

CRX Operation Manual

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MANUAL OVERVIEW

This manual is designed for use with CRX software version 2.0. Updates for Raven manuals are available at the Applied Technology Division web site:

<http://portal.ravenprecision.com/>

Sign up for e-mail alerts to receive notifications when Raven products updates are available on the Raven web site.

IMPORTANT SAFETY INFORMATION

This is a safety-alert symbol. When you see the symbol below on the device, be alert because there is the potential for personal injury.



Follow the recommended precautions and safe operating practices.

INGRESS PROTECTION RATING

The CR7 console is rated to IP65.

CRX OVERVIEWS

CR7 OVERVIEW

DESCRIPTION

The latest innovation from Raven is a small, yet powerful, field computer. The CR7™ is a 7" lightweight field computer with a simplified widget concept. Customizable in-job layouts, easily accessible settings, and ISO UT and Task Controller capabilities make this mighty unit a plug-and-play option for building an affordable system. The CR7 is compatible with many Raven products including:

- SmarTrax™ or SmarTrax 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.

SPECIFICATIONS

Connections	<ul style="list-style-type: none">• 2 CANbus Channels• 3 Serial Channels• One USB 2.0 Port• Gigabit Ethernet Port• Wi-Fi 802.11 b/g/n• Bluetooth 2.1 with EDR and BLE 4.0• Radar Speed Output• Keyed Power Start-Up and Shut-Down• Two Digital Sense Inputs
Display	<ul style="list-style-type: none">• Screen Brightness 850 NITS• 7" Widescreen• Capacitive Touch• 480 x 800 Resolution• Integrated Lightbar
Computing	<ul style="list-style-type: none">• 8 GB Storage• 2 GB RAM• 852 MHz Quad Core Processor
Power	<ul style="list-style-type: none">• 7-16 VDC Input• 850 mA Typical• Supply Power Fuse: 5 Amp MINI[®] Fuse
Mechanical	<ul style="list-style-type: none">• 7.5" x 5.6" x 3.0"• Weight: 1.4 lbs• 1" RAM Ball Mount
Environmental	<ul style="list-style-type: none">• Operating Temperature Range: -20°C to 70°C• Storage Temperature Range: -40°C to 70°C• IP65 Moisture Protection• Operating Altitude: 2000m Maximum
Certifications	<ul style="list-style-type: none">• CE• E-Mark

CR7 CONSOLE OVERVIEW

This section provides a basic overview of the front and back of the CR7. References to various parts of the CR7 may be mentioned through this manual. It is important to become familiar with the CR7 prior to operation.

FIGURE 1. CR7 Display

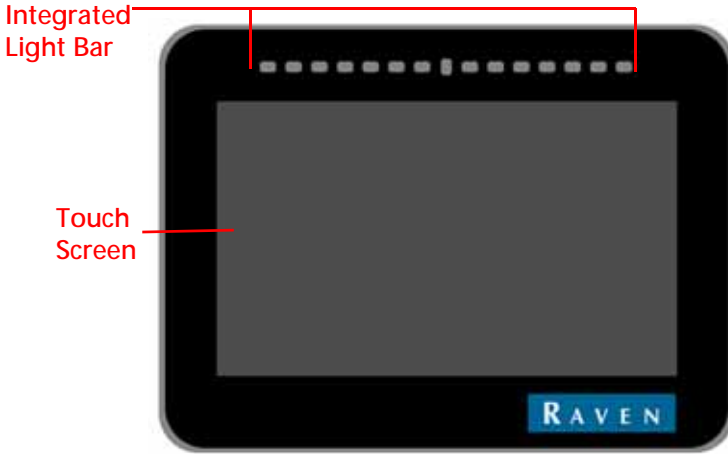


FIGURE 2. Back of CR7 Console



CR12 OVERVIEW

DESCRIPTION

The CR12 is a larger version of the CR7 with a 12.1" capacitive touch screen, and an intuitive, tablet-style interface. CR12 utilizes the CRX operating software platform.

Easy job set-up, fewer touches, and greater efficiency allow for extraordinary data management capabilities.

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

NOTE: Contact a local Raven dealer for information on additional features and options available for use with the CR12.

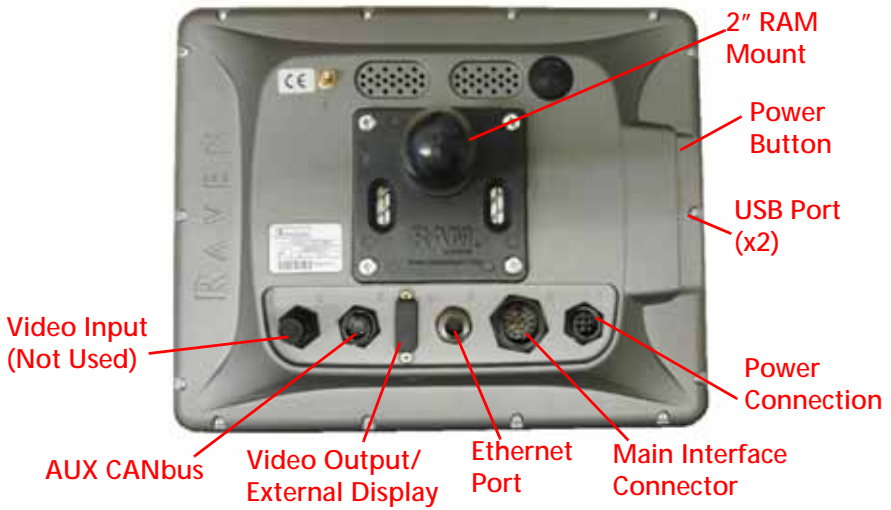
SPECIFICATIONS

Connections	<ul style="list-style-type: none"> • Two USB 2.0 • Four ISO 111898 CANBUS 2.0 Compatible Ports • Five RS232 Series Data Ports (GPS Out, GPS In, Console, Auxiliary, RTK)
Display	<ul style="list-style-type: none"> • Screen Brightness 850 NITS • 12" Widescreen • Capacitive Touch • 1024 x 768 Resolution • Integrated Lightbar
Computing	<ul style="list-style-type: none"> • Quad Core Cortex A9 Processor • 1 GB DDR3 RAM • 30 GB Internal Storage
Power	<ul style="list-style-type: none"> • Four to 35 VDC
Mechanical	<ul style="list-style-type: none"> • 9.63" x 12.02" x 1.79" • Weight: 4.7 lbs • 2" RAM Ball Mount
Environmental	<ul style="list-style-type: none"> • Operating Temperature Range: -20°C to 70°C • Storage Temperature Range: -40°C to 85°C • IP65 Moisture Protection
Certifications	<ul style="list-style-type: none"> • CE

FIGURE 3. CR12 Display



FIGURE 4. Back of CR12 Console



CARE AND MAINTENANCE

- Harsh chemicals may damage the touch screen. Clean the touch screen and console 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 console without shutting down the CRX may result in damage to the unit which will require the console to be returned for service.
- To avoid scratching the touch screen, do not use any type of sharp instrument.
- Store the console in a dry environment when not in use.
- Damage to the console may occur if the USB ports are used to charge mobile devices such as cellular phones, tablets, or mp3 devices. The 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 console from the vehicle and store it in a climate controlled environment.
- Even when powered down, the CRX console 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 console.

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual. Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better. To serve you best, please send an email with the following information to

techwriting@ravenind.com

- CRX™ Operation Guide
- Manual No. 016-0171-664 Rev. C
- Any comments or feedback (include chapter or page numbers if applicable).
- Let us know how long have you been using this or other Raven products.

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

INSTALLATION

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. If the mounting location is not metallic, use a mounting plate to mount the antenna.
2. Route the Power/GPS cable to the back of the CRX console and connect it to the Power/GPS port.
3. Use the provided RAM mount arm to install the CRX inside the cab.
4. For additional cabling and connection assistance, refer to the CRX Installation Quick Guide. Additional system diagrams are available on the Raven web site.

<http://portal.ravenprecision.com/>

QUICK START SETTINGS

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

IMPORTANT: Enter all measurements as accurately as possible to ensure fewer issues with field operations. Verify all measurements before entering them into the CRX and ensure you enter the numbers correctly.

IMPORTANT: If configuring a CR12, the startup wizard will ask for the cable harness type. The default cable harness is 117-8000-064 is the European cable. If using a different cable, select that cable from the drop-down. The cable selection can be edited later in the GPS Information tab if needed.

After powering up the CRX for the first time:

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




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

2. Press Next . The First Run Setup: Select Time Zone screen will open.


NOTE: At any time press Previous  to return to the previous screen.



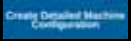
3. Select the desired time zone from the drop-down.

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.

4. Press Next . The First Run Setup: Select Units window will open.
5. Select the desired units (US Standard, Metric, or Turf) from the check boxes beside the Distance Units, Speed Units, Area Units, Weight Units, Volume Units, and Pressure Units.




6. Press Next . The First Run Setup: Grower/Farm screen will open.
7. Enter the desired grower name in the Name the Default Grower cell.

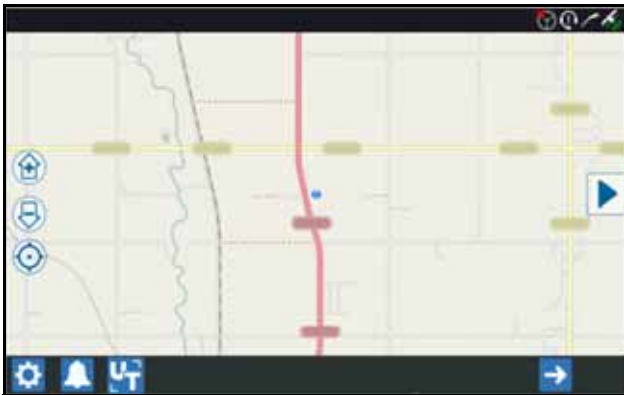
8. Press Next  . The First Run Setup: Configure Machine Configuration window will open.
9. Select Quick Start  to quickly create a simple machine configuration that can be edited later. If desired, select Create Detailed Machine Configuration  to create a detailed machine configuration. After pressing Quick Start, the Machine Configuration: Quick Start window will open.

NOTE: Selecting Quick Start only allows for the creation of basic guidance lines. For additional functionality select Create Detailed Machine Configuration.

10. If Quick Start was selected, enter the desired Guidance Width in feet or meters. Guidance width is the width that will be displayed on the field computer.

NOTE: Guidance width is the width of the implement. This is used for creating swath widths of guidance lines and is crucial for most field applications.

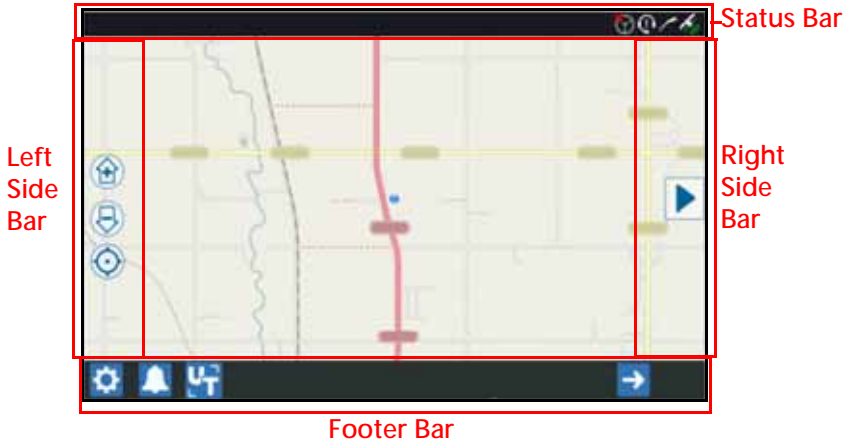
11. Press Accept  . The End User License Agreement window will open.
12. Read the information in the End User License Agreement window and press OK. The Warning window will open.
13. Read and acknowledge the information on the Warning window. The Home screen will open.
14. Refer to the appropriate sections in this manual to adjust the settings, start a job, and perform other tasks on this screen.



NOTE: Press the Settings  button at any time it is visible to return to the Settings screen.

HOME SCREEN OVERVIEW

The home screen is the first screen that opens after powering up the CRX and accepting all disclaimers. The home screen (see image below) provides basic options for starting New Jobs, accessing Machine Setup, and viewing maps.






















NOTE: Go to portal.ravenslingshot.com to locate and download Street Maps for the CRX.

CRX SETTINGS SCREEN OVERVIEW

STATUS BAR







The status bar includes the following informational icons for quick reference. Note that the different icon colors indicate different status:

Item Number	Icon	Description
		Bluetooth Connected Indicates that there is a Bluetooth device connected to the CRX.
		GPS Bad Indicates no GPS. To address GPS issues, refer to the "GPS" on page 48.
		GPS Disabled GPS functionality is turned off. To address GPS issues, refer to the "GPS" on page 48
		GPS Ideal Indicates the GPS is active and receiving a good signal. To address GPS issues, refer to the "GPS" on page 48
		GPS No Data Indicates there is not GPS detected. To address GPS issues, refer to the "GPS" on page 48
		GPS Warning Indicates poor or no GPS connectivity. To address GPS issues, refer to the "GPS" on page 48.
		Job Load Progress Indicates that a job load is in progress.
		Remote Support Active Indicates there is a remote support session active.
		Remote Support Disabled Indicates that there is not currently a remote support session active. Refer to the "Remote Support" on page 49 for additional information on remote support.
		Slingshot Connected Indicates that the CRX has a good Slingshot connection. Refer to the Slingshot operation manual for additional information on Slingshot functionality.

	Slingshot Disabled	Indicates that Slingshot functionality is turned off. Refer to the Slingshot operation manual for additional information on Slingshot functionality.
	Slingshot Transfer	Indicates there is currently information being transmitted/received via Slingshot. Refer to the Slingshot operation manual for additional information on Slingshot functionality.
	SmarTrax Disabled	Indicates that 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 Node Download	Indicates that a software update is being installed on the SmarTrax node. Refer to the SmarTrax operation manual for additional information on SmarTrax operation.
	SmarTrax Not Ready	Indicates that SmarTrax is not ready to be started. Refer to the SmarTrax operation manual for additional information on SmarTrax operation.
	SmarTrax Ready	Indicates that SmarTrax is ready to operate. Refer to the SmarTrax operation manual for additional information on SmarTrax operation.
	Software Update	Indicates a software update is waiting. Refer to “Software and Hardware Updates” on page 58 for additional information on updates.
	USB Scanning	Indicates that the CRX is scanning a USB that was just inserted into the CRX. Refer to “Software and Hardware Updates” on page 58 for additional information on updates.
	USB Transfer	Indicates the status of a USB transfer.

FOOTER ICONS

The icons on the bottom of the screen provide easy access to settings, the UT, and also different view operation views. The table below describes the function of the icons in the footer.



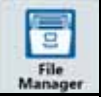


Icon	Function	Description
	3D View	Changes the run screen view to ground level.
	Alarms	Select this to review the notification on the CRX.
	Confirm	Select confirm to either accept the change or exit the job.
	Field View	Provides an aerial view of the field.
	Settings	Press the settings to return to the main CRX operation screen.
	UT	Select UT to open and control components on the ISOBUS.











SETTINGS ICONS





Customizable
Shortcut Bar



The table below shows the icons from the settings screen and provides a brief description of their function. Note that the icons may appear over multiple screens. Scroll to the left or right to view the other screens.

Icon	Information
	Allows the user to add other icons to the Shortcut Library on the main settings screen.
	The display can be set to Day or Night Mode and the Screen and Lightbar Brightness can be adjusted.
	Allows users to import/export files as well as view and delete files.
	Create, Rename, or Delete Growers, Farms, or Fields.
	Review GPS information, diagnostics, and adjust settings.


Icon	Information
 <p>Lightbar</p>	<p>Provides settings for Path Deviation Sensitivity, Center settings, and Reverse LED Indication.</p>
 <p>Localization</p>	<p>Provides setting options for Language, Time Zone, and Units of Measure.</p>
 <p>Machine</p>	<p>Allows the user to add a new machine or to update the existing machine configuration.</p>
 <p>Master Switch</p>	<p>Provides 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.</p>
 <p>Rate Control</p>	<p>Select this page to adjust prescription map Look Ahead settings for Variable Rate Applications (VRA).</p>
 <p>Remote Support</p>	<p>Select this page if working with technical support and they request access to the CRX via Slingshot. Click Enable Remote Support to allow them access to the CRX.</p>
 <p>Section Control</p>	<p>Provides control for individual settings including the On Override, Turn Off Percentage, and Look Ahead settings for section control.</p>
 <p>Serial Console</p>	<p>Configures the units for use with product control of the console. Typically these match the units configured within the SCS console.</p>
 <p>Serial Port</p>	<p>Provides information on the serial connection speed and the type of serial device.</p>
 <p>Slingshot</p>	<p>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.</p>

Icon	Information
	<p>The weather sensor 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.</p>
	<p>Allows the user to adjust On Line (OL) Sensitivity and the Line Acquire speed, configure all SmarTrax settings and run SmarTrax calibration.</p>
	<p>If there is a software update available, it can be installed on this page using either Slingshot Link or a USB drive. GPS and CRX unlock status and System information can also be found on this page.</p>
	<p>Provides information on UT instances, identify UT's or clear UT object pools.</p>

ADDING ICONS TO SHORTCUT LIBRARY

To add a widget to the Customizable Shortcut Bar:




1. Press Add Shortcut  in the Customizable Shortcut Bar.
2. Select the desired icon.
3. To remove an icon in the Customizable Shortcut Bar, press and hold the desired icon.
4. Press the X in the top-left corner of the icon when it appears.

MACHINE CONFIGURATION


IMPORTANT: Entering all measurements as accurately as possible will ensure fewer issues with field operations. Verify all measurements before entering them into the CRX and ensure you enter the numbers correctly.

Perform machine configuration when installing the CRX on a new machine. To configure a machine:



1. On the settings screen, press the Machine  button. The machine Configuration window will open.



2. Press the Add Machine button . The Select Machine window will open.
3. Press Create New Machine.
4. Select the machine type. Available options are:
 - Traditional
 - Self Propelled
 - Articulated
 - Tracked

NOTE: During machine configuration, if creating a self-propelled machine with an ISO boom connected to the CANBUS, select the ISO Boom instead of creating a new boom.

NOTE: During machine configuration, if selecting a SCS, select the desired SCS instead of creating a new boom.

5. Enter the machine name in the <enter name> field.

6. Press Next . The Antenna Height Above Ground window will open.

7. Enter the Height from the ground to the center of the antenna.

8. Press Next . The Distance: Antenna Offset From Center will open.

9. Enter the distance the antenna is offset from the center of the implement.

10. Select if the offset distance is to the Left or Right of center.

11. Press Next . The Distance: Rear Axle to Antenna window will open.

12. Enter the distance from the center of the rear axle to the center of the antenna.

13. Select if the distance is Ahead of or Behind the axle.

NOTE: If an Articulated machine, select if the antenna is in front of or behind the articulation point.

If a Tracked machine, select if the antenna is in front of or behind the track center.

14. Press Next. For Articulated Tractors, enter The Distance:Rear Axle to Pivot.

NOTE: This allows the CRX to calculate the correct position of the implement for determining the coverage rate and boom control functions.


15. Enter the distance from the pivot point to the center of the rear axle.

16. Press Next  . The Distance: Hitch Offset From Center window will open.

17. Enter the distance from the center of the machine to the center of the hitch.

NOTE: This allows the CRX to calculate the correct position of the implement for determining the coverage rate and boom control functions.

18. Select if the distance is to the Left or Right of the axle.

19. Press Next  . The Distance: Rear Axle to Hitch window will open.


20. Enter the Distance from the rear axle to the hitch.

NOTE: If a Tracked Machine, enter the Distance from the track center to the hitch.

21. Press Accept  .


DELETING AN EXISTING MACHINE

To delete an existing machine:

1. Press Machine  on the CRX settings screen.


2. Select the desired machine.

3. Press Delete  . The Confirm Delete Machine window will open.

4. Select Accept  to delete the machine or cancel to return to the Select Machine window.


CREATING A MOUNTED IMPLEMENT

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







1. On the settings page, press the Machine  button. The Machine Configuration window will open.

2. Press the Edit icon. Either modify the existing machine or select an implement to mount to an existing machine.



3. Add Machine button  . The Select Machine window will open.
4. Verify a machine is selected from the drop down.
5. Press Mount Equipment.
6. Press Create New Equipment.
7. Enter a name for the equipment.







NOTE: If selecting a SCS or an item connected to the ISOBus, skip to step 15.

8. Enter the Total Width.
9. Enter the Number of Sections.
10. Press Next  . The Guidance Width will open. The Guidance Width is automatically assigned the same value as the Total Width.
11. If desired, enter a different Guidance Width.
12. Press Next  . The Section Layout window will open.
13. Review the information on the Section Layout information. If desired, select the width below one of the sections to adjust the width for that section.
14. Press Next  . The Axle to Equipment window will open.
15. Enter the Distance from the axle to the equipment.
16. Select if the equipment is Ahead or Behind the axle.
17. Press Next  . The Equipment Offset From Center window will open.
18. Enter the Distance from the center of the implement to the center of the machine.
19. Select if the equipment is offset to the Left or Right of center.
20. Press Accept  if all of the settings are correct. If needed, press previous  and adjust information.

ADDING DRAWN EQUIPMENT

This section describes how to add a piece of drawn equipment to an existing machine:

NOTE: Drawn equipment included two wheel and four wheel carts. Unless the equipment is steered from the front wheels choose a two wheel cart.

1. On the settings page, press the Machine  button. The machine Configuration window will open.
2. Press Add Drawn Equipment . The Select Cart window will open.
3. Select the desired cart type from the <Select Cart> drop-down or select Create New Cart.
4. After selecting Create New Cart the Create New Cart screen will open. If creating a new cart continue with the process. If selecting an existing cart, skip to step 11.
5. Enter the desired name.
6. Select if the cart is a Two Wheel Cart or Four Wheel Cart.
7. Press Next . The Distance: Tongue to Axle will open.
8. Enter the distance from the center of axle to the front of the tongue.
9. Press Next . If a Four Wheel Cart the Distance: Axle to Axle window will open. Enter the distance between the two axles. If a Two Wheel Cart it the Distance: Axle to Hitch screen will open.
10. Enter the distance from the center to the rear axle to the back hitch.
11. Press Accept .
12. Press Mount Equipment. The drawn equipment is now mounted to the implement.
13. To edit a piece of Drawn Equipment, press the Edit  button.
14. To unmount a piece of Drawn Equipment, reset the configuration then add select the desired tractor again.

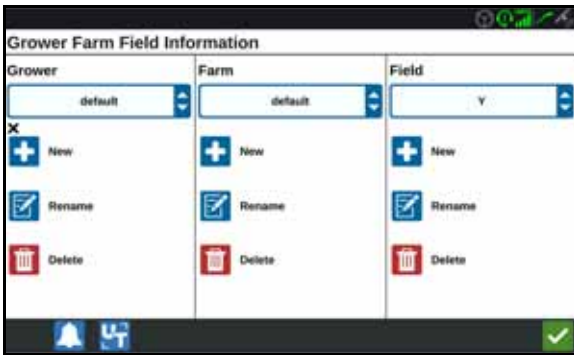
NOTE: Resetting an implement or piece of equipment will not delete previously created profiles but will place it back in the inventory.

CREATING A NEW GROWER, FARM, AND FIELD

Grower, Field, and Farm (GFF) data can be added to the CRX prior to starting a new job.



1. On the Settings screen, press GFF . The Grower Farm Field Information window will open.
2. Select New from the Grower column. The Add Grower window will open.
3. Press in the Enter Grower Name cell and enter the desired grower name.
4. Press Accept . The Grower Farm Field Information window will open.



5. In the Farm column select New . The Add Farm window will open.
6. Press in the Enter Farm Name cell. Enter the desired farm name.
7. Press Accept .
8. In the Field column select New . The Add Field window will open.
9. Press in the Enter Field Name cell. Enter the desired field name.
10. Press Accept .



ACCESSING, EDITING, AND DELETING EXISTING GROWERS, FARMS, AND FIELDS

NOTE: When starting a new job the default grower and farm will set to a default grower and farm. When saving, always ensure that the that the files are saved under the correct growers and farms.



1. On the CRX Settings screen, press GFF . The Grower Farm Field Information window will open.
2. Select the desired Grower, Farm, and/or Field from the appropriate drop-down.

RENAME EXISTING GROWER, FARM, OR FIELD

1. Ensure the desired GFF is visible in the drop-down.
2. Press Rename . The Rename Grower, Rename Farm, or Rename Field window will open.
3. Enter the new name.
4. Press Accept .

DELETE EXISTING GROWER, FARM, OR FIELD

1. Ensure the desired GFF is visible in the drop-down.
2. Select Delete .

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.

STARTING A JOB

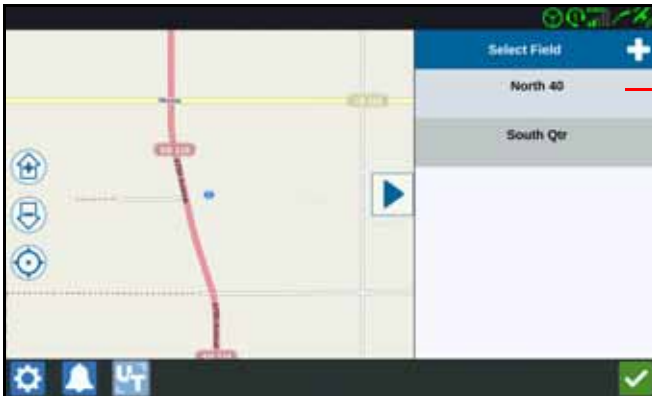
STARTING AN EXISTING JOB

1. On the home screen, press the Blue Arrow  half way up the right side of the home screen.



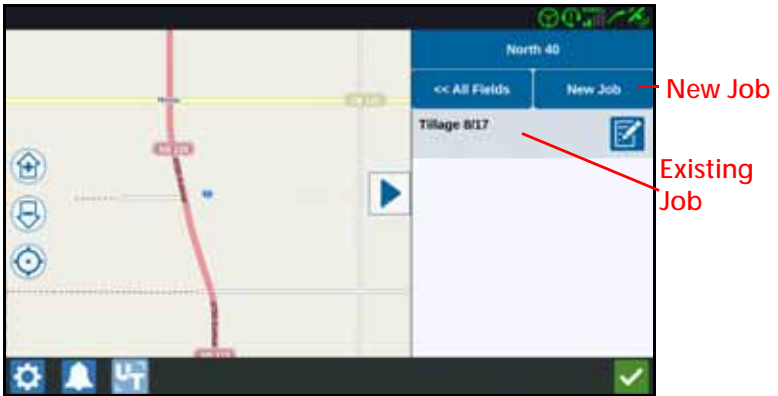
Select an Existing Job

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





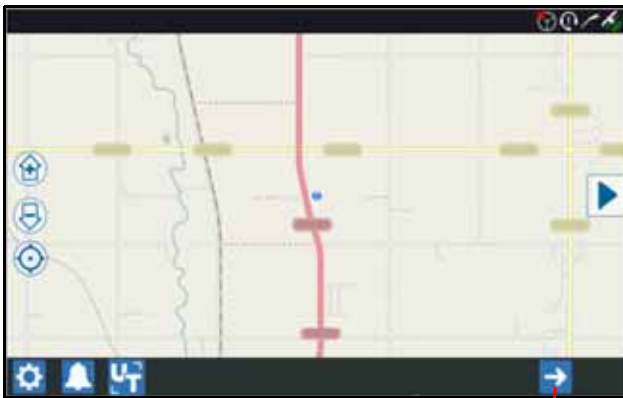
Select Existing Field



3. Select the desired job or select New Job to start a new job.




START A NEW JOB IN A NEW FIELD

4. On the home screen press Next  at the bottom of the screen or press the Blue Arrow  and select New Job.



5. Enter a field name in the Give This Field A Name cell.
6. Enter a job name in the Give Your Job a Name cell.
7. Press Next  . The Product To Implement Assignment window will open.
8. Review the coverage to implement assignments. If desired, press Edit  . The edit window will open.
9. If desired, select an Operation Plan to apply to the field.
10. Select the desired coverage option(s) from the drop-down menu.

11. Press Accept  .

12. Press Next  . The run screen will open.

OPERATION PLANNING


NOTE: Operation planning is only available on CR12.

Operation planning is a method to define guidance lines (including tram lines) and headland application regions for an operation on a field. A operation plan can be selected to use for any job in the 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 two parts:

- Pre-planning allows the user to adjust field boundary and lines that are created based on the boundary.
- Planning allows the user to create a plan for the field using the boundary modified in pre-planning or existing guidance lines, add guidance lines, and application zones.

To create a new operation plan:

1. Select Edit  next to the desired field. A Field Management window will open.
2. Select Operations Planning.

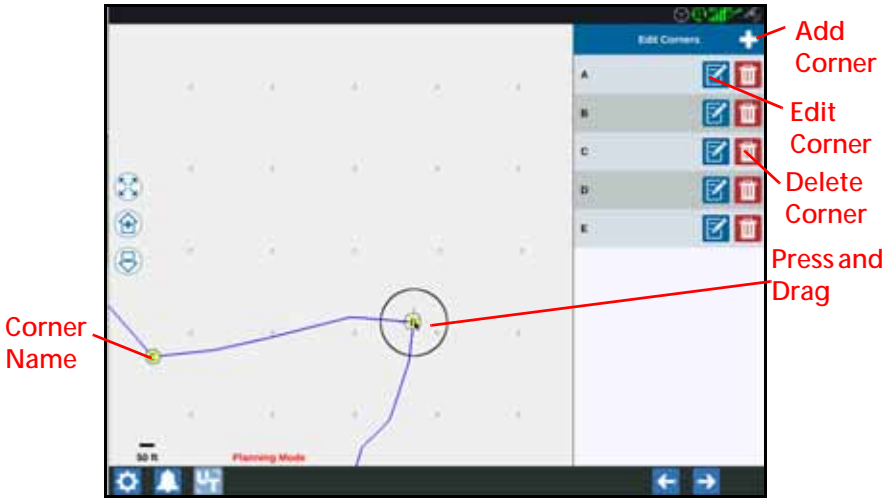
NOTE: If needed, select Scouting to create a field boundary to use for operations planning. A screen similar to the run screen will open but will not apply product.

PRE-PLANNING


NOTE: Pre-planning must be selected.

1. Select the desired boundary.

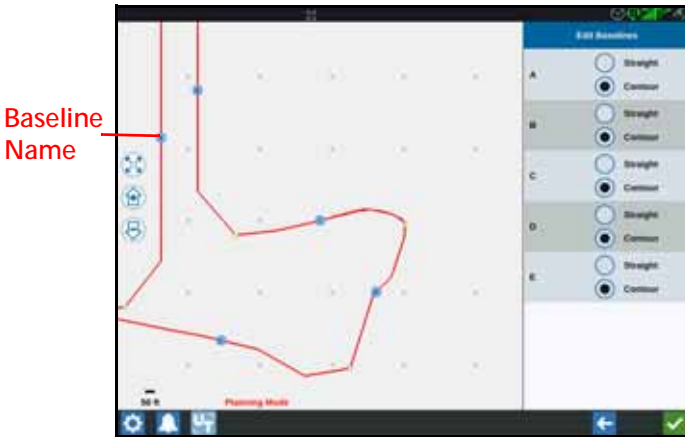
2. Press Accept  . The Edit Corners window will open.



3. If a corner is missing, press Add Corner.
4. The Edit screen allows the user to adjust the corner. Each corner is assigned a letter designation. Select Edit by the desired corner in the Edit Corners list and move the Adjust Corner Detection Radius slider until the edge of the corner has the desired radius. If using the Adjust Corner Detection Radius slider does not provide the desired results, press, hold, and drag on the corner name.
5. Select the desired corner location.


6. Press Next . The Edit Baselines window will open. Each line is assigned a letter. For each baseline, select if the baseline is a straight line or a contoured line.

NOTE: A baseline is a boundary that can be used to create a guidance lines and application zones.



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

7. To change a baseline from a contoured line to a straight line, select the desired radial button next to the baseline name in the Edit Baselines list.

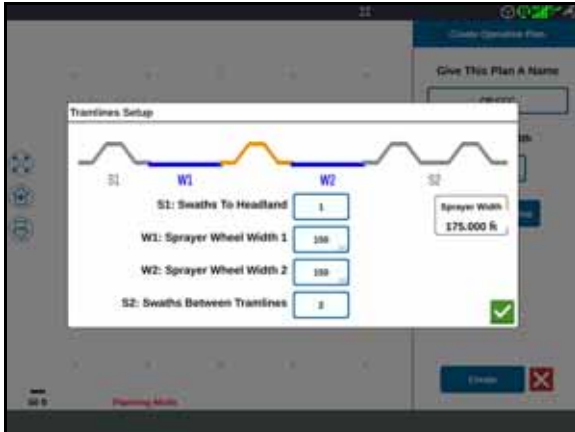
8. Press Accept . The Create Operation Plan window will open.
9. Enter a name for the plan.

PLANNING

1. Enter a Swath Width that matches the implement width.

NOTE: If using tram lines, enter the width of the planter.

2. If desired, select Tramlines Setup. The Tramlines Setup window 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.

3. In the S1: 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 enter 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.

4. In the W1: Enter the value for the extra width of one of the side tires. This is typically the wheel width plus a few inches.

5. In the W2: Sprayer Wheel Width 2 cell, enter the width between the sprayer wheels.

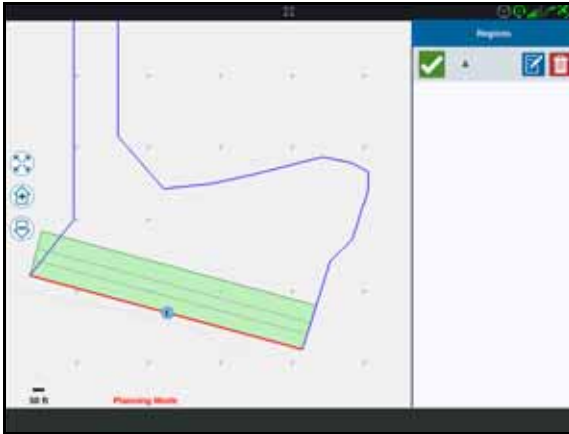
6. In the S2: Swath Between Tramlines cell, desired number of swaths between the tramlines. Generally this will be the number of planter swaths it takes to cover one pass for the sprayer.

7. Press Accept . The Region Settings window will open.

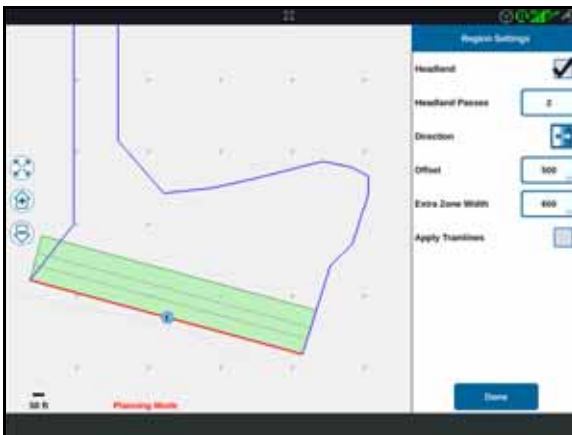
PLAN OVERVIEW

The plan overview screen displays the full plan. Each plan consists 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 one of the baselines. The Regions Settings window will open.



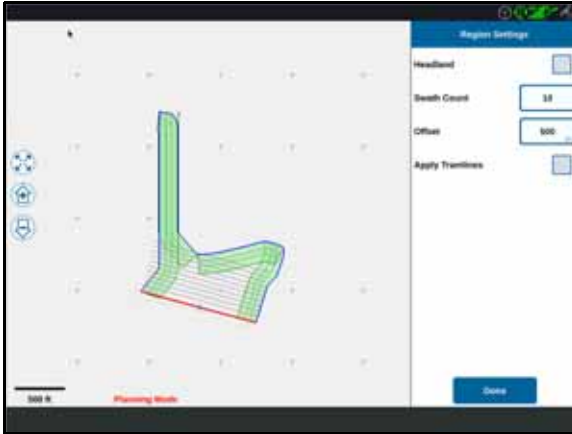
2. Adjust the desired settings.



Setting Option	Description
Apply Tramlines	This typically will only be used when the regions is not a headed region. This will apply the tramline sequence to the selected baseline.
Extra Zone Width	This is the extra space wanted between the center part of the field and the headlands application area. This value of non-zero will leave a gap between the headland and the center part of the field.
Direction	This will switch the side of the baseline that the regions is set for.
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	This is the extra space wanted between the baseline and the first swath. This space will be a non-covered area around the edge of the field.

- To add to the plan, select Add Baseline or Guidance line.
- If this baseline will be a headland, check the Headland checkbox.
- 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.



- Select if the offset Direction will be inside or outside of the baseline.
- Enter an Offset measurement. This will offset the tramline from the edge of the field boundary.
- Enter an Extra Zone Width measurement. This will offset the tramlines within the field from each other by the entered width.
- Select Apply Tramlines. This will apply the tramline settings created earlier.
- Edit any Additional Tramlines.
- Select Done.
- 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.

- When starting a job, select the desired operation plan.
- 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. Any nudges or settings adjusted on the run screen will not be saved with the plan.

RUN SCREEN OVERVIEW







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







RUN SCREEN OVERVIEW

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	Function	Description
	AB Contour	Indicates that the currently selected line is an AB Contour.
	AB Heading	Allows the user to enter a GPS heading.
	AB Load	Load an AB guidance line.
	Guidance Lines	Start or load a new guidance line.
	Last Pass	Create a Last Pass line with this widget.
	Pivot	Create an pivot guidance line with this widget.

Icon	Function	Description
	Scouting Object	Provides information on existing scouting features and creating scout features.
	Widget Configuration	Select or deselect widgets that will display on the run screen.
	Zoom In	Zooms into the run screen map.
	Zoom Out	Press zoom out to zoom out on the run screen map.

WIDGETS


There are many widgets that can be placed on the run screen. The table below shows the widget as well as describes the function.



Pressing and hold widgets with the lower-right corner (shown below) of the widget folded over to open the widget function.
















— Folded Corner

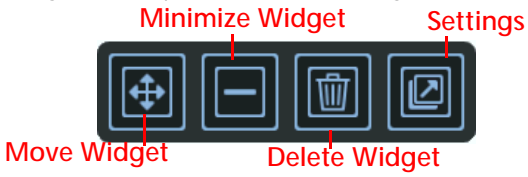
To add/change the widgets visible on the run screen:

1. Press the Widget Configuration  widget.
2. Select or deselect the desired widgets from the list.

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.

Widget	Name	Function
	Altimeter	Displays the machine elevation.
	Applied Area	Provides options for showing the applied area(s).
	Product Rate	Allows the user to adjust the product rate.
	Product Select	Allows the user to select different products.
	Course Over Ground	Provides settings for configuring the settings for the GPS course.
	Distance Off Guidance Line	Displays the distance the implement is off of the guidance line.
	Guidance Line Nudge	Provides settings for nudging the guidance line left or right.
	Line Recal	Recalibrates the line. If in last pass, it will try to find a different line.
	Master Switch	Indicates if the master switch is on (green) or off (red).
	Section Status	Available in various widths and allows the operator to select the best option for displaying configured sections.
	SmarTrax Status	Add the SmarTrax widget to easily view SmarTrax status or access SmarTrax Settings.
	Steering Status	Displays is steering is engaged.
	Swath Number Status	Shows the swath number. Depending on configuration, it will display either relative or absolute.

3. Long pressing the widgets will open the widget bubble. This gives the user an opportunity to move, minimize, or delete a widget. It also provides options to adjust the settings for the product/feature widget.





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:


- Field Boundary
- Do Not Apply Zone
- Application Zone
- Line
- Flags

CREATING A FLAG

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 Scout Object  icon.
2. Select the Add  icon next to Scout Features.
3. Enter the desired name. In this case, Enter Flag 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 .

CREATING A FIELD BOUNDARY, DO NOT APPLY ZONE, OR APPLICATION ZONE






Field boundaries indicate the edges of a field.

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

Application zone indicates the outside edges of the desired application area.

1. Select Scout Object  icon.
2. Select the Add  icon next to Scout Features.
3. Select the desired task.
4. Select the desired start recording point. It can be either centered with the implement, or on either side of the implement.








5. Press Start Recording.
6. Drive the desired path/boundary.
7. When complete, select Scout Object .
8. Select either Pause  recording or End Recording .
9. After selecting End Recording, press Accept  to confirm the end of the job if selected.
10. Enter a name for the feature. If desired, press Delete .

CREATING GUIDANCE LINES

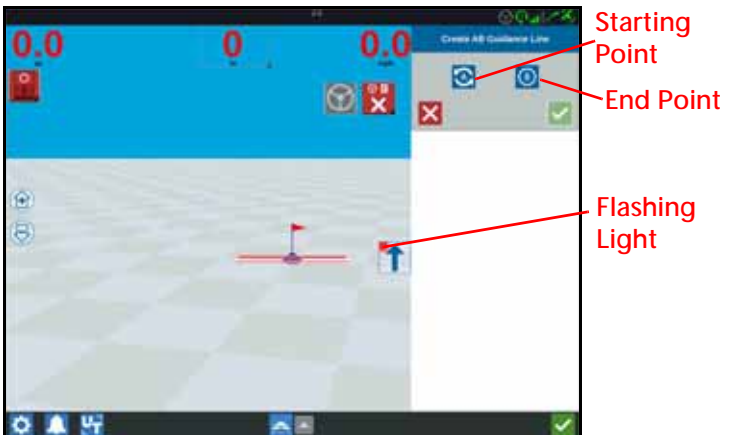
1. Select the guidance line icon.

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






2. Select the desired guidance line type.

Widget	Name	Function
	A+	Creates a guidance line with a starting point (A) and numerous additional points along a path.
	Contour	Allows the user to create a curved guidance line.
	Load	Load an existing guidance line.
	Pivot	Allows the user to create a guidance line to use as a sharp pivot.
	Straight AB	Creates a straight guidance line.

3. When on 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 will indicate the line is recording.



4. When done recording, press 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. Press Accept . If desired, select Delete  to delete the guidance line.
10. When in a job, it select Load  to load and use an existing guidance line.

ADJUSTING 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 and the default Turn Off Percent is 95%. To adjust the number of sections, adjust the tractor settings.

NOTE: 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 to re-apply 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 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.

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.

- 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.

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.

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

To adjust the Off Look Ahead, On Look Ahead, On Override, and Turn Off Percentage:



1. On the CRX Settings page, select Section Control
2. Press in the cell to the right of the desired setting.
3. 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.

4. Press Accept  .

ADJUSTING RATE CONTROL SETTINGS



1. On the CRX Settings page, select Rate Control .
2. Select the desired implement from the drop-down.
3. Select the cell next to the Prescription Map Look Ahead.
4. Enter the desired look ahead distance (in seconds).

ADJUSTING SETTINGS

DISPLAY SETTINGS

To access display settings:



1. Press Display on the CRX Settings page. The Display Settings window will open.
2. 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.

3. In Day Mode or Night Mode it is possible to adjust the Screen Brightness or Lightbar Brightness by dragging the slider bar to the desired brightness.

LOCALIZATION


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



1. Press Localization on the CRX Settings screen. The Localization window will open.
2. Select the desired language from the Language drop down.
3. Select the desired Time Zone from the 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.

4. For units select USA, Metric, or Turf for Distance. Also select the desired Speed, Area, Weight, Volume and Pressure units.




5. After adjusting all the settings, press Accept  .

SERIAL PORT INFORMATION

To access serial port information:


1. Press Serial Port  on the CRX Settings screen. 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.
2. To access information on other serial ports, select the desired Port from the left side of the window.
3. After viewing the Serial Port information, Press Accept .

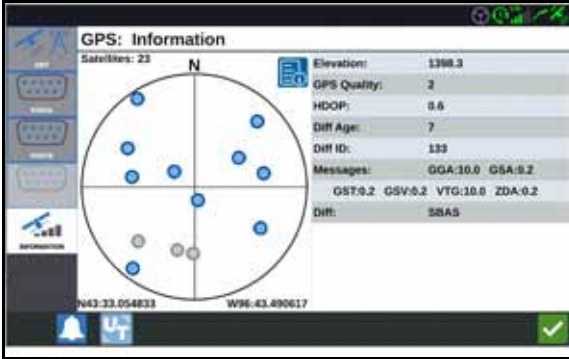
GPS


1. Press GPS  on the CRX Settings screen.
2. Press the DIFF  tab to view and select GPS Differential Setup information such as available differential Type and PRN.
3. Press the PORT A  tab to view and edit information on Port A GPS configuration. If desired, press 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.



- Press 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.




- After viewing and editing the GPS information, Press Accept .

REMOTE SUPPORT

Remote support allows a Raven service specialist to remotely control the CRX. If remote support is needed to troubleshoot or access information on the CRX remote support will have to be enabled. Remote support on the CRX can only be completed via Slingshot. To enable remote support:

- Press Remote Support  on the CRX Settings screen. The Remote Support page will open.
- Select the Enable Remote Support checkbox.
- 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.
- Accept the waiver to enable remote support.
- After Enabling Remote Support, press Accept .

MASTER SWITCH CONFIGURATION


1. Press Master Switch  on the CRX Settings screen. The Master Switch Control Configuration window will open.
2. If desired, select the Require All On checkbox. This requires all selected inputs to be On for the Master to be on. Otherwise only one selected input needs to be on.
3. The default for On-Screen checkbox is selected.

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

AccuBoom - Select this option if there is a wired switch on the AccuBoom cabling orange wire to act as a master switch.

Steering - Select this option if you want the SmarTrax to record data only when steering is engaged.

On-Screen - Only selectable if all other options are not selected.

4. After adjusting all the settings, press Accept .


UNIVERSAL TERMINAL (UT) SETTINGS

The UT Settings page provides options to identify connected UT's, clear the UT Object Pool or change the UT instance when multiple UT's are available. To access

the UT Settings page, press UT Settings  on the CRX Settings page.


LIGHTBAR CONFIGURATION

NOTE: Lightbar configuration will only be available on CR12 if a lightbar is detected.

1. To access the Lightbar Configuration settings, press Lightbar . The Lightbar Configuration window will open.
2. The default setting for the lightbar is that it is enabled. To disable the light-bar, deselect the Enable checkbox.


3. The default setting for the Reverse LED Indication is active. To deactivate the Reverse LED Indication, deselect the Reverse LED Indication checkbox.



NOTE: Selecting or deselecting the Reverse LED Indication will change if the lightbar LEDs display to the right if to the right of the guidance line or to the left if to the right of the guidance line.

4. The default setting for Path Deviation Sensitivity is Fine. To adjust the Path Deviation Sensitivity select the desired radial button. While adjusting the sensitivity, note that the light bar 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, the second light will turn on when the implement is 10" (26 cm) off line. After adjusting all the settings for the light-bar, press Accept .

If an external lightbar is connected via the serial port, that option will display on the Lightbar Settings page and be selected. If desired, deselect the external lightbar.

NOTIFICATIONS

Press the Notifications  button to access the Notification History. To view more information on a specific notification, press the notification. A notification window will open displaying the notification type, additional notification details, and how long ago the notification occurred. After reviewing the notification, press Complete








. When done viewing the notifications, press Accept .

FILE MANAGER

The file manager allows the user to sort and move files (if desired). If the file is currently located on a USB stick, connect to the USB port on the back of the CRX.


FILE TYPES



The table below shows available file types on the CRX.

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.
	Guidance Line	This icon indicates the file type is a guidance line.
	Job	This icon indicates that the file type is a job file.
	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.

COPY A FILE






1. Press File Manager  on the CRX Settings page. The File Management window will open.
2. Select either USB (if connected to the CRX) or Local (on CRX) from the source drop-down.
3. 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.

4. Select the desired file(s) to be copied.
5. Press 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.
6. Press Accept  after selecting the desired file(s).

DELETE A FILE



1. Press File Manager  on the CRX Settings page. The File Management window will open.
2. Select either USB (if connected to the CRX) or Local (on CRX) from the source drop-down.
3. Either select the desired files or All Files checkbox to select all of the files on the CRX or sort files by GFF.
4. Select the desired file(s) to be deleted.
5. Press Delete  to delete the selected file. The Delete Files window will open. Press OK to delete the file(s) or Cancel to not delete the file.
6. Press Accept  after selecting the desired file(s).

IMPORTING MAPS, GUIDANCE LINES, AND FEATURE UNLOCKS

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

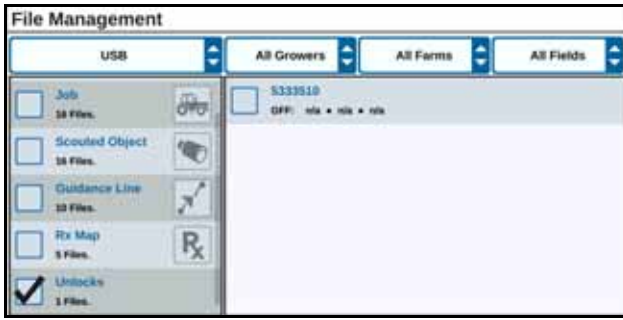


1. Press File Manager  on the CRX Settings page. The File Management window will open.

2. Select USB from the left-most drop-down.




3. Navigate to and select the desired file type. For this example it is a feature unlock.



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




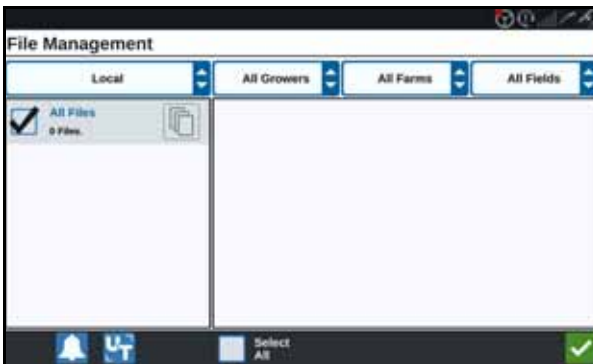
5. Press Copy Files . The files will copy to the CRX.

- 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.

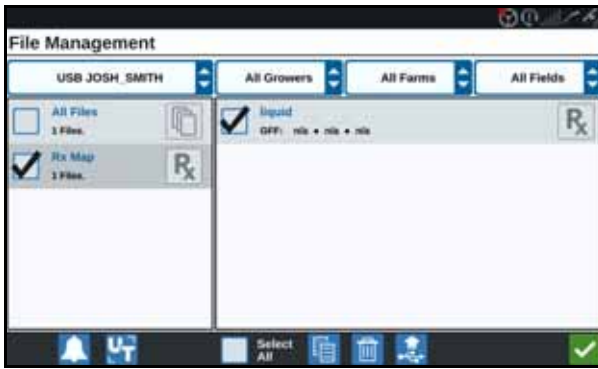


LOADING AND RUNNING A PRESCRIPTION MAP

- Place the prescription map file (this will be a .dpf, .shp, .shx file) on a USB drive. Do not create subfiles for the prescription maps.
- Insert the USB drive into the CRX.
- Select File Manager  on the settings page.
- Select the desired USB drive from the left-most drop down.






5. Select the desired prescription map from the list.

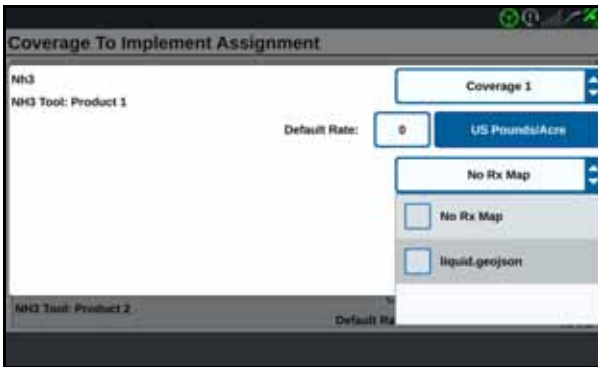


6. Select Copy .

7. Select Accept . A Copy Files window will open.

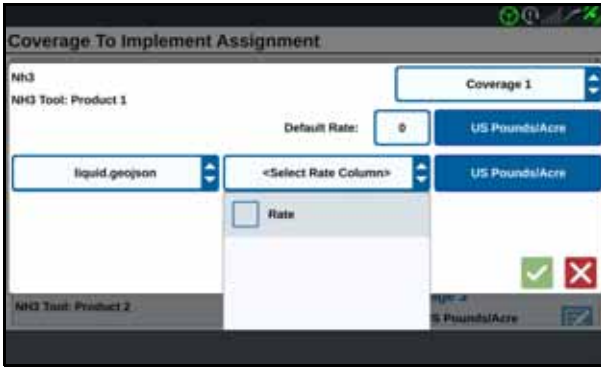
8. Press Accept  to continue copying the file or press Cancel  to select a different file. A Please Wait prompt will open while the files are being transferred.

9. Start a job. On the Coverage to Implement Assignment screen select Edit  beside the desired prescription map.





10. Select the desired prescription map from the No Rx Map drop-down.

11. Select Rate from the <Select Rate Column> drop-down.




12. If needed, adjust the units and conversion factor.

13. Press Accept . The Coverage to Implement Assignment window will open showing the Rx Control for the product.

14. Press Next  to begin the job. The prescription map will be visible on the run screen.



EJECTING THE USB

If a USB stick was installed, press Eject USB  button to properly save the information on the USB stick so it can be removed.

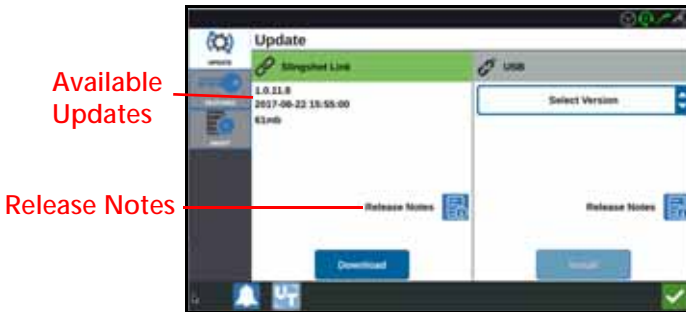
SOFTWARE AND HARDWARE UPDATES

SOFTWARE

To check for CRX software updates via Slingshot:





1. Press Software Update on the CRX Settings page. The Update page will open.
2. 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.



3. To install the update, press download. The update will download to the CRX. After the CRX update has downloaded, the Download button will change to Install. Press Install to install the software update.



4. If desired, press 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.

5. If desired, press 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, press 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.
6. After adjusting all the settings, press Accept .

DOWNLOADING A CRX UPDATE TO USB

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

1. On a computer, enter <http://portal.ravenprecision.com/> into the address bar.
2. Press Enter.
3. Click Product Documentation.
4. Click CRX.
5. Navigate to the dropdown.
6. Select the desired Software.

NOTE: If desired, review the download and installation instructions.

7. Select Save As from the Save dropdown.
8. Select the desktop as the desired save location.
9. Press Save.
10. Extract the files from the .zip file onto the computer.

NOTE: do not rename the extracted files as this will not allow the software to download to the field computer.

11. Transfer the extracted files to the USB flash drive.

INSTALLING CRX UPDATES VIA USB


To apply a software update to the CRX device:

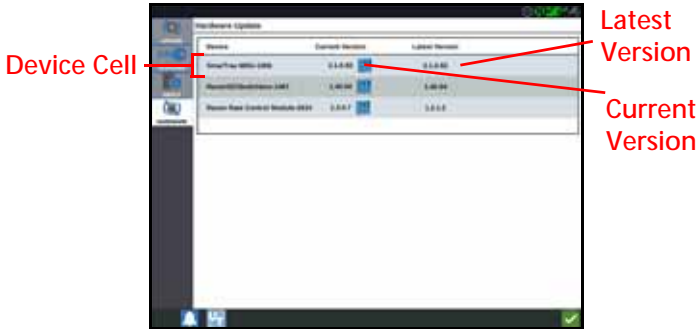
1. Insert the USB flash drive with the CRX update in the required folder into the CRX device.
2. Once the update file is detected on the USB drive, select the desired update from the USB drop down list then press Install.

ISO NODE AND GPS UPDATES

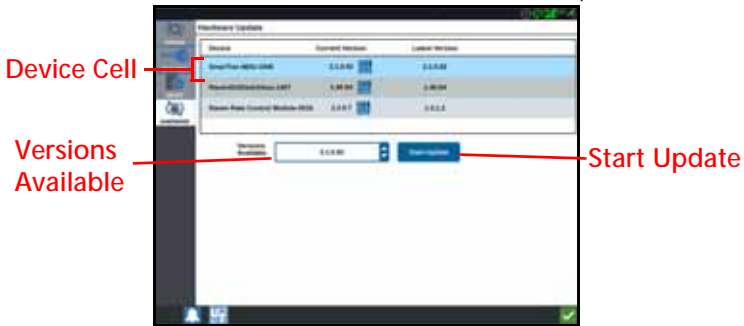
To check for ISO Node or GPS updates via Slingshot:





1. Press Software Update  on the CRX Settings page. The Update page will open.
2. Select the Hardware tab.
3. If there is an update available via Slingshot it will be listed under on the Hardware Update page. To learn more information about the current version, select the information icon. To see the if there is a newer version, compare the Current Version to the Latest Version



4. To install the update, press anywhere on the device cell except the information icon. A Versions Available field will open below the list of Device Cells.
5. Select the desired version from the Versions Available drop down.



6. Select Start Update. The update will install.
7. If desired, press 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, press 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. After adjusting all the settings, press Accept .

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.

FEATURE UNLOCKS

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

- VRA: Uses a prescription map to automatically apply the desired product as configured in the prescription map.
- Multi-VRA: Uses prescription maps to automatically apply multiple products to a field.
- 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.

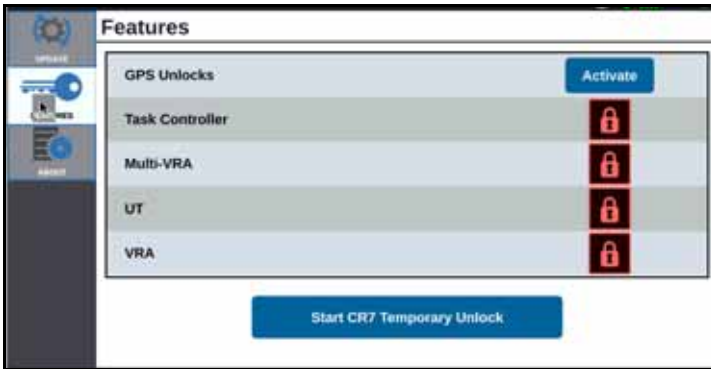
TEMPORARY UNLOCK ACTIVATION

Any temporary unlock will remain active for 20 hours or powered on time 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.

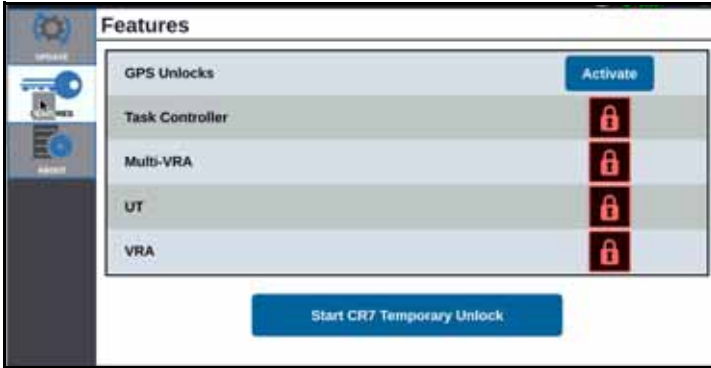
To activate a temporary unlock:




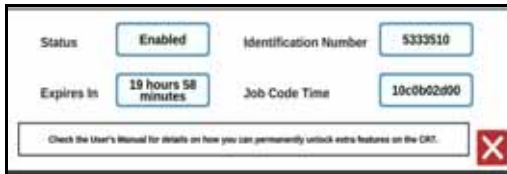
1. Press Software Update on the CRX Settings page. The Update page will open.



2. Press Start CRX Temporary Unlock. The unlock timer will start.




3. Press 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.



ENTERING A PERMANENT UNLOCK

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. On the Raven settings screen, select File Manager .
8. Select USB from the left drop-down.
9. Select the unlock file.

10. Select Copy .

11. Restart the CRX after the files have transferred.

SYSTEM SHUTDOWN



1. To turn off the system, press the System Shutdown  button or press the power button on the back of the CRX. A Confirm Shutdown window will open.
2. Press Accept  to turn off the system or Cancel  to return to the CRX Settings screen.

LIMITED WARRANTY

WHAT DOES THIS WARRANTY COVER?

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

HOW LONG IS THE COVERAGE PERIOD?

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

HOW CAN I GET SERVICE?

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

WHAT WILL RAVEN INDUSTRIES DO?

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

EXTENDED WARRANTY

WHAT DOES THIS WARRANTY COVER?

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

DO I NEED TO REGISTER MY PRODUCT TO QUALIFY FOR THE EXTENDED WARRANTY?

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

WHERE CAN I REGISTER MY PRODUCT FOR THE EXTENDED WARRANTY?

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

HOW LONG IS THE EXTENDED WARRANTY COVERAGE PERIOD?

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

HOW CAN I GET SERVICE?

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

WHAT WILL RAVEN INDUSTRIES DO?

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

WHAT IS NOT COVERED BY THE EXTENDED WARRANTY?

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

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

WHAT IS NOT COVERED BY THIS WARRANTY?

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

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