bolts on the harness connectors to secure the connections.
5. Install the SmarTrax node (P/N 063-0173-228) on the installed mounting bracket using three 3/8"-16 nylon insert hex nuts (P/N 312-4001-109).

FIGURE 5. CAN Connection

6. Connect the 9-pin CAN connector from the node cable into the 9-pin CAN connection of the platform, to the right of the operator's seat.

Node Mounting Locations

FIGURE 6. Node Mounting



When choosing the location for the SmarTrax node, consider the following points:

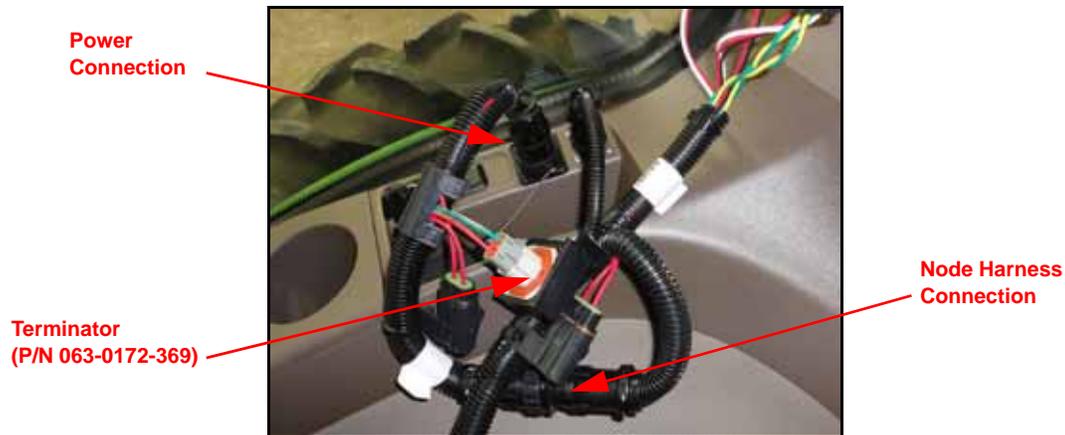
- Mount the SmarTrax node inside the machine's cab on a flat, level surface for proper performance and cable connection.
- One of the six numbered direction arrows on the node must be oriented in the direction of forward vehicle travel, one arrow pointing straight up, and two of the arrows parallel to the ground.

Note: Make a note of the number of the arrow that is oriented in the direction of forward vehicle travel. This number will be needed during the SmarTrax calibration process.

- The node mounting location must not create tripping hazards.
- Mount the node in a location where it will not be kicked or jarred during normal equipment operation.
- The location must allow cable routing to avoid crimping or damaging the cables or the node connections.
- Securely fasten the node using bolts or screws through at least two of the three mounting holes. When mounted properly, the node should not become loose or rotate.

Install the Power Adapter Cable - SmarTrax-Only Systems

FIGURE 7. Power Adapter Cable Installed



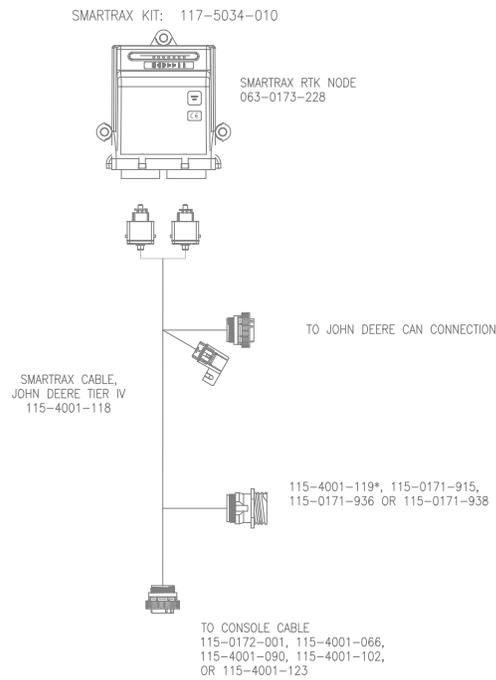
1. Locate the power adapter cable (P/N 115-4001-119).
2. Connect the round, 16-pin connector of the power adapter cable to the mating connector of the node harness cable (P/N 115-4001-118).
3. Connect the mating round connector to the cab's power connection to the right of the operator's seat.
4. Connect the remaining round connector of the node harness to the Raven console harness.
5. Install a terminator (P/N 063-0172-369) on the remaining end of the power adapter cable.

Connect SmarTrax to an Existing Chassis Cable (If Applicable)

1. Locate and disconnect the connection between the Raven console cable and chassis cable on the machine's existing CAN system.
2. Connect the SmarTrax node harness (P/N 115-4001-118) to the machine's chassis cable that was disconnected from the console cable.
3. Connect the remaining node harness connector to the Raven console cable.

System Diagram

CAN SMARTRAX, RTK, JOHN DEERE STEER READY, TIER IV



KIT ALSO INCLUDES:

- JOHN DEERE STEER READY MANUAL (P/N 016-0197-008)
- NODE MOUNTING KIT (P/N 117-0197-102) – TIER IV
- SMARTRAX TERRAIN COMP MANUAL (P/N 016-0171-277)

NOTE:

REFER TO DWG. 054-5000-001 FOR OTHER SYSTEM COMPONENTS.

*USE 115-4001-119, 115-0171-915
OR 115-0171-936 POWER CABLE
IF ONLY USING RAVEN SMARTRAX.
USE 115-0171-938 IF USING
ADDITIONAL RAVEN NODES.

CHAPTER

4

Startup Procedures

Activate the SmarTrax System

Note: There are two different generations of CommandCenter displays that are compatible with the SmarTrax system. Models 2014 and older are equipped with Generation 3 displays; model years 2015 and newer are equipped with Generation 4 displays. Refer to the section applicable to the version of CommandCenter used in the machine.

Generation 4 CommandCenter

1. Contact your local John Deere dealer to purchase a Raven guidance compatibility activation code.

FIGURE 1. Generation 4 CommandCenter Main Menu



2. Select the **MENU** icon.
3. Select **Applications**.

FIGURE 2. Menu Display



4. Select **Automation Status**.

FIGURE 3. Automation Status Menu



5. Select **Activations**.

FIGURE 4. Software Manager Screen



6. Select **Enter Code**.

FIGURE 5. Activation Code Screen



7. Enter the guidance compatibility activation code obtained from John Deere.
8. Select **OK**. The following screen will be displayed:

FIGURE 6. Activation Screen



9. Verify that Raven SmarTrax is enabled.

Note: The Status indicator to the right will be green.

10. Verify that AutoTrac is disabled. If AutoTrac Guidance is enabled:
 - a. Select **AutoTrac Guidance**.
 - b. Select **Details**.
 - c. Toggle **AutoTrac Guidance** to **OFF**.

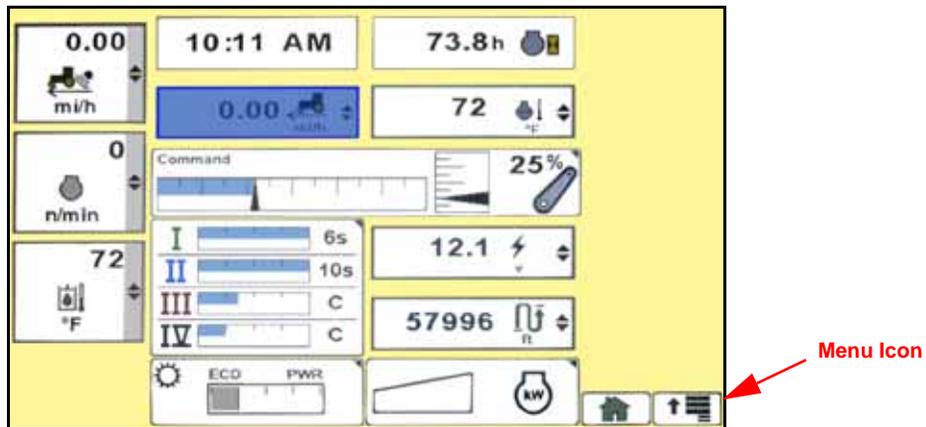
Note: If the AutoTrac Guidance feature is active, the status indicator to the right will be green. If it is disabled, it will be blue.

Generation 3 CommandCenter - Models 2014 & Older

1. Contact your local John Deere dealer to purchase a Raven guidance compatibility activation code.

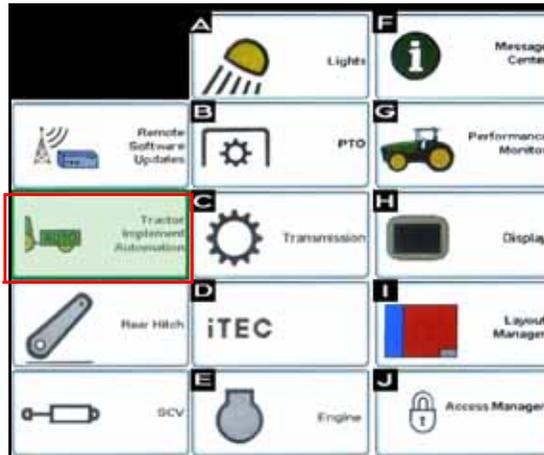
Note: You will need the tractor's serial number to obtain the code.

FIGURE 7. CommandCenter™ Main Menu



2. Select the menu icon on the CommandCenter's main menu.

FIGURE 8. Tractor Implement Automation Icon



3. Select the Tractor Implement Automation icon.

FIGURE 9. Key Icon



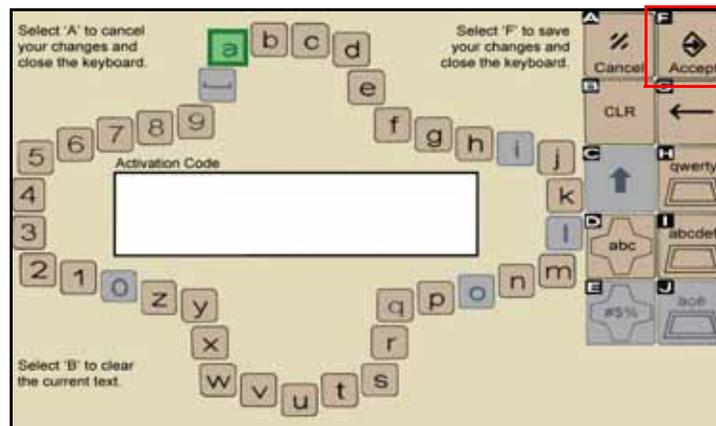
4. Select the Key icon.

FIGURE 10. Enter Code Icon



5. Select **Enter Code**.

FIGURE 11. Code Activation Screen



6. Enter the activation code.
7. Select **Accept**.

Disable the Precision Ag Applications Setting

In order for non-John Deere guidance systems to work properly, the Precision Ag Application setting in the CommandCenter display must be turned off.

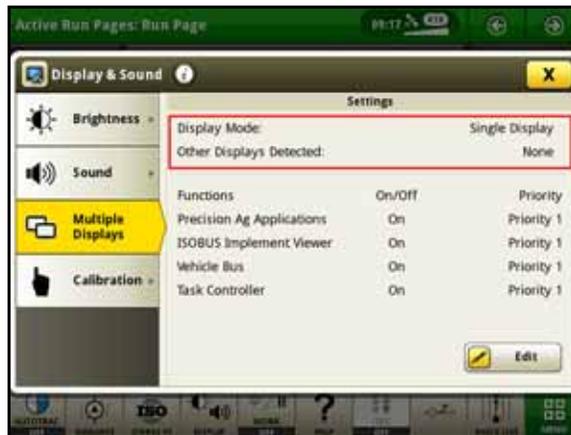
Important: If the machine has a Generation 4 CommandCenter display and a GreenStar 2 or GreenStar 3 2630 display installed, Raven recommends removing the displays before disabling the Precision Ag Applications setting in the CommandCenter display. If there is no GreenStar display present, proceed to "Turn Off the Precision Ag Applications Setting" on page 18.

Remove the GreenStar 2 or GreenStar 3 2630 Display

1. Turn the ignition key to turn the machine's power off.
2. Remove the GreenStar display and its cabling.
3. Remove the fuses in the F5 and F9 slots in the machine's fuse panel.
4. Wait one minute and then reinstall the fuses in the appropriate slots.
5. Turn the ignition key to turn the machine's power on.

Note: A lost communications message should appear in the CommandCenter display within two minutes.

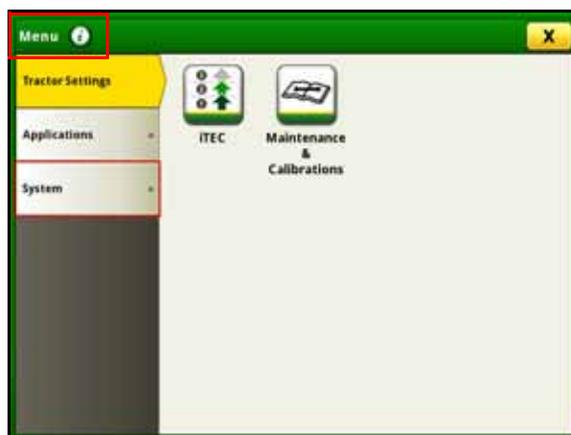
FIGURE 12. CommandCenter Display



6. Verify that the CommandCenter is in “Single Display” mode and that there are no other displays detected.

Turn Off the Precision Ag Applications Setting

FIGURE 13. System Settings Screen



1. Select **Menu**.
2. Select **System**.

FIGURE 14. System Menu



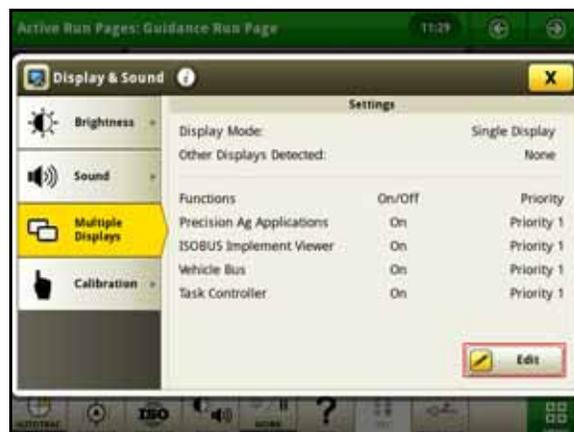
3. Select **Display & Sound**.

FIGURE 15. Display & Sound Menu



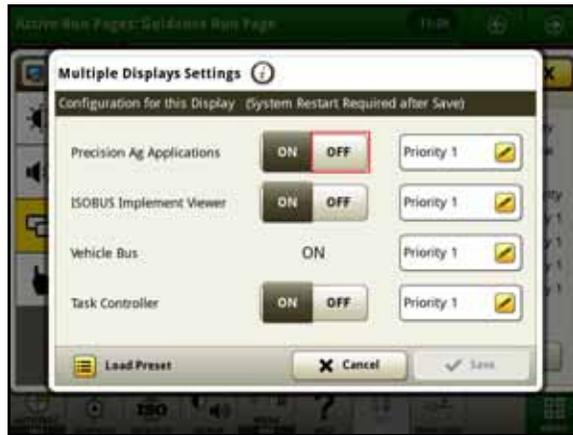
4. Select **Multiple Displays**.
5. Select **Edit**.

FIGURE 16. Multiple Displays Screen



6. Toggle **Precision Ag Applications** to **OFF**.

FIGURE 17. Precision Ag Applications Settings Turned Off



7. Select **Save**.

FIGURE 18. Save Button



8. Follow the on-screen instructions to perform a system restart as shown in Figure 19 below.

FIGURE 19. System Restart Instructions Screen



Calibrate the SmarTrax System

1. Refer to the SmarTrax and SmartSteer Calibration & Operation Manual (P/N 016-0171-277) for instructions on calibrating the SmarTrax system and adjusting system settings.

Note: As long as the correct machine preset is selected in the SmarTrax Setup Wizard, the system will automatically skip the hydraulic system calibration. Refer to the Recommendations section on page 4 for the applicable machine preset options.

FIGURE 20. Machine's Resume Button



2. Use the machine's resume button or switch to engage the SmarTrax system.

I

Important Safety Information 1**Introduction** 3

- Kit Contents 5
- Preparing for Installation 3
 - Point of Reference 4
 - Recommendations 4
- Updates 5

K

Kit Contents 5

S

Startup Procedures 13

- Activating the SmarTrax System 13
 - Generation 3 CommandCenter - Models 2014 & Older 15
 - Generation 4 CommandCenter 13
- Calibrating the SmarTrax System 21
- Disabling Precision Ag Applications Setting 17
 - Removing the GreenStar 2 or GreenStar 3 2630 Display 18
 - Turning Off the Precision Ag Applications Setting 18

System Installation 7

- Installing the Power Adapter Cable - SmarTrax-Only Systems 11
- Installing the SmarTrax Node
 - Node Mounting Locations 10
- SmarTrax Node and Node Harness 7
 - 6R Series 7
 - 7R, 8R, 8RT, 9R, and 9RT Series 8
- System Diagram 12

RAVEN

Limited Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

How Long is the Coverage Period?

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

What Will Raven Industries Do?

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is not Covered by this Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.



Extended Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

Do I Need to Register My Product to Qualify for the Extended Warranty?

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

Where Can I Register My Product for the Extended Warranty?

To register, go online to www.ravenhelp.com and select Product Registration.

How Long is the Extended Warranty Coverage Period?

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology Division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

What Will Raven Industries Do?

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is Not Covered by the Extended Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.