

# **OmniRow® Calibration & Operation Manual**

*P/N P/N. 016-0171-405 Rev. G 06/15*

*E24688*

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# Calibration Reference Sheet

Record the settings and calibration values used when programming the field computer and keep this sheet for future reference or when contacting a service technician.

Circle the setting selected on the field computer for the following options:

<b>Units</b>	US (Acres)	SI (Hectares)	Turf (1000 Square Feet)	
<b>Speed Sensor</b>	SP1 (Wheel Speed)	SP2 (Radar)	<b>Speed Cal</b>	

Write down the selected settings for each configured control channel in the spaces provided.

	<b>Control Channel 1</b>	<b>Control Channel 2</b>	<b>Control Channel 3</b>	<b>Control Channel 4</b>
<b>Control Type</b>				
<b>Valve Type</b>				

Write down the calculated calibration values in the spaces provided.

<b>Section Widths (Boom Cal)</b>			
1.	5.	9.	13.
2.	6.	10.	14.
3.	7.	11.	15.
4.	8.	12.	16.

<b>Meter Cal</b>	<b>Rate Cal</b>	<b>Valve Cal</b>	<b>Volume in Tank/Bin</b>
1.	1.	1.	1.
2.	2.	2.	2.
3.	3.	3.	3.
4.	4.	4.	4.

## Unit Definitions and Conversions

### Unit of Measure Definitions

Abbreviation	Definition	Abbreviation	Definition
GPM	Gallons per Minute	dm	Decimeters
lit/min	Liters per Minute	m	Meter
dl/min	Deciliters per Minute	MPH	Miles per Hour
PSI	Pounds per Square Inch	km	Kilometers
kPa	Kilopascal	km/h	Kilometers per Hour
GPA	Gallons per Acre	US	Volume per Acre
lit/ha	Liters per Hectare	SI	Volume per Hectare
ml/ha	Milliliters per Hectare	TU	Volume per 1,000 Square Feet
GPK	Gallons per 1,000 Square Feet	[ ]	Metric Numbers
mm	Millimeters	lb/acre	Pounds per Acre
cm	Centimeters	kg/ha	Kilograms per Hectare

### Unit of Measure Conversions

To convert the METER CAL value into the selected unit of measure, divide the original number printed on the Flow Meter label by the desired conversion value.

Fluid Ounces Conversion Formula	Liters Conversion Formula	Pounds Conversion Formula
$\frac{\text{Original Meter Cal}}{128}$	$\frac{\text{Original Meter Cal}}{3.785}$	$\frac{\text{Original Meter Cal}}{\text{Weight of One Gallon of Product}}$

#### Liquid

- 1 U.S gallon = 128 fluid ounces
- 1 U.S. gallon = 3.785 liters
- 1 U.S. gallon = 0.83267 imperial gallons
- 1 U.S. gallon = 8.34 pounds (water)

#### Area

- 1 square meter = 10.764 square feet
- 1 hectare = 2.471 acres or 10,000 square meters
- 1 acre = 0.405 hectares or 43,560 square feet
- 1 square mile = 640 acres or 258.9 hectares

#### Length

- 1 millimeter (mm) = 0.039 inches
- 1 centimeter (cm) = 0.393 inches
- 1 meter (m) = 3.281 feet
- 1 kilometer (km) = 0.621 miles
- 1 inch = 25.4 mm or 2.54 cm
- 1 mile = 1.609 km

#### Pressure

- 1 psi = 6.89 kPa
- 1 kPa = 0.145 psi

#### Weight

- 1 Pound = 16 Ounces
- 1 Pound = 0.45 Kilograms

---

CHAPTER

1

*Important Safety  
Information*

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*Safety Information*

**NOTICE**

Read this manual and the operation and safety instructions included with the implement and/or controller carefully before installing the OmniRow planter control system.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of Raven equipment, contact a local Raven dealer for support.
- Follow all safety labels affixed to the 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 a local Raven dealer.

When operating the machine after installing the OmniRow planter control system, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate the OmniRow planter control system while under the influence of alcohol or an illegal substance.
- Remain in the operator's position in the machine at all times when the OmniRow planter control system is engaged.
- Ensure the OmniRow planter control system is disabled prior to starting any maintenance work on the machine or parts of the planter control system.
- Follow all label instructions for proper chemical mixing, handling, and container disposal methods.

 **DANGER**

Thoroughly bleed the nurse tank hose and all other system lines prior to disassembling the flow meter, fittings, and hoses, especially in the case of anhydrous ammonia.

## CAUTION

### Hydraulic Safety

- Raven Industries recommends that appropriate protective equipment be worn at all times when working on any hydraulic system.
- Never attempt to open or work on a hydraulic system with the equipment running. Care should always be taken when opening a system that has been previously pressurized.
- When disconnecting the hydraulic hoses or purging is required, be aware that the hydraulic fluid may be extremely hot and under high pressure. Caution must be exercised.
- Any work performed on a hydraulic system must be done in accordance with the machine manufacturer's approved maintenance instructions.
- When installing hydraulics or performing diagnostics, maintenance, or routine service, ensure that precautions are taken to prevent any foreign material or contaminants from being introduced into the machine's hydraulic system. Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the hydraulic valves.

### Electrical Safety

- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- Ensure that the power cable is the last cable to be connected.
- Always remove the power connections for the field computer and any control nodes from the vehicle battery before jump starting or welding on any component of the vehicle. Jump starting or welding on the equipment will damage the field computer and nodes.

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## CHAPTER

# 2

## *Introduction*

Thank you for purchasing the Raven OmniRow® planter monitoring and management system featuring a Raven Envizio Pro series field computer.

The Envizio Pro series of field computers are multi-purpose tools offering the latest technology in precision agriculture with features including product application control, field map and application reports.

When connected with the OmniRow planter population and section control system, the Envizio Pro field computer is able to monitor singulation and population information for a planter in population control sections or for individual rows.

This manual provides information for operation of the OmniRow system using one of the following Envizio Pro field computers:

- Envizio Pro
- Envizio Pro II
- Envizio Pro XL

**FIGURE 1. Raven Envizio Pro and Envizio Pro XL Field Computers**



This document will explain the following aspects of the Raven OmniRow system:

- Initial Setup and Calibration
- Basic Operation
- Updates and Feature Activation
- Advanced Operation

# Liquid Section Control

The OmniRow system supports use of liquid shut off sections and liquid rate control sections controlled via an optional auxiliary planter node connected to the OmniRow planter control CANbus.

## Liquid Shut-Off Sections

The auxiliary control node used with the OmniRow system is capable of providing automatic on-off control for up to 16 liquid control sections. When controlling liquid shut-off sections, sections may be assigned to planter rows or left unassigned based upon desired operation. When assigned to planter rows, the OmniRow system will shut-off liquid sections only when all rows to which the liquid section is assigned are off. If unassigned, liquid sections will be shut-off based upon previous coverage or no-spray zones in the zone map.

**Note:** *Automatic section control for liquid control sections is provided via the auxiliary planter node. A separate control node is not required or recommended for use with the OmniRow planter control system.*

*The maximum number for liquid section control is based upon the planter implement configuration and other features enabled for use with the OmniRow system. Contact a local Raven dealer for additional assistance when configuring implements and section control capabilities.*

## Liquid Rate Control Sections

Rate control for liquid products is possible via either the planter auxiliary control node with the optional authorization code or by adding a product control node to the planter control CANbus. With either of these optional components, the rate control features for liquid or granular product applications will be available for use during planting operations.

**Note:** *For additional information on the planter auxiliary node authorization or required components for liquid or granular rate control with the OmniRow system, contact a local Raven dealer.*

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# Auxiliary Planter Monitoring Node

The Raven auxiliary planter monitoring node (P/N 063-3001-005) allows the operator to monitor functions such as bin level, down pressure, and fan speed during field operations. The label for sensors that monitor each of these functions may be customized to help the operator track equipment status during operation more easily.

In addition to the monitoring capabilities available for these features, an authorization code may be entered to allow the auxiliary control node to provide control capabilities for the down pressure and fan speed functions as well as up to two control channels for liquid or granular product control during field operations. Fan and down pressure control allows the operator to focus more on other critical tasks during planting operations while the additional product control features allow the system to control rate for products such as a starter fertilizer during the planting operation.

Refer to Chapter 7, *OmniRow Auxiliary Control Node*, for additional information on the down pressure, fan speed, and bin leveling capabilities of the auxiliary planter control node. Review the *Envizio Pro Installation and Operation Manual* for more information on configuring and controlling liquid and granular products using the Envizio Pro field computer.



## Overview of the OmniRow Installation Process

The following section is provided as a reference to the OmniRow installation process.

1. Install the OmniRow planter control hardware and connect the required cabling.  
Refer to the implement specific installation manual for instructions.
2. Mount the field computer.  
Refer to the *Envizio Pro Installation and Operation Manual* for instructions.
3. Install a model specific chassis cable and the Envizio Pro II/Viper Pro chassis interface cable.

**Note:** *The Envizio Pro field computer requires the chassis cable platform to interface with an OmniRow system. Chassis cables are available for installation on specific tractor models. Contact a local Raven dealer for more information.*

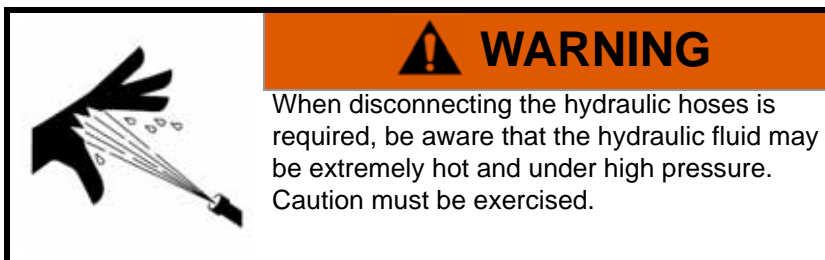
*If an existing field computer is installed using the main interface (P/N 115-0171-746), the cable will need to be replaced with the chassis and chassis interface cables. Contact a local Raven dealer for implement and tractor specific cables required for the planter and tractor installation.*

4. Connect the chassis cable to the OmniRow planter control system at the hitch. The hitch connection allows the operator to quickly disconnect the OmniRow system when switching towed implements.

**Note:** *Refer to the Envizio Pro Installation and Operation Manual or the Raven CANbus System Installation Manual for instructions on building a CANbus system or adding CAN nodes to an existing system.*

## Hydraulic Connections

One set of dedicated remote hydraulic connectors and a high flow oil return line are required for OmniRow system operation. Review the following items to ensure that the OmniRow hydraulic components will operate correctly based upon control inputs from the cab.



**Note:** *Trace hoses from the OmniRow open center manifold to correctly identify hoses prior to installation.*

1. Connect the P (pressure) hose to a dedicated hydraulic remote port on the tractor.
2. If the planter implement is an open center system, connect the EF (excess flow) hose to the return side of a dedicated remote which the Pressure hose is using.

**Note:** *Most implements are configured for closed center operation and will not require an EF hose to be connected. For additional questions regarding the implement hydraulic system requirements, contact a local implement dealer.*

3. Connect the T (tank) hose to a high flow oil return line.

## OmniRow Planter Control Cable Connection Diagrams

Refer to the implement specific installation manual and the *Envizio Pro Installation and Operation Manual* for cable connection diagrams for the planter control system.

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### Updates

Raven software and documentation updates may be made available periodically on the Raven Applied Technology web site:

[www.ravenhelp.com](http://www.ravenhelp.com)

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*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.*

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*-OmniRow® Calibration & Operation Manual*

*-P/N. 016-0171-405 Rev. G*

*-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.*

A Controller Area Network, or CAN, system is a high-integrity serial data communications bus that operates at a data rate of 250 kilobits per second for real-time control applications and uses special cables and terminators for operation. The CAN protocol has excellent error detection and confinement capabilities, making it very suitable and reliable for agricultural applications.

CAN systems allow products to be added to a control system at any time. The planter control system utilizes a single planter control node for control of the planter. Some OmniRow control systems utilize multiple planter control nodes to provide control for larger implements or for some implement configurations. Contact a local Raven dealer for more information.

The diagrams in this chapter show different hardware configurations for use with Envizio Pro series field computers. Some diagrams show optional features which may not apply to each system. These features and components are not required for CAN operation and optional features and cables may be ignored during a basic installation.

## Raven CAN System Installation

Instructions for installing CAN nodes required for the OmniRow system are provided in the implement specific installation manual.

**Note:** *If a radar speed sensor will be used to provide speed signal to the OmniRow node, the 3-pin speed connector should be disconnected from the CAN Switch Box in the cab.*

Refer to the *Raven CANbus Network Installation Manual* for instructions for proper installation of a Raven CANbus system on a spreader, sprayer, or other application equipment.

Refer to the following sections for information on CANbus systems including detecting the planter control nodes and diagnostic information.



### NOTICE

Refer to the OmniRow Installation Manual for information on installing the OmniRow control components. Be sure each component is properly mounted and cables are connected prior to powering the field computer.

## CAN Diagnostics


The field computer must be able to communicate with the CANbus system when monitoring or controlling planter operations. If configured as a CAN control console, the Envizio Pro should automatically establish communication with up to two planter control nodes, an auxiliary planter node, a SmarTrax Terrain Compensation node (if installed), and up to four product control nodes (as available per the system configuration) via the CANbus.

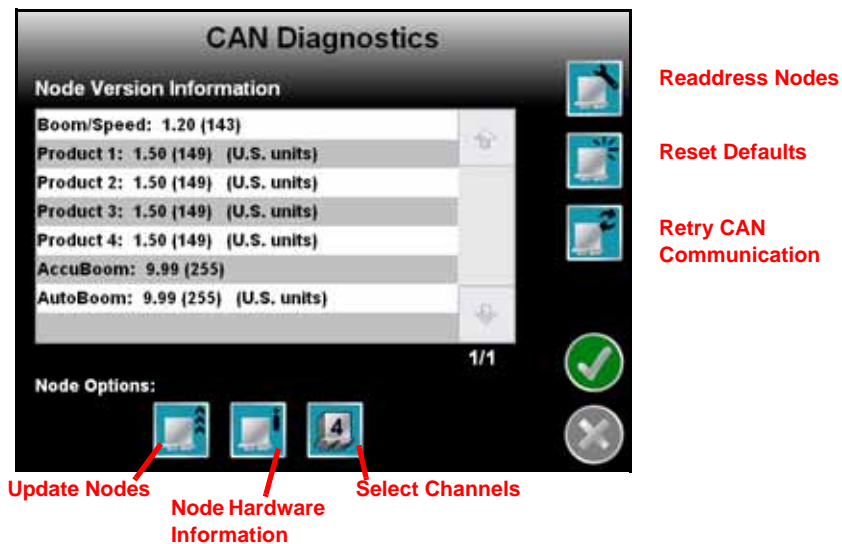
**Note:** Planter control nodes may need to be readdressed prior to detecting each node on the CANbus. See the *Readdressing the Nodes* section on page 9 for detailed instructions on readdressing the planter control nodes.

To view a list of nodes currently detected on the CANbus network:

1. Select the Information icon in the upper, right corner of the Home screen.



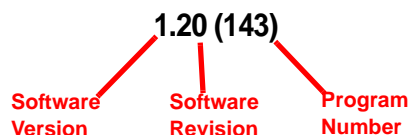
2. Touch the  icon on the About Envizio Pro screen to display the CAN Diagnostics screen.



**Note:** If a product is not found, troubleshoot the node to determine why the field computer cannot communicate with the node. See the *CAN Troubleshooting* section on page 11 for more information about CAN communication failures.

### Node Version Information

The CAN Diagnostics screen displays the software version, software revision, and program number of each node detected on the CANbus.




## Readdressing the Nodes

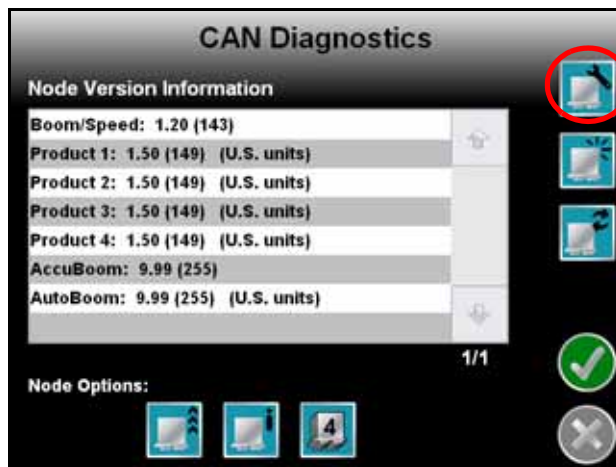
If the field computer is unable to detect a CANbus node on startup, troubleshoot the CANbus and the node (see the *CAN Troubleshooting* section on page 11), and then readdress the CANbus.


Readdress the OmniRow planer control system by completing the section setup wizard from the Wizard menu. Refer to the *Planter Section Setup Wizard* section on page 19 for more information.

1. Select the Information icon in the upper, right corner of the Home screen.




2. Touch the  icon on the About Envizio Pro screen to display the CAN Diagnostics screen.





3. Touch the  icon to begin readdressing the product control nodes.
4. When prompted to cycle power on the first product node, disconnect the logic power from the first planter control node. After approximately 3 seconds, reconnect the node logic power.
5. If additional planter control nodes are installed in the CANbus, repeat step 4 to readdress the remaining node as necessary.
6. After all planter control nodes are properly addressed, repeat step 4 to readdress any product control nodes on the CANbus.
7. Touch the Accept icon to finish readdressing the nodes.

### Reset CANbus Defaults


	<p data-bbox="824 239 1013 285"><b>NOTICE</b></p> <p data-bbox="634 302 1187 497">Resetting system defaults will clear all calibration information from any planter control nodes. Before resetting system defaults, it is recommended to write down any necessary calibration information that may help to recalibrate the system.</p>
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To reset all planter and product control nodes on the system:

1. From the Home screen, touch the Tools Menu icon and access the Control Interface screen from the System menu.
2. Touch the  icon along the right side of the screen to access the CAN Diagnostics screen.
3. Touch the  icon to clear all planter node or control channel settings. To help record settings for the planter control system, step through or review the *Initial Setup Wizard* section on page 16.
4. Touch the Accept icon to proceed with the system reset or select the Cancel icon to return to the CAN Diagnostics screen without resetting the CANbus system.

**Note:** Refer to the *Initial Setup Wizard* section on page 16 for assistance recalibrating the planter control nodes.

### Retry CAN Communication

If a node currently connected to the CANbus system is not displayed on the CAN Diagnostics screen, touch the  icon to start the CAN system. If the node still does not appear on the CAN Diagnostics screen, the CANbus system may need to be readdressed. Review the *Readdressing the Nodes* section on page 9 for instructions on readdressing the product nodes.

### Service Mode

The service mode is intended for use by a trained Raven technician and may be used to assist with troubleshooting and diagnostics. Contact a local Raven dealer for additional assistance.

## Additional Node Options

The following features or options may also be available via the CAN Diagnostics screen:

### Select Control Channels



The Raven product controller node is capable of providing up to four product control channels on an Envizio Pro control system. By default, the product controller will make two control channels available to the field computer for controlling product application.

Select one of the product controller node channels and select the Select Channels icon (shown to the left) to set the number of control channels available via the node.

**Note:** *The Select Channels icon will display the current number of channels which the node is providing to the field computer. Each control channel must be configured separately via the Tools Menu.*

### Hardware Summary



Select a node from the list displayed on the CAN Diagnostics screen and touch this icon to view detailed node hardware information if available. The hardware summary screen provides node operating information that may be helpful when contacting technical support or while troubleshooting CAN communication issues.

**Note:** *If the node is not capable of providing hardware information, the Hardware Summary screen will display "N/A" for the unavailable diagnostic values.*

### Update CAN Nodes



Select a node from the list displayed on the CAN Diagnostics screen and touch this icon to update the node firmware via the CANbus network using the field computer. Refer to Appendix E, *Updating CAN Nodes via the Envizio Pro or Envizio Pro II*, for additional assistance performing a node update using the field computer.

## CAN Troubleshooting

Although the control algorithm is located within the CAN node, all of the same troubleshooting techniques that are used in a traditional hard-wired or serial control systems still apply to a CAN system and the behavior of the system remains the same. Flow and speed sensors, as well as the control valve and boom valves, are used in the same fashion.

### CAN Node Off-line Errors

Occasional reports have been received on Raven consoles sporadically losing communication with one or more CAN nodes. The most likely causes for this problem are:

1. Corroded and/or open connections in the circuit.
2. Computer and/or CAN node logic power and grounds connected to a "dirty" power source (dirty power is defined as any circuit with a variable load that exceeds 1 ampere). This is especially true of circuits loaded by electrical coils.

3. Computer and/or nodes connected to different power and/or ground sources. This can result in components operating at different voltage planes.

Refer to the Raven CANbus Network Installation Manual for detailed troubleshooting procedures and information.



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## Overview

The first time the Envizio Pro field computer is powered up, the field computer requires information about the machine, implement, and the type of applications, products, and additional features connected to the system. The field computer gathers this information through a setup wizard which will prompt the user to input the required information to setup the computer for the first time.

## Initial Setup

The initial setup wizard will automatically begin when the console is powered up for the first time. This process should only take a few minutes to complete and is only required during the initial power up sequence.

**Note:** *If the field computer displays an alert regarding an authorization code after starting the console, contact a local Raven dealer or the Raven Technical Support Center for assistance. Refer to the Special Features Registration section on page 152 for instructions on entering the authorization code.*

The initial setup wizard will require the following vehicle information:

- Desired language and display units for operation.
- Guidance width (width of boom or implement without fence row nozzles, foam markers, etc.).
- Antenna offsets (left/right, fore/aft) and height.
- How the implement master switch operation should be monitored by the field computer.

## Other Required Wizards

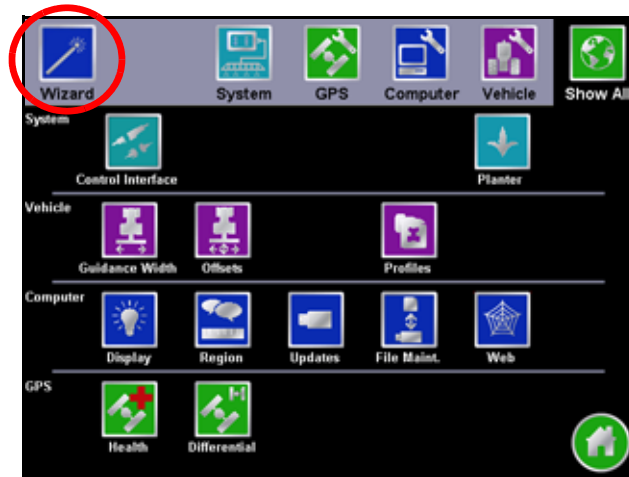
Additional wizards may be required during the initial startup depending upon the settings and selections entered during this process. Detailed descriptions of those wizards are also available in this chapter.

## Hydraulic Pressure Reducing Valve Adjustment

After any required initial setup steps are complete, it is recommended to check that the pressure reducing valve is properly configured for the OmniRow control system prior to starting any planter row or section control operations. Refer to the *Pressure Reducing Valve Adjustment* section on page 49 for assistance with the pressure reducing valve adjustment.

## Launching Wizards

To start the setup wizards after the initial power up has been completed, select the wizard icon in the upper left corner of the Tools menu.



See the *Setup Wizards* section on page 18 for a detailed description of the other available wizards.

## Startup

The Envizio Pro field computer will take several seconds to power up and initialize the user interface, DGPS reception, and the other features of the system.

During startup, the field computer will display the following prompt.



Ignore this prompt to allow the field computer to startup normally.

**Note:** To launch the touch screen calibration wizard, touch the screen while this prompt is displayed.

## Touch Screen Calibration

The touch screen displays an arrow in the location last selected. If the arrow does not appear in the location previously touched, the touch screen may need recalibration.

**Note:** *The Envizio Pro does not require re-calibration of the touch screen every time the console is powered on. Use this procedure only if you are having difficulty with the user interface or the cursor appears in a different location than selected on the touch screen.*

### To Re-Calibrate the Touch Screen

1. When prompted, touch the screen to begin re-calibration of the touch screen.



**Note:** *The operator has approximately 7 seconds to touch the screen to begin the calibration process.*

2. The first calibration target will appear. Touch the center of the target.
3. Each of the four following targets will require the operator to touch the center of the target.
4. Test the touch screen calibration by touching in various areas of the screen.
5. Two options will appear in the lower left corner of the screen:
  - Touch 'Accept' to apply the screen re-calibration and start the field computer.
  - Touch 'Cancel' to reject the screen calibration. The field computer will re-apply the previous touch screen calibration before starting the Envizio Pro management software.

## Initial Setup Wizard

The initial setup wizard will automatically begin when the Envizio Pro is powered up for the first time. This wizard will step through the initial settings and calibration values required for operation of the field computer and control system. This process is only required during the initial power up sequence.



Any values or settings programmed during the initial setup wizard may be modified or refined later through the Tools Menu.

**Note:** *Many of the values entered in the initial setup wizard are required for guidance and/or product control features of the control system. Therefore, the more accurate these values can be measured, the more accurate the control system will be.*



Review the following steps and sections for assistance with completing the initial setup wizard. To confirm the settings displayed on a screen and proceed with the initial setup wizard, touch the 'Next' or 'Accept' icons. If available, the 'Previous' icon will step back to the previous Setup screen.





**Note:** *The following steps are provided as a process overview. The following procedure will reference specific sections in Chapter 8, Tools Menu, for details on specific settings and configuration assistance.*

1. The Region screen is displayed automatically when the field computer is powered on for the first time. Select the preferred language and units for display on the field computer. Refer to the *Region* section on page 151 for details on the available settings or region selections.
2. If desired, the time zone settings may be configured by selecting the Time Zone  icon in the upper, right corner of the Region screen. Refer to the *Time Zone Settings* section on page 152 for details.
3. Touch the Next  icon to proceed with the initial field computer setup.
4. The Control Interface screen will be displayed. Select the Product Control option desired for interfacing with the control system on the implement. For OmniRow systems, select the CAN Planter Control option from this list.

**Note:** *It may not be possible to fully complete configuration of the OmniRow CAN Planter Control option until the activation keys are entered on the field computer. Select the 'None' option to complete the initial configuration wizard. Refer to the *Special Features Registration* section on page 152 for a procedure to enter the activation key and then return to the Setup Wizard menu and restart the set up wizard to configure the CAN Planter Control Interface.*

5. Review the available system options at the bottom of the Control Interface screen. See the *Boom Master and System Options* section on page 120 for details.
6. Touch the Serial Port  icon in the upper, right corner of the screen to configure an optional serial device if desired. See the *Serial Port Configuration* section on page 121 for information on the available serial port settings.
7. Select the CAN Diagnostics  icon in the upper, right corner of the screen to check the status of the network and nodes currently detected and communicating with the field computer. Review the *CAN Diagnostics* section on page 8 for information on using the field computer to check status and readdress the CANbus.



8. Touch the Next  icon to proceed with the initial field computer setup.
9. Use the on-screen keypad to enter the implement, boom, or header width to the nearest inch [centimeter]. The value entered on this screen must be equal to the boom, implement, or header width which completes a field operation as the vehicle drives through the field. See the *Guidance Width* section on page 156 for more information on the Guidance Width value.
10. Once the Guidance width value is entered, select the Next  icon to proceed to the Implement Type screen.
11. Select one of the following options for an initial implement type to which the field computer will be connected during field operations.

**Self Propelled or Mounted Implement.** This option is best suited for fixed implements such as self-propelled sprayer, a harvester or combine, or an implement mounted to a tractor 3-point hitch. See the *Self Propelled or Mounted Implement* section on page 157 for details on configuring implements using this implement type.

**Trailed Implement.** Select this option to configure implements such as anhydrous tool bars, pull-type sprayers, planters, or air seeders with the air cart towed behind the seed drill. Refer to the *Trailed Implement Tractor Setup* section on page 159 for assistance with the trailed implement configuration.

**Trailed Implement with Tow Between.** This option has been designed for seeder implement configurations with the air cart towed between the tractor and seed drill. Refer to the *Trailed Implement with Tow Between Setup* section on page 161 for more information and assistance using the trailed implement with tow between option.

Additional implements may be configured at a later time for different towed implement or tractor configurations. It is recommended to save Profiles for each configured tractor and implement configuration to simplify set up when the field computer is moved between vehicles or the tractor is hitched to different implements. Refer to the *Profiles* section on page 162 for information on saving or loading vehicle profiles.

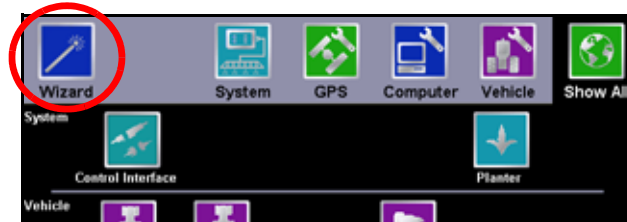
12. Touch Next  to continue with the implement setup process. Refer to the specific implement setup process in the *Offsets and Implement Type Selection* section on page 156 for details on completing the implement configuration.
13. After the specific implement setup process is completed, touch Next  to complete the initial calibration wizard and display the Setup Wizards Menu screen.

## Setup Wizards

The setup wizards simplify the task of setting up the Envizio Pro control system for different products, implements or vehicles. Each setup wizard will display a series of prompts for which settings and calibration values will be required.

### Setup Wizard Menu

After the initial setup is complete, a menu of the available setup wizards can be displayed by selecting the wizard icon in the upper left corner of the Tools menu.




See Chapter 8, *Tools Menu*, for detailed descriptions of the other features accessible through the Tools menu.

The Setup Wizard Menu will display the available setup wizards which may be used to complete the initial setup of the field computer.



**Note:** Depending upon previous options selected during the initial setup wizard, completion of some wizards may be required before the field computer is ready for operation.

Only setup wizards which apply to the system will be displayed in the Setup Wizard Menu. For example, if a SmarTrax Terrain Compensation system is not present on the CANbus, the Steering setup wizard will not be displayed on this screen.

To launch a wizard, touch the icon next to the desired setup wizard to begin. Touch Accept  to exit the Setup Wizard Menu.

**Note:** During the initial setup wizard, the Accept icon will be available only after all required wizards have been completed.

Refer to the following sections for detailed instructions on completing the setup wizards.





## Planter Section Setup Wizard

The planter section setup wizard will guide the operator through configuring section widths and will require the following information:

- Number of rows
- Row widths
- Planter control mode
- Planter and row unit configuration and control

**Note:** *To configure liquid control sections with a separate node on the CANbus, the product section setup wizard will be required to complete the initial calibration of the planter control system. Refer to the Envizio Pro Installation and Operation Manual for assistance with the product section setup wizard, configuring and tuning liquid product sections and for more information on optional features available for liquid system control.*

### Using the Planter Section Setup Wizard

1. Touch the Planter Section Setup Wizard icon. The Planter Re-Address screen will display.
2. If the planter control system uses multiple planter control nodes to monitor and control planter operation, the planter control nodes must be re-addressed before configuring planter sections. Touch the “Re-address Planter Node Now” button and follow the on-screen instructions to begin re-addressing planter control nodes. See the *Readdressing the Nodes* section on page 9 for more information.  
If the planter control system only uses one planter control node, touch Next  and continue to the next step without readdressing the control node.
3. Once the planter control nodes are properly addressed, verify the Guidance Width for the implement and touch Next .
4. Review the on-screen instructions for the trailed implement feature. The trailed implement feature is recommended when using the OmniRow system to control seed rates on a towed implement and will provide more accurate mapping and seed control during planting operations with these implements. If a fixed implement such as a mounted 3-point hitch planter will be used, deselect the trailed implement feature.
5. Touch Next  to accept the displayed trailed implement feature setting.
6. Verify the vehicle and implement settings entered previously in step 9 through step 12 of the initial setup procedure. Refer to the specific implement setup process in the *Offsets and Implement Type Selection* section on page 156 for details on completing the implement configuration.
7. Once the vehicle and implement settings are configured properly, touch Next  and continue to the *Planter Type Selection Setup* section on page 20 to continue with initial system setup.

## Planter Type Selection Setup

1. On the Planter Type Selection screen, select the implement type which best describes the implement to be controlled with the OmniRow system:

**Conventional.** A conventional implement with a single individual row units and no secondary units.

**Twin Row.** Planter implement with groups of row units configured for twin row planting such as a synchronized “diamond” or alternating pattern.

**Interplant.** A planter configured with primary and secondary row units which may be used independently or simultaneously (e.g. multi-hybrid, crop spacing for 30 in. corn versus 15 in. beans, etc.).

2. Next, select the drive or motor control configuration with which the OmniRow system will be interfacing for seed rate control:



**Conventional.** Standard, single tier implement configuration with row units controlled in groups or sections.

**Multi-Hybrid.** Dual seed disks for each row unit which allow the implement to switch seed types, varieties, or hybrids during field operations.

**Twin.** Implement configured to control primary and secondary row units in pairs or groups across the width of the implement.

**Split.** An implement configured to control primary row units separate from secondary row units.


**Individual.** An implement with a drive configuration which controls each row unit independently from other row units.

3. With the appropriate implement type and drive configuration selected, touch Next  to proceed to the Number of Rows screen.
4. Use the on-screen keypad to enter the number of rows on the implement. Touch Next  to proceed to the Row Width screen.
5. Use the on-screen keypad to enter the spacing between implement rows in inches [centimeters]. See the following descriptions, and refer to the on-screen diagram to measure the row spacing appropriately for the different planter implement types:

**Conventional.** Measure the spacing between each row unit.

**Twin Row.** Measure spacing from the center of one primary/secondary row unit set to the center of the next primary/secondary row unit set.

**Interplant.** Measure the spacing set between a primary row unit and adjacent secondary row unit.

6. Touch Next  to proceed to the Planter Implement Setup screen.
7. Touch the implement measurements and use the on-screen keypad to configure the implement to be controlled with the OmniRow planter control system.


**Conventional.** The fore/aft measurement from the implement pivot point to the seed tubes is required to configure a conventional planter implement.


Enable the “Seed Tube in Front” option if the seed tubes are in front of the implement pivot point.

**Twin Row.** For twin row implements, enter the fore/aft measurement from the implement pivot point for both the primary and secondary row unit seed tubes. Enable the “Row 1 on Primary” option if the left-most row unit is in the front bank of row units. Enable the “Primary in Front” or “Secondary in Front” option if the respective seed tubes are in front of the implement pivot point.



**Interplant.** For implements with an interplant configuration, enter the fore/aft measurement from the implement pivot point for both the primary and secondary row unit seed tubes.

**Note:** Touch Information  for additional assistance with the various measurements required for each implement type.

8. Touch the **Next**  icon to proceed to the Planter Control Mode screen.



The Planter Control Mode screen displays the following options for controlling planter operations based upon the implement and drive type selections set previously:

**Note:** *The number of motors or sections available for control with the Planter Section, MultiRow, or Individual Row Control modes will be dependent upon cabling and kit options available for a specific implement. Contact a local Raven dealer for additional assistance with the OmniRow planter control system, available kits, or other hardware required for the specific implement.*

*Be sure the implement is set up and the required hardware has been installed and properly connected to the planter control system to ensure the system is capable of controlling the implement and seed population rate properly.*

*The population rate control activation key (P/N 077-0180-058) must be entered before the Planter Section, MultiRow, or Individual Row Control options will be displayed. Configuration of these control modes is not possible during the initial setup process. Refer to the Special Features Registration section on page 152 for instructions on entering the population rate control key. Contact a local Raven dealer for more information or to acquire an activation key.*

**AccuRow and Monitoring Only.** •This option provides features for automatic section control or shut off for individual rows or sections while monitoring seed singulation and population for each row during planting operations.

**Note:** *This option does not provide features for automatic seed rate control or variable rating seed population.*

See the *AccuRow and Monitoring Only* section on page 23 for step by step instructions for completing the Planter Section Setup Wizard in the *AccuRow and Monitoring Only* mode.

**Planter Section Control.** •This option provides features for automatic rate or population control for up to 4 rate control sections on an implement as well as automatic section control or shut off for individual rows or OEM motors on an implement. Seed singulation and population is monitored for each row via a clutch during seeding operations. See the *Planter Section Control* section on page 25 for step by step instructions for completing the Planter Section Setup Wizard in the *Planter Section Control* mode.

**MultiRow Control.** •This option allows for automatic rate or population control on an implement as well as automatic section control or shut off for each rate control section. Seed singulation and population is monitored for each row during seeding operations. See the *MultiRow Control* section on page 28 for step by step instructions for completing the MultiRow Control Setup Wizard in the *MultiRow Control* mode.

**Note:** *The number of sections available for use with the MultiRow Control mode will be dependent upon the cabling kit options available for a specific implement. Generally, this mode allows rate and population control for up to 8 sections on a 16 row implement or 12 sections on a 24 or 36 row implement.*

*Contact a local Raven dealer for additional assistance with kits available for a specific implement.*

**Individual Row Control.** •This option provides features for automatic rate or population control and row control or shut off for individual row units. Seed singulation and population is monitored for each row during seeding operations. See the *Individual Row Control* section on page 32 for step by step instructions for completing the Planter Section Setup Wizard in the *Individual Row Control* mode.

**Note:** *The Individual Row Control mode may not be available if the user defined row configuration is not supported by the node and connected hardware. The Individual Row Control mode provides AccuRow, automatic section control, functionality using the rate control motors and does not require clutches to shut off planter rows.*

9. Check that the settings displayed on the Planter Summary screen at the end of the planter configuration matches the configuration of the implement and accept the wizard settings. The system may take a few seconds to apply the changes to the implement configuration.
10. If a second Planter Control Node is detected on the CANbus, the Planter Cable Type screen will be displayed. Check the right-most row unit seed tube sensor. If this sensor is labeled as 1 or 2, select the right side flip option to ensure that the system maps planting appropriately.

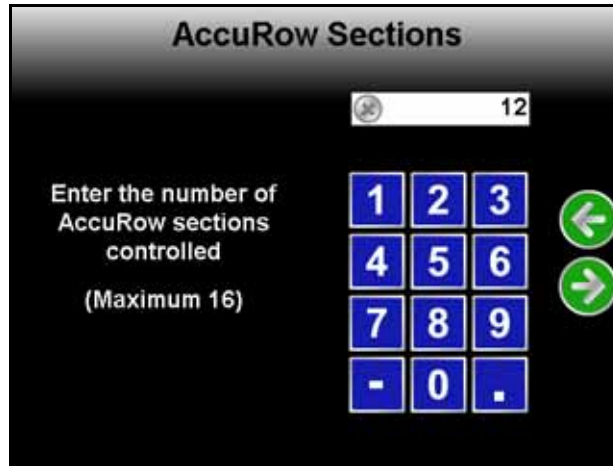
**Note:** *If more than one planter node is detected, the Planter Cable Type screen will open. The Right Side Flip options is intended to be selected when using symmetric toolbar cables (ex. Same cable used on both the left and right side of the planter toolbar). All planter specific kits with dual planter nodes do not use symmetric cables and will require a Normal Cable selection. It is important to verify to motor and clutch output prior to planting.*

*All planter specific kits with dual nodes use a left hand cable designated with an L and user a right hand cable designated with an R (ex. 115-3013-001L or 115-3016-001R).*

11. Check that the Row Assignments screen displays an appropriate representation of the implement and accept the configuration. After the planter section setup is complete, continue to the *Planter Configuration Wizard* section on page 33 for assistance with completing the initial planter configuration.

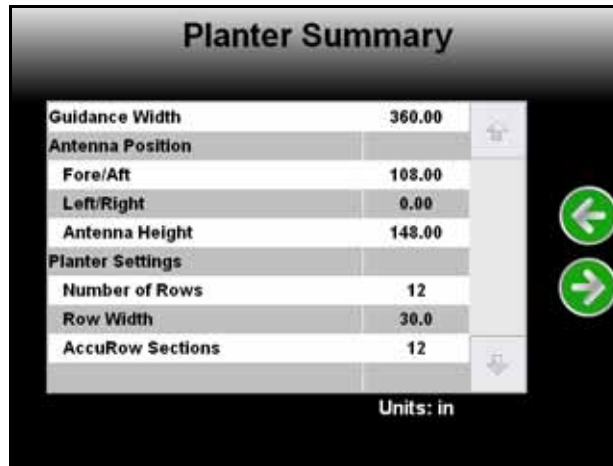
### AccuRow and Monitoring Only

1. Select the “AccuRow and Monitoring Only” option on the Seed Control Selection screen and select Next. The AccuRow Sections screen will open.



**Note:** Touch Previous or Back to review the previously configured settings entered during the Planter Control Setup Wizard.

2. Use the on-screen keypad to enter the number of sections for AccuRow, section shut-off control.
3. Touch Next to advance to the Planter Summary screen.

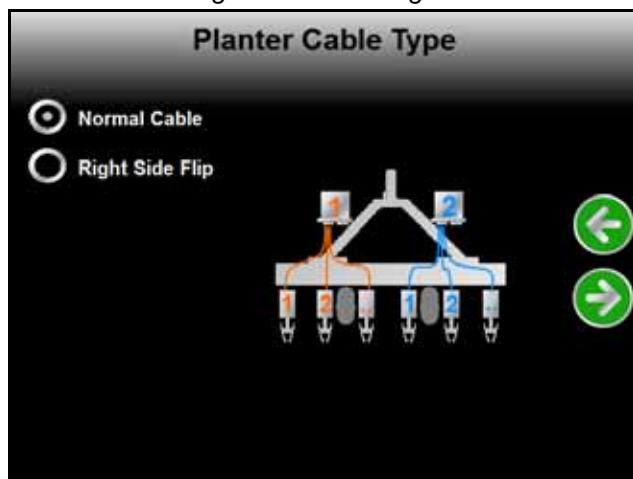


- Use this screen to review the planter implement setup. If any adjustments are necessary, touch Back to change the displayed settings.

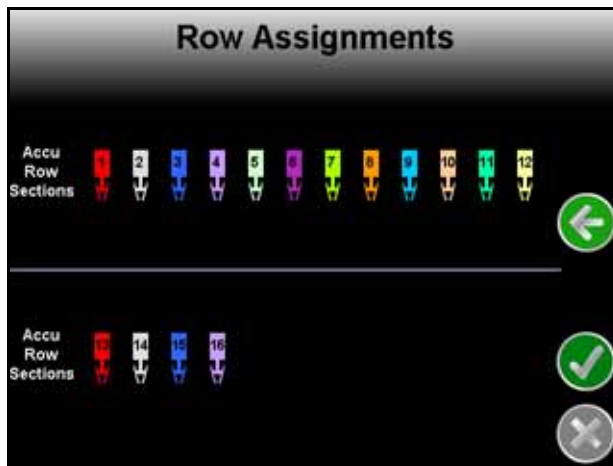
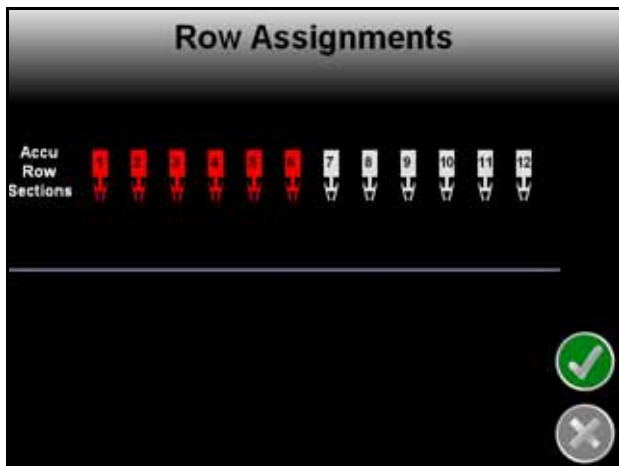
**Note:** *If more than one planter node is detected, the Planter Cable Type screen will open. The Right Side Flip options is intended to be selected when using symmetric toolbar cables (ex. Same cable used on both the left and right side of the planter toolbar).*

*All planter specific kits with dual planter nodes do not use symmetric cables and will require a Normal Cable selection. It is verify to motor and clutch output prior to planting.*

*All planter specific kits with dual nodes use a left hand cable designated with an L and user a right hand cable designated with an R (ex. 115-3013-001L or 115-3016-001R). Check cable labels on the row unit and select the configuration matching the cable numbers*



- Once adjustments are complete, touch the Next icon on the Planter Summary screen to view the Row Assignments screen.



The Row Assignments screen displays the section assignment for each row. Rows assigned to the same section will display in the same color.

**For Example:**

On the screen shown above on the left, rows 1 through 6 are assigned to the first AccuRow section displayed in red. The next AccuRow section contains rows 7 through 12 is displayed in gray.

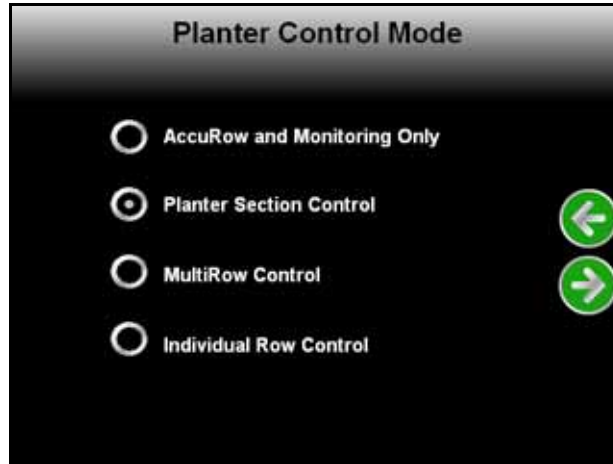
The screen show on the right is an example of a 16 row configuration with 16 AccuRow sections.

**Note:** Seed rate or population sections are not available in the “AccuRow and Monitoring Only” mode and rate control sections are not shown on the Row Assignments screen in this mode.

6. Touch the Accept icon to save the displayed row assignments and return to the Tools Menu screen.

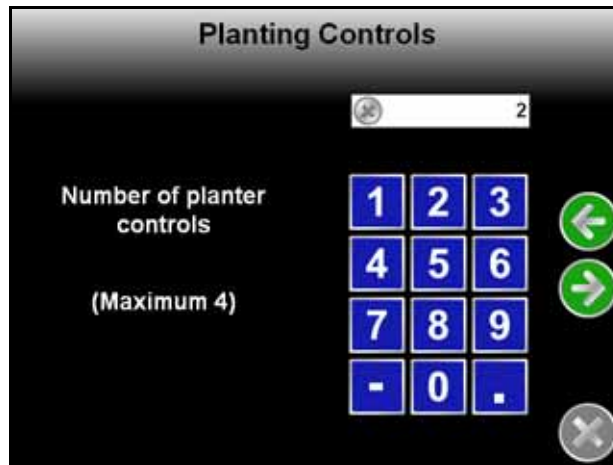
### Planter Section Control

1. On the Seed Control Selection screen, select the “Planter Section Control” option and select Next.

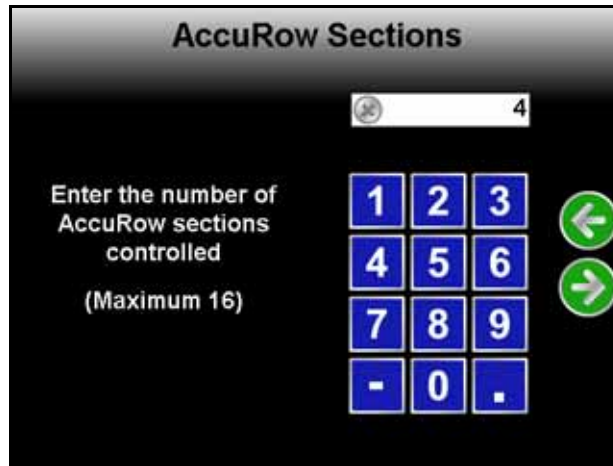


**Note:** Touch Previous or Back to review the previously configured settings entered during the Planter Control Setup Wizard.

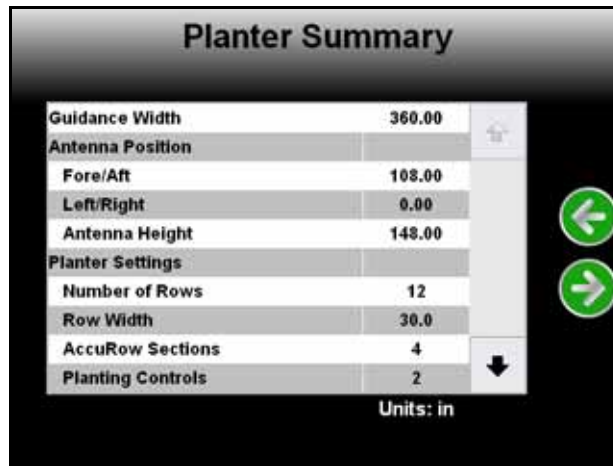
The Planter Controls screen will be displayed.



2. Use the on-screen keypad to enter the number of rate control sections on the planter implement. When finished, select Next to proceed to the AccuRow Sections screen.



3. Use the on-screen keypad to enter the number of AccuRow, automatic shut-off, sections on the planter implement. Touch Next to proceed to the Planter Settings screen.

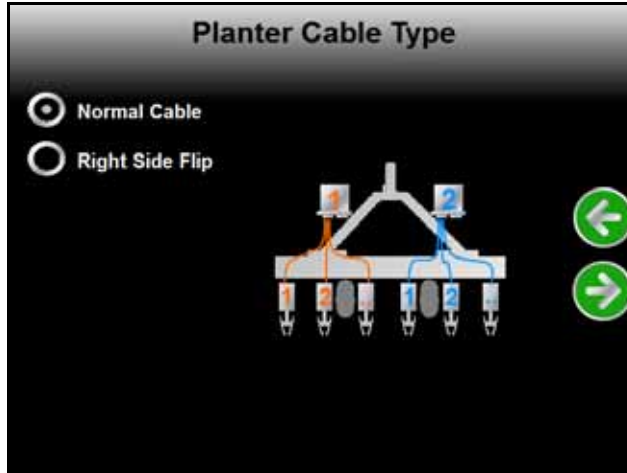


4. Use this screen to review the planter implement setup. If any adjustments are necessary, touch Back to change the displayed settings.

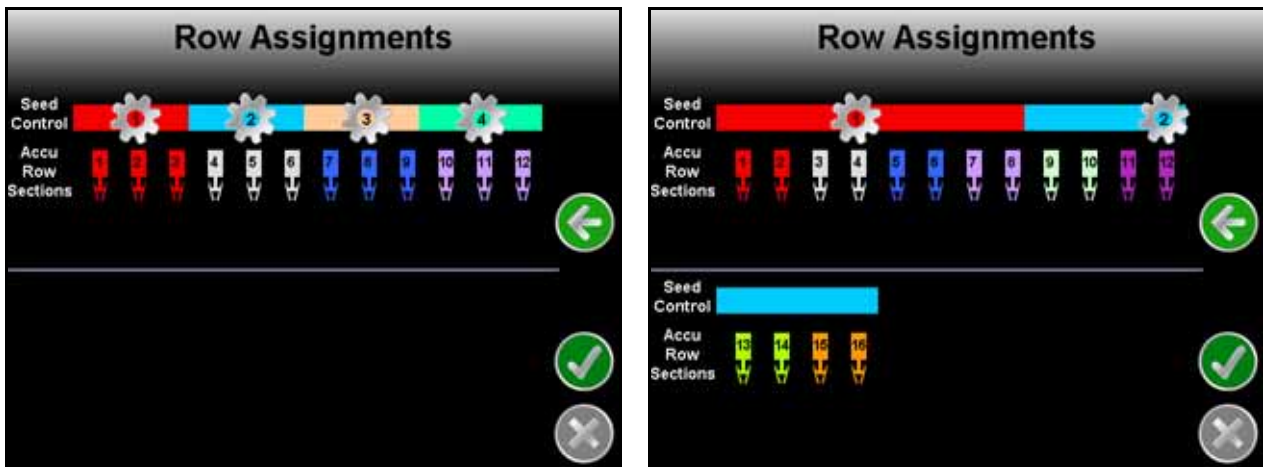
**Note:** *If more than one planter node is detected, the Planter Cable Type screen will open. The Right Side Flip options is intended to be selected when using symmetric toolbar cables (ex. Same cable used on both the left and right side of the planter toolbar). All planter specific kits with dual planter nodes*

do not use symmetric cables and will require a Normal Cable selection. It is verify to motor and clutch output prior to planting.

All planter specific kits with dual nodes use a left hand cable designated with an L and user a right hand cable designated with an R (ex. 115-3013-001L or 115-3016-001R). Check cable labels on the row unit and select the configuration matching the cable numbers



- Once adjustments are complete, touch Next on the Planter Summary screen to view the Row Assignments screen.



The Row Assignments screen displays the rate or seed control sections above the row indicators. The seed rate or population may be controlled for these sections independently of other rate control sections.

**Note:** Rows within each rate control section are controlled to the same seed rate or population.

The row indicators also display the AccuRow, section shut-off, section assignments for each row. Rows assigned to the same AccuRow section will display in the same color.





**For Example:**

For rate control sections on the screen shown above, rows 4, 5 and 6 are assigned to rate control section 2, shown in light blue. These three rows are also assigned to the second AccuRow section shut-off section, shown in gray.

The screen show below is an example of a 16 row configuration with two rate control sections and eight AccuRow sections.

**Note:** *In the screen shown above, rows 1 through 8 will be controlled to the same seed rate or population when enabled. Within each of the rate control sections, each of four AccuRow or shut-off sections may be independently controlled without affecting the status or rate of other sections within the rate control section.*

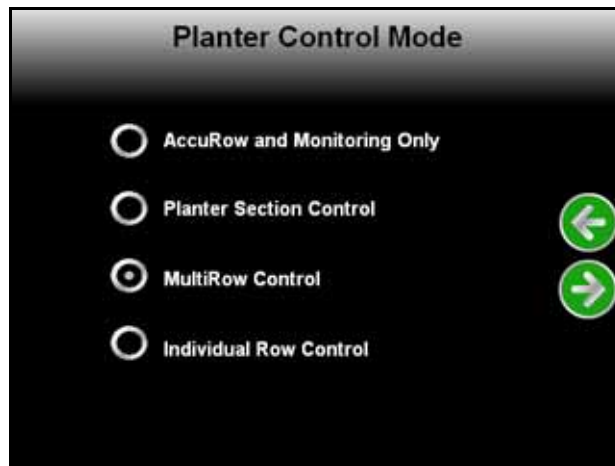
For rate control sections on the screen shown above on the left, rows 4, 5 and 6 are assigned to rate control section 2, shown in light blue. Rows 4, 5 and 6 are also assigned to an AccuRow shut-off section as displayed by the row indicators shown in gray.

The screen show on the right is an example of a 16 row configuration with two rate control sections and eight AccuRow sections.

**Note:** *In the screen shown on the right, rows 1 through 8 will be controlled to the same seed rate or population when enabled. Within each of the rate control sections, each of four AccuRow or shut-off sections may be independently controlled without affecting the status or rate of other sections within the rate control section.*

**MultiRow Control**

1. On the Seed Control Selection screen, select the “MultiRow Control” option and select Next.

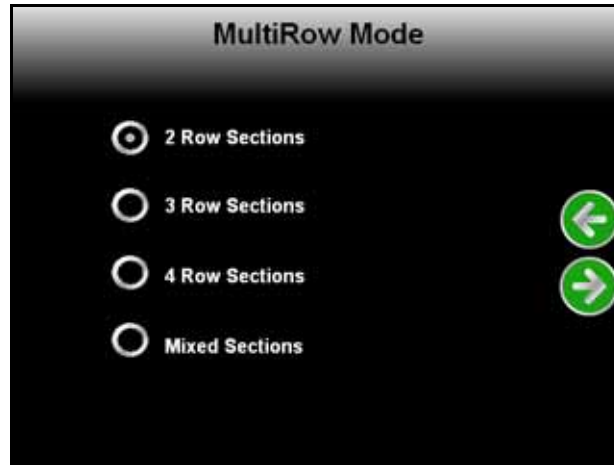


**Note:** *Touch Previous or Back to review the previously configured settings entered during the Planter Control Setup Wizard.*

*If a value larger than 16 is entered on the Number of Rows screen, the MultiRow Control option will require a second planter control node. With two planter control nodes, the OmniRow system may monitor and control a maximum of 36 rows in the MultiRow Control mode.*



The MultiRow Mode screen will display.



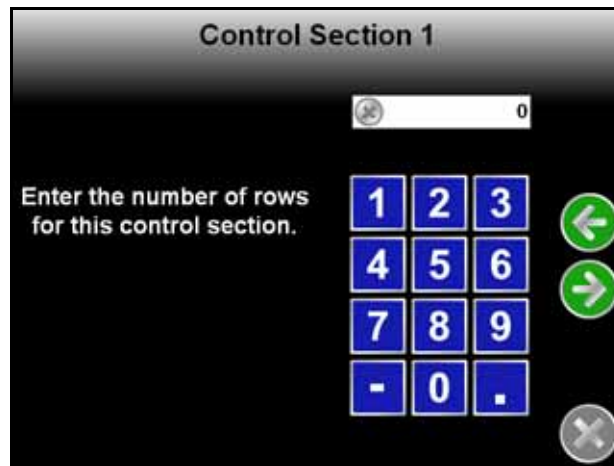
2. Use the MultiRow Mode screen to configure the number of sections on the implement.

To split the implement into equal sections of 2, 3 or 4 rows per section, select one of the available “Row Sections” option and touch Next. Skip to step 6 to continue the configuration wizard.

Select the Mixed Sections option to configure the field computer for mixed sections with different numbers of rows per section. Touch Next and proceed with the following steps to set up the Mixed Sections mode.

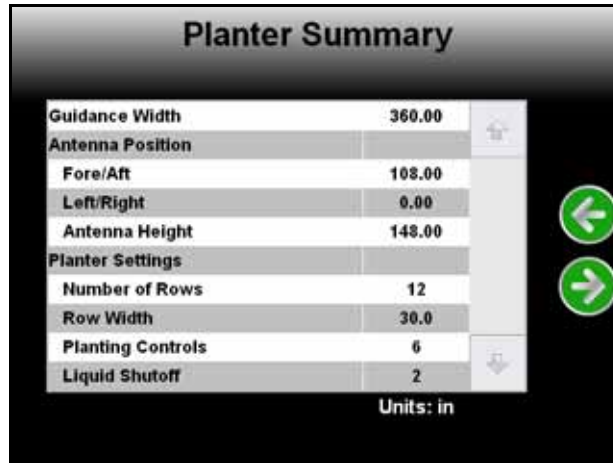
**Note:** To enter a customized configuration, the implement will require the correct number of row control motors and cabling to be installed on the implement. Refer to the implement specific installation manual or contact a local Raven dealer for more information on available cabling options for a specific implement.

3. Use the on-screen keypad to enter the number of rate control sections on the implement. When finished, select Next to proceed to the Control Section 1 screen.



4. Use the on-screen keypad to enter the number of rows in the first control section. The first control section is considered the furthest to the left on the implement.
5. Touch Next and enter the number of rows in the next control section if applicable. Repeat this process to configure remaining control sections. Touch Next to continue.
6. The Liquid Shutoff Sections screen will display. Select one of the available options for the number of liquid sections on the implement.
7. During OmniRow operations, liquid shutoff sections will not be mapped within the job file. Liquid sections are controlled based on active seed control sections for the implement

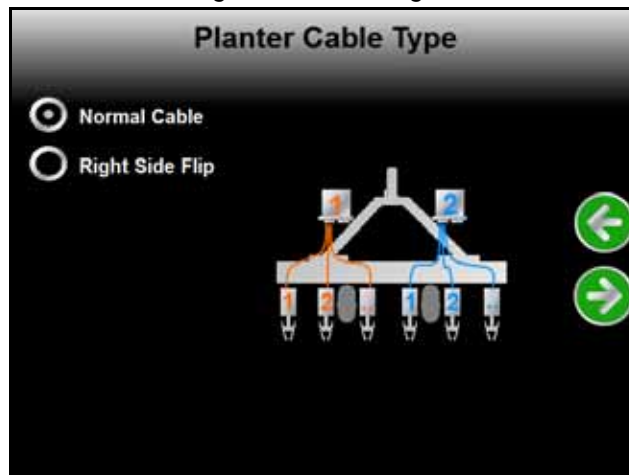
8. Touch Next to proceed to the Planter Summary screen.



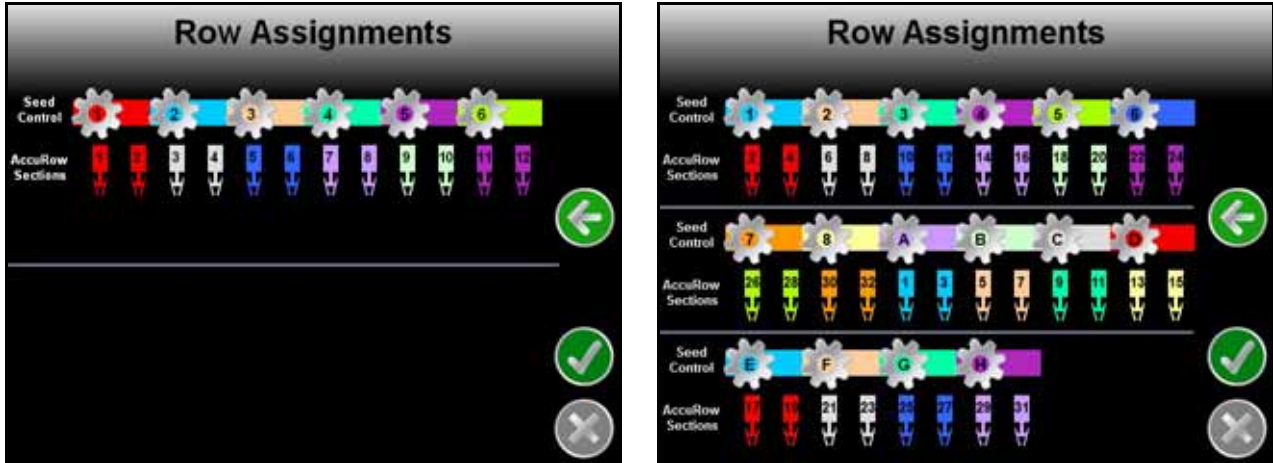
9. Use this screen to review the planter implement setup. If any adjustments are necessary, touch Back to change the displayed settings.

**Note:** *If more than one planter node is detected, the Planter Cable Type screen will open. The Right Side Flip options is intended to be selected when using symmetric toolbar cables (ex. Same cable used on both the left and right side of the planter toolbar). All planter specific kits with dual planter nodes do not use symmetric cables and will require a Normal Cable selection. It is verify to motor and clutch output prior to planting.*

*All planter specific kits with dual nodes use a left hand cable designated with an L and user a right hand cable designated with an R (ex. 115-3013-001L or 115-3016-001R). Check cable labels on the row unit and select the configuration matching the cable numbers.*



10. Once adjustments are complete, touch the Next icon to view the Row Assignments screen.



The Row Assignments screen displays the rate or seed control sections above the row indicators. The seed rate or population may be controlled for these sections independently of other rate control sections.

The row indicators also display the AccuRow, section shut-off, section assignments for each row. Rows assigned to the same AccuRow section will display in the same color.

**For Example:**

For rate control sections on the screen shown above on the left, rows 3 and 4 are assigned to rate control section 2, shown in light blue. Rows 3 and 4 are also assigned to an AccuRow shut-off section as displayed by the row indicators shown in gray.

The screen show on the right is an example of a 16 row configuration with 8 rate control sections and 8 AccuRow sections.

**Note:** *In the screen shown on the right, rows in each seed control section will be controlled to the same seed rate or population when enabled. Since the section shutoff utilizes the seed rate control motors to shut off rows, row shutoff is also dictated by the seed control sections. So rows 6 through 8 in the screen on the right must be shut off as a section, it is not possible to split these rows into separate AccuRow Sections.*



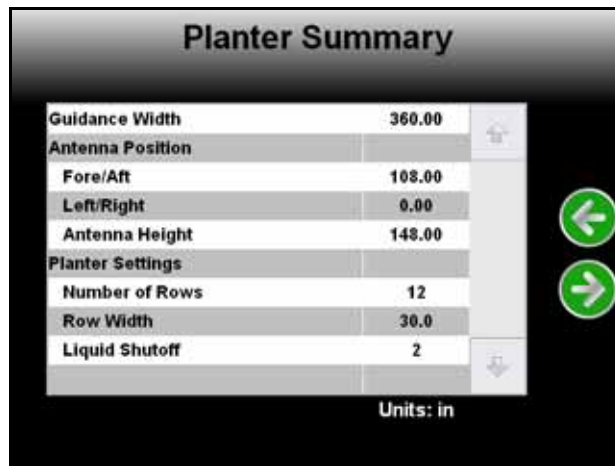
## Individual Row Control

1. On the Seed Control Selection screen, select the “Individual Row Control” option and select the Next icon.



**Note:** Touch Previous or Back to review the previously configured settings entered during the Planter Control Setup Wizard.

If a value larger than 12 is entered on the Number of Rows screen, the Individual Row Control option will require a second planter control node. With two planter control nodes, the OmniRow system may monitor and individually control a maximum of 24 rows. The Planter Settings screen will display.

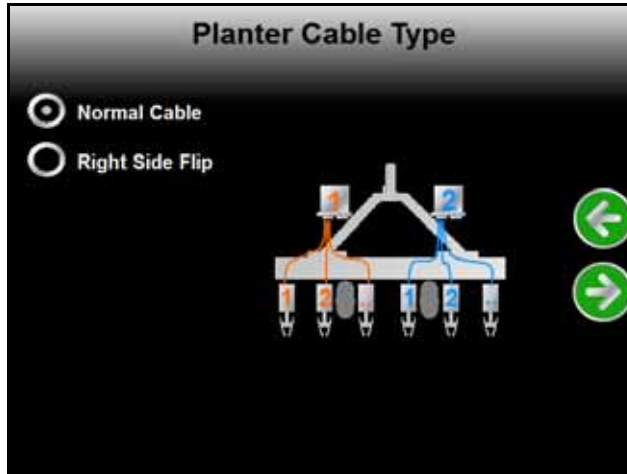


2. Use this screen to review the planter implement setup. If any adjustments are necessary, touch Back to change the displayed settings.

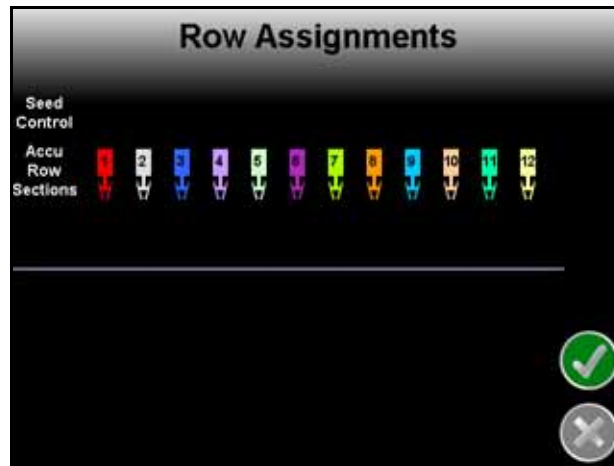
**Note:** If more than one planter node is detected, the Planter Cable Type screen will open. The Right Side Flip options is intended to be selected when using symmetric toolbar cables (ex. Same cable used on both the left and right side of the planter toolbar). All planter specific kits with dual planter nodes do not use symmetric cables and will require a Normal Cable selection. It is verify to motor and clutch output prior to planting.

All planter specific kits with dual nodes use a left hand cable designated with an L and user a right hand cable designated with an R (ex. 115-3013-001L or 115-3016-001R).

3. Check cable labels on the row unit and select the configuration matching the cable numbers.



4. Once adjustments are complete, touch Next on the Planter Summary screen to view the Row Assignments screen.



In the Individual Row Control mode, the seed rate or population and the section status may be controlled independently for each row.

## Planter Configuration Wizard

The planter configuration wizard may require the following information for the planter control system:

- Speed cal and sensor type
- Valve cal and valve type
- Meter cal
- Rate or population cal
- AccuRow feature settings

**Note:** The planter configuration wizard will differ depending upon the Seed Control Selection from the planter section setup wizard. Refer to the AccuRow and Monitoring Only Seed Control Selection section on page 34, Planter Section Control Seed Control Selection section on page 37, or the

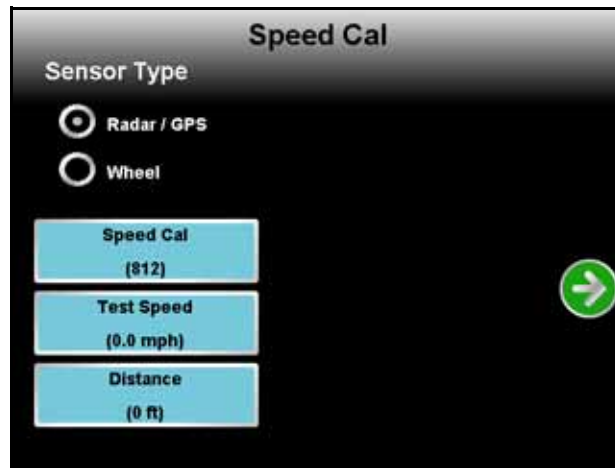


*MultiRow and Individual Row Control Seed Control Selection section on page 43 to complete the planter configuration wizard for the specific planter configuration.*

## AccuRow and Monitoring Only Seed Control Selection

The following procedure offers step by step instructions to complete the Planter Configuration Wizard for the planter control system set to “AccuRow and Monitoring Only” Seed Control Selection. Review to the *Planter Section Setup Wizard* section on page 19 to change the Seed Control Selection if necessary.

1. Touch the planter configuration wizard icon. The Speed Cal screen will display.



2. Select the type of speed sensor which will be used with the OmniRow system.
3. Touch the button labeled Speed Cal and use the on-screen keypad to enter the calibration value for the speed sensor used with planting applications.


Raven Industries recommends the following speed calibration values for initial system setup.

Sensor Type Setting	Used with	English	Metric
Radar/GPS	External Raven GPS Receiver	785	199
	Internal DGPS Receiver	812	206
	GPS Speed over CANbus	1000	1000
	Raven Radar	598	152
Wheel	Wheel Magnets	1000	254
	Speedometer Drive Speed Sensor	612	155

These values are good starting points and generally yield adequate results, however, the speed cal should be refined for each specific vehicle and speed sense system. See Appendix A, *Calculating the Calibration Values*, for instructions on refining the speed cal value.

**Note:** *The GPS speed over CANbus feature is only available with specific Raven speed sense nodes. This feature utilizes NMEA speed over ground data transmitted over the CAN network which eliminates the need for a separate, external speed sensor.*

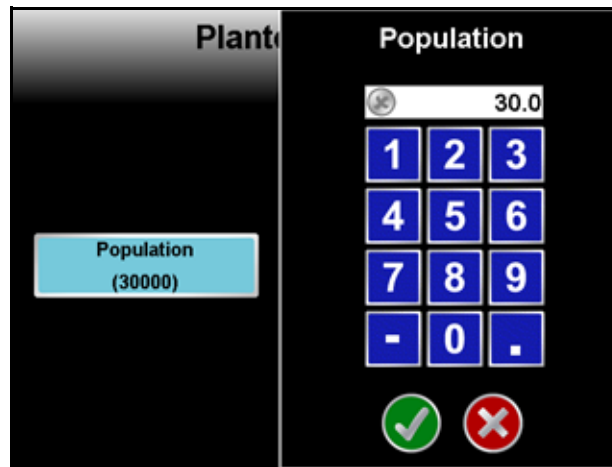
NOTICE



When using the GPS speed over CANbus feature, no calibration or adjustment is necessary or recommended to the speed cal value. Losing GPS signal for more than a second will also result in loss of the CAN speed signal which may affect product application in progress.


*The test speed and distance values are not required to complete initial setup of the field computer. Refer to the System Menu section on page 119 for detailed information about these settings.*

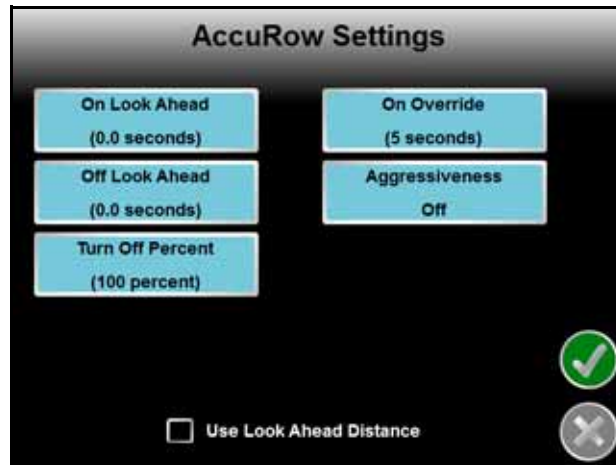
4. Touch the Next  icon to continue to the Planter Settings screen.



5. Touch the Population button and use the on-screen keypad to enter the target seed rate or population in units of 1000 seeds/acre [1000 seeds/hectare].  
For example, to set a target seed rate at 30,000 seeds/acre [30,000 seeds/hectare] enter 30 for the population value and touch the Accept icon. The new seed population will be displayed on the population button.




6. Touch Next  on the Planter Settings screen to proceed to the AccuRow Settings screen.



The AccuRow Settings screen may be used to review the current settings for the following settings:

- On Look Ahead
- Off Look Ahead
- Turn Off Percent
- On Override Time
- Aggressiveness

Select the feature to change on the AccuRow Settings screen and refer to the following sections for detailed information about each setting.

7. When the AccuRow Settings are set up appropriately for the implement, touch Accept  to complete the Planter Configuration Wizard.

**Turn On/Off Look Ahead.** The AccuRow on/off look ahead values are used during planting applications to adjust the section or row shut off features of the planter control system.

Set the AccuRow look ahead setting to the distance in inches [meters] (or the time if desired) the field computer is allowed to scan in front of the current vehicle position for zone map features. The On and Off Look Ahead settings may help to compensate for the time it takes to turn on or off section or row controls based upon the zone map.

A non-zero “On” look ahead value allows AccuRow to begin turning on planter controls while a non-zero “Off” look ahead will allow AccuRow to begin turning off planter controls.

**Note:** *Setting the look ahead values too high may cause the control system to turn on or off too early. This may cause overlaps, skips, or undesirable seed rate in some areas. Generally, a value between 40 to 60 inches [1 to 1.5 m], or 1 to 2 seconds, will be a good starting point for the look ahead settings. Adjust the turn off and turn on look ahead values independently to adjust response of the OmniRow system.*

**Turn Off Percent.** This value controls the percentage of a planter section that must cross a field or plant zone boundary, or enter a previously applied area, before AccuRow will control that section. The default value is 100%.

Using the default setting, when 100% of a section crosses into a no-plant zone or previously applied area, AccuRow will toggle the section off.

**Note:** *If the value is set to 0%, the section will not turn off automatically.*

**On Override Time.** Enter the time to override seed control sections or rows on when the operator selects the override icon on-screen switch box. Refer to the *To enable the override during an AccuRow enabled job:* section on page 177 for details on enabling the AccuRow override during a seeding or planting operation.



**Aggressiveness.** The aggressiveness setting adjusts the AccuRow system response for large implements or aggressive driving styles. Refer to the *Aggressiveness* section on page 178 for more information on the aggressiveness factor and how this setting affects seeding operations.

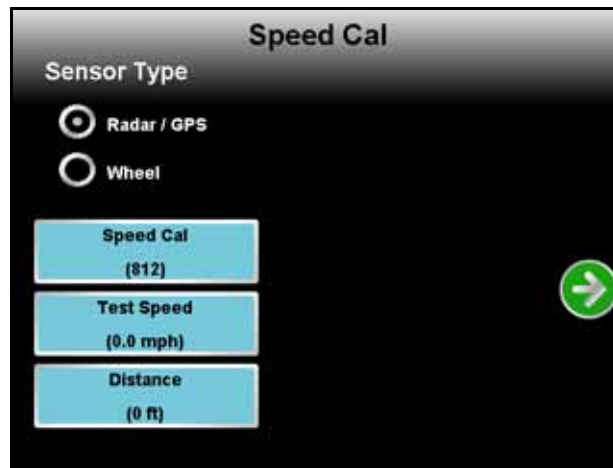
**Use Look Ahead Distance.** Enable the Use Look Ahead Distance option on the AccuRow Configuration screen to set look-ahead values in units of distance rather than time.

**Note:** *The vehicle must travel at a constant speed while using the look ahead distance.*

## Planter Section Control Seed Control Selection

The following procedure will offers step by step instructions to complete the Planter Configuration Wizard for the planter control system set to “Planter Section Control” Seed Control Selection. Review to the *Planter Section Setup Wizard* section on page 19 to change the Seed Control Selection if necessary.

1. Touch the planter configuration wizard icon. The Speed Cal screen will display.



2. Select the type of speed sensor which will be used with the control system.
3. Touch the button labeled Speed Cal and use the on-screen keypad to enter the calibration value for the speed sensor installed on the vehicle.


Raven Industries recommends the following speed calibration values for initial system setup.

Sensor Type Setting	Used with	English	Metric
Radar/GPS	External Raven GPS Receiver	785	199
	Internal DGPS Receiver	812	206
	GPS Speed over CANbus	1000	1000
	Raven Radar	598	152
Wheel	Wheel Magnets	1000	254
	Speedometer Drive Speed Sensor	612	155

These values are good starting points and generally yield adequate results, however, the speed cal should be refined for each specific vehicle and speed sense system. See Appendix A, *Calculating the Calibration Values*, for instructions on refining the speed cal value.


**Note:** *The GPS speed over CANbus feature is only available with specific Raven speed sense nodes. This feature utilizes NMEA speed over ground data transmitted over the CAN network which eliminates the need for a separate, external speed sensor.*

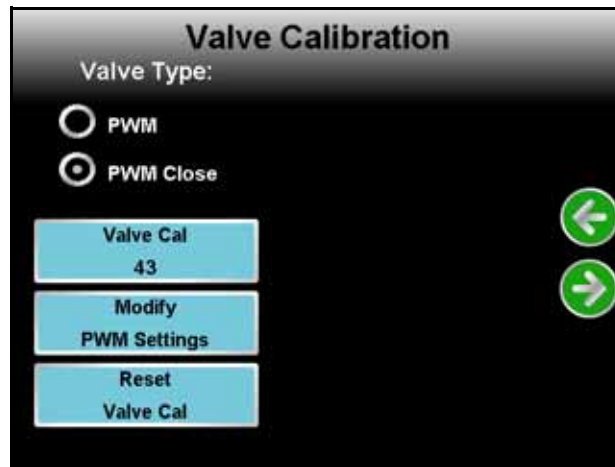
NOTICE



When using the GPS speed over CANbus feature, no calibration or adjustment is necessary or recommended to the speed cal value. Losing GPS signal for more than a second will also result in loss of the CAN speed signal which may affect product application in progress.

*The test speed and distance values are not required to complete initial setup of the field computer. Refer to the System Menu section on page 119 for detailed information about these settings.*

4. Touch Next  to continue to the Valve Calibration screen.




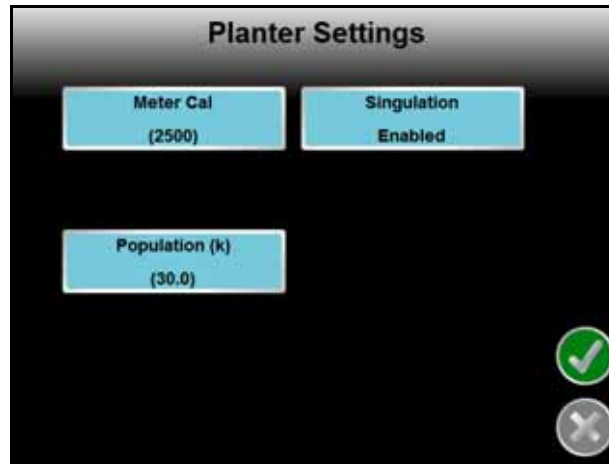
5. Select the control valve type used to adjust seed rate or population. Raven Industries recommends the following valve calibration value for initial system setup.

Control Valve Type	Valve Cal
PWM and PWM Close	43

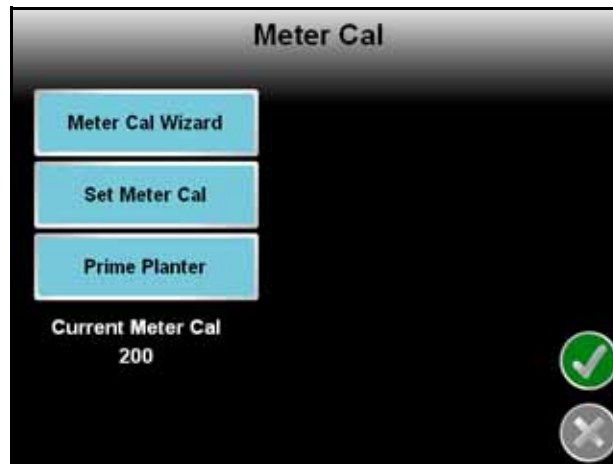
This value is a good starting point and will generally yield adequate results, however, the valve cal should be refined for the individual control valves installed on specific implement. See Appendix A, *Calculating the Calibration Values*, for instructions on refining the valve cal value.

6. Response of the PWM valve for the planter control system may be adjusted for specific planting operations or to better adjust the system for the specific valve type and control system. See the *Modify PWM Settings (PWM or PWM Close Valve)* section on page 129 for information on modifying PWM valve response for the planter control system.
7. Touch the Reset Valve Cal button to reset the valve cal to the recommended value if necessary.

- When the displayed valve cal settings have been adjusted, select Next  to continue with the setup wizard. The Planter Settings screen will be displayed.



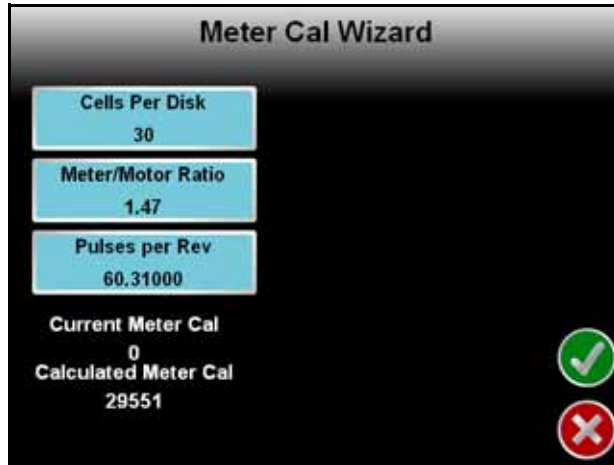
- Touch the Meter Cal button to set the meter calibration value for the planter implement connected to the planter control system. The Meter Cal Menu screen will open.



- Touch the Run Meter Cal Wizard button to begin the meter cal wizard.

**Note:** *If the meter cal value required for the planter control system is already known, touch the Set Meter Cal button and use the on-screen keypad to enter the meter cal value. The Prime Planter feature will not be used during the initial setup procedure.*

11. The Meter Cal Wizard screen will open.



The wizard requires the following values to calculate a meter cal value for use with the planter control system:

**Cells per Disk.** Enter the number of cells each seed disk.

**Meter to Motor Ratio.** Set the ratio of meter revolutions per revolution of the motor or encoder.

The meter to motor ratio is calculated by counting teeth on the meter sprocket compared to the number of teeth on the motor sprocket. If there are additional sprocket sets between the meter and the motor shafts (OEM motor applications), determine each sprocket ratio and multiply the ratios to determine the total gear ratio.

**Note:** *If the implement encoder is on a separate shaft from the motor, use the encoder shaft to determine the ratio.*

While ratios should be verified for each implement, the following are typical ratio for implements:

Implement Manufacture	Ratio
Case IH	2.0
John Deere	1.47
Kinze	1
White	2.2

**For Example:**

To calculate the meter to motor ratio when the meter and motor shafts are connect directly (no additional sprocket sets):

$$(\text{number of teeth on the meter sprocket}) / (\text{number of teeth on motor hex shaft sprocket}) = \text{Meter to Motor Ratio}$$

To calculate the meter to motor ratio with additional sprocket sets between the meter and motor shaft sprockets:

$$(\text{meter sprocket} / \text{shaft sprocket}) \times (\text{second shaft sprocket} / \text{motor sprocket}) = \text{Total Meter to Motor Ratio.}$$

**Pulses per Revolution.** Enter the number of pulses detected by the motor encoder for one revolution of the motor. The pulses per rev setting for the Raven OmniRow hydraulic motor clutch is 60.31.



For OEM or other aftermarket hydraulic motors, check the motor sensor body, or contact a dealer or OEM manufacturer for the pulses per revolution value.

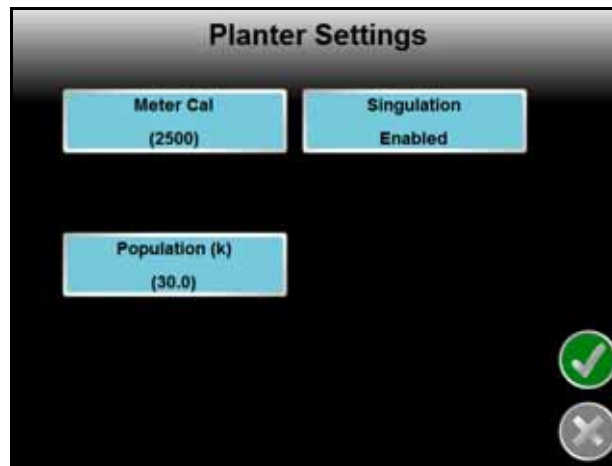
This value may also be obtained through trial and error to achieve the appropriate seed disk revolutions when the prime planter icons are selected. Enter an initial value of 100 for the pulses per revolution value and use the Prime Planter screen to test the initial setting.

Increase the initial value if the seed disk does not complete the expected revolutions or decrease the initial value if the seed disk rotates beyond the expected revolutions.

**Note:** *The initial value can be increased or decreased in ratio to the actual rotation completed by the seed disk. For example, if the seed disk completes only a half revolution with the initial pulses per revolution value, double the initial value and recheck.*


*To ensure the proper pulses per revolution value is entered, test that the seed disks turn the expected number of revolutions when either the 1 and 5 revolutions icons are selected.*

12. The field computer will display the new meter cal value at the bottom of the screen. Touch Accept  to return to the Meter Cal screen and use the calculated meter cal value for the planter control system. Select the Cancel icon to cancel the meter cal calculation and return to the Meter Cal screen without modifying the current value.
13. Touch Accept  to return to the Planter Settings screen.

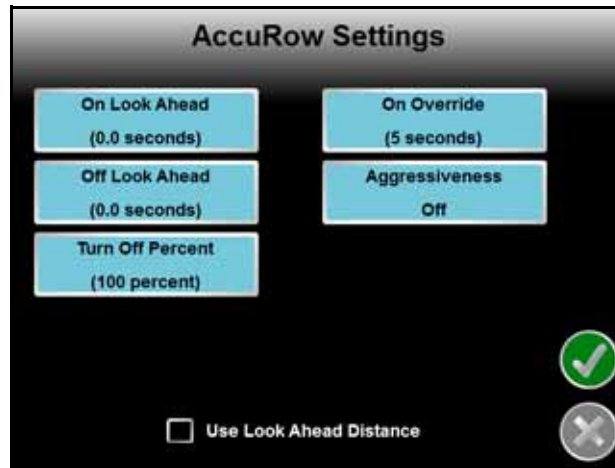


14. Touch the Population button and use the on-screen keypad to enter the target seed rate or population in units of 1000 seeds/acre [1000 seeds/hectare].

**For Example:** To set a target seed rate at 30,000 seeds/acre [30,000 seeds/hectare] enter 30 for the population value and touch the Accept icon. The new seed population will be displayed on the population button.

15. Touch Next  on the Planter Settings screen to proceed to the AccuRow Settings screen.


**Note:** When the singulation enabled/disabled toggle button is disabled, the planter settings window will open. .



The AccuRow Settings screen may be used to review the current settings for the following settings:

- On Look Ahead
- Off Look Ahead
- Turn Off Percent
- On Override Time
- Aggressiveness

Select the feature to change on the AccuRow Settings screen and refer to the following sections for detailed information about each setting.

16. When the AccuRow Settings are set up appropriately for the implement, touch Accept  to complete the Planter Configuration Wizard.

**Turn On/Off Look Ahead.** The AccuRow on/off look ahead values are used during planting applications to adjust the section or row shut off features of the planter control system.

Set the AccuRow look ahead setting to the distance in inches [meters] the field computer is allowed to scan in front of the current vehicle position for zone map features. The On and Off Look Ahead settings may help to compensate for the time it takes to turn on or off section or row controls based upon the zone map.

A non-zero “On” look ahead value allows AccuRow to begin turning on planter controls while a non-zero “Off” look ahead will allow AccuRow to begin turning off planter controls.

**Note:** *Setting the look ahead values too high may cause the control system to turn on or off too early. This may cause overlaps, skips, or undesirable seed rate in some areas. Generally, a value between 40 to 60 inches [1 to 1.5 m], or 1 to 2 seconds, will be a good starting point for the look ahead settings. Adjust the turn off and turn on look ahead values independently to adjust response of the OmniRow system.*

**Turn Off Percent.** This value controls the percentage of a planter section that must cross a field or plant zone boundary, or enter a previously applied area, before AccuRow will control that section. The default value is 100%.

Using the default setting, when 100% of a section crosses into a no-plant zone or previously applied area, AccuRow will toggle the section off.

**Note:** *If the value is set to 0%, the section will not turn off automatically.*

**On Override Time.** Enter the time to override seed control sections or rows on when the operator selects the override icon on-screen switch box. Refer to the *To enable the override during an AccuRow enabled job:* section on page 177 for details on enabling the AccuRow override during a seeding or planting operation.

**Aggressiveness.** The aggressiveness setting adjusts the AccuRow system response for large implements or aggressive driving styles. Refer to the *Aggressiveness* section on page 178 for more information on the aggressiveness factor and how this setting affects seeding operations.

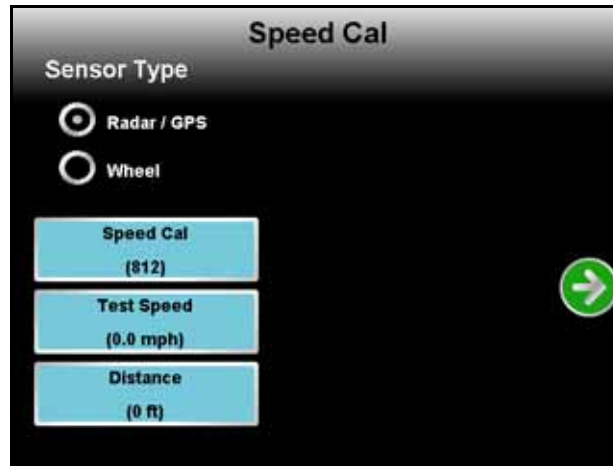
**Use Look Ahead Distance.** Enable the Use Look Ahead Distance option on the AccuRow Configuration screen to set look-ahead values in units of distance rather than time.

**Note:** *The vehicle must travel at a constant speed while using the look ahead distance.*

## MultiRow and Individual Row Control Seed Control Selection

The following procedure will offers step by step instructions to complete the Planter Configuration Wizard for the planter control system set to “Individual Row Control” Seed Control Selection. Review to the *Planter Section Setup Wizard* section on page 19 to change the Seed Control Selection if necessary.

1. Touch the planter configuration wizard icon. The Speed Cal screen will display.



2. Select the type of speed sensor which will be used with the control system.
3. Touch the button labeled Speed Cal and use the on-screen keypad to enter the calibration value for the speed sensor.


Raven Industries recommends the following speed calibration values for initial system setup.

Sensor Type	English	Metric
External Raven GPS Receiver	785	199
Internal DGPS Receiver	812	206
GPS Speed over CANbus	1000	1000
Raven Radar	598	152
Wheel Magnets	1000	254
Speedometer Drive Speed Sensor	612	155

These values are good starting points and generally yield adequate results, however, the speed cal should be refined for each specific vehicle and speed sense system. See Appendix A, *Calculating the Calibration Values*, for instructions on refining the speed cal value.


**Note:** *The GPS speed over CANbus feature is only available with specific Raven speed sense nodes. This feature utilizes NMEA speed over ground data transmitted over the CAN network which eliminates the need for a separate, external speed sensor.*

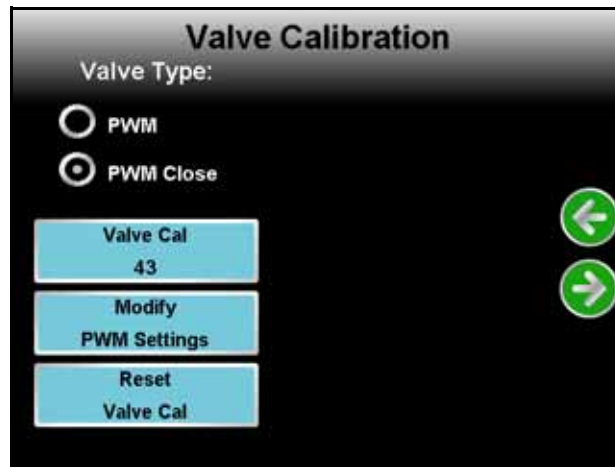
NOTICE



When using the GPS speed over CANbus feature, no calibration or adjustment is necessary or recommended to the speed cal value. Losing GPS signal for more than a second will also result in loss of the CAN speed signal which may affect product application in progress.

*The test speed and distance values are not required to complete initial setup of the field computer. Refer to the System Menu section on page 119 for detailed information about these settings.*

4. Touch Next  to continue to the Valve Calibration screen.




5. Select the control valve type used to adjust seed rate or population. Raven Industries recommends the following valve calibration values for initial system setup.

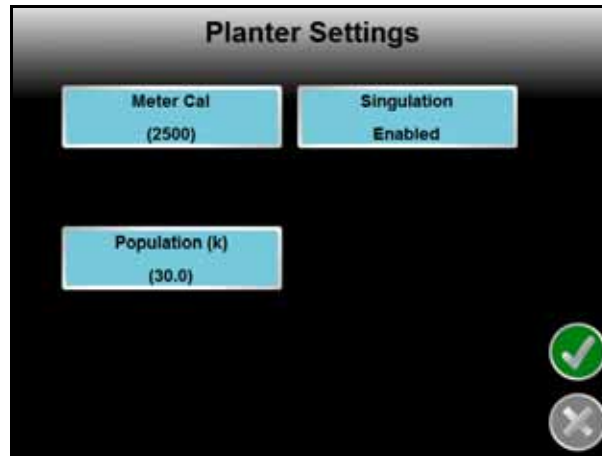
Control Valve Type	Valve Cal
PWM and PWM Close	43

These values are good starting points and will generally yield adequate results, however, the valve cal should be refined for the individual control valves installed on the specific implement. See Appendix A, *Calculating the Calibration Values*, for instructions on refining the valve cal value.

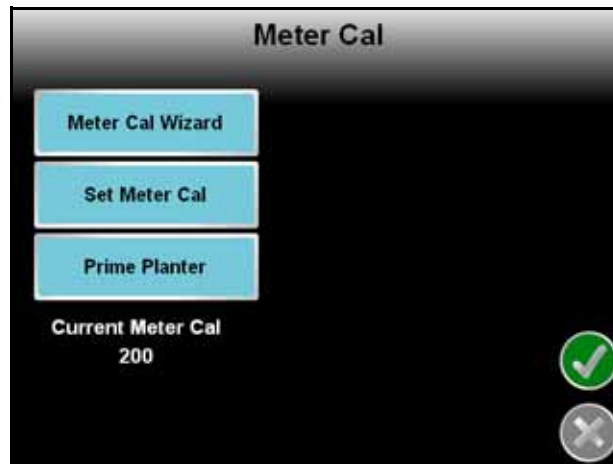
6. Response of the PWM valve for the planter control system may be adjusted for specific planting operations or to better adjust the system for the specific valve type and control system. See the *Modify PWM Settings (PWM or PWM Close Valve)* section on page 129 for information on modifying PWM valve response for the planter control system.
7. Touch the Reset Valve Cal button to reset the valve cal to the recommended value if necessary.



- When the displayed valve cal settings have been adjusted, select Next  to continue with the setup wizard. The Planter Settings screen will be displayed.



- Touch the Meter Cal button to set the meter calibration value for the planter implement connected to the planter control system. The Meter Cal Menu screen will be displayed.

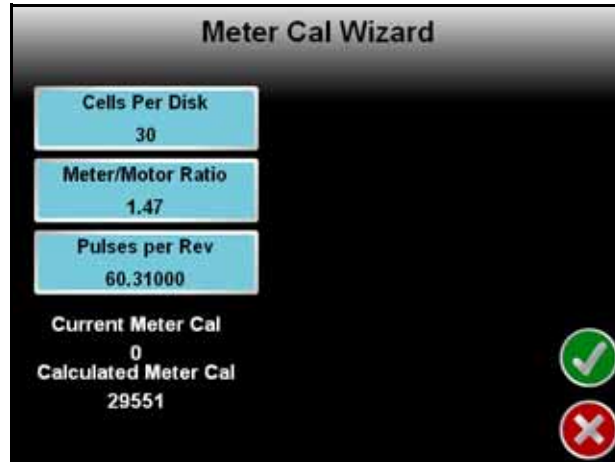


- Touch the Meter Cal Wizard button to begin the meter cal wizard.

**Note:** *If the meter cal value required for the planter control system is already known, touch the Set Meter Cal button and use the on-screen keypad to enter the meter cal value. The Prime Planter feature will not be used during the initial setup procedure.*



11. The Meter Cal Wizard screen will be displayed.



The wizard requires the following values to calculate a meter cal value for use with the planter control system:

**Cells per Disk.** Enter the number of cells each seed disk.

**Meter to Motor Ratio.** Set the ratio of meter revolutions per revolution of the motor.

The meter to motor ratio is calculated by counting teeth on the meter sprocket compared to the number of teeth on the motor sprocket. If there are additional sprocket sets between the meter and the motor shafts (OEM motor applications), determine each sprocket ratio at multiply the ratios to determine the total gear ratio.

All ratios should be verified for each implement, but the typical ratio for John Deere implements is 1.47 and for Kinze implements is 1.

**For Example:**

To calculate the meter to motor ratio when the meter and motor shafts are connect directly (no additional sprocket sets):

$$(\text{number of teeth on the meter sprocket}) / (\text{number of teeth on motor hex shaft sprocket}) = \text{Meter to Motor Ratio}$$

To calculate the meter to motor ratio with additional sprocket sets between the meter and motor shaft sprockets:

$$(\text{meter sprocket} / \text{shaft sprocket}) \times (\text{second shaft sprocket} / \text{motor sprocket}) = \text{Total Meter to Motor Ratio.}$$

**Pulses per Revolution.** Enter the number of pulses detected by the motor encoder for one revolution of the motor. The pulses per rev setting for the Raven OmniRow hydraulic motor clutch is 60.31.



For OEM or other aftermarket hydraulic motors, check the motor sensor body, or contact a dealer or OEM manufacturer for the pulses per revolution value.

This value may also be obtained through trial and error to achieve the appropriate seed disk revolutions when the prime planter icons are selected. Enter an initial value of 100 for the pulses per revolution value and use the Prime Planter screen to test the initial setting.


Increase the initial value if the seed disk does not complete the expected revolutions or decrease the initial value if the seed disk rotates beyond the expected revolutions.

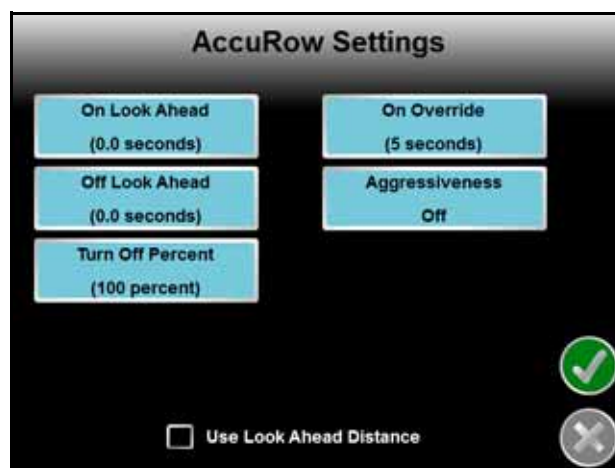
**Note:** *The initial value can be increased or decreased in ratio to the actual rotation completed by the seed disk. For example, if the seed disk completes only a half revolution with the initial pulses per revolution value, double the initial value and recheck.*

*To ensure the proper pulses per revolution value is entered, test that the seed disks turn the expected number of revolutions when either the 1 and 5 revolutions icons are selected.*

12. The field computer will display the new meter cal value at the bottom of the screen. Touch Accept  to return to the Meter Cal screen and use the calculated meter cal value for the planter control system. Select the Cancel icon to cancel the meter cal calculation and return to the Meter Cal screen without modifying the current value.
13. Touch Accept  to return to the Planter Settings screen.




14. Touch the Population button and use the on-screen keypad to enter the target seed rate or population in units of 1000 seeds/acre [1000 seeds/hectare].  
For example, to set a target seed rate at 30,000 seeds/acre [30,000 seeds/hectare] enter 30 for the population value and touch the Accept icon. The new seed population will be displayed on the population button.
15. The rate bump value sets the increment by which the target rate will increase or decrease when using the rate bump buttons on the Guidance screen. See the *Rate Bump Buttons* section on page 78 for more information.
16. Touch Next  on the Planter Settings screen to proceed to the AccuRow Settings screen.



The AccuRow Settings screen may be used to review the current settings for the following settings:

- On Look Ahead
- Off Look Ahead
- Turn Off Percent
- On Override Time
- Aggressiveness

Select the feature to change on the AccuRow Settings screen and refer to the following sections for detailed information about each setting.

17. When the AccuRow Settings are set up appropriately for the implement, touch Accept  to complete the Planter Configuration Wizard.

**Turn On/Off Look Ahead.** The AccuRow on/off look ahead values are used during planting applications to adjust the section or row shut off features of the planter control system.

Set the AccuRow look ahead setting to the distance in inches [meters] (or the time if desired) the field computer is allowed to scan in front of the current vehicle position for zone map features. The On and Off Look Ahead settings may help to compensate for the time it takes to turn on or off section or row controls based upon the zone map.

A non-zero “On” look ahead value allows AccuRow to begin turning on planter controls while a non-zero “Off” look ahead will allow AccuRow to begin turning off planter controls.

**Note:** *Setting the look ahead values too high may cause the control system to turn on or off too early. This may cause overlaps, skips, or undesirable seed rate in some areas. Generally, a value between 40 to 60 inches [1 to 1.5 m], or 1 to 2 seconds, will be a good starting point for the look ahead settings. Adjust the turn off and turn on look ahead values independently to adjust response of the OmniRow system.*

**Turn Off Percent.** This value controls the percentage of a planter section that must cross a field or plant zone boundary, or enter a previously applied area, before AccuRow will control that section. The default value is 100%.

Using the default setting, when 100% of a section crosses into a no-plant zone or previously applied area, AccuRow will toggle the section off.

**Note:** *If the value is set to 0%, the section will not turn off automatically.*

**On Override Time.** Enter the time to override seed control sections or rows on when the operator selects the override icon on-screen switch box. Refer to the *To enable the override during an AccuRow enabled job:* section on page 177 for details on enabling the AccuRow override during a seeding or planting operation.

**Aggressiveness.** The aggressiveness setting adjusts the AccuRow system response for large implements or aggressive driving styles. Refer to the *Aggressiveness* section on page 178 for more information on the aggressiveness factor and how this setting affects seeding operations.

**Use Look Ahead Distance.** Enable the Use Look Ahead Distance option on the AccuRow Configuration screen to set look-ahead values in units of distance rather than time.

**Note:** *The vehicle must travel at a constant speed while using the look ahead distance.*

## Pressure Reducing Valve Adjustment

The OmniRow hydraulic motors are rated up to 200 PSI [1379 kPa] of back pressure. To protect the hydraulic motors, and to reduce pressure to the OmniRow PWM valves and improve performance, the OmniRow open center pressure reducing valve should be checked prior to starting a planting operation.

If the pressure in the tank line reaches 200 PSI [1379 kPa], the pressure reducing valve will shut off flow going to the OmniRow hydraulic motors to prevent damage. A high tank line pressure situation can occur if the tank hose is inadvertently disconnected from the tractor or if there is too much hydraulic flow returning through the 'T' coupler.

**Note:** *Some leakage may occur from the breather in the 'RV' port if the pressure reducing valve does shut off flow to the OmniRow motors.*

A hydraulic pressure gauge is required to complete the following procedure. A pressure testing kit (P/N 117-3001-018) contains all parts necessary to complete the pressure reducing valve adjustment procedure. Contact a local Raven dealer for more information.

The OmniRow hydraulic motors must be calibrated and operating to perform the following test. Refer to Chapter 6, *OmniRow Remote Section Control*, for details on using the Remote Section Control to remotely activate the OmniRow hydraulics. It is also recommended to begin a job and use the test speed feature to allow the motors to turn continuously. See the *Test Speed* section on page 124 for more information on the test speed feature.

To adjust the pressure reducing valve:

1. Turn off the tractor hydraulics and OmniRow motors.
2. Install the tee fitting and gauge coupler (from pressure testing kit) into one of the pressure lines that connects the OmniRow PWM valve to the OmniRow motor.

**Note:** *If the implement has motors controlling multiple rows, choose a section with the most row units being run with a single motor to perform the test. The tee fitting and gauge coupler can be installed either at the PWM valve or the OmniRow motor.*

3. Attach the gauge to the test coupler in the tee fitting.
4. Enable the OmniRow system and operate the hydraulic motor at approximately the maximum desired planting speed and seed rate during planting operations.

**Note:** *If possible, enable implement vacuum fans while performing the test.*

5. Record the pressure displayed on the gauge.
6. Turn off the OmniRow hydraulic motors and shut off the tractor hydraulics.
7. Disconnect the pressure gauge from the row unit.
8. Attach the pressure gauge to the port labeled 'G1' on the pressure reducing valve located at the planter hitch.
9. Turn on the tractor hydraulics.

**Note:** *OmniRow motors do not need to be enabled or running for the following steps.*

10. Adjust the cartridge in the port labeled 'PR1' so that the pressure registered on the gauge (now installed in 'G1') is 200 to 300 PSI [1379 to 2068 kPa] higher than the pressure measured at the row unit.
11. Tighten the jam nut and remove the pressure gauge and tee connected to the row unit when adjustment is complete.



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## *Overview*

This chapter contains information regarding the basic operation of the Envizio Pro field computer in a CANbus control system, including:

- Home screen
- Shutting down
- Starting jobs
- Guidance patterns
- Using the guidance screen

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## *Home Screen*

After the initial startup, the field computer will automatically startup to the Home screen.



The Home screen offers access to the following features of the Envizio Pro field computer:



Start or  
Resume Job



Access the  
Tools Menu



Shutdown

**Note:** The Envizio Pro should be properly shutdown before turning the power off on the field computer.

## GPS Status

The current source and status of DGPS signal is displayed in the upper, left corner of the Home screen.



**Note:** The standard GPS shield will be displayed if the Envizio Pro field computer cannot determine the type of corrections being sent from the DGPS receiver.

The status icon on the Home screen will display:

- Green if the status of GPS is okay.
- Yellow if an error or cautionary condition has been encountered.
- Red if GPS is non-functional. Make sure the DGPS antenna cable connections are secure and the antenna has a clear, 360° view of the sky.

**Note:** Refer to the *GPS Menu* section on page 136 for additional information on settings or features available for the above correction sources.

## RTK Fixed and Float Modes

When using an RTK correction source with the internal dual frequency GPS receiver, the GPS status indicator may be used to determine whether the receiver is operating in RTK fixed or float modes. The RTK shield will display:

Green to indicate a fixed RTK position. This mode indicates that the receiver has a full RTK position fix and is providing sub-inch corrections. The GPS Health screen will display a value of 4 for the differential mode when operating in RTK fixed mode.

Yellow to indicate that the receiver is operating in RTK float mode. This mode indicates that the receiver is not able to provide a full RTK position lock due to the distance from the base station, visibility of the sky, time of day or interference around the base station location. In the float mode, the receiver is still providing a coarse RTK correction signal, but accuracy of the receiver may not be at a sub-inch level. The GPS Health screen will display a value of 5 for the differential mode when operating in RTK float mode.

Touch the shield icon to display the GPS Status screen. Refer to the *GPS Menu* section on page 136 for more information on the GPS Status screen.



## Wireless Communications Status

The current status of wireless communication is displayed along the top of the Home screen display.

This icon will appear:



- Gray if no wireless communications device is connected to the field computer.
- Green if communication is okay.
- Yellow if an error condition has been encountered.
- Red if wireless communication is not available.

Touch the shield icon to display the Wireless Status screen. Refer to the Appendix C, *Wireless Communications & Remote Service* for more information.

## Information

Touch the information icon in the upper, right corner of the home screen to display the software and image versions currently installed on the field computer.



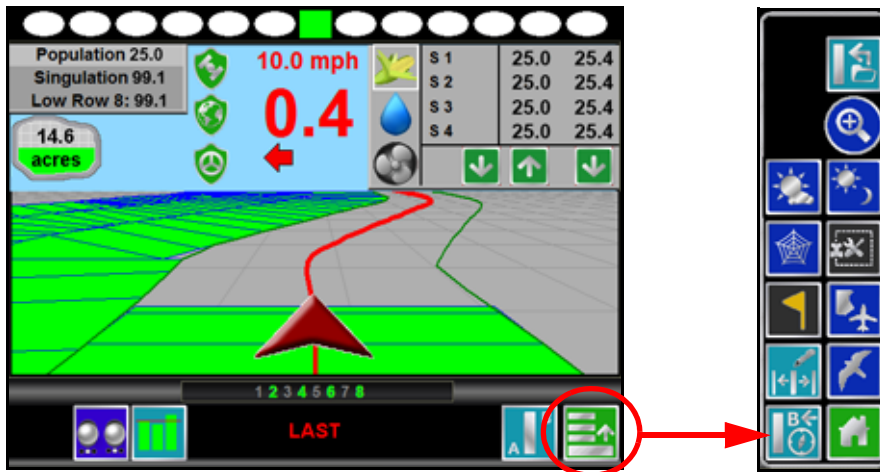
## Closing Jobs and Power Down

Be sure to close any open job files before turning the field computer power off. The Envizio Pro should be powered down using the Shutdown icon on the Home screen.

	<p><b>NOTICE</b></p> <p>Failure to properly close a job before turning off the field computer may result in a loss of application data or other information for that job. Make sure to properly close any open jobs before shutting down the computer.</p>
--	--

**To end jobs on the Envizio Pro:**

1. Open the menu on the Guidance screen and touch the green home icon to return to the Home screen.



2. The Home screen will be displayed. The Home screen displays 'Job in progress' during an active job and the Shutdown icon is replaced by the Stop icon.



3. Touch Stop to close the currently active job.

**Note:** Touching Start with a job in progress will return to the Guidance screen of the active job. To begin a new job, first touch the Stop icon to close the job in progress before selecting the Start icon.

4. Confirm closing the open job file by touching the green check mark. To keep the current job open, touch the red 'x.' Closed jobs can be re-opened later by selecting an existing job file during the Start Job procedure. See the *Setting up a Job* section on page 56 for more information.
5. The Stop icon will be replaced with the Shutdown icon. Touch the Shutdown icon to power down the field computer.

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## Job Files

### Overview

The Envizio Pro stores field and product information in job files. In general, job files are created for each field and contain the following information:

- Target seed rate (min and max)
- Coverage area and area within a field boundary
- Volume of product applied for liquid products
- Prescription or variety map information (if applicable)

These files are automatically created for each job started on the Envizio Pro.

**Note:** *To ensure field computer memory resources are available, Raven recommends performing file maintenance periodically to remove unused job files from the memory on the console. Refer to Chapter 9, Software Updates and File Maintenance for more information.*

A job file allows the operator to:

- Create and save new field boundary and coverage maps and other information for each application without erasing or modifying previous jobs stored on the field computer.
- Load previously created job files and coverage maps to resume a job at a later date. Saved field boundaries, zone maps, guidance paths, or other information stored on the field computer for the job may be recalled to continue the application right where the operator left off.
- Save and load job files at any time during a field application. This allows the field computer to work in multiple fields or on different applications without losing application information for any other existing or unfinished job file.

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## Starting a Job

Before starting field guidance and creating a job file, the Envizio Pro field computers require the operator to check and verify job information. During this process, the operator may choose to create a new job or to resume an existing job as well as enable features and options to be used during field operation.

**Note:** *If the field computer will be controlling products via a Raven CAN system, make sure all nodes connected to the CANbus are recognized and programmed correctly. Refer to Chapter 3, CAN Networking and Diagnostics if nodes do not appear to be recognized by the field computer.*

During the job setup process, the field computer may require the following information:

- Type and name of the job to be created
- Product control and rate information

**Note:** *Prior to starting a job, it is recommended to check that the meter cal is properly configured for the seed disks to be used for the planting operation. Refer to the Run Meter Cal Wizard section on page 126 for details.*



## Setting up a Job


This section contains detailed instructions for setting up a job. Depending upon the application and other features of the product control system, some of the following steps may not be required to begin all jobs.

1. Touch Start on the Home screen. The Start Job - Verify Settings screen will display.



**Note:** Settings and features displayed on this screen may not be accessible while a job is in progress. Verify that all settings are correct and all nodes connected to the CANbus are detected by the control system before beginning the job.

*If the status of any nodes connected to the CANbus display 'Node Offline,' refer to Chapter 3, CAN Networking and Diagnostics, before starting the job.*

2. Touch the Job button and refer to the *Job File Setup* section on page 57 to name a new job file or resume an existing job saved on the field computer.
3. Touch the AccuControl button to enable or disable an available automatic section control feature (i.e. or AccuBoom) or select a zone map. Refer to *AccuControl Setup* section on page 58 for details on configuring the AccuRow feature.
4. Select the Planter button to configure planter nodes, configure varieties, or setup multi-hybrid settings as required. See the *Planter Product Setup* section on page 59 for additional assistance with setting up the planter control node. Refer to the *Multi-Hybrid Job Setup* section on page 63 for additional assistance with the multi-hybrid feature.
5. Touch Accept  in the lower, right corner of the screen to begin the job. See the *Guidance Screen* section on page 64 for more information. Touch the Cancel icon to end job setup without starting the job.

**Note:** Canceling the job will discard any settings or selections made on the setup screens. Any configured settings or selections will be lost.

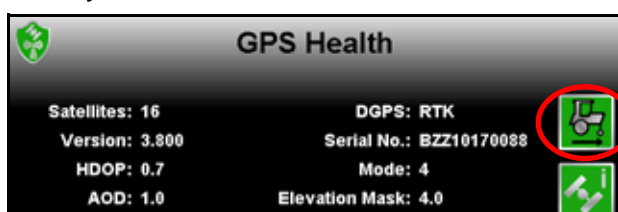
## Direction of Travel

The last direction of travel detected by the field computer is displayed on the Start Job - Verify Settings screen.



If the direction of travel indicator displays incorrectly, touch the indicator to manually toggle the last detected GPS direction.

**Note:** The direction of travel indicator is also displayed on the GPS Health screen and may be toggled during a job if necessary.



Refer to the Reverse Sensing section on page 136 for more information or to enable the direction of travel indicator.

The direction of travel indicator will not be displayed if a SmarTrax 3D node is detected on the CANbus and the terrain compensation feature is active.

## Job File Setup

Select the Job button to select an existing job file or rename the new job.



**Note:** Renaming new job files is highly recommended if a specific job will be referenced at a later date. The operator should enter field location, product, or any other information which may help identify specific job files. Names of job files entered on the field computer cannot begin or end with a space.

The Select Job screen will be displayed.



**To Resume an Existing Job.** Select the existing job file from the list and touch the Accept icon to return to the Verify Settings screen. When the Guidance screen is displayed, coverage maps from the existing job will be displayed on the Guidance screen.

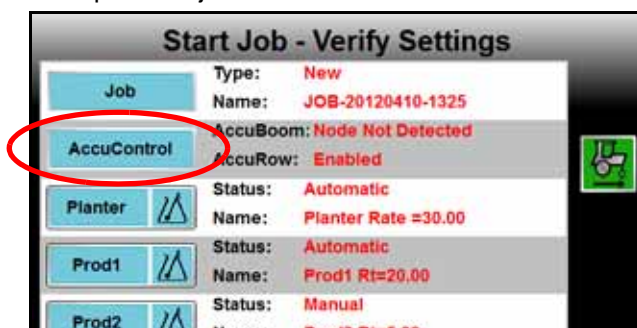
**To Start a New Job.** On the Select Job screen, touch the Create New icon. The New Job: Enter Name screen is displayed. Use the on-screen keypad to enter the name of the new job file. Touch the Accept icon to confirm the entered name and return to the Start Job - Verify Settings screen. Touch the Cancel icon to return to the Start Job - Verify Settings screen without accepting the job name.



**Note:** Job names stored on the field computer cannot begin or end with a space.

### AccuControl Setup

If an optional section control feature is available, touch the AccuControl button to create a new zone map or load a previously created zone map for the job.



**Note:** The AccuRow feature of the planter control system is always enabled. Refer to Chapter 10, Using AccuRow™, for more information about zone mapping and using AccuRow.

The status for optional section control features may be displayed as follows:

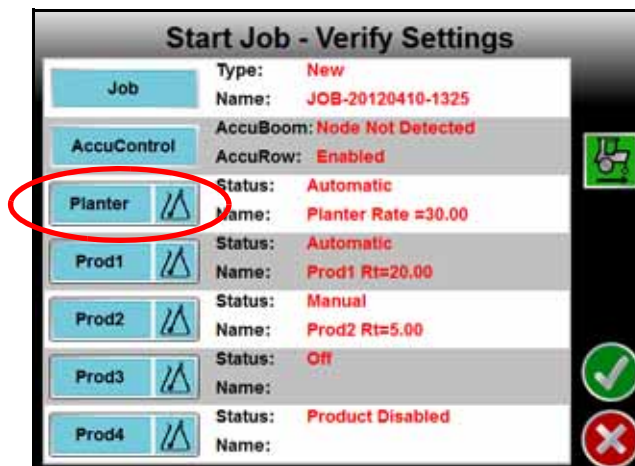
- Disabled - Feature is available or CANbus node is communicating but optional features are not enabled for this system.
- Enabled - Feature is available or CANbus node is communicating and optional system features are enabled.
- Node Not Detected - The CANbus node is currently not detected by the field computer.

If selected, the name of the selected zone map will be displayed in the zones field.



## Planter Product Setup

1. Touch the Planter button to configure the seed rate control mode, configure seed varieties, and target rate.



**Note:** The planter setup is not available for the AccuRow and Monitoring Only seed control selection.

2. The Start Job - Planter Settings screen will be displayed.



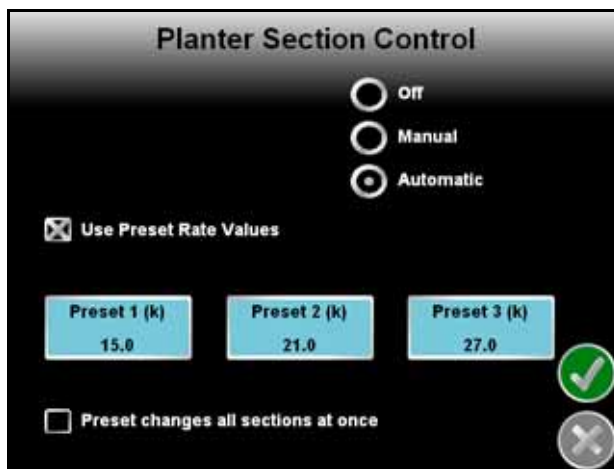
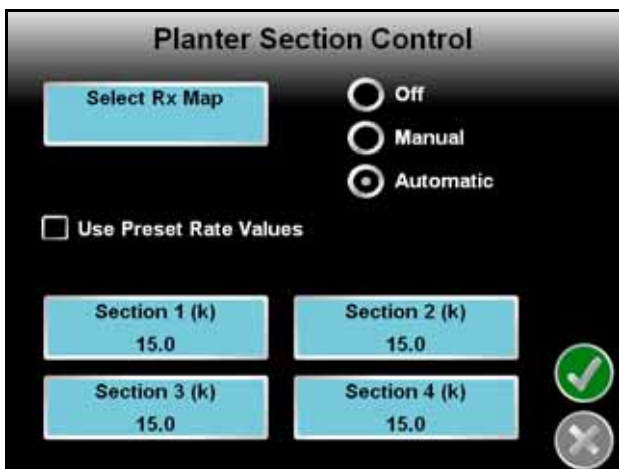
3. Touch the Rate button to configure the planter control settings including the target seed population rate, seed prescription, or configure seed control groups for use during the field operation. Refer to the *Planter Rate Control Set Up* section on page 60 for additional assistance with these settings for each seed control mode.
4. Touch the Job Setup button to select primary, secondary, or all rows for twin row or interplant implements. For multi-hybrid operations, enable the Multi-Hybrid application feature and select the initial rows to enable. Refer to *Multi-Hybrid Job Setup* section on page 63 for assistance with configuring multi-hybrid features for job operations.
5. Touch the Variety buttons to configure the seed varieties for the field operation and assign planter rows in which the seed varieties are currently loaded. Refer to *Seed Variety Monitor* section on page 62 for additional assistance with configuring seed varieties.

## Planter Rate Control Set Up

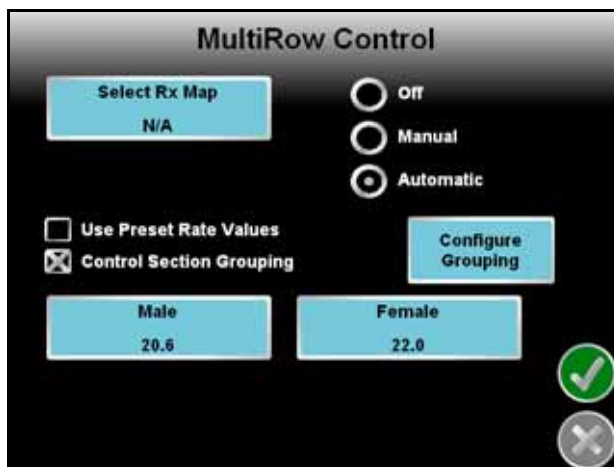
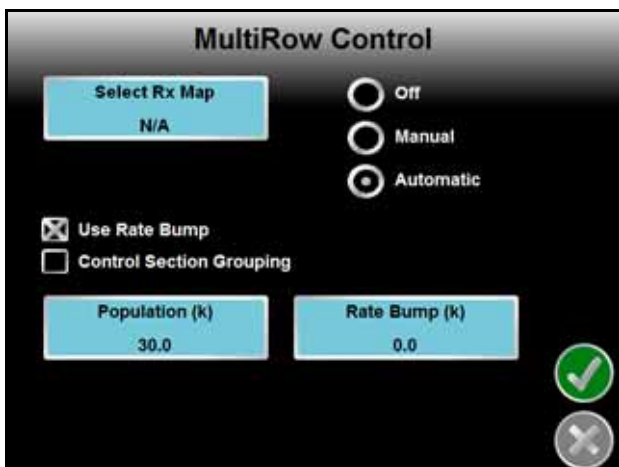
**Note:** Refer to the *Planter Section Control* section on page 60, the *MultiRow Control* section on page 60, or the *Individual Row Control* section on page 61 for assistance with setting up for field operations with each planter control mode.

1. Depending upon the configured planter control mode, one of the planter mode screens will display.
2. Select the control mode (Off, Manual, Automatic) for planter control at the start of the job.
3. Touch the 'Select Rx Map' button to select a prescription map previously loaded on the field computer.
4. Select the desired target seed rate for the planter.

**Planter Section Control.** On the Planter Section Control screen, enter the target population for each section, or enable the 'Use Preset Rate Values' option to set three rate presets to use during the job. See the *Rate Preset Buttons* section on page 77 for a detailed description of the rate control buttons in the Planter Section Control mode.



**MultiRow Control.** On the MultiRow Control screen, enter the target population at which to start the planting operation. Enable the 'Use Rate Bump' option to display the rate increase/decrease buttons on the guidance screen if desired. See the *Rate Bump Buttons* section on page 78 for a detailed description of this rate control feature.





Control sections may also be grouped during planting operations to control different sections simultaneously. Enable the 'Control Section Grouping' option and touch the 'Configure Grouping' button to set up to 4 section groups for the job. See the *Control Section Grouping* section on page 61 for more information on setting up control groups.

**Note:** *When grouped, rate control sections on the implement will be controlled simultaneously from operator inputs to change the target population or seed rate. Each control section within the group will still be controlled independently due to AccuRow or section switch status inputs or commands.*

*The job will automatically reselect the same control groups if the job is resumed at a later date. To reconfigure the control groups, a new job must be started.*

Preset rate values may be configured for the control groups similar to the Planter Section Control mode. Refer to the *Rate Preset Buttons* section on page 77 for a detailed description of this rate control feature.

**Individual Row Control.** On the Individual Row Control screen, enter the target population at which to start the planting operation. Enable the 'Use Rate Bump' option to display the rate increase/decrease buttons on the guidance screen if desired. See the *Rate Bump Buttons* section on page 78 for a detailed description of this rate control feature.



Control sections may also be grouped during planting operations to control different sections simultaneously. Enable the 'Control Section Grouping' option and touch the 'Configure Grouping' button to set up to 4 section groups for the job. See the *Control Section Grouping* section on page 61 for more information on setting up control groups.

**Note:** *When grouped, rate control sections on the implement will be controlled simultaneously from operator inputs to change the target population or seed rate. Each control section within the group will still be controlled independently due to AccuRow or section switch status inputs or commands.*

*The job will automatically reselect the same control groups if the job is resumed at a later date. To reconfigure the control groups, a new job must be started.*

Preset rate values may be configured for the control groups similar to the Planter Section Control mode. Refer to the *Rate Preset Buttons* section on page 77 for a detailed description of this rate control feature.

## Control Section Grouping

To configure control section groups for a field operation:

1. Touch the 'Configure Grouping' button on the planter mode control screen to display the Group Settings screen.
2. Select the desired 'Group' to configure.
3. Touch the 'Group Name' field and use the on-screen keyboard to name the control group. Touch the Accept icon when finished.

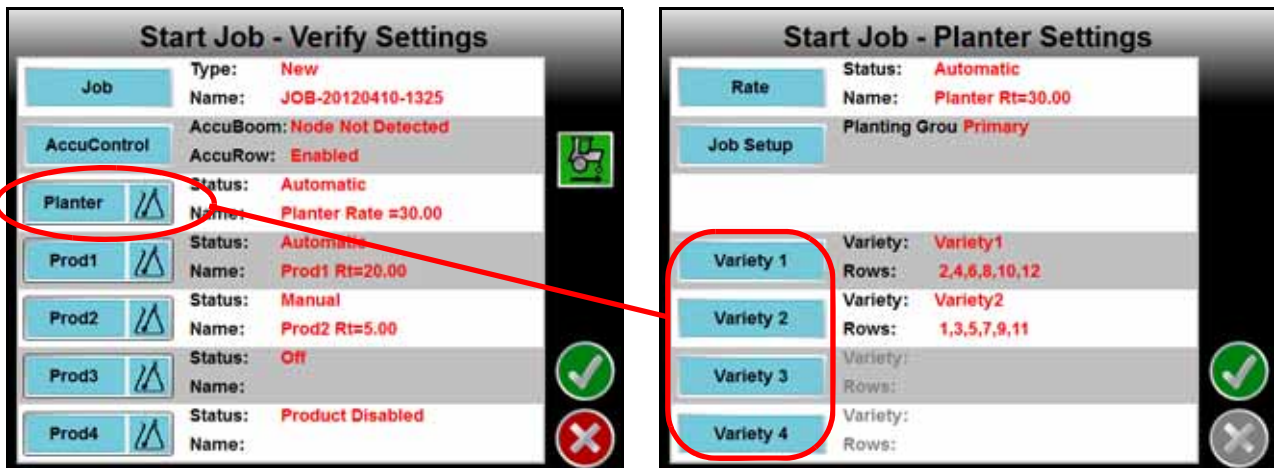
4. Touch the 'Population' button and enter the initial population for the control group using the on-screen keypad. Touch the Accept icon when finished.
5. Touch the 'Section Selection' button and select available sections or rows to include in the group.

**Note:** Rows or sections assigned to a group will not be available for selection in subsequent groups. Deselect rows or sections from assigned groups before reassigning to a different control group.

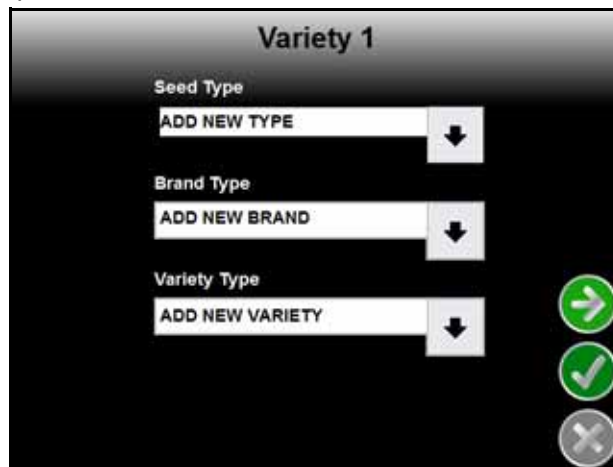
### Seed Variety Monitor

The field computer is capable of monitoring up to four seed varieties during planter operations. The variety entered will be displayed on the application report. To configure seed varieties to monitor during the active job:

1. Touch Planter and then select one of the available varieties to setup.




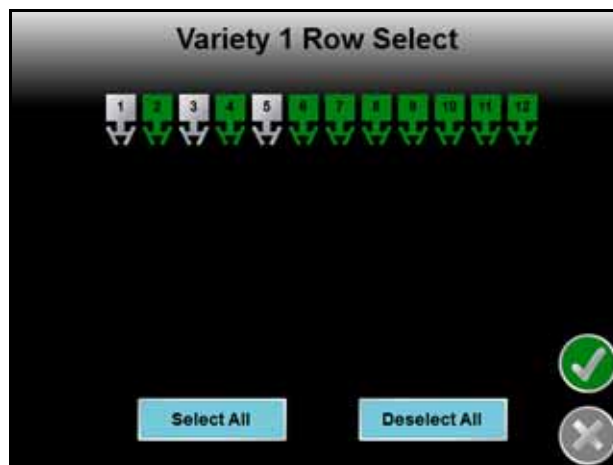
The following screen will open.



2. Touch the "Add New" field for the seed type, brand, or variety to enter new seed information for the selected variety or touch the list arrow at the right of each entry to display a list of previously created varieties.

**Note:** Names or descriptions of seed types, brands, or varieties cannot begin or end with a space.

3. Touch Next  to display the Row Select screen for the selected variety.



4. Touch the row indicators to toggle assigned rows on or off for the selected seed variety.

### Multi-Hybrid Job Setup


Selecting the Multi-Hybrid feature for a field operation will change the planter job settings for multi-hybrid operations. To configure a multi-hybrid field operation:

**Note:** An authorization code is required to unlock the multi-hybrid feature. The multi-hybrid feature may not be available if the selected implement configuration is not capable of supporting the multi-hybrid functionality. Contact a local Raven dealer for purchasing information.

1. Touch the Planter button and then select the Job Setup button.




2. Select the primary or secondary rows to set the rows initially enabled when the job is started.
3. Enable the Multi-Hybrid option in the Application Features area.

4. Touch Accept  to return to the Planter Settings screen which will be displayed similar to the following.



Start Job - Planter Settings	
Rate	Status: Automatic Name: Planter Rt=30.00
Job Setup	Planting Group: Primary
Multi-Hybrid Setup	Hybrid Map: Field:
Primary	Variety: Variety1 Rows: 2,4,6,8,10,12
Secondary	Variety: Variety2 Rows: 1,3,5,7,9,11

5. Touch the Multi-Hybrid Setup button to select a hybrid map previously loaded onto the field computer. Refer to Chapter 9, *Software Updates and File Maintenance*, for assistance with transferring maps onto the Envizio Pro.
6. Touch Primary and Secondary to assign varieties to row units.
7. Once the row assignments and planter settings are configured for the field operation, touch Accept  to finish the planter setup and return to the Verify Settings screen and start the job.

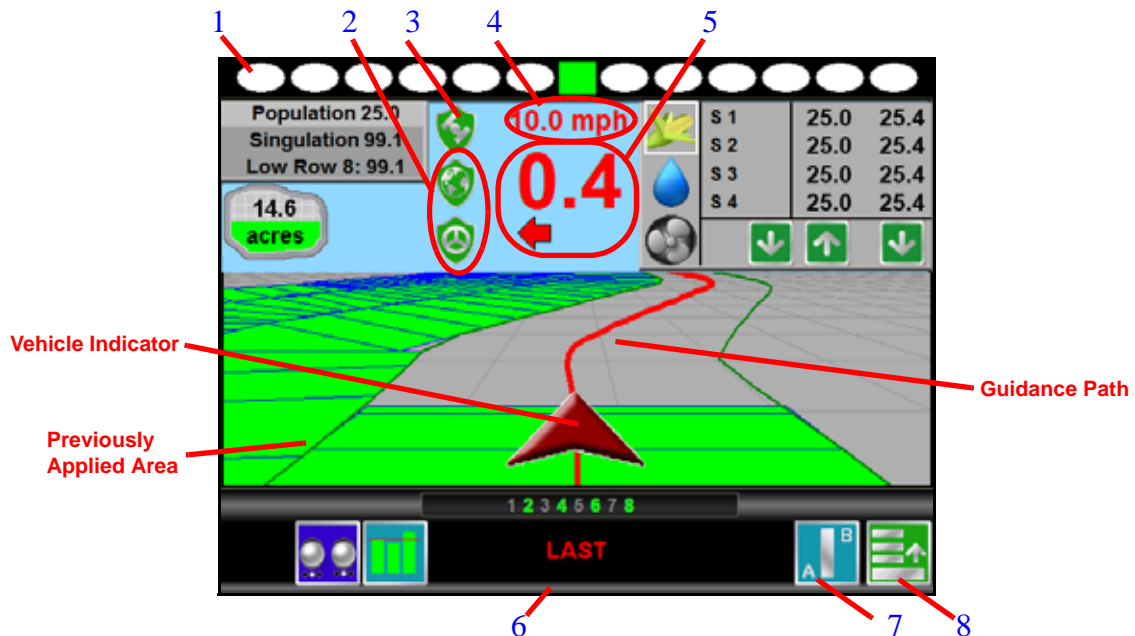
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## Guidance Screen

### Guidance Features

During a field operation, or job, on the Envizio Pro field computers, the Guidance screen provides the application or coverage information and will likely be the most viewed screen during a job. Using DGPS coordinates, the field computer offers several field guidance tools to help reduce operator fatigue and minimize skips and overlaps during product application.

The following features are available during a job on the Envizio Pro field computer:



**Note:** With the reverse sensing feature enabled, it may be necessary to manually override the course of the vehicle indicator. Touch the GPS Status Indicator and touch the direction of travel icon (shown to the right) on the GPS Health screen to manually toggle the displayed vehicle course.



If the reverse direction icon is not displayed on the Guidance screen, touch the GPS Status Indicator and touch the direction of travel icon along the right side of the screen to manually toggle the displayed vehicle course.

1. On-Screen Light Bar - The on-screen light bar illuminates to represent the vehicle's location with respect to the displayed guidance path.  
The center square displays green when the vehicle is "on line." As the vehicle moves away from the line, the center square will turn yellow and the surrounding ovals will begin illuminating to represent distance from the guidance path. See the System menu section in Chapter 8, *Tools Menu*, to setup the light bar display.
2. Wireless and Steering Status Indicators - If connected to a Slingshot® Field Hub or a Raven automated steering system, the field computer will display the status of these systems during a field operation.
3. GPS Status Indicator - Displays the current GPS correction source and signal status. Review the *GPS Status* section on page 52 for details.
4. Speed or COG Display - Vehicle speed or Course Over Ground is displayed in this area. Touch this area to toggle between the Speed or COG display.
5. Distance from Path - This display shows the distance and the direction to the guidance path. The value displayed is in feet (English) or meters (Metric) and the arrow points in the direction to the displayed guidance path.
6. Swath Number - During straight line, pivot, and fixed contour guidance patterns, the number of the current swath is displayed in this area. When in Last Pass mode, this area displays LAST.
7. Guidance Pattern - Touch the icon displayed in this area to toggle between the available guidance patterns. See the *Using Guidance Patterns* section on page 66 for more information on using specific patterns.
8. Menu - Guidance screen views, path tools and options, and AccuRow mapping features are all accessible through the Menu. See the Menu section later in this chapter for more information on using tools and features found within the Menu.

## Using Guidance Patterns

The following Guidance Patterns are available on the Envizio Pro:

- Enhanced Last Pass
- Straight (A-B) Line
- Fixed Contour
- Pivot

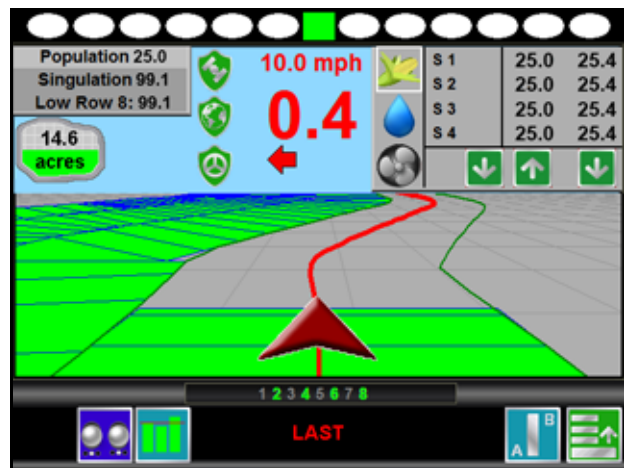
Refer to the following descriptions for more information on the available Guidance Patterns as well as using selected patterns during a job.

### Enhanced Last Pass

The Last Pass pattern uses the last, or nearest, applied or covered area and the guidance width to create the following guidance path.

While this pattern does not require the operator to set 'A' or 'B' points, a previously applied or covered area must be present in the active job before this pattern will display the next guidance path. The Last Pass must follow the previous applied area and will not project subsequent paths beyond the next guidance path.

The Last Pass guidance pattern has been enhanced to provide accurate steering along the displayed guidance path with systems such as the Raven SmarTrax assisted steering systems. Contact a local Raven dealer for more information about Raven assisted steering systems available for use with the Envizio Pro field computer.



The Enhanced Last Pass is well suited to provide guidance for irregular swaths due to irregular field boundaries, well heads, or waterways, etc.

**Note:** *The Last Pass guidance pattern is designed to function in areas with a single, well defined, continuous coverage or as-applied map. If the coverage map displays multiple coverage areas or breaks in coverage, one of the other guidance patterns may provide better results and is recommended.*

**Headlands Mode.** If the Last Pass pattern attempts to lock onto headlands swaths incorrectly, be sure to select the 'Enable Last Pass Headlands Mode' option on the Select Pattern screen while setting up the job. This will allow the field computer to ignore the headlands passes when working the field in alternating 180° swaths.

If the Last Pass guidance pattern will be used to cover the field in a rectangular pattern (outside to inside) leave the 'Enable Last Pass Headlands Mode' option disabled (empty).

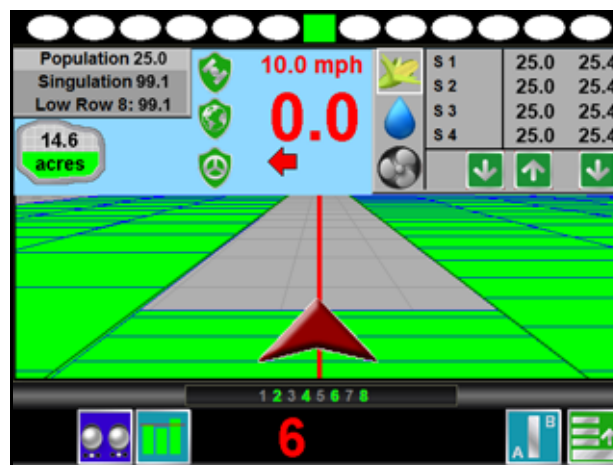


## Straight (A-B) Line

The Straight Line, or parallel, guidance pattern is created by drawing a straight line through two user defined points (points A and B). After the A and B points are set, the field computer is able to use the programmed guidance width and the original path to project parallel guidance paths for the rest of the field.

As long as the Straight (A-B) Line pattern is active and the original path is available, the field computer will display the nearest path regardless of previous application history or coverage mapping.

See the *A-B Path Tools* section on page 84 for help using the A-B guidance line tools and features with the Straight Line pattern.

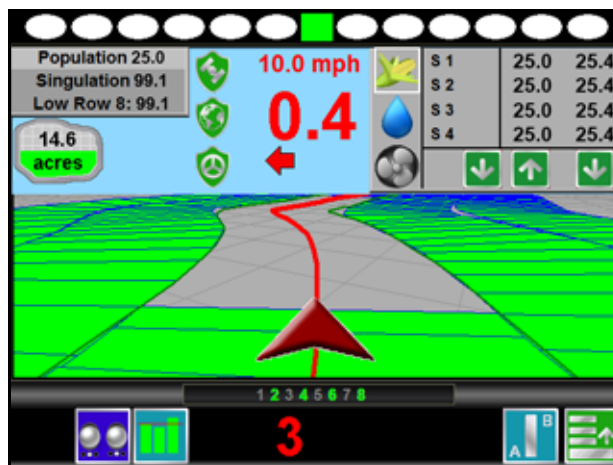


The Straight (A-B) Line pattern is well suited for applications within rectangular fields and row crops.

## Fixed Contour

The Fixed Contour guidance pattern allows the operator to record and save an irregular swath pattern and to use the same tools available for other A-B paths. Similar to the Straight Line pattern, the operator sets the first, or A, point of the swath and begins driving the swath. The field computer records points along the driven path until the operator sets the B point. The field computer then connects the recorded points and displays the Fixed Contour path. After the A and B points are set, the field computer is able to use the programmed guidance width and the original path to project additional contour paths for the rest of the field.

As long as the Fixed Contour pattern is active and the original path is available, the field computer will display the nearest path regardless of previous application history or coverage mapping. See the *A-B Path Tools* section on page 84 for help using the A-B guidance line tools and features with the Fixed Contour pattern.



The Fixed Contour pattern is ideal for creating and saving swaths which follow irregular field boundaries, waterways, well heads, etc., or where the ability to skip swaths in an irregular pattern is necessary.

**Note:** *Curvature of the Fixed Contour guidance path should not be too aggressive. Overly aggressive curves may produce undesirable results.*

*Always be aware of sharp turns when using the Fixed Contour pattern if an assisted steering system such as Raven SmarTrax system is engaged. Contact a local Raven dealer for more information about Raven assisted steering systems available for use with the Envizio Pro field computer.*

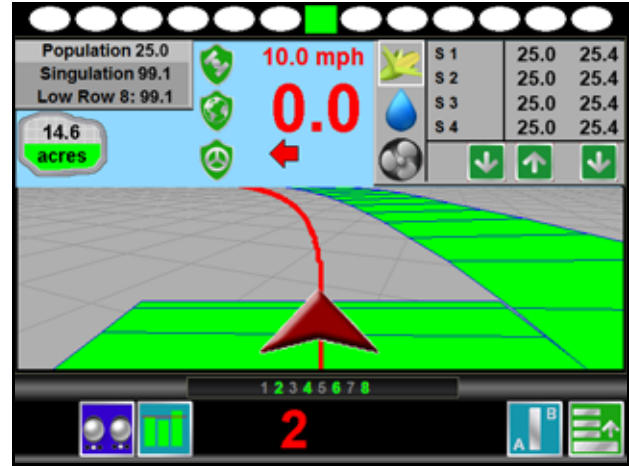
## Pivot

The pivot pattern is designed to provide guidance within row crops with a center pivot, or circle, irrigation system. To begin guidance using the pivot pattern, the operator must set two points along the circumference of the field or the swath furthest from the irrigation hub.

Set the first, or 'A,' point at the start of the swath furthest from the irrigation hub and drive along the field circumference and set the second, or 'B,' point at the end of the swath. Using these two operator defined points and the vehicle guidance width, the field computer calculates circular paths stepping toward the center of the field area.

As long as the Pivot pattern is active and the original path is available, the field computer will display the nearest circular path regardless of previous application history or coverage mapping. Currently, this pattern does not require that the entire circumference of the field is driven before beginning guidance; however, better results are achieved by driving further along the guidance line.

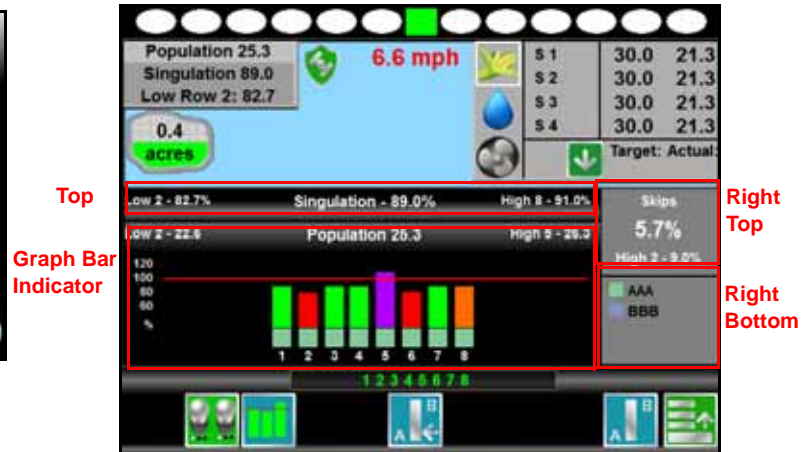
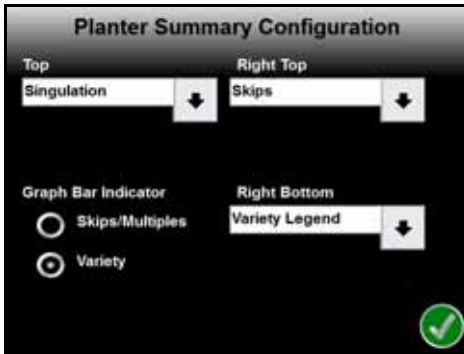
See the *A-B Path Tools* section on page 84 for additional assistance when using the A-B guidance line tools and features with the Pivot pattern.



## Planter Control Features

### Planter Control Screen Configuration

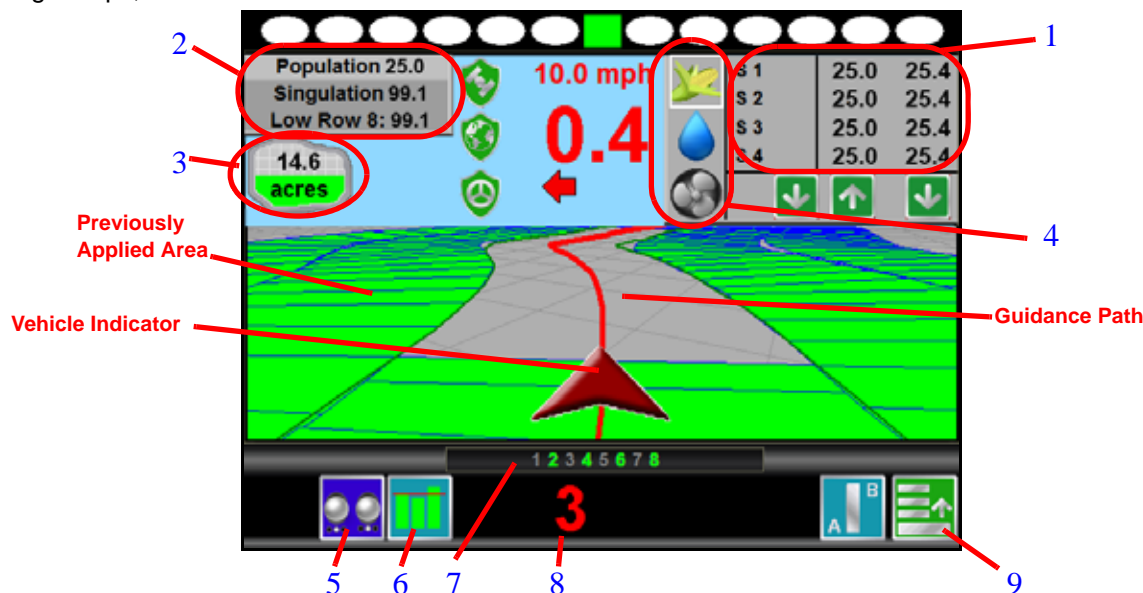
Pressing on the planter control screen will open the planter summary configuration window. Select from the drop downs for the top, right top, right bottom, or graph bar indicator radial buttons to customize the planter control screen.





## Planter Control Features

In addition to guidance features of the Envizio Pro, the Guidance screen displays product control information, coverage maps, as well as vehicle and GPS information.



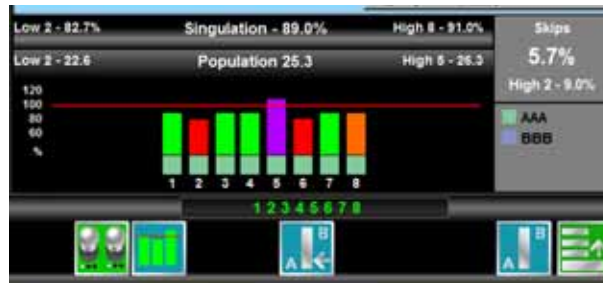
1. Seed Rate Display - This area displays the target and actual motor population rates for each planter section, group or row. In the Planter Section Control mode, a white box is displayed behind the target rate on the selected section. Touch the section heading area of the product rate display to toggle the selected section.

Touch the target and actual seed rates area to access additional features and configuration settings while in a job. See the *Seed Rate Display* section on page 76 for more information on using this display with the planter section or individual row control modes.

**Note:** Seed rate information is not collected with the AccuRow and Monitoring Only systems. This information will not be displayed when operating the OmniRow system in AccuRow and Monitoring Only mode.

2. Planter Status Area - Displays a summary of the actual seed population, average singulation, and row with the lowest singulation rate for the planter during the current operation. Touch this display to view the Planter Status screen. See the *Planter Status and Row Data Screens* section on page 71 for more information.
3. Area Covered - This indicator displays the area covered during the current job.
4. Planter, Product, and Auxiliary Display - Select the planter control, product control, or auxiliary icons along the left side of the rate display area to toggle the seed population rate, applied product rate, or auxiliary monitor information during the field operations. Touching the rate area will access the detailed configuration or information displays for the selected system.
5. On-Screen Switch Box Status - The status of the section or row switches is displayed in this area. Touch this indicator to display the AccuRow Override screen. Refer to Chapter 10, *Using AccuRow™*, for more information on the AccuRow feature or the *Seed Rate and Liquid Shutoff Switch Box* section on page 80 for details on using the on-screen switch box for manual control of sections or rows.

6. Row Status Display - Touch this button to access a chart of the current seed rate for each row and detailed status information.



The chart represents the ratio of the actual seed rate for each row to the target seed rate represented by the red, 100% line. The row status bars may display:

- Red - Below target rate
- Purple - Above target rate
- Orange - At rate but previously off rate within the last four seconds
- Green - At target rate

**Note:** *The actual to target seed rate display values are displayed in relation to the off rate percentage entered by the operator on the Alarm Settings screen within the Planter Settings sub-menu. Refer to the Alarm Settings section on page 133 for details.*

Row units experiencing  $\pm 2\%$  or greater skips will display a red “down arrow” indicator below the row status. For row units with greater than  $\pm 2\%$  multiples, the status on this chart will display an orange “up arrow.”

7. Sections - The label for each section or row configured on the field computer is displayed in this area. Active sections appear green while sections currently disabled (or toggled off) appear in white.

If the AccuRow system is enabled, section labels displayed in amber signify that AccuRow control of the section is enabled, but AccuRow has toggled the section off.

If the implement is configured for liquid shutoff sections, indicators for each liquid section is displayed to the left and right of the seed sections. Refer to *Seed Rate and Liquid Shutoff Switch Box* section on page 80, for details on liquid shutoff section control.

8. Swath Number - During straight line, pivot, and fixed contour guidance patterns, the number of the current swath is displayed in this area. When in Last Pass mode, this area displays LAST.
9. Menu - Guidance screen views, path tools and options, and AccuRow mapping features are all accessible through the Menu. See the *Menu* section on page 82 for more information on using tools and features found within the Menu.

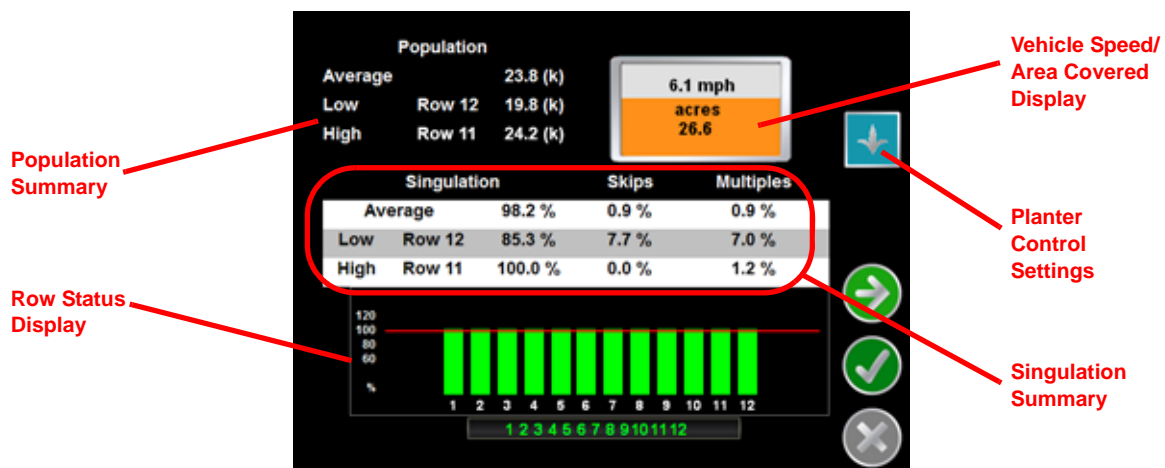
## Planter Status and Row Data Screens

During planter control operation, the field computer displays a summary of the actual seed population and singulation for the planter during the active operation. To access more details on the planter status and view monitored information for each row on the implement, touch the summary display on the Guidance screen.



### Planter Status Screen

The first screen to display is the Planter Status screen.



The Planter Status screen displays an overview of population, singulation, and real-time row status information for the operator. Touch the Accept icon to return to the Guidance screen.

**Note:** Touch the Planter Control icon along the right side of the Planter Status screen to quickly access the Planter Control screen and settings during an active job session.

### Population

The average seed population is displayed for the implement overall. This screen also displays the rows with population furthest above and below the implement average.

### Vehicle Speed and Area Covered

The current vehicle speed and area covered tally is displayed in the upper, right corner of the planter status screen. The area covered tally displays the area covered by active rows during the current planting operation.

### Singulation, Skips, and Multiples

The average seed singulation, or individual seeds set and spaced accurately, skips and multiples for the implement overall is displayed on the planter status screen. The rows with singulation furthest above and below the implement average are also displayed on this screen.

### Current Row Status

The current status of each row is displayed at the bottom of the planter status screen. The row status bars may display:

- Red - Below target rate
- Purple - Above target rate
- Orange - At rate but previously off rate within the last four seconds
- Green - At target rate

**Note:** *The actual to target seed rate display values are displayed in relation to the off rate percentage entered by the operator on the Alarm Settings screen within the Planter Settings sub-menu. Refer to the Alarm Settings section on page 133 for details.*

Touch the Next icon on the planter status screen to access the Planter Row Data, Planter Section Diagnostics, and Planter Node Diagnostics screens. Touching the Accept icon from any one of these screens will return to the planter status screen.

## Planter Row Data

To view population and singulation data for each row during a planter control operation, touch the summary display on the Guidance screen and touch the Next icon on the planter summary screen.



The Planter Row Data screen will be displayed.

Planter Row Data				
Row	Population	Singulation	Skips	Multiples
1	25.7 k	98.0 %	0.0 %	2.0 %
2	25.7 k	98.0 %	0.0 %	2.0 %
3	25.7 k	98.0 %	0.0 %	2.0 %
4	25.7 k	98.0 %	0.0 %	2.0 %
5	25.7 k	98.0 %	0.0 %	2.0 %
6	25.7 k	98.0 %	0.0 %	2.0 %
7	25.7 k	98.0 %	0.0 %	2.0 %
8	25.7 k	98.0 %	0.0 %	2.0 %
9	25.7 k	98.0 %	0.0 %	2.0 %
10	25.7 k	98.0 %	0.0 %	2.0 %
11	25.7 k	98.0 %	0.0 %	2.0 %
12	25.7 k	98.0 %	0.0 %	2.0 %

Press next arrow for row 13 to 24 data

**Note:** If the implement configuration has more than 12 rows, touch the Next icon to view additional rows on a second Planter Row Data screen.

This screen displays population and singulation information for each row on the implement. Touch Next from the last Planter Row Data screen to view the Planter Diagnostics screen.

## Planter Diagnostics

To view diagnostic information for each configured planter section, group or row, touch the summary display on the Guidance screen and touch Next on the planter summary screen.



Touch Next until either the Planter Section or Planter Row Diagnostics screen will display.

**Planter Section Control**

Planter Section Diagnostics					
Section	Encoder Pop	PWM Output	Control Range		
1	24.6 k	253	INCR	FULL ON	
2	24.6 k	253	INCR	FULL ON	

**Individual Row Control**

Planter Row Diagnostics					
Row	Encoder Pop	PWM Output	Control Range		
1	25.7 k	253	INCR	FULL ON	
2	25.7 k	253	INCR	FULL ON	
3	25.7 k	253	INCR	FULL ON	
4	25.7 k	253	INCR	FULL ON	
5	0.0 k	253	INCR	FULL ON	
6	0.0 k	253	INCR	FULL ON	
7	0.0 k	253	INCR	FULL ON	
8	0.0 k	253	INCR	FULL ON	
9	0.0 k	253	INCR	FULL ON	
10	0.0 k	253	INCR	FULL ON	
11	0.0 k	253	INCR	FULL ON	
12	0.0 k	253	INCR	FULL ON	

**Note:** The Planter Section Diagnostics screen is displayed with the field computer in the Planter Section Control mode. Planter Row Diagnostics is used with the Individual Row Control mode.

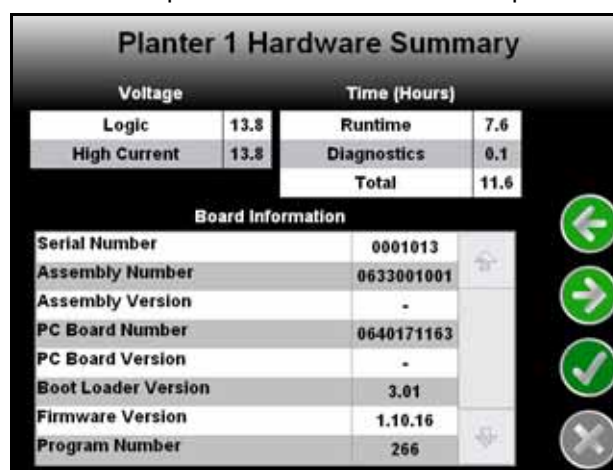
The diagnostics screen displays the registered encoder population, hydraulic PWM valve output frequency, and the control range or valve status for each configured row or section used to control the planter seed rate. This screen is used primarily for troubleshooting or system installation and set up.

## Planter Node Diagnostics

To view diagnostic information for each planter control node connected to the CANbus, touch the summary display on the Guidance screen and touch the Next icon on the planter summary screen.



Touch Next until the Planter Node Diagnostics screen is displayed. The node diagnostics screen may be helpful if technical support is required for the planter control system and displays information such as node voltages, system run time, and node build information. A Raven dealer or Product Support Specialist may request information from this screen to help troubleshoot the OmniRow planter control system.



## Seed Rate Display

The field computer displays seed rate information for each enabled section, group or row in the upper, right corner of the Guidance screen.

**Planter Section Control**

	Target Rates	Actual Rates
S 1	15.0	15.0
S 2	15.0	15.0

15.0   22.0   27.0

**Individual Row Control**

	Target Rates	Actual Rates
R 5	23.0	23.0
R 6	23.0	23.0
R 7	23.0	23.0
R 8	23.0	23.0

↑ ↓   ↑ ↓

The following information appears in the Product Rate Display:

- Section, group or row label
- Target seed population of the OmniRow system
- Actual rate of the OmniRow system
- Selected section (Planter Section Control mode only)
- Rate control buttons (if enabled)

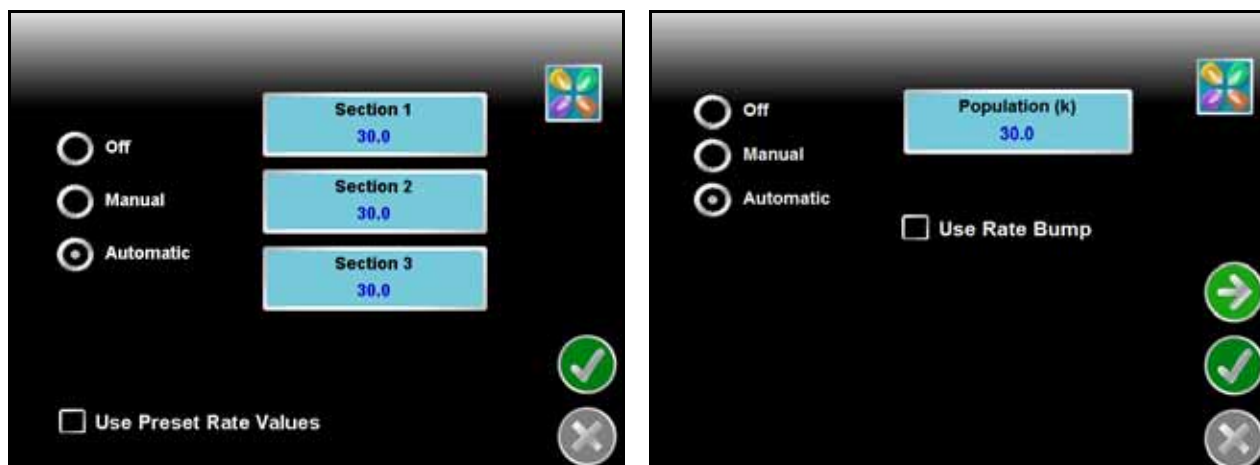
**Note:** The target rate for each section, group or row is shown to the left of the actual rate in the seed rate display.

## Seed Rate Control Features

The Seed Rate display shows the section label and the section target seed rate followed by the actual seed rate.



Touch in the rates area to display the in-job rate settings screen.



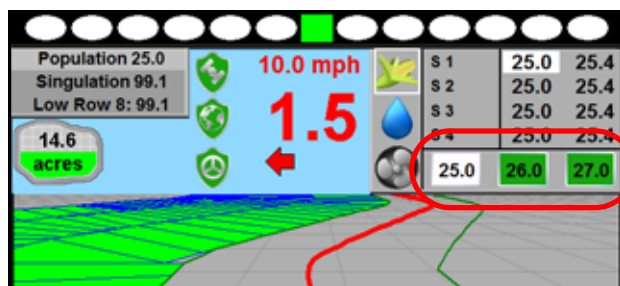
Change the control mode by touching the Off, Manual, or Automatic options to the left of the rate settings screen. Select:

- Off to turn off product control for the selected product.
- Manual to control the actual application rate manually.
- Automatic to allow the field computer to control seed population rates automatically based upon the implement ground speed and/or a prescription map.

To change the target population, touch the section or population button and use the on-screen keypad to enter the new target population. Touch the Accept icon to set the new target population and return to the in-job rate settings screen.

### Rate Preset Buttons

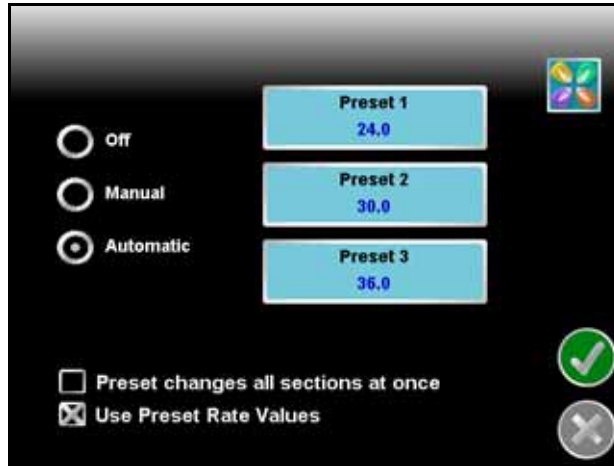
If the “Use Preset Rate Values” option is enabled, the rate preset buttons will be displayed at the bottom of the seed rate display.



Touch the desired rate preset button to change the target seed rate for the selected section. Touch the section label area to toggle the selected sections.

To change the rate preset values:

1. Touch in the rates area to display the in-job rate settings screen.

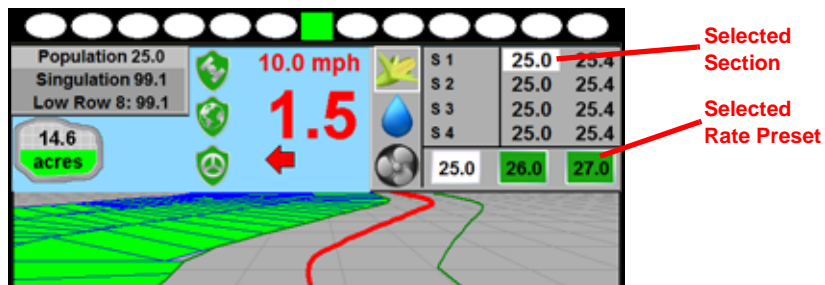


**Note:** The Preset Rate Values option must be enabled to display the rate preset buttons on the Guidance screen.

2. Touch the desired Preset button and use the on-screen keypad to enter the new target seed rate.
3. Touch the Accept icon to return to the in-job rate settings screen.

**Note:** Enable the “Preset changes all sections at once” option to change all rate control sections simultaneously when a rate preset button is selected.

4. To begin planting at the new target population, return to the Guidance screen and touch the desired rate preset button in the seed rate display.



### Rate Bump Buttons

**Note:** The rate bump feature is only available in MultiRow Control and Individual Row Control modes.

If the “Use Rate Bump” option is selected during the job setup process (if available), the rate bump buttons will be displayed at the bottom of the seed rate display.



Touch the desired rate bump buttons to “bump” the target rate up or down for all configured rows on the implement.

To adjust the rate bump value:

1. Touch in the rates area to display the in-job rate settings screen.



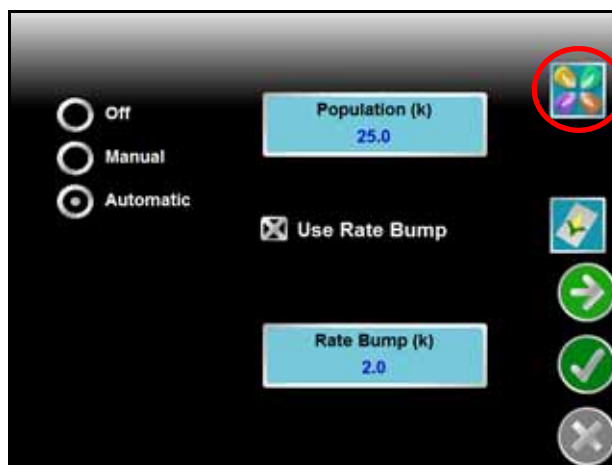
2. Touch the rate bump button and use the on-screen keypad to enter the new rate bump value.
3. Touch Accept to set the new rate bump value and return to the in-job settings screen.
4. To begin planting at the new target population, return to the Guidance screen and touch the up or down rate bump button in the seed rate display to adjust the target population for all configured sections or rows by the set bump value.

## Variety Switching

The Envizio Pro allows the operator to map changes in seed varieties during a field operation by selecting existing, or entering new, variety information during a field operation. This feature allows the operator to accurately map field inputs during the operation and may be used later during the growing season to assist with application needs or to help determine expected yields at harvest.

To switch variety information during a field operation:

1. Touch in the rates area to display the in-job rate settings screen.



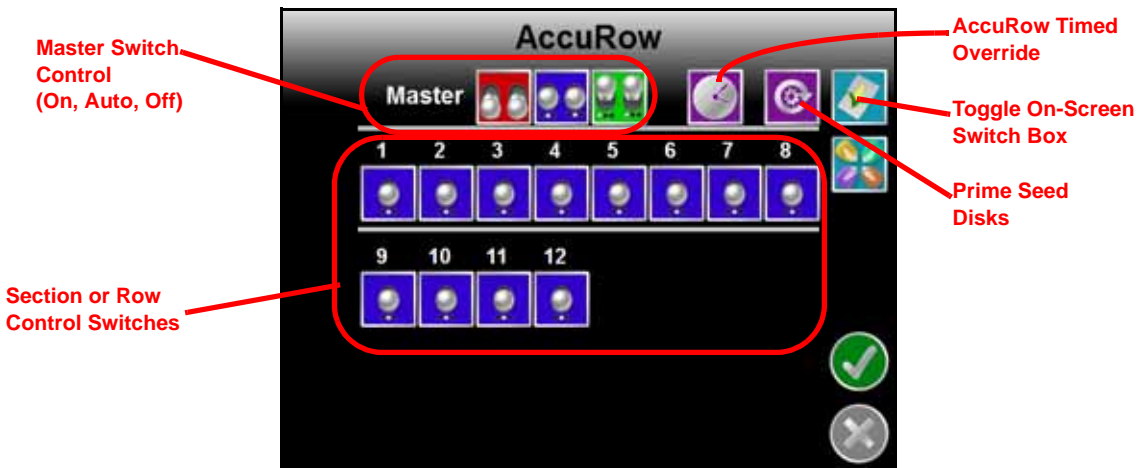
2. Touch the seed variety button in the upper, right corner of the display.
3. Refer to the *Seed Variety Monitor* section on page 62 for additional assistance with configuring the seed variety monitoring features.

## Seed Rate and Liquid Shutoff Switch Box

During planting operations, the operator may override automatic section controls for both seed rate and liquid shutoff sections if desired.



Touch the Switch Status icon at the bottom of the Guidance screen to display the AccuRow Override screen.



The AccuRow Override screen displays the following icons to control seed rate and liquid shutoff sections:

**Note:** *AccuRow or automatic section shutoff capabilities will be disabled during field operations without GPS coverage.*

**Master Switch Control.** Touch the master off, automatic or on icons to toggle all seed rate or liquid section switches currently displayed on the switch box screen.

**Note:** *Unless the liquid shutoff sections are set to on or off manually, toggling the seed rate sections off on the AccuRow Override screen will also shutoff all liquid sections on the implement. The Liquid Shutoff Sections screen will still display the liquid sections in automatic mode, but all liquid sections will be shut off. See the Seed Rate and Liquid Shutoff Section Control Examples section on page 81 for more information.*

**Section Control Switches.** Touch the individual section control switches to toggle individual sections or rows between the automatic, off or on.

**Note:** *Recall that liquid shutoff sections are controlled by the OmniRow system according to seed rate control sections or rows. If all seed rate sections or rows corresponding to the liquid shutoff section are toggled off, the OmniRow system will automatically shut off the liquid section. See the Seed Rate and Liquid Shutoff Section Control Examples section on page 81 for more information.*

*The section switches will not affect seed rate control groups in the MultiRow or Individual Row Control modes.*

**AccuRow Timed Override.** Touch the timed override icon to override the AccuRow system on for the user defined time. Refer to the *AccuRow™ Setup* section on page 175 for more information on calibrating the AccuRow feature and using the AccuRow Override.

**Prime Seed Disks.** Touch the Prime Seed Disks icon to cycle all seed disks one revolution. Use this feature after refilling row units to ensure the implement is ready to resume planting operations. Review Chapter 6, *OmniRow Remote Section Control*, to perform this function using the hand-held controller.

**Toggle On-Screen Switch Box.** Touch the Liquid or Seed icon in the upper, right corner of the on-screen switch box display to toggle the switch box between seed rate section control and liquid shutoff section control modes.



When controlling seed rate sections manually, the OmniRow system may automatically shutoff corresponding liquid control sections if the liquid sections are set to automatic control. Review the following *Seed Rate and Liquid Shutoff Section Control Examples* section for some examples of how the OmniRow system will control liquid shutoff sections.

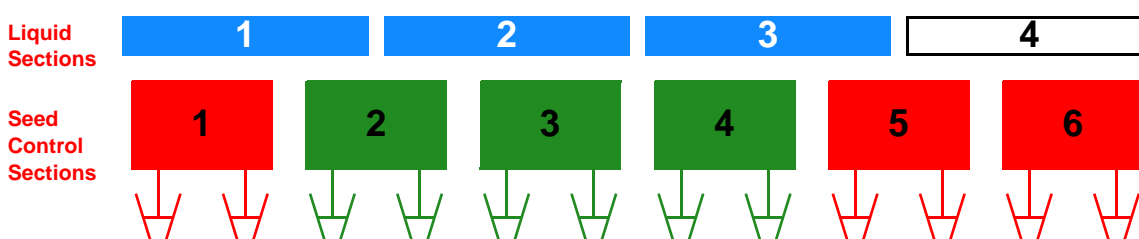
**Multi-Hybrid Switch Box.** Touch the Multi-Hybrid icon in the on-screen switch box display to access the manual switch box used with a conventional (non-split row) multi-hybrid planter implement. This switch box allows the operator to manually toggle the active hybrid for each row unit.



## Seed Rate and Liquid Shutoff Section Control Examples

The following statements would be correct when operating an OmniRow system configured for 6 seed rate sections and 4 liquid shutoff sections as shown below.

**FIGURE 1. Planter Section Control with Liquid Shutoff Sections**



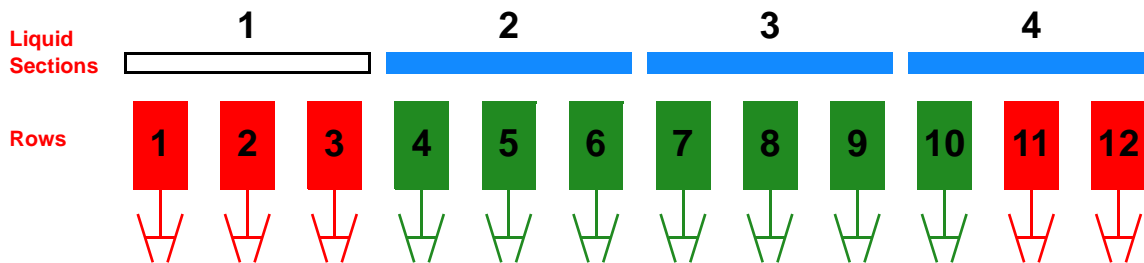
- Liquid shutoff section 1 will remain on if seed rate section 1 is toggled or controlled off. Since part of seed section 2 remains active and corresponds to the implement width covered by liquid shutoff section 1, the liquid section will remain on.
- Liquid shutoff section 4 is shut off if seed rate sections 5 and 6 are toggled or controlled off. Since all seed rate sections corresponding to this liquid section are off, the AccuRow system would automatically turn off liquid shutoff section 4.



## Chapter 5

The following statements would be correct when operating an OmniRow system configured for individual row control on a 12 row implement with 4 liquid shutoff sections as shown below.

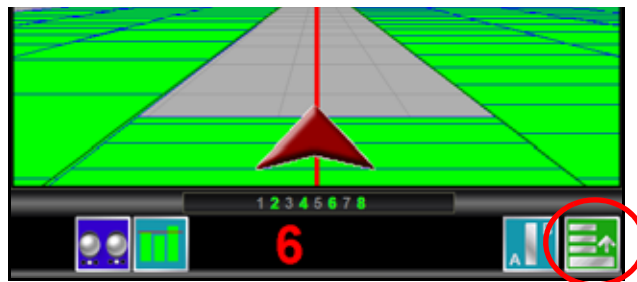
FIGURE 2. Individual Row Control with Liquid Shutoff Sections



- Liquid shutoff section 1 is shut off if seed rows 1, 2, and 3 are toggled or controlled off. Since all rows corresponding to this liquid section are off, the AccuRow system would automatically turn off liquid shutoff section 1.
- Liquid shutoff section 4 will remain on if seed rows 11 and 12 toggled or controlled off. Since row 10 remains active and corresponds to the implement width covered by liquid shutoff section 4, the liquid section will remain on.

## Menu

Guidance path tools, field boundary tools, and additional guidance views are available by accessing the Menu in the lower right corner of the Guidance screen.



The features and tools available in the Menu will depend upon the selected view, active guidance pattern, and features enabled when the Menu was accessed. Review the following icons and their descriptions for help working within the Menu.

## Home



Touch the Home icon to return to the Home screen. The job in progress will continue in the background. Note that some Tools Menu screens may not be accessible while a job is in progress.

## Guidance Views

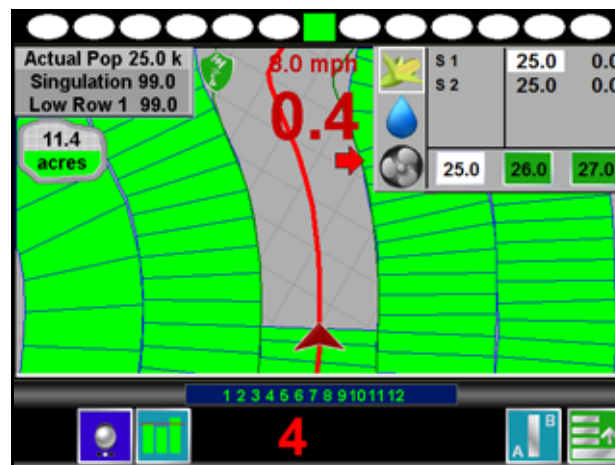
The down field and bird's eye views are the primary screens used while a job is in progress. These views seamlessly integrate guidance and navigation information with rate control information. This minimizes the amount of time which the operator must focus on the field computer and allows more time to manage the other important aspects of the operation. Touching one of the following icons will switch the guidance view to the indicated perspective.



The Down Field view is the initial view displayed when a job is started. This is a simulated perspective as seen from the cab of the vehicle.



Switch to the Bird's Eye view to change to a view from above the vehicle position. This view will display all of the same guidance features and tools as the down field view.





## A-B Path Tools

The following tools and features may be found in the Menu when the Straight Line, Fixed Contour, or Pivot guidance patterns are active.

**Note:** *The following icons may not appear in the Menu at the same time. Tools may only be available before or after a guidance line has been set.*

### Loading an A-B Line



If an A-B Line has been saved on the field computer, touch the Load A-B Line icon to load the saved line into the current job. This icon will not appear if an A-B Line has already been set. Reset the line to access the Load A-B Line tool.

**Note:** *The A-B Line must be stored on the field computer internal memory to be able to access and load the guidance path. Be sure to transfer all necessary files to the field computer before beginning a job.*

*Names or descriptions of A-B Lines stored on the field computer cannot begin with a space.*

### Setting A-B Points

To create a new A-B line, the operator must set A and B points. The following icons and tools may be used to set a new A-B line.



Touching the Set A icon will place the first, or A, point of the path at the vehicle's current location. Regardless of where the vehicle moves from this point, the field computer will use the selected pattern to connect this point with the next set point. After the Set A icon is selected, the Set B icon will appear.



Touch the Set B icon to place the second, or B, point of the guidance path. Once the B point has been set, the field computer will use the selected pattern to create the guidance path displayed on the Guidance screen.

### Set B by Heading

The Set B by Heading feature is only available with the straight line guidance pattern. This feature allows the operator to set an A-B line before completing the first swath.



Use the Set B by Heading feature to create a guidance path along a heading. Touch this icon and use the displayed keypad to enter a heading between 0° and 359° (with 0° being due North).

**Note:** *If Set B by Heading is selected before an A point has been set, the field computer will place the A point at the vehicle location when Set B by Heading was selected.*



## A-B Path Tools

The following tools are available in the Menu when a compatible A-B line is displayed on the Guidance screen.



Select the A-B Tools icon to access additional tools for use with the current A-B line.



Select the Reset A-B Line icon to clear the displayed path. If the displayed path will need to be recalled in the future, be sure to save the current path before selecting reset.



Touch the Save A-B Line icon to save the displayed path. Once saved, an A-B line may be recalled at any time or loaded into other jobs. In addition, saved paths can be transferred from the field computer via the File Maintenance feature. See Chapter 9, *Software Updates and File Maintenance* for details on the file maintenance feature and transferring saved paths.

**Note:** Names or descriptions of saved A-B lines cannot begin or end with a space.



Use the Re-calibrate A-B Line tool to re-calibrate the displayed path to the machine's current position. Due to DGPS drift over time, this feature allows the operator to re-calibrate the A-B line to a known position in a field.

## Nudge Feature

The Nudge Feature allows the operator to fine tune the displayed path for actual field conditions. For example, if the displayed path guides the vehicle too close to crop rows, nudge the line to the left or right to adjust the path and guide the vehicle away from rows.

**Note:** The Nudge Feature is only available with A-B guidance paths (Straight Line, Pivot, Fixed Contour).

The Nudge Feature works especially well with the Raven SmarTrax assisted steering systems. Contact a local Raven dealer for more information about these systems.

## On-Screen Nudge Enabled

To enable and use the on-screen nudge feature to adjust a displayed guidance path:

1. Begin a job and set A and B points for a guidance path using the Straight Line, Fixed Contour or Pivot patterns.

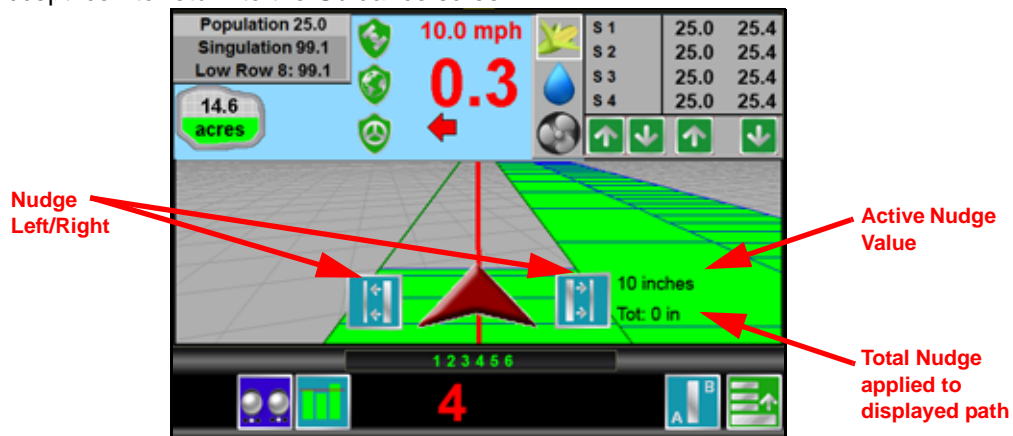


2. Select the Menu icon in the lower, right corner of the display and select the Edit Nudge icon to display the In Job Nudge Settings screen.



**Note:** Touch the Reset Nudge button at the bottom of the Nudge Settings screen to reset any adjustments to the path displayed on the Guidance screen.

3. On the Nudge Settings screen, select the 'Enabled' radio button to display the nudge control icons on the Guidance screen during field operations.
4. Touch the Nudge 1 and Nudge 2 buttons and use the on-screen keypad to enter the desired values for each nudge setting. Select the desired units for the entered nudge value and touch the Accept icon to return to the Nudge Settings screen.
5. Select either the Nudge 1 or Nudge 2 radio button to select the active nudge applied when the on-screen nudge controls are used. During field operations, the active nudge radio buttons may be used to quickly select one of the pre-configured nudge values.
6. Touch the Accept icon to return to the Guidance screen.



The following icons will be displayed on the Guidance screen if the on-screen nudge controls option is set to enabled.



Touch the Nudge Right icon to move the displayed guidance path to the right. The distance which the path will be nudged is determined by the user defined value for the active nudge.

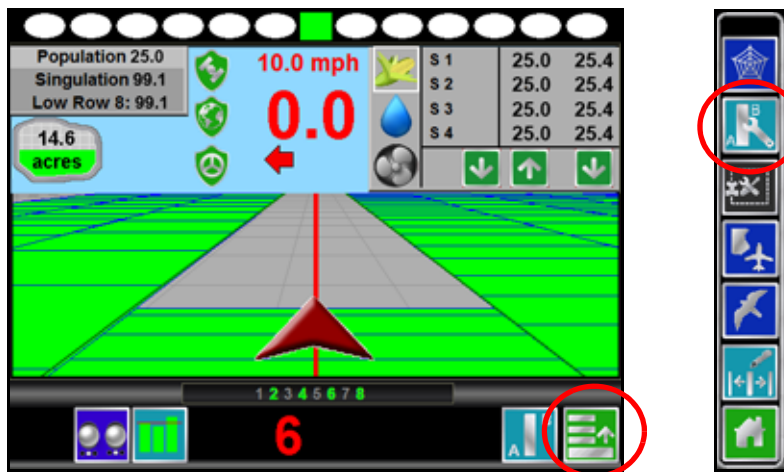


Touch the Nudge Left icon to move the displayed guidance path to the left. The distance which the path will be nudged is determined by the user defined value for the active nudge.

### Guidance Menu Nudge Tools

The nudge feature may also be accessed via the Guidance menu to make small adjustments to the guidance path if the on-screen nudge tools are not enabled. To Nudge a displayed guidance path without the on-screen nudge controls:

1. Begin a job and set A and B points for a guidance path using the Straight Line, Fixed Contour, or Pivot patterns.
2. Select the Menu icon in the lower, right corner of the display and select the A-B Tools icon.



The following nudge icons are available in the Menu:

	<p>Touch the Nudge Right icon to move the guidance path to the right in 1 inch [2 cm] increments.</p>		<p>Touch the Nudge Left icon to move the guidance path to the left in 1 inch [2 cm] increments.</p>
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## Field Markers

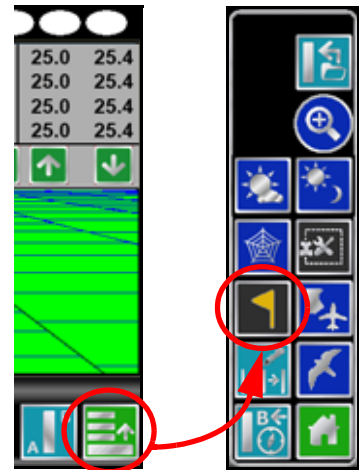
Field markers allow the operator to mark locations such as well heads, rock piles, or points of interest during a field operation. Markers will be displayed during the operation and will allow the operator to view the marker information.

To place a field marker:

1. Touch the Menu icon in the lower, right corner of the guidance display.
2. Select the Marker icon. A field marker will be placed at the current vehicle location.

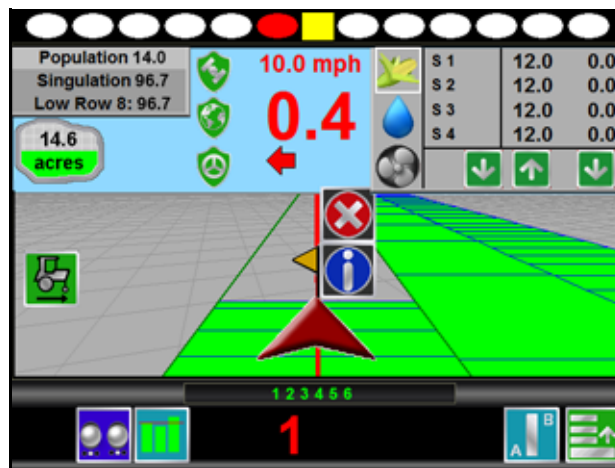
Touch the marker to access marker information or delete the field marker.

**Note:** *Field markers are independent of job information and will be displayed for subsequent jobs in the area of the field marker.*



### Marker Information

Touch the base of the marker and select the Information icon to display the Marker Information screen. This screen displays the marker name, current distance to the marker, and geographic coordinates.



Touch the name field and use the on-screen keyboard to rename the marker.

**Note:** *Marker names should not begin or end with a space.*

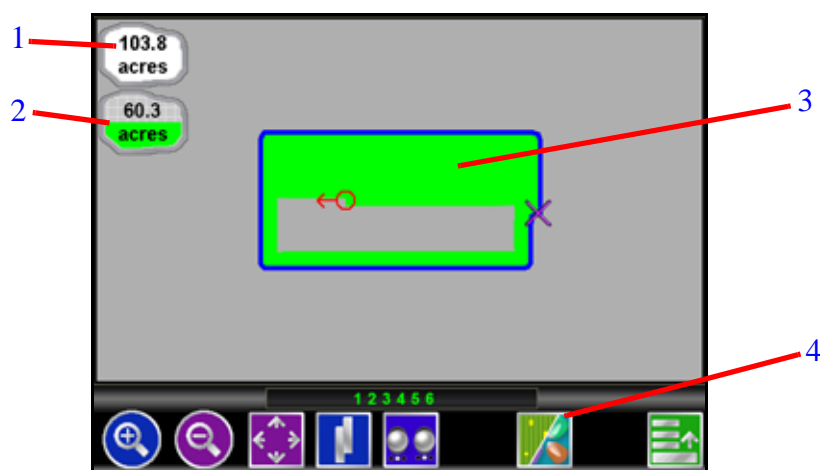
### Delete Markers

To delete a marker, touch the base of the marker and select Delete to remove the field marker.

## Field Review Mode



Unlike the guidance views, the field review mode allows the operator to pan and zoom the display to any area of the field.



The field review mode displays the following information:

1. Field Boundary Area - area within a completed field boundary.
2. Coverage Area Tally
3. Coverage Map
4. Product Section or Toggle Coverage or Variety Map Display

## Field Review Mode Tools

In field review mode, the following icons appear along the bottom of the Guidance screen:

- Pan lock
- Show overlaps
- Switch product

### Pan Lock

The pan lock feature locks the current view in field review mode.



When the pan lock is disabled, the display will automatically scroll to the vehicle indicator as the indicator moves out of the current view. Disable the pan lock to always display the vehicle indicator while in field review mode.



When the pan lock is enabled, the display is locked to the current view regardless of the vehicle indicator position. The operator can manually pan and zoom with the pan lock enabled to view specific portions of a field while in field review mode.

To pan the display manually, touch the Field Review screen. The point touched will become the center of the field review display.

## Show Overlaps

In addition to coverage, the field review mode can display application overlaps. The show overlaps feature displays areas where active sections entered a previously applied area and allows the operator to quickly review skips and overlaps on the same screen.



With the show overlaps feature disabled, the field review mode displays the covered areas (including overlaps) in a solid green color. Touch this icon to toggle the show overlaps feature.



When the show overlaps feature is enabled, application overlaps are displayed in red. Overlaps appear where application (i.e. active sections) cover previously applied areas. Note that the area covered will not display as an overlap unless product application has overlapped.

## Toggle Maps on the Guidance Screen

During a job with an active prescription or zone map, the field computer will display either map on the Guidance and Field Review screens. If both a prescription map and a zone map will be used, the operator may toggle which map to display on the guidance and field review screens by selecting the toggle maps icon.

To toggle the displayed map, touch:



The view zone map icon to view the loaded zone map.



The view prescription map icon to display the loaded prescription map on all guidance displays.



When viewing liquid product control products, the product selection button will be displayed and may be used to toggle the coverage or as-applied for the selected product.



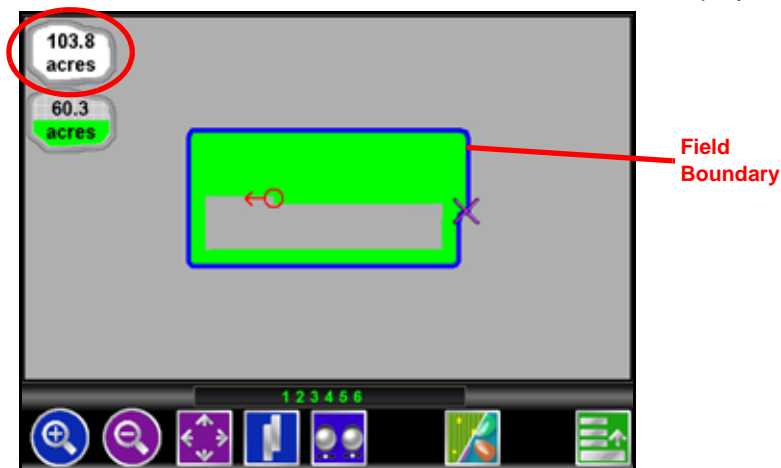
Use the variety map icon to toggle between the variety and coverage map displays during a field operation with variety monitoring or multi-hybrid features.

## Field Boundaries

A field boundary and zone map may be created for each job on the Envizio Pro field computer.

### Field Boundary

A field boundary provides a visual reference of the outline of the current field on the display.



Once a field boundary has been completed, the Envizio Pro can calculate and display the area within the field boundary in acres (English) or hectares (Metric) in field review mode. Only one field boundary may be recorded per job.

With the AccuRow, automatic section control, feature enabled, a field boundary will also create a basic zone map of the current field. Refer to Chapter 10, *Using AccuRow™*, for more information on field boundaries with the AccuRow feature.

### Zone Maps

With the AccuRow, automatic section control, feature enabled, a map of plant and/or no-plant zones may be created and saved with the job. Refer to Chapter 10, *Using AccuRow™*, for more information on field boundaries with the AccuRow feature.



## Field Boundary Tools

The following Menu tools and features are available while creating a field boundary.

**Note:** Zone maps are only available if the AccuRow feature is enabled. Refer to Chapter 10, Using AccuRow™, for more information using the AccuRow feature.

### Loading a Field Boundary



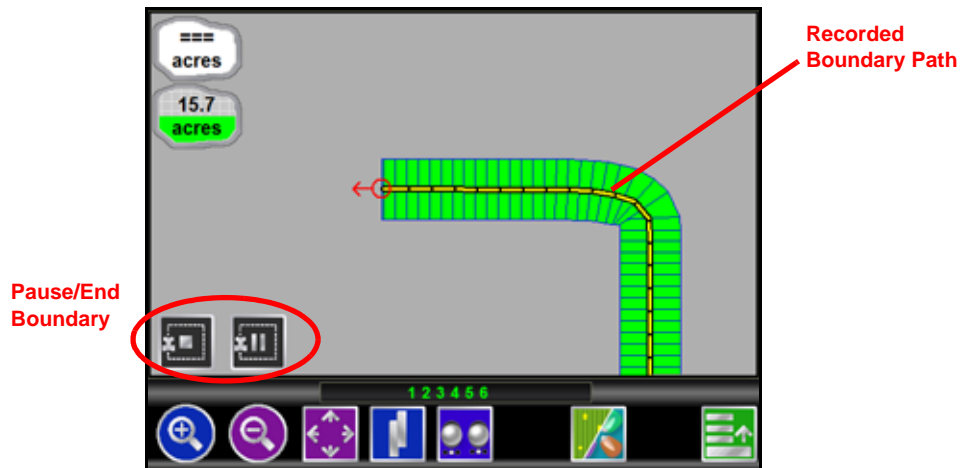
A previously recorded boundary may be loaded into the current job file by selecting the Load Field Boundary icon in the Menu. A list of job files or boundaries stored on the field computer is displayed. Select the desired boundary to load into the current job.

**Note:** Field boundaries exported from the Envizio Pro will be named either using the job file name entered when the job was started or the Zone Map name set for the map created during the job. Shapefile boundaries may be renamed on a PC or laptop computer and re-imported to the Envizio Pro for future operations.

### Recording a New Field Boundary



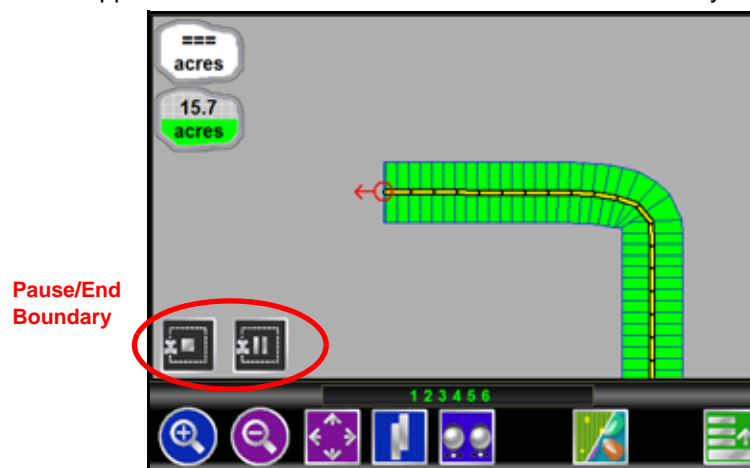
Touch Record Field Boundary to begin recording a new field boundary. While a field boundary is being recorded, the Pause and End Field Boundary icons (see the following icon descriptions) are displayed on the Guidance screen.





## Pause, Resume and End Boundaries

The following icons will appear on the Guidance screen while a field boundary is being recorded.



Touch Pause Boundary to pause recording of the field boundary. Use this feature when the vehicle's path will not reflect the boundary such as when re-filling tanks, etc. To resume recording, touch the Resume icon.



While paused, Resume Boundary replaces Pause and End Boundary on the Guidance screen. Touch this Resume Boundary to resume recording of the current boundary.



To finish recording a boundary, touch End Field Boundary. Note that the field computer draws a straight line from the boundary starting point to the vehicle's current location when closing a boundary.

## Boundary Tools

Once a field boundary has been completed, the following tools will be available through the Menu on the Guidance screen.



Touch Boundary Tools to display additional boundary tools available for the current job.



Touch Delete Boundary to reset the current field boundary. A field boundary must be present in the current job or this icon will not appear in the Menu.

## AccuRow™ Tools

Additional tools and features may be available in the Menu if the AccuRow feature is enabled for the current job. Refer to Chapter 10, *Using AccuRow™*, for more information using the AccuRow feature.

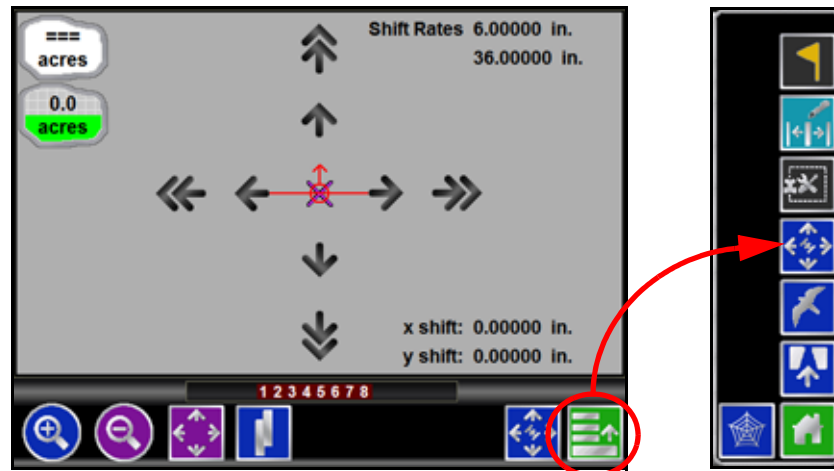
## Drift Shift

**Note:** The drift shift feature must be enabled prior to starting a job to allow the following features to be available during the field operation. Refer to Drift Shift section on page 149 for assistance with the drift shift settings.

### Manual Coverage Adjustment

To manually adjust the reported position of all job features:

1. Touch Menu in the lower, right corner of the guidance display.
2. Select Drift Shift.



3. Use the fine and coarse nudge arrows on the screen to adjust the field features displayed to the actual vehicle location. As the job features are adjusted, the cumulative nudge applied in each direction is displayed in the lower, right corner of the display.
4. Touch Menu and select Accept to accept the applied drift shift values and return to the Field Review mode or Cancel to return to the Field Review mode without applying the shift values.

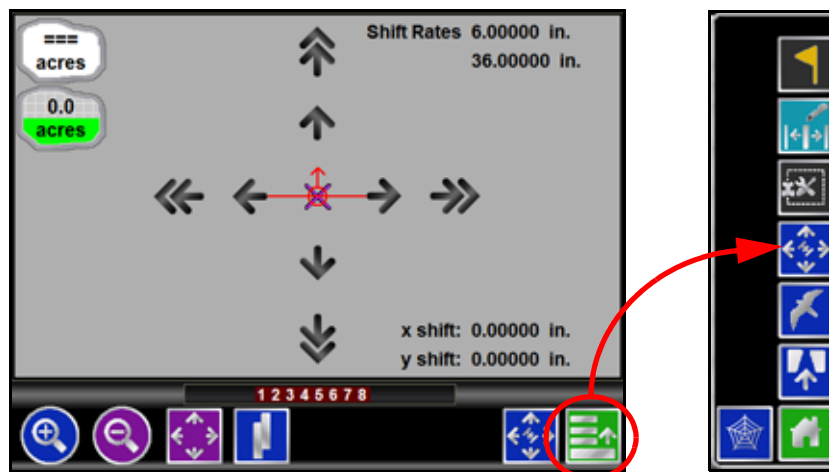
### Reference Point

**Note:** When the drift shift feature is enabled, the field computer will automatically place a reference point at the start of each job. The reference point will allow the machine operator to quickly shift field features by shifting all field features based upon the current vehicle position and the reference point set or configured by the machine operator.

Reference Point Settings:

1. Touch Menu in the lower, right corner of the guidance display.

## 2. Select Drift Shift.



Touch Drift Shift in the lower, right corner of the display to access the Drift Shift Settings screen. Use the following features to set the reference point or shift the coverage features:

**Set Drift Correction Now.** With the vehicle positioned at the actual reference point, touch the “Set Now” button to shift the reference point and all field features to the current vehicle position.

**Set Reference Point Here.** Touch Set Here to reset the reference point to the current vehicle location. The previous reference position will be lost.

## *Prescription Maps and Variable Rates*

With the optional variable rate application (VRA) feature enabled, the Envizio Pro is capable of using a prescription map to automatically change the target seed population or application rate.

Envizio Pro field computer uses the shapefile format for prescription maps used to provide variable rate product control. If the variable rate feature is activated, a prescription map, created using GIS (Geographic Information Systems) software capable of creating shapefiles, may be transferred to the field computer. These shapefiles must be in a polygon shape format that complies with the ESRI (Environmental Systems Research Institute) shapefile specifications and must also be in the WGS (World Geodetic System) 84 datum.

The .shp, .shx, and .dbf files required to create a shapefile prescription map must be saved to the rxMaps folder on a USB flash drive to allow the field computer to locate and transfer the required files to internal memory. Refer to the Chapter 9, *Software Updates and File Maintenance*, for additional assistance with performing file maintenance or creating the required folder structure on a USB flash drive for use with the Envizio Pro.

Shapefiles for prescription maps must be saved to the rxMaps folder in the folder structure on the USB flash drive used with the Envizio Pro to allow the field computer to locate and save the required .shp, .shx, and .dbf files to internal memory. Each of these files should be saved to the rxMaps folder on the USB drive used to upload files to the field computer. Refer to the *File Structure* section on page 169 for more information.

To ensure peak performance of the field computer during variable rate applications, create maps with a minimum number of zones. Maps with too many zones may yield undesired results or limit performance of the field computer. To help limit the number of zones within a map, use the control section width as a guide. The smallest zones on the map should be no smaller than the width of the control section. For example, if the

control sections on the implement are 12 feet [3.7 m] wide, zones within the prescription map should not be less than 12 feet [3.7 m] square.

### Loading Prescription Maps

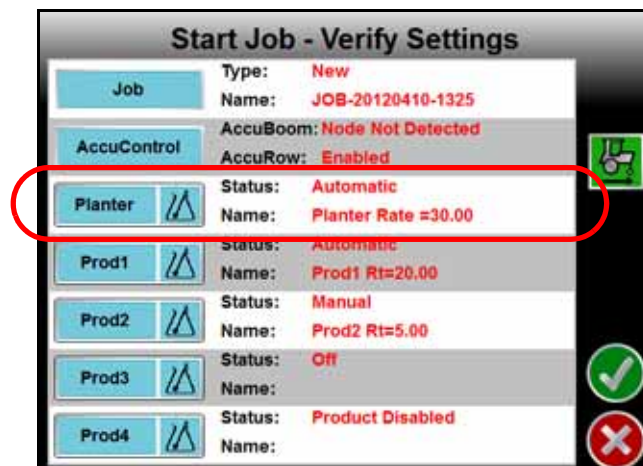
Prescription maps are loaded onto the field computer using the File Maintenance features described in the *File Maintenance* section on page 154.

Prescription maps must have one .shp, .shx, and .dbf file for each map. If any of these files are missing from the rxMaps folder, the field computer will not be able to load the prescription map.

**Note:** Names of prescription map files loaded on the field computer cannot begin with a space.

### Applying Prescription Maps

A prescription map may be applied to the planter system or any enabled product during the Start Job process. With the variable rate feature enabled, the Start Job - Verify Settings screen displays the name of the prescription map with the planter settings on the Start Job - Verify Settings screen.



### To Apply a Prescription Map

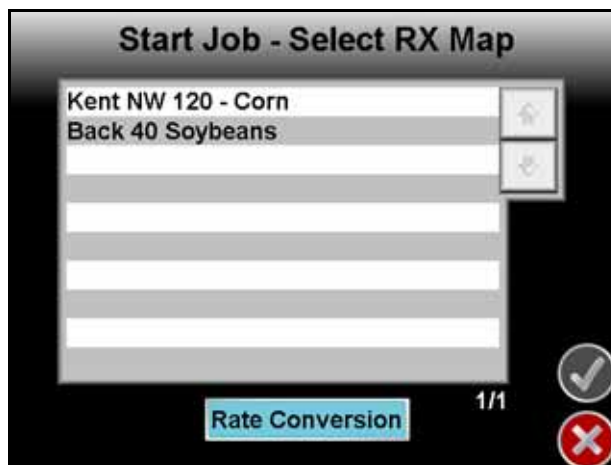
1. Touch the Rx symbol in the Planter or Product button.




For example, touch the Rx symbol in the Planter button to apply a prescription map to the seed product controlled by the OmniRow system.

**Note:** To remove a prescription map, touch the 'Planter' area of the button to display the Planter Control setup screen. Touch the Rate button and enter a value for a straight seed rate for planter operation.

- A list of available prescription maps is displayed on the Start Job - Select Rx Map screen.



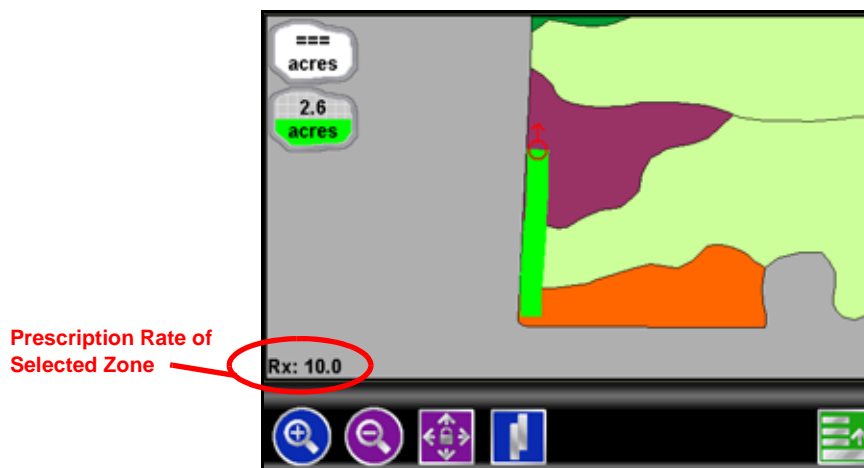
Select the name of the prescription map to apply during the planter operation and then touch Accept  to apply the prescription map.

**Note:** To modify the rates within the selected prescription map, select the Rate Conversion button. Use the on-screen keypad to enter the multiplier of the prescription map for the current job.

- Verify other job settings before beginning the job. Refer to the *Starting a Job* section on page 55 for more information.

## Using Prescription Maps

The field computer will display the prescription map used during product application on the guidance screens.



To display the prescription rate for any zone displayed in the prescription map while in the field review mode, touch the desired zone on the screen. The display will center the location touched on the screen and display the prescription rate in the lower, left corner.

## Variety Maps

With the multi-hybrid feature enabled, the Envizio Pro is capable of automatically switching seed varieties or hybrids based upon a variety map.

**Note:** *Variety control is based upon the planter implement. The Envizio Pro will not automatically control individual sections or rows based upon zones in the variety map. The Envizio Pro will not shut off individual sections or rows if the vehicle moves outside of the variety map. A zone map or prescription map will be required to automatically control an implement section or row, or to shut off seeding if the implement moves outside of the field area.*

Envizio Pro field computer uses the shapefile format for variety maps. If the multi-hybrid feature is enabled, a prescription map, created using GIS (Geographic Information Systems) software capable of creating shapefiles, may be transferred to the field computer. These shapefiles must be in a polygon shape format that complies with the ESRI (Environmental Systems Research Institute) shapefile specifications and must also be in the WGS (World Geodetic System) 84 datum.

The .shp, .shx, and .dbf files required to create a shapefile variety map must be saved to the rxMaps folder on a USB flash drive to allow the field computer to locate and transfer the required files to internal memory. Refer to the Chapter 9, *Software Updates and File Maintenance*, for additional assistance with performing file maintenance or creating the required folder structure on a USB flash drive for use with the Envizio Pro.

To ensure peak performance of the field computer during multi-hybrid planting operations, create maps with a minimum number of zones. Maps with too many zones may yield undesired results or limit performance of the field computer. To help limit the number of zones within a map, use the implement, or Guidance, width as a guide. The smallest variety zones on the map should be no smaller than the width of the implement. For example, if the implement is 30 feet [9 m] wide, zones within the variety map should not be less than 30 feet [9 m] square.

## Loading Variety Maps

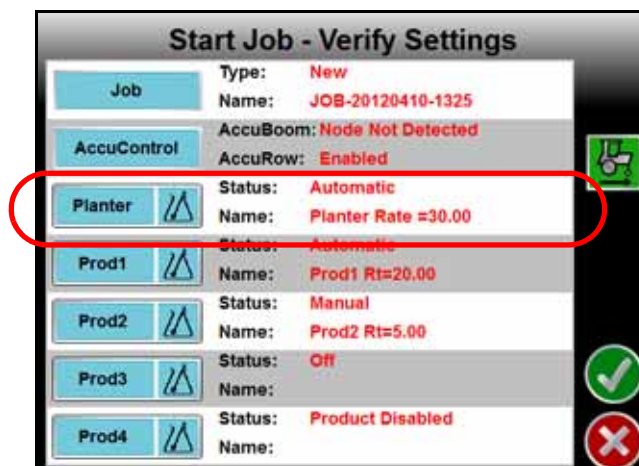
Variety maps are loaded onto the field computer using the File Maintenance features described in the *File Maintenance* section on page 154.

Variety maps must have one .shp, .shx, and .dbf file for each map. If any of these files are missing from the rxMaps folder, the field computer will not be able to load the map.

**Note:** *Names of variety map files loaded on the field computer cannot begin with a space.*

## Applying Variety Maps

With the multi-hybrid feature enabled, the Start Job - Verify Settings screen displays the name of the prescription map with the planter settings on the Start Job - Verify Settings screen.

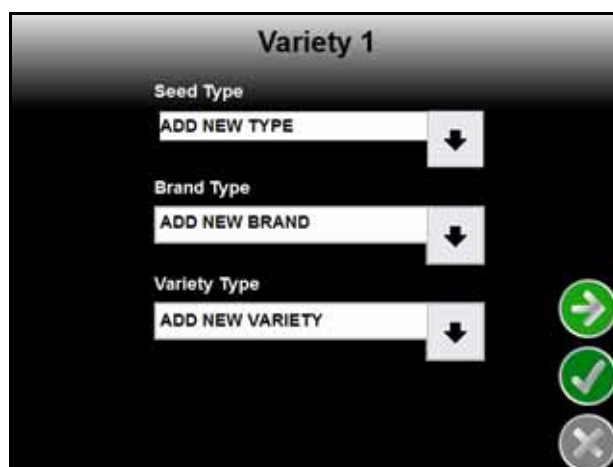


### To Apply a Variety Map

1. Touch the Planter button.



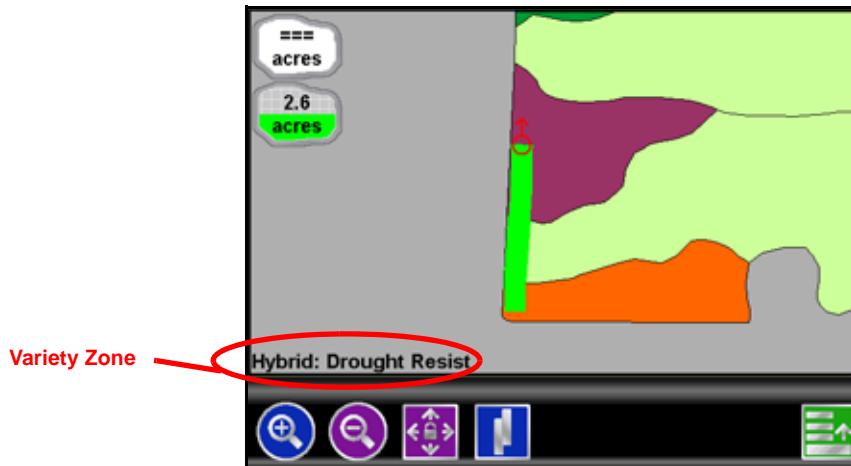
2. On the Planter Settings screen, touch Multi-Hybrid Setup and then Select Hybrid Map.
3. On the Reference Maps screen, select the desired map which contains the variety information for the field operation.
4. Touch the Primary and Secondary buttons and assign the varieties being applied during the field operation.



5. Use the drop down fields to select configured seed variety information previously entered, or select the "Add New..." option to enter information for types.
6. Verify other job settings before beginning the job. Refer to the *Starting a Job* section on page 55 for more information.

## Using Variety Maps

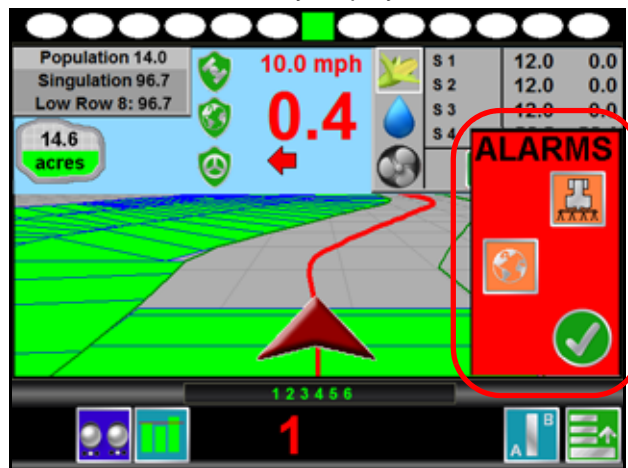
The field computer will display the variety map used during product application on the guidance screens.



**Note:** To display the variety information for any zone displayed in the map while in the field review mode, touch the desired zone on the screen. The display will center the location touched on the screen and display the variety information in the lower, left corner.

## System Alarms

Important warning and alert information is immediately displayed on the screen in the Alarms area.



The Alarms area displays icons representing the portion of the system which requires the operator's attention. In addition to visual alarms, the operator may wish to enable the audible alarms feature of the Envizio Pro and field computers.



## Alarms Area

Depending upon the alert or warning condition, the field computer may display one or more of the following icons:



**Planter/Product Control**



**Show All**

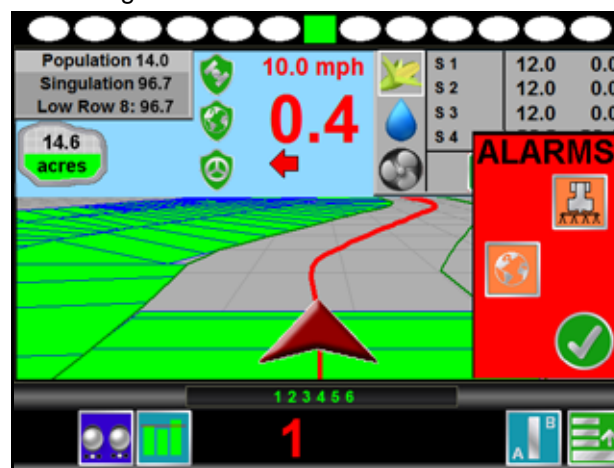
Touch any of the displayed icons to display information regarding the corresponding alarm.

- The Planter/Product Control Alarm icon is displayed if an alarm condition such as a low bin or tank, or when product control cannot reach the target rate.
- Touch the Show All Alarms icon to view all current alarm conditions.

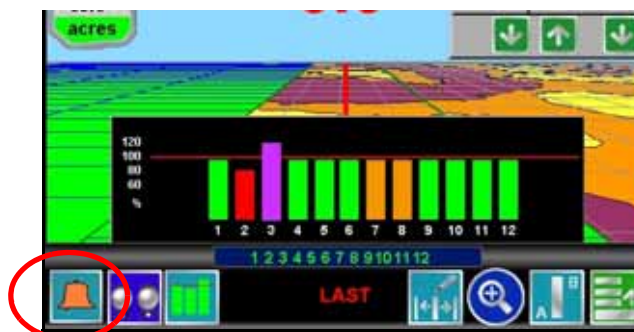
## Hiding the Alarms Area

Once the operator has reviewed any alert information, the Alarms area can be hidden to resume operation.

1. To hide the Alarms area, touch the green check mark icon.



2. If the alarm condition still exists, an Alarm icon will be displayed on the screen until the alarm condition has been cleared.



Touch this icon to re-display the Alarms area.

3. For help clearing alarm conditions, refer to Chapter 11, *Troubleshooting*, for product control troubleshooting information.

### Pop-up Alarms

**Note:** *The following alarm conditions indicate a significant issue with the OmniRow control system and, in most cases, will require immediate corrective action.*

If pop-up alarms are enabled, the following alarm conditions will display an alarm prompt on the field computer:

- Row Failure - Row seed tube is plugged. Clear any obstructions in the indicated seed tubes to return to normal operation.
- Row Sensor Failure - Seed sensor is not responding properly. Check sensor connection and operation.
- Row Shut Off Failure - A row or section is not responding to control commands from the field computer.

**Note:** *Confirming the alarm conditions listed above will return to the field computer guidance screen. The alarm condition will not be displayed again for any rows experiencing an alarm condition until the row returns to normal operation. Once normal operation is resumed, alarm conditions for that row will be displayed as conditions occur.*

- Encoder Failure Alarm - Row encoder has failed. Confirm the alarm condition to switch to the seed tube sensor for rate feedback.
- High Current Power Disconnect - High current power has been removed or disconnected from the planter control node.
- Zero Speed Shutoff - When this alarm is displayed, the OmniRow system will shut off all hydraulic row or section motors for safety purposes. This prevents the motors from turning unexpectedly while the vehicle is stopped or if someone is working on the implement.

To restart the system, touch the resume button. A speed of 0.7 MPH [1.1 km/h] must be maintained for more than 10 seconds or the Zero Speed feature will reactivate.

**Note:** *If the zero speed shutoff alarm is encountered while the vehicle is moving, the field computer will sound a continuous audible alarm.*

### Audible Alarms

Audible alarms are enabled by default. To disable the notification tone or change available alarm settings, see the *Alarm Settings* section on page 133 to setup the Audible Alarms.

#### Row Off Rate

The field computer will sound an audible alarm if a row is not reaching the current target seed rate. The audible alarm will not occur if any of the pop-up alarm conditions have already been confirmed for that row.

#### Hybrid Change Alert

The Envizio Pro will provide an audible alert when switching hybrids or varieties during field operations to alert the operator to the planter change.

Prior to starting a planting operation with the OmniRow system, it is recommended to check functionality of the implement, planter section or row control hardware and the overall system. To do this, the operator should prime the seed disks and turn on each section or row independently to check that the AccuRow feature will control the appropriate sections or rows based on previously planted or field boundary areas.

To simplify this process, the OmniRow system toggle sections on and off, the OmniRow Remote Section Control comes standard with the planter section control and individual row control systems and is available as an optional feature for AccuRow and monitoring systems. The remote can be used outside the cab and behind the implement which allows the operator to watch each planter section or row during the test process.

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## *OmniRow Remote Overview*

**Note:** *The remote requires a direct line of sight with the planter control node for operation. Review the Remote Section Control Operator's Guide for an overview of the remote and basic operation. The following sections offer detailed information on using the Remote Section Control with the OmniRow planter control system.*

Remote Section Control may be used either with the planter raised up or lowered to the ground and regardless of the field computer control mode or job status. The OmniRow system will automatically return to the previous control state if one of the following conditions is observed:

- after 30 seconds of inactivity on the remote
- if the vehicle speed accelerates above 2 mph [3.2 km/h]
- if the implement switch changes state (raised or lowered)
- the OFF key is pressed

**Note:** *The vehicle speed must remain below 2 mph [3.2 km/h] or the remote will not activate. Press 0, 0 and ON to override the inactivity time-out feature until one of the other conditions is observed.*

*It is recommended to leave any product switches in the off position to allow the remote to shut off any active sections when the OFF key is pressed.*

If the OmniRow planter control node is visible, the diagnostic LED's on the node may be used to verify that the remote is communicating with the OmniRow system. Both the DIAG 1 and DIAG 2 LED's should be on solid when the Remote Section Control is active. The DIAG 1 light will flash for 1 second after each key press and DIAG 2 will blink once after each key press.

## Seed Disk Priming

The following commands may be entered on the Remote Section Control to turn seed disks a set number of revolutions for priming purposes.

**Note:** *It is recommended to leave any product switches in the off position to allow the remote to shut off any active sections when the OFF key is pressed.*

*The < and > keys do not have any function when entering the following priming commands.*

### All Sections or Rows

#### To turn all seed disks one full revolution:

Press 0, 9, 9 and ON.

#### To turn all seed disks five full revolutions:

Press 0, 9, 9, 5 and ON.

### Individual Sections or Rows

#### To turn a section or row seed disk one full revolution:

Press 0, # and ON where '#' is the desired section number.

#### **For Example:**

Press 0, 1 and ON to turn the section or row 1 seed disk one full revolution. Press 0, 1, 2 and ON to turn the section or row 12 seed disk one full revolution.

Repeat the above command entry to activate other sections or rows as necessary.

#### To turn a section or row seed disk up to nine revolutions:

Press 0, 0, 1, # and ON where '#' is the desired number of revolutions (from 1-9) to turn the section or row 1 seed disk.

**Note:** *Press 0, 1, 2, # and ON to turn the section or row 12 seed disk the set number of revolutions.*

## Seed Disk Testing

The following commands may be entered on the Remote Section Control to begin turning seed disks at a specified RPM for pre-planting checks, testing and troubleshooting.

**Note:** *By default, the following commands will activate sections or rows for 30 seconds before returning the OmniRow system to the previous control state. It is recommended to leave any product switches in the off position to allow the remote to shut off any active sections when the OFF key is pressed.*

*Press 0 and ON to toggle the < and > keys between RPM control and section or row advance.*

### All Sections or Rows

#### To turn all seed disks on at 5 RPM:

Press 9, 9 and ON. All section or row seed disks will begin turning at a rate of 5 RPM. Press > to increase rate by 5 RPM or < to decrease rate by 5 RPM.

### Individual Sections or Rows

#### To turn a section or row seed disk on at 5 RPM:

Press # and ON where '#' is the desired section number. The section or row seed disk will begin turning at a rate of 5 RPM.

#### For Example:

Press 1 and ON to turn the section or row 1 seed disk on. Press 1, 2 and ON to turn the section or row 12 seed disk on.

**Note:** *Turning a section or row on with the above procedure will override any other active sections or rows off.*

Press the > key to increase the rate by 5 RPM or < to decrease rate by 5 RPM. Repeat the above command entry to activate other sections or rows as necessary.

### Cycle Rows

#### To cycle through sections or rows:

Press ON and > to turn on the first section or row starting at the left end of the implement. The section or row will begin turning at 5 RPM.

Press the > to cycle to the next section or row from left to right. Press < to cycle to the next section or row from right to left.

**Note:** *Pressing the < key with the left-most section active will shut off all rows. Pressing the > key with the right-most section active will also shut off all rows.*



# CHAPTER 7

## OmniRow Auxiliary Control Node

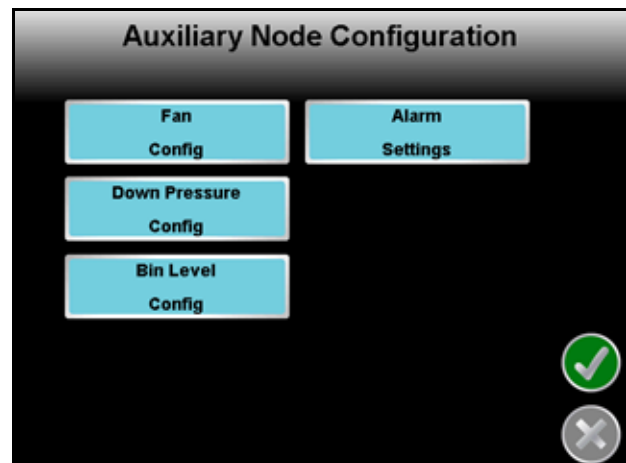
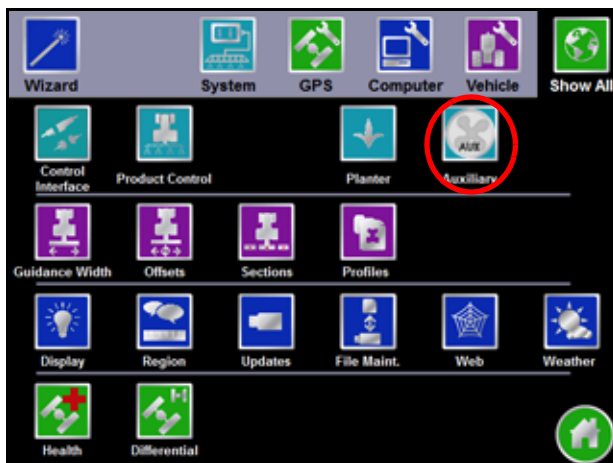
The monitoring capabilities of the auxiliary planter control node are available as soon as the node is connected to the planter control CANbus. Refer to the *Updates* section on page 152 for more information on entering the auxiliary control node key (P/N 077-0180-071) to unlock the control capabilities and auxiliary node product rate control channels.

**Note:** Refer to the *Envizio Pro Installation and Operation Manual* for more information on obtaining and entering activation codes.

### Auxiliary Node Configuration

To access the Auxiliary Node Configuration screen to configure the node settings:

1. From the Home screen, touch the Tools Menu icon.
2. Select the Auxiliary icon from the System menu.

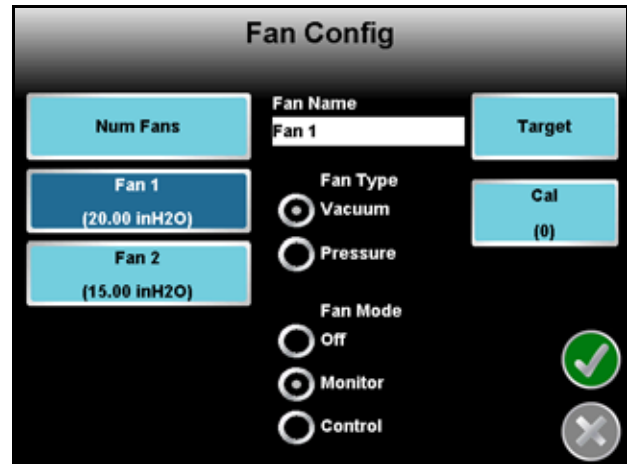


3. The Auxiliary Node Configuration screen will be displayed. Refer to the following sections for details on the bin level, down pressure, and fan speed monitoring or control capabilities of the Raven Auxiliary Planter Control Node.

## Fan or Vacuum Pressure Settings

The auxiliary node is capable of monitoring the pressure of a fan or vacuum system used for seed distribution on the implement. When monitoring fan or vacuum pressure, the system is capable of displaying alerts for the operator if the measured system pressure falls below a user defined percentage of the target system pressure.

If the control capabilities of the node are activated, the auxiliary node may be set to control the fan or vacuum pressure automatically to ensure both a stable pressure and to help ensure that the pressure system is more capable to meet seed delivery demands as necessary for the planting operation.



To configure monitoring or control features for a fan or vacuum system, select the Fan Config button on the Auxiliary Node Configuration screen.

### Number of Fans

Touch the “Num Fans” button and use the on-screen keypad to enter the number of fan or vacuum pressure sensors connected to the planter control system.

### Selected Fan

Touch the desired fan to display the settings and values for each fan currently programmed on the auxiliary control node.

### Fan Name

To rename a fan or vacuum pressure sensor:

1. Touch the desired fan button below the “Num Fans” button on the left side of the screen.
2. Select the Sensor Name field.
3. Use the on-screen keyboard to enter the desired name or description for the sensor.

### Fan Type

Select the vacuum or pressure option as appropriate for the seed delivery system.

### Fan Mode

Select the mode for fan operation. Select:

- “Off” to disable fan or vacuum monitoring and control features.
- “Monitor” to allow the system to monitor the pressure.
- “Control,” if available, to automatically control the pressure system to the user defined target pressure.

**Note:** *The Control option is not available if the auxiliary control node key (P/N 077-0180-071) has not been activated. Refer to the Envizio Pro Installation and Operation Manual for more information on obtaining and entering activation codes.*



## Target

Touch the “Target” button and use the on-screen keypad to enter the target pressure in inches of water [kPa] for the selected sensor.

## Fan Calibration

**Pressure Calibration.** Enter the sensor calibration value necessary to “zero” the vacuum or pressure sensor. With the fan or vacuum system turned off, enter a value of zero to set the sensor for ambient conditions.

**Valve Calibration.** Enter the PWM valve calibration value for the fan or vacuum system. Refer to *Valve Cal* section on page 128 for additional assistance with the recommended PWM values.

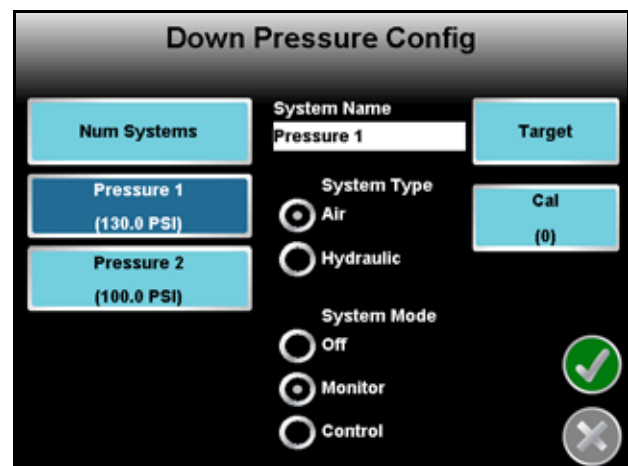
**Modify PWM Valve Settings.** Refer to *PWM Calibration Screen* section on page 130 for additional information on PWM valve settings.

**Rate Bump.** Enter a value by which the target pressure may be adjusted using the rate bump buttons during a field operation.

## Down Pressure Settings

The auxiliary node is capable of utilizing a pressure transducer to monitor the pneumatic or hydraulic down pressure on the implement to assist with planting operations. While monitoring the down pressure system, the auxiliary node is capable of displaying alerts for the operator if the measured down pressure exceeds or falls below a user defined percentage of the target down pressure.

If the control capabilities of the node are activated, the auxiliary node is capable of using a pneumatic or hydraulic control valve to ensure a steady down pressure over the implement during the planting operation.



To configure down pressure monitoring or control features for the OmniRow system, select the Down Pressure Config button on the Auxiliary Node Configuration screen.

## Number of Systems

Touch the “Num Systems” button and use the on-screen keypad to enter the number of down pressure systems on the implement and monitored via the auxiliary planter control node.

## Selected System

Touch the desired system button to display the settings and values for each down pressure system currently programmed on the auxiliary control node.

### System Name

To rename a down pressure sensor:

1. Touch the desired pressure button below the “Num Systems” button on the left side of the screen.
2. Select the System Name field.
3. Use the on-screen keyboard to enter the desired name or description for the sensor.

### System Type

Select the air (pneumatic) or hydraulic option as appropriate for the implement down pressure system.

### System Mode

Select the mode for down pressure operation. Select:

- “Off” to disable down pressure monitoring and control features.
- “Monitor” to allow the system to monitor the current implement down pressure.
- “Control,” if available, to automatically control the pressure system to the user defined target pressure.

**Note:** *The Control option is not available if the auxiliary control node key (P/N 077-0180-071) has not been activated. Refer to the Envizio Pro Installation and Operation Manual for more information on obtaining and entering activation codes.*

### Target

Touch the “Target” button and use the on-screen keypad to enter the target pressure in PSI [kPa] for the selected sensor.

### Down Pressure System Calibration

**Pressure Calibration.** Enter the sensor calibration value necessary to calibrate the down pressure transducer. To set the down pressure:

- Use a gauge installed on the down pressure system to read the system pressure. Enter the current pressure value.
- With the down pressure system turned off, set the hydraulic remote to a “float” condition, and enter a value of zero to set the system to zero pressure.

**Valve Calibration.** Enter the PWM valve calibration value for the down pressure system. Refer to *Valve Cal* section on page 128 for additional assistance with the recommended PWM values.

**Modify PWM Valve Settings.** Refer to *PWM Calibration Screen* section on page 130 for additional information on PWM valve settings.

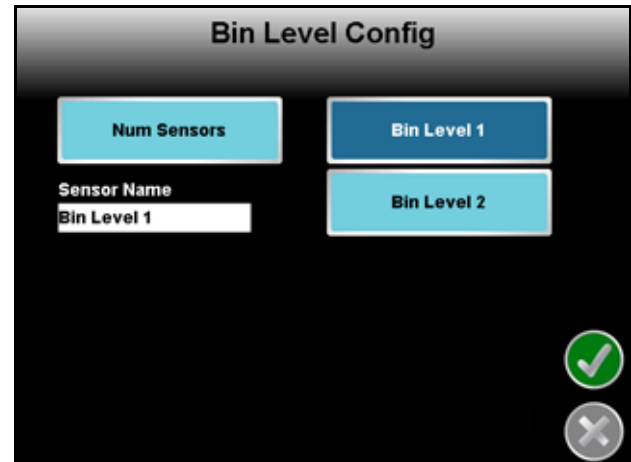
**Rate Bump.** Enter a value by which the target pressure may be adjusted using the rate bump buttons during a field operation.

## Bin Level Monitoring

Proximity sensors may be installed in implement bins to monitor the level of seed remaining in a central fill bin or selected row units. When the level of seed remaining in the bin falls below the sensor, the field computer will display a low bin alert for the operator.

To configure the bin level sensors for the OmniRow system, select the Bin Level Config button on the Auxiliary Node Configuration screen.

**Number of Sensors.** Touch the “Num Sensors” button and use the on-screen keypad to enter the number of bin level sensors connected to the planter control system.



**Note:** *The proximity bin level sensors used with the OmniRow auxiliary planter control node do not require further calibration.*

**Sensor Name.** To rename a sensor:

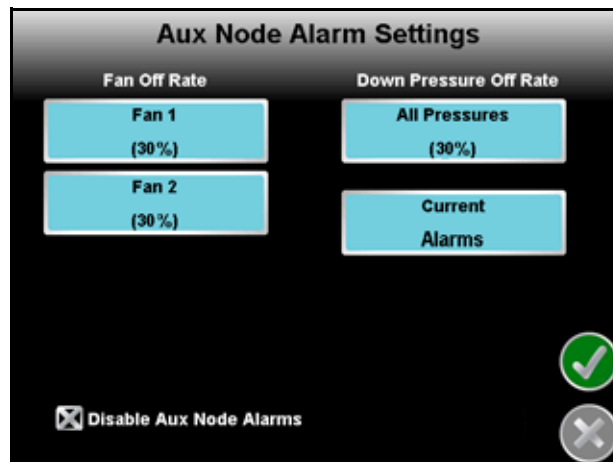
1. Touch the desired bin level sensor button on the right side of the screen.
2. Select the Sensor Name field.
3. Use the on-screen keyboard to enter the desired name or description for the sensor.

**Sensor Selection.** Touch the bin level sensor button to the right side of the screen to select the sensor.

**Note:** *No additional settings are available for proximity bin level sensors.*

## Alarm Configuration

To configure the alarm conditions for the auxiliary planter control node, select the Alarm Settings button on the Auxiliary Node Configuration screen. The Aux Node Alarm Settings screen will be displayed.



### Fan or Vacuum Pressure Off Rate

Enter the percentage at which the fan or vacuum alarm will activate. The off rate alarm activates when the actual pressure differs from the target pressure by the programmed value for longer than five seconds.

## Down Pressure Off Rate

Enter the percentage at which the down pressure alarm will activate. The off rate alarm activates when the actual pressure differs from the target pressure by the programmed value for longer than five seconds.

## Current Alarms

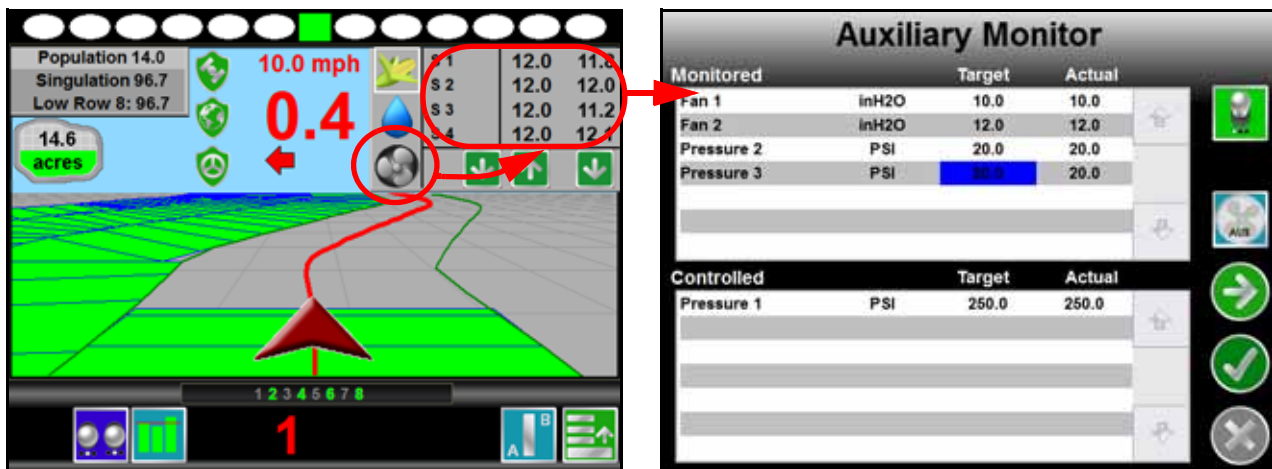
Touch the Current Alarms button to display a list of any current alarm conditions detected by the auxiliary planter control node.

## Disable Auxiliary Node Alarms

Touch this option to toggle all alarms based on systems connected with the auxiliary planter control node off. If this option is selected, the field computer will not display any pop up alerts or sound an audible alarm if an error condition is encountered.

## Auxiliary Node Operation

If the auxiliary planter control node is detected on the CANbus during an active job, the aux node icon will be displayed in the lower, left corner of the information display area.



Touch the Aux icon and then select the auxiliary information display to access the Auxiliary Monitor screen. The Auxiliary Monitor screen provides an overview of the current status for all sensors and systems either monitored or controlled by the auxiliary planter control node. Refer to the following sections for details on the information displayed on the Auxiliary Monitor screen.

## Monitored Area

The area at the top of the Auxiliary Monitor screen shows information on sensors and systems set to be monitored by the auxiliary planter control node. This area displays the defined name for the system or sensor, the units in which the system is measured and the target and actual pressures.

## Controlled Area

**Note:** *The Control area is not displayed if the auxiliary control node key (P/N 077-0180-071) has not been activated. Refer to the Envizio Pro Installation and Operation Manual for more information on obtaining and entering activation codes.*

The area at the bottom of the Auxiliary Monitor screen shows the status of sensors and systems set to be controlled by the OmniRow system via the auxiliary planter control node. This area displays the defined name for the sensor or system, the units in which the system is measured and the target and actual pressures.

## Aux Node Master Switch

Touch the switch icon in the upper, right corner of the Auxiliary Monitor screen to toggle monitoring and control features off. When the aux node master switch is toggled off, the field computer will not display any actual pressures for any system connected to the system via the auxiliary node.

## Auxiliary Node Configuration

While in an active job, the Auxiliary Node Configuration screen is accessible from the guidance screens by selecting the Aux Node icon in the lower, left corner of guidance screen and then selecting the Aux Node icon along the right side of the Auxiliary Monitor screen.

Review the *Auxiliary Node Configuration* section on page 107 for details on configuring the auxiliary control node.

## Auxiliary Node Diagnostic Information

Select the Next icon on the Auxiliary Monitor screen to view diagnostic information for systems set for control by the auxiliary planter control node.

Auxiliary Control Diagnostics				
Name	Rate	PWM Output	Control Status	
Pressure 1	250.0	0.0	Idle	Off

**Note:** *Control diagnostics will not be available if the auxiliary control node key (P/N 077-0180-071) has not been activated. Refer to the Envizio Pro Installation and Operation Manual for more information on obtaining and entering activation codes.*

The diagnostics screen displays additional information that may be used during operation or system verification. The diagnostics screen displays the defined name for the sensor or system, the current actual rate, the current PWM output and the current control status.



## *Accessing and Navigating the Tools Menu*

After the initial setup wizards are complete, all settings and configurations are accessible by selecting the Tools icon on the Home screen.

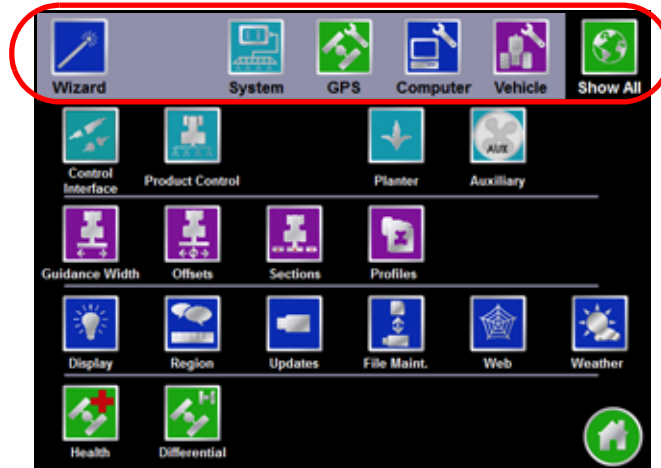


The Tools menu contains the following submenus:

- Wizard
- System
- GPS
- Computer
- Vehicle

**Note:** *Verify that the field computer is setup correctly for the job, vehicle, and application prior to starting an actual job application. See the Planter Control section on page 122 to enter a test speed and check settings while the vehicle remains stationary.*

The Quick Access Bar appears along the top of the Main Tools menu screen.



Touch any of the icons to display a detailed view of the selected submenu.

### Wizard Menu



The Setup Wizard Menu is available in the Tools menu. Review the *Setup Wizards* section on page 18 for more details on using the setup wizards.

### System Menu



Access the System menu to setup the planter and product control system and control features.

### GPS Menu



Use the GPS menu to adjust the internal GPS receiver or to enable the field computer to receive DGPS from an external receiver. The GPS menu also contains screens to review the status of GPS reception, set message outputs (for the internal DGPS receiver only), or select the PRN.

### Computer Menu



The Computer menu sets display and feature settings of the field computer. Access the Computer menu to change the display brightness, language, and units, as well as activate features or update the Envizio Pro software.

If the light bar interface option is enabled, the Computer menu will also contain options for adjusting the brightness of the external light bar. See the *Serial Port Configuration* section on page 121, for more information on setting the light bar interface.



## Vehicle Menu



Access the Vehicle menu to setup or modify vehicle profiles for each machine or implement with which the field computer will be used. Profiles allow the operator to setup GPS antenna heights and offsets as well as the swath width and section setup for each implement once and quickly reload a vehicle's profile when transferring the Envizio Pro between vehicles.

## Show All



Select the Show All icon to show an overview of the Tools menu. The Show All screen is displayed each time the Tools menu is accessed.

## Navigation

The following icons will be used to navigate within the menu screens and to edit and save settings:



Touch the Home icon to return to the Home screen.



Touch the Accept icon to confirm any changes to a screen. Touching the Accept icon will save those settings and proceed to the next screen.



Touch the Cancel icon to exit the current screen without saving any changes made on a screen. If the Cancel icon is displayed in gray, the cancel feature is currently unavailable.



Like the Accept icon, the Next icon accepts changes and proceeds to the next screen in a setup procedure. Touch this icon where it appears to access more settings or to continue a setup procedure. The last screen in a setup procedure should display the Accept icon.



Touch the Previous icon to return to the last screen displayed during a setup procedure or wizard.



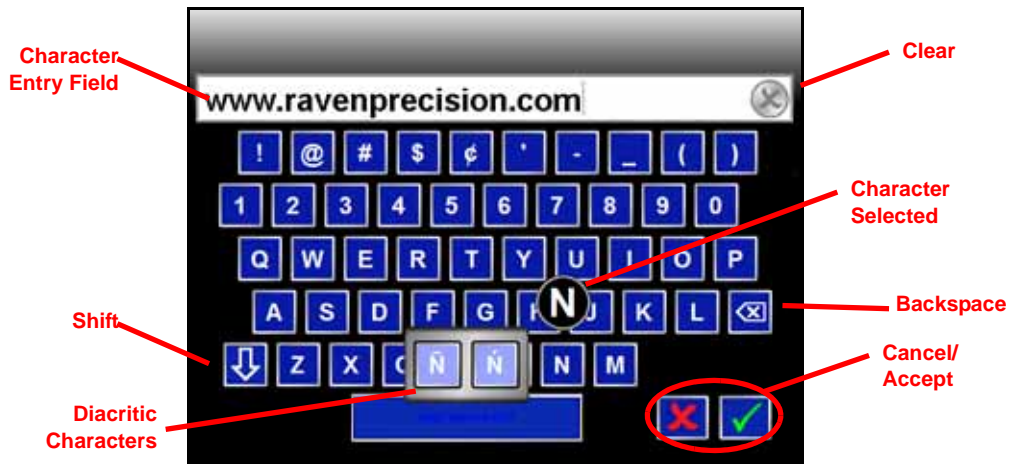
The Up icon, where it appears, increases displayed values in preset increments. Touch this icon to increase a value until the desired value is displayed.



The Down icon, where it appears, decreases displayed values in preset increments. Touch this icon to decrease a value until the desired value is displayed.

## On-Screen Keyboard

Data entry on the Envizio Pro is quick using the full, on-screen keyboard.



This keyboard is displayed when entering or modifying profile, product, or job names or while browsing the web with a wireless modem. The following features may be used with the keyboard:

### Character Entry


When the keyboard is touched, the character selected will be displayed above the key. If the character displayed is not the character intended for entry, continue touching the screen while dragging to the correct character to enter. The character will not be entered in the character entry field until the touch is released.


If the Envizio Pro is set to a language with diacritical signs (e.g. accent, grave, tilde, etc.), these special characters may be entered by:






1. Touch and hold the desired basic character for approximately 3 seconds.
2. Drag drag to the diacritic character in the popup displayed.
3. Release the touch to enter the selected character.

**Note:** *Diacritic symbols are only available if the language selected on the Envizio Pro contains these characters.*




### Shift/Caps Lock

The keyboard displays the character set that will be entered in the character field when any of the keys are selected. To shift the character set to lowercase, touch the  key.



**Note:** *The keyboard automatically capitalizes the first character entered into the character entry field. To cancel this feature, touch the  key before entering characters using the keyboard.*

Touch the  key to enter the next character using the uppercase character set. Double tapping the  or  keys will enable caps lock and display the  key. Touch the  key again to disable caps lock


## Symbols


When browsing the web using the field computer, the  key will be displayed on the keyboard. Touch the  key to display the symbols keyboard. Touch the  key to return to the alphabetic keyboard.

## Backspace and Clear

Touch the  key to delete the previously entered character or the  icon above the keyboard to clear all characters within the character entry field.

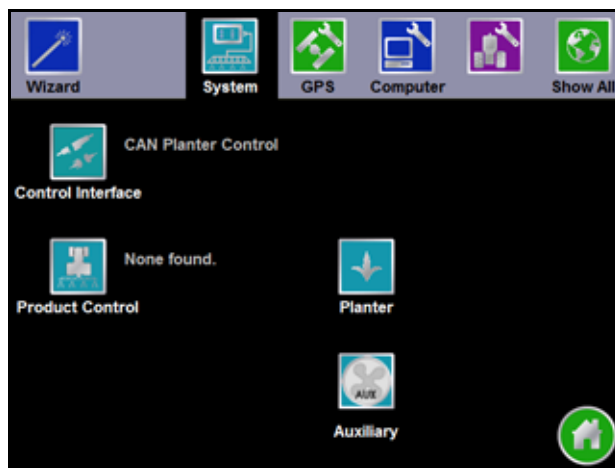
## Accept/Cancel

Touch the  key on the keyboard to accept the text or characters displayed in the character entry field. The displayed text or characters will be entered in the selected text field on the previous screen.

Touch the  key to return to the previous screen without entering the keyed text or characters.

## System Menu

The System menu contains the options for setting up how the Envizio Pro will interface with the planter control hardware. The System menu also contains setup screens for the optional auxiliary planter control node features (if connected). Touch the System icon in the quick Access Bar to display a detailed System menu screen.



**Note:** *The Product Control set up is only available with a CAN product control system and is not available when operating with an OmniRow planter control system.*

## Control Interface

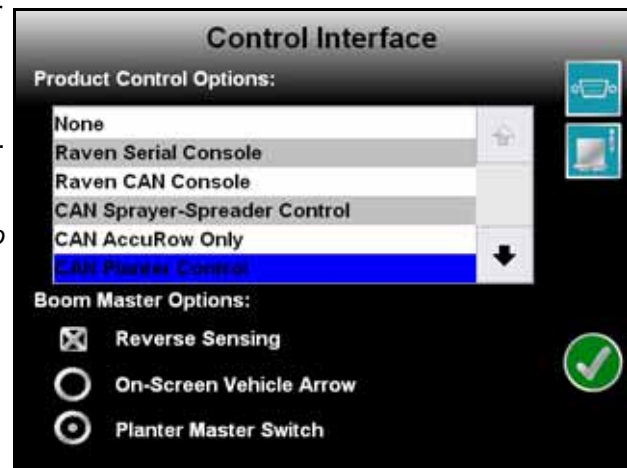
The multi-functional capabilities of the Envizio Pro means that the field computer is capable of interfacing with several product application or planter control systems. To function properly in any one of the possible systems, the field computer must be set up to receive application information from the correct source.

The following sections describe the options displayed on the Control Interface screen and will help with selecting the appropriate product control and available options for the system.

### Product Control Options

On the Control Interface screen, select the “CAN Planter Control” option from the list of available Product Control options. This setting is required for the field computer to properly interface with the OmniRow planter control nodes and control seed rate hardware on the implement.

**Note:** For more information on the available Product Control Options, see the *Envizio Pro Installation and Operation Manual*.



### Boom Master and System Options

The available system or boom master options allow the operator to select the preferred method to toggle recording of the coverage map. Depending upon the product control system and any detected CAN hardware, the following options may be available to configure the input of the master switch used with the field computer:

#### CAN Options

When ‘CAN AccuRow Only’ or ‘CAN Planter Control’ is selected, the boom master options displays the available options for CAN planter control.

**Reverse Sensing.** •The reverse sensing feature may be enabled or disabled from the Control Interface screen. Refer to the *Reverse Sensing* section on page 136 for details about using this feature or to enable or disable the feature from the GPS menu.

**On-Screen Vehicle Arrow.** This option allows the operator to touch the Vehicle Arrow (shown to the right) displayed on the Guidance screen to toggle the coverage history on or off.



**AccuRow Master Switch.** •If an optional AccuRow system has been installed with the field computer, select the AccuRow master switch option to create the coverage map based upon the section information reported by the AccuRow node.

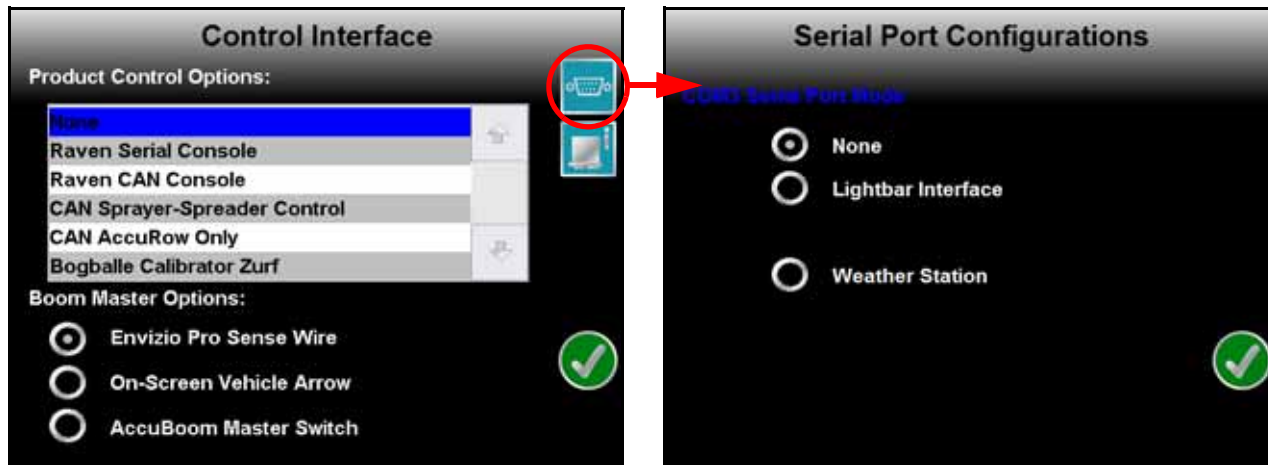
If the ‘OmniSeed’ option is selected, the following option may be enabled.

**Remote Master.** Select this option if a remote master switch or proximity switch is connected to the “Remote Switch” connector on the chassis cable.

## Serial Port Configuration

To control an external serial device with the field computer:

1. Select Control Interface from the System menu.
2. On the Control Interface screen, touch the Serial Port icon in the upper right corner.



The following screen and options are displayed.

**None.** Select this option if no serial device is connected to the field computer.

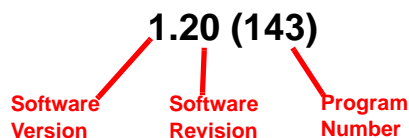
**Lightbar Interface.** Select this option to allow the field computer to control an external light bar connected to the connector labeled 'COM3/Light Bar' on the auxiliary interface cable (P/N 115-0171-745) or chassis interface cable (P/N 115-0172-001).

**Note:** Refer to the *Display* section on page 150 to adjust the brightness of the external light bar via the field computer interface.

**Weather Station.** Select this option to connect an optional WatchDog Sprayer Station to the Envizio Pro field computer. Depending upon the current system and connected controllers, the weather station may be connected to either 'COM2/Console' or 'COM3/Light Bar' ports on the interface or chassis cabling. Refer to Appendix D, *Weather Station*, for additional assistance with connecting and configuring the field computer and WatchDog Sprayer Station.

## CAN Diagnostics

The CAN Diagnostics screen displays the software version, software revision, and program number for each node detected on the CANbus.



Review the *CAN Diagnostics* section on page 8 for additional information on the CAN Diagnostics screen and readdressing or restarting CANbus nodes.

## Planter Control

The Planter Control menu displays the current settings and calibration values for the planter control system.



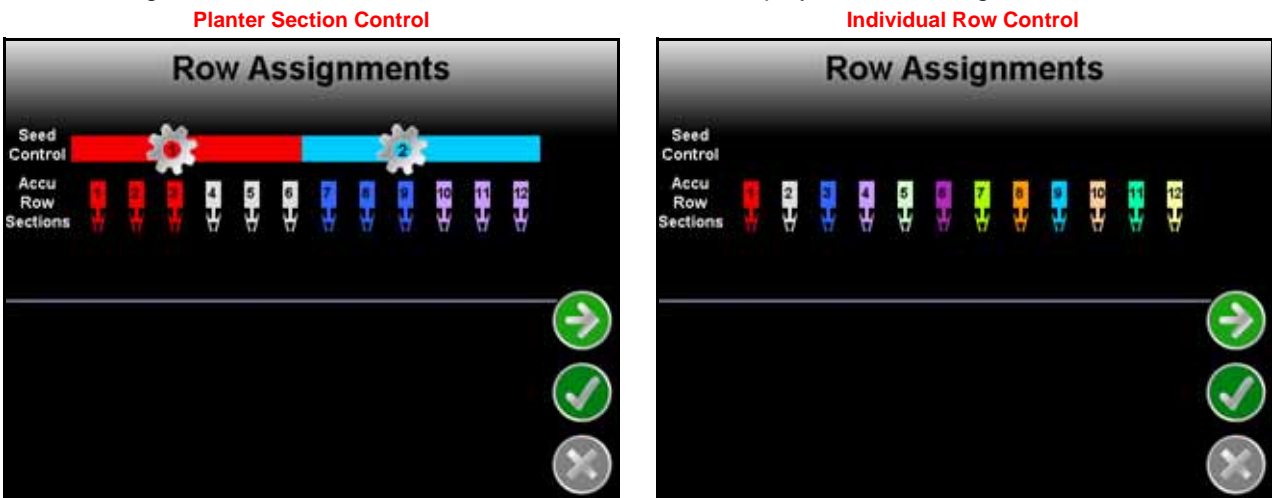
The Planter Control screen contains the settings which the field computer requires to provide planter control.

Access the planter control configuration to adjust the following settings for the planter control system:

- Row Assignment
- Speed - sensor type and cal
- Planter Settings
- AccuRow Settings
- Seeds/Area Settings
- Feature Settings
- Alarm Settings
- Prescription (Rx) Settings
- Hybrid Settings

## Row Assignments

From the Home screen, touch the Tools Menu icon and select the Planter icon from the System menu. Touch the Row Assignment button from the Planter Control screen to display the Row Assignments screen.

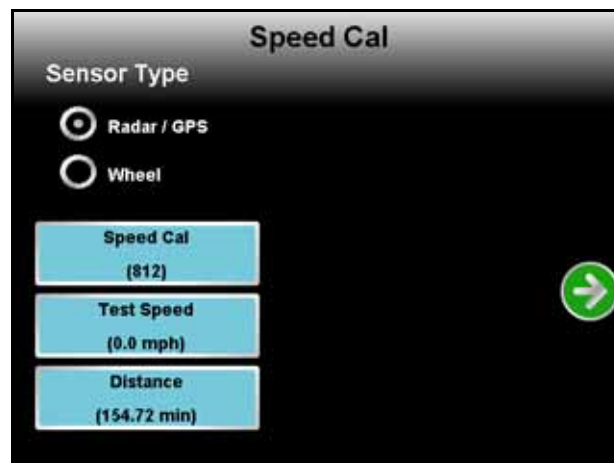


The row assignments screen displays an overview of the planter row and control section configuration. The Row Assignments screen displays the current row and planter control configuration based upon the selected Seed Control Selection.

**Note:** It is recommended to make changes to the OmniRow row assignments using the Planter Section Setup Wizard. Review the Planter Section Setup Wizard section on page 19 for assistance with completing the Row Assignment configuration.

## Speed Cal

The Speed button displays the current speed calibration value. Touch the Speed button to display the Speed Cal screen.



### Sensor Type

Select the type of speed sensor to be used with the Envizio Pro planter control system.



## Speed Cal


The current speed cal is displayed on the Speed Cal button. Touch the Speed Cal button and use the on-screen keypad to enter a speed cal value.

Raven Industries recommends the following speed calibration values for initial system setup.

Sensor Type Setting	Used with	Recommended Initial Speed Cal	
		English	Metric
Radar/GPS	External Raven GPS Receiver	785	199
	Internal DGPS Receiver	812	206
	GPS Speed over CANbus	1000	1000
	Raven Radar	598	152
Wheel	Wheel Magnets	1000	254
	Speedometer Drive Speed Sensor	612	155

These values are good starting points and generally yield adequate results, however, the speed cal should be refined for the specific vehicle and speed sense system. See Appendix A, *Calculating the Calibration Values*, for instructions on refining the speed cal value.

**Note:** *The GPS speed over CANbus feature is only available with specific Raven speed sense nodes. This feature utilizes NMEA speed over ground data transmitted over the CAN network which eliminates the need for a separate, external speed sensor.*

	<b>NOTICE</b>
<p>When using the GPS speed over CANbus feature, no tuning or adjustment is necessary or recommended to the speed cal value. Losing GPS signal for more than a second will also result in loss of the CAN speed signal which may affect product application in progress.</p>	

## Test Speed

The test speed may be used to simulate speed when testing or troubleshooting the planter control system. Enter a value approximately equal to normal application speeds to allow the field computer to control product application functions while the vehicle remains stationary. The test speed is useful for troubleshooting the CAN and product control systems.

**Note:** *A speed cal must be entered to allow the test speed feature to function.*

The test speed area displays the current test speed. Touch this area to enter a test speed.

**Note:** *The test speed will clear if the field computer receives a pulse from the actual speed sensor. To keep the test speed from disengaging, disconnect the speed sensor from the system.*

## Distance

The distance value can be used as an odometer of the distance traveled by a vehicle over a season, or the distance traveled during one application. Touch the Reset Value button to clear the distance value, or allow the field computer to keep a running tally of the total distance traveled.



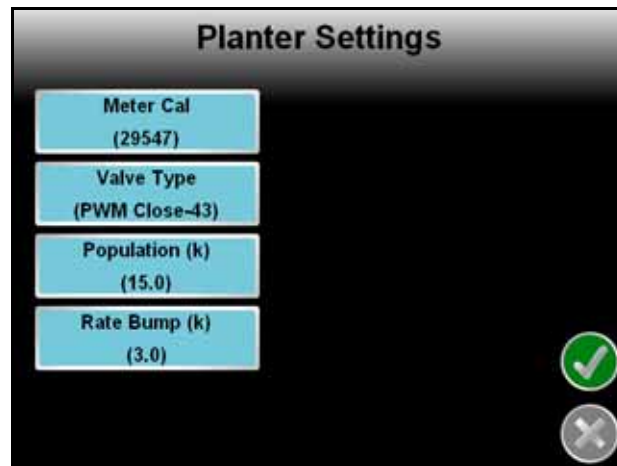
## Planter Settings

Access the Planter Settings screen to set up or modify the following settings:

- Meter Cal
- Valve Type and Valve Cal
- Target Population
- Rate Bump

To access the Planter Settings screen from the Home screen:

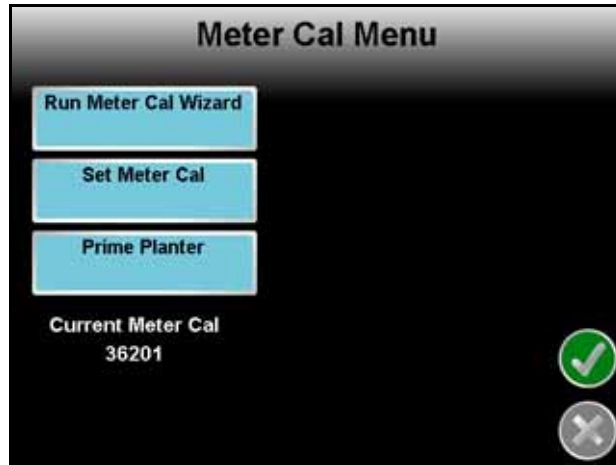
1. Select the Tools Menu icon and select the Planter icon from the System menu.
2. Touch the Planter Settings button. The Planter Settings screen will be displayed.



**Note:** The Meter Cal, Valve Cal, and Rate Bump buttons described in this section are not available when operating in the “AccuRow and Monitoring Only” mode.

## Meter Cal

The current meter cal value is displayed on the Meter Cal button. The meter cal must be adjusted if the crop type or variety is changed. To recalibrate or adjust the meter calibration, touch the Meter Cal button. The Meter Cal Menu screen will be displayed.



### Run Meter Cal Wizard

Touch the Run Meter Cal Wizard button to begin the Meter Cal Wizard for assistance calculating the meter cal value. If the meter cal value is already known, refer to the *Set Meter Cal* section on page 127.

**Cells per Disk.** Enter the number of cells each seed disk.

**Meter/Motor Ratio.** Set the ratio of meter revolutions per revolution of the motor.

The meter to motor ratio is calculated by counting teeth on the meter sprocket compared to the number of teeth on the motor sprocket. If there are additional sprocket sets between the meter and the motor shafts (OEM motor applications), determine each sprocket ratio at multiply the ratios to determine the total gear ratio.

**Note:** *If the implement encoder is on a separate shaft from the motor, use the encoder shaft to determine the ratio.*

While ratios should be verified for each implement, the following are typical ratio for implements:

Implement Manufacture	Ratio
Case IH	2.0
John Deere	1.47
Kinze	1
White	2.2

### For Example:

To calculate the meter to motor ratio when the meter and motor shafts are connect directly (no additional sprocket sets):

(number of teeth on the meter sprocket) / (number of teeth on motor hex shaft sprocket) = Meter to Motor Ratio

To calculate the meter to motor ratio with additional sprocket sets between the meter and motor shaft sprockets:

(meter sprocket / shaft sprocket) x (second shaft sprocket / motor sprocket) = Total Meter to Motor Ratio

**Pulses per Revolution.** Enter the number of pulses detected by the motor encoder for one revolution of the motor. The pulses per rev setting for the Raven OmniRow hydraulic motor clutch is 60.31.

For OEM or other aftermarket hydraulic motors, check the motor sensor body, or contact a dealer or OEM manufacturer for the pulses per revolution value.

This value may also be obtained through trial and error to achieve the appropriate seed disk revolutions when the prime planter icons are selected. Enter an initial value of 100 for the pulses per revolution value and use the Prime Planter screen to test the initial setting.

Increase the initial value if the seed disk does not complete the expected revolutions or decrease the initial value if the seed disk rotates beyond the expected revolutions.

**Note:** *The initial value can be increased or decreased in ratio to the actual rotation completed by the seed disk. For example, if the seed disk completes only a half revolution with the initial pulses per revolution value, double the initial value and recheck.*

*To ensure the proper pulses per revolution value is entered, test that the seed disks turn the expected number of revolutions when either the 1 and 5 revolutions icons are selected.*

**Current/Calculated Meter Cal Display.** The current meter cal value is displayed at the bottom of the Meter Cal Wizard screen. Once the required values are entered, the calculated value for the new meter cal value will also display at the bottom of the screen. Touch the Accept icon to accept the calculated meter cal value and return to the Meter Cal screen. To keep the current meter cal value, touch the Cancel icon.

## Set Meter Cal

The Meter Cal Wizard is not required if the meter cal value has already been calculated for the implement. Touch the Set Meter Cal button and use the on-screen keypad to enter the meter cal value without using the Meter Cal Wizard.

## Prime Planter

Use the planter priming buttons to populate the seed disks before starting a planting operation.

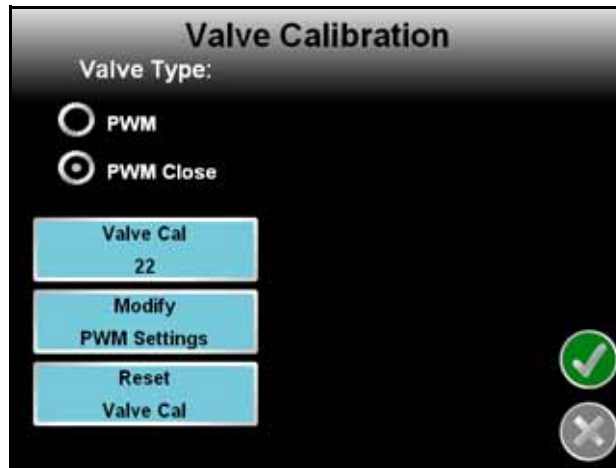
**Turn 1 Revolution.** Touch the “Turn 1 Revolution” icon to prime the seed disks before starting a planting operation. The disks will turn one full revolution to populate the cells in the seed disk.

**Turn 5 Revolutions.** Touch the “Turn 5 Revolutions” icon to empty the seed disks when switching seed varieties. The disks will turn 5 revolutions to ensure the previous seed variety is purged before starting a new seeding application.



## Valve Cal

Touch the Valve button to access the Valve Calibration screen.



### Valve Type

Select the type of control valve used to control the selected product during a job.

### Valve Cal

The valve cal value helps the field computer adjust the valve control response for slight differences between control valves and is required for product control. Raven Industries recommends the following calibration values for initial system setup.

Control Valve Type	Valve Cal
PWM (C-P) or PWM Close (C-PC)	43

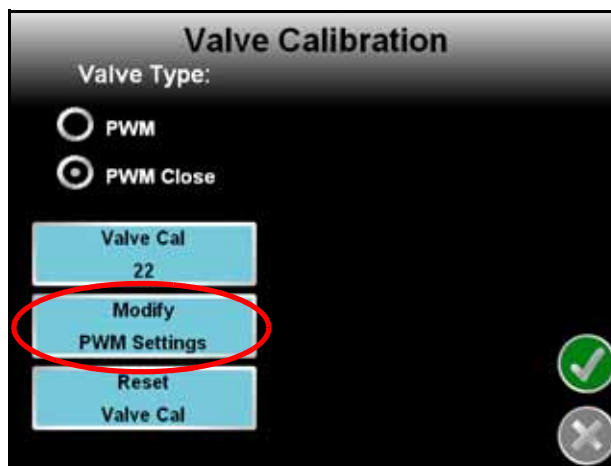
These values are good starting points and will generally yield adequate results, however, the valve cal should be refined for the individual control valves installed on the specific machine. See *Valve Cal* section on page 197 for information on the components of the valve cal setting or on tuning the valve cal value.

### Reset Valve Cal

Touch the Reset Valve Cal button to replace the current valve cal with the recommended value from the table shown above.

## Modify PWM Settings (PWM or PWM Close Valve)

If either 'PWM' or 'PWM Close' is selected as the valve type, a Modify PWM Settings button will display.



Select one of the following methods to configure the PWM control valve associated with the selected node or control channel.

**Manual Calibration.** The manual calibration mode allows the operator to manually enter the PWM minimum, maximum and preset values to known values using an on-screen keypad.

**Note:** *The PWM valve is not operated in the manual calibration mode. It is recommended to verify that any changes to these settings have the desired affect before controlling planting operations.*

*Refer to the PWM Calibration Screen section on page 130 for more information on the PWM values configured using the manual calibration mode.*


**Calibration Assistant.** The calibration assistant allows the operator to increase or decrease the PWM output using on-screen controls and set the PWM minimum, maximum, frequency and preset values based upon observed operation.

	<p><b>WARNING</b></p> <p>The PWM valve output will increase and decrease as the up and down arrows are selected. Keep any bystanders away from areas where product may be expelled and moving components when performing the calibration process.</p>
--	---

To use the calibration assistant mode, toggle the vehicle master switch and at least one section to the on position. To stop PWM output at any time during the calibration process, toggle the vehicle master switch to the off position.

**Note:** *Refer to the PWM Calibration Screen section on page 130 for more information on the PWM values configured using the calibration assistant.*

**Automatic Calibration.** The automatic calibration mode will allow the field computer to automatically adjust the PWM output and attempt to determine the minimum, maximum and preset values.



**WARNING**

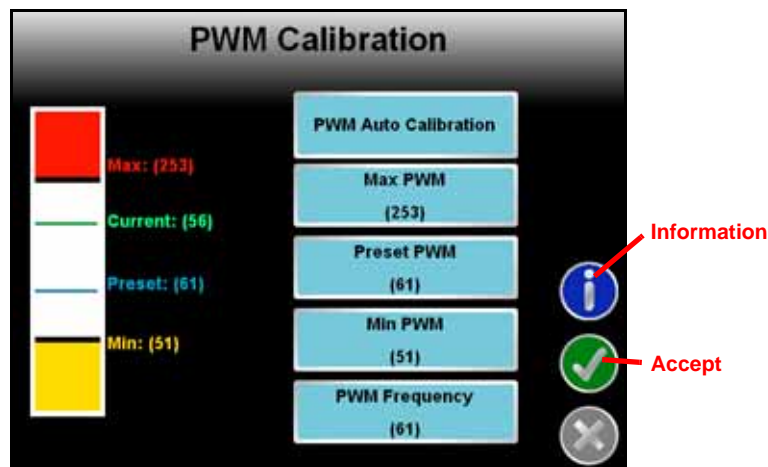
The PWM valve output will increase and decrease during the calibration procedure. Keep away from areas where product may be expelled and moving components and alert anyone around the equipment when performing the calibration process.

To use the automatic assistant mode, toggle the vehicle master switch and at least one section to the on position. Touch the 'Cancel' button at any time during the calibration to stop PWM output.

The automatic calibration process may take up to two minutes to complete. Maintain sufficient engine RPM and set the remote hydraulic flow to allow for at least 1 GPM [3.8 L/min] flow for each motor on the control system. The field computer will display a prompt when the calibration process is complete. If the system fails to calibrate properly, touch the 'Re-calibrate' button to restart the calibration process.

### PWM Calibration Screen

In the manual calibration and calibration assistant modes, the PWM Calibration screen will display with the following options or settings available.



**Information.** Touch the blue Information icon to display a brief explanation of the settings and options available on the PWM Calibration screen.

**Max PWM.** Enter a Max PWM value to set the maximum desired RPM or hydraulic output for a Pulse Width Modulated (PWM) hydraulic control valve. This setting limits how far the PWM valve will open.

With the master switch in the on position and the planter lowered down, increase this value to achieve the desired maximum motor speed.

**Preset PWM.** When operating with a PWM valve, the preset PWM value sets how far the valve will stay open to maintain pressure in the system. When the master switch is off, the PWM pulse width will remain at the existing value or go to the preset PWM value, whichever is lower.

When operating with a PWM close valve, the preset PWM setting is the initial target pulse width when the master switch is turned on. If this value is set to zero, the pulse width will return to the last value when the master switch is turned on.

**Min PWM.** Enter a Min PWM value to set the minimum desired RPM or hydraulic output (zero point or shutoff point) for a Pulse Width Modulated (PWM) hydraulic control valve.

With the master switch in the on position and the planter lowered down, decrease this value to achieve the desired minimum motor speed.

**PWM Frequency.** This value sets the frequency of the pulses that are sent to the PWM valve. The default value is 200 Hz for Raven OmniRow valves.

## Population

The current target population rate for planter operation is displayed on the Population button.

Touch the Population button on the Planter Settings screen and use the on-screen keypad to change the target population for seeding operations.

## Rate Bump (MultiRow and Individual Row Control Only)

The current rate bump value is displayed on the Rate Bump button. This is the value which the target rate value will be increased or decreased when the rate bump buttons are selected on the Guidance screen. For more information on using the rate bump buttons during a job, see the *Rate Bump Buttons* section on page 78.

Touch the Rate Bump button on the Planter Settings screen to change the rate bump value.

---

## AccuRow Settings

From the Home screen, touch the Tools Menu icon and select the Planter icon from the System menu. Touch the AccuRow Settings button from the Planter Control screen to display the AccuRow Settings screen. See Chapter 10, *Using AccuRow™*, for more information on setting up and using the AccuRow feature with the OmniRow system.

**Note:** *If AccuRow is not detected on the CANbus, a Function Disabled screen will appear. If the Planter Control node has been installed, troubleshoot the node and readdress the CANbus. See Chapter 3, CAN Networking and Diagnostics, for CAN installation and troubleshooting information.*

## Seeds/Area Settings

From the Home screen, touch the Tools Menu icon and select the Planter icon from the System menu. Touch the Seeds/Area Settings button from the Planter Control screen to display the Seeds/Area Settings screen.

Touch the Seeds/Area Settings button to view the calculated seed population and area tallies.

### Field Seeds and Field Area

The area and seed tallies for the field allow the operator to keep a running tally of the seed count (in thousands) and coverage area in acres [hectares] for the current field. Touch the Field Seeds or Field Area button and use the Reset Value button to reset the tally register.

### Total Seeds and Total Area

The total area and seed tallies allow the operator to keep a running tally over of the seed count (in thousands) and coverage area in acres [hectares] to keep a record for longer application time frames. Touch the Total Seeds or Total Area button and use the Reset Value button to reset the tally register.

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## Feature Settings

From the Home screen, touch the Tools Menu icon and select the Planter icon from the System menu. Touch the Feature Settings icon to configure additional features settings on the field computer. The Feature Settings screen may display the following options:

### PWM Smart Control

The PWM smart control feature may be enabled to allow the planter control system to estimate the required PWM duty cycle for changes in vehicle speed or target rate, or when the hydraulic valve is toggled on. When this feature is enabled, control response will be much more aggressive.

**Note:** *Smart control will be tuned during the PWM calibration. Refer to the Modify PWM Settings (PWM or PWM Close Valve) section on page 129 for additional information on performing calibration or adjustments for PWM type control valves.*

### Display Smoothing

Toggle the display smoothing feature to allow the field computer to smooth the rate display on the Guidance screen. With the feature selected, as long as the actual rate is within 10% of the actual application rate, the target rate will display as the actual rate on the Guidance screen. The actual rate will be displayed if the actual rate does not reach the target rate dead band (+/-10%) within 10 seconds.



## Trailed Implement

The trailed implement feature allows field computer to be calibrated more accurately for towed implements such as planters and will provide more accurate mapping and seed control during planting operations. With this feature enabled, the field computer will calculate course changes of the implement based upon the course changes of the DGPS antenna on the tractor.

**Note:** *The trailed implement feature is recommended for use with towed implements and is required to enable the turn compensation feature.*

*The trailed implement feature does not correct for implement drift or gravity due to tilt on side hills.*

## Turn Compensation

**Note:** *The trailed implement feature must be enabled to allow the operator to access the turn compensation feature.*

The turn compensation feature allows the OmniRow system to make adjustments to each seed rate section across the implement for course changes and turns. When enabled, the OmniRow system automatically adjusts each seed rate section to maintain the desired population as the implement changes course behind the tractor. This feature is recommended to help maintain the desired population during planting operations.

## Alarm Settings

From the Home screen, touch the Tools Menu icon and select the Planter icon from the System menu. Touch the Alarm Settings button from the Planter Control screen to display the Alarm Settings screen. The Alarm Settings screen is used to set the values at which the field computer will display a visual alarm on-screen. The Alarm Settings screen also allows the operator to enable an audible alarm tone when the visual alarm notice is displayed.



**Note:** *Some alarm settings or features may be available only in specific control modes or when the field computer detects specific components or features on the CANbus.*

### Alarm Pop Up

Enable the alarm pop up to display an alarm prompt on the field computer screen when an alarm condition is encountered.

### CAN Audible Alarm

Select the CAN Audible Alarm to enable the audible alarm tone for the configured settings on this screen. If any of the following settings are encountered, the field computer plays an audible tone to warn the operator of the condition.

### Off Rate Alarm Percent

Enter the percentage at which the Off Rate alarm will activate. The Off Rate alarm activates when the actual rate differs from the target rate by the programmed value for longer than five seconds.

The off rate alarm percent value will also determine the population graph displayed on the guidance screen during a job and the coverage mapping colors.

### Current Alarms

Touch the Current Alarms button to display a list of any current alarm conditions detected by the OmniRow planter control system or field computer.

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## *Prescription (Rx) Settings*

From the Home screen, touch the Tools Menu icon and select the Planter icon from the System menu. Touch the Rx Settings button from the Planter Control screen to display the Rx Settings screen.

### Zero Rate Shutoff

Enable the Zero Rate Shut Off option to allow the field computer to turn off sections or rows based on zones with a target rate of zero on the prescription map. Refer to Chapter 9, *Software Updates and File Maintenance*, for more information on transferring prescription maps.

**Note:** *Enabling the Zero Rate Shut Off feature will affect all control channels.*

### Prescription (Rx) Look Ahead Distance

Enable the 'Use Look Ahead Distance' option on the Rx Settings screen to set look-ahead values in units of distance rather than time for changing the prescription map rate control zones.

**Note:** *The vehicle must travel at a constant speed while using the look ahead distance.*

*Enabling the look ahead distance option will affect all control channels.*

## Prescription (Rx) Look Ahead

Set the Rx Look Ahead setting to the number of seconds (determined by speed) the field computer is allowed to scan in front of the current implement position. This feature may help to compensate for the time it takes a valve to adjust to a different rate or to fully open or close.

## Prescription (Rx) Default Rate

Set the Rx Default Rate at the Target rate for areas without Prescription information. The field computer will apply the default rate within any areas of a prescription map without a rate. Product control in Zero Rate zones will remain at zero. The Default Rate only affects areas where prescription rate information has not been entered.

---

## *Hybrid Settings*

From the Home screen, touch the Tools Menu icon and select the Planter icon from the System menu. Touch the Hybrid Settings button from the Planter Control screen to display the Hybrid Settings screen.

There are three look ahead settings for the multi-hybrid control system.

### Shift Look Ahead

The shift look ahead value is the number of seconds (determined by speed) which the field computer scans in front of the current vehicle position for changes in the hybrid or variety map and allows the steering system to begin steering the vehicle as required for the variety switch.

### On Look Ahead

Set the On Look Ahead setting to the number of seconds (determined by speed) the field computer is allowed to scan in front of the current implement position to turn on sections or row units. Increase this value to compensate for the time it takes to begin planting with a section or set of row units, or to overlap varieties when switching variety zones on a map.

### Off Look Ahead

Set the Off Look Ahead setting to the number of seconds (determined by speed) the field computer is allowed to scan in front of the current implement position to turn off sections or row units. Increase this value to compensate for the time it takes to shut off a section or set of row units, or to space varieties out when switching variety zones on a map.

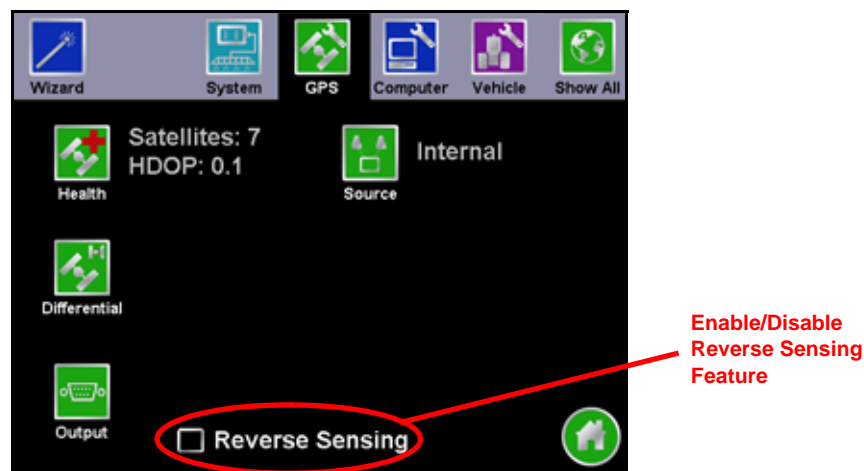


## Steering

If an optional assisted steering system has been installed, the Steering icon will be displayed in the System menu. Touch this icon to access the Steering Settings screen. For more detailed installation and calibration information, refer to the SmarTrax Calibration and Operation Manual.

## GPS Menu

The GPS menu displays available options for the DGPS source. The GPS menu contains the DGPS Source selection options as well as settings for Message Outputs, Differential Sources, a DGPS Status, or Health, screen.



**Note:** The Source and Output screens are only available on consoles featuring the built-in receiver. These screens are only accessible if the built-in receiver is selected as the source of DGPS signal.

## Reverse Sensing

Select this option to allow the field computer to automatically detect when the vehicle is traveling in reverse. When reverse speed is detected, the field computer will keep the previous orientation of vehicle indicator while updating the vehicle position.

**Note:** If this feature is disabled, the guidance display will assume all vehicle motion is in the forward direction.

Touch the 'Reverse Sensing' option at the bottom of the GPS Menu screen to toggle the reverse sensing feature. It is recommended to enable this feature if the field computer must accurately map application or field coverage while the vehicle is reversing (i.e. backing into corners).

**Note:** When the reverse sensing feature is enabled, the field computer may occasionally require the operator to manually override the current direction of travel during field operations. Review the GPS Health section on page 137 and the Direction of Travel Indicator section on page 139 before starting a job to ensure that the operator can toggle the direction of travel if necessary.

The reverse sensing feature is not displayed if a SmarTrax terrain compensation node is connected to the field computer.

The direction of travel icon (shown to the right) will be displayed on the Guidance screen any time the field computer detects that the vehicle is traveling in reverse. Touch the reverse direction icon to manually toggle the direction of travel displayed on the Guidance screen.

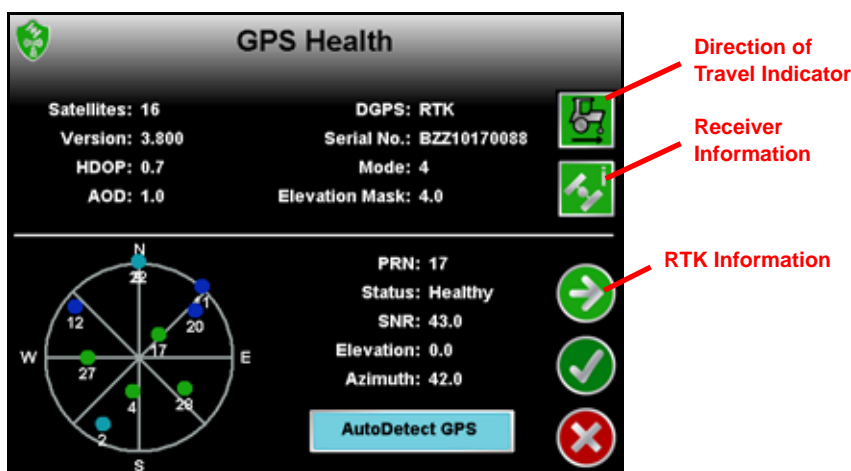


If the reverse direction icon is not displayed on the Guidance screen, touch the GPS Status Indicator and touch the direction of travel icon along the right side of the screen to manually toggle the displayed vehicle course.



## GPS Health

The GPS Health screen displays the status of GPS reception and can be used to troubleshoot the DGPS receiver and signal.



**Note:** The GPS Health screen is quickly accessible from the Home screen or from the Guidance screens by touching the GPS Status icon.



The RTK Information screen accessible by touching the Next on the GPS Health screen will only be available if the field computer is configured for RTK corrections.

## GPS Status Display Information

The upper portion of the GPS Health screen displays the following information:

**Satellites.** Number of satellites locked onto and used to determine correction. The field computer requires a minimum of 5 satellites to provide differential correction.

**DGPS.** Displays the source of differential correction being used.

**Note:** If using the e-Dif correction source with the Envizio Pro internal receiver, the DGPS field will display AUTO.

**Version.** The firmware version of the DGPS receiver. This information may not be available in all configurations or with some third party receivers.

**Serial Number.** The serial number of the DGPS receiver. This information may not be available in all configurations or with some third party receivers.

**HDOP.** The Horizontal Dilution of Precision must be below 2.0 to maintain differential. If HDOP exceeds 2.0, the GPS Status shield will change to yellow to alert the operator of the DGPS condition.

**Mode.** Displays the current differential fix status. The mode value will display:

- '0' or '1' if no differential corrections are being received
- '2' when the DGPS receiver is converging GS correction services, or the receiver has locked onto a differential source when using SBAS
- '4' for RTK fixed mode for fine GPS course correction mode
- '5' for RTK float mode for coarse GPS correction mode, or a converged status when using OmniSTAR XP/HP or GS correction services.

**Note:** Refer to the *RTK Fixed and Float Modes* section on page 52 for more information on RTK fixed and float modes.

**AOD.** The Age of Data corrections is shown in seconds. This is the time since the last GPS message update has been received.

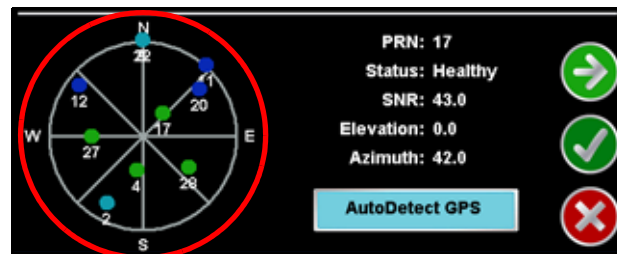
**Note:** A Raven assisted steering system will disengage after a few seconds without a GPS message update.

**Elevation Mask.** The elevation mask sets the minimum elevation of a satellite above the horizon which the field computer may use for differential correction. This value is displayed in degrees above horizontal.

Refer to the *Elevation Mask* section on page 140 to modify the elevation mask setting.

The lower portion of the GPS Health screen displays the following satellite constellation information:

**Satellite Constellation Map.** The field computer displays the constellation of satellites currently locked and used to determine differential. Touch a satellite displayed in the constellation to display information about each satellite in the constellation.



**Note:** To view the satellite constellation, be sure to set the GSA message to 1 Hz from an external DGPS receiver.

*If a Raven automatic steering system is connected, the satellite constellation and individual satellite information may not be available on the GPS Health screen.*

The satellites being tracked by the field computer will display green in the constellation map if the signal to noise ratio (SNR) value is 42 or higher. Satellites displayed as blue have an SNR value between 30 and 41 while satellites with an SNR below 30 will display as light blue.

**PRN.** Displays the PRN for the satellite currently selected in the constellation map area.

**Status.** The signal status of the selected satellite is displayed in this field. Satellites with a Signal to Noise Ratio (SNR) at 40 or above will display a Healthy status and appear green in the satellite constellation map while an SNR below 40 will show an Unhealthy status and appear blue in the map.

**SNR.** Displays the Signal to Noise Ratio of the selected satellite. To maintain differential signal, at least two satellites in the constellation must have a Signal to Noise Ratio higher than 50.

**Elevation.** This value represents the elevation of the satellite and is displayed as degrees above the horizon.

**Azimuth.** The azimuth, or bearing, of the satellite is displayed as degrees from due North.

### Direction of Travel Indicator

This indicator displays the last direction of travel detected by the field computer. Touch the indicator to toggle the direction of travel manually if the indicator or map display is incorrect.

**Note:** *When operating with an optional Raven SmarTrax™, assisted steering system, the direction of travel icon may not be displayed in this location if the terrain compensation feature is enabled. Review the SmarTrax Calibration and Operation Manual for details on using these systems with the Envizio Pro field computers.*

### Receiver Information

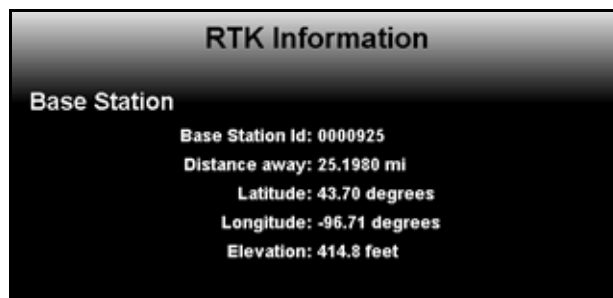
Touch the this icon to access details about the GPS receiver such as serial number, firmware version, receiver model, and the type of GPS receiver on-board the field computer.

### AutoDetect GPS

Touch the AutoDetect GPS button on the GPS Health screen to allow the Envizio Pro to attempt to automatically detect GPS information coming from an external device. The autodetect feature is normally only required when interfacing with an external receiver or when receiving GPS information back from a SmarTrax or TM-1 Tilt Module.

### RTK Information Screen

When using the internal GPS receiver, or a compatible external GPS receiver such as the Raven Phoenix 300, in RTK mode, touch the Next icon on the GPS Health screen to view RTK base station information such as the base station I.D. and baseline distance. This information may be used to help troubleshoot issues with the system if necessary.

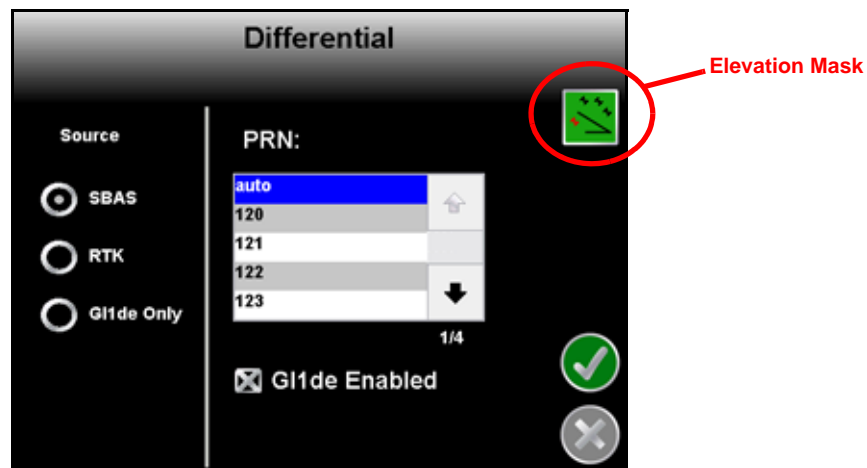


## Differential

**Important:** If a SmarTrax assisted steering system is connected to the Envizio Pro field computer, set the correction source to internal before making changes to the Envizio Pro internal receiver.

**Note:** If the Envizio Pro is not able to detect the source or type of differential corrections received from the an external GPS receiver, or if corrections are routed from the internal GPS receiver through a Raven SmarTrax system or TM-1 Tilt Module, the Differential screen will be replaced by the Default Differential screen. Refer to the Default Differential section on page 145 for more information on using the differential settings displayed on this screen.

Select the Differential icon from the GPS menu to set up the internal receiver for the desired GPS correction source. Generally, the SBAS (WAAS/EGNOS) option is selected by default.



**Note:** Touch the Auto Detect button on the GPS Health screen if a Raven receiver is connected directly to the GPS Receiver/DGPS port on the chassis interface or main interface cables. If the field computer detects a Raven receiver, the field computer can be used to select the differential source and PRN of the external receiver.

If GPS is routed through an assisted steering system such as Raven SmarTrax, the receiver cannot be configured with the field computer.

### Elevation Mask

The elevation mask sets the minimum elevation of a satellite above the horizon which the field computer may use for differential correction. This value is displayed in degrees above horizontal.

Touch the Elevation Mask icon in the upper, right corner of the Differential screen and use the on-screen keypad to modify the elevation mask setting. The default value for the elevation mask is 4.0.

The current elevation mask value is displayed on the GPS Health screen.



## SBAS (Satellite Based Augmentation System)

**Note:** Some Envizio Pro field computers may have an internal receiver enabled for e-Dif and L-Dif only. These receivers do not have an SBAS option and will not be able to utilize SBAS correction signals.

Select the SBAS option to utilize the Wide Area Augmentation System (WAAS) or European Geostationary Navigation Overlay Service (EGNOS) correction signals. For most internal GPS receivers, this is the default option selected.

**PRN (Pseudo-Random Number).** The PRN scroll list allows the operator to manually set the PRN, or pseudo-random number, for the differential satellite which provides coverage for the operation area if desired. Selecting a PRN from the list locks the correction signal to the selected satellite. If the 'auto' option is selected, the field computer will scan and automatically set the PRN throughout an operation.

**GL1DE Smoothing.** Toggle the GL1DE Enabled option to enable the NovAtel GL1DE<sup>®</sup> algorithm while using SBAS corrections. When enabled, the NovAtel GL1DE feature helps to smooth reported GPS positions and reduce position jumps during operation and provides for a more stable position input for guidance systems.

**Note:** The NovAtel GL1DE feature is only available on Envizio Pro II field computers with the dual frequency GPS receiver. Visit the NovAtel web site for a full description and additional information on the NovAtel GL1DE feature.

[www.novatel.com](http://www.novatel.com)

**GLONASS Authorization.** An optional Global Navigation Satellite System (GLONASS) authorization key is also available to enhance the standard GPS satellite constellation. This key allows the dual frequency receiver to utilize the GLONASS satellite constellation which can increase the number of satellites visible at any given time and help improve satellite coverage.

**Note:** The GLONASS satellites will be utilized when the internal receiver is configured for the following correction sources:

- GL1DE Only
- RTK using RTCM v 3.0
- OmniSTAR G2
- Slingshot GS or Satellite GS

## e-Dif (Envizio Pro Only)

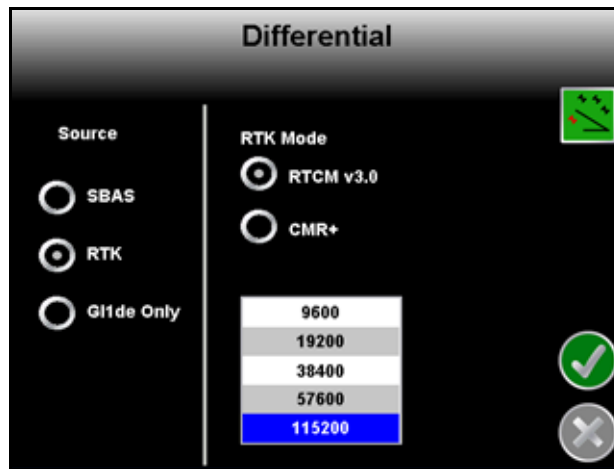
If an optional e-Dif key has been authorized, an option to enable e-Dif will be displayed on this screen. Select the e-Dif option to display the timer for the last time the e-Dif was reset. Touch the Reset button to reset the timer.

**Note:** The Envizio Pro internal DGPS receiver is e-Dif capable. If connecting an external receiver to the Envizio Pro console, make sure that it is capable of using e-Dif prior to purchasing or authorizing an e-Dif code.

Contact a local Raven dealer for more information about the optional e-Dif correction source and upgrades.

## RTK (Envizio Pro II Only)

With an optional RTK authorization key, the Envizio Pro II dual frequency receiver may be used with a Slingshot<sup>®</sup> Field Hub to receive RTK corrections via a wireless or cellular service provider or via a Continuously Operating Reference Station (CORS) network.



**Note:** The RTK option is only displayed after an RTK authorization key is entered using the procedure in the Special Features Registration section on page 152. Contact a local Raven dealer to obtain the authorization code or for more information on the Slingshot RTK services.

Check that the following settings are configured correctly to ensure that RTK corrections are used by the on-board receiver:

**RTK Mode.** Select the format of the correction messages sent from the RTK correction source. The default setting is RTCM v3.0.

**Baud Rate.** Select the baud rate at which the correction messages are transmitted from the RTK correction source. The default baud rate setting is 115200.

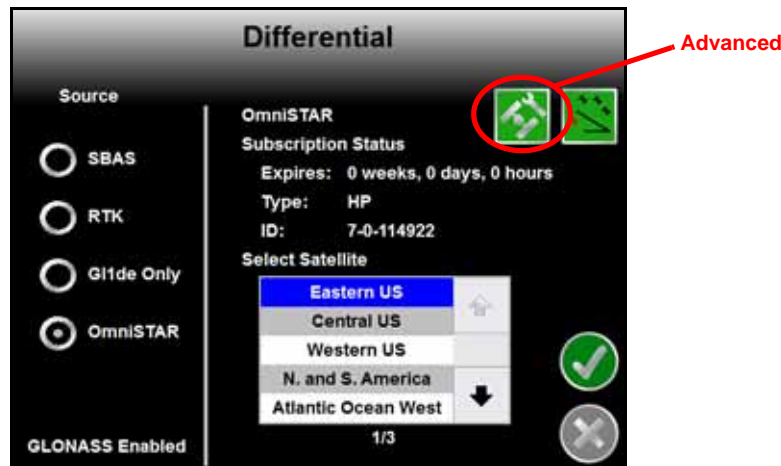
**Network.** Select the network from which the RTK corrections will be delivered. The default setting is 'Disabled' and is recommended when connected with a Slingshot Field Hub.

### GL1DE<sup>®</sup> Only

For areas with limited SBAS coverage, the Envizio Pro II dual frequency receiver features the NovAtel GL1DE as a GPS correction source option. In GL1DE only mode, the Envizio Pro II will use existing GPS or EGNOS satellites to locate the vehicle position within 20 in [50 cm].

## OmniSTAR

If the OmniSTAR correction service is selected for differential corrections, the Differential screen will display subscription status information and region of operation.



### Advanced Menu

Touch the Advanced Menu icon in the upper, right corner of the screen access additional OmniSTAR correction settings. The following options and information will be displayed on the OmniSTAR Advanced Menu screen:

**Enable Custom Satellite.** Enable custom satellite frequency and rate settings only when instructed by an OmniSTAR technician.

**Custom Frequency.** The Custom Frequency button displays the current satellite frequency used with OmniSTAR corrections.

**Custom Rate.** The Custom Rate button displays the current message rate for OmniSTAR corrections.

**Signal Strength.** Displays the signal strength of the selected satellite.

### Subscription Status

The subscription status area displays the following subscription information when available:

**Note:** *If SmarTrax is connected to the Envizio Pro field computer, the operator must set the correction source to Internal before the following information will be available. Be sure to move the vehicle to a location with a clear view of the sky before contacting OmniSTAR for subscription information.*

**Expiration.** The time until the current subscription will expire is displayed in weeks, days, and hours. Contact OmniSTAR for subscription information.

**Type.** The type of subscription will be displayed in this area. OmniSTAR corrections are available in HP, XP, and G2 modes.

**ID.** The OmniSTAR ID is required for registration with the OmniSTAR correction service.

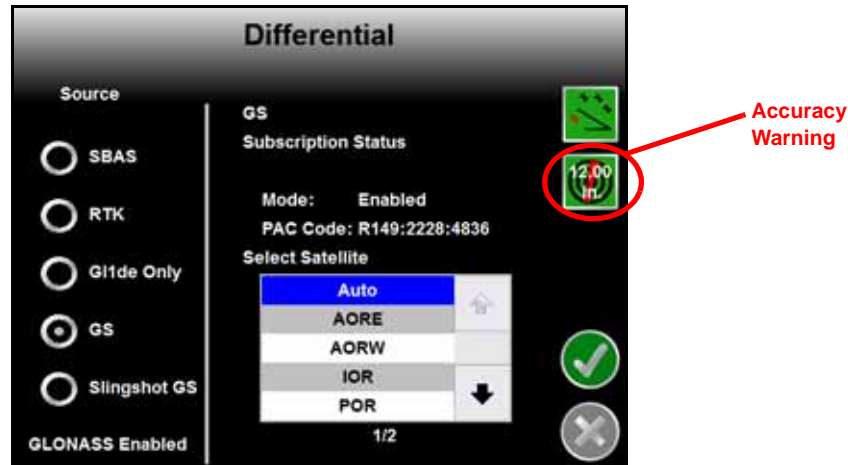
## Select Satellite

Use the scroll list to select the region in which the field computer will be operating. This is necessary to ensure that the receiver utilizes corrections appropriate for the area in which the receiver is operating. A satellite selection guide is available on the OmniSTAR web site:

[www.omnistar.com](http://www.omnistar.com)

## Satellite GS

If the Satellite GS correction service is selected for differential corrections, the Differential screen will display subscription status information and the regional satellite currently selected for corrections.



## Subscription Status

The subscription status area displays the following subscription information when available:

**Note:** If SmarTrax is connected to the Envizio Pro field computer, the operator must set the correction source to Internal before the following information will be available. Be sure to move the vehicle to a location with a clear view of the sky before contacting a local Raven dealer for subscription assistance.

**Expiration.** The time until the current subscription will expire is displayed in days and hours. Contact a local Raven dealer for subscription information.

**Mode.** This field will display whether the Satellite GS subscription is enabled or disabled. The mode must display Enabled to allow Satellite GS corrections during field operations.

**PAC Code.** The PAC Code is required for registration with the Satellite GS correction service.

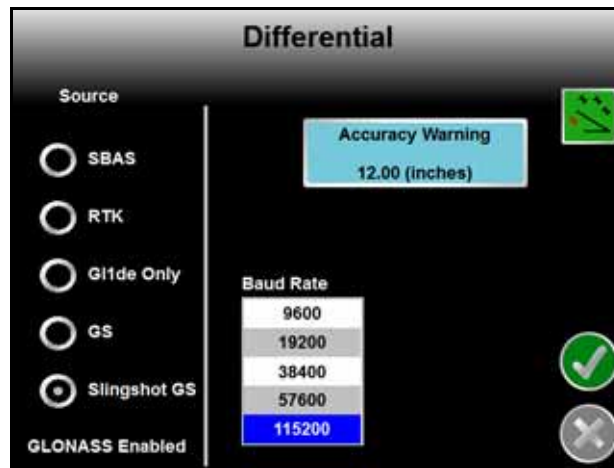
## Select Satellite

Use the scroll list to select the region in which the field computer will be operating. This is necessary to ensure that the receiver utilizes corrections appropriate for the area in which the receiver is operating. A satellite selection guide is available at the Raven web site:

[www.ravenhelp.com](http://www.ravenhelp.com)

## Slingshot GS

If the Slingshot GS correction service is selected for differential corrections through the Slingshot wireless network, the Differential screen will display the following options.



**Accuracy Warning.** Select the distance, in inches [centimeters], which allowed before the field computer will provide a GPS accuracy warning or the GPS status shield will turn yellow during operations.

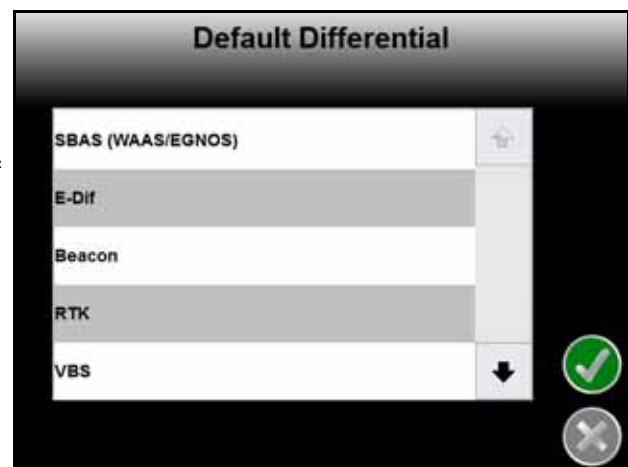
**Baud Rate.** Select the baud rate at which the correction messages are transmitted from the correction source. The default baud rate setting is 115200.

## Default Differential

The Default Differential screen replaces the Differential screen if:

- any non-Raven external GPS receiver connected to the field computer for position corrections.
- the field computer is not able to determine the type of differential corrections provided for position corrections.
- GPS messages are passed through a Raven TM-1 Tilt Module or SmarTrax steering system.

In any of the conditions outlined above, the Default Differential screen allows the operator to manually set the type of corrections being used for position information and corrections.



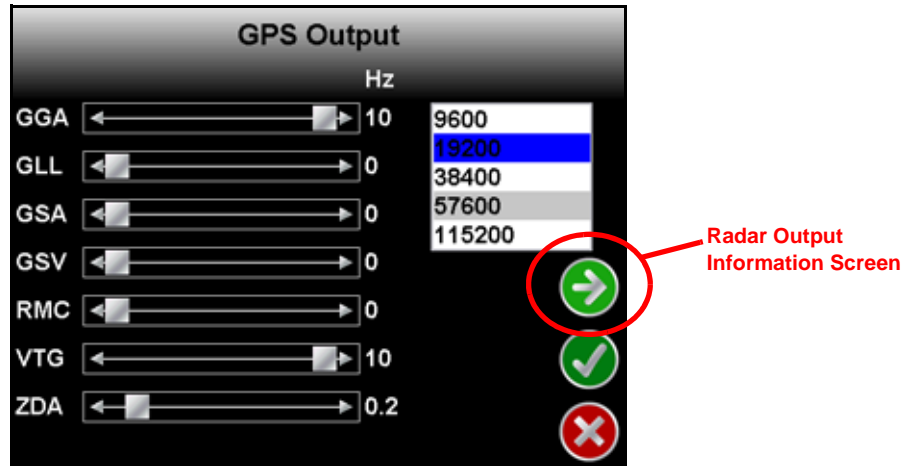
Selecting the appropriate source of differential corrections allows the Envizio Pro to display the GPS Status Icon as outlined in the *GPS Status* section on page 52. The Default Differential selection also allows the field computer to identify and display potential GPS error conditions during field operations.

**Important:** Potential error conditions must be verified and addressed on the external receiver or the source setting must be set to Internal to access the internal GPS receiver settings.

## Output

**Important:** If a SmarTrax assisted steering system is connected to the Envizio Pro field computer, set the correction source to internal before making changes to the Envizio Pro internal receiver.

To setup the type, frequency, and baud rate of message outputs from the built-in receiver, touch the Output icon.



**Note:** The GPS Output screen is only available when using the internal GPS receiver. Message outputs from an external GPS receiver must be setup through the external hardware.

### Message Types and Frequency

Use the sliding bar next to the desired message type to set the frequency of the output message. Messages may be sent out at 0.2, 1, 5, or 10 Hz, depending upon the message. Set the slider to 0 Hz to turn the corresponding message off.

Messages sent out of the built-in receiver are sent out of the connector labeled GPS Out on the auxiliary interface cable or chassis interface cable. Contact a local Raven dealer for more information.

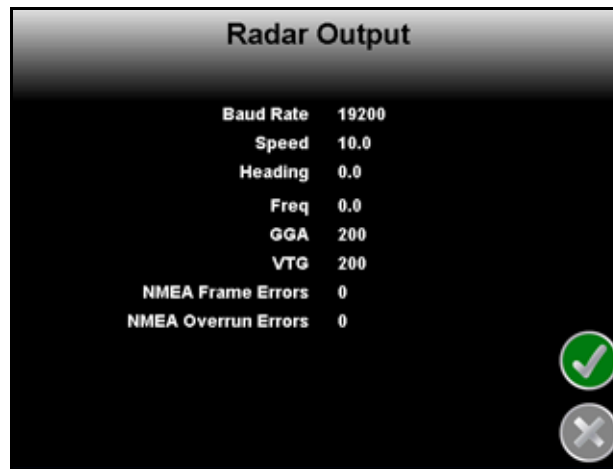
### Baud

Select the Baud Rate of the message strings sent from the built-in receiver.

**Note:** Some GPS or Assisted Steering components may require specific Baud Rate settings.

## Simulated Radar Output

Touch the Next icon displayed on the GPS Output screen to view the simulated radar output from the field computer. These settings may be used to help set up an external device to receive GPS speed signal output from the internal GPS receiver.



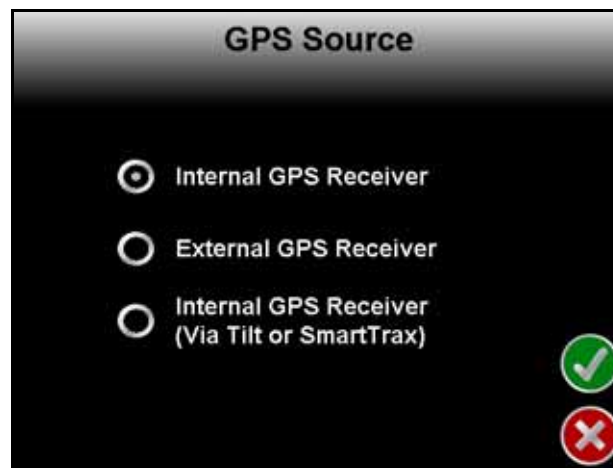
## External Light Bar, TM-1 Tilt Module, and SmarTrax™

If an optional Raven SmarTrax assisted steering system, external light bar, or TM-1 Tilt Module is connected to the field computer, the GPS Output Baud setting must be set to 19,200 before changing the Source selection. For more information on the GPS Source settings, see the *Source* section on page 147.

## Source

**Important:** If a SmarTrax assisted steering system is connected to the Envizio Pro field computer, set the correction source to internal before making changes to the Envizio Pro internal receiver.

The GPS Source screen allows the operator to select between the internal GPS receiver or an optional external receiver such as a Raven Phoenix 200/300.



**Note:** The GPS Source screen is only available on field computers with the internal DGPS receiver.

The GPS Source screen also displays an option to automatically setup the output messages from the built-in receiver to route through an optional TM-1 Tilt Module or SmarTrax system.

### Internal GPS Receiver

To use the internal receiver, select the Internal GPS Receiver option. Verify settings on the GPS Output screen to ensure that any required messages are properly configured.

#### Via TM-1 or SmarTrax™

**Important:** *If a SmarTrax assisted steering system is connected to the Envizio Pro field computer, set the correction source to internal before making changes to the Envizio Pro internal receiver.*

To output DGPS signal from the built-in receiver to an optional TM-1 Tilt Sensor or SmarTrax controller, select the Internal GPS Receiver (Via Tilt or SmarTrax) option.

**Note:** *The GPS Output Baud must be set to 19,200 before selecting the Via TM-1 or SmarTrax option (see the External Light Bar, TM-1 Tilt Module, and SmarTrax™ section on page 147). Do not select this option if the optional hardware components are not connected. The field computer may take several minutes to properly setup these components or may lock up if the TM-1 or SmarTrax controller are not connected.*

*This option requires additional cables to route DGPS signal from the internal receiver out to the TM-1 or SmarTrax controller and then back into the field computer. Review the installation sections for these optional system components or contact a local Raven dealer for more information.*

### External GPS Receiver

If an optional external GPS receiver is connected to the field computer via the connector labeled 'DGPS' on the chassis interface cable (P/N 115-0172-001) select the External Receiver option. Selecting this option overrides the internal DGPS receiver.

## Tilt Sensor

If the TM-1 Tilt Sensor is connected directly to the DGPS connector on the chassis interface cable (P/N 115-0172-001), the Envizio Pro may be used to configure the TM-1. Touch the Tilt icon to access the Tilt Configuration screen.

**Note:** *When routing tilt corrected signal through a SmarTrax controller and back into the field computer, the TM-1 must be calibrated through the SmarTrax controller rather than the Envizio Pro. See the SmarTrax Quick Start Guide or Operator's Manual for more information.*

### Information

Touch the blue Information icon to display a brief explanation of the settings and options available on the Tilt Configuration screen.

**Note:** *Refer to the TM-1 Tilt Module Installation and Operation Manual for detailed installation and calibration information.*

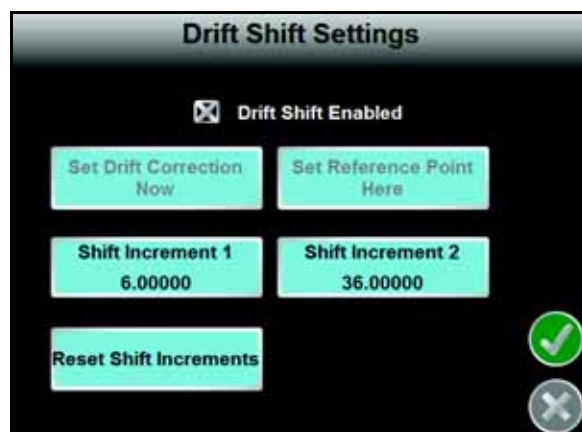


## Drift Shift

The drift shift feature allows the operator to manually adjust, or nudge, the reported GPS position of all features (e.g. boundaries, coverage and zone maps, field markers, and guidance lines, etc.) within the job simultaneously. This feature allows the operator to manually correct for GPS drift over the course of a field operation or to recalibrate the position of field features if the job is resumed at a later date or time.

**Note:** *It is necessary to stop the vehicle while nudging job features. When enabled, the drift shift feature will automatically pan and zoom onto the current vehicle location to allow the operator to adjust the position of job features based upon the current vehicle location.*

**Drift Shift Enable.** Touch this option to toggle the drift shift feature on or off. Ensure this option is selected to allow the drift shift features to be used during field operations.



**Set Drift Correction Now.** With the vehicle positioned at the actual reference point, touch the “Set Now” button to shift the displayed reference point and all field features according to the current vehicle position.

**Set Reference Point Here.** Touch the “Set Here” button to reset the reference point to the current vehicle location. The previous reference position will be lost.

**Shift Increment 1 and 2.** Enter increments for manually adjusting field features with drift shift. These values allow a coarse and fine adjustment to allow the operator to shift the coverage map as necessary during the field operation.

**Reset Shift Increments.** Reset the default 6 in [15 cm] and 36 in [91 cm] drift shift values for increments 1 and 2.

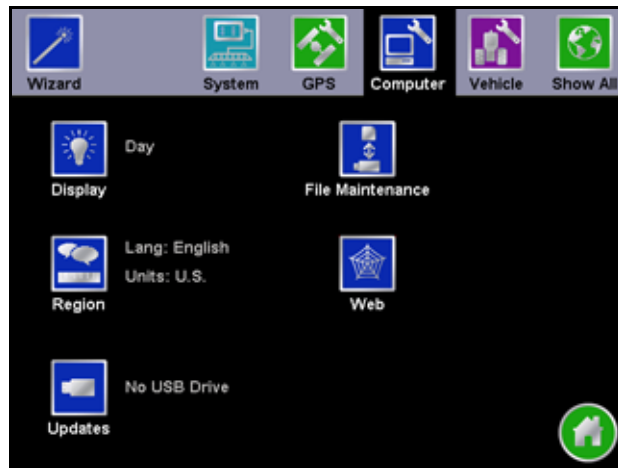
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## Computer Menu

The Computer menu contains settings and preferences for the Envizio Pro field computer and display. Settings such as the display mode, brightness, language, light bar and display units are modified through the Computer

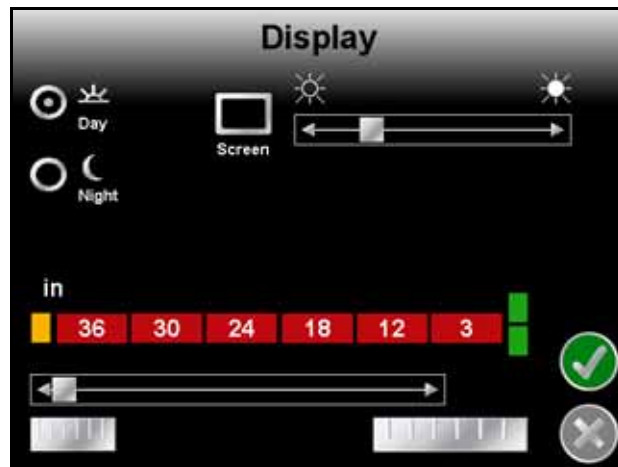
## Chapter 8

menu. Features available with a USB flash drive, such as software updates and file maintenance are also accessed via the Computer menu.



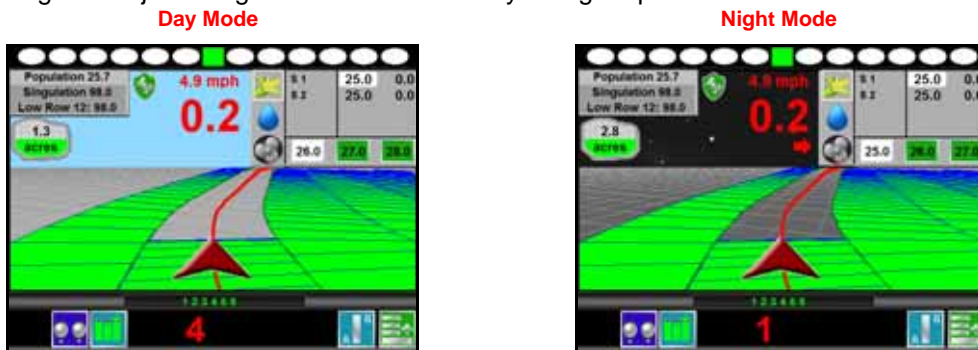
## Display

The Display settings screen allows the user to change settings for the field computer screen display and the on-screen light bar.



## Display Mode

Select Day or Night to adjust the guidance screen for day or night operations.



## Screen Brightness

The Screen slider adjusts the brightness of the field computer display.

## On-Screen Light Bar

**Offset Scale Sensitivity.** The light bar sensitivity can be adjusted to match the type of application with which the field computer will provide guidance. Select between the coarse, normal, and fine adjustments. The example light bar displays the units and measurements used for each setting.

## External Light Bar

The brightness of an external light bar, controlled by the field computer, may be adjusted using the External Light Bar slider on the Display screen.

**Note:** *The External Light Bar adjustment will only display if the field computer is configured to control an external light bar. See the Serial Port Configuration section on page 121 to setup the external light bar interface.*

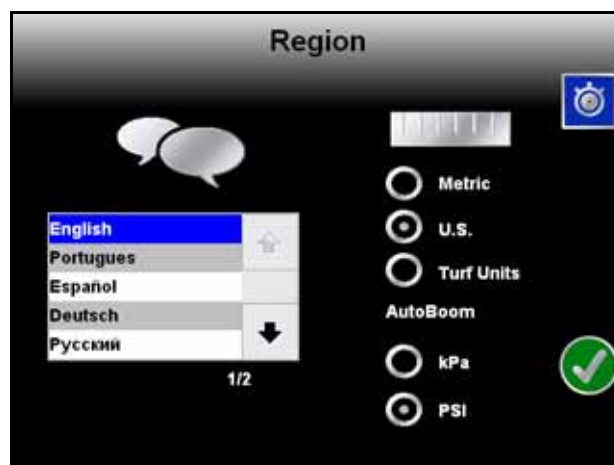
## Region

Select the Region icon to modify display settings for the region in which the field computer will be used. The Region screen displays settings for the following:

- Language
- Display Units
- Pressure Units

### Language

The available languages are displayed in the scroll list. Select the desired language displayed on the field computer from the list.



### Unit System

Select the desired system (English or Metric) used with the control system.

Unit System	Units
Metric	centimeters (cm), liters (L), hectares (ha), kilometers per hour (km/h)
English	inches (in), gallons (gal), acres (ac), miles per hour (mph)
Turf Units	inches (in), gallons per 1000 square feet (gal/1000 ft <sup>2</sup> ), miles per hour (mph)

All measurements will be displayed by the field computer in the selected system. All user inputs must be entered using the selected system.

## AutoBoom® Pressure

The units used to display pressure of an optional AutoBoom system are also selected on this screen. Select between pounds per square inch (PSI) or kilo pascals (kPa).

**Note:** *The AutoBoom pressure setting only affects the AutoBoom pressure display and is not used with OmniRow systems.*

## Time Zone Settings



Touch the Time Zone icon in the upper right corner to view and modify time zone settings. The default selections will allow the field computer to automatically configure the time zone and daylight savings for the region. To manually change the time zone, select the Manual Time Zone option and enter the UTC (Coordinated Universal Time) offset hours for the local time zone.

## Updates

Access the Updates screen to update the field computer software or to register a special feature, such as VRA or planter population control. The Updates screen also provides access to the demonstration, or demo, mode.

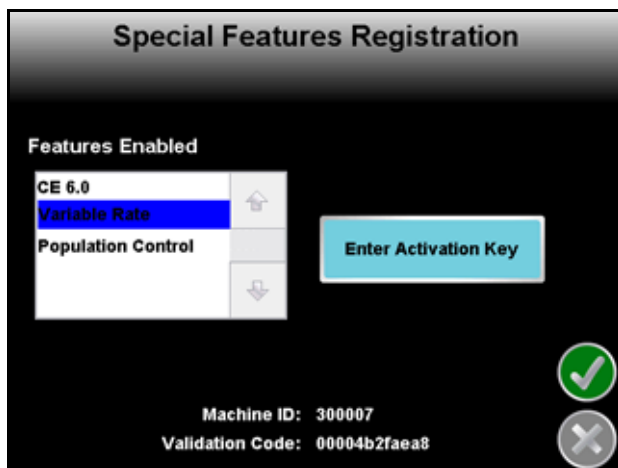
### Software Updates

Software updates for the field computer will be available periodically from the Raven web site:

[www.ravenhelp.com](http://www.ravenhelp.com)

Refer to the *Updates* section on page 152 for detailed instructions on downloading and applying software updates to the Raven Envizio Pro field computer.

### Special Features Registration



The Updates screen also offers the ability to activate special features using activation keys for the field computer as well as some Raven control nodes. While on the Updates screen, touch the 'Special Features Registration' button to begin activation of available features.

**Note:** *Contact a local Raven dealer for a complete list of features or activation codes. Consoles with software version 3.0 or higher will require an activation key to allow operation. If 'CE 6.0' is not listed in the enabled features list, contact a local Raven dealer or the Raven Technical Support Center for assistance.*

The Raven dealer will require the Machine ID and Validation Code information displayed at the bottom of the Special Features Registration screen to generate the activation key.

#### To Activate a Special Feature.

1. Obtain a registration code from a local Raven dealer.
2. Visit the Raven web site below and fill out the Activation Key Request form with the registration code received from the Raven dealer.

[www.ravenhelp.com](http://www.ravenhelp.com)

3. Submit the request form to receive the activation key used to unlock the special feature on the Envizio Pro field computer.

**Note:** Refer to the *To Authorize Raven Control Node Features* section on page 153 or the *To Authorize Internal DGPS Receiver Features* section on page 153 for special instructions on entering activation codes for these components.

4. On the Envizio Pro, touch the Tools Menu icon on the Home screen.
5. Select the Updates icon from the Computer menu.
6. Touch the Special Features Registration button to access the Special Registration Features screen.
7. Touch the Enter Activation Key button and use the on-screen keyboard to enter the activation key received from the Raven web site.
8. Touch the Accept icon in the lower, right corner of the on-screen keyboard to confirm the activation key.
9. Touch the Next icon on the right side of the screen to activate the special feature.  
If the key has been entered correctly, the activated feature will be displayed on-screen.  
If the activation key does not activate the feature, verify that the key has been entered correctly.

#### To Authorize Raven Control Node Features.

**Note:** A Raven node with optional features must be connected to the field computer to enable additional features.

1. Obtain an registration code from a local Raven dealer.
2. Visit the Raven web site below and fill out the Activation Key Request form with the registration code received from the Raven dealer.

[www.ravenhelp.com](http://www.ravenhelp.com)

3. Submit the request form to receive the activation key used to unlock the special feature on the Envizio Pro field computer.
4. On the Envizio Pro, touch the Tools Menu icon on the Home screen.
5. Select the Updates icon from the Computer menu.
6. Touch the Special Features Registration button to access the Special Registration Features screen.
7. Touch the Enter Activation Key button and use the on-screen keyboard to enter the activation key from the Raven web site.
8. Touch the Accept icon in the lower, right corner of the on-screen keyboard to confirm the authorization code. If the key has been entered correctly, the field computer will display a prompt confirming the code has been accepted. The node activation key will not be displayed on the Special Features Registration screen. Check the CAN Diagnostics screen or test the control system to verify that the special feature(s) purchased are accessible.

#### To Authorize Internal DGPS Receiver Features.

1. From the Envizio Pro II home screen, touch the Tools Menu (blue) button and select the Source icon from the GPS menu.
2. On the GPS Source screen, write down the current source setting before selecting the Internal GPS Receiver option.
3. Touch the Accept icon to return to the main Tools Menu display.
4. Select the Output icon from the GPS menu.
5. On the GPS Output screen, write down the current NMEA message rates before setting all NMEA messages to zero.
6. Touch the Accept icon to return to the main Tools Menu display.
7. Select the Updates icon from the Computer menu.

8. Touch the Special Features Registration button to access the Special Registration Features screen.
9. Touch the Enter Activation Key button and use the on-screen keyboard to enter the activation key from the Raven web site.
10. Touch the Accept icon in the lower, right corner of the on-screen keyboard to confirm the authorization code.
11. Touch the Next icon.  
Check the Differential screen and verify that the feature is unlocked and available.

### Demo Mode

Touch the Demo icon in the upper-right corner of the Updates screen to toggle the demonstration mode. This mode enables a GPS simulation. The field computer will create a coverage map based on the simulated GPS position.

To start the demonstration mode:



Touch the Start Demo icon to toggle the demo mode on. The field computer must be restarted before the demonstration mode will be activated.

Shutdown and power off the console. Wait a few seconds and turn the console power back on.



To end demo mode, return to the Updates screen and select the Stop Demo icon to toggle demo mode off.

Be sure to restart the field computer to restore the Envizio Pro to normal operation.

## File Maintenance



To transfer files to or from the field computer, select the File Maintenance icon in the Computer menu. The following File Maintenance may be conducted directly from the field computer:

- Setup required file structure for use with the field computer on the USB drive
- Copy files to USB drive
- Copy files from USB drive
- Delete files from internal memory

Raven recommends performing File Maintenance at least once a week and storing or backing up these files on a home or office PC. See Chapter 9, *Software Updates and File Maintenance* for details on using the File Maintenance feature.

**Note:** *Depending upon the size of the completed job(s), file maintenance may take several minutes to complete.*

*When interfacing with a planter control or yield monitor system, a typical job of 200 acres should take less than 5 minutes. Larger fields and coverage maps with several sections (e.g. MultiRow or Individual Row Control) could take significantly longer. Check the File Maintenance screen available memory display periodically and perform file maintenance as necessary. Refer to Chapter 9, *Software Updates and File Maintenance*, for more information.*

## Wireless File Transfer

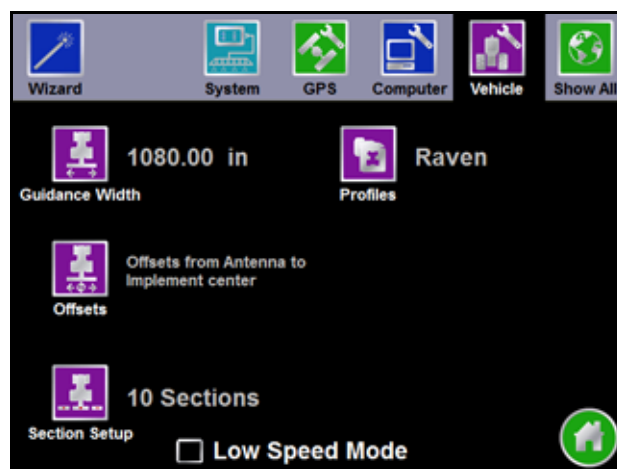
If a Slingshot® Field Hub is connected to the field computer, job files may be transferred to a home or office computer automatically at the end of each job. Refer to Appendix C, *Wireless Communications & Remote Service*, for more information on setting up and using Slingshot and the wireless file manager to manage job file transfers.

## Web

If the required components are connected to the ethernet port on the back of the field computer, pressing the Web button will allow the operator to access the world wide web via the field computer touch screen. Refer to the Field Hub Quick Start Guide for set up and wireless navigation instructions.

## Vehicle Menu

Use the Vehicle menu to configure the field computer for the machine or implement configuration. The field computer requires calibration for the GPS antenna location on each vehicle as well as the swath width (guidance width) and the section configuration for the machine or implement. Once configured, vehicle profiles can be saved for later use, transferred to a USB drive, or loaded onto another Envizio Pro field computer.



**Note:** Selecting the Section Setup icon on this screen will display the Row Assignments screen. Refer to the Row Assignments section on page 123 for details.

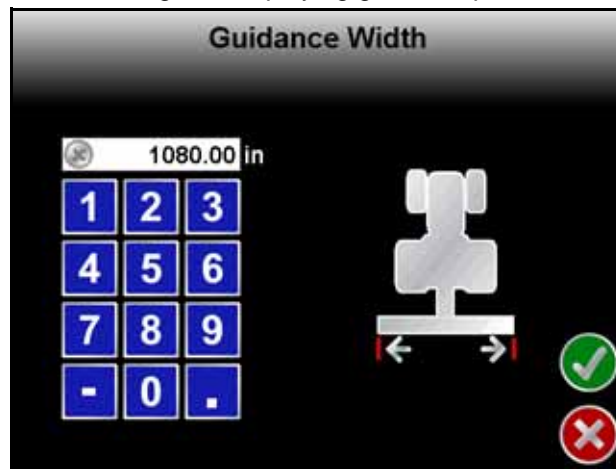
## Low Speed Mode

A filter is normally applied to the course over ground or heading information displayed by the Envizio Pro at speeds under 1.5 mph [2.4 km/h]. The low speed mode reduces the minimum speed to 0.7 mph [1.1 km/h] for operations and equipment that require normal operation speeds near this range. It is recommended to disable the low speed mode if the normal operation speeds for field operations will be above 1.5 mph [2.4 km/h] consistently.



## Guidance Width

Use the on-screen keypad to enter the guidance width in inches [centimeters] for the implement. This is the width of each swath used when calculating and displaying guidance paths.



The guidance width should be entered as the width of the boom, implement or header which actually completes an operation while the vehicle drives a swath. A few examples of the guidance widths for various implements would include the following:

- Enter the guidance width for a sprayer boom as the number of spray tips multiplied by the tip spacing. The entered guidance width should not include fence row nozzles or foam markers.
- The guidance width of a combine header should be the cutting surface, not the overall header width.
- The guidance width for row crop planters is equal to the row spacing multiplied by the number of row units.

## Offsets and Implement Type Selection

To properly display the vehicle location within a field and create accurate coverage information, the field computer must be calibrated for the location of the center of the implement and the relative location of the GPS antenna. This information is used by the field computer to provide accurate swath guidance and to create coverage maps based on the location of the implement.

Select one of the following implement types with which the field computer will interface during field operations:

**Important:** *It is highly recommended to create and save profiles for each specific vehicle, tractor and implement configuration on which the field computer will be used for field operations.*

**Important:** *Anytime the implement configuration or the antenna location is changed, be sure to verify that the section and implement offsets are set up correctly.*

**Self Propelled or Mounted Implement.** This option is best suited for fixed implements such as self-propelled sprayer, a harvester or combine, or an implement mounted to a tractor 3-point hitch. See the *Self Propelled or Mounted Implement* section on page 157 for details on configuring implements using this implement type.


**Trailed Implement.** Select this option to configure implements such as anhydrous tool bars, pull-type sprayers, planters, or air seeders with the air cart towed behind the seed drill. Refer to the *Trailed Implement Tractor Setup* section on page 159 to begin configuring the trailed implement.



**Trailed Implement with Tow Between.** This option has been designed for seeder implement configurations with the air cart towed between the tractor and seed drill. Refer to the *Trailed Implement with Tow Between Setup* section on page 161 to begin configuring the trailed implement.

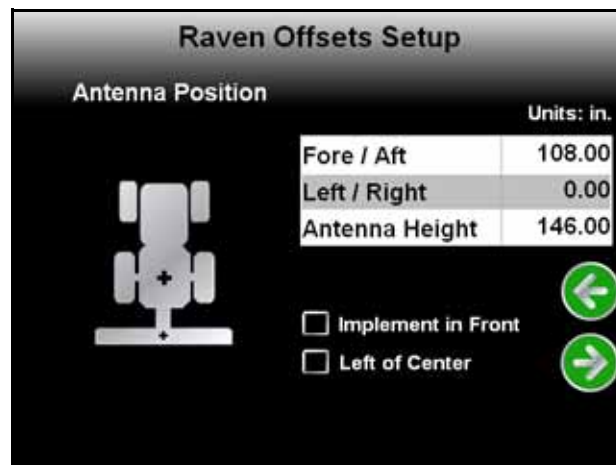
## Self Propelled or Mounted Implement

If the Self Propelled or Mounted Implement option is selected on the Implement Type selection screen,

touch the Next  icon to display the Raven Offsets Setup screen. The antenna position settings shown on this screen are used to calibrate the field computer for the relative location of the center of the boom or implement with respect to the DGPS antenna.

**Note:** *Be sure to enter positive values for each offset setting. All negative values entered will be reset to zero.*

The Raven Offsets Setup screen displays the currently calibrated values for the following antenna offsets:

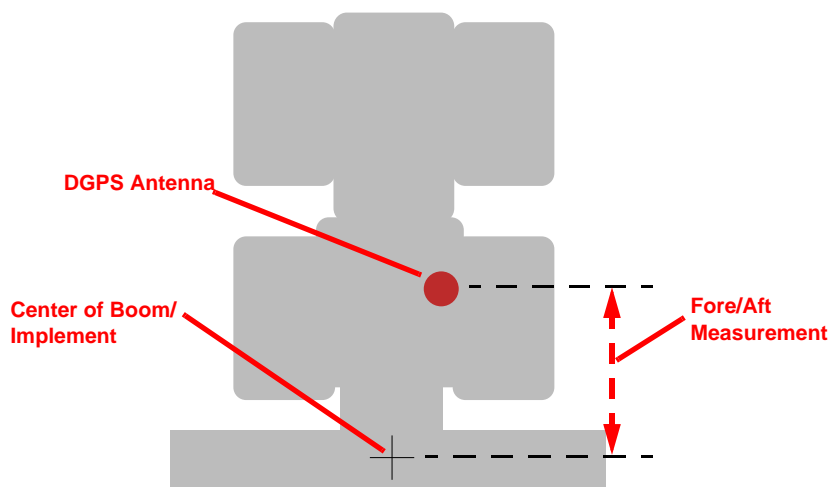


Antenna Position		Units: in.
Fore / Aft	108.00	
Left / Right	0.00	
Antenna Height	146.00	

Implement in Front  
 Left of Center

**Fore or Aft Offset.** The fore/aft offset is the distance of the boom or implement in front or behind the GPS antenna. The fore/aft offset must be measured perpendicular to the boom or implement width. See Figure 1 below.

FIGURE 1. Example of the Fore/Aft Measurement



To set the fore/aft value:

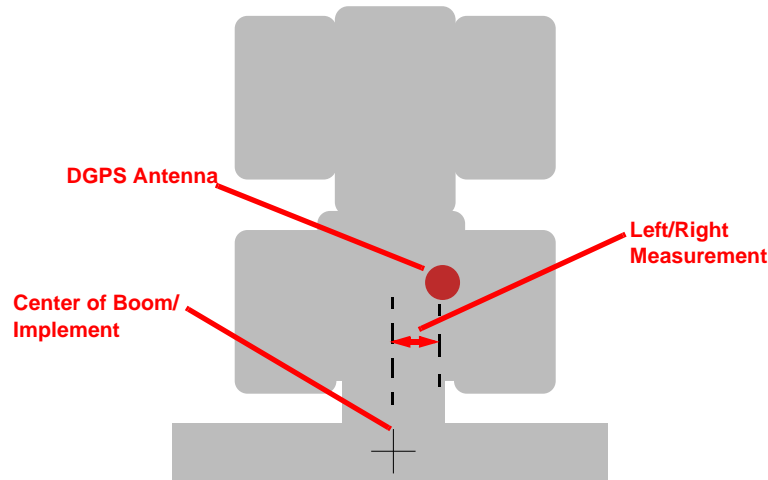
1. Touch the current fore/aft value displayed on the Raven Offsets Setup screen.
2. Use the keypad to enter the measured fore/aft value in inches [centimeters]. If the boom or implement is in front of the GPS antenna, select the 'Implement in Front' option.

**Left or Right Offset.** The left/right offset is the distance from the GPS antenna to the center line of the boom or implement.

**Note:** *The left/right offset must be measured parallel to the boom or implement width. See Figure 2 below.*

FIGURE 2. Example of Left/Right Measurement

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To set the left/right value:

1. Touch the current left/right value displayed on the Raven Offsets Setup screen. Use the keypad to enter the measured left/right value in inches [centimeters]. If the center line of the boom or implement is to the left of the GPS antenna, select the 'Left of Center' option.


**Antenna Height.** The height value is the measurement from the ground to the bottom of the GPS antenna.

**Note:** *This value is only required if a tilt corrected DGPS signal is sent to the field computer.*

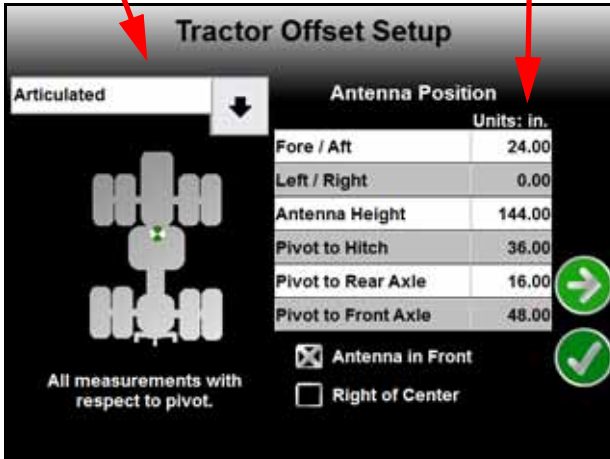
To set the Height value:

1. Touch the current height value displayed on the Raven Offsets Setup screen.
2. Use the keypad to enter the measured height of the antenna in inches [centimeters].

## Trailed Implement Tractor Setup

If either of the trailed implement options are selected on the Implement Type screen, touch the Next  icon to display the Tractor Offset Setup screen. The antenna position settings are used to calibrate the field computer for the relative location of the tractor pivot point with respect to the GPS antenna position.

**Important:** *The pivot point for a conventional tractor is the center of the rear axle.  
The pivot point for a tracked tractor is the center of the track length between the tracks.  
The pivot point for an articulated tractor is the point of articulation.*



**Tractor Type Selector**

**Antenna Position Offsets**

Antenna Position		Units: in.
Fore / Aft		24.00
Left / Right		0.00
Antenna Height		144.00
Pivot to Hitch		36.00
Pivot to Rear Axle		16.00
Pivot to Front Axle		48.00

Antenna in Front  
 Right of Center

1. Touch the drop down selection in the upper, left corner of the screen and select the tractor type which will be used with the control system.
2. Review the following definitions of the offsets necessary to complete the tractor setup process. These values are critical for performance of the field computer and product or implement control system. Measure carefully and enter the offset values as accurately as possible to help ensure the best results.

**Fore/Aft Offset.** The fore/aft offset is the distance of the GPS antenna in front or behind the pivot point. The fore/aft offset must be measured parallel to the direction of travel.

**Note:** *If the GPS antenna is in front of the pivot point, select the 'Antenna in Front' option at the bottom of the screen. See Figure 1 on page 157.*

**Left/Right Offset.** The left/right offset is the distance of the GPS antenna to the left or right of the pivot point. The left/right offset must be measured perpendicular to the direction of travel.

**Note:** *If the GPS antenna is to the right of the pivot point, select the 'Right of Center' option at the bottom of the screen. See Figure 2 on page 158.*

**Antenna Height.** The antenna height value is the measurement from the ground to the bottom of the GPS antenna.

**Pivot to Hitch.** The pivot to hitch value is the distance from the pivot point to the vehicle hitch. This value must be measured parallel to the direction of travel.


**Important:** *The field computer assumes that the vehicle hitch is located directly behind the vehicle pivot point.*

**Pivot to Rear Axle.** (Articulated Vehicles Only) The pivot to rear axle value is the distance from the pivot point to the center of the rear axle. This value must be measured parallel to the direction of travel.

**Pivot to Front Axle.** (Articulated Vehicles Only) The pivot to front axle value is the distance from the pivot point to the front axle. This value must be measured parallel to the direction of travel.


3. To enter or edit the antenna offset values on the Tractor Offset Setup screen:
  - a. Touch the desired offset or value to edit.
  - b. Use the on-screen keypad to enter the measured offset value in inches [centimeters].

**Note:** *The field computer will not recognize a negative value for any of the offset values. Be sure to enter sure to enter positive values for each offset. All negative values entered will be reset to '0.'*

4. Touch the Next  icon to proceed with the trailed implement configuration.

To configure standard pull-type implements (e.g. towed sprayers, anhydrous tool bars, planters, etc.), refer to the *Trailed Implement Setup* section on page 160.

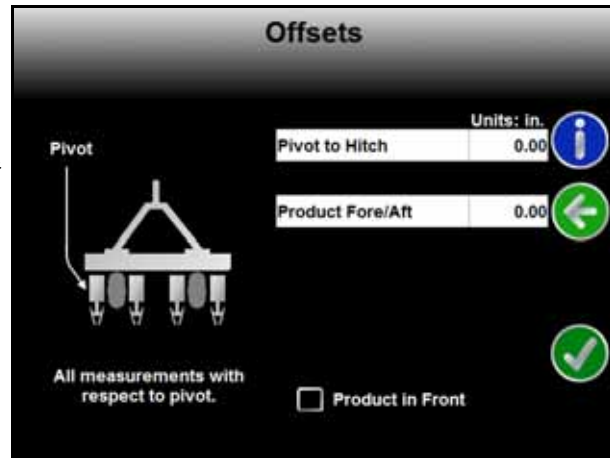
Refer to the *Trailed Implement with Tow Between Setup* section on page 161 to set up an implement like an air seeder where the air cart is towed between the tractor and seed drill.

**Note:** Use the standard trailed implement type to configure an air seeder system where the air cart is towed behind the seed drill. Use the Previous  icon to return to the Implement Type screen if necessary.

### Trailed Implement Setup

**Note:** The following instructions apply to a implement pulled directly behind a tractor such as a pull-type sprayer, anhydrous tool bar or planter. Refer to the *Trailed Implement with Tow Between Setup* section on page 161 to configure an implement such as an air seeder with the air cart towed between the seed drill and the tractor.

1. If the standard Trailed Implement option is selected as the implement type, the Offsets will display after the Tractor Offsets Setup screen.
2. Review the following definitions of the offsets for the trailed implement setup. These values are critical for performance of the field computer and product or implement control system. Measure carefully and enter the offset values as accurately as possible to help ensure the best results.



**Pivot to Hitch.** The pivot to hitch value is the distance from the hitch point to the implement pivot point. The pivot point on an implement is usually either the center of the wheel base which the implement turns around or the point where the implement makes contact with the ground during field operations.

This value must be measured parallel to the direction of travel.

**Product Fore/Aft.** Enter the distance between the implement pivot point and the product sections on the implement. The product sections are the point which completes the desired task during field operations such as the center of the boom on a pull-type sprayer, seed tubes on a planter, knives on an anhydrous tool bar, or the center of the working width of a disc. This value must be measured parallel to the direction of travel.

**Important:** If an implement configuration or modification changes the product fore/aft setting, verify that the section configuration will need to be reconfigured. Refer to the *Sections* section on page 162 for information on setting up the sections and section offsets.

**Product in Front Option.** Select the option at the bottom of the screen if the product sections are in front of the implement pivot point.

3. To enter or edit the implement offset values on the Offset screen:
  - a. Touch the desired offset or value to edit.
  - b. Use the on-screen keypad to enter the measured offset value in inches [centimeters].

**Note:** The field computer will not recognize a negative value for any of the offset values. Be sure to enter sure to enter positive values for each offset. All negative values entered will be reset to '0.'

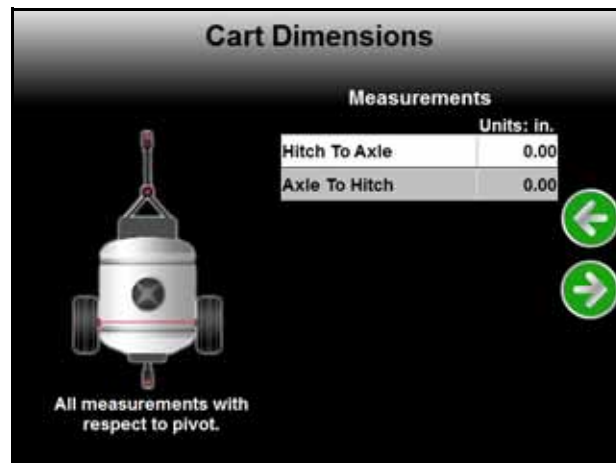
4. Touch the Next  icon to complete the trailed implement configuration.

## Trailed Implement with Tow Between Setup

**Note:** The following instructions apply to implement configurations such as air seeders with the air cart towed in between the seed drill and the tractor. Refer to the Trailed Implement Setup section on page 160 to configure an implement pulled directly behind the tractor such as a pull-type sprayer, anhydrous tool bar, or planter.

1. If the Tow Between option is selected as the implement type, the Cart Dimensions screen will display after the Tractor Offsets Setup screen.
2. Review the following definitions of the offsets for the trailed implement setup. These values are critical for performance of the field computer and product or implement control system. Measure carefully and enter the offset values as accurately as possible to help ensure the best results.

**Hitch to Axle.** The first value on the Cart Dimensions screen should be measured from the tractor hitch pin to the air cart pivot point, usually the center of the air cart axle.





**Note:** If used with a four wheel air cart, the hitch to axle measurement may need to be adjusted to provide accurate trailed implement mapping.

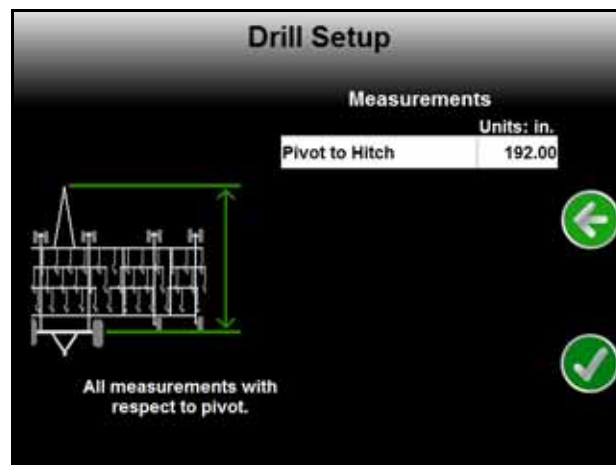
This value must be measured parallel to the direction of travel.

**Axle to Hitch.** The second value on the Cart Dimensions screen is the measurement from the pivot point to the hitch at the back of the air cart. When the two measurements on the Cart Dimensions screen are added together, the value should equal the overall length of the air cart from the tractor hitch pin to the rear hitch. This value must be measured parallel to the direction of travel.

3. To enter or edit the implement offset values on the Cart Dimensions screen:
  - a. Touch the desired offset or value to edit.
  - b. Use the on-screen keypad to enter the measured offset value in inches [centimeters].

**Note:** The field computer will not recognize a negative value for any of the offset values. Be sure to enter sure to enter positive values for each offset. All negative values entered will be reset to '0.'

4. Touch the Next  icon to proceed to the Drill Setup screen.
5. The final value required for the tow between implement type is the distance between the drill hitch pin to the pivot point of the seed drill. Generally, the pivot point for a seed drill is the center of the rear frame axle.
6. Touch the Next  icon to complete the trailed implement with tow between cart configuration.



## Sections

If the planter control node is detected on the CANbus, the Sections icon provides access to the Product Section Setup and Planter Section Setup Wizards.

**Product Section Setup Wizard.** The Product Section Setup Wizard allows the operator to configure liquid shutoff sections or rate control sections if a product rate control node is connected to the CANbus control system. Review the Envizio Pro Installation and Operation Manual for details on completing the setup wizard for product sections.

**Planter Section Setup Wizard.** The Planter Section Setup Wizard is required to configure seed rate control and shutoff sections for a planter type implement. Review the *Planter Section Setup Wizard* section on page 19 for details on completing the section setup wizard for planter sections.

## Profiles

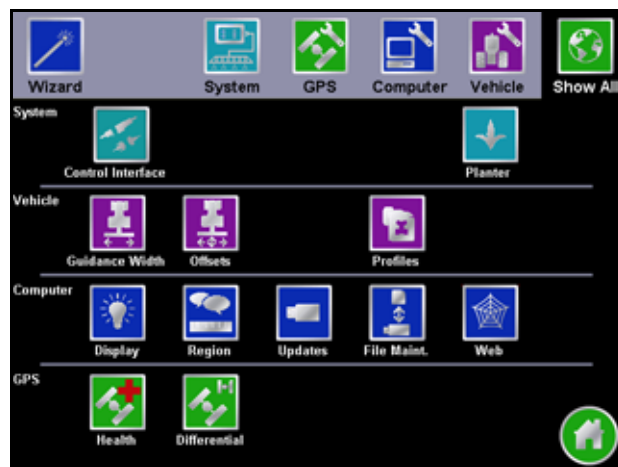
Select the Profiles icon within the Vehicle submenu to select a previously created profile, or to save the current settings as a new profile.

Profiles save the following settings:

- GPS Antenna Height and Offsets
- Swath Width
- Section Widths and Configuration

## Show All

The Show All icon in the upper, right corner of the screen displays the Tools Menu overview screen. Touch this icon to display the System, Vehicle, Computer, and GPS menus and the individual pages accessible in each menu on one screen. Touch the Show All icon to display the Tools Menu overview.



---

## *Overview*

The Envizio Pro File Maintenance feature allows the operator to manage job related files right in the cab.

Raven recommends performing File Maintenance at least once a week and storing job related files on a home or office PC. Printable job reports may be created from files stored on a home or office PC.

**Note:** *The File Maintenance feature requires a specific file structure on the USB drive which the field computer uses to automatically transfer job files. The field computer will not be able to locate files if the file structure is modified. Make sure to save the files to the correct folder on the USB drive before attempting to load files back onto the Envizio Pro field computer.*

*Depending upon the size of the completed job(s), file maintenance may take several minutes to complete. A typical job of 200 acres should take approximately five minutes. Larger fields and coverage maps with the Individual Row Control system could take significantly longer. Check the File Maintenance screen available memory display periodically and perform file maintenance as necessary.*

Job related information transferred to a USB drive or stored on a PC may also be transferred back to the field computer as necessary for new job applications.

This chapter also contains detailed instructions for downloading and applying software updates for the Envizio Pro field computers.

## File Maintenance

Coverage maps and field boundaries, saved A-B Lines, as well as zone maps can be transferred to a USB drive or deleted from memory using the File Maintenance feature.

### File Outputs

When performing file maintenance, the field computer transfers job and file information in the following formats:

- Job data package, or .jdp files, for use with the Slingshot web service.
- Bitmap, or .bmp files, can be opened on nearly any computer operating system without special software.
- The shapefile format requires specialized software to view the shapefiles on a home or office PC. Shapefiles consist of four separate files, each with the same file name. A file with the .shp, .shx, .prj, and .dbf file extensions are all essential for the shapefile format to function correctly.

To save memory resources on the field computer, the Envizio Pro only generates the printable bitmap and shapefile reports when file maintenance is performed. For this reason, actual memory requirements for the USB drive will be greater than the disk space used on the field computer internal memory.

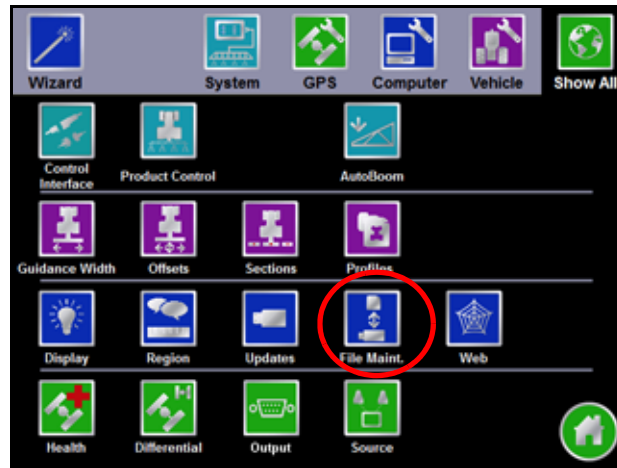


Available memory resources of the field computer and the connected USB drive are displayed at the bottom of the File Maintenance screen. It is recommended to use a USB flash drive with at least 512 MB.



## Performing File Maintenance

1. Open the Tools menu and select the File Maintenance icon in the Computer Menu.




2. If the connected drive has not previously been used to transfer job files from the Envizio Pro, touch the icon along the right side of the screen to setup the required file structure.



For more information regarding the file structure on the USB drive, refer to the *File Structure* section on page 169.

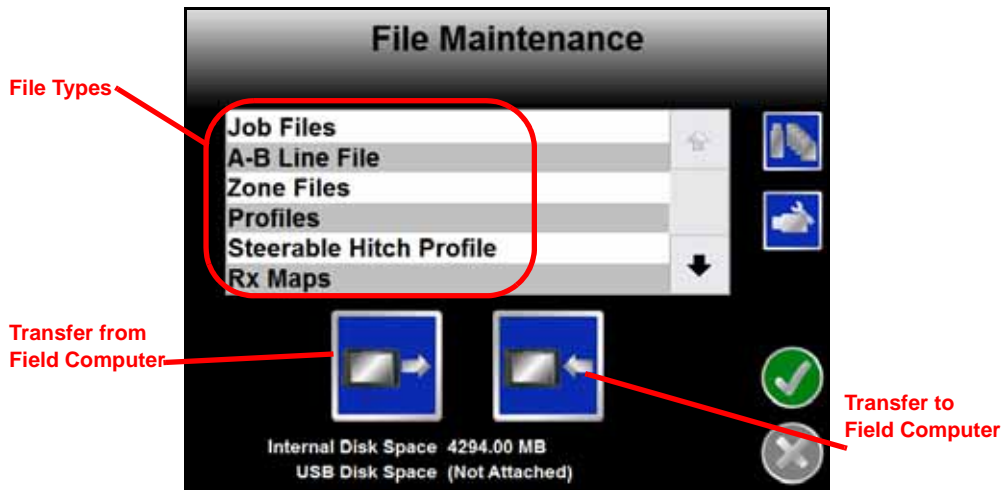
3. Select the type of file on which the file maintenance operation will be performed.

4. Press the Configure File Output  icon.
5. Check the configuration setup.

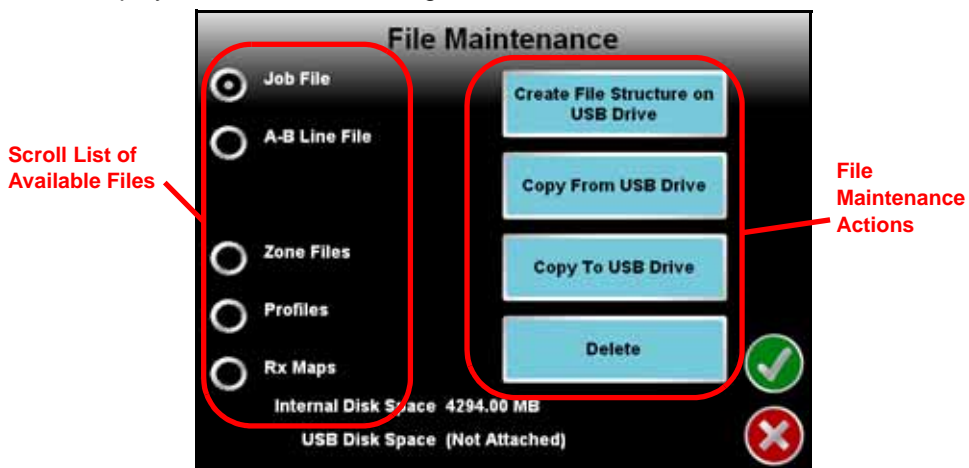
- Report: A report file includes rate, area covered, and other basic operation information.
- Shapefile: records the geographic features (field boundaries, spray zones, etc).



- Slingshot: Selecting Slingshot creates a JDP report that will be uploaded to the Slingshot report website.



6. To begin working with the selected file type, touch the transfer to or transfer from field computer icon below the list of file types. For example, if the operator selects “Job Files” and the “from Field Computer,” the Job Files screen will display similar to the following:



7. Use the following icons to perform the desired file maintenance actions:

## Transfer From Field Computer



Configuration settings.



Select left icon to transfer a selected file to the connected USB flash drive or the right icon to transfer all files of the selected type currently saved on the field computer.



Select the left icon to export the Slingshot® data package for a selected job file to the connected USB flash drive or the right icon to export data packages for all job files currently stored on the field computer



**Note:** *Jobs exported to a USB flash drive using the Slingshot File type may be uploaded to the Slingshot web site using a home or office computer. Jobs exported using only the slingshot file type are not transferable to other Envizio Pro field computers.*

[www.ravenslingshot.com](http://www.ravenslingshot.com)



Select the left icon to delete a selected file from the field computer or the right icon to delete all files of the selected type currently saved on the field computer.



**Note:** *The Delete button will not affect any files on the flash drive. To remove files from the flash drive, use the PC's file browser (i.e. Windows Explorer) to remove, delete or copy files from the flash drive.*



Touch this icon to manually initiate upload of a selected file currently stored on the field computer via a Slingshot® Field Hub and available wireless connection.

**Note:** *Refer to Appendix C, Wireless Communications & Remote Service, for more information on transferring files using the Slingshot service.*

## Transfer To Field Computer



Select the left icon to transfer a selected file to the field computer or the right icon to transfer all files of the selected type currently stored on the USB flash drive.



1. A confirmation screen will appear. Touch the Accept icon to proceed with the selected action or the Cancel icon to return to the File Maintenance screen without moving or deleting the selected files.
2. Once the action has been completed, touch the Accept icon again to return to the previous file type screen.

3. A confirmation screen will appear. Touch the Accept icon to proceed with the selected action or the Cancel icon to return to the File Maintenance screen without moving or deleting the selected files.

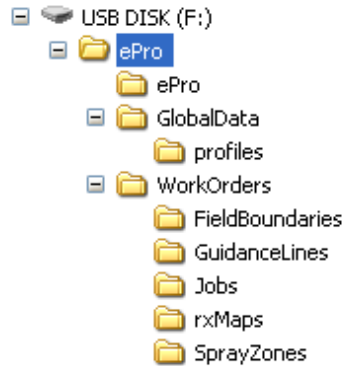


4. Once the action has been completed, touch the Accept icon again to return to the previous file type screen.



## File Structure

When the File Structure is properly setup on the USB drive, the following directories and files are created and can be found on the flash drive when the flash drive is inserted into a home or office PC. Below is a list of files and folders that the field computer automatically creates on the USB drive:



### ePro Directory

The main directory containing all of the information transferred from the field computer. The ePro directory keeps all Envizio Pro files separated from other files which may be stored on the flash drive.

#### ePro

The ePro sub-folder contains files used by the field computer.

#### Global Data

Information not specific to individual job files is stored in the Global Data folder.

**Profiles.** The .pfl files contained within the Profiles folder contain configuration information for each profile. The field computer creates one .pfl file for each saved profile. Profile files are used by the field computer OS and are not viewable.

#### Work Orders

Job information for each job transferred to the USB flash drive is stored in sub-folders contained within the folder labeled Work Orders.

**Field Boundaries Folder.** All shapefile boundaries (consisting of .shp, .shx, .dbf files) saved to the field computer for use as boundary shapes will be stored in this folder.

**Note:** *The shapefile format consists of four separate files, each with the same file name. A file with the .shp, .shx, and a .dbf file extensions are all essential for the shapefile format to function correctly.*

**Guidance Lines Folder.** All transferred guidance paths are saved in the Guidance Lines folder. Line or path files have the .ab file extension. Guidance Line files are used by the field computer OS and are not viewable.

**Jobs Folders.** Each job transferred to the USB drive is stored in a separate folder within the jobs directory. Each job folder contains the Coverage, Shapefiles, and Reports sub-folders. A Slingshot folder may also display in the job folder if a Slingshot job data package is exported to the USB flash drive. When selected in the field configuration, to save memory resources on the field computer, files saved within the Shapefiles and Reports folders are created only when the job files are transferred to the USB drive.

- The Coverage folder contains product coverage map files that have a .cov, .ini or .jdf extension. The field computer saves one coverage file for each product and each job. Coverage files are used by the field computer OS and are not viewable.
- The Shapefiles folder contains reports which the field computer generates during file maintenance. Each product applied during each job will have four separate files with .shp, .shx., .prj, and .dbf file extensions. Specialized software may be required to view the shapefile reports and each file is essential for the shapefile format to function correctly.
- The Reports folder contains bitmap reports which the field computer generates during file maintenance. Each product applied during each job will have a .bmp file. Bitmap reports are viewable on any computer.
- A Slingshot folder will be created for any job for which a job data package (\*.jdp.zip) is exported to the USB flash drive. The Slingshot folder contains the files required to upload to a Slingshot viewer or user account to create reports or archive job information. Review the *Performing File Maintenance* section on page 165 for more information on exporting a job data package to a connected USB flash drive.

**Reference (Ref) Maps Folder.** Reference maps may be transferred to the field computer for use during harvest operations using the Raven SmartYield system. Reference maps are generally the coverage or as-planted maps with population, crop variety, or other information that may be used to compare crop inputs with the harvest yields for the same field.

To transfer a reference map onto the field computer:

1. A previous planting operation must be completed and completed job data package (.jdp) files transferred to the Slingshot web site.  
Review the *Performing File Maintenance* section on page 165 for more information on exporting a job data package to a connected USB flash drive if a Slingshot Field Hub wireless subscription is not available.
2. Export the shapefiles from the completed job data package and copy these files into the “RefMaps” folder on the USB flash drive used with the Envizio Pro field computer.
3. When setting up a new job for the harvesting operation using SmartYield, select the appropriate reference map. Refer to the SmartYield Installation and Operation Manual for details on setting up a SmartYield job and loading the reference map files.

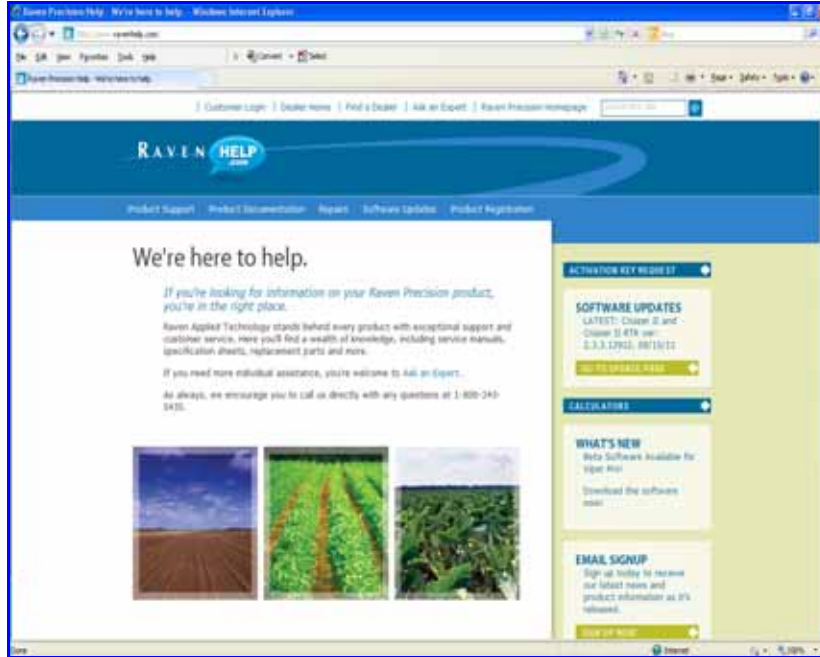
**Rx Maps Folder.** Prescription maps, variety, or hybrid maps saved on the USB drive are located in the rxMaps folder. Each map must have the .shp, .shx., and .dbf files associated with the prescription map saved in this folder. Each file must have the same file name and each file extension is essential for the shapefile format to function correctly. Special software may be required to view the rxMaps files.

**Spray Zones Folder.** Any zone maps transferred to the USB drive are stored in the spray zones folder. Files saved in this folder will have the .zone extension. Each zone map creates one .zone file. Zone files are used by the field computer OS and are not viewable.

## Updates

Software updates for the field computer will be available periodically from the Raven web site:

[www.ravenhelp.com](http://www.ravenhelp.com)

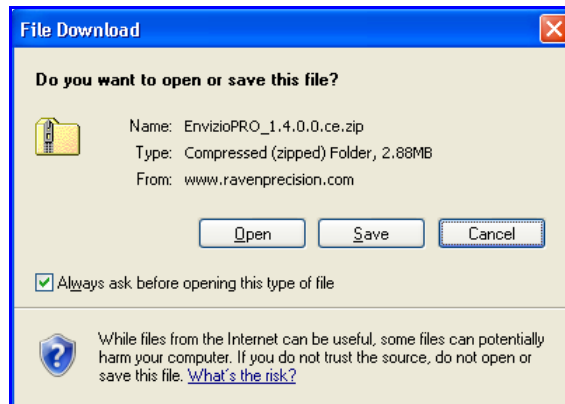


**Note:** Screens and prompts may display differently depending upon the version of operating system and the PC or laptop on which the field computer update is downloaded. For additional assistance, refer to the user help information for your specific browser or operating system.

1. Locate the latest Envizio Pro update.

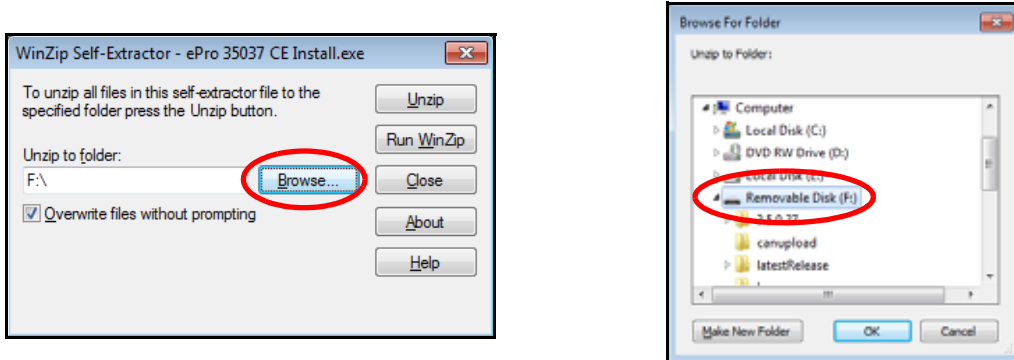
**Note:** Verify that the correct product and software version is displayed at the top of the release notes before proceeding.

2. Select View to review the software release notes for the new software version. The release notes page may have important information about the software update and how updating the field computer may affect operation. Please read this page and be sure to follow any special instructions.
3. Select the Download link to begin downloading the software update.
4. If the following dialog displays, select the Save option to save the files to a home or office computer.



Download the update file to the desktop. The software must be extracted to the USB flash drive before loading onto the Envizio Pro field computer.

5. Insert the USB flash drive used with the field computer into an available USB port.
6. Double click on the .exe file and, if prompted, select “Run” to display self-extractor prompt.

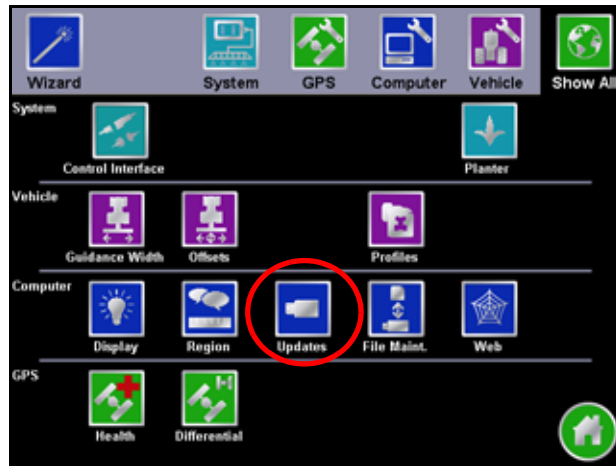


7. Select the Browse... button and then locate the flash drive in the Browse For Folder prompt.
8. Select the primary directory, or root, disk to extract the software update file. To successfully update the Envizio Pro, the update files cannot be placed in any sub folders or directories. The Unzip to folder field in the self-extractor prompt should display similar to the example above where F:\ may be replaced by the drive letter assigned to the flash drive connected to your PC.

## Applying Software Updates

Use the following procedure to apply software updates to the field computer.

1. Before inserting the flash drive into the Envizio Pro, switch the power on and wait for the field computer to power up.
2. From the Home screen, select the Tools menu icon and touch the Updates icon located in the Computer Menu.





3. Insert the USB flash drive with the extracted software update into an available USB port on the field computer. A list of the available updates will appear on the screen.



**Important:** The 'EnvizioPro\_NoCanDemo' update is for demonstration purposes only. Do not select this option for normal operation applications.

4. Select the software update and touch the Next icon to begin updating the field computer.
5. Once the software update is finished, restart the field computer.



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## *Introduction*

AccuRow is an automatic planter section control feature included with the OmniRow planter control system. The AccuRow feature allows the control system to automatically control planter sections by referencing the coverage map. When AccuRow detects a section entering an area where a product has previously been applied, AccuRow will automatically turn that section Off. When the section leaves the previously applied area, AccuRow automatically turns the section back On.

**Note:** *Prior to using the AccuRow feature to control planter rows or seed rate control sections, the supporting hardware components must be purchased and installed on the implement. Contact a local Raven dealer for more information.*

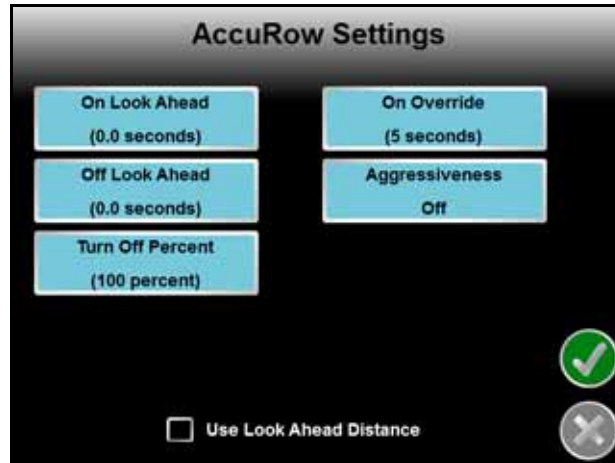
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## *AccuRow™ Setup*

Prior to using the AccuRow feature with the planter control system, the AccuRow feature must be configured. To access the AccuRow settings:

1. Touch Tools Menu.
2. Select Planter in the System menu.

3. Touch AccuRow to display the AccuRow Settings screen.



**Note:** If the Function Disabled screen appears when the AccuRow icon is selected, troubleshoot the planter control node. See the CAN Troubleshooting section in Chapter 3, CAN Networking and Diagnostics, or Chapter 11, Troubleshooting, for help troubleshooting the planter control node.

The following options are available on the AccuRow Settings screen.

### Look Ahead

Set the AccuRow Look Ahead setting to the number of seconds (determined by speed) the field computer is allowed to scan in front of the current implement position for zone map features. The On and Off Look Ahead settings may help to compensate for the time required to adjust the section rate control or row shut off features based upon the zone map.

A non-zero On look ahead value allows AccuRow to begin turning on planter controls while a non-zero “Off” look ahead will allow AccuRow to begin turning off planter controls.

**Note:** Setting the look ahead values too high may cause the control system to turn on or off too early. This may cause overlaps, skips, or undesirable seed rate in some areas. Generally, these settings should not exceed 5 seconds and a value between 1 to 2 seconds will yield the best results. Adjust the turn off and turn on look ahead values independently to adjust response of the OmniRow system.

### Use Look Ahead Distance

Enable the Use Look Ahead Distance option on the AccuRow Settings screen to set look-ahead values in units of distance rather than time.

**Note:** The vehicle must travel at a constant speed while using the look ahead distance.

## Turn Off Percent

This value controls the percentage of a section that must cross a field or plant zone boundary, or enter a previously applied area, before AccuRow will control that section. The default value is 100%.

Using the default setting, when 100% of a section crosses into a no-plant zone or previously applied area, AccuRow will toggle the section off.

**Note:** *If the turn off percent value is set to 0%, sections will not turn off automatically.*

## On Override

Touch On-Override and use the up or down arrows to increase or decrease the override time for the AccuRow feature.

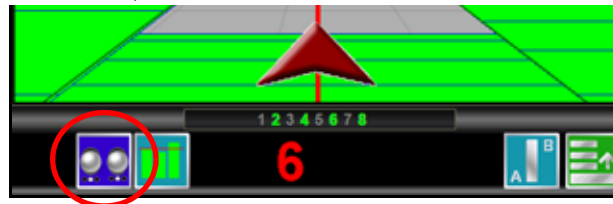
**Note:** *The Override value is not used if a CAN switch box is installed on the CANbus. The On Override feature is useful when backing into corners during boundary planting, to begin applying product from a complete stop, or to recover a specific area of a field.*

To enable the override during an AccuRow enabled job:

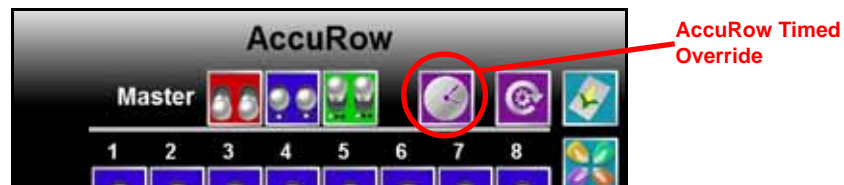
1. Toggle the Master on the Raven CAN Switch Box to the Override position.
2. The override timer will display a countdown for the override time in the switch box icon location. When the override time expires, the switch box icon will return.

If a CAN switch box is not installed with the control system, the on-screen switch box may be used to enable the override feature. To enable the override during an AccuRow enabled job using the on-screen switch box:

1. Touch the master switch in the lower, left corner of the Guidance screen.



The AccuRow Override screen will open.



2. Touch the Override button. AccuRow section control will toggle all sections on for the set override time. The remaining override time will be displayed on the master switch icon displayed at the bottom of the Guidance screen.

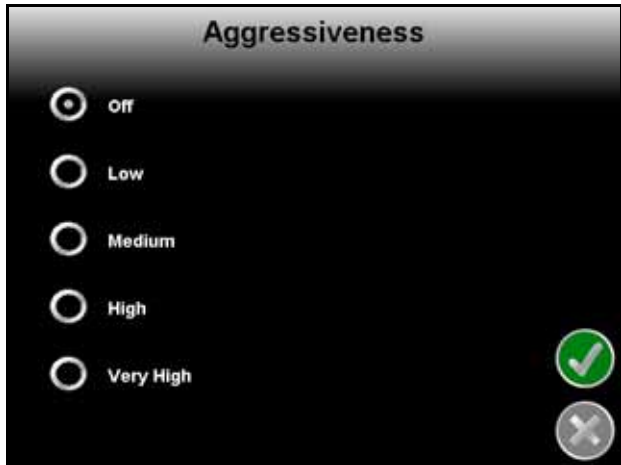
**Note:** *Refer to the Enabling AccuRow™ section on page 179 for more information about the master switch and AccuRow Override screen.*

## Aggressiveness

The aggressiveness setting adjusts the AccuRow feature response for large implements or aggressive driving styles.

The look-ahead values set the amount of time ahead of the implement (based on vehicle speed) which the field computer will scan for zone boundaries or unapplied areas when turning sections on or off. By default, AccuRow overrides any additional zone boundaries detected until the look-ahead time has passed. For example, if the turn-on look-ahead value is set to 5 seconds and AccuRow detects an unapplied area 5 seconds ahead of a section, AccuRow toggles that section on and will ignore subsequent commands to turn that section off until the section has entered the unapplied area.

For sections at the end of larger implements, or where sharp turns or aggressive maneuvering is necessary, this override may cause unexpected skips in coverage. The aggressiveness factor uses the user defined look-ahead values to adjust AccuRow response for these driving styles and/or field areas requiring aggressive maneuvering when crossing zones. Higher aggressiveness settings will increase the override distance for subsequent AccuRow section control commands. To set the AccuRow aggressiveness from the main screen:



1. Touch the Tools Menu and select the Planter icon located within the System menu.
2. Select AccuRow Settings > Aggressiveness.
3. Select the desired aggressiveness setting to match the operator driving style or requirements.
4. Touch Accept to save the aggressiveness factor setting and return to the AccuRow Settings screen.

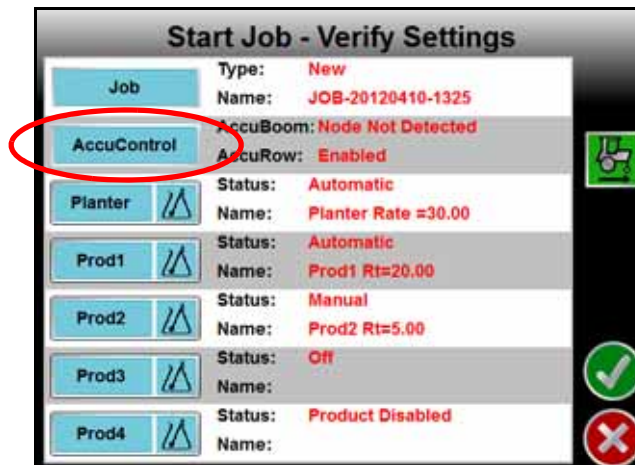
## Enabling AccuRow™

The AccuRow feature is active during planter control operations. To create a new plant zone map or load a previously created plant zone map:

1. Select Start Job on the Home screen.

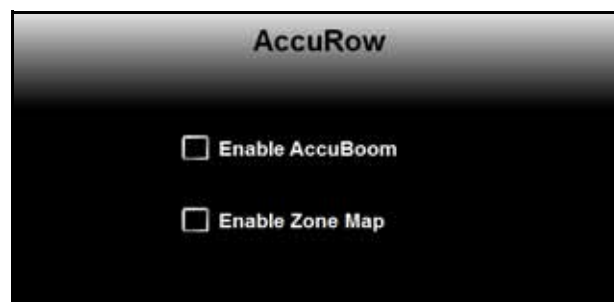


2. Touch the AccuControl button on the Verify Settings screen (See Chapter 5, *Basic Operation*, for details on other settings and features enable on the Verify Settings screen).



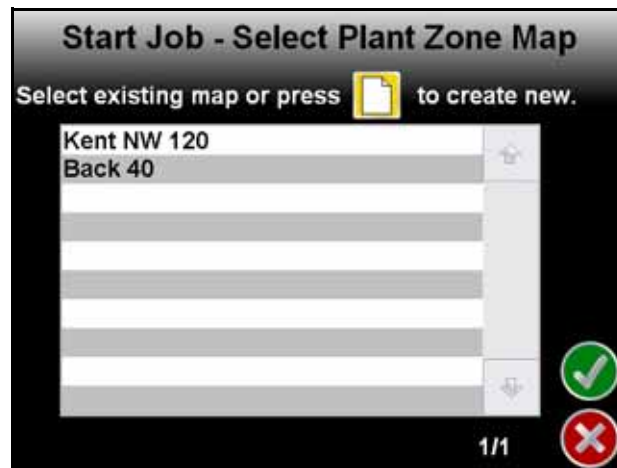
3. Leave the 'Enable Zone Map' option deselected to use Standard AccuRow section control only. See the *AccuRow™ Modes* section on page 180 for more information on the AccuRow modes.

Touch Accept and skip to step 6 if Standard AccuRow is the desired mode of operation for this job. Proceed to step 4 to select a zone map for this job.



4. Select the Enable Zone Map option to enable the zone mapping mode.

The Start Job - Select Zone Map screen is displayed when the 'Use Plant Zone Map' option is enabled.



- a. Select the name of a previously saved zone map to use with this job and touch the Accept icon to return to the Start Job - Verify Settings screen.
- b. To create a new map, touch Create New and enter a name for the zone map that will be created within the job.

**Note:** Zone maps and map file names cannot begin with a space.

5. Touch the Accept icon to save the entered name and return to the Verify Settings screen.
6. Verify the other available settings or features are setup correctly before beginning the job.

## AccuRow™ Modes

The available modes for operating AccuRow are:

### Standard AccuRow™ Mode

In jobs using Standard AccuRow mode, zone maps cannot be created or loaded. Automatic section control is based upon the coverage map only. As sections enter previously applied areas, AccuRow will automatically turn that section Off. When the section leaves the previously applied area, AccuRow automatically turns the section back On.

The standard field boundary tools are used while operating in Standard AccuRow mode. Refer to the *Field Boundary* section on page 91 for information on the standard field boundary tools.

Zone maps cannot be loaded or created in the Standard AccuRow mode. To use or create a zone map, be sure to select the 'Enable Zone Map' option during the Start Job - Verify Settings procedure. See the *Enabling AccuRow™* section on page 179 for more information on enabling zone mapping.

### Zone Mapping Mode

Zone maps create features within a field which allow AccuRow and the field computer to automatically shut off or turn on product application as the machine travels through the field. The field computer may be used to create and save AccuRow zone maps for each field in which automatic section control is desired.

**Plant Zones.** In areas where planting or seeding is desired, a plant zone allows AccuRow to turn on sections and the field computer to control application rates as normal.



**No-Plant Zones.** No-plant zones may be created and saved around any areas in which planting or seeding should be avoided, such as access ways, waterways, or around well heads. AccuRow uses the zone map to control sections as the machine travels through the field.

For example, as the implement crosses into a no-plant zone, AccuRow will automatically shut off any sections that enter the no-plant zone while other sections remain enabled. As the sections re-enter unplanted plant zones, AccuRow will automatically toggle sections back on.

**Field Boundaries.** Field boundaries within an AccuRow enabled job automatically create a zone map based upon the completed boundary. A field boundary recorded without the AccuRow feature enabled can be converted to an AccuRow field boundary later. See the *Loading a Field Boundary* section on page 182 for details.

**Note:** *A job file can be saved with any number of plant or no-plant zones, but a job file may only contain a single field boundary.*

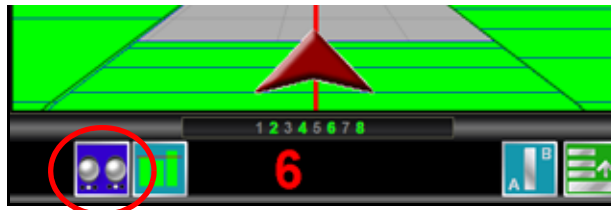
Within the completed boundary, AccuRow assigns the area as a normal plant zone. No-plant zone's can be recorded later to edit the area within the field boundary. AccuRow assigns a minimum of three boom or implement widths outside of the completed field boundary as a no-plant zone. The Envizio Pro will also disable section control features when the vehicle is outside of the recorded field boundary.

**Note:** *Even though the field computer automatically controls sections when the vehicle is outside of the field boundary, it is not recommended to approach nurse trucks or refilling stations while automatic section control is enabled. Toggle the vehicle master switch to keep AccuRow from turning on sections unexpectedly.*

*If the Enable Zone Map option is not selected during the Start Job - Verify Settings process, AccuRow will not assign plant/no-plant zones to completed field boundaries.*

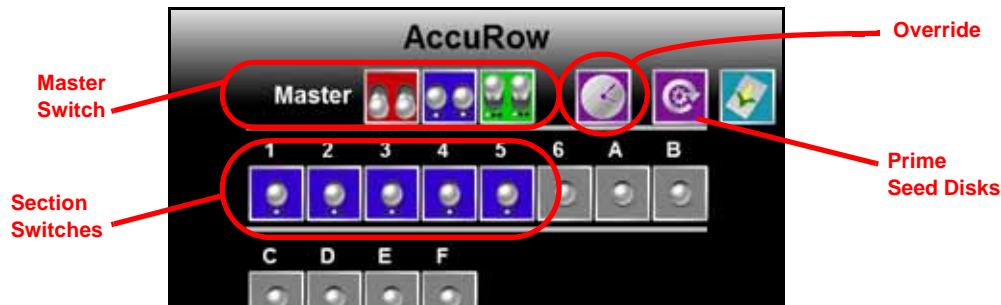
## On-Screen Switch Box

If an optional automatic section control feature is enabled for the current job, the on-screen switch box icon will be displayed in the lower, left corner of the Guidance screen.



**Note:** *The on-screen switch box is not available if a Raven CAN switch box is connected to the CANbus.*

Touch this icon to access the section control feature screen to control individual sections or activate the feature override.



The AccuRow screen displays the following icons to control sections:

**Master Switch Control.** Touch the master off, automatic or on icons to toggle all sections currently set to automatic control. Tapping the master switch indicator will toggle any sections currently in the automatic mode to the selected status. Tap the automatic mode will toggle those sections back to automatic while leaving any manually controlled sections to the assigned mode.

Double tap the master switch icon to toggle all section switches to the selected status.

**Section Control Switches.** Touch the individual section control switches to toggle individual sections or rows between the automatic, off or on.

**AccuRow Timed Override.** Touch the timed override icon to override the feature on for the set override time. Refer to the *On Override* section on page 177 for more information on calibrating the AccuRow feature and using the override.

**Prime Seed Disks.** Touch the Prime Seed Disks button to turn all rate control sections or row units one full revolution to refill empty seed disks after refilling the planter seed boxes.

## Using Zone Maps

An AccuRow zone map may contain numerous plant and no-plant zones for each field. Zone maps may be modified at any time using the available tools and features of the zone mapping mode. The following sections will cover various methods of using zone maps and field boundaries stored on the field computer.

### Loading a Field Boundary

A field boundary recorded without the AccuRow feature enabled can be loaded as an AccuRow field boundary within a zone mapping enabled job. To load a standard field boundary into an AccuRow enabled job:

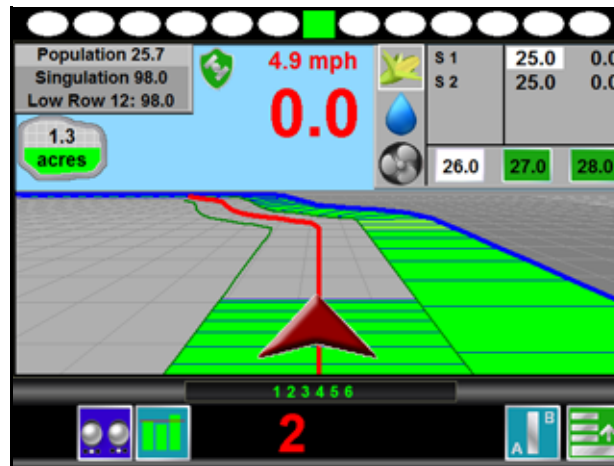
1. Touch Menu in the lower, right corner of the Guidance screen.



2. Select Zone Mapping Tools.



3. Select Load Field Boundary. A list of available field boundaries currently saved on the field computer will display.
4. Select the name of the desired field boundary and touch the Accept icon. The selected field boundary is displayed on the Guidance screen.



**Note:** Field boundaries created or exported by the Envizio Pro will be named using the job name or zone map name provided when the job was started. Shapefile boundaries may be renamed on a PC or laptop before importing the boundary onto the field computer.

## AccuRow™ Mapping Tools

The following tools are available via the Menu on the Guidance screen during an AccuRow enabled job with zone mapping.



Select the zone mapping tools to display AccuRow and zone map tools available for the current job. Tools displayed in this menu may only appear if certain map features are present within the current job. Read the descriptions of the following tools for more information regarding when the tool or feature is available.



While editing zone maps, the Home button is replaced with the Accept button. To save the currently displayed map and restore normal Menu tools, select the Accept button.



Touch the Record No-Plant Zone icon to begin recording points along a no-plant zone boundary. The area inside of the completed boundary will become a no-plant zone.



Touch the Record Plant Zone icon to begin recording points along a plant zone boundary. The area inside of the completed boundary will become a planting zone.



Touch the Record Field Boundary icon to create a new AccuRow field boundary. With the zone mapping mode enabled, AccuRow will assign a minimum of three implement widths outside of the completed boundary as a no-plant zone.

## On-Screen Tools

While recording a zone map feature, the following icons will be displayed on the Guidance screen.

### Pause

Select the Pause button displayed on the Guidance screen to temporarily interrupt recording the current zone map feature.



This feature is useful if the vehicle course will move away from the desired boundary to refill a tank, etc.

### Resume

While Paused, a Resume button will replace the Pause and End buttons on the Guidance screen. Touch this button to resume recording the paused zone feature.



### Stop

When finished recording a Zone or Boundary, touch the Stop button to close Zone or Boundary.

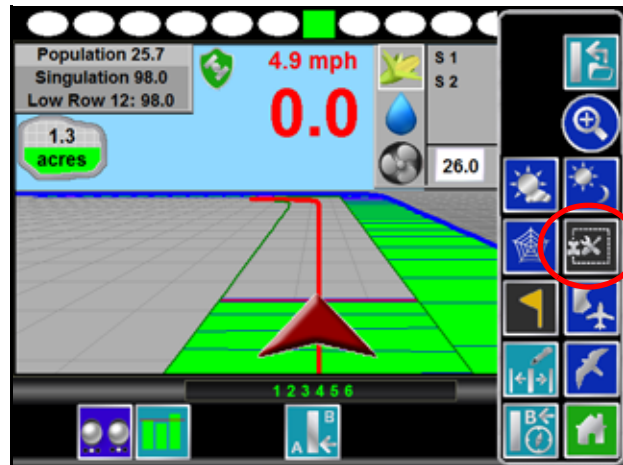


**Note:** *The field computer will draw a straight line from the starting point of the feature to the current vehicle location when closing the zone map feature.*

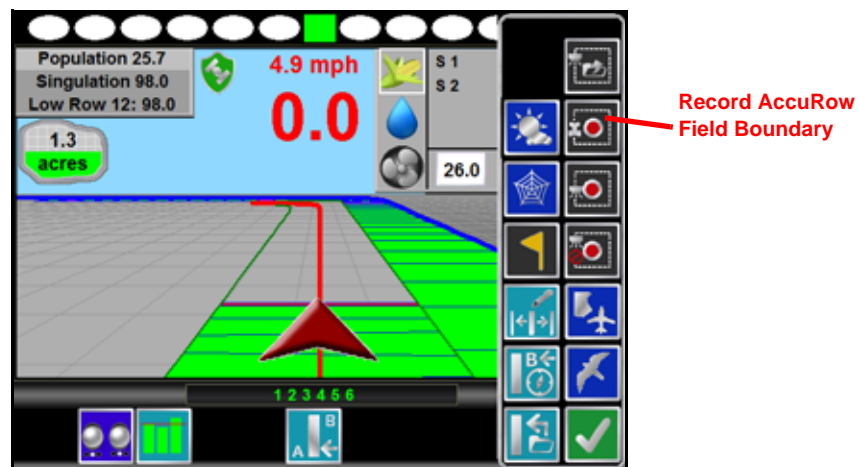
## Creating an AccuRow™ Zone Map

The following is an example of recording an AccuRow field boundary in the zone mapping mode. Other zone features may be recorded using the same procedure by using the buttons and tools as described in the *AccuRow™ Mapping Tools* section.

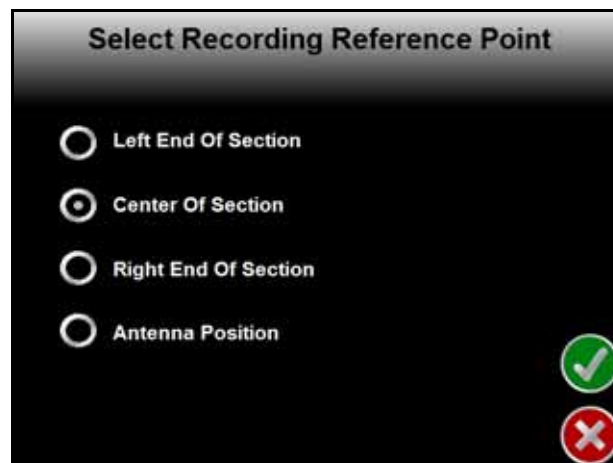
1. On the Guidance screen, access the Menu and select AccuRow Boundary Tools.



2. Select Record Field Boundary to begin recording a new AccuRow field boundary.

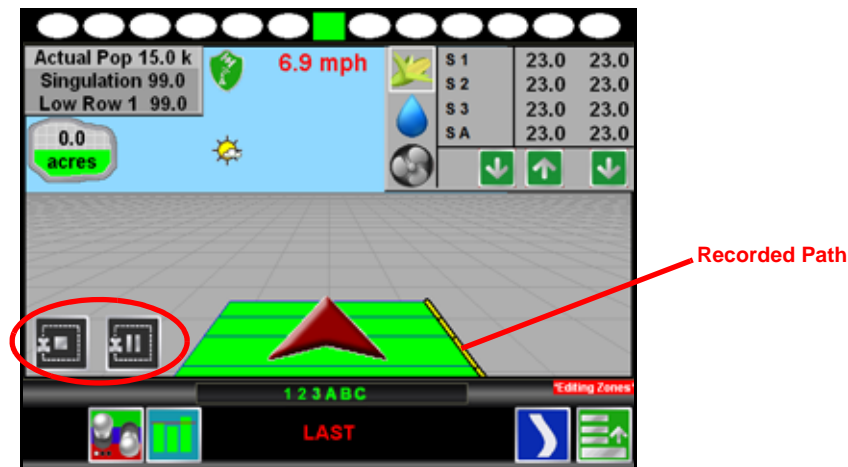


3. The Select Reference Point screen will open.



The Reference Point is the point on the vehicle where the field computer will record the selected feature boundary.

- Left and Right End of Section options set the Reference Point at the left or right end of the guidance width.
  - Center of Section sets the Reference Point at the center of the configured guidance width.
  - Antenna Position uses the left/right and fore/aft offset values to determine the DGPS antenna location.
4. To set the Reference Point, select the option that corresponds to the orientation of the vehicle with respect to the feature being recorded and then touch Accept.
  5. The Guidance screen will re-appear and the field computer will begin recording the feature at the selected Reference Point. On the Guidance screen, Pause and End appear for the feature currently being recorded.



6. Begin driving along the boundary while keeping the Reference Point aligned with the field boundary. A yellow path will be created on screen to display the path recorded.
7. Touch Stop to finish recording the current feature on the AccuRow map.

**Note:** The field computer will close the feature by drawing a straight line from the current vehicle location to the point where recording of the feature was started. Areas inside and outside of the feature will be treated accordingly.

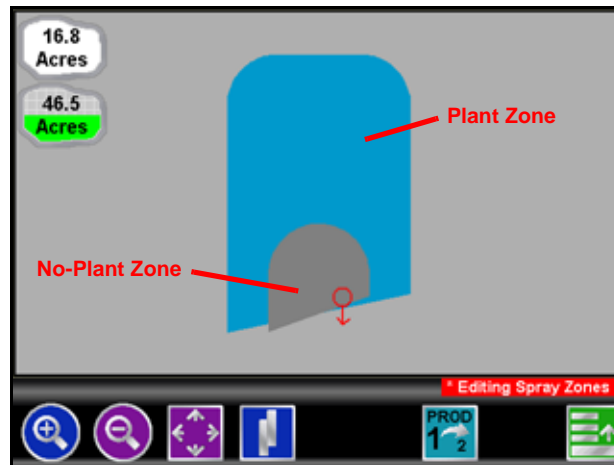
8. Repeat step 2 through step 7 for any additional features.
9. When finished recording features for the AccuRow map, select the Menu icon and then touch the Accept button to save the currently displayed AccuRow map and close the AccuRow tools menu.

**Note:** Zone map features created while recording a field boundary will not appear until the Save and Close icon is selected from the AccuRow Tools Menu.

## AccuRow™ Zone Map Examples

The following screens are examples of AccuRow maps displayed on the field computer.

**FIGURE 1. Field Review Mode While Recording a Boundary**



**FIGURE 2. Field Review Mode with Completed AccuRow™ Field Boundary and No-Plant Zone**

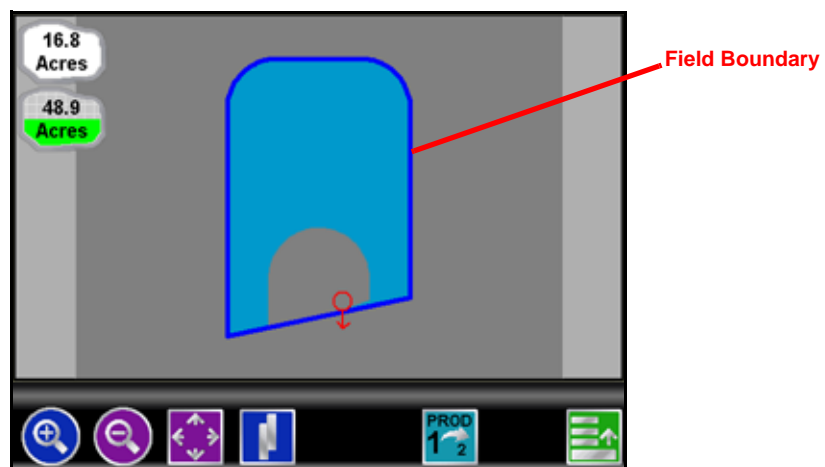


FIGURE 3. Guidance Screen in Down Field View with Completed Field Boundary

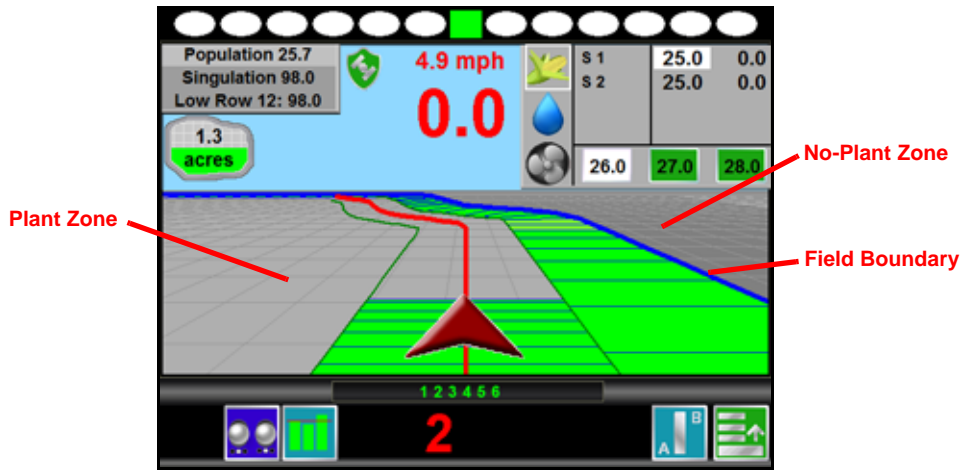
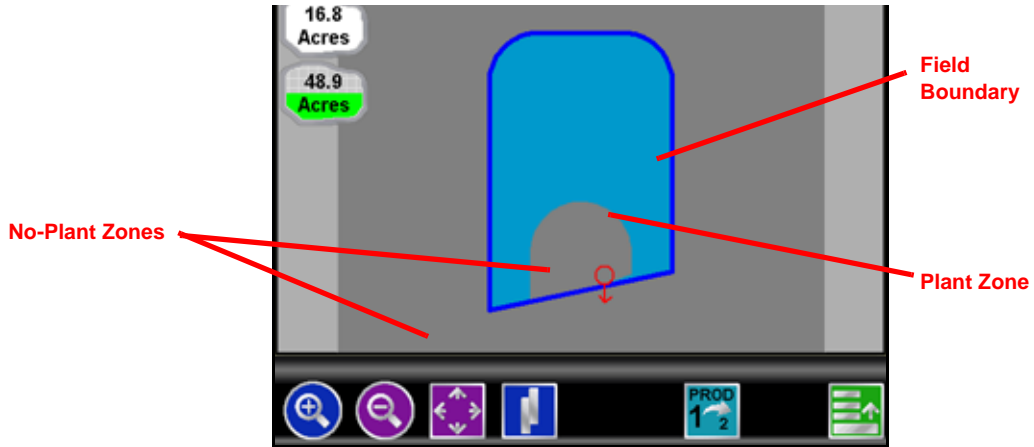


FIGURE 4. Field Review Mode with Completed AccuRow™ Field Boundary and No-Plant Zone





*Troubleshooting Information*

This chapter contains information on troubleshooting possible issues with the Envizio Pro control system. Please read through this chapter before contacting technical support, as many common issues and solutions are covered here.

## General Issues

Issue	Possible Cause	Solution
Field computer does not power up.	<ul style="list-style-type: none"> <li>• No power to unit</li> <li>• Blown fuse</li> <li>• Poor ground</li> <li>• Unit is locked up</li> </ul>	<ul style="list-style-type: none"> <li>• Check for +12V DC on pin 16 of the power cable.</li> <li>• Check for continuity in 10 amp fuse in power cable.</li> <li>• Make sure that pin 1 is connected to the battery ground.</li> <li>• Disconnect power for approximately 3 seconds and re-connect.</li> </ul>
CAN node(s) not detected.	<ul style="list-style-type: none"> <li>• No power to CAN node(s)</li> <li>• Weak or dirty power to the CAN node(s)</li> <li>• Water in CAN node(s)</li> <li>• Corrosion in CAN connections</li> <li>• Broken cable to node</li> <li>• Low power voltage</li> </ul>	<ul style="list-style-type: none"> <li>• Verify that there is 12 volt power and a proper ground to the CAN node's logic power.</li> <li>• Verify that the 12 volt power to the CAN node is coming from the switch relay that is connected to the battery.</li> <li>• Do not direct any pressure or wash stream directly at the CAN node(s) to prevent water and moisture from building up in the nodes.</li> <li>• Disconnect and clean the CAN connections.</li> <li>• Repair or replace cable.</li> <li>• Verify at least +10V DC at node.</li> </ul>
Touch screen does not respond to touch	<ul style="list-style-type: none"> <li>• Area touched does not include a selectable function</li> <li>• System is busy processing a previous request</li> </ul>	<ul style="list-style-type: none"> <li>• Touch an area of the screen that contains a selectable function.</li> <li>• Wait for system to finish processing previous requests.</li> </ul>

Issue	Possible Cause	Solution
Red DGPS Status indicator on the Home screen	<ul style="list-style-type: none"> <li>• GPS cable is not connected</li> <li>• No power to the GPS receiver</li> <li>• Incorrect port setting</li> <li>• Incorrect GPS source selected</li> </ul>	<ul style="list-style-type: none"> <li>• Check the cable between the GPS receiver and the field computer.</li> <li>• Check power to the GPS receiver.</li> <li>• Make sure that the port settings on the field computer and the GPS receiver are the same.</li> <li>• Verify that the correct GPS Source is selected. (Tools Menu&gt;GPS menu&gt;Source).</li> </ul>
Field computer does not completely power down	<ul style="list-style-type: none"> <li>• The orange wire is connected directly to a 12V power source</li> </ul>	<ul style="list-style-type: none"> <li>• Do not connect the orange wire to a source of +12VDC.</li> </ul>
Vehicle battery discharges overnight	<ul style="list-style-type: none"> <li>• CAN nodes are wired directly to the battery</li> </ul>	<ul style="list-style-type: none"> <li>• Wire the CAN nodes through a relay or switched power source.</li> </ul>

## Setup Issues

Issue	Possible Cause	Solution
Previous settings have been lost	<ul style="list-style-type: none"> <li>• Settings data deleted from memory</li> <li>• Poor CAN connections</li> </ul>	<ul style="list-style-type: none"> <li>• Review Chapter 8, <i>Tools Menu</i>, or Chapter 9, <i>Software Updates and File Maintenance</i>, for data information.</li> <li>• See the <i>CAN Troubleshooting</i> section on page 11 for more information.</li> </ul>

## Job Issues

Issue	Possible Cause	Solution
Section numbers do not turn green (remain white)	<ul style="list-style-type: none"> <li>• Switches are turned off</li> <li>• AccuRow enabled but implement not planting</li> <li>• Implement switch sensor not working properly</li> <li>• CAN is disconnected</li> <li>• The section is not set up properly</li> <li>• Wrong boom master option selected</li> <li>• Nodes not completely programmed</li> <li>• The section is disconnected</li> </ul>	<ul style="list-style-type: none"> <li>• Turn section and master switches on the on-screen switch box.</li> <li>• Move the machine out of the applied zone.</li> <li>• Check sensor LED. The LED should be on when the sensor detects a metal surface within sensor range.</li> <li>• See the <i>CAN Troubleshooting</i> section on page 11 for more information.</li> <li>• Check the section setup in the Sections screen of the Vehicle menu.</li> <li>• Verify the boom master option setting is correct for the control system. (Tools Menu&gt;System menu&gt;Control Interface).</li> <li>• Check node calibration and ensure all settings have been completed.</li> <li>• Check the connection and wiring to the boom or implement.</li> </ul>
CAN AccuRow will not turn on	<ul style="list-style-type: none"> <li>• Section switches are in the 'Off' position</li> </ul>	<ul style="list-style-type: none"> <li>• Section switches for CAN AccuRow must be in the 'On' position.</li> </ul>
	<ul style="list-style-type: none"> <li>• Variety name does not match map name.</li> </ul>	<ul style="list-style-type: none"> <li>• If the entered variety name does not match the exact name on the variety map, AccuRow will not enable sections as anticipated. Verify that the map name and variety name are entered exactly the same.</li> </ul>

Issue	Possible Cause	Solution
Date and time are incorrect (Default job name on the Verify Settings screen shows incorrect date and time)	<ul style="list-style-type: none"> <li>No GPS</li> <li>No GPS RMC or ZDA</li> <li>Incorrect time zone selected</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that the GPS receiver is operating properly and that the DGPS Status indicator displays as a green icon in the upper left corner of the Home screen.</li> <li>Check the GPS receiver to make sure the RMC or ZDA string is selected.</li> <li>Verify the settings on the Time Zone Settings screen are correct (Tools Menu&gt;Computer menu&gt;Time Zone).</li> </ul>

## Coverage Map Issues

Issue	Possible Cause	Solution
Gaps displayed in coverage map	<ul style="list-style-type: none"> <li>Section widths not set correctly</li> <li>Guidance and section width not the same</li> </ul>	<ul style="list-style-type: none"> <li>Check sections widths and section center values.</li> <li>Set guidance width and section width to the same value.</li> </ul>
Cannot achieve target rate	<ul style="list-style-type: none"> <li>Driving too fast for vehicle</li> <li>Calibration numbers incorrect</li> <li>Speed calibration incorrect</li> </ul>	<ul style="list-style-type: none"> <li>Speed may exceed capabilities of the vehicle to deliver product. Slow down or configure the vehicle to supply a higher amount of product.</li> <li>Check and adjust the calibration settings and values.</li> <li>Check and adjust the speed calibration setting.</li> </ul>

## OmniRow Motor Issues

Issue	Possible Cause	Solution
All OmniRow motors will not turn	<ul style="list-style-type: none"> <li>Hydraulics on tractor not engaged.</li> <li>'P,' 'EF' and 'T' hoses connected to tractor remote ports incorrectly.</li> </ul>	<ul style="list-style-type: none"> <li>Engage tractor hydraulics.</li> <li>Reconnect OmniRow hydraulic hoses correctly. 'P' and 'EF' hoses need to be connected to dedicated remote ports. 'T' must be connected to a separate high flow return port.</li> </ul>
	<ul style="list-style-type: none"> <li>Tractor hydraulic controls incorrectly engaged</li> <li>Hydraulic line(s) disconnected from tractor</li> </ul>	<ul style="list-style-type: none"> <li>Reverse hydraulics so that the hydraulic flow is supplied to the 'P' port on the open center valve.</li> <li>Check and reconnect hydraulic line(s). Connect 'P' and 'EF' hoses to dedicated remote ports. 'T' must be connected to a separate high flow return port.</li> </ul>
OmniRow motors will not achieve rate or intermittently shut off	<ul style="list-style-type: none"> <li>Insufficient hydraulic flow to run all motors at target rate</li> </ul>	<ul style="list-style-type: none"> <li>Ensure the tractor is running at sufficient engine RPM.</li> <li>Increase hydraulic flow from tractor.</li> </ul>
Individual motor will not turn	<ul style="list-style-type: none"> <li>PWM valve disconnected</li> </ul>	<ul style="list-style-type: none"> <li>Check electrical connections on PWM valve.</li> </ul>
	<ul style="list-style-type: none"> <li>Debris stuck in hex shaft, drive chain or seed meter</li> </ul>	<ul style="list-style-type: none"> <li>Remove debris from operating components.</li> </ul>
	<ul style="list-style-type: none"> <li>'P' and 'T' connections to motor reversed</li> </ul>	<ul style="list-style-type: none"> <li>Verify the hydraulic motor has been connected properly according to the installation manual. Correct connections as necessary.</li> </ul>

## Error Messages

This section contains information regarding possible error messages displayed on the field computer and troubleshooting procedures.

### Job Error Messages

Issue	Possible Cause	Solution
Planter Control node has gone off line		Refer to CAN Troubleshooting
No CAN nodes have been found		Refer to CAN Troubleshooting

### GPS Error Messages

Issue	Possible Cause	Solution
Guidance Not Available	<ul style="list-style-type: none"> <li>Displays when starting a job without a GPS signal</li> </ul>	<ul style="list-style-type: none"> <li>Make sure a GPS receiver is connected to the field computer and that the receiver is powered up, then select Auto-Detect.</li> <li>Make sure the correct GPS Source is selected (Tools Menu&gt;GPS menu&gt;Source).</li> </ul>
No Differential	<ul style="list-style-type: none"> <li>Differential GPS has not been detected by the field computer</li> </ul>	<ul style="list-style-type: none"> <li>Check the GPS receiver to make sure that it has the differential correction function. Contact the manufacturer for additional information.</li> </ul>
No GPS	<ul style="list-style-type: none"> <li>Field computer does not detect a GPS signal</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that the GPS receiver is turned on and receiving a signal.</li> <li>Make sure that the port setting for the field computer and the GPS receiver match.</li> <li>Make sure that the required NMEA messages are turned on in the GPS receiver.</li> </ul>
High HDOP	<ul style="list-style-type: none"> <li>Satellite constellation issue</li> </ul>	<ul style="list-style-type: none"> <li>There is no issue with the DGPS system or cabling. Wait for the constellation issue to resolve before continuing job.</li> </ul>

## CAN Troubleshooting

Although the control algorithm is located within the CAN node, all of the same troubleshooting techniques used in a traditional hard-wired system still apply to a CAN system. CAN allows for modularization of the control system, but the behavior of the system remains the same. Speed and singulation sensors, as well as the control valve, are used in the same fashion.

## Calculating the Calibration Values

**Note:** The following sections contain calibration information for use with the OmniRow planter control system. For calibration instructions on other vehicle or application equipment, refer to the Envizio Pro Installation and Operation Manual.

### Speed Cal

Raven industries recommends the following values for the initial speed cal:

Sensor Type Setting	Used with	English	Metric
Radar/GPS	External Raven GPS Receiver	785	199
	Internal DGPS Receiver	812	206
	GPS Speed over CANbus	1000	1000
	Raven Radar	598	152
Wheel	Wheel Magnets	1000	254
	Speedometer Drive Speed Sensor	612	155

These values are usually a good starting point and will generally yield adequate results; however, the speed cal should still be refined for each vehicle.

**Note:** The GPS speed over CANbus feature is only available with specific Raven speed sense nodes. This feature utilizes NMEA speed over ground data transmitted over the CAN network which eliminates the need for a separate, external speed sensor.



#### NOTICE

When using the GPS speed over CANbus feature, no tuning or adjustment is necessary or recommended to the speed cal value. Losing GPS signal for more than a second will also result in loss of the CAN speed signal which may affect product application in progress.

## Appendix A

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1. Make sure any section switches are turned OFF before powering the console ON.
2. In the System menu, touch Product Control and touch the Speed button.
3. Touch Distance and then reset the odometer display to "0" using the keypad.
4. Drive 1 mile [1 kilometer]. The field computer will measure the distance driven using the original (or last programmed) speed cal.

**Note:** *Accelerate and decelerate slowly. To achieve the most accurate calibration, do not use the vehicle odometer or the field computer distance display to measure the actual distance driven. Use section lines or highway markers to determine the actual distance.*

5. At the end of the driven distance, view the distance display again and record the value.
  - a. The field computer distance should read a value of approximately 5280 [1000]. If the display reads between 5260-5300 [990-1010], the default value of 598 [152] is accurate for the speed cal value.
  - b. If the distance displayed is not between 5260-5300 calculate the speed cal with the formula:

$$CSC = \frac{OSC \times 5280}{D}$$

where CSC = Corrected Speed Cal, OSC = Old Speed Cal (speed cal number used to drive the test distance), and D = the field computer Distance reading. Round to the nearest whole number.

### **For Example:**

Assume that the field computer odometer reads 5000 [980] after a known 1 mile distance has been driven using an initial speed cal value of 598 [152].

$$CSC = \frac{598 \times 5280}{5000} = 631.48$$

or

$$CSC = \frac{[152] \times [1000]}{[980]} = [155]$$

The Corrected Speed Cal value is 631 [155].

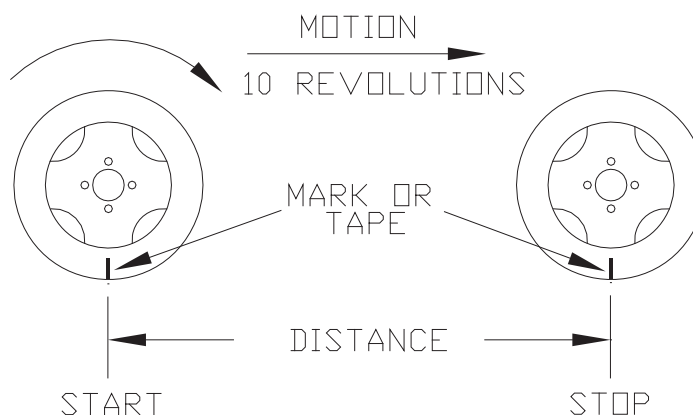
6. Touch Speed and use the keypad to enter the new value as the speed cal.
7. Verify the new speed cal derived in Step 5 by repeating Steps 2 through 4.

---

## Wheel Drive Speed Sensor

1. Mark the tire on which the speed sensor is installed using chalk or a piece of tape as shown below.
2. Mark the corresponding spot on the ground.
3. Count 10 full revolutions of the wheel while traveling in a straight path. The mark must stop with the chalk or tape in the same orientation that it began at the starting point.

**FIGURE 1. Calculating the Speed Cal with a Wheel Magnet Speed Sensor System**



4. Mark the stopping point and measure the distance between the starting and stopping marks on the ground in inches [dm]. Round to the nearest whole number.

**Note:** *This measurement is critical to the performance of the console. Measure Carefully. Be sure tire is properly inflated before measuring. If possible, measurements should be made in the type of soil in which the vehicle will be operating. Tire circumference will vary when measured in soft or hard packed soil. For best results, measure several times and average the results.*

5. Enter this measurement as the new speed cal.

### Adjusting for Additional Magnets

Typically, four magnets are used with the wheel drive speed sensor. However, to ensure accurate speed readings for large tires and very low speed applications, additional wheel magnets may be necessary. Any even number of magnets may be used as long as they are of alternating color and equally spaced. After calculating the speed cal, this number must be adjusted according to the number of magnets installed using the following formula:

$$\frac{4}{NM} \times D = ADJ$$

where ADJ = Adjusted Speed Cal, NM = Number of Magnets used, and D = the Distance Measured.

### For Example:

The distance measured between starting and stopping marks is 1200 and six magnets are installed.

$$\frac{4}{6} \times 1200 = 800$$

The Adjusted Speed Cal is 800.

## Speedometer Drive Speed Sensor

1. In the System menu, touch Product Control and then select Speed. Touch the Distance button and use the keypad to enter "0" as the distance displayed on the field computer.
2. Touch the Speed Cal button and use the keypad to enter a speed cal value of 612 [155].
3. Drive 1 mile [1 km]. The field computer will measure the distance driven using the speed cal value of 612.

**Note:** *Accelerate and decelerate slowly. To achieve the most accurate calibration, do not use the vehicle odometer or the field computer distance display to measure the actual distance driven. Use section lines or highway markers to determine the actual distance.*

4. Touch Distance.
  - a. The field computer odometer should display a value of approximately 5280 [1000]. If it reads between 5200-5350 [990-1010], the speed cal for the vehicle is 612 [155].
  - b. If the field computer odometer displays any other value, perform the following calculation:

$$\frac{OSC \times D_A}{D_o} = CSC$$

where OSC = Old Speed Cal, DA = Actual Distance traveled, Do = the field computer odometer Distance, and CSC = the Corrected Speed Cal. Round to the nearest whole number.

### For Example:

Speed Cal = 612 [155]  
 Actual Distance = 5280 [1000]  
 Field computer odometer reading = 5000 [980]  
 English Units:

$$\frac{612 \times 5280}{5000} = 646.3$$

Metric Units:

$$\frac{[155] \times [1000]}{[980]} = [158.1]$$

The Corrected Speed Cal value is 646 [158].

5. Touch the Speed button and use the keypad to enter the Corrected Speed Cal. To verify the corrected speed cal calculated above:
  - a. Re-zero the distance display as in step 1.
  - b. Repeat step 3 and step 4. If the field computer odometer reading still does not match the distance driven, use the new values and redo the calculation and repeat step 5.



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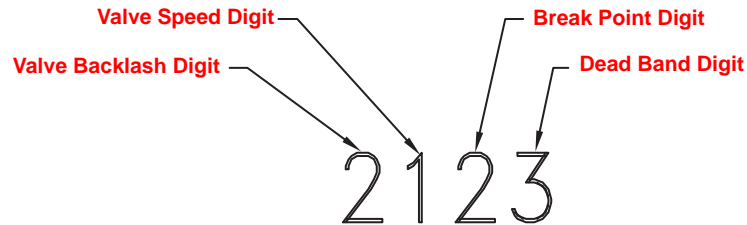
## Valve Cal

To ensure that the correct seed population is achieved, the valve cal must be programmed for the type of control valves connected to the control system. The field computer uses the valve calibration number to adjust the response time of the control valve motor to changes in the vehicle speed.

The following control valve calibration numbers are recommended for the valves listed:

Control Valve Type	Valve Cal
PWM and PWM Close	43

Each digit in the calibration number corresponds to a specific function of the valve. The following functions apply to the digits in the valve calibration number:



### Valve Backlash Digit

This value controls the time of the first correction pulse after detecting a change in correction direction. The values range from 1 to 9, where 1 is for a short pulse and 9 is for a long pulse.

**Note:** *The backlash digit is not used with a fast, fast close, PWM, PWM close or standard motor control valve.*

### Valve Speed Digit

This value controls the response time of the control valve motor. If the valve speed setting is too fast, the valve will over correct and the system can start to oscillate. The following valves have specific values:

- Standard Control Valve: This valve has a range of values from 1 to 9, with 1 being slow and 9 being fast.
- Fast and Fast Close Control Valve: These valves have a range of values from 0 to 9, with 0 for fast and 9 for slow.

**Note:** *The speed digit is not used with a PWM or PWM close valve.*

### Brake Point Digit

The Brake Point digit sets the percent away from the target rate at which the control valve starts to turn at a slower rate so that it does not overshoot the target rate. The values range from 0 to 9, where 0 is a 5% rate, 1 is a 10% rate, and 90 is a 90% rate.

### Dead Band Digit

The Dead Band digit is the allowable difference between the target rate and the actual application rate. The values range from 1 to 9, where 1 equals 1% difference and 9 equals 9% of the difference.



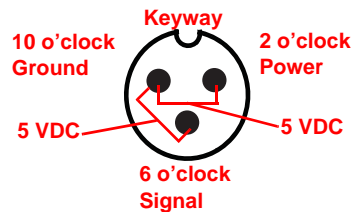
**B**

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*Speed Sensor Extension Cable*

Disconnect the extension cable from the speed sensor assembly cable. Hold the extension cable connector so that the keyway is pointing in the 12 o'clock position as shown below.

**FIGURE 1. Speed Sensor Extension Cable Pin Diagram**



**Note:** *If a radar type speed sensor is used, the voltage between the 10 o'clock and 2 o'clock positions may read 12V DC.*

### Testing the Speed Sensor Extension Cable

1. Enter a speed cal of 9999 by touching the Speed button on the Product Control screen.
2. Zero the odometer by entering a zero value in the Distance button.
3. With a small jumper wire (or paper clip), short between the 10 o'clock and 6 o'clock sockets with a 'short-no-short' motion. Each time contact is made, the distance total should increase by increments of 1 or more.
4. If the distance total does not increase, remove the section of cable and repeat the test at the connector that is the next closest to the node. If the distance total now increases with the short-no-short test, replace the defective cable as required.
5. If no pulses are registered, perform the above voltage checks.
6. If all of the cables test 'good,' replace the speed sensor.

**Note:** *After testing is complete, re-enter the correct speed cal before starting an application.*



APPENDIX

C

# Wireless Communications & Remote Service

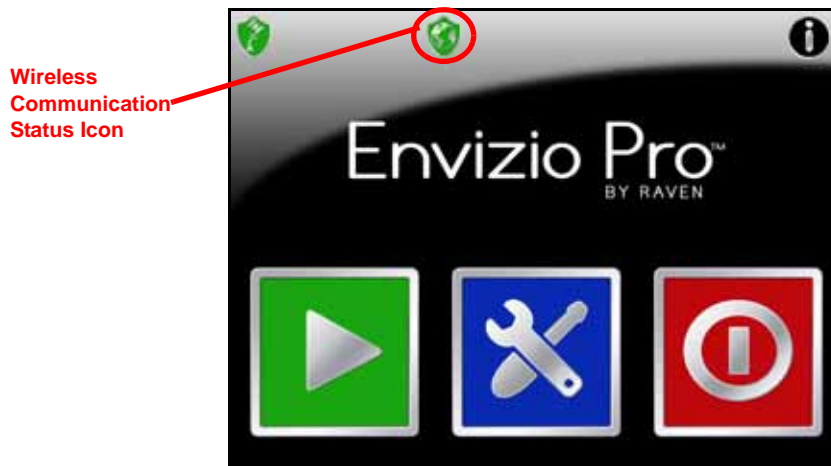
The Envizio Pro, with a Slingshot® Field Hub, allows the operator to wirelessly transfer application data back to the home or office and transfer prescription data from the office to the field. This feature also adds the ability to allow service technicians and support specialists to remotely control the field computer. With a Slingshot Field Hub, help is just a touch away.

Via the Field Hub, the field computer can also be used to keep up-to-date with the latest weather forecasts or crop prices from Internet web sites while still managing product application.

**Note:** For instructions on installing and setting up the Slingshot Field Hub, refer to the Field Hub Installation Guide provided with the wireless device.





## Wireless Communication Status

The status of wireless communications is displayed along the top of the Home screen.





## Appendix C

The following icons may be displayed in the wireless status area:

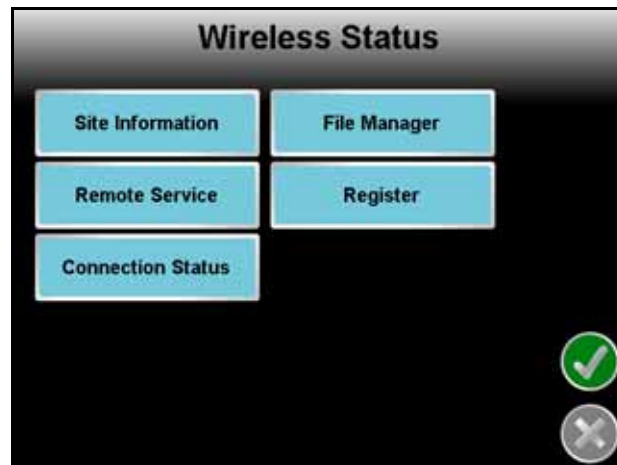
	<b>No Device Connected</b> - No supported wireless device is connected to the ethernet port on the field computer. This icon is also displayed if wireless communication is unavailable or has been lost.
	<b>Communication OK</b> - The status of wireless communication is good and no errors or alarms are present.
	<b>Communication Error</b> - An error has occurred with wireless communication or during a file transfer.
	<b>Communication Lost or Unavailable</b> - This icon will be displayed if the registration process has not been successfully completed.

The wireless status symbols also display the file transfer status for any files to or from the field computer.

	<b>Synch In Progress</b> - The arrow symbol is displayed on the wireless status icon while the field computer and the Slingshot® site are synchronizing.
	<b>Files Received</b> - The envelope symbol is displayed on the wireless status icon when files have been received by the field computer. When this symbol is displayed, touch the icon to display the File Manager tab.

## Wireless Status Screen

Touch the wireless status symbol displayed on the Home screen to display the Wireless Status screen.



### Site Information

Touch the Site information button to view information from the Slingshot® site.

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## Remote Service

The Remote Service feature allows a service technician to view and control a field computer in the field from his or her service location and assist the machine operator diagnose or troubleshoot the system.

**Note:** *The service technician will be able to determine whether a remote service session is necessary to assist with any issues encountered with the field computer. Contact a local Raven dealer or technical service provider before starting the remote service feature.*

To begin a remote service session:

1. Touch the Wireless Status icon on the Home screen and touch the Remote Service button.
2. Touch the “Enable Remote Service” button. Have the code displayed on the screen available when contacting a local Raven dealer for support.
3. Read the code to the technician to allow them to view and control the field computer and planter control system.

**Note:** *If an error code is displayed in place of the remote service code, wait a few seconds for the Field Hub to receive correct data and the error should be cleared automatically. Do not initiate remote service while an error code is displayed. If the error message does not clear after several seconds, contact a local Slingshot or Raven dealer for support.*

## Connection Status

The connection status screen displays the following information:

- **Signal Strength** - Displays bars to represent the current strength of wireless signal. Four bars represent a strong signal.
- **Ethernet Status** - Displays the status of the connection via the ethernet port on the back of the field computer.
- **Internet Status** - View the status of communication with the world wide web in this area.
- **Suggested Solutions** - If any issues or errors are detected, possible solutions will be displayed in the solutions area.



**Note:** *If any error conditions are encountered, the Communication Status screen will display possible solutions.*

## File Manager

Access the Wireless File Manager to view a history of files recently transferred to or from the field computer.



Use the up or down arrows to scroll through the history of files sent from, or received by, the field computer.

Touch a file from one of the lists to view file information such as the file type and size as well as the date and time the file was sent or received.

**Note:** Completed job data may be exported to a connected USB flash drive if desired or if a wireless connection is unavailable. Refer to the Performing File Maintenance section on page 165 to export a Slingshot® data package using the File Maintenance feature. Jobs exported to a USB flash drive may then be uploaded to the Slingshot web site using a home or office computer.

## Registration

The Registration tab is used to register the Field Hub with the Slingshot web site and activate the various features of wireless communication on the field computer.

**Note:** If the Field Hub has been registered previously, the Registration button will display as re-registration. Touching the Re-Register button will display the Re-Registration Warning prompt below. To re-register the Field Hub, touch the green check mark and proceed with the registration instructions to re-register the Field Hub.





### To register:

1. Touch the Wireless Status icon on the Home screen and select the Registration button.



2. Wait while the field computer registers with the Slingshot web site and receives the registration code. It may take up to 15 minutes after the registration code is received for features to become fully enabled.

**Note:** *Be sure to enable the Remote Service and Web Access features if desired (recommended). These features may be enabled later by accessing the Slingshot site.*

### To test wireless access:

1. Wait for the field computer to automatically search for available files for transfer. This process may take up to five minutes.
2. If the Remote Service feature was enabled during registration, select the Remote Service tab and touch the Enable Remote Service button.
3. If a remote service session is enabled successfully, touch the button now labeled "Disable Remote Service."
4. Exit the Wireless Status screen by pressing the OK button in the lower, right corner of the screen.
5. If the Web Access feature was enabled during registration, touch the Tools Menu icon and select the Web icon within the Computer submenu to open the field computer Internet browser and test the web access feature.

# File Transfer Settings

The File Transfer Settings options allow the operator to configure automatic file upload features with the Slingshot Field Hub. Touch the File Transfer Settings button and select one of the following options:

**Automatically Upload.** With the automatic upload option selected, the field computer will automatically upload the completed job file to the Slingshot server when the operator stops the job operation. If the job is resumed at a later date, a separate copy of the job will be available on the Slingshot server for review.

**Prompt.** With this option selected, the field computer will prompt the operator to upload job files each time a job is closed. When the operator stops a job operation, the field computer will provide a prompt and allow the operator to upload the latest job file or to wait. This option may be preferable if jobs are frequently stopped and resumed to minimize data usage and ensure that only the completed job file is uploaded to the Slingshot server.

**Disable.** Select this option to disable all automated wireless file transfer options. To upload files to the Slingshot server, the operator must manually initiate wireless file transfer using the File Maintenance features or use a USB flash drive to transfer completed job information from the field computer to a home or office PC.

Refer to Chapter 9, *Software Updates and File Maintenance*, additional assistance with the File Maintenance features of the Envizio Pro field computers.

**D**

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*Weather Station Overview*

Envizio Pro field computers with software version 3.6 or newer are capable of reading information from an external weather station and recording this information into job report files. The information being recorded to the report includes:

- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Wind Speed
- Wind Direction
- Wind Gust

The Envizio Pro may only read information from one specific model of weather station. This unit is the WatchDog Sprayer Station Model 3349SS (P/N 117-0171-138) manufactured by Spectrum Technologies, Inc. This system may be ordered through any Raven dealer. For more information on this system contact Spectrum Technologies at (800) 248-8873.

## Connecting the Weather Station

The weather station may connect to the field computer via either of the following connectors:

- COM2 or Console connector on the main interface or chassis cabling.
- COM3 or Light Bar connector on the auxiliary interface or chassis cabling.

**Note:** *If the field computer is connected to an external Raven serial controller, the weather station must be connected to COM 3/Light bar on the auxiliary interface or chassis cabling.*

## Weather Station Activation Key

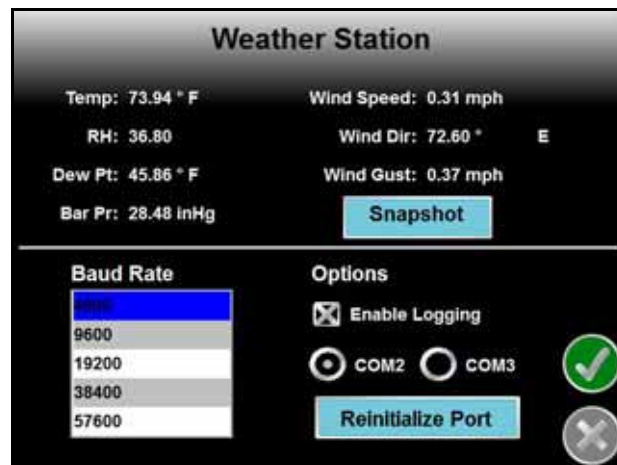
In order to use the weather station with the Envizio Pro, the weather module authorization code (P/N 077-0180-030) must be purchased from a Raven dealer. Once the code has been purchased and registered on-line, the activation key must be entered into the Envizio Pro.

**Note:** *Refer to the Special Features Registration section on page 152 for additional assistance with obtaining the activation key and entering the authorization code.*

## Weather Station Configuration

To view weather information collected by the weather station:

1. Touch the Tools Menu icon on the Home screen.
2. Select the Weather Station icon from the Computer menu to display the Weather Station screen.



**Note:** *The upper portion of the Weather Station screen displays the current weather conditions collected by the weather station. The snapshot button will only display during an active job.*

3. The default baud rate for communication with the weather station is 4800 and should generally not need to be changed.
4. Ensure that the Enable Logging option is enabled to record weather information during an active job and provide this information on the completed application report file. If weather data is not needed, leave this option un-checked to help conserve memory on the field computer.

5. Select the communication port to which the weather station is connected. Select the:
  - **COM2** option if the weather station is connected to the COM2 or Console port on the main interface or chassis cables.
  - **COM3** option if the weather station is connected to the COM3 or Auxiliary port on the auxiliary interface or chassis cables.
6. Touch the Reinitialize Port to restart the weather station comm port if necessary. This feature may be used if the weather information does not display current conditions as anticipated.

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## Using the Weather Station

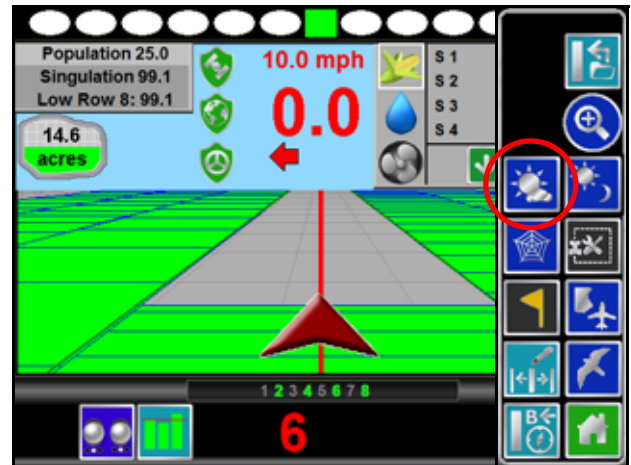
If weather station logging is enabled during an active job, the Envizio Pro will periodically record current weather conditions for the application report.

To view current conditions or other weather station information during an active job:

1. Touch the Menu icon in the lower, right corner to access the in-job menu.
2. Select the Weather Station icon to display the Weather Station screen.
3. Touch the snapshot button to manually record the current conditions to an active job for the application report.

**Note:** *The snapshot button will only display during an active job.*

4. Touch the Reinitialize Port to restart the weather station comm port if the current conditions reported by the station do not reflect conditions as expected.






## APPENDIX

# E

## *Updating CAN Nodes via the Envizio Pro*

Envizio Pro with version 2.2 or higher software are capable of programming nodes on the CANbus directly through the field computer and connected cabling using a USB flash drive with the CAN Update program.

**Note:** Before trying to update a CAN Node, make sure the node is communicating properly over the CANbus. If the node is not communicating properly, the field computer will be unable to update the node.



**NOTICE**

Updating a CAN node erases the current settings in the node. To retain settings and calibration data, be sure to write down all settings stored by the node(s) being updated.


Node updates are available by contacting the Raven customer support center at 1-800-243-5435.


**Note:** Create a folder labeled *canupload* on the root of a USB flash drive (i.e. "G:\canupload") and place the necessary .hex files within this folder.

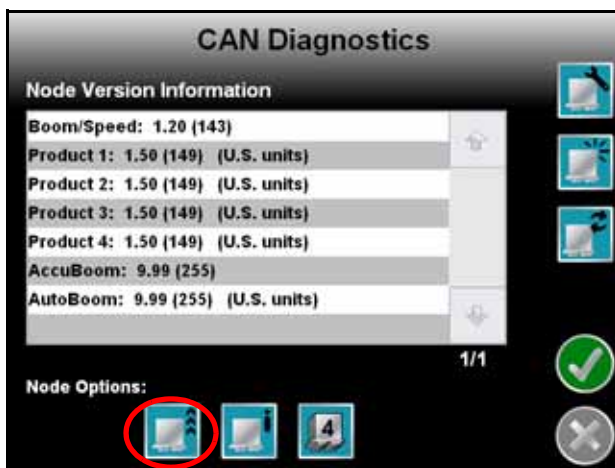
### To Update CAN Nodes

1. Start the field computer and touch the Information icon in the upper, right corner of the Home screen.



2. Touch the  icon on the About Envizio Pro screen to display the CAN Diagnostics screen.
3. Insert the USB flash drive with the required .hex files into an available USB port on the field computer.

4. On the CAN Diagnostics screen, select the  to begin the CAN Update Program.





## APPENDIX

# F


## *Updating the On-board DGPS Receiver*

Occasionally, updates for some Envizio Pro II on-board DGPS receivers may be made available for download from the Applied Technology web site:

[www.ravenhelp.com](http://www.ravenhelp.com)

**Note:** *The receiver update may be located under the additional software versions available on the Envizio Pro II field computer software updates web page.*

These updates are made available for field computers with the on-board receiver serial numbers starting with “BZZ” or “BFN” and are not required unless a specific issue encountered during operation has been addressed with the update. Please review the required components and read the firmware update procedure before starting the process. Contact a local Raven dealer for more information or additional assistance with any part of the firmware update.

	<p style="text-align: center;"><b>CAUTION</b></p> <p>Updating GPS firmware may result in the loss of OmniSTAR correction services. Internal receivers with a serial number beginning with “BFN13” or lower are capable of OmniSTAR correction services with NovAtel firmware “OEM060220SN0009” or lower. Updating the GPS engine firmware will result in the loss of OmniSTAR subscription services.</p>
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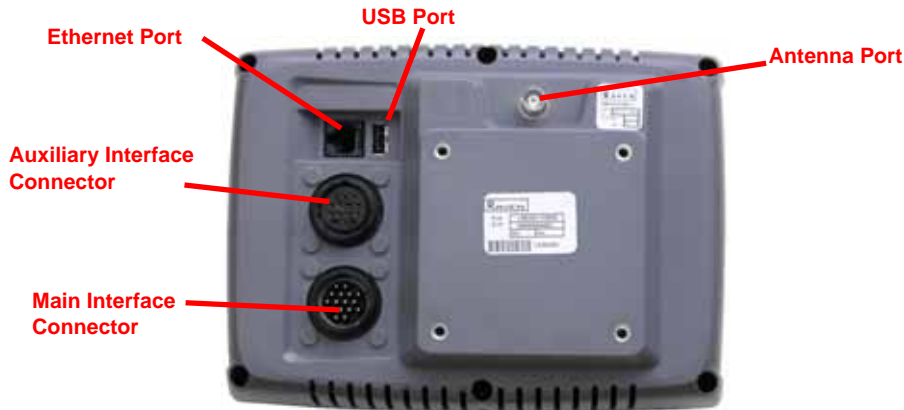
### *Required Components*

- Envizio Pro field computer with an on-board receiver serial number starting with “BZZ” or “BFN.”
- Home or office PC or laptop with Microsoft Windows® operating system and the WinLoad utility.
- “Straight through” serial cable (optional)
- USB to Serial adapter (optional)
- Envizio Pro cable with ‘GPS Out’ connector
- WinLoad and firmware update .hex file

## Updating the On-Board DGPS Receiver

1. Power up the Envizio Pro II field computer.
2. Check the cable connections on the back of the field computer and trace the cable connected to the auxiliary interface connector.

FIGURE 1. Envizio Pro II Rear Panel Features and Connectors



**Note:** *If there is no cable connected to the auxiliary interface connector, contact a local Raven dealer for more information and assistance.*

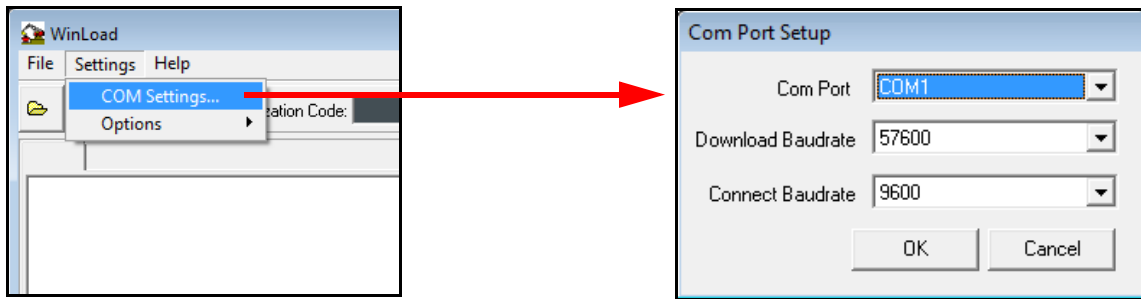
3. Locate the connector labeled “GPS Out” on the cable connected to the auxiliary interface connector.
4. Disconnect any serial cables currently connected to the GPS out port and route the port to a serial port on a home or office PC or laptop.

**Note:** *If the PC or laptop does not have a serial port, a USB to serial port adapter will be required to proceed with the firmware update procedure.*

*If the GPS out port will not reach the PC or laptop serial port directly, use a straight through serial cable to extend the port connector.*

5. From the Envizio Pro II home screen, touch the Tools Menu (blue) button and select the Source icon from the GPS menu.
6. On the GPS Source screen, write down the current source setting before selecting the Internal GPS Receiver option.
7. Touch the Accept icon to return to the main Tools Menu display.
8. Select the Output icon from the GPS menu.
9. On the GPS Output screen, write down the current NMEA message rates before setting all NMEA messages to zero.
10. Touch the Accept icon to return to the main Tools Menu display and then touch the Home icon to display the field computer Home screen.
11. Touch the Shutdown (red) button on the Home screen. Do not press and hold the power button to shutdown the field computer at this time.
12. On the PC or laptop, open the downloaded firmware update folder and locate the WinLoad application.

13. Click on the Settings option in the upper, left corner of the WinLoad window and select the COM Settings... option.



14. In the Com Port Setup prompt, select the com port on the PC or laptop connected to the GPS out connector. Refer to the operating system help for assistance determining which com port is connected to the field computer cable.
15. Set the Download Baudrate to 57600.
16. Set the Connect Baudrate to 9600 and click OK.
17. Click on the File option in the upper, left corner of the WinLoad window and select the File Open... option. Use the file browser to locate and select the update .hex file (e.g. "3902. hex").
18. The file information should now be displayed in the main WinLoad panel.
19. Click the Write Flash button to the right side of the main WinLoad panel. Immediately start the next step when the timer displays.
20. Press and hold the Envizio Pro II power button until the unit shuts down. Press the power button to turn the field computer back on.
21. The WinLoad program should display information in the main panel to indicate that the update is in progress.
22. Wait for the WinLoad update to complete.
23. Once the update has finished, close the WinLoad application and restart the field computer.
24. Verify that the firmware update was applied successfully:
  - a. Touch the Tools Menu (blue) button from the field computer Home screen
  - b. Select the Health icon from the GPS menu. Check that the version displayed on the GPS Health screen is the new firmware version.
25. Touch the Accept icon to return to the main Tools Menu display.
26. Reset the NMEA and Source settings as appropriate before beginning any field operations.

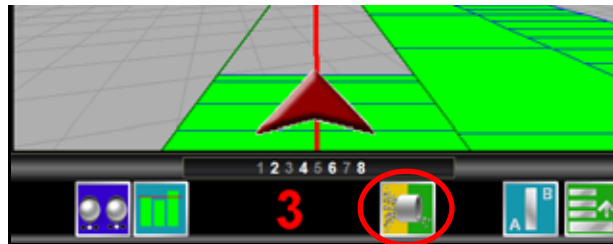


# Blockage Monitoring Sensors

## System Overview

With the optional blockage sensor system, the field computer is capable of monitoring seed or product flow during field operations. If an obstruction is detected, the field computer will display information from the sensors to help the operator quickly locate the obstruction.

During a field operation, the status of the blockage sensor system is displayed at the bottom of the Guidance screen.



The field computer may be connected to two separate sensor loops with up to 120 sensors per loop to monitor seed or product flow at various locations on the implement depending upon the level of system monitoring desired.


## Blockage Node Detection

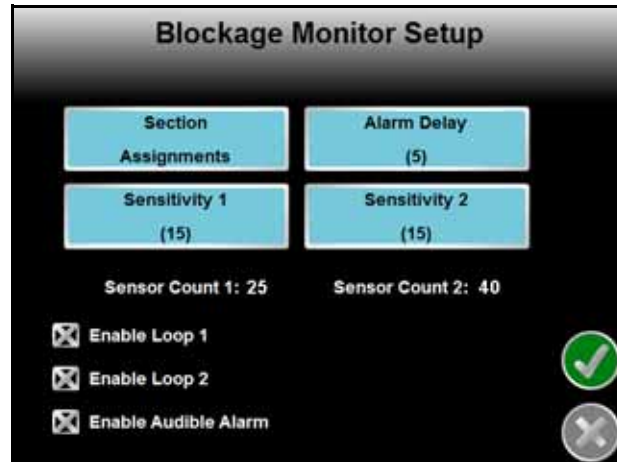
If the blockage system is installed and correctly connected to the field computer, the blockage node should display on the CAN Diagnostics screen. Refer to the *CAN Diagnostics* section on page 8 for details on using CAN Diagnostics.

If the blockage node is not displayed on this screen, check the node connections and restart CANbus communication. If the node is still not detected, contact a local [Raven](#) dealer for assistance.

## Configuring Blockage Sensor Loops

Each sensor loop may be configured individually to allow the system to accurately monitor the status of separate delivery systems (e.g. seed or product tubes) and alert the operator to obstructions in either delivery system. To properly monitor the seed or product delivery system, the field computer must be configured for the number of blockage sensors installed in each section of the implement.

1. Review the *Planter Section Setup Wizard* section on page 19 to configure the implement.
2. After the implement is correctly configured, select the Blockage  icon from the System menu. The Blockage Monitor Setup screen will be displayed on the field computer.



The following information is displayed at the bottom of the Blockage Monitor Setup screen:

- Currently configured sensor counts for each configured sensor loop. The field computer must be programmed for the number of sensors in each loop. This value does not change when sensors are added or removed from the blockage monitoring system.
- Enable options for sensor loop 1 and 2.
- Enable option for the audible alarm feature for the blockage monitor.

**Section Assignments.** The Section Assignments button allows the operator to configure the sensor loops connected to the control for each implement section. Refer to the *Configure Sensor Loops* section on page 219 information on the sensor section setup procedure.

**Alarm Delay.** The alarm delay setting allows the operator to set a delay between when the system detects a blockage and when the alarm features are activated on the field computer. Use this setting to avoid displaying errors during field operations if the control system intermittently encounters momentary stoppages in product or seed flow.

**Loop Sensitivity.** Use the sensitivity value to set the approximate number of seeds per second which each sensor in the loop should detect when the system is operating normally. If a sensor does not detect the set value for seeding rates, the system will display a blockage or obstruction and indicate which sensor is detecting the error. The default sensitivity value is 15.

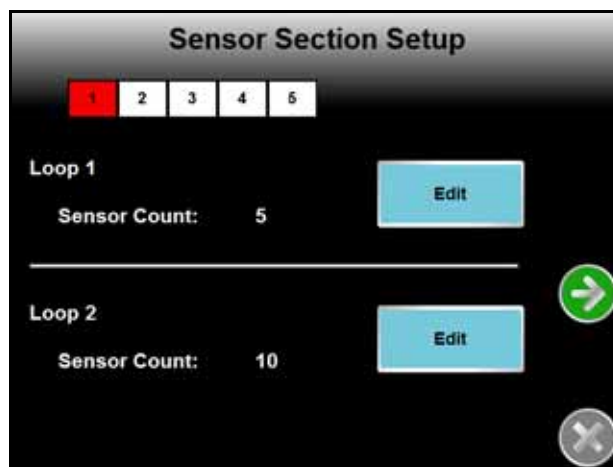
Refer to the *Setting the Sensitivity* section on page 221 for more information on setting and adjusting the sensitivity value for each sensor loop.

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## Configure Sensor Loops

To setup the blockage monitoring sensor loops:

1. Touch the Section Assignments button. The Sensor Section Setup screen for the first implement section will be displayed.



2. Touch the Edit button corresponding to loop 1 and loop 2 and use the on-screen keypad to configure the number of sensors associated with the first implement section. Touch the Next icon to advance to the next implement section.

**Note:** Only enter values for the number of configured sections on the drill. Leave the value at zero for any unused sections.

*Do not count any sensor more than once. If a sensor is used for multiple sections, count the sensor for the section most frequently used and do not count the sensor for the remaining section(s).*


3. After the sensor loops are configured for each implement section, touch the Next icon to display the Sensor Summary screen. Review the configured sensors per section in each loop and touch the Accept icon to store the displayed settings. To reconfigure any of the sections, touch the Previous icon to return to the section setup screens.


## Blockage Monitor Status


During field operations, the field computer displays the status of each sensor loop at the bottom of the Guidance screen.



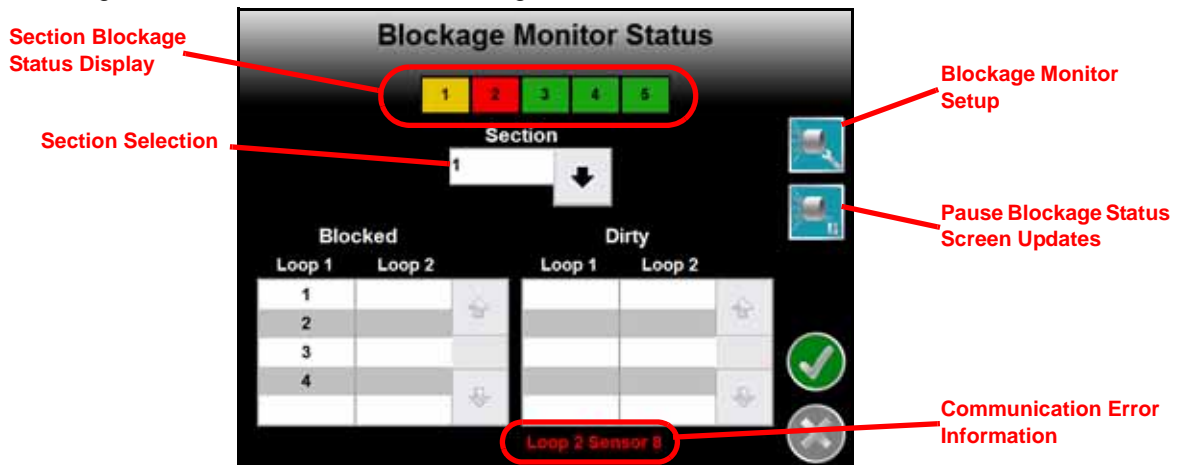
The left half of the icon displays the status of sensor loop 1 while the right half of the icon displays the status of sensor loop 2. The blockage status will display:

 Green when the system is operating normally.

 Yellow when a product blockage or dirty sensor is detected in the system. Check the indicated sensor locations in the *Blocked* display and clear any obstructions as necessary during operation.

 Red if a communication issue is detected with the blockage sensors. Check sensor assemblies and cables for disconnected or damaged parts and replace parts as necessary.

Touch the blockage status icon to access the Blockage Monitor Status screen.



At the top of the status screen, the sensor status for each implement section is displayed to assist the machine operator locate and address equipment blockages. Touch the section selection drop down to display detailed information for each sensor loop for the selected section.

**Blocked.** When a blockage is detected in loop 1 or loop 2, the sensor number(s) which detect an obstruction or blockage will be displayed in this area. Check these sensor locations for obstructions in the line to clear the blockage condition.

**Note:** *To help locate blockages during operation more quickly, it is recommended to number the sensors. Refer to the seed blockage sensor installation instructions for details on numbering the sensors.*

**Dirty.** Sensors may need to be cleaned periodically during seeding operations to ensure that the system is accurately detecting the flow of seed or product through seed tubes. Check and clean the indicated sensor(s) to ensure optimal system performance.

When monitoring particularly dirty seed types or products, it may be necessary to clean each sensor in the loop when a the system indicates a sensor or sensors in the loop are dirty.



**Communication Error Information.** If a communication issue is encountered on either sensor loop, the status screen will display the value of the of the last sensor which the system is currently able to detect on the sensor loop. For example, “Loop 2 Sensor 8” means that sensor 8 on loop 2 is currently communicating correctly. This information may be useful to address communication problems.

**Blockage Monitor Setup Icon.** Touch the setup icon to go to the Blockage Monitor Setup screen if necessary during a field operation to adjust loop sensitivity or alarm settings. Refer to the *Configuring Blockage Sensor Loops* section on page 218 for details on using the Blockage Monitor Setup screen.

**Pause Status Updates Icon.** The blockage system updates the status screen continuously during field operations. Use the pause screen updates icon to ignore status screen updates and to allow the operator to address multiple blockage conditions or to review blockage information for momentary blockages detected during field operations.

**Note:** *The pause icon only pauses updates to the blockage monitor screen. Additional blockage alerts will still be received by the field computer and product control features will be unaffected.*

## Setting the Sensitivity

Refer to the following table to set and adjust the sensitivity setting for each loop for a specific seeding operation.

Sensitivity	Seeds per Second		Sensitivity (cont.)	Seeds per Second (cont.)
0 <sup>a</sup>	Loop off		70	148
1 <sup>b</sup>	1 seed every 30 seconds		80	281
5 <sup>b</sup>	1 seed every 20 seconds		90	539
10 <sup>b</sup>	1 seed every 10 seconds		100	1043
			110	2019
15	1		120	4400
20	7		121	4800
30	17		122	5300
40	27		123	5800
50	44		124	6400
60	80		125	7000

a. A sensitivity setting of zero will disable the sensor loop and blockage alarms.

b. A sensitivity value less than 15 will allow the sensor loop to scan for longer than 1 second periods to count seeds down to one seed per 30 seconds.

The best obstruction and blockage detection is achieved when the sensitivity is set as high as possible without encountering a constant alert condition. To set the sensitivity for a specific field operation:

1. Ensure that the system is clear of obstructions.
2. Select and enter a sensitivity value from the table above and begin operation. Ensure that the system continues to display a normal operating condition at the initial setting.

**Note:** *If the seed blockage sensors consistently display a blockage alert, select a lower initial sensitivity value before proceeding.*

3. Increase the sensitivity until the system indicates a blockage.
4. Decrease the sensitivity by three to five units at a time until the field computer no longer indicates blockage conditions.

**Note:** *Do not decrease the sensitivity value below the initial value. Check the indicated sensor locations and clear any obstructions and repeat the above procedure if the sensitivity value is decreased below the initial setting.*

**H***Navigation*

The following icons will be used to navigate within the menu screens and to edit and save settings.



Touch the Home icon when it appears to return to the Home screen. Any active jobs will continue in the background. Note that some Tools Menus will not be accessible while a job is in progress.



Touch the Accept icon to confirm any changes to a screen. Touching the Accept icon will save those settings and proceed to the next screen.



Touch the Cancel icon to exit the screen without saving any changes made on a screen. If the Cancel icon is displayed in gray, the cancel feature is not available.



Like the Accept icon, the Next icon accepts changes and proceeds to the next screen in a setup procedure. Touch this icon where it appears to access more settings or to continue a setup procedure. The last screen in a setup procedure should display the Accept icon.



Touch the Previous icon to return to the last screen displayed during a setup procedure or wizard.



The Up icon, where it appears, increases displayed values in preset increments. Touch this icon to increase a value until the desired value is displayed.



The Down icon, where it appears, decreases displayed values in preset increments. Touch this icon to decrease a value until the desired value is displayed.



Touch the Create New icon when it appears to create and rename new job related files.

**Note:** Names of jobs, vehicle profiles, guidance lines, or boundary maps stored on the Envizio Pro cannot begin or end with a space.

## Home Screen

The Home screen offers access to the following features of the field computer:



Touch the Start Job icon to begin a new job, select a previous job, or to return to the Guidance screen if a job is already in progress.



Touch this icon to access the Tools Menu. The Tools Menu is only available from the Home screen. Refer to Chapter 8, *Tools Menu*, for information about settings and using the Tools Menu.



If a job is in progress, the End Guidance icon will appear on the Home screen. Touch this icon to end the active Guidance session.



When the console is powered on or when Guidance is not active, the Shutdown icon will be displayed. Raven recommends using the Shutdown feature before pressing the power button.

## Information

Touch the information icon in the upper, right corner of the home screen to display the software and image versions currently installed on the field computer.



## GPS Status

The current source and status of DGPS signal is displayed in the upper, left corner of the Home screen.



**Note:** The standard GPS shield will be displayed if the Envizio Pro field computer cannot determine the type of corrections being sent from the DGPS receiver.

The status icon on the Home screen will display:

- Green if the status of GPS is okay.
- Yellow if an error condition has been encountered.
- Red if GPS is non-functional. Make sure the DGPS antenna cable connections are secure and the antenna has a clear, 360° view of the sky.

---

## RTK Fixed and Float Modes

When using an RTK correction source with the internal dual frequency GPS receiver, the GPS status indicator may be used to determine whether the receiver is operating in RTK fixed or float modes. The RTK shield will display:

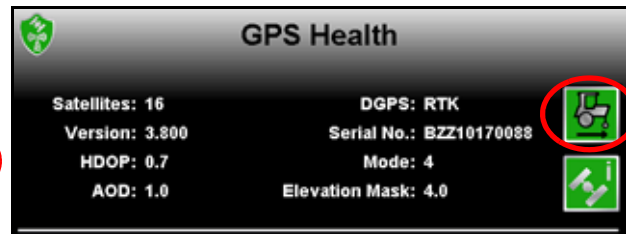
- Green to indicate a fixed RTK position. This mode indicates that the receiver has a full RTK position fix and is providing sub-inch corrections.  
The GPS Health screen will display a value of four for the differential mode when operating in RTK fixed mode.
- Yellow to indicate that the receiver is operating in RTK float mode. This mode indicates that the receiver is not able to provide a full RTK position lock due to the distance from the base station, visibility of the sky, time of day or interference around the base station location. In the float mode, the receiver is still providing a course RTK correction signal, but accuracy of the receiver may not be at a sub-inch level.  
The GPS Health screen will display a value of five for the differential mode when operating in RTK float mode.

## Direction of Travel



The last direction of travel detected by the field computer is displayed on the screen when setting up a job on the field computer and may also be found on the GPS Health screen by selecting the GPS Status icon.

If the direction of travel displays incorrectly during a field application, touch the direction of travel icon to manually toggle the course over ground.



## Wireless Communications Status

The current status of wireless communication is displayed along the top of the Home screen display.



This icon will appear:

- Gray if no wireless communications device is connected to the field computer.
- Green if communication is okay.
- Yellow if an error condition has been encountered.
- Red if wireless communication is not available.

Touch the shield icon to display the Wireless Status screen. Refer to the Appendix C, *Wireless Communications & Remote Service* for more information.

## Tools Menu

The following icons may be found within the Quick Access Bar at the top of the Tools Menu screen.



The Setup Wizard Menu is available in the Tools menu. Review the *Setup Wizards* section on page 18 for more details on using the setup wizards.



Access the System Menu to setup the product control system, or configure the optional or AutoBoom systems on application equipment or the OmniRow system.



The GPS Menu contains screens to setup the internal GPS receiver or to enable the field computer to use signal from an external receiver. The GPS menu also contains screens to review the status of GPS reception, set message outputs (for the internal DGPS receiver only), setup an optional TM-1 Tilt Module, or select the PRN.



The Computer Menu sets display and feature settings of the field computer. Access the Computer menu to change the display brightness, language, and units, adjust the on-screen or external light bar, as well as activate features or update the field computer software.



Access the Vehicle Menu to setup or modify vehicle profiles for each machine or implement with which the field computer will be used. Profiles allow the operator to setup GPS antenna heights and offsets as well as the swath width and section setup for each implement once and quickly reload a vehicle's profile when transferring the field computer between vehicles.



Select the Show All icon to show an overview of the Tools menu. The Show All screen is displayed each time the Tools menu is accessed.

## File Maintenance

To begin file maintenance from the Home screen:

1. Touch Tools Menu icon.



2. Select the File Maintenance icon within the Computer menu.

**Note:** Before performing file maintenance with a new USB flash drive, set up the required file structure on the connected USB flash drive by selecting the icon shown to the right.



3. Select the type of files to transfer from the list at the top of the screen.
4. Touch one of the following icons to select the direction in which to transfer files.

From Field  
Computer



To Field  
Computer



---

## Transfer From Field Computer



Select left icon to transfer a selected file to the connected USB flash drive or the right icon to transfer all files of the selected type currently saved on the field computer.



Select the left icon to export the Slingshot® data package for a selected job file to the connected USB flash drive or the right icon to export data packages for all job files currently stored on the field computer



Select the left icon to delete a selected file from the field computer or the right icon to delete all files of the selected type currently saved on the field computer.



**Note:** *The Delete button will not affect any files on the flash drive. To remove files from the flash drive, use the PC's file browser (i.e. Windows Explorer) to remove, delete or copy files from the flash drive.*



Touch this icon to manually initiate upload of a selected file currently stored on the field computer via a SlingShot Field Hub and available wireless connection.

**Note:** *Refer to Appendix D, Wireless Communications & Remote Service, for more information on transferring files using the Slingshot service.*

## Transfer To Field Computer



Select the left icon to transfer a selected file to the field computer or the right icon to transfer all files of the selected type currently stored on the USB flash drive.



## CAN Diagnostics



Touch this icon to readdress product control nodes connected to the CANbus. Readdressing product control nodes may be necessary if a node is not detected by the field computer. Verify that the node is properly powered and connected to the CANbus communication lines before readdressing the product control nodes. See the *Readdressing the Nodes* section on page 28 for more information.



Select this icon to reset all product control nodes to their default values. Use the *Calibration Reference Sheet* section on page vii if necessary to record the required calibration values for system operation. To help record additional settings for each node, step through or review the *Product Control Setup Wizard* section on page 47. After resetting nodes, it is recommended to run the Product Control Setup Wizard to reconfigure each product node or control channel.



Touch this icon to retry CAN communications. If a node is not recognized when starting up the field computer, restarting CAN communication may allow the system to recognize the node without further troubleshooting steps. If a node is still not detected, additional troubleshooting or readdressing the CANbus may be required. Refer to the *CAN Troubleshooting* section on page 31 or *Readdressing the Nodes* section on page 28 for additional information.





Touch this icon to update CAN nodes via the field computer. Review Appendix E, *Updating CAN Nodes via the Envizio Pro or Envizio Pro II*, for more information on obtaining node update files and performing an update via the field computer.



Detailed node hardware information is available by selecting a node listed on the CAN Diagnostics screen and touching this icon. The hardware summary screen provides node operating information that may be helpful when contacting technical support or while troubleshooting CAN communication issues.

**Note:** *If the node is not capable of providing hardware information, the Hardware Summary screen will display “N/A” for the unavailable diagnostic values.*



The Raven product controller node is capable of providing up to 4 product control channels on an Envizio Pro control system. By default, the product controller will make two control channels available to the field computer for controlling product application.

Select one of the product controller node channels and select the Select Channels icon (shown to the left) to set the number of control channels available via the node.

**Note:** *The Select Channels icon will display the current number of channels which the node is providing to the field computer. Each control channel must be configured separately via the Tools Menu.*

---

## Guidance Patterns

The following icons represent the available Guidance patterns available for use with the field computer.



The Enhanced Last Pass is well suited to provide guidance for irregular swaths due to irregular field boundaries, well heads, or waterways, etc.



The Straight (A-B) Line pattern is useful for applications in fields with row crops.



The Pivot pattern is useful for applications in fields irrigated by a center pivot.



The Fixed Contour pattern is ideal for creating and saving swaths which follow irregular field boundaries, waterways, well heads, etc., or where the ability to skip swaths in an irregular pattern is necessary.

Refer to the *Using Guidance Patterns* section on page 66 for more information on using Guidance patterns.



---

## Guidance Screen

The following icons and tools are displayed on the Guidance screens.



The Vehicle Arrow represents the vehicle's position in the field. The Vehicle Arrow may also be used to toggle coverage mapping if the correct master switch option is selected. Refer to the *Planter Control* section on page 122 for more information about this feature.



Touch the Menu icon in the lower right corner of the Guidance screen to display a menu of available views and tools.



Within the Menu, touch the Home icon to return to the Home screen. Any active jobs will continue in the background until the job is ended. Note that some Tools Menus will not be accessible while a job is in progress.



Touch the row status display icon on the guidance screen to view a chart of the current seed rate for each row.

## Guidance Views

The following views may be selected for viewing the Guidance screen. To select the desired view, access the Menu on the Guidance screen and touch one of the following icons.



Touch this icon to display the Down Field view. The Down Field view is the view displayed when starting or resuming Guidance from the Home screen.



Touch this icon to switch to a Bird's Eye view. The Bird's Eye view is follows the vehicle's current position with a view looking down onto the vehicle indicator.



Touch this icon to switch to the field review mode. The field review mode can be used to review the entire as applied map.

## On-Screen Switch Box



The section or master switch is off. OmniRow will not control any sections or rows if the section switch is in the off position. If the master switch is toggled off, the OmniRow system will shut off seeding for all seed rate sections or rows.

The master switch displays off if one or more sections are in the manual off position.



Sections or master switch is on. If the master switch is toggled on, the OmniRow system will not automatically shut off seeding for seed rate sections or rows.

The master switch displays on if one or more sections are in the manual on position.



The On/Off icon will be displayed if at least one section is in the manual on position and at least one section is in the manual off position.



Sections or master switch is in the automatic position. The OmniRow system will automatically turn on or turn off seed rate sections or rows based upon previous coverage, field boundaries or zone maps during planting operations.

This icon is only displayed for the master switch status if all sections are set to the automatic control mode.



When operating a multi-hybrid system, the disabled switch status will be displayed for rows or sections assigned to the hybrid or variety not currently enabled for input. Touch the seed rate display in the upper, right corner of the Guidance screen to select the active variety for input during a field operation.



The prime planter icon is displayed within the on-screen switch box. Touch this icon to turn each seed disk one revolution. This feature is useful to prime seed disks after refilling row units.



Touch the AccuRow timed override icon within the on-screen switch box to override AccuRow controlled sections for the time entered as the on override time. Refer to the *On Override* section on page 177 for more information.



Touch the Liquid icon displayed in the upper, right corner of the on-screen switch box display to toggle to the Liquid Shutoff Sections Override screen. This screen allows the operator to manually override the liquid shutoff sections on or off.

To allow the OmniRow system to automatically control the liquid shutoff sections based on the seed application sections, set the liquid section switches to the automatic position. Toggle the switch on or off to override automatic control and keep the liquid section(s) on or off as desired. The AccuRow feature will not automatically shut off liquid sections that are not in the automatic position.

**Note:** *The field computer does not map liquid shutoff sections during planting operations. All seed rate control sections or rows must be off before the liquid section will automatically shut off. If any seed rate section, group or row is enabled and active, the corresponding liquid section will remain on.*



Touch the Plant icon to toggle the on-screen switch box to the AccuRow Override control screen. Use the switches on this screen to manually override seed rate control sections, groups or rows. To allow AccuRow to automatically control section status, set all section switches to the automatic position.

---

## Field Review Mode Tools

The following icons appear in the field review mode.

### Pan Lock



When the pan lock is disabled, the display will automatically scroll to the vehicle indicator as the indicator moves out of the current view. Disable the pan lock to always display the vehicle indicator while in field review mode.



When the pan lock is enabled, the display is locked to the current view regardless of the vehicle indicator position. The operator can manually pan and zoom with the pan lock enabled to view specific portions of a field while in field review mode.

To Pan the display Manually, touch the Field Review screen. Touch the screen to pan the center of the field review display to the selected location.

### Show Overlaps



With the show overlaps feature disabled, the field review mode displays the covered areas (including overlaps) in a solid green color. Touch this icon to toggle the show overlaps feature.



When the show overlaps feature is enabled, application overlaps are displayed in red. Overlaps appear where application (i.e. active sections) cover previously applied areas. Note that the area covered will not display as an overlap unless product application has overlapped.

### Drift Shift



The drift shift feature allows the operator to manually adjust, or nudge, the reported GPS position of all features (e.g. boundaries, coverage and zone maps, field markers, and guidance lines, etc.) within the job simultaneously. This feature allows the operator to manually correct for GPS drift over the course of a field operation or to “recalibrate” the position of field features if the job is resumed at a later date or time.

### Field Markers



Field markers allow the operator to mark locations such as well heads, rock piles, or points of interest during a field operation. Markers will be displayed during the operation and will allow the operator to view the marker information.

### Toggle Maps on the Guidance Screen

During a job with an active prescription or plant zone map, the field computer will display either map on the Guidance and Field Review screens. If both a prescription map and a plant zone map will be used, the operator may toggle which map to display on the guidance and field review screens by selecting the toggle maps icon.

To toggle the displayed map, touch:



The view plant zone map icon to view the loaded plant zone map.



The view prescription map icon to display the loaded prescription map on all guidance displays.

### A-B Path Tools

The following tools and features may be found in the Menu when the Straight Line, Fixed Contour, or Pivot guidance patterns are active.

#### Loading an A-B Line



If an A-B Line has been saved on the field computer, touch the Load A-B Line icon to load a saved line into the current job. This icon will not appear if an A-B Line has already been set. Reset the line to access the Load A-B Line tool.

**Note:** *The A-B Line must be stored in the field computer internal memory to be able to access and load the guidance path. Be sure to transfer all necessary files to the field computer before beginning a job.*

*A-B Lines stored on the Envizio Pro cannot begin or end with a space.*

#### Setting A-B Points

To create a New A-B Line, the operator must set A and B points. The following icons and tools may be used to set a New A-B Line.



Touching the Set A icon will place the first, or A, point of the path at the vehicle's current location. Regardless of where the vehicle moves from this point, the field computer will use the selected pattern to connect this point with the next set point. After the Set A icon is selected, the Set B icon will appear.



Touch the Set B icon to place the second, or B, point of the guidance path. Once the B point has been set, the field computer will use the selected Pattern to create the Guidance Path displayed on the Guidance screen.

---

## Set B by Heading

The Set B by Heading feature is only available with the Straight Line Guidance Pattern. This feature allows the operator to set an A-B Line before completing the first swath.



Use the Set B by Heading feature to create a guidance path along a heading. Touch this icon and use the displayed keypad to enter a heading between 0° and 359° (with 0° being due North).

## A-B Path Configuration

The following tools are available in the Menu when a compatible A-B Line is displayed on the Guidance screen.



Select the A-B Tools icon to access additional tools for use with the current A-B Line.



Select the Reset A-B Line icon to clear the displayed path. If the displayed path will need to be recalled in the future, be sure to save the current path before selecting reset.



Touch the Save A-B Line icon to save the displayed path. Once saved, an A-B Line can be recalled at any time or loaded into other jobs. In addition, saved paths can be transferred from the field computer via the File Maintenance feature. See Chapter 9, *Software Updates and File Maintenance*, for details on the File Maintenance feature and transferring saved paths.



Use the Re-calibrate A-B Line tool to re-calibrate the displayed path to the machine's current position. Due to DGPS drift over time, this feature allows the operator to re-calibrate the A-B Line to a known position in a field.

## Nudge Feature

The Nudge Feature allows the operator to fine tune the displayed path for actual field conditions. The Nudge Feature works especially well with Raven assisted steering systems. Contact a local Raven dealer for more information about these systems.



During an active job, touch the Edit Nudge icon at the bottom of the Guidance screen to display the In Job Nudge Settings screen. This screen allows the operator to enable the on-screen nudge controls, adjust the nudge values, and select the active nudge applied when the nudge icons are selected. See the *Nudge Feature* section on page 85 for more information on setting up and using the Nudge Feature.

### On-Screen Nudge Enabled

The following icons will be displayed on the Guidance screen if the on-screen nudge controls option is set to Enabled.



Touch the Nudge Right icon to move the displayed guidance path to the right. The distance which the path will be nudged is determined by the user defined value for the Active Nudge.



Touch the Nudge left icon to move the displayed guidance path to the left. The distance which the path will be nudged is determined by the user defined value for the active nudge.

### A-B Tools Menu Nudge

The following nudge icons appear in the Menu on the Guidance screen. Touch the Menu icon and select the A-B Tools icon to access the following nudge tools.



Touch the Nudge Right icon in the A-B Tools menu to move the guidance path to the right in 1 inch [2 cm] increments.



Touch the Nudge Left icon in the A-B Tools menu to move the guidance path to the left in 1 inch [2 cm] increments.

## Field Boundary Tools

The following icons will be used while creating a field boundary.



Touch the Boundary Tools icon to display boundary tools available for the current job.



A previously recorded boundary can be loaded into the current job file by selecting the Load Field Boundary icon in the Menu. A list of files stored on the field computer is displayed. Select the desired field boundary to load the selected field boundary into the current job.



Touch the Delete Boundary icon to reset the current field boundary. A field boundary must be present in the current job or this icon will not appear in the Menu.



Touch the Record Field Boundary icon to begin recording a new field boundary. While a field boundary is being recorded, the Pause and End Field Boundary icons are displayed on the Guidance screen.

---

## Pause, Resume and End Boundaries

The following icons will appear on the Guidance screen while a field boundary is being recorded.



Touch the Pause Boundary icon to pause recording of the field boundary. Use this feature when the vehicle's path will not reflect the boundary such as when re-filling tanks, etc. To resume recording, touch the Resume icon.



While paused, the Resume Boundary icon replaces the Pause and End Boundary icons on the Guidance screen. Touch this icon to resume recording of the current boundary.



To finish recording a boundary, touch the End Field Boundary icon. Note: The field computer draws a straight line from the boundary starting point to the vehicle's current location when closing a boundary.

---

## Alarms

Depending upon the alert or warning condition, the field computer may display one or more of the following icons:



The Product Control Alarm icon is displayed if an alarm condition such as a low bin or tank, or when product control cannot reach the target rate.



Touch the Show All Alarms icon to view all current alarm conditions.

# AccuRow™

The following tools and icons will be displayed when working in a job with the AccuRow feature enabled.



Select the zone mapping tools to display AccuRow and zone map tools available for the current job. Tools displayed in this menu may only appear if certain map features are present within the current job. Read the descriptions of the following tools for more information regarding when the tool or feature is available.



While editing zone maps, the Home button is replaced with the Accept button. To save the currently displayed map and restore normal Menu tools, select the Accept button.



Touch the Record No-Plant Zone icon to begin recording points along a no-plant zone boundary. The area inside of the completed boundary will become a no-plant zone.



Touch the Record Plant Zone icon to begin recording points along a plant zone boundary. The area inside of the completed boundary will become a plant zone.



Touch the Record Field Boundary icon to create a new AccuRow field boundary. With zone mapping mode enabled, AccuRow will assign a minimum of three implement widths outside of the completed boundary as a no-plant zone.

## On-Screen Tools

While recording a zone map feature, the following icons may be displayed on the Guidance screen.

### Pause

Select the Pause button displayed on the Guidance screen to temporarily interrupt recording the current zone map feature.

Pause  
No-Plant Zone



Pause  
Plant Zone



Pause  
Field Boundary



This feature is useful if the vehicle course will move away from the boundary path to refill a tank, etc.

### Resume

While Paused, a Resume button will replace the Pause and End buttons on the Guidance screen. Touch this button to resume recording the paused plant zone feature.

Resume  
No-Plant Zone



Resume  
Plant Zone



Resume  
Field Boundary





---

## Stop

When finished recording a Zone or Boundary, touch the Stop button to close Zone or Boundary.

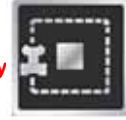
Stop  
No-Plant Zone



Stop  
Plant Zone



Stop  
Field Boundary



**Note:** *The field computer will draw a straight line from the starting point of the feature to the machine's current location when closing the plant zone map feature.*



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# RAVEN

## Limited Warranty

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### ***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](http://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.**