CRX Operation Guide

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Contents

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CR7™ and CR12™ Overview

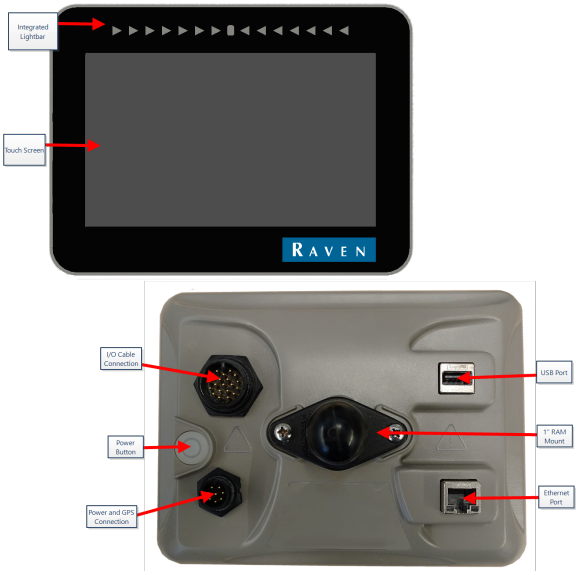
Both the CR7™ and CR12™ field computers feature a dust-proof design (IP65); bright, easy-to-use touchscreen interface; and ISO Universal Terminal (UT) and Task Controller (TC) capabilities making these field computers a flexible plug-and-play option for building an affordable system.

Both the CR7™ and CR12™ utilize the CRX operating software platform featuring easy job set-up; customizable in-job layouts; and an intuitive tablet-style interface. These field computers are also compatible with many Raven systems including:

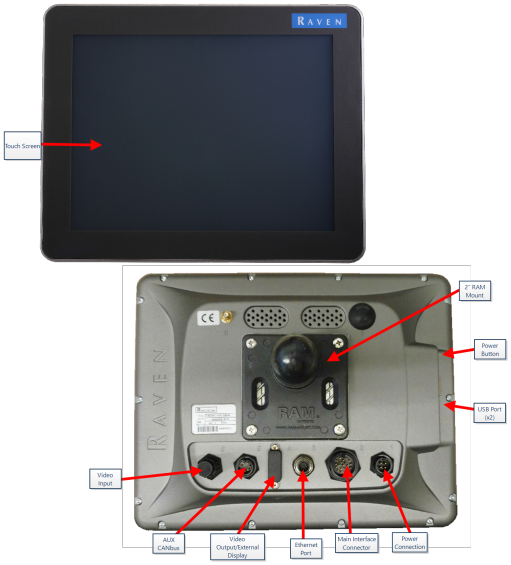
- SmarTrax™ or MD automated steering control
- Slingshot® Online Services
- Raven ISO Products such as Hawkeye® and Raven Rate Control Module (RCM)
- Raven ISO AutoBoom® boom height management
- Raven AccuBoom™
- Raven SCS 400, 600, 4400, and 4600 series consoles

Note: *Contact a local Raven dealer for information on additional features and options available for use with the CR7™ and CR12™ field computers.*

The CR7™ is a 7" lightweight field computer with a simplified widget concept.



The CR12™ is a larger version of the CR7™ with a 12.1" capacitive touchscreen, and an intuitive, tablet-style interface.



Both the CR7™ and CR12™ consoles feature:

- Dustproof design
- Anti-reflective touchscreen for optimal visibility
- Clear and easy to use
- Integrated Wi-Fi module for easy remote support

Specifications

	CR7™	CR12™
Connections	• 2 ISOBUS Channels • 3 Serial Channels • 1 USB 2.0 Port • 1 Gigabit Ethernet Port • 1 Wi-Fi 802.11 b/g/n • 1 Radar Speed Output • 2 Digital Sense Inputs	• 2 USB 2.0 ports • 4 ISOBUS 2.0 Compatible Ports • 5 RS232 Series Data Ports (GPS Out, GPS In, Console, Auxiliary, RTK)
Display	• 7″ Widescreen • Capacitive Touch • 480 x 800 Resolution • Screen Brightness 850 NITS • Integrated Lightbar	• 12″ Widescreen • Capacitive Touch • 1024 x 768 Resolution • Screen Brightness 850 NITS
Computing	• 8 GB Storage • 1 GB RAM • 852 MHz Quad Core Processor	• 30 GB Internal Storage • 1 GB RAM • Quad Core Cortex A9 Processor
Power	• 7 to 16 VDC Input • 850 mA Typical • Supply Power Fuse: 5 Amp MINI® Fuse • Keyed Power Start-Up and Shut-Down	• 4 to 35 VDC Input
Mechanical	• 7.5″ x 5.6″ x 3.0″ (19 cm x 14.25 cm x 7.62 cm) • Weight: 1.4 lbs (0.64 kg)	• 9.63″ x 12.02″ x 1.79″ (24.46 cm x 30.53 cm x 4.55 cm) • Weight: 4.7 lbs (2.13 kg) • 2″ RAM® Ball Mount

	CR7™	CR12™
	• 1" RAM® Ball Mount	
Environmental	• Operating Temperature Range: -20°C to 70°C • Storage Temperature Range: -40°C to 70°C • IP65 Moisture Protection • Operating Altitude: 2000m Maximum	• Operating Temperature Range: -20°C to 70°C • Storage Temperature Range: -40°C to 85°C • IP65 Moisture Protection
Certifications	• CE • E-Mark	• CE • ANATEL

Care and Maintenance

Follow these best practices to maintain your field computer:

- Harsh chemicals may damage the touchscreen. Clean the touchscreen and exterior as needed with a soft cloth dampened with glass cleaner. Apply the cleaner to the cloth and then wipe the screen gently.
- Removing power from the field computer without shutting down may result in damage to the unit which will require the field computer to be returned for service.
- To avoid scratching the touchscreen, do not use any type of sharp instrument.
- Store the field computer in a dry environment when not in use.
- Damage to the field computer may occur if the USB ports are used to charge mobile devices such as cellular phones, tablets, or MP3 devices. USB ports should only be used for performing file transfer and maintenance.
- Route cables to prevent tripping hazards and to keep wires from pinching or breaking.
- When temperatures are expected to be 10° F (-12° C) or lower, remove the field computer from the vehicle and store it in a climate controlled environment.
- Even when powered down, the field computer will draw a small amount of power from the vehicle battery. If the machine will not be in operation for an extended period of time (e.g. more than a couple weeks), disconnect the power cable from the back of the field computer.

Install the Display

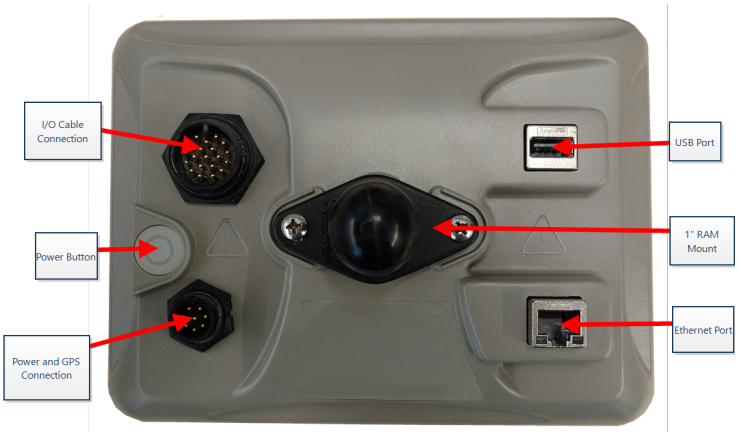
1. Mount the antenna on the centerline of the tallest point of the vehicle (usually on the top of the vehicle cabin) using the magnetic mount. Make sure that the antenna has a clear, 360° view of the sky.

   Note: *If the mounting location is non-magnetic, use a mounting plate to mount the antenna.*

2. Route the Power/GPS cable to the back of the field computer and connect it to the Power/GPS connection.

   ### CR7™ Back

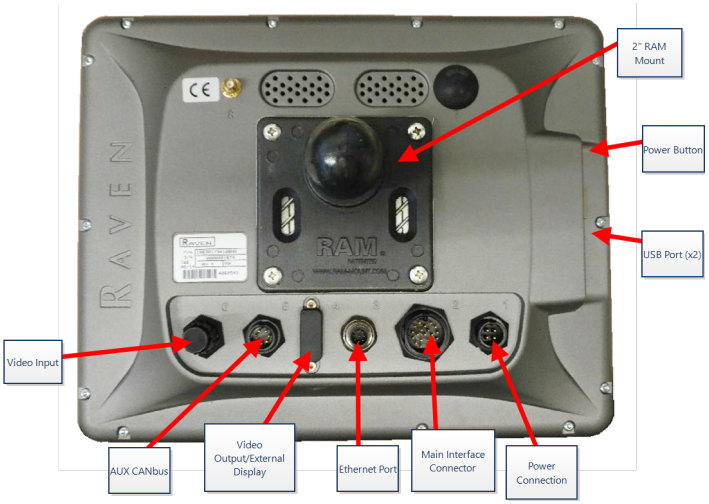
   The image below shows the connections on the back of the CR7™ that will be used for installation. Note that, depending on machine configuration, some of these connections may not be used.



   See "System Diagrams" on page 143 for additional information on cabling.

   ### CR12™ Back

   The image below shows the connections on the back of the CR12™ that will be used for installation. Note that, depending on machine configuration, some of these connections may not be used.



See "System Diagrams" on page 143 for additional information on cabling.

3. Use the provided RAM® Mount arm to install the field computer inside the cab.
4. For additional cabling and connection assistance, refer to the CR7™ and CR12™ Installation Guide and "System Diagrams" on page 143.

http://portal.ravenprecision.com/

Initial Set Up

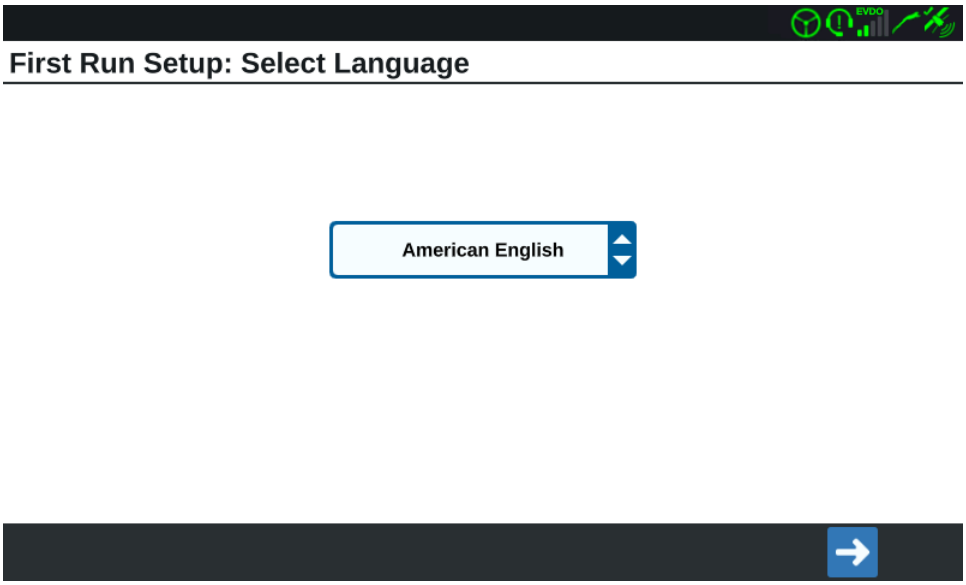
When starting the system for the first time, a setup wizard will walk you through a setup process and, if desired, allow you to quickly begin creating guidance lines. This section covers the first time startup.

Note: *Check all measurements before entering values into the field computer and enter all measurements as accurately as possible. Check that values entered on the field computer are consistent with measurements.*

CR7™ Initial Set Up

After powering up the system for the first time:

1. Select the desired language from the drop-down on the *First Run Setup: Select Language* page.



Note: *Screen layout and button/widget location may vary slightly from the images shown in this manual.*

2. Select **Next** . The *First Run Setup: Select Time Zone* page will be displayed.

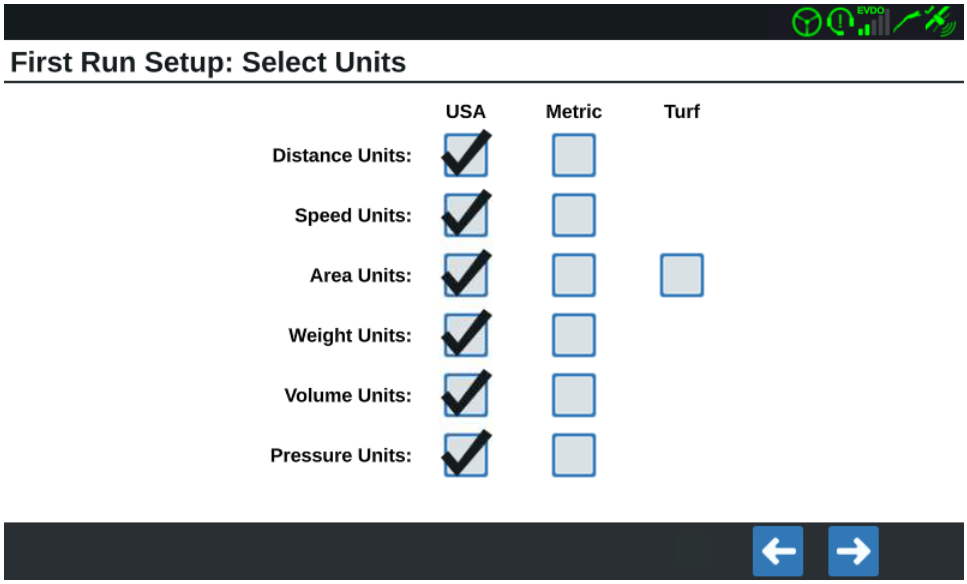
Note: *Select* ***Previous*** *at any time to return to the previous page.*

3. Select the desired time zone from the drop-down.

Note: *Time zones are based on an offset from Coordinated Universal Time (UTC). Ex. Los Angeles is UTC-08:00, New York is UTC-05:00, Berlin is UTC+01:00, and Moscow is*

UTC+03:00. It may be necessary to add an extra hour for daylight savings time for some regions.

4. Select **Next** . The *First Run Setup: Select Units* page will be displayed.
5. Select the desired units (US Standard, Metric, or Turf) for each of the measurement types (Distance, Speed, Area, Weight, Volume, Pressure, and Temperature).



6. Select **Next** . The *First Run Setup: Simplified User Interface* page will open.
7. CR7™ offers a **Simplified User Interface** option which provides a basic set of guidance focused features and options.
   Do not enable this feature if the field computer will be used to control product application or planting operations, if detailed application maps and reports will be needed for multiple operations, if it will be connected to an ISO or CANbus system, or detailed file maintenance is necessary for field operation reporting.
8. Select **Next** . The *First Run Setup: Grower/Farm* page will display.
9. Enter the desired grower name in the **Name the Default Grower** field.
10. Select **Next** . The *First Run Setup: Configure Machine Configuration* page will be displayed.

    Note: *A Machine Configuration allows the user to select the type of equipment used for various field operations (e.g. tractor and implement, self-propelled sprayer, etc.)*

and quickly switch between configurations when using the CRX system with various machines or types of towed implements.

11. Select the **Quick Start** button to set up a basic machine configuration or the **Create Detailed Machine Configuration** button to set up a more detailed machine configuration such as a tractor with a towed implement.

    Note: *The Quick Start option provides simple set up to complete the initial configuration and begin using the CRX system. The Detailed option allows the user to enter detailed machine and implement measurements for optimized guidance for specific equipment types (e.g. self-propelled sprayer versus towed planter behind an articulated tractor) and additional guidance features. Both configuration options may be edited later as needed.*

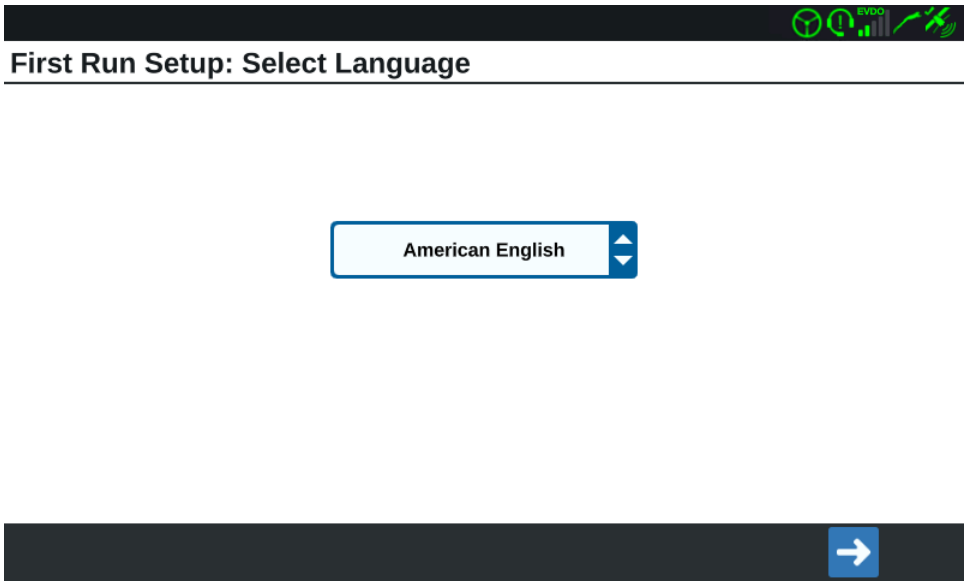
    For more information on the Quick Start Option, see "Quick Start Machine Configuration" on page 20. For more information on the Detailed option, see "Configure Machine" on page 24.

CR12™ Initial Set Up

Note: *The CR12™ startup wizard will ask for the cable harness type used with the field computer. The default option is 115-8000-064 and should only be used if the part number of the cable harness connected to the CRX field computer matches. If using a different cable, select* ***Other*** *from the drop-down. If needed, the cable selection can be edited later in the* ***GPS Information*** *tab.*

After powering up the system for the first time:

1. Select the desired language from the drop-down on the *First Run Setup: Select Language* page.



Note: *Screen layout and button/widget location may vary slightly from the images shown in this manual.*

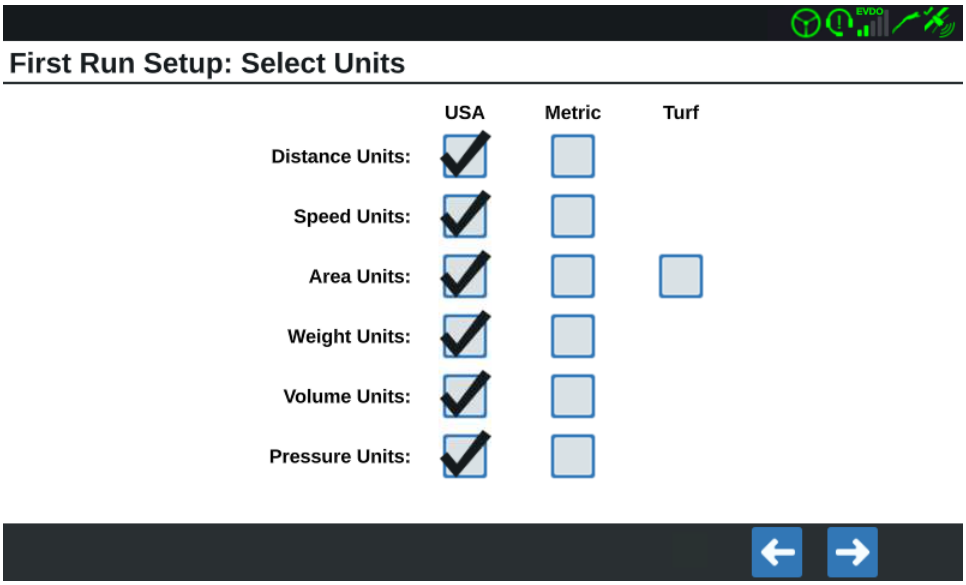
2. Select **Next** . The *First Run Setup: Select Time Zone* page will be displayed.

   Note: *Select* ***Previous*** *at any time to return to the previous page.*

3. Select the desired time zone from the drop-down.

   Note: *Time zones are based on an offset from Coordinated Universal Time (UTC). Ex. Los Angeles is UTC-08:00, New York is UTC-05:00, Berlin is UTC+01:00, and Moscow is UTC+03:00. It may be necessary to add an extra hour for daylight savings time for some regions.*

4. Select **Next** . The *First Run Setup: Select Units* page will be displayed.
5. Select the desired units (US Standard, Metric, or Turf) for each of the measurement types (Distance, Speed, Area, Weight, Volume, Pressure, and Temperature).



6. Select **Next** . The *First Run Setup: Grower/Farm* page will display.
7. Enter the desired grower name in the **Name the Default Grower** field.
8. Select **Next** . The *First Run Setup: Configure Machine Configuration* page will be displayed.

   Note: *A Machine Configuration allows the user to select the type of equipment used for various field operations (e.g. tractor and implement, self-propelled sprayer, etc.) and quickly switch between configurations when using the CRX system with various machines or types of towed implements.*

9. Select the **Quick Start** button to set up a basic machine configuration or the **Create Detailed Machine Configuration** button to set up a more detailed machine configuration such as a tractor with a towed implement.

   Note: *The Quick Start option provides simple set up to complete the initial configuration and begin using the CRX system. The Detailed option allows the user to enter detailed machine and implement measurements for optimized guidance for specific equipment types (e.g. self-propelled sprayer versus towed planter behind an articulated tractor) and additional guidance features. Both configuration options may be edited later as needed.*

   For more information on the Quick Start Option, see "Quick Start Machine Configuration" on the next page. For more information on the Detailed option, see "Configure Machine" on page 24.

Quick Start Machine Configuration

Note: *This topic picks up from the procedure in "Initial Set Up" on page 15. See "Initial Set Up" on page 15 before proceeding.*

Note: *The Quick Start option only allows the operator to create basic guidance lines. For additional functionality, select the Create Detailed Machine Configuration option during the initial set up and see "Configure Machine" on page 24.*

1. Select **Quick Start**. The *Machine Configuration: Quick Start* window will be displayed.
2. Enter the desired measurement in feet or meters in the **Guidance Width** field.

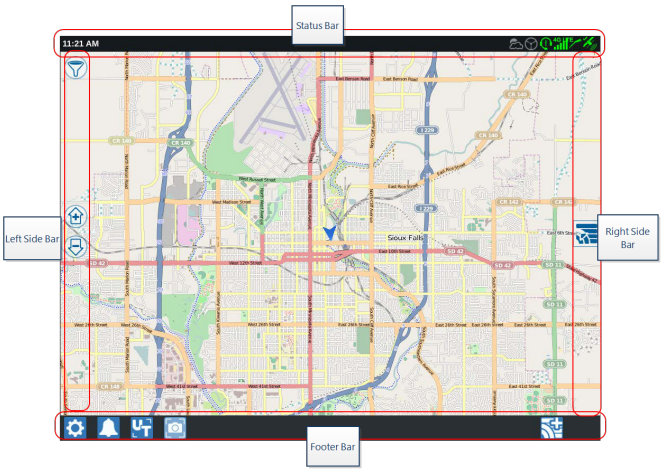
   Note: *The Guidance Width is the width of the implement and that will be "painted" to display previous area covered during a field operation. This measurement is used for creating swath widths for guidance lines and is crucial for most field applications.*

3. Select **Accept**  . The *End User License Agreement* prompt will be displayed.
4. Review the information in the *End User License Agreement* prompt and select **OK**. The *Warning* prompt will be displayed.
5. Read and acknowledge the information in the *Warning* prompt. The Home screen (see "CRX Home Screen Overview" on the facing page) will be displayed and the CRX system is ready for in-field operations.

   Note: *Select* ***Settings***  *at any time it is visible to return to the Settings menu. See "CRX Settings Menu" on page 92.*

CRX Home Screen Overview

The Home screen provides a basic location display, access to system and machine settings, and options for starting new jobs.



Note: *Go to portal.ravenslingshot.com to locate and download Street Maps for use with CRX.*

- See "Initial Set Up" on page 15 for additional assistance with system setup.
- See "Start a Job" on page 42 for assistance with starting a job.
- See "Run Screen Overview" on page 59 for additional information on using tools and features during an in-field operation.

Status Bar

The status bar provides a quick reference for status of the CRX system and connected devices. Note that some status icons use different icon colors to indicate a different status.

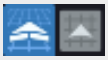
Icon	Name	Description
	GPS No Data	GPS is not detected. For assistance with GPS issues, see "View GPS Information" on page 99.
	GPS Bad	No GPS. For assistance with GPS issues, see "View GPS Information" on page 99.
	GPS Warning	Poor GPS signal. For assistance with GPS issues, see "View GPS Information" on page 99.

Icon	Name	Description
	GPS Ideal	GPS is active and receiving a good signal.
	Slingshot® Disabled	Slingshot® is not available. Refer to the Slingshot® operation manual for additional information on Slingshot® functionality.
	Slingshot® Connected	Slingshot® is connected. Refer to the Slingshot® operation manual for additional information on Slingshot® functionality.
	Slingshot® Transfer	Slingshot® is currently transferring data. Refer to the Slingshot® operation manual for additional information on Slingshot® functionality.
	Signal Strength	Strength of wireless signal. Refer to the Slingshot® operation manual for additional information on Slingshot® functionality.
	Remote Support Disabled	Remote support session is not active. See "Enable Remote Support" on page 101.
	Remote Support Active	Remote support session active.
	SmarTrax™ Disabled	SmarTrax™ is turned off. If desired, press one of the SmarTrax™ resume switches on the machine to turn SmarTrax™ back on. Refer to the SmarTrax™ operation manual for additional information on SmarTrax™ operation.
	SmarTrax™ Not Ready	SmarTrax™ is not ready to be engaged. Refer to the SmarTrax™ operation manual for additional information on SmarTrax™ operation.
	SmarTrax™ Ready	SmarTrax™ is ready to operate. Refer to the SmarTrax™ operation manual for additional information on SmarTrax™ operation.
	SmarTrax™ Node Download	SmarTrax™ node update is being installed. Refer to the SmarTrax™ operation manual for additional information on SmarTrax™ operation.
	Software Update	A CRX software update is available. See "Update Software and Hardware" on page 132 for additional information on performing a CRX software update.

Icon	Name	Description
	USB Scanning	Indicates that CRX is scanning the connected USB drive.
	USB Transfer	CRX is transferring files from the connected USB drive.
	Outdoor Sensor	Outdoor Sensor is communicating.

Footer Tools

The buttons at the bottom of the screen provide easy access to settings and features such as the ISO Universal Terminal (UT), any active alarms or notifications, and also different views for use during an in-field operation. Review the following descriptions of the function of the icons displayed in the footer.

Icon	Name	Description
	Toggle View	Toggle between the 3D/2D guidance view, widget view, and aerial view.
	Notifications	Display information about active alerts or review notification history. See "View Notifications" on page 107.
	Accept	Accept the change or exit the job.
	Cancel	Stop performing the current selection.
	Screen Capture	Capture a screen shot of the current screen. See "Manage Screen Shots" on page 111
	Create Job in a New Field	Start a new job in a new field. See "Start a Job" on page 42.
	Settings	Open the Settings Menu. See "CRX Settings Menu" on page 92.
	UT	Open and control components on the ISOBUS.
	Widget View	Display simultaneous view of the job screen and any other available widget. The UT widget is only available in the Widget View for CR12™.

Configure Machine

Note: *Entering all measurements as accurately as possible will ensure the best coverage and guidance results during in-field operations. Verify all measurements before entering them into CRX and check values entered for each setting or option.*

The *Machine Configuration* screen has the following options:

Configure New Machine

Note: *Entering all measurements as accurately as possible will ensure the best coverage and guidance results during in-field operations. Verify all measurements before entering them into CRX and check values entered for each setting or option.*

The following options are available for configuring new machines:

Traditional Machine

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select the **New Configuration** button . The *Configure Machine* window will open.
4. Select **Create New Machine**.
5. Select the **Traditional** checkbox.
6. Enter the machine name in the **<Enter Name>** field.
7. Select **Next**. The *Antenna Height Above Ground* page will open.
8. Enter the height from the ground to the center of the antenna.
9. Select **Next**. The *Antenna Offset From Center* page will open.
10. Enter the distance the antenna is offset from the center of the implement.
11. Select the **Left** or **Right** checkbox to set whether the antenna is mounted to the left or right of the centerline.
12. Select **Next**. The *Antenna Offset From Rear Axle* page will open.
13. Enter the distance from the center of the rear axle to the center of the antenna.
14. Select the **Ahead** or **Behind** checkbox to set whether the antenna is ahead of or behind the axle.
15. Select **Next**. The *Connection Point Offsets* page will open.

16. Enter the appropriate measurements in the **Rear Axle to Front Equipment Mount**, **Rear Axle to Drawn Equipment Hitch**, and **Rear Axle to 3 Point Hitch Distances** fields.
17. Select **Accept** to return to the *Configure Machine* window.
18. Select **Accept** to save the displayed settings and return to the Settings menu.

Self Propelled Machine

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select the **New Configuration** button . The *Configure Machine* window will open.
4. Select **Create New Machine**.
5. Select the **Self Propelled** checkbox.
6. Enter the machine name in the **<Enter Name>** field.
7. Select **Next**. The *Antenna Height Above Ground* page will open.
8. Enter the height from the ground to the center of the antenna.
9. Select **Next**. The *Antenna Offset From Center* page will open.
10. Enter the distance the antenna is offset from the center of the implement.
11. Select the **Left** or **Right** checkbox to set whether the antenna is mounted to the left or right of the centerline.
12. Select **Next**. The *Antenna Offset From Rear Axle* page will open.
13. Enter the distance from the center of the rear axle to the center of the antenna.
14. Select the **Ahead** or **Behind** checkbox to set whether the antenna is ahead of or behind the axle.
15. Select **Next**. The *Connection Point Offsets* page will open.

16. Enter the appropriate measurements in the **Rear Axle to Front Equipment Mount**, **Rear Axle to Drawn Equipment Hitch**, and **Rear Axle to 3 Point Hitch Distances** fields.
17. Select **Accept** to return to the *Configure Machine* window.
18. Select **Accept** to save the displayed settings and return to the Settings menu.

Articulated Machine

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select the **New Configuration** button . The *Configure Machine* window will open.
4. Select **Create New Machine**.
5. Select the **Articulated** checkbox.
6. Enter the machine name in the **<Enter Name>** field.
7. Select **Next**. The *Antenna Height Above Ground* page will open.
8. Enter the height from the ground to the center of the antenna.
9. Select **Next**. The *Antenna Offset From Center* page will open.
10. Enter the distance the antenna is offset from the center of the implement.
11. Select the **Left** or **Right** checkbox to set whether the antenna is mounted to the left or right of the centerline.
12. Select **Next**. The *Antenna Offset From Pivot* page will open.
13. Enter the distance from the center of the articulation point to the center of the antenna.
14. Select the **Ahead** or **Behind** checkbox to set whether the antenna is ahead of or behind the articulation point.

15. Select **Next** . The *Distance: Rear Axle to Pivot* page will open.

    Note: *This allows CRX to calculate the correct position of the implement for determining the coverage rate and section control functions.*

16. Enter the distance from the pivot point to the center of the rear axle.
17. Select **Accept** to return to the *Configure Machine* window.
18. Select **Accept** to save the displayed settings and return to the Settings menu.

Tracked Machine

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select the **New Configuration** button . The *Configure Machine* window will open.
4. Select **Create New Machine**.
5. Select the **Tracked** checkbox.
6. Enter the machine name in the **<Enter Name>** field.
7. Select **Next** . The *Antenna Height Above Ground* page will open.
8. Enter the height from the ground to the center of the antenna.
9. Select **Next** . The *Antenna Offset From Center* page will open.
10. Enter the distance the antenna is offset from the center of the implement.
11. Select the **Left** or **Right** checkbox to set whether the antenna is mounted to the left or right of the centerline.
12. Select **Next** . The *Antenna Offset to Track Center* page will open.
13. Enter the distance from the track center to the center of the antenna.
14. Select the **Ahead** or **Behind** checkbox to set whether the antenna is ahead of or behind the track center.
15. Select **Next** . The *Connection Point Offsets* page will open.

16. Enter the appropriate measurements in the **Rear Axle to Front Equipment Mount**, **Rear Axle to Drawn Equipment Hitch**, and **Rear Axle to 3 Point Hitch Distances** fields.
17. Select **Accept** to return to the *Configure Machine* window.
18. Select **Accept** to save the displayed settings and return to the Settings menu.

Implement Steering Only

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select the **New Configuration** button . The *Configure Machine* window will open.
4. Select **Create New Machine**.
5. Select the **Implement Steering Only** checkbox.
6. Enter the machine name in the **<Enter Name>** field.
7. Select **Next**. The *Antenna Height Above Ground* page will open.
8. Enter the height from the ground to the center of the antenna.
9. Select **Next**. The *Antenna Offset From Center* page will open.
10. Enter the distance the antenna is offset from the center of the implement.
11. Select the **Left** or **Right** checkbox to set whether the antenna is mounted to the left or right of the centerline.
12. Select **Next**. The *Antenna Offset From Rear Axle* page will open.
13. Enter the distance from the center of the rear axle to the center of the antenna.
14. Select the **Ahead** or **Behind** checkbox to set whether the antenna is ahead of or behind the axle.
15. Select **Next**. Mount desired equipment to the machine type.
16. Select **Accept** to return to the *Configure Machine* window.

17. Select **Accept**  to save the displayed settings and return to the Settings menu.

Delete An Existing Machine

To delete an existing machine:

1. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine**  button on the Settings menu. The *Machine Configuration* window will open.
3. Select the desired machine. The *Configure Machine* window will open.
4. Select **Delete**  . The *Delete Machine* window will open.
5. Select **Accept**  to delete the machine or **Cancel**  to return to the *Configure Machine* window.

Create New Mounted Implement

Note: *Entering all measurements as accurately as possible will ensure the best coverage and guidance results during in-field operations. Verify all measurements before entering them into CRX and check values entered for each setting or option.*

The following options are available for creating new mounted implements:

SCS or ISOBUS-Connected Item

To create a new implement that is mounted to the frame structure or the machine:

1. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine**  button on the Settings menu. The *Machine Configuration* window will open.
3. Select **Edit**  on an existing machine. The *Configure Machine* window will open. Either modify the existing machine or select an implement to mount to an existing machine.
4. Select the desired machine from the drop-down.
5. Select the **Mount Equipment** button under the *Front Mounted* or *Rear Mounted* labels to select if the equipment is front or rear mounted. The *Select Equipment To Mount On* window will open.
6. Select **Create New Equipment**.
7. Enter a name for the equipment in the **<enter name>** field.
8. Enter the distance from the axle to the equipment or the distance from the connection point to the connection point.

   Note: *For ISO supported products, it is possible to adjust individual section offsets in the ISO connected piece of equipment and operate it in CRX.*

9. Select **Next**  . The *GPS Solution Source* page will open.
10. If desired, select a GPS source. If a GPS source is selected, there will be additional screens before the next step.
11. Select if the equipment is **Ahead** or **Behind** the axle.
12. Select **Next**  . The *Equipment Offset From Center* page will open.

13. Enter the distance from the center of the implement to the center of the machine in the **Distance** field.
14. Select if the equipment is offset to the **Left** or **Right** of center.
15. Select Accept to return to the *Configure Machine* window.
16. Select **Accept** to save the displayed settings and return to the Settings menu. If needed, select **Previous** and adjust information.

Other

To create a new implement that is mounted to the frame structure or the machine:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select **Edit** on an existing machine. The *Configure Machine* window will open. Either modify the existing machine or select an implement to mount to an existing machine.
4. Select the desired machine from the drop-down.
5. Select the **Mount Equipment** button under the *Front Mounted* or *Rear Mounted* labels to select if the equipment is front or rear mounted. The *Select Equipment To Mount On* window will open.
6. Select **Create New Equipment**.
7. Enter a name for the equipment in the **<enter name>** field.
8. Enter the **Total Width**.
9. Enter the **Number of Sections**.
10. Select **Next**. The *Guidance Width* page will open. The Guidance Width is automatically assigned the same value as the Total Width.
11. If desired, enter a different measurement in the **Guidance Width** field.
12. Select **Next**. The *Section Layout* page will open.

13. Review the information on the *Section Layout* page. If desired, select the width below one of the sections to adjust the width for that section.
14. Select **Next**  . The *Axle to Equipment* page will open.
15. Enter the distance from the axle to the equipment or the distance from the connection point to the connection point.

    Note: *For ISO supported products, it is possible to adjust individual section offsets in the ISO connected piece of equipment and operate it in CRX.*
16. Select **Next**  . The *GPS Solution Source* page will open.
17. If desired, select a GPS source. If a GPS source is selected, there will be additional screens before the next step.
18. Select if the equipment is **Ahead** or **Behind** the axle.
19. Select **Next**  . The *Equipment Offset From Center* page will open.
20. Enter the distance from the center of the implement to the center of the machine in the **Distance** field.
21. Select if the equipment is offset to the **Left** or **Right** of center.
22. Select Accept to return to the *Configure Machine* window.
23. Select **Accept**  to save the displayed settings and return to the Settings menu. If needed, select **Previous**  and adjust information.

Add Drawn Equipment to Existing Machine

Note: *Entering all measurements as accurately as possible will ensure the best coverage and guidance results during in-field operations. Verify all measurements before entering them into CRX and check values entered for each setting or option.*

To add drawn equipment, a machine must have already been configured. See "Configure New Machine" on page 25.

Add Existing Equipment

Existing Cart

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select **Add Drawn Equipment**. The *Configure Carts* window will open.
4. Select the desired cart from the drop down list.
5. Select **Mount Equipment**. The drawn equipment is now mounted to the implement.
6. To edit a piece of Drawn Equipment, select **Edit**.
7. To remove a piece of Drawn Equipment, select the **Remove** button on the *Machine Configuration* screen.

   Note: *Resetting an implement or piece of equipment will not delete previously created profiles but will place it back in the inventory.*

8. Select **Accept** to save the displayed settings and return to the Settings menu.

Create New Equipment

Note: *Drawn equipment includes two wheel and four wheel carts. Unless the equipment is steered from the front wheels, create a two wheel cart.*

Two Wheel Cart

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select **Add Drawn Equipment**. The *Configure Carts* window will open.
4. Select **Create New Cart**. The *Create New Cart* page will open.
5. Enter the desired name in the **<Enter Name>** field.
6. Select the **Two Wheel Cart** checkbox.
7. Select **Next**. The *Axle to Tongue Distance* page will open.
8. Enter the distance from the center of axle to the front of the tongue.
9. Select **Next**. The *Distance: Axle to Hitch* page will open.
10. Enter the distance from the center of the rear axle to the back hitch.
11. Select **Accept** to return to the *Configure Carts* window.
12. Select **Mount Equipment**. The drawn equipment is now mounted to the implement.
13. To edit a piece of Drawn Equipment, select **Edit**.
14. To remove a piece of Drawn Equipment, select the **Remove** button on the *Machine Configuration* screen.

    Note: *Resetting an implement or piece of equipment will not delete previously created profiles but will place it back in the inventory.*

15. Select **Accept** to save the displayed settings and return to the Settings menu.

Four Wheel Cart

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine** button on the Settings menu. The *Machine Configuration* window will open.
3. Select **Add Drawn Equipment**. The *Configure Carts* window will open.

4. Select **Create New Cart**. The *Create New Cart* page will open.
5. Enter the desired name in the **<Enter Name>** field.
6. Select the **Four Wheel Cart** checkbox.
7. Select **Next**  . The *Axle to Tongue Distance* page will open.
8. Enter the distance from the center of axle to the front of the tongue.
9. Select **Next**  . The *Distance: Axle to Axle*page will open.
10. Enter the distance between the two axles.
11. Select **Accept**  to return to the *Configure Carts* window.
12. Select **Mount Equipment**. The drawn equipment is now mounted to the implement.
13. To edit a piece of Drawn Equipment, select **Edit**  .
14. To remove a piece of Drawn Equipment, select the **Remove** button on the *Machine Configuration* screen.

    Note: *Resetting an implement or piece of equipment will not delete previously created profiles but will place it back in the inventory.*

15. Select **Accept**  to save the displayed settings and return to the Settings menu.

Drawn Equipment

1. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
2. Select the **Machine**  button on the Settings menu. The *Machine Configuration* window will open.
3. Select **Add Drawn Equipment**  . The *Configure Carts* window will open.
4. Select **Create New Cart**. The *Create New Cart* page will open.
5. Enter the desired name in the **<Enter Name>** field.
6. Select the **Drawn Equipment** checkbox.
7. Select **Next**  . The *Axle to Tongue Distance* page will open.
8. Enter the distance from the center of axle to the front of the tongue.

9. Select **Next**  . The *Distance: Axle to Hitch* page will open.
10. Enter the distance from the center of the rear axle to the back hitch.
11. Select **Next**  . The *New Equipment* page will open.
12. Enter Total Width and the Number of Sections.
13. Select **Next**  . Review the *Section Layout* information.
14. Select **Next**  . The *Equipment Offset From Axle* page will open.
15. Enter the distance from the center of the equipment to the axle.
16. Select the **Ahead** or **Behind** checkbox for whether the equipment is ahead of or behind the center of the axle.
17. Select **Next**  . The *Equipment Offset From Center* page will open.
18. Enter the distance between the equipment and the centerline of the machine.
19. Select the **Left** or **Right** checkboxes for whether the equipment is mounted to the left or right of the centerline.
20. Select **Accept**  to return to the *Configure Carts* window.
21. Select **Mount Equipment**. The drawn equipment is now mounted to the implement.
22. To edit a piece of Drawn Equipment, select **Edit**  .
23. To remove a piece of Drawn Equipment, select the **Remove** button on the *Machine Configuration* screen.

    Note: *Resetting an implement or piece of equipment will not delete previously created profiles but will place it back in the inventory.*

24. Select **Accept**  to save the displayed settings and return to the Settings menu.

Manage Grower, Farm, Field (GFF)

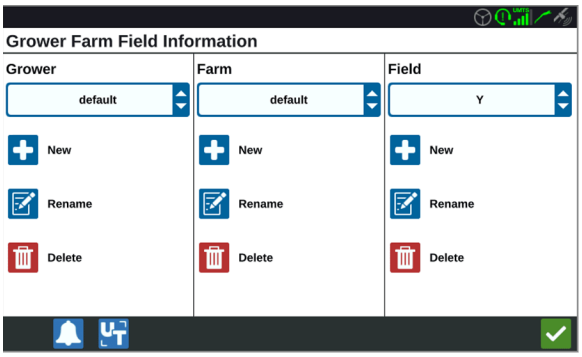
CRX offers a Grower, Farm, Field (GFF) utility to create and manage GFF information right on the CRX device.

The following actions are available to manage GFF files:

Create a New GFF

GFF data can be added to CRX prior to starting a new job.

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **GFF** on the Settings menu. The *Grower Farm Field Information* window will open.



3. Select **New** from the Grower column. The *Add Grower* window will open.
4. Select the **Enter Grower Name** cell and enter the desired grower name.
5. Select **Accept**.
6. In the Farm column select **New**. The *Add Farm* window will open.
7. Select the **Enter Farm Name** cell. Enter the desired farm name.
8. Select **Accept**.
9. In the Field column select **New**. The *Add Field* window will open.
10. Select the **Enter Field Name** cell. Enter the desired field name.

11. Select **Accept** .
12. Select **Accept** to save the displayed settings and return to the Settings menu.

Edit a GFF

Note: *When starting a new job, CRX will select the default grower and farm. When saving, always ensure that the correct GFF information is selected to save an in-field operation in the correct location.*

To edit a GFF:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **GFF** on the Settings menu. The *Grower Farm Field Information* window will open.
3. Select the desired Grower, Farm, and/or Field from the drop-down options.

To rename a GFF:

1. Ensure the desired GFF is visible in the drop-down.
2. Select **Rename** . The *Rename Grower, Rename Farm, or Rename Field* prompt is displayed.
3. Enter the new name.
4. Select **Accept** .
5. Select **Accept** to save the displayed settings and return to the Settings menu.

Delete a GFF

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **GFF** on the Settings menu. The *Grower Farm Field Information* window will open.

3. Select the desired GFF from the drop-down options.

   Note: *If deleting a Farm with associated Fields, delete the Fields before attempting to delete the Farm.*

   Note: *If deleting a Field with associated files (jobs, scouted objects, guidance lines), delete the files before attempting to delete the Field.*

4. Select **Delete**  .
5. Select **Accept**  to confirm.
6. Select **Accept**  to save the displayed settings and return to the Settings menu.

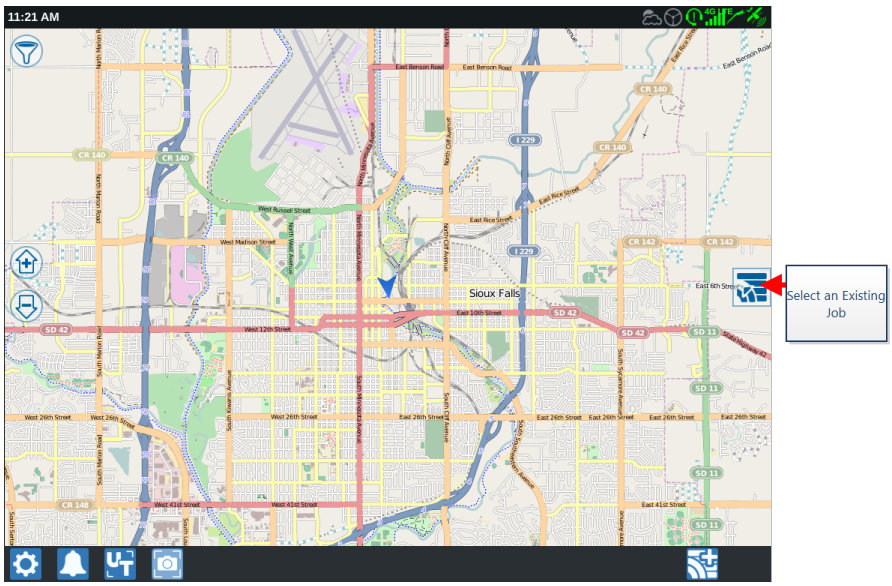
Start a Job

A job can be started from the Home screen. The following options are available for starting a job:

Start or Resume an Existing Job

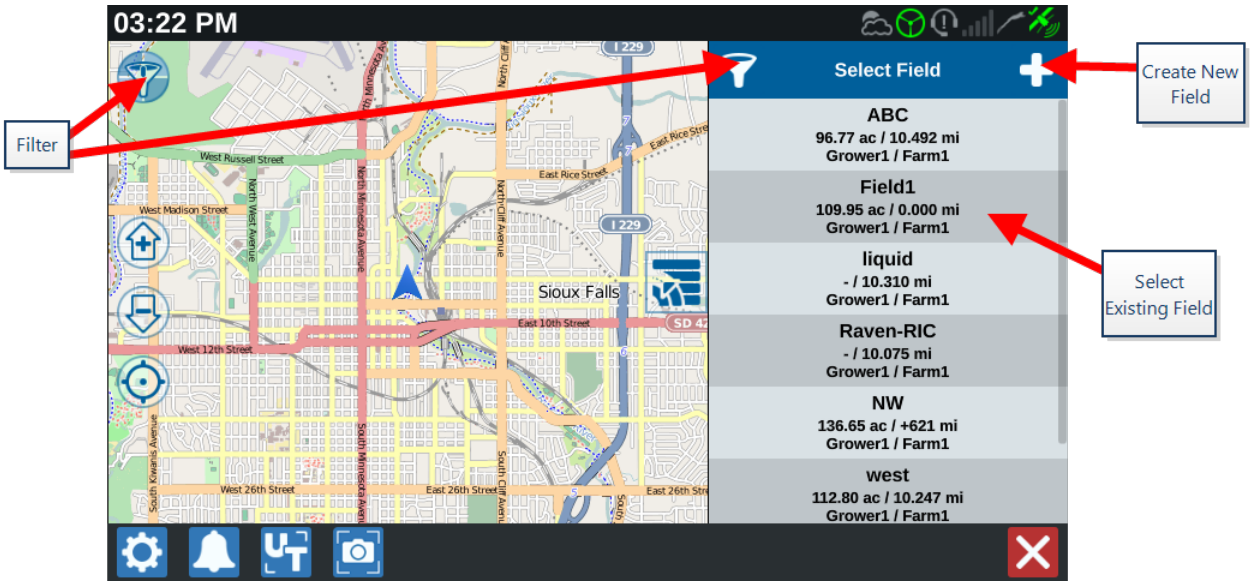
To start or resume an existing job:

1. Select **Select Existing Job** halfway up the right side of the Home screen.



2. Select the desired field from the *Select Field* list.

   Note: *Select* ***Add*** *in the upper right corner to create a new field for the job.*



3. Select the desired job to resume the previous coverage or select **Next** and select the **New Job** option to start the job with a new coverage map.

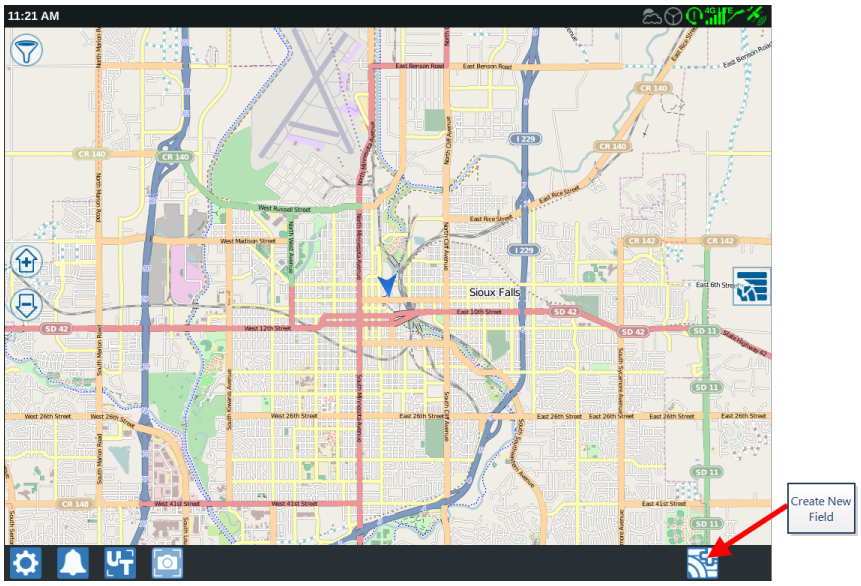
   Note: *The filter options allow filtering based on Grower Farm Field (GFF) info, as well as selecting how the fields are sorted.*

   Note: *There are three checkboxes to specify the type of job.*

Start a New Job in a New Field

To start a new job in a new field:

1. On the Home screen, select **Create New Field** at the bottom of the Home screen.



2. Select the **Grower** and **Farm** drop-down lists to select the appropriate location for the new field.
3. Enter the field name in the space provided.
4. Enter a job name in the **Give Your Job a Name** cell.
5. Select **Next**. The *Product To Implement Assignment* window will open.
6. Review the coverage to implement assignments. If desired, select **Edit**. The *Edit* window will open.
7. Select the desired coverage option(s) from the drop-down menu.
8. Select **Accept**.
9. Select **Next**. The Run screen will be displayed. Refer to the "Run Screen Overview" on page 59 for additional assistance with using the CRX Run Screen.

Operation Planning Overview

Operation planning is a method to define guidance lines (including tramlines) and headland application regions for an operation on a field. A operation plan can be selected to use for any job in a field that has an operation plan association. Also, preconfigured guidance lines, headrows, and tramlines can be selected and applied to numerous jobs within an existing field boundary.

Operation planning consists of:

Create New Plan

To create a new operation plan:

1. Select **Select Existing Job**  on the right side of the Home screen.
2. Choose the desired field and select **Next**  . The *Field Management* page will open.
3. Select **Operations Planning**.

   Note: *If needed, select* ***Scouting*** *to create a field boundary to use for operations planning. A screen similar to the Run screen will open but will not apply product.*

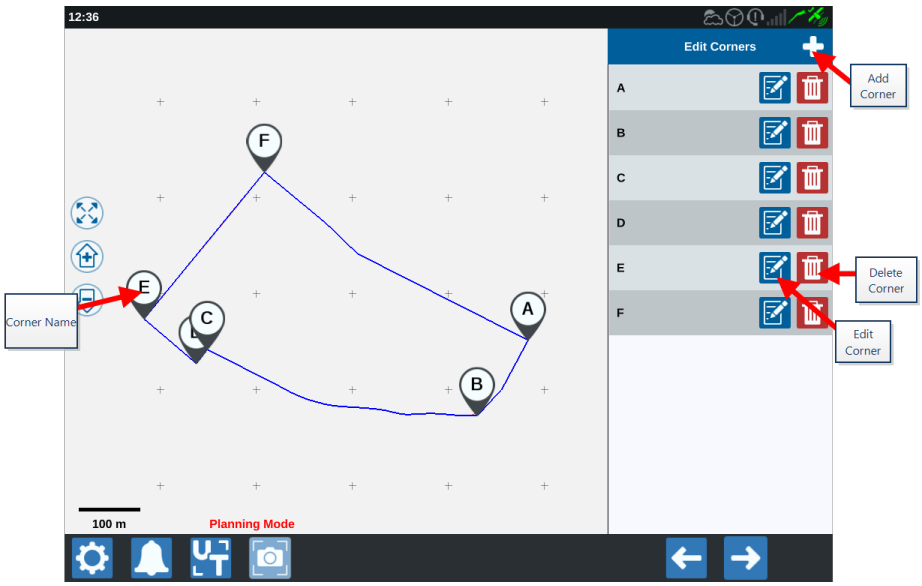
Pre-Planning: Adjust Field Boundary and Lines

Pre-planning allows the user to adjust the field boundary and lines that are created based on the boundary.

Note: *Pre-planning must be selected.*

1. Select **Select Existing Job** on the right side of the Home screen.
2. Choose the desired field and select **Next**. The *Field Management* page will open.
3. Select **Operations Planning**.

   Note: *If needed, select **Scouting** to create a field boundary to use for operations planning. A screen similar to the Run screen will open but will not apply product.*
4. Select the desired boundary.
5. Select **Accept**. The *Edit Corners* page will open.



6. If a corner is missing, select **Add Corner**.
7. Select the location on the screen for the new corner. If needed, use the zoom controls to zoom in on the desired segment of the field boundary. The *Adjust Corner* page will open.

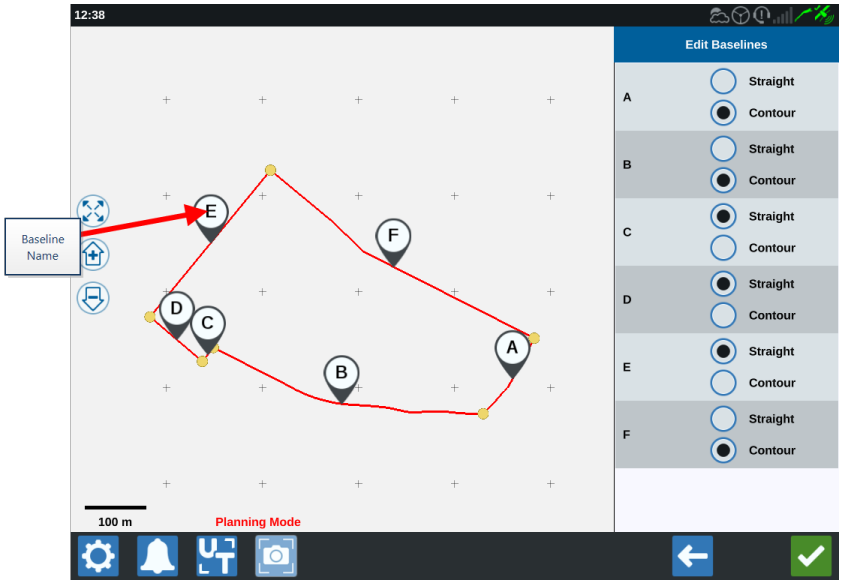
8. Each corner is assigned a letter designation. Select **Edit** by the desired corner in the *Edit Corners* list. Move the **Adjust Corner Detection Radius** slider until the edge of the corner has the desired radius or use the arrow buttons to move the corner.

   Note: *Corners created via corner flags cannot be adjusted or moved if they are placed at the beginning or end of a curve. Refer to "Create a Field Boundary with Corner Flags" on page 78 for more information on corner flags.*

9. Select **Accept** to accept the corner changes or use the **Left** and **Right** arrows to cycle through the rest of the corners.

10. Select **Next**. The *Edit Baselines* page will open. Each line is assigned a letter. For each baseline, select if the baseline is a **Straight** or **Contour**.

    Note: *Baselines created via corner flags cannot be adjusted between straight or contour. Refer to "Create a Field Boundary with Corner Flags" on page 78 for more information on corner flags.*



    Note: *Changes to baselines will affect the field boundary used when running the plan.*

11. Baselines can be joined together by selecting the desired baselines and selecting **Join lines** with a straight or contoured line. To separate previously joined baselines, select **Split lines**.

Note: *There must be at least three valid baselines at all times. Baselines cannot be joined if it will result in less than three baselines.*

12. To change a baseline from a contoured line to a straight line, select the button next to the baseline name in the *Edit Baselines* list.
13. Select **Accept**  .

Planning: Create Operation Plan

Planning allows the user to create a plan for the field using the boundary, existing guidance lines, and application zones. See Pre-Planning to modify the boundary.

To create an operation plan:

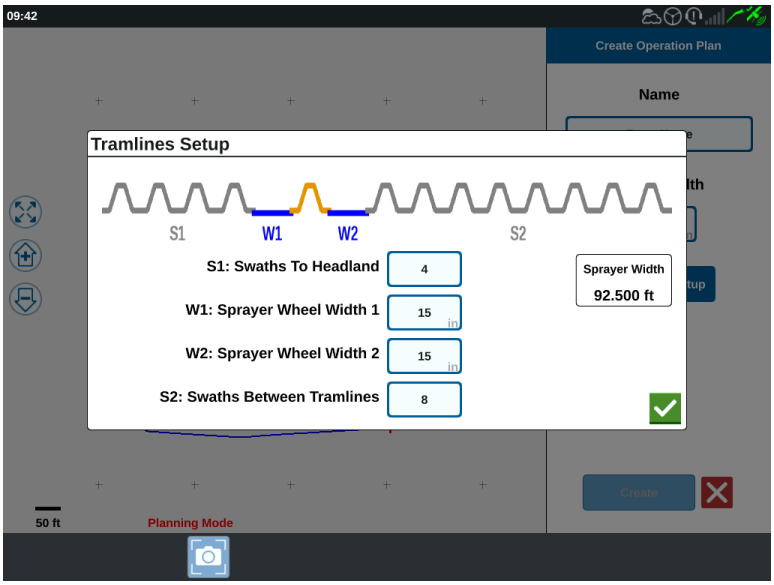
1. Select **Select Existing Job** on the right side of the Home screen.
2. Choose the desired field and select **Next**. The *Field Management* page will open.
3. Select **Operations Planning**.

   Note: *If needed, select* ***Scouting*** *to create a field boundary to use for operations planning. A screen similar to the Run screen will open but will not apply product.*

4. Select the **Add** button in the upper right corner. The *Create Operation Plan* page will open.
5. Enter a **Name** for the plan.
6. Enter a **Swath Width** that matches the implement width.

   Note: *If using tramlines, enter the width of the planter.*

7. If desired, select **Tramlines Setup**. The *Tramlines Setup* page will open.



Note: *Tramlines are spaces between rows that are not planted so future operations in that field (such as spraying) will not drive over rows of crops.*

8. In the **S1: Swaths To Headland** cell, enter the number of swaths before the first tramline or extra wheel width will start. Typically, this will be the number of planter swaths it takes to apply half of the sprayer width.

   Note: *Adjust any of the cells on the Tramlines Setup page automatically adjusts the Sprayer Width cell on the right side of the window.*

9. In the **W1: Sprayer Wheel Width 1** cell, enter the value for the extra width of one of the side tires. This is typically the wheel width plus a few inches.
10. In the **W2: Sprayer Wheel Width 2** cell, enter the value for the extra width of one of the side tires. This is typically the wheel width plus a few inches.
11. In the **S2: Swaths Between Tramlines** cell, enter the desired number of swaths between the tramlines. Generally this will be the number of planter swaths it takes to cover one pass for the sprayer.
12. Select **Accept**  .
13. Select **Create**. The *Region Settings* window will open.

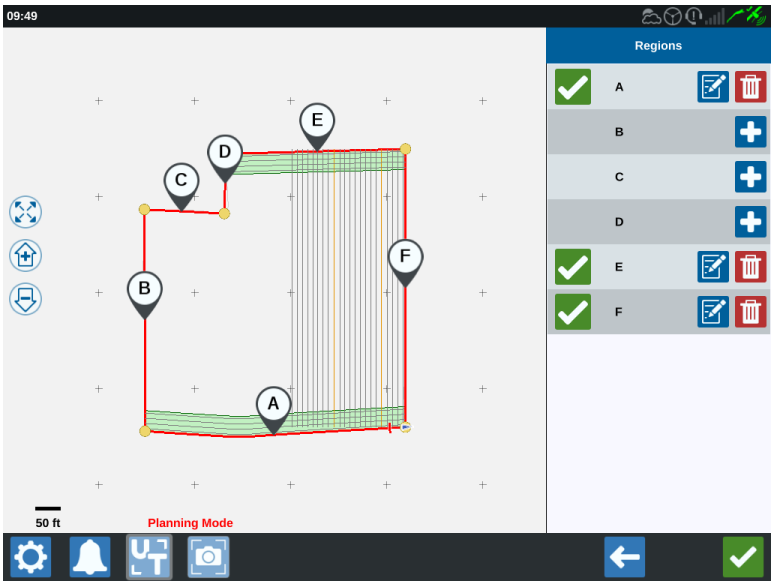
Plan Overview: Add, Edit, or Remove Regions

The plan overview screen displays the full plan. Each plan consists of field regions, lines, and offsets specific to that field. From this page, the user can add, edit, or remove regions. Any changes to the regions will be reflected in the plan overview screen.

1. Select **Select Existing Job** on the right side of the Home screen.
2. Choose the desired field and select **Next**. The *Field Management* page will open.
3. Select **Operations Planning**.

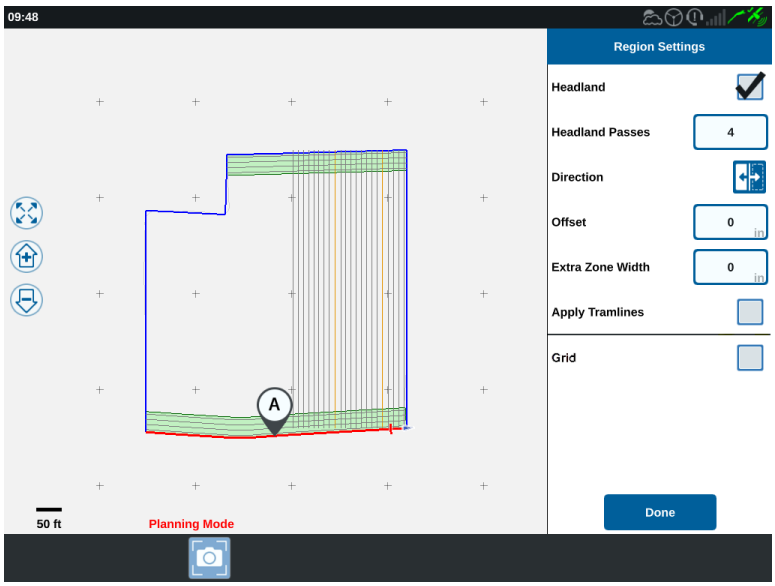
   Note: *If needed, select* ***Scouting*** *to create a field boundary to use for operations planning. A screen similar to the Run screen will open but will not apply product.*

4. Select **Add** to the right of the desired baseline. The first baseline selected will generate the guidance line for the main or center field region. Additional baselines will be added in headland regions.



5. Select **Edit** to modify a region.

6. Adjust the desired settings. See below table for setting descriptions.



Setting Option	Description
Apply Tramlines	This typically will only be used for areas not assigned as a headland region. Enabling this option will apply the tramline sequence to the selected baseline.
Extra Zone Width	Assign extra space between the main or center field region and the headlands. A non-zero value will leave a gap between the headland and the main field region.
Direction	Toggle to which side of the selected baseline the region will be set.
Headland	Select this box if you want an application region to be created that will allow automatic shutoff.
Headland Passes	Enter the number of swaths needed for turn around. Guidance lines will be created based on this setting.
Offset	Assign extra space between the baseline and the first swath. This space will be a non-covered area around the edge of the field.

7. To add to the plan, select **Add Baseline or Guidance line**.

Note: *In some cases, it might be desirable to work the first few lines of an operation plan to obtain a new guidance line for a better, more optimized operation plan. AB Straight, A+, and Contour types of guidance lines can be created and saved within jobs*

with an operation plan and added later during operation planning. See "Create a Guidance Line" on page 87 for more information on creating new guidance lines.

8. If this baseline will be a headland, check the **Headland** checkbox.
9. Enter a **Swath Count**. For headlands this may only be a few swaths. For using the baseline for the entire field, this will be as many lines as necessary to complete the field or leave as zero. CRX will insert guidance lines as needed to fill the entire field.
10. Select whether the offset **Direction** will be inside or outside of the baseline.
11. Enter an **Offset** measurement. This will offset the tramline from the edge of the field boundary.
12. Enter an **Extra Zone Width** measurement. This will add an additional offset at the inner side of the headland region.
13. Select **Apply Tramlines**. This will add an additional offset at the inside of the headland region.
14. Edit any Additional Tramlines using the side panel.
15. Select an existing guidance line and select **Add**  to create a new tramline.

    Note: *If necessary, select the remove button to delete a tramline from the operation plan.*
16. Select **Done**.
17. Apply the Region Settings to all the desired baselines.

    Note: *The region settings will default to the most recent Region Setting Configuration. As a rule, apply all the same types of offsets in order to minimize reconfiguration.*
18. When starting a job, select the desired operation plan.
19. During a job, select the **Operation Planning** widget to access the settings. Any settings updated within the job will be saved and applied to the plan.

Configure and Generate a Grid

With the Grid feature, auto-generated points can populate within a job to trigger the connected RCM to perform specific actions when driving over the points.

Note: *The Grid feature is an additional feature and must be unlocked to be accessed. Refer to Feature Unlocks for more information on unlocking features.*

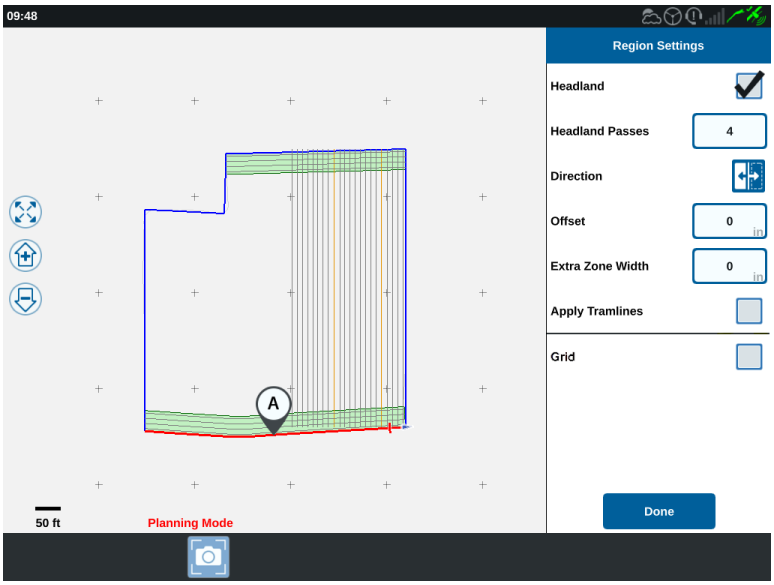
Configure a Grid

1. Select **Select Existing Job**  on the right side of the Home screen.
2. Choose the desired field and select **Next**  . The *Field Management* page will open.
3. Select **Operations Planning**.

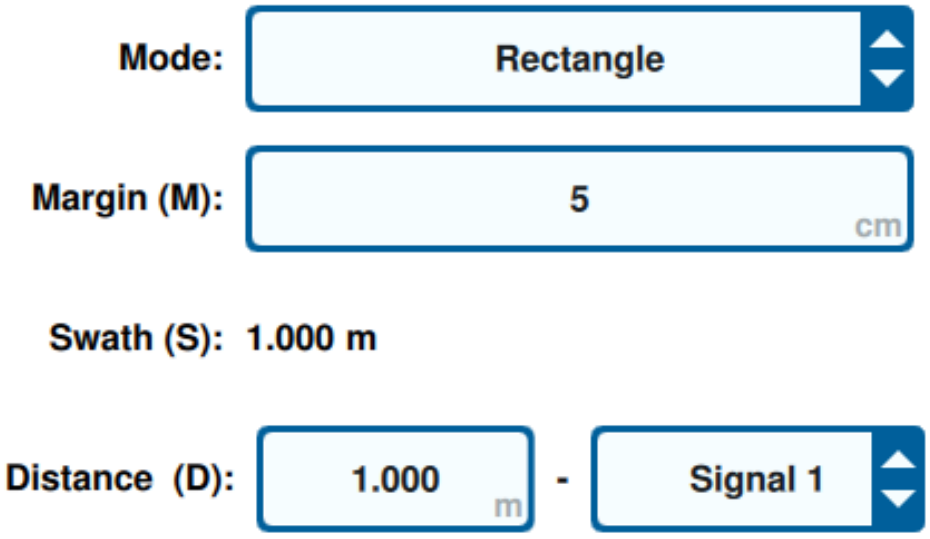
   Note: *If needed, select **Scouting** to create a field boundary to use for operations planning. A screen similar to the Run screen will open but will not apply product.*
4. Select the **Operation Plans** button near the bottom of the screen to display the existing operation plans.

   Note: *Refer to "Operation Planning Overview" on page 45 for assistance with operation plans.*
5. Enter the desired value in the **Swath Width** option to determine the distance between the generated rows in which the grid points will populate.
6. Select the straight baseline from which the grid will originate. The grid will always generate parallel to the selected baseline.

   Note: *A grid can only be added on a straight baseline and only one grid region can be added per operation plan.*
7. Once the baseline is chosen, select the **Edit**  button.
8. If the selected field has a boundary, the selected baseline is straight, and the grid feature is unlocked, the grid option will now be available in the *Region Settings* panel.



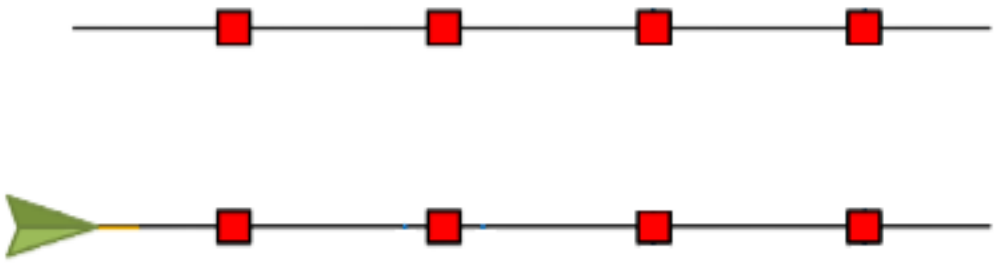
9. Select the **Grid** checkbox. The *Grid Configuration* screen will open.
10. The *Grid Configuration* screen offers several adjustable options:



Mode

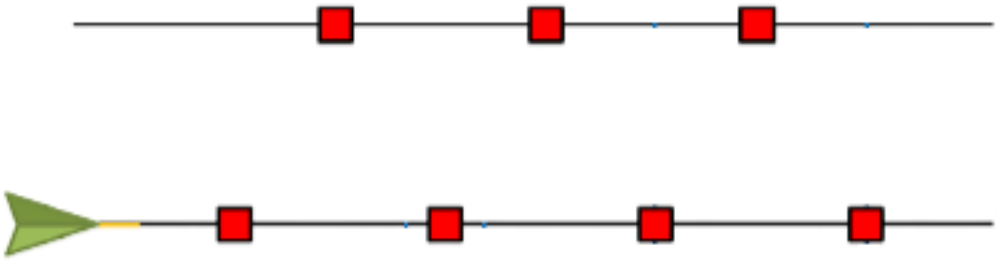
Select which mode to generate the grid:

Rectangle



Note: *The generated grid points will populate directly across each other.*

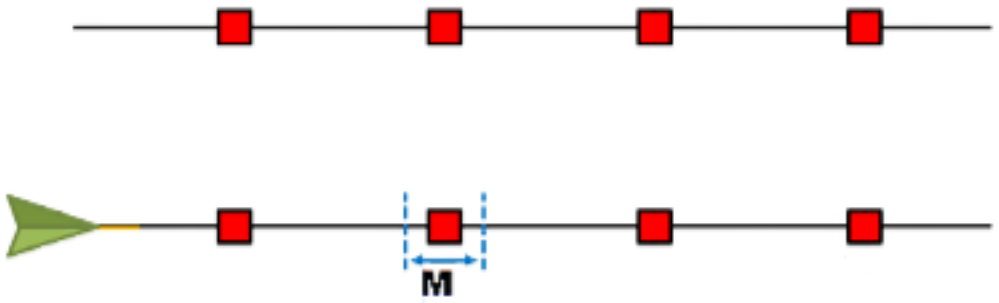
Triangle



Note: *The generated grid points will populate staggered across each other.*

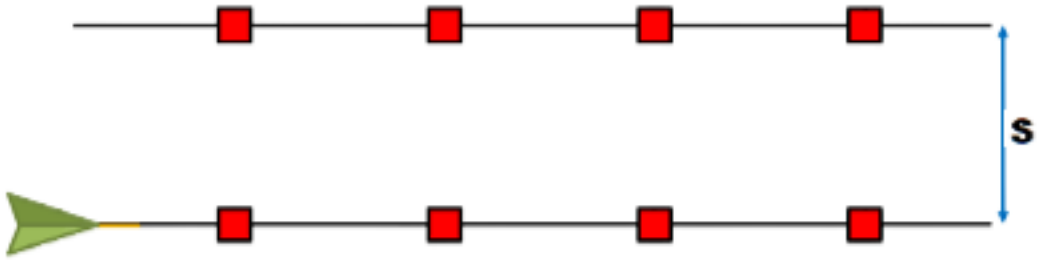
Margin (M)

Set the margin of the generated grid point perpendicular of the driving direction. The bigger the margin, the bigger the area that will trigger the signal while driving over a grid point. For example, a margin of 10 cm will extend the grid point 10 cm to the left and right of the driving direction, resulting in a total grid point width of 20 cm.



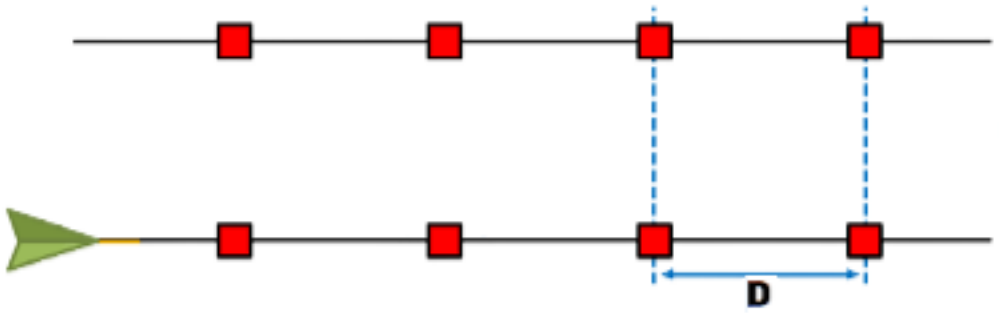
Swath (S)

Set the swath to determine the distance, left and right, between grid points as the machine travels along the guidance line.



Distance (D)

Set the distance between grid points down the guidance line.



Note: *Different signals can be configured for different, specified distances.*

Signal

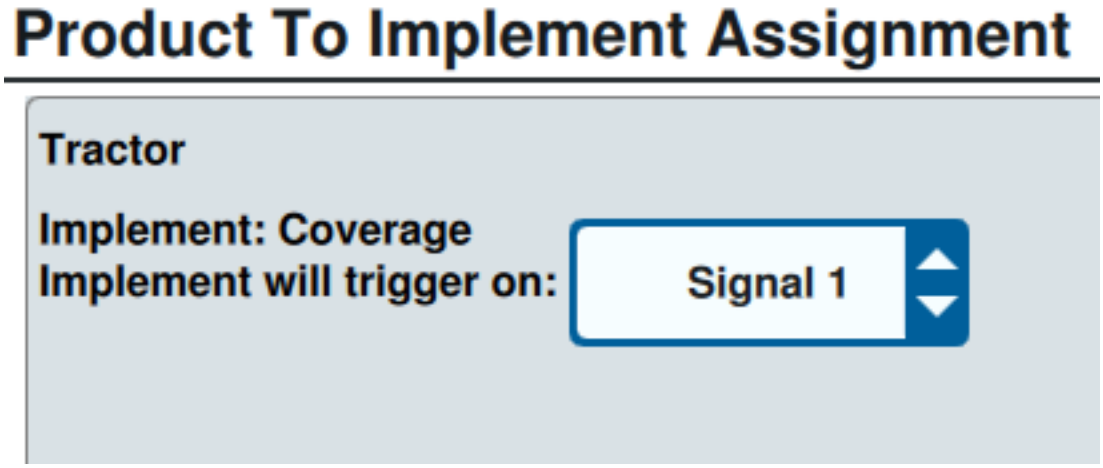
Set the signal that will activate when the implement drives over a grid point.

Note: *When configuring a new job, a signal can be selected per implement.*

Use a Grid in a Job

Once a grid-enabled operation plan is configured, it can be selected when starting a job:

1. Select **Select Existing Job** on the right side of the Home screen.
2. Select the field that was previously configured with the grid-enabled operation plan when resuming an existing job or when starting a new job.
3. In the *Product To Implement Assignment* screen, select the signal that the implement is looking for and that matches the grid-enabled operation plan.

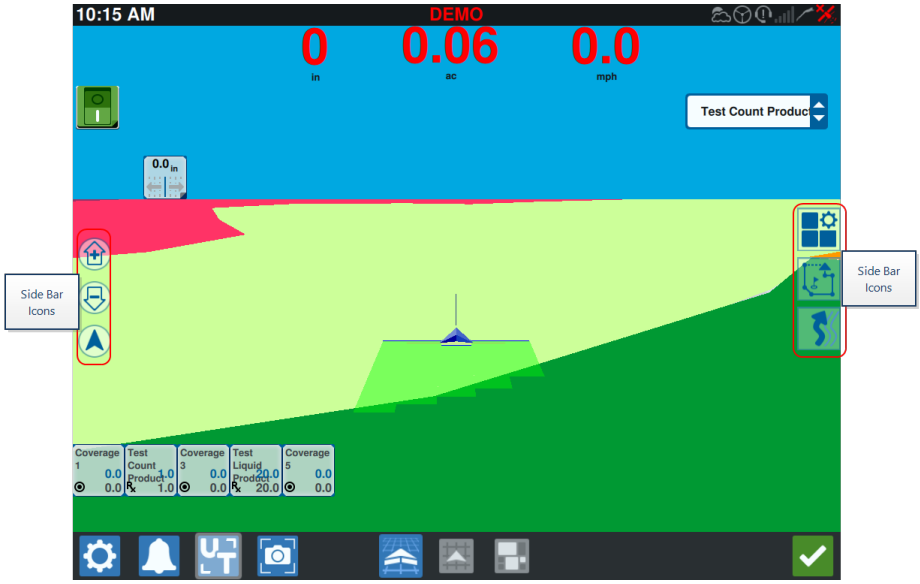


4. Start the job. When the center of the implement drives through the center of a grid point, all implement sections will turn on and the selected signal will be sent to the connected RCM.

   Note: *Grid points follow the machine; grid points will only load immediately around the machine, not throughout the field.*

Run Screen Overview

The image below is an example of a CRX Run screen. This section provides basic information on Run screen layout and widgets.



Side Bar Icons

There are many side bar icons available on the Run screen. The table below shows the widget image as well as a brief description of function. Run screen configuration will vary by device and settings.

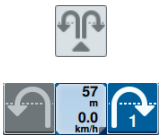
Icon	Name	Description
	AB Contour	Indicates that the currently selected line is an AB Contour.
	AB Heading	Enter a GPS heading.
	AB Load	Load an AB guidance line.
	AB Straight	Indicates that the currently selected line is a straight AB guidance line.
	Center to Vehicle	Adjust the map so the vehicle is in the center.
	Guidance	Start or load a new guidance line.

Icon	Name	Description
	Lines	
	Last Pass	Create a Last Pass line with this widget.
	Layers	Toggle layers that are generated to display information about direction, velocity, altitude, or product maps of coverage. See "Use Layers" on page 71.
	Pivot	Create an pivot guidance line with this widget.
	Scouting Object	Provides information on existing scouting features and creating scout features. See "Scouting Objects" on page 77.
	Widget Menu	Select or remove widgets displayed on the run screen or edit the widget layout.
	Zoom In	Zoom into the Run screen map.
	Zoom Out	Zoom out on the Run screen map.
	3D Toggle	Toggle to the 3D down-field view of the Run screen during active field operations.
	2D Toggle	Toggle to the 2D over-head view of the Run screen during active field operations.

Widgets

CRX offers additional tools, in the form of widgets, that may be placed on the run screen. Refer to the following table for a brief overview of the widgets available for use during in-field operations.

Widget	Name	Function
	AccuBoom™ Control	Shows AccuBoom™ Override status and also provides quick access to additional AccuBoom™ information. Green indicates AccuBoom™ is active, Blue indicates AccuBoom™ is available but not running.
	Add Flag	Provides the option to place a marker flag on the CRX run screen.
	Altimeter	Displays the machine elevation.

Widget	Name	Function
	Analog Video	Allows for view of multiple analog cameras for real-time vision while in a job. See "Use Analog Video" on page 65.
	Applied Area	Provides options for showing the applied area(s).
	Auto Turn	Enables automatic headland turning, allowing the machine to automatically turn itself to the next determined swath when approaching boundaries. See "Auto Turn" on page 67.
	Course Over Ground	Provides settings for configuring the settings for the GPS course.
	Day/Night Switch	Changes the color scheme of the display.
	Distance Off Guidance Line	Displays the distance the implement is off of the guidance line.
	Distance to Border	Displays the distance from the front of the machine to the nearest boundary (on top) and the distance to the nearest headland (on bottom). Select and hold the widget on the run screen to choose to display the distance to border, distance to headland, or both.
	Guidance Line Nudge	Provides settings for nudging the guidance line left or right.
	Guidance Width Status	Displays the actual guidance width.
	ISO Generic	Provides generic information from a connected ISO device.
	ISO UT	Displays the ISO Universal Terminal (UT) on top of the run screen.
	Layer Value Legend	Displays information about the currently selected layer. See "Use Layers" on page 71.
	Line Recal	Recalibrates the line. If in last pass, it will try to find a different line.

Widget	Name	Function
	Master Switch	Indicates if the master switch is on (green) or off (red). See "Configure Master Switch" on page 104.
	Object Pool Toggle	Switches between ISO UT screens if there are multiple ISO devices.
	Product Assignment	Assigns a different product to the selected coverage.
	Product Rate	Adjusts the product rate.
	Product Select	Selects different products.
	Section Status	Selects the best option for displaying configured sections. Available at various widths.
	Seed Plot	Displays additional information about the current and upcoming seed plot.
	SmarTrax™ Status	Add the SmarTrax™ widget to easily view SmarTrax™ status or access SmarTrax™ Settings.
	Steering Status	Steering is engaged.
	Implement Disk Angle	Displays actual position of the discs/wheels.
	Implement Side- Shift	Displays actual position of the side-shift cylinder.
	Swath Number Status	Shows the swath number. Depending on configuration, it will display either relative or absolute.
	Switchbox	Provides access to easily turn sections on or off. See "Use Switchbox" on page 75.

Note: *CRX supports Windows Mask widget. When an ISO node has Windows Masks, they will appear at the bottom of the widget list.*

Add Widgets

To add/change the widgets visible on the Run screen:

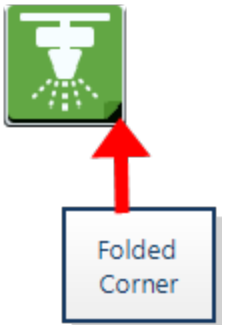
1. Select the **Widget Menu** button.
2. Select the **Add** button to add a new widget layout, or select the **Edit** button to edit an existing widget layout.

   Note: *Widget layouts can be saved as custom widget profiles, allowing the user to save different combinations and orientations of widgets for different kinds of jobs or applications.*
3. Select or deselect the desired widget(s) to display on the Run screen.
   Adding a widget will enter the widget Layout Mode. In the Layout Mode, the user may move widgets around as desired to customize the display of information on the run screen.

   Note: *Use the **Enable Snapping** option to prevent new widgets from covering up previously added widgets on the Run screen.*
4. Select **Accept** in the lower right corner to return to the Run screen and resume normal in-field operation and application controls.

Widget Options

Several widgets offer additional settings or options accessible on the run screen directly through the widget. Select and hold a widget to display a settings prompt for the specific widget.



Configure Analog Video

Note: *This feature is only available on CR12™.*

This topic describes how to configure the analog video from the Settings menu. For how to configure and operate the analog video widget on the Run screen, see "Use Analog Video" on the facing page.

To configure the analog video functions from the Settings menu:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Analog Video** on the Settings menu.
3. Up to four analog cameras will display. If desired, click on Camera 1-4 to rename the cameras.
4. Use the directional arrows to assign each camera to one of the numbers listed on the left side of the screen.

   Note: *Only one camera can be viewed at a time within a job.*
5. If desired, assign one of the four cameras to the automatic rear view camera. This camera will automatically turn on when the machine is in reverse.

Use Analog Video

Note: *This feature is only available on CR12™.*

This topic describes how to configure and operate the analog video widget from the Run screen. For how to configure analog video settings from the Settings menu, see "Configure Analog Video" on the previous page.

The analog video widget allows viewing of up to four analog cameras in real-time while in a job. The designated rear view camera will automatically activate when in reverse.

See "Add Widgets" on page 62 to place the **analog video**  widget on the Run screen.

Configure Analog Video

To configure and use the analog video functions after placing the widget on the Run screen:

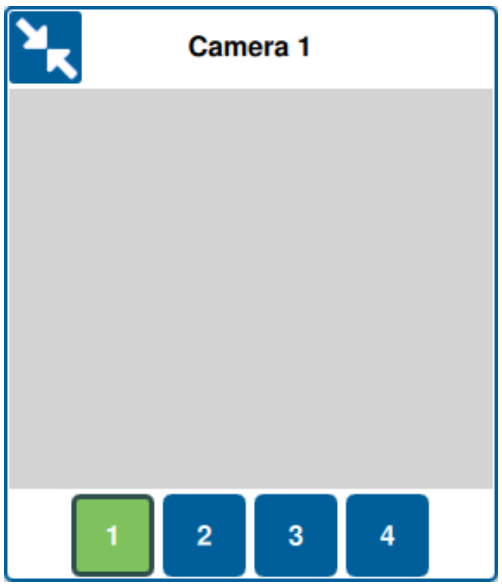
1. Select and hold the **analog video**  widget on the Run screen. The widget settings window will open.
2. Up to four analog cameras will display. If desired, click on Camera 1-4 to rename the cameras.
3. Use the directional arrows to assign each camera to one of the numbers listed on the left side of the screen.

   Note: *Only one camera can be viewed at a time within a job.*
4. If desired, assign one of the four cameras to the automatic rear view camera. This camera will automatically turn on when the machine is in reverse.

Operate Analog Video

To view a real-time analog camera while in a job:

1. Short-press the **analog video** widget. The widget will expand.
2. Select which camera to view by selecting the assigned number of the desired camera.



Note: *If an analog camera is assigned to the automatic rear view camera, the video feed will automatically change to the assigned rear view camera when the machine is in reverse.*

Auto Turn

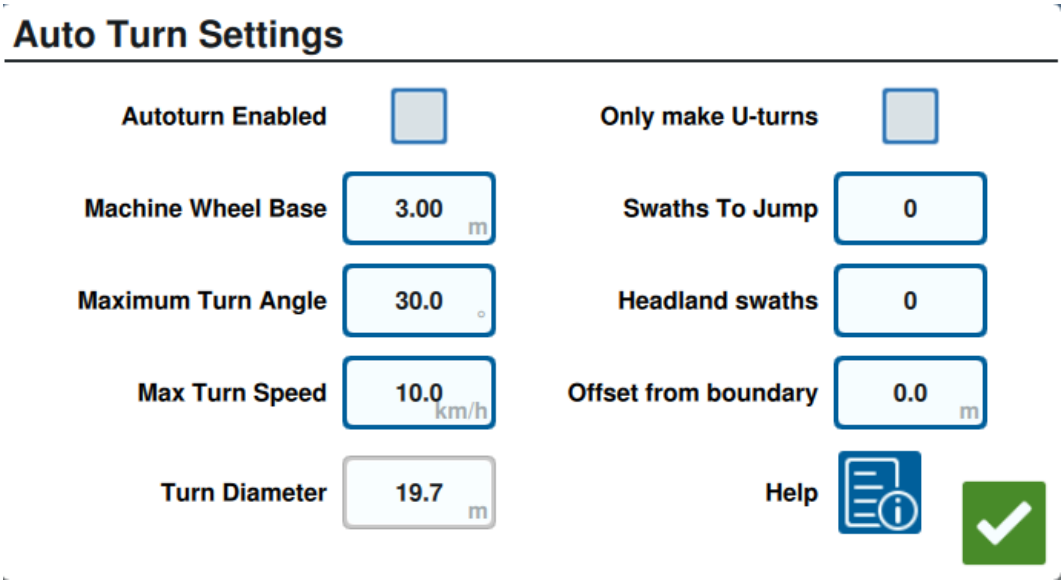
Note: *Auto Turn is an additional feature that must be unlocked to be accessed. Refer to Feature Unlocks for more information on unlocking features.*

Configure Auto Turn

To configure the Auto Turn feature in CRX:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Auto Turn** on the settings menu. The *Auto Turn Settings* window will open.

   Note: *The* Auto Turn Settings *window can also be accessed in a job by pressing and holding the* ***Auto Turn Widget*** *on the run screen.*



3. Configure the available settings to the operator's preference:

   ### Autoturn Enabled

   Select this option to enable the Auto Turn feature. The Auto Turn widget will extend to include directional arrows on the run screen.

   Note: *Refer to "Widgets" on page 60 for more information on widgets on the run screen.*

Machine Wheel Base

Input the distance between the front and rear axles of the machine.

Maximum Turn Angle

Input the maximum angle the wheels are allowed to turn.

Max Turn Speed

Input the maximum speed the tractor is allowed to drive when turning automatically.

> ***Note:*** *A higher maximum speed will also cause a larger diameter of the turn.*

Turn Diameter

This option is not set by the operator. This will display the calculated turn diameter that was determined by the wheel base, max turn angle, and maximum speed. If the distance between swaths is less than the turn diameter, a "lightbulb" turn will commence.

Only make U-turns

Select this option to only allow u-turns. If selected, Auto Turn will not allow "lightbulb" turns.

Swaths to Jump

Input the number of swaths desired to be skipped at each turn. If set to 0, Auto Turn will not skip any swaths.

Headland swaths

Input the number of desired headland passes at the top of the field. When set to 1, the turn will be made in such a way that the implement will not enter this area.

> ***Note:*** *For example, if the implement is 10 meters, then the AutoTurn line will be at 15 meters from the boundary (1 headland pass plus half implement width). This can be increased or decreased using the offset from boundary.*

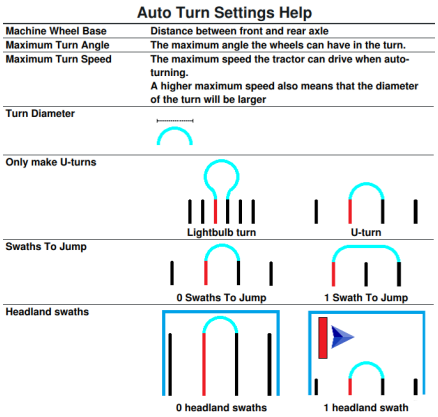
Offset from boundary

Input the desired offset to add to the total distance from boundary. The default distance from the boundary will be determined by the number of swaths multiplied by the width of the implement and added to half of the width of the implement. Set the

offset from boundary to add to this distance.

Help

Select this option to view descriptions and visual representations of several available options.



Operate the Auto Turn Widget

Once activated, the Auto Turn widget will extend directional arrows for right and left:

Selected (Blue) Side

- The selected (blue) arrow indicates the direction of the upcoming turn.
- Pressing the selected arrow will increase the number of skipped swaths by one for the upcoming turn to a maximum of four skipped swaths.

Unselected (Gray) Side

- The unselected (gray) arrow indicates the opposite direction of the upcoming turn.
- Pressing the unselected arrow will change the direction of the upcoming turn but will not change the number of swaths to skip.

Middle Section

- The middle portion of the widget displays the current machine speed and the distance to the turn.

  Note: *If the machine exceeds the configured speed, the speed in the widget will turn red.*

- Pressing and holding on the middle portion of the widget will open the *Auto Turn Settings* page.

Use Layers

Layers can offer a view of specific information of applied coverage, such as driving direction, velocity, altitude, or product information.

See "Add Widgets" on page 62 to place a widget on the Run screen.

Enable a Layer from the Current Job

1. Select the **layer tab** icon from the Run screen sidebar. The layer sidebar will open.
2. Select the **Direction**, **Velocity**, **Altitude**, or **Product Map** checkbox to select which layer to show.

   Note: *Altitude or velocity cannot be activated simultaneously.*
3. The layer will automatically load on coverage.

   Note: *To delete a layer, select the **Trash** button next to it. The layer will not be permanently deleted and can be reactivated at any time.*

Enable a Layer from a Previous Job

1. Select the **layer tab** icon from the Run screen sidebar. The layer sidebar will open.
2. Select **Add** in the upper right corner of the *Active Layers* sidebar.
3. Select the **Direction**, **Velocity**, **Altitude**, or **Product Map** checkbox to select which layer to show. A list of jobs in the current field will show.

   Note: *The current, active job will be marked with a green circle next to the job name.*
4. Select the desired previous job. The layer will automatically load on coverage.

   Note: *To delete a layer, select the **Trash** button next to it. The layer will not be permanently deleted and can be reactivated at any time.*

Driving Direction Layer

The direction layer has a **live direction** widget that allows for a live view. When the widget is enabled in the widget sidebar, the live direction layer can be enabled by selecting the widget on the Run screen. When activated, the live direction widget will turn green .

When live direction is activated, red arrows indicating drive direction will appear once the following conditions are met:

- The master switch is turned on.
- Coverage is currently being applied.
- The distance between arrows is equal to or greater than 50 meters.
- The driving direction COG change is equal to or greater than 90 degrees.

Configure Direction Layer

To configure direction layer options:

1. Select and hold the **driving direction**  widget on the Run screen. The *Driving Direction Config* window will open.
2. Drag the **Arrow Size** slider near the top of the window to increase or decrease the size of the direction arrows.

   Note: *The **Auto Scale** checkbox locks the slider and scales the arrows automatically in proportion to the zoom level of the map.*
3. Select the **Cover Center** checkbox to position the arrows in the center of the coverage. By default, the arrows are positioned in the center of the vehicle position.

Altitude / Velocity Layer

When the altitude or velocity layer is activated, the coverage applied will not show the rate mapped color but instead will show the color corresponding to the layer value (altitude/velocity). Use the **Layer Legend**  widget to change the automatically selected colors.

Configure the Velocity/Altitude Layer

To configure the velocity and/or altitude layers, the **Layer Legend**  widget must be enabled on the Run screen. When enabled, the **Layer Legend** will display colors with listed values that corresponding to the colors of the velocity/altitude layer.

To configure the velocity/altitude layer:

1. Select and hold the **Layer Legend**  widget on the Run screen. The *Layer config* window will open.
2. Input the desired values in the **Max** and **Min Altitude range** and **Velocity range** fields.
3. Drag the **Legend colors** slider to change the colors of the coverage.
4. If desired, select the **Autoscale legend** checkbox to automatically generate the max and min values, and automatically scale the legend to the current velocity/altitude. By default, Autoscale is disabled and the max and min values can be altered manually.
5. Select **Accept**  to save the displayed changes. The active layer will reload.

Product Maps Layer

Note: *Product Maps must be unlocked to be accessed. Refer to Feature Unlocks for more information on unlocking features.*

Product maps are controlled by crop registration. Crop registration displays information and the properties of the applied product when driving through already-applied coverage. The user can configure products with crop registration via the "Product Manager" on page 113.

The product map layer uses crop registration to display color-coded coverage, showing the applicator what product was applied during coverage. When enabled, each registered crop will display a unique color for the coverage of that product. Product maps can be freshly generated or loaded from previous coverage.

Configure Product Maps For a New Job

To configure products for a Product Map in a new job:

1. Start a new job in a desired field.
2. On the *Product To Implement Assignment* screen, select the **Edit**  button on the right side of the page.
3. Select the desired product, and enter a new default setpoint, if applicable.
4. Start the job. If the Product Maps layer is active, any coverage from the selected product will be displayed in the coordinating color.

Product Maps in-Job Operation

There are several options when operating a job with Product Maps enabled, such as:

- Switching between products with the Product Assignment widget.
- Viewing details about recently-planted products. When driving through applied coverage, the Crop Registration widget will display the following information about the coverage: GFF data, applied area, distance to the next crop, total distance of the applied area, and four of the configured properties of the product.
- View detailed lists of products by long-pressing either the Product Assignment or Crop Registration widgets.

Use Switchbox

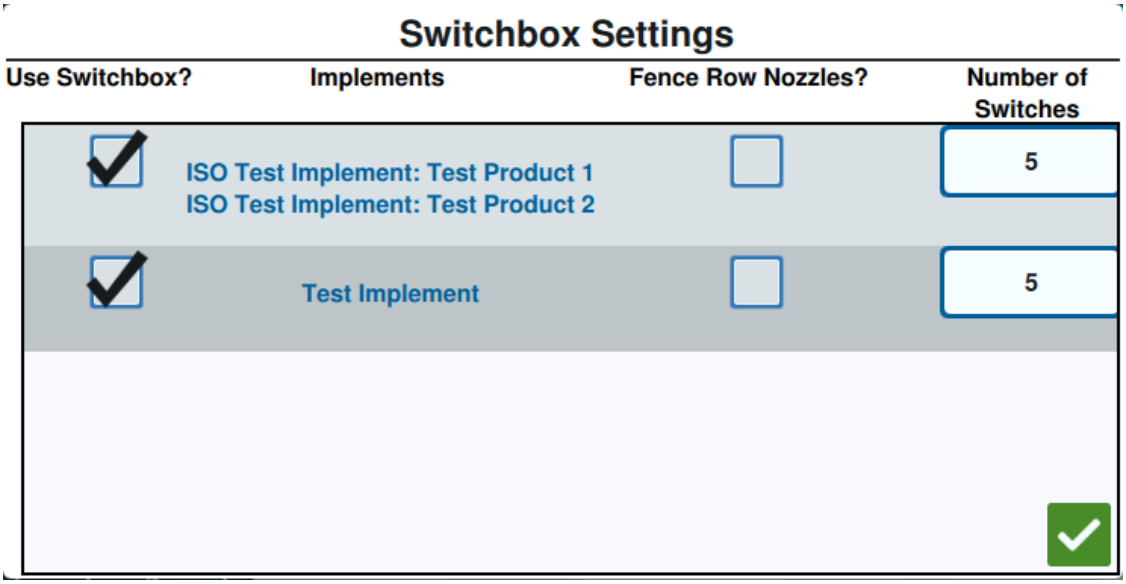
The switchbox widget allows the user to enable or disable sections or groups of sections while in the CRX Run screen.

See "Add Widgets" on page 62 to place the **switchbox**  widget on the Run screen.

Configure Switchbox

To configure the switchbox from the widget:

1. Select and hold the **switchbox**  widget. The widget settings window will open.
2. Select **Settings**. The *Switchbox Settings* screen will open.
3. Select the desired implements to use with the switchbox(es).



4. Enter the number of switches. This number can be no greater than the total number of sections. If the number of switches is less than the number of sections, the sections are assigned to the switches proportionally. Any remaining switches are assigned from the center out.
5. If desired, select the **Fence Row Nozzles** checkbox to map the outside sections to the outside switches. The remaining sections will be reassigned proportionally to the remaining switches.

Operate Switchbox

1. Turn the **Master Switch** on.
2. Select the desired switch to turn it on or off. Press override (left-most button) to turn on or off all switches that are not already manually turned on. If a switch button is blue, the switch is being automatically controlled by the system. If a switch button is red, the switch is off. If a switch button is green, the switch is on.

Note: *If switchboxes are present for multiple products, the boxes will stack in the order the corresponding products appear in when configuring a job.*

Scouting Objects

Scouting objects allows the user to create or mark different areas of the field to indicate obstacles, low spots, or field boundaries. The following options are available for Scouting Objects:

Note: *Points of interest were previously called flags in CRX software versions 22.1 and earlier. Please refer to "Create a Flag" on page 83 if using a CRX device with software version 22.1 or older, and refer to "Point of Interest" on page 84 if using a CRX device with software version 22.2 or newer.*

Create a Field Boundary

Field boundaries indicate the edges of a field.

When creating a boundary, two options are available:

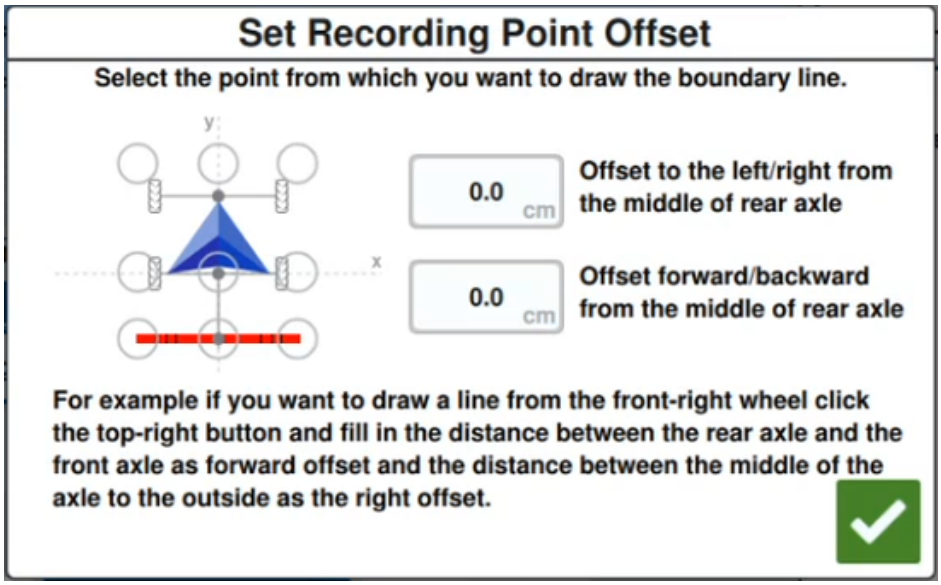
Create a Field Boundary with Corner Flags

Note: *This feature is only available in CRX software version 22.2 and newer.*

Corner flags can be placed at designated points to denote the corners of a field and generate a field boundary from the corners.

To create a boundary via corner flags:

1. Select the **Scout Object** icon on the Run screen.
2. Select **Add** next to Scout Features.
3. Select **Field Boundary**.
4. Select **Record Cornerflags**.
5. Select **Recording point** if desired to set the offset point for the recording.



6. Drive the machine to one of the corners of the field.
7. Select **Place cornerflag**. A flag will display on the run screen.

8. Drive the machine to the next corner of the field. A straight, dotted line will be generated from the initial corner flag to the current position of the recording point.
9. If there exists any obstacles between corners, such as ponds or large boulders, that prevent a straight line between corners, select **Start Curve** and maneuver the machine in a curve around the obstacle. Select **Stop Curve** once the curve has been completed.

   Note: *When conducting a curve between two corners, the machine must start facing directly away from the last placed corner flag and end the curve facing directly towards the location of the next desired corner flag.*

10. At the next corner of the field, select **Place cornerflag**. Another flag will display with a straight line connecting to the initial corner flag.

    Note: *Some operators may find it more suitable to place two corner flags slightly before and after each corner of the field. This can assist in avoiding obstacles or sharp corner turns.*

11. Once all corner flags are placed, select **Accept** in the bottom, right corner of the screen. The *Confirm End Recording* window will display.
12. Select **Accept** to confirm the recording.

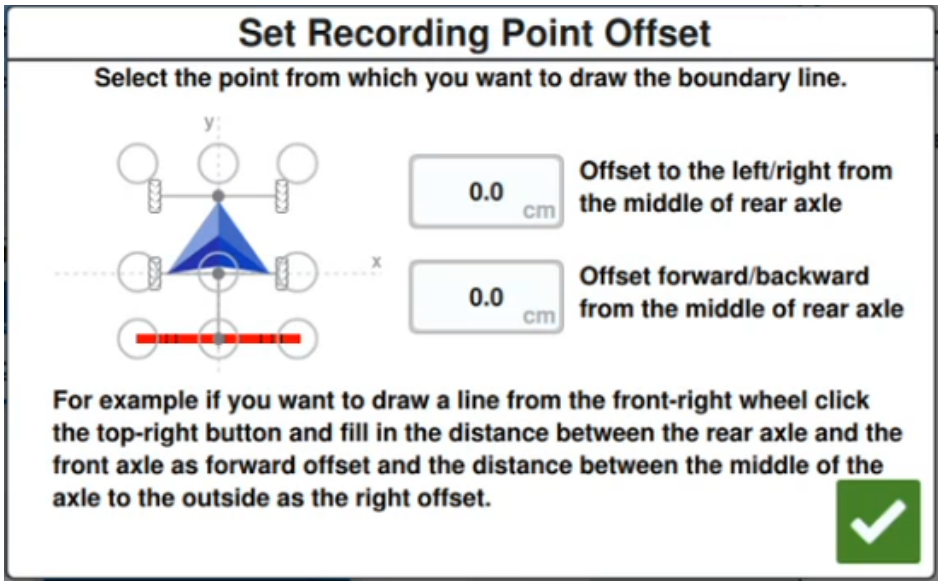
    Note: *When creating a boundary via corner flags, the user must select **Go to Pre Planning**. See "Pre-Planning: Adjust Field Boundary and Lines" on page 46 for more details on pre-planning an Operation Plan.*

Create a Field Boundary by Driving the Boundary

A field boundary can be created by driving the outline of a field and recording the path.

1. Select the **Scout Object** icon on the Run screen.
2. Select **Add** next to Scout Features.
3. Select **Field Boundary**.
4. Select **Quick Recording**.

5. Select **Recording point** if desired to set the offset point for the recording.



6. Select **Start Recording** .
7. Drive the desired path of the field boundary.
8. When complete, select **Scout Object** if the toolbar was closed.
9. Select either **Pause Recording** or **End Recording** .

   Note: *Enable the* ***Close automatically*** *option to allow CRX to automatically close the field boundary when the position nears the spot where the field boundary recording started.*

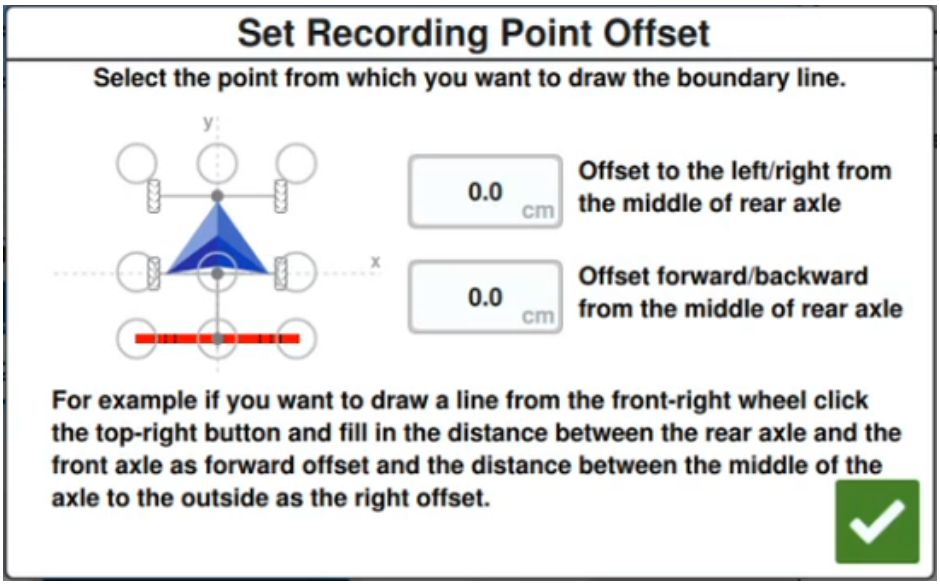
10. After selecting **End Recording** , select **Accept** to confirm the end of the job if selected.

Create a Do Not Apply Zone or Application Zone

Do Not Apply Zone

Do not apply zones indicate an area in the field where application is prohibited.

1. Select the **Scout Object** icon on the Run screen.
2. Select **Add** next to Scout Features.
3. Select **Do Not Apply Zone**.
4. Select **Recording point** if desired to set the offset point for the recording.

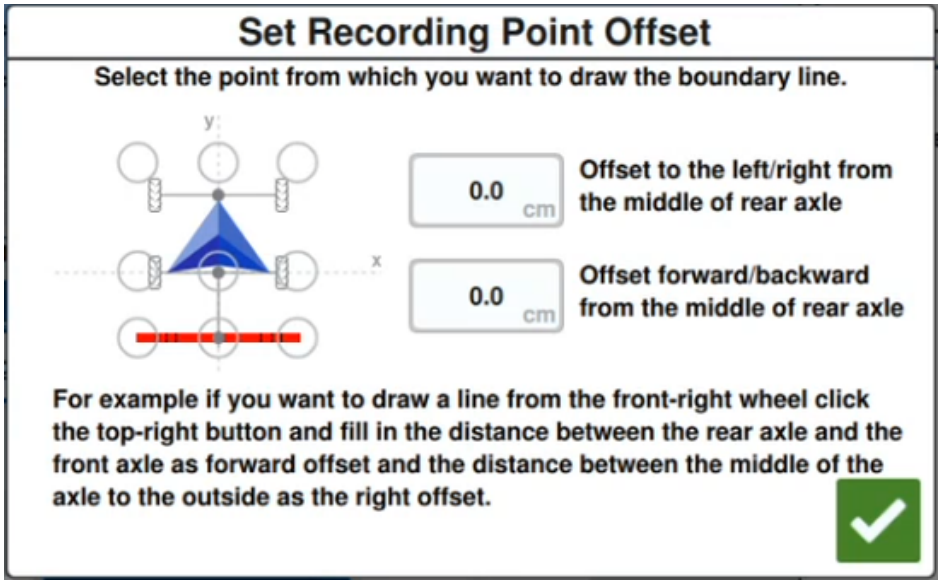


5. Select **Start Recording**.
6. Drive the desired path of the do not apply zone.
7. When complete, select **Scout Object** if the toolbar was closed.
8. Select either **Pause Recording** or **End Recording**.
9. After selecting **End Recording**, select **Accept** to confirm the end of the job if selected.
10. Enter a name for the new zone. If desired, select **Delete**.

Application Zone

Application zones indicate an area where product should always be applied. They are generally used inside a do not apply zone.

1. Select the **Scout Object** icon on the Run screen.
2. Select **Add** next to Scout Features.
3. Select **Application Zone**.
4. Select **Recording point** if desired to set the offset point for the recording.



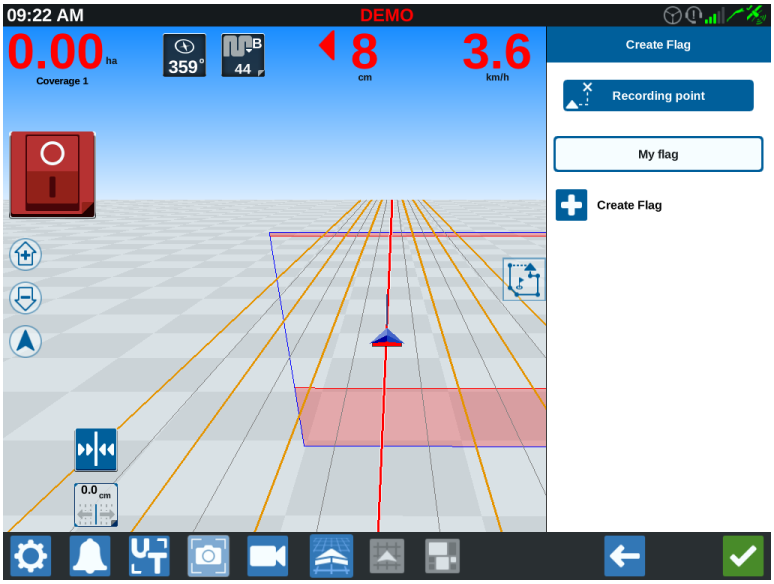
5. Select **Start Recording**.
6. Drive the desired path of the application zone.
7. When complete, select **Scout Object** if the toolbar was closed.
8. Select either **Pause Recording** or **End Recording**.
9. After selecting **End Recording**, select **Accept** to confirm the end of the job if selected.
10. Enter a name for the new zone. If desired, select **Delete**.

Create a Flag

Note: *Points of interest were previously called flags in CRX software versions 22.1 and earlier. Please refer to "Create a Flag" above if using a CRX device with software version 22.1 or older, and refer to "Point of Interest" on the next page if using a CRX device with software version 22.2 or newer.*

Flags can be used to indicate large rocks or other obstacles that may be present in the field but may not be visible with mature crops.

1. Select the **Scout Object** icon on the Run screen.
2. Select **Add** next to Scout Features.
3. Select the **Enter Flag Name** field and enter the desired name.



4. Select the desired recording point for the flag. It can be either centered with the implement, or on either side of the implement.
5. Select **Create Flag**. The flag will be placed on the run screen.

Point of Interest

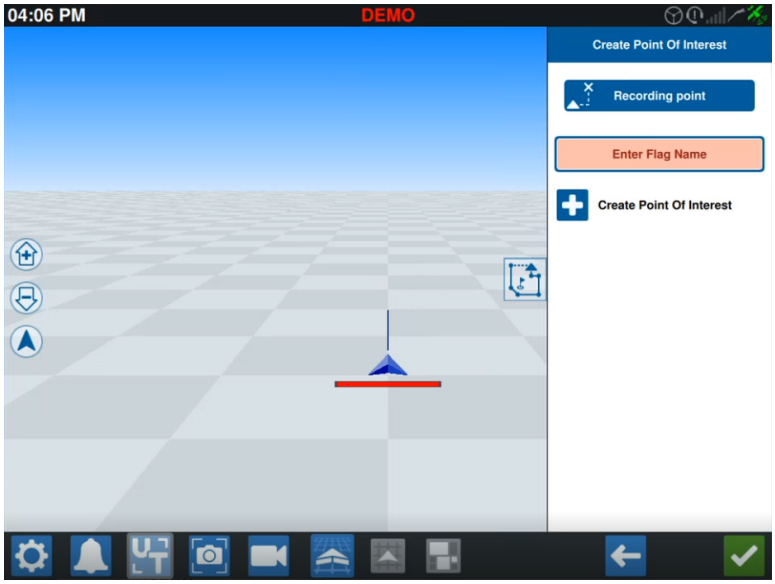
Points of interest can be used to indicate large rocks or other obstacles that may be present in the field but may not be visible with mature crops.

Note: *Points of interest were previously called flags in CRX software versions 22.1 and earlier. Please refer to "Create a Flag" on the previous page if using a CRX device with software version 22.1 or older, and refer to "Point of Interest" above if using a CRX device with software version 22.2 or newer.*

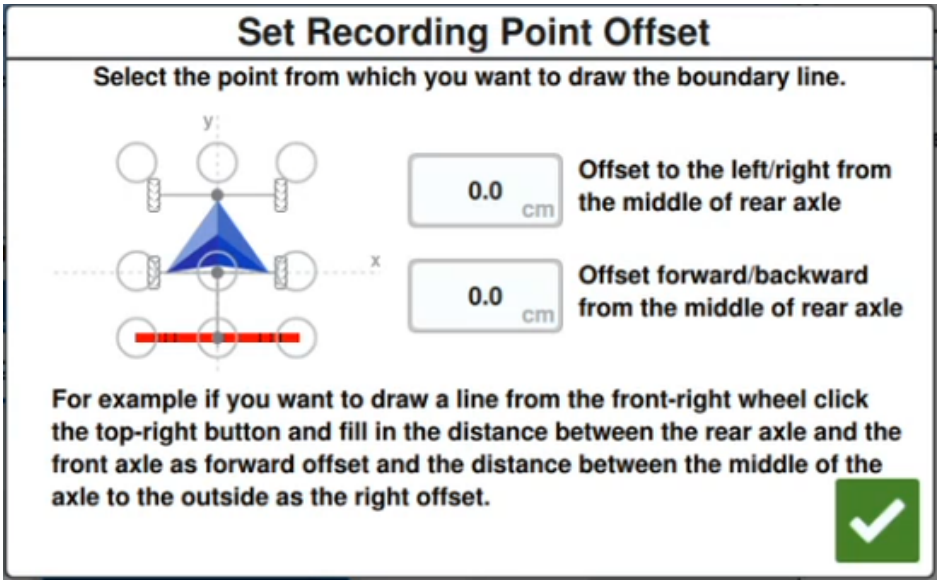
Create a Point of Interest

To create a point of interest:

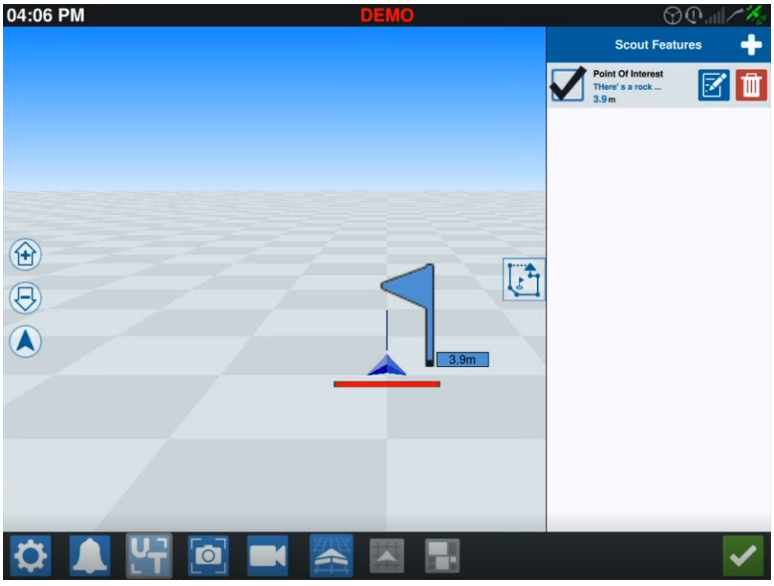
1. Select the **Scout Object** icon on the Run screen.
2. Select **Add** next to Scout Features.
3. Select the **Enter Flag Name** field and enter the desired name.



4. Select **Recording point** and set the desired offset point for the point of interest.



5. Select **Create Point of Interest**. The flag will appear on the run screen with a box that indicates the distance from the point of interest.

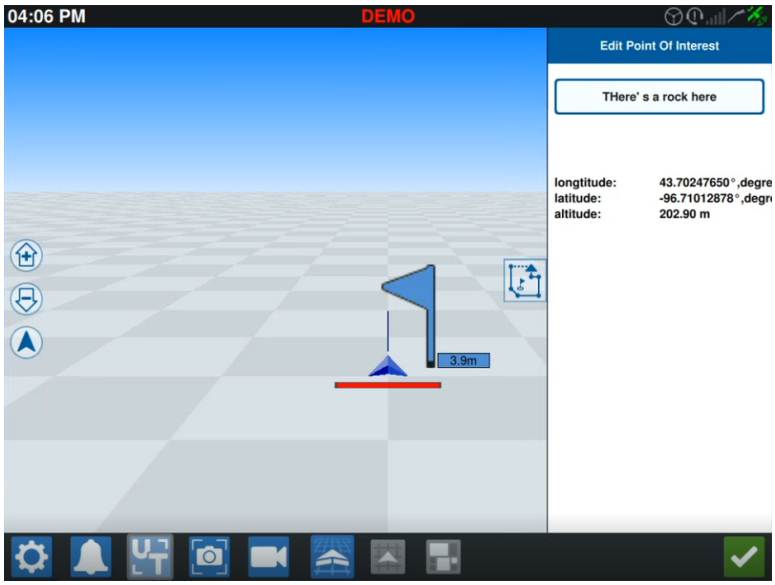


Note: *If the point of interest is tapped in the list of Scout Features, the point of interest will blink on and off on the run screen. This can be useful when there are many points of interest in the field.*

Rename of a Point of Interest

To rename an existing point of interest:

1. Select the **Scout Object** icon on the Run screen.
2. Select the **Edit** button on the point of interest that is desired to be renamed.



Note: *This screen will also display longitude, latitude, and altitude information of the selected point of interested.*

Create a Guidance Line

To create a guidance line:

1. Select the guidance line icon.

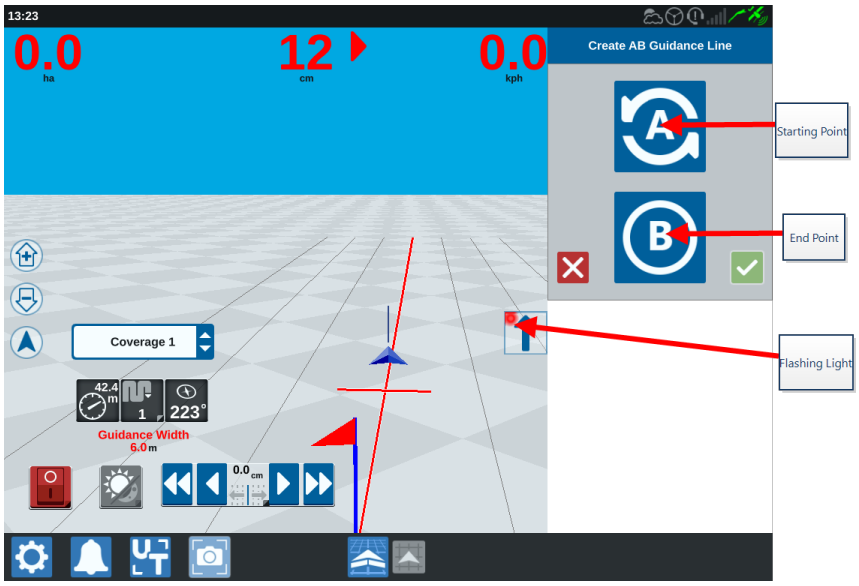
   Note: *The guidance line icon is the lowest icon on the right side of the Run screen and will be displayed as one of the available guidance line options.*

2. Select the desired guidance line type.

Widget	Name	Function
	Straight AB	Create a straight guidance line.
	A+	Create a straight guidance line using a starting (A) point and a compass heading.
	Contour	Create a curved guidance line with a starting (A) point and numerous additional points along the path driven by the operator.
	Pivot	Create a guidance line to use as a sharp pivot.
	Round Trip	Create a guidance line based off of the field boundary. Includes the option to set the count of alternative lines that will be generated from the boundary, as well as the offset of the first alternative line.
	Load	Load an existing guidance line.

   Note: *If operating in a job with an operation plan, only Straight AB, A+, and Contour guidance lines will be available.*

3. When the machine is on the desired starting point and in the proper orientation, select the guidance line starting point. During the recording, the line widget will display a flashing red light.



4. When done recording, select the next point (in this case it will be B).
5. Select **Accept** to complete the line.
6. Select the guidance line icon along the right side of the screen.
7. Select the **Edit** next to the newly created line. The *Edit Guidance Line* window will open.
8. Enter a name for the guidance line.
9. Select **Accept**. If desired, select **Delete** to delete the guidance line.
10. When in a job, select **Load** to load and use an existing guidance line.

    Note: *If in a job with an operation plan, guidance lines cannot be loaded.*

Adjust Section Control

The number of sections is based on the information entered while creating the implement. The default settings for On Override is five seconds. The default Turn Off Percent is 95%. The default Exiting/Entering Overlap is zero meters. The default Boundary Percent Overlap is 5%. To adjust the number of sections, adjust the tractor settings.

On/Off Override

The On/Off Override feature allows the operator to override the automatic section control and force all AccuBoom™ controlled sections on for a user defined interval. This feature is useful for re-applying product to a heavily infested field area or when accelerating from a complete stop. The time for the override may be modified to match specific application needs.

Turn Off/On Percent

Turn Off/On Percent allows the user to define the amount of coverage tolerated during an application. For applications which require complete coverage, the coverage percent setting should be set to a higher value (80% to 100%). When applying products that do not tolerate overlaps, the percent coverage should be set to a lower value.

Exiting/Entering Overlap

Exiting/Entering Overlap settings allows the operator to avoid gaps in coverage by adjusting the amount (in meters) of entering and exiting coverage overlap. If sections turn off too early while entering existing coverage, adjust the Entering Overlap setting to force the sections to remain on for an additional specified distance. Conversely, if sections turn on too late when exiting coverage, adjust the Exiting Overlap setting to force sections to turn on earlier, avoiding possible gaps in coverage.

> ***Note:*** *If Entering Overlap is set to 1 meter, the implement sections will stay activated for an extra meter of coverage. If Exiting Overlap is set to 1 meter, the implement sections will activate 1 meter early.*

On/Off Look Ahead

On/Off Look Ahead monitors the GPS position and coverage map while considering the look ahead times to begin controlling sections on or off before the section crosses spray or no-spray boundaries. Look ahead times may help compensate for delays in the sprayer system including the time it takes for boom or control valves to open.

Note: *Off Look Ahead is the amount of time before entering an already applied area or a no spray zone that the section will turn off.*

Note: *On Look Ahead is the amount of time before area that needs to be applied that a section will turn on.*

- Adjust the Off Look Ahead to determine how far (in seconds) to turn a section off.
- Adjust the On Look Ahead to determine how far (in seconds) to turn a section on.

Boundary Percent Overlap

The Boundary Percent Overlap feature allows the operator to configure the percent of the boom section allowed to pass beyond the field boundary before the section is commanded to turn off.

Note: *The default Boundary Percent Overlap is set to 5%, so the boom section will turn off after 5% of the section is outside of the boundary. If Boundary Percent Overlap is set to 90%, the boom section will not turn off until 90% of the boom section is outside of the boundary.*

Adjust Section Control Settings

To adjust any of the Section Control settings:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Section Control** on the Settings menu. The *Section Control* window will open.
3. Select in the cell to the right of the desired setting.
4. Enter the desired setting.

   Note: *If using a Raven AccuBoom™ node, select the* ***Use AccuBoom™*** *checkbox and the AccuBoom™ node will control the sections for the implement selected in the drop-down list.*

5. Select **Accept** to return to the *Section Control* window.
6. Select **Accept** to save the displayed settings and return to the Settings menu.

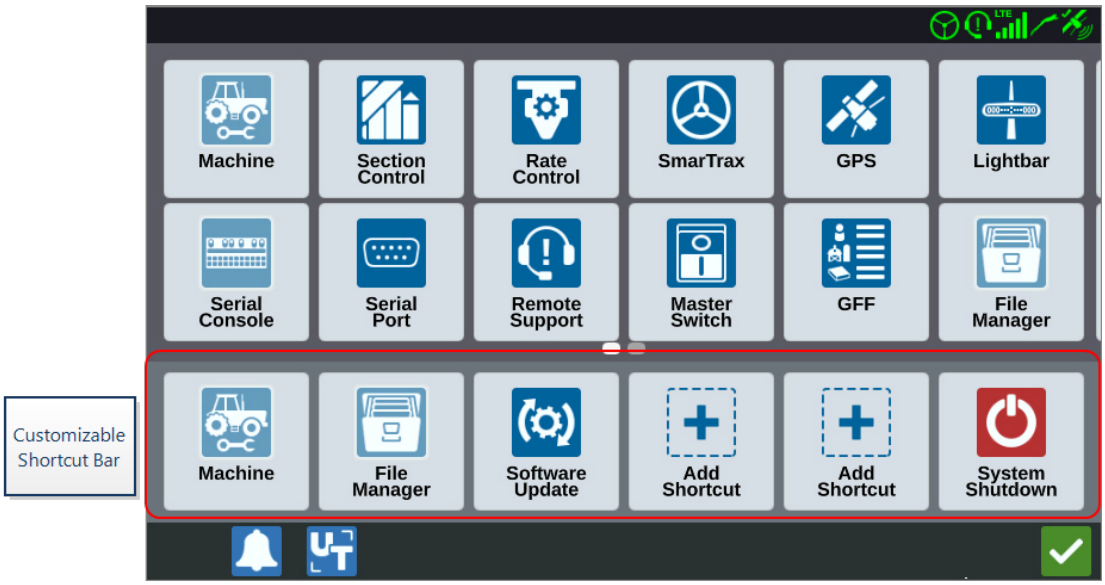
Adjust Rate Control

To adjust rate control:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Rate Control** on the Settings menu.
3. Select the desired implement from the drop-down.
4. Enter the desired look ahead distance (in seconds) in the **Look Ahead** cell.
5. Select **Auto** or **Manual** from the **Zero Rate Control on/off** drop-down.
6. Select the **Coverage** tab.
7. If desired, select the **Enable Thresholds** checkbox.
8. Enter the desired **Min "Rate OK"** value.
9. Enter the desired **Max "Rate OK"** value.
10. If desired, select the colored cells next to **Rate High Color**, **Rate OK Color**, and **Rate Low Color** to adjust those colors.
11. Select **Accept** to save the displayed settings and return to the Settings menu.

CRX Settings Menu

Overview



The following settings and options are available via the various menu screens.

Note: *Menu options may appear over multiple screens. Swipe to the left or right to view additional menus.*

Icon	Name	Information
	Add Shortcut	Add menu options to the Shortcut Bar for quick access to frequently used settings and features. See "Customize Shortcuts" on page 95.
	Analog Video	Adjust the settings for the analog camera viewer while not in a job. Only available on CR12™. See "Use Analog Video" on page 65.
	Audio Set-tings	Adjust notification volume levels and configure proximity audio signals. See "Configure Proximity Audio Signals and Volume Settings" on page 102.
	Auto Turn	Enables automatic headland turning, allowing the machine to auto-matically turn itself to the next determined swath when approach-ing boundaries. See "Auto Turn" on page 67.
	Base Stations	Create and configure local base stations.

Icon	Name	Information
	Display	Set display to Day or Night Mode and adjust Screen and Lightbar Brightness. See "Adjust Brightness Settings" on page 96.
	File Manager	Import and export files as well as view and delete files. See "File Manager" on page 115.
	GFF	Create, rename, or delete Growers, Farms, or Fields. See "Manage Grower, Farm, Field (GFF)" on page 39
	GPS	Review GPS information, diagnostics, and adjust settings. See "View GPS Information" on page 99.
	ISOBUS	View information on ISO Universal Terminal (UT) instances, identify UT's or clear UT object pools. See "ISOBUS Settings" on page 105.
	Job Settings	Allows configuration of globally applied in-job settings, such as: Allow Sprayer Mode If this option is selected, only tram lines will be shown if an implement wider than two times the swath width is mounted in the machine garage. ***Note:*** *This is only relevant to jobs with operation planning.* Enable Clear Coverage Pop-up If this option is selected, a pop-up will appear when reentering a job and offer the option to clear previous coverage. Reference Point Offset Set this option for moving the reverence point for selecting the guidance lines in the forward direction.
	Lightbar	Adjust settings for Path Deviation Sensitivity, Center settings, and Reverse LED Indication. See "Configure Lightbar" on page 106.
	Localization	Adjust settings for Language, Time Zone, and Units of Measure. See "Adjust Localization Settings (Language, Time Zone, Units)" on page 97.
	Networking	Create and configure Wi-Fi and other network connections. See "Configure Wi-Fi" on page 108.
	Machine	Add a new machine or update the existing machine configuration. See "Configure Machine" on page 24.

Icon	Name	Information
	Master Switch	Select options that can be used as the input for master switch status of connected nodes. If no other options are selected, select the On-Screen option to record coverage. See "Configure Master Switch" on page 104.
	Product Manager	Manage the products applied to the field. These can be tank mixes, liquid or granular products, or plant varieties. See "Product Manager" on page 113.
	Rate Control	Adjust prescription map Look Ahead settings for Variable Rate Applications (VRA). See "Adjust Rate Control" on page 91.
	Remote Support	Select this page if working with technical support and they request access to the CRX via Slingshot®. See "Enable Remote Support" on page 101.
	Section Control	Adjust individual settings including the On Override, Turn Off Percentage, and Look Ahead settings for section control. See "Adjust Section Control" on page 89.
	Serial Console	Configure the units for use with product control of the console. Typically these match the units configured within the SCS console.
	Serial Port	View information on the serial connection speed and the type of serial device. See "View Serial Port Information" on page 98.
	Slingshot®	Slingshot® is a subscription based service that allows the user to transfer files remotely. Slingshot® also allows the service desk to perform remote service on the system.
	SmarTrax™	Adjust On Line (OL) Sensitivity and the Line Acquire speed, configure all SmarTrax™ settings and run SmarTrax™ calibration.
	Software Update	Install available software updates using either Slingshot® Link or a USB drive. GPS and CRX unlock status and system information can also be found on this page. See "Update Software and Hardware" on page 132.
	Weather Station	Provides support for add on components that measure temperature, humidity, etc. The information from the weather station can be recorded along with other job information.

Customize Shortcuts

Add Shortcuts

To add a widget to the Shortcut Bar:

1. Select **Add Shortcut**  in the Customizable Shortcut Bar.
2. Select the desired setting icon.

Remove or Change Shortcuts

To remove or change an icon in the Customizable Shortcut Bar:

1. Select and hold the desired icon for 2 seconds. An **X** will be displayed in the upper left corner of the selected menu item.
2. Select the **X** to remove the icon or select a different icon from the Settings menu options.

Adjust Brightness Settings

The *Display Settings* window provides options to adjust Screen Brightness and Lightbar Brightness. For more lightbar settings, see "Configure Lightbar" on page 106.

To access display settings:

1. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
2. Select **Display**  on the Settings menu. The *Display Settings* window will open.
3. The default settings for the display are **Day Mode** with the Screen Brightness and Lightbar Brightness at 100%. If desired, select **Night Mode** which switches the screen background and foreground colors and sets the Screen Brightness to 30% and Lightbar Brightness to 30%.

   Note: *Lightbar brightness will be hidden on CR12™ unless an external lightbar is detected.*
4. If desired, select the **Automatically Switch Day/Night Mode** checkbox.
5. Drag the **Sunset Adjustment** slider bar to manually adjust when the CRX will switch from Day Mode to Night Mode. The default setting is directly at sunset.
6. Drag the respective slider bars to manually adjust the **Screen Brightness** or **Lightbar Brightness**.
7. Select **Accept**  to save the displayed settings and return to the Settings menu.

Adjust Localization Settings (Language, Time Zone, Units)

The *Localization* window provides options to adjust the language, time zone, and measurement units. To access Localization settings:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Localization** on the Settings menu. The *Localization* window will open.
3. Select the desired option from the **Language** drop-down.
4. Select the desired option from the **Time Zone** drop-down.

   Note: *The time zones are based on an offset from Coordinated Universal Time (UTC). Ex. Los Angeles is UTC-08:00, New York is UTC-05:00, Berlin is UTC+01:00, and Moscow is UTC+03:00.*
5. Select either an AM/PM clock or a 24 hour clock under the **Time Format** drop-down.
6. Use the checkbox options to set the desired display units for Speed, Area, Weight, Volume, Pressure, and Temperature.
7. Select **Accept** to save the displayed settings and return to the Settings menu.

View Serial Port Information

To access serial port information:

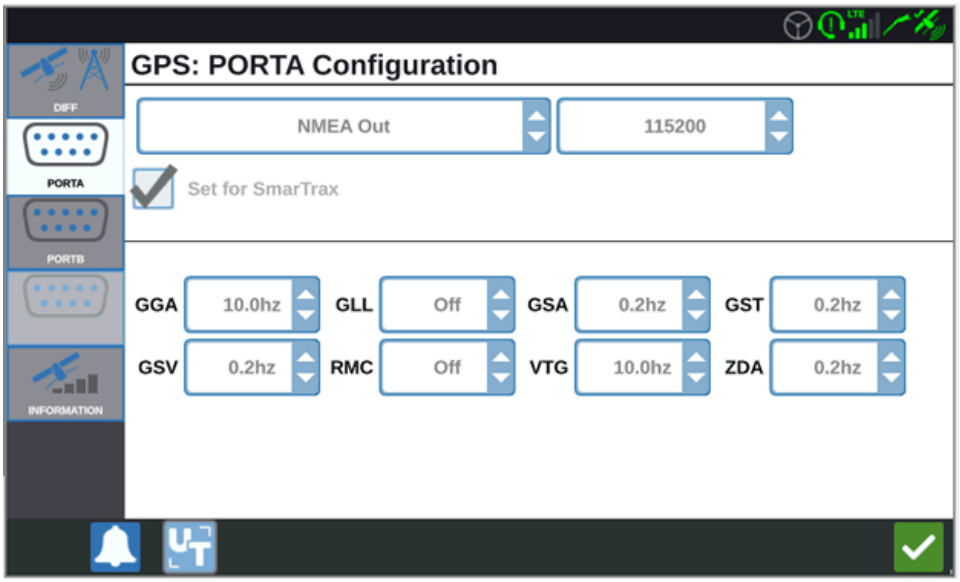
1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Serial Port** on the Settings menu. The *Serial Ports - Port A* window will open. Information for the Serial Port such as Baud Rate, Stop Bits, Parity, TX, and RX will display. If needed, select **Detect Device** to update the information.
3. To access information on other serial ports, select the desired **Port** from the left side of the window.
4. Select **Accept** to save the displayed settings and return to the Settings menu.

View GPS Information

Note: *If Implement Steering is available, verify the Implement Steering GPS in addition to the machine's GPS.*

To access GPS information:

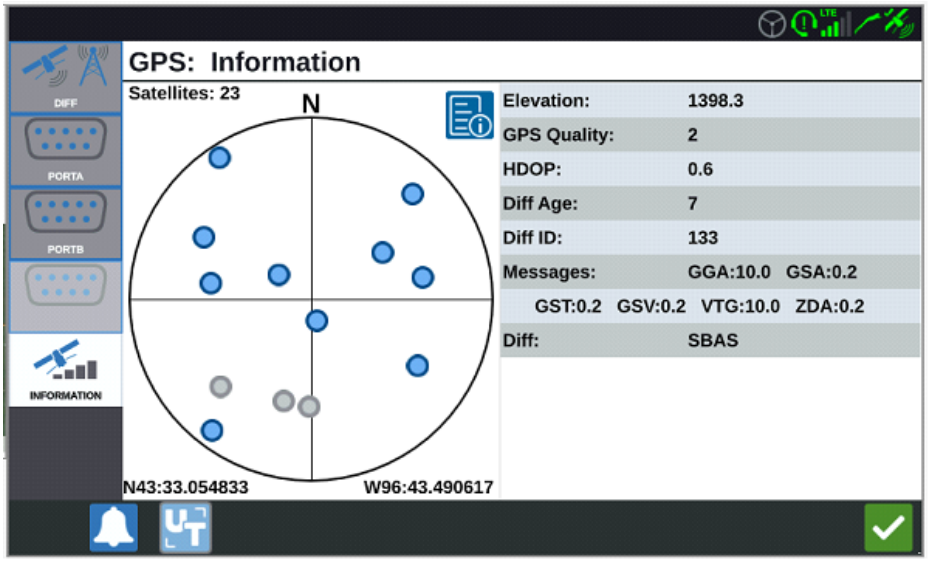
1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **GPS** on the Settings menu.
3. Select the **DIFF** tab to view and select GPS Differential Setup information such as available differential Type and PRN.
4. Select the **PORT A** tab to view and edit information on the *GPS: Port A Configuration* screen. If desired, select additional port tabs to view and edit GPS information for those ports. In some cases Port may be referred to as COM.



Note: *Port A is not configurable.*

5. Select the **INFORMATION** tab to view information on the number of satellites visible, Elevation, GPS Quality, HDOP, Diff Age, Diff ID, Messages, and Differential type. The image below shows an example of what a GPS satellite array may look like above an implement. The blue dots are GPS satellites current being used for corrections. The

GPS satellites that are grayed out indicate satellites not being used for correction.



6. Select **Accept** to save the displayed settings and return to the Settings menu.

Enable Remote Support

Remote support allows a Raven service specialist to remotely view and control the CRX system. Remote support must be enabled by the user to allow a service specialist to help troubleshoot or access information. To enable remote support:

Note: *Remote support on CRX can only be performed via Slingshot®.*

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Remote Support** on the Settings menu. The *Remote Support* window will open.
3. Select the **Enable Remote Support** checkbox.
4. Provide the support code displayed in the lower left corner of the CRX to the service specialist. Once remote support is connected, the name of the Remote Viewer will be visible in the list.
5. Accept the waiver to enable remote support.
6. After enabling remote support, select **Accept**.

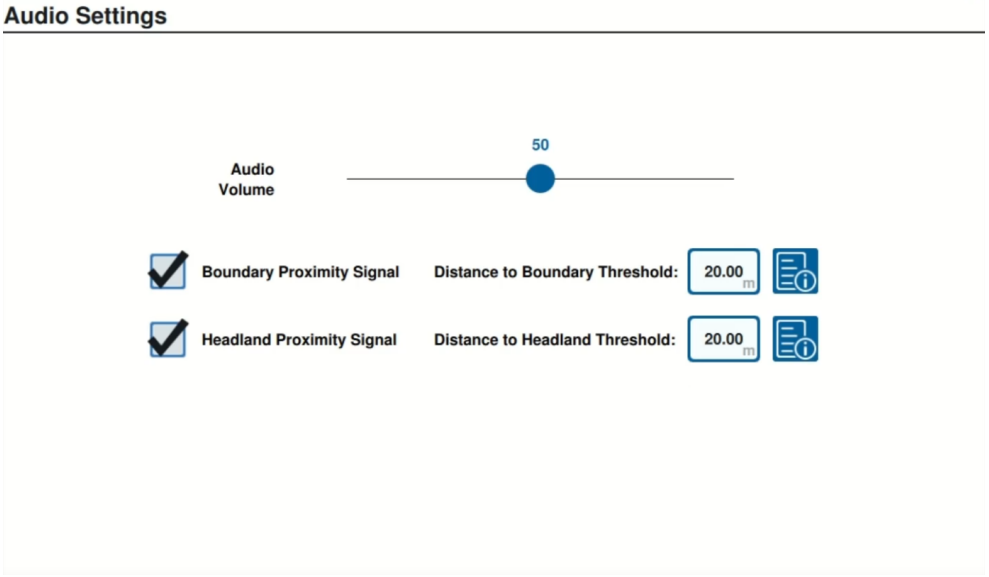
Configure Proximity Audio Signals and Volume Settings

Proximity Audio Signals

Proximity audio signals are audible notifications that will be heard when the implement reaches a user-defined distance from the boundary or headland.

To configure proximity audio signals:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Audio Settings** on the Settings menu. The *Audio Settings* window will open.



3. Select the checkboxes to activate the proximity alarm for boundaries, headlands, or both.
4. Select the distance boxes to set the desired distance from the boundary or headland for the alarm to go off.

System Volume

To configure the volume settings for all audible signals or alarms:

1. Use the slider to set the desired volume level (0 to 100).

   Note: *This volume setting will affect all sounds emitted from the CRX device.*

Configure Master Switch

To configure the master switch:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Master Switch** on the Settings menu. The *Master Switch Control Configuration* window will open.
3. If desired, select the **REQUIRE ALL ON** checkbox. This requires all selected inputs to be on for the Master Switch to be on. Otherwise only one selected input needs to be on.
4. By default the **On-Screen** checkbox is selected.

   Note: ***Aux Input*** *- Select this checkbox if there is a wired switch to the CRX Aux Input wire to act as a master switch.*

   Note: ***AccuBoom™*** *- Select this checkbox if there is a wired switch on the AccuBoom™ cabling orange wire to act as a master switch.*

   Note: ***Steering*** *- Select this checkbox if you want the SmarTrax™ to record data only when steering is engaged.*

   Note: ***On-Screen*** *- Only selectable if all other options are not selected.*
5. Select **Accept** to save the displayed settings and return to the Settings menu.

ISOBUS Settings

The ISOBUS Settings page provides options to identify connected ISOBUS devices, clear the ISOBUS Object Pool or change the ISOBUS Universal Terminal (UT) instance when multiple universal terminals are available on the ISOBUS. To access the UT Settings page:

1. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
2. Select **ISOBUS**  on the Settings menu. The *Diagnostic Trouble Codes* window will open.
3. Select **Accept**  to save the displayed settings and return to the Settings menu.

Configure Lightbar

Note: *Lightbar configuration will only be available on CR12™ if an external lightbar is detected.*

For lightbar brightness settings, see "Adjust Brightness Settings" on page 96.

To access the Lightbar Configuration settings:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Lightbar** on the Settings menu. The *Lightbar Configuration* window will open.
3. The default setting for the lightbar is enabled. To disable the lightbar, deselect the **Enable** checkbox.
4. The default setting for the Reverse LED Indication is active. When disabled, LEDs will illuminate in the direction the operator needs to steer to get back on line. Deselect the **Reverse LED Indication** checkbox if desired.
5. Select the **Use CrossTrack Error** checkbox to have the lights directly correlate to the distance from the guidance line. This option is automatically enabled if steering is detected and the option has not been manually changed by the user. The option is disabled by default and the lights integrate both cross track and track angle errors to give the user a more natural steering feedback response for manual steering.
6. The default setting for **Path Deviation Sensitivity** is Fine. Select the desired radial button to adjust the Path Deviation Sensitivity. While adjusting the sensitivity, note that the lightbar increments along the bottom indicates the distance off line for each light. For example, with Fine selected the first red light will turn on when the implement is 4” (10 cm) off line, and the second light will turn on when the implement is 10” (26 cm) off line.
7. If an external lightbar is connected via the serial port, that option will display on the *Lightbar Settings* window and be selected. If desired, deselect the external lightbar.
8. Select **Accept** to save the displayed settings and return to the Settings menu.

View Notifications

To view notifications:

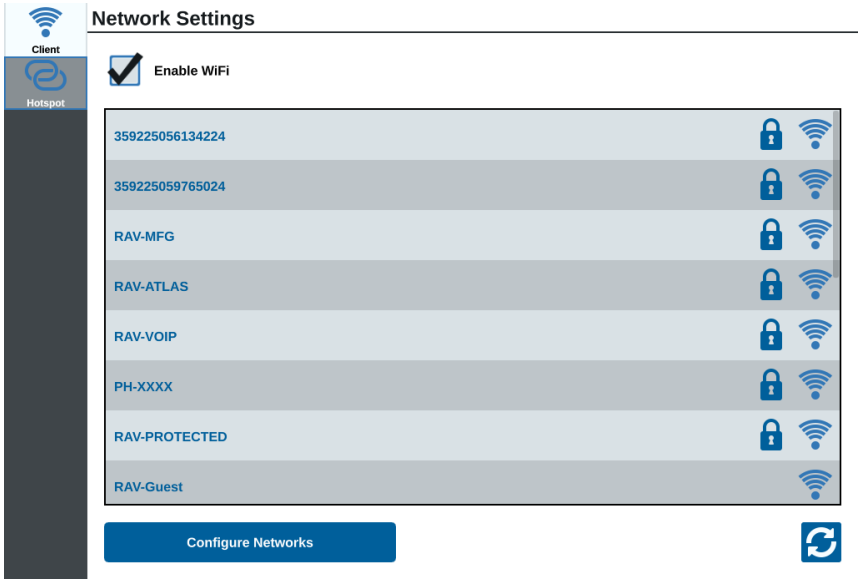
1. Select **Notifications**  on the bottom left of the Home screen. The *Notification History* window will open.
2. To view more information on a specific notification, select the notification. A window will open displaying the notification type, additional notification details, and how long ago the notification occurred.
3. After reviewing the notification, select **Complete**  .

   Note: *The* ***Complete***  *button may be yellow for warnings and red for alerts.*
4. When done viewing the notifications, select **Accept**  to return to the Home screen.

Configure Wi-Fi

To configure Wi-Fi settings and create a priority connection list:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Networking** on the Settings menu. The *Network Settings* window will open.
3. Select the **Enable WiFi** checkbox. A list of available Wi-Fi connections will appear.



4. Select the desired Wi-Fi Connection. If needed, select **Refresh** to update the Wi-Fi connection list.
5. If needed, enter the Wi-Fi Password to connect to that network.
6. Select **Connect**. The CRX will attempt to connect to that Wi-Fi hotspot. If an invalid password is entered, a notification will open saying the password was invalid.

   Note: *If desired for future Wi-Fi connections to this hotspot, select* ***Connect Automatically****. This will allow the CRX to connect to that hotspot when it is in range.*
7. After a successful connection, the hotspot information will have a blue background.
8. Repeat the process for all desired connections.

Note: *Wi-Fi priority is created by the CRX connecting to the Wi-Fi connections that do not have data or speed restrictions. Unrestricted connections will take priority over restricted networks.*

9. Select **Accept** to save the displayed settings and return to the Settings menu.

Create Manual Network

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Networking** on the Settings menu. The *Network Settings* window will open.
3. Select **Configure Networks** at the bottom of the *Network Settings* screen.
4. Select **Add**.
5. Enter a name for the network in the SSID field.
6. Select the desired security level. If a secured network is selected, enter the desired Password.
7. If desired, select **Data Restriction** to limit the amount of data that is transferred via the network.
8. If desired, select **Auto-Connect** to allow devices to automatically connect to this network.
9. Select **Accept** to save the displayed settings and return to the Settings menu.

Create a Personal Hotspot

A Personal Hotspot will allow other devices to connect to and use the CRX Internet source. To create a Personal Hotspot:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Networking** on the Settings menu. The *Network Settings* window will open.
3. Select the **Hotspot** tab.

4. Select the **Enable Wi-Fi Hotspot** checkbox. The SSID number displayed will the be network name. The Password is the password to connect to the network.
5. Select **Accept**  to save the displayed settings and return to the Settings menu.

Manage Screen Shots

Note: *CRX will store the last ten screen shots. CRX will begin replacing stored screen shots after ten screens are captured. Refer to "Export Screen Shots" below to transfer screen shots to a USB drive for viewing.*

Capture Screen Shots

There are two ways to capture screen shots:

Use Screen Capture Tool

1. Select **Screen Capture** on the bottom left of the Home screen.
2. To move files from the CRX to a USB stick, perform the steps in "Export Screen Shots" below.

Use the Power Button

1. Press the power button until the *Power Button Pressed* prompt is displayed.
2. Select **Screen Capture**.
3. To move files from the CRX to a USB stick, perform the steps in "Export Screen Shots" below.

Export Screen Shots

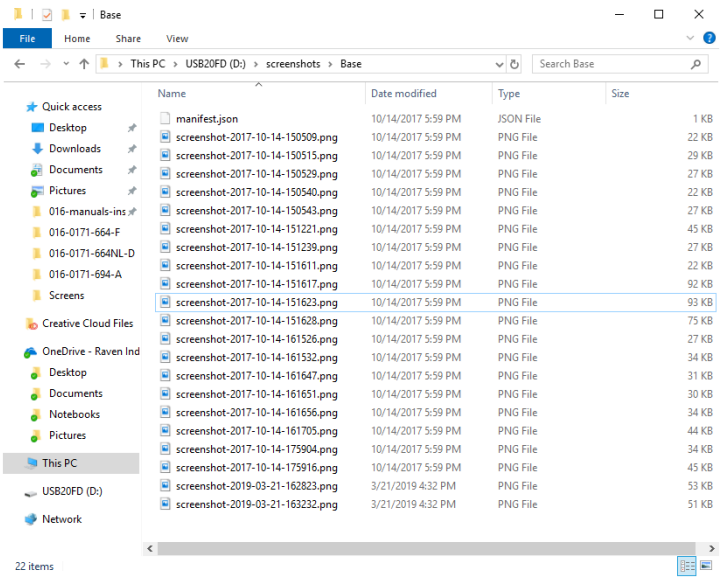
1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open..
2. Select **File Manager** on the Settings menu. The *File Management* window will open..
3. Select **Diagnostics** on the footer bar. The *Send Diagnostics* window will open.
4. Select the desired USB drive from the **Send To** dropdown.
5. Select **Screen Capture**.
6. If desired, enter a comment about the screen shot.

7. Select **Eject USB** to properly save the information on the USB stick so it can be removed.
8. Select **Accept** to return to the *File Management* window.
9. Select **Accept** to return to the Settings menu.
10. Select **Accept** to return to the Home screen.

View Screen Shots

To view the screen shot after the screen shot has been exported to a USB drive:

1. Complete the "Export Screen Shots" on the previous page procedure to transfer the screen shot to a USB drive.
2. Insert the USB into a computer.
3. Use the file browser to open the USB drive directory.
4. Navigate to the screen shots folder.



5. View or copy the screen captures as desired.

Product Manager

The Product Manager allows the user to create, edit, and delete products. Users can register products with Crop Registration for usage within product maps. See "Product Maps Layer" on page 73 for more information on using product maps within a job.

Note: *The Product Manager and product maps must be unlocked to be accessed. Refer to Feature Unlocks for more information on unlocking features.*

Create a New Product

To create a new product in the Product Manager:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Product Manager** on the settings menu. The *Product Manager* window will open.
3. Select **Create New Product**.
4. Select a general product and configure the product with any desired properties, or select a non-general product.

   Note: *A general product can be configured with up to six properties with corresponding values, which will be displayed when the "Product Maps Layer" on page 73 is active. Non-general products cannot be configured with additional properties and cannot be used with product maps.*
5. Save the new product and return to the *Products Master List* to verify the new product has been created.

Edit an Existing Product

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Product Manager** on the settings menu. The *Product Manager* window will open.

3. Select the **Edit**  button next to the desired product.
4. Update or change the desired information about the product.
5. Select **Accept**  to save any changes to the product.

File Manager

The File Manager allows the user to sort and move files. If the file is currently located on a USB stick, connect to the USB port on the back of the CRX. The following actions are available through the File Manager:

File Types

The table below shows available file types on the CRX.

For a comprehensive list of file types, their extension type, and where they are typically located when saved to a USB stick, see "USB Import and Export File Types" on the next page

Icon	File Type	Description
	All Files	Select this to select all of the files stored on the device or on the installed USB memory stick.
	Backup	Backup files can be saved on the CRX or moved to a USB port. These files can include backups of machine configurations, GFF information, and jobs.
	Crop Registration	This icon indicates the file type is a .csv file meant for importation. Possible types include Product List or Reference Map.
	ECU Profile	This icon indicates the file type is a RS1™/SC1™/TC1™ machine profile.
	Field Data	Select this to view/move field data files.
	Guidance Line	This icon indicates the file type is a guidance line.
	Job	This icon indicates that the file type is a job file.

Icon	File Type	Description
	Prescription Map	This icon indicates the file is a prescription map either create for, or downloaded to, the CRX.
	Scouted Object	This icon indicates that the file type is a scouted object which includes Field Boundaries, Zones, Lines and Flags.
	Street Maps	This icon indicates that there is a Street Map available for download to the CRX.

USB Import and Export File Types

Function	Import Type	Export Type	Typical USB Location
KWS	.kws (AreaFeature.shp, LineFeature.shp, Boundary.shp)		
SBGuidance Fields	/export/*.kml		
ISO Tasks	/*/TASKDATA.xml		/ISOXML/*/TASKDATA.xml
Backup	/*.crb	/*crb	
Cruizer Flags			/WorkOrders/Jobs/{Job Dir}/*.jdf (.zone, .inj, .fld, .fcp, .com)
Cruizer Flags			/Coverage_Maps/{Job Dir}/logs/scout.dat
Diagnostics		/*.dbg	
ECU Profile	/*.prf	/*.prf	/Raven/ECU/Profiles/*.prf
ePro Line			/ePro/WorkOrders/GuidanceLines/*.ab
Field			/Raven/GFF/{Grower Name}/ {Farm Name}/{Field Name}*.fld
Field Extent			GFF/{Grower Name}/ {Farm Name}/ {Field Name}/*.shp (.shx, .dbf, .prj) /Raven/GFF/{Grower Name}/ {Farm Name}/{Field Name}/*.shp (.shx, .dbf, .prj)
Firmware	/Raven/500S/*.bin		

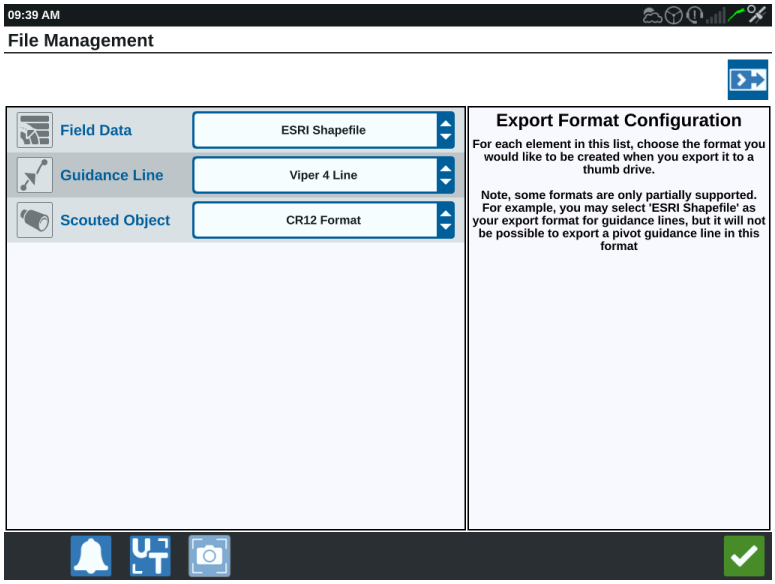
Function	Import Type	Export Type	Typical USB Location
500S			
Firmware 600S	/Raven/600S/*.hex /Raven/600S/*.shex		
Firmware CAN	/Raven/CAN/*.hex Raven/CAN/*.rvu /*.hex /*.rvu		
Job	/*.jdp	/*.jdp	
Multi Boundary			GFF/{Grower Name}/ {Farm Name}/ {Field Name}/*shp (.shx, .dbf, .prj) Raven/GFF/{Grower Name}/ {Farm Name}/*.shp (.shx, .dbf, .prj)
Prescription Map	/*.shp (.shx, .dbf, .prj) /rsmap/*.shp (.shx, .dbf, .prj) /rpmaps/*shp (.shx, .dbf, .prj)	/*.shp (.shx, .dbf, .prj)	/Raven/GFF/{Grower Name}/ {Farm Name}/{Field Name}/RxMaps/*.shp (.shx, .dbf, .prj)
Product	/*.csv		/*.csv
ROS Line			/Raven/GFF/{Grower Name}/ {Farm Name}/{Field Name}/scoutRoot/ {ScoutGroup}/*id
Scouted Object	/*.sct	/*.sct	
Street Map	/*.rsm /streetmap/*.rsm		
Trimble Boundary			/AgGPS/Data/{Grower Name}/ {Farm Name}/{Field Name}/Boundary.shp
Trimble Swaths			/AgGPS/Data/{Grower Name}/ {Farm Name}/{Field Name}/Swaths.shp
Unlock	/Raven/{Barcode}.zip		

Copy a File

To copy a file:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **File Manager** on the Settings menu. The *File Management* window will open.
3. Select either **USB** (if connected to the CRX) or **Local** (on CRX) from the source drop-down.
4. Select the checkbox for the desired file(s) or **All Files** checkbox to select all of the files on the CRX or sort files by GFF.
5. Select the desired file(s) to be copied.
6. Select **Copy** to copy the selected file. The *Copy Files* window will open. Select **OK** to copy the file or **Cancel** to stop copying the file.
7. Select **Accept** after selecting the desired file(s).

   Note: *There are options available to change the format of the exported data.*



8. If a USB stick was installed, select **Eject USB** to properly save the information on

the USB stick so it can be removed.

9. Select **Accept**  to save the displayed settings and return to the Settings menu.

Delete a File

To delete a file:

1. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
2. Select **File Manager**  on the Settings menu. The *File Management* window will open.
3. Select either **USB** (if connected to the CRX) or **Local** (on CRX) from the source drop-down.
4. Select the desired file(s) or **All Files** checkbox to select all of the files on the CRX or sort files by GFF.
5. Select **Delete**  to delete the selected file(s). The *Delete Files* window will open. Select **OK** to delete the file(s) or **Cancel** to not delete the file.
6. Select **Accept**  after selecting the desired file(s).
7. Select **Accept**  to save the displayed settings and return to the Settings menu.
8. If a USB stick was installed, select **Eject USB**  to properly save the information on the USB stick so it can be removed.

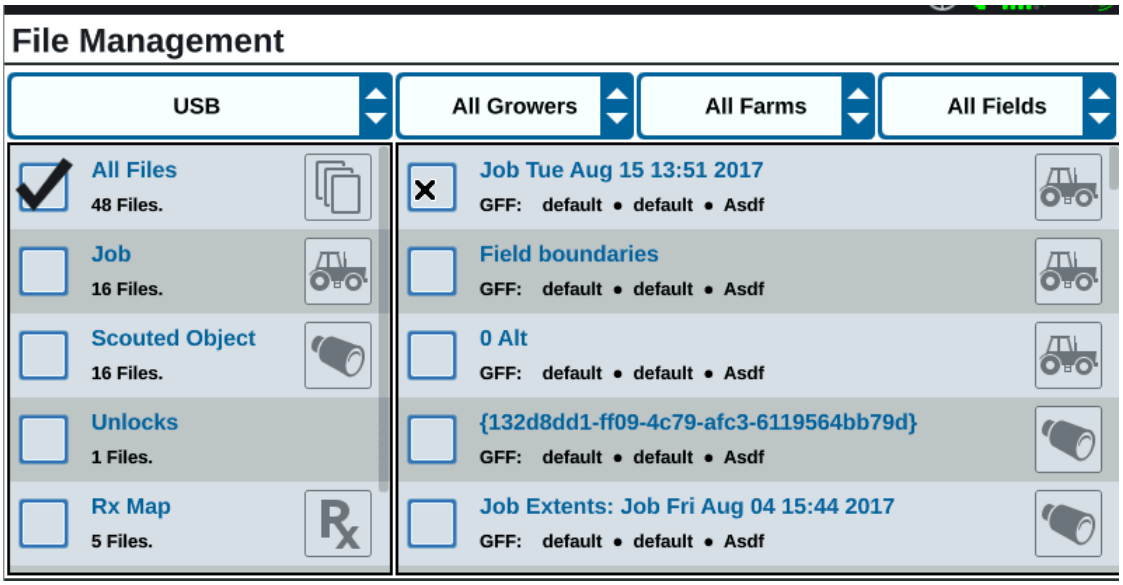
Import a File

Files such as maps, guidance lines, and feature unlocks may be imported with CRX.

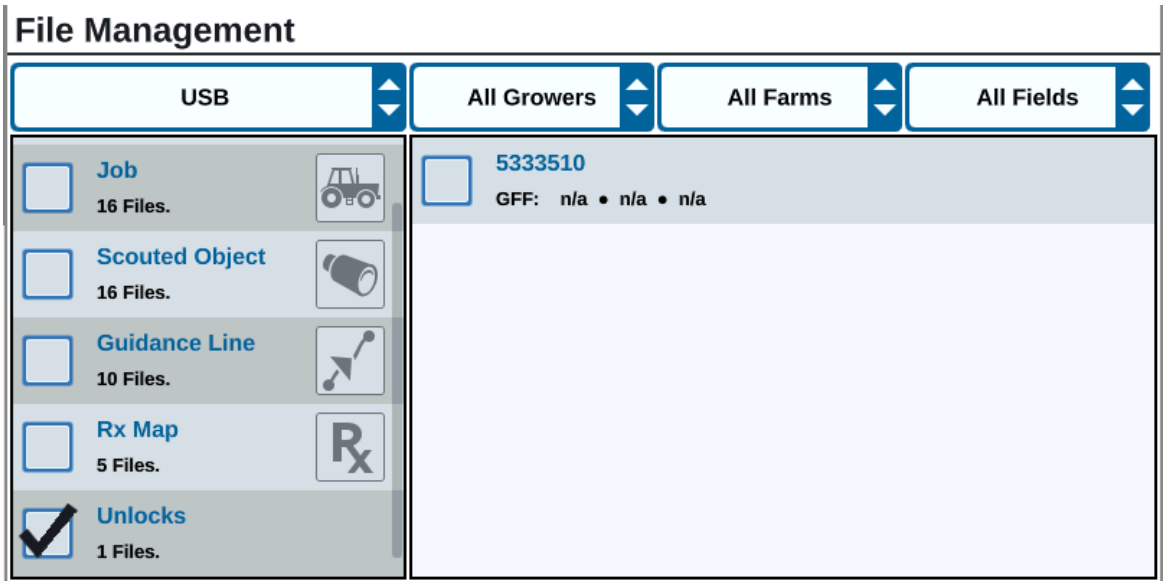
Note: *Product may be imported via the file manager as well, but require specific formatting of the file. Refer to Import a Product via .CSV File for more information on importing a product.*

After downloading the desired file to a USB and inserting the USB into the CRX:

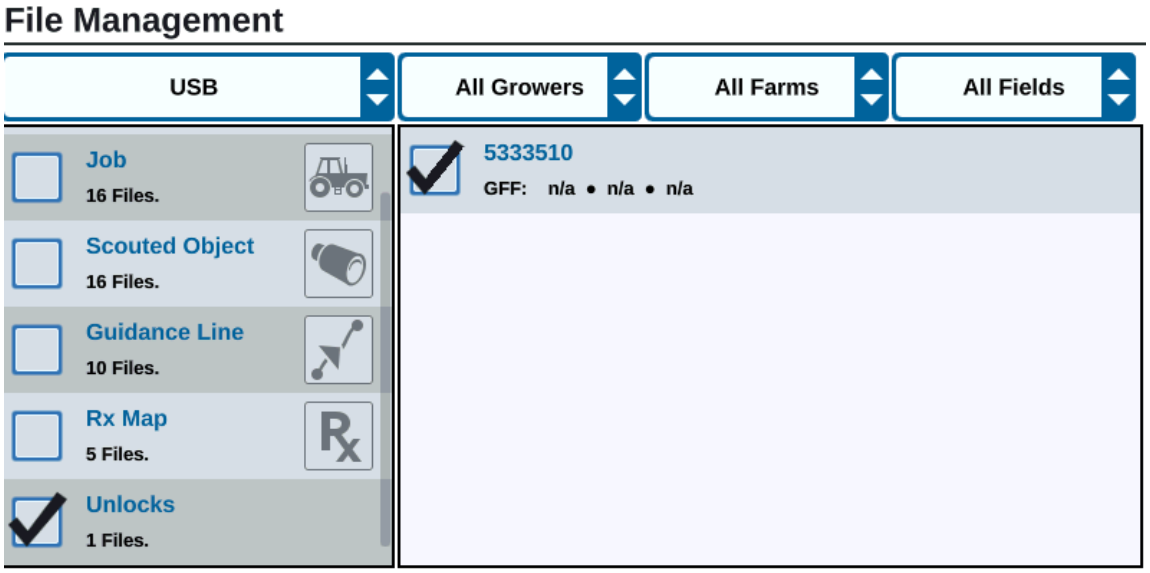
1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **File Manager** on the Settings menu. The *File Management* window will open.
3. Select **USB** from the left-most drop-down.



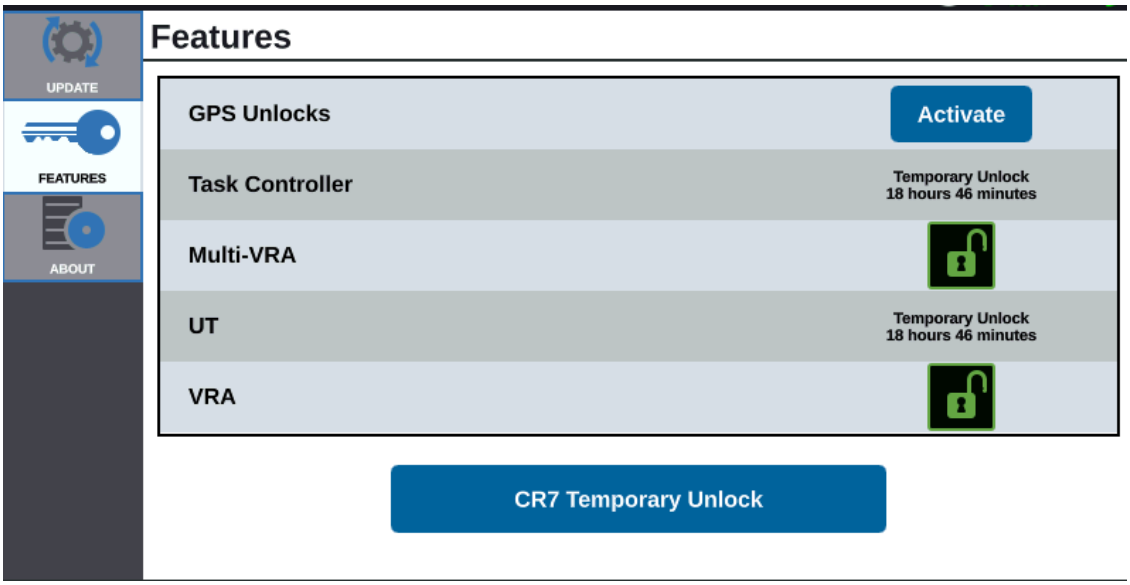
4. All files located on the USB will display. Navigate to and select the desired file type to filter which files are shown. For this example, it is a feature unlock, but maps and guidance lines are imported by the same process. See "Feature Unlocks" on page 138 for more information.



5. Select the desired file from the cell to the right.



6. Select **Copy** near the bottom of the screen and select **Accept** in the pop-up window. The files will copy to the CRX.
7. To verify unlocks have transferred successfully, navigate to the **Features** tab in the System Update field. The downloaded unlocks should now display with an open lock icon beside the feature.



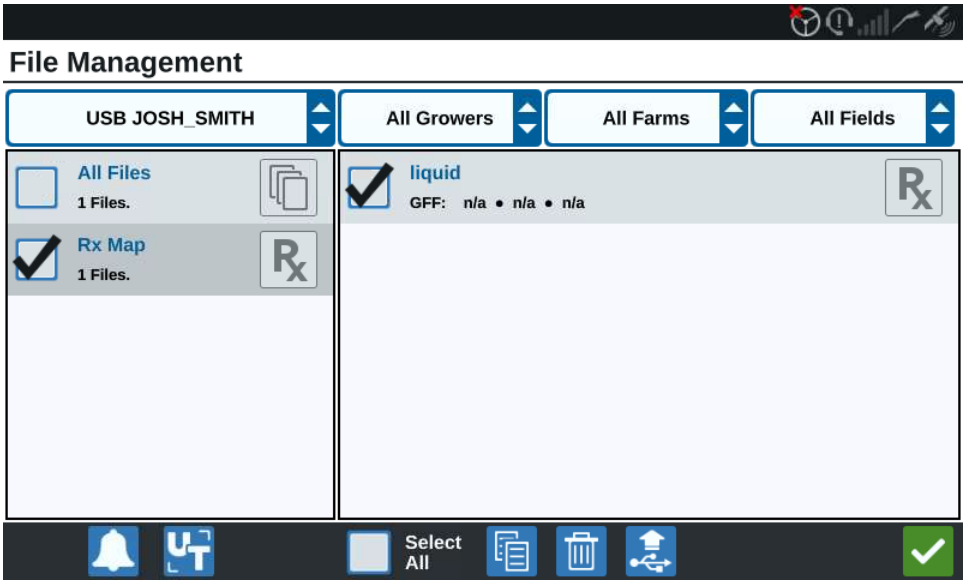
8. Select **Accept** near the bottom of the screen to save the displayed settings and return to the Settings menu.
9. Select **Eject USB** to properly save the information on the USB stick so it can be removed.

Load a Prescription Map

To load a prescription map:

1. Place the prescription map file (this will be a .dbf, .shp, .shx file) on a USB drive. Do not create subfiles for the prescription maps.
2. Insert the USB drive into the CRX.
3. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
4. Select **File Manager** on the Settings menu. The *File Management* window will open.
5. Select the desired USB drive from the left-most drop down.

6. Select the desired prescription map from the list.

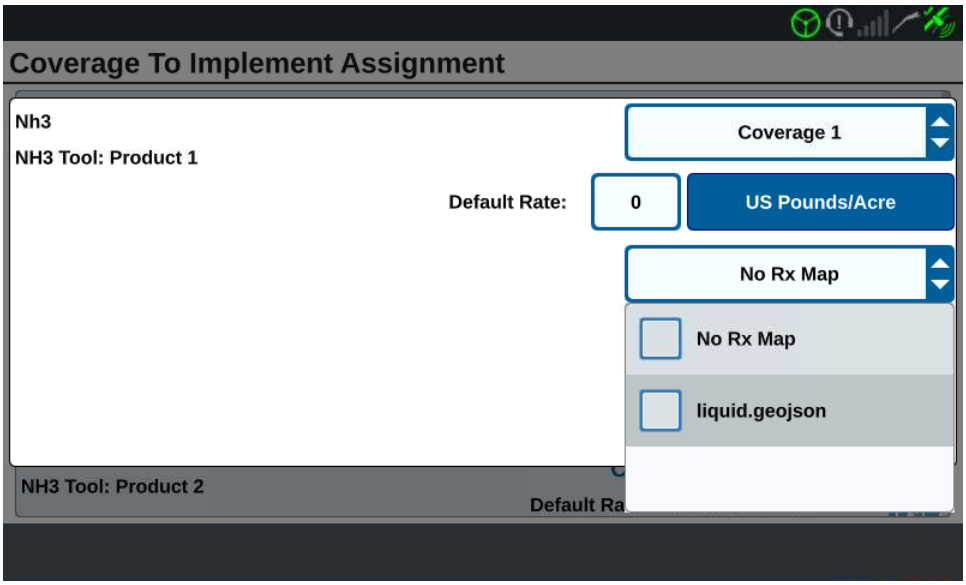


7. Select **Copy** .

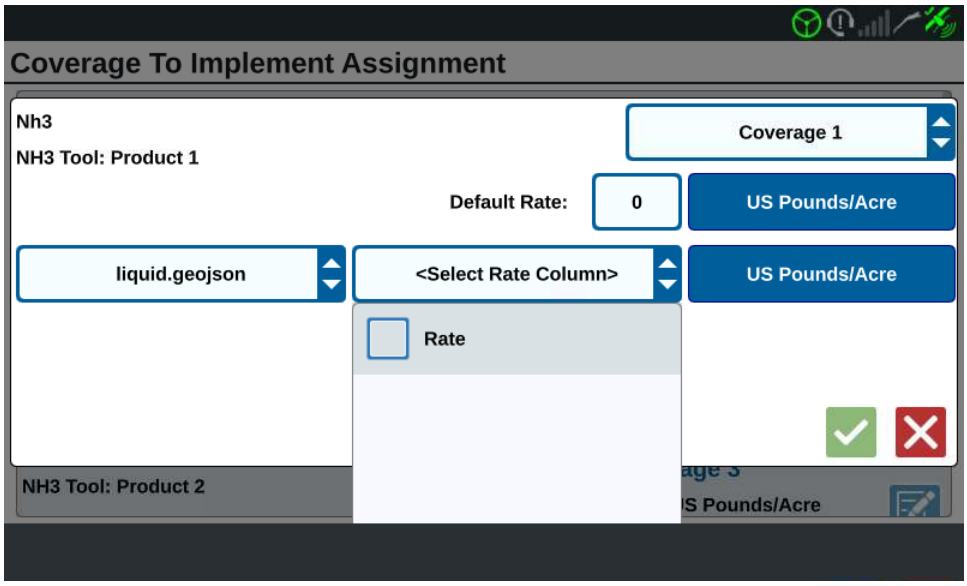
8. Select **Accept** . A *Copy Files* window will open.

9. Select **Accept** to continue copying the file or select **Cancel** to choose a different file. A *Please Wait* prompt will open while the files are being transferred.

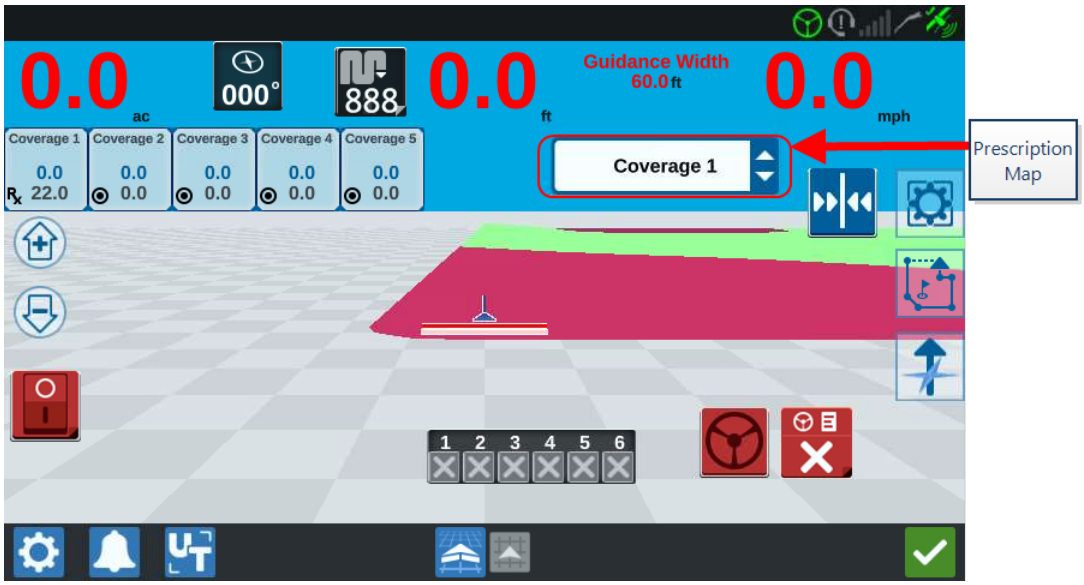
10. Start a job. On the *Coverage to Implement Assignment* window select **Edit** beside the desired prescription map.



11. Select the desired prescription map from the **No Rx Map** drop-down.
12. Select **Rate** from the **<Select Rate Column>** drop-down.



13. If needed, adjust the units and conversion factor.
14. Select **Accept** . The *Coverage to Implement Assignment* window will open showing the Rx Control for the product.
15. Select **Next** to begin the job. The Run screen will open. The prescription map will be visible on the Run screen.



16. Select **Eject USB** to properly save the information on the USB stick so it can be removed.

Use Virtual Thumb Drive (VTD)

Virtual Thumb Drive (VTD) is a feature that allows for easy transfer of data between CRX field computers. After creating and linking a Microsoft OneDrive account to the CRX, users can transfer data between VTD without the need of a physical USB drive. Additional computers linked to the same OneDrive account will be able to access all data saved to VTD.

Note: *Use of VTD requires a Slingshot® subscription.*

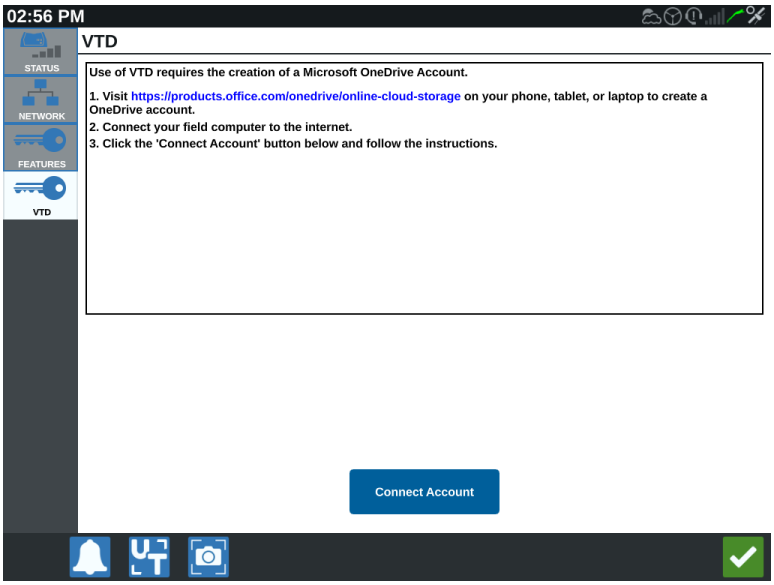
Connect OneDrive Account to VTD

Use of the Virtual Thumb Drive requires the creation of a Microsoft OneDrive account. To authenticate and connect a Microsoft OneDrive to VTD:

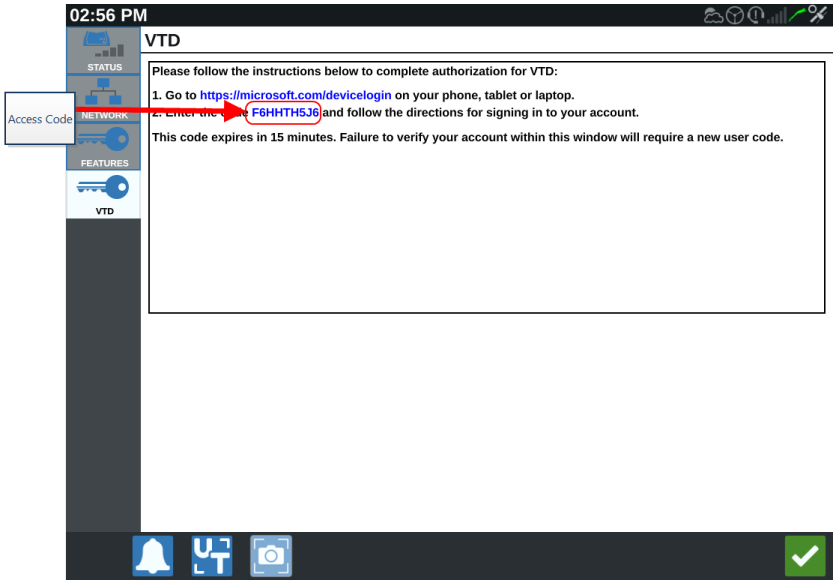
1. On a computer or mobile device, enter https://products.office.com/onedrive/online-cloud-storage into the address bar.
2. Select **Sign up for free** and follow the instructions to create a Microsoft OneDrive account.
3. Create a directory titled "vtd" on the OneDrive account.

   Note: *Ensure that "vtd" is all in lowercase on the OneDrive account.*
4. Connect the field computer to the internet.
5. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
6. Select the **Slingshot®**  button on the Settings menu to navigate to the *Slingshot® Field Hub* screen.

7. Select **VTD** on the sidebar to navigate to the VTD authorization screen.

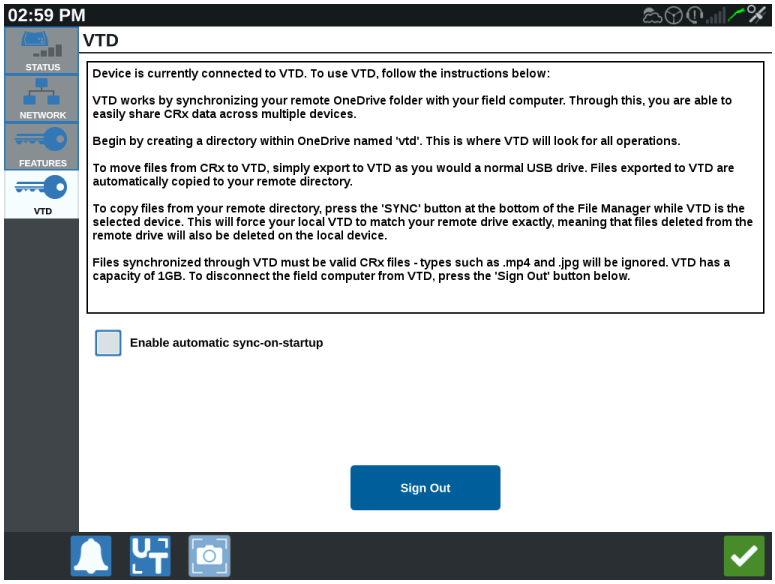


8. Select **Connect Account** on the prompted page.
9. On a computer or mobile device, enter https://microsoft.com/devicelogin into the address bar.
10. Once on the web page on the computer or mobile device, enter the access code prompted on the CRX screen.



Note: *The access code will not be the same code as shown above.*

11. Once the account is linked with VTD, the screen shown in below will display.



Note: *The folder structure of the VTD should be the same structure as USB. See "File Types" on page 115 for more information about folder structure of USB.*

Operate VTD

VTD will utilize a remote VTD hosted in the OneDrive account, and a local VTD located directly in the CRX software. Local and remote VTD files synchronize, sending local files to the remote drive, and remote files to the local drive. Files locally stored on the CRX device but not in the local VTD folder will be stored in “local file storage.”

Note: *Files must be transfered from VTD to local file storage for usage.*

To transfer a file stored locally on the CRX to VTD:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **File Manager** on the Settings menu. The *File Management* window will open.
3. Select **Local** from the source drop-down.
4. Select the checkbox for desired file(s) or **All Files** checkbox to select all of the files on the CRX or sort files by GFF.
5. Select **Copy** to copy the selected file. The *Copy Files* window will open.

6. Select the VTD and select **OK** to copy the file or **Cancel** to stop copying the file.
7. Select **Accept** after selecting the desired file(s).

To transfer a file stored remotely on VTD to CRX:

1. On the OneDrive account, place the desired file into the vtd folder.
2. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
3. Select **File Manager** on the Settings menu. The *File Management* window will open.
4. Select **VTD** from the source drop-down.
5. Select **Sync** to send files from the OneDrive vtd folder to local VTD folder on the CRX.

   Note: *After the VTD sync completes, import the files to CRX with the same process as a physical USB drive to use the transfered files.*
6. Select the checkbox for desired file(s) or **All Files** checkbox to select all of the files on the VTD or sort files by GFF.
7. Select the desired file(s) to be copied.
8. Select **Copy** to copy the selected file. The *Copy Files* window will open.
9. Select **Accept** to begin the copy operation or **Cancel** to stop the copy operation.

   Note: *To delete a file in the local VTD folder in the CRX device, the file must first be deleted in the OneDrive vtd folder. Then resynchronize on the CRX device to remove the deleted file from the local VTD folder.*
10. Select **Accept** to return to the Settings menu.

Update Software and Hardware

- For software updates, refer to "Download Update Via Slingshot®" on the facing page and/or "Download a CRX Update Via USB" on page 135.
- For hardware updates, refer to "ISO Node and GPS Hardware Updates" on page 136.
- For feature unlocks, refer to "Temporary Feature Unlock" on page 139.

SmarTrax™ System Information

The SmarTrax™ System Information page provides options for adjusting sensitivity, performing diagnostics, and general SmarTrax™ information. For SmarTrax™ operation and calibration information, refer to the appropriate SmarTrax™ Calibration and Operation Manual.

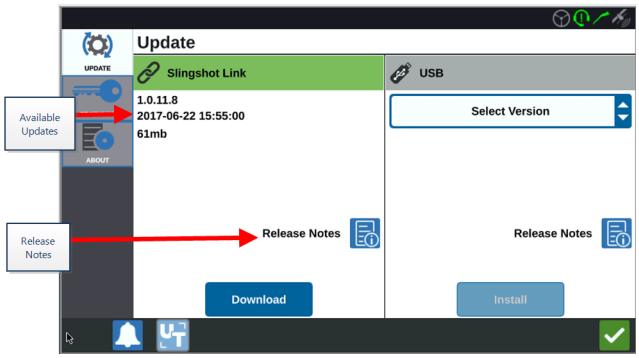
Implement Steering System Information

The Implement Steering Information page provides options for adjusting sensitivity, performing diagnostics, and general Implement Steering information. For Implement Steering operation and calibration information, refer to the appropriate Implement Steering Calibration and Operation Manual.

Download Update Via Slingshot®

To check for CRX software updates via Slingshot®:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Software Update** on the Settings menu. The *Update* window will open.
3. If there is an update available via Slingshot® it will be listed under the *Slingshot® Link* column. To learn more information about what is included in the update, read the **Release Notes**.



4. To install the update, select **Download**. The update will download to the CRX. After the CRX update has downloaded, the **Download** button will change to **Install**.
5. Select **Install** to install the software update.
6. If desired, select the **Features** tab to access the desired unlock. The following options are available:

   ### GPS Unlocks

   Unlock to access more precise GPS corrections.

   ### Task Controller

   The task controller unlock is required to allow the UT to automatically control sections.

   ### Multi-VRA

   Unlock Multi-VRA to use prescription maps to automatically apply multiple products to a field.

   ### UT

   UT allows the user to monitor and adjust nodes connected to the ISOBUS network.

VRA

Unlock VRA to use a prescription map to automatically apply the desired product as configured in the prescription map.

Operation Planning

Operation planning allows the creation of headlands, offsets, and guidance lines within an existing boundary. The operation plan can then be selected jobs for various implements.

Product Maps

Unlock Product Maps to create and use custom products. This feature utilizes crop registration to allow users to assign user-defined properties to products, allowing for better distinction for products applied in coverage.

7. If desired, select the **About** 

tab to view information about the CRX including the software version, when the software version was installed, Run Hours, and Total Run Hours. If desired, select **Erase Data** to reset the system and erase all data stored on the CRX. This includes all implements, Grower/Farm/Field data, and settings on the CRX.
8. Select **Accept**  to save the displayed settings and return to the Settings menu.

Download a CRX Update Via USB

Download a CRX Update to USB

To locate and download a CRX software update to a USB stick:

1. Insert a USB into a computer.
2. On the computer, enter http://portal.ravenprecision.com/ into the address bar.
3. Select **Enter**.
4. Select **Product Documentation**.
5. Select **CRX**.
6. Navigate to the drop-down.
7. Select the desired software.

   Note: *If desired, review the download and installation instructions.*
8. Select **Save As** from the **Save** drop-down.
9. Select the desktop as the desired save location.
10. Select **Save**.
11. Click and drag the .zip file into the root directory of the USB stick.

    Note: *Do not "unzip" or extract the software update file.*

Install CRX Update Via USB

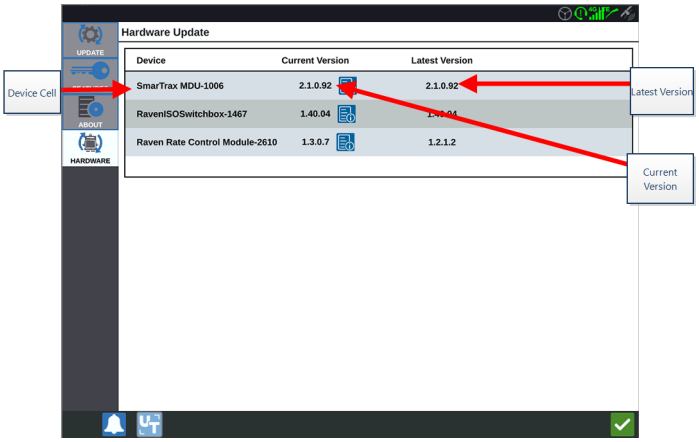
To apply a software update to the CRX device:

1. Insert the USB flash drive with the CRX update in the required folder into the CRX device.
2. Once the update file is detected on the USB drive, select the desired update from the **USB** drop-down list then select **Install**.
3. Select **Eject USB** to properly save the information on the USB stick so it can be removed.

ISO Node and GPS Hardware Updates

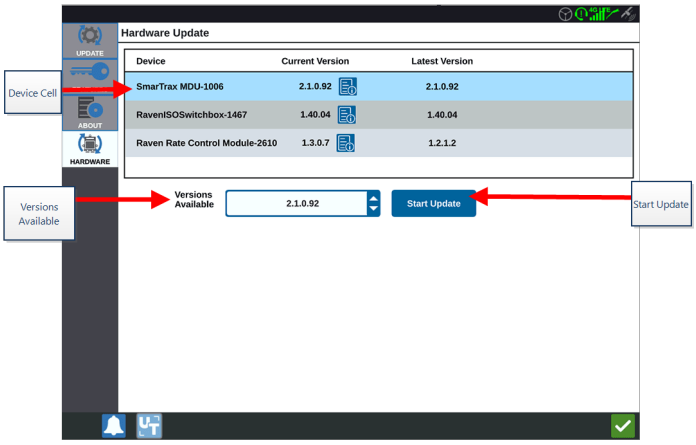
To check for ISO Node or GPS updates via Slingshot®:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Software Update** on the Settings menu. The *Update* window will open.
3. Select the **Hardware** tab.
4. During the device start-up sequence, CRX will download available software if the device is connected to Slingshot®. The available software will be listed on the *Hardware Update* window. To learn more information about the current version, select the information icon. To see if there is a newer version, compare the Current Version (installed version) to the Latest Version.



5. To install the update, select anywhere on the device cell except the information icon. A **Versions Available** drop-down will open below the list of Device Cells.

6. Select the desired version from the **Versions Available** drop-down.



7. Select **Start Update**. The update will install.
8. If desired, select the **About** 

tab to view information about the CRX including the software version, when the software version was installed, Run Hours, and Total Run Hours. If desired, select **Erase Data** to reset the system and erase all data stored on the CRX. This includes all implements, Grower Farm Field data, and settings on the CRX.
9. Select **Accept**  to save the displayed settings and return to the Settings menu.

Feature Unlocks

Some CRX features are locked, or temporarily unlocked, when shipped. These features include:

VRA

Allows the operator to assign a prescription map to a product control channel to automatically apply the desired product as configured in the prescription map.

Multi-VRA

Allows multiple prescription maps per job.

Task Controller

Task controller is required to allow the CRX UT to automatically control sections based on field position and previous coverage data collected during the application.

There are two options for feature unlocks:

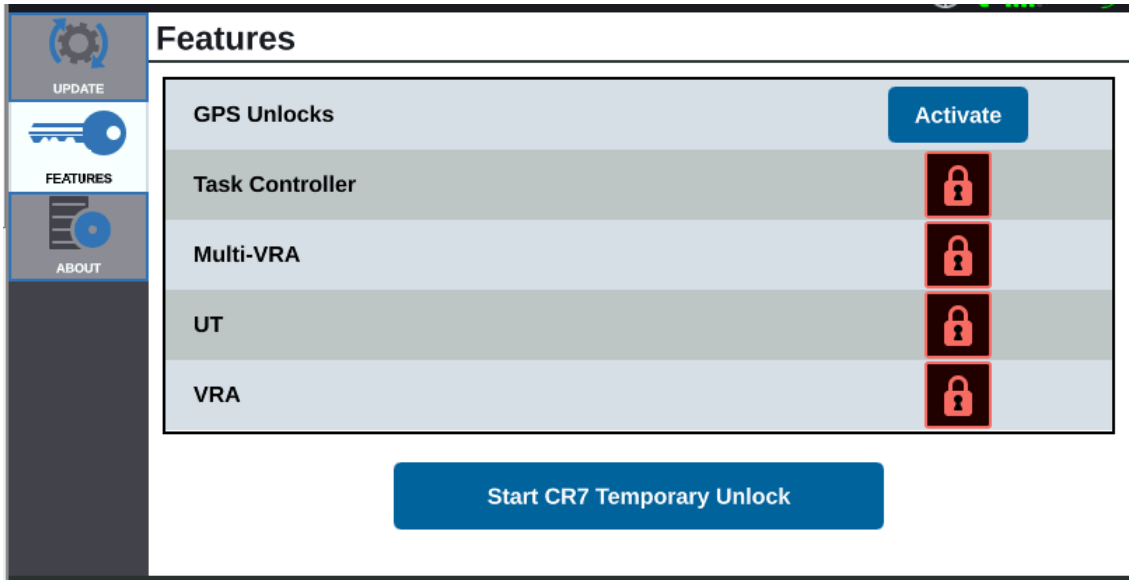
Temporary Feature Unlock

Some CRX features are locked when shipped.

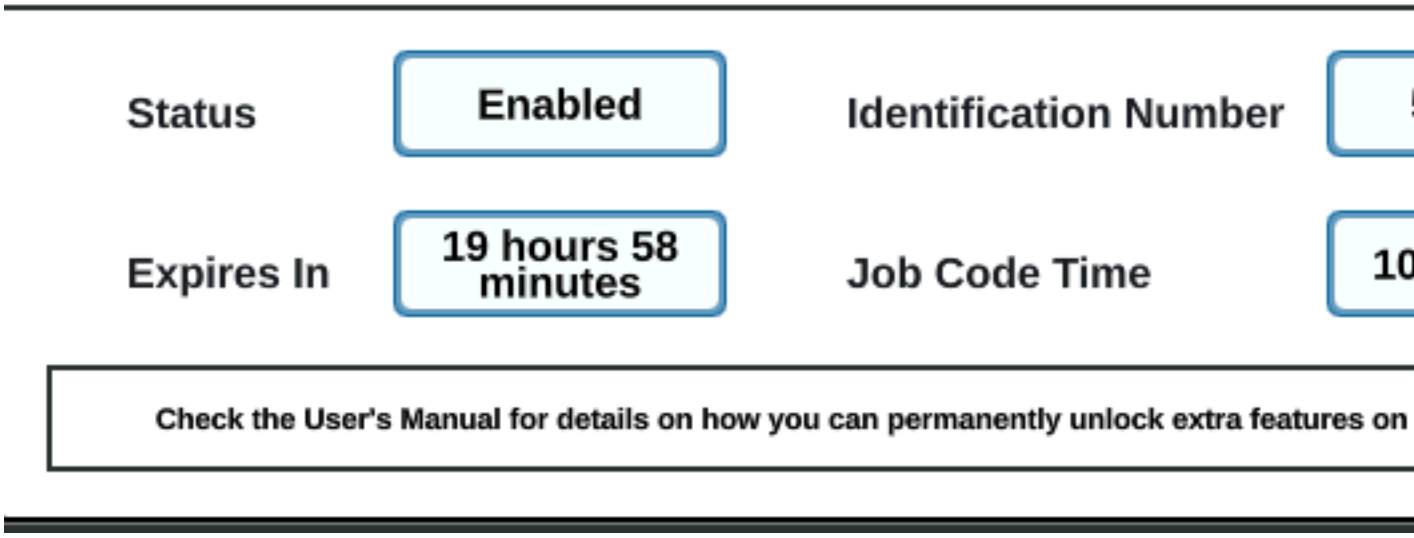
Any temporary unlock will remain active for 20 hours of CRX operation after the unlock is activated. The temporary unlock timer will continue until the unlock expires. Once the temporary unlock expires, the feature will be available using the activation package. Contact a local Raven dealer for additional assistance with temporary unlocks or feature activation.

To activate a temporary unlock:

1. Select **Settings** on the bottom left of the Home screen. The Settings menu will open.
2. Select **Software Update** on the Settings menu. The *Update* window will open.
3. Select the **Features** tab. The *Features* window will open.



4. Select **Start CRX Temporary Unlock**. The unlock timer will start.
5. Select the **Features** tab to review the Subscription Status along the bottom of the window. This portion of the window includes information such as Status, Job Code, Identification Number, and the countdown clock for the subscription.



6. Select **Accept** to save the displayed settings and return to the Settings menu.

Permanent Feature Unlock

Some CRX features are locked when shipped.

Permanent unlocks must be purchased through a Raven dealer. After purchasing the unlocks the files are loaded to the CRX with a USB drive. To install a permanent unlock on the CRX:

1. Locate the file sent to you from the Raven dealer.
2. On a computer, create a folder named Raven.
3. Transfer the unlock file to the Raven folder.
4. Install a USB drive into one of the USB ports on the computer.
5. Transfer the Raven folder to the USB drive.
6. Insert the USB drive into the CRX.
7. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
8. Select **File Manager**  on the Settings menu. The *File Management* window will open.
9. Select **USB** from the left drop-down.
10. Select the unlock file.
11. Select **Copy**  .
12. Restart the CRX after the files have transferred.

System Shutdown

To turn off the system:

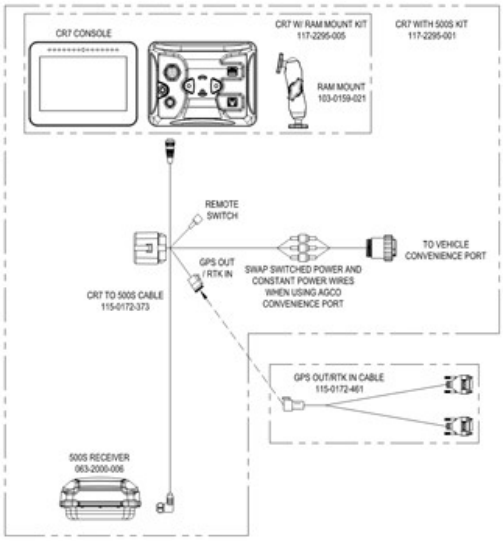
1. Select **Settings**  on the bottom left of the Home screen. The Settings menu will open.
2. Select the **System Shutdown**  button on the Settings menu or press the power button on the back of the CRX. The *Confirm Shutdown* window will open.
3. Select **Accept**  to turn off the system or **Cancel**  to return to the Settings menu.

System Diagrams

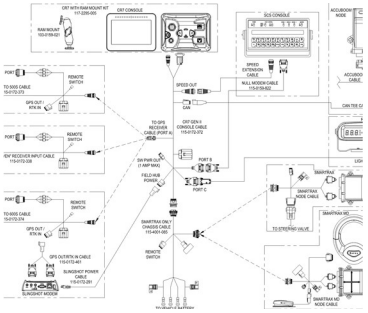
CR7™ System Diagrams

The illustrations below show CR7™ wiring diagrams for various cabling generations with optional accessories and are for reference only.

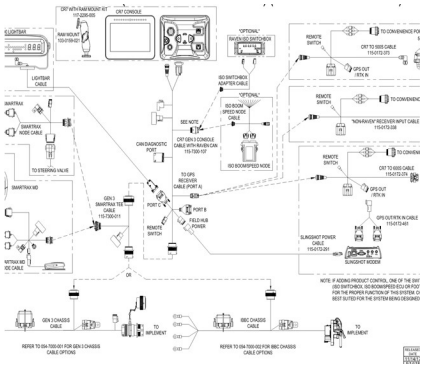
CR7™ With 500S Smart Antenna Kit



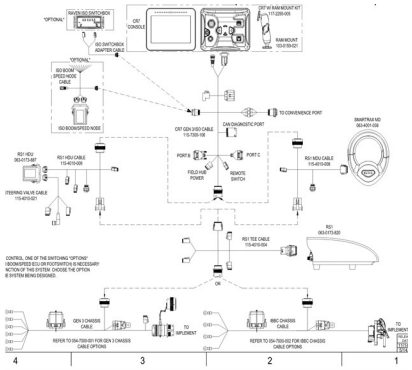
Gen II Cabling CR7™SmarTrax™/AccuBoom™ Only



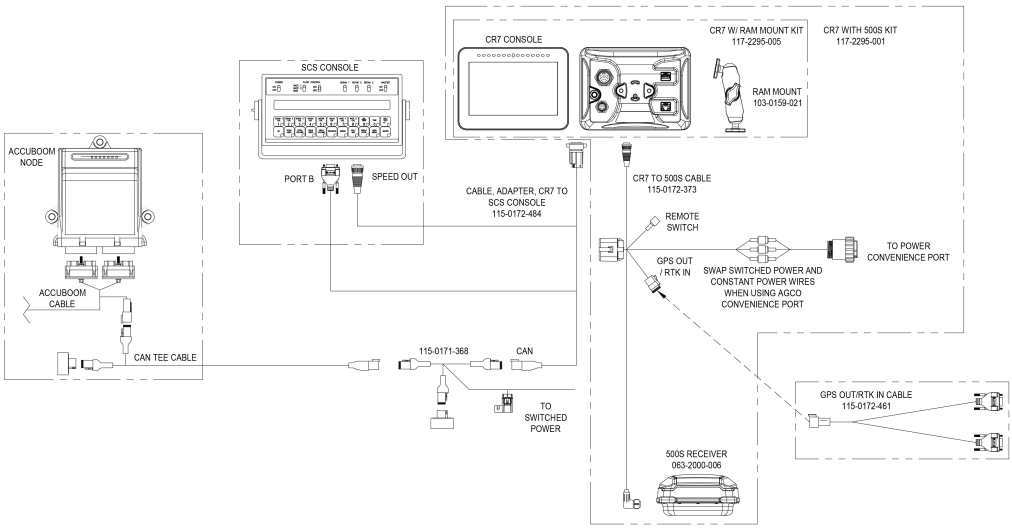
Full Gen II Cabling CR7™SmarTrax™/AccuBoom™



Gen 3 or IBBC Cabling CR7™SmarTrax™/AccuBoom™



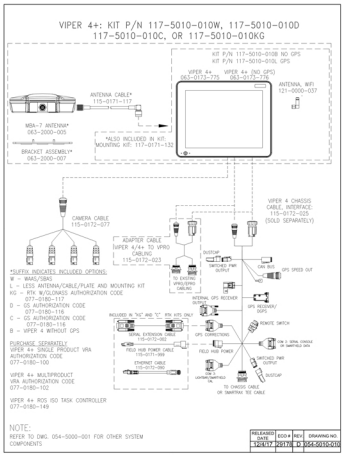
Gen 3 or IBBC Cabling CR7™SmarTrax™ ISO Product Control



CR12™ System Diagrams

The illustrations below show CR12™ wiring diagrams for various cabling generations with optional accessories and are for reference only.

CR12™ Basic Installation



Glossary

A

APN

Access Point Name

AprilTag

A specific system of fiducial markers used in robotics with visual or perception systems. OMNiDRIVE™ utilizes an AprilTag marker on the hood of the tractor with the Perception Controller.

B

baseline

In RTK correction systems, the baseline is the range between the base and rover. A maximum baseline defines the range between the base and the rover before RTK corrections begin to lose precision. Alternatively in some Raven field computers, a baseline is a segment of a boundary that can be used to create guidance lines and application zones.

C

COG

Course Over Ground

controlling combine

The combine that may assign paths to, and may sync with, the OMNiDRIVE™ tractor. One controlling combine is required for all OMNiDRIVE™ locations.

D

dBm

decibel milliwatt

DGPS
Differential Global Positioning System is an enhancement to standard GNSS/GPS messages to provide better position accuracy.

Differential
Differential Global Positioning System is an enhancement to standard GNSS/GPS messages to provide better position accuracy.

DTC
Diagnostic Trouble Code

E

E-Stop
Emergency stop button or switch.

ECU
Electronic Control Unit

ESN
Electronic Serial Number

ESRI
Environmental Systems Research Institute

EULA
End User License Agreement

F

FNRP
Forward, Neutral, Reverse, Park

G

GFF
Grower, Farm, Field

GIS
Geographic Information System

GLONASS
Global Navigation Satellite System

GNSS
Global Navigation Satellite System

H

HDOP
Horizontal Dilution of Precision

HDU
Hydraulic Drive Unit

homologation
Approval or certification of devices (especially electrical and communications devices) for use in specific regions or countries.

I

IBBC
Implement Bus Breakaway Connector. Connects to the IBIC on the towed implement.

IBIC
Implement Bus Implement Connector. Connects to the IBBC mounted on the tractor or tow implement.

IMEI
International Mobile Station Equipment Identity

IVT
Infinitely Variable Transmission

L

lightbar

(a.k.a. light bar) Provides guidance control and display for swathing applications.

M

mid-point

Mid-points are points through which the cart must pass on the way to the stage or unload points. Mid-points may be used during route planning to adjust the route to keep the cart away from obstacles or to help point the tractor in the desired direction at the stage or unload points.

multipath

error induced in GNSS corrections due to signals arriving at the GNSS antenna after reflecting off of or diffusing from objects around the vehicle.

N

NMEA

National Marine Electronics Association

non-controlling combine

A combine operating with the OMNiDRIVE™ tractor and controlling combine. A non-controlling combine may share harvest coverage data to the coverage map during a harvest job, but cannot sync with or plan routes for the OMNiDRIVE™ tractor.

O

object pool

The user interface for a system or feature connected to an ISOBUS UT.

OLAF

Online Activation Form

OTA

(Over the Air) Software updates and other information pushed from Slingshot® servers via the Slingshot® system.

P

prescription map

Variable Rate Application utilizes a prescription (Rx) map for a given field and product to automatically adjust the rate of application based upon the target rate zones within the field. The .shp, .shx, and .dbf files required to create a shapefile prescription map must be in a polygon shape format that complies with the ESRI (Environmental Systems Research Institute) shapefile specifications and must also be in the WGS (World Geodetic System) 84 datum.

PRN

Pseudo-Random Number

PST

PowerShift Transmission

R

RSSI

Received Signal Strength Indicator

RTK

Real-time Kinematic

Rx map

Variable Rate Application utilizes a prescription (Rx) map for a given field and product to automatically adjust the rate of application based upon the target rate zones within the field. The .shp, .shx, and .dbf files required to create a shapefile prescription map must be in a polygon shape format that complies with the ESRI (Environmental Systems Research Institute) shapefile specifications and must also be in the WGS (World Geodetic System) 84 datum.

S

scout map

A map of field features or areas of interest in a field. Field features may include, but are not limited to field boundaries, weed or insect infestations, tile lines or waterways, rocks and rock piles, trees, spray or no-spray zones, etc.)

shapefile

A shapefile is a vector format consisting of a .shp, .shx, and .dbf file and is used to store geospacial data and information such as field boundaries, product application coverage, and waypoints.

SHCS

Socket Head Cap Screw

SIM

Subscriber Identification Module

SNR

Signal to Noise Ratio

SOG

Speed Over Ground

SSID

Service Set IDentifier

stage point

Location where the grain cart will stop and wait to sync with the combine. During harvesting, move the stage point to ensure the tractor is positioned conveniently for efficient syncing with the combine.

T

task controller

A software feature of an ISOBUS network which automates a system or logs data from various field operations. Capabilities of a task controller vary, but may offer

some simple control features such as automatic section control or more complex features for prescription rate control, etc.

U

unload point

Location where the grain cart will stop and wait to be unloaded into a grain truck. Move the unload point if the location where trucks will access the field changes.

UT

A Universal Terminal (formerly Virtual Terminal) is an electronic display or console capable of interfacing with ECUs on an ISOBUS network.

V

VRA

Variable Rate Application utilizes a prescription (Rx) map for a given field and product to automatically adjust the rate of application based upon the target rate zones within the field. The .shp, .shx, and .dbf files required to create a shapefile prescription map must be in a polygon shape format that complies with the ESRI (Environmental Systems Research Institute) shapefile specifications and must also be in the WGS (World Geodetic System) 84 datum.

VT

A Universal Terminal (formerly Virtual Terminal) is an electronic display or console capable of interfacing with ECUs on an ISOBUS network.

W

WGS

World Geodetic System

working set

The user interface for a system or feature connected to an ISOBUS UT.

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