

SOFTWARE OPERATING GUIDE

Patriot[®] 50 Series

Precision Farming and Guidance

Viper[®] 4+ Display

RSI[™] Guidance (if equipped)

AFS VectorPro[™] /SCI[™] Guidance (if equipped)

VSN[®] Visual Guidance (if equipped)

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1 - GENERAL

Manual scope

This software operating guide covers guidance operation with the **Viper®** 4+ display in your vehicle.

This software operating guide does not cover general display usage or vehicle functions such as Heating, Ventilation, and Air Conditioning (HVAC) or automatic axle adjustment setup. You should read the vehicle operator's manual to fully understand basic machine operation before you read this software operating guide.

This software operating guide also covers basic setup and troubleshooting of your Global Satellite System Navigation (GNSS) system. If your vehicle is specifically operating with the **VectorPro** receiver, see the **VectorPro** receiver operator's manual for additional information.

This manual is organized so that an operator can quickly begin using the autoguidance and telematics applications.

This manual contains setup and calibration instructions for the installed features on your vehicle. However, your display was configured at the factory with the settings for your machine. You or your CASE IH dealer may need to perform setup and calibrations in some cases, so the instructions for doing so are given in this manual.

Introduction: Viper® 4+ display

This document provides information regarding the following aspects of the software on the **Viper® 4+** display:

- Initial setup and navigation
- File maintenance
- Updates
- Feature activation

Viper® 4+ display features

The following sections provide an overview of the **Viper® 4+** display capabilities and features.

Viper® 4+ display software platform

The **Viper® 4+** display is designed to assist with managing multiple operators, various implements, a constantly growing and changing list of agricultural products, and various field operations throughout the growing season.

- Multiple user profiles allow the system administrator to set up multiple operators. Each user profile may configure various user preferences to ensure that the operator is comfortable using the system.
- Machine configurations allow the system user to configure the **Viper® 4+** display for multiple tractor and implement types. As the **Viper® 4+** display is moved from machine to machine, the device will detect the machine configuration for the equipment with which the device is currently running to simplify operation preparation.
- Pre-configured product and job profiles allow the system user to set up operation or application details which allow the equipment operator to quickly select pre-configured settings for the product loaded and the job or operation to perform and begin field work without setting up the system.

The system administrator may view and use the above information from the job report to make administrative decisions required with as much information as needed for the specific operation.

NOTE: Please review this manual for details on setting up user or job profiles and equipment or product configurations.

Customizable 2D and 3D guidance screens and widget dashboard

The **Viper® 4+** display features widget-based screens for field operation and guidance. Select from various widgets to customize the information displayed on the screen during field operations. Customize the widget layout to keep important operation information or operation tools available at a glance. Save each screen profile to quickly recall and view additional information as necessary or as different tasks become more critical for the field operation.

NOTE: See "Introduction" (3-14) for additional information about widgets or saving and using screen profiles.

During field operations, the **Viper® 4+** display provides either a two or three dimensional view of the equipment location within the field area. The **Viper® 4+** display also utilizes the configured equipment geometry to provide a swath guidance line on the map to assist the operator and keep the equipment on track during the field operation.

NOTE: This guidance path may also be used by the autoguidance system to automatically steer the equipment onto the displayed swath guidance line, to help reduce operator fatigue and allow the operator to monitor input or application systems.

On-screen mapping and job reporting

During field operations, the **Viper® 4+** display monitors and tracks the vehicle location and records input or application systems. As active sections or the working equipment width covers field area, the **Viper® 4+** display creates a live map of previous equipment coverage. When the job is complete, the **Viper® 4+** display compiles the location and any population, rate, or yield information into a report file for transfer to a home or office PC. The reports may be edited and used for customer billing, tracking product input for government purposes, or to help plan future crop inputs and field operations.

Job reports must be transferred to a **Slingshot®** user account via either a **Slingshot®** field hub or a USB flash drive. The **Slingshot®** web service is free and does not require any hardware or monthly subscriptions to utilize the reporting features of the web site. With a **Slingshot®** field hub, files may be transferred to the equipment cab from a home or office PC and completed job reports may be transferred from the cabin to the home or office via the wireless network.

Visit the **Slingshot®** web site for more information or to locate a local CASE IH dealer for additional assistance with available **Slingshot®** services (<https://portal.ravenslingshot.com>).

Universal Terminal (UT) and task controller capability

The **Viper®** 4+ display is capable of interfacing with many ISOBUS control systems via the universal terminal (UT) capabilities. This feature allows the operator to monitor or control various aspects of the vehicle or implement over an ISOBUS network via the **Viper®** 4+ display without the need for additional displays or control consoles in the vehicle cabin.

Task controller

The ISO Section Control activation key allows the **AccuBoom™** feature to control implement sections that are connected to the task controller. The task controller is required to allow the **Viper®** 4+ display UT to automatically control sections based upon field position and previous coverage data collected during the application.

2 - SAFETY INFORMATION

Safety rules

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual and on machine safety signs, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

! DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

! WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

! CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine damage or property damage. The color associated with Notice is BLUE.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine damage or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety

NOTICE: Follow the operation and safety instructions included with the sprayer and read this manual carefully before operating this system.

- Follow all safety information presented within this manual and the sprayer operator's manual. Review sprayer operation with your local dealer.
- Contact a local CASE IH dealer for assistance with any portion of the installation, service, or operation of this equipment.
- Follow all safety labels affixed to system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. Contact a local CASE IH dealer to obtain replacements for safety labels.

Observe the following safety measures when operating the system:

- Do not operate this system or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Be alert and aware of surroundings and remain in the operator seat at all times when operating this system.
 - Disable this system before exiting the operator seat.
 - Determine and remain a safe working distance from obstacles and bystanders. The operator is responsible for disabling the system when a safe working distance has diminished.
 - Disable this system prior to starting any maintenance work on the components of this system.
- Do not attempt to modify or lengthen any of the system control cables. Extension cables are available from a local CASE IH dealer.

Displays and control consoles

- If the display will not be used for an extended period, it is best to remove the display from the machine and store it in a climate controlled environment. This may help to extend the service life of electronic components.
- To prevent theft, secure the display and GPS antenna when leaving the machine unattended.

Agricultural chemical safety

Follow all federal, state, and local regulations regarding the handling, use, and disposal of agricultural chemicals, products, and containers. These include but are not limited to pesticides, herbicides, and fertilizer. Triple-rinse and puncture or crush empty containers before properly disposing of them. Contact a local environmental agency or recycling center for additional information.

- Always follow safety labels and instructions provided by the chemical manufacturer or supplier.
- Always wear appropriate personal protective equipment as recommended by the chemical and/or equipment manufacturer.
- When storing unused agricultural chemicals:
 - Store agricultural chemicals in the original container and do not transfer chemicals to unmarked containers or containers used for food or drink.
 - Store chemicals in a secure, locked area away from human and livestock food.
 - Keep children away from chemical storage areas.
- Fill, flush, calibrate, and decontaminate chemical application systems in an area where runoff will not reach ponds, lakes, streams, livestock areas, gardens, or populated areas.
- Follow all label instructions for chemical mixing, handling, and disposal.
- Avoid direct contact with agricultural chemicals or inhaling chemical dust or spray particulate. Seek immediate medical attention if symptoms of illness occur during, or soon after, use of agricultural chemicals or products.
- After handling or applying agricultural chemicals:
 - Thoroughly wash hands and face after using agricultural chemicals and before eating, drinking, or using the restroom.
 - Thoroughly flush or rinse equipment used to mix, transfer, or apply chemicals with water after use or before servicing any component of the application system.

NOTE: You can find information about safety standards for agricultural chemicals at <https://www.iso.org/standard/70623.html>.

Hydraulic safety

When servicing a hydraulic system or hydraulic components, be aware that hydraulic fluid may be extremely hot and under high pressure. Caution must be exercised.

- Always wear appropriate personal protective equipment when installing or servicing hydraulic systems.
- Never attempt to open or work on a hydraulic system with the implement running.
- Any work performed on the hydraulic system must be done in accordance with CASE IH approved maintenance instructions. For assistance, see your CASE IH dealer.
- Care should always be taken when servicing or opening a system that has been pressurized.
- The sprayer must remain stationary and switched off with booms or implement sections unfolded and supported during installation or maintenance.
- Take precautions to prevent foreign material or contaminants from being introduced into the sprayer hydraulic system. Contaminants that are able to bypass the hydraulic filtration system will reduce performance and may damage hydraulic components.
- Stand clear of hydraulically-powered equipment when starting the system for the first time after installing or servicing hydraulic components in case a hose has not been properly connected or tightened.

Caution

Electrical safety

- Always verify that power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to any of the electrical systems or other components.
- Never attempt to open or work on an electrical system with the sprayer running.
- To prevent personal injury or fire, replace defective or blown fuses with only fuses of the same type and amperage.
- Do not connect the power leads to the battery until all system components are mounted and all electrical connections are completed.
- Always start the machine before initializing this system to prevent power surges or peak voltage.
- To avoid tripping and entanglement hazards, route cables and harnesses away from walkways, steps, grab bars, and other areas used by the operator or service personnel when operating or servicing the equipment.

Touch screen

- Only touch the touch-screen with your finger or by using a special touch-screen stylus/pen. Operating the touch-screen with sharp objects may cause permanent damage to the screen.
- Only clean the screen using a damp cloth. Never use caustic or other aggressive substances.

3 - ICONS AND WINDOWS

Viper®4+ display overview

Start up

Initial start-up

When powered on for the first time, the **Viper® 4+** display will prompt the operator to configure the machine before proceeding. The following procedure is designed to assist the user or equipment owner with the initial set up and configuration of the **Viper® 4+** display and is recommended to avoiding entering profile calibration information more than once.

Please read the following procedure from start to finish before starting the initial setup. Completing the tasks in the order presented in the following section will help make sure that the **Viper® 4+** display and connected systems are ready for operation in the shortest time possible.

Power button and status

Key on the ignition. The **Viper® 4+** display will begin to boot up.

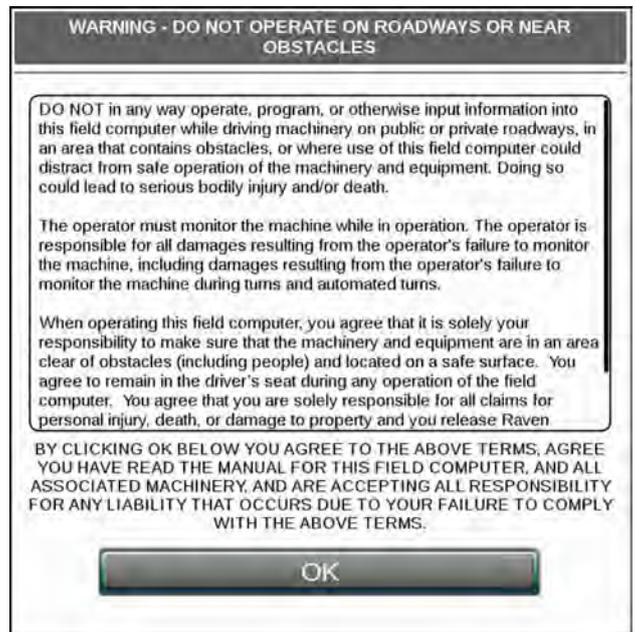
The power button (1) on the left-hand side of the display flashes red and then should illuminate green. If the status indicator stays red or does not illuminate, contact your CASE IH dealer for additional assistance.

NOTE: Do not connect any USB drives or devices to the **Viper® 4+** display device during the power up sequence.



RAIL21TR02847AA 1

Acknowledge the advisory message that may appear.



RAPH22PLM0518BA 2

Viper® 4+ display built-in self test

If the **Viper® 4+** display fails to display a picture on the screen, perform a **Viper® 4+** display self test to diagnose the issue. The built in self test will help determine if a black screen symptom is caused by a hardware issue or a software issue.

To perform a **Viper® 4+** self test:

1. Remove power from the display by disconnecting the four pin power plug.
2. Press and hold the power button on the side of the display.
3. Reconnect the four pin power plug.
4. Release the power button and note the power button color. If the button is:
 - Green - Hardware is working properly. The cause of the black screen is likely a software issue. Reload the software on the **Viper® 4+** display.
 - Yellow - Hardware is functioning properly but the firmware may be corrupt. Use the thumb drive with the appropriate firmware to reinstall the firmware.
 - Red - A hardware issue has occurred. Contact your CASE IH dealer for analysis and repair.
 - No Color - If the power button does not display a color, this could indicate that there is no power being applied to the **Viper® 4+** display. Check the power and input with the voltmeter and troubleshoot any external power issues. If power is present at the **Viper® 4+** display power plug, contact your CASE IH dealer for service or repair.

Device shut down

When finished using the **Viper® 4+** display:

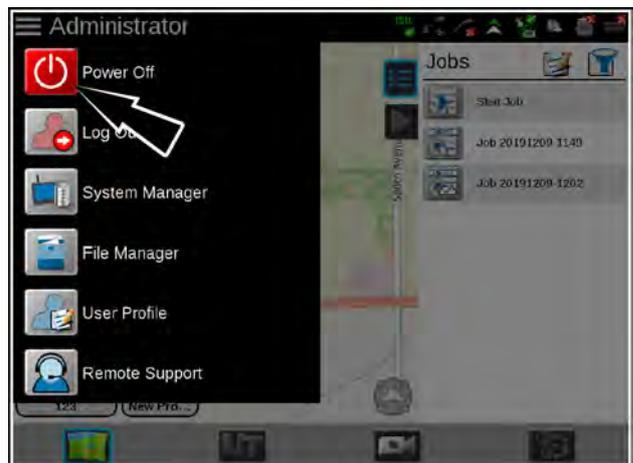


Close any active jobs by selecting the home icon in the lower right-hand corner of the display.

Press the “Administrator” panel.



Press the “Power Off” button.



RAPH23PLM1161BA 1

Initial start up overview

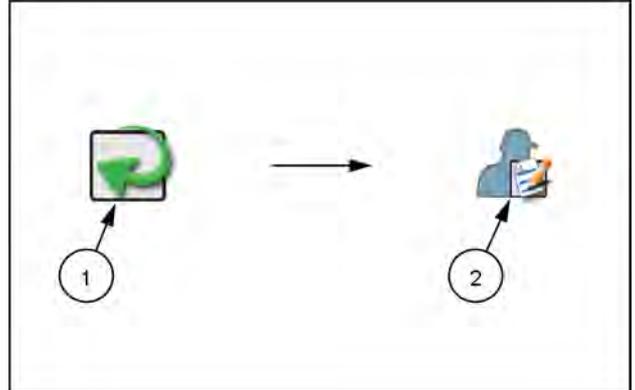
Language and units



Press the Done icon (1) to clear the initial machine configuration prompt.



Press the administrator panel at the top of the display. Press the User Profile icon (2).



RAPH22PLM0311AA 1

1. Press the location information tab and set the desired language at the bottom of the tab display.
2. If desired, update the time zone to the local universal coordinated time (UTC).
3. Press the unit preferences tab and select the desired base and pressure units for display. These units will be used to enter the machine configuration and calibrate control systems.

NOTE: See “Administrator and user profiles; Overview” (4-1) for additional details on setting up user profiles on the **Viper® 4+** display.

4. Proceed to the “Initial machine configuration” heading in this section to continue the initial set up of the **Viper® 4+** display.

Capturing screen shots

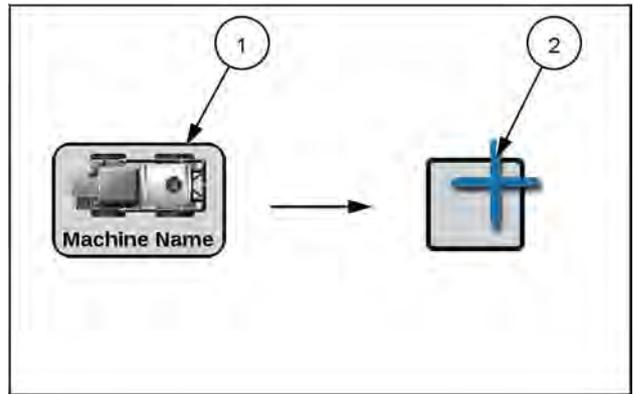
1. Quickly press and release the power button. The screen shot is saved as soon as the power button is pressed. A “Shutdown Requested” window will open.
2. Press the “Save Screen Shot” button.
3. To capture a screen shot while not in a job, quickly press and release the power button. A “Shutdown Requested” window will open.
4. Press the “Save Screen Shot” button.
5. After capturing a screen shot, export the data using the file manager. See “Using the file manager” (7-38).



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Initial machine configuration

1. Use the on-screen keyboard to enter a name for the machine or equipment configuration. The machine configuration includes the vehicle or tractor and any connected implements, carts, or tanks. Choose a profile name that will assist with identifying profiles with similar components as new profiles are added for future operations.
2. Press the “Tractor” name field and use the on-screen keyboard to enter the name or designation for the vehicle or tractor used with the profile. When setting up a configuration for a pull-type sprayer, the operator might enter the configuration name as “Liquid Applicator” and the tractor nickname as “Front Wheel Assist.”



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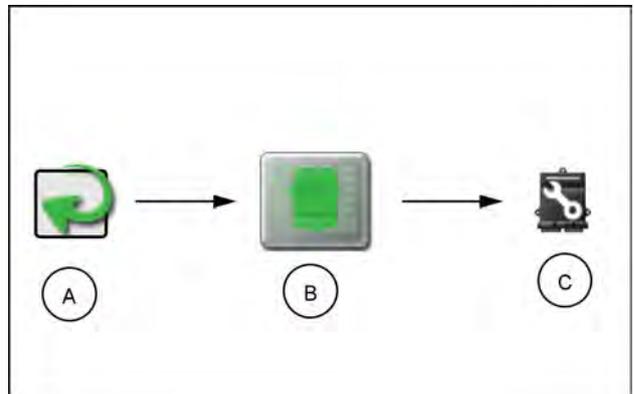


Select the machine configuration icon (1) in the bottom-left corner of the “Street Maps” view to display the available machine configurations.



Press the add button (2).

1. Select Done (A) on the machine configuration tab to return to the machine panel.
2. Locate and select the CAN System icon (B) in the machine panel editor to view CAN system information.
3. Verify that all CAN bus nodes are detected and displayed by the Viper® 4+ display.
4. Readdress any product control nodes (C) connected to the CAN bus at this time.
5. Verify any multi-channel nodes are configured correctly for the control channels necessary for the equipment during field operations.



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1. Finish the machine configuration setup. See “Machine panel and configurations; Overview” (4-12) for details on setting up and completing machine configurations.
2. If desired, enter product information to set up a product configuration during the initial setup.
3. If desired, set up job profiles for various field operations during the initial set up process. See “Job profile panel and configurations; Overview” (4-36).

Navigation overview

Home screen and panel navigation

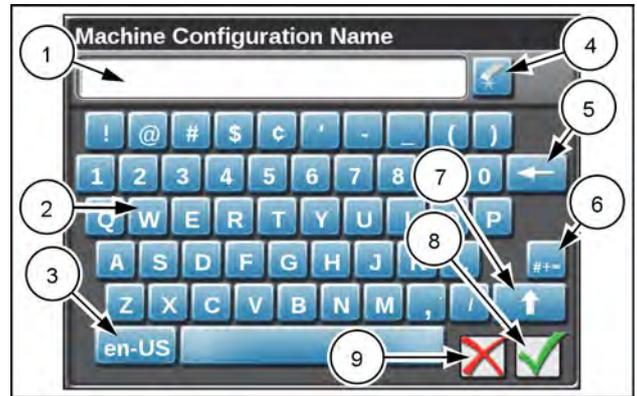
When the machine is powered on, the **Viper® 4+** display will show the following profile areas or panels:

- On-Screen Keyboard
- Status Header
- Administrator or User Panel
- Machine Configuration Panel
- Product Configuration Panel
- Street Maps
- Job Profile Panel
- Universal Terminal (UT) Panel
- Camera Panel

On-screen-keyboard

This keyboard is displayed when entering or modifying profile, product, or job names. The following features may be used on the keyboard:

1. Character Entry Field
2. Character
3. Language Select
4. Clear
5. Backspace
6. Symbol
7. Shift
8. Accept
9. Cancel



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Character entry

When you press keys on the keyboard, the selected character displays above the key. If the displayed character is not the intended character for entry, continue pressing the screen while dragging to the correct character to enter. The character does not appear in the character entry field until you release the press.

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 lower case, press the shift key.

NOTE: The keyboard automatically capitalizes the first character entered into the character entry field. To cancel the feature, press the shift key before entering characters using the keyboard.

Press the shift key to enter the characters using the upper case character set. Double tapping the shift key enables caps lock. Press the shift key again to disable caps lock.

Symbols



When browsing the web using the **Viper®** 4+ display, this symbol button appears on the keyboard. Use this button to open the symbol keyboard.



This button returns the alphabetical keyboard.



Press the backspace button to remove the previously entered character or space.



Use this button to clear all characters in the character entry field.



Press this button 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.

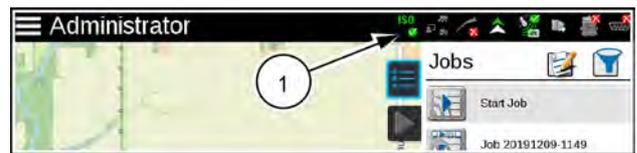


Press this button to return to the previous screen without entering the keyed text or characters.

Status header

The status of various features or other system components connected to the **Viper®** 4+ display is displayed in the upper right-hand corner (1) of the **Viper®** 4+ display.

This area allows the equipment operator to quickly check communication or processes in progress at a glance and, if necessary, take action to address any issues before beginning the days operations.



The following status indicators will be displayed in the status header:



Slingshot® - The status of a **Slingshot®** Field Hub is displayed. A red X will display on this indicator if a Field Hub is not connected or not detected. When a Field Hub is connected to the **Viper®** 4+ display, this area will display the current signal strength for wireless communication status.



GPS. This indicator displays the current status of the position solution. This indicator 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



Software Update Available. One of these status displays will be available if a **Viper®** 4+ display update or feature unlock file is available. The update will remain available even after the USB flash drive is disconnected from the device to allow the operator to perform the update process at a convenient time during the day and without disrupting field operations.



File Transfer. the status header displays the status of wireless file transfers with a **Slingshot®** Field Hub. If a file transfer is in progress, the file transfer indicator will display a green "in progress" status.



CAN bus Communications. This indicator displays the communication status for a CAN bus system. A green indicator will be displayed when communication is detected without errors.



ISOBUS Communications. This status display indicates the status of ISOBUS communication with electronic control units (ECU), working sets, implements, etc. This status will only be shown if an ISOBUS ECU is detected by the **Viper® 4+** display.



Machine Telematics. This indicator displays the status of telematic messages received from the engine, including information such as fuel levels, DEF levels, RPM, and run-time hours. This information is then sent to the **Slingshot®** system. This indicator will display:

- Green if any information is being received by the **Viper® 4+** display.
- Grey if no information is being received by the **Viper® 4+** display.



Serial Communications. This indicator displays the communication status for serial communication ports. A green indicator will be displayed when all configured communication ports.



Forward/Reverse. The forward/reverse status indicator shows if the machine is traveling forward or reverse according to the **Viper® 4+** display.

Administrator or user panel

Press “Administrator” or “User Name” at the top of the display to access the “Administrator” or “User” panel and the following utilities:



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Power down

Press the power down icon to shut down the **Viper® 4+** display. It is recommended to shut down the device using this icon prior to removing power from the **Viper® 4+** display by switching the vehicle ignition off.



Log out

Press the log out icon to exit the current user profile. Log out of the **Viper® 4+** display when leaving the equipment for short periods or at the end of the shift or when switching operators to secure the management system from unauthorized access or operation of the control system.

NOTE: *Demonstration mode features are also available via the logout prompt.*

See “Administrator and user profiles; Overview” (4-1) for more information on setting up and using administrator and user profiles.



System manager

Access the system manager utility within the administrator or user panel to perform software updates and CAN node firmware updates. Product software and documentation updates may be made available periodically. See your CASE IH dealer.

NOTE: See “System manager overview” (7-27) for more information on performing system and hardware updates.



File manager

Access the file manager to perform file maintenance, access utilities for exporting and transferring job files and other data to and from the **Viper® 4+** display, and to view the transfer history for previous job data.

NOTE: See “File manager overview” (7-37) for more information on performing file maintenance. Do not store job and field information on the **Viper® 4+** display for long term reference or archiving. Perform file maintenance regularly and remove files associated with completed jobs or field operations to ensure memory resources are available for new operations as needed. Archive and back up job and field information on a home or office PC to ensure the data is securely archived and backed up.



User profile

User profiles may be created for each operator to save user preferences such as language and displayed units to maximize each user’s comfort level while operating the equipment with the **Viper® 4+** display. Each user profile may also be assigned a unique Personal Identification Number (PIN) to secure the **Viper® 4+** display from unauthorized access, modifications, or operations from the operator.

In addition to securing the system from unauthorized use, the **Viper® 4+** display saves active user profile information with each job report. If multiple operators will be using the same machine during a specific field operation, the job report will contain a list of users that completed the specific field operation. The system administrator may also review the specific field areas in which each operator was logged in and operating the equipment.

See “Administrator and user profiles; Overview” (4-1) for more information on setting up and using administrator and user profiles.



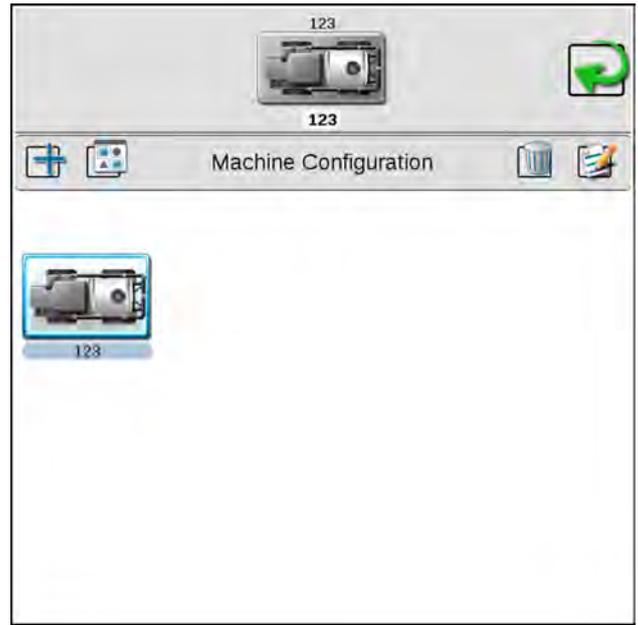
Remote support

Access assistance from the support team remotely.

Machine configuration panel

The “Machine Configuration” panel contains utilities for selecting and configuring the various types of vehicles and equipment operated by the **Viper® 4+** display.

NOTE: On initial start up, the **Viper® 4+** display will require a machine configuration before other system features may be accessible. See “Initial start up overview” (3-3) for an overview of the initial settings required and the recommended procedure to complete setup of the **Viper® 4+** display.



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Machine configuration

A machine configuration saves vehicle calibration information, applicator geometry, and CAN bus system information. The **Viper® 4+** display will automatically identify and select the matching configuration on start up. The **Viper® 4+** display will also alert the operator if a CAN component in the saved profile is not detected. See “Machine panel and configurations; Overview” (4-12) for detailed information on setting up machine configurations.



Machine configuration selection

In some instances, a machine configuration matches more than one equipment set up. If necessary, create profiles for each of these machines to allow the system to save geometry and guidance settings for each specific machine. When the system detects a set up matching these configurations, it allows the operator to select the saved machine configuration to quickly set up the system for current operations.

Product configuration panel

The product configuration panel provides utilities for setting up control channels for common product applications, which the **Viper® 4+** display uses to control application.



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Product configuration

The **Viper® 4+** display allows the operator or system administrator to set up a profile for common applications, tank mixes, or for upcoming field operations. The product configuration saves control channel and product or mix information for various application or product types. It allows the operator to select existing profiles to quickly resume or restart an application or operation for various fields. You can create new product configurations using existing products entered into the **Viper® 4+** display or via the pre-loaded **agX®** product database.

NOTE: *Displayed product configurations appear only for the selected machine configuration.*



Product configuration selection

Once a product configuration is set up, the product may be selected to quickly set up the **Viper® 4+** display for operations and resume operation or repeat the same operation in a different field. Simply select the product configuration, verify and adjust mix ratios as necessary for accurate job reporting, and get to the field tasks at hand. Simply select the product configuration, verify and adjust the mix ratio's, and start the field tasks at hand.

NOTE: *If the product control nodes are readdressed between field operations, the product configuration must be adjusted to properly control the product assigned to each control channel. Check and verify the product configuration before starting any field operations.*

Universal Terminal (UT) panel

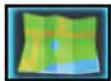
Press the “UT” button (1) to open the Universal Terminal (UT) panel.

The Universal Terminal (UT) panel provides access to the ISOBUS working set displays (also known as “object pools”) and ECU options or features. Use this panel to access operating software for **RS1™** guidance (if equipped), **SC1™** guidance (if equipped), Rate Control Module (RCM) operation, **AutoBoom®** XRT (if equipped), and other systems that are connected to the ISOBUS CAN network.



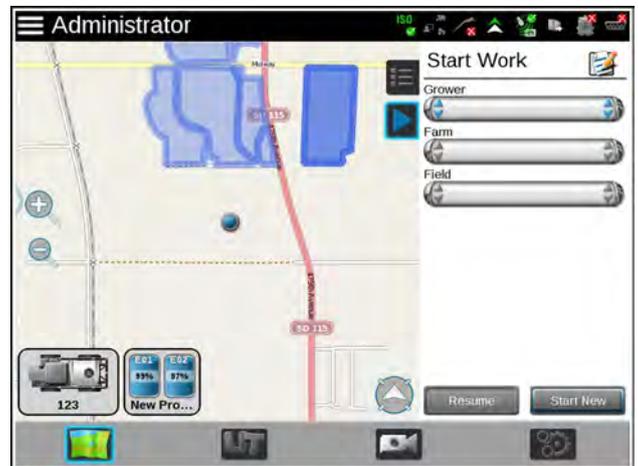
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NOTE: The UT panel will be available at the bottom of the main panel display only if an ISOBUS-compatible ECU is detected by the **Viper®** 4+ display.



Street maps

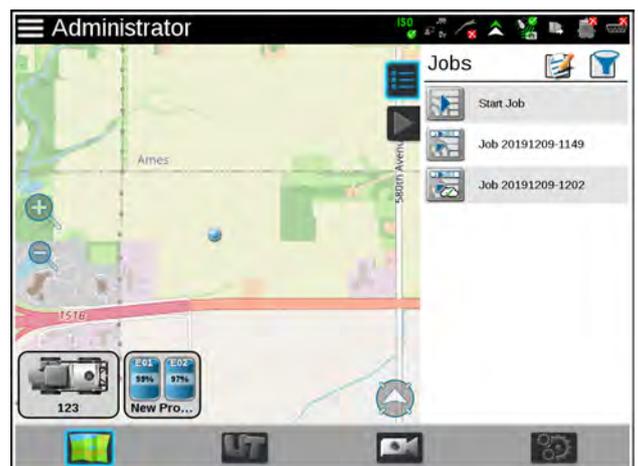
The street maps screen provides a view of scouting field boundaries in the area. If desired, the user can filter the scouting field boundaries by grower, farm, and field. The user can also select the scout field boundary directly from the map. You create street maps on the **Slingshot®** portal. See “Street maps” (4-34) for additional information on street maps.



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Job profile panel

The job profile panel provides the operator or system administrator with the following tools to set up, filter, and select profiles for specific field operations or tasks:



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Job profile configuration

Configure common or recurring field operations to save job settings such as grower and field data, scouting information, or saved guidance lines for use during upcoming field operations or reuse during future seasons.

See “Job profile panel and configurations; Overview” (4-36) for assistance setting up various job profiles.



Job profile selection

When the equipment arrives at the field, perform the following actions:

- Select the pre-configured job profile and verify the job settings.
- Enter the target product rate or rates.
- Select any modifications to the guidance or scout information.
- Press start to begin a new field application or start operations.

The job profile panel also displays any previous jobs started using a pre-configured profile. To resume a previous job operation, enter the street maps view. Select the specific job file, verify the job settings, and select start. The **Viper® 4+** display also provides utilities to help sort and filter the items displayed in the job profile panel to help the operator quickly locate and select the correct profile or previous operation.

NOTE: Setting up a job profile is not a requirement and is designed as a Grower function. The default Start Job profile allows a user to quickly start a job and allows the user to assign GFF, saved guidance lines, and scout groups (if applicable).

NOTE: Perform file maintenance regularly to keep device resources available for active field operations. Transfer completed job files to a home or office PC, or a **Slingshot®** account, for backup and archiving. See “File export” (7-42) for more information on transferring job files.



Camera panel

The camera panel allows the user to access cameras connected to the display. Toggle between up to four video sources with one designated as a reverse camera.

Guidance views and widgets

The **Viper® 4+** display features a customizable guidance display using widget based tools and display utilities. Each equipment operator may select the widgets to be displayed during a job, move each of the widgets around the screen to create the best or most desirable information display, and save the layout for use during future operations or by different operators.

1. Zoom
2. View selection
3. Alarms
4. Widget setup
5. Home



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View selection

The guidance display allows the operator to set up various screen layouts and switch between saved layouts and views at any point during field operations. The following guidance views are available during an active job:

3D Guidance. Provides a three-dimensional view of the current equipment location in the field.

Field Review. The field review allows the operator to review any part of the active job or the overall coverage map for the current operation.

Web View. If wireless services are available, this view allows the operator to access web based services for up to date information delivered right to the vehicle cabin.

NOTE: Access to web based services may require additional hardware with a wireless service contract. For additional information on these features, see your CASE IH dealer.

Widget. The widget view provides the operator with a view for additional widgets, tools, and other feature controls that may be necessary during various field operations and allows the operator to place as many widgets as necessary without covering guidance or field information.



Widget selection and set up

The guidance screen widgets featured in the **Viper® 4+** display allow the equipment operator to create and save multiple screen configurations for various types of field operations, equipment, or applications. The operator may select as few or as many widgets as desired or necessary to perform tasks in the field. Each customized layout may be saved to allow the operator to quickly switch from one layout to the next with a few screen presses, complete a specific task, and then return to the desired operation screen.



Alerts and alarms

To help the equipment operator make the most informed decisions possible, the **Viper® 4+** display provides active alert information as well as alert history. When encountering problems in the field, the operator is able to access this information while troubleshooting to help the operator and support personnel correct potential issues quickly while in the field.

Guidance screens and widgets

Introduction

The **Viper® 4+** display, features a customizable guidance display using widget-based tools and display utilities. From the factory, the **Viper® 4+** display is configured with pre-defined layouts that are applicable to most sprayer operations, with the more commonly-used items along the right-hand side and less commonly-used items on the left-hand side.

The **Viper® 4+** display allows each equipment operator to select which widgets will be displayed during operation, move each of the widgets to a desired portion of the screen, and save multiple screen configurations for use during future operations and other operators. The **Viper® 4+** display also allows an administrator to create a custom wallpaper and copy it to multiple **Viper® 4+** displays so all machines can have the same guidance screens the administrator deems appropriate for operation. The administrator-created screens are locked and cannot be modified by the users.



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The following sections assist with using the operation and guidance utilities, selecting widgets, and saving screen layouts used during field operations:

- “Operation displays” (3-15)
- “Alarms” (3-16)
- “Screen layout configurations” (3-18)
- “Widget selection and setup” (3-20)
- “Guidance patterns overview” (5-1)
- “Scout groups overview” (5-15)

Operation displays

Views

To select a view during an operation:

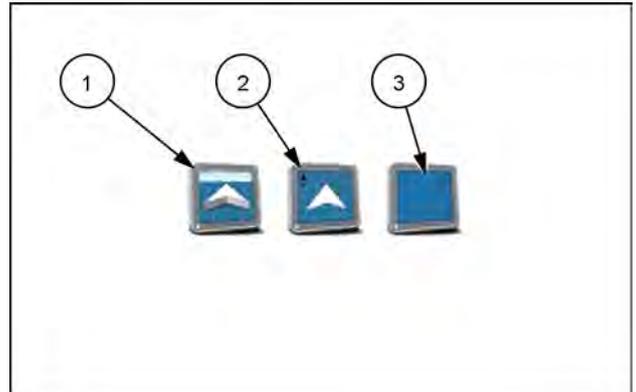
- Select one of the following views to switch the display to the selected view.

3D Guidance - Select this view **(1)** to use a three dimensional view of the current machine position in the field area.

Field Review - The field review mode **(2)** allows the operator to move the display to any portion of the field area to review coverage or operation data for the current operation.

NOTE: Press a completed field boundary in the field review mode to display the boundary area.

Widget View - The widget view **(3)** provides the operator with a view for additional widgets, tools, and other feature controls necessary during various field operations and allows the operator to place as many widgets as necessary without covering guidance or field information.



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Zoom and view tools

The following tools are available in the 3D Guidance and Field Review modes:



Zoom – Press the zoom icon in the lower left-hand corner of the display. Use the sliding bar to adjust the zoom level desired for monitoring the field operation.

NOTE: While using the 3D Guidance mode, the zoom slider will also adjust the view angle for down-field or overhead view of the vehicle location.



View coverage extents – In the field review mode, select the coverage extents icon along the bottom of the display to automatically set the zoom to display the extents of the coverage area, scout map, or prescription map completed or loaded into the job.

NOTE: Press a completed field boundary in the field review mode to display the area within the scout group.



Vehicle lock – In the field review mode, select the vehicle lock icon along the bottom of the display to keep the field review display centered on the current vehicle position during field operations.

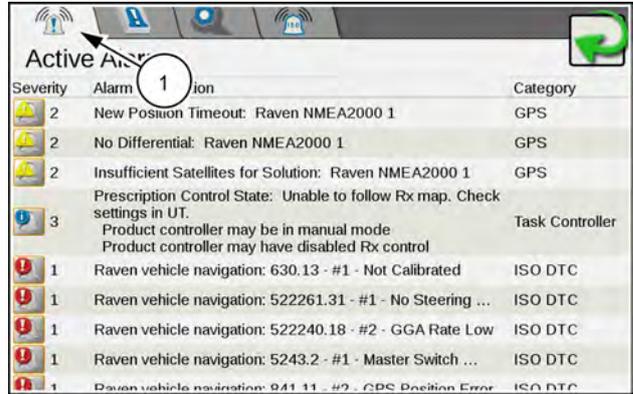
Alarms

To help the equipment operator make the most informed decisions possible, the **Viper® 4+** display provides active alert information as well as alert history. When encountering problems in the field, the operator is able to access this information while troubleshooting to help the operator and support personnel correct potential issues quickly while in the field.

NOTE: Additional alarm settings may be available for various add on systems or features. Please refer to the system or feature documentation for assistance with configuring alarms or defining alarm conditions. Alarms from ISO Electronic Control Units (ECU) are handled by the Universal Terminal (UT), which has it's own pop up and audible indicator. Alarms for ISO ECU's will not show on the alarm widget or in the alarm history. Alarm settings do not apply to the ISO ECU alarms.

Active alarms

If an alert or alarm condition is detected during a field operation, the **Viper® 4+** display will show an alert or alarm notice on the alarm icon along the bottom of the display.



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 Press the alarms icon.

Select the Active Alarms tab (1). If an alarm condition is currently detected during the field operation, the **Viper® 4+** display will show the following alarm details:



Alarm Severity. The alarm severity may be used as an indication of the impact which the detected condition may have on the operation. A critical error may cause significant application issues or indicate a severe problem with the system while a notice may be an indication of a minor issue during which the system is able to function normally. Regardless of the severity of the alarm, it is recommended to check the alert or alarm details and address the condition as necessary for the current field operation.



Alarm Information. The **Viper® 4+** display will provide a short description of the alert or alarm condition to assist the operator with diagnosing or correcting the cause for the alarm.



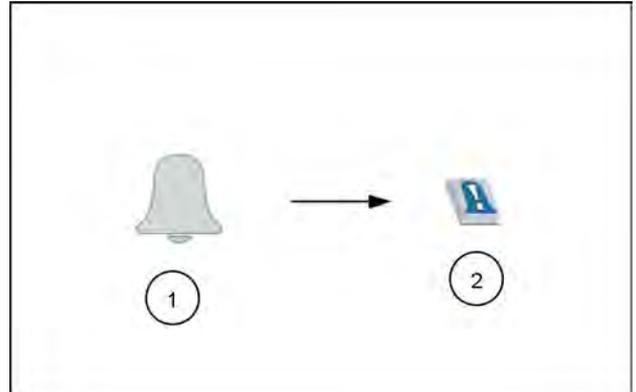
Category. The category of the alarm may be helpful when addressing specific alarms to either identify systems or components which may be encountering or causing the error.

Alarm history

Even after the alarm condition has been addressed or corrected, the **Viper® 4+** display provides a log of alert conditions throughout the field operation.

To access the alarm history during an active operation:

1. Press the Alarms icon (1).
2. Select the Alarm History tab (2). The **Viper® 4+** display will show a list of previously detected alarm conditions. Refer to the Active Alarms section above for details on the severity, alarm information, and category information displayed.



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Alarm settings

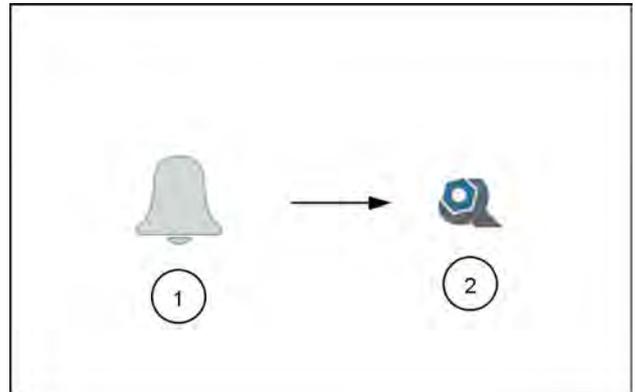
To access the alarm history during an active operation:

1. Press the Alarms icon (1).
2. Select the Alarm Settings tab (2). The following global alarm settings will be accessible:

Audible Alarms - Enable the audible alarms option to receive an audible tone for alarm conditions detected during the active field operation.

Popup Alarms - Enable the popup alarms option to display an alert prompt on the **Viper® 4+** display for alarm conditions detected during the active field operation.

Audible Backup Alarm Enabled - Enable the audible backup alarm to receive an audible notification when GPS detects the machine is backing up.



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Screen layout configurations

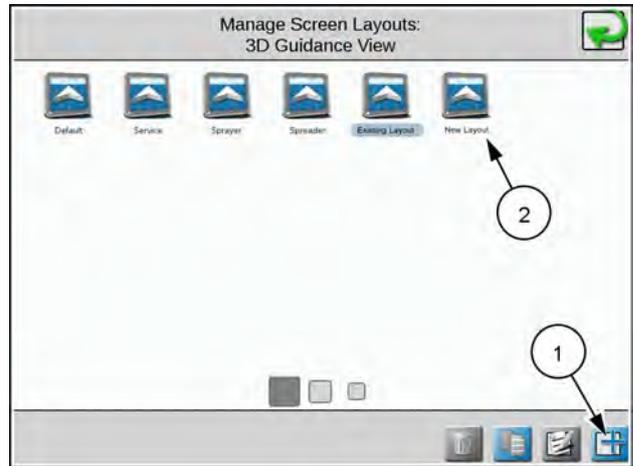
NOTE: You must start a job before you can edit or change screen layouts.

Create a new screen layout

Press the Screen Configuration icon.



1. Swipe or use the page navigation at the bottom of the “Manage Screen Layouts” prompt to select the view or mode in which to add the new screen configuration.
2. Select the Add button (1) and use the on-screen keyboard to enter a name or description for the new configuration.
3. The new configuration will be displayed (2) on the view or mode layouts prompt. For assistance with editing widgets on the new screen layout, see “Widget selection and setup” (3-20).



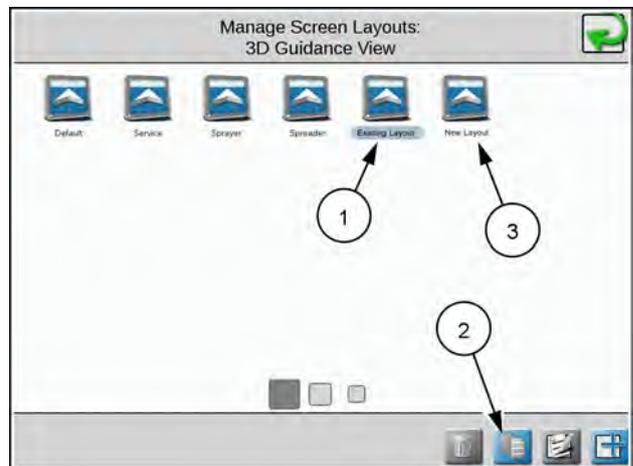
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Copy an existing screen layout

Press the Screen Configuration icon.



1. Swipe or use the page navigation at the bottom of the “Manage Screen Layouts” prompt to select the view or mode with the screen layout to be copied.
2. Select the layout to copy (1).
3. Press the “Copy button (2) and use the on-screen keyboard to enter a name or description for the new configuration.
4. The new configuration will be displayed (3) on the view or mode layouts prompt. For assistance with editing widgets on the new screen layout, see “Widget selection and setup” (3-20).



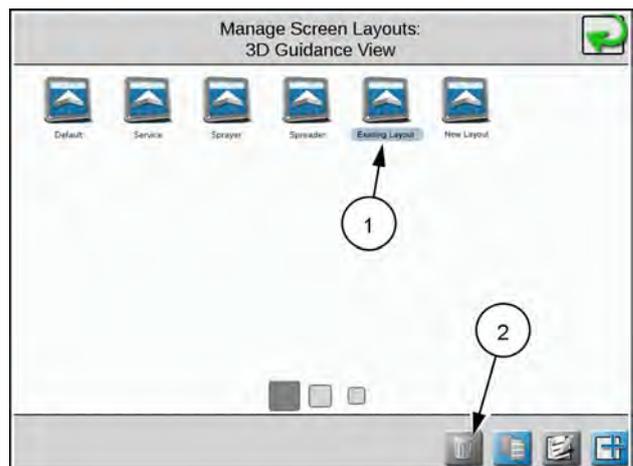
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Delete a screen layout

Press the Screen Configuration icon.



1. Swipe or use the page navigation at the bottom of the manage screen layouts prompt to select the view or mode with the screen layout to be deleted.
2. Select the icon for the existing layout (1) to be removed.
3. Press the Delete button (2). The configuration will be displayed with a “deleted” icon over the layout button.
4. To undo the delete function, press the screen layout to remove the “deleted” status. To proceed and remove the configuration, press the done button in the upper, right corner of the prompt.



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Edit a screen layout

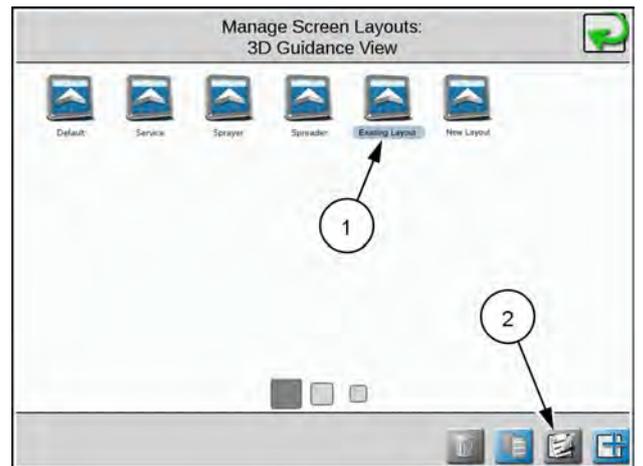
Press the Screen Configuration icon.



To add, remove, or modify widgets on a screen configuration:

1. Swipe or use the page navigation at the bottom of the Manage Screen Layouts prompt to select the view or mode with the screen layout to be copied.
2. Select the icon for the existing layout **(1)** to be edited.
3. Select the Edit button **(2)** to enter the widget editing mode. For more information on adding, modifying, or removing widgets on a screen layout, see “Widget selection and setup” **(3-20)**

NOTE: Job and guidance operations will continue in the background while in the widget editing mode, however, job and guidance information will not be displayed. If significant layout changes will be made, pause field operations while editing the screen layout or widget selection. Default screen layouts cannot be edited.



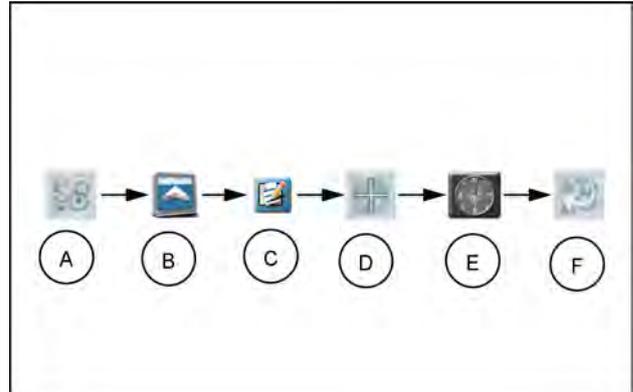
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Widget selection and setup

Add widgets to a screen layout

To use the widget editing mode to add widgets to a screen layout:

1. Press the Screen Configuration icon **(A)**.
2. Swipe or use the page navigation at the bottom of the manage screen layouts prompt to select the view or mode with the screen layout **(B)** to be modified.
3. Select the Edit button **(C)** to enter the widget editing mode.
4. Press the Add Widgets icon **(D)** along the bottom of the display. The Widget Selection icon **(E)** will display.
5. Swipe or use the page navigation at the bottom of the widgets prompt to browse the available widgets.
6. To add a widget to the screen, press and hold the desired widget for approximately two seconds. The widget edit mode screen will be displayed.
7. Press the exit widget mode button **(F)** along the bottom of the display to return to the manage screen-layout screen or refer to the Move Widgets section below to for instructions on modifying the widget layout.



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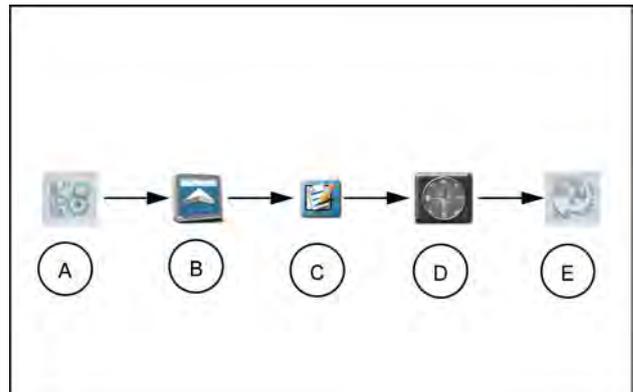
Move widgets to modify a screen layout

To move widgets or customize a screen layout:

1. Press the Screen Configuration icon **(A)**.
2. Swipe or use the page navigation at the bottom of the manage screen layouts prompt to select the view or mode with the screen layout **(B)** to be modified.
3. Select the Edit button **(C)** to enter the Widget Editing mode.
4. In the widget editing mode, press and hold on the widget **(D)**. The widget will be highlighted.

NOTE: Refer to the *Add Widgets to a Screen Layout* on above to select and add widgets to a screen layout.

5. Drag the widget to the desired display location and release.
6. Press the exit icon **(E)** to return to the manage screen layout prompt.

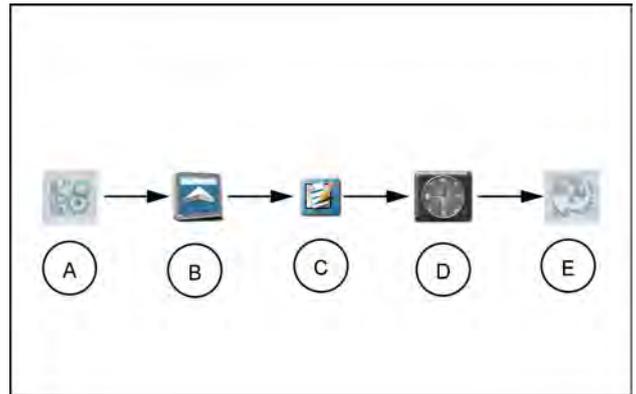


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Remove a widget from a screen layout

To remove a widget from a screen layout:

1. Press the Screen Configuration icon **(A)** .
2. Swipe or use the page navigation at the bottom of the manage screen layouts prompt to select the view or mode with the screen layout **(B)** to be modified.
3. Select the Edit button **(C)** to enter the widget editing mode.
4. In the Widget editing mode, tap the widget to be removed. **(D)**.
5. Press the Delete icon in the upper, left corner of the widget to remove the widget from the screen layout
6. Press the Exit Widget mode button **(E)** along the bottom of the display to return to the manage screen layout prompt.



RAIL21TR03971AA 3

Widget definitions

The **Viper® 4+** display features user selectable widgets which allows the **Viper® 4+** display to be configured to display the information necessary for various field operations or customized for operator preferences. Some widgets may be required to perform specific tasks with the **Viper® 4+** display while others may be used for status or information display if desired.

Several widgets will require installation of additional hardware or components to enable use of the widget during a field operation. The following sections are intended to assist with selecting and using various widgets available for use with standard system installations.

NOTE: Some widgets may appear in the display for selection that support dry products or other applications not present on your machine.

Operational widgets

Day/night toggle



The day/night widget allows the operator to toggle between a day and night display mode during a field operation. Tap the widget to toggle the display mode. Press and hold the widget to view screen and LED brightness settings for the current mode.

See the “System preferences tab” section in “User profile settings definition” (4-5) for additional information on the brightness settings available.

Accessory application widgets

Camera interface



If a camera system is connected to the **Viper® 4+** display, select the Camera Interface widget to view camera feeds for the connected devices. Tap on the camera feeds along the bottom of the widget to select the desired feed to view during a field operation.

Long-press the widget during a field operation to access camera feed settings. Select a reverse camera to set the camera feed to view when the **Viper® 4+** display detects reverse vehicle travel. There will be a camera interface widget available for the cameras configured on the machine (up to four) but only one camera widget can be placed on the screen at a time.

Scouting



The scouting widget is used to record or manage scout groups during field operations. Use the scouting widget to record features such as field boundaries, zone maps, or field markers for future reference.

See “Important safety notes” (5-14) for additional assistance with using the **Viper® 4+** display to record scout group features.

Cloud job



When running in a cloud job, the Cloud Job widget will be visible. This widget shows the names of the other profiles in the same job and the response time for those profiles. If there isn't a number after the profile name, the operator is no longer active in that job.

GPS widgets

Forward override



The Forward Override widget may be necessary if the reverse sensing feature is enabled. See the “Enable GPS reverse sensing” section in “GPS information and diagnostics” (4-110) for more information about the reverse sensing feature. If the **Viper® 4+** display detects reverse vehicle travel, press the forward override widget to manually override the **Viper® 4+** display to a forward direction of travel.

GPS status



The GPS Status widget may be used as a status indicator for signal reception used for the current position solution. This widget will display the selected and current correction type and status for National Marine Electronics Association (NMEA) messages received by the **Viper® 4+** display during field operations.

Press and hold the widget to access a GPS Health prompt with additional details on GPS reception.

GPS summary



The GPS Status widget provides an indicator for signal reception used for the current position solution and the current speed detected by the GPS receiver. This widget will display the selected and current correction type and status for NMEA messages received by the **Viper® 4+** display during field operations.

Press and hold the widget to access a GPS Health prompt with additional details on GPS reception.

Heading and speed widget



The Heading and Speed widget displays the current GPS heading and vehicle speed as detected by the receiver. Long-press this widget to access the GPS Health screen with additional details on GPS reception.

NOTE: The GPS filter mode allows the operator to filter the course over ground information provided for position information during field operations. Higher filter settings may be desirable in some regions to help smooth rapid course variations reported by the GPS receiver and provide smoother course information on job reports. The default filter setting is Low (this is the recommended setting). Raise the filter mode setting to increase the filtering capabilities if GPS corrections in your region normally create erratic or fluctuations in GPS course over ground information, or create other issues during field operations or on job reports.

Vehicle speed



The Vehicle Speed widget displays the current vehicle speed as reported by a speed sense node on the CAN bus. The speed displayed using this widget is the speed to which a rate control system will be using for speed compensated rate control systems.

Compass



The Compass widget displays the current GPS heading as detected by the receiver.

Press the Compass widget to toggle the compass display.

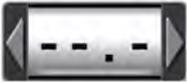
Guidance widgets

Light bar



On-screen Light Bar widgets provide the operator with a heads-up display of the machine position during swath guidance. Select the size of the light bar widget desired to provide a representation of the distance and direction to the displayed guidance path.

Distance from guidance line



The Distance from Guidance Line widget will be used with a guidance line set using the AB utilities and will display the distance and direction from the current vehicle position to the displayed guidance path in feet.

See “Setting guidance paths” (5-4) for assistance with setting an AB line with the AB Utilities widget.

Nudge arrow



The Nudge Arrow widget offers the same display information as the Nudge Status widget, but provides access to nudge controls directly on the current display view or mode. Select this option to allow the operator to manually adjust the guidance line directly from the guidance display during field operations.

Tap the arrow buttons displayed on the Nudge Arrow widget to nudge the displayed guidance line by the active nudge value. Press and hold the widget to access the Nudge and Swath prompt.

Nudge status



The Nudge Status widget displays the current nudge applied to the displayed guidance line. Press and hold the Nudge Status widget to access the Nudge and Swath prompt.

AB utilities



Use the AB Utilities widget to select guidance modes, set AB paths, or to save or load an AB guidance path. Pressing the AB utilities widget will set A and B points for a guidance path if a guidance path is not set. The AB guidance line tools provide access to the Nudge and Swath screen. See “Setting guidance paths” (5-4) for additional assistance with using the AB guidance mode features.

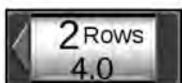
Swath info



Select the Swath Info widget to display the guidance path number when using an AB guidance mode (e.g. Straight AB, Pivot, or Fixed Contour) for field guidance. This widget will display “LST” when using the Last Pass guidance mode.

See “Guidance patterns overview” (5-1) for additional information on using guidance modes and setting AB guidance paths.

Row width distance from guidance line widget



Row Width Distance from Guidance Line widget displays how many rows off from the desired row the machine is. After placing the widget on the guidance screen, press and hold the widget until the Row Width box appears, then enter the row width. The arrow on the widget indicates the direction the machine is off from the desired row. The row value is approximate and rounds up or down depending on how close the machine is to the row.

3D map



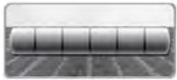
Add the 3D Map or 3D Map Wide widgets to the widget only view to display a picture in picture display of the application area while viewing the widget only view.

NOTE: Only one of the 3D map widgets may be added to the widget only view at any time.

Implement status and control widgets

NOTE: The section switches below the **Pro 1200** display will override the on-screen master switch widget. It is not recommended to select this widget if another master switch will be used to control section status on the implement.

Section status



The Section Status widget is available in various widths and allows the operator to select the best option for displaying configured sections. This only appears when the Rate Control Module (RCM) is configured in bypass mode.

Select the Product-Based widget to display status for sections assigned to specific products only. Press and Hold the widget to select the desired product or to view all sections.

Tap the on-screen section switch to select the switch state for the selected section. Toggle the master switch to control all sections at the same time.

AccuBoom™



The **AccuBoom™** widget shows **AccuBoom™** status and also provides quick access to additional **AccuBoom™** information.

Product control widgets

Field area

Select the Field Area widget to display a tally of area covered during the current field operation. Press and hold the field area widget to select the desired product map to display the area coverage tally.



Select the "Product On Applied Map" option to display the area for a product control channel selected in one of the product list widgets.



Select the "Remaining" option to display the remaining area that has not yet been covered.

NOTE: If the "Remaining" option is selected, coverage outside of the boundary is considered applied area. If the user applies coverage outside of the boundary, the remaining value will be inaccurate. To consistently obtain accurate remaining coverage, stay within the boundary during application.

ISO AutoBoom®



Select the ISO **AutoBoom®** widget to access settings that automate boom height adjustment. This widget gives **AutoBoom®** status at a glance. It reflects the boom height as seen in the **AutoBoom®** object pool.

Slingshot® telematics



The **Slingshot®** field hub provides wireless access to transfer Grower-Farm-Field (GFF) data or to import software updates for **Viper®** 4+ displays.

Tally registers



Select the Tally Registers widget to provide a display of total volume, field volume, total area, field area during field operations.

Tap the Tally Registers widget to toggle the available register information for display during the operation. Press and hold the tally registers widget to access the Tally Registers prompt. See “Tally register prompt” (5-23) for assistance with tally register information.

NOTE: Some ISOBUS Electronic Control Units (ECU) may not report tally register values.

Rx (prescription) options



Having the Rx options on the operating screen provides quick access to view the current prescription information and Rx look ahead settings for prescription rate map zones.

Liquid pressure



The Liquid Pressure widget displays the approximate pressure of the liquid in the system. This is for informational purposes only.

Pump



The Pump widget shows the pump number and the operation status of each pump.

Product levels



The Product Levels widget shows the calculated product level based on the starting level and application rate. These levels are for informational purposes only.

Individual product control



Displays the target and actual application rate for the selected product. This widget allows the user to select the Data Type, Implement, Function or Feature, Data Element, and the product Name. This widget will show status on/off status, volume, and allow the user to increase or decrease flow rate.

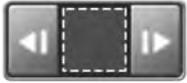
ISO widgets

ISO device status



The ISO widget shows the status of ISO devices on the machine.

Interactive Universal Terminal (UT)



To scroll through various ISOBUS applications, place the ISO Working Set (object pool) Selector widget on the run screen. This allows the user to have a scroll through all of the items running on the ISOBUS system. Scroll left or right through the selector to view the available systems on the ISOBUS system. Press the center of the button to show all available ISO working sets. From the list of available working sets, select a working set to make it active.

Assignable UT



The assignable item widget allows the user to create a configurable widget for any ECU that makes data points available to monitor a desired data type, function, feature, or data element on the desired implement.

4 - SETUP

Viper® 4+ display setup

Administrator and user profiles

Overview

User profiles save preferences such as language, units, screen brightness, and on-screen coverage map colors without affecting equipment operation for other users. With a customized user profile, equipment operators can quickly start or resume operations over shift or operator changes with their personalized settings.

Personal Identification Number (PIN) security and profile reporting

If desired, a unique PIN can be created for each user profile to secure the Viper® 4+ display from unauthorized operation. With PIN's enabled, the operator or administrator must provide the assigned PIN to log in to the device and operate control features, start a job, or record field data.

The Viper® 4+ display also stores active profile information with completed job reports for review by an equipment owner or manager. A system administrator is also able to review field area covered by each active profile if multiple profiles were active during a single field operation.

This information is potentially useful to identify operator training needs, improve operator performance, or make adjustments for future field operations.

Administrator profile

Using the administrator profile, an equipment owner or manager can create new user profiles for each operator on the Viper® 4+ display.

Managing user profiles

NOTE: Only the administrator profile may be used to create, edit, and manage various user profiles. User profiles are only allowed to edit and modify settings for the active profile.

The **Viper® 4+** display will not be able to recover or reset the administrator Personal Identification Number (PIN) if the default (1111) is changed. Be sure to write down the administrator PIN and store it in a safe place if this feature is desired to ensure the ability to create user accounts remains accessible.

Creating user profiles

To create new user profiles:

1. Open the “Administrator” panel. Select the User Profile button (1).

NOTE: Verify that “Administrator” is displayed in the upper, left corner of the prompt. New user profiles cannot be created while logged in with a user profile. If you are logged in as a user, log out of the **Viper® 4+** display and back in using the administrator profile. Then restart this procedure.

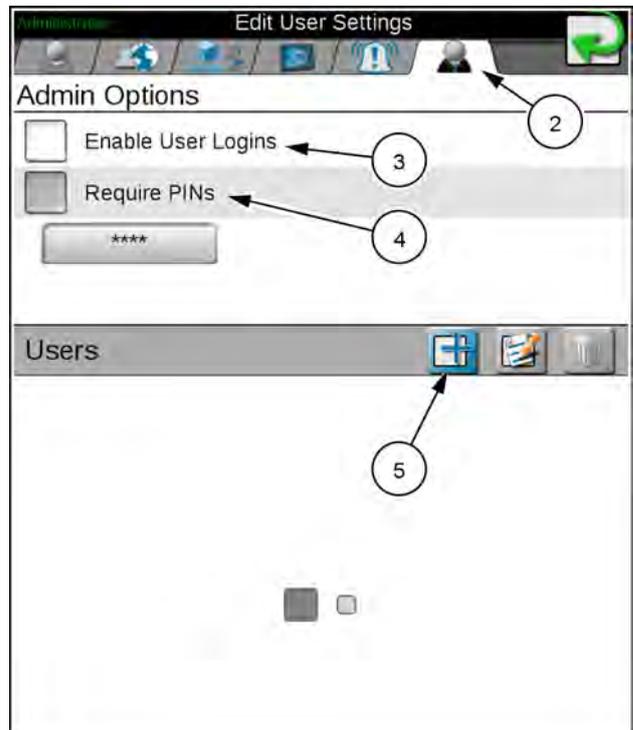
2. Press the Administrator Options tab (2) at the far right of the general user settings screen.
3. In the Administration Options area at the top of the Administrator Options tab, verify that the enable user logins option (3) is selected.

NOTE: Enable the “Require PIN’s” option (4) if you wish to prompt the equipment operator for a PIN before accessing **Viper® 4+** display control features.

4. In the Users area toward the bottom of the Administrator Options tab, press the Add button (5) to create a new user profile.
5. Refer to the User Profile Settings Definition section in “User profile settings definition” (4-5) for details on completing the profile information for the new user profile.



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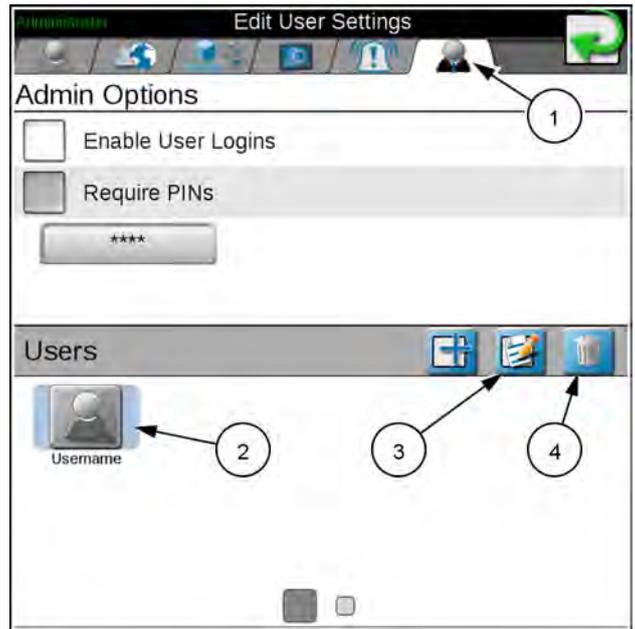


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Editing or deleting user profiles

To edit or delete new user profiles:

1. Press the Administration panel along the top of the main panel display and select the user profile button. See above.
2. Press the Administration Options tab **(1)** at the far right of the general user settings screen.
3. Select an existing user profile **(2)** from the user area at the bottom of the Administrator tab.
4. Press the Edit button **(3)** to edit the profile or the delete button **(4)** to delete the selected profile. Refer to “User profile settings definition” **(4-5)** for details on completing the profile information for user profiles.



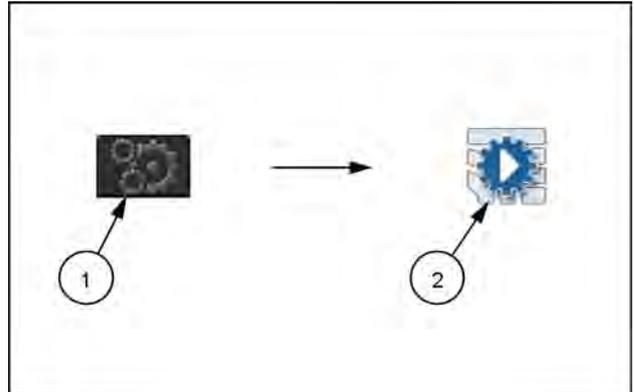
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Demonstration mode

Demonstration mode

Set the **Viper® 4+** display to demonstration mode to allow the unit to be used for display purposes. To switch to the demonstration mode:

1. Press the Settings button **(1)**.
2. Press the Demo Mode button **(2)**.
3. Select the option to “Restart with the Demo Mode Enabled.” The **Viper® 4+** display will restart with the demonstration mode features enabled.
4. Perform the above procedure again to toggle the demonstration mode off.



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User profile settings definition

Each user profile provides fields for entering contact information, display preferences, and security settings. There are two pages of user profile settings:

- General User Settings
- Product Control User Settings

NOTE: Audible and pop-up alarms will be triggered based upon the product control user settings. See the “Product control user settings” section below for details on these user settings.

General user settings

NOTE: An administrator profile is available by default with the Viper® 4+ display. It is recommended that the administrator profile be used only by an equipment owner or manager.

User information tab

The user information tab provides fields for entering the operator contact information. To enter or edit user information:

1. Press the Administrator or User Panel. Select the User Profile button (1).
2. Press the User Information tab (2) on the General User Settings prompt. The following fields will be available:

User Name – Enter a name for the user or profile that will be used to identify the profile on the Viper® 4+ display and in job reports.

NOTE: The user name in the administrator profile cannot be modified.

First and Last Name – Enter the first and last name of the system administrator or equipment operator in these fields.

Contact Information – Enter the home and mobile phone numbers, fax number, and email address as desired for contacting the equipment operator in the associated fields.

Operator License Information – Enter the operator license and expiration date in these fields.



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 A screenshot of the "Add New User" form. The form has a title bar "Add New User" with a close button and a refresh button. Below the title bar is a "User Information" tab, which is highlighted with a white arrow pointing to a circled number "2". The form contains several input fields: User Name, First Name, Last Name, Phone #, Mobile #, Fax #, Email, Operator's License #, and Expiration Date. At the bottom of the form, there is a red warning message: "You are currently editing another user. Changes made on this page will take effect when this user logs in."

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Location information tab

The location information tab provides fields for company contact information and desired display language. To access location information:

1. Press the Administrator or User Panel. Then select the User Profile button .
2. Press the Location Information tab (1) on the General User Settings prompt. The following fields will be available:

Company Name – Enter the name of the company with which the operator or administrator is employed.

NOTE: The user name in the administrator profile cannot be modified.

Company Address and Location – Enter the company or branch address, city and state, and country of operation.

Time Zone – Select the Coordinated Universal Time (UTC) for the time zone in which the **Viper® 4+** display will be operating.

NOTE: The time zone setting will affect the time shown on the Job Reports screen.

Language. Select one of the available languages desired for operation of the **Viper® 4+** display. Each equipment operator may select a different language for operation and the **Viper® 4+** display will automatically switch to the desired language on log in.

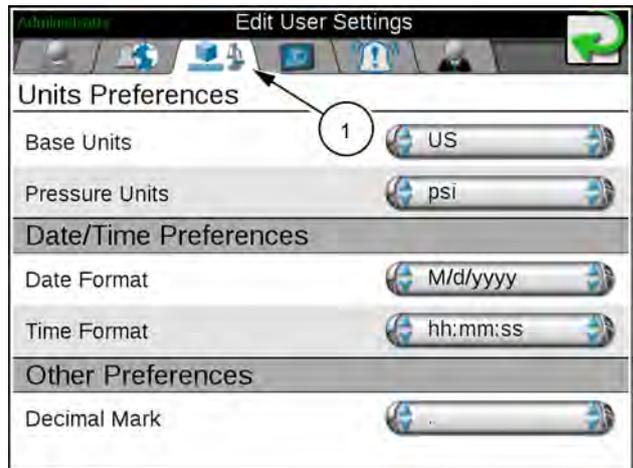


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Unit preferences tab

The Unit Preferences tab provides access to personalized language and display unit preferences. To configure unit preferences:

1. Press the Administrator or User Panel. Then select the User Profile button.
2. Press the Location Information tab (1) on the General User Settings prompt. The following fields will be available:



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Base Units – Select the desired unit system:

| Unit system | Units |
|----------------|---|
| Metric | Centimeters (cm), liters (L), hectares (ha), kilometers per hour (km/h) |
| U.S. (English) | Inches (in), gallons (gal), acres (ac), miles per hour (mph) |
| Turf | Inches (in), gallons per 1000 square feet (gal/1000 ft ²), miles per hour (mph) |

Pressure Units – Select the desired pressure units:

| Abbreviation | Units |
|--------------|------------------------|
| PSI | Pounds per square inch |
| kPa | kilopascal |
| bar | bar or atmospheric |
| inHg | Inches of mercury |
| mmHg | Millimeters of mercury |
| atm | Atmospheres |
| hPa | Hectopascal |

Date Format – Select the preferred date format.

Time Format – Select the preferred time format.

Automatic Daylight Savings – Enable automatic daylight savings time adjustments if the local time zone jurisdiction observes daylight savings time.

System preferences tab

The System Preferences tab provides access to settings to customize the **Viper® 4+** display and operation. To adjust system preferences:

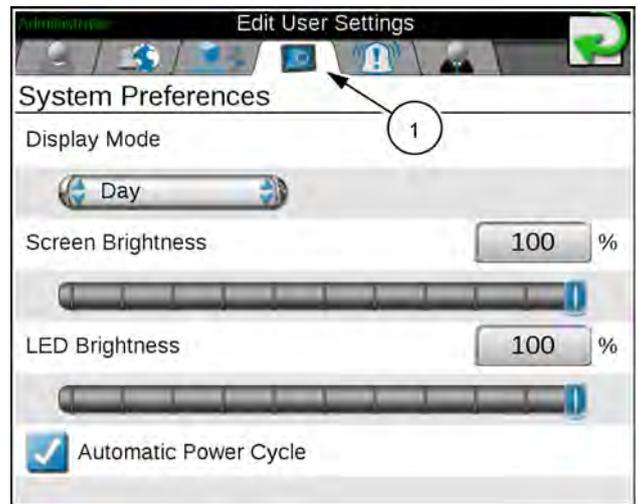
1. Press the Administrator or User Panel. Then select the User Profile button.
2. Press the System Preferences tab **(1)** on the General User Settings prompt. The following fields will be available:

Mode – set the display mode for day or night operations.

Screen Brightness – Adjust the screen brightness for personal preference and ambient lighting conditions.

LED Brightness – Adjust the LED brightness for personal preference and ambient lighting conditions. This setting will also adjust the brightness of a compatible light bar connected to the **Viper® 4+** display.

Automatic Power Down – Enable the automatic power down option to automatically shut down the **Viper® 4+** display when the vehicle ignition is switched off. This feature may be enabled to help ensure job information is saved and the device is properly powered down.



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Alarm settings tab

To edit Alarm Settings:

NOTE: Audible and pop-up alarms will be triggered based upon the product control user settings. Refer to the *Product Control User Settings* section above for details on these user settings.

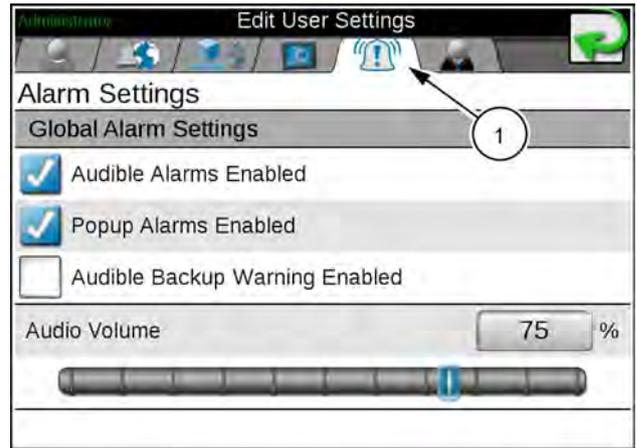
1. Press the Administrator or User Panel along the top of the Main Panel display. Then select the User Profile button.
2. Press the Alarm Settings tab **(1)** on the General User Settings prompt. The following fields will be available:

Audible Alarms – Enable this option to receive audible alerts for alarm conditions detected by the **Viper® 4+** display.

Popup Alarms – Enable this option to receive a prompt for alarm conditions detected by the **Viper® 4+** display.

Audible Backup Warning Enabled – Select this check box to enable an Audible Backup Warning alarm.

Alarm Volume – Adjust the alarm volume on the Audio Volume slider.



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Administrator options tab

When logged in as a system administrator, the Administrator Options tab provides access to the utilities to manage and edit user profiles. To access the system Administrator Options:

1. Press the Administrator or User Panel along the top of the Main Panel display and select the User Profile button.
2. Press the Administrator Options tab **(1)** on the general user settings prompt. The following fields will be available:

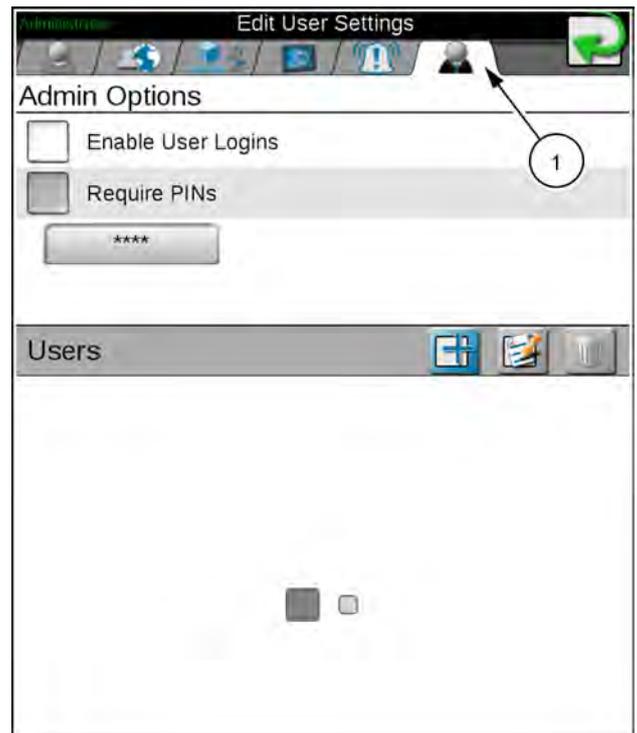
NOTE: The Administrator Options tab will only be available when logged in with the administrator profile.

Enable User Logins – Select this option to enable the user login feature on the **Viper® 4+** display. When enabled, the system administrator may create and manage multiple users or equipment operator profiles. See “Managing user profiles” (4-2) for details on creating new user profiles or managing user profiles.

Require PIN's – Enable this option to require a personal identification number, or PIN, to access the **Viper® 4+** display and the control system features. This feature is recommended to help secure the control system from unauthorized access or operation.

Set PIN – The administrator PIN field is displayed below the “Require PIN's” option. Enter the desired administrator PIN or personal identification number used to log into the administrator profile.

NOTE: CASE IH will not be able to recover or reset the administrator PIN if the default (1111) is changed. Be sure to write down the administrator PIN and store it in a safe place to ensure the ability to create user accounts remains accessible.

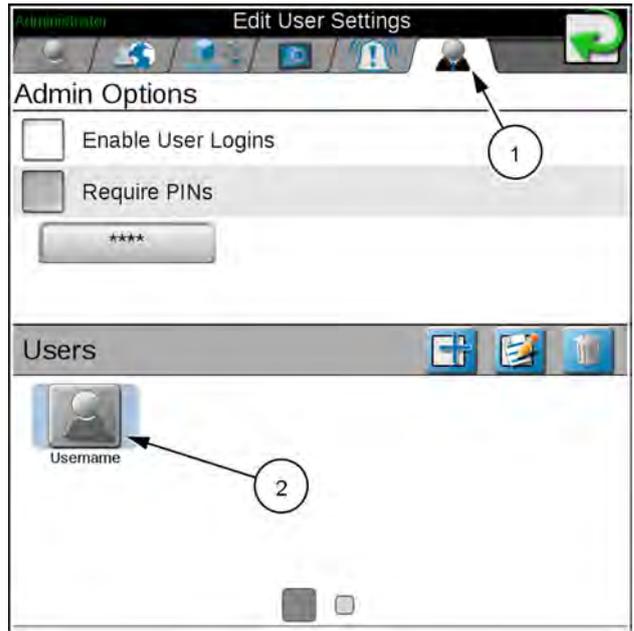


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User profile security options tab

The Security Options tab allows a profile user to enter a new personal identification number, or PIN, for secure login. To access the Security Options tab:

1. Press the Administrator Panel along the top of the Main Panel display. Then select the User Profile button.
2. Press the Administrator Options tab (1) on the General User Settings prompt.
3. Press the desired user (2) for a PIN assignment.

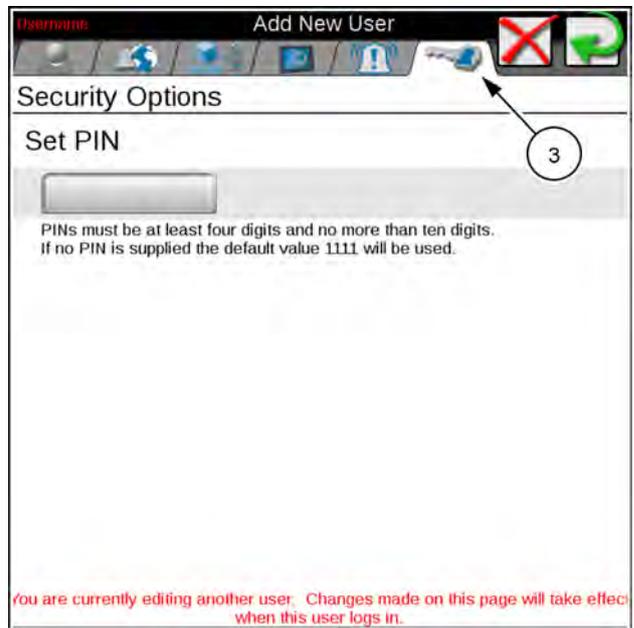


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4. Press the Security Options tab (3) on the General User Settings prompt. The following fields will be available:

NOTE: Secure PIN login must be enabled by the system administrator. See “Managing user profiles” (4-2) for information on enabling PIN’s. The system administrator may access and modify any user profile even if PIN’s are enabled for secure log in. Press the User panel along the top of the main panel display and select the User Profile button.

Set PIN – Enter the desired personal identification number used to log into the profile.



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Product control user settings

During field operations, the **Viper® 4+** display creates and displays a live coverage reference map for the equipment operator. During rate control operations, the **Viper® 4+** display will show field areas in which the actual monitored rate of product application is at, or within tolerance, of the target rate or where the actual rate is too high or too low.

To access the available product control User Settings:

1. Press the Administrator or User Panel at the top of the main panel display.
2. Select the User Profile button.
3. Swipe or use the page navigation at the bottom of the General User Settings screen to access the product control user settings.

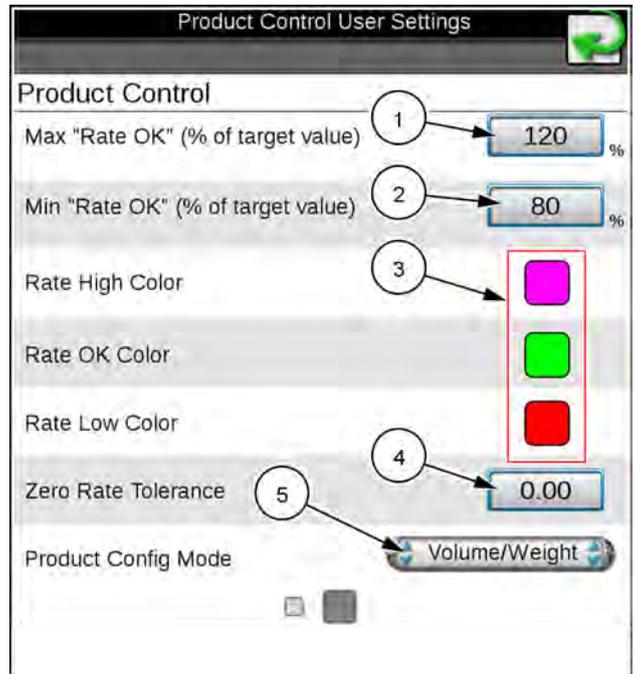


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Rate Thresholds

The "Product Control" screen allows each user to set the high and low limits tolerated for application before the system provides an alert or alarm condition during field operations.

1. Max Rate Threshold – Enter the top limit for product application before the **Viper® 4+** display provides alerts for a high rate condition.
2. Min Rate Threshold – Enter the bottom limit tolerated for product application before the **Viper® 4+** display provides alerts for a low rate condition.
3. Rate Colors – Press the High, OK, and Low rate colors to select custom rate colors for the user.
4. The "Product Configuration Mode" drop-down menu provides the following choices:
 - Volume/Weight
 - Application Rate
5. Enter zero for liquid applications.



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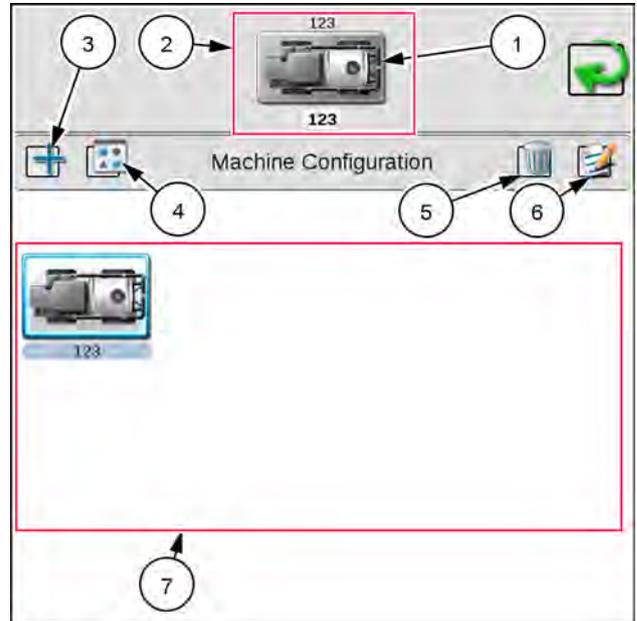
Machine panel and configurations

Overview

The Machine Panel displays the selected machine configuration and provides access to the following settings which make up the machine configurations:

NOTE: Your display contains a machine and section configuration installed at the factory for your sprayer.

1. Edit Machine Devices
2. Selected Machine Configuration
3. Create New Machine Configuration
4. Filter Machine Configurations
5. Delete Selected Configuration
6. Edit Machine Configuration
7. Detected Machine Configurations



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You can also configure the following items:

- Machine profiles
- Equipment section groups
- Machine device configurations

Automatic machine configuration detection

Machine configurations allow an administrator or equipment owner to set up specific configurations in a fleet or in the machine shed. With completed machine configurations, the **Viper® 4+** display will attempt to detect and select the machine configuration to which the device is connected.

If a machine configuration does not exist for the detected system, the **Viper® 4+** display will select the closest compatible match. See “Machine configuration” (1-2) and “Machine profiles” (4-15) for more information on machine profiles and configurations created using the **Viper® 4+** display.

NOTE: A compatible match must have the same active nodes, or defined but not currently active, as the previous machine configuration.

Filter machine configurations

Use the filter button in the Machine Configuration panel to toggle the panel view.

-  Toggle (2) the Machine Panel display between all available machine configurations
-  Toggle (2) only machine configurations compatible with the current machine configuration.

Machine configuration

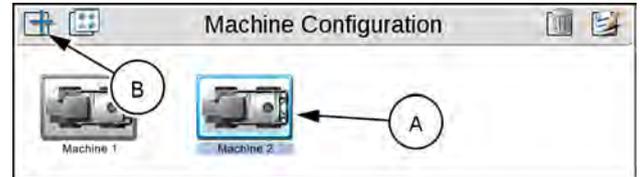
NOTE: A new machine configuration may be created without being connected to the specific equipment to be used with the configuration. However, if the configuration is created while the **Viper® 4+** display is connected to a different CAN bus system, the created machine configuration will need to be modified or adjusted when the **Viper® 4+** display first detects the CAN bus system to be associated with the machine configuration.

NOTE: Your display was configured at the factory for this machine.

Create a new machine configuration

To create a new Machine Configuration:

1. Press the Machine Panel **(A)** to display the available machine configurations.
2. Press the Add button **(B)** to create a new machine configuration.
3. Use the on-screen keyboard to enter the desired machine configuration name and press the done button. The machine garage will display
4. Select one of the following options to complete the machine configuration:
 - Press a vehicle icon to use an existing vehicle profile already set up in **Viper® 4+** display. The **Viper® 4+** display will use the selected machine profile for use with the new machine configuration.
 - Press the Add button to create a new profile for the machine configuration. See “Machine profiles” (4-15) for information on setting up a new machine profile.



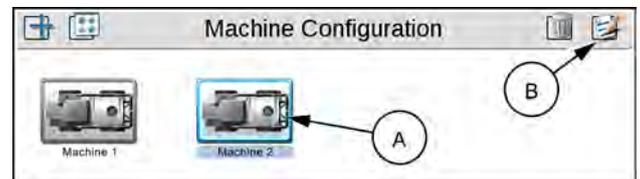
RAPH22PLM0001AA 1

Edit an existing machine configuration

The **Viper® 4+** display allows the operator to quickly make changes or adjustments to an existing machine configuration to set up for a different field operation.

To edit or modify an existing machine configuration:

1. Press the Machine Panel **(A)** to display the available machine configurations.
2. If necessary, select the machine configuration.
3. Press the Edit button **(B)**.
4. Use the Delete, Edit, or Add buttons in the selected garage to manage profiles. See “Machine profiles” (4-15) for assistance with creating or editing a machine profile.



RAPH22PLM0001AA 2

5. Select the Machine Garage to edit the machine profile currently assigned to the machine configuration.



OR:

6. Select the Implement Garage (if available) to edit the implement profile currently assigned to the machine configuration.

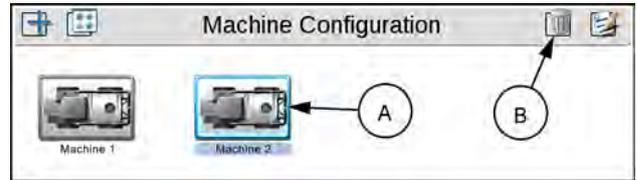


Delete an existing machine configuration

NOTE: Deleting a machine configuration does not delete individual machine or implement profiles used within the configuration.

To delete an existing machine configuration:

1. Press the Machine Panel (**A**) to display the available machine configurations.
2. Select the desired machine configuration.
3. Press the Delete button (**B**).
4. Press the Yes button on the displayed prompt to permanently delete the machine configuration.



RAPH22PLM0001AA 3

Machine profiles

Machine profiles save information for your vehicles in the machine garage and that may be used with the **Viper® 4+** display. Profiles may be saved and assigned to multiple machine configurations to allow the display to function for various field operations throughout the growing or operation seasons.

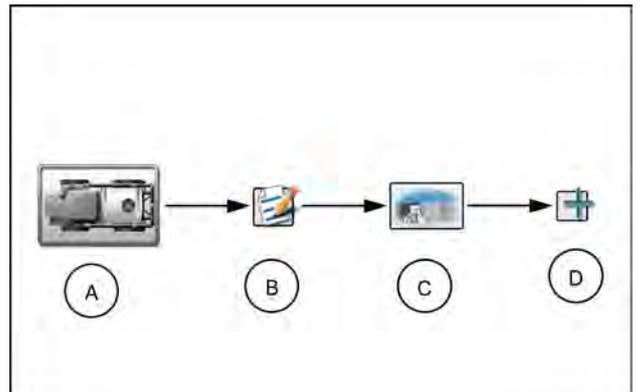
NOTE: The display software offers a continually expanding database of preset machine profiles. Selecting these profiles will automatically set known factory calibration values for the profile. Due to changes during model year production, check all measurements and verify values shown in the display prior to using a preset profile during a field operation.

A new machine profile must be created in either the machine garage or while creating a new machine configuration. The following procedure is for creating or completing a new machine profile using either of these methods. For additional assistance with creating a machine configuration or assigning machine profiles to the configuration, see "Machine configuration" (4-13).

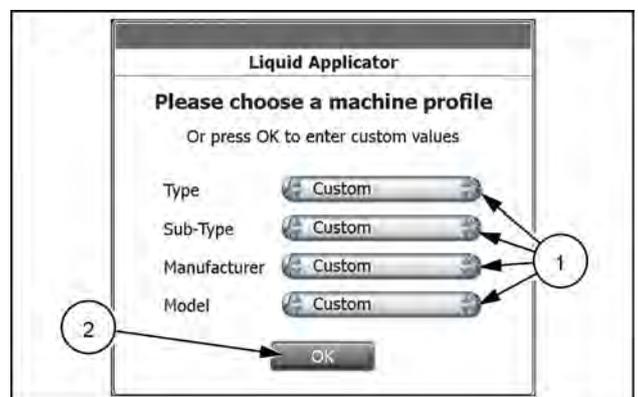
Create a new machine profile

To access the machine garage and create a new machine profile:

1. Press the Machine Panel **(A)** button to view any available machine configurations.
2. Press the Edit **(B)** button.
3. Press the Machine Garage button **(C)** to view any machine profiles already configured.
4. Press the Add **(D)** button to create a new machine profile.
5. Select either:
 - the "Self-Propelled" machine type to create a new profile from scratch.
 - an existing self-propelled machine to clone the machine profile settings for the new machine.
6. Use the on-screen keyboard to enter the name for the new machine profile and press the done button. If a new "Self-Propelled" machine type is selected, proceed to step 7. If using an existing machine profile to create the new profile, skip to step 13.
7. The Machine Profile selection prompt will display if creating a new machine profile from scratch.
8. Use the drop down selections **(1)** to set the machine profile type, sub-type, manufacturer, and model (if available) of the machine to be created.
9. When the appropriate selections are set, press the OK button **(2)**. The equipment selection prompt will display.
10. Review the available OEM equipment options.
11. Depending upon the equipment offered from the manufacturer or the optional features installed on the machine for which the profile is being created, select:
 - no options to enter custom section profiles later in this procedure.
 - a specific option matching, or close to, the OEM equipment currently installed on the machine.



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RAIL21TR02879AA 2

- o multiple, or all, equipment options if the machine offers multiple equipment configurations using the installed equipment.

NOTE: Delete or adjust section groups as necessary later in this procedure for optional features or customized configurations.

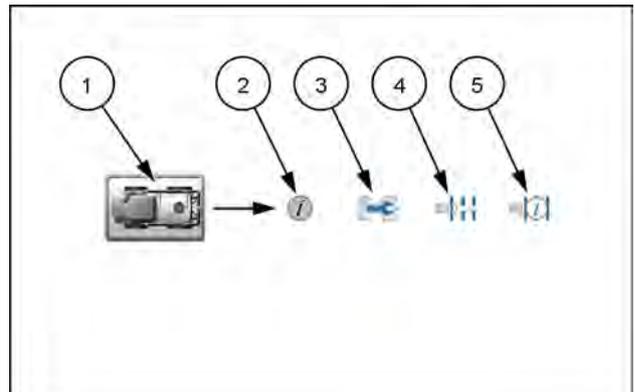
12. Press the OK button to accept the selected equipment options and proceed with the machine profile configuration.
13. The General Information tab allows the operator to enter or modify machine information. Press the information fields and use the on-screen keyboard to enter general information about the machine for identification purposes. If a preset machine profile was selected, verify the information displayed and make adjustments if necessary.
14. Press Next.
15. Set or adjust the GPS Offset measurements and Antenna Height. See “Machine configurations and profile settings definitions” (4-18) for assistance with measuring these values.
16. Enter the Wheel Base measurement. See “Machine configurations and profile settings definitions” (4-18) for assistance with measuring the machine wheel base.
17. Press Next.
18. Review the section information. If a preset machine profile was selected, the section information for the equipment available from the manufacturer will be set for section groups as appropriate. Press:
 - o the Delete button to remove section groups from the machine profile.
 - o the Edit button to modify sections labels, widths, or offset information.
 - o the Add button to create a new or customized section group.

See “Section group settings definitions” (4-24) for more information on setting up applicator section groups.

Edit the current machine profile

To make adjustments to the current machine profile:

1. Press the Machine Profile button (1) to access the profile settings.
2. Select the General Information tab (2) and enter identification information for the machine. See “Section group settings definitions” (4-24) for additional information on machine identification or “Machine profiles” (4-15) for assistance with creating or modifying machine profiles.



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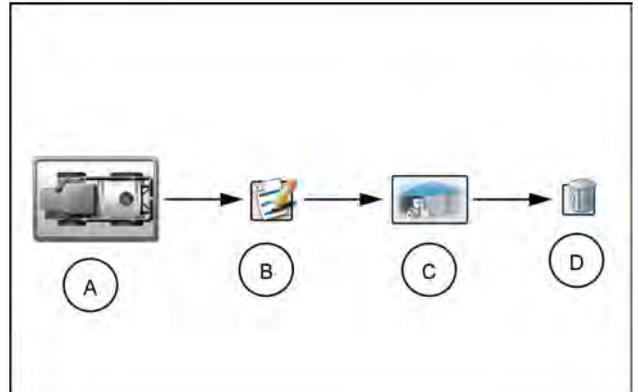
3. Select the Measurements tab (3) and adjust GPS offset values and the machine wheelbase. See “Section group settings definitions” (4-24) for assistance with measuring these values on various vehicle types.
4. Select the Equipment tab (4) to view configured section groups. See “Machine profiles” (4-24) for additional information on creating, editing, or deleting section groups.
5. Use the page navigation buttons at the bottom of the machine profile tabs, or swipe from left to right, to access the machine configuration Information tab (5).
6. Use this page to modify the machine configuration information or override the implement width or offset information used for field guidance. See “Machine configurations and profile settings definitions” (4-18) for more assistance with the machine configuration information.

Delete an existing machine profile

NOTE: If a machine profile is deleted, any machine configurations to which the profile was associated will be incomplete until a new machine profile is assigned to the configuration.

To delete an existing machine profile:

1. Press the Machine Panel **(A)** to view any available machine configurations.
2. Press Edit **(B)**.
3. Press the Machine Garage button **(C)** to access the Machine Garage and view any machine profiles already configured.
4. Select the machine to be deleted from the list of machine profiles to be deleted.
5. Select the Delete button **(D)** to remove the machine profile from the Machine Garage.



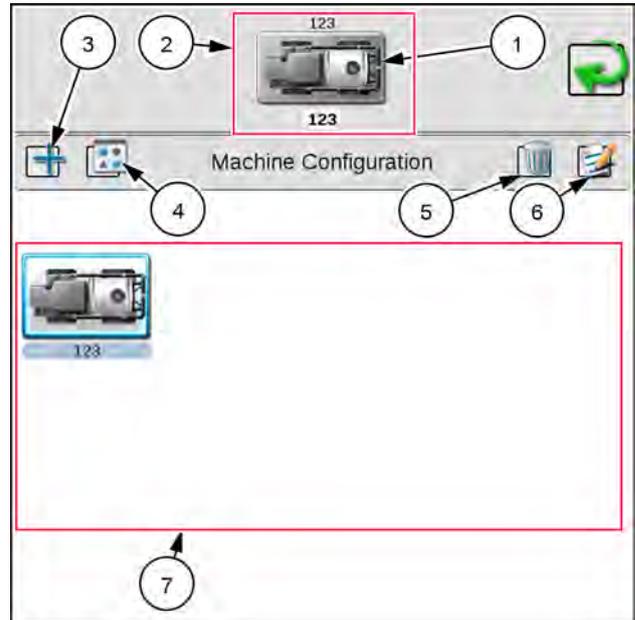
RAIL21TR03888AA 4

Machine configurations and profile settings definitions

The following sections provide detailed information about the settings and options accessible via the Machine panel.

Panel Navigation

1. Edit Machine Devices
2. Selected Machine Configuration
3. Create New Machine Configuration
4. Filter Machine Configurations
5. Delete Selected Configuration
6. Edit Machine Configuration
7. Detected Machine Configurations



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Machine profiles

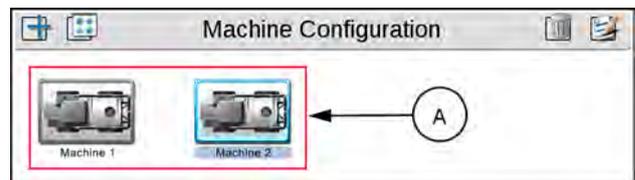
Machine profiles store information such as the machine geometry and GPS antenna mounting position which will be used to provide guidance during field operations. To complete the machine configuration, machine profiles are paired with a self-propelled profile.

NOTE: The display software offers a continually expanding database of preset machine profiles. Selecting these profiles will automatically set known factory calibration values for the profile. Due to changes during model year production, check all measurements and verify values shown in the display prior to using a preset profile during a field operation.

A new machine profile must be created in either the machine garage or while creating a new machine configuration. The following procedure is for creating or completing a new machine profile using either of these methods. For additional assistance with creating a machine configuration or assigning machine profiles to the configuration, see "Machine configuration" (4-13).

Profiles for self-propelled sprayers are configured with an applicator fixed on the vehicle.

- A. Sprayers appear as self-propelled machine configurations



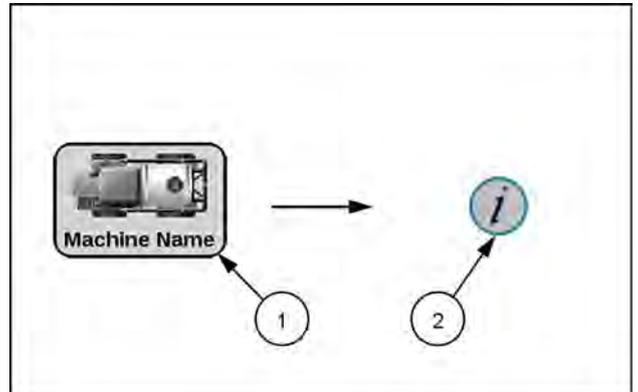
RAPH22PLM0001AA 2

NOTE: The operator may choose to create a new machine profile when setting up a new machine configuration. See “Machine configuration” (4-13) for additional assistance with creating machine configurations.

Any machine configurations associated with the profile may be incomplete until another profile is assigned to replace the deleted profile.

Machine configurations

1. Press the Machine Panel icon (1) in the bottom left corner of the street maps view the machine configurations.
2. Select any profile button for the machine that you wish to configure.
3. Select the larger machine icon near the top of the screen. The General Information (2) tab of the selected machine appears.

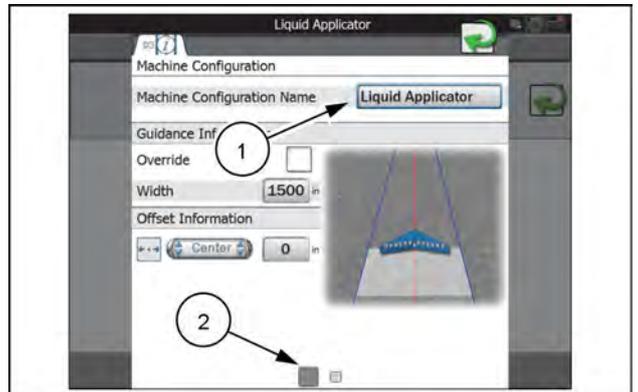


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Name and navigation

The machine configuration name (1) displays the name or description for the current machine configuration.

Use the page navigation (2) at the bottom of the screen or swipe across the screen to display the first settings page and display the “Machine Configuration” tab.



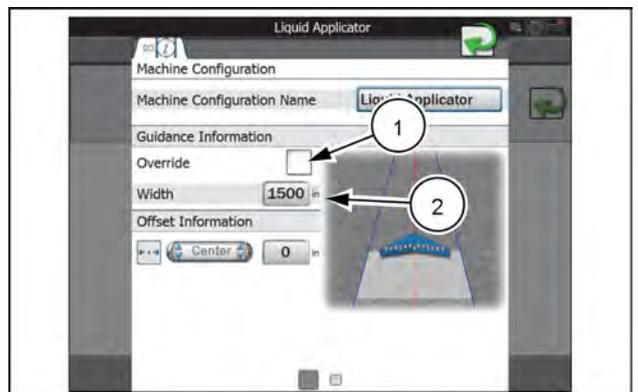
RAIL21TR02883AA 4

Guidance information

Override Enable (1) – Press the Override option to enable or disable the guidance override option. Use this option to override the configured applicator section width for calculating and displaying guidance paths during field operations.

Width (2) – Enter the desired override width for calculating and displaying guidance paths during field operations.

NOTE: The override width does not modify configured section information. Coverage of active sections will be displayed and mapped as configured for the machine profile.

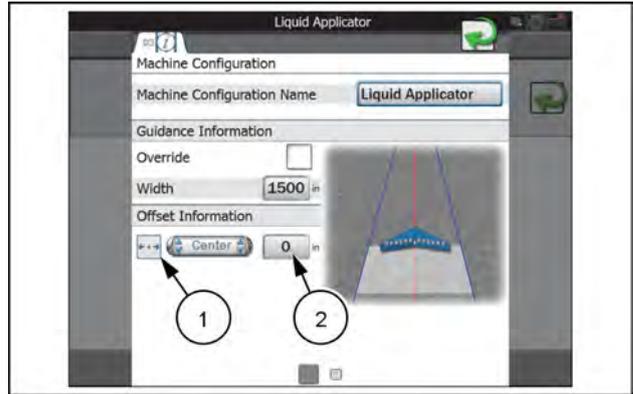


RAIL21TR02883AA 5

Offset information

Left/Right Override Direction – Press the direction drop down (1) and select the direction in which the guidance path should be overridden.

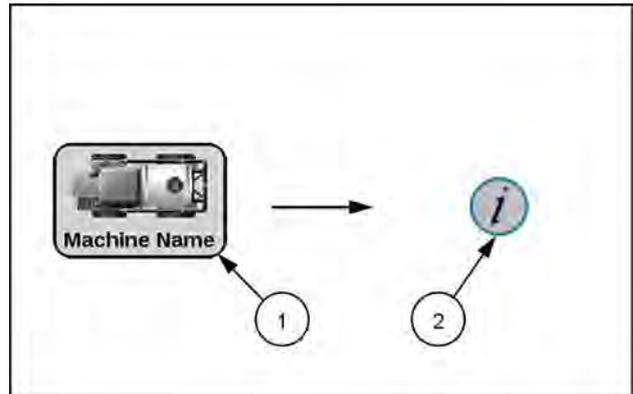
Left/Right Override Distance – Press this field (2) and enter the distance for the guidance path override direction.



RAIL21TR02883AA 6

General information tab

1. Press the Machine Panel icon (1) in the bottom left corner of the street maps view the machine configurations.
2. Select any profile button for the machine that you wish to configure.
3. Select the larger machine icon near the top of the screen. The General Information (2) tab of the selected machine appears.



RAPH23PLM0452AA 7

NOTE: Use the page navigation at the bottom of the screen (1), or swipe across the screen, to access other information for profiles assigned to the selected machine configuration.

NOTE: Information may be pre-populated in the following fields if a preset machine profile has been selected during set up. Press any of the fields described below and use the on-screen keyboard to edit the displayed profile information.

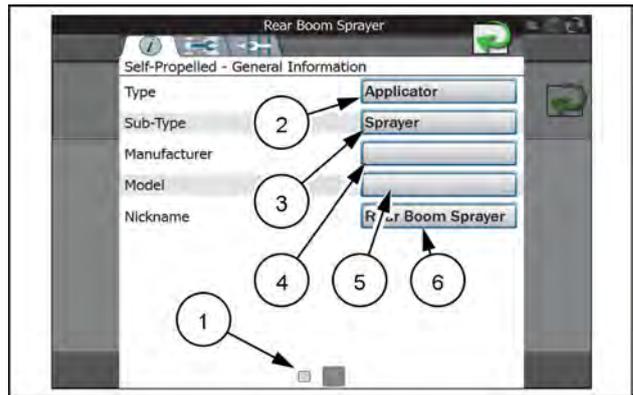
Type (2) – A description of the type of machine used with the selected profile.

Sub-Type (3) – The sub-type field offers an additional line of equipment description to help identify the appropriate equipment with which the profile should be used.

Manufacturer (4) – Name or description of the original equipment manufacturer.

Model (5) – A model number, model year, or other designation to help identify the equipment used with the profile.

Nickname (6) – If desired, a name or description used by operators or fleet administrators to identify the equipment may be entered. This description will be displayed in the machine panel area on the main display.



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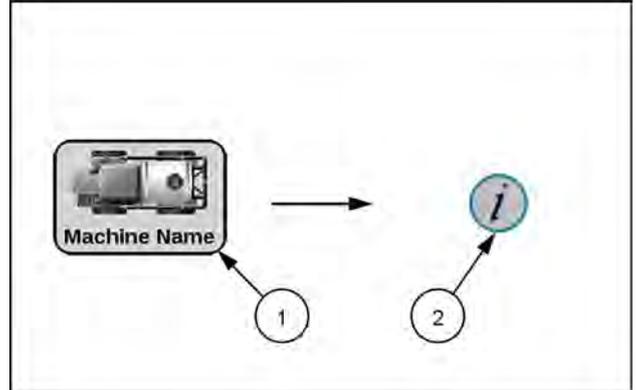
GPS measurements

To provide accurate guidance during field operations, calibrate the **Viper® 4+** display for the position of the GPS antenna on the machine relative to the center of the pivot point. Refer to the following sections for assistance with measuring and setting the GPS measurements on the **Viper® 4+** display.

NOTE: The pivot point for a self-propelled sprayer is the center of the rear axle.

1. Press the Machine Panel icon (1) in the bottom left corner of the street maps view the machine configurations.
2. Select any profile button for the machine that you wish to configure.
3. Select the larger machine icon near the top of the screen. The General Information (2) tab of the selected machine appears.

NOTE: Use the page navigation at the bottom of the screen or swipe across the screen to access other information for profiles assigned to the selected machine configuration.



RAPH23PLM0452AA 9

Select the measurements tab (1).

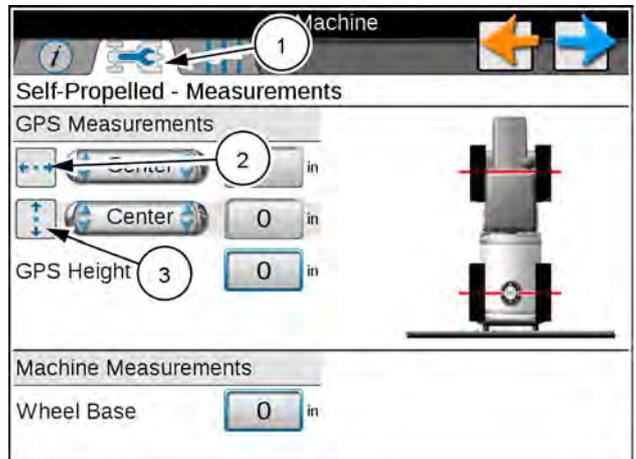


Press the left/right offset direction drop down (2) and select the position of the GPS antenna from the center-line of the machine.

Select the GPS offset distance field and enter the distance from the center line of the machine to the GPS antenna. The left/right offset distance must be measured perpendicular to the direction of travel.



Press the fore/aft offset direction drop down (3) and select the position of the GPS antenna from the machine pivot point.



RAPH22PLM0529BA 10

Select the GPS offset distance field and enter the distance from the pivot point to the GPS antenna. The fore/aft offset distance must be measured parallel with the direction of travel.

NOTE: If offset distance is not correct, there may be line A/B guidance movement on the screen.

The GPS Height value is the measurement from the ground to the bottom of the GPS antenna. The height value will only be necessary if a tilt corrected DGPS signal is provided to the **Viper® 4+** display.

Machine measurements

The machine measurement settings provide information about the machine geometry used by the **Viper® 4+** display to map the vehicle position during field operations and create coverage or as-applied data for field operations.

1. Press the Machine Panel icon **(1)** in the bottom left corner of the street maps view the machine configurations.
2. Select any profile button for the machine that you wish to configure.
3. Select the larger machine icon near the top of the screen. The General Information **(2)** tab of the selected machine appears.

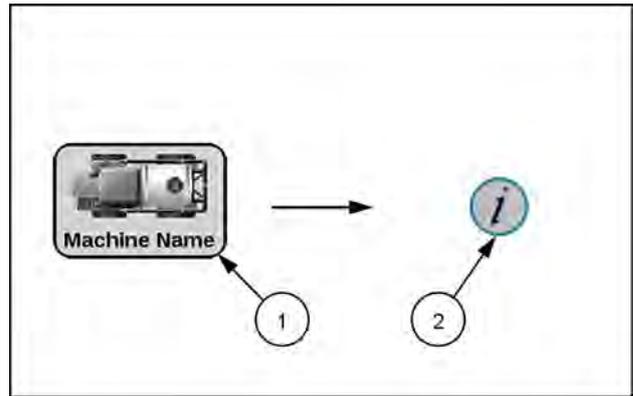
NOTE: Use the page navigation at the bottom of the screen or swipe across the screen to access other information for profiles assigned to the selected machine configuration.

NOTE: The axle to boom offset is configured in and imported from the Rate Control Module (RCM).

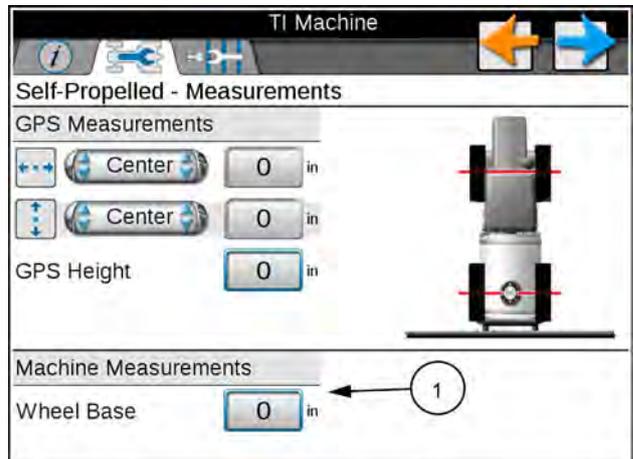
The wheelbase value **(1)** is used by the **Viper® 4+** display to map coverage of the applicator during field operations. Enter the distance between the front and rear "axle." The wheelbase must be measured parallel with the direction of travel.

The wheel base measurement on 4350 and 4450 model sprayers is **406 cm (160 in)**.

The wheel base measurement on 3250 model sprayers is **381 cm (150 in)**.



RAPH23PLM0452AA 11



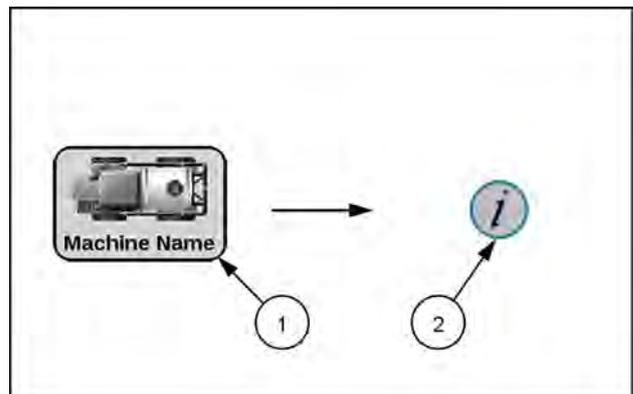
RAPH22PLM0529BA 12

Equipment tab

The Equipment tab provides an overview of configured section groups and allows the operator to create or manage section groups.

1. Press the Machine Panel icon **(1)** in the bottom left corner of the street maps view the machine configurations.
2. Select any profile button for the machine that you wish to configure.
3. Select the larger machine icon near the top of the screen. The General Information **(2)** tab of the selected machine appears.

NOTE: Use the page navigation at the bottom of the screen, or swipe across the screen to access other information for profiles assigned to the selected machine configuration.



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Press the Equipment tab **(1)** to display configured section groups for the self-propelled machine profile.

See “Section group settings definitions” **(4-24)** for more information about section groups.



Section group settings definitions

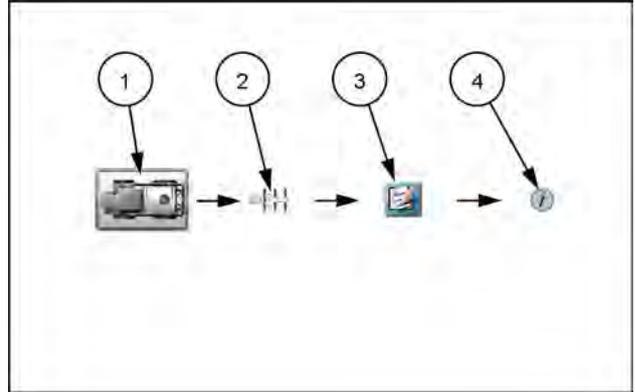
Review the following sections for additional assistance with entering section group information and setting up section configurations within a section group.

Equipment tab – General information tab

1. Press the profile buttons (1) for the machine configuration to view the general information tab (4) for the selected machine or implement.

NOTE: Use the page navigation at the bottom of the prompt, or swipe across the screen, to access other information for profiles assigned to the selected machine configuration.

2. Select the Equipment tab (2) to view the currently configured section group information.
3. Select the Edit button (3) in the desired section group to edit section group information.
4. Press the General Information tab (4) to access the following settings for the selected section group:
5. Press the General Information tab (5) to access the following settings for the selected section group:



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NOTE: Information may be pre-populated in the following fields if a preset machine or implement profile has been selected during set up. Press any of the fields described below and use the on-screen keyboard to edit the displayed profile information. Depending on equipment type, reporting information may not be available.

General information

Name. A name or description of the sections configured in the selected section group.

Type. A description of the type of sections in the selected section group.

Reporting information

The lower portion of general information equipment setup or section groups allows the operator to enter the following information as applicable to the field operation:

NOTE: The following fields are for report notation or display information purposes only and will not set or adjust any values or control system characteristics for an application control system.

Tip Type. Type of spray tips used on a liquid boom system during a field operation.

Tip Spacing. Spacing between spray tips on a liquid boom system.

Tip Pressure. This field may be used to note the average or target pressure for the currently installed spray tips.

Tip Size. Enter the tip size information for display or information.

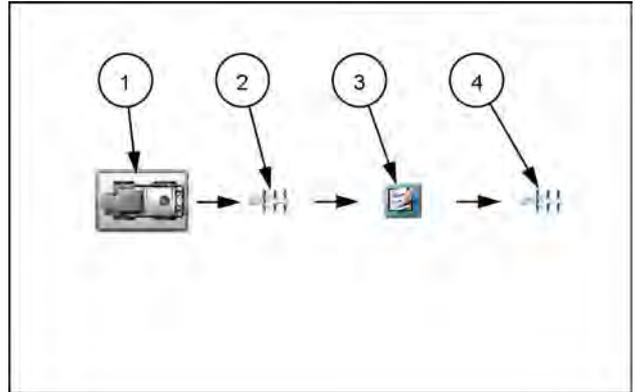
Height. Use this field to note the average or target height in feet [meters] maintained for the current tips or boom configuration.

Equipment setup- measurements tab

1. Press the profile button **(1)** for the machine configuration to view the General Information tab for the selected machine or implement.

NOTE: Use the page navigation at the bottom of the prompt, or swipe across the screen, to access other information for profiles assigned to the selected machine configuration.

2. Select the Equipment tab **(2)** to view the currently configured section group information.
3. Select the Edit button **(3)** in the desired section group to edit section group information.
4. Press the Measurements tab **(4)** to access the following settings for the selected section group:



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Equipment offsets

Use the following settings to configure the location of the section group on the machine or implement:



Left/Right Offset Direction – Press the left/right offset direction drop down and select the overall offset for the selected section group from the center-line of the machine.

Left/Right Offset Distance – Select the offset distance field and enter the distance from the center-line of the machine to the center of the section group. The left/right offset distance must be measured perpendicular to the direction of travel.



Fore/Aft Offset Direction – Press the fore/aft offset direction drop down and select the position of the section group from the machine or implement pivot point.

Fore/Aft Offset Distance – Select the offset distance field and enter the distance from the pivot point to the section group. The fore/aft offset distance must be measured parallel with the direction of travel.

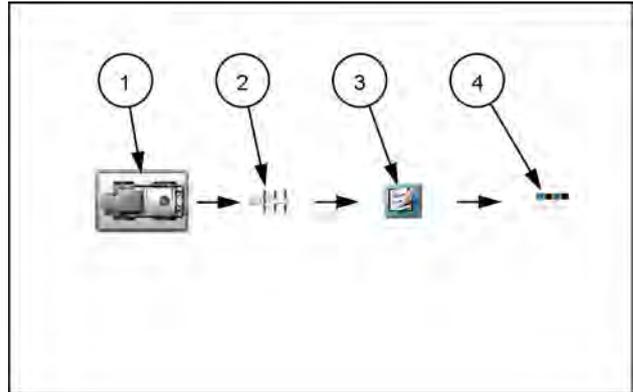
Equipment setup- sections tab

NOTE: You should not normally alter the settings in the sections tab. The system imports the settings from the Rate Control Module (RCM).

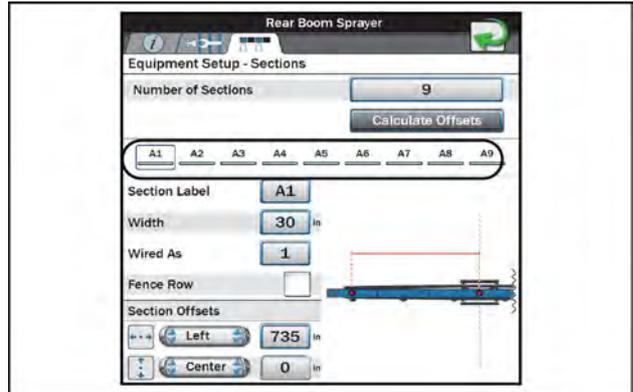
1. Press the profile button (1) for the machine configuration to view the General Information tab for the selected machine or implement.

NOTE: Use the page navigation at the bottom of the prompt, or swipe across the screen, to access other information for profiles assigned to the selected machine configuration.

2. Select the Equipment tab (2) to view the currently configured section group information.
3. Select the Edit button (3) in the desired section group to edit section group information.
4. Press the Sections tab (4) to access the following settings for the selected section group:



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NOTE: The section group display will not necessarily represent the physical section layout of the applicator.

NOTE: To migrate UT boom over to "Machine Configuration" boom setup, press the add (+) icon.

Number of Sections. This field sets the number of sections available within the section group. Edit this number to add or remove sections from the section display area.

Calculate Offsets Feature. The **Viper® 4+** display is capable of calculating section left/right offsets for standard section configurations (e.g. sections aligned end-to-end and centered on the swath midpoint).

To use the automated offset calculator:

1. Set and verify width values for all sections in the group.
2. Press the "Calculate Offsets" button. The **Viper® 4+** display will automatically set the left/right offsets for a standard section configuration.
3. If necessary, manually adjust the fore/aft or left/right offset direction and distance values to customize the section group configuration.

Section Group Display. This area displays an abstract of the current section group configuration with the number of sections and assigned section labels. Press a section indicator shown in this area to view settings for each section in the group.

NOTE: The section order displayed in this area will be duplicated for section status indicators during field operations. It is recommended to enter sections from left to right to ensure that the status indicators display a general representation of the section group status.

Section Label. Set the label to be displayed for each section during field operations. The section label may be up to three characters and will be displayed on section status display or on-screen switch box widgets selected for use during active jobs.

Width. Set the width in inches [centimeters] to calibrate the **Viper® 4+** display for the area covered by each specific section during field operation.

Fence Row. Select the fence row option to designate the configured section as a fence row. The **Viper® 4+** display will not include sections assigned as fence rows in overall guidance width calculation. Guidance width and offset may still be overridden on the Machine Configuration tab. See “Machine configurations and profile settings definitions” (4-18) for additional assistance.

Section offsets



Left/Right Offset Direction – Press the left/right offset direction drop down and select the direction from the center of the boom to the center of the section.

Left/Right Offset Distance – Select the offset distance field and enter the distance from the center of the boom to the center of the section. The left/right offset distance must be measured perpendicular to the direction of travel.



Fore/Aft Offset Direction – Press the fore/aft offset direction drop down and select the direction from the center of the boom to the center of the section.

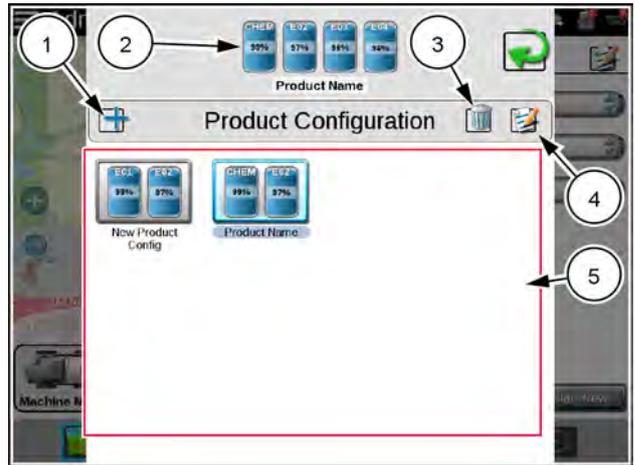
Fore/Aft Offset Distance – Select the offset distance field and enter the distance from the center of the boom to the center of the section. The fore/aft offset distance must be measured parallel with the direction of travel.

Product panel and configurations

Overview

The product panel allows an operator or system administrator to set up control channel assignments and enter product information for a field operation. A product configuration may be saved for common or recurring field operations to will allow the operator to re-select the product settings from a previous operation to quickly change the **Viper® 4+** display setup for different configurations used during various field operations.

1. Create new product configuration
2. Selected product configuration
3. Delete selected configuration
4. Edit product configuration
5. Available product configurations



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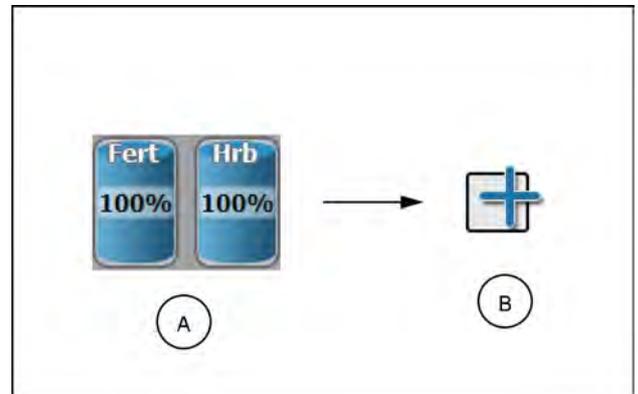
NOTE: Product configurations will be displayed only for the selected machine configuration.

Product configurations

Product configurations save information on products assigned to each control channel and may be used to quickly set up the **Viper® 4+** display for common or various input or application operations. The product configuration information may be used to enhanced job reporting information and allows improved product information to be saved, changed, and used quickly and easily.

Create a new product configuration

1. Press the Product Configuration **(A)** panel to display the available product configurations.
2. Press the Add button **(B)** to create a new product configuration.
3. Use the on-screen keyboard to enter the desired name or description for the product configuration and press the Done button. The product setup screen will be displayed.
4. See “Product channel and ingredient setup” **(4-31)** to configure the product or mix information for each control channel available in the product configuration.

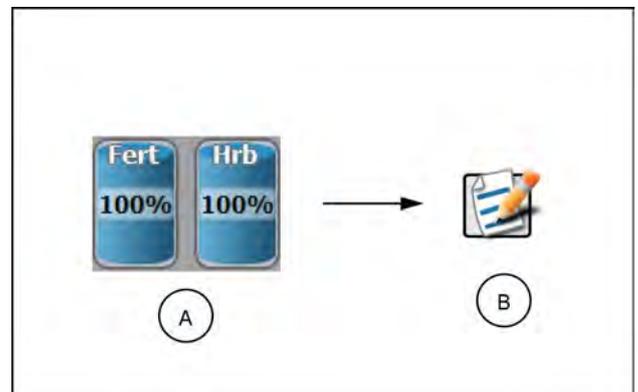


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Edit an existing product configuration

To edit or modify an existing product configuration:

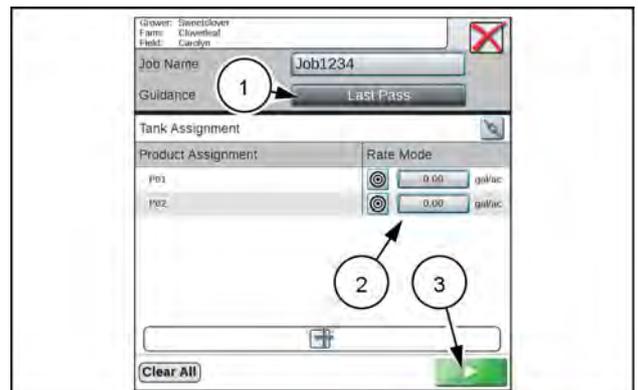
1. Press the Product Configuration panel **(A)** to display the available product configurations.
2. If necessary, select the product configuration to be modified.
3. Press the Edit button **(B)** to edit the selected product configuration. The product configuration prompt will be displayed.
4. Edit the existing information for each control channel as necessary to modify or adjust the configuration for the field operation needs. See “Product channel and ingredient setup” **(4-31)** for additional information on entering product information for each control channel available in the product configuration.



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Assign a product configuration (for agX®)

1. Select the desired **agX®** field.
2. Select the Guidance type **(1)**.
3. Enter the desired rate **(2)** for each product node.
4. Press the Start button **(3)**.



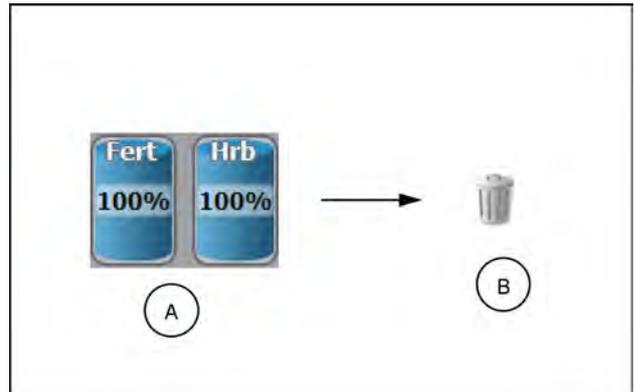
RAIL21TR02912AA 3

Delete an existing product configuration

NOTE: Deleting a product configuration does not delete product information assigned to the configuration.

To delete an existing product configuration:

1. Press the Product Configuration panel **(A)** to display the available product configurations.
2. Select the product configuration to be removed.
3. Press Delete **(B)**.
4. Press the “Yes” button on the displayed prompt to permanently delete the product configuration.



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Product channel and ingredient setup

The following sections are intended to assist with setting up and entering product information for each control channel in a product configuration. The product channel information may be used to enhance the job reporting features and provide detailed input or application information for reference during the growing season or for archival record keeping.

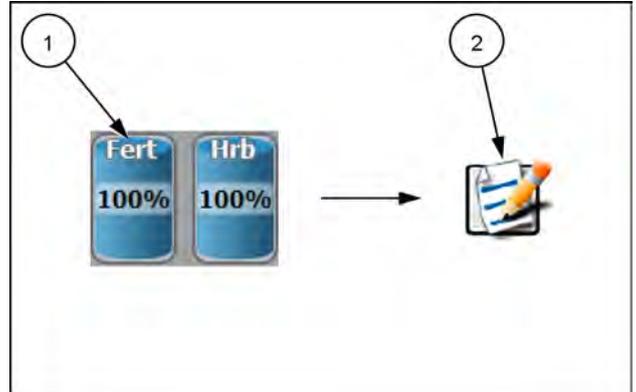
Product reporting information

To set up control channel information:

1. Press the “Product Configuration” panel and select a product configuration to modify or create a new configuration.

NOTE: See “Product configurations “ (4-29) for assistance on creating or editing a product configuration.

2. Press the edit button (2) in the “Product Configuration” (1) panel to edit the selected product configuration.
3. Select a channel indicator shown along the left side of the prompt to select the control channel on which to add product information.



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4. Press the “Mix Name” field to create or edit the tank mix name. To select a previously configured mix,

press the “Mix Name” drop down and select a previous mix to assign the mix to the selected control channel.

NOTE: Selecting a previous mix or blend will automatically enter any information entered previously for the remaining fields. Verify the mix or blend information before proceeding to the next control channel. Editing the mix name will not create a new mix with the existing mix or blend information.



If needed, there is a mix calculator available to assist with determining the appropriate mix. Press the rate calculator button and enter the desired values

5. If desired, press the unit to toggle between units of measure.
6. Once the mix name is entered, the **Viper® 4+** display will set the “Display As” label for the mix. If desired, press the “Display As” field and edit the label (up to 4 characters) to be displayed during field operations on user selected widgets.



7. Press the tank manager button.

8. Press the “Current Volume” or “Current Weight” field and set the current tank volume or bin weight available for the mix or blend. This value is the total amount of product (carrier and all ingredients) in the tank or bin.



To refill a tank or bin to the full capacity of the product tank or bin, press the refill button.



To refill all tanks or bins to full capacity, press the refill all button at the top of the prompt

Mix ratios and ingredients

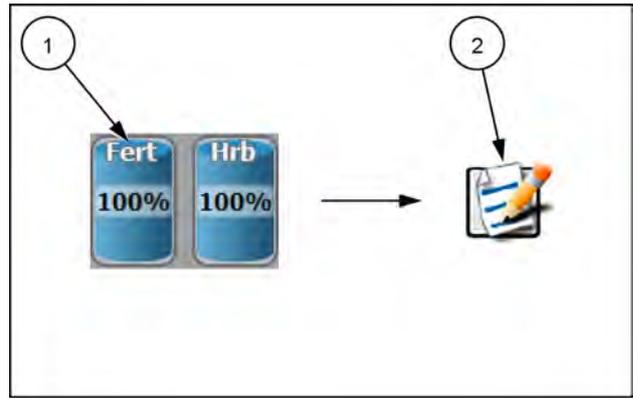
When configuring a control channel for liquid control, the “Product Configuration” prompt will display a “Carrier” and “Carrier Volume” field. The **Viper® 4+** display uses the carrier volume or rate field to calculate the ratio of carrier and mixed ingredients during the field application.

To enter carrier information for a tank mix:

1. Press the “Product Configuration” panel (1) and select a product configuration to modify or create a new configuration.

NOTE: See “Product configurations “ (4-29) for assistance on creating or editing a product configuration.

2. Press the “Edit” button (2) in the “Product Configuration” panel to edit the selected product configuration. If the control channel is configured for liquid product control, the “Carrier” and “Carrier Volume” fields will appear. Press the “Carrier” drop down selection and select the existing carrier product or select the Add button to create a new carrier.



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3. For liquid products, press the “Carrier Volume” field and enter the volume of carrier used in the mix. This field is used to set the ratio of product and does not have to reflect the actual volume of carrier in the tank.

For example, if a chemical supplier used **5678 L/hour (1500 US gal/hour)** of water mixed with **1893 L/hour (500 US gal/hour)** of a liquid fertilizer for the nurse tank mixture, the “Carrier Volume” may be entered as **5678 L/hour (1500 US gal/hour)** and the ingredient volume may be entered as **1893 L/hour (500 US gal/hour)**. The Viper® 4+ display will calculate the ratio for each tank load for the field application.

Add ingredients

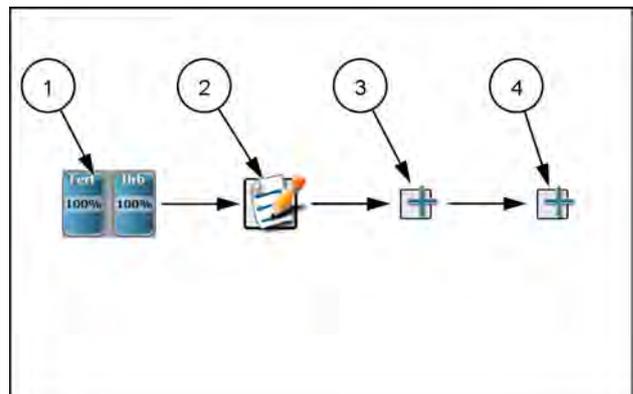
The lower portion of the “Product Configuration” prompt allows mix or blend ingredients to be added to the product configuration. This information is used to calculate the ratios of product applied during field operations with the mix or blend assigned to the control channel.

To select ingredients and enter product information:

1. Press the “Product Configuration” (1) panel and select a product configuration to modify or create a new configuration.

NOTE: See “Product configurations “ (4-29) for assistance on creating or editing a product configuration.

2. Press the edit button (2) in the “Product Configuration” panel to edit the selected product configuration. Press the add button (3) to add a product to the ingredient list. The “Favorite Products” list will be displayed. The “Favorite Products” prompt displays products that have been used for previous product configurations.



RAPH23PLM0241AA 3

3. Select the desired product from the recently used list if available and press the “Done” button to add the product to the ingredients list. To add an ingredient from the product database, press the add button (4) at the bottom of the “Favorite Products” prompt. The “Reference Products” prompt will be displayed. The “Reference Products” database contains thousands of preconfigured agricultural products and information that may be added to the ingredient list.

4. Use the filter options at the top of the “Reference Products” prompt to help locate and select the desired product for the ingredients list and press the “Done” button to add the selected product to the ingredients list.

NOTE: The selected product will also be added to the “Favorite Products” list.

5. To create a new product or ingredient not available in the product database, press the add button at the bottom of the “Reference Products” prompt. Proceed with the procedure described in the “Create a New Ingredient” section below for additional assistance with creating a new product for field operations.

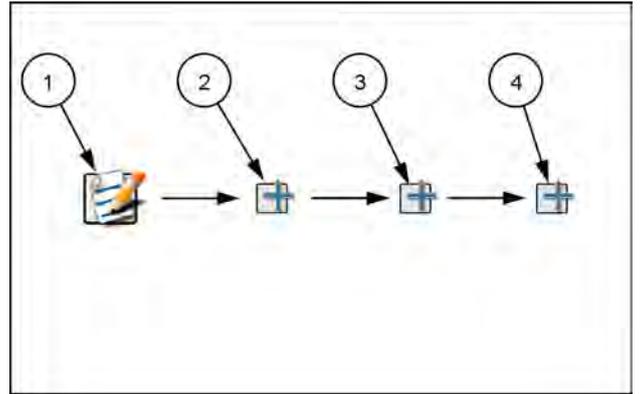
Create a new ingredient

To create a custom product or ingredient for a product configuration:

1. Press the edit button **(1)** in the “Product Configuration” pane **(A)**.

NOTE: See “Product configurations “ (4-29) for assistance on creating or editing a product configuration.

2. Select the add button **(2)** at the bottom of the “Product Configuration” prompt to display the “Favorite Products” list.
3. Press the add button **(3)** again to view the “Reference Products” database.
4. Press the add button **(4)** once more to access the “Product Details” prompt.



RAPH23PLM0242AA 4

5. Select the “Type” drop down list and select the type of product to be added.

NOTE: Use the “Type” filter option available to the right of the “Type” drop down to filter the product database information. This feature may be useful when adding a new product based off of a previous product line already in the database.

6. Press the “Manufacturer” field or select the drop down option to enter or select a manufacturer.

NOTE: Use the “Manufacturer” filter option to the right of the “Manufacturer” drop down list to filter the product database information. This feature may be useful when adding a new product from a manufacturer already in the database.

7. Press the “Name” field or select the drop down option to enter or select a product name or description already in the product database.

NOTE: Use the product “Name” filter option to the right of the “Name” drop down list to filter the product database information. This feature may be useful when adding a new product based upon a product or product line already in the database.

8. Press the “Liquid/Dry” drop down and select the type of product to be configured.

9. Press the “Units” drop down and select the preferred application rate units.

10. Press the “Registration” field and enter any registration information as available or necessary for reporting to governmental or environmental agencies.

11. Enter any additional product notes in the “Notes” area.

Street maps

Street maps

Street maps provides an aerial map view of an area along with available field boundaries in the area.

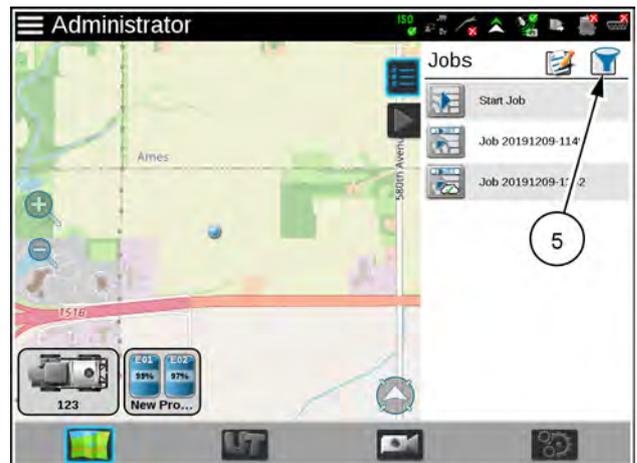


To open street maps, press the street maps icon. The street maps window opens showing the street view as well as field boundaries. The field boundaries appear in blue polygons.

1. Field boundaries
2. Follow machine/pan
3. Zoom in
4. Zoom out
5. Job filter



RAPH23PLM1166BA 1



RAPH23PLM1166BA 2

Downloading maps

Before using street maps, a map must be downloaded from the **Slingshot®** portal. The downloaded map will only show the area selected by the user (in mile radius) and does not automatically update based on location. Since street maps is offline, it will only show areas imported to the **Viper®** 4+ display.

To download Street Maps:

1. Select the Manage drop-down from the top of the page then select Street Maps.
2. Select a location on the map. This will create a center point for map creation. At any time, if desired, select a different center point.
3. Use the Size slider bar to increase or decrease the map size. The map size (Tile size) is measured in square kilometers or miles.
4. The latitude and longitude of the center point will display after choosing the center point.

NOTE: If you know the coordinates of the center point location, you can enter the coordinates into the latitude and longitude and the Street Maps will create the center point for you.

5. Enter a name for the map.

NOTE: Having “Street Map” or “Map” as part of the name will make it easier to identify the file as a Street Map when in “File Manager.”

6. Select Create. The map name will display on the left side of the screen. If desired, select the map name to view the download status. The display status “Processing” indicate the map is getting ready for download. “Ready to Download” indicates the map is ready to download.
7. Select Ready to Download to download the map.
8. Select Save.
9. Navigate to the desired save location on the computer or on the USB.

Filtering

If desired, press the filter in the top-right corner of the screen to filter visible field boundaries by grower, farm, field, or job type. The field boundaries can also be filtered by most recent, name, etc.

Zoom

Use the magnifying glass icons to zoom in or out on the map.

Follow

Press the arrow icon in the lower left corner of the screen to either have the map follow the machine or be able to pan and navigate around the map.

Selecting a job

On the map, field boundaries will be visible as blue shapes on the screen. Pressing the desired field boundary will highlight the field boundary and open a window with a list of available jobs for that field boundary. Select the desired job to start an existing job or press Start Job to start a new job. For **agX®**, select a new **agX®** job image since there is no start button.

If there are multiple field boundaries in the area that have overlapping boundaries, select the desired area. A window will open that shows the available field boundaries in the selected area. Select the desired field boundary then select the desired job.



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Job profile panel and configurations

Overview

The Job Profile panel contains configured job profiles and any jobs, completed or in progress, and currently stored on the **Viper®** 4+ display. Job profiles allow field information such as guidance lines or scouting features to be pre-configured for various fields and assigned to the grower, farm, field (GFF) folder structure.

Jobs previously started on the **Viper®** 4+ display are also available in the Job Profile panel until removed. To resume the field operation, select the job file with the previous coverage map to be amended and begin field operation.

NOTE: Perform file maintenance regularly to keep device resources available for active field operations. Transfer completed job files to a home or office PC, or a **Slingshot®** account, for backup and archiving.

Job profiles

Job profiles allow the operator to select a profile with preset grower, farm, field (GFF) assignments, preferred guidance type, and field scouting information, all with one press instead of multiple procedures to load each of these options.

Job profiles may be used to provide as much, or as little, of the above information as needed or desired for a grower or custom applicator operation. This function is not required.

Job profile panel overview

Job profile panel overview

Press the jobs tab (1) toward the top of the street maps display to expand the Jobs panel. The Jobs panel displays job profiles and previous job files in progress and stored on the **Slingshot®** device.

Job profiles allow field information such as guidance lines or scouting features to be preconfigured for various fields and assigned to the grower, farm, field (GFF) folder structure.

Job filter and sort

Filter and sort features are available in the upper, right corner of the Job Profile panel. Press the Filter (2) button to select options to filter or sort jobs and job profiles displayed in the Jobs panel. Use these features to quickly locate files for a job in progress or the appropriate job profile, recommendations, or cloud job features for a new field operation.

Job filtering also allows the operator to view only work assigned to a specific grower, farm, or field, type of job file, or to a specific operator.

NOTE: The *Only My Work* filter option is only used with AgSync cloud jobs (if equipped).

Applied filter options will be displayed each time the Job Profile panel is selected. If a job profile or previous application is not displayed, clear the filter options or check that the set filtering options do not exclude the desired selection.

Job profile editor

The edit feature (3) available in the upper, right corner of the Jobs panel allows the operator or system administrator to create or manage job profiles for future field operations using the **Viper® 4+** display.



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Job profile setup

Job profile setup

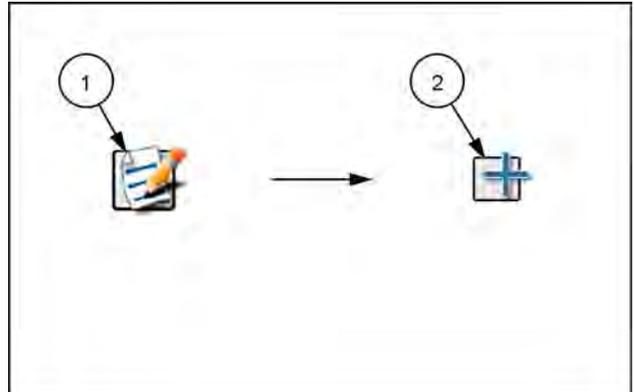
Job profiles save common field preferences such as guidance type and lines, scouting information, and grower, farm, field (GFF) associations and allow a machine operator to load these settings quickly at the start of a field operation.

NOTE: Setting up a job profile is not a requirement and is designed as a Grower function. The default Start Job profile allows a user to quickly start a job and allows the user to assign GFF, saved guidance lines, and any applicable scout groups.

Create a new job profile

To configure a job profile for future field operations:

1. In the street map screen press the Jobs tab.
2. Press the Edit (1) button.
3. Press the Add button (2). The Job Profile Settings screen will display.
4. Proceed with the following sections to complete the job profile set up as desired for use when starting future field operations.



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Job profile name

1. Select the profile name field and use the on-screen keyboard to enter the name or description of the profile.
2. Enter a name or description that will help identify the specific field for which the profile is configured.

Field information



1. Press the edit button in the field information area and use the selection fields to assign the job profile. See "Using the file manager" (7-38) for details on creating or editing GFF assignments to help sort and manage field and job information.

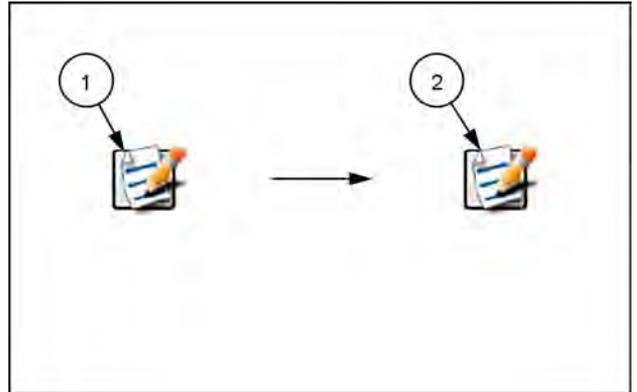
General settings

1. Press the guidance drop down field and select the preferred guidance type or line to use during field operations with the selected profile. A guidance line must be available on the **Viper® 4+** display to select a guidance line for the profile. See "Guidance patterns overview" (5-1) for assistance with setting or saving a guidance path.
2. Press the scout drop down field and select an available scout group to use with the profile. A scout group must be available on the **Viper® 4+** display to select a scout group for the profile. See "Scout groups overview" (5-15) for additional information on creating scout groups and features for use during field operations.

Edit an existing job profile

To modify an existing job profile:

1. Press the Jobs tab.
2. Press the Edit button **(1)**.
3. On the Job Profile screen, select the Edit button **(2)** for the job profile to be modified.

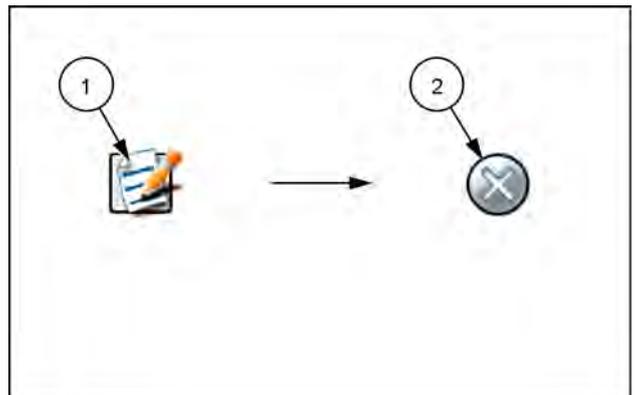


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Delete a job profile

To remove a job profile from the Job Profile panel:

1. Press the Job Profile panel.
2. Press the Edit button **(1)**.
3. On the Job Profile screen, select the Delete button **(2)** for the desired file.
4. Confirm that the delete process to permanently remove the job profile.



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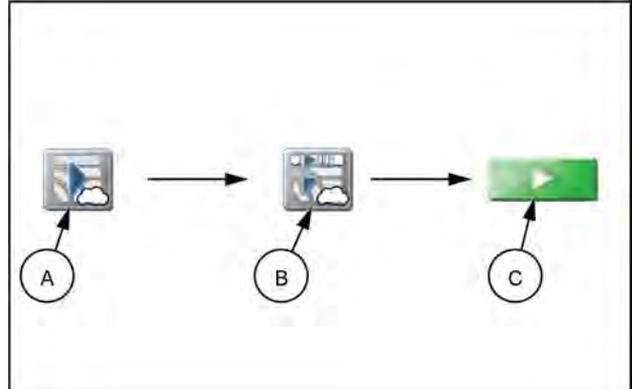
Starting a job

Starting a job

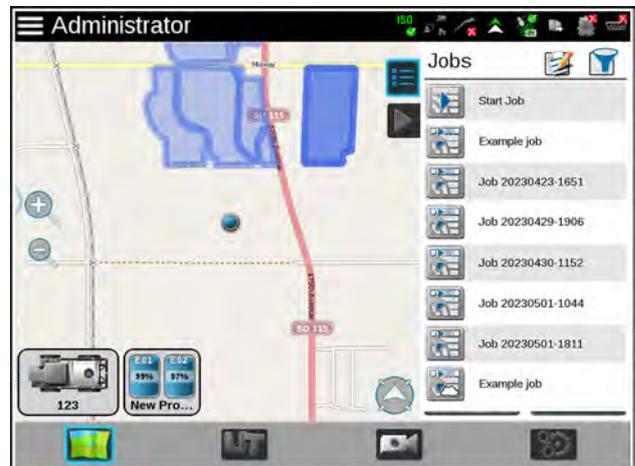
NOTE: To avoid loss of job information, it is recommended to close any active job operation before shutting down the **Viper® 4+** display or removing power from the display. Refer to the Power Down section on 3-5 for additional information on the proper procedure to shutdown the display.

To start a new job or field operation:

1. Press the Map View button at the bottom of the Main Panel display.
2. Press the “Start Job” button (A) OR the “Resume Previous Job” button (B).
3. Press the “Start” (C) button to start the job.



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Start Job (A): Press the Start Job option to begin a default field operation with or without assigning Grower, Farm, Field (GFF) data or profiles to the job. This option may be desired to quickly start a job or if additional data collection or record keeping will not be necessary. Grower-Farm-Field data, scout guidance lines, and scout groups can be loaded if applicable.

Start agX® Job: agX® files are created on a computer before heading out the field. These files are called “recommendations”. Recommendations contain information such as field boundaries, application rates, and prescription maps. The process to start an agX® job varies from a typical application.

Start a Connected Workflow™ Job: Connected Workflow™ jobs are created in Slingshot® and sent to the Viper® 4+ display via the Slingshot® link. Information such as grower, farm, field, prescription maps, and mix ratios are pre configured in the pre-populated job. Pre-populated job icons appear similar to other jobs but have a small check box on the icon.

Start a Cloud Job: Cloud jobs are similar to Connected Workflow™ jobs but can have multiple machines operating within the same job. When in a cloud job the pre-populated job information and coverage from other machines in the same Slingshot® account will be visible on the Viper 4+ display. Cloud job icons look similar to other jobs but have a cloud on the job icon.

Job Profile: Select a configured Job Profile to begin a field operation using a previously configured job profile. Refer to the Job Profile Setup section in “Job profile setup” (4-38) for assistance with creating or editing job profiles.

Resume Previous Job (B): Select a previous job to add to the previous coverage history.

3. Verify the GFF assignments displayed in the upper, left corner of the prompt. This information will be set with the job profile if already configured. If necessary, press the Edit button at the top of the Job Setup prompt to reassign

the job to GFF structure or create new GFF entries as necessary. Refer to the Grower, Farm, Field (GFF) Manager section on **7-47** for additional information on creating GFF entries for assignment to the new job. Editing GFF is not available for **agX®** or **Connected Workflow™** jobs or cloud jobs unless you are the originator.

4. If desired, press the Job Name field and use the on-screen keyboard to enter a new name or description for the field operation being started.
5. Enter a name or description that may be used to identify the job if it is necessary to resume the field operation at a later date or to help with archiving field data back at the home or office.
6. To change the job profile in the Job Setup prompt, pressing the Job Profile drop down and select the desired profile. If a different profile is selected, restart this procedure to verify settings as required before starting the field operation.
7. Verify the guidance type or path for the field operation. If a guidance line is saved on the **Viper® 4+** display, press the Guidance drop down field and select the saved line to load for the field operation.
8. Verify the scout group for the field operation. Scout groups may contain a field boundary, recorded zone map features, and other scouted field map features as saved. Press the Scout drop down field and select the saved scout group to load for the field operation. Scout groups are not available for **agX®** or **Connected Workflow™** jobs or cloud jobs unless you are the originator and are starting a job for the first time.
9. Verify any application control or monitoring features for active control channels to be used during the field operation being initiated.

Application control/monitoring examples



Product chaining



Fixed rate



Prescription map rate



Greenseeker rate

NOTE: This button is always present, but the intent is only to identify the button. This is a third-party product that you can unlock in the **Viper® 4+** display.

NOTE: If the same product has been assigned to multiple nodes, the **Viper® 4+** display will automatically combine the same products into a chain.

Other optional input, application control, or operation monitoring systems may offer additional control settings or specific features for use with the **Viper® 4+** display.

10. Press start to open the operation screen.

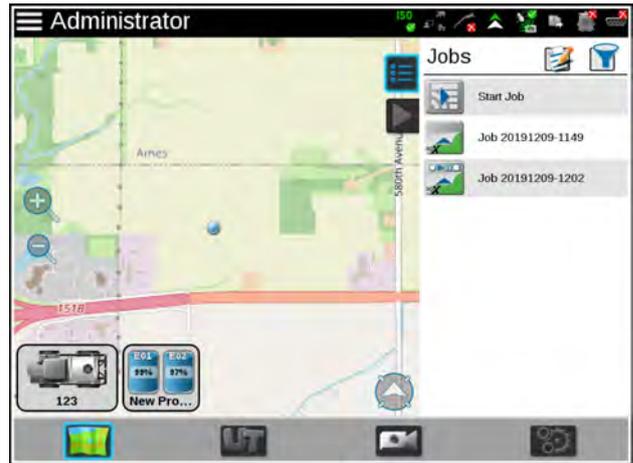
agX® Job



To start a new **agX®** job, press the icon for the desired job.

agX® recommendations are created on a computer and sent to the **Viper® 4+** display via **Slingshot®** or transferred via a thumb drive. The data, saved as a remote desktop profile (*.rdp) file contains information such as field boundaries, prescription maps, and chemical information.

1. New **agX®** field
2. Already ran **agX®** job

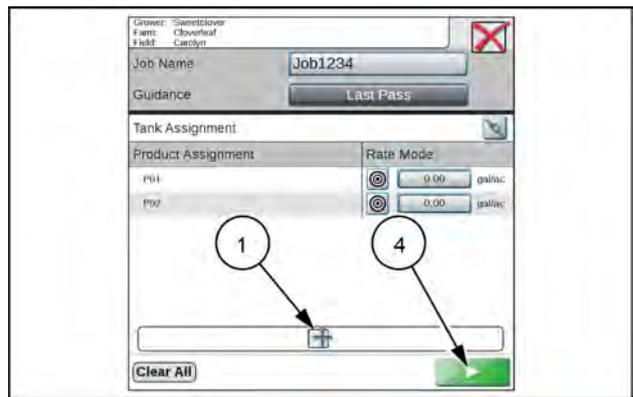


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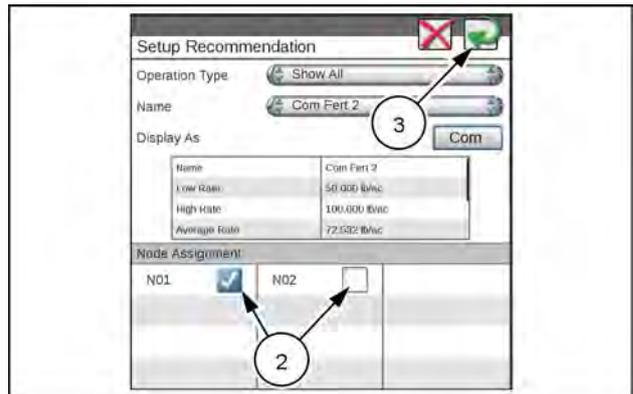
Starting an agX® job

After transferring the (*.rdp) file to the **Viper® 4+** display:

1. Select the desired **agX®** field boundary.
2. Press the Add button (1).
3. Select the desired recommendation from the Name drop down.
4. Select the Node Assignment (2) for the recommendation.
5. Press the back arrow (3) to go the previous screen.
6. Either press the Start button (4) to start the job or press the Add button to add additional recommendations.



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RAIL21TR02917AA 5

Resume agX® job



To resume an **agX®** job that was started previously, select the desired **agX®** job.

The **agX®** jobs that have already been started have play, pause, and stop buttons along the top of the button.

Cloud jobs

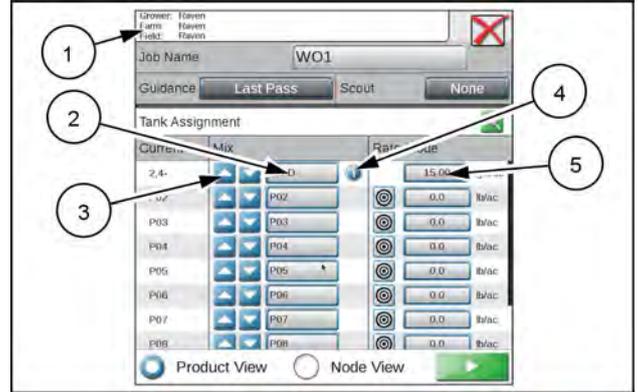
Before starting a cloud job it is important that there is an active **Slingshot®** connection and that Cloud Jobs are enabled in File Manager. To enable cloud jobs in File Manager:

1. Select Administrator or User Panel along the top of the Main Panel display to expand the panel.

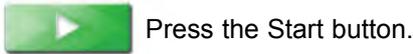
2. Select File Manager.
3. Select the File Management Options Tab.
4. Select the Enable Cloud Jobs check box.

Starting a cloud job

1. Select the desired cloud job.
2. If joining a cloud job, confirm that the auto-assigned products from the cloud job are correctly assigned to the control channels on the machine:
 - GFF
 - Editable mix name
 - Product reorder
 - Information
 - Editable rate field



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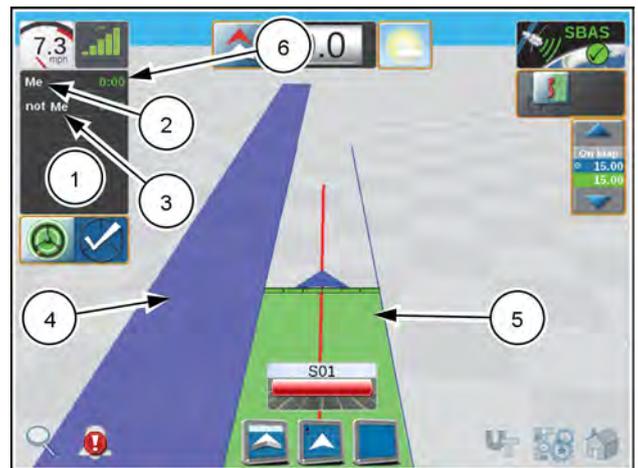


Press the Start button.

NOTE: If there is an issue with **Slingshot®** or **Enable Cloud Jobs** is not selected, a **Cloud Job Warning** error window will open. Exit the job, verify **Enable Cloud Jobs** is selected and **Slingshot®** is connected.

4. Start a job as normal. On this screen you will be able to see the areas you applied and other the areas other operators have applied (in blue). A list of the other operators in the same job will be visible in the Cloud Job widget. The number to the right of the operator name indicates the time (in seconds) since that **Viper® 4+** display last communicated. If there isn't a number behind the name it indicates that the operator is no longer active in the job.

- Cloud job widget (1)
- Current machine (2)
- Other operator in job (3)
- Applied areas of other operators (4)
- Current V4 applied area (5)
- Response lag time (6)



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Start work

The “Start Work” option allows you to quickly start field operations without setting up a job. The “Start Work” option saves the Grower, Farm, Field (GFF) data from the last field operation to allow you to quickly resume previous work. This option saves previous work data in the selected field until you clear it.

Alternatively, you can enter new GFF information and start a new field operation.

Resume previously started work

Press the start work icon (1) on the right side of the street maps view. The “Start Work” panel appears.

Ensure the GFF information (2) is correct.

Press the “Resume” button (3) to continue the previous work in the field.



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Start new work

Press the start work icon (1) on the right side of the street maps view. The “Start Work” panel appears.

Enter the desired GFF (2) information.

Press the “Start New” button (3). The guidance screen appears and displays the field. You can begin field operation.



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Modifying Connected Workflow™ Jobs (pre-populated jobs)

Connected Workflow™ jobs are created in the **Slingshot®** system and imported to the **Viper® 4+** display via the **Slingshot®** system. **Connected Workflow™** jobs contain information such as Grower, Farm, Field, prescription maps, and mix ratios.



Connected Workflow™ jobs have a small checklist icon on the job icon .

After pressing the pre-populated job a pre-populated job confirmation screen will open:

1. If needed, use the product reorder arrows to move the mix(es) up or down to the desired node location.

NOTE: Select the **Node View** radio button to view the node name and the current mix.

Pre-populated job products will have the information button **(B)** visible behind the Editable Mix Name. Products without the Information button are extra nodes on the bus and not associated with the prepopulated job.

2. If desired, press in the Editable Mix Name field **(A)** and rename the mix. The edited name will only be visible to the current operator and is not saved in the pre-populated job.
3. Press the button in the Guidance cell to select the desired Guidance type **(C)** .
4. Press the button in the Scout cell **(D)** to select (if applicable) a Scout group.
5. After completing the pre-populated job configuration, press Start **(E)** to start the pre-populated job.



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Example



RAIL21TR02921AA 2

Product re-configuration

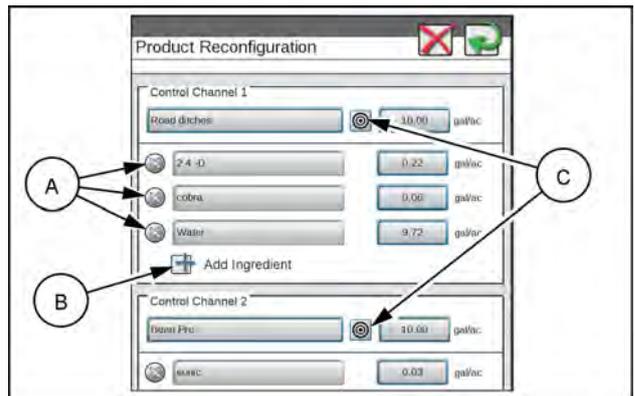
In some instances, jobs sent via work orders will require product reconfiguration for accurate job completion.

To re-configure products (mixes, application methods, etc.) from work orders:

1. Select the desired job.
2. Press the edit button **(A)**.
3. The Product Re-configuration dialog page will open:
 - o Delete Ingredient
 - o Add ingredient
 - o Editable values
4. If any of the displayed values, totals, or products are inaccurate, press the field that needs to be corrected and edit until the desired changes are made.
5. If a new ingredient is needed, as example for a product mixture, press the Add Ingredient button **(B)** and a new dialog window will open.
6. After all correct changes have been made, tap the green enter button in the upper right-hand corner to save the new ingredients.
7. Once all changes have been made in the Product Re-configuration window, tap the green return arrow in the upper right-hand corner to save the new products configurations to the job.



RAIL21TR02922AA 3



RAIL21TR02923AA 4



RAIL21TR02924AA 5



RAIL21TR02925AA 6

Ending a job

To close or end a job currently in progress:

1. Press the Home button (A). The Application Report tab (B) will display.
2. Press any information fields and enter any desired or necessary job data or notes regarding the field operation.
3. Press the Weather Report tab (C).

NOTE: The weather report feature is optional.

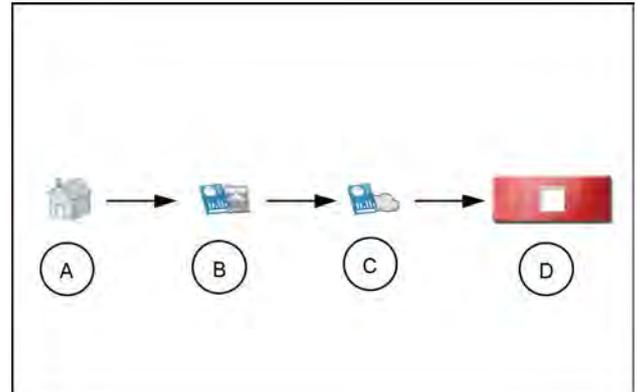
4. Select Include Weather Report option at the top of the prompt to include weather information in the job report for the field operation.
5. Press any information fields and enter any desired or necessary weather information or notes regarding weather during the field operation.

NOTE: Weather information may be collected automatically during the field operation if a weather station is connected to the Viper® 4+ display.

6. Select the Job Complete option if the field operation is finished.

NOTE: The job will still be displayed in the Job Profile panel, but will display a check mark to indicate the job has been completed and does not need to be restarted to complete any operations.

7. If a Slingshot® Field Hub is connected with the Viper® 4+ display, select the “Send to Slingshot” option to transfer the job to the Slingshot® web service via the wireless network.
8. Select the Stop button (D) in the lower, right corner of the prompt to close the job and return to the main panel display.

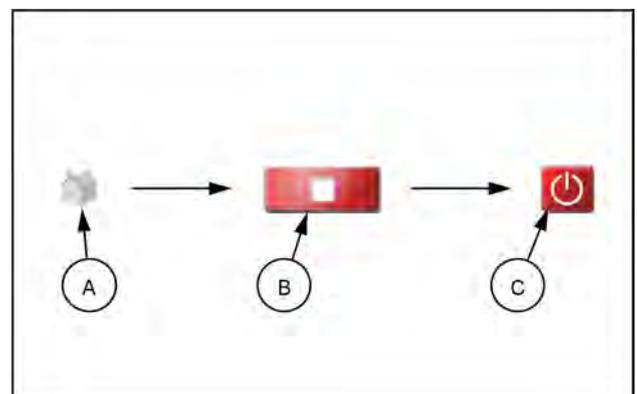


RAIL21TR03959AA 1

System shutdown

To shutdown the system while in a job:

1. Press the home icon (A) in the lower, right corner of the display.
2. Press the Stop icon (B).
3. Press the Administrator or User panel at the top of the Main Panel display.
4. Select the Shutdown button (C) to properly power off the Viper® 4+ display before removing power or shutting off the machine ignition.



RAPH22PLM0320AA 2

RS1™ guidance setup (if equipped)

Introduction

Introduction

NOTE: Your display was configured at the factory with the settings for your machine.

The RS1™ unit contains two sets of software loaded into the Universal Terminal (UT) on the Viper® 4+ display:

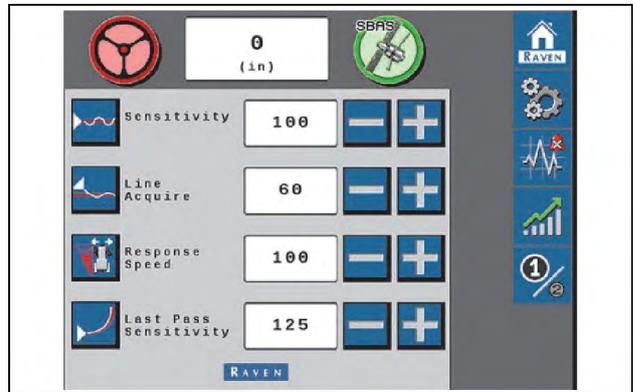
- RS1™ guidance and steering working set icon (1)
- Slingshot® working set icon (2)



RAPH23PLM1170BA 1

Guidance and steering software home screen

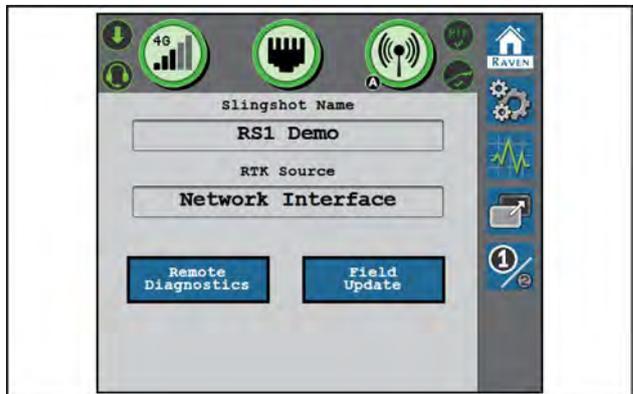
Guidance and Steering – Allows the steering and GPS settings within the RS1™ unit to be calibrated and modified.



NHIL22PLM0150AA 2

Slingshot® software home screen

Slingshot® – Allows the cellular settings within the RS1™ unit to be modified.



RAIL21TR02627AA 3

RS1™ terms of use

RS1™ terms of use

Operator liability screen

Read and accept the Operator Liability Warning. If the operator does not accept liability, the **RS1™** system will disable and cannot be reengaged until the liability warning is accepted. The Operator Liability Warning screen will appear each time a steering partner is registered with the **RS1™** system.



RAPH23PLM1171BA 1

Calibration: RS1™ GPS and steering

NOTE: Perform RS1™ calibration if the steering valve or cylinders were replaced, or if the tire size was changed. In addition, perform the steering valve calibration in the **Pro 1200** display. For assistance, see the sprayer operator's manual.

Initial calibration of the RS1™ system consists of the following component setup calibrations:

- GPS setup
- Terrain compensation calibration
- Auto-steering calibration

NOTE: The system information, fault codes, and machine test screens can be viewed during calibration. For further information on these settings, see "System information" (6-5).

GPS calibration

1. Use the drop-down options to select the Machine Type, Machine Make, and Machine Model that matches the current machine.
2. When all options have been set, select the Next button.
3. Confirm that the steering valve was detected as the Steering Partner.
4. Select the Next arrow.



NHIL22PLM0159AA 1



NHIL22PLM0157AA 2

- Verify the antenna fore/aft offset value matches the default value for the machine model.

Serial numbers ending in ST074999 and below

| Model | Default value |
|---------------|--------------------|
| Patriot® 3250 | 5258 mm (207.0 in) |
| Patriot® 4350 | 5588 mm (220.0 in) |
| Patriot® 4450 | |

Serial numbers ending in ST075000 and above

| Model | Default value |
|---------------|----------------------|
| Patriot® 3250 | 5046.6 mm (198.7 in) |
| Patriot® 4350 | 5376.6 mm (211.7 in) |
| Patriot® 4450 | |

NOTE: The antenna fore/aft position is calculated by measuring from the rear axle of the machine to the middle of the **RS1™** receiver. Enter a negative value if the **RS1™** receiver is located behind the rear axle.

- Select the Next arrow.
- Verify the antenna center offset value. The default center offset is 0 for all models.

NOTE: The antenna center offset position is calculated by measuring from the center of the machine to the center of the **RS1™** receiver. Enter a negative value if the **RS1™** receiver is located to the left of the machine center line.

- Select the Next arrow.

- Verify the antenna height value matches the default value for the machine model.

Serial numbers ending in ST074999 and below

| Model | Default value |
|---------------|--------------------|
| Patriot® 3250 | 3955 mm (155.7 in) |
| Patriot® 4350 | 4057 mm (159.7 in) |
| Patriot® 4450 | |

Serial numbers ending in ST075000 and above

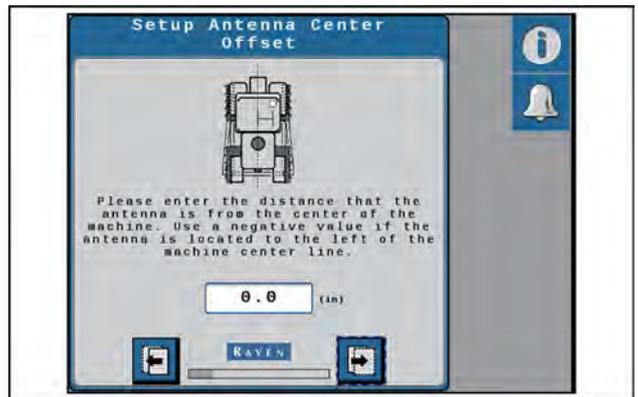
| Model | Default value |
|---------------|----------------------|
| Patriot® 3250 | 3972.5 mm (156.4 in) |
| Patriot® 4350 | 4074.5 mm (160.4 in) |
| Patriot® 4450 | |

NOTE: The antenna height is calculated by measuring from the ground to the center of the receiver.

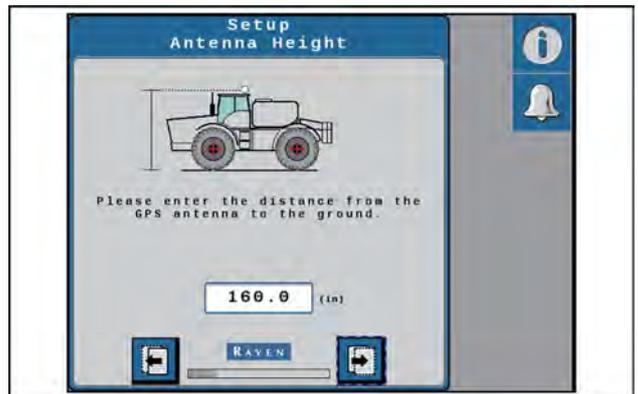
- Select the Next arrow.



NHIL22PLM0154AA 3



RAIL21TR02633AA 4



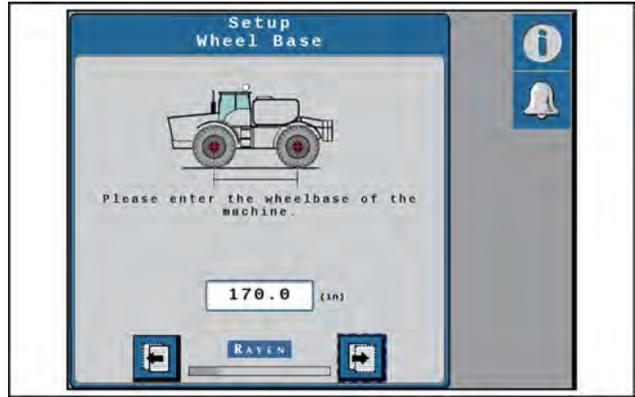
RAIL21TR02634AA 5

11. Verify the wheelbase value matches the default value for the machine model.

| Model | Default value |
|--------------------------------|------------------|
| Patriot® 3250 | 3810 mm (150 in) |
| Patriot® 4350 Patriot® 4450 | 4064 mm (160 in) |

NOTE: The wheelbase is calculated by measuring from the center of the front tire to the center of the rear tire on both sides of the machine. Add these measurements together and then divide by two to get the average wheelbase value.

Select the Next arrow.

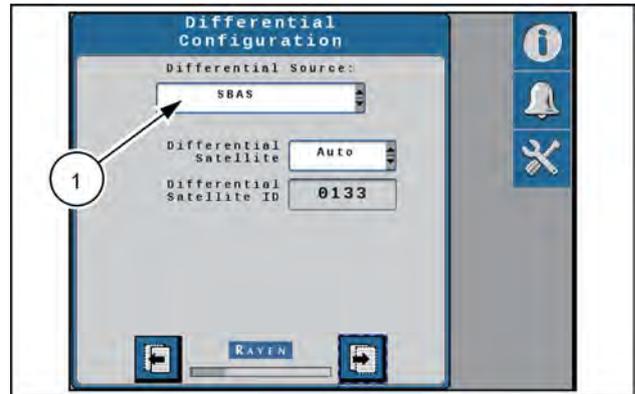


RAIL21TR02635AA 6

13. Select the appropriate GPS differential correction source from the “Differential Source” drop-down menu (1):

- GL1DE®
- SBAS
- Satellite GS
- RTK

NOTE: Depending on the number of feature unlocks purchased, all options may not be available for selection in the drop-down box. Contact your local CASE IH dealer to purchase additional unlock codes for differential corrections with the RS1™ receiver.

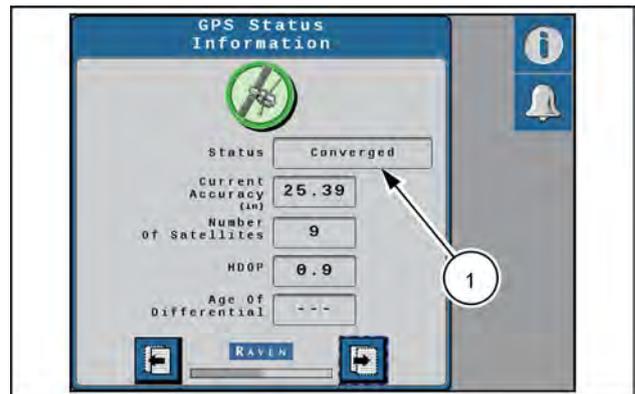


RAIL21TR02636AA 7

14. Select the Next arrow.

15. Review the displayed GPS status information.

NOTE: The GPS solution must be converged (1) to calibrate and proceed with the initial system calibration.



RAIL21TR02637AA 8

Terrain compensation calibration

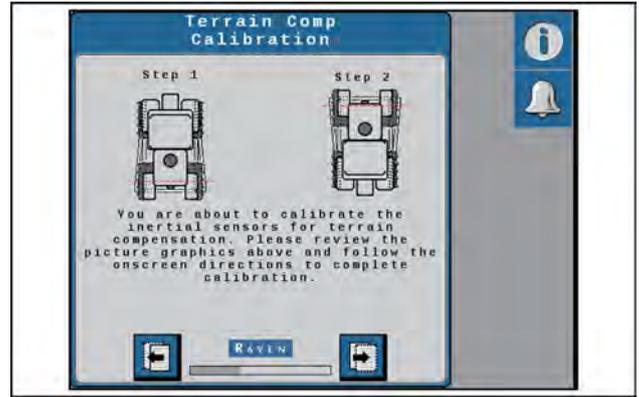
1. Drive the machine forward 10 m (33 ft) and park on a flat surface.

NOTE: The system must detect a converged GPS status with a green shield and a forward motion prior to calibration to determine which direction is forward.



RAIL21TR02638AA 9

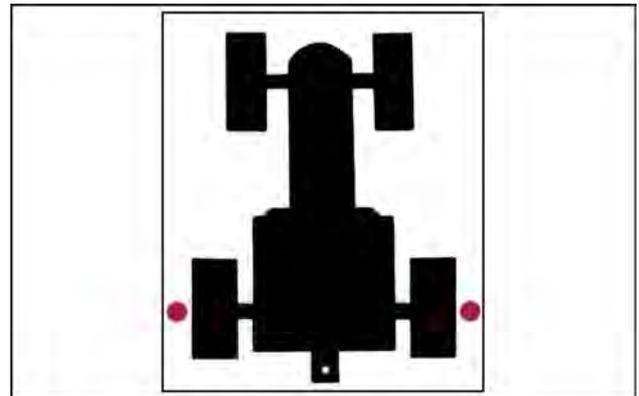
- Follow the on-screen instructions to begin the calibration process.



RAIL21TR02639AA 10

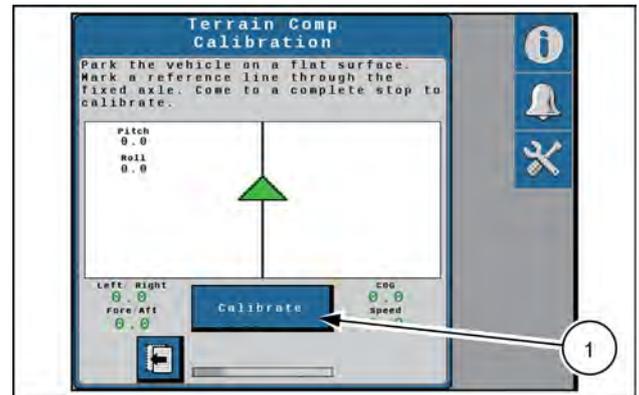
Machine rear axle marked before terrain comp calibration

- Place flags or markers on the outside of each wheel of the rear axle of the machine.



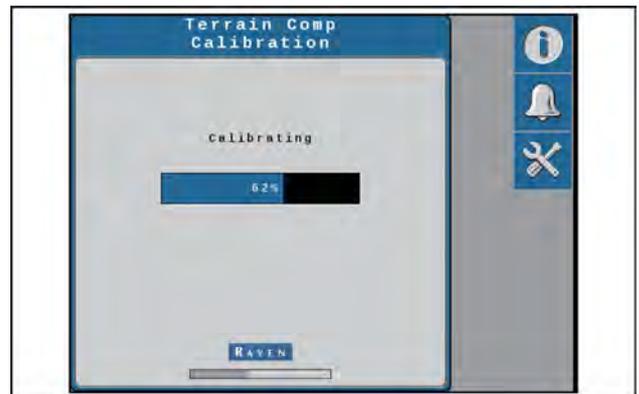
RAIL21TR02640AA 11

- Press the “Calibrate” button (1) to begin the calibration process. The screen depicted in Figure 13 will appear:



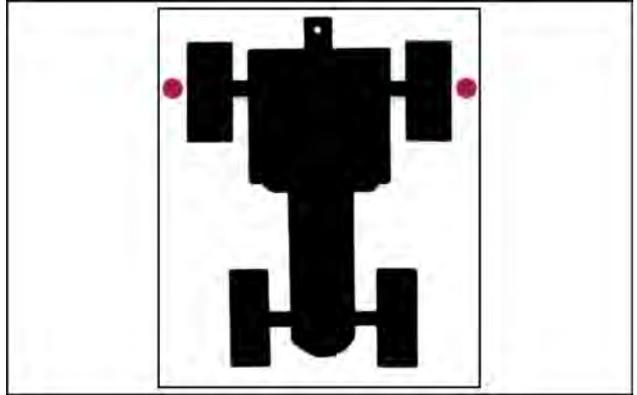
RAIL21TR02641AA 12

- Wait for the calibration process to be completed before moving the vehicle.



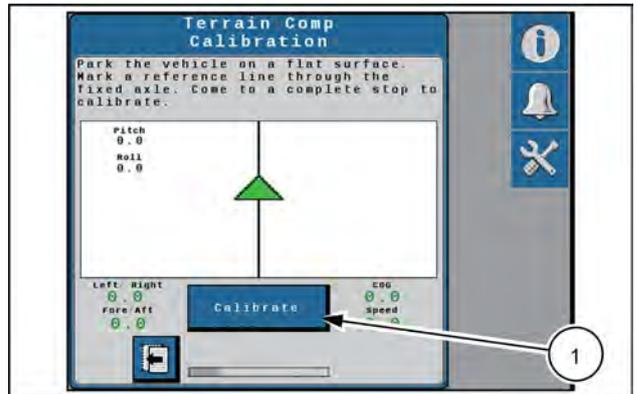
RAIL21TR02642AA 13

- Turn the machine around **180°** and park with the machine facing the opposite direction and the fixed axle in between the flags or markers.



RAIL21TR02643AA 14

- Press the “Calibrate” button **(1)**. Once the calibration is complete, the screen depicted in Figure 16 will appear.



RAIL21TR02644AA 15

Finish calibration

- Select the Next arrow to complete the calibration.



RAIL21TR02645AA 16

Calibration: RS1™ steering

Resume/disengage calibration

1. Press the autoguidance engage button on the Multi-Function Handle (MFH).

NOTE: The screen should automatically advance to the next screen if the resume switch is detected.



RAIL21TR02646AA 1

2. Calibrate the disengage sensor by turning the steering wheel.

NOTE: The disengage status indicator will turn red while the steering wheel is being turned and will advance to the next screen once calibration is complete.



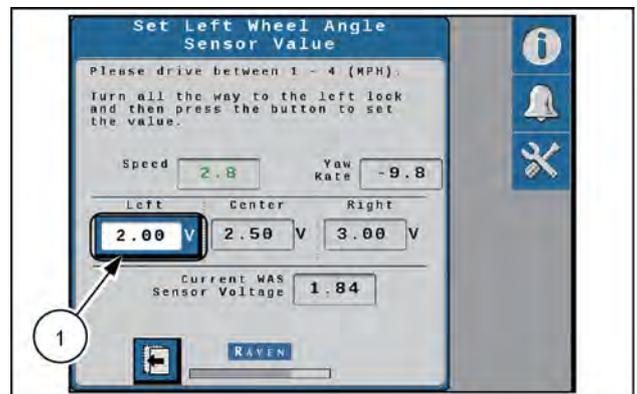
RAIL21TR02647AA 2

Calibrate the Wheel Angle Sensor (WAS)

NOTE: The machine must remain moving during the Wheel Angle Sensor (WAS) calibration.

1. Drive forward between 2 – 6 km/h (1 – 4 mph).
2. Turn the steering wheel all the way to the left-hand steering lock.
3. Press the “Left” box to set the left-hand WAS value.

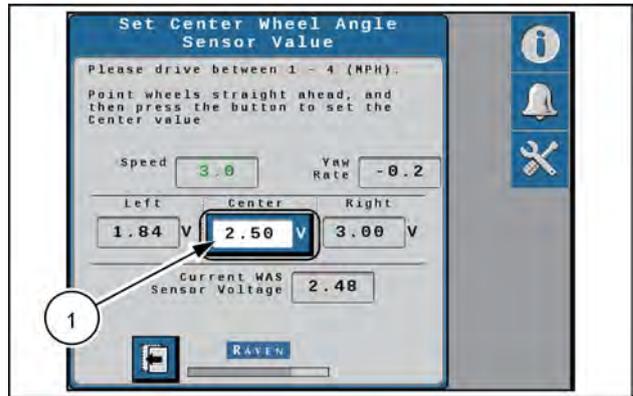
NOTE: Do not turn the steering wheel until the WAS screen advances to the Center WAS setting.



RAIL21TR02648AA 3

4. Drive forward between **2 – 6 km/h (1 – 4 mph)** with the machine wheels pointing straight ahead.
5. Press the “Center” box **(1)** to set the center WAS value.

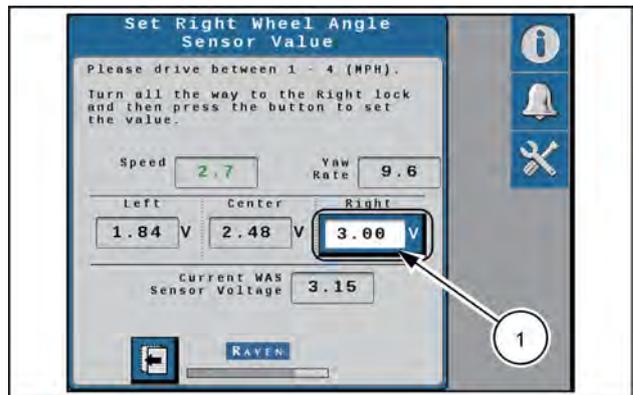
NOTE: Do not turn the steering wheel until the WAS screen advances to the Right WAS setting.



RAIL21TR02649AA 4

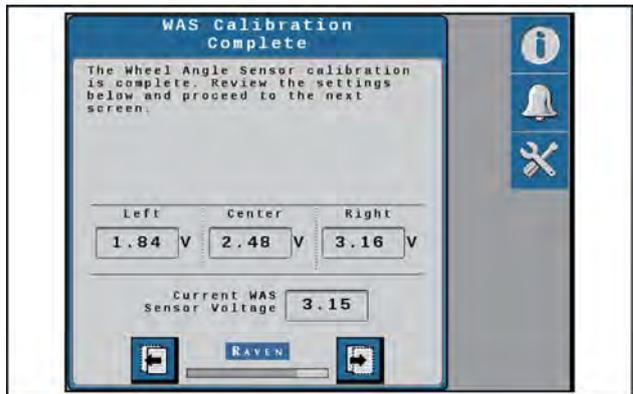
6. Drive forward between **2 – 6 km/h (1 – 4 mph)**.
7. Turn the steering wheel all the way to the right-hand steering lock.
8. Press the “Right” box **(1)** to set the right-hand WAS value.

NOTE: Do not turn the steering wheel until the following Calibration Complete screen is displayed.



RAIL21TR02650AA 5

9. Review the WAS calibration information.
10. Press the Next arrow to complete the calibration.



RAIL21TR02651AA 6

Calibrate the machine steering system

NOTE: Although the **RS1™** system should be automatically calibrated to ensure optimal system performance, the automatic calibration of the system can be bypassed by selecting the Use Quick Calibration option. This causes the system to load default gains for the machine selected during the calibration process.

The steering control calibration process allows the **RS1™** system to learn the hydraulic capabilities of the machine for optimal steering performance in the field.

Before beginning the machine steering system calibration, ensure that the following conditions are met:

- The booms are racked.
- The machine engine is running at the normal operating RPM.
- The machine measurements are correctly entered into the **Viper® 4+** display.
- The machine hydraulic fluid is at the normal operating temperature.

⚠ WARNING

Stay clear! The steering tires will move automatically during this procedure. ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure. Failure to comply could result in death or serious injury.

W0066A

NOTICE: The calibration of the machine steering system should be performed in a field or other large, open space and during conditions similar to normal vehicle operation.

If the ground or surface is slippery, muddy, or freshly tilled, the **RS1™** system may learn incorrect steering responses for normal operating conditions.

Ensure the machine hydraulics are operating properly and there are no other mechanical issues that may affect the performance of the **RS1™** system.

NOTE: To ensure the calibration is successful, the number of starts and stops during the calibration process should be limited. If it is necessary to pause the calibration process, turn the steering wheel or press the Stop button on the **Viper® 4+** display. Tap the foot/enable switch again to resume calibration.

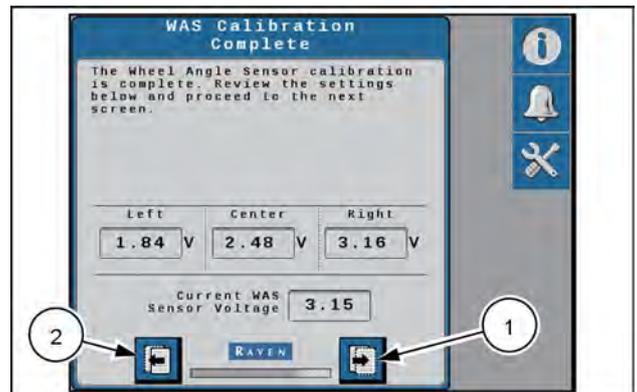
NOTE: During calibration, the machine will make several hard left and right turns. Adjust the vehicle speed and location as necessary.

NOTE: If an error message is displayed during calibration, refer to the fault code section on 6-1 for possible causes and corrective action steps to be taken.

Perform the following procedure if you wish to perform an automatic steering control calibration:

1. At the end of the wheel angle sensor calibration, park the machine on a level surface with several acres of smooth ground available .
2. Press the right-arrow button (1) to proceed to the automatic steering control calibration.

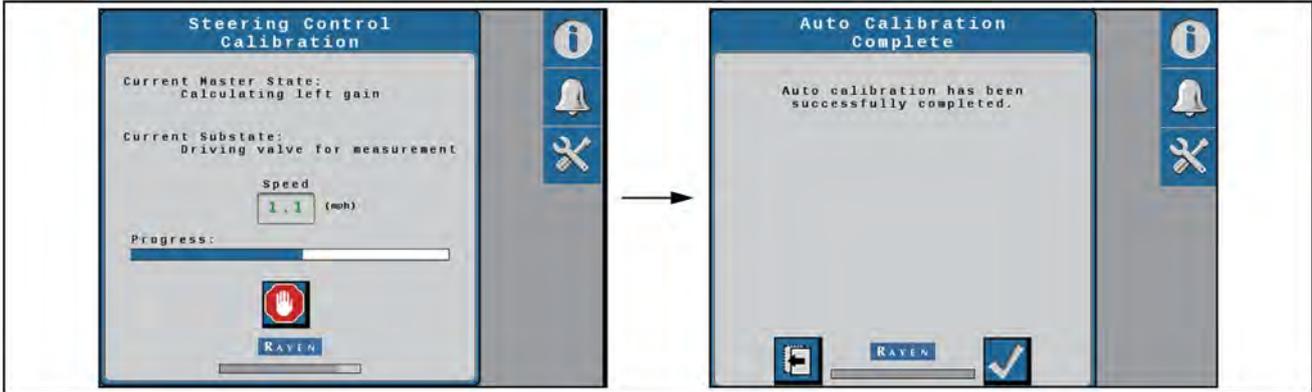
NOTE: Press the back button (2) if you wish to bypass the automatic steering control calibration process.



RAIL21TR02651AA 1

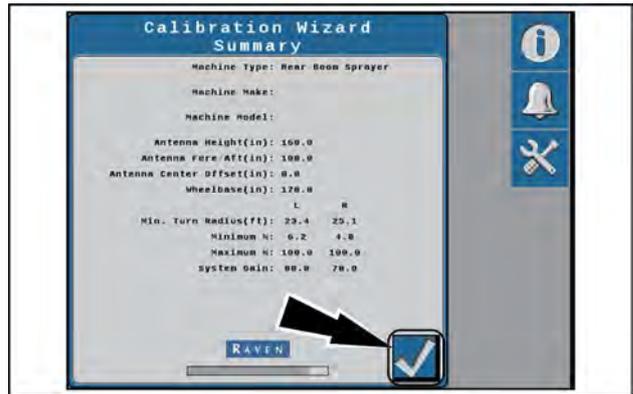
4 - SETUP

3. Drive forward at **2 – 6 km/h (1 – 4 mph)**.
4. Press the autoguidance engage button on the Multi-Function Handle (MFH) to begin calibration. The following screens will be displayed during the process:



RAIL21TR02655EA 2

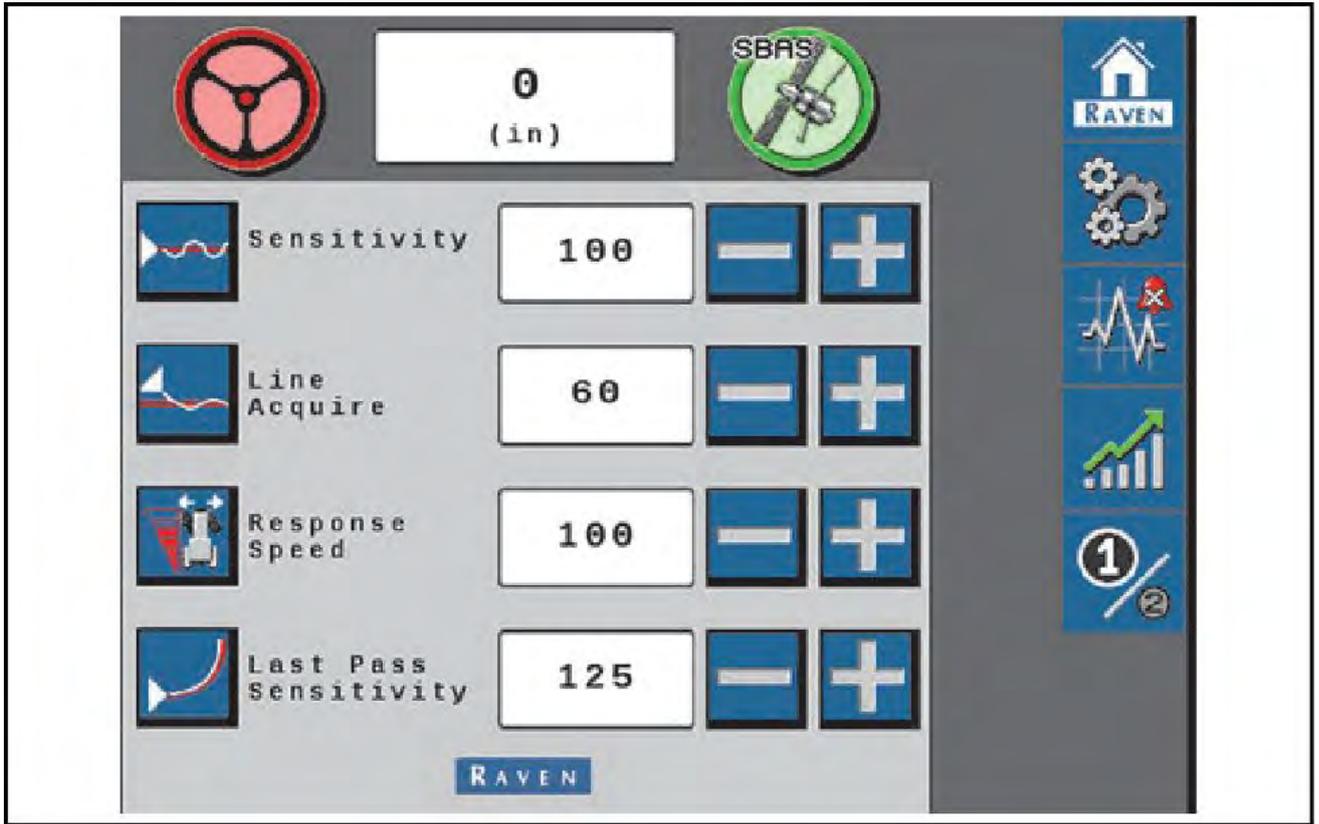
5. Review the Calibration Wizard Summary.
6. Press the accept button to complete the calibration.



RAIL21TR02656AA 3

Steering home screen

Steering home screen



NHIL22PLM0150AA 1

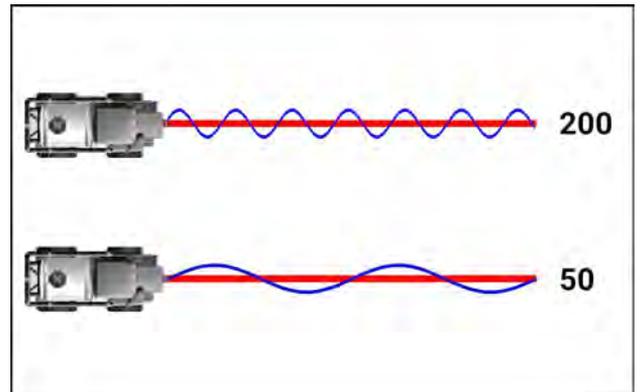
Sensitivity

This value controls the overall steering sensitivity, especially with on-line steering.

- Increase this value if the machine hangs off of the guidance line.
- Decrease this value if the machine is constantly crossing back and forth across the guidance line.

Adjust the value by 10 until you get close to your desired result, and then use smaller numbers to dial it in.

| | |
|----------------|-----------|
| Setting Range: | 50 to 200 |
| Typical Value: | 100 |
| +/- Amount: | 10 |



NHIL22PLM0162AA 2

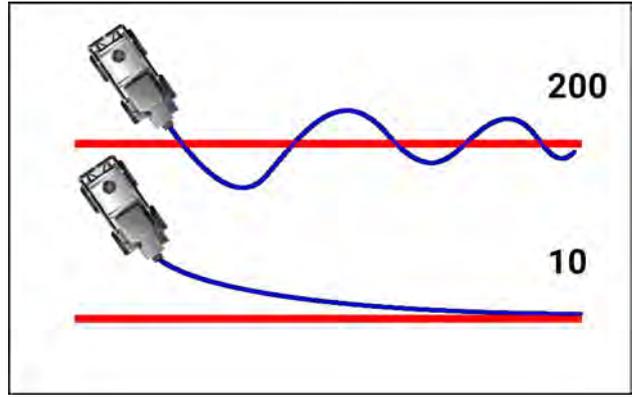
NOTE: If the machine is slow to react after a steering adjustment, increase the sensitivity setting in increments of 10. If the machine makes an adjustment too quickly, decrease the sensitivity value.

Line acquire

This value controls how the machine approaches the guidance line. It will determine how soon the machine will start adjusting its heading to match the heading of the guidance line.

A lower number will cause the machine to start adjusting its heading from a farther distance away, and a higher number will wait to adjust the heading until the machine gets closer to the line.

- Increase this value if the machine is too lazily acquiring the line.
- Decrease this value if the machine is overshooting the guidance line. Adjust the value by 10 to 15 until you get close to your desired result, and then use smaller numbers to dial it in.



NHIL22PLM0163AA 3

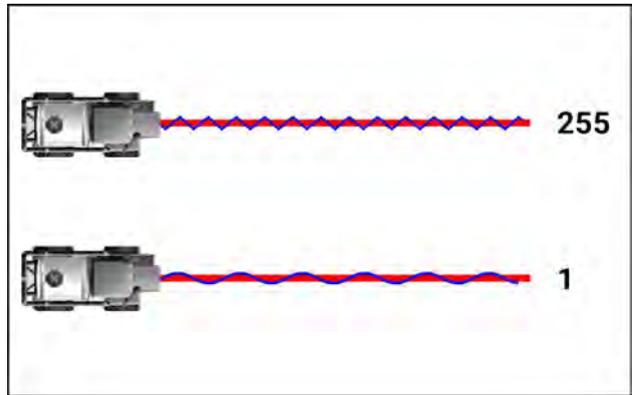
| | |
|----------------|-----------|
| Setting Range: | 10 to 200 |
| Typical Value: | 50 to 100 |
| +/- Amount: | 10 to 15 |

NOTE: A low value will minimize the risk of over-correction, but it could take longer to acquire the guidance line. A high value increases the risk of over-correction, but the machine is quicker to re-acquire the guidance line. If the machine takes too long to acquire the guidance line, increase the Line Acquire value in increments of 10. If the machine over-shoots the guidance line, decrease the value in increments of 10.

Response speed

This value controls how aggressively the system steers the machine's wheels. Increase this value if the wheels seem to be slowly wandering back and forth.

- Decrease this value if the wheels seem to be aggressively turning from side-to-side, or if they twitch on the guidance line. Adjust the value by 10 until you get close to your desired result, and then use smaller numbers to dial it in.
- Typically the value should be set approximately 10 points below what you feel as too much wheel movement. You may need to decrease this number slightly as you decrease your travel speed.



NHIL22PLM0156AA 4

| | |
|----------------|----------|
| Setting Range: | 1 to 255 |
| Typical Value: | 100 |
| +/- Amount: | 10 |

Last pass sensitivity

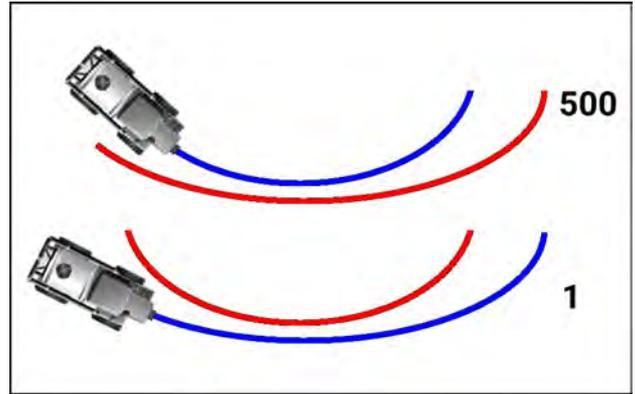
This value determines how tightly the machine tries to steer on a curved path.

Too high of a value will cause the machine to steer to the inside of a curve. Too low of a value will cause the machine to steer to the outside of a curve.

- Increase this value if the machine hangs off a curve to the outside of the desired path.
- Decrease this value if the machine hangs off of a curve to the inside of the desired path.

| | |
|----------------|------------|
| Setting Range: | 0 to 500 |
| Typical Value: | 115 to 145 |
| +/- Amount: | 10 |

NOTE: The last pass sensitivity value only adjusts the system performance on Last Pass and A-B Curve lines. Adjusting the last pass sensitivity value will not affect pivot irrigation guidance line performance. To adjust pivot line performance, adjust the response speed and sensitivity values.



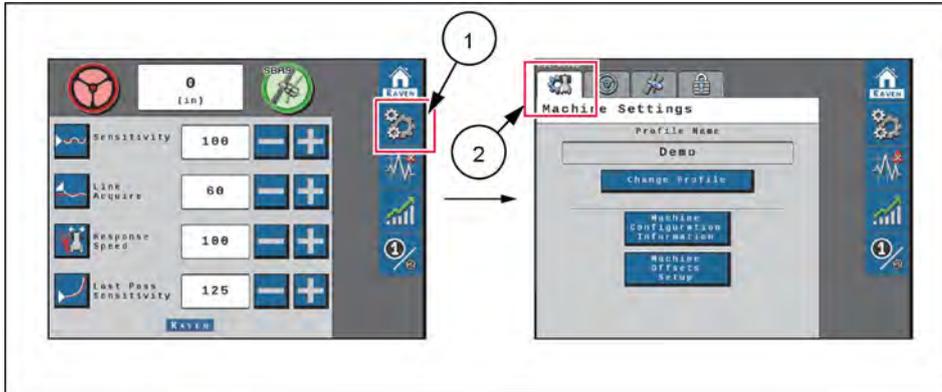
NHIL22PLM0165AA 5

Machine settings

Machine settings

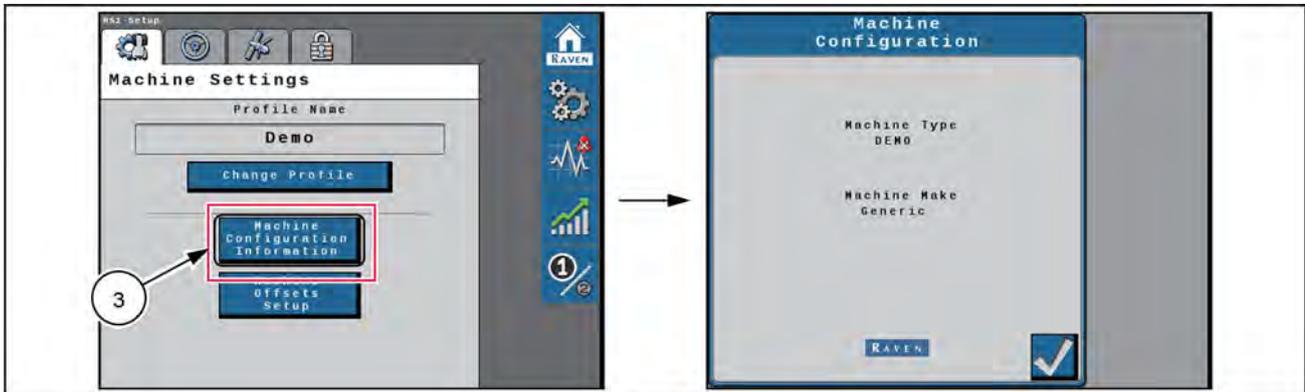
NOTE: Your display was configured at the factory with the settings for your machine.

Machine settings



NHIL22PLM0151EA 1

Machine configuration

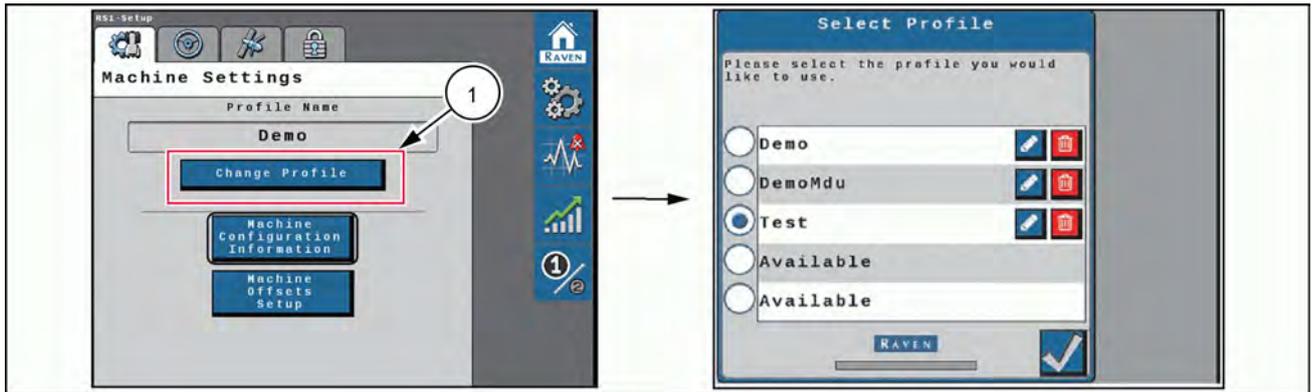


RAIL21TR02659EA 2

To view the current machine configuration:

1. From the **RS1™** home screen, select the Settings Menu button (1).
2. On the Machine Settings tab (2), select the “Machine Configuration Information” button (3).
3. The current machine profile that was entered during the calibration process displays. The Machine Configuration settings cannot be changed unless the **RS1™** system is re-calibrated.
4. Select the Accept button in the lower, right-hand corner of the screen to return to the Machine Settings tab.

Change profile



NHPH23PLM1407EA 3

To select a different profile, create a new profile, or re-calibrate the current profile:

1. From the **RS1™** home screen, select the Settings Menu button.

NOTE: The name of the current profile selected is displayed at the top of the Machine Settings tab.

2. Select the “Change Profile” button (1).

NOTE: Up to five machine profiles may be saved for the **RS1™** system.

3. Use the radio buttons to select a different profile. Selecting an “Available” profile will require the operator to complete the initial machine configuration process.



4. Select the Edit button to rename the selected profile.

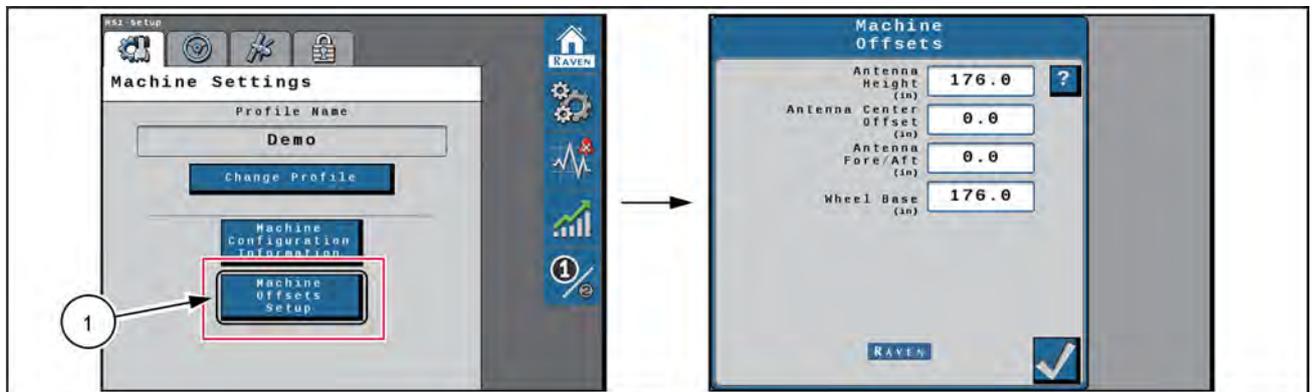
OR



5. Select the Delete button to remove profile settings from the **RS1™** system. The profile will need to be re-calibrated.

6. Select the Accept button in the lower right-hand corner of the screen to return to the Machine Settings tab.

Machine offsets



RAIL21TR02660EA 4

The Machine Offsets Setup button (4) allows the user to view and adjust the following:

- Antenna Height - The antenna height is calculated by measuring from the ground to the center of the **RS1™** unit.
- Antenna Center Offset - The antenna center offset position is calculated by measuring from the center of the machine to the center of the **RS1™** unit. Enter a negative value if the **RS1™** unit is located to the left-hand side of the machine center line.
- Antenna Fore/Aft - The antenna fore/aft position is calculated by measuring from the rear axle of the machine to the middle of the **RS1™** unit. Enter a negative value if the **RS1™** unit is located behind the rear axle.

- Wheel Base - The wheelbase is calculated by measuring from the center of the front tire to the center of the rear tire.

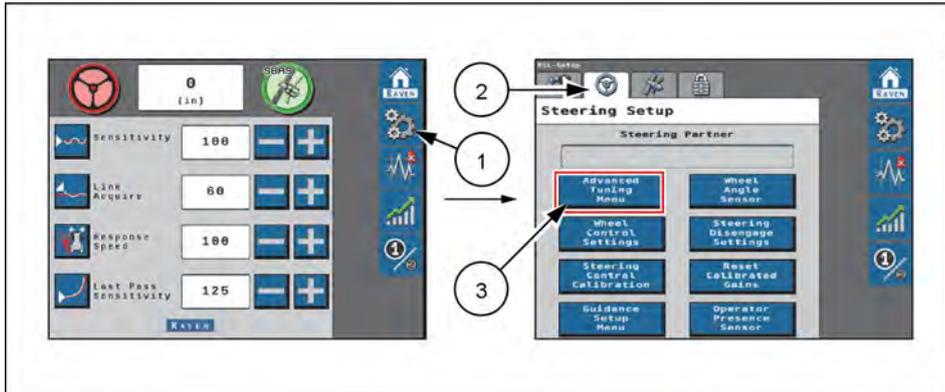
NOTE: *The wheelbase is calculated by measuring from the center of the front tire to the center of the rear tire on both sides of the machine. Add these measurements together and then divide by two to get the average wheelbase value.*



Help menu icon - Pressing the help menu icon displays the help menu. The help menu contains additional information about the settings contained within that screen.

Steering setup

Advanced tuning

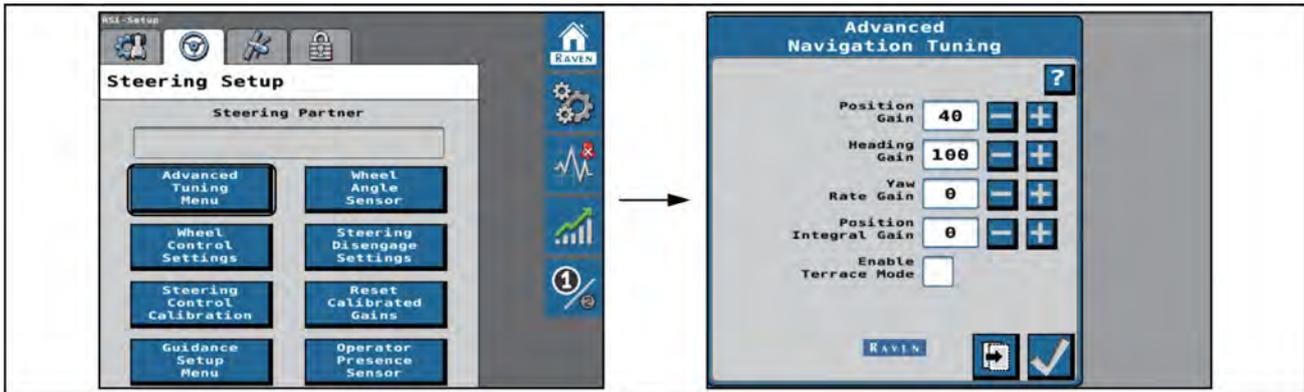


NHIL22PLM0152FA 1

The Steering Setup screen displays the steering partner that the **RS1™** unit communicates with during steering operation. The Steering Setup screen contains the functions that allow the operator to fine-tune the steering system.

NOTE: The Steering Setup tab is hidden from view if GPS Only was selected during the **RS1™** system calibration.

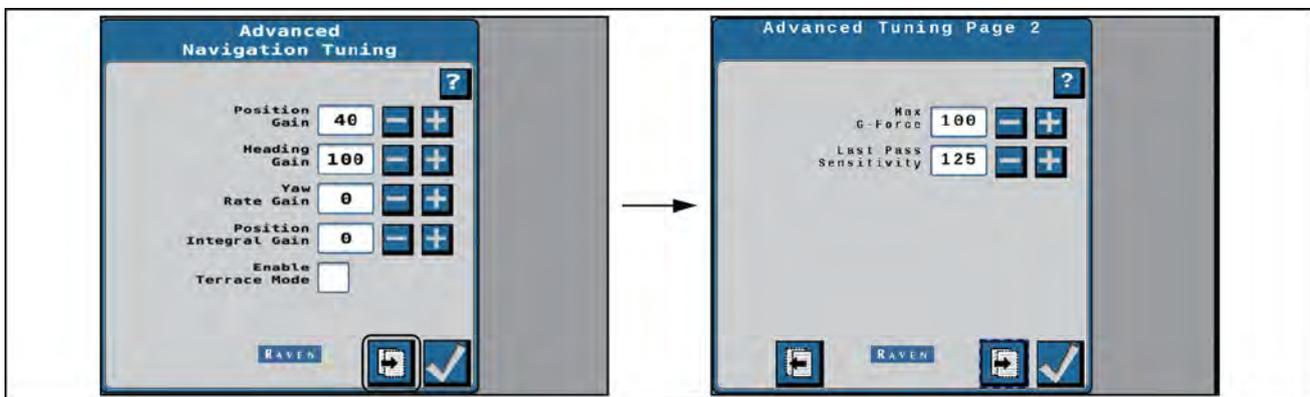
Advanced tuning



RAIL21TR02662EA 2

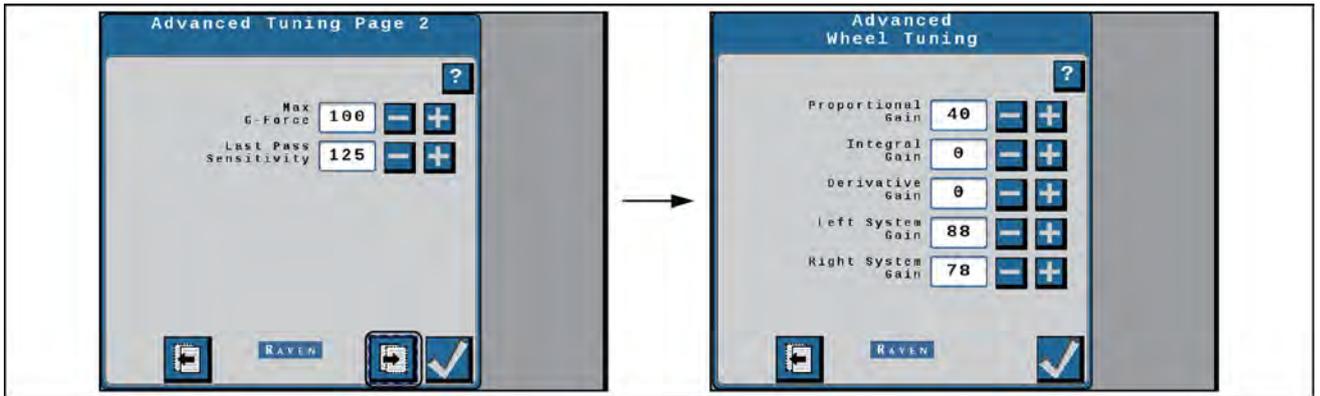
To access advanced auto-steering tuning options and settings:

1. From the **RS1™** home screen, select the Settings Menu button (1).
2. Select the Steering Setup tab (2) and the “Advanced Tuning Menu” button (3).
3. The following settings and options are displayed on the Advanced Navigation Tuning page:
 - Position Gain - Determines how aggressively the **RS1™** system responds to an off-track error. A higher position gain value results in a more aggressive response to an off-track error, while a lower value indicates a less aggressive response.
 - Heading Gain - Determines how aggressively the **RS1™** system responds to a heading error. A higher heading gain value results in a more aggressive response to a heading error, while a lower value indicates a less aggressive response.
 - Yaw Rate Gain - Determines the impact of the yaw rate on tracking performance. A higher yaw rate gain value results in a more aggressive response to yaw rate, while a lower value results in a less aggressive response.
 - Integral Gain - This value corrects long-term errors in the wheel control. If the system is not achieving the desired wheel angle during operation, the system will re-direct the wheels to the desired set point. This value is generally at or near zero.
 - Terrace Mode - Select the terrace mode check box to enable terrace Mode. This mode temporarily adjusts some configuration settings to increase performance on terraced fields.
4. Select the Next button to display the Advanced Tuning Page 2.



RAIL21TR02663EA 3

- Max G-Force - Limits the centripetal force experienced by the operator during a turn. A higher value allows to the machine to perform sharper turns, while a lower value limits the machine turning radius.
- Last Pass Sensitivity - The last pass sensitivity determines how tightly the machine tries to steer on a curved path. Too high of a value will cause the machine to steer to the inside of a curve. Too low of a value will cause the machine to steer to the outside of a curve. Values range from 1 - 500.

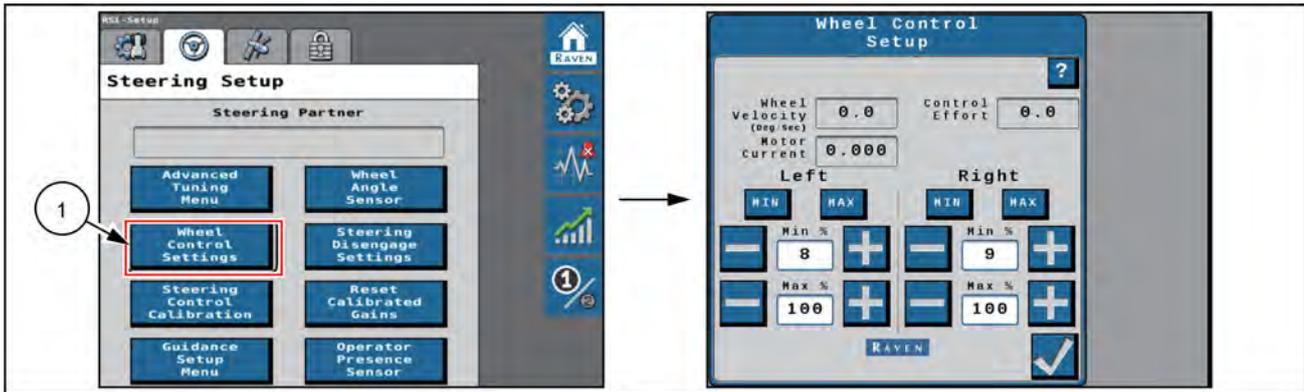


RAIL21TR02664EA 4

Advanced wheel tuning screen

- Proportional Gain - Determines the rate of the wheel response. Increasing the Proportional Gain value causes the wheel response to be faster, but can result in the machine overshooting the target wheel angle position or can cause the wheels to take a longer time to stabilize.
- Integral Gain - This value corrects long-term errors in the steering control loop. This setting should be adjusted by qualified technicians only.
- Derivative Gain - The derivative gain value limits the wheel response time. A larger derivative gain value will reduce the tendency to overshoot the target wheel angle position, but will limit the wheel speed.
- Left System Gain - Compensates for any bias or non-linearity in the steering valve while the machine is turning to the left-hand side.
- Right System Gain - Compensates for any bias or non-linearity in the steering valve while the machine is turning to the right-hand side.

Wheel control settings



RAIL21TR02665EA 1

To access the Wheel Control Setup screen:

1. From the **RS1™** home screen, select the Settings Menu button.
 2. Select the Steering Setup tab and the “Wheel Control Settings” button (1).
 3. The following settings and options are displayed on the Wheel Control Settings screen:
 - Wheel Velocity – The speed at which the wheels are moving, measured in degrees per second.
 - Control Effort – The amount of effort the **RS1™** system is using to drive the wheels.
 - Left/Right Min – These values control the slowest wheel movement that the steering valve is able to make. The wheels should just barely move when the steering valve is actuated at the minimum values. However, the wheel velocity should be consistent at around **1 °/s**, which you can see on the Wheel Control Setup screen. Increase this value if the wheel movement seems to start and stop when steering at the Mins. Decrease this value if the wheel movement is rapid. The value should be set as low as possible while still maintaining consistent wheel movement (1 degree/second).
- NOTE:** *The minimum values cannot exceed the maximum values.*
- Left/Right Max – These values control the fastest wheel movement that the steering valve is able to make. These values typically are never changed from their calibrated values. If the machine is turning too slowly, these values can be increased if not already at 100.



Help menu icon – Pressing the help menu icon displays the help menu. The help menu contains additional information about the settings contained within that screen.

Calibration: RS1™ Wheel control

NOTE: The Wheel Control Calibration allows the machine hydraulic system to be calibrated separately from the complete RS1™ system calibration.

The steering control calibration process allows the RS1™ to learn the hydraulic capabilities of the machine for optimal steering performance in the field.

Before beginning the machine steering system calibration, ensure that the following conditions are met:

- The booms are racked.
- The machine engine is running at the normal operating RPM.
- The machine measurements are correctly entered into the Viper® 4+ display.
- The machine hydraulic fluid is at the normal operating temperature.

⚠ WARNING

Stay clear! The steering tires will move automatically during this procedure. ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure. Failure to comply could result in death or serious injury.

W0066A

NOTICE: The calibration of the machine steering system should be performed in a field or other large, open space and during conditions similar to normal vehicle operation.

If the ground or surface is slippery, muddy, or freshly tilled, the RS1™ system may learn incorrect steering responses for normal operating conditions.

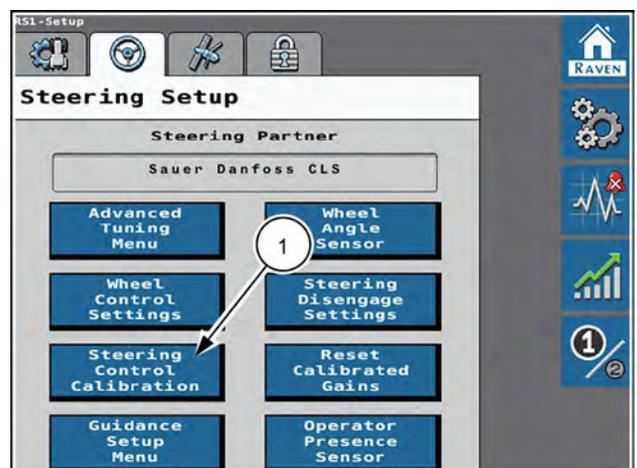
Ensure the machine hydraulics are operating properly and there are no other mechanical issues that may affect the performance of the RS1™ system.

NOTE: To ensure the calibration is successful, the number of starts and stops during the calibration process should be limited. If it is necessary to pause the calibration process, turn the steering wheel or press the Stop button on the Viper® 4+ display. Switch the engage switch on the multi-function handle to resume calibration.

NOTE: During calibration, the machine will make several hard left and right turns. Adjust the vehicle speed and location as necessary.

NOTE: If an error message is displayed during calibration, see 6-1 for possible causes and corrective action steps to be taken.

1. Park the machine on a level surface with several acres of smooth ground available.
2. Press the "Steering Control Calibration" button.

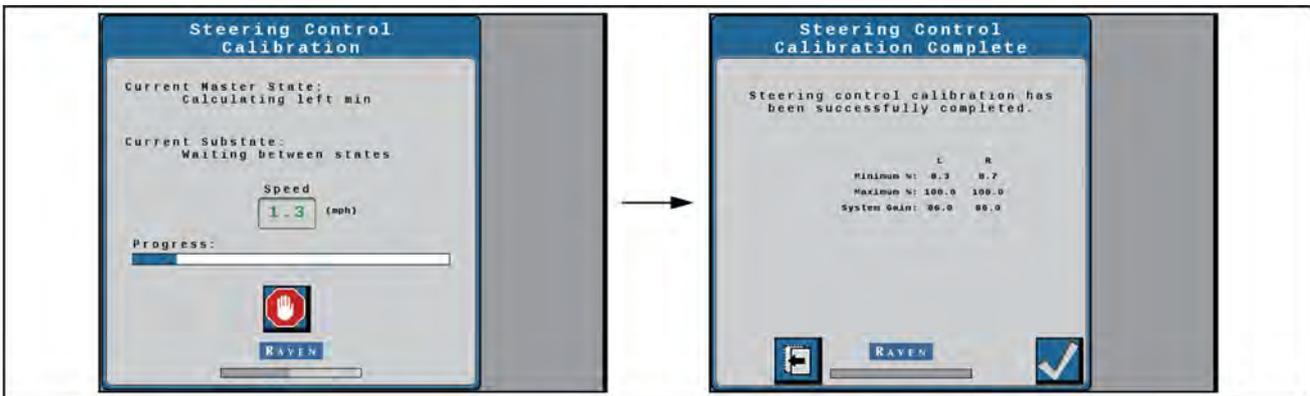


RAPH22PLM0539BA 1

3. Drive forward at **2 – 6 km/h (1 – 4 mph)**.
4. Press the autoguidance engage button on the Multi-Function Handle (MFH). The following screens will be displayed during the process:



RAPH22PLM0535BA 2

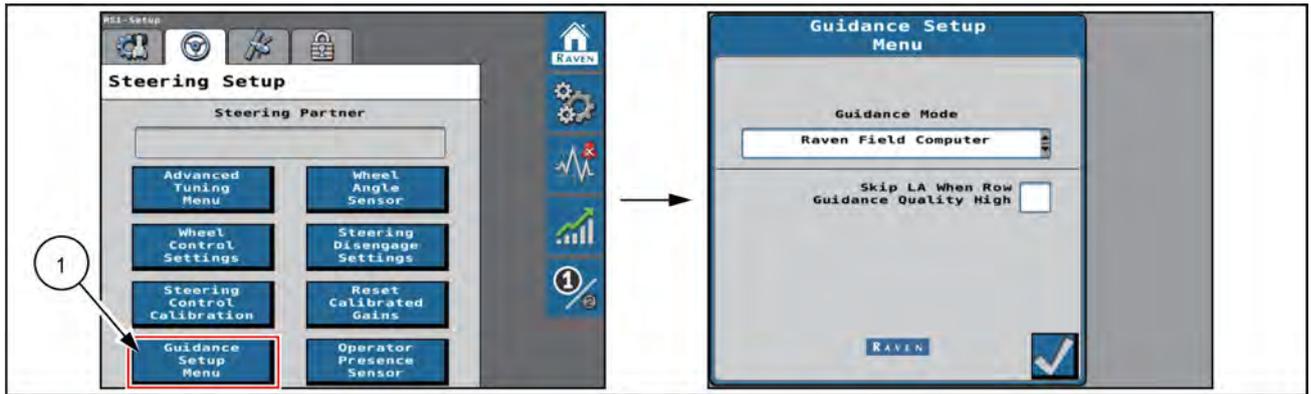


RAIL21TR02670EA 3

Calibration in process screens

5. Press Accept to complete the calibration.

Guidance setup settings



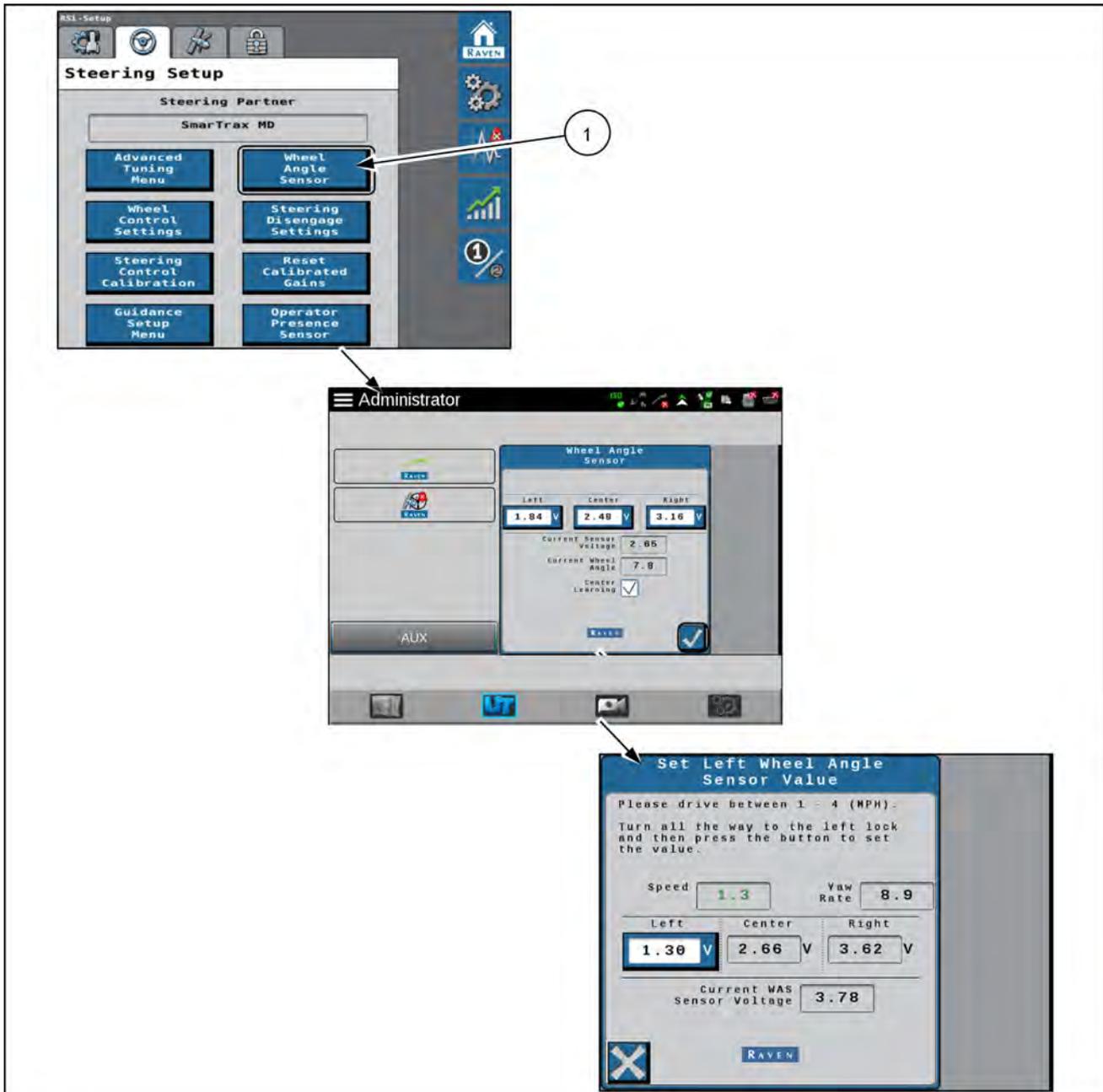
RAIL21TR02671EA 1

Guidance setup screen

To access the Guidance Setup Menu screen:

1. From the **RS1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Guidance Setup Menu” button (1).
3. The following settings are displayed on the Guidance Setup Menu screen:
 - Guidance Mode - Displays the guidance modes:
 - Viper® 4+** guidance is performed via GPS guidance points only.
 - “Vision” - Guidance is performed via the **VSN®** camera only. GPS corrections are neither utilized for guidance nor available as a fall-back solution. Line acquire must be performed manually. When the solution quality falls below the minimum threshold the steering system will disengage.
 - “Vision+” - Guidance is performed via a combination of GPS and the **VSN®** camera. This mode can be utilized for line acquire via GPS with the system switching to the **VSN®** camera when the machine is aligned and near the guidance line. This mode will also fall back to GPS guidance if the solution quality falls below the minimum threshold. The system will then return to **VSN®** guidance automatically when the solution quality is above the minimum threshold.
 - “Skip LA When Row Guidance Quality High” - When enabled, the system will not attempt to line-acquire when the quality from **VSN®** is above the threshold set on **VSN®**.

Wheel angle sensor settings



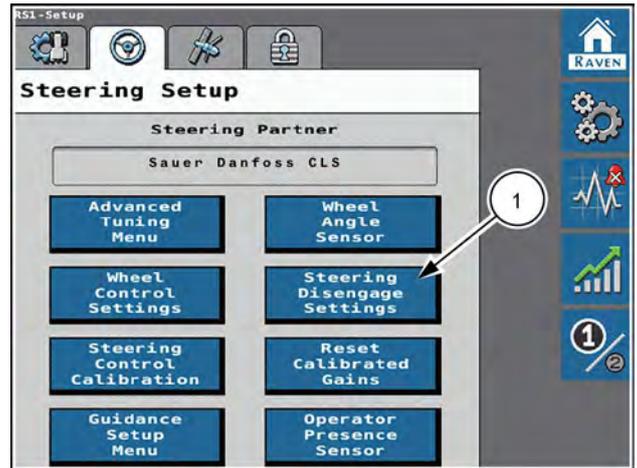
RAPH23PLM2595HA 1

To access the Wheel Angle Sensor (WAS) screen:

1. From the **RS1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the "Wheel Angle Sensor" button (1).
3. The following settings are displayed for the WAS:
 - Left/Center/Right - Displays the current calibration values. These values can be modified by selecting the desired WAS value to be changed, moving the wheels to the correct position, and pressing the Accept button.
 - Current Sensor Voltage - Displays the sensor voltage detected during calibration.
 - Current Wheel Angle - Displays the WAS angle detected during calibration.
 - Center Learning - When selected, the center learning option the system will continuously correct its calibrated center position while the machine is steering straight ahead.

Disengage settings

1. From the **RS1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Steering Disengage Settings” button (1).



RAPH22PLM0539BA 1

1. Disengage Type - Reports the type of disengage switch being used in the system. On this sprayer, guidance will disengage when you move the steering wheel.



RAPH22PLM0537BA 2

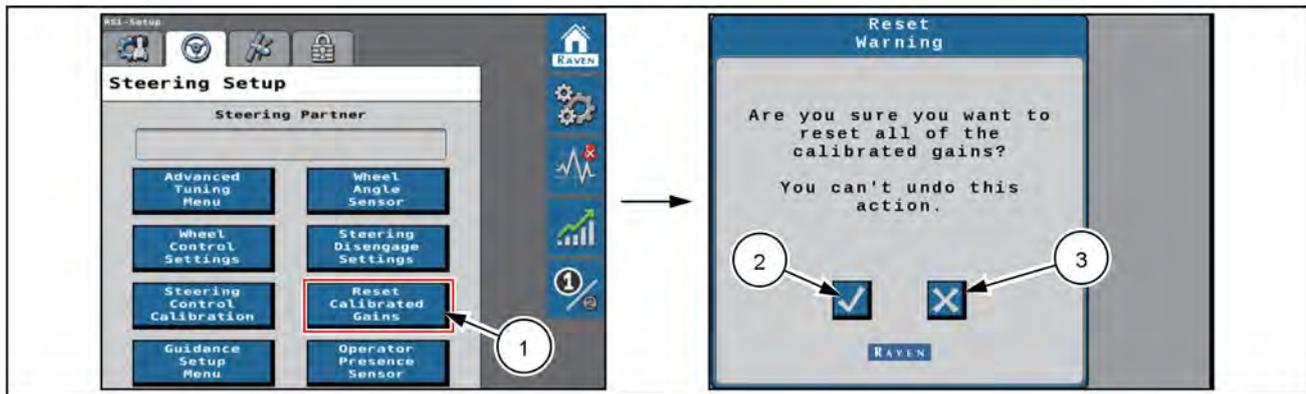
Disengage Status (1) - Indicates the status of the disengage switch. Disengage switch status types displayed in this field include:

- Green - The disengage switch is detected and the steering wheel is not moving. The **RS1™** system may be engaged when this status is displayed.
- Red - The disengage switch is detected and the steering wheel is moving. The **RS1™** system may not be engaged when this status is displayed.
- Yellow - No disengage switch is detected in the system. Turn the steering wheel to activate the disengage switch. If the disengage switch is not activated, check cabling for loose or missing connections.



RAPH22PLM0537BA 3

Resetting calibrated gains



RAIL21TR02674EA 1

To access the Guidance Setup Menu screen:

1. From the **RS1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Reset Calibrated Gains” button **(1)**.

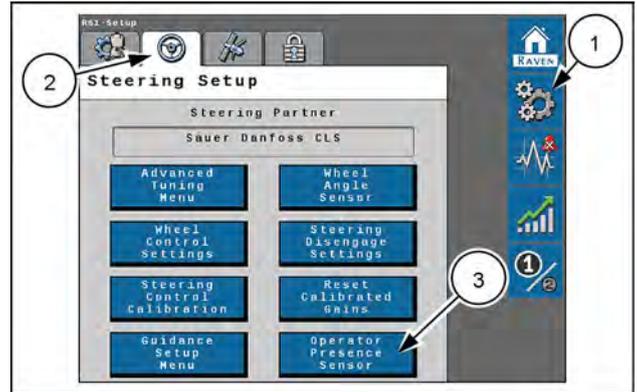
“The pop-up warning appears. Are you sure you want to reset all of the calibrated gains? You can’t undo this action.”

3. Select the Accept button **(2)** to reset the **RS1™** steering settings back to factory defaults, or select the X button **(3)** keep the current steering settings.

Operator presence sensor

To access the Operator Sensor Type Selection screen:

1. From the **RS1™** home screen, select the Settings Menu button (1).
2. Select the Steering Setup tab (2) and the “Operator Presence Sensor” button (3).



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The following settings are displayed on the Guidance Setup Menu screen:

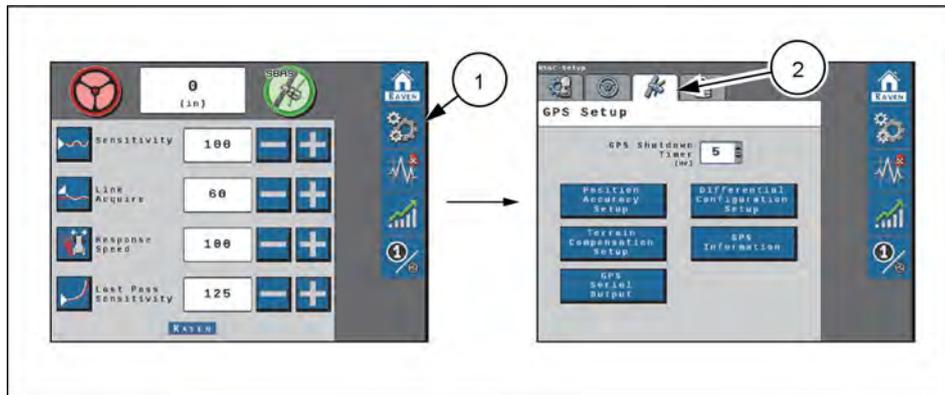
- Operator Presence Sensor Type (1) – Displays the type of switch used to detect the presence of the operator while the system is engaged. Select the “CAN Switch” menu option if needed.
- Status – Displays the operator presence switch status (2) Toggle the presence switch by standing or sitting in the operator seat and confirm that the status indicates the switch is on when the operator is seated.



RAPH22PLM0310AA 2

GPS configuration

Configure GPS



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To access GPS Setup options:

1. From the **RS1™** home screen, select the Settings Menu button (1).
2. Select the GPS Setup tab (2).

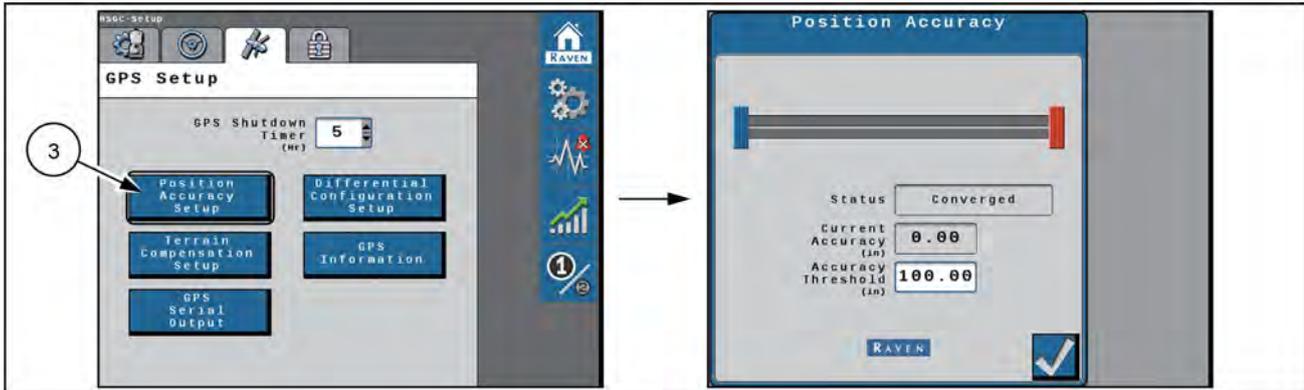
The following option is available:

- GPS Shutdown Timer – The GPS Shutdown Timer value determines the length of time the **RS1™** unit remains powered after the machine switched power is turned off. The GPS remains converged for the length of time selected.

NOTE: The default value for the shutdown timer is 1 h.

Select one of the buttons on the GPS Setup screen to access additional options.

Position accuracy setup



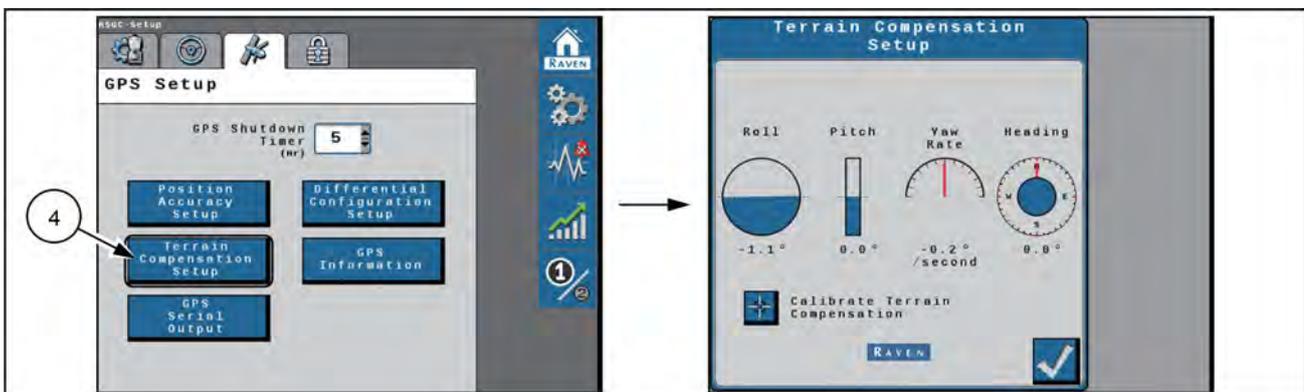
RAIL21TR02679EA 2

Select the "Position Accuracy Setup" button (3). The following options are available:

- Status – Displays the status of the GPS solution. Statuses that may be displayed in this area include:
 - No Signal
 - Error
 - Converging
 - Converged
- Current Accuracy – Value displayed is the horizontal standard deviation reported by the GPS receiver.
- Accuracy Threshold – This value dictates the distance from which the machine GPS position may deviate from the current accuracy position. If the GPS solution falls outside the set accuracy threshold, a fault code will be displayed into the "Diagnostic Trouble Code" screen. The accuracy threshold will be populated with a default value.

Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

Terrain compensation setup



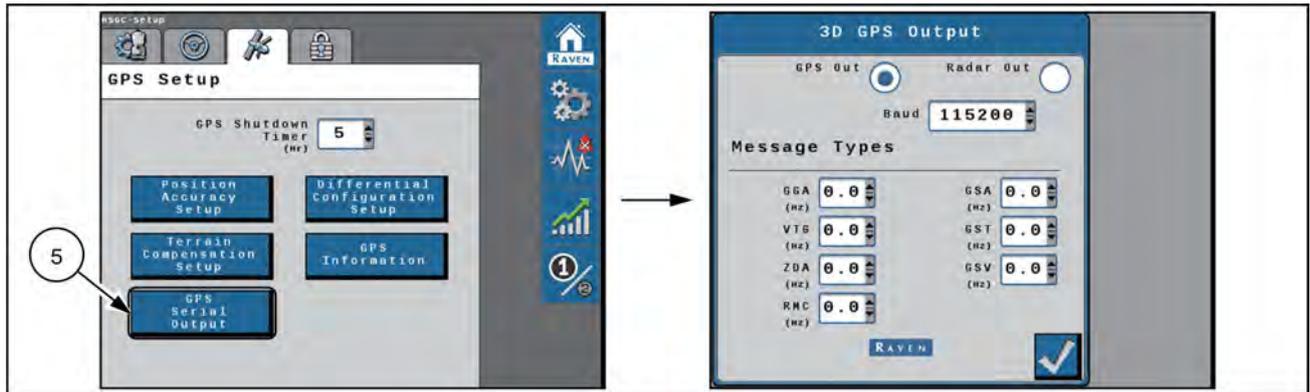
RAIL21TR02680EA 3

Select the "Terrain Compensation Setup" button (4). The following information and functions are shown:

- Roll, Pitch, Yaw Rate, and Heading – Real-time measurement data used by the 3D terrain compensation feature.
- Calibrate Terrain Compensation – Begins the terrain compensation process.

Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

3D GPS output



RAIL21TR02681EA 4

Select the “GPS Serial Output” button (5). The following functions are shown:

- Serial output selection – Choose between GPS position output and radar output.
- Baud rate configuration

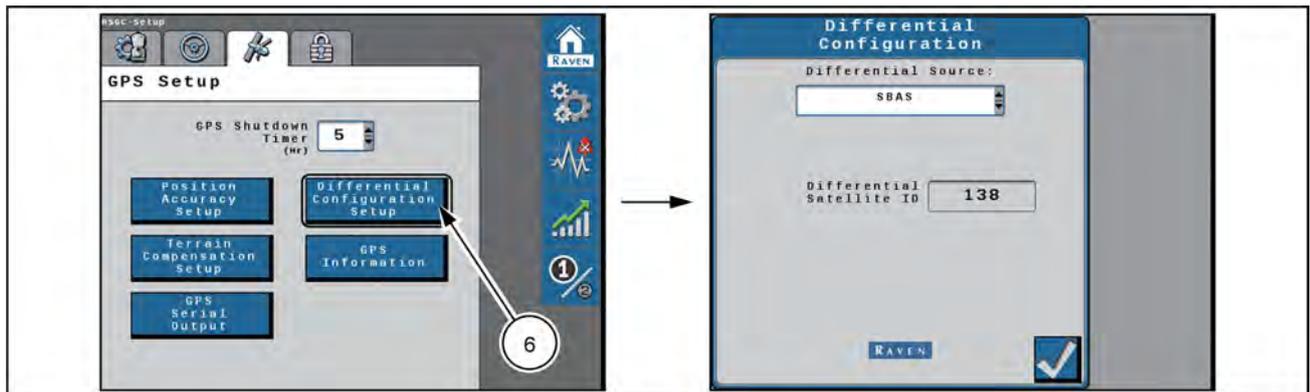
NOTE: The baud rate and message types are not used in radar outputs.

- **NMEA 0183®** message configuration

If you are operating with a third-party device that requires output from the **RS1™** system, consult the manufacturer of the device to determine the appropriate **NMEA 0183®** messages and baud rate.

Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

Differential configuration setup



RAIL21TR02682EA 5

Select the “Differential Configuration Setup” button (6). The drop-down list to select your correction source is shown, along with additional information about that correction source. The following differential correction sources are available:

GL1DE™

Satellite-Based Augmentation System (SBAS)

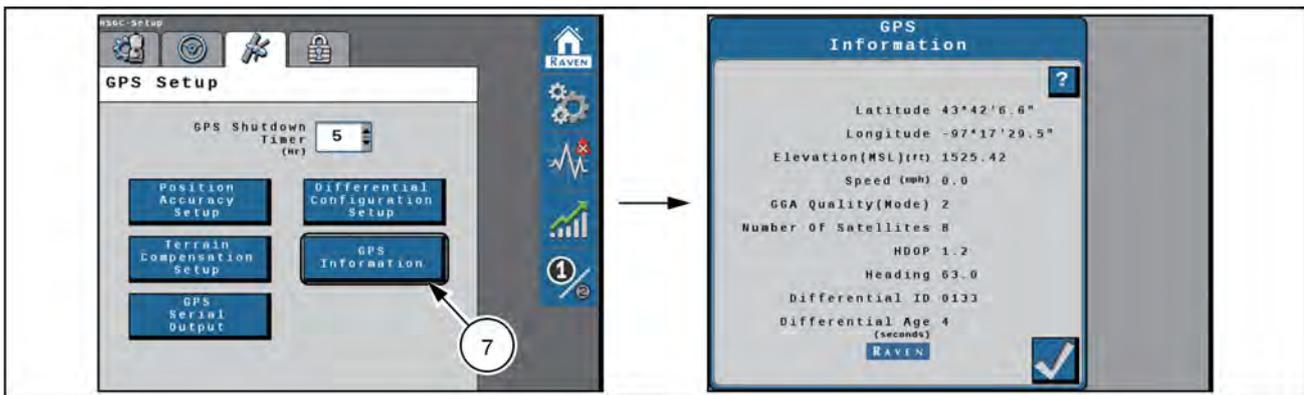
Satellite GS

Real-Time Kinematic (RTK)

NOTE: Depending on the number of feature unlocks purchased, all options may not be available for selection. Contact your local dealer to purchase additional unlock codes.

Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

GPS information



RAIL21TR02683EA 6

Select the "GPS Information" button **(7)**. The following information is shown:

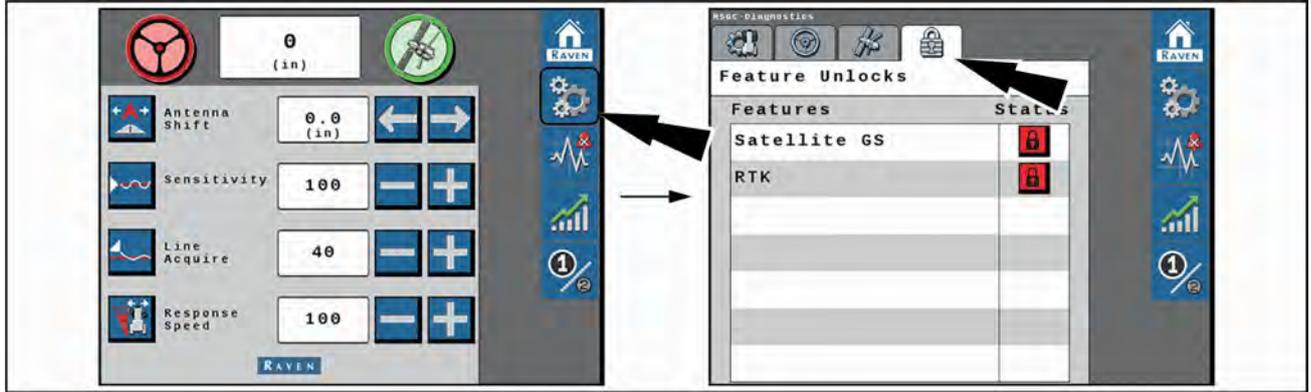
- Latitude – The angular distance of a place north or south of the earth equator.
- Longitude – The angular distance of a place east or west of the meridian at Greenwich, England.
- Elevation (MSL) – The height of the antenna in reference to sea level.
- Speed – Current speed based on GPS measurements.
- GGA Quality (Mode) – The current convergence state of the GPS receiver.
 - 0 = No data received.
 - 1 = Single solution, no differential corrections being received.
 - 2 = When the receiver has locked onto a differential source and formed a solution (SBAS or GS-Lite fixed solution or converging with Satellite GS).
 - 4 = RTK fixed mode.
 - 5 = Fixed solution for Satellite GS differential source or RTK Float.
- Number of Satellites – The number of satellites currently in view by the GPS receiver.
- HDOP – Horizontal Dilution of Precision. If all of the satellites in view are from the same direction, the number will be higher and the accuracy will be reduced.
- Heading – The machine direction of travel.
- Differential ID – The ID of the differential source used to obtain the solution.
- Age of Differential – Time (in seconds) since the last differential correction was received. If a differential source is not currently tracked this entry will be "- - -".

Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

Feature unlock codes

Feature unlock codes

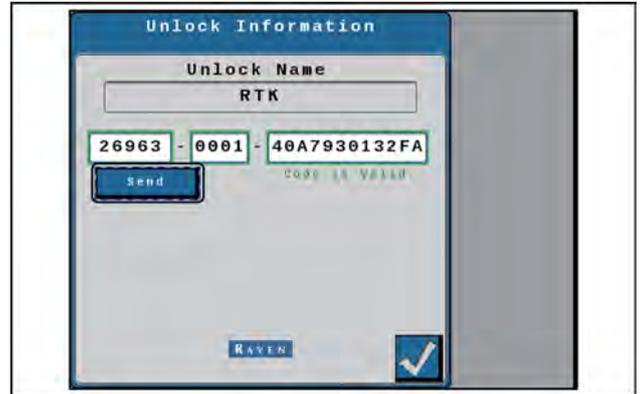
The RS1™ unit is capable of operating with Real-Time Kinematic (RTK) and satellite-delivered correction sources. In order to activate any of these products, a feature unlock code is required. Contact your local dealer to purchase feature unlock codes.



RAIL22PLM1004EA 1

1. Select the Gears icon on the home screen.
2. Select the Padlock tab.
3. Select the Padlock icon next to the feature to be unlocked.
4. Enter the feature unlock code and press Send.

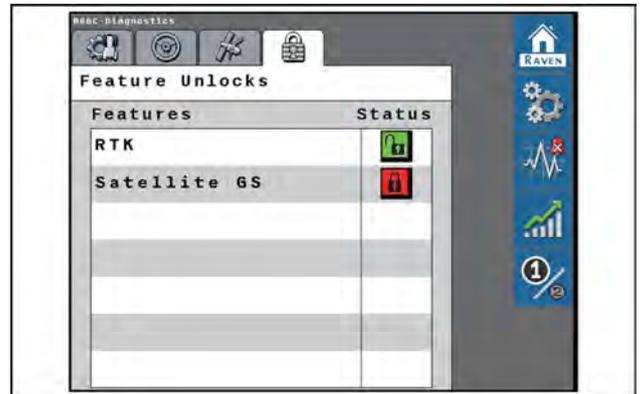
NOTE: A message will appear indicating whether or not the unlock code that was entered is valid. If the code is valid, the padlock icon next to the feature will turn green and indicate that it is unlocked as shown here.



RAPH22PLM0361AA 2

Unlock status

| Color | Status |
|--------|--|
| Red | Locked |
| Yellow | Unlocked. A subscription is required to activate and use the feature. |
| Green | Unlocked. If a subscription is required, an active subscription is detected. |



RAPH22PLM0362AA 3

SC1™ guidance setup (if equipped)

Introduction

Overview

When coupled with the **Viper® 4+** display and the **VectorPro** receiver, the **SC1™** system is designed to offer hands-free steering of your sprayer. The receiver sends serial Global Navigation Satellite System messages in the **NMEA 0183®** standard to the **SC1™** system for guidance operation.

The sections in this manual are intended to assist with the proper setup and operation of the **SC1™** system for autoguidance operation.

NOTE: Your display was configured at the factory with the settings for your machine.



NHIL22PLM0103AA 1

Reference the section below to get started on setting up the **SC1™** system:

- See "Configure serial output for the SC1™ controller" (4-81) to configure position output from the **VectorPro** receiver with the appropriate **NMEA 0183®** messages.

NOTE: The configuration should already be set in the **Pro 1200** display. Changes to this area should only be made if you previously changed the configuration, or if you performed a factory data reset.

- For correction source setup information, see the **VectorPro** in the **Pro 1200** display software operating guide that ships with the sprayer.
- See "Calibration overview" (4-84) for initial calibration of the **SC1™** system.

NOTE: The calibration is performed prior to initial machine delivery. Only perform the calibration if you reset the **SC1™** controller, or if advised by authorized **CASE IH** support personnel.

- Confirm that the correction source is configured in the **Viper® 4+** display for mapping and task controller purposes.

Receiver configuration

Configure serial output for the SC1™ controller

Messages that conform to the **NMEA 0183®** serial standard must be output on the system serial ports for use by the **SC1™** system.

To operate with autoguidance on the sprayer, make sure that the serial output of the **VectorPro** receiver is configured per the information provided in this section.

NOTE: The GNSS position output settings should already be setup to operate with the SC1™ controller. Follow the directions in this section if you must setup position output for the SC1™ controller again (such as, after a Factory Data Reset was performed).

View the default configuration or create a new configuration with the “Configuration” drop-down menu to setup **NMEA®** serial output. You must first create a new configuration in order to use settings other than the settings stored in the “Default” configuration. You can create up to ten position output configurations. Each setup can contain any combination of the serial ports from the receiver.

To create a configuration, press the “Configuration” drop-down menu (1), and then press the “Add New” button (2).

Define your new configuration name, and then press the “OK” button.

NOTE: Any changes that you make within the “GNSS Position Output” settings will be automatically saved to your selected configuration.

Once you have an added configuration to the drop-down menu, the following actions are available:

| Icon | Function |
|---|-------------------------|
|  | Edit configuration name |
|  | Delete configuration |

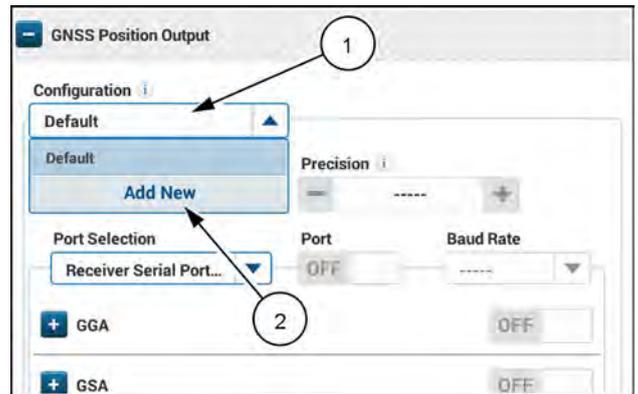
Select “Receiver Serial Port #2” from the “Port Selection” drop-down menu (1).

Before configuring the serial messages, make sure that the “Terrain Compensation” option (2) is OFF. Terrain compensation is configured for the **SC1™** controller through the Universal Terminal (UT).

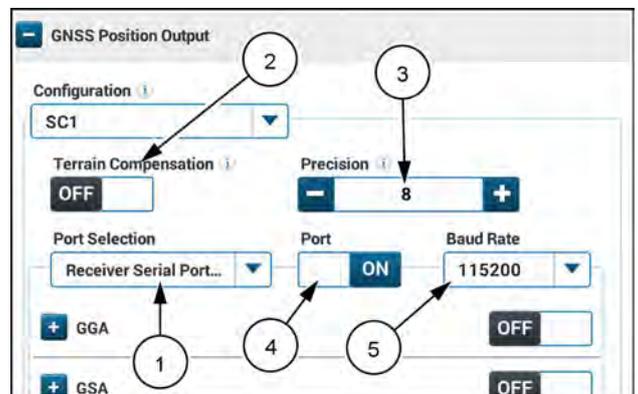
Make sure that the “Precision” value is set to “8”. Press and hold the value box (3) or use the plus and minus buttons to change the precision value.

Before configuring the individual serial messages, turn the port “ON” (4) and select the baud rate (5) to 115200.

NOTE: If the port is correctly configured and turned “ON,” you may edit all relevant settings and messages for that port. If the port is correctly configured but turned “OFF,” the relevant settings and messages for that port will appear as read-only.



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NHIL22PLM0100AA 2

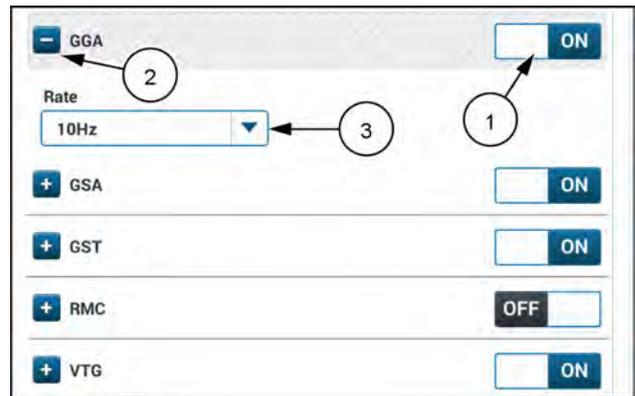
4 - SETUP

To enable each message, press the adjacent toggle switch **(1)**. To set the output rate, press the (+) icon **(3)** to expand the message and select the rate from the drop-down menu **(3)**.

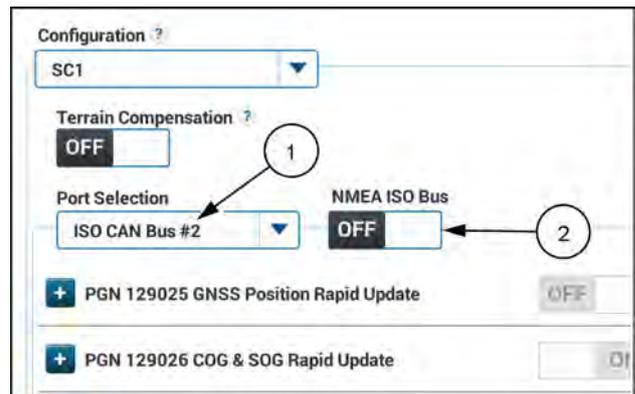
Set up the following **NMEA®** messages:

- GGA = ON; Rate = **10 Hz**
- GSA = ON; Rate = **0.1 Hz**
- GST = ON, Rate = **1 Hz**
- RMC = OFF
- VTG = ON; Rate = **0.1 Hz**
- ZDA = ON; Rate = **1 Hz**

Return to the “Port Selection” drop-down menu **(1)** and select “ISO CAN Bus #2”. Make sure that the “NMEA ISO Bus” setting **(2)** is set to OFF.



NHIL22PLM0101AA 3



NHIL22PLM0102AA 4

Correction source setup

Select the correction source in the Viper® 4+ display

After configuring the correction source for the **VectorPro** receiver in the **Pro 1200** display, you must select the same correction source in the **Viper® 4+** display. See “GPS information and diagnostics” (4-110) for more information on this topic.

NOTE: For AFS corrections, make sure that the “GS-Satellite” correction source is shown in the **Viper® 4+** display. For Networked Transport of RTCM via Internet Protocol (NTRIP), make sure that the “GS-Slingshot” correction source is shown in the **Viper® 4+** display.

Initial calibration (SC1™)

Calibration: SC1™ steering

▲ WARNING

Stay clear! The steering tires will move automatically during this procedure. Make sure that the area around the vehicle is clear of people and obstacles before you engage the automatic steering system. To disengage automatic steering at any time, turn the steering wheel or select the on-screen STOP button. Failure to comply could result in death or serious injury.

W1647A

NOTE: During the auto-steering calibration, the machine will make several hard left-hand and right-hand turns. Adjust the vehicle speed and location as necessary.

NOTICE: Calibration of the machine steering system should be performed in a field or other large, open space and with conditions similar to normal vehicle operation. If the ground or surface is slippery, muddy, or freshly tilled, the SC1™ system may learn incorrect steering responses for normal operating conditions. Ensure the machine hydraulics are operating properly and there are no other mechanical issues that may affect the performance of the SC1™ system.

Preparation and best practices

- For best performance, the SC1™ guidance and steering system must be calibrated specifically for each machine configuration.
- Start the calibration process with the machine parked on a level surface with several acres of smooth ground available.
- Ensure that the engine and hydraulic systems are at normal operating temperature and perform all calibration procedures at typical operating RPM.
- It is recommended to calibrate in conditions as close to actual field operations as possible. Before starting the calibration process:
 - Fold and rack the booms.
 - Verify the machine measurements are correctly entered into the Universal Terminal (UT).
- During the auto-steering calibration, the machine will make several hard left-hand and right-hand turns. Adjust the vehicle speed and location as necessary.
 - To pause the calibration at any time, turn the steering wheel or press the Stop button on the UT.
 - To ensure successful auto-steering calibration, try to minimize the number of pauses.
 - If an error message is displayed during calibration, see “Diagnostic Trouble Code (DTC) screen” (6-15) for possible causes and corrective action steps to be taken.

Initial calibration (SC1™)

NOTE: Perform **SC1™** calibration if the steering valve or cylinders were replaced, or if the tire size was changed. In addition, perform the steering valve calibration in the **Pro 1200** display. For assistance, see the sprayer operator's manual.

Initial calibration of the **SC1™** system consists of the following component setup calibrations:

- GPS setup
- Terrain compensation calibration
- Auto-steering calibration

NOTE: The **SC1™** system can be used for GPS only or for GPS and auto-steering. The following sections walk through the calibration procedures for both GPS only as well as GPS guidance and auto-steering. If you are using the system for GPS only, the steering calibration steps will not be completed.

Operator liability

When prompted, accept the operator liability page.

Select the Guidance and Steering terminal from the UT menu. The Machine Selection page will be displayed.

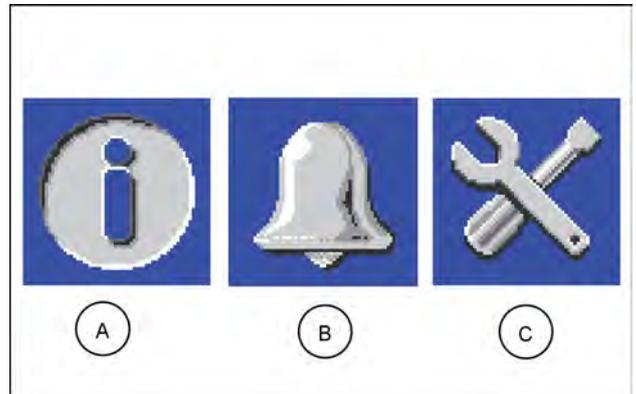
GPS setup

System Information, Diagnostic Trouble Codes (DTC), and Machine Test screens may be viewed during the calibration process. For additional information, see:

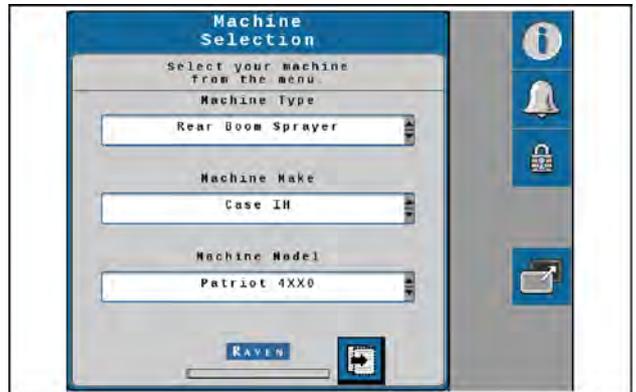
- “System information” (6-20)
- “Diagnostic Trouble Code (DTC) screen” (6-15)
- “Steering setup tab” (4-99). The Machine Test icon will only be displayed if a Steering Partner is detected.

- Information
- Alarms
- Machine Test

1. Use the drop-down options to select the Machine Type, Machine Make, and Machine Model that matches the current machine.
2. When all options have been set, select the Next button.



RAIL21TR02792AA 1



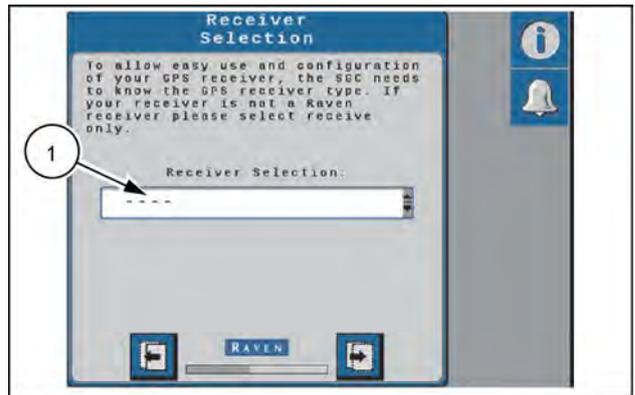
NHIL22PLM0159AA 2

3. Confirm that the steering valve was detected as the Steering Partner.
4. Select the Next button.



NHIL22PLM0157AA 3

5. Use the drop-down (1) to select the appropriate GPS receiver.



NHIL22PLM0104AA 4

Select the "Receive Only" option, and then press the Next arrow to continue.



NHIL22PLM0146AA 5

- Verify the antenna fore/aft offset value matches the default value for the machine model.

Serial numbers ending in ST074999 and below

| Model | Default value |
|---------------|--------------------|
| Patriot® 3250 | 5258 mm (207.0 in) |
| Patriot® 4350 | 5588 mm (220.0 in) |
| Patriot® 4450 | |

Serial numbers ending in ST075000 and above

| Model | Default value |
|---------------|----------------------|
| Patriot® 3250 | 5046.6 mm (198.7 in) |
| Patriot® 4350 | 5376.6 mm (211.7 in) |
| Patriot® 4450 | |

NOTE: The antenna fore/aft position is calculated by measuring from the rear axle of the machine to the middle of the receiver. Enter a negative value if the receiver is located behind the rear axle.

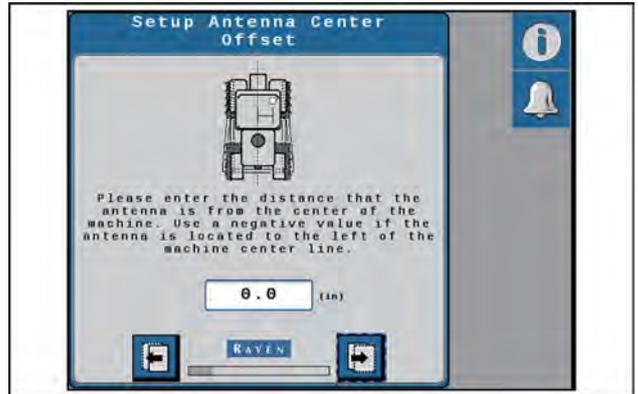
- Select the Next arrow.
- Verify the antenna center offset value. The default center offset is 0 for all models.

NOTE: The antenna center offset position is calculated by measuring from the center of the machine to the center of the receiver. Enter a negative value if the receiver is located to the left of the machine center line.

- Select the Next arrow.



NHIL22PLM0105AA 6



RAIL21TR02633AA 7

- Verify the antenna height value matches the default value for the machine model.

Serial numbers ending in ST074999 and below

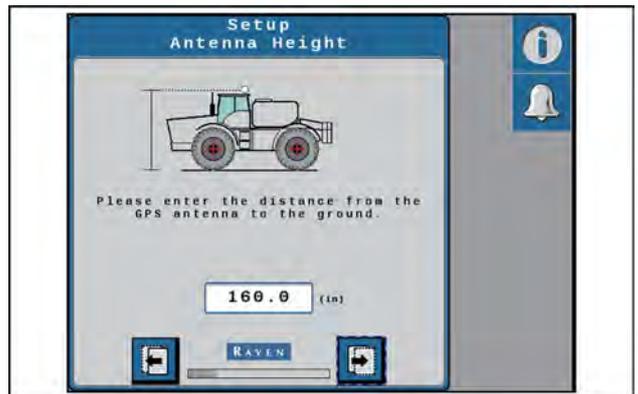
| Model | Default value |
|---------------|--------------------|
| Patriot® 3250 | 3955 mm (155.7 in) |
| Patriot® 4350 | 4057 mm (159.7 in) |
| Patriot® 4450 | |

Serial numbers ending in ST075000 and above

| Model | Default value |
|---------------|----------------------|
| Patriot® 3250 | 3972.5 mm (156.4 in) |
| Patriot® 4350 | 4074.5 mm (160.4 in) |
| Patriot® 4450 | |

NOTE: The antenna height is calculated by measuring from the ground to the center of the receiver.

- Select the Next arrow.



RAIL21TR02634AA 8

- Verify the wheelbase value matches the default value for the machine model.

| Model | Default value |
|---------------|------------------|
| Patriot® 3250 | 3810 mm (150 in) |
| Patriot® 4350 | 4064 mm (160 in) |
| Patriot® 4450 | 4064 mm (160 in) |

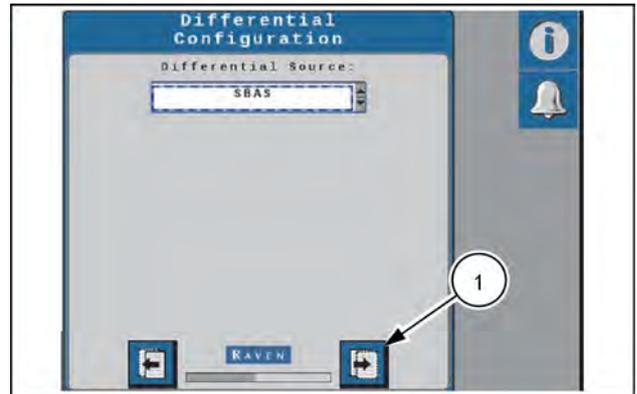
NOTE: The wheelbase is calculated by measuring from the center of the front tire to the center of the rear tire on both sides of the machine. Add these measurements together and then divide by two to get the average wheelbase value.



RAIL21TR02635AA 9

- Select the Next arrow.
- Select the appropriate differential GPS configuration that you configured for the **VectorPro** receiver in the **Pro 1200** display from the drop-down box (1).

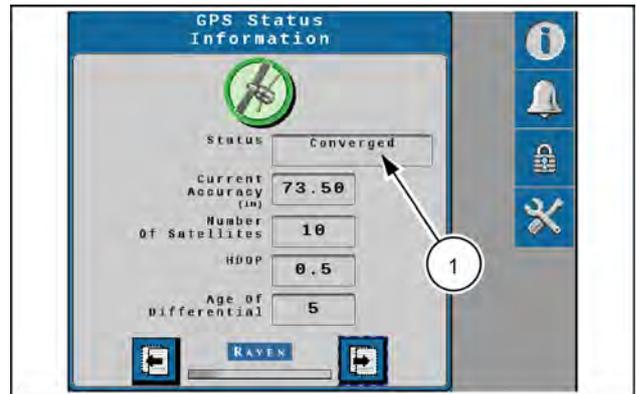
NOTE: Some differential sources may require accuracy upgrades. Contact your CASE IH dealer for assistance with purchasing accuracy upgrades.



NHIL22PLM0107AA 10

- Select the Next arrow.
- Review the displayed GPS status information.

NOTE: The GPS solution must be converged (1) to calibrate and proceed with the initial system calibration.



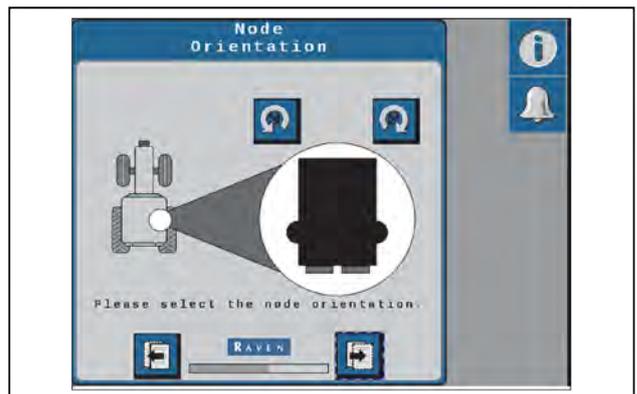
NHIL22PLM0161AA 11

Terrain compensation calibration

- Verify the orientation of the **SC1™** controller. Use the rotation buttons until the on-screen display matches the orientation of the **SC1™** controller.

NOTE: The **SC1™** controller must be mounted in a horizontal orientation. The mounting surface is parallel to the ground.

- Select the Next arrow.



RAIL21TR02773AA 12

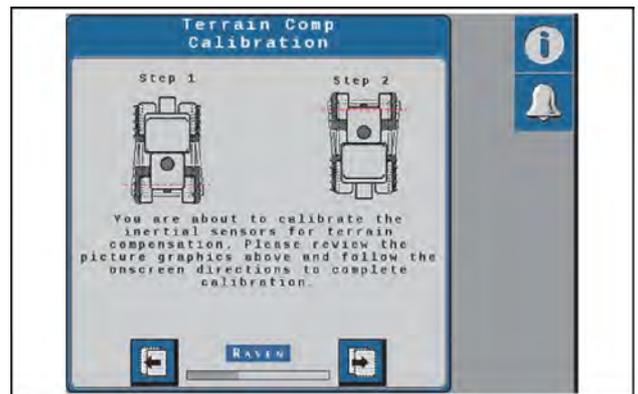
- Drive the machine forward at least **10 m (33 ft)** and park on a flat surface.

NOTE: The **SC1™** system must detect the direction of forward travel to properly calibrate the terrain compensation features.



NHIL22PLM0109AA 13

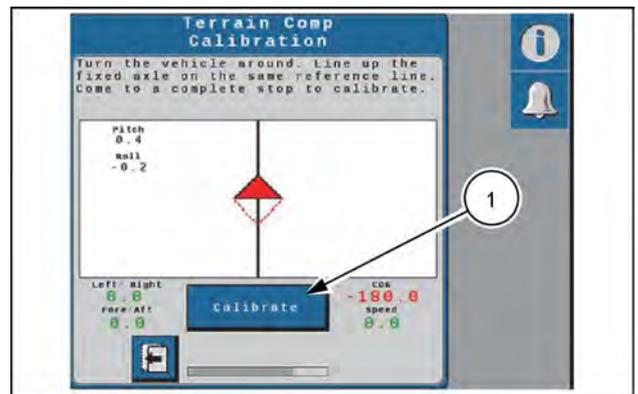
- Stop the machine on a level surface.
- Place flags or markers to mark the rear tire position on each side of the machine.
- Select the Next button and follow the on-screen instructions to begin the terrain compensation calibration.



NHIL22PLM0110AA 14

- Select the "Calibrate" button (1) to begin the calibration process. The progress of the terrain compensation calibration will be displayed on the screen. Wait for the calibration process to be completed before moving the sprayer.
- Drive forward and turn the sprayer around **180°**. Park the sprayer between the markers, facing in the opposite direction as when the "Calibrate" button was first selected. Lower the boom to the spraying position.

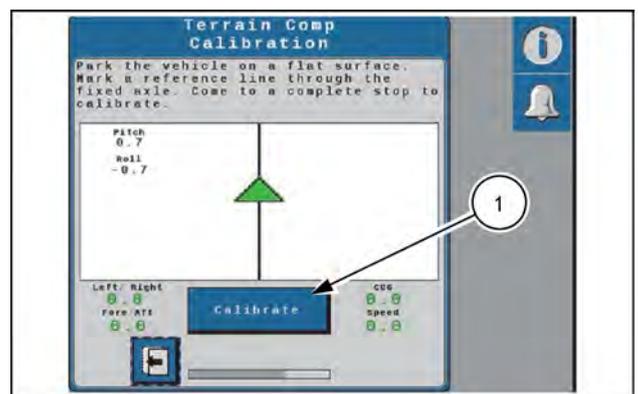
NOTE: The two triangles on the display should line up on top of each other when the boom is in the correct position.



NHIL22PLM0111AA 15

- Select the "Calibrate" button (1) again to complete the terrain compensation calibration.
- Select the Next arrow.

NOTE: If you are calibrating the **SC1™** system for GPS only operation, the calibration wizard summary will be displayed. Press the "Accept" button to go to the GPS only home screen.

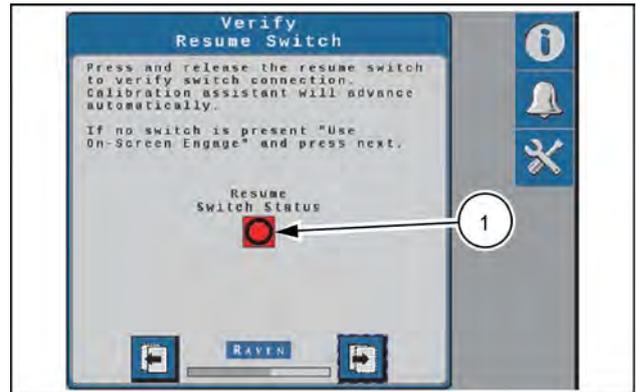


NHIL22PLM0112AA 16

Auto-steering calibration

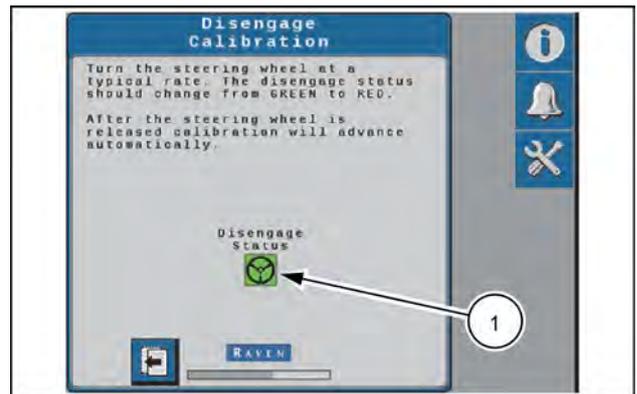
The auto-steering calibration consists of the following component setup calibrations:

- Resume and disengage switch calibration
 - Wheel Angle Sensor (WAS) calibration
 - Hydraulic system calibration
1. Press the autoguidance engage button on the Multi-Function Handle (MFH). The switch status icon (1) will change if the switch input is detected and the calibration will automatically proceed to the next screen.



NHIL22PLM0114AA 17

2. Turn the steering wheel to calibrate the disengage sensor. The status icon (1) will change if the input is detected and the calibration will automatically proceed to the next screen.



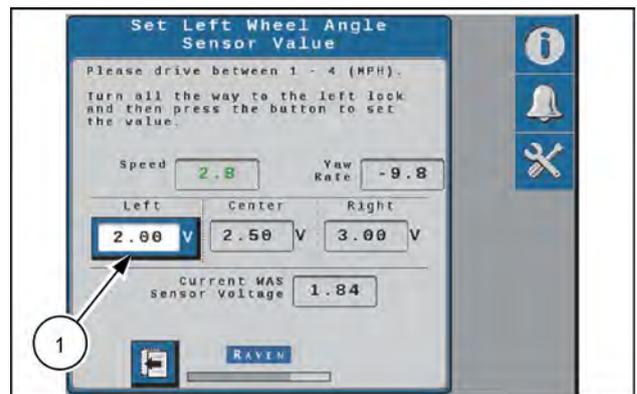
NHIL22PLM0115AA 18

Wheel Angle Sensor (WAS) calibration

NOTE: The machine must remain moving during the WAS calibration.

1. Drive forward between 2 – 6 km/h (1 – 4 mph).
2. Turn the steering wheel all the way to the left-hand steering lock.
3. Select the “Left” box (1) to set the left-hand WAS value.

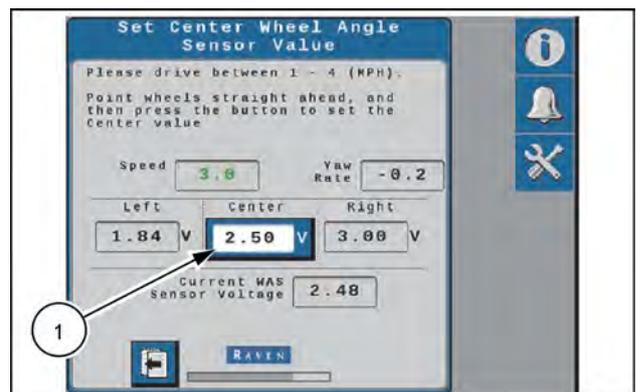
NOTE: Do not move the steering wheel until the calibration screen advances to the “Center” WAS setting.



NHIL22PLM0116AA 19

4. While driving forward between 2 – 6 km/h (1 – 4 mph), re-center the steering wheel to drive straight ahead.
5. Select the “Center” box (1) to set the center WAS value.

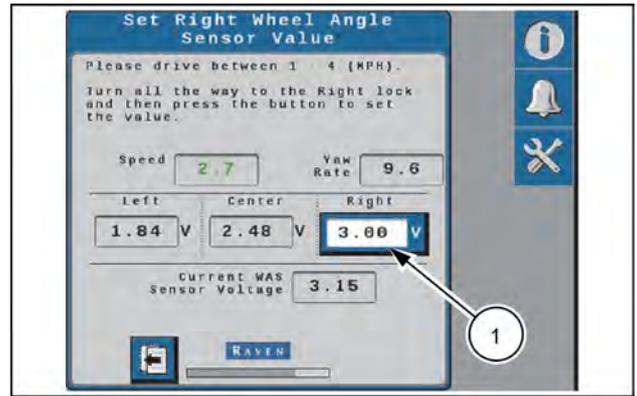
NOTE: Do not move the steering wheel until the calibration screen advances to the “Right” WAS setting.



NHIL22PLM0117AA 20

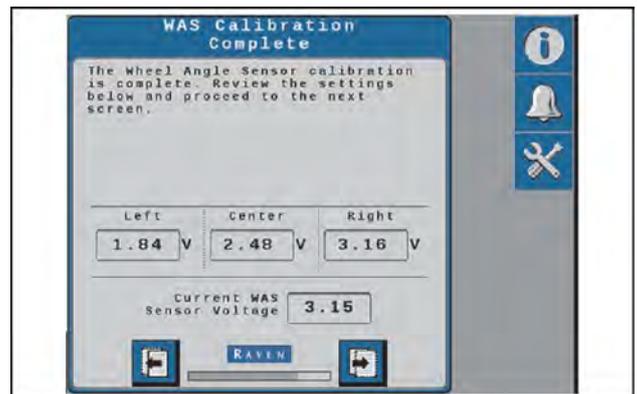
6. Continue driving forward between **2 – 6 km/h (1 – 4 mph)**.
7. Turn the steering wheel all the way to the right-hand steering lock.
8. Select the “Right” box (1) to set the right-hand WAS value.

NOTE: Do not move the steering wheel until the “Calibration Complete” screen is displayed.



NHIL22PLM0118AA 21

9. Review the WAS calibration details.
10. Select the Next arrow.



NHIL22PLM0119AA 22

Hydraulic system calibration

⚠ WARNING

Stay clear! The steering tires will move automatically during this procedure. ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure. Failure to comply could result in death or serious injury.

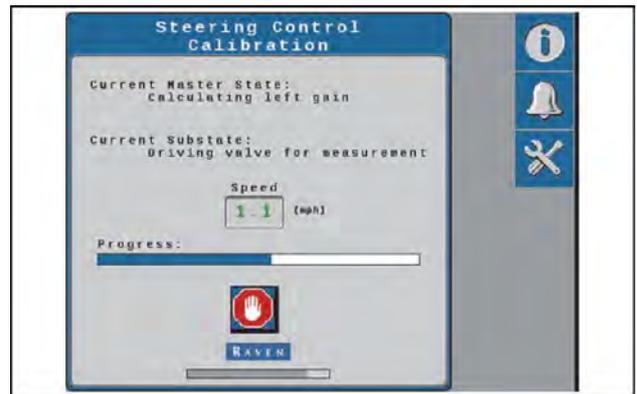
W0066A

The steering control calibration process allows the **SC1™** system to learn the hydraulic capabilities of the machine for optimal steering performance in the field.

NOTE: Review the “Preparation and best practices” section as outlined in “Calibration overview” (4-84) for tips on completing the auto-steering calibration successfully. It is recommended to complete the **SC1™** steering control calibration for optimal system performance. However, the automatic calibration may be bypassed by selecting the “Use Quick Calibration” option. The system will load default gains for the machine selected during the calibration process. The “Quick Calibration” option will not be available if a generic machine make was selected during the GPS calibration process.

To complete the hydraulic system calibration:

1. Drive forward between **2 – 6 km/h (1 – 4 mph)**.
2. Press the autoguidance engage button on the MFH or use the on-screen arrow to begin the calibration.
3. The display will show progress of the auto-steering calibration.



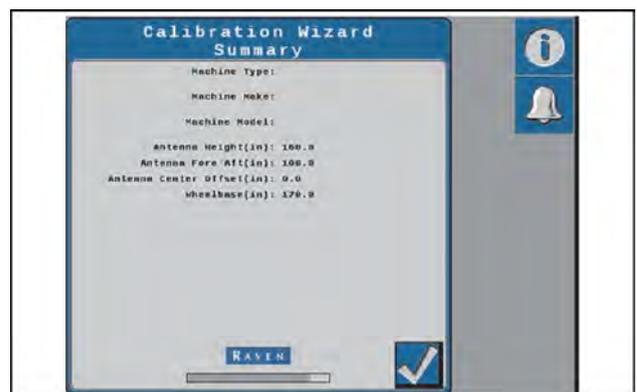
NHIL22PLM0121AA 23

4. Once the calibration process is complete, select the Accept button.



NHIL22PLM0122AA 24

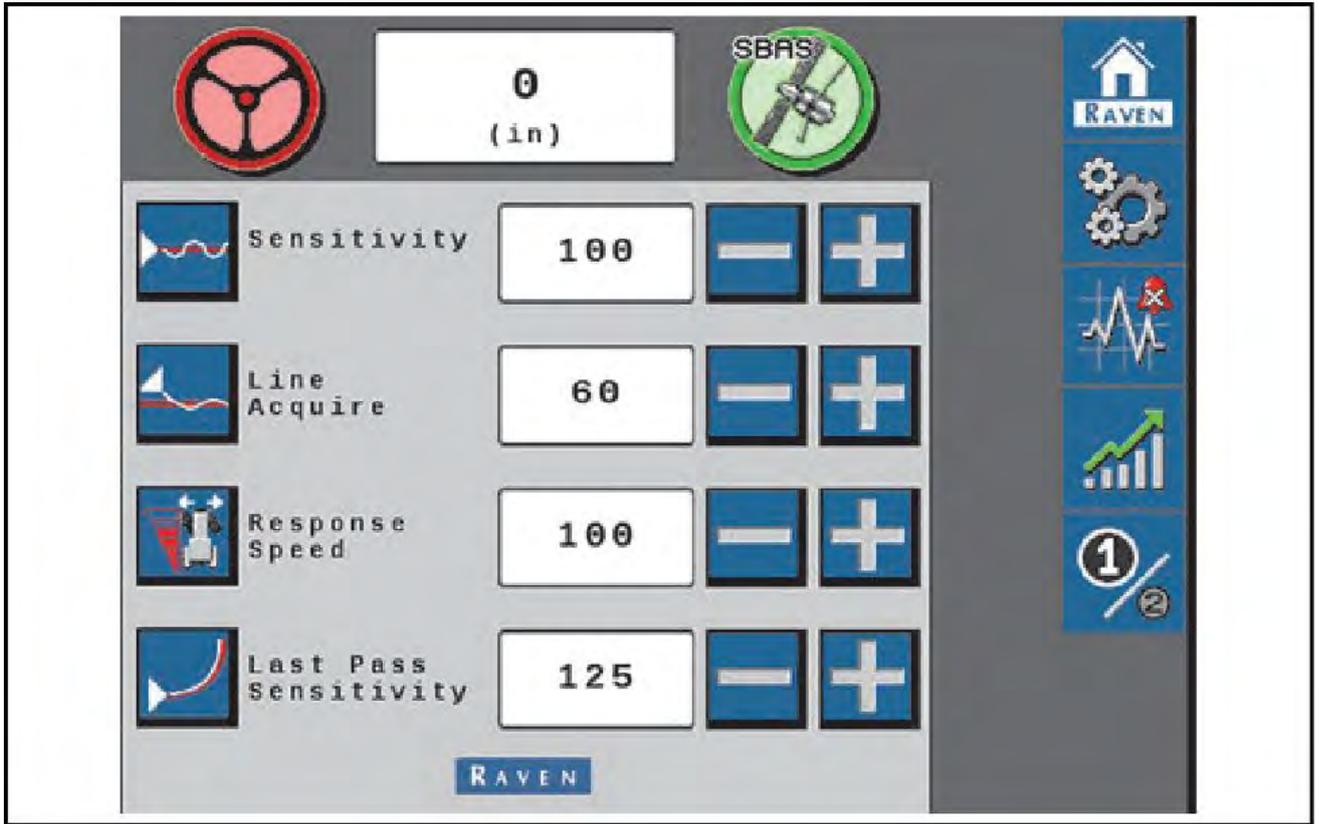
5. Review the calibration wizard summary information, and then select the Accept button to complete the calibration process.



NHIL22PLM0113AA 25

SC1™ system settings and tuning

Steering home screen



NHIL22PLM0150AA 1

Sensitivity

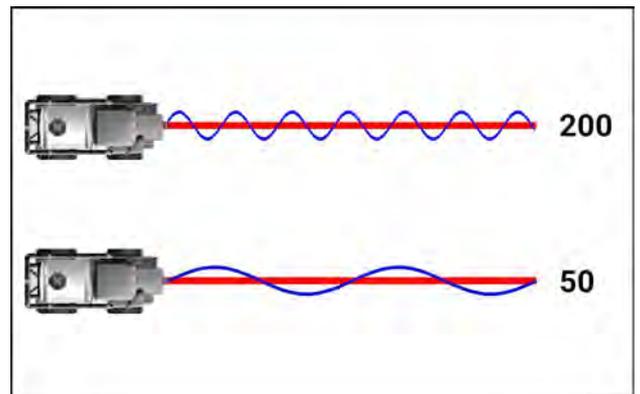
This value controls the overall steering sensitivity, especially with on-line steering.

- Increase this value if the machine hangs off of the guidance line.
- Decrease this value if the machine is constantly crossing back and forth across the guidance line.

Adjust the value by 10 until you get close to your desired result, and then use smaller numbers to dial it in.

| | |
|----------------|-----------|
| Setting Range: | 50 to 200 |
| Typical Value: | 100 |
| +/- Amount: | 10 |

NOTE: If the machine is slow to react after a steering adjustment, increase the sensitivity setting in increments of 10. If the machine makes an adjustment too quickly, decrease the sensitivity value.



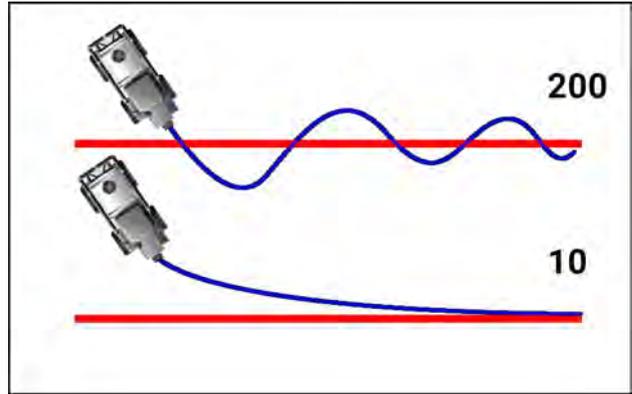
NHIL22PLM0162AA 2

Line acquire

This value controls how the machine approaches the guidance line. It will determine how soon the machine will start adjusting its heading to match the heading of the guidance line.

A lower number will cause the machine to start adjusting its heading from a farther distance away, and a higher number will wait to adjust the heading until the machine gets closer to the line.

- Increase this value if the machine is too lazily acquiring the line.
- Decrease this value if the machine is overshooting the guidance line. Adjust the value by 10 to 15 until you get close to your desired result, and then use smaller numbers to dial it in.



NHIL22PLM0163AA 3

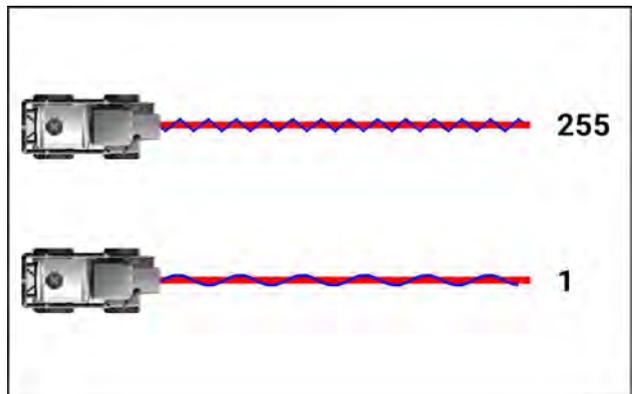
| | |
|----------------|-----------|
| Setting Range: | 10 to 200 |
| Typical Value: | 50 to 100 |
| +/- Amount: | 10 to 15 |

NOTE: A low value will minimize the risk of over-correction, but it could take longer to acquire the guidance line. A high value increases the risk of over-correction, but the machine is quicker to re-acquire the guidance line. If the machine takes too long to acquire the guidance line, increase the Line Acquire value in increments of 10. If the machine over-shoots the guidance line, decrease the value in increments of 10.

Response speed

This value controls how aggressively the system steers the machine's wheels. Increase this value if the wheels seem to be slowly wandering back and forth.

- Decrease this value if the wheels seem to be aggressively turning from side-to-side, or if they twitch on the guidance line. Adjust the value by 10 until you get close to your desired result, and then use smaller numbers to dial it in.
- Typically the value should be set approximately 10 points below what you feel as too much wheel movement. You may need to decrease this number slightly as you decrease your travel speed.



NHIL22PLM0156AA 4

| | |
|----------------|----------|
| Setting Range: | 1 to 255 |
| Typical Value: | 100 |
| +/- Amount: | 10 |

Last pass sensitivity

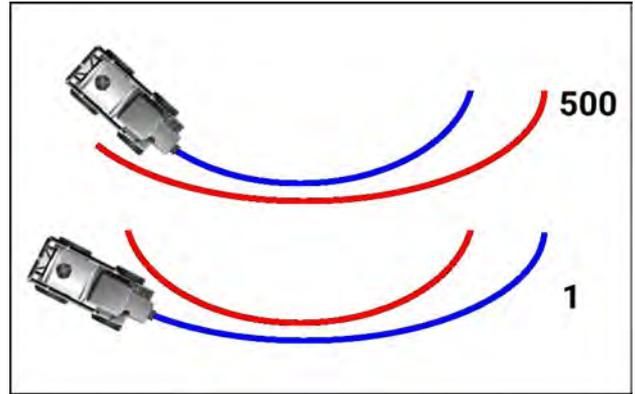
This value determines how tightly the machine tries to steer on a curved path.

Too high of a value will cause the machine to steer to the inside of a curve. Too low of a value will cause the machine to steer to the outside of a curve.

- Increase this value if the machine hangs off a curve to the outside of the desired path.
- Decrease this value if the machine hangs off of a curve to the inside of the desired path.

| | |
|----------------|------------|
| Setting Range: | 0 to 500 |
| Typical Value: | 115 to 145 |
| +/- Amount: | 10 |

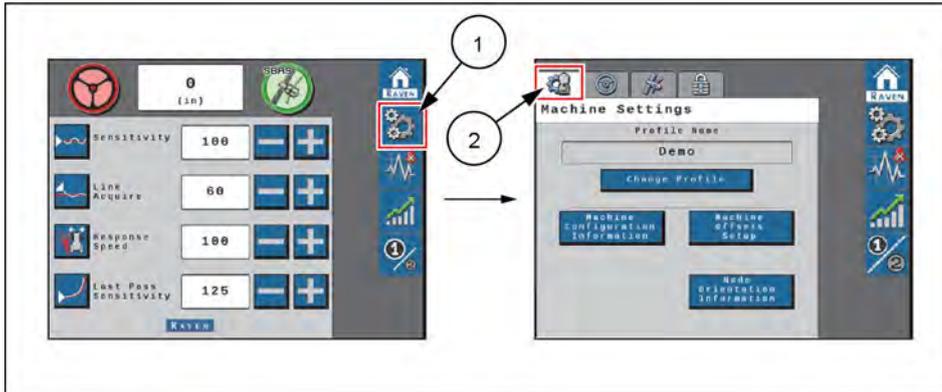
NOTE: The last pass sensitivity value only adjusts the system performance on Last Pass and A-B Curve lines. Adjusting the last pass sensitivity value will not affect pivot irrigation guidance line performance. To adjust pivot line performance, adjust the response speed and sensitivity values.



NHIL22PLM0165AA 5

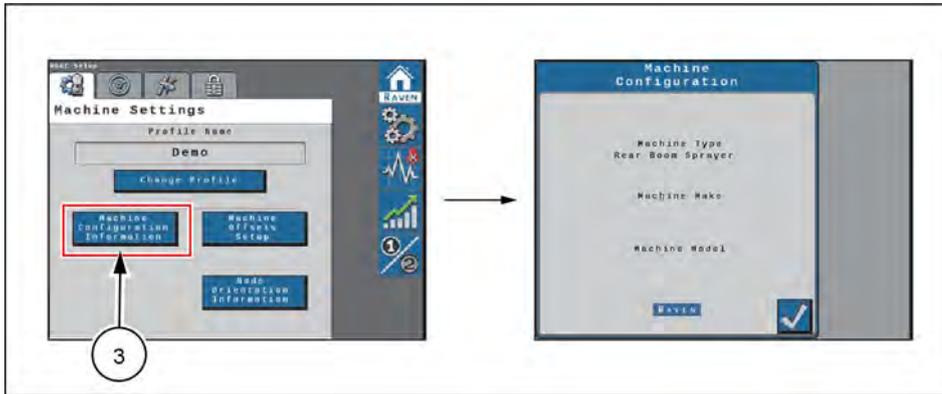
Machine settings tab

Machine settings



NHIL22PLM0168FA 1

Machine configuration

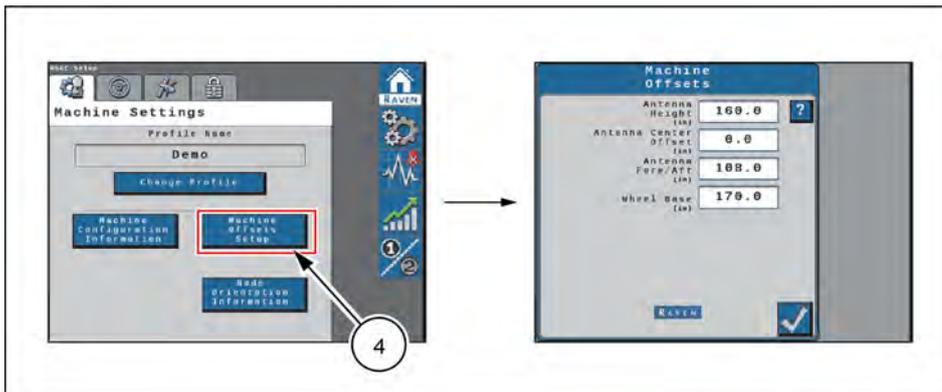


NHIL22PLM0125EA 2

To view the current machine configuration:

1. From the **SC1™** home screen, select the Settings Menu button (1).
2. On the Machine Settings tab (2), select the “Machine Configuration Information” button (3).
3. The current machine type, make, and model information that was entered during the calibration process. The machine configuration settings cannot be changed unless the **SC1™** system is re-calibrated.
4. Select the Accept button in the lower, right-hand corner of the screen to return to the Machine Settings tab.

Antenna offsets settings



NHIL22PLM0127EA 3

To adjust the antenna offset measurements:

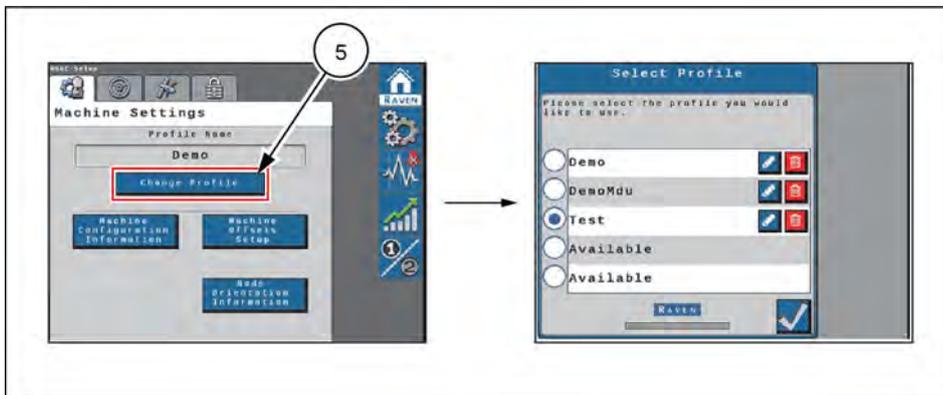
1. From the **SC1™** home screen, select the Settings Menu button.
2. On the Machine Settings tab, select the “Machine Offsets Setup” button (4).
3. The Machine Offsets screen displays the machine-specific measurements that were entered during the system calibration:



Help menu icon – Pressing the help menu icon displays the help menu. The help menu contains additional information about the settings contained within that screen.

- Antenna Height – The antenna height is measured from the ground to the middle of the receiver.
- Antenna Center Offset – The antenna center offset position measured from the centerline of the machine to the center of the receiver. A negative value should be entered if the receiver is located to the left-hand side of the center line.
- Antenna Fore/Aft – The antenna fore/aft position is measured from the rear axle of the machine to the center of the receiver. A negative value should be entered if the receiver is located behind the rear axle.
- Wheel Base – The wheelbase is calculated by measuring from the center of the front tire to the center of the rear tire.
- Select the Accept button in the lower right-hand corner of the screen to return to the Machine Settings tab.

Change profile



NHIL22PLM0128EA 4

To select a different profile, create a new profile, or re-calibrate the current profile:

1. From the **SC1™** home screen, select the Settings Menu button.

NOTE: The name of the current profile selected is displayed at the top of the Machine Settings tab.

2. Select the “Change Profile” button (5).

NOTE: Up to five machine profiles may be saved for the **SC1™** system.

3. Use the radio buttons to select a different profile. Selecting an “Available” profile will require the operator to complete the initial machine configuration process.



4. Select the Edit button to rename the selected profile.

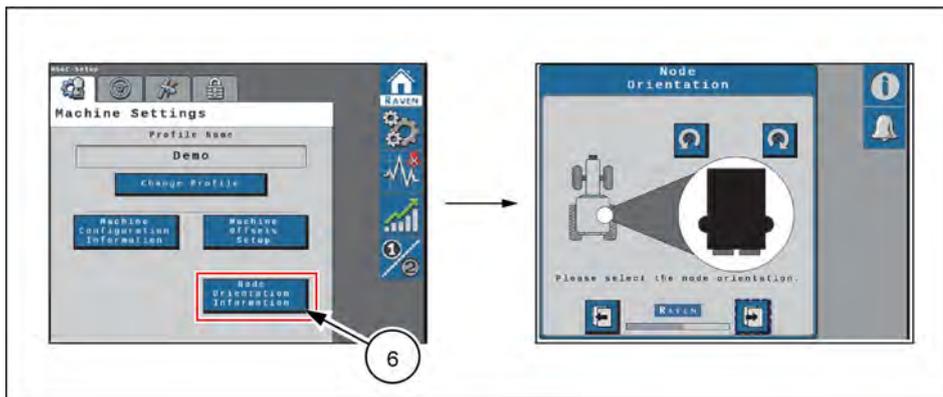
OR



5. Select the Delete button to remove profile settings from the **SC1™** system. The profile will need to be re-calibrated.

6. Select the Accept button in the lower right-hand corner of the screen to return to the Machine Settings tab.

Node orientation



NHIL22PLM0129EA 5

To adjust the node orientation:

1. From the **SC1™** home screen, select the Settings Menu button.
2. On the Machine Settings tab, select the “Node Orientation” button (6).
3. Use the rotation buttons to rotate the node image in **90°** increments. The node image shown on the screen should match the orientation of the controller in the machine cab.

NOTE: The **SC1™** controller must be mounted in a horizontal orientation. Vertical orientations are not supported.

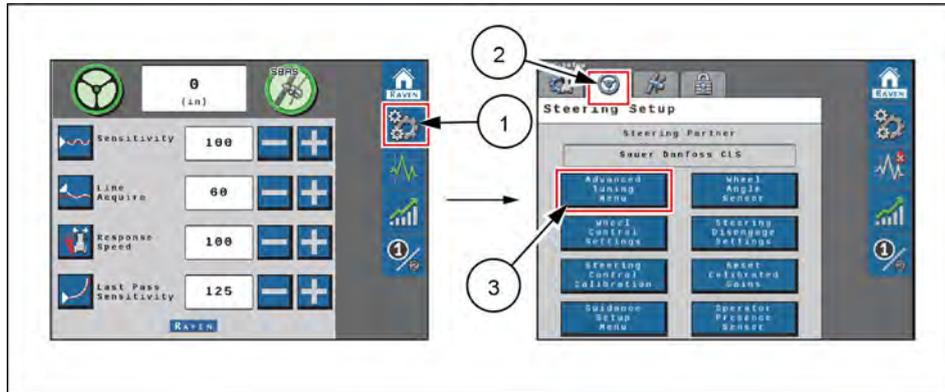
4. Select the Accept button in the lower right-hand corner of the screen to return to the Machine Settings tab.

Steering setup tab

The Steering Setup tab displays the steering partner with which the **SC1™** system works during auto-steering operation.

The Steering Setup tab offers settings and options which allow the operator to fine-tune the steering system.

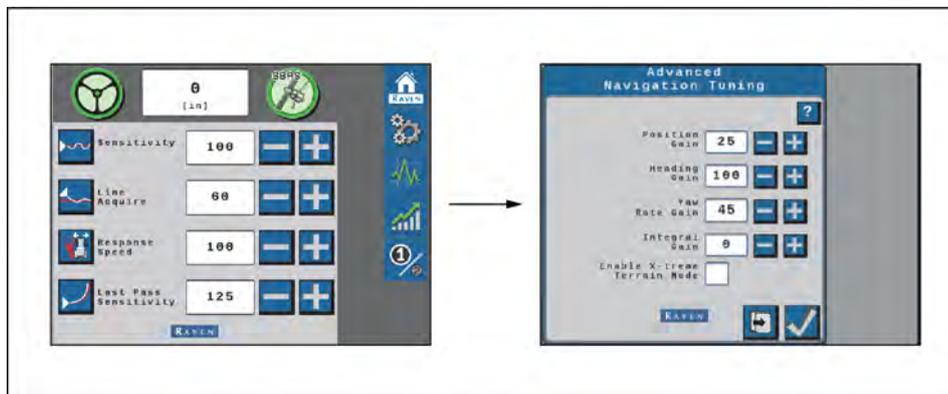
NOTE: The Steering Setup tab will not be available if the **SC1™** system is calibrated for the GPS only mode.



NHIL22PLM0171FA 1

Steering setup screen

Advanced tuning



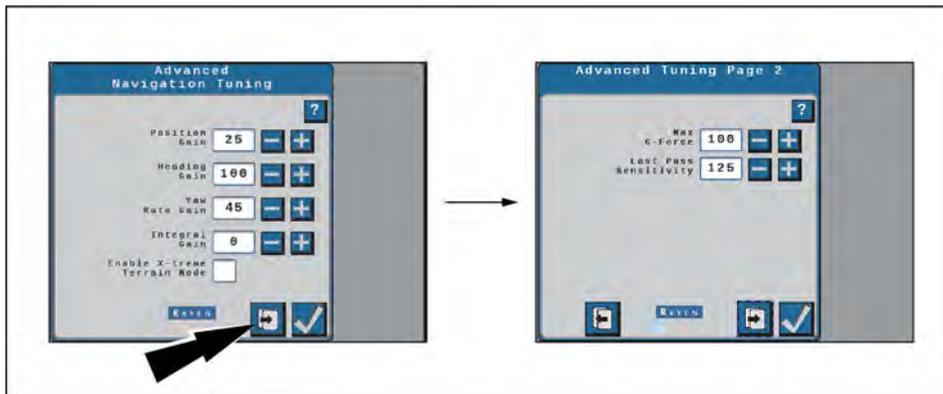
NHIL22PLM0131EA 2

To access advanced auto-steering tuning options and settings:

1. From the **SC1™** home screen, select the Settings Menu button (1).
2. Select the Steering Setup tab (2) and the “Advanced Tuning Menu” button (3).
3. The following settings and options are displayed on the Advanced Navigation Tuning page:
 - Position Gain – Determines how aggressively the **SC1™** system responds to an off-track error. A higher position gain value results in a more aggressive response to an off-track error, while a lower value indicates a less aggressive response.
 - Heading Gain – Determines how aggressively the **SC1™** system responds to a heading error. A higher heading gain value results in a more aggressive response to a heading error, while a lower value indicates a less aggressive response.
 - Position Integral Gain – This value corrects long-term errors in the actuator control. If the system is not achieving the desired actuator position during operation, the system will re-direct the position to the desired set point. This value is generally at or near 0.
 - Yaw Rate Gain – Determines the impact of the yaw rate on tracking performance. A higher yaw rate gain value results in a more aggressive response to yaw rate, while a lower value results in a less aggressive response.
 - Integral Gain – This value corrects long-term errors in the wheel control. If the system is not achieving the desired wheel angle during operation, the system will re-direct the wheels to the desired set point. This value is generally at or near 0.

- o Enable X-Treme Terrain Mode – This setting allows adjustment for steering performance on terraces.

4. Select the Next button to display the Advanced Tuning Page 2.

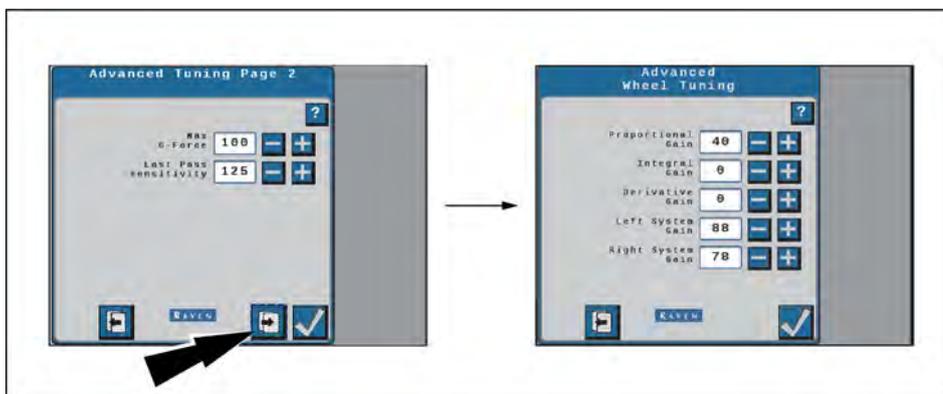


NHIL22PLM0132EA 3

The following settings and options are displayed:

- Max G-Force – Limits the centripetal force experienced by the operator during a turn. A higher value allows to the machine to perform sharper turns, while a lower value limits the machine turning radius.
- Last Pass Sensitivity - The last pass sensitivity determines how tightly the machine tries to steer on a curved path. Too high of a value will cause the machine to steer to the inside of a curve. Too low of a value will cause the machine to steer to the outside of a curve. Values range from 1 - 500.

5. Select the Next button to display the Advanced Wheel Tuning page.



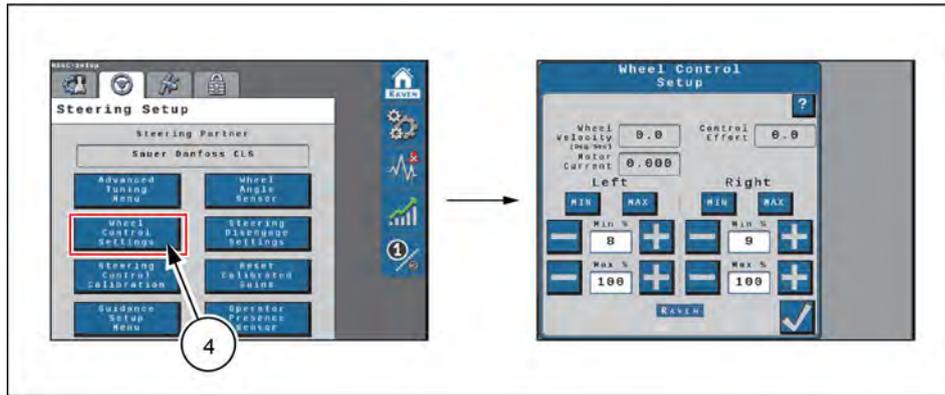
NHIL22PLM0133EA 4

The following settings and options are displayed:

- Proportional Gain - Determines the rate of the wheel response. Increasing the Proportional Gain value causes the wheel response to be faster, but can result in the machine overshooting the target wheel angle position or can cause the wheels to take a longer time to stabilize.
- Integral Gain - This value corrects long-term errors in the steering control loop. This setting should be adjusted by qualified technicians only. CASE IH does not recommend that anyone other than a qualified technician make changes to this setting.
- Derivative Gain - The derivative gain value limits the wheel response time. A larger derivative gain value will reduce the tendency to overshoot the target wheel angle position, but will limit the wheel speed.
- Left System Gain - Compensates for any bias or non-linearity in the steering valve while the machine is turning to the left.
- Right System Gain - Compensates for any bias or non-linearity in the steering valve while the machine is turning to the right.

6. Select the Accept button in the lower right-hand corner of the screen to save the displayed selections and values and return to the Steering Setup tab

Wheel control settings



NHIL22PLM0169FA 5

Implement control setup screen

To access implement control settings:

1. From the **SC1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Wheel Control settings” button (4). The following information and settings are displayed on the page:



Help menu icon – Pressing the help menu icon displays the help menu. The help menu contains additional information about the settings contained within that screen.

- Wheel velocity - The speed at which the wheels are moving, measured in degrees per second.
- Control Effort - The amount of effort the **SC1™** system is using to drive the wheels.
- Valve/Motor Current - Displays the current draw of the steering valve.
- Left/Right MIN/MAX - Press and hold the MIN or MAX button to test the steering system response using the set minimum and maximum values. For example, pressing the Left MIN button will steer the machine to the left-hand side using the minimum control effort.
- Left/Right Min % - The minimum control effort that the control valve must use to turn the wheels. Values range from 0 - 99.

NOTE: The minimum values cannot exceed the maximum values.

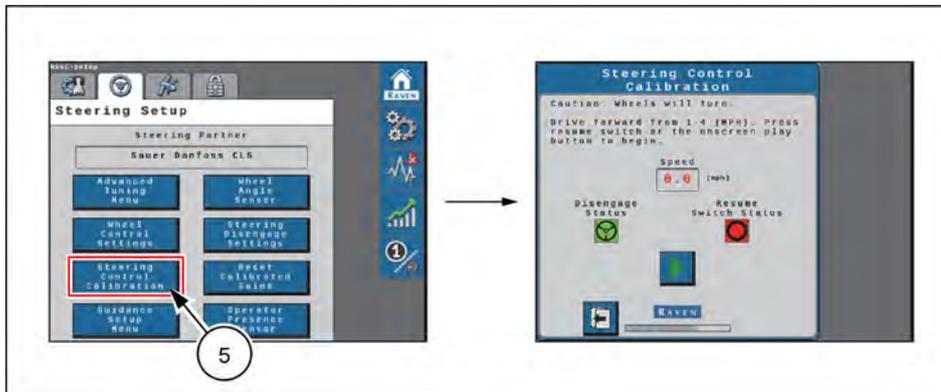
- Left/Right Max % - The maximum control effort that the valve may use to turn the wheels. Values range from 1 - 100.
3. Select the Accept button in the lower right-hand corner of the screen to save the displayed settings and return to the Steering Setup tab.

Wheel control calibration

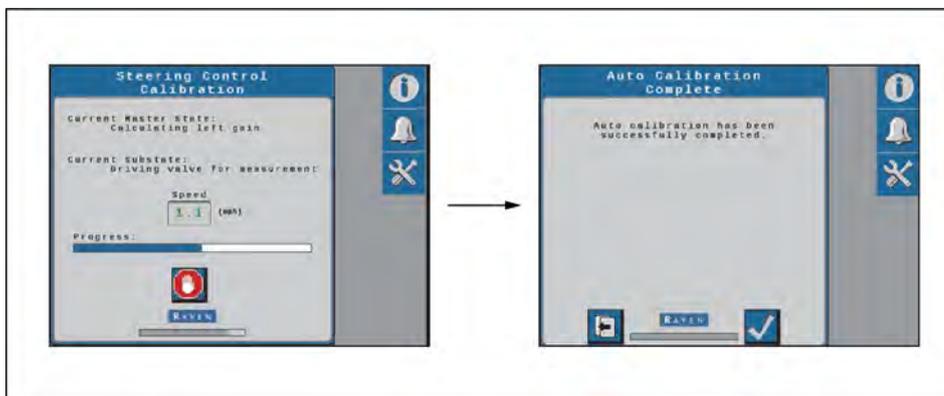
⚠ WARNING

Stay clear! The steering tires will move automatically during this procedure. ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure. Failure to comply could result in death or serious injury.

W0066A



NHIL22PLM0170FA 6



NHIL22PLM0136EA 7

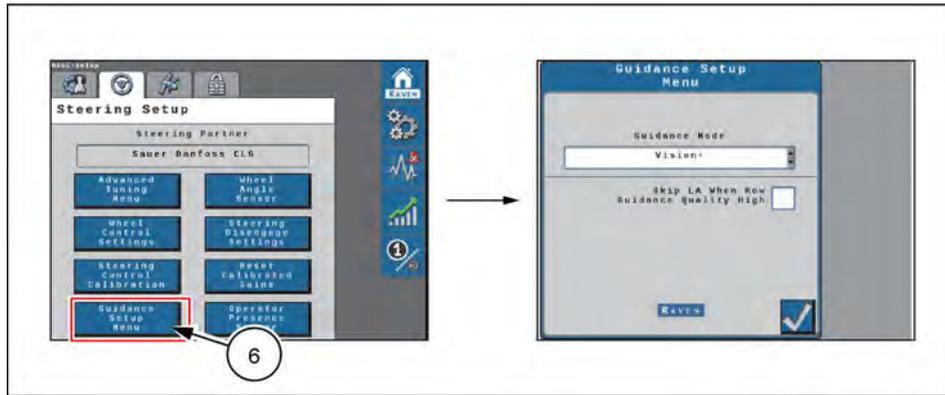
The Wheel Control Calibration process allows the **SC1™** system to learn the hydraulic capabilities of the machine hydraulic system for optimal steering performance in the field. Complete the following steps to calibrate the **SC1™** system to the machine hydraulic system without completing the full **SC1™** system calibration.

NOTE: Review the "Preparation and best practices" section as outlined in "Calibration overview" (4-84) for tips on preparing for and completing the calibration process.

To perform a wheel calibration:

1. From the **SC1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the "Steering Control Calibration" button (5).
3. Drive the machine forward at **2 – 6 km/h (1 – 4 mph)**.
4. Press the resume switch or use the on-screen Start button to begin calibration. The **SC1™** system will display the progress of the calibration.
5. When the calibration is complete, select the Accept button in the lower right-hand corner of the screen to return to the Steering Setup tab.

Guidance setup menu



NHIL22PLM0172EA 8

If the **VSN®** visual guidance system is connected, the guidance setup menu allows the operator to set the mode and row guidance.

To access guidance setup settings:

1. From the **SC1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Guidance Setup Menu” button **(6)**. The following information and settings are displayed on the page:

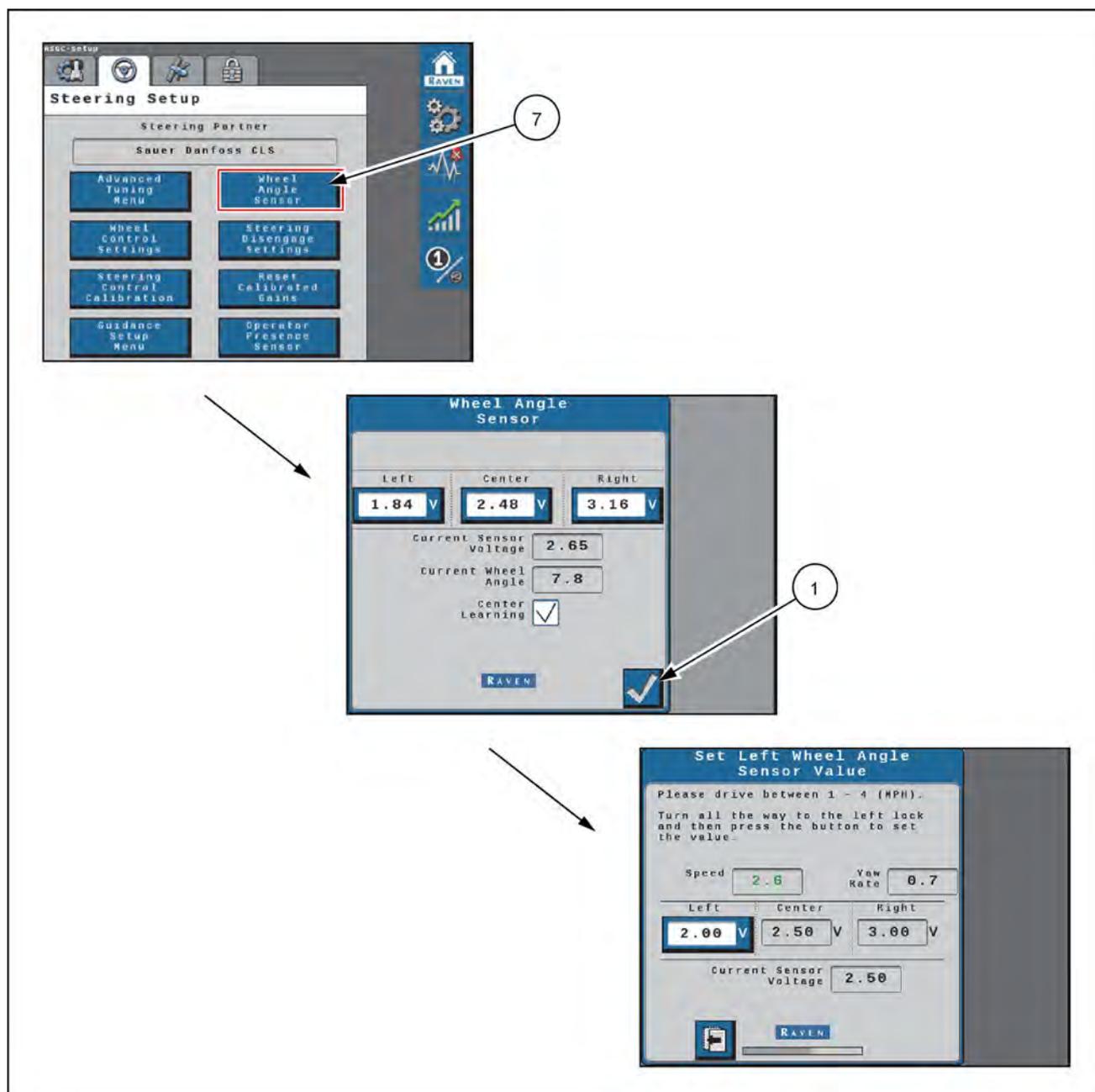
Guidance Mode – Displays the guidance modes:

- Raven Field Computer – Guidance is performed via GPS guidance points only.
- Vision - Guidance is performed via the **VSN®** camera only. GPS corrections are neither utilized for guidance nor available as a fall-back solution. Line acquisition must be performed manually. When the solution quality falls below the minimum threshold, the steering system will disengage.
- Vision+ - Guidance is performed via a combination of GPS and the **VSN®** camera. This mode can be utilized for line acquire via GPS with the system switching to the **VSN®** camera when the machine is aligned and near the guidance line. This mode will also fall back to GPS guidance if the solution quality falls below the minimum threshold. The system will then return to **VSN®** guidance automatically when the solution quality is above the minimum threshold.

Skip LA When Row Guidance Quality High – When enabled, the system will not attempt to line-acquire when the quality from the **VSN®** system is above the set threshold.

3. Select the Accept button in the lower right-hand corner of the screen to return to the Steering Setup tab.

Wheel angle sensor settings



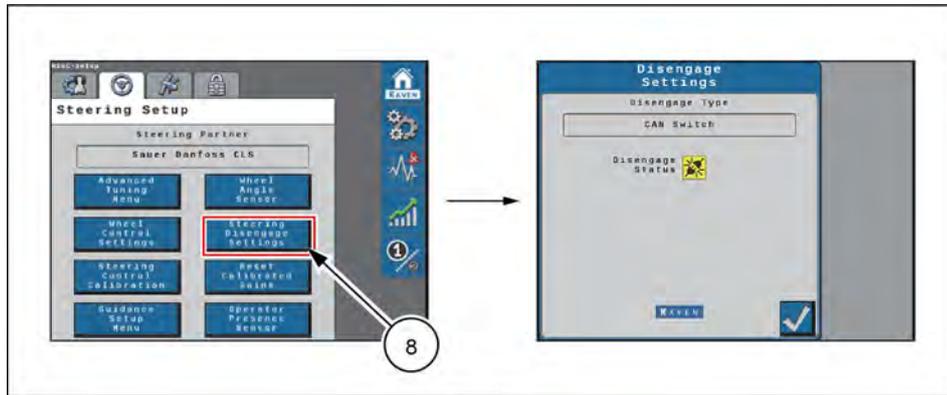
NHIL22PLM0173GA 9

To access Wheel Angle Sensor (WAS) settings:

1. From the **SC1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the "Wheel Angle Sensor" button (7). The following information and settings are displayed on the page:
 - Left/Center/Right – Displays the current calibration values. Complete the following steps to adjust or tune the WAS.
 - Current Sensor Voltage – Displays the sensor voltage detected during calibration.
 - Current Wheel Angle – Displays the WAS angle detected during calibration.
 - Center Learning – When selected, the center learning option the system will continuously correct its calibrated center position while the machine is steering straight ahead.
3. Drive the machine forward at **2 – 6 km/h (1 – 4 mph)**.
4. Manually turn the steering wheel to the left-hand steering lock, right-hand steering lock, or center position to drive straight ahead.

5. Select the “Left”, “Center”, or “Right” box as appropriate to the steering wheel position.
6. Select the Accept button (1) to save the new value.
7. When the calibration is complete, select the Accept button in the lower right-hand corner of the screen to return to the Steering Setup tab.

Steering disengage settings



NHIL22PLM0174EA 10

Steering Engage/Disengage settings screen

To access steering disengage settings:

1. From the **SC1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Steering Disengage Settings” button (7). The following information is displayed on the page:

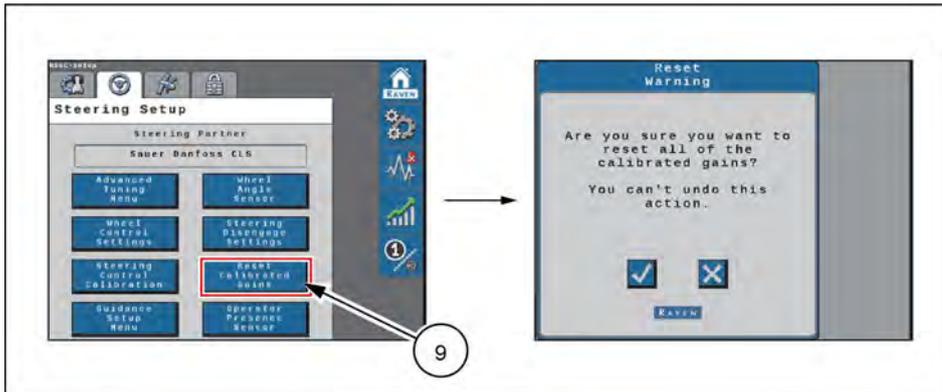
Disengage Type – Displays the type of disengage switch calibrated with the auto-steering system.

Disengage Status – Indicates the status of the disengage switch. The disengage status will display:

- Green – The disengage switch is detected and the steering wheel is not moving. The **SC1™** system may be engaged when this status is displayed.
- Red – The disengage switch is detected and the steering wheel is moving. The **SC1™** system may not be engaged when this status is displayed.
- Yellow – No disengage switch is detected in the system. Turn the steering wheel to activate the disengage switch. If the disengage switch is not activated, check cabling for loose or missing connections.

3. Select the Accept button in the lower right-hand corner of the screen to return to the Steering Setup tab.

Reset calibrated gains



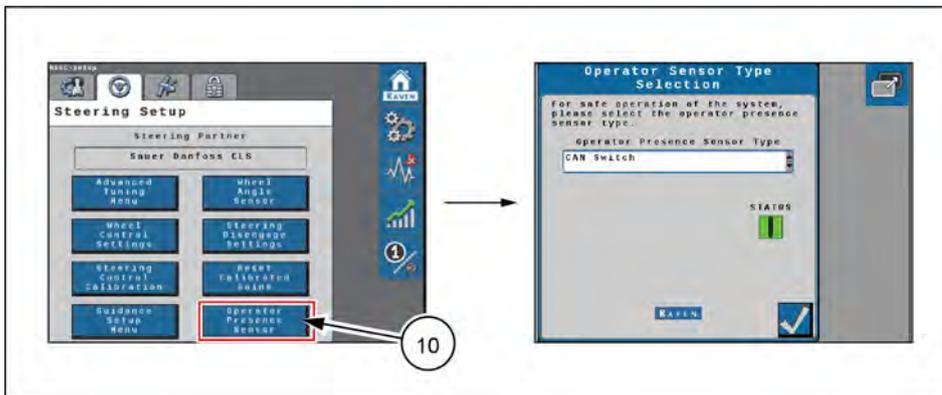
NHIL22PLM0175EA 11

Reset calibrated gains screen

To reset the **SC1™** system to factory defaults:

1. From the **SC1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Reset Calibrated Gains” button (9).
3. Review the warning prompt and select the Accept button to reset the **SC1™** system to a factory condition. Select the Cancel button to keep the current system configuration and return to the Steering Setup tab.

Operator presence sensor



NHIL22PLM0176EA 12

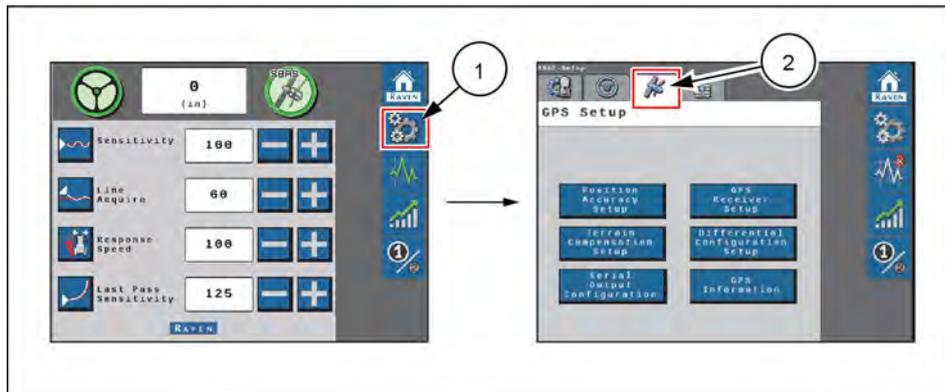
To access the operator presence sensor type:

1. From the **SC1™** home screen, select the Settings Menu button.
2. Select the Steering Setup tab and the “Operator Presence Sensor” button (10).

Make sure that the operator presence sensor type is set to “CAN Switch”.

GPS settings in the SC1™

Configure GPS in the SC1™



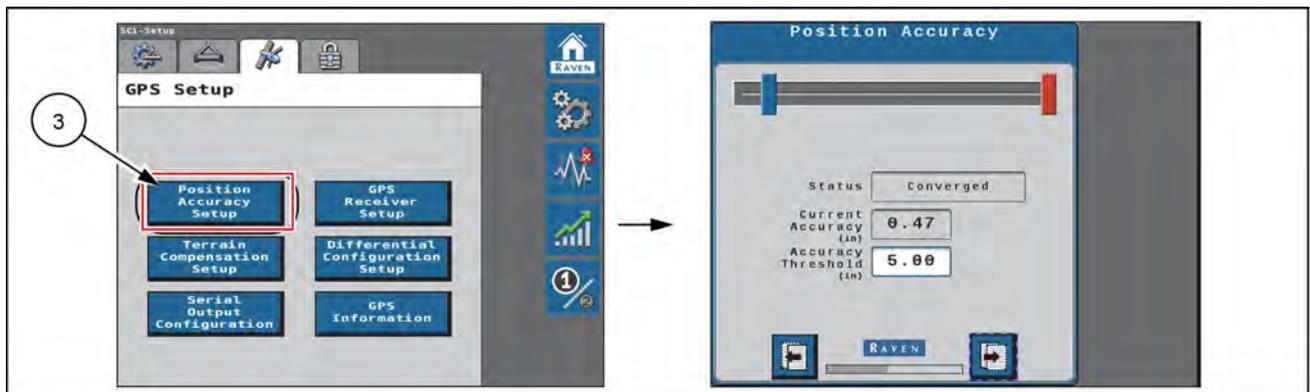
NHIL22PLM0178FA 1

To access GPS Setup options:

1. From the **RS1™** home screen, select the Settings Menu button (1).
2. Select the GPS Setup tab (2).

Select one of the buttons on the GPS Setup screen to access additional options.

Position accuracy setup



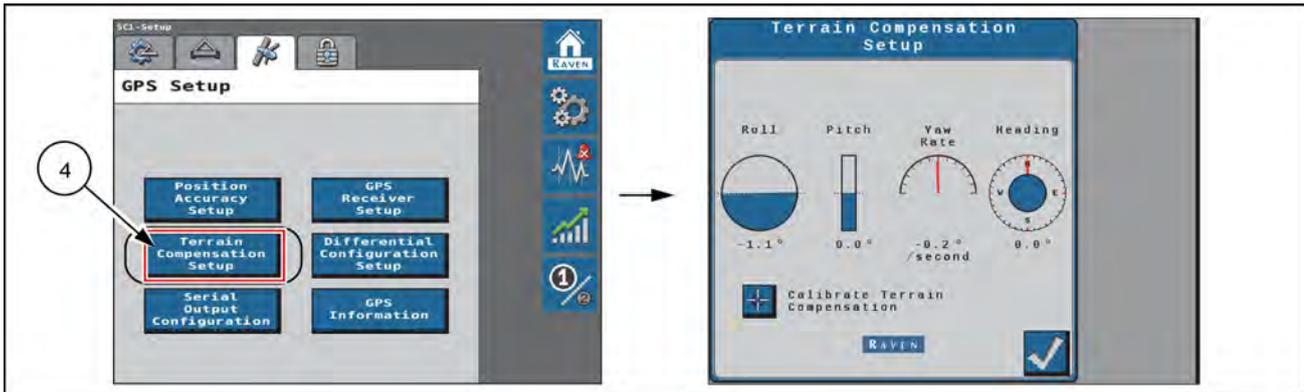
RAIL21TR02809EA 2

Select the “Position Accuracy Setup” button (3). The following options are available:

- Status – Displays the status of the GPS solution. Statuses that may be displayed in this area include:
 - No Signal
 - Error
 - Converging
 - Converged
- Current Accuracy – Value displayed is the horizontal standard deviation reported by the GPS receiver.
- Accuracy Threshold – This value dictates the distance from which the machine GPS position may deviate from the current accuracy position. If the GPS solution falls outside the set accuracy threshold, a fault code will be displayed into the “Diagnostic Trouble Code” screen. The accuracy threshold will be populated with a default value.

Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

Terrain compensation setup



RAIL21TR02810EA 3

Select the “Terrain Compensation Setup” button (4). The following information and functions are shown:

- Roll, Pitch, Yaw Rate, and Heading – Real-time measurement data used by the 3D terrain compensation feature.
- Calibrate Terrain Compensation – Begins the terrain compensation process.

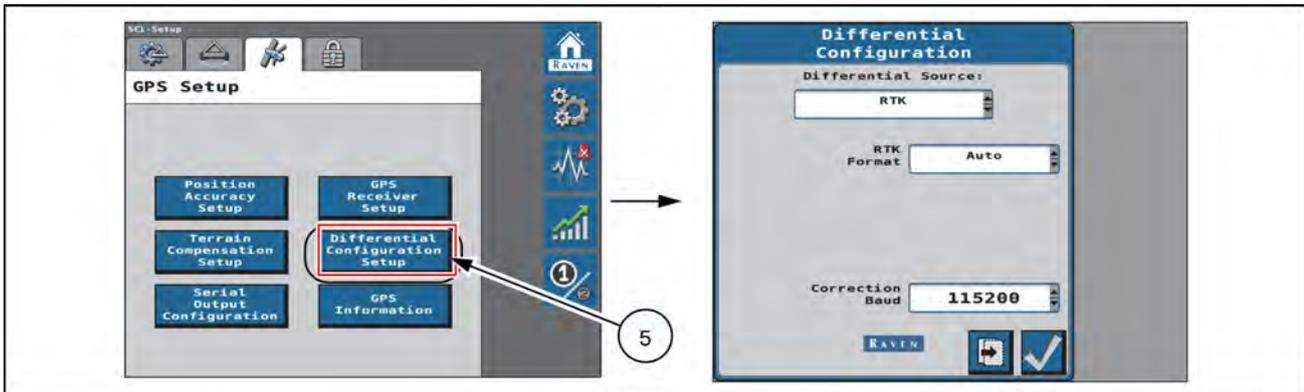
Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

GPS receiver setup screen

Use the “GPS Receiver Setup” screen to configure the type of receiver connected to the **SC1™** system.

- In order for the **SC1™** to receive the position from the **VectorPro** receiver, you must select “Receive Only”.
- The **VectorPro** receiver must also be set to output the correct **NMEA 0183®** serial messages for operation. Position output is configured through the **Pro 1200** display. For more information, see “Configure serial output for the SC1™ controller” (4-81).

Differential configuration screen



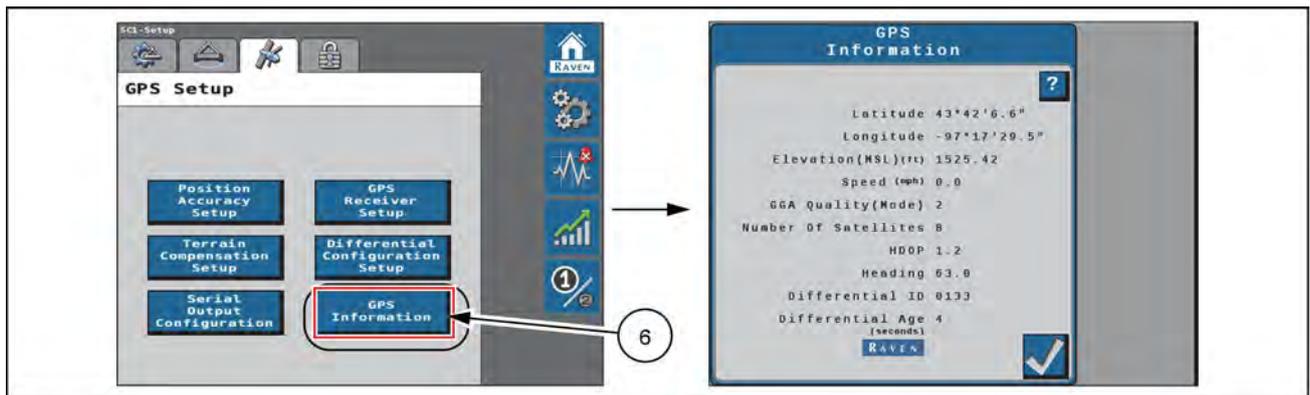
RAIL21TR02812EA 4

Select the “Differential Configuration Setup” button (6). The drop-down list to select your correction source is shown, along with additional information about that correction source. The following differential correction sources are available:

- GL1DE®
- Satellite-Based Augmentation System (SBAS)
- Satellite GS
- Real-Time Kinematic (RTK)

NOTE: Depending on the number of feature unlocks purchased, all options may not be available for selection. Contact your local dealer to purchase additional unlock codes.

GPS information



RAIL21TR02813EA 5

Select the "GPS Information" button **(6)**. The following information is shown:

- Latitude – The angular distance of a place north or south of the earth equator.
- Longitude – The angular distance of a place east or west of the meridian at Greenwich, England.
- Elevation (MSL) – The height of the antenna in reference to sea level.
- Speed – Current speed based on GPS measurements.
- GGA Quality (Mode) – The current convergence state of the GPS receiver.
 - 0 = No data received.
 - 1 = Single solution, no differential corrections being received.
 - 2 = When the receiver has locked onto a differential source and formed a solution (SBAS or GS-Lite fixed solution or converging with Satellite GS).
 - 4 = RTK fixed mode.
 - 5 = Fixed solution for Satellite GS differential source or RTK Float.
- Number of Satellites – The number of satellites currently in view by the GPS receiver.
- HDOP – Horizontal Dilution of Precision. If all of the satellites in view are from the same direction, the number will be higher and the accuracy will be reduced.
- Heading – The machine direction of travel.
- Differential ID – The ID of the differential source used to obtain the solution.
- Age of Differential – Time (in seconds) since the last differential correction was received. If a differential source is not currently tracked this entry will be " - - - -".

Select the Accept button in the lower right-hand corner of the screen to return to the GPS Setup tab.

GPS Settings in the Viper® 4+ display

GPS information and diagnostics

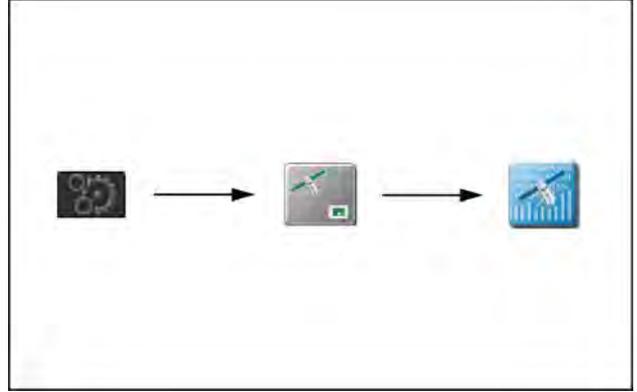
The Global Positioning System (GPS) solution information should be configured in the **Viper® 4+** display for use in mapping and task controller operations.

GPS solution information

Press the settings icon **(1)** on the bottom of the screen. The Settings menu opens.

Locate and select the GPS module **(2)**. The GPS Global Settings prompt appears.

Select the GPS Diagnostics button **(3)** to the right of the desired GPS receiver. The GPS Solutions Information page **(D)** appears.



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Select the radio button **(1)** next to the “NMEA2000” option.



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The table below outlines the information shown for the current GPS solution on this screen:



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| | |
|--|---|
| Latitude/Longitude | The current geographic coordinates of the receiver. |
| Elevation | The current GPS elevation above sea level. |
| Satellites | Displays the number of satellites currently used in the position solution. |
| Differential ID | Depending upon the correction source used, this value will display the differential source identification such as the differential satellite PRN, a base station ID, etc. Some correction sources will not populate this field. |
| Differential Age | This value is the age of the last differential update. The differential age should not rise above a few seconds to ensure accurate position corrections during field operations depending on correction type. |
| HDOP | Horizontal Dilution of Precision (HDOP) is a value indicating the geometry of the satellites used in the position solution. Lower values indicate better positioning of the used satellites. |
| Global Positioning System Fix Data (GGA) Quality | Displays the current differential fix status. This value will display: <ul style="list-style-type: none"> • '0' or '1' if no differential corrections are being received, single solution. • '2' when the DGPS receiver has locked on to a differential source. These are Satellite Based Augmentation System (SBAS) satellites or converging with GS corrections). • '4' for RTK fixed mode for fine GPS course correction mode. • '5' for fixed GS or RTK float mode. |
| UTC Time and Date | Universal coordinated time and date information is displayed in these fields (Greenwich Mean Time). |
| Messages | Displays what NMEA® messages are being received by the Viper® 4+ display and the frequency at which they are being received. |

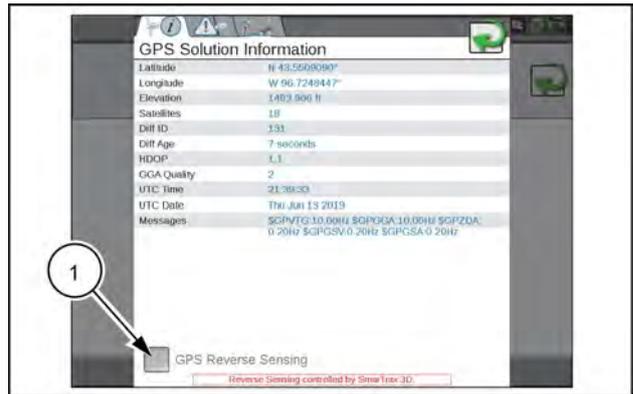
Enable GPS reverse sensing

The GPS reverse sensing feature may be enabled if the **Viper® 4+** display will be used to map application or field coverage where the vehicle may be traveling in reverse (i.e. backing into corners).

To allow the **Viper® 4+** display to automatically detect when the vehicle is traveling in a reverse direction, press the “GPS Reverse Sensing” check box **(1)**.

When reverse movement is detected during field operations, the device will maintain the vehicle indicator orientation when the system detects that the machine is moving in reverse.

NOTE: If this feature is disabled, the guidance display will assume all vehicle motion is in the forward direction. When the reverse sensing feature is enabled, the **Viper® 4+** display may require the operator to manually override the current direction of travel during field operations. Before beginning field operations, see “Widget selection and setup” (3-20) and “Widget definitions” (3-22) and make sure that the appropriate widgets for this feature are available on the guidance screen(s) as appropriate. The Forward Override widget is required to manually override the direction of travel during a field operation.



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View current GPS warnings

Information may be available for current GPS warning or alarm conditions as encountered by the **Viper® 4+** display.

NOTE: Warning information displayed by the **Viper® 4+** display only applies to corrections transmitted to the device. If using an external receiver, corrections may be received by the external equipment, but not transmitted to the **Viper® 4+** display. Check cable connections and verify communication settings before troubleshooting the correction source.



Press the tab to access the current GPS warnings. Any active warnings or alarm conditions will be displayed on the current warnings prompt. This tab will also display possible solutions for the current warning or alarm conditions to assist with troubleshooting or correcting the current condition.

Configure the correction source for the Viper® 4+ display

NOTE: This selection does not configure the receiver for position solutions during field operations. Selecting an option other than the correction type used during field operations may cause the **Viper® 4+** display to indicate GPS status incorrectly.

When using the **VectorPro** receiver for a differential correction solution, you must set the type of correction source that will be supplied to the **Viper® 4+** display. This setting allows the **Viper® 4+** display to help monitor status of GPS corrections during field operations.

VSN® visual guidance setup (if equipped)

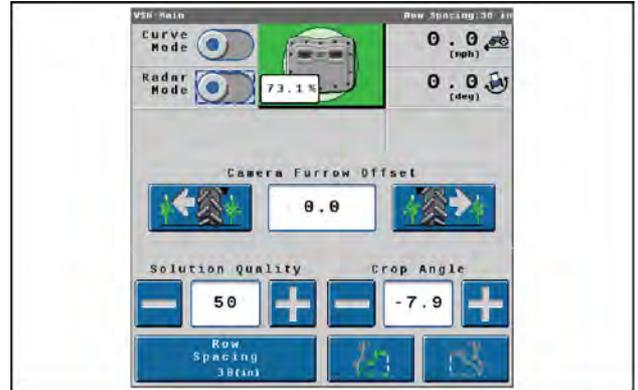
Overview

NOTE: Your display was configured at the factory with the settings for your machine.

VSN® home screen

When coupled with the **Viper® 4+** display and **RS1™** or **SC1™** steering system, **VSN®** is designed to offer hands-free steering of agricultural sprayers.

This section is intended to assist with the proper calibration and operation of the **VSN®** system.



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Calibration wizard

Calibration: VSN® camera and equipment

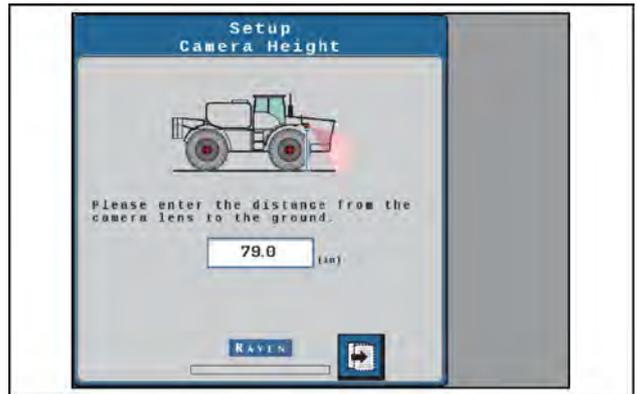
Camera measurements

NOTE: For best results, take all measurements in operating conditions and measure to the nearest **6.35 mm (0.25 in)**. To reset or adjust the machine calibration, the **VSN®** system must be reset to factory defaults.

1. Use the Machine Type drop-down menu to select the "Rear Boom Sprayer" option.
2. Use the Machine Make and Model drop-down menu to select your machine.

NOTE: If your machine make or model is not listed, select the *Generic* option.

3. Confirm the default camera height value. Measure the height of the camera lens to the bottom of the furrow.
4. If required, press the value box and use the on-screen keypad to enter the camera height value.
5. Select the Next button.



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| Machine model | Height |
|---------------|-------------------|
| Patriot® 3250 | 2007 mm (79.0 in) |
| Patriot® 4350 | 2082 mm (82.0 in) |
| Patriot® 4450 | |

- Confirm the default fore/aft value. Measure the distance from the rear axle of the vehicle to the camera lens.

NOTE: A positive value means the camera is located in front of the rear axle.

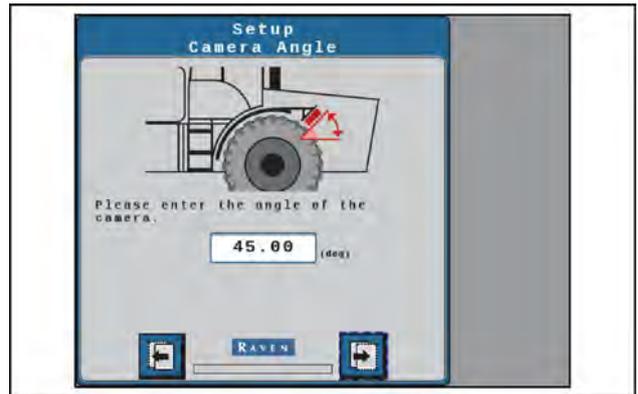
- If required, press the value box and use the on-screen keypad to enter the camera fore/aft value.
- Select the Next button.

| Machine model | Fore/aft |
|---------------|--------------------|
| Patriot® 3250 | 5063 mm (199.3 in) |
| Patriot® 4350 | 5316 mm (209.3 in) |
| Patriot® 4450 | |



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- Confirm the pitch (tilt) of the camera from horizontal. The default value for all machine models is 45°.
- Select the Next button.



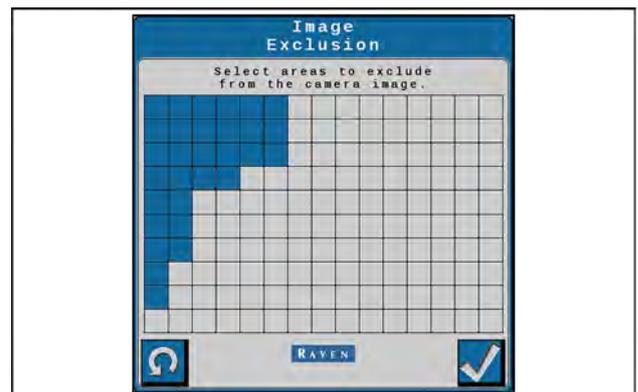
RAIL21TR02953AA 3

- Confirm the default wheelbase value. Measure the distance between the front and rear axles of the machine and enter the measurement as the wheelbase.
- If required, press the value box and use the on-screen keypad to enter the wheelbase value.
- Select the Next button.

| Machine model | Wheelbase |
|---------------|--------------------|
| Patriot® 3250 | 3810 mm (150.0 in) |
| Patriot® 4350 | 4064 mm (160.0 in) |
| Patriot® 4450 | |

Image exclusion

- Select areas to exclude from the camera image. For example, if part of the machine is in sight of the camera, exclude this area to avoid issues with row guidance.
- Select the Next button and proceed to the Radar Sensors section to proceed with calibration wizard.



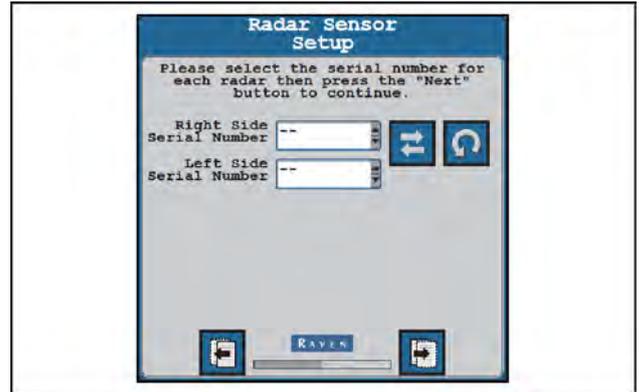
RAPH22PLM0298AA 4

Radar sensors (if equipped)

1. Use the Left and Right Side drop-down lists to select the serial number of the radar sensor mounted on the left and right wheel.

NOTE: Press the Flip Left/Right button to flip the entered values for the left and right radar sensors. Press the Refresh button to re-detect the radar sensors connected to the system.

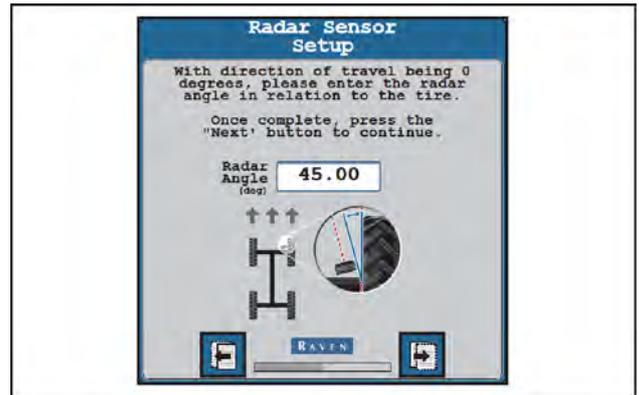
2. Select the Next button.



RAIL21TR02961AA 5

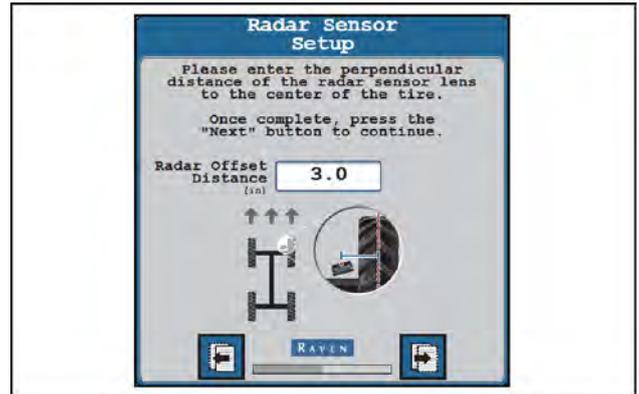
3. Measure the angle of the radar sensors. This angle is measured using the direction of forward vehicle travel as 0°.

NOTE: The factory radar brackets are designed to mount the radar sensors at a 45° angle with the forward course over ground. Enter the radar sensor angle as a positive value.



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4. Enter the offset from the center of the tire to the radar sensor lens.
5. Select the Next button.



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Calibration summary

1. The Calibration Summary page will be displayed after all camera and machine settings have been entered.
2. To complete the Machine Calibration and save the displayed settings, select the check mark button.
3. See "Row spacing preset calibration" (4-116) to continue with the calibration wizard.



RAIL21TR02964AA 8

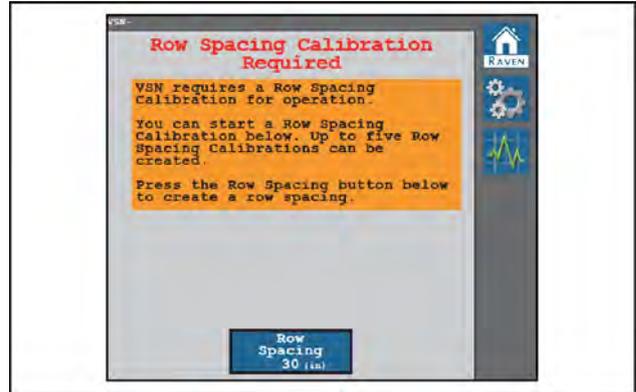
Calibration: VSN® row-spacing preset

Complete the following steps to calibrate a row spacing preset on the VSN® system.

NOTE: Up to five row spacing presets may be saved with the VSN® system.

1. Select the Row Spacing button to proceed with the calibration process.

NOTE: If your sprayer is equipped with radar sensors, VSN® may be run in a radar only mode. If no radar sensors are installed, a row spacing calibration will need to be completed before the VSN® camera may be used for row guidance.



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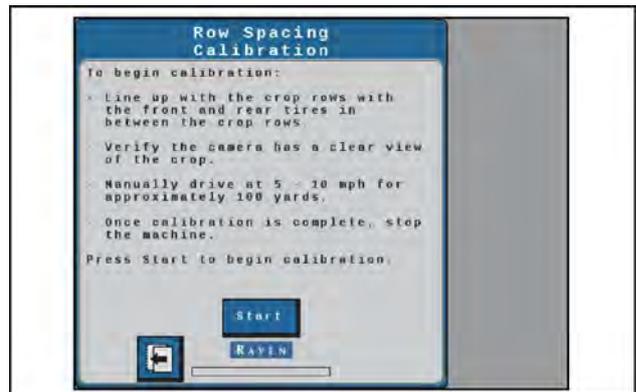
2. Enter the row spacing of the crop (in inches [cm]) in which the VSN® steering system will be used.
3. Enable the Radar Only option to bypass the Row Spacing Calibration.

NOTE: If the Radar Only option is enabled, the system will skip the following calibration steps and the row sensor source will be locked to radar sensors. This option may be useful when completing the calibration in full canopy or late season crops where the VSN® system may encounter lower visual solution qualities. See "Home screen" (5-38) for assistance with VSN® operation in the Radar Only mode.



RAIL21TR02966AA 2

4. Select the Next button.
5. Review the calibration instructions on-screen before selecting the Start button to begin the calibration.



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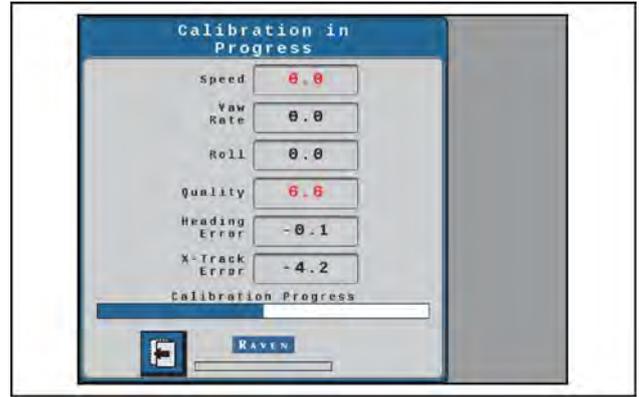
- Drive slowly down the row while steering the machine manually. Drive at a speed of **8 – 16 km/h (5 – 10 mph)**. After approximately **91 m (100 yd)**, the calibration process will be complete.

NOTE: The **VSN®** camera needs to be calibrated in a flat field with straight rows. A good calibration is extremely important to good steering performance.

NOTE: Values displayed in red during the calibration process indicate an issue with the calibration parameters and may cause the calibration to stop or require the calibration to be restarted.

To successfully complete calibration, the following values will be required:

- Yaw rate must remain below **2.5°** per second.
 - Roll must be less than **2°**.
 - Quality must be above 50.
- Bring the machine to a complete stop.
 - Review the Camera Calibration Results page. To complete the calibration and save the displayed values, select the check mark button.



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RAIL21TR02969AA 5

VSN® system settings and tuning

Machine settings tab

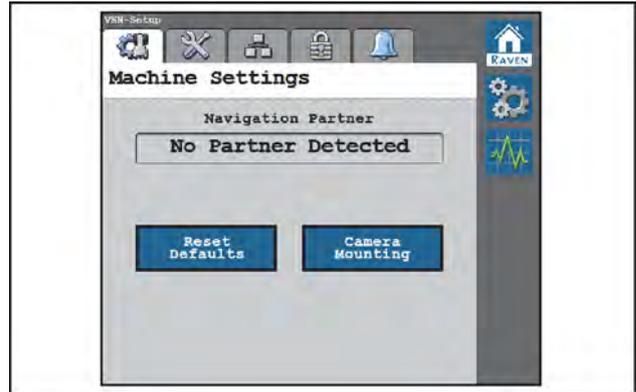
The following buttons will be used to navigate the settings and option pages in the following sections and will be referenced while offering assistance with the settings menus and options available for tuning the **VSN®** system.

| | |
|--|--|
| | Accept – Saves the changes made to the VSN® system at the end of the setup process and returns the to the Tools Menu. |
| | Next – Saves the changes made to the VSN® system and proceeds to the next step in the setup process. |
| | Previous – Returns the Universal Terminal (UT) display to the previous screen in the setup process. |

Machine settings tab

Navigation partner

Displays the navigation controller to which the **VSN®** system is communicating.



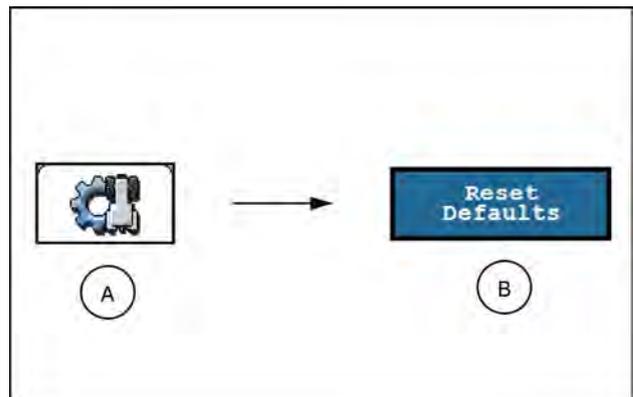
RAIL21TR02974AA 1

Reset defaults

To restore system default settings:

Go to the Machine Settings screen **(A)** and press the Reset Defaults **(B)** button to clear stored row spacing presets and re-calibrate the system. Accepting the confirmation will restore the **VSN®** back to factory default settings.

NOTE: See “Camera and equipment calibration” (4-113) and “Row spacing preset calibration” (4-116) for additional assistance with calibrating the **VSN®** system and completing the calibration wizard after resetting the system defaults.

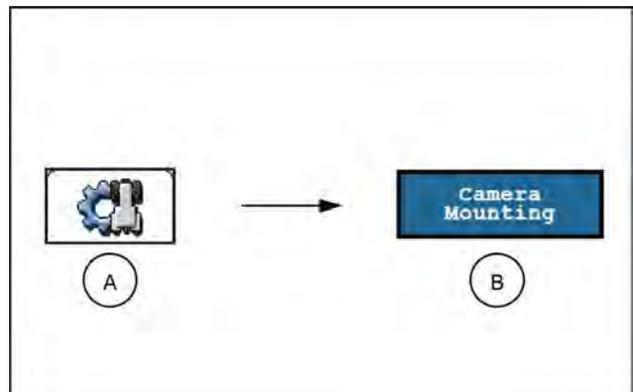


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Camera mounting

The “Camera Mounting” button **(B)** window is accessible via the Machine Settings **(A)** screen.

The Camera Mounting screen allows you to view camera mounting settings and measurements



RAIL21TR03731AA 3

NOTE: A factory reset will be required to change or adjust the camera mounting settings.

The following information is shown:

Camera Fore/Aft – Distance from the **VSN®** camera lens to the rear axle. A positive value indicates the camera is positioned in front of the rear axle.

Camera Height – Distance from the **VSN®** camera lens to the bottom of the furrow.

Camera Angle – Pitch of the camera from horizontal.

Wheel Base – Measurement between the front and rear axle.

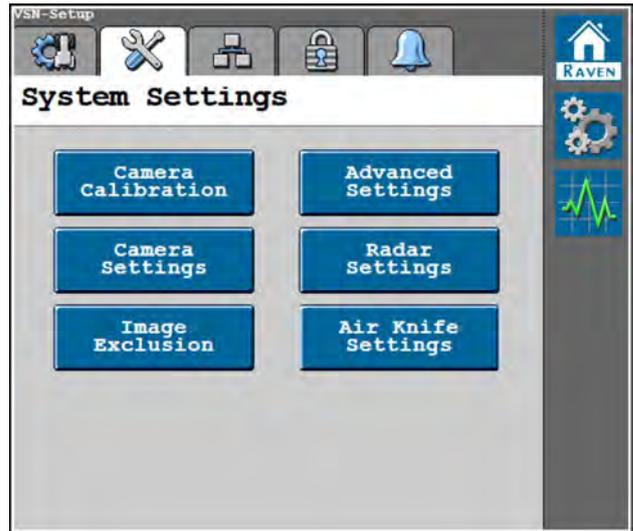


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System settings tab

The System Settings screen allows you to access:

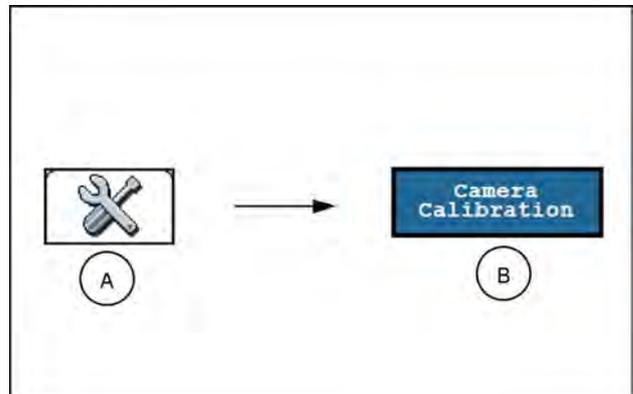
- Camera Calibration
- Camera Settings
- Advanced Settings
- Radar Settings (if equipped)
- Image Exclusion
- Air Knife Settings
-



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Camera calibration

The “Camera Calibration” button (B) window is accessible via the System Settings screen (A).



RAIL21TR03732AA 2

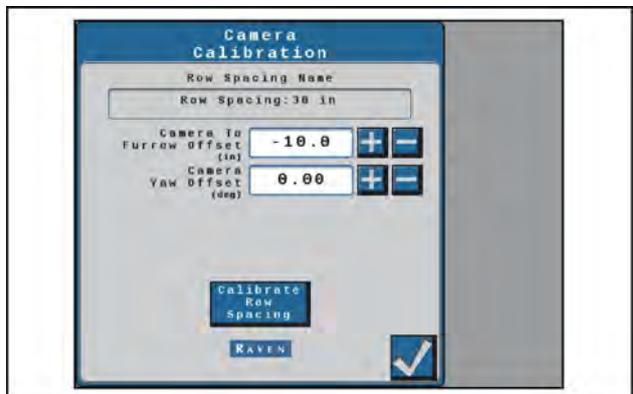
The following options and information are available:

Row Spacing Name – Displays the currently selected Row Spacing Preset.

Camera to Furrow Offset – Displays the distance from the right-hand camera lens to the center of the nearest furrow bottom. This distance value is calculated during the row spacing preset calibration procedure. Use the + and - buttons to fine tune the tire-to-furrow position to center the tire in the furrow.

Camera Yaw Offset – Displays the calibrated camera Yaw offset value. This value can be tuned to help account for any camera left or right heading alignment errors.

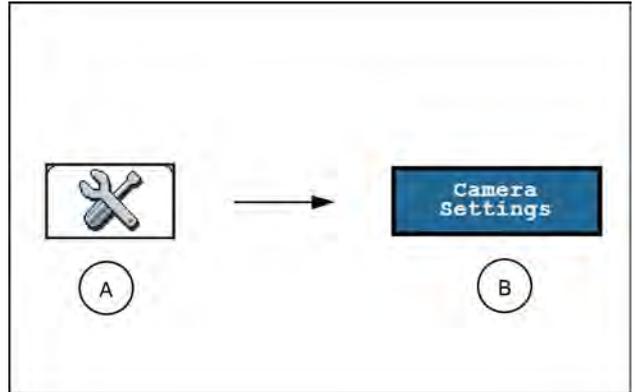
Row Spacing Calibration – Press the Calibrate Row Spacing button to re-calibrate the row spacing preset outside of the preset calibration wizard.



RAIL21TR02977AA 3

Camera settings

The Camera Settings screen (B) window is accessible via the System Settings screen (A).



RAIL21TR03733AA 4

Camera settings page

The following options and information are available:

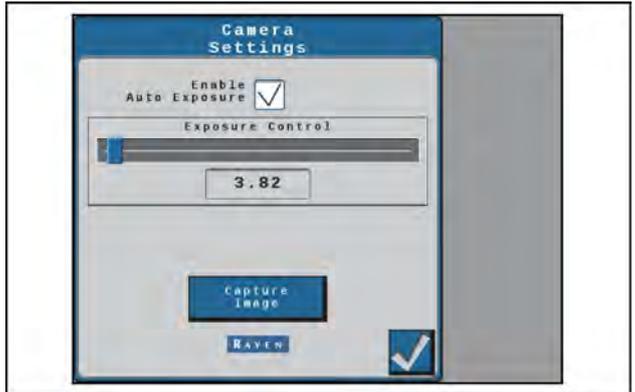
Enable Auto Exposure – Automatically determines the correct exposure for video without any user input. Disable this option to manually adjust camera exposure.

NOTE: Auto exposure is enabled by default and it is recommended to allow the VSN® system to automatically adjust exposure during operation.

Exposure Control – Determines how much light is allowed to reach the VSN® sensor and adjusts how light or dark the image appears. The correct exposure allows optimal contrast for system performance.

NOTE: It is not recommended to manually adjust the exposure control value.

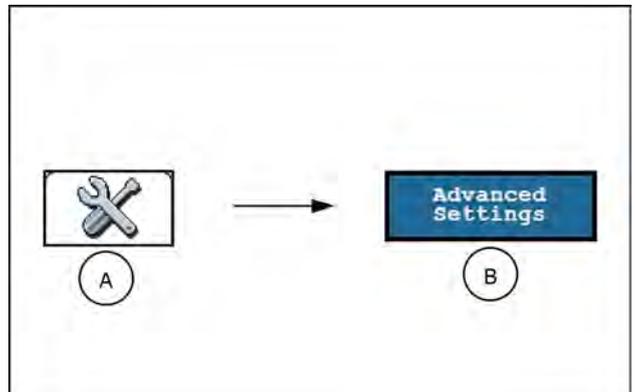
Capture Image – Press the “Capture Image” button to save a still image of the current VSN® camera view. The image will be saved on the VSN® system and may be used by support personnel to troubleshoot potential field issues.



RAIL21TR02978AA 5

Advanced settings

The Advanced Settings (B) window is accessible via the System Settings screen (A).



RAIL21TR03734AA 6

The following options are available:

Filter Level – This setting controls the noise level in the guidance errors sent onto the Controller Area Network (CAN) bus from **VSN®**. A lower setting has less filtering and lower latency. A higher setting has more filtering and more latency.

NOTE: The default value for the filter level is 2. It is only recommended to adjust this setting with the support of a technician.

Quality Warning Offset – The threshold above the row detection quality (shown on home screen) at which the operator will be notified that the solution quality from the **VSN®** system has dropped to into a caution state. This value is editable.

NOTE: For example, if the row detection quality is set to 50 and the quality warning offset is set to 10, the **VSN®** icon will be in a caution (yellow) state when the row detection quality is between 50 and 60.

Side Hill Compensation – Provides additional compensation to adjust for guidance errors due to machine roll.

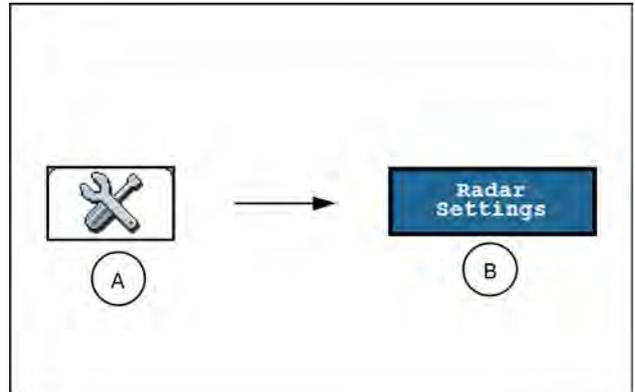
NOTE: Side hill compensation is enabled by default and it is recommended to leave this option selected.



RAPH22PLM0300AA 7

Radar settings (if equipped)

The Radar Settings (**B**) window is accessible via the System Settings screen (**A**).



RAIL21TR03735AA 8

The following options are available:

Right/Left Side Serial Number – Use the drop down options to set the orientation of the radar sensors on the machine.

Radar Angle – Set the horizontal angle of the radar sensors. This angle is measured using the direction of forward vehicle travel as 0°.

NOTE: The factory radar brackets are designed to mount the radar sensors at a 45° angle with the forward course over ground. Enter the radar sensor angle as a positive value.

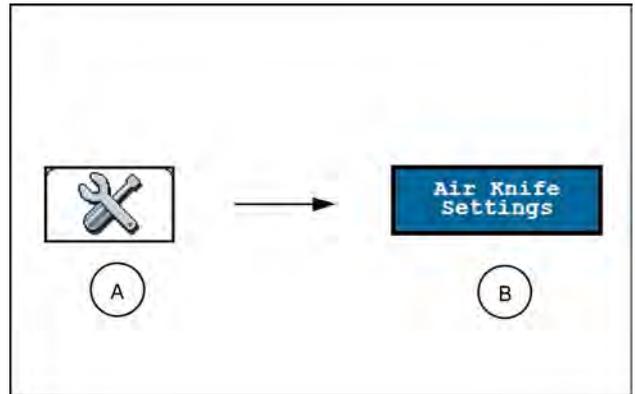
Radar Offset Distance – The offset distance from the centerline of the tire to the radar sensor lens.



RAIL21TR02980AA 9

Air knife settings (if equipped)

Air knife settings (B) window is accessible via the System Settings screen (A).



NHIL23PLM0164AA 10

The following options are available:

Air Knife Installed (toggle on/off)

Air tank pressure reading (read only) – A pressure above **552 kPa (80 psi)** is required for the air knife to function.

NOTE: If the machine struggles to maintain a pressure above **552 kPa (80 psi)**, adjust the duration frequency, and check the air system for leaks.

Air blast duration (seconds) – When the machine is applying product, the air blast will be active for the duration defined in this setting. The allowable range is 1 to 9 seconds, with a default value of 5 seconds.

Air blast frequency (seconds) – When the machine is applying product, the air blast will activate on the frequency defined in this setting. The allowable range is 10 to 60 seconds, with a default value of 45 seconds.

NOTE: The air knife will only trigger automatically when steering is engaged.

Press the start button (1) to perform a manual test with the configured settings.

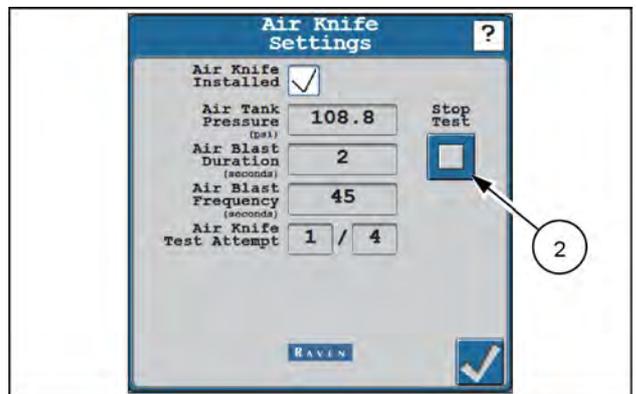
During a manual test of the air knife feature, the system will perform four cycles of the air nozzle based on the duration and frequency that was configured on this screen.

NOTE: During the manual test, the duration and frequency values are locked and cannot be changed.

Press the stop button (2) to stop the manual test while the test is in process.



NHIL23PLM1677AA 11



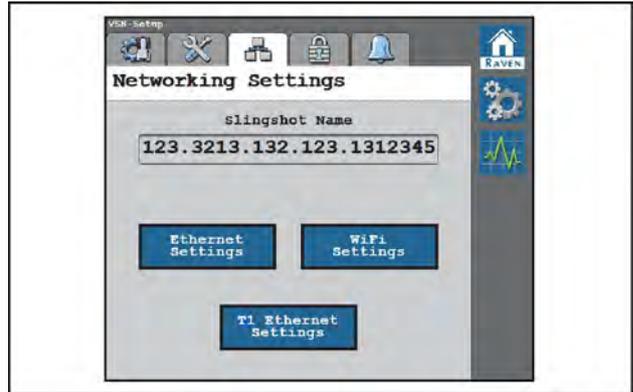
NHIL23PLM1678AA 12

Network settings tab

The Networking Settings screen allows you to access:

- Ethernet Settings
- T1 Ethernet Settings
- WiFi Settings

The registered name of the **VSN®** system on the **Sling-shot®** portal is also shown.



RAIL21TR02982AA 1

Ethernet settings

Press the Ethernet Settings button to review the Internet Protocol (IP) address assigned to the **VSN®** system and the current link speed.

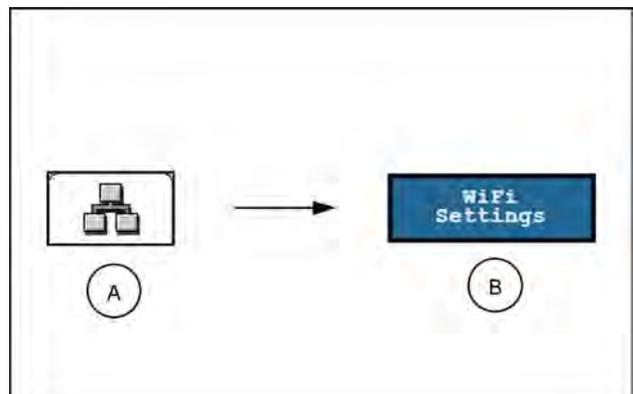


RAIL21TR02983AA 2

WiFi settings

The WiFi Settings **(B)** window is accessible via the Networking Settings screen **(A)**.

Press the WiFi Settings button to review all WiFi Networks available to the **VSN®** system. The network to which **VSN®** is currently connected will be displayed with a green check mark next to the name.



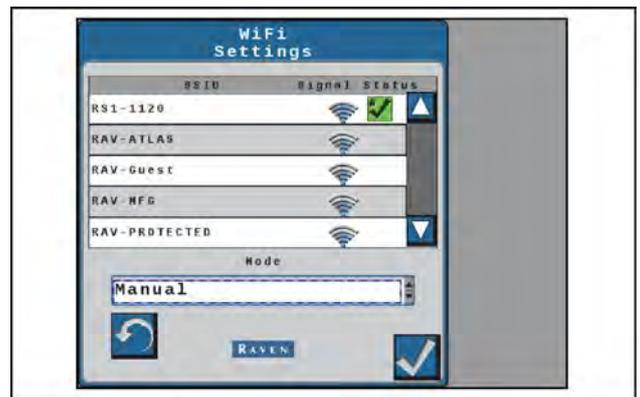
RAIL21TR03737AA 3

Select "Raven Auto" to allow **VSN®** to automatically connect with the devices on your machine.



RAIL21TR02984AA 4

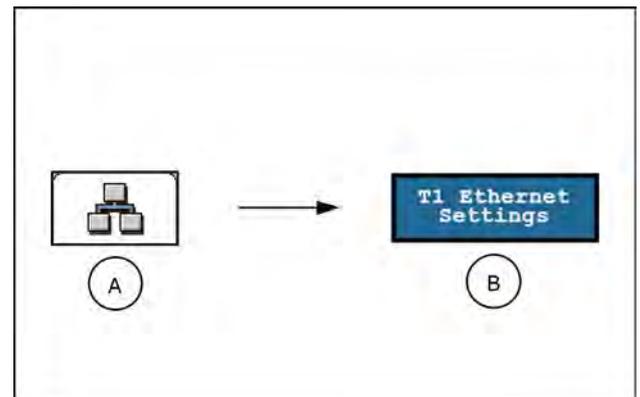
To manually configure the WiFi network, select "Manual" from the Mode drop down list to display a list of available WiFi networks. The network to which **VSN®** is currently connected will be displayed with a green check mark next to the name.



RAIL21TR02985AA 5

T1 Ethernet settings

The T1 Ethernet Settings (**B**) window is accessible via the Networking Settings screen (**A**).



RAIL21TR03738AA 6

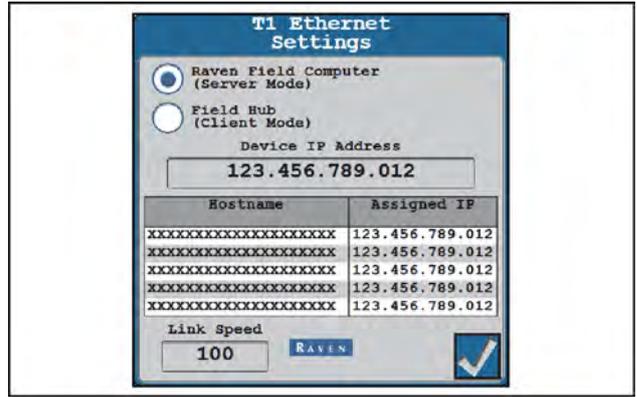
The following options and information are available:

Raven Field Computer (Server Mode) – Allows other devices to connect to the **VSN®**.

Field Hub (Client Mode) – Allows the **VSN®** to connect to another device via wireless Internet.

Device IP Address – Displays the IP address the **VSN®** has received (via Field Hub) or the IP address of the **VSN®** broadcast (via Server Mode).

Link Speed – Displays the fastest data rate for all devices connected via ethernet cable. The value is measured in megabits per second (MB/s).



RAIL21TR02986AA 7



RAIL21TR03001AA 8

5 - OPERATION

Guidance operation with Viper® 4+

AB guidance utilities and nudge features

Guidance patterns overview

The following sections provide information on using **Viper® 4+** display guidance utilities to set and manage AB guidance paths during field operations.

Straight (AB) line



The straight (A-B) line pattern is well suited for operations within rectangular fields and straight swaths.

The straight line, or parallel, pattern is created by drawing a straight line through two user defined points (A and B). After A and B points are set, the **Viper® 4+** display uses the programmed equipment width and the original path to calculate parallel guidance paths for the rest of the coverage area.

As long as the straight (A-B) line pattern is active and the original path is available, the **Viper® 4+** display will display the nearest path regardless of previous application history or coverage mapping. See “Setting guidance paths” (5-4) for assistance with setting and using the AB utilities with the straight line pattern.

Pivot



The pivot pattern is designed to provide guidance within a field with a center pivot, or circle, irrigation system.

The pivot pattern is created using two user defined points on the circumference, or swath furthest from the irrigation hub, of the field area. The pivot pattern does not require the entire circumference of the field to be driven before beginning guidance; however, best results are generally achieved by driving further along the initial swath when creating a pivot guidance pattern.

As long as the pivot pattern is active and the original path is available, the **Viper® 4+** display uses the programmed equipment width to calculate concentric circular paths stepping toward the center of the field area regardless of the previous application history or coverage mapping. See “Setting guidance paths” (5-4) for assistance with using the AB utilities with the pivot guidance pattern.

Fixed contour



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.

The fixed contour pattern is created by setting the first, or “A,” point and driving the first full swath before setting the second, or “B,” point. The **Viper® 4+** display will then connect points recorded along the first swath and displays the fixed contour path.

As long as the fixed contour pattern is active and the original path is available, the **Viper® 4+** display uses the initial swath and programmed equipment width to calculate contours for the rest of the coverage area nearest path regardless of previous application history or coverage mapping.

NOTE: Curvature of the fixed contour guidance path should not be too aggressive. Overly aggressive curves may produce undesirable results.

See “Setting guidance paths” (5-4) for assistance with using the AB utilities with the fixed contour guidance pattern.

Last pass

Features and uses



The Last Pass mode applies product around the headlands of a field, in U-shaped areas, and circular patterns. The last pass mode creates a guidance path based on previous coverage in a field. Every **2 s**, the last pass mode searches for a piece of coverage (previously applied area) in order to maintain the guidance path.

Enhancement

Depending on the shape or location in the field, last pass could cause the guidance path to “bounce” between two pieces of coverage. When using auto-steering, the machine would attempt to stay on the now “bouncing” guidance line, causing the machine to hard weave from side to side. This typically occurred in situations where two areas of previous coverage were close together, such as valleys and the very last pass of a field. Last Pass has been enhanced to now cause the current pass to tether to an anchor point along the previous pass. It looks approximately **40 m (131 ft)** ahead and behind the anchor point to maintain the tether, keeping the current pass from jumping to another nearby piece of coverage.

When not to use last pass

Do not use the last pass mode while making swaths back and forth across a field. The last pass pattern can often cause what is referred to as “line straightening” or “line smoothing.” Line straightening/smoothing occurs when the guidance path gradually loses the contour from the previous pass, resulting in gaps in coverage. Use Last Pass - Swathing for these situations.

Last pass swathing

Features and uses



Last pass swathing makes passes back and forth across a field. After turning roughly **30 – 45°**, the system assumes the machine is turning around for the next swath in the field. A dynamic fixed contour line is created after a turn, which enables the guidance path and the machine to hold tighter to the previous coverage. The line is also extended out approximately **40 m (131 ft)** at the beginning and end to help with leading in and out of the headlands. These line extensions also help auto-steering by allowing the machine to acquire the line earlier.

The line will not disappear as long as the center of the machine is within one-half of a swath width. After one-half of a swath width, it will search for another piece of good coverage. The refresh button can be used to clear the line and cause guidance to search for another good piece of coverage. For example, use the refresh button when switching from making north/south passes to making east/west passes. Driving one-half of a swath width away from the current line will also work in this situation.

NOTE: Using the refresh button or driving one-half of a swath width away from the line will not create the line extensions. The line extensions will not display until the following pass.

When not to use last pass swathing

Last pass swathing (Last Pass 2) is not meant for headlands, U-shaped areas, or circular patterns. Use the a last pass pattern for these situations.

Multi line coverage



Multi-line coverage is a guidance pattern type in which multiple already created guidance lines are loaded in at the same time. When loaded, the guidance system will attempt to lock onto a nearby line and steer the machine to the detected line until the user attempts to steer to an alternative line.

If multi-line is selected, it is recommended to check the box next to the “Show extra lines” option. This shows the multiple lines of coverage. The guidance pattern should switch automatically, but the user can manually switch the guidance pattern by using the rightmost option in the selection group.

Each line in the multi-line file has an associated line number determined from the file. The swath count widget displays the associated line number of the currently tracked line.

NOTE: Multi-line files are shape files (.shp and .shx) which can be imported from a USB thumb drive using the same method as other guidance line types. For more information on importing files from a USB thumb drive, see “Import Guidance Lines” in “USB import manager” (7-47).

Setting guidance paths

Setting guidance paths



The AB Utilities widget will be required to set and manage AB guidance paths during field operations. See “Widget selection and setup” (3-20) to add the AB utilities widget to a screen layout before performing the following procedures.

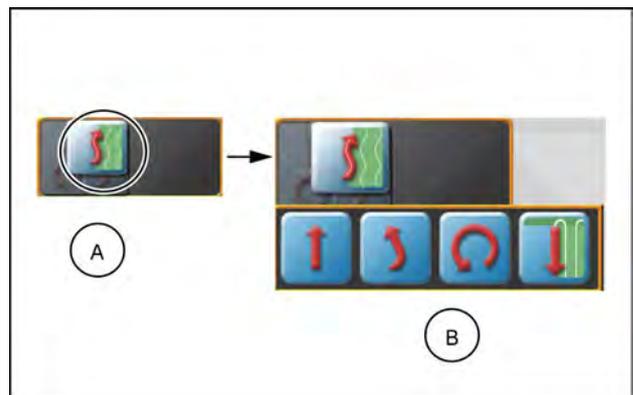
NOTE: The AB Utilities widget may also be used to access nudge features and tools. See “Nudge features and tools” (5-9) for assistance with using AB guidance nudge during field operations.

To select a guidance pattern

NOTE: The last pass mode is enabled and set by default when starting a job without selecting a saved guidance path. See “Starting a job” (4-40) for assistance with configuring job settings or setting up a job profile.

To select a guidance pattern:

1. Press the guidance pattern button (A).
2. Select the desired pattern (B).

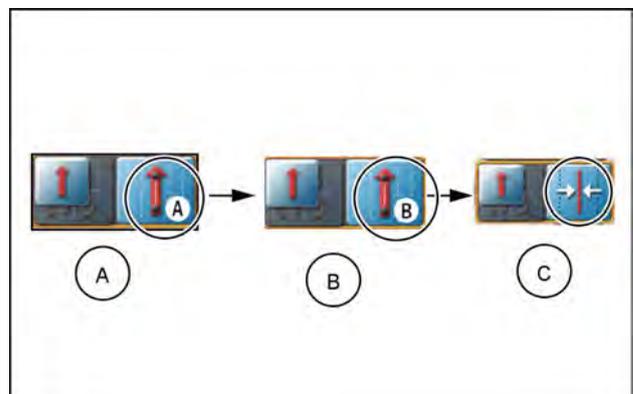


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Set a straight (AB) line

To set a new straight AB line guidance path:

1. Press the Set A button (A) on the AB Utilities widget.
2. Begin driving the first swath. While the Viper® 4+ display may allow the second point to be set before driving the full swath, best results are generally achieved by driving further along the initial swath before setting the B point.
3. Press the Set B button (B).
4. If needed, press the recalibrate button (C) to move the guidance line to the current position.



RAIL21TR03973AA 2

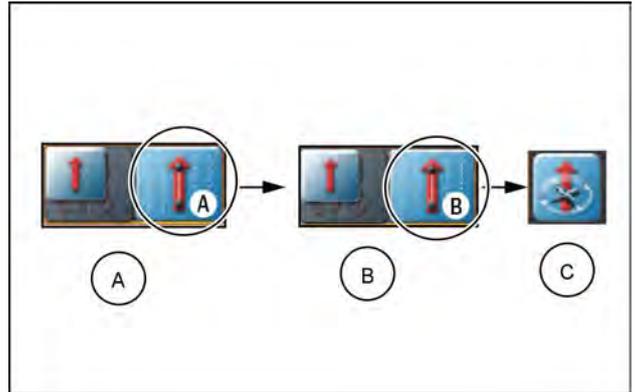
Setting straight line guidance using a heading

To set a new straight AB line guidance path using a compass heading:

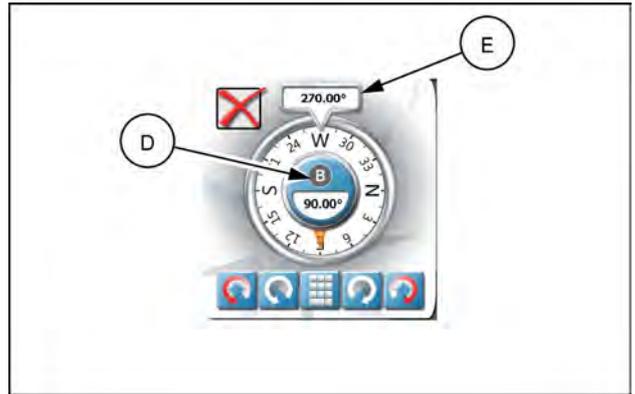
1. Press the Set A button **(A)** on the AB Utilities widget.
2. Press the Pattern Type button.
3. Select the Straight A-B by heading button.

NOTE: There is no minimum distance between A and B points when setting an AB line using a heading.

4. Press the Set B by Heading button **(C)** to display the Set B by Heading prompt.
5. Use the course setting options along the bottom of the prompt to adjust the value displayed as the selected heading.
6. Press the Set B button **(D)** in the middle of the compass display to set the guidance path using the selected heading.



RAIL21TR03974AA 3

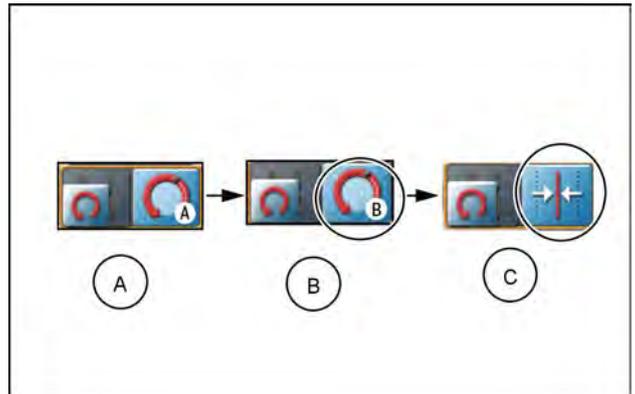


RAIL21TR04095AA 4

Set a pivot line

To set a new pivot guidance path:

1. Press the Set A button **(A)** on the AB Utilities widget.
2. Begin driving the first swath. While the **Viper® 4+** display may allow the second point to be set before driving the full swath, best results are generally achieved by driving further along the initial swath before setting the B point.
3. Press the Set B button **(B)**.
4. If needed, press the Recalibrate button **(C)** to move the guidance line to the current position.

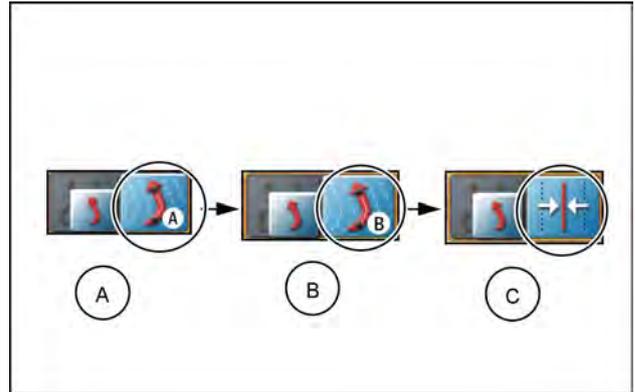


RAIL21TR03975AA 5

Set a fixed contour line

To set a new fixed contour guidance path:

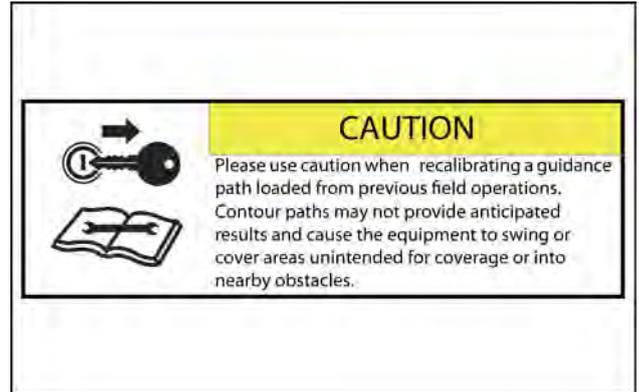
1. Press the Set A button **(A)** on the AB Utilities widget.
2. Begin driving the first swath. When creating a fixed contour path, the **Viper® 4+** display will require that the full swath length be driven to plot points along the swath.
3. At the end of the swath, press the Set B button **(B)**.
4. If needed, press the Recalibrate button **(C)** to move to the current position.



RAIL21TR03976AA 6

Re-calibrate AB guidance path

The “Recalibrate Guidance Path” feature is intended to be used to reset an existing guidance path to the current vehicle position to correct for issues such as GPS drift. This feature may also be useful to adjust an AB guidance path for use with an implement with a different width than the implement used to record the path.



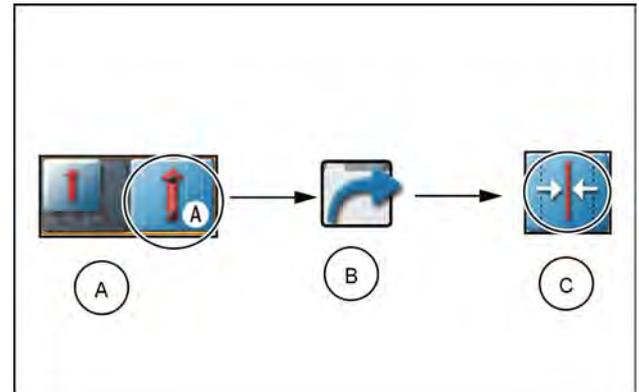
RAIL21TR02939AA 7

To clear the current AB guidance path:

1. Tap the AB Utilities widget (A) to display the swath tools prompt.
2. Press the More button (B) to access the “Nudge and Swath” prompt.

NOTE: The nudge features are also available on the “Nudge and Swath” prompt. See “Nudge features and tools” (5-9) for assistance with using AB guidance nudge during field operations.

3. Select the “Recal” button (C). The AB path resets to the center of the configured vehicle swath.



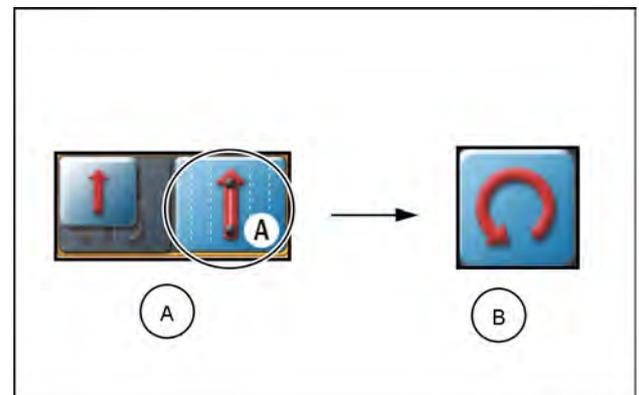
RAIL21TR03977AA 8

Reset AB guidance path

Multiple AB paths may be used during a field operation as desired for field guidance. Before a new AB guidance path may be created during a field operation, the existing AB path must be cleared.

To clear the current AB guidance path:

1. Tap the AB Utilities widget (A).
2. Press the Reset button. (B).



RAIL21TR03978AA 9

Saving guidance paths

Saving an AB guidance path allows the line to be assigned to a job profile or selected when setting up for a field operation.

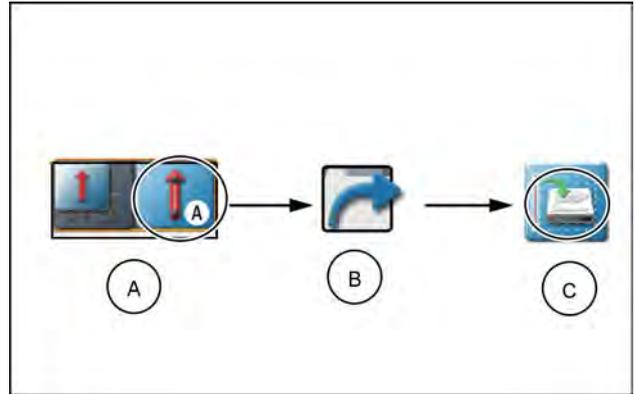
NOTE: Only the active AB guidance paths will be saved. Last pass paths will not be stored by the Viper® 4+ display.

To save the displayed guidance path:

1. Tap the AB Utilities widget (**A**) to display the swath tools prompt.
2. Press the “More” button (**B**) to access the nudge and swath prompt.

NOTE: The nudge features are also available on the Nudge and Swath prompt. See “Nudge features and tools” (5-9) for assistance with using AB guidance nudge during field operations.

3. Select the Save button (**C**).
4. Press the Name field to the right side of the Save Guidance Line screen and use the on-screen keyboard to create a new guidance path or select an existing guidance path to replace.



RAIL21TR03979AA 10

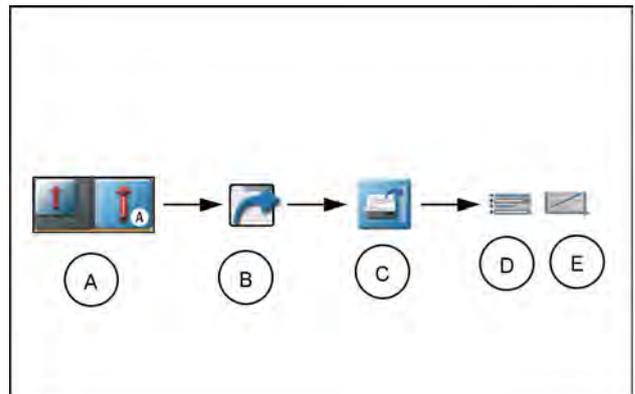
Loading a saved guidance path

To load a guidance path into the current field operation:

1. Tap the AB Utilities widget (**A**) to display the swath tools prompt.
2. Press the More button (**B**) to access the nudge and swath prompt.

NOTE: The nudge features are also available on the Nudge and Swath prompt. See “Nudge features and tools” (5-9) for assistance with using AB guidance nudge during field operations.

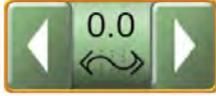
3. Select the Load button (**C**).
4. Select either the path list or path map tab to locate and select the desired guidance path to be loaded.
5. Select the path from the list (**D**) or on the map (**E**) and press the Done button to load the selected path into the job for the current field operation.



RAIL21TR03980AA 11

Nudge features and tools

The nudge feature allows an operator to make small or incremental adjustments to a guidance path during field operations. This feature is designed to allow the equipment operator adjust the guidance path to keep the implement running between rows or inside tramlines.



The **Viper® 4+** display offers two nudge feature widgets to match how frequently the nudge feature may be used, or what nudge information is needed, during various field operations.



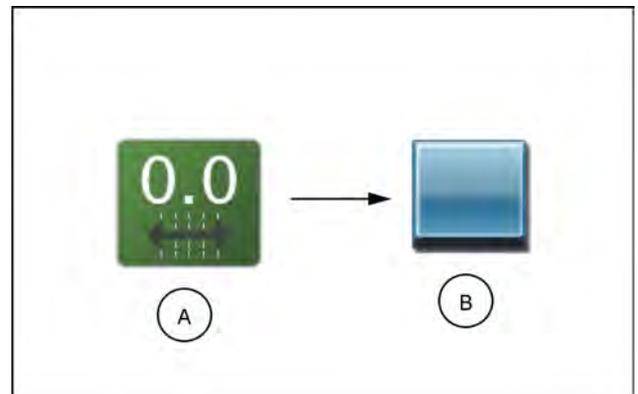
See “Widget selection and setup” (3-20) to add a widget to a screen layout before performing the following procedures.

NOTE: The nudge widgets also provide to access to some AB guidance tools. See “Setting guidance paths” (5-4) for assistance with using these AB guidance tools during field operations.

Configuring nudge values

To configure nudge distance setting for use during field operations:

1. Press and hold the Nudge widget **(A)** to access the Nudge and Swath prompt.
2. Tap the Unit Toggle button **(B)** to the right of the Nudge 1 or Nudge 2 to select the desired measurement for the nudge distance.
3. Press the Nudge 1 or Nudge 2 value and use the on-screen keypad to set the nudge distance.



RAIL21TR03981AA 1

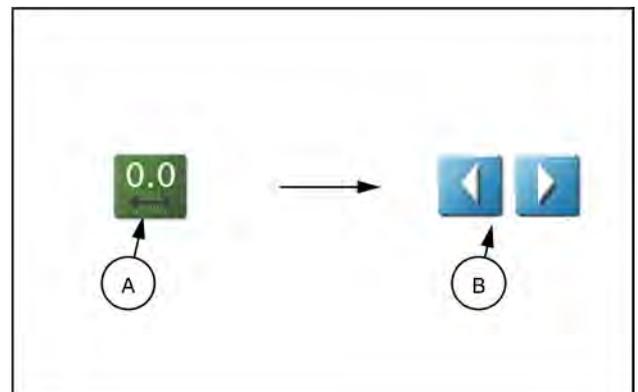
Activating and using nudge

To activate a nudge distance and adjust an AB guidance path during a field operation:

1. Press and hold the Nudge widget **(A)** to access the Nudge and Swath prompt.
2. Tap the Nudge 1 or Nudge 2 button along the left side of the prompt to select the active nudge distance.
3. Press the Nudge Left or Right button **(B)** to adjust the displayed guidance path by the active nudge distance.

NOTE: If using the nudge arrow widget, tap the left or right arrows on the widget to adjust the displayed guidance line by the active nudge distance right from the guidance view or mode.

4. The Status area on the on-screen widget will display the nudge distance and direction applied the guidance path currently displayed.

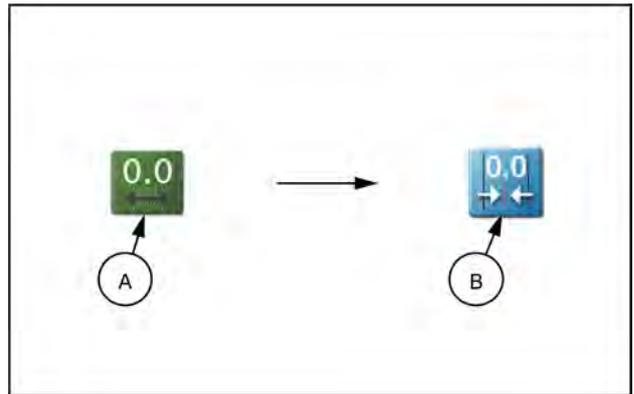


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Reset nudge

To remove any nudge distance applied to the current AB guidance path:

1. Press and hold the Nudge widget (**A**) to access the Nudge and Swath prompt.
2. Select the Reset Nudge button (**B**) to remove all nudge adjustments currently applied to the displayed guidance path.



RAPH22PLM0330AA 3

AutoTurn™

Feature overview

NOTE: The **AutoTurn™** feature is an unlocked feature. For information on unlocking features, see “Unlocked features and activation” (7-32).

NOTE: Installing the **VSN®** feature automatically unlocks the **AutoTurn™** feature.

The **AutoTurn™** feature aids in automatic headland turning, allowing the machine to automatically turn itself to the next swath when approaching boundaries.

In order for the **AutoTurn™** feature to function correctly, ensure:

- The current job has a defined field boundary. See “Scout groups overview” (5-15) for more information on field boundaries.
- GPS is enabled and functioning.
- Guidance width is set up and accurate.

The **AutoTurn™** feature is currently compatible with:

- Straight AB mode.
- Fixed contour mode.
- AB-Heading mode.



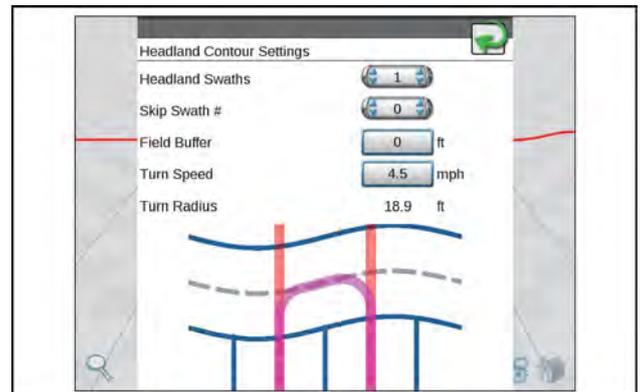
The **AutoTurn™** widget is divided into three buttons:

1. Pressing the unselected arrow will change the turn direction.
2. Pressing the middle button will enable/disable the **AutoTurn™** feature. Pressing and holding this button will open the configuration dialog window.
3. Pressing the selected arrow will increase the number of skip swaths by one.

Configuration options

ATTENTION: The “Turn Radius” feature must be checked before operation to ensure no harm is inflicted on any machine or equipment.

1. Headland Swaths. This determines the number of swaths that will be used on the headlands.
 - The **AutoTurn™** feature assumes that the operator wants to reduce crop run-over and target the most inner swath for the turn.
 - Utilizing more than one swath reduces the chance of a boom tip exceeding the boundary or hitting a fence line.
2. This is the number of swaths that will be skipped when driving down the headland.
 - A value of “0” indicates that the operator will turn back into the field for the very next swath.
 - A value of “1” indicates that the operator will drive past one swath, then turn back into the field, skipping the swath to be filled later (if applicable).
 - Up to four skip swaths are available.



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3. Field Buffer. This allows the user to add an additional buffer zone away from the boundary so that the boom tips do not approach the fence line.
4. Turn Speed. This determines the target speed at which the tractor will turn.
 - The faster the target speed, the larger the arc.
 - The slower the target speed, the smaller the arc.
5. Turn Radius must be checked and verified before operation to ensure there is no harm done to any machine or equipment.

AutoTurn™ status widgets

These widgets will indicate **AutoTurn™** status:

| Image | Description |
|---|------------------------------------|
|  | Configuration Needed |
|  | Turn Planned |
|  | Turn in Progress |
|  | Not Unlocked |
|  | Too Fast for Current Turn |
|  | Distance to Turn and Current Speed |
|  | Unable to Find Turn |
|  | Manually Disabled |
|  | Possible Error Statuses |

Field mapping

Important safety notes

CAUTION

When operating with an automatic section control system or feature with the **Viper® 4+** display:

- Always toggle the master switch to the off position and keep bystanders clear of all equipment when using the scout group manager during a field operation.
The **Viper® 4+** display may activate sections or control system hardware immediately if a scouting feature is added or removed from the selected scout group.
- Use caution when loading or copying scout groups or features during an active job with an automatic section control system or feature in use with the **Viper® 4+** display.
Toggle the vehicle or implement master switch off when loading section groups to avoid activating sections in areas not intended for application or coverage.

Scout groups overview

The **Viper® 4+** display saves features such as field and zone boundaries, scouting lines, or flags as components of a scout group. Each job may utilize multiple scout groups or features may be copied from one scout group to another to complete various phases of a field operation.

The following sections are intended to assist with using the **Viper® 4+** display to perform scouting functions such as recording field boundaries, zone maps, or marking various field areas for future reference.

Scouting widget



The scouting widget is required to record scouting features during field operations. See “Widget selection and setup” (3-20) to add the scouting widget to a screen layout before performing the following procedures.

Scouting features

The following features may be recorded and stored with scout groups on the **Viper® 4+** display:

Field Boundaries – Boundaries allow the operator to mark the field perimeter or outline the field area. If an optional section control system is enabled for field operations, the field boundary will also create a basic zone map for the field. Refer to the calibration and operation documentation for the optional section control system or contact a local CASE IH dealer for additional assistance with setting up or using section control features with the **Viper® 4+** display.

NOTE: To review the field boundaries, go to the field review mode and press anywhere in the field boundary to view the field boundary acres.

Spray and Plant Zones – Zone map features may be used to assign areas of a field to zones designated for coverage or no-coverage.

If the optional automatic section control system is enabled, the **Viper® 4+** display will reference the zone map for section control features during the field operation. Refer to the calibration and operation documentation for the optional section control system or contact a local CASE IH dealer for additional assistance with setting up or using section control features with the **Viper® 4+** display.

Scout Zone – Scout zones may be used to mark field areas for future reference or that may require attention. For example, use a scout zone to mark an area that has rocks, flooded areas, or a particularly heavy weed or insect infestation. When recalled in a future job, the operator will be able to find the area using the recorded scout zone. Scout zones will not provide any section control options, but may be useful for reference or to relocate specific areas within a field.

Scout Obstacles – Scout obstacles are very similar to scout zones, and may be used to mark field areas for future reference or that may require attention. However, scout obstacles are sharable via the cloud to any cloud participants. The display treats scout obstacles the same as generic scout zones but they are transferred to the cloud on request and marked as obstacles. Scout obstacles affect path planning.

Scout Line – A scout line may be recorded to mark a swath or dividing line within a field area. Similar to scout zones, a recorded scout line will not provide any section control or guidance options but may be used for reference or to relocate areas within a field.

Flags – Flags may be used to mark a spot in a field and may be used for reference or to relocate a spot within a field.

Boundary Creation – Previously existing coverage can be used to create a field boundary. If coverage already exists around the intended boundary, a field boundary can be created from the coverage, eliminating the need to drive around the field.

Auto-Application Zone – Uses coverage from previous jobs to create a spray/plant zone. The feature draws a no-spray zone box around the coverage from the previous job, and then the auto-application zone is carved out of the box using the coverage of previous jobs. See “Auto-Application Zone (AAZ) feature” (5-22) for instructions on creating and managing auto-application zones.

Scout Object Sharing – Share active field boundaries of scout groups with other cloud job participants. When shared, all field boundaries in the active scout group are uploaded to the cloud and associated with the cloud job. Other participants of the cloud job can view the shared field boundaries in an automatically-created scout group. The shared scout group is automatically named “JobName_sct,” which is the same name for the default scout group. This replaces the default scout group, allowing other cloud job participants to automatically view the shared field boundaries shortly after the originating participant has shared the scout group. Other scout groups may be selected at any time, but will not contain the field boundaries from the shared scout group. See “Scout group manager” (5-18) for instructions on sharing scout objects.

Visual Boundary Conversion – If a work order includes a visual boundary, the user can promote the boundary to a field boundary in the scout widget dialog. If selected, a new field boundary will appear in the active scout group. Visual boundaries have no functionality aside from visual reference, while field boundaries can also be used to control shut-off sections of the boom and can be transferred to the cloud for path planning. See “Automatic and visual boundary” (5-17) for instructions on converting a visual boundary to a field boundary.

Automatic and visual boundaries

Automatic boundary creation

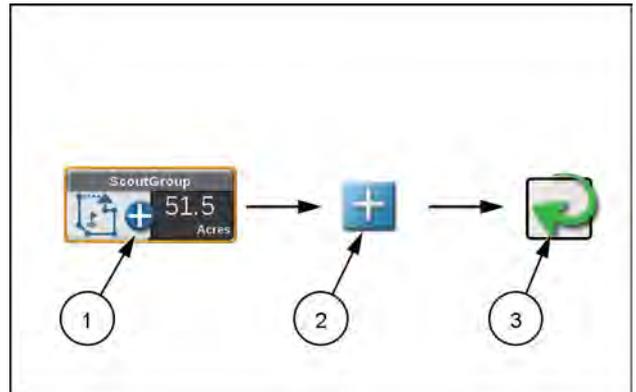
To create a field boundary from previously existing coverage:

1. Tap and hold the Scout Group widget (1) on the Guidance View or Mode.
2. Press the Create Boundary From Coverage button (2).

NOTE: The Viper® 4+ display may take several moments to create the boundary. A status bar will be seen next to the "+" button.

3. The status bar will read "Success" to indicate a successful boundary creation. Tap the Done button (3) to return to the Guidance View or Mode.

NOTE: The generated boundary will follow the coverage exactly.

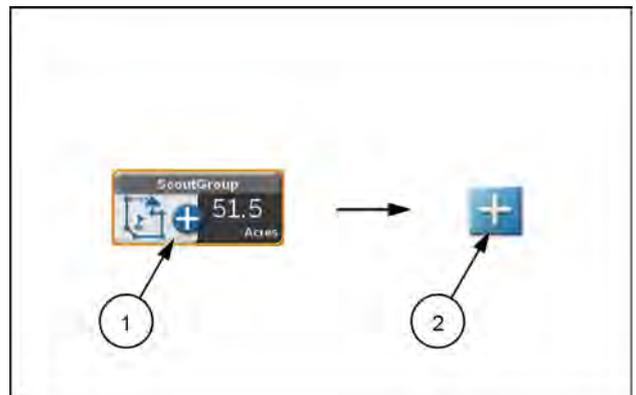


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Visual boundary conversion

To convert a visual boundary to a field boundary:

1. Press the scout group widget (1) in the guidance view.
2. Select the field boundary in the "Scout Feature Type" drop-down menu.
3. Select "Work Order" in the "Create Boundary From" drop-down menu.
4. Press the add button (2). The visual boundary from the work order converts to a field boundary.



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Scout group manager

Refer to the following sections to manage scout groups and group features during field operations.

Create a new scout group

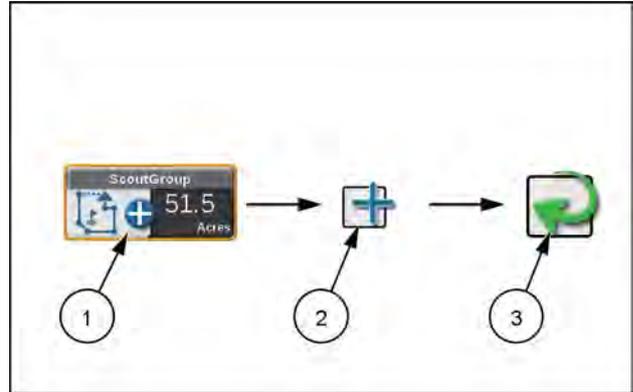
To create a new group for scouting features:

1. Tap the Scout Group widget (1) on the Guidance View or Mode.
2. Press the Add Scout Group button (2).

NOTE: It may be beneficial to identify the scout group with the application or field id.

3. Tap the Done button (3) to return to the Guidance View or Mode.

NOTE: Scout groups may be deleted using the File Maintenance features without an active job in progress on the Viper® 4+ display. See "File manager overview" (7-37) for assistance with using the file manager utilities.



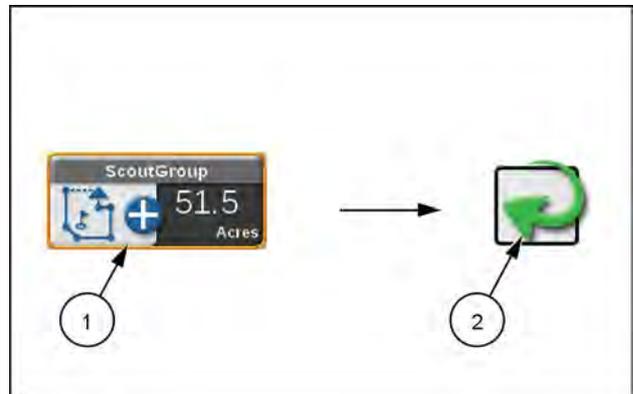
RAIL21TR03985AA 1

Load a scout group

NOTE: Scout groups may be deleted using the File Maintenance features without an active job in progress on the Viper® 4+ display. See "File manager overview" (7-37), for assistance with using the file manager utilities.

To select and load a scout group, and all recorded features within the scout group, into an active job:

1. Tap the Scout Group widget (1) on the Guidance View or Mode.
2. Press the Active Group drop down field and select the Scout Group to load.
3. Tap the Done button (2) to return to the Guidance View or Mode.

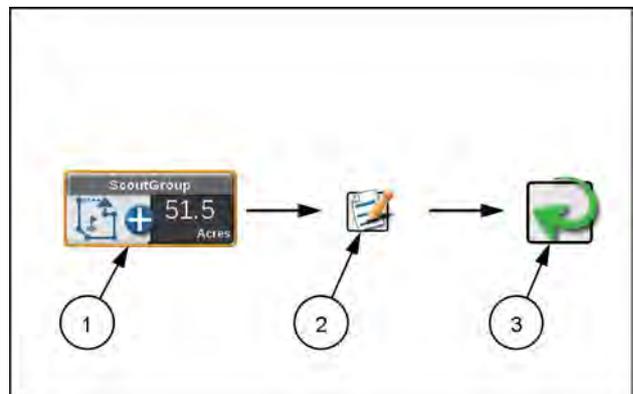


RAIL21TR03986AA 2

Delete a scouting feature

To delete individual scouting features, press the Edit icon to open the Scout Group manager. To delete specific scouting features:

1. Tap the Scout Group widget (1) on the Guidance View or Mode.
2. Set the scout group that contains the specific scout feature from the active groups list.
3. Press the Edit icon (2) to open the Scout Group manager.
4. Press the Delete icon.
5. Tap Done (3) in the upper, right corner of the Scout Group manager prompt to return to the main Scout Group manager.



RAIL21TR03984AA 3

Deleting scouting groups is performed through the File Manager. For information on deleting files, see "Using the file manager" (7-38).

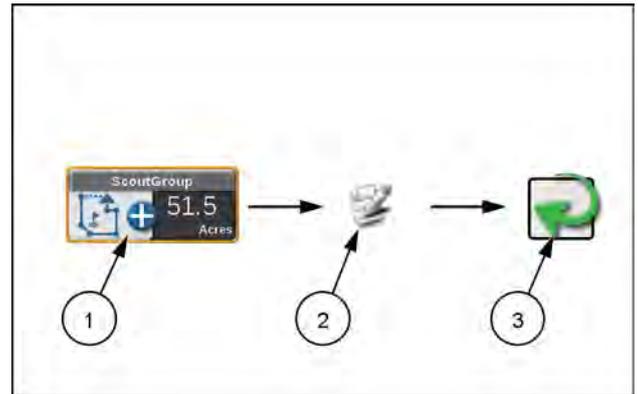
Copy a scouting feature

Features available on the **Viper® 4+** display may be copied into the current field operation by copying recorded feature(s) into the current scout group. To copy a scouting feature(s) into the current scout group:

1. Press the Scout Group widget **(1)** on the Guidance View or Mode.
2. Press the Edit icon **(2)**.
3. Select the source to be copied from the Select Source Group drop down.

NOTE: The feature will remain in the source scout group.

4. Use the check boxes to select the features to copy.
5. Click Copy.
6. Tap Done **(3)** to return to the Main Scout Group page.
7. Tap done in the upper right corner to return to the guidance view or mode.

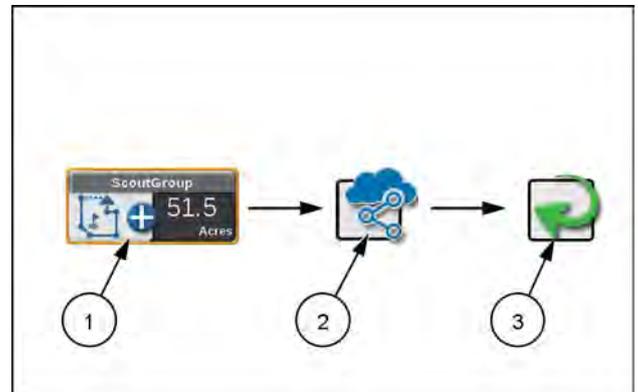


RAIL21TR03840AA 4

Share a scout group

To share a scout group to cloud participants:

1. Select the scout group widget **(1)** on the Guidance View or mode.
2. Ensure the correct scout group and field boundaries are active and selected.
3. Press the share icon **(2)** to send the field boundaries to the cloud job.
4. Press the done button **(3)** to return to the Guidance View or mode.



RAPH23PLM0259AA 5

Scout feature setup

To configure the **Viper® 4+** display to record a field feature boundary, line, or place flags to mark various positions in a field during an operation:



1. Press the Scout Group widget on the Guidance View or Mode.
2. Select an existing group or add a new group.
3. Tap the Scout Feature Type drop down field and select the desired feature. See “Scout groups overview” (5-15) for more information on the features available for use with the **Viper® 4+** display.
4. Press the Name drop down field to select a feature name previously recorded using the **Viper® 4+** display. Selecting a name used previously for a new feature will not affect the previous feature. If needed, modify the name to assist with feature selection during future field operations.
5. Press the color indicator and select the desired color for the feature to be recorded or location to be marked.
6. Select the desired point recording mode. Select:
 - Auto Point Capture. to allow the **Viper® 4+** display to automatically record the vehicle path while recording the feature boundary.
 - Manual Point Capture. to manually select points for the feature or area. Refer to the Manual Point Capture section in “Recording a field feature” (5-21) for assistance with using the Scouting widget to manually capture points during a field operation.
7. Select the left, center, or right position for recording points on the feature boundary. The **Viper® 4+** display will record points at the left, center, or right of the configured equipment width.
8. Enable the override shift distance option to enter a custom left or right offset distance if desired.
9. When creating a spray/plant zone for automatic section control features, select the following options to configure section control features:
 - Spray. Select this option to allow the **Viper® 4+** display to use an optional section control system to enable application sections to cover or apply product to the designated area.
 - No-Spray. Select this option to designate the area within the completed boundary as a non-application area. The **Viper® 4+** display will use any optional automated section control features to shut off application sections in these areas.
10. Select ready to start recording in the lower right-hand corner of the prompt to finish set up and to begin recording the boundary or plotting points for future reference. See “Recording a field feature” (5-21) for assistance with starting to record a zone boundary or plotting points for scout features.

Recording a field feature

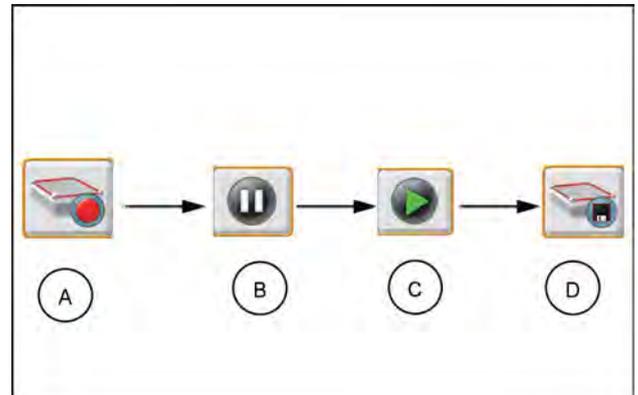
NOTE: See “Scout feature setup” (5-20) for assistance with setting up the **Viper® 4+** display to record a feature or plot points in a field during operation.

Auto point capture

To begin recording a field feature using the automatic point capture mode:

1. Press the Start Recording button **(A)** shown on the scouting widget to begin recording the field feature. The **Viper® 4+** display will automatically capture points along the path driven by the equipment.
2. Press the Pause Recording button **(B)** at any time to momentarily stop recording the current equipment path for the feature being recorded. Press Resume Recording **(C)** to resume recording the field feature boundary.
3. Select the save and end recording button **(D)** to stop recording the field feature and save the current boundary to the scout group.

NOTE: If the feature provides any features for automatic section control systems enabled for the field operation, **Viper® 4+** display will begin controlling sections after the feature is saved to the scout group.



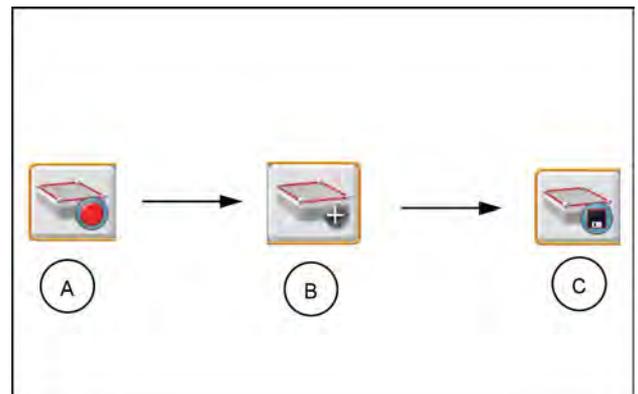
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Manual point capture

To begin recording a field feature using the manual point capture mode:

1. Press the Start Recording button **(A)** shown on the Scouting Widget to begin recording the field feature.
2. Press the Add point button **(B)** on the Scouting widget to plot the first point.
3. Continue driving the field feature boundary, pressing the add point button as necessary to record the outline of the field feature.
4. Select the Save and End Recording button **(C)** to stop recording the field feature and save the current boundary to the scout group.

NOTE: If the feature provides any features for automatic section control systems enabled for the field operation, the **Viper® 4+** display will begin controlling sections after the feature is saved to the scout group.



RAIL21TR04098AA 2

Auto-Application Zone (AAZ) feature

Refer to the following sections to create and manage Auto-Application Zones.

Create an auto-application zone

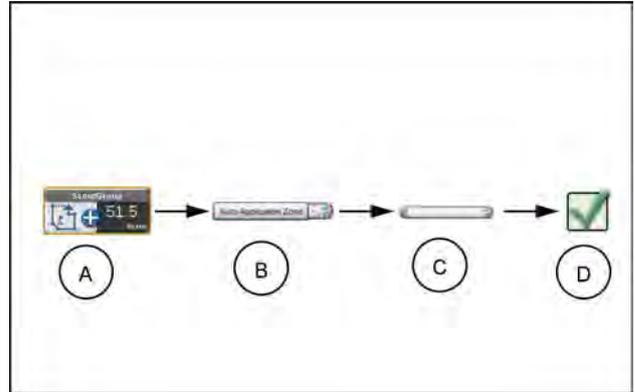
To create an auto-application zone from the coverage of previous jobs:

1. Tap and hold the Scout Group widget **(A)** on the Guidance View or Mode.
2. Tap the Scout Feature Type drop-down list **(B)**, and select Auto-Application Zone.
3. Tap the Select Job Coverage Data drop-down list **(C)**, and select the desired previous job coverage from which to create the auto-application zone.

NOTE: There is an option to filter previous jobs via Grower, Farm, Field (GFF). Tap Filter Jobs By GFF and select a grower, farm, and field to filter and narrow down the previous jobs.

4. Tap Load Data **(D)** to begin creating the auto-application zone. A loading status notification will display at the bottom of the screen.

NOTE: Selecting the job does not load the auto-application zone. The Load Data button must be pressed to create the AAZ.



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Manage auto-application zones

An auto-application zone and a no-spray zone that encloses the AAZ will be added to the list of scout features as the chosen name for the AAZ and as No-Spray Zone. For more information on how to manage scout features, see "Scout group manager" (5-18).

Tally registers

Tally register prompt

The **Viper® 4+** display provides a tally of the volume and area values to track totals over a period of time such as a field application or over the course of a season.

NOTE: Tally registers are a running total and do not automatically reset. The user must reset the tally registers.

To view the register:



1. Press and hold the Tally Registers widget . The Tally Registers prompt will display.

2. Use the following table to reset tallies displayed on the register as necessary or desired over the course of an operation or season.

| To reset | Press and hold |
|--|--|
| One register value | The desired value displayed in the register |
| A tally for all control channels |  Tally reset |
| All tallies for a specific control channel |  Channel reset |
| The full register |  Register reset |



3. To configure tank or bin levels or capacities during the field operation, press and hold the Product Levels button.

4. Tap the widget to toggle through the tally registers. Long press to change the product widget tally.

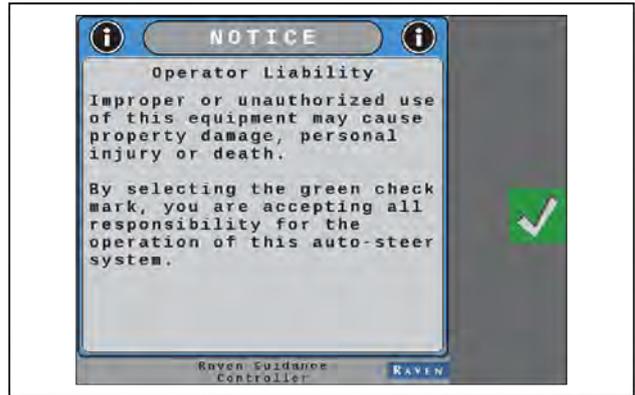
Routine operation with RS1™ or SC1™ (if equipped)

Operator liability

The Operator Liability Warning is displayed each time the **RS1™** system is powered on. If the operator does not accept liability, the **RS1™** system will be disabled and cannot be reengaged until the liability warning is accepted.

To proceed with normal operation of the **RS1™** Global Positioning System (GPS) and auto-steering features, read and accept the Operator Liability Warning.

Operator liability prompt



RAIL21TR02789AA 1

Home screen

SC1™ home screen



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NOTE: Both the steering wheel and GPS icons must be green in order to engage the **SC1™** system.

Steering status indicator

The following are common steering status or mode messages which may occur while the **SC1™** system is on the ISOBUS:

| Display | Message |
|---|--|
|  | System critical fault codes are present. The SC1™ system cannot be engaged in this state. See "Fault code index - SC1™" (6-15) for assistance with resolving active fault codes and troubleshooting the system. |
|  | Active fault codes are present. The SC1™ system may be engaged in this state, but system performance may be impacted. |
|  | No active fault codes are present. The SC1™ system is ready to be engaged. |
|  | Steering is engaged, with no active fault codes present in the SC1™ system. |

Off-line indicator

Shown in the top center of the home screen, the off-line indicator displays the distance and direction to the current guidance line.

Select the steering wheel icon to display the steering status screen. See "Steering status screen" (5-32) for additional assistance with the information available on this screen.

GPS status indicator

The following are common GPS status or mode information which may occur while the **SC1™** system is engaged:

| Display | Message |
|---|--|
|  | No GPS information is detected by the SC1™ system. |
|  | GPS is not converged or GPS is converged and a warning fault code is present. |
|  | GPS is converged and no active fault codes are present. |
|  | GPS Real Time Kinematic (RTK)-L solutions are being used for field guidance. fault codes may be present. |

Select the satellite icon to display the GPS status screen. See “GPS status screen” (5-35) for additional assistance with the information available on this screen.

Tuning settings

The following settings and adjustments are displayed on the **SC1™** home screen and may be used during normal operation to adjust or tune the system:

- Sensitivity – The sensitivity value determines how aggressively the implement will attempt to remain on the guidance line. The sensitivity value is used to fine-tune the **SC1™** system. Values range between 50 - 200.

NOTE: If the machine is slow to react after a steering adjustment, increase the sensitivity setting in increments of 10. If the machine makes an adjustment too quickly, decrease the Sensitivity value.

- Line Acquire – The line acquire value determines the distance away from the set guidance line at which the machine will make adjustments to come closer to the guidance line. If a low value is entered, the machine will make an adjustment at a greater distance as it drifts away from the guidance line. If a high value is entered, the machine is quicker to adjust the steering while it is still close to the guidance line. Values range between 1 - 200.

NOTE: A low value will minimize the risk of over-correction, but it could take longer to acquire the guidance line. A high value increases the risk of over-correction, but the machine is quicker to re-acquire the guidance line. If the machine takes too long to acquire the guidance line, increase the line acquire value in increments of 10. If the machine over-shoots the guidance line, decrease the value in increments of 10.

- Response Speed – The response speed determines how quickly the machine will steer when prompted. If the response speed is too high, the steering may become jittery. If the response speed is too low, the machine may wander lazily. Values range between 1 - 255.

NOTE: If steering becomes jittery, lower the response speed value in increments of 10. If steering does not become jittery, the response speed value may be increased in increments of 10 until the desired response speed is reached.

- Last Pass Sensitivity – The last pass sensitivity determines how tightly the machine tries to steer on a curved path. Too high of a value will cause the machine to steer to the inside of a curve. Too low of a value will cause the machine to steer to the outside of a curve. Values range from 1 - 500.

NOTE: Last pass sensitivity only adjusts the system performance on “Last Pass” and “A-B Curve” lines.

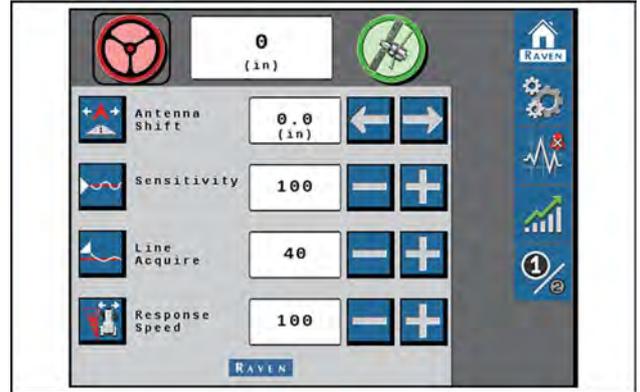
NOTE: Adjusting the last pass sensitivity will not affect pivot performance. To adjust pivot performance, tune the response speed and sensitivity values.

Button definitions

Steering status

Guidance system home screen

The table below gives common steering status or mode messages that may occur while the guidance system is engaged:



RAIL21TR02695AA 1

| Display | Message |
|---|--|
|  | Active diagnostic and troubleshooting codes are present. The guidance system cannot be engaged in this state. |
|  | Active diagnostic and troubleshooting codes are present. The guidance system can be engaged in this state, but performance quality may be degraded. |
|  | No active diagnostic or troubleshooting codes are present. The guidance system is ready to be engaged. NOTE: Both the steering wheel and GPS icons must be green in order to engage the guidance system. |
|  | Steering is engaged, with no active diagnostic or troubleshooting codes present in the guidance system. |

Steering status screen

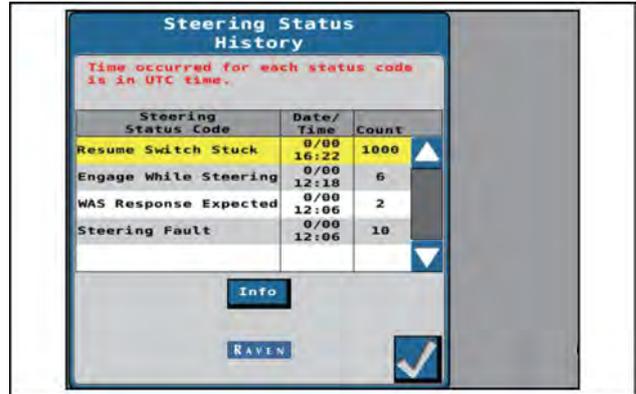
| Display | Message |
|---|--|
|  | Press the steering wheel icon to display the Steering Status screen. The Steering Status field displays the last exit code and the reason why steering was disabled. |



RAIL21TR02696AA 2

Steering status history screen

The Steering Status History button shows a table for the reason steering disengaged, including a time stamp and the number of occurrences.



RAIL21TR02697AA 3

Master switch

| Display | Message |
|---------|--|
| | The master switch is set to "road mode." The guidance system cannot be enabled until the master switch is toggled to "field mode." |
| | The master switch is set to "field mode" and the guidance system can be enabled. |

Resume switch

The status of the enable switch on the Multifunction Handle (MFH) used to engage the steering system.

| Display | Message |
|---------|---|
| | The resume switch is set in the OFF position. |
| | The resume switch is in the ON position. |

Disengage sensor

Status of the steering sensor used to disable steering when the steering wheel is turned.

| Display | Message |
|---------|---|
| | The guidance disengage sensor is active. The guidance system cannot be enabled. |
| | The guidance disengage sensor is out of range or disconnected. |

| Display | Message |
|---|--|
|  | The guidance disengage sensor is inactive. The guidance system can be enabled. |
| | |

Wheel angle sensor

Displays the status of the position sensor.

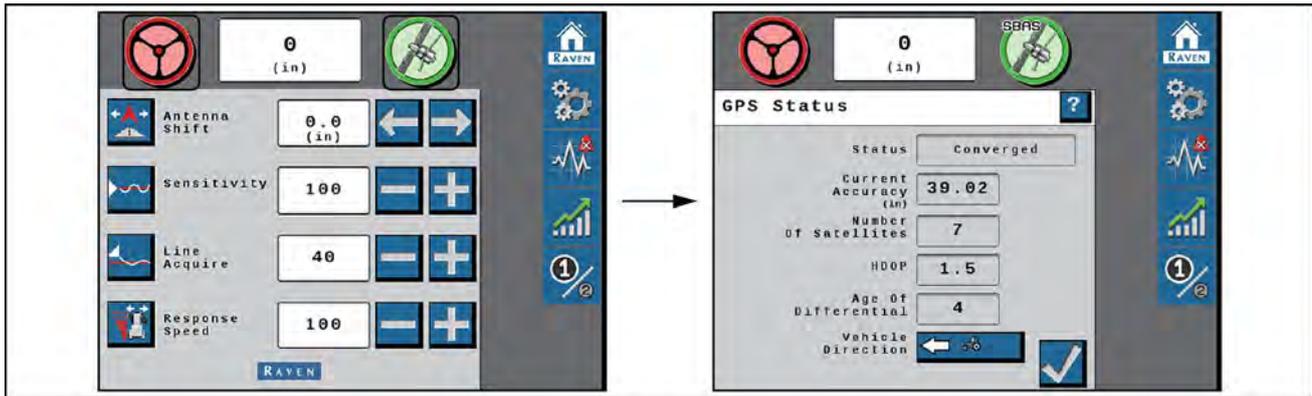
| Display | Message |
|--|--|
|  | The wheel angle sensor (WAS) is out of range or disconnected. |
|  | Wheel angle sensor (WAS) is not calibrated. |
|  | The wheel angle sensor (WAS) is calibrated and ready to operate. |

Operator presence switch

Displays the status or presence of the operator presence switch.

| Display | Message |
|---|---|
|  | The presence switch is not available or not used with the selected machine profile. |
|  | The operator is not present in the seat. |
|  | The operator presence switch is disconnected. |
|  | The operator presence switch detects the operator. The guidance system can be operated. |

GPS status



RAIL21TR02698EA 4

Home screen

The following are common GPS status or mode information which may occur while the guidance system is engaged

| Display | Message |
|---------|--|
| | No GPS information is being detected in the guidance system. |
| | GPS signals are not converged or GPS is converged and a warning fault code is present. |
| | GPS signals are converged and no warning fault codes are active. NOTE: Both the steering wheel and GPS icons must be green in order to engage the guidance system. |
| | GPS RTK-L or RTK Pro solutions are converged and actively being used. |

Press the GPS icon to display the GPS Status screen.

| Display | Message |
|----------------------|---|
| Status | Displays the selected GPS convergence status. <ul style="list-style-type: none"> • Error • No Signal • Converging • Converged |
| Current Accuracy | Value displayed is the horizontal standard deviation reported by the GPS receiver. |
| Number of Satellites | The number of satellites currently in view by the GPS receiver. |
| HDOP | Horizontal Dilution of Precision. If all of the satellites in view are from the same direction, the number will be higher and the accuracy will be reduced. |
| Age of Differential | Time (in seconds) since the last differential correction was received. If a differential source is not currently tracked this entry will be “- - -”. |

Widget definitions

The following are common status or mode information which may be displayed in the **RS1™** system while in a job:

| Icon | Message |
|--|--|
|  | The RS1 is detected, but the operator must accept responsibility for the operation of the RS1 system. |
|  | No A-B path or guidance line has been set or an active DTC is preventing the RS1 system from engaging. |
|  | RS1 is detected, turned on, and calibrated. |
|  | RS1 is detected and in operation. |
|  | Vehicle speed is too fast or too slow for RS1 operation and the system will disengage. |

NOTE: See “Fault code index - RS1™” (6-1) for additional status conditions which may be displayed in the **RS1™** on-screen widget.

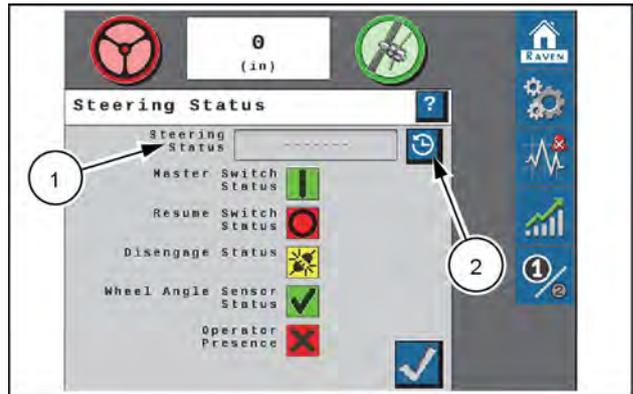
UT Navigation buttons

| | |
|---|--|
|  | Accept - Saves the changes made to the system at the end of the setup process and returns the to the Tools Menu. |
|  | Next - Saves the changes made to the system and proceeds to the next step in the setup process. |
|  | Previous - Returns to the previous screen in the setup process. |

Steering status screen

Select the steering wheel icon to display the steering status screen. The steering status field (1) displays the last exit code and the reason why steering was disabled.

Select the steering status history icon (2) next to the steering status field to view the history including the times the system disengaged and why it disengaged.

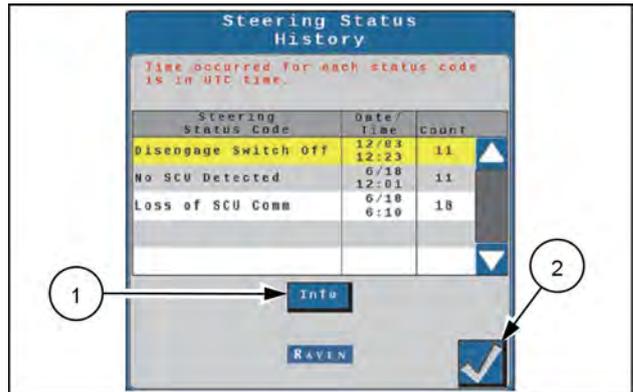


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Info button information

From the steering status history page, select the Info button (1) to display a description of the highlighted disengagement code.

Press the Accept button (2) to return to the steering status screen.



NHIL22PLM0143AA 2



RAIL21TR02793AA 3

Status displays

Master switch (roading switch)

| Display | Message |
|---|--|
|  | The master switch is set to "road mode." The guidance system cannot be enabled until the master switch is toggled to "field mode." |
|  | The master switch is set to "field mode" and the guidance system can be enabled. |

Resume switch

Displays the status of the engage switch on the Multi Function Handle (MFH), which is used to engage the steering system.

| Display | Message |
|---|---|
|  | The resume switch is set in the OFF position. |
|  | The resume switch is in the ON position. |

Disengage sensor

Displays the status of the steering sensor used to disable steering when the steering wheel is turned.

| Display | Message |
|---|---|
|  | The guidance disengage sensor is active. The guidance system cannot be enabled. |
|  | The guidance disengage sensor is out of range or disconnected. |
|  | The guidance disengage sensor is inactive. The guidance system can be enabled. |

Wheel Angle Sensor (WAS)

Displays the status of the position sensor.

| Display | Message |
|---|--|
|  | The Wheel Angle Sensor (WAS) is out of range or disconnected. |
|  | Wheel Angle Sensor (WAS) is not calibrated. |
|  | The Wheel Angle Sensor (WAS) is calibrated and ready to operate. |

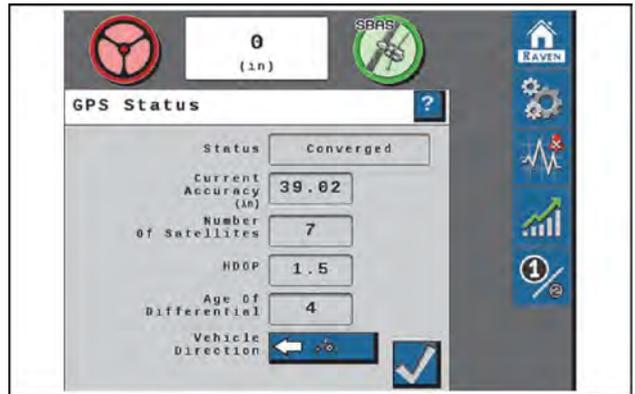
Operator presence switch

Displays the status or presence of the operator presence switch.

| Display | Message |
|---|---|
|  | The presence switch is not available or not used with the selected machine profile. |
|  | The operator is not present in the seat. |
|  | The operator presence switch is disconnected. |
|  | The operator presence switch detects the operator. The guidance system can be operated. |

GPS status screen

Press the GPS icon on the home screen to display the GPS status screen.



NHIL22PLM0144AA 1

| Display | Message |
|----------------------|---|
| Status | Displays the selected GPS convergence status. <ul style="list-style-type: none"> • Error • No Signal • Converging • Converged |
| Current Accuracy | A value representing the reported horizontal accuracy of the current GNSS solution as detected by the receiver. |
| Number of Satellites | The number of satellites currently in view by the GPS receiver. |
| HDOP | Horizontal Dilution of Precision – A higher value indicates that the satellites currently used for the machine position are grouped closer together and accuracy may be reduced. If the satellites are too close, the system may record a high HDOP fault code. |
| Age of Differential | Time (in seconds) since the last differential correction was received. This field will not display a value if a differential source is not currently tracked. |
| Vehicle Direction | Select the vehicle direction button to manually override the displayed direction of travel. |

Engage guidance

See “Starting a job” (4-40) for instructions on starting a job and setting guidance lines.

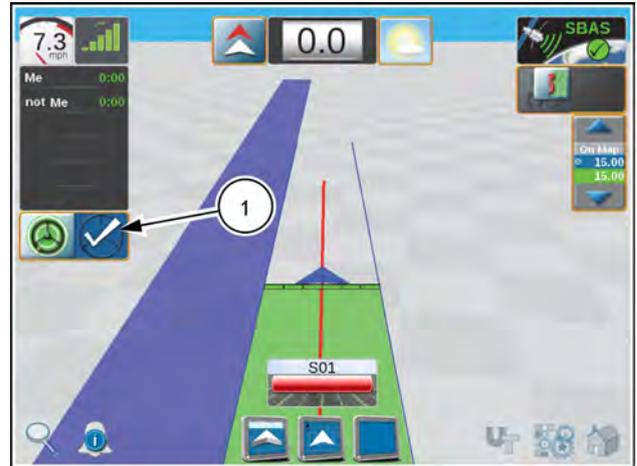
Engage steering

RS1™ status widget

NOTE: If the steering widget (1) does not appear on the screen, see “Home screen and panel navigation” (3-5) for further information on adding widgets.

NOTE: The operator liability waiver must be accepted before the RS1™ system can be enabled for operation.

Engage the RS1™ steering system using the autoguidance engage button on the Multi-Function Handle (MFH).



RAPH23PLM1172BA 1

VSN® visual guidance operation (if equipped)

Care and maintenance

Glass care and cleaning

Glass care and cleaning

- Avoid pressure washing the camera lens.
- Use any glass cleaning products with a soft cloth. Avoid any abrasive products that could scratch or damage the glass.

Radar sensors

NOTE: CASE IH recommends the best practice is to inspect the radar sensors every time you reload the spray tank. Clean them with a rag or cloth if they are dirty.

- If the system does not allow you to engage while using radar sensors, use a rag or cloth to clean the radar sensors and allow for better solution quality.

Home screen

NOTICE: Do not use abrasive cleaning materials or sharp objects on the VSN® camera lens. Check the lens periodically during field operations. Wipe lens with a soft cloth using glass cleaner if needed.

VSN® home screen – Calibrated row spacing

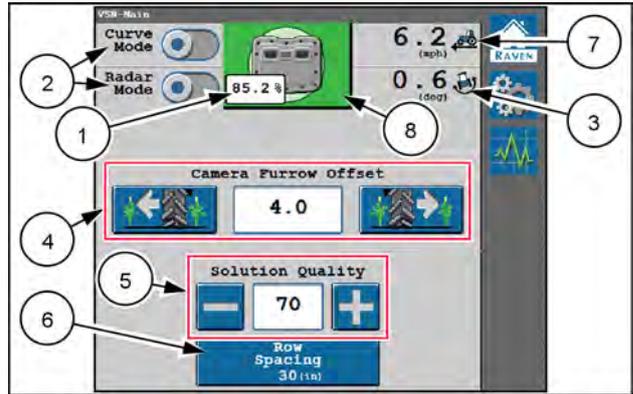
The following sections provide information about the system status and settings shown on the VSN® home screen:

- (1) – Quality
- (2) – Mode selections

Curve mode – For guidance in center pivot, contours, and other curved rows, select this mode to provide optimal machine position and minimize crop damage.

Radar mode – Use the radar sensors to detect the crop stalks below the canopy.

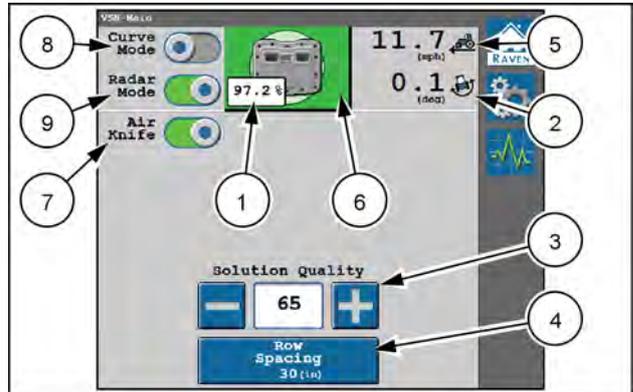
- (3) – Machine roll
- (4) – Camera furrow offset
- (5) – Solution quality
- (6) – Row spacing
- (7) – Machine speed
- (8) – VSN® status



RAPH23PLM0550AA 1

VSN® home screen – Radar only (if equipped)

- (1) – Quality
- (2) – Machine roll
- (3) – Solution quality
- (4) – Row spacing
- (5) – Machine speed
- (6) – Radar status
- (7) – Air Knife (on / off)
- (8) – Curve mode
- (9) – Radar mode



RAPH23PLM0551AA 2

VSN® status icon

| Status icon | Description |
|-------------|--|
| Green | System is ready for row steering operation. No active fault codes. |
| Yellow | Solution quality is low. No active fault codes. System may be operated with caution. |
| Red | Active fault codes are preventing the system from operating. |

Quality

The percentage displayed indicates the current steering solution quality.

Curve mode

Toggles curve mode on and off.

- On – For guidance in center pivot, contours, and other curved rows, select this mode to provide optimal machine position and minimize crop damage.

- Off – Optimized guidance for straight rows or rows with minor curves. This mode is set by default.

NOTE: Press and hold on the Curve Mode widget to navigate to the advanced settings page.

Radar mode

NOTE: The radar mode option is not available when operating in radar only mode.

Toggles radar mode on and off.

- On – Use the radar sensors to detect the crop stalks below the canopy.
- Off – Use the **VSN®** camera for visual row guidance in the Vision or Vision+ operation modes.

NOTE: Press and hold on the Radar Mode widget to navigate to the advanced settings page.

Air knife

NOTE: The air knife option will only be available if air knife is configured as installed.

The air knife feature enables the system to automatically clear dust and debris from radar sensors when solution quality drops below **80%**.

NOTE: Press and hold on the air knife widget to navigate to the settings page. See “System settings Tab” (4-120).

Machine roll

The machine roll is the left-hand/right-hand tilt angle of the vehicle.

Machine speed

The machine speed is the current GPS speed of the machine.

Camera furrow offset

NOTE: The camera furrow offset is not available when operating in radar only mode.

The Camera furrow offset is the distance from the camera to the center of the nearest furrow bottom.

- A positive value means the camera is to the right of the furrow.
- A negative value means the camera is to the left of the furrow.

The offset value may be edited after the **VSN®** camera has been calibrated to fine tune the tire-to-furrow position and help to center the tire in the furrow. Select the left button to nudge the tire to the left, and the right button to nudge the tire to the right. Using these buttons will nudge the tire in ± 1 inch increments.

Row detection solution quality

Set the minimum quality value that must be met to engage **VSN®**. This value is the cameras ability to detect the crop rows versus the furrows. This value is editable.

A value of **50%** is recommended. In Vision Only mode, **VSN®** will disengage if the solution quality goes below the set percentage. In Vision Plus mode, **VSN®** will revert back to GPS guidance. See “VSN® operation widgets” (5-40) for more information about the Vision Only and Vision Plus modes.

Row spacing preset

The row spacing preset displays the current row spacing entered for the current row spacing preset. Select the button to select a currently calibrated row spacing preset or calibrate a new row spacing preset.

NOTE: Up to five row spacing presets may be saved.

VSN® operation widgets

The following widgets are available for use with the **VSN®** system to quickly change modes, monitor system operations, and engage the system from the **Viper® 4+** display during field operations.

Operation mode widgets

The Operation Mode widget must be added to the **Viper® 4+** display guidance screen to allow the operator to change modes during a field operation.

VSN Operation modes

| Widget | Description |
|--|--|
|  | GPS Mode – Guidance is performed via GPS guidance points only. |
|  | Vision – Guidance is performed via the VSN® camera or radar sensors (if equipped) only. GPS corrections are neither utilized for guidance nor available as a fall-back solution. Line acquire must be performed manually. When the solution quality falls below the minimum threshold the steering system will disengage. |
|  | Vision Plus – Guidance is performed via a combination of GPS and the VSN® camera or radar sensors (if equipped). This mode can be utilized for line acquire via GPS with the system switching to the VSN® camera when the machine is aligned and near the guidance line. This mode will also fall back to GPS guidance if the solution quality falls below the minimum threshold. The system will then return to VSN® guidance automatically when the solution quality is above the minimum threshold. NOTE: <i>It is recommended to use Last Pass when using Vision Plus mode.</i> |

Status and engage widget

The following widget may be used with **RS1™** and **SC1™** steering systems to engage steering from the **Viper® 4+** display screen and view the current status of the steering system.

NOTE: The **VSN®** steering system may also be engaged with the autoguidance engage button on the Multi-Function Handle (MFH).

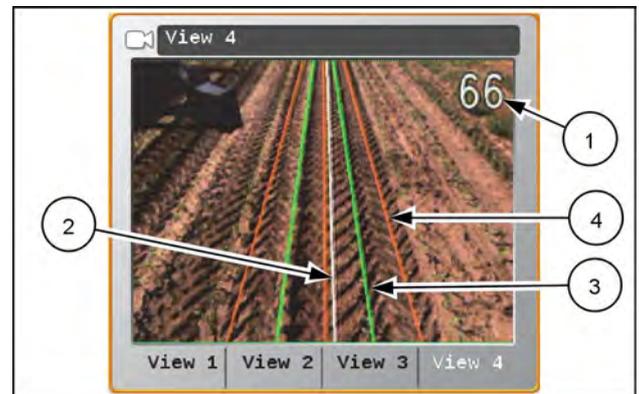
| Widget | Description |
|---|--|
|  | The system disabled and cannot be engaged. Check for active fault codes and VSN® solution quality. |
|  | The VSN® solution quality is nearing minimum thresholds. System may be engaged, but system performance may be impacted. |
|  | The system is ready for steering. |
|  | The system is engaged in GPS mode or using GPS fall back corrections in Vision+ mode. |
|  | The system is engaged and using Vision or radar sensors (if equipped) for the steering solution. |

Analog video display widget

The analog video display widget can be helpful when troubleshooting the visual guidance system.

The analog video display widget shows the following information:

- (1) – Solution quality: The solution quality is displayed on the analog video display from the **VSN®** camera.
- (2) – Vehicle Heading: The current vehicle heading is displayed on the **VSN®** analog video as a white line.
- (3) – Rows: The green lines shown on the analog video display should correspond with crop rows shown in the video image.
- (4) – Furrows: The brown lines displayed in the analog video should correspond to the furrow bottoms.



NHIL22PLM0179BA 1

VSN® status widget

The **VSN®** status widget allows the operator to quickly check the current status of the **VSN®** system during operation.

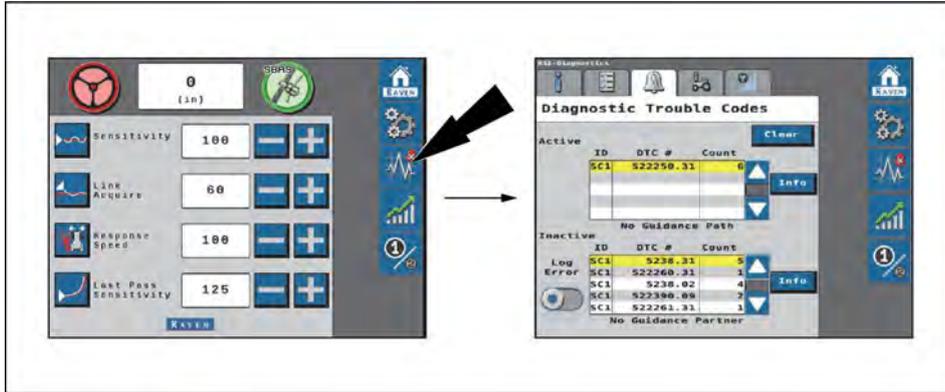
| Widget | | Description |
|--|--|---|
| Vision | Radar | |
|  | | The VSN® system requires calibration. |
|  |  (if equipped with radar) | No A-B path or guidance line has been set, solution quality is below minimum threshold, or an active fault code is preventing the VSN® system from engaging. |
|  |  (if equipped with radar) | The VSN® system is detected and ready. |
|  |  (if equipped with radar) | The VSN® solution quality is nearing minimums. While in a caution state, the system may be engaged, but system performance may be impacted. |

NOTE: See “Diagnostic Trouble Code (DTC) screen” (6-29) for additional status conditions which may be indicated by the **VSN®** widget.

6 - TROUBLESHOOTING

RS1™ diagnostics and troubleshooting

Diagnostic Trouble Code (DTC) screen



NHIL22PLM0153FA 1

Diagnostic trouble codes screen

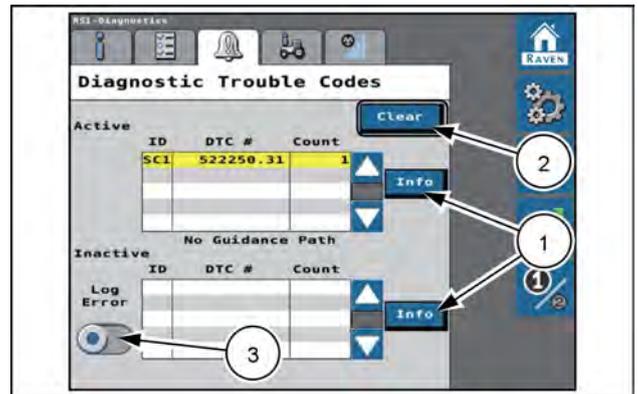
The Diagnostic Trouble Codes screen displays active and previous fault codes that occurred during **RS1™** system operation. Active fault codes must be fixed before the **RS1™** system can be enabled for guidance and steering operation. Once a fault code has been corrected, the code moves to the inactive fault code list. See **1** for an example of active and inactive fault codes and summaries.

See “RS1™ and SC1™ DTC codes” (**6-23**) for a comprehensive list of fault codes for this system.

Press the Info button (**1**) to display the complete description of the highlighted fault code.

Press the Clear button (**2**) to delete the inactive fault codes from the fault code error log. For a complete list of the **RS1™** system fault codes, see your CASE IH dealer.

Press Log Error slider (**3**) to record a random failure condition.



RAIL21TR02702AA 2

System health tests

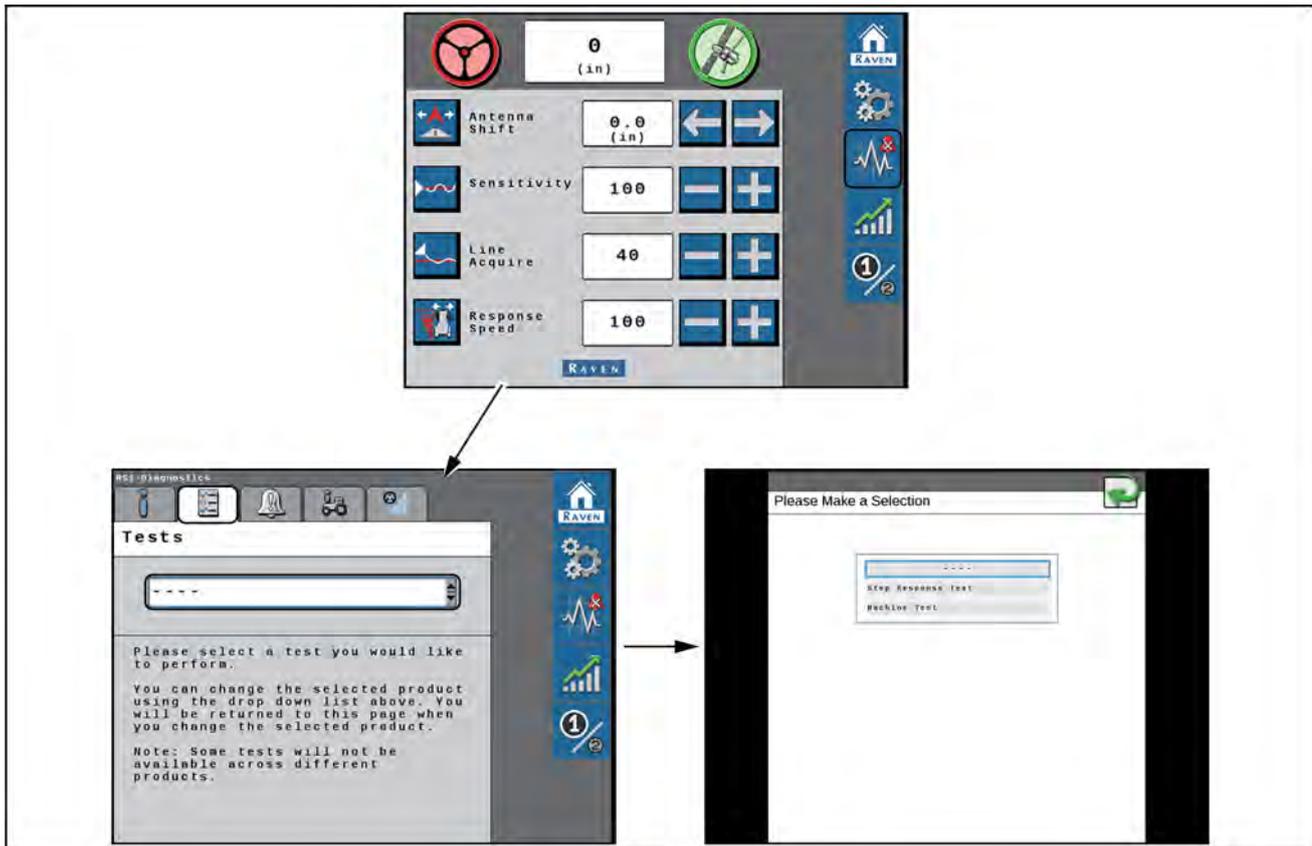
⚠ WARNING

Stay clear! The steering tires will move automatically during this procedure. Make sure that the area around the vehicle is clear of people and obstacles before you engage the automatic steering system. To disengage automatic steering at any time, turn the steering wheel or select the on-screen STOP button. Failure to comply could result in death or serious injury.

W1647A

System health tests are performed to diagnose and correct machine and RS1 calibration issues. The following system health test can be performed via the RS1 system:

- Step Response Test

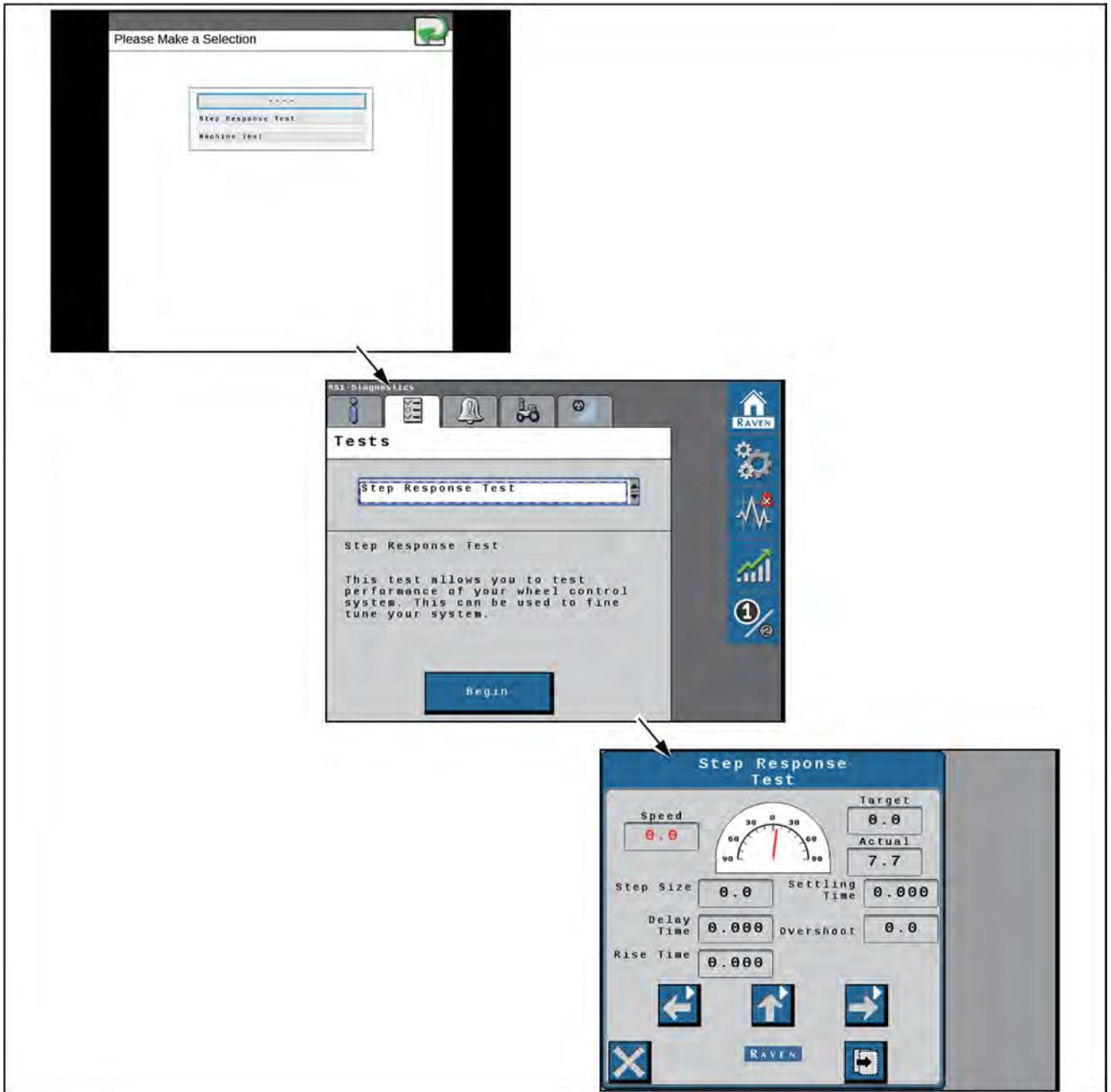


RAIL21TR02705FA 1

Test selection screen

Step response test

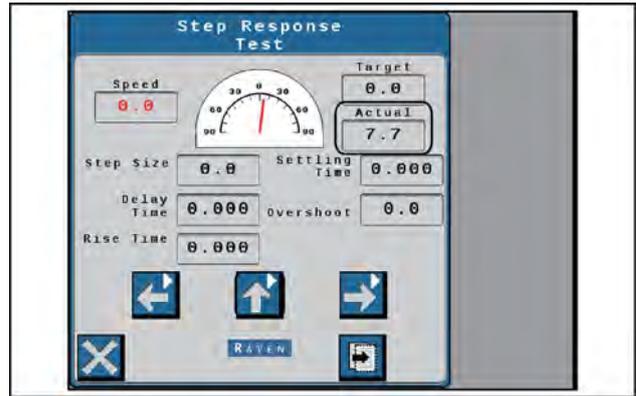
The Step Response Test is used to determine the responsiveness of the machine steering system.



RAIL21TR02706GA 2

Step response test screen

1. Drive forward **2 – 6 km/h (1 – 4 mph)** with the engine speed set at 3/4 throttle.
2. Turn the steering wheel to the right so that the Actual reading displays **20°**.
3. Press the center up arrow.
4. Wait for the following fields to populate and record the data:
 - Step Size
 - Delay Time
 - Rise Time
 - Settling Time
 - Overshoot
5. Drive forward **2 – 4 km/h (1 – 4 mph)** with the engine RPM set at 3/4 throttle.
6. Turn the steering wheel to the left so that the Actual reading displays **- 20°**.
7. Press the center up arrow.
8. Wait for the following fields to populate and record the data:
 - Step Size
 - Delay Time
 - Rise Time
 - Settling Time
 - Overshoot
9. Repeat step 1 through step 8.



RAIL21TR02707AA 3

NOTE: Once the Step Response Test has been completed, the machine performance reading should fall within the recommended system settings. Provide the collected data to your CASE IH dealer to verify machine performance falls within the recommended settings.

System information

1. Select the steering control device from the drop-down menu.
2. Select the desired system component from the second drop-down menu.

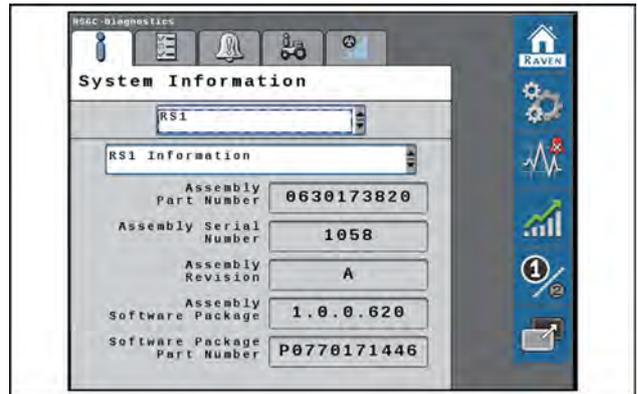


RAIL21TR02708GA 1

System information screen

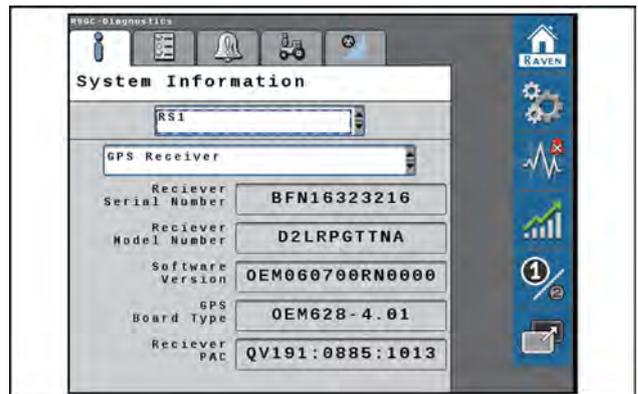
System information screens

RS1™ information



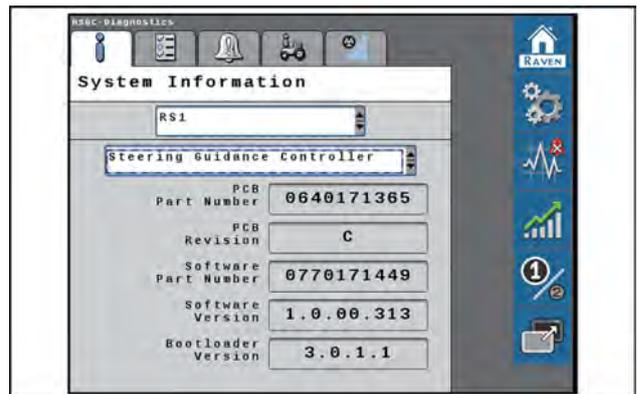
RAIL21TR02709AA 2

GPS receiver information



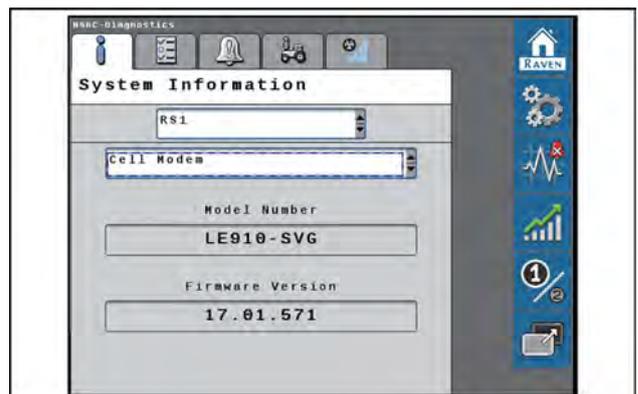
RAIL21TR02712AA 3

Steering guidance controller information



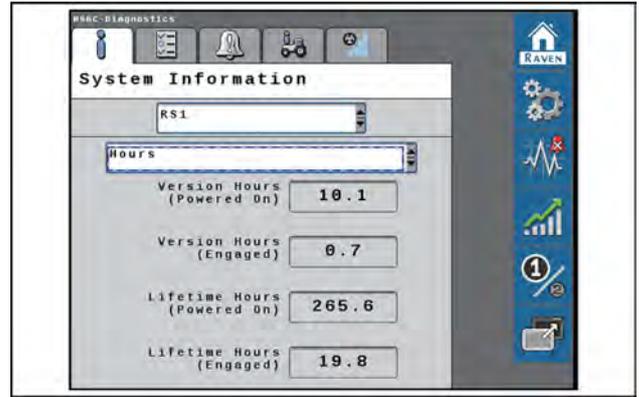
RAIL21TR02710AA 4

Cell modem information



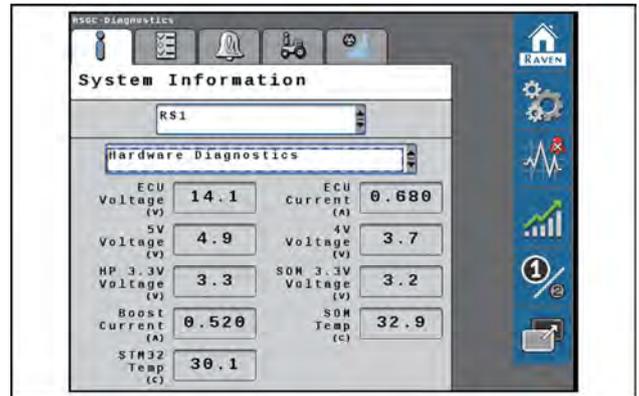
RAIL21TR02713AA 5

RS1™ unit hours



RAIL21TR02711AA 6

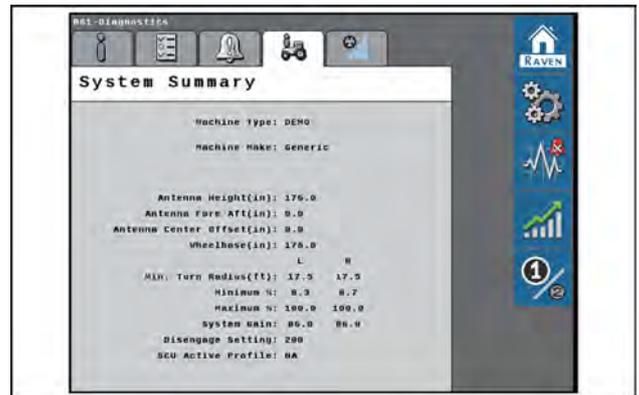
RS1™ hardware diagnostics



RAIL21TR02714AA 7

System summary screen

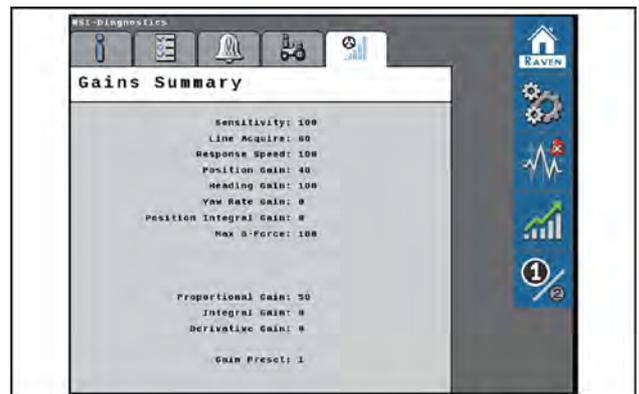
The System Summary screen displays the machine settings and calibrated steering settings for the RS1™ system.



RAIL21TR02715AA 8

Gains summary screen

The Gains Summary screen displays all of the advanced steering settings used to steer the machine.

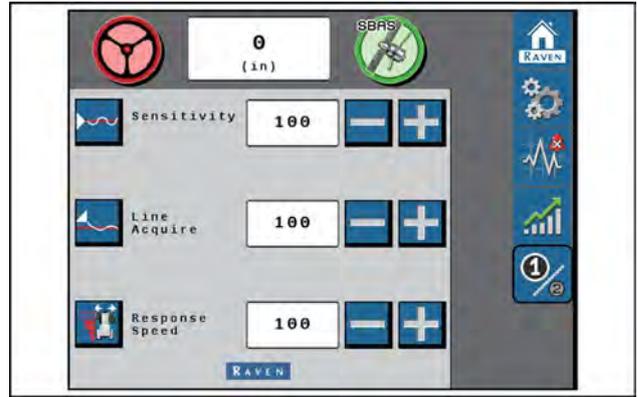


RAIL21TR02716AA 9

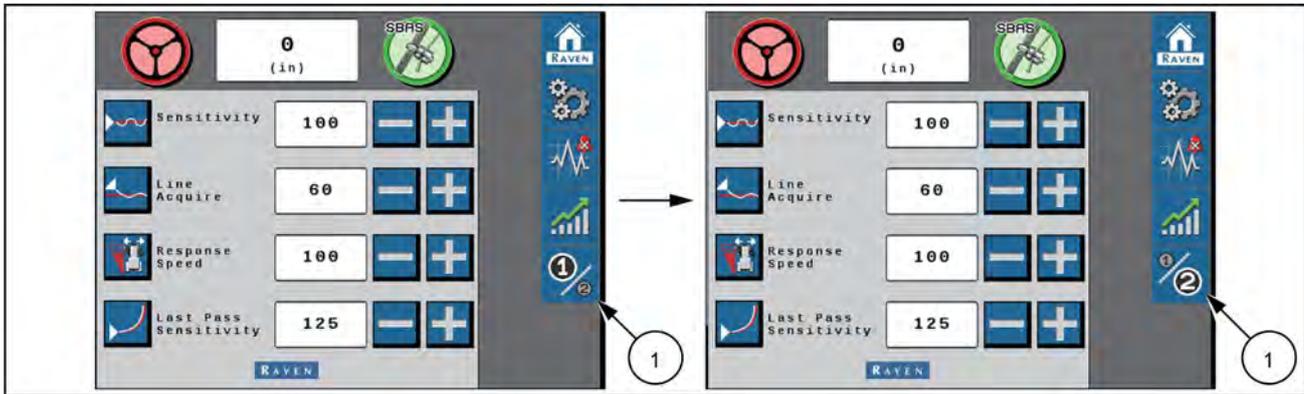
Preset steering gains

The Preset Gains option allows the operator to switch back and forth between two sets of steering gain settings. Different sets of settings may be useful when:

- The machine uses two tire configurations (floater vs. row crop tires)
- Different soil types
- Different speeds



RAIL21TR02717AA 10



RAIL21TR02718EA 11

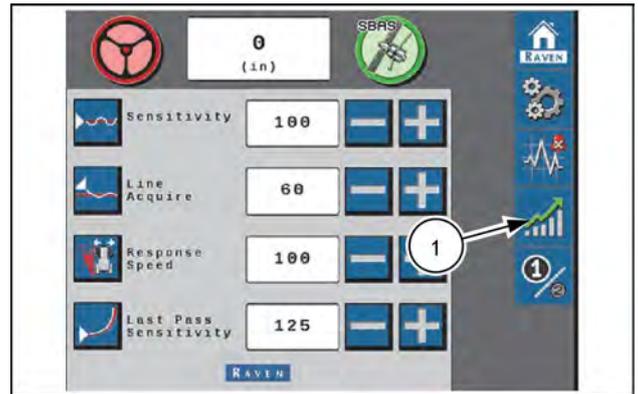
Preset gains settings



To toggle between the settings, press the settings button (1).

Performance monitor

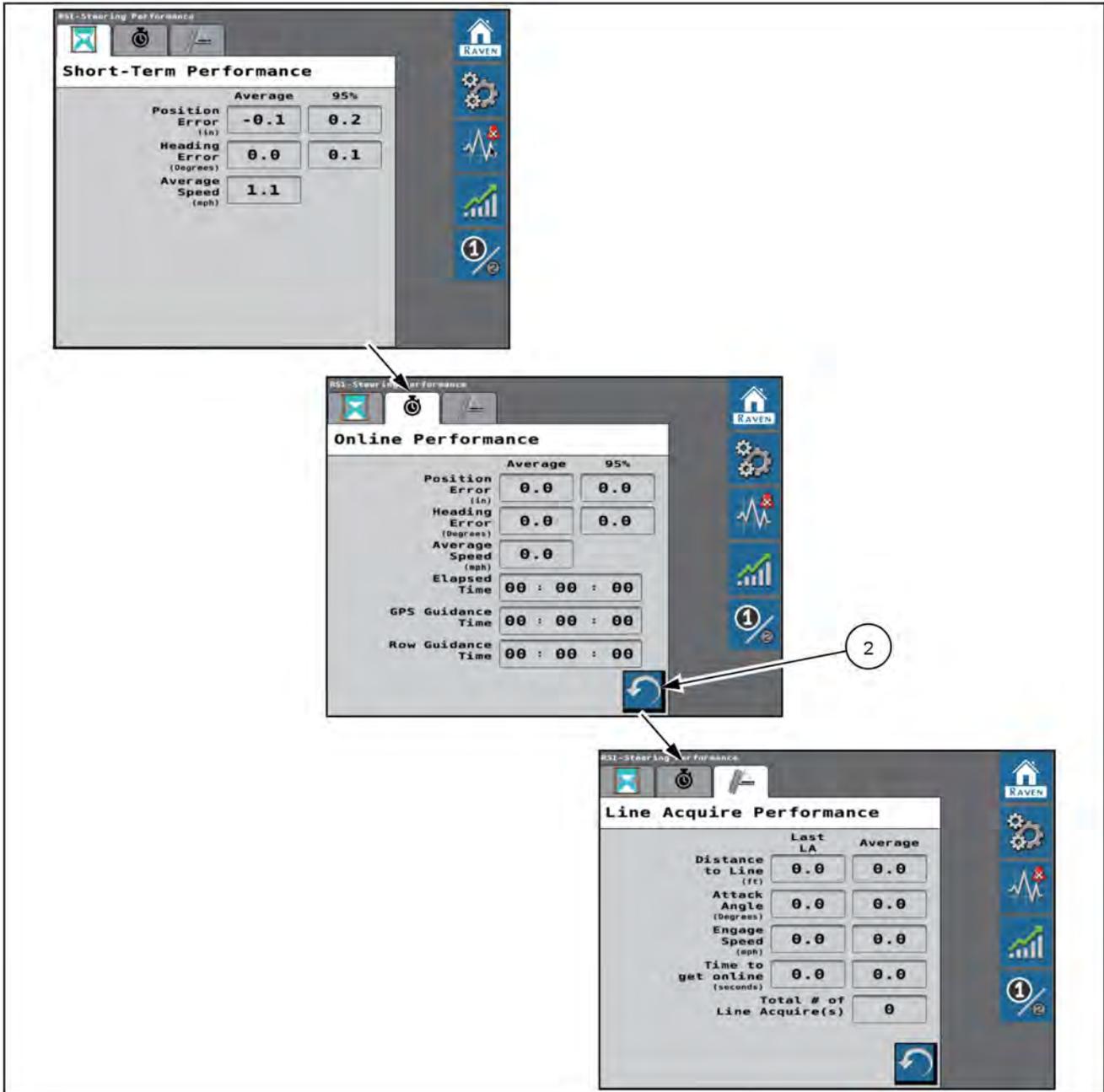
1. Select the Performance icon (1) on the right side of the home screen to view the short-term system performance.



NHIL22PLM0150AA 1

NOTE: The Short-Term Performance screen displays the averages and 95% performance values.

2. Select the tab with the watch icon to view the Resettable Performance values.
3. Select the Reset icon (2) to reset the values.



RAIL21TR02720GA 2

Short-Term and resettable performance screen

SC1™ diagnostics and troubleshooting

Satellite navigation overview

All Global Navigation Satellite System (GNSS) correction types

| Problem | Probable cause | Impact to user | Detection | Corrective action |
|--|---|---|--|--|
| Not enough satellites tracked | Receivers view of the sky blocked by obstructions, such as trees or buildings | Degraded GNSS Performance for all correction types. | Low number of active satellites, correlates to driving in areas with obstructions. | Avoid operation in obstructed areas as much as possible. After receiver is in open area, GNSS performance will improve, and performance in obstructed areas will be improved for a short time. |
| | Interference from another electronic device | Degraded GNSS Performance for all correction types. | Low number of active satellites, correlates installation of an on-board electronics device or operation near electronics. | Turn off or relocate device causing issue. Move cabling away. |
| | Extreme vibration or shock | Degraded GNSS Performance for all correction types. | Low number of active satellites, correlates with higher vibrations or shock due to specific operations | Check for receiver being loose and tighten latch or mounting. |
| | Ionospheric scintillation | Degraded GNSS Performance for all correction types. | Low number of active satellites, with no interference or vibration present. Known issues with ionospheric scintillation in region. | Interference cannot be avoided, but can possibly be anticipated during certain times of the day and seasons. |
| Missing satellites or constellations | System wide GNSS issue | Degraded GNSS Performance | Low number of active satellites. Similar performance from other GNSS systems. Reported issues from system providers or media. | Monitor system providers websites for up-to-date reports. In some situations specific satellites or constellations can be disabled in the receiver. |
| Poor satellite geometry | Few satellites are visible and they are group in the same part of the sky. | No Real-Time Kinematic (RTK) solution, poor position, slow startup and/or jumps in position | Low number of active satellites and poor Dilution of Precision (DOP). | Avoid operation in obstructed areas as much as possible. After receiver is in open area, GNSS performance will improve, and performance in obstructed areas will be improved for a short time. |
| Inertial Measurement Unit (IMU) status does not reach "good" | Insufficient motion to establish heading and orientation. | No corrected GNSS position, no autoguidance possible. | Display indicates to drive to establish heading | Driving faster than minimum alignment speed for a prolonged time. Turn the vehicle. Avoid areas with obstructed view of the sky until system initializes. |
| IMU status does not reach "good" or reach incorrect heading or orientation | Incorrect receiver mounting information entered. | No corrected GNSS position, no autoguidance possible. | Display indicates to drive to establish heading, or heading is not correct on map or in diagnostics menu. | Check receiver installation, make sure receiver is facing forward and mounting is tight. Check GNSS antenna locations offset if mounting has been altered. |

Satellite-Based Augmentation System (SBAS) correction type

| Problem | Probable cause | Impact to user | Detection | Corrective action |
|----------------------------------|--|---|---|---|
| SBAS satellite signal obstructed | Line of sight to satellite is obstructed due to mountains, terrain, or buildings. | SBAS corrected positions not available. | Check correction age and signal strength | Avoid operation in area if possible. See dealer; in some situations, manually selecting the frequency may be advised. |
| SBAS waiting for ephemeris data | If receiver has not been powered recently, ephemeris data may need to update, which can take time. | SBAS corrected positions not available. | Abnormal time to get ready when satellite signal is strong. | Remain in open sky if possible, until SBAS becomes available |
| No SBAS satellite visible | Manually configured to wrong satellite | SBAS corrected positions not available. | SBAS satellite manually selected to wrong satellite. | Automatic mode is generally recommended. |

AFS Correction Types

| Problem | Probable cause | Impact to user | Detection | Corrective action |
|---|--|---|--|---|
| AFS corrections not selectable (not activated) | receiver is not activated for medium accuracy for AFS 2 2 operation. | AFS corrected positions not available. | Check accuracy level in the unlocks screens | See dealer to purchase upgrade to medium accuracy |
| No AFS Subscription | In addition to the medium accuracy unlock, a AFS subscription is required. | AFS corrected positions not available. | Check AFS expiration date and status in the GNSS Diagnostics | See dealer for subscription purchase. |
| Subscription expired | Subscriptions for the AFS service are for a specific time period and expire. | AFS corrected Positions not available. | Check AFS expiration date and status in the GNSS Diagnostics | See dealer to renew subscription. Follow instructions for over the air update. |
| AFS Satellite signal obstructed | Line of sight to satellite is obstructed due to mountains, terrain, or buildings. | AFS corrected positions not available. | Check AFS correction age and signal strength | Avoid operation in area if possible. See dealer; in some situations, manually sele AFS frequency may be advised. |
| Weak AFS Signal Strength | Line of sight to satellite is obstructed due to mountains, terrain or buildings. Possible interference source. | AFS corrected Positions not available. | Check AFS correction age and signal strength | Avoid operation in area if possible. See dealer; in some situations, manually selecting the AFS frequency may be advised. |
| Receiver outside subscription-permitted region | AFS subscription does not allow operation in some remote areas | AFS corrected positions not available. | Check for out of range warning. | Avoid operation in area if possible. See dealer; in some situations, manually selecting the AFS frequency may be advised. |
| Receiver outside subscription-permitted region such as near or over ocean | AFS subscription does not allow operation over oceans. | AFS corrected positions not available for sea navigation. | Check for out of range warning. | See dealer if issue occurs on land. |

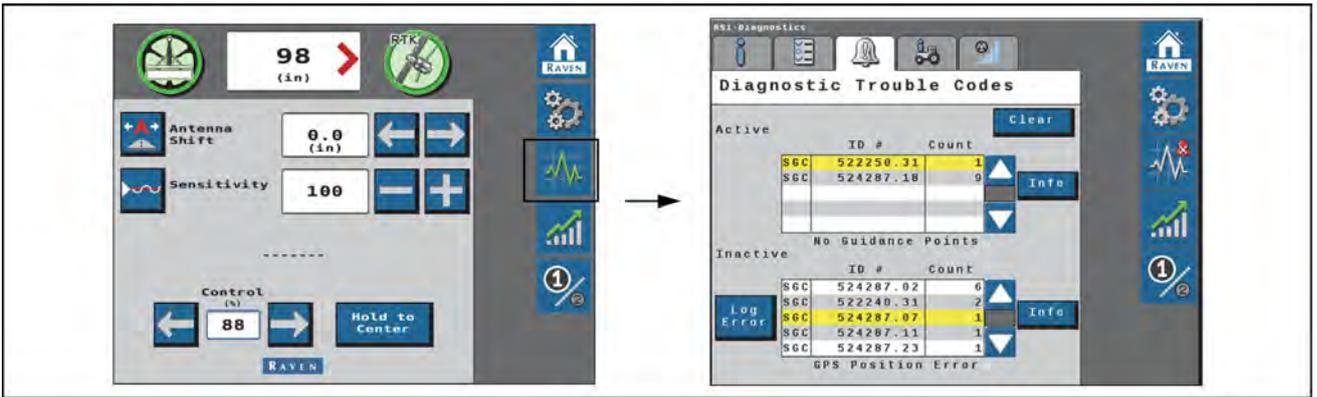
Networked Transport of RTCM via Internet Protocol (NTRIP) RTK correction type

| Problem | Probable cause | Impact to user | Detection | Corrective action |
|---|--|---------------------------------------|--|--|
| RTK correction type not selectable | receiver is not unlocked for high accuracy corrections | No RTK positions available | Check accuracy level in the unlocks screens | See dealer to purchase upgrade to high accuracy. |
| No corrections received or intermittent corrections when using internet RTK | Poor cellular signal strength | No RTK solution or poor RTK solution. | Correction age is high and packet value low. | Invalid internet settings. No cellular coverage. |

Radio RTK correction type

| Problem | Probable cause | Impact to user | Detection | Corrective action |
|--|--|---------------------------------------|--|--|
| RTK correction type not selectable | receiver is not unlocked for high accuracy corrections | No RTK positions available | Check accuracy level in the unlocks screens | See dealer to purchase upgrade to high accuracy. |
| No corrections received or intermittent corrections when using radio RTK | Poor radio link | No RTK solution or poor RTK solution. | correction age is high and Packet Value low. | Wrong base station channel settings. No radio reception. Check RTK radio and antenna installation. Longer antenna rod may improve range. |
| Correction type not supported by receiver and radio | Incompatible correction type | No RTK solution | correction age is high and packet value is 0%. | Incompatible base station. See dealer or network supplier for alternative base station or radio options |
| Distance to RTK base station is too high | Wrong base station selected or RTK network problem | Degraded RTK performance | It is preferred that base station is within 15 km (9 miles) . RTK may be operated with degraded performance up to 50 km (31 miles) . It is not recommend to operate more than 50 km (31 miles) from the base station. | Move portable base station closer to field. Select an NTRIP base station closer to your location. See your RTK network provider. |

Diagnostic Trouble Code (DTC) screen

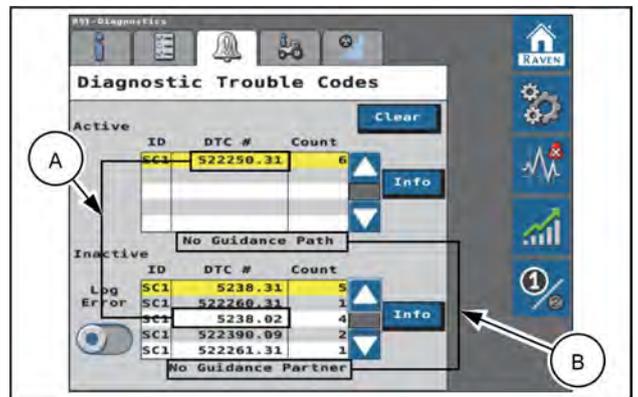


RAIL21TR02825TA 1

The Diagnostic Trouble Code screen displays active and previous diagnostic trouble codes (DTCs), also known as fault codes, that occur during **SC1™** system operation. Active fault codes must be fixed before the **SC1™** system can be enabled for guidance and steering operation. Once a fault causing a fault code has been corrected, the code moves to the inactive fault code list. See “RS1™ and SC1™ DTC codes” (6-23) for a comprehensive list of fault codes for this system.

Diagnostic Trouble Codes screen

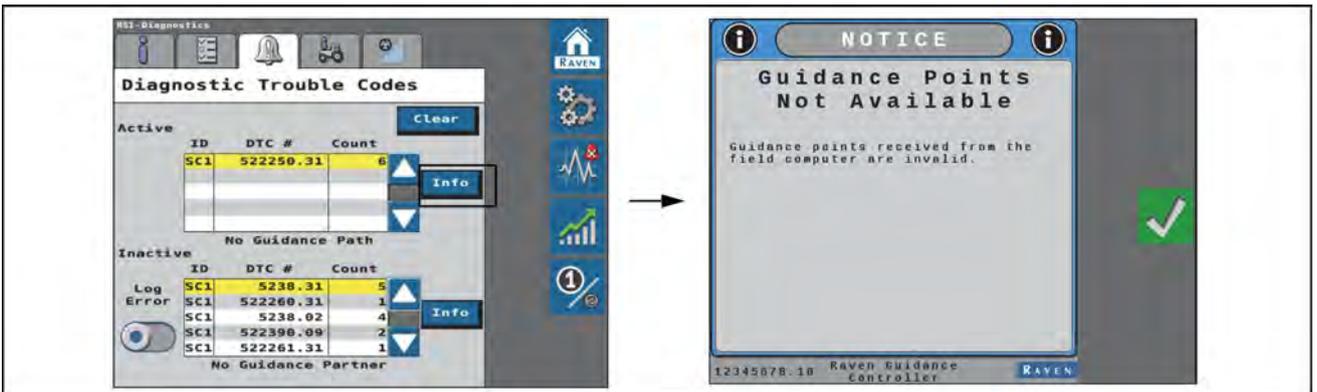
NOTE: The active fault code is 522250.31 (A) and the fault code summary (B) is “No Guidance Points.” The inactive fault code is 522261.31 (A) and the fault code summary (B) is “No SCU Detected.”



RAIL21TR02826AA 2

Information screen

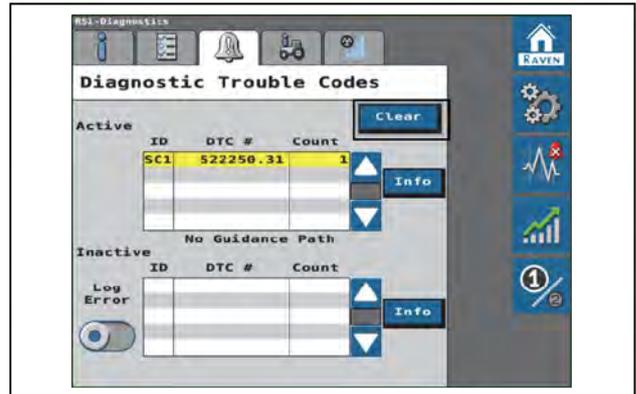
Pressing the Information button displays the complete description of the highlighted active fault code.



RAIL21TR02827TA 3

Inactive fault codes cleared from error log

Pressing Clear deletes the inactive fault codes from the Inactive fault code error log.



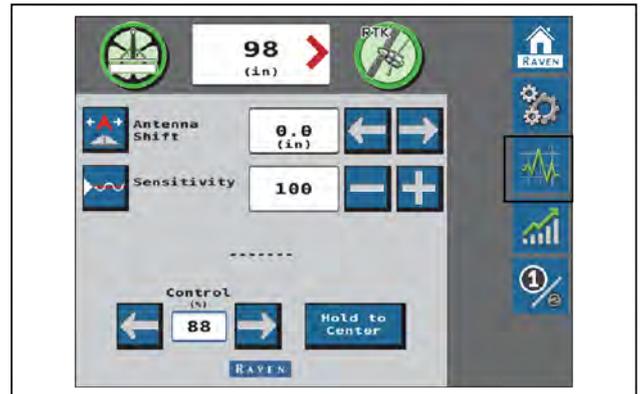
RAIL21TR02828AA 4

System health tests

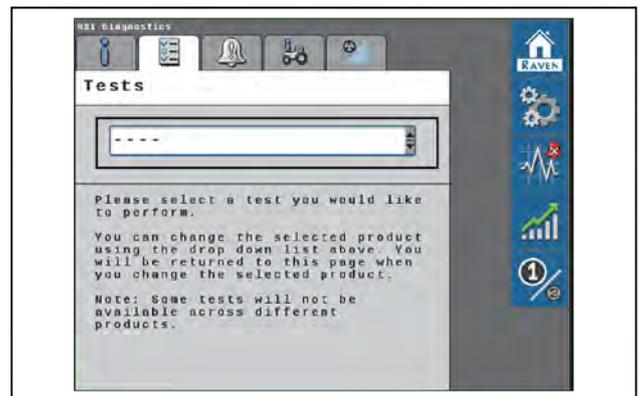
Test selection screen

System health tests are performed to diagnose and correct machine and **SC1™** calibration issues. The following system health tests can be performed via the **SC1™** system:

- Step Response Test
- Machine Test



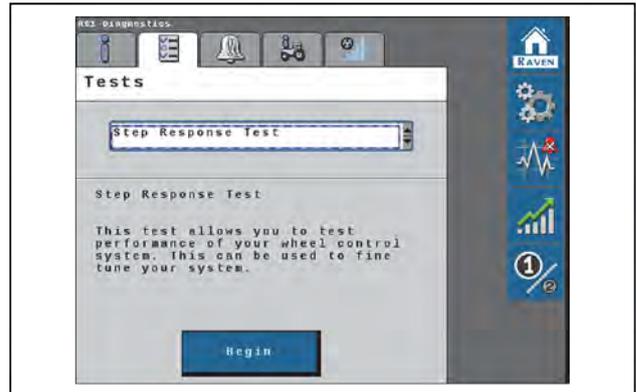
RAIL21TR02830AA 1



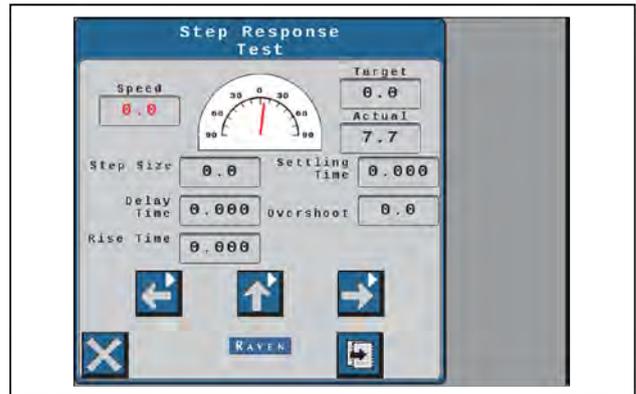
RAIL21TR02831AA 2

Step response test

The Step Response Test is used to determine the responsiveness of the implement steering system



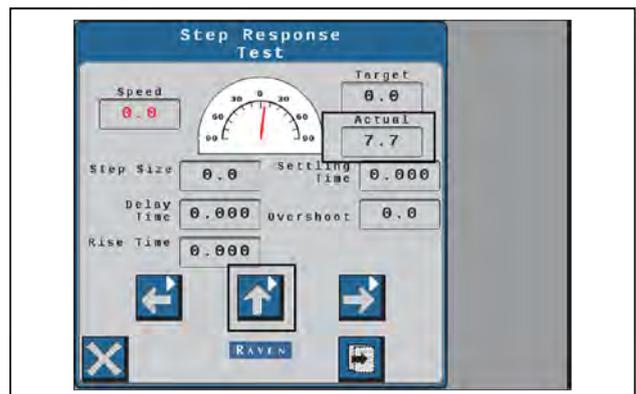
RAIL21TR02997AA 3



RAIL21TR02998AA 4

Step response test screen

1. Drive forward **1.61 – 6.44 km/h (1.00 – 4.00 mph)** with the engine RPM set at 3/4 throttle.
2. Press the center up arrow. Wait for the actuator to reach the center position.
3. Press the left arrow.
4. Wait for the following fields to populate and record the data:
 - A. Step Size
 - B. Delay Time
 - C. Rise Time
 - D. Settling Time
 - E. Overshoot
5. Drive forward **1.61 – 6.44 km/h (1.00 – 4.00 mph)** with the engine RPM set at 3/4 throttle.
6. Press the center up arrow. Wait for the actuator to reach the center position.
7. Press the right arrow.



RAIL21TR02832AA 5

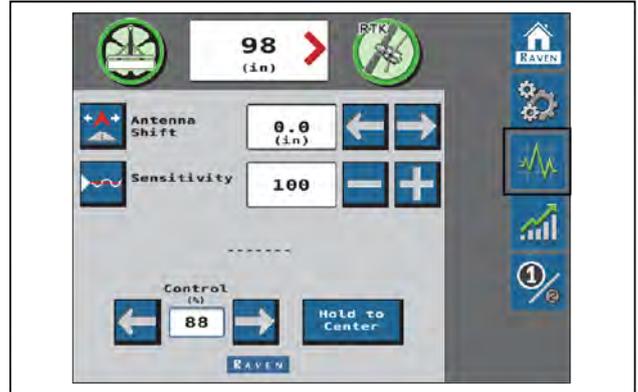
8. Wait for the following fields to populate and record the data:
 - A. Step Size
 - B. Delay Time
 - C. Rise Time
 - D. Settling Time
 - E. Overshoot
9. To test consistency, repeat steps 1 to 8.

NOTE: *Once the Step Response Test has been completed, the machine performance reading should fall within the recommended system settings. Provide the collected data to a CASE IH service technician to verify machine performance falls within the recommended settings.*

System information

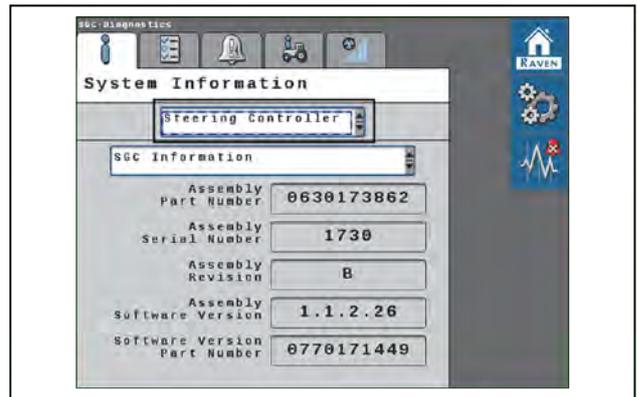
System information screen

1. Select the desired device from the drop-down menu.



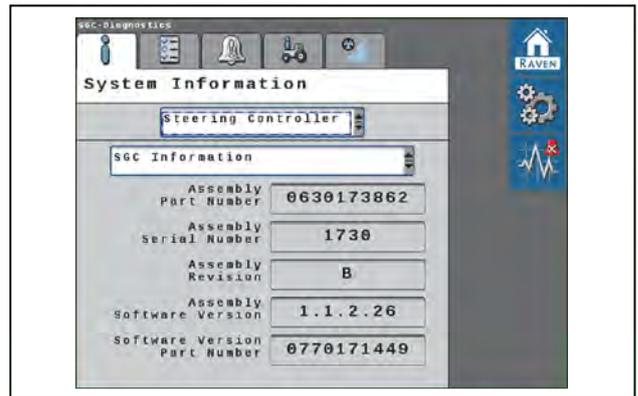
RAIL21TR02833AA 1

2. Select the desired system component from the second drop-down menu.



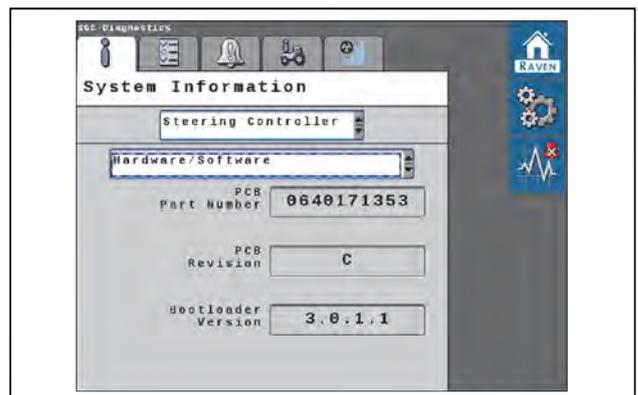
RAIL21TR02999AA 2

SC1™ Information



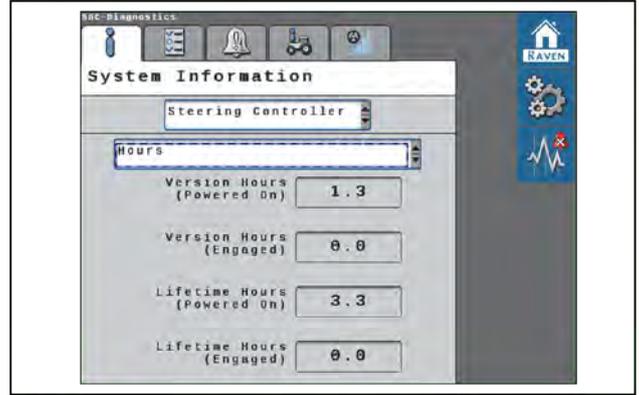
RAIL21TR02834AA 3

Hardware/Software information



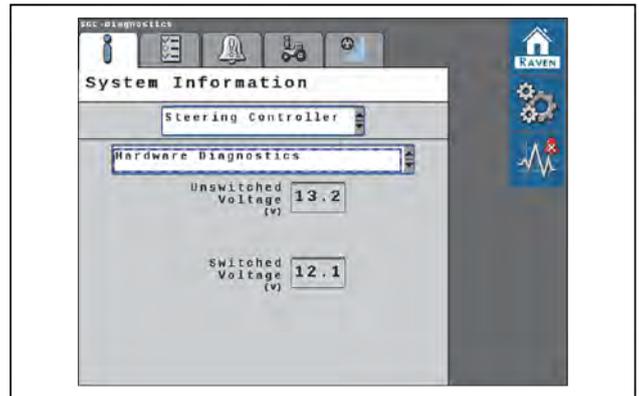
RAIL21TR02835AA 4

SC1™ unit hours

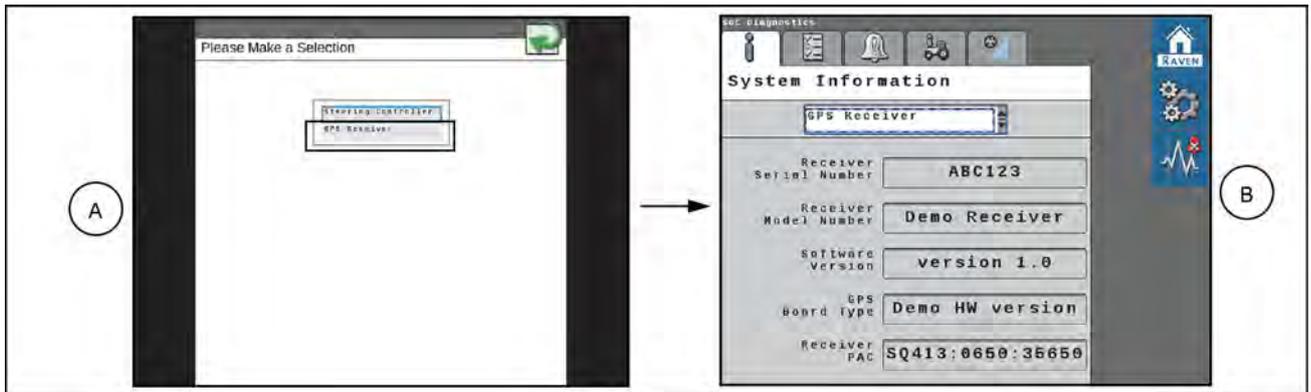


RAIL21TR02836AA 5

SC1™ hardware diagnostics



RAIL21TR02837AA 6



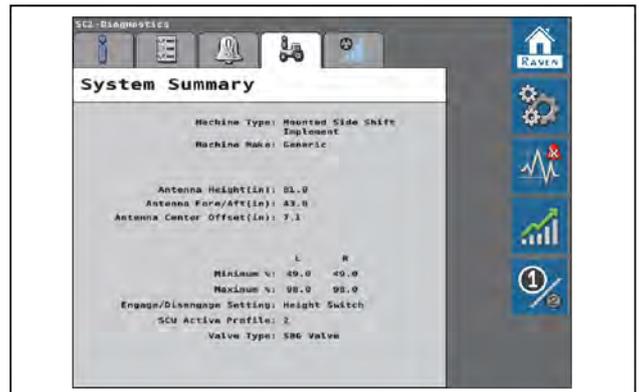
RAIL21TR02838EA 7

A. Global Positioning System (GPS) receiver information

B. GPS receiver

System summary screen

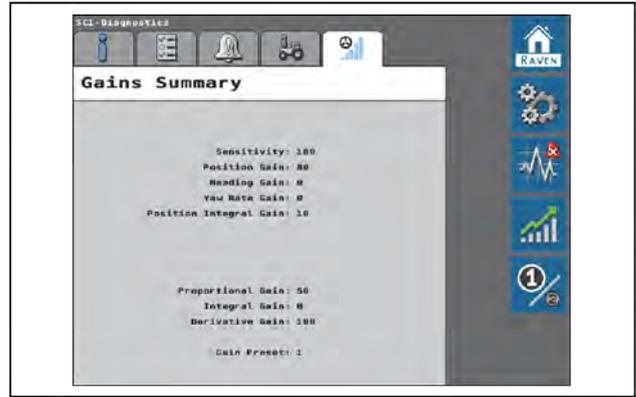
The System Summary screen displays the machine settings and calibrated steering settings for the SC1™ system.



RAIL21TR02840AA 8

Gains summary screen

The Gains Summary screen displays all of the advanced steering settings used to steer the machine.

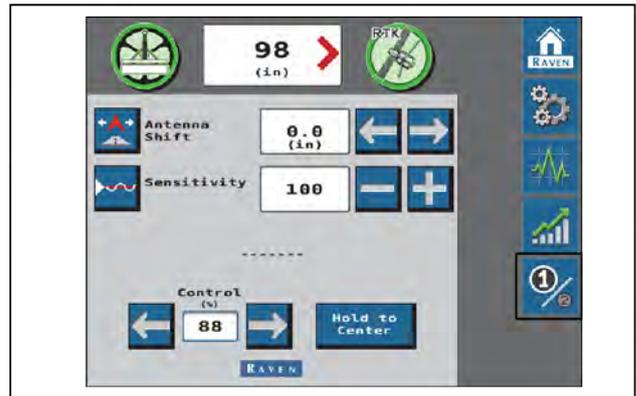


RAIL21TR02841AA 9

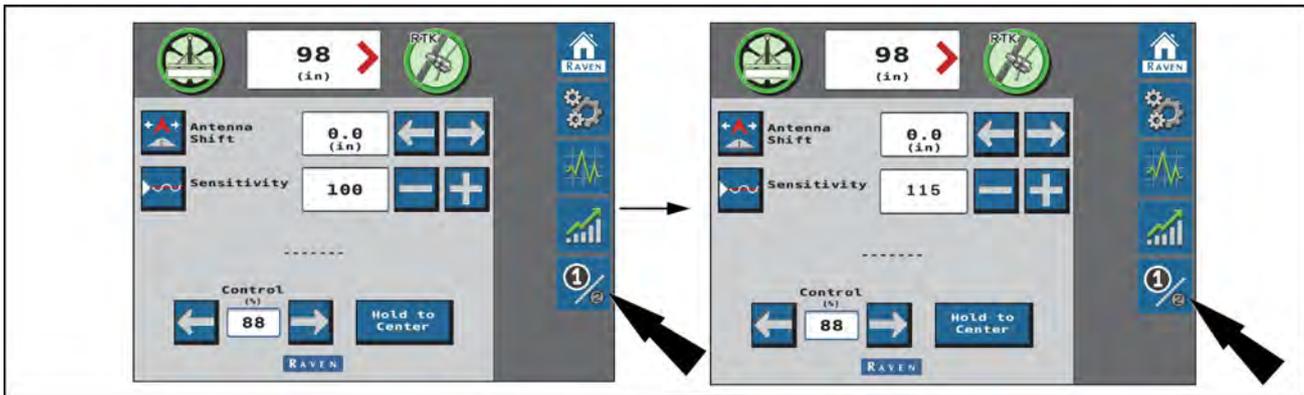
Preset steering gains

The Preset Gains option allows the operator to switch back and forth between two sets of steering gain settings. Different sets of settings may be useful when:

- Different terrain conditions
- Different soil types
- Different speeds (planting vs. cultivating)



RAIL21TR02842AA 10



RAIL21TR02843EA 11

Preset gains settings



Press the button to toggle between the two sets of steering gains.

RS1™ and SC1™ fault codes**RS1™ and SC1™ fault codes**

The table below gives all of the Diagnostic Trouble Codes (DTC), also known as fault codes, for both the **RS1™** and the **SC1™** systems. Any fault code that is unique to one of the systems states that in the description.

See “Diagnostic Trouble Code (DTC) screen (6-1) for instructions on examining fault codes in the **RS1™** system.

See “Diagnostic Trouble Code (DTC) screen” (6-15) for instructions on examining fault codes on the **SC1™** system.

RS1™/SC1™ DTC Codes

| Code ID | Display Name | Description |
|---------|--------------|--|
| 74 | .0 | Max Speed Shutdown Vehicle speed has exceeded the warning threshold for the calibrated platform and has shutdown. |
| | 0.16 | Max Speed Warning Vehicle speed has exceeded the warning threshold for the calibrated platform. |
| 87 | .0 | Max Speed Engage RS1™ cannot be engaged over 29 km/h (18 mph) . |
| 88 | 0.1 | Speed Too Low. Vehicle Speed is not above the required speed to engage. Please drive above 5 km/h (3 mph) . |
| 168 | 0.3 | HC High Voltage The supply voltage is greater than 32 V . Check battery voltage. |
| | 0.4 | HC Low Voltage The supply voltage is less than nine 9 V . Check battery voltage. |
| 621 | 0.4 | GPS RCVR: Antenna S. |
| | 0.5 | GPS RCVR: Antenna O. |
| | 0.11 | GPS RCVR: LNA Fail. |
| | 0.31 | GPS RCVR: Antenna P. |
| | | The GPS receiver has encountered an error. If this problem persists, contact dealer. |
| 628 | 0.13 | Memory Error. Memory failure |
| 630 | 0.13 | Steering No Cal System is not fully calibrated. |
| 701 | 0.3 | Resume Switch Stuck The resume switch has been in the on position for too long. If this problem persists, contact dealer. |
| 841 | .0 | GPS Not Converged. GPS has not converged. This can take up to 30 min . If this problem persists, contact dealer. |
| | 0.11 | GPS Position Error GPS position is currently invalid. |
| | 0.15 | Poor GPS Pos Accuracy The user set position accuracy has been reached or passed. Performance may not be as desired. |
| 1504 | 0.2 | Operator Not Present Operator presence switch indicates that the operator is not present. |
| 2901 | 0.2 | Incompatible HW This hardware platform isn't supported by the current software loaded onto it. |
| 3045 | 0.31 | SCU Denied Steering Steering Control Unit is preventing system operation. Please check steering control unit. |
| 3509 | 0.31 | Curvature Msmatch WRN. Machine heading and wheel direction does not match. Check wheel angle sensor and/or reset system. |
| | 0.7 | Curvature Msmatch FLT. The wheel angle sensor measurement is not aligned with the yaw rate sensor measurement. |
| 5238 | 0.2 | Invalid Curvature The estimated curvature from the Steering Control Unit is invalid. |
| 5238 | 0.31 | Loss of SCU Comm Steering Control Unit was detected, but communication has stopped. Please check cabling. |
| 5241 | 0.31 | Disengage Switch Off The disengage switch is currently off. If this persists, contact dealer. |
| 5243 | 0.2 | Master Switch Off Master Switch is turned off. |
| 5613 | 0.2 | INS Data Invalid System is unable to measure data from inertial sensors. |
| 5613 | 0.11 | No Field 3D Cal. Recalibrate terrain compensation. |

6 - TROUBLESHOOTING

| Code ID | | Display Name | Description |
|---------|---------------------|-----------------------|---|
| 5613 | 0.13 | 3D Not Calibrated | Terrain Compensation has not been factory calibrated. If this problem persists, contact dealer. |
| 5613 | 0.31 | GPS RCVR: INS Reset. | The GPS receiver has encountered an error. If this problem persists, contact dealer. |
| 522240 | 0.31 | No GPS Comm | System is unable to communicate with the GPS receiver. |
| | 0.16 | GGA Rate High | Communication to the receiver is active, but the GGA string is being received at > 20 Hz . |
| | 0.18 | GGA Rate Low | Communication to the receiver is active, but the GGA string is being received at < 5 Hz . |
| 522242 | 0.16 | ZDA Rate High | Communication to the receiver is active, but the ZDA string is being received at > 1 Hz . |
| | 0.18 | ZDA Rate Low | Communication to the receiver is active, but the ZDA string is being received at < 0.1 Hz . |
| 522250 | 0.2 | SWATH JUMP. | A swath jump has been detected. |
| | 0.31 | No Guidance Path | Guidance points received from Viper® 4+ display are invalid. |
| | 0.7 | Max XT ERR Exceeded | Machine exceeded max error from the guidance line. |
| | .0 | End of Line ERR | Reset/update Viper® 4+ display. Contact dealer. |
| | 0.15 | Max Point Space ERR | |
| | 0.16 | Segment Angle ERR | |
| | 0.17 | Min Point Space ERR | |
| | 0.4 | NoPts Ahead Start | |
| | 0.5 | Curve No Pts Behind | |
| | 0.6 | Curve No Pts Ahead | |
| 0.8 | Lookahead too Large | | |
| 522260 | 0.31 | No Guidance Partner | |
| 522261 | 0.31 | No SCU Detected | Steering Control Unit has not been detected during the current power cycle. Please check cabling. |
| 522390 | 0.9 | Engage SW Error | An engage switch is currently in a failed state. Please check engage switch. |
| 522550 | 0.16 | FNRP Not in Park. | Forward Neutral Reverse Park (FNRP) Lever is not seated in the park position. If this problem persists, contact your dealer. |
| | 0.18 | TCU Fault. | Machine cannot enter automation. |
| 523827 | .0 | Rev Steer No Support | Reverse steering is not supported for this machine. |
| 523830 | 0.31 | Steering Not Unlcked. | Steering has not been unlocked. To use the steering feature, contact dealer for an unlock code. |
| 523832 | .0 | GPS Mode Not Unlocked | The differential correction mode requested is not unlocked. |
| 523839 | 0.31 | Tuneset Not Released. | The selected tuneset has not been released yet. Contact dealer for updates on this tuneset. |
| 523842 | 0.31 | Libaility Acceptance | RS1™/SC1™ Liability has not been accepted. |
| 523843 | .0 | Lost Internal Comm. | The is no communication between the SOM and the SGC. This could affect RTK streams and file management. If this problem persists, contact dealer. |

6 - TROUBLESHOOTING

| Code ID | Display Name | Description | | |
|---------|--------------|-----------------------------|--|--|
| 523844 | 0.11 | GPS RCVR: Error. | | |
| 523845 | 0.16 | GPS RCVR: Temp. | | |
| 523846 | 0.16 | GPS RCVR: Voltage. | | |
| 523847 | 0.31 | GPS RCVR: CPU Max. | | |
| 523848 | 0.2 | GPS RCVR: COM1 OVR. | | |
| 523849 | 0.2 | GPS RCVR: COM2 OVR. | | |
| 523850 | 0.2 | GPS RCVR: COM3 OVR. | | |
| 523851 | 0.2 | GPS RCVR: Link OVR. | | |
| 523852 | 0.31 | GPS RCVR: Aux Tx OR. | | |
| 523853 | 0.3 | GPS RCVR: AGC Error. | The GPS receiver has encountered an error. If this problem persists, contact dealer. | |
| 523854 | 0.11 | GPS RCVR: Almanac Er. | | |
| 523855 | 0.31 | GPS RCVR: Position S. | | |
| 523856 | 0.31 | GPS RCVR: Position F. | | |
| 523857 | 0.31 | GPS RCVR:Clock Steer. | | |
| 523858 | 0.31 | GPS RCVR:Clock Model. | | |
| 523859 | 0.31 | GPS RCVR: Oscillator. | | |
| 523860 | 0.31 | GPS RCVR:Software Re. | | |
| 523861 | 0.31 | GPS RCVR:Aux 3 Event. | | |
| 523864 | 0.31 | GPS Source Mismatch | | Implement and tractor are using different correction sources. |
| 523868 | 0.31 | G-Force Limit Active. | | The maximum G force has been limited. This can happen when the SGC limits the amount the machine turns when performing operations such as line acquire and curve steering. |
| 523874 | 0.13 | Memory Comm Error. | | Memory failure |
| 523875 | 0.13 | SCU SW Out of Date. | | The MDU/HDU needs to be higher than this version for support |
| 523898 | 0.31 | OEM Engage Error. | | Tried to engage using Viper® 4+ display when system only supports machine engage switch to engage |
| 523913 | 0.31 | GPS Invalid Auth. | The GPS receiver has lost the unlock code | |
| 523916 | 0.13 | SC1 SW Out of Date. | SC1 version does not support current SCU version. Update SC1 software. | |
| 523916 | 0.13 | RS1™ SW Out of Date. | RS1™ version does not support current SCU version. Update RS1™ software. | |

| Code ID | | Display Name | Description |
|---------|------|-----------------------|---|
| 523918 | 0.2 | GPS RCVR: Input OVR. | The GPS receiver has encountered an error. If this problem persists, contact dealer |
| 523919 | 0.31 | GPS RCVR: Jammer Det. | |
| 523920 | 0.2 | GPS RCVR:IMU Comm Er. | |
| 523921 | 0.31 | GPS RCVR:Tracking Mo. | |
| 523922 | 0.31 | GPS RCVR: Dig Filter. | |
| 523923 | .0 | VSN Data Invalid Wrn. | SC1™ software is older than what is supported by the steering control unit. |
| 523924 | .0 | VSN Data Invalid Err. | VSN guidance vectors not valid. Restart VSN. |
| 523925 | 0.2 | No Row Cam Comm. | VSN communication timeout. Restart the system. |
| 523926 | 0.31 | No User Activity. | No user activity detected. Check operator switch settings and operator switch harness (if present). |
| 523927 | 0.31 | Vision Only Needs TC. | System requires a Viper® 4+ display to function. Start a job. |
| 523928 | 0.13 | Invalid Factory Cal. | Restart RS1™ . If problem persists, contact dealer. |

VSN® visual guidance diagnostics (if equipped)

System information

NOTE: If the system does not allow you to engage while using radar sensors, use a rag or cloth to clean the radar sensors and allow for better solution quality.

The following buttons will be used to navigate the diagnostics menus and pages described in the following sections.

UT navigation buttons

| | |
|---|--|
|  | Accept - Saves the changes made to the VSN® system at the end of the setup process and returns the to the Tools Menu. |
|  | Next - Saves the changes made to the VSN® system and proceeds to the next step in the setup process. |
|  | Previous - Returns the Universal Terminal (UT) display to the previous page in the setup process. |

System Information

The System Information tab displays the following information associated with the **VSN®** system:

- Hardware version
- Software version
- Inertial data
- System hours
- System voltages



RAIL21TR02987AA 1

Slingshot® status icon

The **Slingshot®** status icon displays current **Slingshot®** connection status:

- Green – Denotes a **VSN®** connection to **Slingshot®**.
- Red – Denotes that the **VSN®** is NOT connected to **Slingshot®**.

Software update

If the **RS1™** or field hub cell plan has been activated, OTA updates will be available for the **Viper®** 4+ display, **RS1™** receiver, and **VSN®** system. Nodes like the RCM node, **SC1™** node, ABM node, and direct injection can be updated in the The node file goes OTA to the **Viper®** 4+ display, and then the file is available in the hardware update screen.

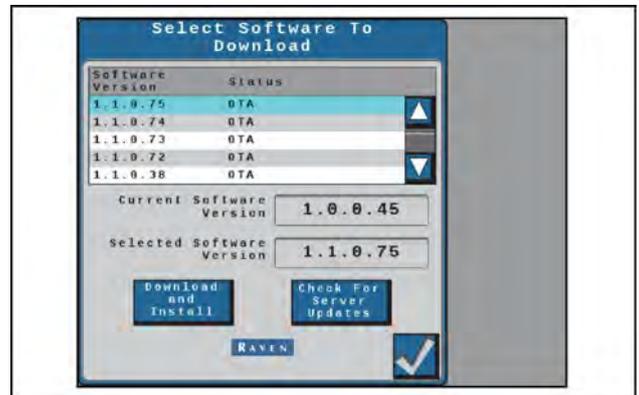
Select the “Update Software” button at the bottom of the screen to update the software version on the **VSN®** system.

The current software version installed on the **VSN®** system is displayed along with any available Over-The-Air (OTA) updates.

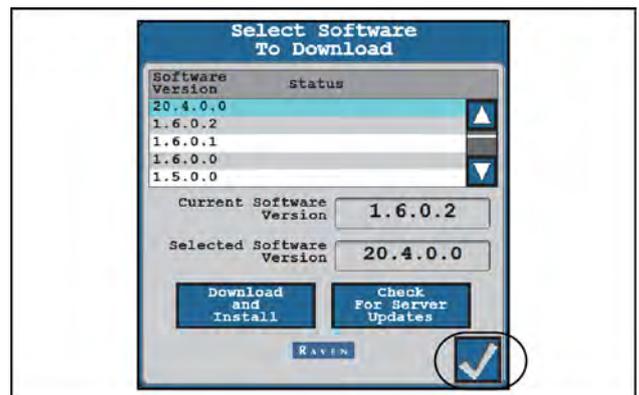
NOTE: VSN® may be updated with a Universal Serial Bus (USB) drive via the Viper® 4+ display or the UT. An OTA update may be completed with an Internet connection either via WiFi or Ethernet.

To update software

1. Select the “Check for Server Updates” button to search for available updates.
2. Select the desired software update from the list.
3. Select the Accept button.



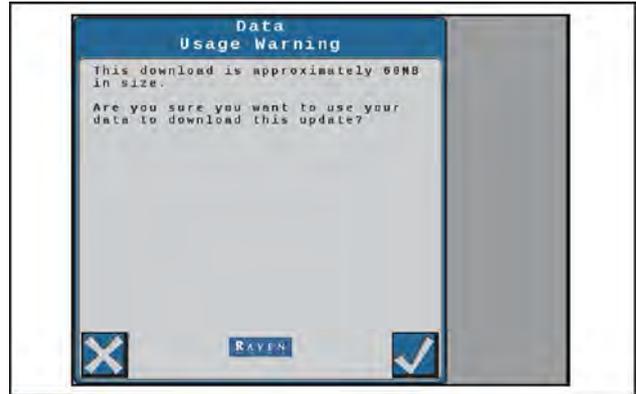
RAIL21TR02988AA 2



RAIL21TR02989AA 3

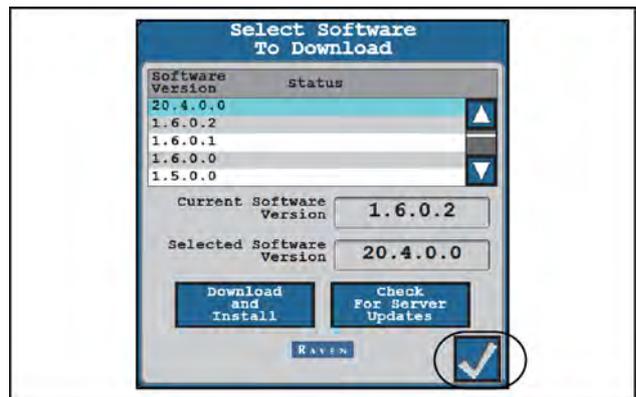
NOTE: The software will download, but will not be installed until later in the procedure. Before proceeding, accept the Data Usage Warning to allow the system to use cellular data to download the updates.

NOTE: Select Cancel to exit without downloading the software update.



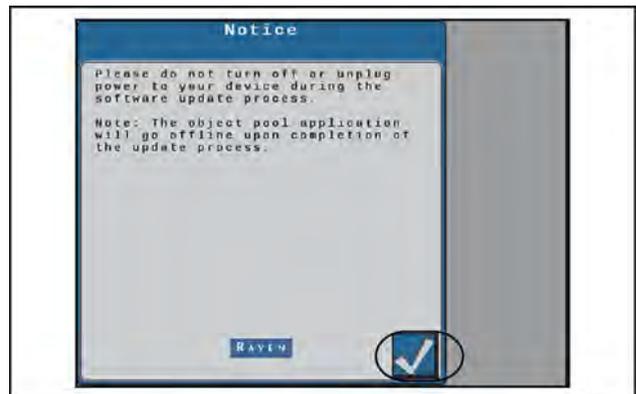
RAIL21TR02990AA 4

4. Select Accept to begin the software download.
5. Wait for the software download to be completed.



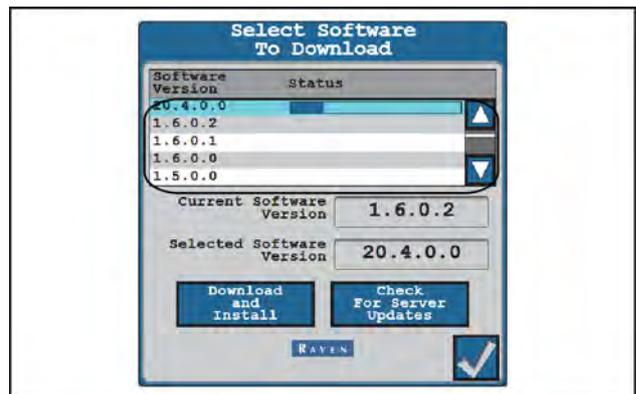
RAIL21TR02991AA 5

6. Select Accept to install the software.



RAIL21TR03002AA 6

NOTE: Do not shutdown the system or the Viper® 4+ display during the software update.



RAIL21TR03003AA 7

Diagnostic Trouble Code (DTC) screen

Diagnostic trouble codes tab

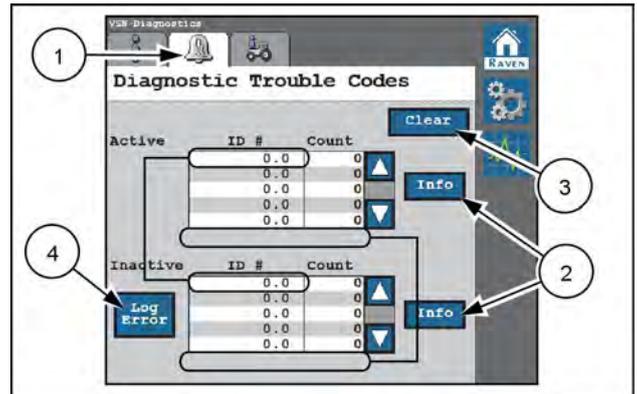
To access the fault codes for the **VSN®** visual guidance system:

1. Press the “Diagnostics” button on the left-hand pane of the home screen.
2. Select the “Diagnostic Trouble Codes” tab (1).

Press the Info button (2) to display the complete description of the highlighted fault code.

Press the Clear button (3) to deletes the inactive fault codes from the fault code error log. For a complete list of the **VSN®** system fault codes, see your CASE IH dealer.

Press Log Error button (4) to record a random failure condition.



RAIL21TR03004AA 1

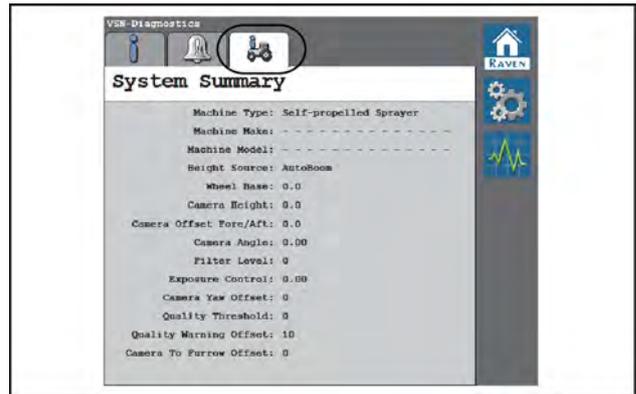
VSN® diagnostic Light-Emitting Diode (LED) states

VSN diagnostic LED displays

| Status | Description |
|--------------|--|
| Green | <ul style="list-style-type: none"> • Flashing (1 Hz) - VSN® system is calibrated and detecting rows. |
| Yellow | <ul style="list-style-type: none"> • Flashing (10 Hz) - No CAN communication. • Flashing (1 Hz) - CAN Communication Present. |
| Red | <ul style="list-style-type: none"> • Flashing - VSN® has power and is starting up. |
| Red / Purple | <ul style="list-style-type: none"> • Flashing - VSN® needs reprogramming. |

System summary

The System Summary tab provides an overview of the current **VSN®** settings and may be useful to verify that the system is configured properly for the machine or implement with which the system is operating.



RAIL21TR03005AA 1

7 - SERVICES

Slingshot®

Slingshot® with RS1™ (if equipped)

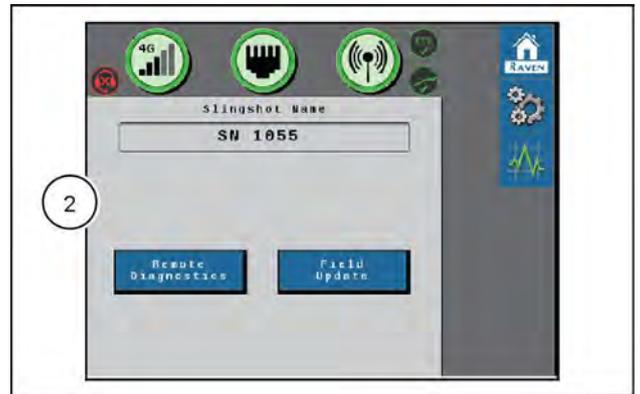
Overview

Sprayers that are equipped with the **RS1™** system have an integrated cellular device to connect to the **Slingshot®** portal for telematics and cellular-delivered differential corrections. In this scenario, **Slingshot®** setup is performed through a unique working set (object pool) in the Universal Terminal (UT).

To access the **Slingshot®** home screen, select the **Slingshot®** working set item (1) from the UT. The **Slingshot®** screen (2) appears.



RAPH23PLM0252AA 1



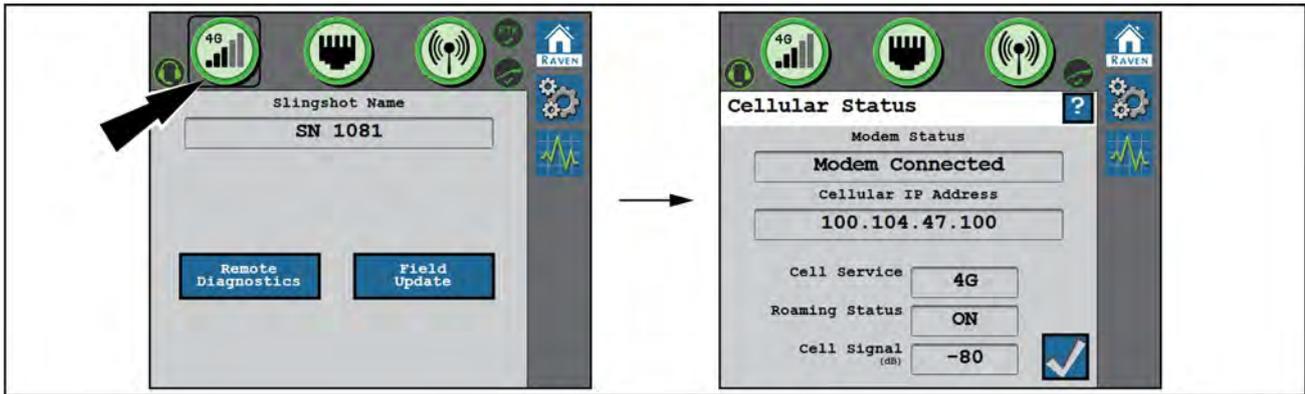
RAPH23PLM0251AA 2

Button navigation

UT navigation buttons

| | |
|---|--|
|  | Accept - Saves changes made to the Slingshot® system and returns the user to the previous status screen (or returns the user to the tools menu during the initial setup process). |
|  | Next - Press to proceed to the next page. |
|  | Previous - Returns the display to the previous screen in the setup process. |

Cellular modem



RAIL21TR02722EA 3

Cellular status screen

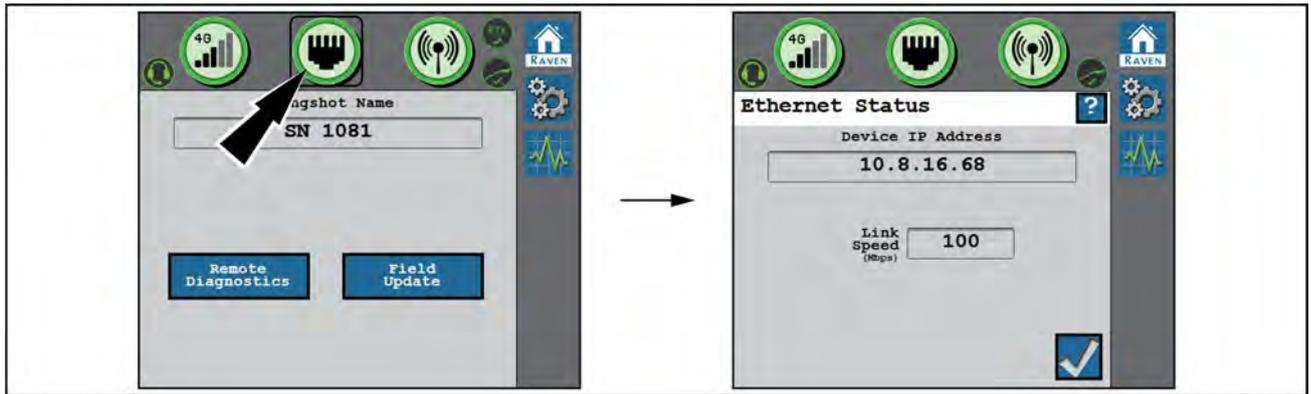
| Display | Message |
|---------|---|
| | RS1™ is connected to the network via the cellular modem. |
| | The cellular modem is functional, but is not connected to the network. |
| | The cellular modem is not functional and RS1™ is not connected to the network. |
| | The RS1™ unit is equipped with a cellular modem, but the feature has not been unlocked. Contact your local dealer to purchase feature unlock codes. |
| | The RS1™ unit is not equipped with a cellular modem. |

Cellular status

The table below defines some of the terms used as cellular status:

| Status | Definition |
|----------------|--|
| Cellular APN | Displays the current Access Point Name (APN) used by the cellular mode. If Not Available is displayed, either no cellular connection was established or the user did not enter an APN. |
| WAN | Displays the Wide Area Network (WAN) Internet Protocol (IP) address the cellular modem is receiving from the network. |
| Cell Signal | Displays the current Received Signal Strength Indicator (RSSI), or signal strength, of the cellular modem. |
| Cell Service | Displays the current cellular service connection type. |
| Roaming Status | Displays if the cellular modem is roaming. |

Ethernet status

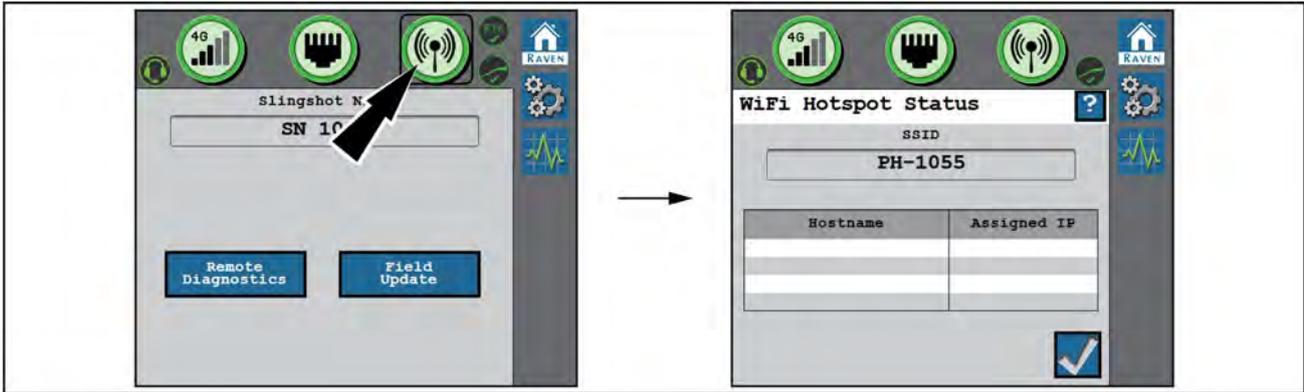


RAIL21TR02723EA 4

Ethernet status screen

| Display | Message |
|---|---|
|  | Indicates that a valid connection has been established between the RS1™ and a Viper® 4+ display or field hub. |
|  | No Ethernet connection has been made or the RS1™ does not recognize that an Ethernet has been made. |
|  | Ethernet device failure. Contact dealer for support. |
| Device IP Address | Displays the IP Address the RS1™ will broadcast to a connected device. |
| Link Speed | The speed data can pass from the RS1™ to the devices it is connected to. |

WiFi status



RAIL21TR02724EA 5

WiFi status screen

| Display | Message |
|---|--|
|  | The WiFi hotspot is active and functioning properly. |
|  | WiFi hotspot is not functioning properly. |
|  | The WiFi client is active and has connection. |
|  | The WiFi client is active, but does not have a valid connection to a WiFi network. |
|  | The WiFi hardware is not functioning properly. |

SSID – The Service Set Identifier (SSID) is a wireless network identifier name that connects to via a WiFi network.

Hostname – The hostname is the name of any device that is connected to the **RS1™** system.

Assigned IP – The Assigned IP is the IP address that is given to the device when it connects to the **RS1™** system.

NOTE: See “System settings” (7-7) for additional information regarding hotspot and WiFi configurations.

Slingshot® and Real-Time Kinematic (RTK) status

The home screen provides status indicators for the **Slingshot®** connection (1) and Real-Time Kinematic (RTK) correction status (2).



RAIL21TR02725AA 6

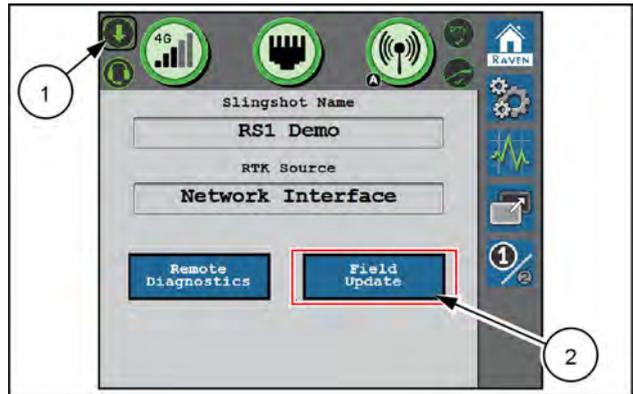
| Display | Message |
|------------------------|--|
| | The RS1™ unit is connected to the Slingshot® portal. |
| | The RS1™ unit is not connected to the Slingshot® portal. |
| | The RS1™ unit is receiving RTK corrections. NOTE: This icon is hidden if RTK corrections have not been unlocked in the RS1™ unit. |
| | RS1™ is not receiving RTK connections. NOTE: This icon is hidden if RTK has not been unlocked in the RS1™ unit or an RTK correction profile has not been setup on the Slingshot® website. |
| | RS1™ remote diagnostics are being sent to the Slingshot® portal. |
| | RS1™ remote diagnostics are not being sent to the Slingshot® portal. |
| Slingshot® Name | Displays the default system name given to the RS1™ unit in the Slingshot® portal when the device was registered. |

Field updates

Slingshot home screen

NOTE: A status icon (1) will be displayed on the **Slingshot®** home screen when an update is in progress.

1. Select the Field Update button (1) to view the latest software updates for the **RS1™** unit.



RAIL21TR02726AA 1

2. Select the “Check for Server Updates” button (1).

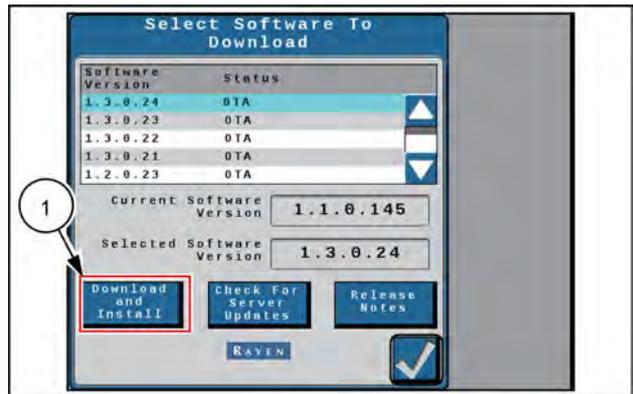
NOTE: This will search the **RS1™** system for the latest software updates.

3. Select the desired software update from the list.



RAIL21TR02727AA 2

4. Select the “Download and Install” button (2).



RAIL21TR02729AA 3

NOTE: When the button is pressed, the following warning screen appears notifying the user that cellular data will be used to download the software and asks if the user would like to proceed with the download.

5. Select the Accept button (1).

NOTE: Select the Cancel button (2) to exit the field update without performing a software update.

NOTE: The software is downloaded to the **RS1™** unit, but is not installed in the system until later in the procedure.



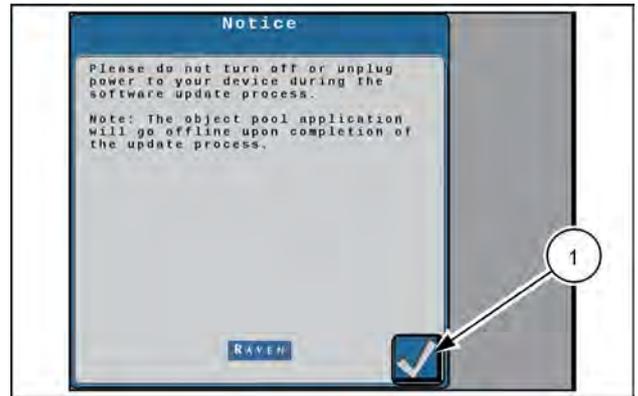
RAIL21TR02728AA 4

Software update notice

6. Press the Accept button (1) to install the software.

Please do not turn off or unplug power to your device during the software update process.

NOTE: The object pool application will go offline upon completion of the update process.



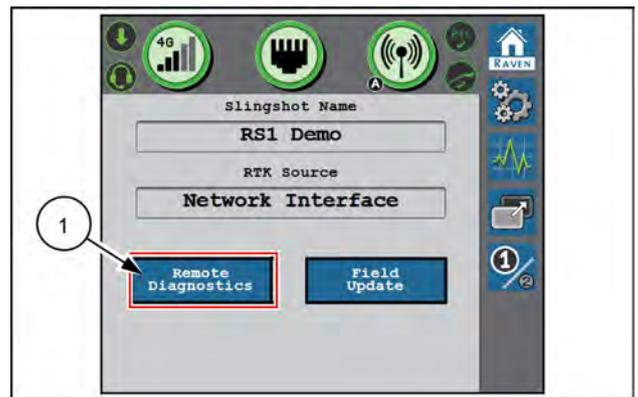
RAIL21TR02730AA 5

Remote diagnostics

Slingshot home screen

The remote diagnostics feature enables the **RS1™** unit to send usage logs to the **Slingshot®** server for use by CASE IH to monitor **RS1™** system performance. Press the “Remote Diagnostics” button (1) and accept the End User License Agreement (EULA).

The EULA must be pressed after every power cycle. To accept the EULA so that it does not need to be pressed until the next time the EULA is revised, accept the EULA on the **Slingshot®** portal.

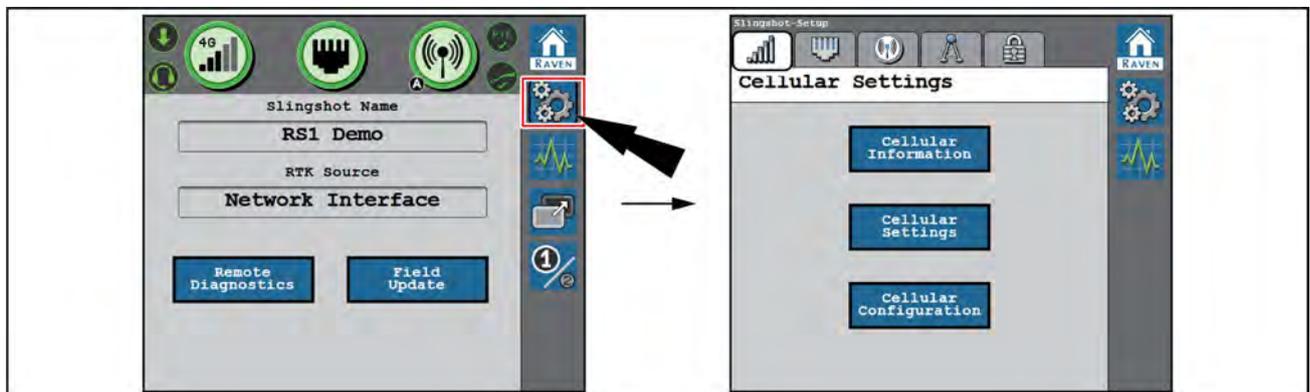


RAIL21TR02732AA 1

System settings

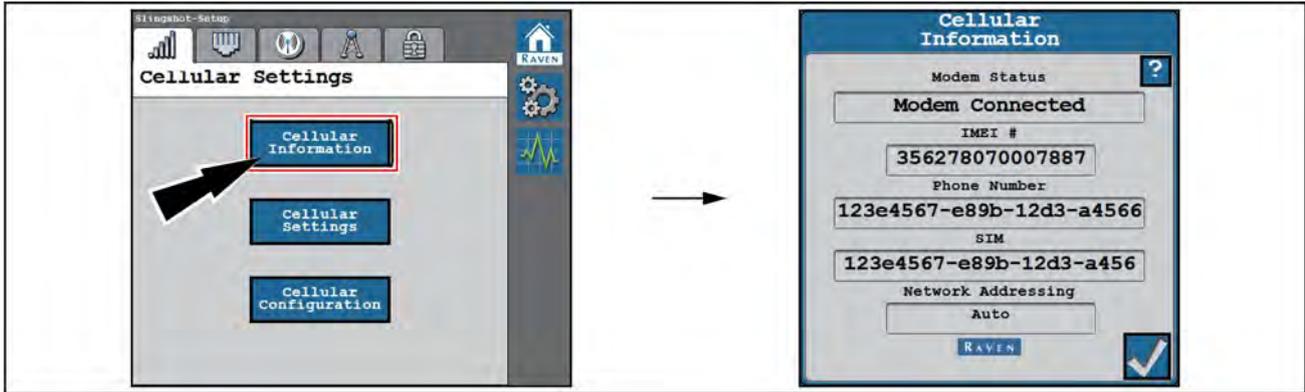
Cellular settings

The Cellular Settings screen allows the operator to access the cellular information and cellular settings used in the **RS1™** system.



RAIL21TR02733EA 1

Cellular information



RAIL21TR02734EA 2

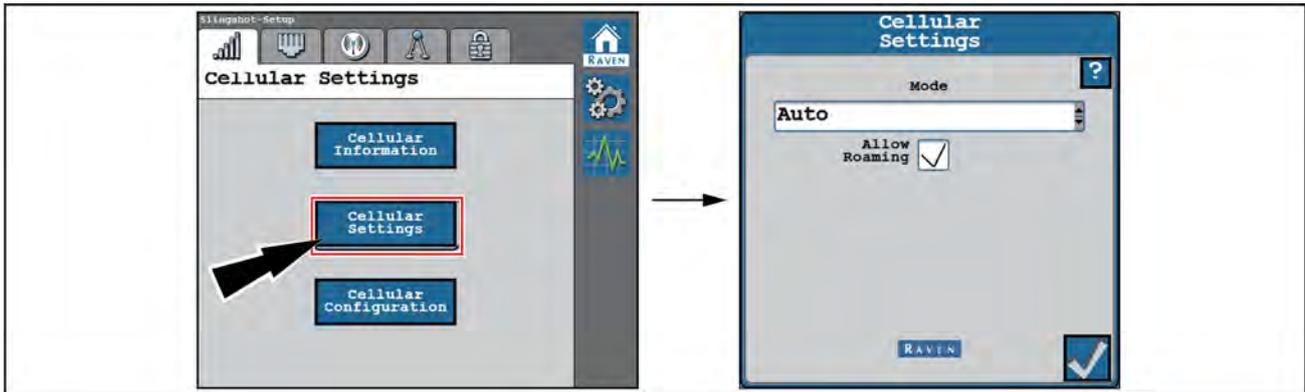
The following options are available on the Cellular Information screen:

- IMEI # – Displays the International Mobile Equipment Identity (IMEI) number with the modem installed in the **RS1™** unit.
- Phone Number – Displays the phone number assigned to the SIM card in the **RS1™** unit when a valid data plan is active.
- SIM – Displays the identification number associated with the SIM card currently in use in the **RS1™** system.
- Network – Displays the cellular network the **Slingshot®** system is utilizing.
- Country – Displays the country that the cellular network provides is in.
- Network Provider – Displays the cellular network used by the SIM card that is in the modem in the **RS1™** unit.

NOTE: See “Overview” (7-1) for additional information on cellular settings.

- APN Password - Dictated by the cellular provider. This is not applicable for all networks.

Cellular settings

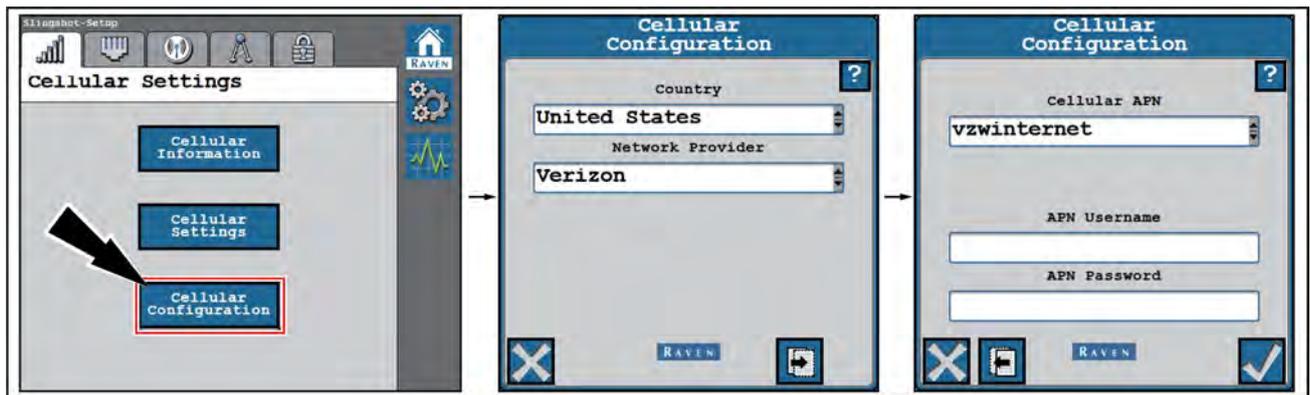


RAIL21TR02735EA 3

The following options are available on the Cellular Settings screen:

- Mode – Indicates the cellular network mode in which the **RS1™** receiver is operating.
- Allow Roaming – Allows the user to restrict or allow cellular data usage when the system is not in its home network. This is not available on all cellular networks.

Cellular configuration

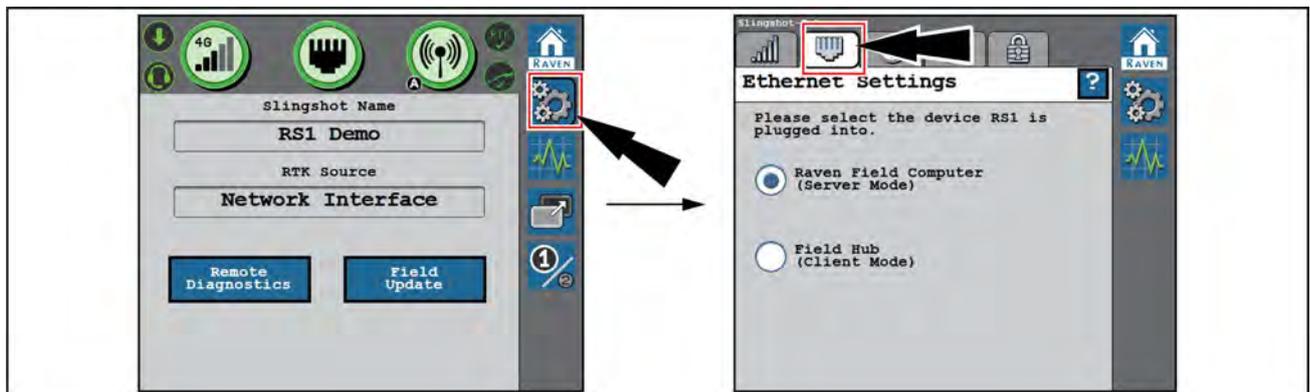


RAIL21TR02736EA 4

The following options are available on the Cellular Configuration screen:

- Country – Displays the country, chosen by the user, of the cellular provider. Can be changed by the user.
- Network Provider – Displays the cellular network provider, chosen by the user. The setting can be changed on this page.
- Cellular APN – Displays the cellular APN in use. The network can be selected from the drop down or defined by the user.
- APN Username and Password – Displays the APN username and password, when applicable. This is only used by some providers and must be given by such providers.

Ethernet settings

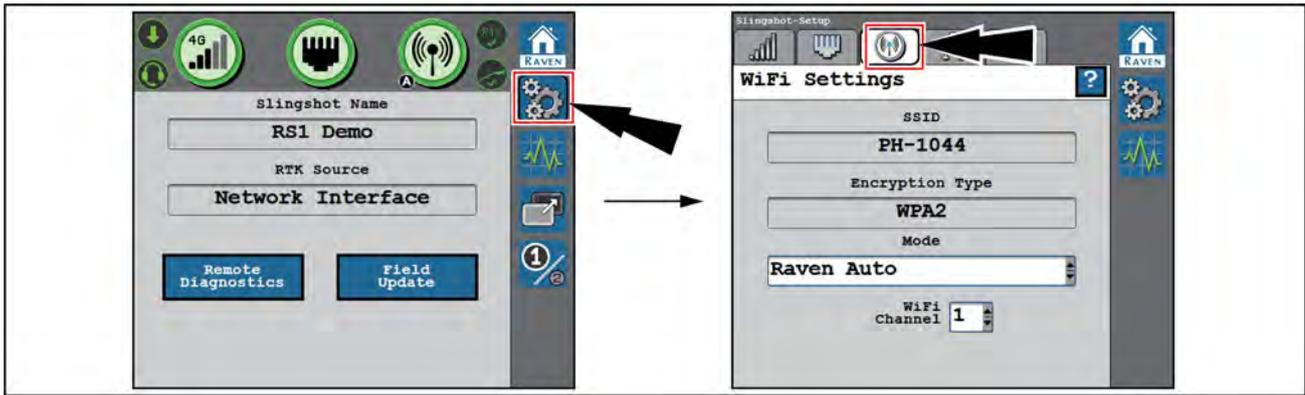


RAIL21TR02737EA 5

There are two selectable modes for the Ethernet connection in the **RS1™** unit:

- **Raven™** Field Computer (Server Mode) – Select this mode when the **RS1™** unit is directly connected to the field computer via an Ethernet cable.
- Field Hub (Client Mode) – Select this mode when the **RS1™** unit is directly connected to the field hub via an Ethernet cable.

WiFi settings



RAIL21TR02738EA 6

There are two selectable modes for the Ethernet connection in the **RS1™** unit.

- SSID – Displays the WiFi SSID (network name). This setting cannot be modified by the operator.
- Encryption Type – Displays the encryption mode being used on the **RS1™** WiFi hotspot. This setting cannot be modified by the operator.
- Mode – Select the mode for WiFi or hotspot operation.
 - Manual Client
 - Manual Hotspot
 - “**Raven™** Auto”
- WiFi Channel - Displays the channel the WiFi hotspot is currently using. If the operator is experiencing issues with connectivity or staying connected, adjusting these settings may improve connectivity issues. This setting can be modified by the operator. The WiFi password can only be modified through the **Slingshot®** website.

Manual client

Select Manual Client to manually connect to available WiFi networks.

WiFi connection status

- Select the Refresh button (1) in the lower left-hand corner to update the list of available WiFi networks.
- Select an available network to enter the WiFi password and connect to the selected network. The network to which the system is currently connected will display with a green check mark on the WiFi Connection Status screen.



RAIL21TR02739AA 7

Manual hotspot

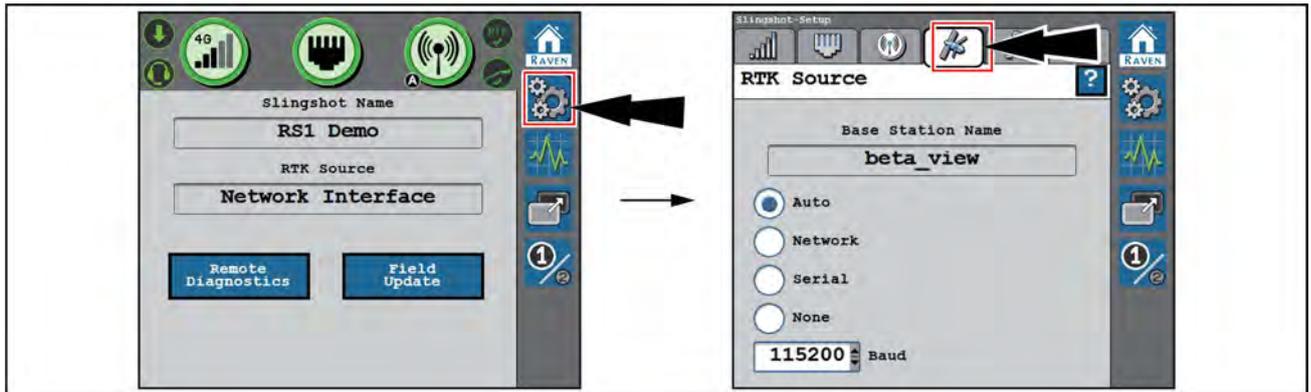
Select Manual Hotspot to broadcast a hotspot for local WiFi devices.

Raven™ auto

Select “Raven Auto” to allow the system to automatically select the best WiFi network connection. To change which WiFi network the system is connected to, select the Manual Client mode.

NOTE: When set to “Raven Auto,” a small “A” indicator will be displayed to indicate your receiver is controlling the hotspot and WiFi settings for the system.

RTK source settings



RAIL21TR02741EA 8

The RTK Source screen displays the base station information (if applicable) and allows the operator to choose the RTK source.

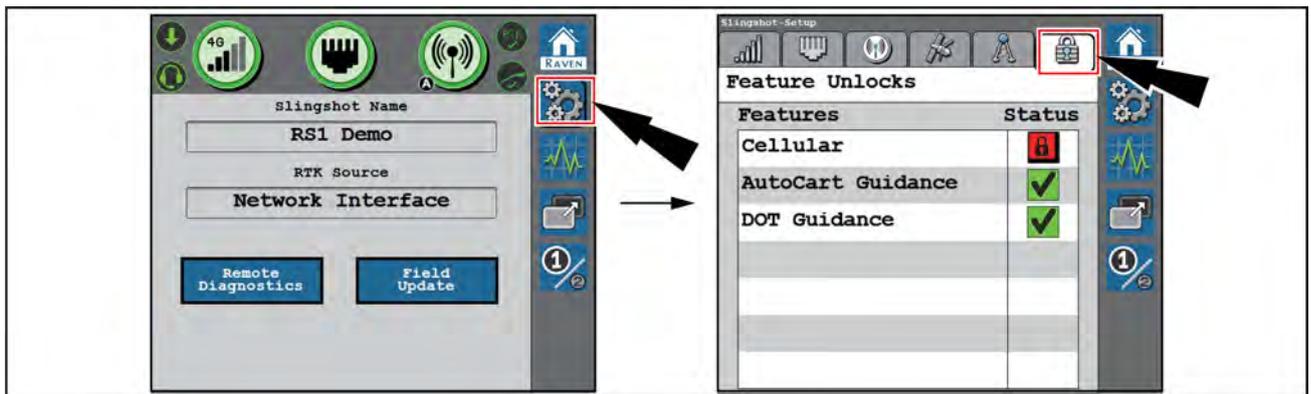
NOTE: Generally, the RTK source setting should be set to “Auto”. However, this setting may be locked to a “Serial” setting if the RTK is provided via a non- CASE IH source or **Slingshot®** Field Hub connected serially. This setting may be switched based on location or customer.

NOTE: If RTK has not been unlocked in the **RS1™** unit, this tab will display “RTK Is Not Unlocked” and this feature will not be available until an unlock code for RTK is entered into the system.

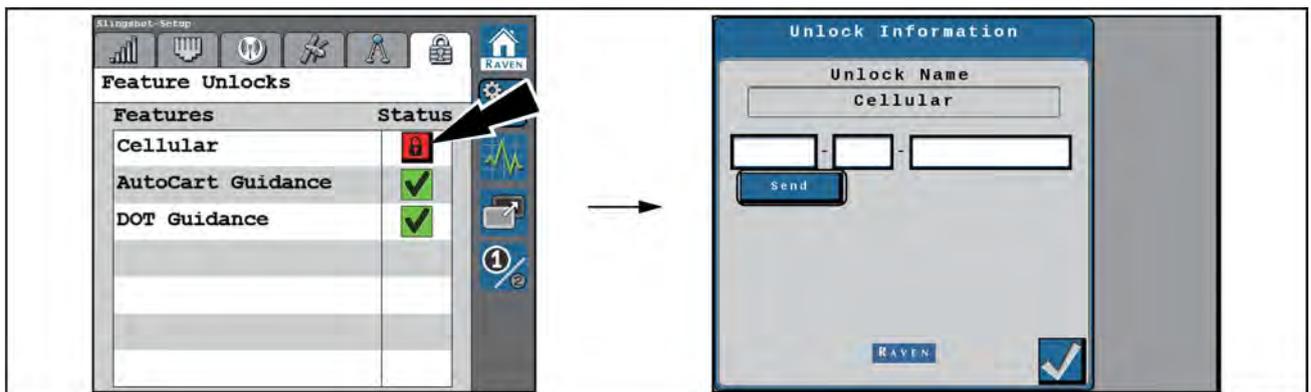
The following RTK source setting options are available:

- Network – Select if the source is provided via the **Slingshot®** server, either through Ethernet or cellular receiver.
- Serial – Select if the source is provided via serial input to the **RS1™** unit.
- None – Use this setting to turn off a source if there are multiple RTK over CAN devices on the system.

Feature unlocks



RAIL21TR02743EA 9



RAIL21TR02744EA 10

The integrated **Slingshot®** modem is unlocked via the Feature Unlocks screen. To unlock the **Slingshot®** modem:

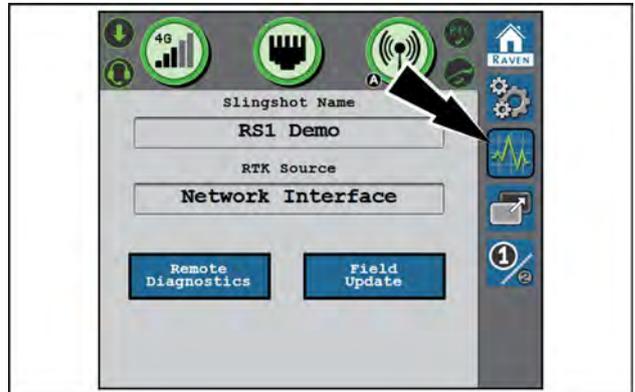
1. Select the Padlock icon in the Status column.
2. Enter the feature unlock code.
3. Select Send.

NOTE: Once the **Slingshot®** modem is successfully unlocked, the icon next to the feature will turn green. If the code is invalid, a message will appear below the unlock code field.

System information

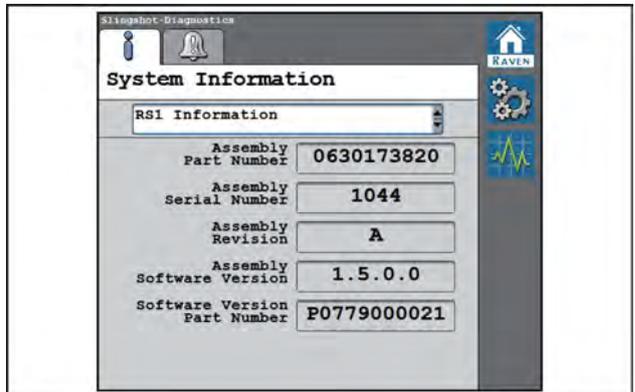
Select the System Information softkey on the right-hand pane of the home screen.

From the System Information screen, use the drop-down to select the appropriate information screen.



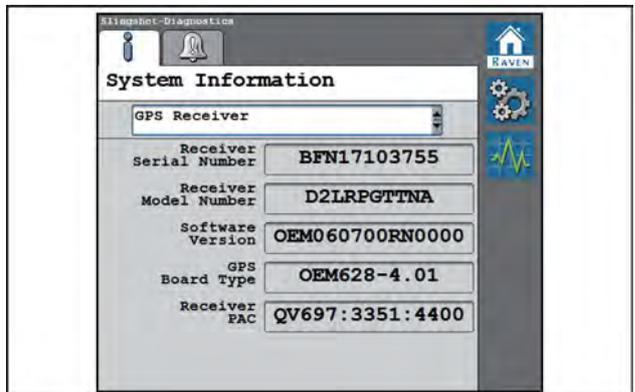
RAIL21TR02745AA 1

RS1™ information



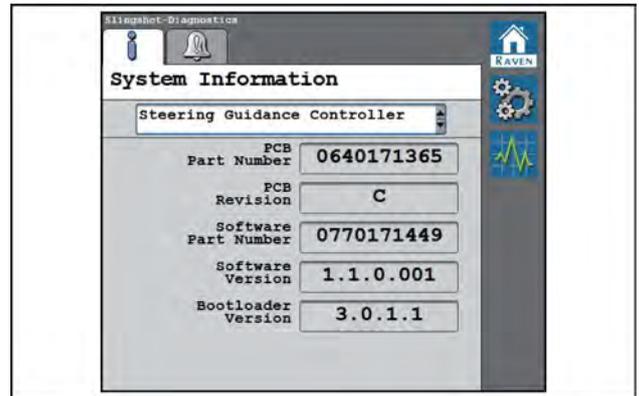
RAIL21TR02746AA 2

GPS receiver information



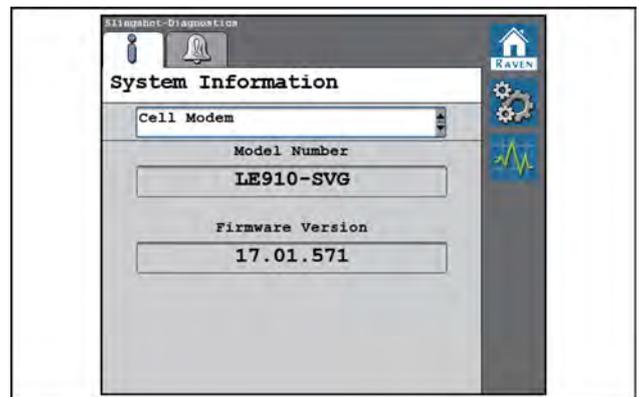
RAIL21TR02749AA 3

Steering guidance controller information



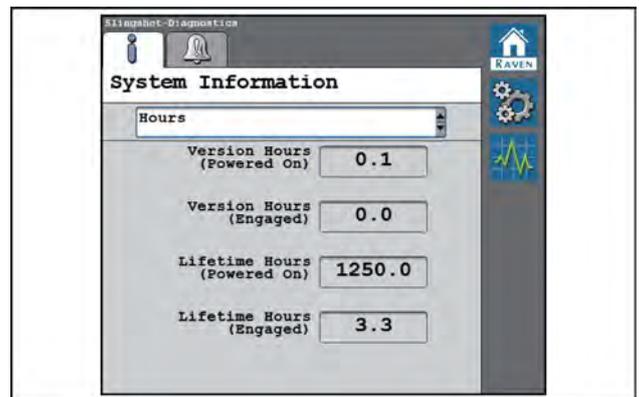
RAIL21TR02747AA 4

Cell modem information



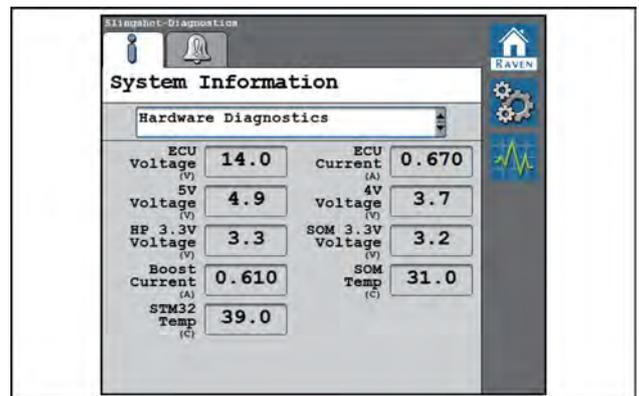
RAIL21TR02750AA 5

RS1™ unit hours



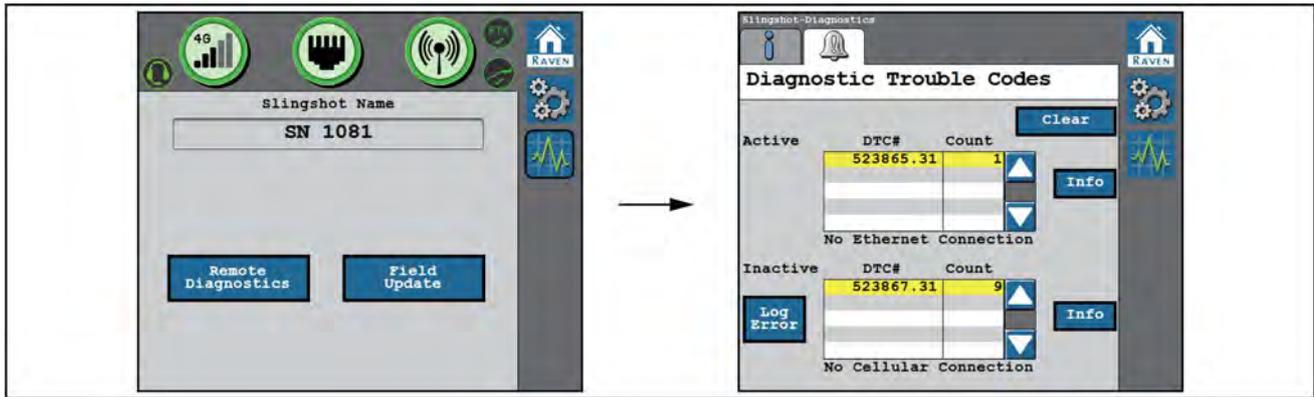
RAIL21TR02748AA 6

RS1™ hardware diagnostics



RAIL21TR02751AA 7

Diagnostic Trouble Code (DTC) screen



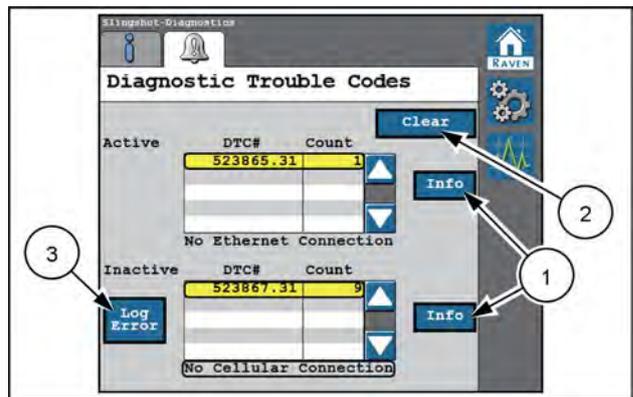
RAIL21TR02752EA 1

The Diagnostic Trouble Code screen displays active and past fault codes that occur during **RS1™ / Slingshot®** system operation. Active fault codes must be fixed before the **RS1™** system can be enabled for guidance and steering operation. Once a fault code has been corrected, the fault code moves to the inactive fault code list.

Press the Info button (1) to display the complete description of the highlighted fault code.

Press the Clear button (2) to delete the inactive fault codes from the fault code error log. For a complete list of the **RS1™** system fault codes, see your CASE IH dealer.

Press Log Error button (3) to record a random failure condition.



RAIL21TR02753AA 2

Slingshot® with Field Hub™ (if equipped)

Overview

Introduction

This chapter covers using **Slingshot®** services with a **Viper® 4+** display.

NOTE: See the **Slingshot®** website <http://www.ravenslingshot.com> or a local CASE IH dealer for additional assistance if needed.

Overview

Once connected and activated, the **Viper® 4+** display will automatically detect the **Field Hub™** upon start-up. Features such as Fleet View, Real Time Kinematic (RTK) position corrections, and wireless file transfer may be available with the appropriate **Field Hub™**.

See “Feature unlock codes” (4-79) for assistance with using the Differential Global Positioning System (DGPS) authorization code. See “Configure GPS in the SC1™” (4-107) for assistance with using the **Viper® 4+** display to configure the integrated GPS receiver to utilize RTK or **Slingshot®** GS corrections provided via a **Slingshot®Field Hub™**.

Slingshot® status indicators

The following indicators appear in the status header area on the **Viper® 4+** display:

Slingshot® status



The status of a **Slingshot®Field Hub™** is displayed. A red “X” appears on this indicator if a **Field Hub™** is not connected or not detected by the system. When a **Field Hub™** is connected to the **Viper® 4+** display, this area will display the current wireless communication status.

Viper® 4+ display updates with the Slingshot® system



Viper® 4+ display updates may be made available via the **Slingshot®** wireless network connection. When an update file is available, the **Slingshot®** status provides an operator with the available update status. The download in progress status displays the download progress.

File transfer



The status header displays the status of wireless file transfers with a **Slingshot®Field Hub™**. If a file transfer is in progress, the file transfer indicator will display a green “in progress” status.

Slingshot® file management

To configure an automatic wireless file transfer:

Press the Administrator or User panel along the top of the main display to expand the panel.



Select the File Manager button.



Press the File Maintenance Options tab.

Send jobs to the Slingshot® service

Select this option to allow the **Viper® 4+** display to automatically send job files to the **Slingshot®** server when you close a job. You may manually override this option if you intend to resume the job at a later date or to perform file maintenance via a USB flash drive.

NOTE: See “File manager overview” (7-37) for additional information on file maintenance procedures.

Job close option

You can stop a job in order to manually select jobs to upload to the **Slingshot®** server with the following procedure:



During an active job, press the Home button along the bottom of the display.

Fill in any necessary or desired information for the job report.

At the bottom of the Job Summary prompt, enable the “Send to Slingshot” option to transfer job files to the **Slingshot®** server automatically.

NOTE: Do not enable this feature unless a **Slingshot®Field Hub™** is connected to the **Viper® 4+** display.



Press the Stop button to stop the job and begin the transfer process. The **Viper® 4+** display automatically transfers job files to the **Slingshot®** server via the **Slingshot®Field Hub™**.

Network diagnostics

Additional diagnostic information may be available during an active job. To access additional diagnostic information:



Long-press the **Slingshot®** Connection Status widget. The Remote Support tab appears.



Press the Slingshot Info tab to access the following information:

- Phone Number – The wireless phone number assigned to the **Field Hub™**.
- Network Type – The network that the **Field Hub™** is currently using for data.
- Network Provider – Name of the wireless service provider.
- Location Fixed – Displays the status of the **Field Hub™** GPS position.

NOTE: Some correction services, such as some **Field Hub™** **Field Hub™** Continuously Operating Reference Stations (CORS) networks, require a valid GPS position before differential corrections will be provided. The location fixed status is not related to GPS corrections used for machine position or guidance during field operations and is only a reference for the **Field Hub™** position.

- IP Address – The Internet Protocol (IP) address assigned to the **Field Hub™**.

Field Hub™ settings

You may need to use the Slingshot Connection Status widget to access the following information on the **Viper® 4+** display during field operations. See “Widget selection and setup” (3-20).

Field Hub™ features

Depending upon the **Field Hub™** capabilities, some **Slingshot®** features may not be available. Contact your CASE IH dealer for additional device assistance. To access **Field Hub™** feature information:



Long-press the **Slingshot®** Connection Status widget.



Select the Features tab. The available **Slingshot®** features and current feature availability appear. Contact your CASE IH dealer for additional feature information.

Slingshot® remote support

If a **Slingshot®Field Hub™** is connected to a **Viper® 4+** display, and a wireless signal is available, you can use the **Viper® 4+** display to request remote assistance from a CASE IH dealer or technician.

Begin a remote support session from the administrator or user panel

Press the Administrator or User panel along the top of the main panel display to expand the panel.



Select the Remote Support utility.

The **Viper® 4+** display sends the request to the **Slingshot®** server and provides a service code. Depending upon wireless network connectivity and signal strength, the service code request may take a few minutes to return to the **Viper® 4+** display.

Provide the service code to the CASE IH technician or support representative to allow remote access to the **Viper® 4+** display.

Begin a session from the Slingshot® widget

NOTE: You must use the **Slingshot® Connection Status** widget to initiate a remote support session during a job. See “Widget selection and setup” (3-20) for assistance with adding widgets to the screen layout.



Long-press the **Slingshot®** Connection Status widget to access the in-job prompt.



Press the Remote Support tab.



Press the Request Support button at the bottom of the prompt.

The **Viper® 4+** display sends the request to the **Slingshot®** server. A service code will be provided by the system. Depending upon wireless network connectivity and signal strength, the service code request may take a few minutes to return to the **Viper® 4+** display.

Provide the service code to the CASE IH technician or support representative to allow remote access to the **Viper® 4+** display.

Updates via Slingshot®

Updates to the **Viper® 4+** display and the **RS1™** receiver software version become available periodically for download via the **Slingshot®** wireless service. This feature allows a system administrator or operator to download and install display software updates from the vehicle cabin without requiring a USB flash drive or a home or office computer to update the display software version.

NOTE: The **Viper® 4+** display automatically checks for updates upon startup if the **Slingshot®Field Hub™** is connected to and communicating with a wireless service provider.

To manually check for a system update:

Press the Administrator or User panel along the top of the main panel display to expand the panel.



Press the System Manager button.



Select the Operating Software tab.



Press the Update button along the right side of the prompt to check the **Slingshot®** server for available **Viper® 4+** display updates.

To review and install **Viper® 4+** display updates:

Press the Administrator or User panel along the top of the main panel display to expand the panel.



Press the System Manager button.



Select the Operating Software tab.

If a **Viper® 4+** display update is available, review the release notes at the bottom of the prompt. Select the Download button to begin the software download.

NOTE: Allow several minutes for the software download to complete. Contact a local CASE IH dealer for additional information regarding the **Viper® 4+** display update.

The software update may be removed from the **Viper® 4+** display without applying the update by selecting the Delete button. Contact a local CASE IH dealer for additional assistance if necessary.

Once the software download is completed, select the Install button to begin the software update process. The **Viper® 4+** display automatically restarts to complete the installation.

Job generator

Creating jobs with the Slingshot® Job Generator

You can create jobs in the “Job Generator” window, and then send them to a **Field Hub™** for application. Jobs include:

- Job name
- Grower-Farm-Field (GFF) information.
- Product configurations.
- Field information.

To create a job:

On the **Slingshot®** home page press Job Generator.

Enter a job name into the “Job Name” field.

The screenshot shows the top section of the Job Generator form. It has a green header bar labeled '1 JOB NAME'. Below it is a text input field labeled 'Job Name' containing the text 'Job 1'. A lightning bolt icon and an arrow point to this field. Below the input field are four grey bars labeled '2 GROWER, FARM, FIELD', '3 PRODUCT CONFIG', and '4 FIELD INFORMATION'. At the bottom, there is a checkbox for 'Available as Cloud Job' which is checked, and five buttons: 'SAVE', 'DISPATCH', 'CREATE ANOTHER', 'JOB REPORT', and 'RESET'.

RAPH22PLM0250AA 1

Click the “Grower, Farm, Field” bar to expand the GFF menu.

Select the desired grower from the “Grower” drop-down menu.



If you need to add a new grower, click the add button at the top of the drop-down menu (not shown).

The screenshot shows the 'GROWER, FARM, FIELD' section expanded. A green header bar labeled '2 GROWER, FARM, FIELD' is at the top. Below it is a text input field labeled 'Job Name' containing 'Job 1', with a circle '1' pointing to it. Below that is a dropdown menu labeled 'Select a Grower' with a circle '2' pointing to it. Underneath are three more dropdown menus: 'Farm: Select a Farm', 'Field: Select a Field', and another 'Field: Select a Field'. At the bottom, there is a checkbox for 'Available as Cloud Job' which is checked, and five buttons: 'SAVE', 'DISPATCH', 'CREATE ANOTHER', 'JOB REPORT', and 'RESET'.

RAPH22PLM0501BA 2

To add a grower, enter the information in the “Grower Information” window that appears after you click the add button.

Click the “Save” button.

RAPH22PLM0503BA 3

Repeat the procedure for the farm (1) and field (2) information.



If you need to remove a grower, farm, or field, click the applicable “X” button (3).

RAPH22PLM0504BA 4

Click the “Product Config” bar (1).

Click the “Mix” drop-down menu (2). If desired, select from an existing mix.



If you need to add a new mix, click the add button at the top of the list of mixes (not shown).



If you wish to remove a mix, click the delete button (3).



Click the information button (4) if you wish to see a popup window that gives information about an existing mix.

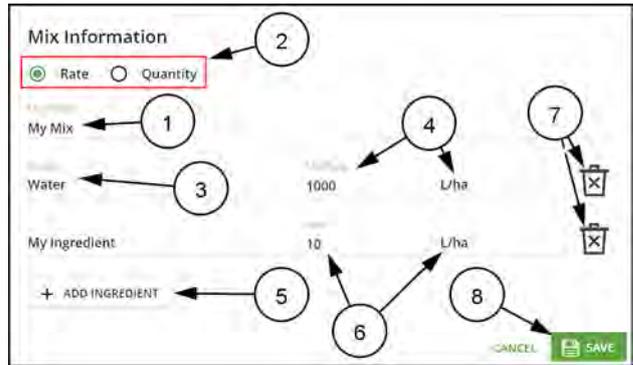
RAPH22PLM0505BA 5

Enter the mix information (1) in the “Mix Information” window that appears after clicking the add button.

You can specify the mix in terms of rate or quantity (2).

Add a desired carrier (3) and its rate and unit of measure (4).

Add any desired additional ingredient by clicking the “Add Ingredient” button (5). Enter the application rate and unit of measure (6) of the ingredient.



RAPH22PLM0251AA 6



If you wish to remove a carrier or additional ingredient, click the delete button (7).

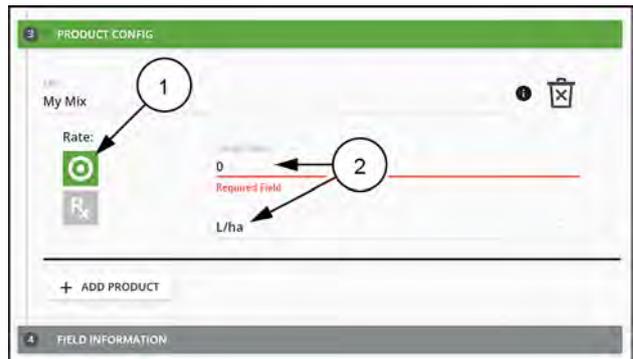
Click the “Save” button (8).



If you will use a target rate to apply the product, click the target button (1).

NOTE: The “Rate” buttons appear green if active or gray if inactive.

Enter the desired target rate (2).

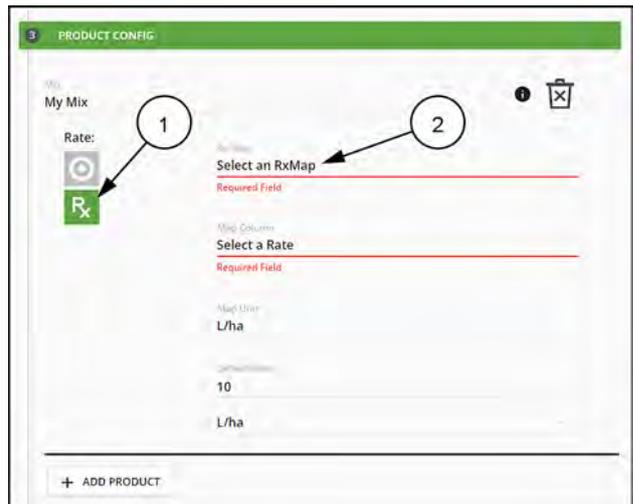


RAPH22PLM0252AA 7



If you will use a prescription map to apply the product, click the prescription button (1).

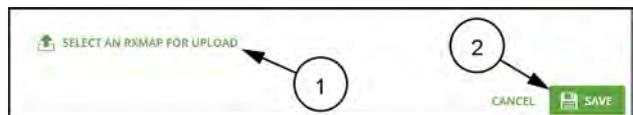
Press the “Rx Map” drop-down menu (2). A popup window appears, giving you the option to add a prescription map or search for one on your computer appears.



RAPH22PLM0506BA 8



If you click the add button in the popup window, an upload popup appears. Click the “Select An Rx Map For Upload” area (1).



RAPH22PLM0255AA 9

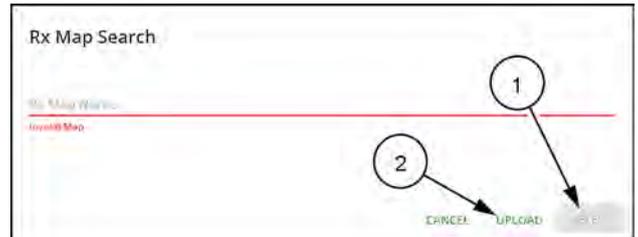
A file manager window appears. Select the desired prescription map file from the computer.

Click the “Save” button (2).

If you click the search button, an “Rx Map Search” window appears.

Choose the prescription map. The “Select” button (1) activates. Click the “Select” button.

You can also click the “Upload” button (2) to select a previously-downloaded prescription map in your computer.



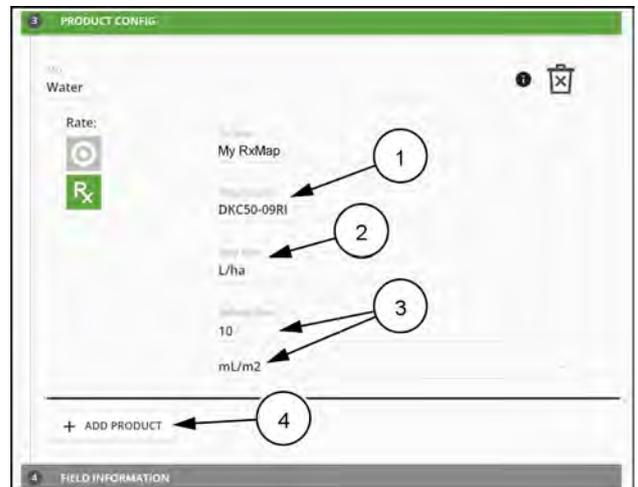
RAPH22PLM0253AA 10

Select the appropriate map for the product from the Map Column drop-down (1).

Select the units of measure used in the map from the Map Unit drop-down (2).

Enter a default rate (3). Select the unit of measure for the default rate.

If you need any additional products, click the “Add Product” button (4).



RAPH22PLM0510BA 11

The “Location” (1), “Entry” (2), and “Boundary” (3) buttons activate as you select them. The delete button (4) changes to match the active selection button.

Click the “Location” button (1), then click a place on the field to mark the location with a pointer (5). Click the “Undo” button (6) if you have made a mistake and wish to mark the location again.

If you wish to remove a location pointer, click the “Remove Location” button (4) located under the “Location” button.

To mark a field entry point, click the “Entry” button (2). Then click the location on the map for the entry point (7). Click the “Undo” button (6) if you have made a mistake and wish to mark the location again.

If you wish to remove an entry point, click the “Remove Entrance” button (4) located under the “Entry” button.

To configure a non- **AccuBoom™** field boundary, click the “Boundary” button (3). Click the points (8) on the map that will define the corners of the field boundary. The system fills the polygon as you click corners. Click the “Undo” button (6) if you need to remove the most recently placed corner.

Click the “Clear Boundary” button (4) if you wish to remove the boundary.



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If desired, deselect the “Available as Cloud Job” check box **(1)**. Deselecting the “Available as Cloud Job” option prevents the file from being sent automatically to a vehicle associated with the **Slingshot®** subscription.

Click the “Save” button **(2)** to save the job to the system for later. The “Create Another” button **(3)** activates. You can also dispatch a job immediately after you save it.

Click the active “Create Another” button **(3)** if you wish to create another job.

Click the “Dispatch” button **(4)** to save the job and queue it for direct transfer to one or more specific machines with a **Field Hub™**. You can disable the job as a cloud job if you wish the job to only be available to specific machines. Or you can dispatch the job to specific machines while leaving it available as a cloud job.

Click the “Job Report” button **(5)** to download a report on the currently selected job. This feature is intended for record keeping purposes.

Click the “Reset” button **(6)** to reset all data in the “Job Generator” application.



Viper® 4+ software management

System manager

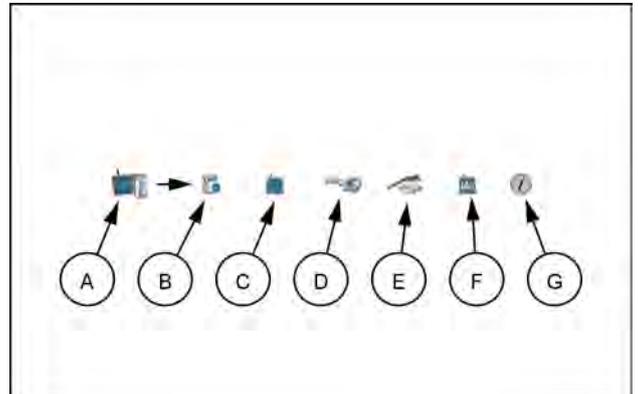
System manager overview

The system manager utilities allow the operator to review the software and firmware versions currently installed on various system devices, temporarily activate system features, and check status of a **Slingshot®** Field Hub or request remote support.

To view information on software currently installed or available for use with this device.

1. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.
2. Select the System Manager utility **(A)**. The following tabs will be available:

NOTE: To transfer or copy files or settings using the **Viper® 4+ display**, see “File manager overview” (7-37) for more information on file maintenance operations.



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Software Update – The software update tab **(B)** displays software version information for the **Viper® 4+** display, and allows the operator to update software or revert a previous version as needed. See “Information and updates” (7-28) for additional information about using the software update tab.

Hardware Update – Firmware version information is displayed on the hardware update tab **(C)**. This information may be useful for troubleshooting CAN systems or components. This tab also allows the operator to update the CAN system components as necessary to take advantage of new features available from CASE IH.

Features Keys – The Features Keys tab **(D)** displays permanent feature activations available. This tab also displays the time remaining for temporary authorization of **Viper® 4+** display features. Temporary time codes entered on this prompt will only be available for a specific time period and will expire at a set time interval. Contact a local CASE IH dealer for assistance with permanent authorization of available **Viper® 4+** display features.

Slingshot® Field Hub - Select the “Slingshot” tab **(E)** to view Field Hub wireless communication information or to enable a remote support session.

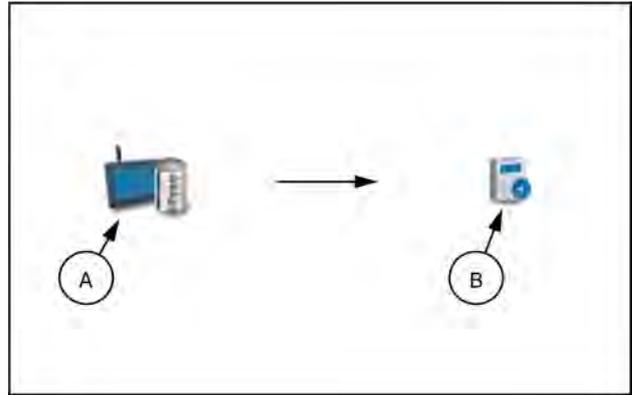
Hardware Information – The hardware information tab **(F)** contains information about the internal hardware states of the display, usage statistics, diagnostics tools for the CAN bus, and network connectivity information.

License (G) – Contains the End User License Agreement (EULA) for the **Viper® 4+** display software.

Viper® 4+ software information and updates

To view information regarding the **Viper® 4+** display software version currently installed or for a software update available for the **Viper® 4+** display:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager utility **(A)** and press the Software Update tab **(B)**. The following **Viper® 4+** display version information will be available:



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Current Version – Software version used by the **Viper® 4+** display during field or control system operations. This version information may be important if service or support is required.



Press the version information button to view additional software and database information.

Install Latest Update. – If a newer software version is available, the updated version number will display. Select the install latest update button to install the version displayed onto the device. When the system is restarted, this will be the current version used for operation. If desired, select Delete and the update will not install.

NOTE: Updates can be performed if connected to a **Slingshot® Field Hub**.



Revert to Last– In the event that an update to the **Viper® 4+** display provides undesirable operation, the device will store the last software version installed and allow the operator to revert to the version displayed in this field.

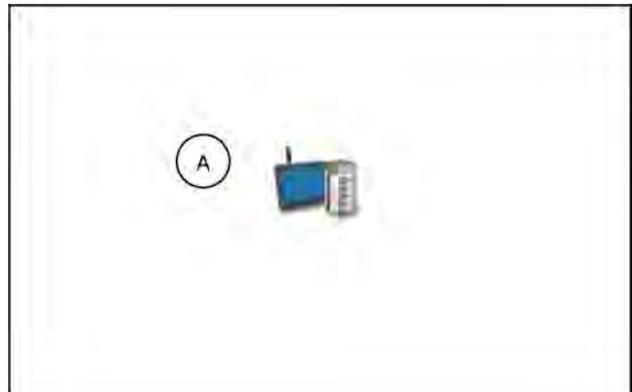


Factory Reset – The factory reset feature may be used to revert the device to a factory condition. Only perform this procedure if instructed by a dealer or service technician. All settings and user files will be erased during the factory reset process. Perform file maintenance and copy all critical data to a USB flash drive prior to performing a factory reset.

Installing software updates

To apply a software update to the **Viper® 4+** display:

1. When a update is detected, press Install. The update will install. The Update Available status will be displayed in the upper, right corner of the main panel display and the update file will be copied to the **Viper® 4+** display.
2. Press the Administrator or User Panel to expand the panel.
3. Select the System Manager utility **(A)** and press the Software Update tab.
4. Press the Install Update button to update the software version. The device will install the available update version and automatically restart.



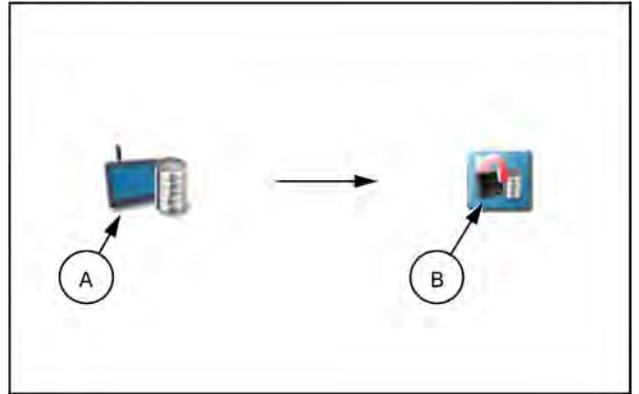
RAPH22PLM0343AA 2

NOTE: After the **Viper® 4+** display restarts, it is necessary to re-detect GPS.

Reverting to previous software versions

To revert to a software version previously installed on the **Viper® 4+** display:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager (**A**).
3. Press the revert to previous version button (**B**) to re-install the displayed software version. The device will re-install previous version and automatically restart.



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Hardware information and updates

To view firmware information for the system components currently connected to the **Viper® 4+** display:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager utility **(A)** and press the hardware update tab **(B)**. The following firmware version information will be available for each node currently detected on the CAN bus:
 - Node – The node name or identification information will be displayed in this column.
 - Program Number – The program number is used to identify the node on the **Viper® 4+** display.

NOTE: The program number displayed on the hardware update tab does not reflect the program identified on the physical serial number tag affixed to the node from the factory.

- Current Version – The firmware currently installed on the node will be displayed in this column.
- Newest Version – If node firmware updates have been transferred to the **Viper® 4+** display, the update version will be displayed in this area.

Installing CAN bus or ISOBUS firmware updates

NOTE: Transfer the node firmware from the Universal Serial Bus (USB) flash drive onto the **Viper® 4+** display before applying the firmware updates to spraying nodes connected to the system using the System Manager utility. See “USB import manager” (7-47) for assistance copying CAN Node Update files.

To apply a firmware update to a CAN bus spraying system component:

1. Insert the USB flash drive with the firmware update files into the **Viper® 4+** display.

NOTE: See “Information and updates” (7-28) for more information on the folder structure required for performing the update.

2. Use the USB Manager utility within the File Manager to import the CAN node updates. See “USB import manager” (7-47) for more information.
3. Press the Administrator or User Panel to expand the panel.
4. Select the System Manager utility **(A)** and press the Hardware Update tab **(B)**.

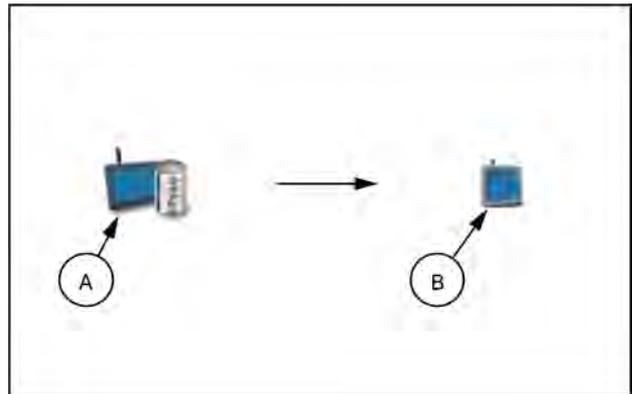
To apply a firmware update to a CAN bus spraying system component:

5. Select a specific node to be updated.

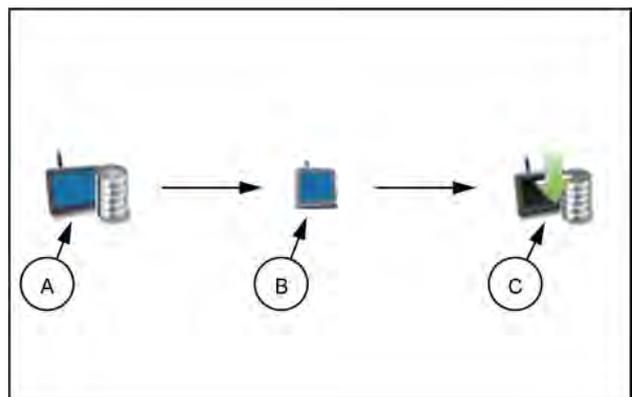
NOTE: Note the program number (PGM #) for the node selected. In case of problems with the node update, this number will be required to select the appropriate program number for recovering the node. See the “Node Recovery Mode” section below or contact a local dealer for additional assistance.

6. Select the appropriate update from the Versions Available list for the selected node.
7. Press the apply update button **(C)** to update the firmware on the selected node. The **Viper® 4+** display will install the selected firmware update. Repeat the process to update any other nodes as necessary or required.

NOTE: If a problem is encountered during the firmware update process, see your dealer.



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Node recovery mode

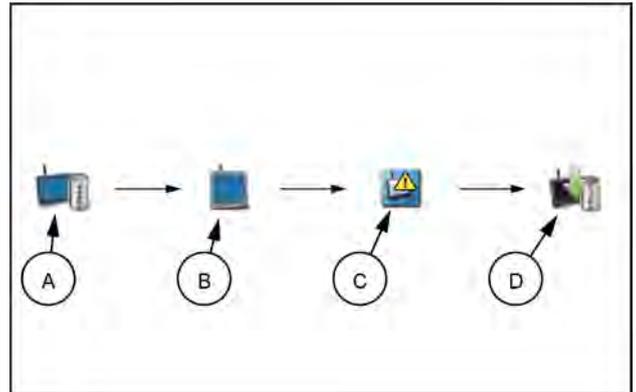
NOTE: The node program number is required to properly recover the node. If the program number is unknown, contact a local dealer for additional assistance with appropriate program numbers for recovering a CAN bus node.

To attempt to recover a CAN bus node on which a failed update has occurred:

1. Insert the USB flash drive with the firmware update files in the required folder into the **Viper® 4+** display.

NOTE: Review the **7-28** for more information on the folder structure required for performing the update.

2. Use the USB Manager utility within the File Manager to import the CAN node updates. See "USB import manager" (**7-47**) for more information.
3. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.
4. Select the system manager utility (**A**) and press the hardware update tab (**B**).



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5. Disconnect the rectangular connectors on the node or remove the power fuse for approximately **5 s** to cycle power to the node. Ensure any status LED's are off or stop flashing before reconnecting the node.
6. On the **Viper® 4+** display, press the versions field and use the scrolling list to select the appropriate node program to reset the node (**C**).
7. Press the Apply Update button (**D**) to attempt to recover the node. If the node recovery fails, or for additional support, contact your dealer.

Unlocked features and activation

Refer to the following procedures to activate special or optional features available for use with the **Viper® 4+** display.

Permanent feature activation

To permanently activate optional features for the **Viper® 4+** display:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager utility **(A)** and press the Unlocked Features tab **(B)**.
3. Note the identification number displayed on the prompt.

NOTE: The identification number may also be found on the bar code on the back of the **Viper® 4+** display.

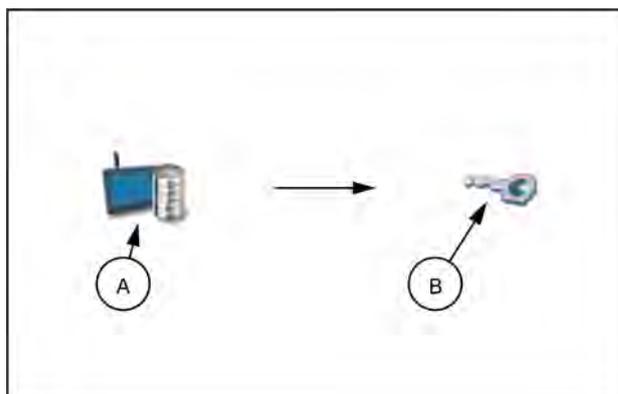
4. Contact your local CASE IH dealer to purchase a registration code for the feature.
5. Download the software feature package from the link provided after the activation key request form is submitted.
6. Copy the feature package to the USB flash drive used with the **Viper® 4+** display. The feature package must be copied to the following directory on the flash drive: ("USB Drive Name" > Raven > Feature Unlocks).

NOTE: In current updates, the feature package can be placed anywhere in the USB flash drive. Check the **Viper® 4+** display version to verify.

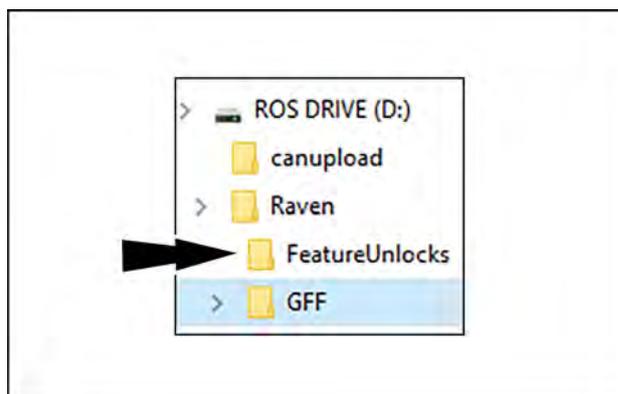
7. Connect the USB flash drive to the **Viper® 4+** display. The feature package will automatically install.
8. Key cycle the vehicle when prompted to make the new feature available for use.
9. Pull out the USB when the reboot starts.

NOTE: If a **Viper® 4+** display update is available on the USB flash drive, the update must be applied to install the feature package. See "Information and updates" (7-28) for assistance with installing an update.

10. After the device restarts, access the unlocked features tab and verify the activated features are displayed in the "Unlocked Features" area.



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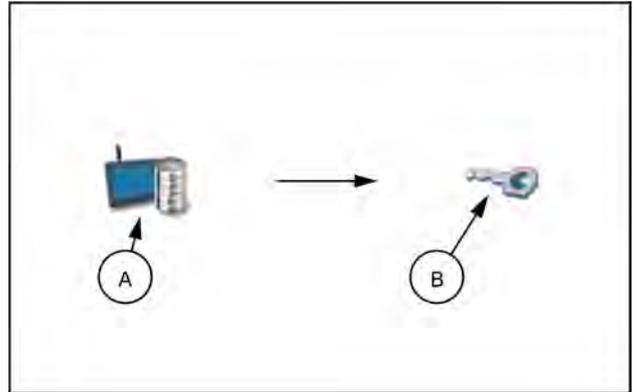
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Temporary unlock

NOTE: Any temporary keys will remain active after the activation code is entered. The temporary key timer will continue until the key expires. Once the temporary key expires, the feature will be available using the activation package. Contact a local dealer for additional assistance with temporary keys or feature activation.

The **Viper® 4+** display features the ability to temporarily unlock additional features for a predetermined time. To temporarily authorize features for use with the **Viper® 4+** display:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager utility **(A)** and press the Unlocked Features tab **(B)**.
3. Press Activate located next to Temporary Unlock. The Begin Temporary Unlock window will open.
4. Review the list of features and press Yes to begin the temporary unlock.



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NOTE: There are two, 20-hour unlocks available by default. The 20-hour timer will only decrease when in a job. When not in a job, the timer will not decrease.

When no additional temporary unlocks are available, a temporary authorization code may be obtained to unlock **Viper® 4+** display features for a predetermined time. To manually temporarily authorize features for use with the **Viper® 4+** display:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager utility and press the Unlocked Features tab.
3. Note the Identification Number and Job Code Time values displayed on the prompt.
4. Contact your CASE IH dealer with the values observed from the previous step.
5. Press "Enter Code" and enter the temporary service code to add time to the temporary features time remaining.

NOTE: Temporary key operation time remaining begins at the time the temporary code is requested. Even if the temporary code is not entered on the **Viper® 4+** display, time will be deducted from the time remaining if the device is used to manage field operations.

Slingshot® Field Hub

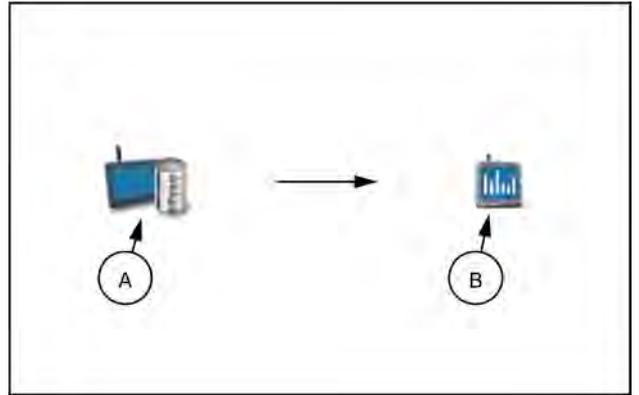
The **Slingshot®** tab provides access to **Slingshot®** Field Hub information and will be used when requesting remote support.

See the chapter “Slingshot® with Field Hub™ (if equipped)” (**7-15**) for additional information.

Hardware information

To access information about the **Viper® 4+** display hardware:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager utility **(A)** and press the Hardware Information tab **(B)**.
3. Press the General or Lifetime Views to display the following hardware information details for the **Viper® 4+** display:



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General

Provides information on the hardware such as:

Platform - The **Viper® 4+** display device type or name.

Original equipment manufacturer (OEM) ID - Displays the OEM ID number.

Hardware Revision - The **Viper® 4+** display hardware version.

Micro-controller Version - The firmware version installed on-board the **Viper® 4+** display.

FPGA Version - Firmware version of the FPGA controller.

Lifetime

The lifetime statistics provides runtime information for the **Viper® 4+** display. The following information will be available when the lifetime option is selected:

Hardware Lifetime - Provides a tally of operational hours on the **Viper® 4+** display, the number on power cycles, and the number of shutdowns.

Hardware Status - Includes information on the switch power, camera power, camera fault, and FPGA fault.

Usage

Provides CAN Bus information such as warning counts, bus off counts, and on error states.

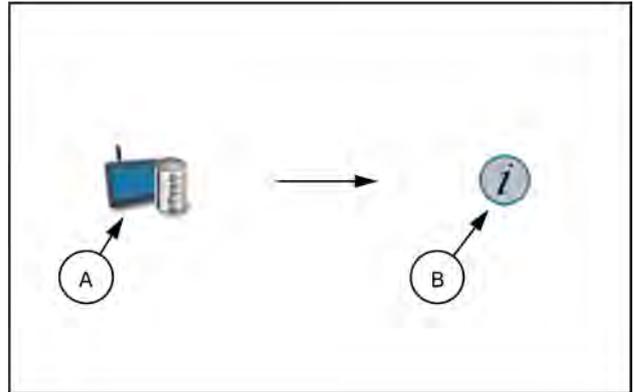
Networking

Provides information on the IP address, gateway, and the interface name.

License

To review and accept the End User License Agreement (EULA) for the **Viper® 4+** display software at any time:

1. Press the Administrator or User Panel to expand the panel.
2. Select the System Manager utility **(A)** and press the license tab **(B)**.
3. Review the EULA as necessary. Contact your CASE IH for further information.



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NOTE: Acceptance of the EULA is required before operation.

File manager

File manager overview

To view job and file information currently stored on the **Viper® 4+** display:

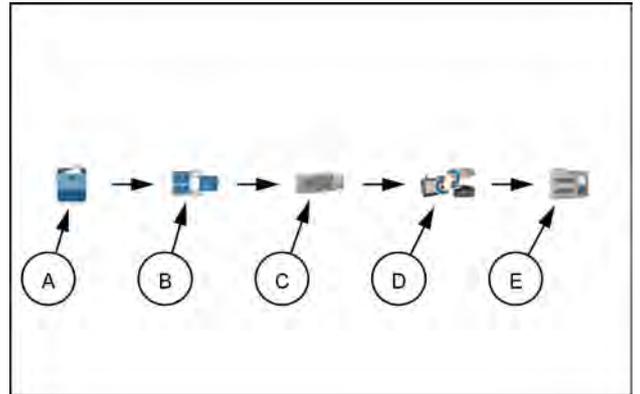
1. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.
2. Select the File Manager utility **(A)**. The following tabs will be available:

File Manager Tab - The file manager tab **(B)** allows the operator to rename files and manage grower, farm, field (GFF) folders and assignments right on the **Viper® 4+** display. Manual file transfer is also located under this tab. See “Using the file manager” **(7-38)** for assistance with using the file manager.

USB Import Manager Tab – The USB import manager tab **(C)** allows the operator to find and transfer files from a connected USB flash drive to the **Viper® 4+** display. See “USB import manager” **(7-47)** for assistance using the USB manager.

File Transfer History Tab (D) – The **Viper® 4+** display provides a log of files transferred to and from the device via a **Slingshot®** Field Hub.

File Management Options (E) – Additional options may be available on this tab to set up file management features with the **Viper® 4+** display.



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Using the file manager

If desired, edit, rename, and remove files right on the **Viper® 4+** display in the vehicle cabin. Refer to the following sections for more assistance with using File Manager features.

NOTE: CAN node update files, or the “canupload” files will be displayed in the file manager. To ensure that the CAN firmware version information is available on the **Viper® 4+** display, it is recommended not to edit the file names for the node firmware update files.

If desired, remove all firmware update files from the **Viper® 4+** display after performing any necessary node updates. See “Hardware information and updates” (7-30) for more information on downloading and applying CAN node firmware updates.

Using filters and renaming files

To use the file filters or rename files:

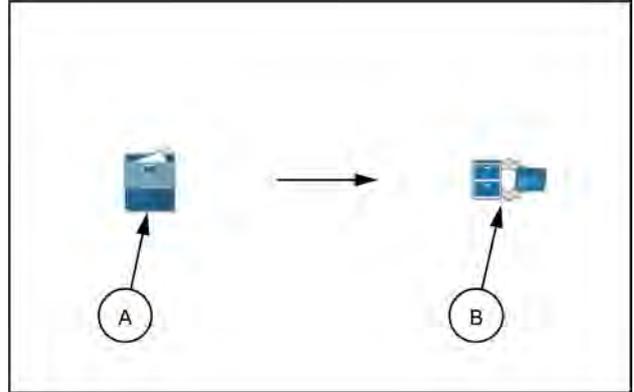
1. Press the Administrator or User Panel to expand the panel.
2. Select the File Manager utility (A) and press the File Manager tab (B). The File Manager tab will display a list of the following file types currently stored on the **Viper® 4+** display:

| | |
|------------------------|------------------|
| User Files | System Files |
| Job | CAN node updates |
| ISO XML | Screen Shots |
| Prescription (Rx) Maps | Core Dumps |
| Scout Groups | Log Files |
| Saved Guidance Lines | Street Maps |
| AgX Rec | Wallpapers |

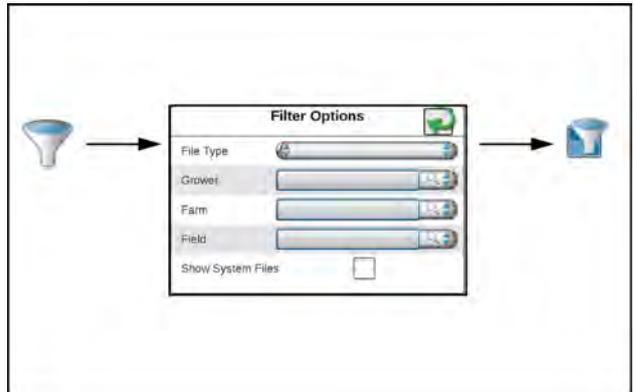
NOTE: Enable the Show System Files option to view and manage system files while performing file maintenance operations.

To use the file filters or rename files:

3. Press the Filter icon at the top of the “All Files” list to set filters for file type or grower, farm, or field assignments.
4. To rename a file, press the file name in the Files list and use the on-screen keyboard to rename the file.



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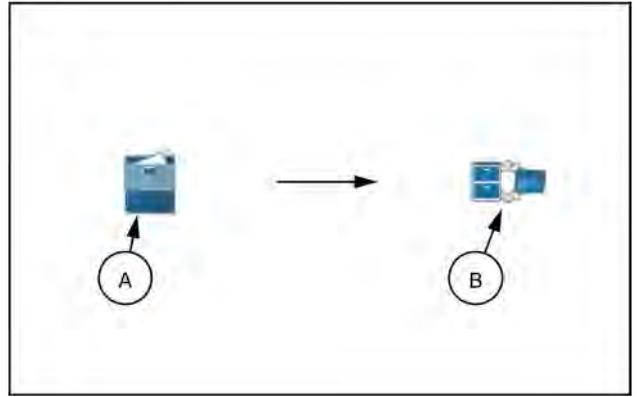


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Selecting files

If desired, select a file to modify grower, farm, or field (GFF) assignments. To select files:

1. Press Administrator or User Panel to expand the panel.
2. Select the File Manager utility **(A)** and press the File Manager tab **(B)**. The File Manager tab will display a list of the following file types currently stored on the **Viper® 4+** display.
3. Use the File Manager to filter the “Files” list as desired.



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4. Press the Select icon displayed to the right of the file name to move individual files to the Selected Files list. To move all files currently displayed in the Files list, press the Select All button at the top of the “Files” list.

NOTE: If files are filtered, the Select All button will only select files available with the existing filter settings.



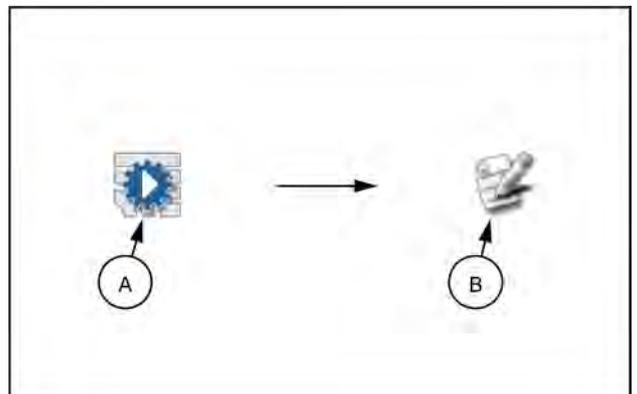
5. Press the clear button to the right of a file name to remove the file from the Selected Files list or press the clear all button at the top of the list to remove all files at once.

6. Proceed to the Manage Grower, Farm, Field (GFF) Information section on below or the Delete Files section on below for assistance with performing these file management procedures.

Grower, Farm, Field (GFF) manager

The **Viper® 4+** display offers a Grower, Farm, Field (GFF) utility to create and manage GFF information right on the **Viper® 4+** display.

NOTE: The GFF Manager is also available via the Job Profile panel. See “Overview” (4-36) for additional assistance with setting up job profiles or starting jobs with the **Viper® 4+** display.



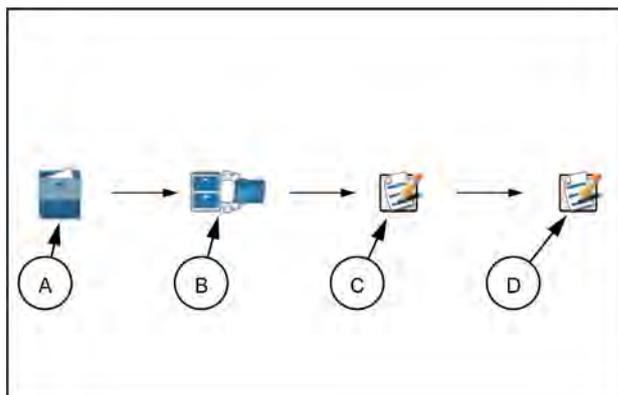
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- A. Jobs/Work orders
- B. Edit

Create Grower, Farm, Field (GFF) structure

To create new Grower, Farm, Field (GFF) associations for jobs:

1. Press the Administrator or User Panel to expand the panel.
2. Select the File Manager utility **(A)** and press the File Manager tab **(B)**.
3. Press the Edit button **(C)** at the top of the Selected Files list.
4. Select the Edit button **(D)** displayed at the top of the GFF display.
5. Press the Grower panel at the top of the display to expand the Grower panel.



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6. To add a new:



- grower to the GFF structure, select the Add button.
- farm or field to an existing Grower, select the appropriate grower from the list.

7. Press the Farm panel below the list of available growers to expand the Farm panel.

8. To add a new:

- farm to the GFF structure, select the Add button.
- field to an existing grower and farm, select the appropriate farm from the list.

9. Press the Field panel at the bottom of the GFF display to expand the Field panel.



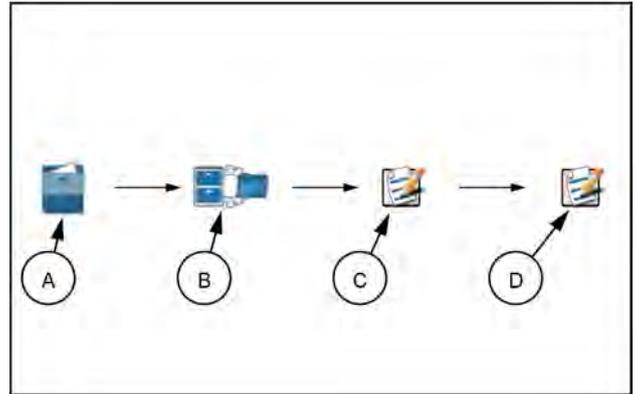
10. To add a new field, press the Add button to add a field to the selected grower and farm.

Manage Grower, Farm, Field (GFF) information

To create new Grower, Farm, Field (GFF) associations for jobs:

NOTE: Review the *Selecting Files* section below for assistance with selecting files.

1. Press the Administrator or User Panel to expand the panel.
2. Select the File Manager utility **(A)** and press the File Manager tab **(B)**. File Manager will open and display a list of files currently stored on a **Viper® 4+** display.
3. Press the Edit button **(C)** at the top of the Selected Files list.
4. Select the Edit button **(D)** displayed at the top of the GFF display.
5. Use the file browser to select the desired grower, farm, or field entry to edit.



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6. With the appropriate entry selected, press the Edit button. To delete a GFF entry, press the delete button.



Reset Growers, Farms, Fields

To reset grower, farm, field information:

1. Open File Manager
2. Press the Arrow next to the desired grower, farm, or field in the all files column to move the desired GFF to the Files column.
3. Press the Notepad key above the files column. This will open the grower, farm, field manager screen.
4. Press the Delete icon in the reset grower, farm, field cell. A prompt will open asking "This action will permanently remote all growers, farms, fields and their associations. Do you wish to continue?".
5. Select Yes to reset all growers, farms, fields and their associations. Press No to return to the previous screen.

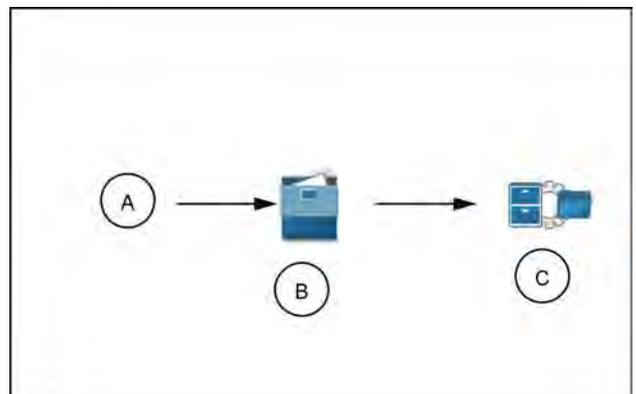
Delete files

To delete files from the **Viper® 4+** display:

1. Press the Administrator or User Panel **(A)** to expand the panel.
2. Select the File Manager utility **(B)** and press the File Manager tab **(C)**. The File Manager tab will display a list of files currently stored on the **Viper® 4+** display.
3. Review the Selecting Files section on below to move files to the "Selected Files" list.



4. Press the Delete button at the top of the "Selected Files" list and accept the displayed prompt to delete the selected files from the **Viper® 4+** display.



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File export

Use the following procedures to export files to a USB flash drive if a **Slingshot®** Field Hub, or a wireless network connection, is not available for wireless file transfer.

Export Job reports and coverage information

The **Viper®** 4+ display is capable of exporting job reports and coverage information in the following formats:

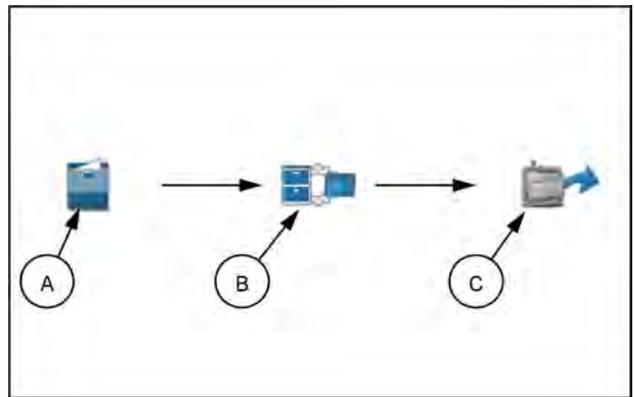
- Portable document format (*.pdf)
- Job data package (*.jdp)
- Slingshot archive (*.ssa)
- Shape file (*.shx, *.shp, and *.dbf)

The following procedures assist with exporting job and field information to a connected USB flash drive for transferring information to a home or office computer system.

NOTE: A **Slingshot®** Field Hub and wireless service contract or an **RS1™** subscription with cellular card and data plan is necessary to send files to the **Slingshot®** web service from the vehicle cabin. Contact your CASE IH dealer or refer to the chapter, "Slingshot® system" in this manual for additional assistance with using the **Slingshot®** Field Hub for transferring job files.

To export job data from the **Viper®** 4+ display in the above formats:

1. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.
2. Select the File Manager utility and press the file manager tab **(A)**. The File Manager tab will display a list of files currently stored on the **Viper®** 4+ display.
3. If necessary, use the file list type and grower, farm, field (GFF) filters to assist with finding and selecting the desired files for export.
4. Move the files to Export from the left side of the File Manager **(B)** to the right side. Alternatively, press the Select All option at the top of the file list to select all files currently displayed and matching the set filter conditions.
5. Select the File Export icon **(C)**.
6. From the File Export screen, select either the **Slingshot®** feature or the listed USB drive. If more than one USB drive is inserted there can be multiple choices.



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3. With at least one file selected, select one of the following export actions:

- Copy - create a duplicate of the selected information on the destination to be selected.
- Move - export the selected information to the destination to be selected and remove the information from the **Viper®** 4+ display.



Send with Folder Structure (*.jdp). Select this option to create a job data package (*.jdp) on the USB flash drive with the grower, farm, field (GFF) file structure. You can transfer the (*.jdp) file to a **Slingshot®** viewer or user account to review job information or create job reports, or to another **Viper®** 4+ display via the USB flash drive to continue the job.

NOTE: While the GFF file structure transfers to the USB flash drive using this export option, the GFF assignments do not inherently associate with the (*.jdp) file if they transfer to another **Viper®** 4+ display.

To reassociate the (*.jdp) file with the GFF information, import the GFF structure via the USB manager and then reassign the (*.jdp) file to the GFF using the File Manager tab. See “USB import manager” (7-47) for assistance with importing the GFF information and “File manager overview” (7-37) for details on using the file manager to reassign the GFF associations.

Send as **Slingshot®** Archive (*.ssa). The Slingshot Archive (*.ssa) file type may be used with either a **Slingshot®** user account or to transfer multiple files to another **Viper®** 4+ display. Select this file type to transfer multiple files as one package. The (*.ssa) file allows multiple files to be imported into the Slingshot web portal as a single file.

NOTE: If imported onto another **Viper®** 4+ display, files exported as an (*.ssa) file will retain GFF associations from the original device. All files exported to the “Slingshot Archives” directory on the USB flash drive will be required to retain the GFF associations from the previous device.

Enable the following “Report Generation” options to export additional report or coverage map files for viewing, creating, or archiving completed job information:

NOTE: Report generation options will not be available when exporting **Slingshot®** Archive (*.ssa) file types.

Generate Report (*.pdf). Select this option to export a portable document format (*.pdf) document directly from the **Viper®** 4+ display. A (*.pdf) document is a common file format viewable on any computer system, often with a free software package available on-line from several sources.

Include Shape Files (*.shx, *.shp, and *.dbf). The shapefile format consists of four separate files created for each product channel active during the field operation. Select the “Include Shape Files” option to export a shape format (*.shp), a shape index (*.shx), an attribute database (*.dbf), and a project (*.prj) file for each control channel active during the field operation. The shapefile format requires specialized software to view on a home or office computer system and each of the above file types must have the same file name (different extension) for the shapefile format to function correctly.

Press the confirm button in the lower, right corner of the Export to USB prompt to start the export process. When complete, the **Viper®** 4+ display will return to the File Export tab.

Export other field operation files

The **Viper®** 4+ display is capable of exporting the following files used during field operations:

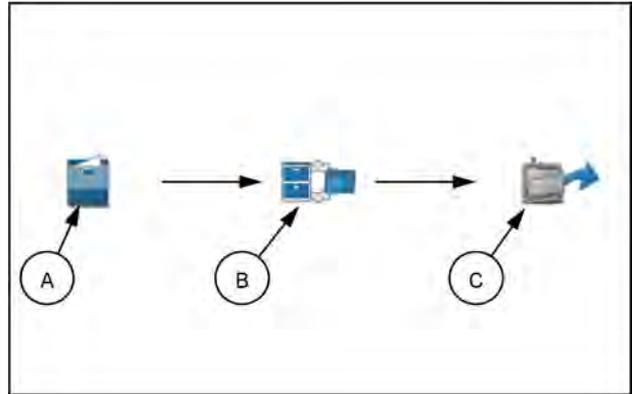
- Prescription (Rx) Maps (shapefile format)
- Scout Groups (*.sct)
- Guidance Lines (*.ab)
- CAN Node Updates
- Screen Shots
- Core Dumps
- Log Files

If desired, files can be exported for archiving or be transferred for use on another **Viper®** 4+ display. The following procedures are for exporting field operation files to a connected USB flash drive.

NOTE: A **Slingshot®** Field Hub and wireless service contract will be required to send files to the **Slingshot®** web service from the vehicle cabin. Contact your CASE IH dealer or refer to the chapter, “Slingshot® system” in this manual for additional assistance with using the **Slingshot®** Field Hub.

To export the above field operation files from the **Viper® 4+** display:

1. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.
2. Select the File Manager utility and press the file manager tab **(A)**. The File Manager tab will display a list of files currently stored on the **Viper® 4+** display.
3. Press the File Export tab **(B)**.
4. If necessary, use the file type and grower, farm, field (GFF) filters to assist with finding and selecting the files. Move the files to export from the left side of the file manager to the right side. Alternatively, press the Select All option at the top of the file list to select all files currently displayed and matching the set filter conditions.
5. Select the File Export icon **(C)**.
6. From the File Export screen, select either Slingshot or the listed USB drive. If more than one USB drive is inserted there may be multiple choices.



RAPH22PLM0357AA 2



3. With at least one file selected, select one of the following export actions:

- Copy - create a duplicate of the selected information on the destination to be selected.



- Move - export the selected information to the destination to be selected and remove the information from the **Viper® 4+** display.

The Export Files prompt will display.

Send with Folder Structure Select this option to export the field operation file types to the USB flash drive with the grower, farm, field (GFF) file structure. The field operation files may be transferred to a **Slingshot®** viewer or user account to review job information, or to another **Viper® 4+** display via the USB flash drive to continue the job.

NOTE: While the GFF file structure is transferred to the USB flash drive using this export option, the GFF assignments will not be inherently associated with the field operation files if transferred to another vehicle with a **Viper® 4+** display. To reassociate the (*.jdp) file with the GFF information, import the GFF structure via the USB manager and then reassign the (*.jdp) file to the GFF using the File Manager tab. See "USB import manager" (7-47) for assistance with importing the GFF information and "Using the file manager" (7-38) for details on using the file manager to reassign the GFF associations.

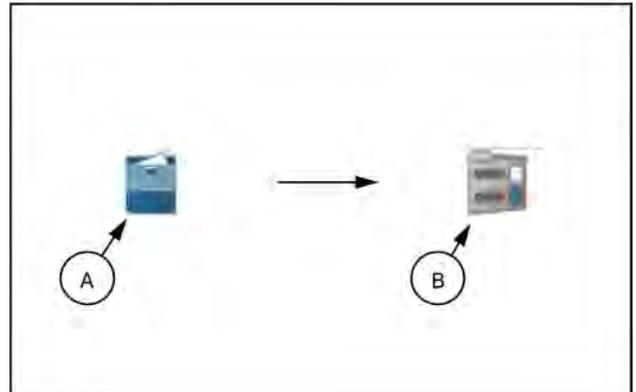
Send as Slingshot Archive. The Slingshot Archive (*.ssa) file type may be used with either a Slingshot user account or to transfer multiple files to another **Viper® 4+** display. Select this file type to transfer multiple files as one package.

NOTE: If imported onto another **Viper® 4+** display, files exported as an .ssa will retain GFF associations from the original device. All files exported to the "Slingshot Archives" directory on the USB flash drive will be required to retain the GFF associations from the previous device.

Press the Confirm button on the Export to USB prompt to start the export process. When complete, the **Viper® 4+** display will return to the File Export tab.

Export ISO task data

1. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.



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2. Select the File Manager utility **(A)** and press the File Management Options tab **(1)**.
3. Select Export GFF data **(C)** to USB as ISO TASKDATA. The ISO GFF Export window will open.



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NOTE: "Send Jobs to Slingshot" is set as the default setting to send jobs via Slingshot when closing the job.

4. Select the desired USB drive from "Select export media **(1)**." The GFF data will export to the USB device in an ISO XML format. Press the Export button **(2)**.



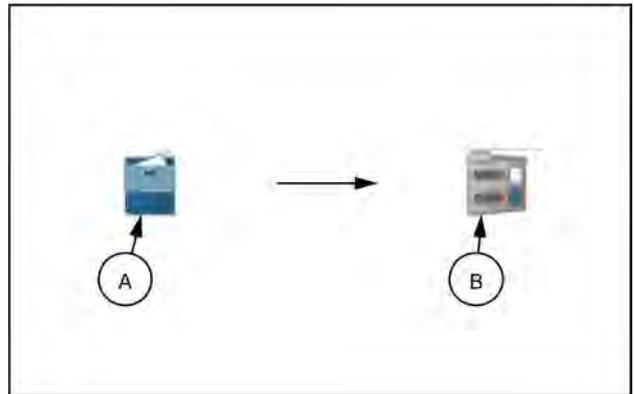
RAIL21TR02865AA 5

NOTE: ISO TASKDATA can only be edited on the device the TASKDATA was created on.

Exporting a widget profile

1. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.
2. Select the File Manager utility **(A)** and press the File Management Options tab **(1)**.
3. Select Export Widget Profiles to USB **(2)**. The Wallpaper Export window will open.
4. Select the desired USB drive from "Select export media" **(3)**. Press the Export button **(4)**.

NOTE: *Widget Profiles can only be edited on the device the wallpaper was created on.*



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USB import manager

The USB Import Manager utilities allow the machine operator to select and import the following file types from a USB flash drive connected to the **Viper® 4+** display:

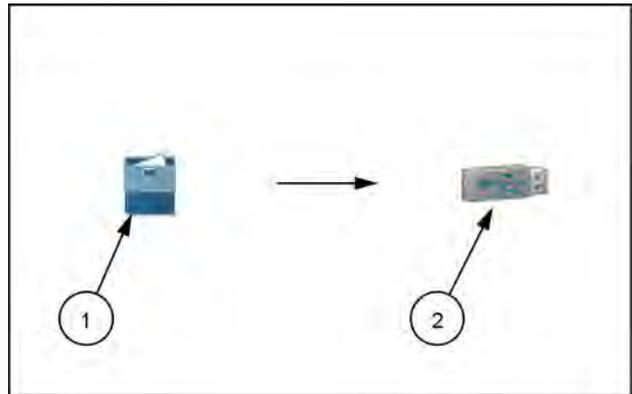
- Grower, Farm, Field Folder Structure
- CAN Node Updates
- Jobs
- Slingshot Archives
- Prescription (Rx) Maps
- Scout Groups
 - Field Boundary
 - Flags
 - Line
 - Zone
- Guidance Lines
- ISO Task Data
- Street Maps
- agX Rec Package
- Widget Profiles

NOTE: The USB manager only displays file types recognized and used with the **Viper® 4+** display. Other file formats or types may not be transferred to the **Viper® 4+** display using the USB Manager.

Import Grower, Farm, Field (GFF) folder structure

To import Grower, Farm, Field (GFF) folder information from a USB flash drive:

1. Insert a USB flash drive used with the **Viper® 4+** display and containing the folder structure and files to be imported.
2. Press the Administrator or User Panel along the top of the Main Panel display to expand the panel.
3. Select the File Manager utility **(1)** and press the USB manager tab **(2)**.
4. Press the USB drop down and select the connected USB flash drive from which to import files.
5. Press the File Type drop down and select the "GFF Folder Structure" option.



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NOTE: Only one file type may be imported at a time. Perform the import procedure multiple times in order to import multiple file types.

To import grower, farm, field (GFF) folder information from a USB flash drive:

6. Press the next button on the USB manager tab. The USB flash drive and folder structure will display
7. Use the displayed browser to locate the Grower folder within the GFF folder structure to be imported. For Example. "USB Drive Name" > GFF > "Grower Name"

NOTE: When importing the GFF folder structure, only select to the "Grower" folder level of the GFF folder structure. The **Viper® 4+** display will automatically transfer the folder information contained within the grower folder to complete the GFF structure. If farm or field folders are selected, the GFF folder structure will be incorrect when imported to the **Viper® 4+** display.



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8. With the grower file selected, select one of the following import actions:

Copy - create a duplicate of the selected information on the **Viper® 4+** display.



Move - import the selected information to the **Viper® 4+** display and remove the information from the USB flash drive. The Import Files prompt will display.

9. Verify imported files list is correct. If the list requires further configuration, press the Cancel button to return to the USB Manager tab.
10. Press the Import button to begin the file transfer process.

Import CAN node updates

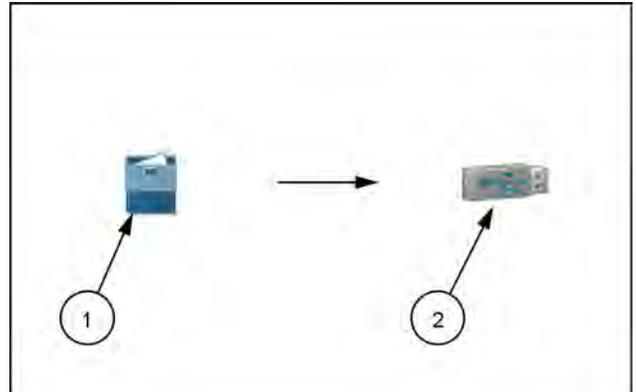
NOTE: See “Hardware information and updates” (7-30) for additional information on downloading and applying updates to CAN bus hardware.

Any node firmware updates copied or moved to the **Viper® 4+** display will be saved on the device until deleted using the file maintenance feature. See “Using the file manager” (7-38) for assistance with deleting node update files from the **Viper® 4+** display.

To import CAN node firmware updates from a USB flash drive:

1. Insert a USB flash drive used with the **Viper® 4+** display and containing the CAN node updates.
2. Press the Administrator or User Panel to expand the panel.
3. Select the File Manager utility (1) and press the USB manager tab (2).
4. Press the USB drop down and select the connected USB flash drive from which to import files.
5. Press the File Type drop down and select the “Node Update” option.
6. Press the Next button on the USB manager tab. The USB flash drive and folder structure will display.
7. Use the displayed browser to locate and select the “CAN upload” or “ISO Upload” folder downloaded from the Raven web site. Node update files currently stored on the USB flash drive will be displayed in the lower portion of the USB manager tab.
For Example “USB Drive Name” > canupload

NOTE: See “Hardware information and updates” (7-30) for additional information on downloading and applying updates to CAN bus hardware.



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8. Press Select All at the top of the file list to import all node updates from the USB flash drive. Node updates may be removed or deleted after the CAN bus hardware update process has been completed. Alternatively, press the box displayed to the left of the node update file name to import only a specific node update if the file name is known.



9. With at least one CAN node update file selected, select one of the following import actions:
Copy - create a duplicate of the selected information on the **Viper® 4+** display.



- Move - import the selected information to the **Viper® 4+** display and remove the information from the USB flash drive.
The Import Files prompt will display.

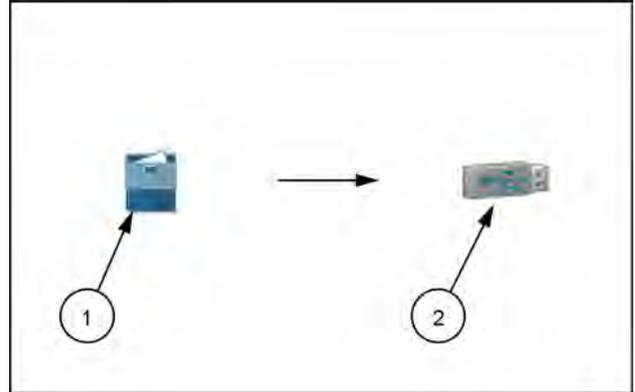
10. Verify the list of files to be imported is correct. If the list requires further configuration, press the Cancel button to return to the USB Manager tab.
11. Press the Import button to begin the file transfer process.

Import jobs

Follow the procedure below to import job files saved or exported as a job data package (.jdp). To import a .jdp file from a USB flash drive:

NOTE: Jobs may also be imported via a Slingshot Archive (.ssa) file type. Refer to the Import a Slingshot Archive section for assistance importing this file type.

1. Insert the USB flash drive with the job profile.
2. Select the Administrator or User Panel to expand the panel.
3. Select the File Manager utility (1) and press the USB Manager tab (2).
4. Press the USB drop down and select the connected USB flash drive from which to import files.
5. Press the File Type drop down and select the "Jobs" option.



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- NOTE:** Only one file type may be imported at a time. Perform the import procedure multiple times in order to import multiple file types.
6. Press the Next button. The USB flash drive and folder structure will display.
 7. Use the browser to locate and select the "Jobs" folder which contains the desired .jdp files. Job files currently stored on the USB flash drive will be found within the GFF folder structure and are displayed in the lower portion of the USB manager tab.
For Example. "USB Drive Name" > GFF > "Grower Name" > "Farm Name" > "Field Name" > Jobs
 8. Press the box displayed to the left of the listed file names to select specific files to import. Alternatively, press the Select All option at the top of the file list to select all files currently displayed.



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9. With at least one job file selected, select one of the following import actions:



Copy - create a duplicate of the selected information on the **Viper® 4+** display.



Move - import the selected information to the **Viper® 4+** display and remove the information from the USB flash drive.

The Import Files prompt will display.

10. Verify the list of files is correct. If the list requires further configuration, press the Cancel button to return to the USB Manager tab.
11. Press the Import button to begin the file transfer process.

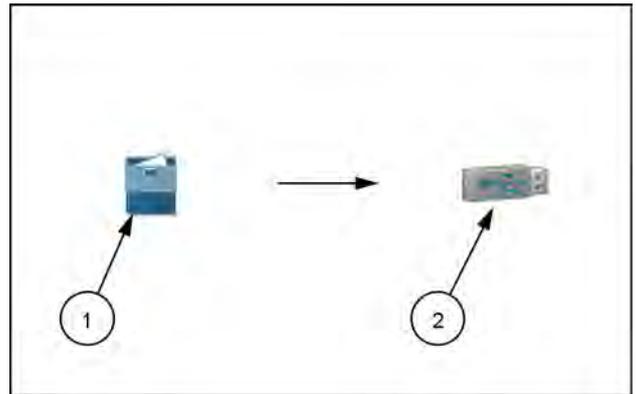
Import a slingshot archive

To import a Slingshot Archive (.ssa) file from a USB flash drive:

1. Insert the USB flash drive containing the Slingshot Archive file.
2. Select the Administrator or User Panel to expand the panel.
3. Select the File Manager utility (1) and press the USB Manager tab (2).
4. Press the USB drop down and select the connected USB flash drive from which to import files.
5. Press the File Type drop down and select the "Slingshot Archive" option.

NOTE: Only one file type may be imported at a time. Perform the input procedure multiple times in order to import multiple file types.

6. Press the Next button. The USB flash drive and folder structure will display.
7. Use the displayed browser to locate and select the "slingshotArchives" folder. Slingshot Archive files currently stored on the USB flash drive will be displayed in the lower portion of the USB manager tab. "USB Drive Name" > Raven > slingshotArchives.
8. Press the box displayed to the left of the listed file names to select specific files to import. Alternatively, press the Select All option at the top of the file list to select all files currently displayed.



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9. With at least one job file selected, select one of the following import actions:

Copy - create a duplicate of the selected information on the **Viper® 4+** display.



Move - import the selected information to the **Viper® 4+** display and remove the information from the USB flash drive.

The Import Files prompt will display.

10. Verify the list of files to be imported is correct. If the list requires further configuration, press the Cancel button to return to the USB Manager tab.
11. Press the Import button to begin the file transfer process.

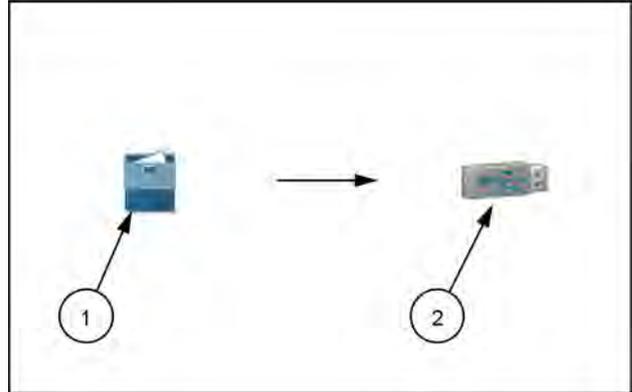
Import prescription (RX) maps

NOTE: Prescription maps may also be imported via a Slingshot Archive (.ssa) file type. Refer to the Import a Slingshot Archive section for assistance importing this file type. If working in a cloud job, prescription maps loaded locally will automatically share with other **Viper® 4+** displays in the same cloud job.

Viper® 4+ displays must have VRA capability and the necessary unlock(s) to achieve prescription map sharing.

To import a Slingshot Archive (.ssa) file from a USB flash drive:

1. Insert a USB flash drive used with the **Viper® 4+** display and containing the prescription map to be imported.
2. Select the Administrator or User Panel along the top of the Main Panel display to expand the panel.
3. Select the File Manager utility (1) and press the USB Manager tab (2).
4. Press the USB drop down and select the connected USB flash drive from which to import files.
5. Press the File Type drop down and select the “Rx Maps” option.



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NOTE: Only one file type may be imported at a time. Perform the input procedure multiple times in order to import multiple file types.

6. Press the Next button. The USB flash drive and folder structure will display.
7. Use the browser displayed to locate and select the “RxMaps” folder which contains the map to be imported. Prescription map files currently stored on the USB flash drive will be found within the GFF folder structure and are displayed in the lower portion of the USB manager tab.
For Example “USB Drive Name” > GFF > “Grower Name” > “Farm Name” > “Field Name” > RxMaps
8. Press the box displayed to the left of the listed file names to select specific files to import. Alternatively, press the Select All option at the top of the file list to select all files currently displayed.



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9. With at least one job file selected, select one of the following import actions:



Copy - create a duplicate of the selected information on the **Viper® 4+** display.



Move - import the selected information to the **Viper® 4+** display and remove the information from the USB flash drive.

The Import Files prompt will display.

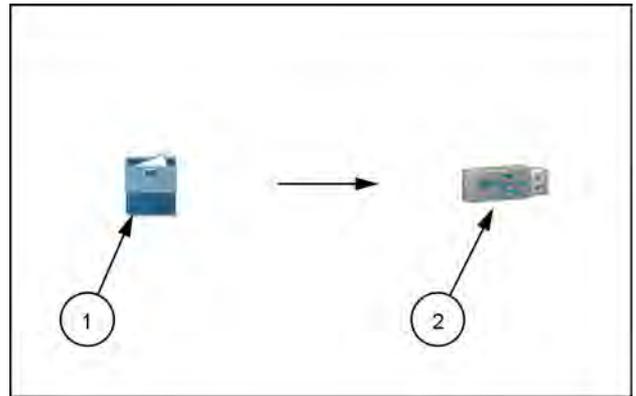
10. Verify the list of files to be imported is correct. If the list requires further configuration, press the Cancel button to return to the USB Manager tab.
11. Press the Import button to begin the file transfer process.

Import scout groups

NOTE: Scouting information such as field boundaries and no-coverage zones may also be imported via a Slingshot Archive (.ssa) file type. Refer to the Import a Slingshot Archive section for assistance importing this file type.

To import a prescription or Rx map from a USB flash drive:

1. Insert a USB flash drive used with the **Viper® 4+** display and containing the scout group files to be imported.
2. Press the Administrator or User Panel to expand the panel.
3. Select the File Manager utility (1) and press the USB Manager tab (2).
4. Press the USB drop down and select the connected USB flash drive from which to import files.
5. Press the File Type drop down and select the “Rx Maps” option.



RAPH23PLM0257AA 11

6. Select the specific feature type in the scout groups category to import individual scout group features (e.g. field boundaries, flags, lines, and zones) independently

NOTE: Only one file type may be imported at a time. Perform the input procedure multiple times in order to import multiple file types.

7. Press Next. The USB flash drive and folder structure will display.
8. Use the browser displayed to locate and select the “scoutRoot” folder which contains the scout group to be imported. Scout group files currently stored on the USB flash drive will be found within the GFF folder structure and are displayed in the lower portion of the USB manager tab.
For Example. “USB Drive Name” > GFF > “Grower Name” > “Farm Name” > “Field Name” > scoutRoot > “Scout Group Name”



RAIL21TR02873AA 12

9. With at least one job file selected, select one of the following import actions:



Copy - create a duplicate of the selected information on the **Viper® 4+** display.



Move - import the selected information to the **Viper® 4+** display and remove the information from the USB flash drive.
The Import Files prompt will display.

10. Verify the list of files to be imported is correct. If the list requires further configuration, press the Cancel button to return to the USB Manager tab.
11. Press the Import button to begin the file transfer process.

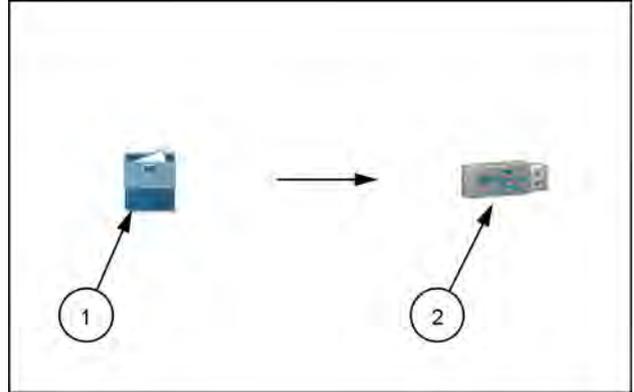
NOTE: When importing a Field Boundary or Zone not created on a **Viper® 4+** display you must assign a Scout Group Name for all features.

Import guidance lines

NOTE: Guidance lines may also be imported via a Slingshot Archive (.ssa) file type. Refer to the Import a Slingshot Archive section for assistance importing this file type.

To import guidance lines from a USB flash drive:

1. Insert a USB flash drive used with the **Viper® 4+** display and containing the prescription map to be imported.
2. Press the Administrator or User Panel to expand the panel.
3. Select the File Manager utility (1) and press the USB Manager tab (2).
4. Press the USB drop down and select the connected USB flash drive from which to import files.
5. Press the file type drop down and select the Guidance Lines option.



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NOTE: Only one file type may be imported at a time. Perform the input procedure multiple times in order to import multiple file types.

6. Select Next. The USB flash drive and folder structure will display.
7. Use the browser displayed to locate and select the "abLines" folder which contains the line to be imported. Guidance line files currently stored on the USB flash drive will be found within the GFF folder structure and are displayed in the lower portion of the USB manager tab.
For Example. "USB Drive Name" > GFF > "Grower Name" > "Farm Name" > "Field Name" > "abLines"
8. Press the box displayed to the left of the listed file names to select specific files to import. Alternatively, press the Select All option at the top of the file list to select all files currently displayed.



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9. With at least one job file selected, select one of the following import actions:



Copy - create a duplicate of the selected information on the **Viper® 4+** display.



Move - import the selected information to the **Viper® 4+** display and remove the information from the USB flash drive.

The Import Files prompt will display.

10. Verify the list of files to be imported is correct. If the list requires further configuration, press the Cancel button to return to the USB Manager tab.
11. Press the Import button to begin the file transfer process.

Import ISO task data

The import ISO TASKDATA section provides options to import data from Slingshot or a USB stick. This information can be GFF data or field boundaries.

File transfer history

If a **Slingshot**® Field Hub is connected with the **Viper**® 4+ display for wireless communication, the File Transfer History tab may be used to track and review transfer history via the Field Hub.

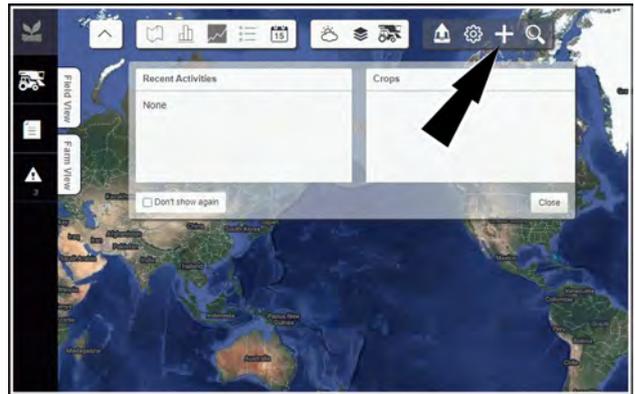
File management options

The File Management Options tab is currently only used if a **Slingshot**® Field Hub is connected to the **Viper**® 4+ display. If a Field Hub is not installed, it is not recommended to leave the “Send Jobs to Slingshot” option enabled.

Import data from AFS Connect™

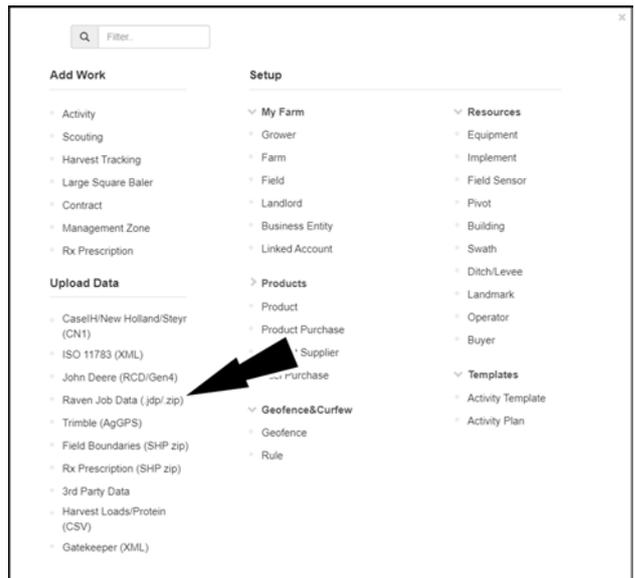
Open the **AFS Connect™** application.

Select the “+” icon on the top toolbar.



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In the “Upload Data” section of the popup, click the “Raven Job Data” item.



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In the “Equipment” drop-down menu **(1)**, select the desired vehicle.

Press the “Please select file to upload” button **(2)**.



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Navigate to the file location in your computer that contains the data file.

Select the desired file. Click the “Open” button.

NOTE: You can upload multiple files in a compressed (*.zip) file.

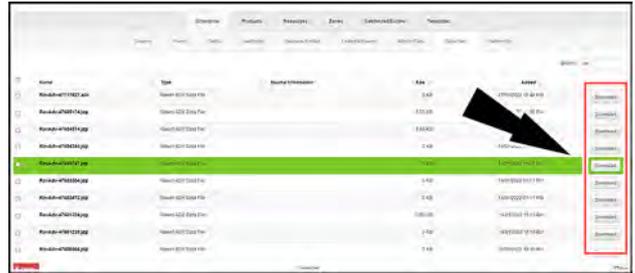


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Once you upload the file, the **AFS Connect™** service sends the file to the **Raven™** servers for processing.

Find the processed files in the **AFS Connect™** portal by navigating to the Setup > Enterprise > Data Files location.

You can download these files and use them in the **Viper®** 4+ display.



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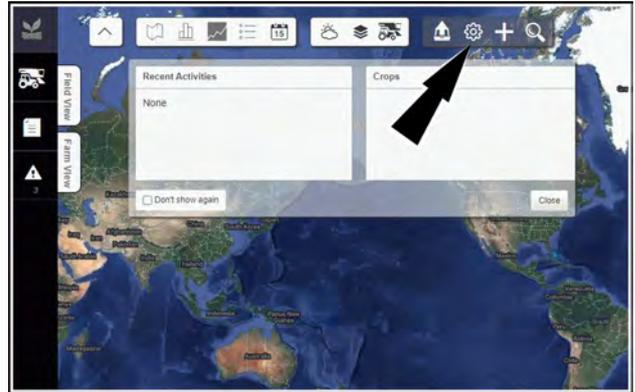
AFS Connect™ and Slingshot® data transfers

To send setup files and to receive setup and job files wirelessly via the **Raven™ Slingshot®** service, you must establish a connection and a partnership between the **AFS Connect™** portal and the **Slingshot®** service.

Import and export data

NOTE: CASE IH recommends having the Grower/Farm/Field structure and boundaries in the **AFS Connect™** service before making the initial connection. This is because setup file data cannot be imported during this connection. Only agronomic data can be imported.

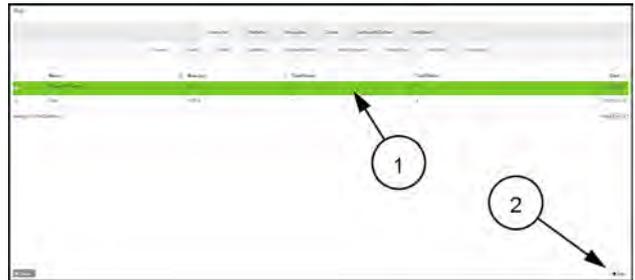
In the **AFS Connect™** portal navigate to Setup > Enterprise > Partnership.



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Select the **Raven™** option (1).

Click the “Add” button (2).



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Click the “Raven” button.



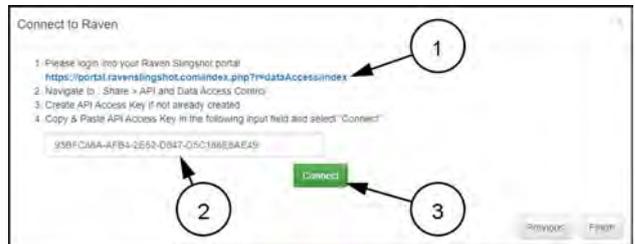
RAPH22PLM0063AA 3

Follow the instructions in the popup.

If you need to obtain an API key, click the link (1) in the popup to log in to your **Slingshot®** account. From there, you can obtain your API key.

Enter the Application Programming Interface (API) key you obtained from the **Slingshot®** service into the “API Access Key” field (2).

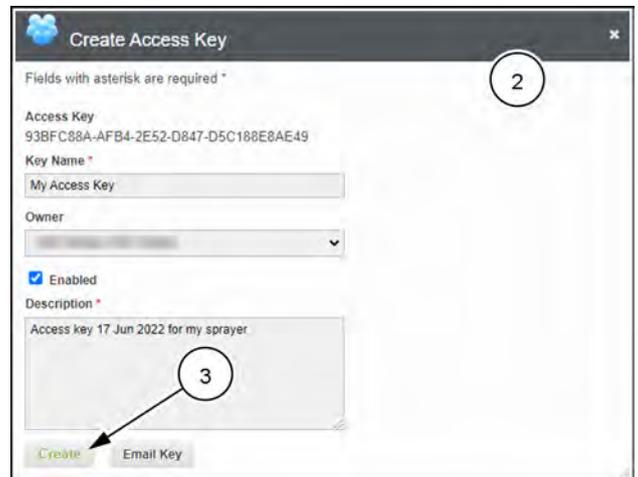
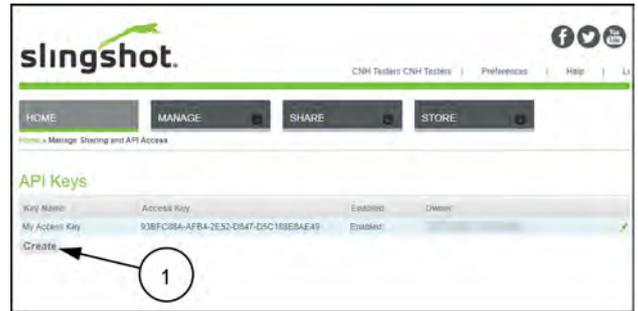
Click the “Connect” button (3).



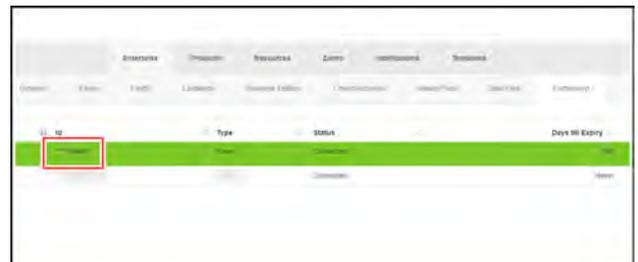
RAPH22PLM0065AA 4

If you clicked the link to obtain an access key from **Raven™**, click the “Create” button (1).

Enter the desired key information into the “Create Access Key” window (2). Click the “Create” button (3).



Once the initial connection is established with the **Raven™ Slingshot®** service, all historical agronomic data from the **Viper® 4+** display synchronizes every 15 minutes. You must close a job before the system synchronizes it.



Export to Viper® 4+ display

NOTE: This requires **Viper® 4+** display software v22.2.0.0 or newer.

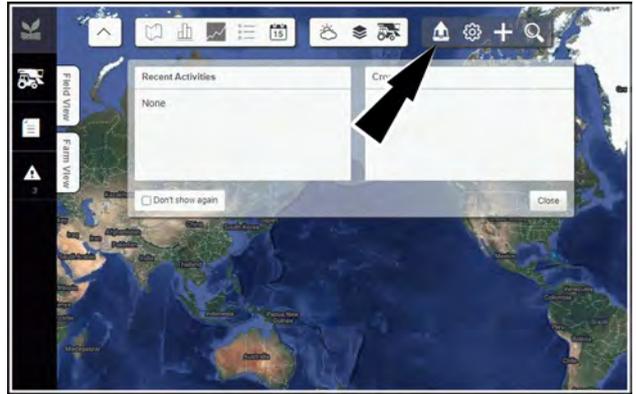
You can send setup files via the **Slingshot®** service connection.

You can send the following items:

- Grower/Farm/Field
- Interior boundaries
- Exterior boundaries
- Straight AB swath
- Curve swath
- Heading swath
- Pivot swath – Center point and radius only
- Variable rate prescription files

NOTE: This procedure sends **Raven™** ISO XML setup files directly to the **Viper® 4+** display if it is connected to the **Slingshot®** service.

In the **AFS Connect™** portal select the “Export” icon.

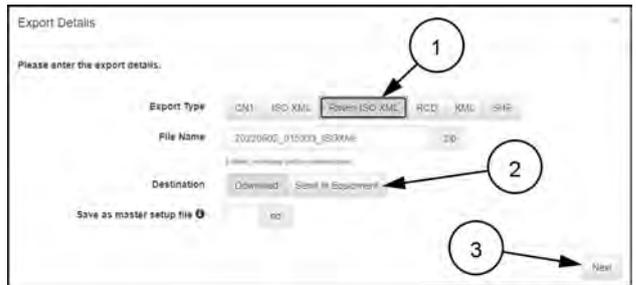


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In the popup window click the “Raven ISO XML” button (1).

Click the “Send to Equipment” toggle (2).

Click the “Next” button (3).



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In the “Organization” drop-down menu (1), select the **Slingshot®** account.

In the “Field Computers” drop-down menu (2), select the **Viper® 4+** display that will receive the file.

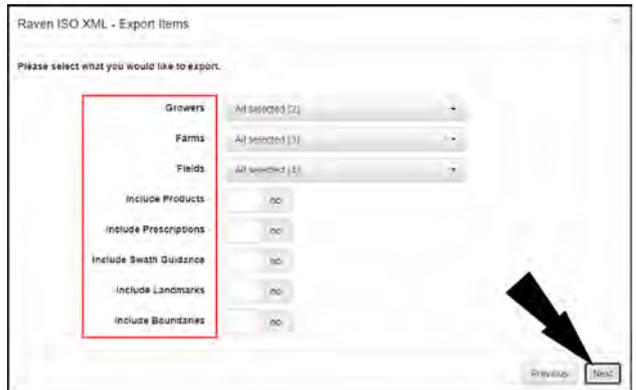
Click the “Next” button (3).



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Select the assets you wish to export.

Click the “Next” button.

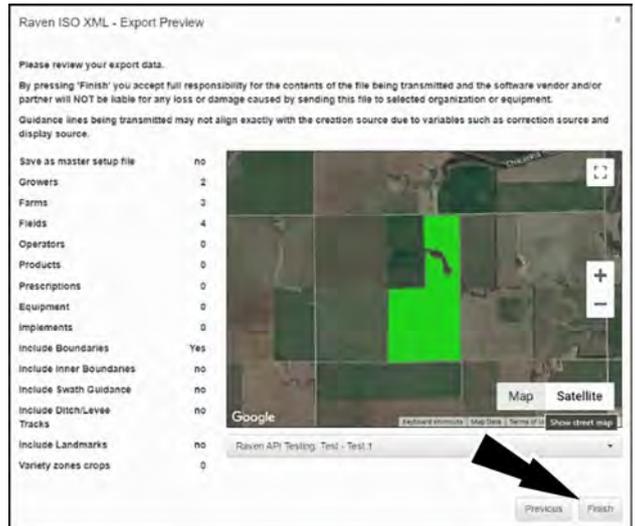


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7 - SERVICES

Review the “Export Preview” window containing the list of assets you will send.

Click the “Finish” button.



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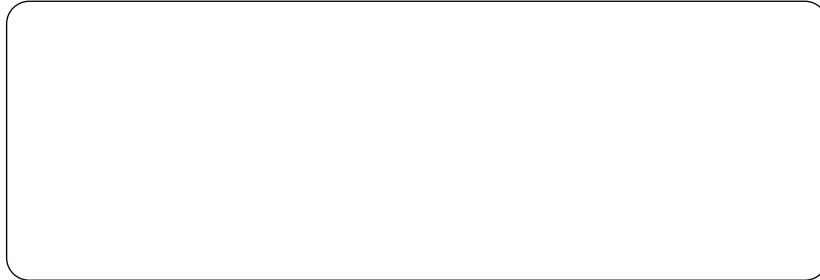
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