Ultra SR
SM20 Operator's Manual

www.seedmaster.ca

Date

SeedMaster unit Serial # Size / Spacing / / /

Primary Owner
Last First

Farm name / Corporation

Land Location

Mailing Address
City P.O. Box

Province / Territory / State Postal / Zip Code

Phone Cell Phone Fax

Email

Dealer purchased from

Dealers for part pick-up

Shipping method to be used:

Please include a description to your farm from nearest town:

I hereby accept the terms and conditions of the SeedMaster Warranty listed on page 14:

Signature Date

To ensure prompt and organized warranty service, fill out and please submit to:

SeedMaster

#1 South Plains Road West, Emerald Park, SK S4L 1C6

E-MAIL: warranty@seedmaster.ca

CUSTOMER WARRANTY REGISTRATION COPY

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INTRODUCTION

Thank you for purchasing a new SeedMaster Ultra SR. This manual will assist you in becoming a safe and efficient operator. The crops you grow because of the proper use of the unit will be your reward for spending some time studying this manual.

If you encounter any problems, contact your dealer for clarification or correction. It is important to us and to you that all SeedMaster units maintain a solid reputation.

We are building our company's reputation not only on a quality product, but also on providing quality advice and fast response to service requirements. Our objective is to keep a high resale value on used units, so the positive image you pass on to your neighbors is as important to you as it is to us in the long term.

SAFETY

Please be SAFE! Carefully read and understand all safety alerts and warnings in this manual and all safety decals on the SeedMaster Ultra SR. Ensure that anyone who is going to use the unit reads and understands the Operator's Manual. We recommend that only mature and well-trained or experienced persons operate this product. We advise that periodic visual checks continue as a mandatory part of the implement operating procedure. Conduct regular maintenance checks on fasteners, hydraulic connections, etc. Always follow safety precautions. Serious INJURY or DEATH can result from improper operating practices

Safety notices are one of the primary ways to call attention to potential hazards.

This Safety Alert Symbol identifies important safety messages in this manual. When you see this symbol, carefully read the message that follows. Be alert to the possibility of personal injury or death.

- Read and understand the Operator's Manual and all safety signs before operation or maintenance.
- Do not allow riders on any part of the equipment.
- Install and properly secure all shields and guards before operating the seeder.
- Keep hands, feet, clothing, and hair away from moving and/or rotating parts.
- Beware of all power lines and other overhead obstructions. Know the transport height and width of your Ultra SR. Ensure that minimum safe working distances are maintained from any obstruction at all times.
- Before servicing, adjusting, repairing, refilling, or unplugging: stop the engine, remove the engine key, set the park brake, disengage the hydraulics and wait for all moving parts to stop.
- Ensure your seeder is properly marked as required by the local highway and transport authorities. Make sure the "Slow Moving Vehicle" sign, lights, and all reflectors are in place, clean, and visible to overtaking or oncoming traffic.
- Store a fully stocked first-aid kit in a visible, accessible place for use in case of an accident.
- Keep a fire extinguisher in an accessible location.
- Be sure that the area is clear of people before starting or moving your machine.
- Do not work around or under the raised wings, unless the wings are securely chained in the transport position.
- In the event that wheel and tire assemblies must be raised off the ground for maintenance, block the implement up securely.
- Use extreme caution when working around or with high-pressure hydraulic systems. Depressurize the system when connecting or disconnecting the hose couplers.

- Wear heavy gloves and eye protection when searching for suspected hydraulic leaks. If an injury occurs, seek immediate medical attention as infection and toxic reaction could develop. Use a piece of cardboard or wood (instead of hands) when searching for such leaks.
- Never wear baggy or frayed clothing or hanging jewelry when working around or on any of the drive system components.
- When performing, a product catch for meter calibration, keep hands and clothes well clear of rotating components.
- We recommend that all maintenance and adjustments on the seeder be made when the implement wings are lowered.
- Be aware that when the hydraulics are activated, opener movement may start unexpectedly at any time.
- Store and transfer fuel, solvents, cleaners, or any flammable liquids only in safety standard (i.e. CSA) approved containers.
- Clean and inspect all components in the hydraulic system on a regular basis.
- Replace all worn, cut, abraded, flattened, damaged, or crimped hoses and metal lines. Do not repair hydraulic components with tape, clamps, or cements. The system operates under extremely high pressure; such repairs will fail and create hazardous and unsafe conditions.
- Before applying pressure to the hydraulic system, make sure all connections are tight. Ensure lines, hoses, and couplings are not damaged.
- Ensure that the seeder is properly and safely connected to the tractor.
- Transport per local regulations for width and height.
- Follow all road safety regulations for your state or province.
- Store the seeder on a firm, level surface.
- Store with wings down.
- Have a qualified tire dealer or service person perform tire maintenance. Failure to follow proper procedures when mounting a tire on a wheel or rim can cause an explosion that may result in serious injury or death.
- Keep safety decals and signs clean and legible at all times. Replace safety decals and signs that are missing or have become illegible.
- Ensure proper use of wing lock-up chains in transport.
- Always use hitch safety chain.
- Do not transport at high speeds on loose gravel behind a truck or a tractor.
- Do not transport with product in tanks.
- Ensure proper hook-up of safety lights.
- Maneuver machine to ensure castors are moving feely before going onto roads.
- Do not transport at speeds higher than that recommended on tires (25 mph or 40 kph).
- Check all transport wheel nuts after 100 miles and periodically thereafter. (See PAGE 5).
- Use proper tire inflation pressures. (See TIRE TORQUE AND PSI SPECS, PAGE 5).

SEEDMASTER WARRANTY

This limited warranty supersedes all previous SeedMaster Manufacturing warranties and is exclusive with no other guaranties or warranties expressed or implied.

LIMITED Warranty – Subject to the terms and conditions below, SeedMaster Manufacturing Inc., Emerald Park Saskatchewan, warrants to its original retail purchaser that new SeedMaster equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITIES AND FITNESS.

Within the warranty periods listed below, SeedMaster will repair or replace any warrantied parts or components that fail due to such defects in material or workmanship.

SeedMaster shall honor warranty claims on warrantied equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on first of April, or the first of September of the first seeding season, after the original manufacturing date.

1. 2 Years parts replacement on: all opener parts except tires and knives, all hydraulic components, all electrical components & all fasteners.
2. 2 Year parts & labor Frame structural components.
3. 1 Year (maximum 10000 acres) parts replacement for Seed knife failure, and Fertilizer knife failure.
4. Pumps, motors, fans, tires, frame spindles and hubs and metering components are warranted separately by other original manufacturers.

(SeedMaster Limited Warranty shall not apply to):

1. Road or field hazard to tires
2. Knife wear
3. Hub over heating due to high transport speed or poor service maintenance
4. Damage due to under or over inflated tires
5. Damage due to transport at high speeds
6. Damage due to transporting with loaded product tanks
7. Packer or wing wheel hubs and bearings when stored with wings up thru rain or snow events
8. Packer hubs and bearings when twine is allowed to build up on hub.
9. Equipment that has been modified by any party other than SeedMaster, or equipment that has been improperly installed, improperly operated or misused based on industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.
10. Items furnished by SeedMaster, but manufactured by others, such as fans, tires, motors. These items are covered by the manufacturer's warranty.
11. Damage due to improper hydraulic hook up.
12. Damage due to pulling out of stuck position while product tanks are loaded.

SEEDMASTER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY FARMERS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF SEEDING EQUIPMENT.

SeedMaster Factory warranty provides coverage to factory issued, serial numbered items and machines. SeedMaster factory warranty is not applicable to over the counter part sales without documented serial numbers and dealer sales dates.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at SeedMaster's option: (1) repair; or (2) replacement; or, where authorized in writing by SeedMaster in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized SeedMaster Dealer. SeedMaster's option of repair or replacement will be F.O.B. SeedMaster at Emerald Park Saskatchewan or F.O.B. at a SeedMaster Authorized SeedMaster Dealer as determined by SeedMaster. Therefore, no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT, SHALL SEEDMASTER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTEE OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT, TORT, OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY SEEDMASTER IS EXCLUDED AND DISCLAIMED BY SEEDMASTER.

TIRE TORQUE AND PSI SPECIFICATIONS

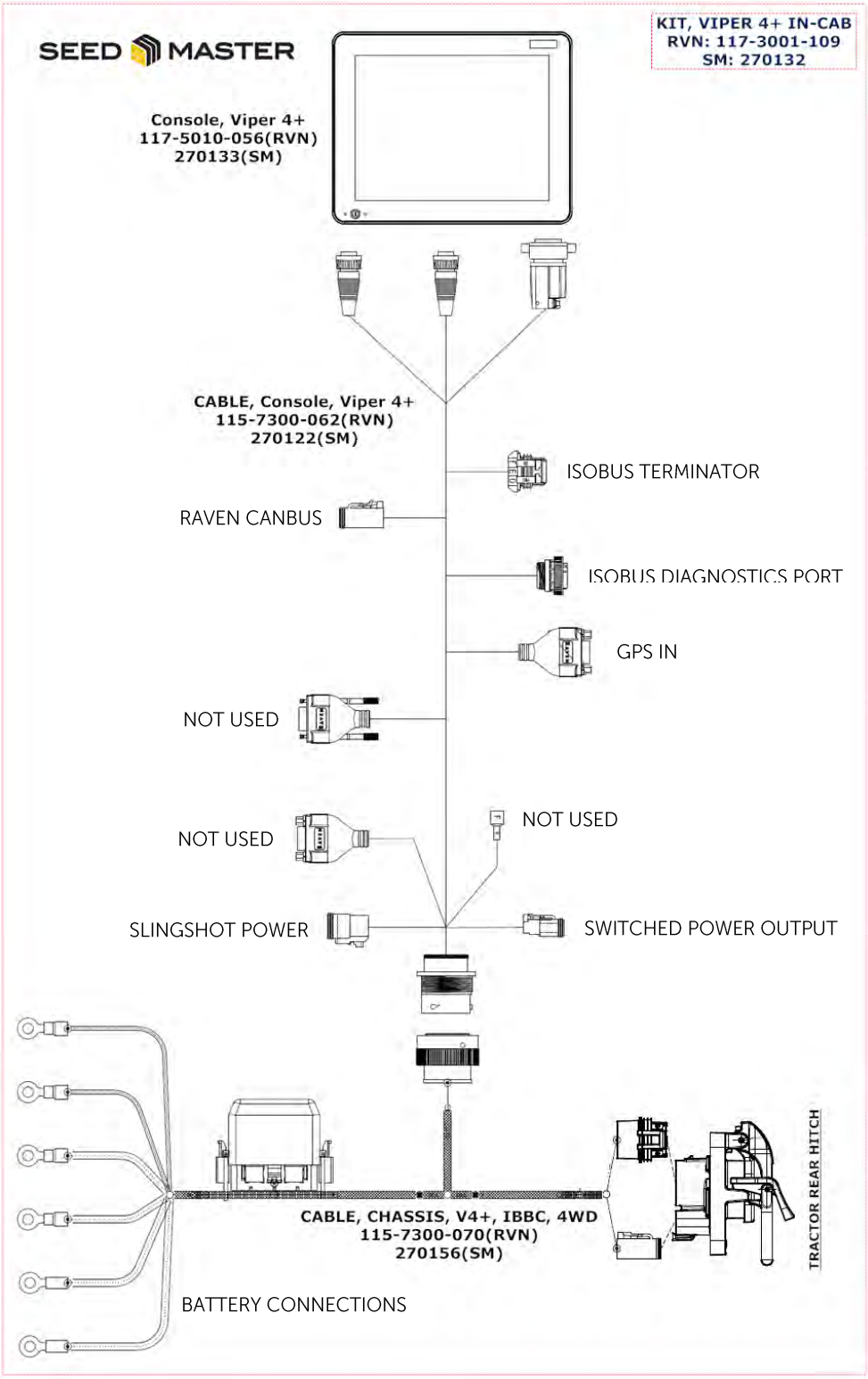
TIRE SIZE	*TORQUE REQUIREMENTS (FT. LBS.)*	*MAXIMUM PRESSURE RATING (PSI)*
12.5L15 (10 PLY)	200	44
Dual 710/70R38	750	23

SEEDER SPECIFICATIONS

- 4 Products totaling 735 bushels equipped with electric metering
- 2 Seed tanks – 240bu and 60bu tanks
- 2 Fertilizer tanks – 325bu and 110bu tanks
- 8 electric meter motors: 4 seed, 4 fertilizer
- Meter motors max speed is 78 rpm
    - Accommodates higher rates such as Wheat & Fertilizer
    - Max estimated delivery rate of Urea (60lb/bu) is 309 lb./ac at 5mph
- 48 openers on 15" Row spacing, total width = 60 feet
- Load cells under each tank to measure tank weight
- Equipped with two product delivery fans with isolated airflows
- Equipped with trash wheels for clearing field debris in-between the openers
- Drill ECU – ISOBUS Toolbar Functions
- RCM rate controller
- Digitroll Blockage Monitoring

IN-CAB ELECTRICAL HOOKUP

RAVEN VIPER 4+ IN-CAB HOOK UP



ULTRA SR HITCH AND TRANSPORT

HITCH

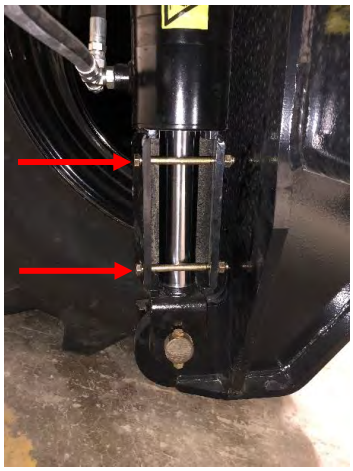
Main frame castors found on traditional SeedMaster drills help carry and distribute the machine's weight. The Ultra SR's simplicity and maneuverability is gained by removing the main frame front castors, resulting in a higher tongue weight and the requirement for a Category 5 hitch.

LOAD STATUS	*MACHINE WEIGHT (LBS)*	*TONGUE WEIGHT (LBS)*
UNLOADED	~40,000	~2,800
LOADED	~92,000	~15,000

TRANSPORT

To help ensure the Residue Management System and openers have adequate clearance during transport, the Ultra SR's rank height adjustment raises to its highest position automatically when you raise the machine's wings. To alleviate some of the extreme forces of transport on the cylinders, it is required to install the supplied cylinder stops whenever you're transporting the machine. ***NOTE:*** *DO NOT transport the machine on roadways or faster than 6 mph when fully loaded. Damage of this nature is NOT covered by warranty.*

1. Raise the wings fully into transport. Ensure the system pressure is disengaged before proceeding.
2. Locate the cylinder stops hanging on the backside of the rear axle.
3. Remove the retaining pins.
4. Mount the cylinder stop on the fully extended rank height cylinder.
5. Reinstall the retaining pins.
6. Due to the forces incurred during transport, it is a good practice to provide very brief pressure to the wing up circuit to facilitate the removal of the cylinder stops. Ensure the system pressure is disengaged before proceeding.



TRACTOR HYDRAULIC HOOKUPS

SEEDMASTER ULTRA SR HYDRAULIC COUPLERS

HOSE MARKING CONVENTION: Each hose pair has been assigned a unique colour. The hose with 1 colour band is pressure, and the hose with 2 colour bands is return.

OPENER RAISE/LOWER HOSES: Direct Opener Lift & Lower Lines - The two 1/2" hydraulic lines with red colour bands are the opener lift and lower lines. The hose with 1 red band is opener down pressure. The hose with 2 red bands and the manual valve attached is the hose that is pressurized to raise the openers. The manual valve is used to lock the openers up for long transport and to facilitate unhooking under lift pressure. Open the valve after hooking hydraulics to tractor. Leave the pressure engaged to operate the Smart Openers. *See page 13 for operation instructions.*

SYSTEM PRESSURE HOSES: Green Tagged Lines - The two 1/2" hydraulic lines with the green colour bands are used to activate the block and raise and lower the wings. These lines are connected to one tractor remote. In the field, operating position for this remote is locked-on to provide continuous pressure to the block via the line with 1 green band. Pressure should be adjusted and set between 2600-3000 psi by using the tractor remote flow control.

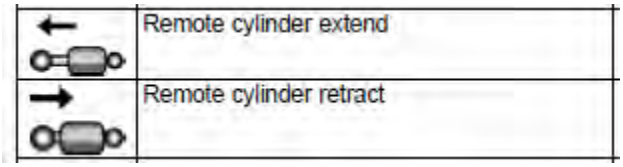
SEED AND FERT FAN HOSES: There will be two ¾" fan pairs. The seed fan hoses will be tagged with 1x orange (pressure) and 2x orange (return) and the fertilizer fan will be tagged with 1x purple (pressure) and 2x purple (return).

Ensure that you connect the right pair of hoses together on your tractor.

CASE DRAIN HOSE: Drills and tanks are set up with ONE 1/2" case drain/return line (zero back pressure). This line has a ½" NPT full open return coupler without any restriction or back pressure. Ensure this return line is routed to your tractor properly without any possibility of back pressure. Improper connection or undersized return lines on the tractor may cause inaccuracies in operation and the possibility for severe damage to the drill's hydraulic system. ***SeedMaster Manufacturing recommends using the factory connections provided with the drill and tank.***

HYDRAULIC CONNECTION REFERENCE CARD

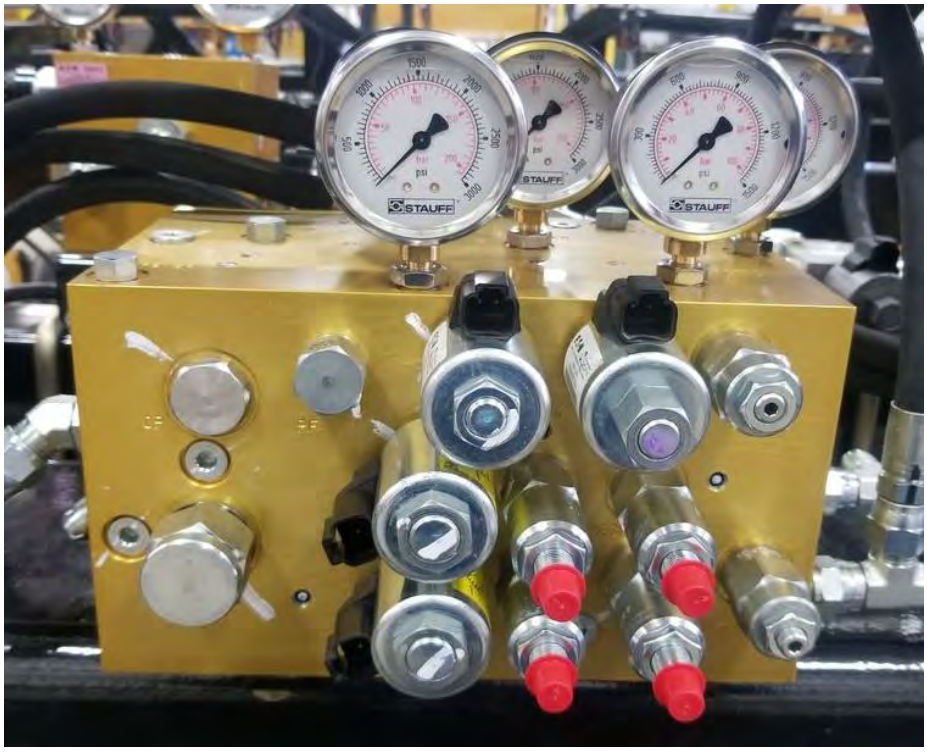
The Ultra SR's hydraulic hookup reference card is below. Ensure that you are hooking the pressure and return hoses to the appropriate remotes on your tractor: Pressure to Retract, Return to Extend.

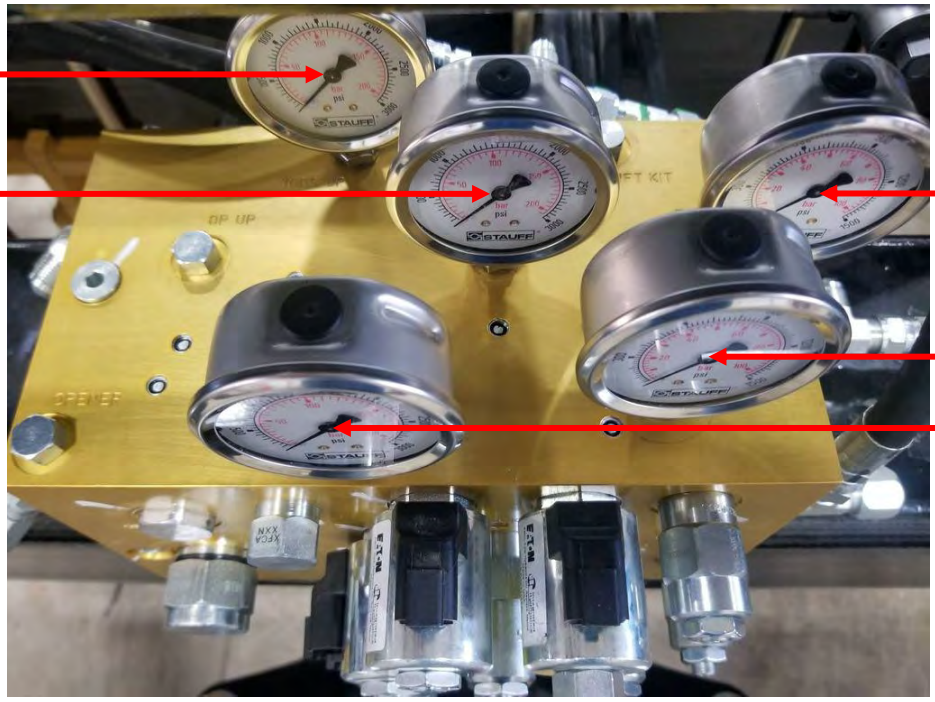


Ultra SR Hydraulic hookup			
TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ½" Line	2 RED ½" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ½" Line	2 GREEN ½" Line	SYSTEM PRESSURE
SCV 3 SEEDMASTER	1 ORANGE ¾" LINE	2 ORANGE ¾" LINE	SEED FAN ONFRAME
SCV 4 SEEDMASTER	1 PURPLE ¾" LINE	2 PURPLE ¾" LINE	FERT FAN ONFRAME
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

MAIN HYDRAULIC BLOCK DETAILS

HYDRAULIC BLOCK GAUGES

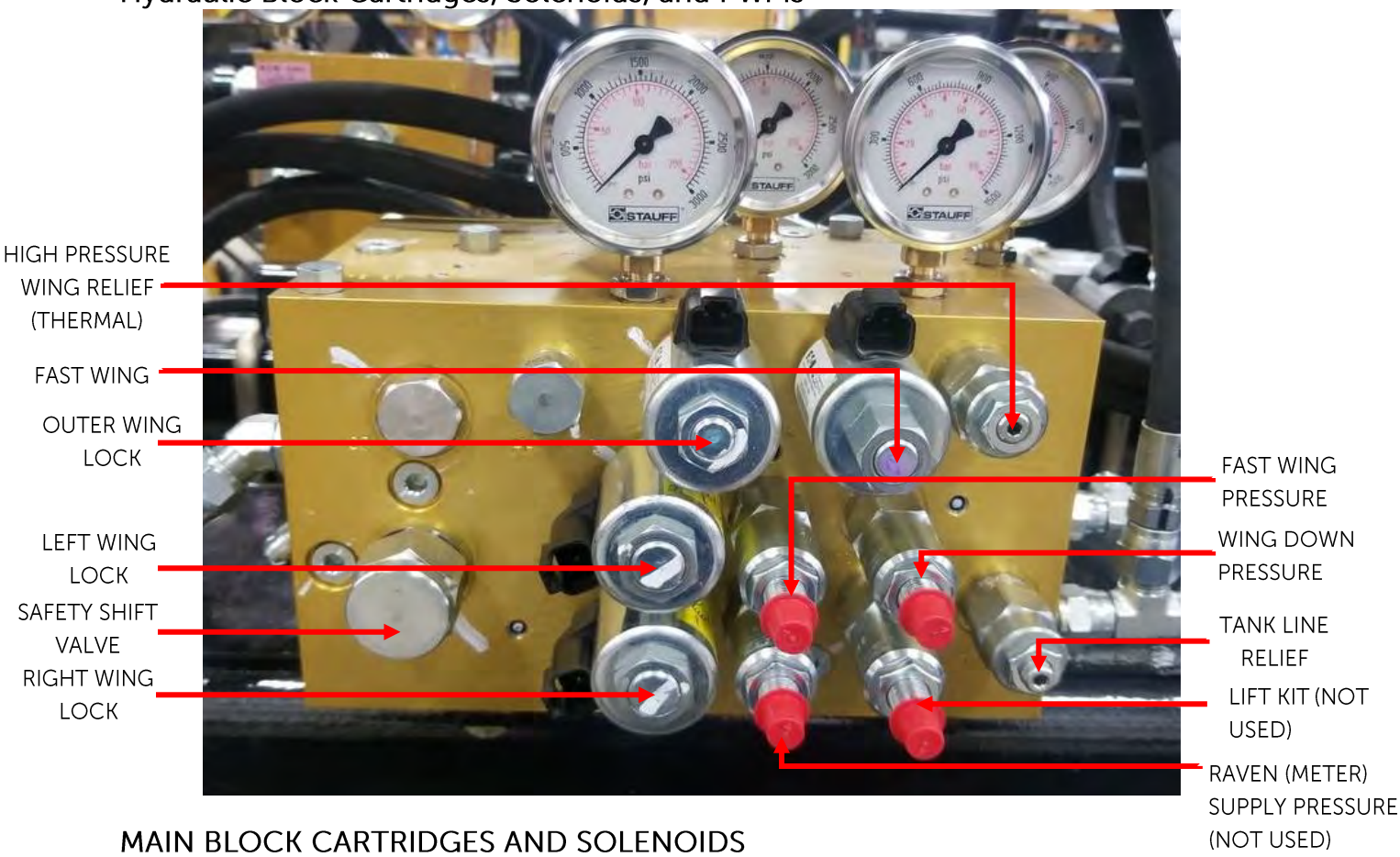




MAIN BLOCK GAUGES

WING UP: The WING UP gauge reads the amount of pressure applied and required for lifting and should read 0 psi until folding up. A positive reading during field operation is an indication of back pressure on the system.
RAVEN: The RAVEN gauge reads the amount of pressure being supplied to hydraulic metering motors. It is not used on the Ultra SR.
TANK: The TANK gauge reads the amount of pressure being returned to tank.
WING DOWN: The WING DOWN gauge reads the amount psi being applied to the wings while they are down and in field operation.
SYS: The SYS gauge reads the amount of system pressure being applied to the system. System Pressure is the main pressure supply for the WING UP/DN circuits. 2600-3000 psi indicates tractor working pressure to block. Pressure fluctuation can indicate back pressure or lack of flow to the circuit. Adjust tractor flow as necessary to hold within that range.

Hydraulic Block Cartridges, Solenoids, and PWMs



MAIN BLOCK CARTRIDGES AND SOLENOIDS

LEFT WING LOCK: This on/off solenoid turns the oil flow on/off to the left wing cylinders.
RIGHT WING LOCK: This on/off solenoid turns the oil flow on/off to the right wing cylinders.
OUTER WING LOCK: This on/off solenoid turns the oil flow on/off to the outer wing cylinders.
FAST WING: This on/off solenoid turns the oil flow on/off to the inner wing cylinders.
HIGH PRESSURE WING RELIEF (THERMAL): High tank pressure cut off cartridge is preset set at **3500 psi**
TANK LINE RELIEF: The tank line relief cartridge is preset at 450 psi. If the cartridge exceeds 450 psi it will relieve to the atmosphere.
WING-DOWN PRESSURE: 300-500 psi ***(NOTE: REQUIRED PRESSURE SETTING MAY VARY FROM FACTORY PRESET TO SPECIFIC TRACTOR AND DRILL COMBINATIONS).***

★Wing-Down pressure may need to be increased if the wings start to float and not contour correctly while in the seeding position or if a positive Wing-Up pressure is detected.
★Wing-Down pressure may need to be decreased if the wings become too rigid while in the seeding position.
FAST WING PRESSURE: 1500 psi
SAFETY SHIFT VALVE: The safety shift valve will shut the hydraulic flow off to the block if back pressure reaches 240 psi on tank line to prevent system damage.

PRESSURE SETTING PROCEDURES

Setting Wing-Down Procedure (WING-DOWN PRESSURE)

The Wing-Down pressure is the amount of hydraulic pressure being applied to the inner and outer wing circuits; the oil supply is supplied from the system pressure. The Wing-Down Pressure is required so the wings will contour while travelling through the field. The Ultra SR requires a ***Net Wing-Down Pressure*** of 300-500 PSI. To determine your net value, subtract your wing-up pressure from your current wing-down pressure (ie. 700 PSI wing-down – 200 PSI wing-up = 500 PSI net wing-down).

- To adjust the **WING-DOWN PRESSURE**, loosen the jam nut on the cartridge in port **WD** on the main block. Turn the cartridge in to increase the pressure, and out to decrease the pressure. When the desired pressure is set, re-tighten the jam nut.

Setting Wing Unfold Procedure (FAST WING PRESSURE)

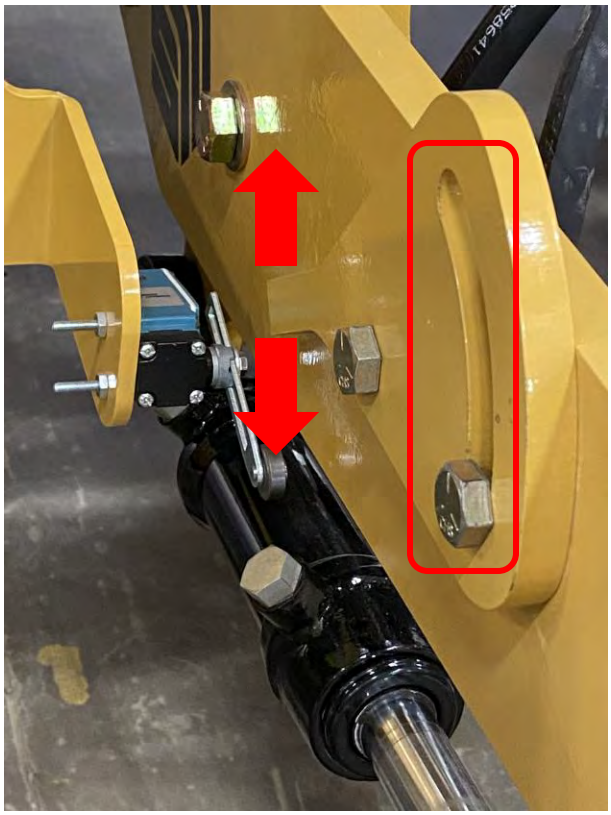
The wing unfold pressure is the amount of hydraulic pressure being applied to the inner and outer wing circuits while the tool bar is unfolding. This is also known as the Fast Wing Pressure. If the wings are not unfolding the pressure will need to be increased. The oil supply is supplied from the system pressure.

- To adjust the **FAST WING PRESSURE**, loosen the jam nut on the cartridge in port **FW PRESS** on the main block. Turn the cartridge in to increase the pressure and out to decrease the pressure. When the desired pressure is set, re-tighten the jam nut.

RANK HEIGHT SETTING PROCEDURE

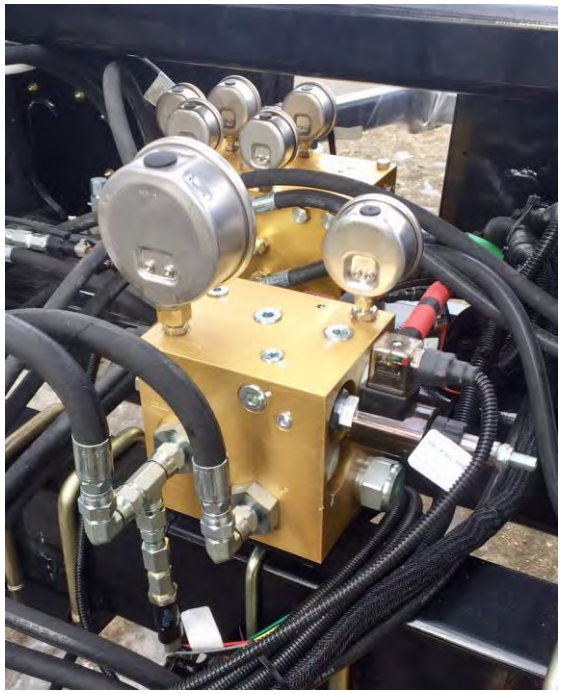
Proper product placement and opener penetration is relative to the height of the "opener rank". This height is controlled electronically over hydraulic via an adjustable limit switch. To check/adjust the rank height:

1. Engage the System Pressure.
2. Set your opener down pressure to 1000 PSI.
3. Activate the master switch to lower the openers into the ground and build pressure.
4. Pull your tractor forward approximately 100 feet to ensure the openers are properly penetrating.
5. Visually inspect the knives facing the front of the machine. Using the deflector shields as an added visual, the fertilizer knives should all be consistently penetrating to the point that their carbides are not visible.
6. Measure from the bottom of the main frame rank 4 x 4 to the ground. Measurements should be taken from the left and right ends of the rank to ensure consistency.
7. Adjust the limit switch stop up or down so the bottom of the main frame rank is 34" above the ground (+/- ½").



SMART OPENERS HYDRAULIC BLOCK DETAILS AND OPERATION

SMART OPENERS HYDRAULIC BLOCK



The Smart Openers block contains the main functions of your Ultra SR openers: raising, lowering, and down-pressure. These functions are controlled by a Master ON/OFF solenoid and coil to raise and lower, and a PWM valve for down-pressure. The SmartOpeners block is located on the rear frame above the rank. For it to operate, you will leave the connected tractor hydraulic remote engaged during field operation. Recommended flow for this remote is 75%.

SMART OPENER OPERATION

LOWER, LIFTING, THEN LOWERING THE OPENERS

LOWER:

1. LOCK ON REMOTE TO SUPPLY OPENERS WITH HYDRAULIC PRESSURE.
2. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH “ON” OPENERS WILL LOWER.

LIFT:

3. AFTER THE TOOLBAR IS COMPLETEY OVERLAPPED INTO AN APPLIED AREA.
4. SHUT THE MASTER FOOT SWITCH OFF, OPENERS WILL LIFT.
5. COMPLETE THE TURN.

LOWER:

6. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH “ON” OPENERS WILL LOWER.

ELECTRICAL HOOKUPS

There are three electrical hooks required when mounting the Seeder. The IBBC connector (Image 1), the High Current Auxiliary connection (Image 2), and Implement Master Switch (Image 3).

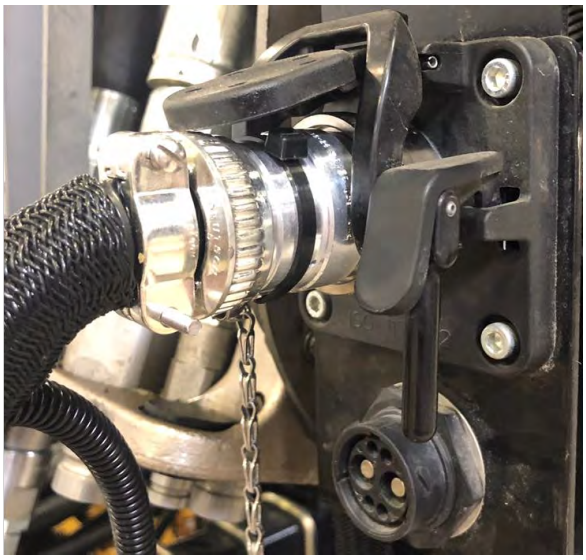


Image 1

Image 2

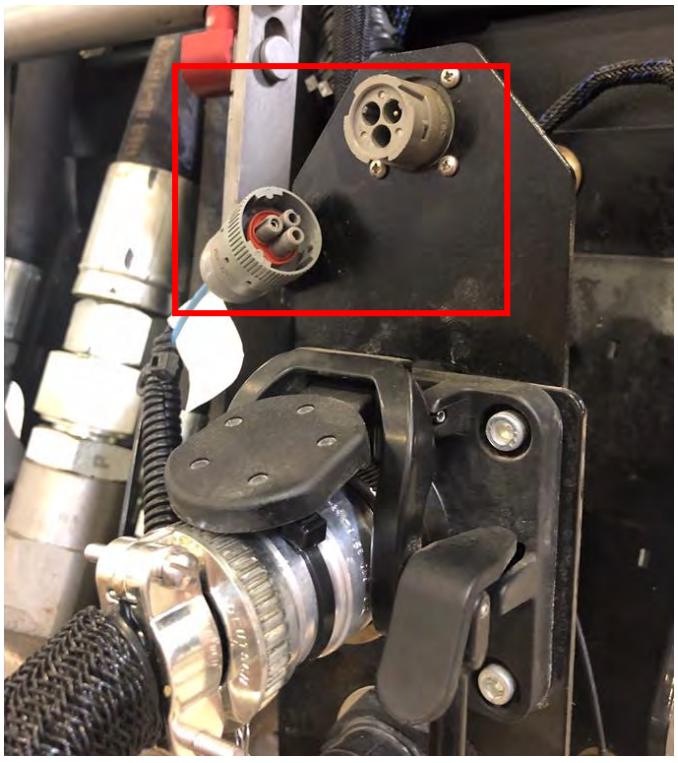
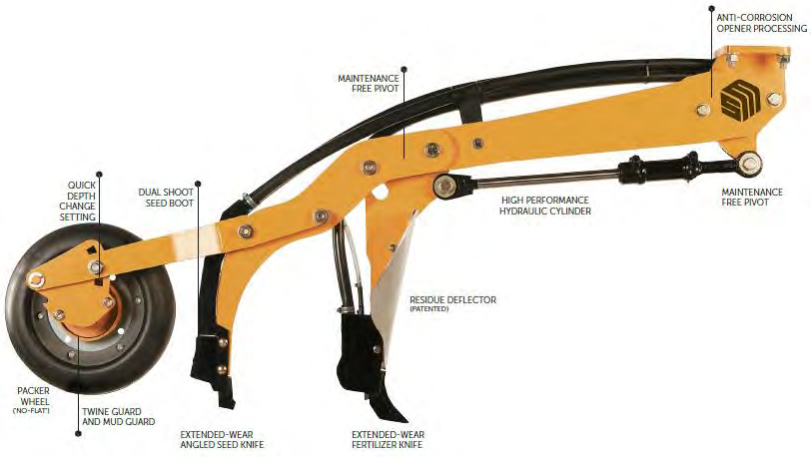


Image 3

OPENER DETAILS

The opener is preset for seed and fertilizer depth. The seed depth is factory set at 3/4" below the packed surface and the fertilizer depth is factory set approximately 3/4" below and 1 ½" to the side of the seed.



In varying field conditions, soil types, and moisture conditions, it may be required to adjust the openers from the pre-set depths. We recommend seeding cereals, oil seeds, and all other products at the determined seed and fertilizer depths desired by the owner/operator. The notches on the hub plate correspond to 1/4" changes in depth, with the inverted notch being the factory pre-set depth of 3/4".

To change depth using the SeedMaster Quick Depth Adjusting Tool, simply loosen the nut on the slotted portion of the hub plate and rotate packer tire upwards to increase depth, or downwards to decrease depth.

Semi-pneumatic packer tires are a standard feature on all SeedMaster drills. There is no internal air pressure that needs to be checked.

The resulting dent the packer wheel leaves behind is dependent on soil type and hardness. The variation in dent depth does not affect the crop, since the seed depth is always monitored from the packed surface.

**Avoid the temptation to harrow after seeding, as harrowing will reduce the uniformity of crop emergence and reduce yield potential. The dent left by the packer wheel and the loose soil tossed to the side as the openers move through the soil may appear rough at first glance, but you will find the residue and soil settles over time leaving just the ripple of the packer wheel. This dent provides several agronomic benefits.

RESIDUE MANAGEMENT SYSTEM

The Ultra SR is equipped with a Residue Management System running in-between the openers (Image 1). These 15" rotating discs are outfitted with replaceable tines to break down residue and allow excess straw to flow between the openers. There are 5 sensors that recognize if the tines are turning (Image 2 & 3). If the Residue Management System plugs up and stops turning, an alarm will be raised.

Image 1

Image 2

Image 3

DRUM WHEEL AND SCRAPER

SeedMaster's Ultra SR is equipped with a drum-style outer wing wheel rather than a traditional tire and rim assembly. Because the machine's pivot point is in front of the openers, the outer wing can possibly skid inward on certain turns. To relieve some of the force that occurs during certain turns and prevent soil berming, a drum-style wheel has been installed to allow the wing to move sideways while maintaining contact with the ground under wing-down pressure. A scraper has been installed on the backside of the drum to maintain a constant circumference of the wheel in wet field conditions. This promotes precise opener penetration and product placement. As the machine naturally wears through normal use, this scraper should be periodically checked and adjusted.

1. Raise the outer wing utilizing a jack and proper blocking. ***NOTE:*** *DO NOT utilize the wing up circuit to raise the outer wing for inspection. The potential for serious injury or machine damage can result.*

2. Measure the distance between the scraper and the face of the drum. The measurement should be 3/16". If this value is found to be greater or less, an adjustment will be needed.

3. Loosen the 4 nuts and bolts that hold the scraper in place. Loosen them only to the point that they are still providing friction to the scraper. This will make adjustment easier.

4. Using a rubber mallet, tap the scraper either up or down to equal a measurement on each outer edge of 3/16" from the drum face.

5. Tighten the four nuts and bolts to lock the scraper into place.

6. Check the drum wheel to ensure that it rotates freely when spun by hand.

7. Remove the blocks, lower the jack, and move to a safe area.

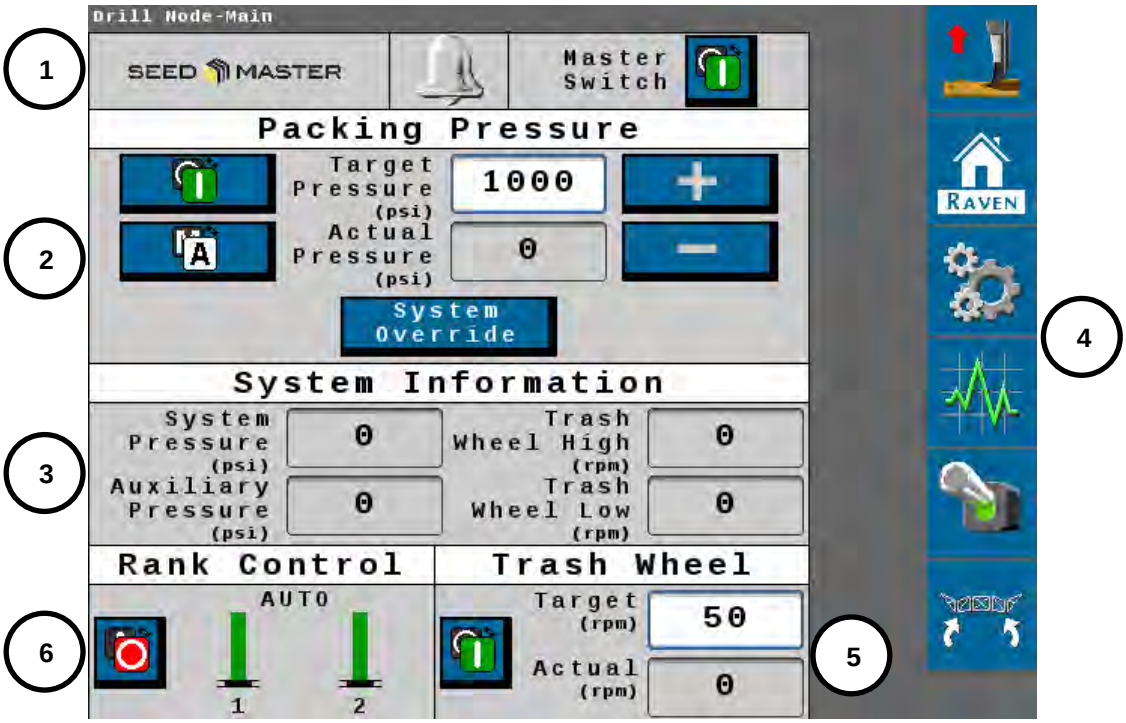
8. Finally, test the wheel by pulling the machine forward a few feet with wing-down pressure active.

ISOBUS SR FUNCTIONS

HOME SCREEN LAYOUT

The Drill ECU will monitor and control your SeedMaster Ultra SR via the installed Universal Terminal. To access the ISO Toolbar Functions, touch the ISOBUS SR soft key on your UT display. See your UT's operator's manual for more information on locating UT soft keys.

SR SOFT KEY



1. **Status Area:** This area will show the current status of different components of the machine including the System Alarms and Master Switch Status.
2. **Packing Pressure Area:** This area will allow you to toggle the packing pressure from **OFF** to **Manual** or **Auto**. The Packing pressure can also be quickly changed by using the PLUS arrow to increase and MINUS arrow to decrease or set to a predetermined pressure. The System Override will dump the opener pressure. This target override pressure and override time can be adjusted in the settings page. See packing pressure setup and operation section on page 21.
3. **System Information Area:** This area will allow for a quick view of different pressure sensors installed on your SeedMaster Ultra SR.
4. **Soft Key Area:** Touch soft keys to access different settings and functions.
5. **Trash Wheel:** This area shows the target and actual RPM for the Trash Wheel. The Trash Wheel can be toggled from OFF to ON from here.
6. **Rank Control:** This area is currently not used. Leave switch in the OFF position.

ISO SR QUICK START PROCEDURE

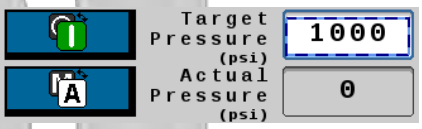
Before you go to the field, please review the steps below to ensure your Ultra SR is field ready.

1. **Turn safety switch ON:** Before turning the safety switch on please ensure the seeder is free of any persons, animals, or objects that could damage your equipment. Touch the RED safety switch in the Soft Key Area. The Safety Switch will turn green indicating that the system is ready.

2. **Engage System Pressure:** Engage the machines hydraulic supply for system pressure. The System Pressure will display in the System Information Area.

3. **Unfold Drill:** Start unfolding the drill by touching the Drill Unfold Soft Key. ***BEFORE UNFOLDING MAKE SURE THE WING TRANSPORT SAFETY CHAINS ARE REMOVED AND THAT WINGS ARE FREE AND CLEAR OF ANY OBJECTS THAT COULD CAUSE HARM TO YOU OR ANYONE ELSE.*** Start by unfolding the Inner Wings first then the Outer Wings. *NOTE: The buttons need to be held down during the unfold process.*

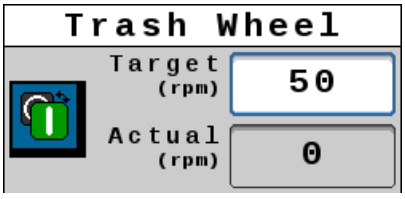
4. **Set Packing Pressure:** Ensure that the packing pressure is set to your desired mode. Recommended mode is AUTO, but field conditions may require Manual mode. After setting the mode to Auto the desired packing pressure must be set. The recommended starting point is 1000psi. ***NOTE:*** *PACKING PRESSURE NEEDS TO CHANGE WITH FIELD CONDITIONS.*



5. **Engage Opener Pressure:** Engage the tractor's hydraulic remote for Opener Pressure. ***NOTE:*** *Ensure tractor remote is set to constant flow for Smart Openers. Recommended flow is 75%.*

6. **Test Openers Function UP/DWN:** You will need to note what your master switch configuration is. *BEFORE ENGAGING THE OPENERS MAKE SURE THE OPENERS ARE FREE AND CLEAR OF ANY OBJECTS THAT COULD CAUSE HARM TO YOU OR ANYONE ELSE.* Begin by engaging the Master Switch by stepping on the foot switch. After engaging the master, the openers will go to the ground and start building pressure. You will see the Master Switch Icon turn green and say on. To lift the openers, step on the foot switch again to disengage the packing pressure. ***NOTE:*** ***If the openers are not going up and down your hydraulic pressure on the tractors remote could be reversed or a hose could have popped out of the tractor SCV. Also note that if the openers are not going down on the center section, the Opener transport shipping bolts may need to be removed.***

7. **Turn Trash Wheel Alarms on:** Turn Trash Wheel Alarm ON by pressing the ON/OFF button to the left of the target rpm.

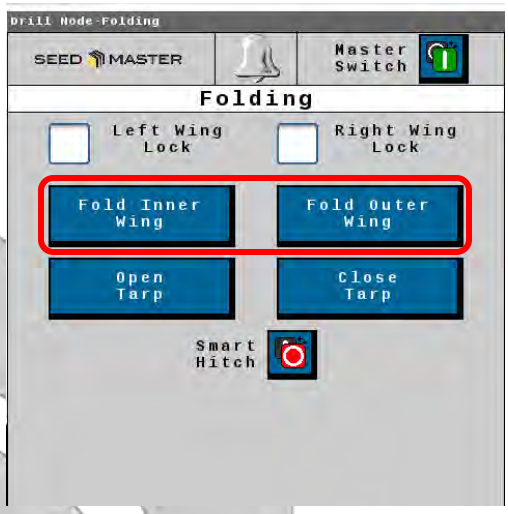


UNFOLD OPERATION, FOLDING OPERATION, & WING LOCKS

Touch the Fold button soft key located in the soft key area to access the Unfold Operation & Wing Locks. The machine's system pressure will need to be engaged before the unfold process can begin. The live pressure can be viewed in the System Information Area on the Home Page. System pressure must be 2600psi or greater to unfold.

Wing Unfold Buttons

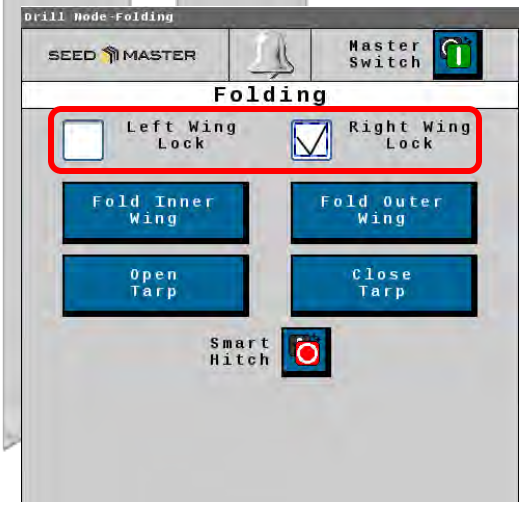
Begin by unfolding the **INNER Wings first**. It is important to unfold the **INNER Wings first** as you can damage the **OUTER** Wings by unfolding them into each other if the **INNER** wings are not completely unfolded.



1. Touch and hold the **FOLD INNER WING** button to unfold the inner wings. Ensure that the wings have completely finished unfolding before moving to the next step.
2. Touch and hold the **FOLD OUTER WING** button to unfold the outer wings.
3. Once the wings are unfolded, touch the home button and touch **YES** to acknowledge that you are leaving the page to return to the Home screen.
4. **OPEN TARP** and **CLOSE TARP** are for future use. These do not function currently.

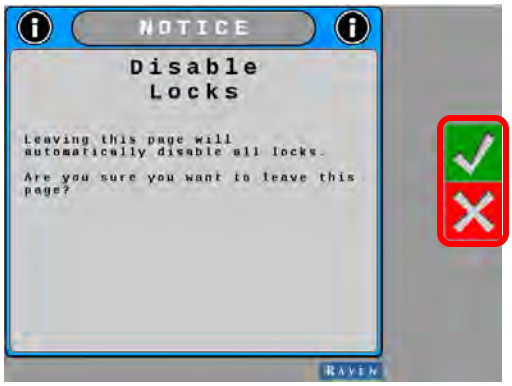
Wing Lock Buttons

Left Wing Lock Check Box: When the wings are unfolding, or folding up, use the check box to lock the left wing into its current position. Uncheck the check box to unlock the wing.
Right Wing Lock Check Box: When the wings are unfolding, or folding up, use the check box to lock the right wing into its current position. Uncheck the check box to unlock the wing.



Unfold Operation and Wing Lock Safety Page

After touching the Home soft key, a safety page will be displayed. You must acknowledge the fact that you will be leaving the page and the wing locks will be disabled. Before touching **"YES"**, make sure the machine is free and clear of any persons, animals, or objects. After touching yes, you will return to the home page and wing locks are disabled. If you are not ready to disable the wing locks, simply touch the "NO" button and the wing locks will stay enabled.



Folding Operation

After completing the seeding operation for a field, the drill must be folded for transport to the next location. To prepare the drill for folding, ensure all jobs on the tank monitor(s) are either paused, or completed and closed.

1. Disengage the master switch by stepping on the foot pedal. This will ensure the openers are raised out of the ground.
2. Return the opener hydraulic circuit to neutral.
3. Return the system pressure remote to neutral and allow the gauge to return to "zero".
4. To begin folding, reverse the flow on the system pressure remote and ensure that **"Wing Up"** pressure starts building. You may need to increase the SCV flow from field operation to get the wings to fold.
5. The outer wings will begin folding first, followed by the inner wings. Depending on certain physical and environmental conditions (such as temperature, uneven terrain, or excess soil buildup on the openers and tires), it is also completely normal for one side of the drill to complete folding first.
6. Normally, it is not necessary to use the "**FOLD INNER WING**" and "**FOLD OUTER WING**" buttons. If you find folding slower than normal, it may slightly speed up the folding process.
7. Once the drill has completed folding, return the tractor remote back to neutral. Then, exit the tractor and reinstall the wing transport safety chains before moving the machine in the folded position.

⚠ *NOTE: OVER TIME, OR IF THE MONITOR IS POWERED OFF, IT IS NORMAL FOR THE OPENERS TO BEGIN TO "SAG". IF TRANSPORTING OVER A LONGER PERIOD, OBSERVE THE OPENERS AND MANUALLY ENSURE THEY STAY IN THE RAISED POSITION PERIODICALLY.*

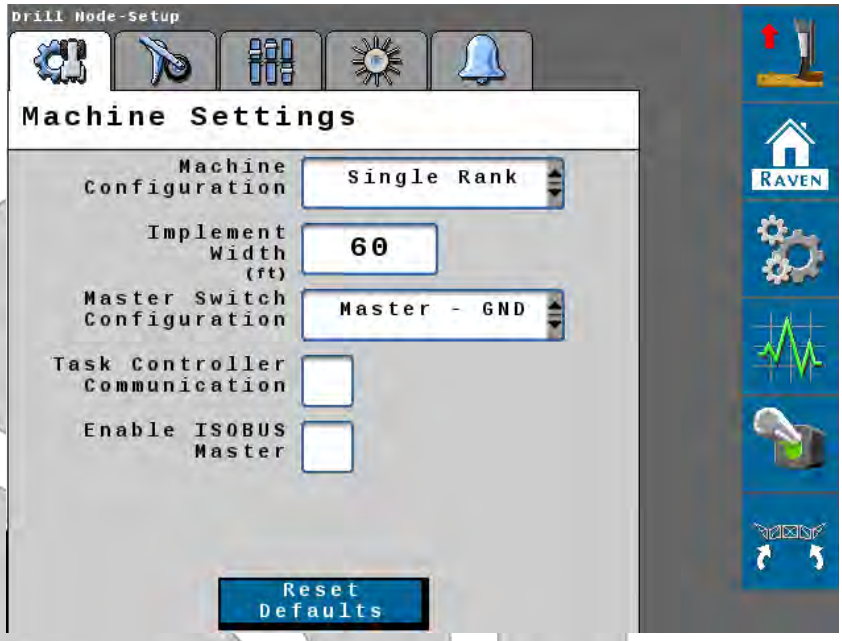
ENSURE WINGS ARE CLEAR OF ANY OBJECTS THAT COULD CAUSE HARM TO YOU OR ANYONE ELSE.

DO NOT LEAVE CONSTANT PRESSURE ENGAGED TO WINGS AFTER THE FOLDING PROCESS HAS COMPLETED. DOING SO CAN RESULT IN SEVERE DAMAGE TO BOTH THE HYDRAULIC SYSTEM AND FRAME COMPONENTS. DAMAGE OF THIS NATURE IS NOT COVERED BY WARRANTY.

MACHINE SETUP & MASTER SWITCH CONFIGURATION

Machine Settings Setup

To access the machine settings setup page, touch the Settings Soft key found in the soft key area, it will default to the machine settings.



Machine Configuration – There are 3 different machine configurations. Choose "**Single Rank**" machine configuration for your Ultra SR.

Implement Width – Set the implement width equal to your seeder width.

Master Switch Configuration: Packing pressure can be enabled by four different methods: On-Screen, Master – GND, Master – PWR and Remote. Touch the drop box to choose the method of choice. Choose a default setting of "**Master - GND**".

On-Screen Master: This setting uses the Soft Key on the Home Page. Simply touch the soft key to enable or disable the Master Switch.

Master Switch - GND: Your SeedMaster machine comes standard with a Foot Switch to enable and disable the Master Switch. Press the foot switch to enable/disable the packing pressure.

Master Switch - PWR: Your SeedMaster machine comes standard with a Foot Switch to enable and disable the Master Switch. Use this setting when the ISO Toolbar uses +12-volt to enable. Press the foot switch to enable/disable the packing pressure.

Remote Master: The Master Switch can be enabled or disabled by a third party +12-volt signal. The "Implement Height Connection" found on the Toolbar is used for this function. Pin C or the Black/White wire is the signal wire. This is also a power and ground wire supplied if the use of a relay is needed.

Task Controller Communication – The Drill ECU can communicate to the Task Controller. This is for future use. Please leave this setting *UNCHECKED*.

Enable ISOBUS Master – The Drill ECU has the ability to utilize the ISOBUS Master Switch, this is used in conjunction of the Task Controller Communication and is for future use. Please leave this setting *UNCHECKED*.

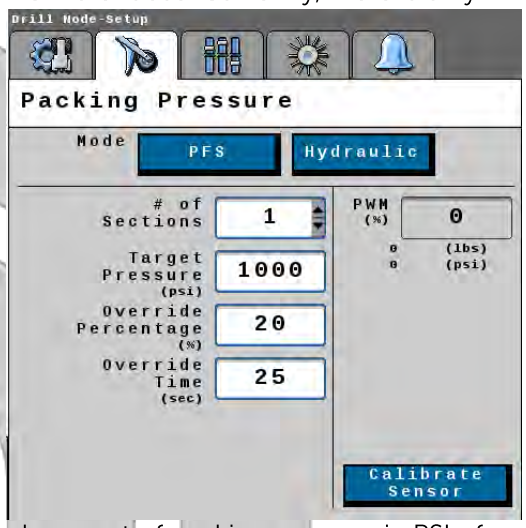
PACKING PRESSURE SETUP & OPERATION

Packing Pressure keeps the openers engaged in the ground while seeding. The "Packing Pressure ON/OFF" icon in the top left corner indicates whether Packing Pressure is engaged or disengaged. The Icon will be green if the packing pressure is ON. The Icon will be red when it's OFF.

Packing Pressure Setup

To access the packing pressure setup page, touch the Settings Soft key found in the soft key area, it will default to the machine settings to access the Packing Pressure settings touch the second tab.

Mode Area – There are two packing pressure options from which to choose. Currently, there is only one option available.



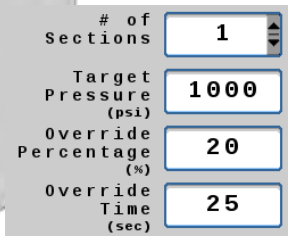
Hydraulic Mode: This is the option that should be chosen to run your machine. The transducer is plumbed into the opener down circuit to display the toolbar packing pressure.

PFS: This option is not available at this time and should not be chosen. Packing pressure will not function correctly if this is chosen.

# of Sections: All machines are equipped with 1 packing pressure section. Multiple packing pressure sections is for future use. Please set this to 1.

Target Pressure setting: The target pressure will be the desired amount of packing pressure in PSI of down force to the openers. For example, if the desired amount of packing pressure is 1000psi, touch the white box to the right of Target Pressure and enter 1000.

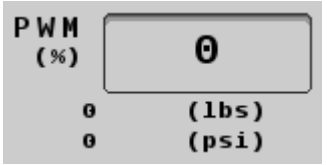
Pressure Override % setting: This setting will reduce the amount of packing pressure to the openers by a percentage of the set target pressure. Use the System Override button to turn the override function on/off/reset the override time. Use a lower percentage value to reduce the pressure significantly. For example, if the Target Pressure is set at 1000psi, the Override % is set at 20%, and the system override is tripped, it will drop the Target Pressure to 200psi. To set the Pressure Override %, enter the percentage in the white box to the right of Override.



Pressure Override Time: This setting sets the amount of time that the system will override the packing pressure setting. Enter the desired amount of time in seconds in the white box to the right of Override Time.

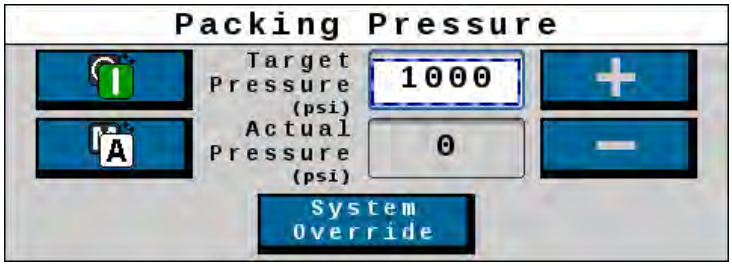
Calibrate Sensor Button: With the openers raised and the hydraulic remotes disengaged, press the "Calibrate Sensor" button to zero out the hydraulic pressure transducer.

PWM Reading: This reading will display the current position in percentage of the PWM valve.



PACKING PRESSURE OPERATION ON HOME PAGE

Touch the Home soft key to return to the home page to have access to the Packing Pressure operation settings.



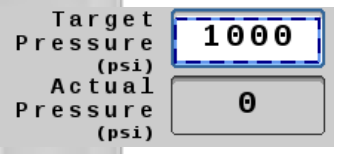
Off/Manual/Auto settings: The system is equipped with a PWM valve for controlling the hydraulic pressure to the openers when they are in the down position.

OFF: When the "OFF" button is selected, the PWM will not control the packing pressure.

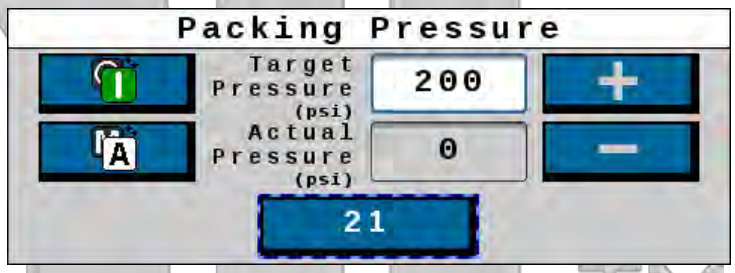
MANUAL: When "M" is selected, this puts the packing pressure into manual mode. Use the plus and minus buttons to increase or decrease the amount of down pressure to the openers.

AUTO: When the button is in the "A" position, this puts the packing pressure into an automatic mode. In automatic mode, the system will automatically adjust the packing pressure to keep it at the desired "Target Pressure". ***This is the recommended setting.***

Target and Actual Packing Pressure: The Target Pressure and Actual Pressure are displayed in the middle of the Packing Pressure area. Touch in the white area to easily change the target on the fly.



System Override: Touch the System Override button to reduce the amount of packing pressure to the openers by a percentage of the set target pressure. The System Override button will override the packing pressure for the set amount of time (set in the settings page). A timer will be displayed to show the remaining override time. To reset the time simply touch the System Override button again and it will start the timer from the top of the set amount of time.

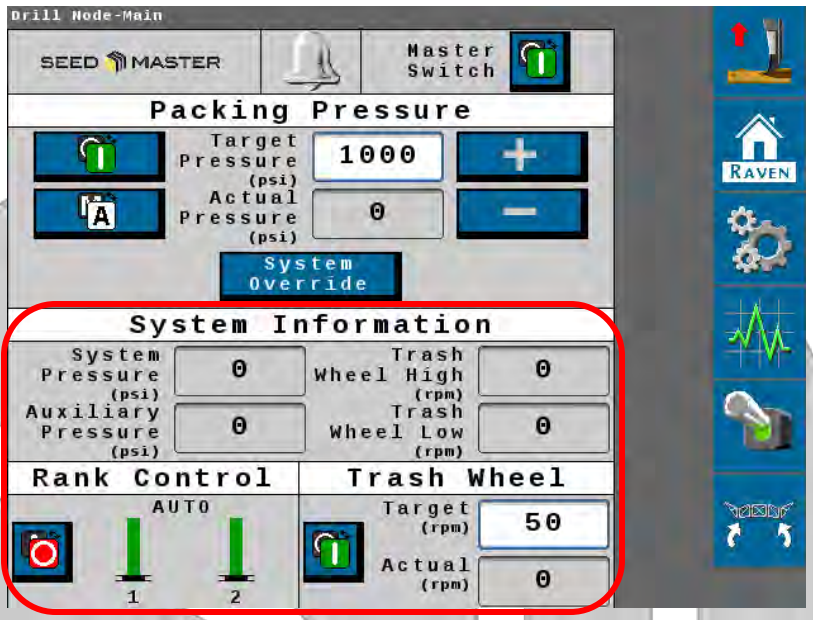


You can also touch the System Override Soft Key in the top right-hand corner of the page. Touching this soft key will initiate the System Override. Touching this icon again will cancel the timer and normal packing pressure will resume.

SYSTEM INFORMATION HOME PAGE SETUP

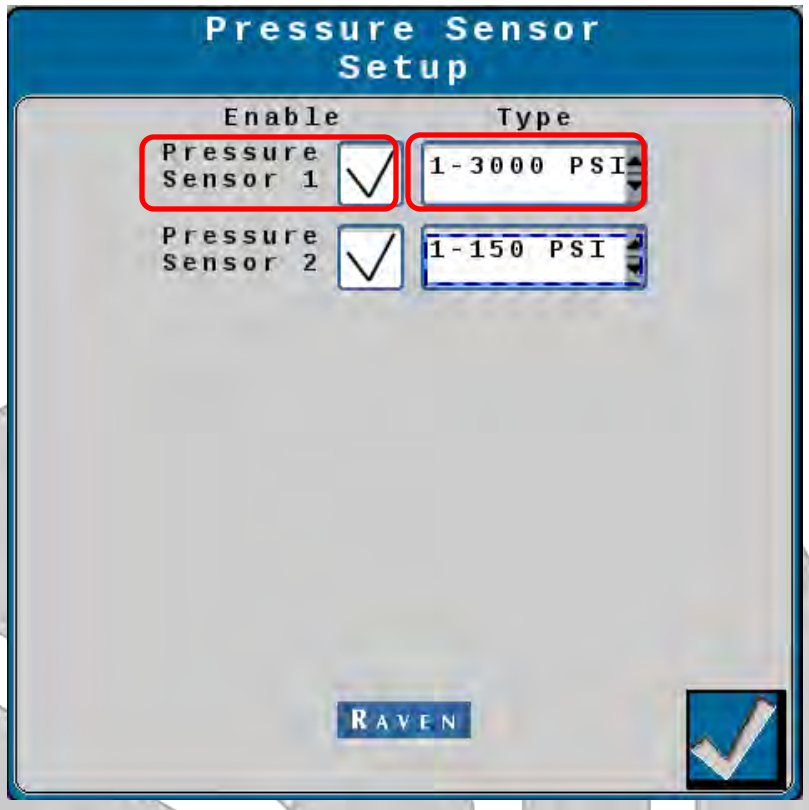
The System Information area on the home page displays the System Pressure, Auxiliary Pressure (if equipped with another pressure sensor), and Trash Wheel Alarm.
Follow the steps below to set up the parameters for your sensors. Please note that your machine will need to be equipped with the corresponding pressure transducer in order to monitor pressure.

1. Touch the Settings Soft Key to access the System Alarms page.



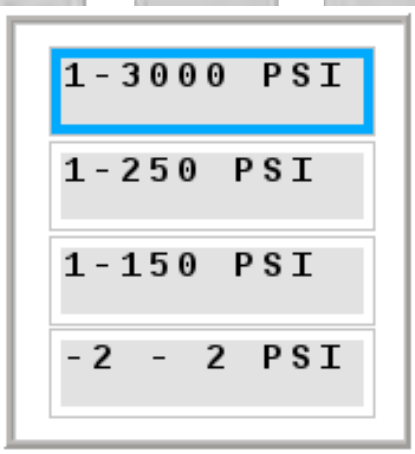
2. Touch the System Alarms tab at the top right of the page. Ensure System Pressure Alarm, Packing Pressure Alarm, and Trash Wheel Speed Alarm all have checkmarks. *Rank position alarm remains UNCHECKED.* Then, choose Pressure Setup at the bottom of the page to access the sensors required and their corresponding pressures.

3. For Sensors 1 and 2, a checkmark box is available to enable the sensor on the System Information area. Touch the "Type" drop-down menu to change the sensor to the appropriate style for the sensor display.



4. For System Pressure, choose the "1-3000 PSI" sensor.

5. For Auxiliary Pressure, choose the setting appropriate to the range of the sensor installed.

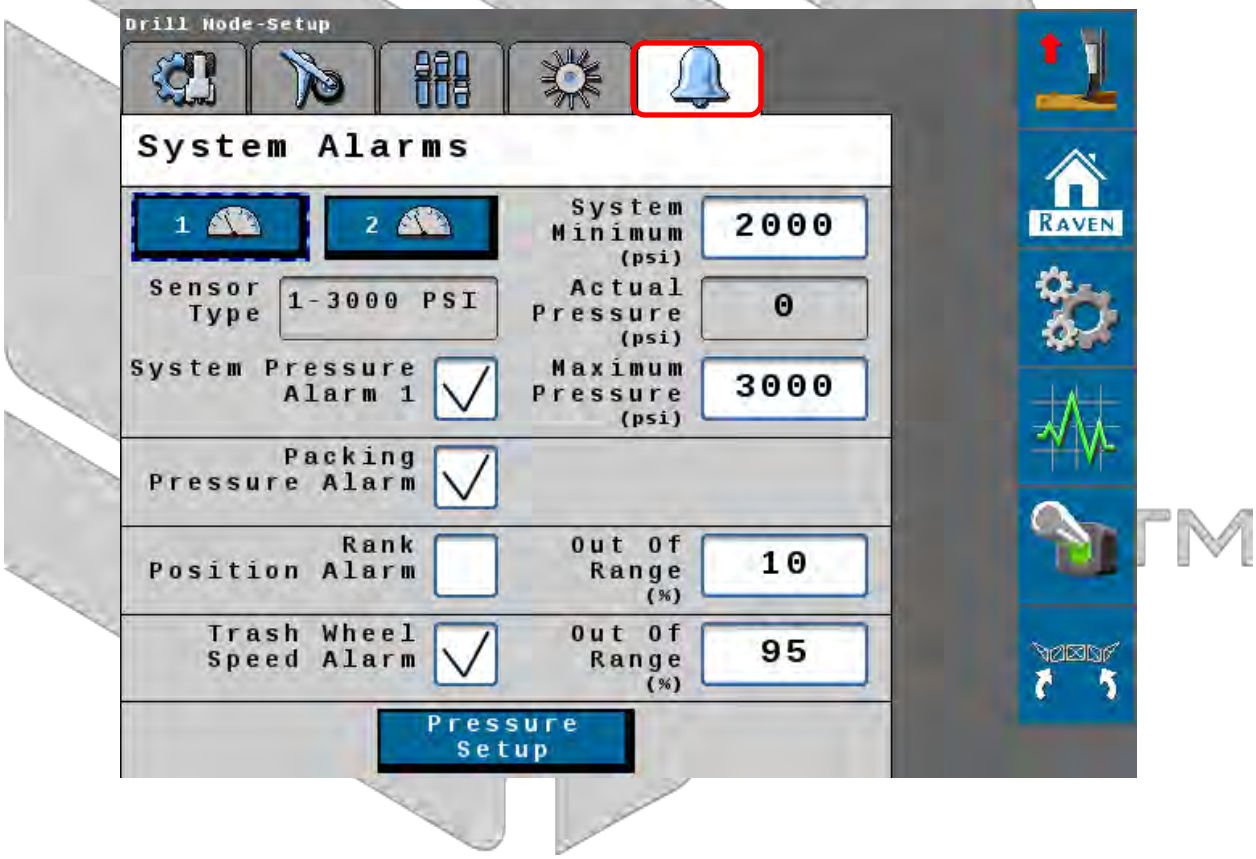


SYSTEM ALARMS

The system is equipped with alarms to warn the operator of any potential issue on the machine. To access the System Alarms settings, touch the Settings Soft Key. After touching the settings soft key, touch the Systems Alarm Tab to access the System Alarm settings.

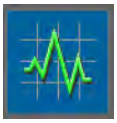
Enabling or Disabling an alarm: To enable an alarm, place a check mark beside the corresponding alarm. To disable an alarm, remove the check mark beside the corresponding alarm. If the alarm is enabled, the Min and Max values of the alarm range must be set.

Setting the Min and Max Range: To set the Min alarm value, touch the white area to the right of System Minimum. If the installed sensor drops below this value, the operator will be notified that a System Alarm has been tripped. To set the Max value, touch the white area to the right of Max. The default is the maximum that the transducer can read. If the installed sensor rises above this value, the operator will be notified that a System Alarm has been tripped. The recommended minimum alarm for System Pressure is 2500 PSI.



After the alarms have been set, touch the home button to return to the operating home page.

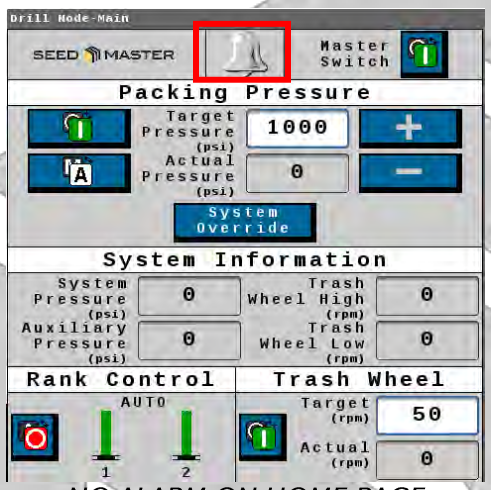
SYSTEM DIAGNOSTICS PAGE



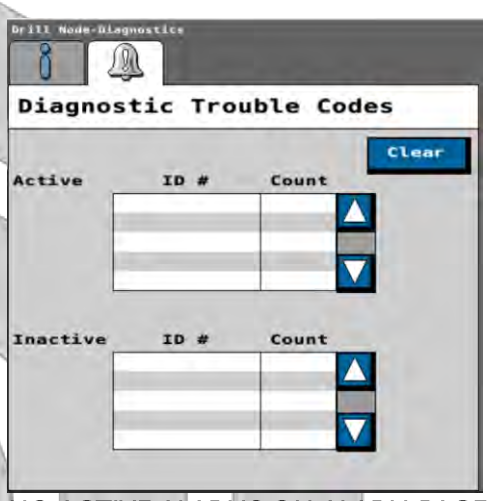
Touch the System Diagnostic Soft Key to access the Diagnostics page. The Diagnostics page houses a drop-down menu that allows you to select what to display: ECU Firmware version, Load Cell Voltage for diagnosing any potential issues, or Service Menu. The Service Menu allows a code to be entered to be used for diagnostics during a service call or visit.

ACTIVE ALARM PAGE

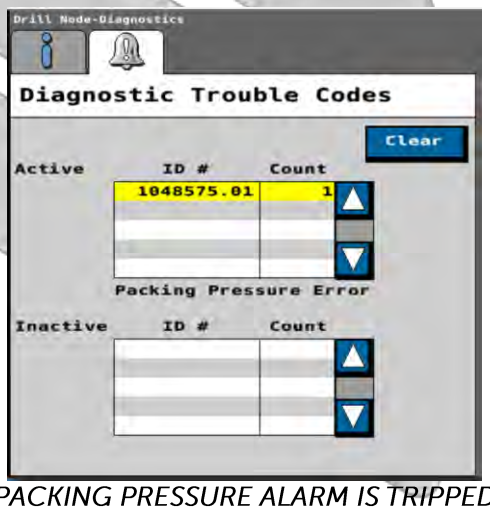
If the color around the bell changes to yellow, this means that there is an active alarm. If you touch in the bell it will display the Active Alarms Page. Touch the Home button to return to the home page after the alarm has been determined.



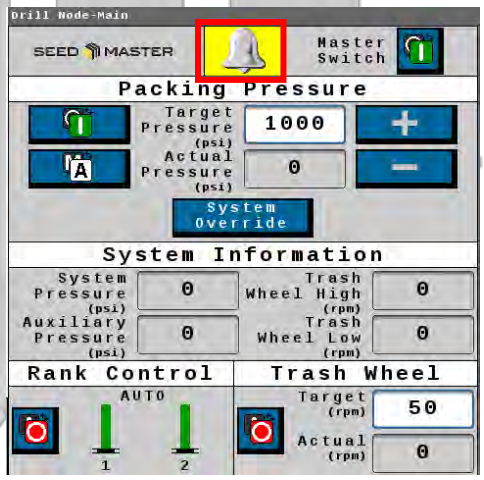
NO ALARM ON HOME PAGE



NO ACTIVE ALARMS ON ALARM PAGE



PACKING PRESSURE ALARM IS TRIPPED

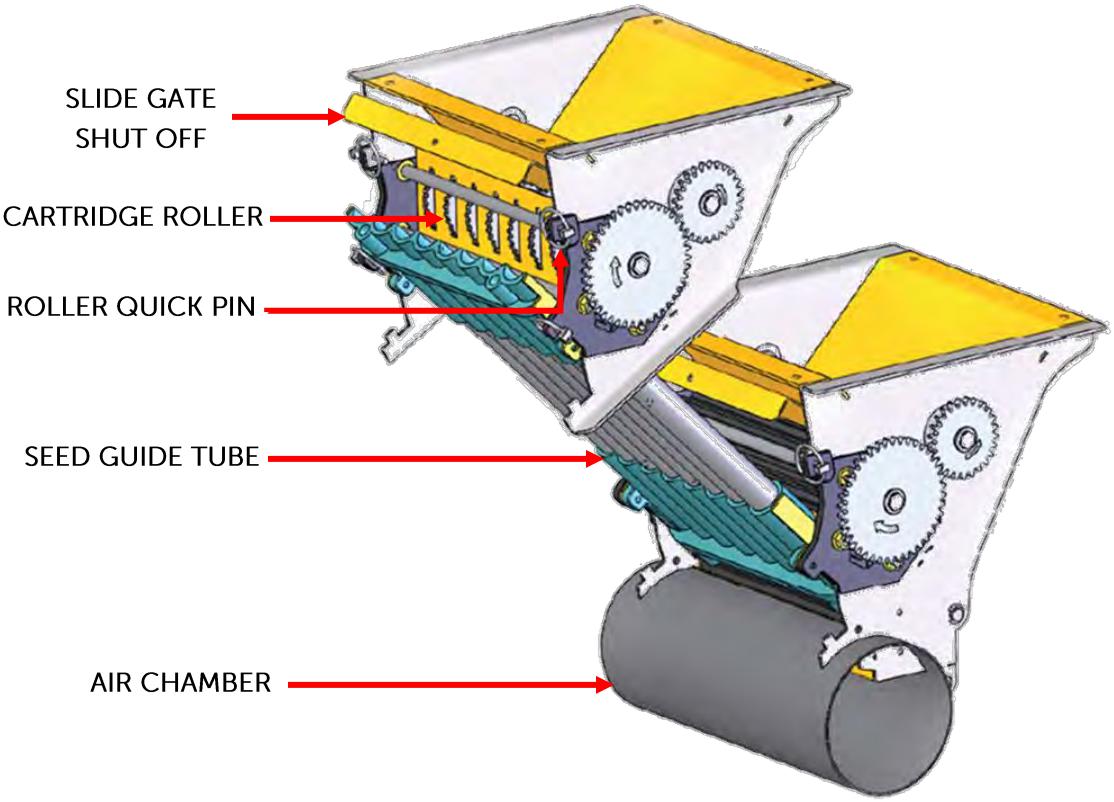


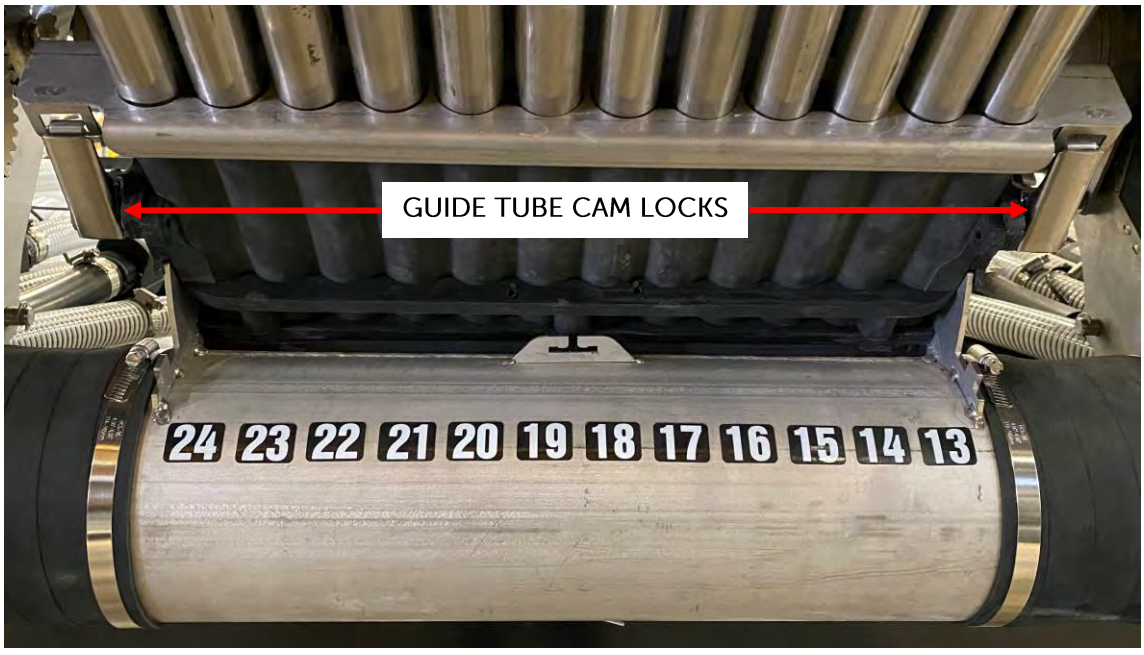
ACTIVE ALARM PRESENT ON HOME PAGE

ULTRAPRO II ONFRAME TANKS (UPII)

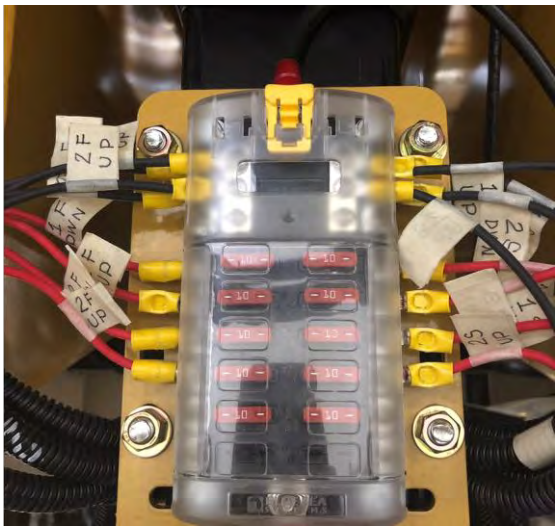
ULTRAPRO II ZONE COMMAND METER BOX (UPII)

The UltraPro II Meter is the next generation in SeedMaster metering.





The machine is equipped with 8 electric meter motors. There are 4 seed, and 4 fertilizer motors. The electric meter motors are supplied with high current power and fused individually in a self-contained fuse box. If a fuse fails, it will light up.



ULTRAPRO II CALIBRATION PROCEDURE PRE-SETUP (UPII)

Check the metering rollers. Worn, encrusted, or dirty rollers will not meter accurately. Ensure that the metering ledge is free of buildup as product application rate can be affected by the gap between the metering rollers and metering ledge.

Note: *It is crucial that all metering rollers are installed fully, ensuring that all retaining quick pins are placed into all pin locations.*

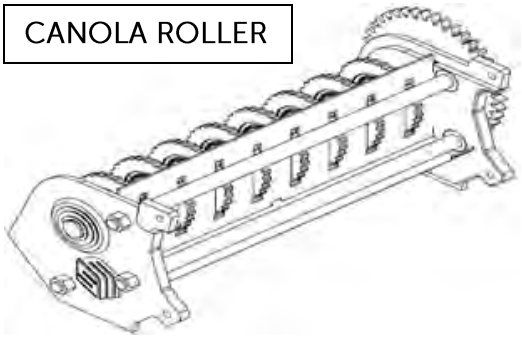
⚠CAUTION Hoppers must contain material. Use Zone Command controls to dispense product from the desired metering section. Be prepared to catch the material from one metering section in a container so it can be weighed at the end of the calibration.

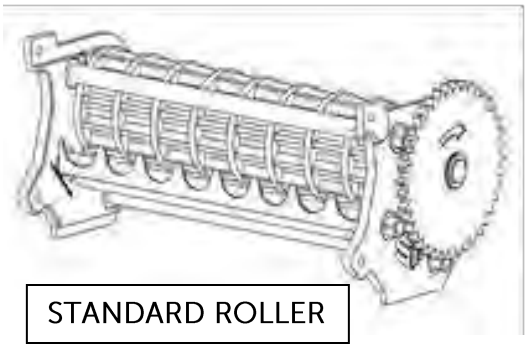
ULTRAPRO II METER ROLLERS:

The UltraPro II Canola Roller can be used to meter Canola, Mustard, Granular Inoculant, and other fine products.

The UltraPro II Standard Roller can be used to meter Cereals, Lentils, Peas, Beans, and all other coarse products.

CANOLA ROLLER



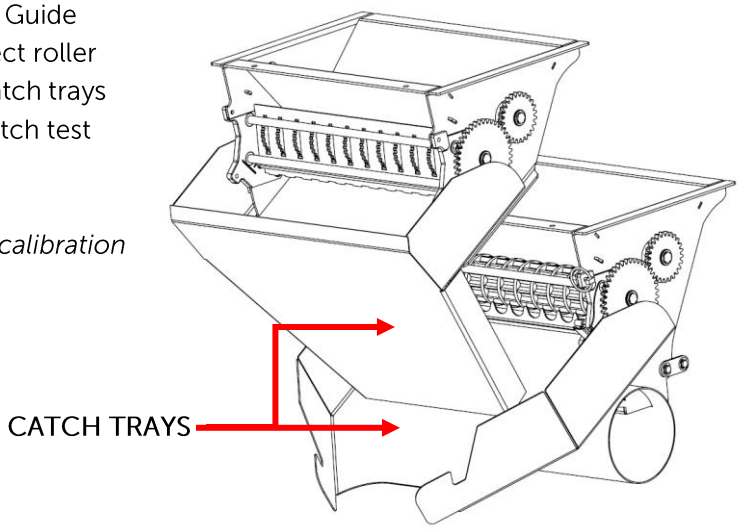


STANDARD ROLLER

METER BOX WITH CATCH TRAYS

To setup for calibration remove the Seed Guide Tube, and ensure that you have the correct roller for your product type. Then, install the catch trays on to the desired meter to complete a catch test and proceed to calibration procedure.

NOTE: See page 41 for the step-by-step calibration procedure.



ULTRAPRO II FAN PRESSURE GUIDELINES (UPII)

Before starting for the day, run the fan(s) for a minimum of 10 minutes to dry moisture out of the hoses and venturis.

Use the following table as a guide for setting on-board tank fan pressures.

Product	Application Rate Lbs/ac	Drill Size Range Feet	Air Pressure Ounces	FAN RPM
Fertilizer	50 to 100	30 to 48	10 to 12	3800 to 4000
Fertilizer	50 to 100	50 to 100	12 to 16	4000 to 4900
Wheat	80 to 130	30 to 48	12 to 14	4000 to 4800
Wheat	80 to 130	50 to 100	14 to 17	4800 to 5000
Barley	70 to 100	30 to 48	12 to 14	4000 to 4800
Barley	70 to 100	50 to 100	14 to 17	4500 to 5000
Canola	2 to 5	30 to 48	9 to 10	3000 to 3800
Canola	2 to 5	50 to 100	10 to 11	3800 to 3900
Flax	40 to 55	30 to 48	10 to 11	3800 to 3900
Flax	40 to 55	50 to 100	11 to 12	3900 to 4300
Peas	150 to 200	30 to 48	12 to 16	4000 to 5000
Peas	150 to 200	50 to 100	15 to 18	4900 to 5300

Pressure too LOW - causes potential plugging in lines

Pressure too HIGH - product bounces or blows out of furrow

SEEDMASTER APP

The SeedMaster Seed Rate Calculator is a two-part app. Part one of the app will allow a grower to rapidly and effectively calculate a seeding rate to achieve a desired plant population within a given field. Part one of the app will also allow a grower to calculate how many pounds of seed is required and the total cost associated.

Part two of the app is associated with SeedMaster machines that are controlled by the Raven Viper in-cab monitor or ISOBUS RCM. A "cal weight" number controls the rate of the granular metering system. Every granular product requires an accurate cal weight number to allow the product to be metered at the desired rate.

The Cal Weight Estimator will allow a grower to receive an estimated calibration number for a specific product being metered, meter type used, and drill width. ***SeedMaster recommends that an initial calibration catch test be performed to ensure calibration accuracy.*** The purpose of providing this tool is to alert a grower of a potential error during the calibration process before unwanted field results can occur. This tool will be especially valuable for new operators or when new products are metered.

The Cal Weight Info Submission will allow growers to very easily and quickly send their calibration information to SeedMaster. This allows SeedMaster to provide a more accurate estimated calibration number to all users of the app. This results in a benefit for all users of the app in the future. All submissions are reviewed by SeedMaster to ensure validity before becoming part of the Cal Weight Estimator.

The Cal Weight Notebook is a grower's own personal notebook with saved calibration values from his or her own specific machine(s). All Cal Weight submissions are automatically stored for the grower for future reference at any time.

Download on the App Store

ANDROID APP ON Google play

Part 1: Seed Rate Calculator

Figure 1: **Rate Tab**. Pg1 → Using the slider bars or the manual white box, enter the desired values to determine your seed rate in LBS/ACRE.

Figure 2: **Rate Tab**. Pg2 → Use this page as a guideline for target plants/ft and TKW.

Figure 3: **Cost Tab** → Using the slider bars or the manual white box, enter the desired values to determine how much seed is required and an estimated cost.

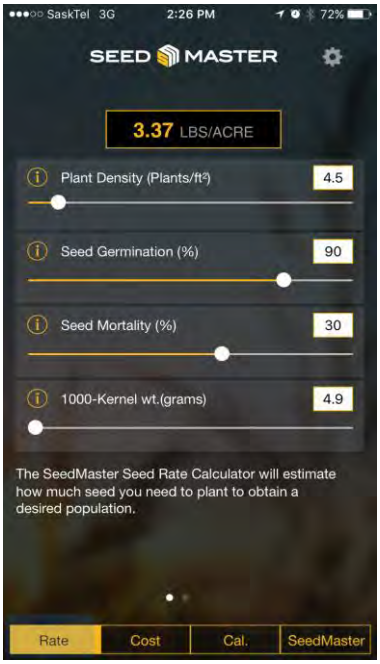


Figure 1

Figure 2

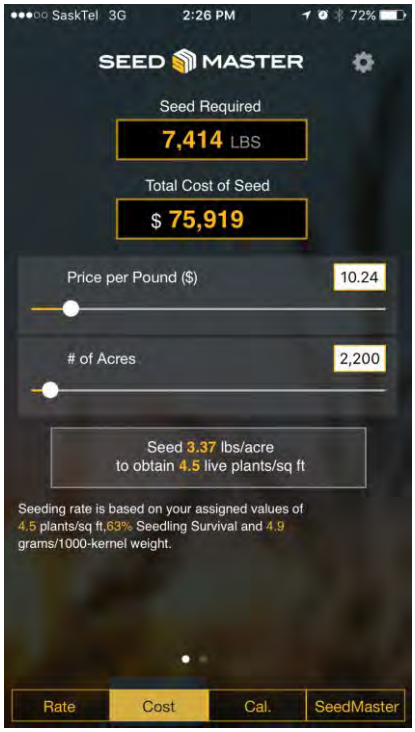


Figure 3

Part 2: Cal Weight Estimator

Figure 4: → Operator Liability Warning.

Figure 5: **Cal. Tab.** Pg1 → Choose the product type, meter type, and drill width to determine an estimated cal weight.

Figure 6: **Cal. Tab**. Pg2 → This page gives you the ability to submit your cal weights.

Figure 7: **Cal. Tab**. Pg3 → Submitted cal weights get stored in the Cal Weight Notebook.

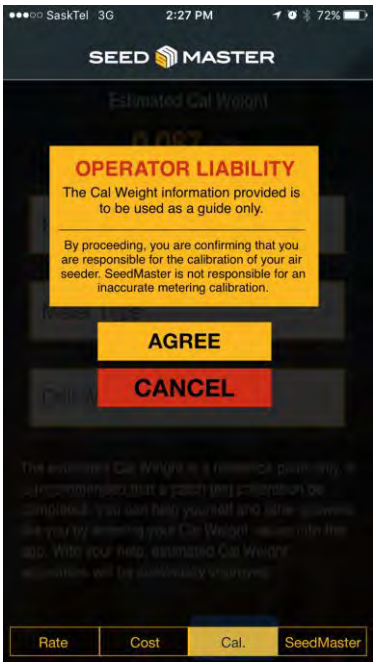


Figure 4

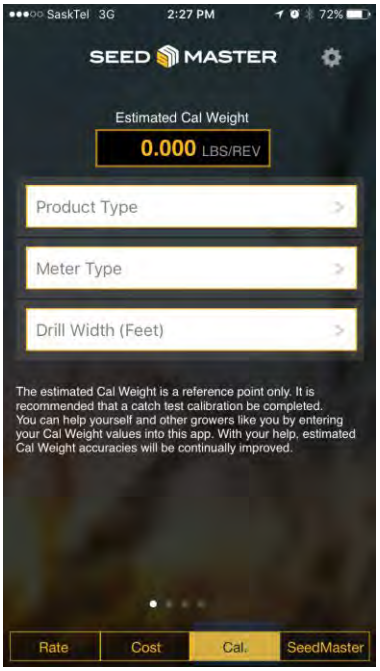


Figure 5

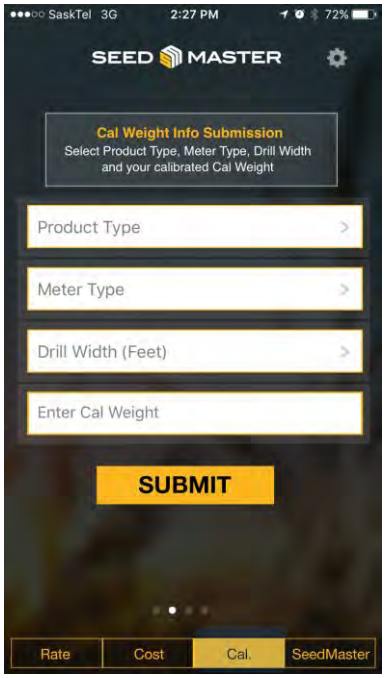


Figure 6

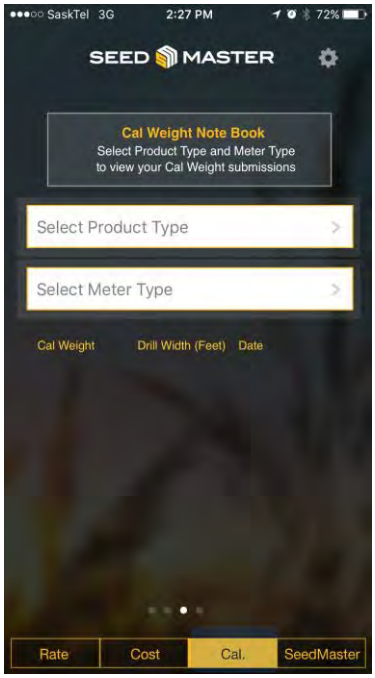


Figure 7

ISOBUS RCM FUNCTIONS

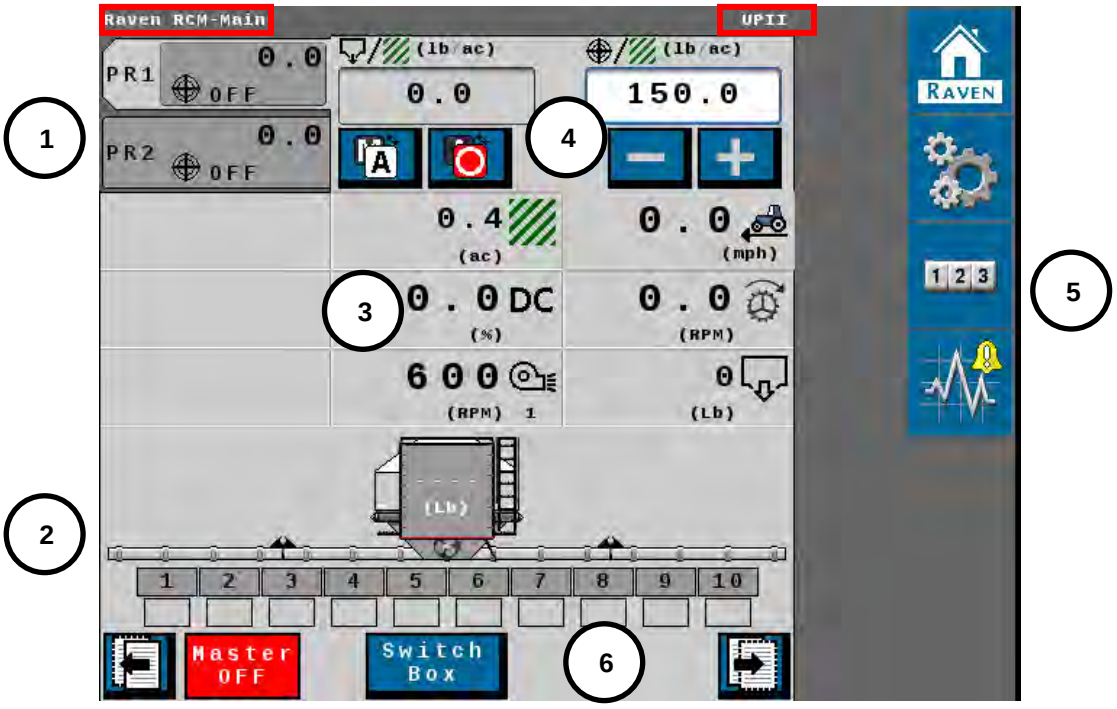
HOME SCREEN LAYOUT

The Raven Rate Control Module (RCM) is a multi-product application control system built on an ISOBUS platform. Raven Rate Controller Module controls up to 4 product applications such as liquid, granular, and NH3 via ISOBUS Virtual Terminal (VT) and task control for as-applied documentation, prescription rate, and section control. ISOBUS RCM will control your Ultra SR multi-product OnFrame Tank via the installed Virtual Terminal. To access the RCM Tank Functions, touch the ISOBUS RCM soft key on your VT display. See your VT's operator's manual for more information on locating VT soft keys.

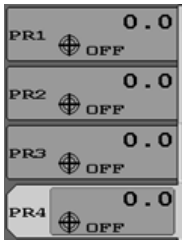
RCM SOFT KEY

DISPLAYS THE NAME OF THE CURRENT PAGE

RCM PROFILE NAME



1. **Product Area:** Displays the products that are set up for the specific RCM. Each product displays the state of the product. It will display "**Off**" when the product is off, it will display the target rate when it is "**On**" and set to "**Auto**" and will display "**MAN**" when it is on and set to Manual mode. Simply touch the desired product to make it the active product. The active product shows the product number in a light grey color. If the active product button is touched while it is active, it will go to the "**Setup Rates**" page.



ACTIVE PRODUCT

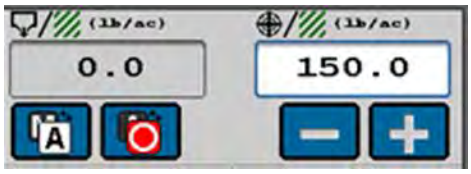
2. **Tank Area:** Displays the current tank weight. The tank is also a button that will go to the Refill Tank/Bin page if touched. Below the tank, implement sections are displayed with their status. If they are grey, that indicates that they are off. If they are brown in color, that indicates that they are on.

3. **Display Menu:** This area displays different information about the active product. Its factory defaults are set up to display:

- **Task Area (ac)**: this will display how many acres have been covered by the active product.
- **Traveling Speed (mph)**: this will display the current ground speed or Test Speed.
- **PWM Duty Cycle (DC)**: this will display the current PWM position as a percentage.
- **RPM sensor (rpm)**: this will display the current RPM of the drive motor for the active product.
- **RPM 1 or 2 (rpm)**: this will display the current FAN RPM for the active product.
- **Volume Applied (lb):** this will display how many pounds of product has been applied for the active product.

NOTE: The Task Area and Volume Applied can be reset from the Current Totals page. Touch the Tally Registers button to access the Totals page.

4. **Rate Control:** Adjust the rate control. This area displays the actual rate and target rate. It includes the Auto/Manual toggle button, Product Master ON/OFF button, and the Rate increase or decrease buttons.



5. **Softkeys:** Touch soft keys to access different settings and functions.

6. **Switches:** Displays the page left/right buttons, the Master Switch indicator, the SwitchBox button, and the Quick Start button.

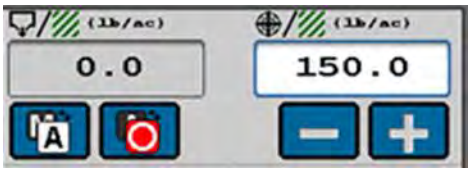
ISO RCM QUICK START PROCEDURE

Before you go to the field please review the steps below to ensure your Ultra SR is field ready.

Step 1. Review ISO SR Quick Start Procedure (PAGE 19)

Step 2. Turn Product Master ON/OFF Switch ON for each product being applied: Before turning the safety switch on please ensure the machine is free of any persons, animals, or objects that could damage your equipment. Touch the RED safety switch. The Safety Switch will turn green indicating that the system is ready.

Step 3. Review the Calibration Weight: The Calibration Weight value indicates the number of pounds per revolution that the product meter will output. ***ALWAYS ensure that the correct Calibration Weight is entered into the Calibration Weight area***. Refer to the **Catch Test Calibration Procedure (PAGE 41)** section for instructions to perform a Calibration Catch Test. To access the Calibration weight, touch the tank for the active product. It is important to review the calibration weight for any active product.



Step 4. Review the Target Rate & Product Control: The target rate is the desired pounds of product that will be applied per acre. Before going to the field, ensure the correct rate is set. Also, ensure that the product control is set to "**Auto**". Auto mode will automatically adjust the product rate during seeding to keep the rate at the desired target. If set on Manual, it will lock the PWM valve at its current setting and will not adjust for terrain changes or speed changes. Typically, manual mode is used for troubleshooting or the loss of the rate controller's speed input.

Step 5. Review Tank Weight: The live tank weight from the load cells is displayed on the home page in the middle of the screen. Ensure the tank weight is correct before entering the field. Before filling the tank, it is important to zero the scale. Touch tank then the "**zero**" button. After filling, a tank capacity can be entered. Touch the tank, then view the Current Tank Level, and then enter that number into the Tank Capacity. This would be used if a low tank alarm is being used. If scale weight is inaccurate, refer to page 51 to recalibrate the scales.

Step 6. Review Tally Registers: Before starting a new field, review and reset the Field Area and Field Product Weight. Touch the reset button on the Current Totals page to reset the Tally Registers for a new field.

Step 7. Review Onscreen Switch Box: Ensure that all Zone Sections are enabled. There will be a square located below the Zone Sections indicating that the Zone is enabled and will be engaged when the product control is turned on. The square will turn green when zone is engaged.

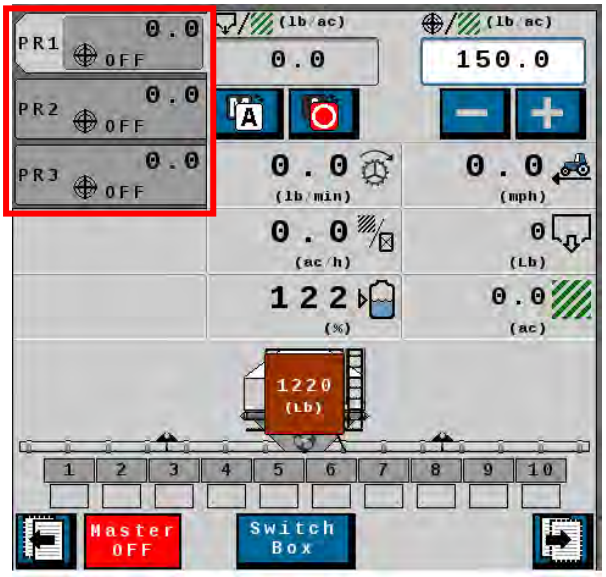
Step 8. Review Fan RPM: Fan RPM is located Display Menu Area. Ensure that each active product has a Fan RPM.

Step 9. Turn Master Switch ON: When the machine is in position to apply product, use the foot switch to turn the master switch on. The Master will display Green and ON.

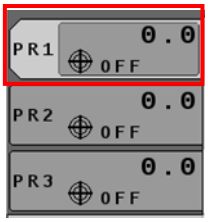
RCM MAIN (HOME) PAGE

PRODUCT SELECTION

The product selection area displays the products that are setup for the specific RCM. Each product displays the state of the product. It will display "Off" when the product is off, it will display the target rate when it is on and set to "**Auto**" and will display "**MAN**" when it is on and set to Manual. Simply touch the desired product to make it the active product. The active product shows the product number in a light grey color. If the active product button is touched while it is active it will go to the "**Setup Rates**" page.



SETUP RATES PAGE

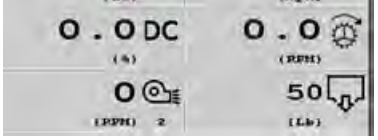


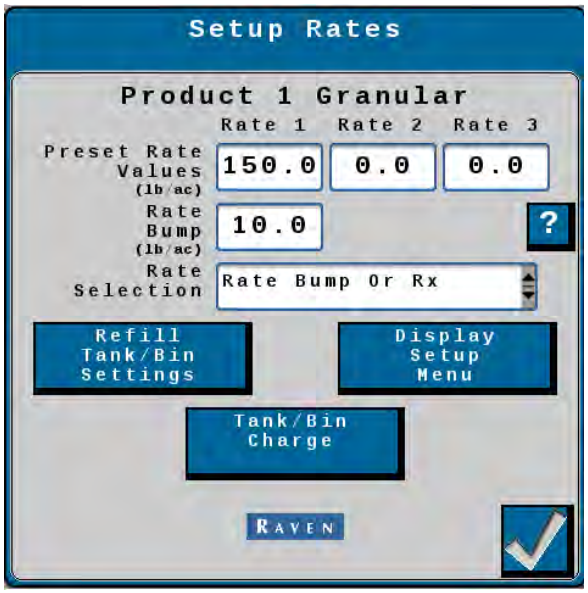
The Setup Rates page allows the operator to change the rate settings after creating a profile with the setup wizard. Touch on the active product to access this setup page. Three predefined preset rate values can be set for quick rate changes on the fly. To have the predefined rates display on the home screen select the Rate Selection from the drop-down Menu then choose the rate type "**Predefined or RX**". Set each value to the desired rate.

The "**Rate Bump or RX**" selection displays plus (+) and minus (-) buttons that increase or decrease the target rate by the "**Rate Bump**" value. Enter the desired "Rate Bump". If a job is set up with a prescription map, the target rate will be generated from the map.

Touching the "**Refill Tank/Bin Settings"** button takes you to the Refill setup page also accessible by touching the bin. See next page for more details.

Touching the "**Display Setup Menu"** button allows you to setup the main page display area. ***It is recommended to leave these settings at the factory defaults***.



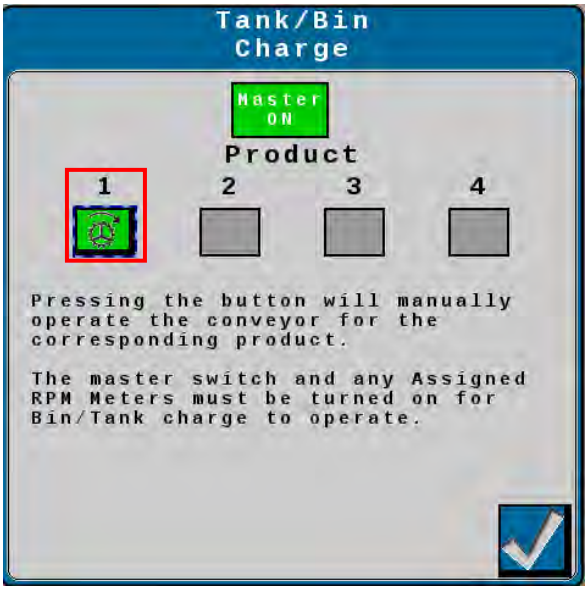


Touch the **Tank/Bin Charge** button to access the Tank/Bin Charge function page. See next page for more details.

TANK/BIN CHARGE PAGE

Use this page to quickly charge the meter roller.

1. Engage the master switch.
2. Touch the product Tank/Bin Charge button for the desired meter/product.
3. The meter will spin for 3 seconds.
4. Repeat to charge other meter rollers.
5. When finished, disengage the master switch.
6. Touch the check mark to exit.



CONTROL MODE

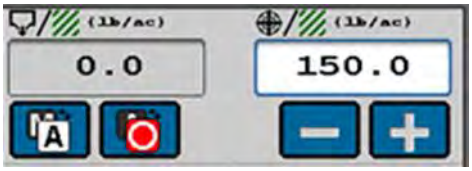
The control mode indicator displays the selected mode for product application. Select the "Auto/Manual" button to toggle the application mode between automatic and manual. If the product is active the safety switch will display green to the right of the Auto/Manual button.

- **Manual mode** allows the operator to control the actual application rate directly using the on-screen increase and decrease buttons.
- **Automatic mode** automatically adjusts the application rate to an operator set target rate. Use the rate increase or decrease buttons in auto mode to adjust the target application rate.

NOTE: Both the remote master and the product safety switch must be toggled on to apply product.

RATES AREA

The application rates area displays the actual and target rate information as well as the currently selected units in which the information is displayed.

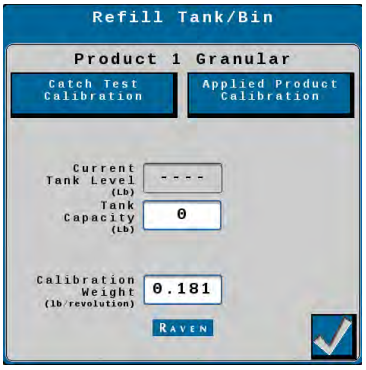


Target Rate: Select the target value to enter the target rate for the current application. (i.e. 150 pounds per acre).

Actual Rate: The actual rate display shows the operator the actual volume of product being applied.

REFILL TANK/BIN & PRODUCT CALIBRATION PAGE

To quickly access the tank fill and product calibration settings simply touch on the tank in the middle of the screen. The tank indicator on the product control home screen displays a tally of product remaining based upon the load cells. The tank volume is the volume of product currently in the tank or bin, not the capacity of the tank or bin. The tank capacity can manually be set by entering the Current Tank Level. The current tank level value will adjust as product is applied. Before adding product to the tank, it is important to zero out the Current Tank Level. Simply touch the "**Zero**" button to zero the tank weight.

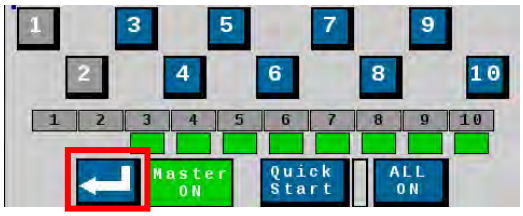


To perform a product calibration test, touch the "**Catch Test Calibration**" button. Please see the "**CATCH TEST CALIBRATION PROCEDURE**", (PG. 41) for more info.

To perform an automatic product calibration, where the load cells and rate controller compare applied product weights, touch on the "**Applied Product Calibration**" button. Please see the "**APPLIED PRODUCT PROCEDURE**", PG. 45 for more info. A manual calibration weight can be entered from this page.

SECTION STATUS & SWITCH BOX

1. Select the Section Switchbox button.
2. Disable or enable sections:
   a. Select the Section Number button to enable or disable a section. If operating multiple product configurations, enabling or disabling a section affects all products in that section group. If needed, select a different product to access different section groups.



   b. Select "All On" button to enable all sections for the product or section group.
3. Select the back button to return to the main run page.
4. The implement sections can be in one of three states:

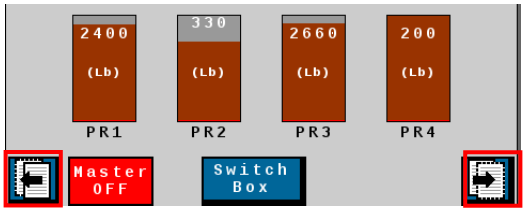
Disabled - Manually disabled by Section Switchbox buttons. Square block below section number is clear.

Enabled - Section is ready to apply. Square block below section number has a black rectangular outline.

Active - Section is applying. Square block below section number is filled green.

ALTERNATE TANK VIEW

Use the "Page Left" or "Page Right" buttons to show the following screen. It shows each product's tank weight. Touch on any one of the tanks to access the tank fill and product calibration page. To toggle back to the single tank view, use the "Page Left" or "Page Right" buttons.



QUICK START BUTTON

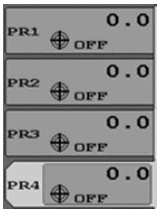
The Quick Start button enables after activating the system for a product. If operating multiple products, select the desired products and enable the system. Then, select the "Quick Start" button for each product. Selecting a "Quick Start" button turns on all sections only for the active product and applies the product at target rate. When selected, "Quick Start" overrides the Section Control and machine speed threshold for 15 seconds for the active product. A countdown indicator appears when selected. Select the Quick Start button at any time during countdown to reset counter back to 15 seconds.

CATCH TEST CALIBRATION PROCEDURE (ISO SCREEN)

Your Ultra SR will need to be calibrated for the specific product you are using. The calibration procedure will require two 5-gallon pails, a catch tray, and a digital scale. Install a catch tray on the meter from which you will be catching product. For Remote Tank Monitor Rate Calibration, see page 63.

CALIBRATION PROCEDURE

1. Zero the digital scale and tare the weight of the pail you will be using to catch product.
2. Prepare the meter that you will be catching out of by placing the pail underneath the catch tray.
3. Shut the **MASTER SWITCH OFF** (Foot Switch). If turned on, the calibration soft-keys will be greyed out.



SELECT ACTIVE PRODUCT

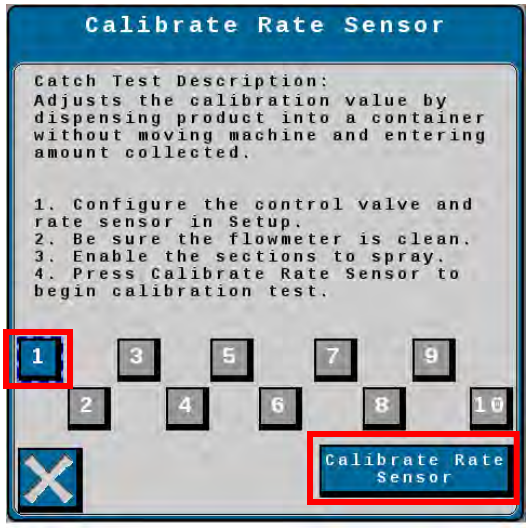
4. Select the product that the catch test will be performed on.
5. Touch the Tank in the middle of the screen.

REVIEW INITIAL CALIBRATION SETTINGS

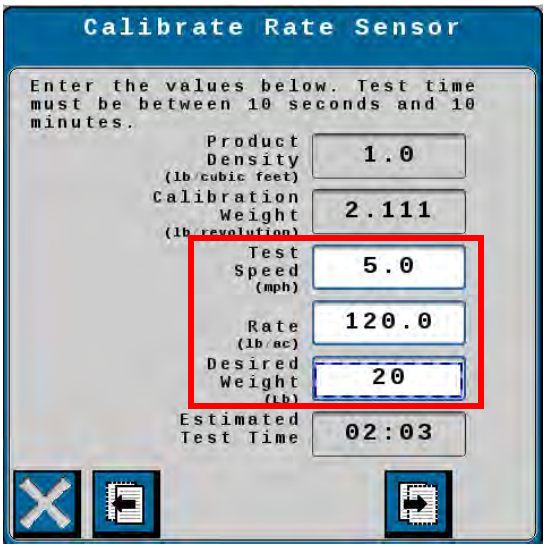
6. Enter the Current Tank Level Reading into the Tank Capacity area.
7. Enter a Calibration Weight. This Estimated Cal Weight will be used as a starting point.
8. After the settings have been reviewed, touch "Catch Test Calibration".

9. After touching "Catch Test" a warning screen will appear saying that product will be expelled. Please read the warning before touching the green check mark. Note: *If buttons are greyed out, shut the master switch off.*

10. Please read through the Catch Test Description.
11. Touch the Zone (section) number that is setup to catch product. In this example the catch tray would be setup under Zone 1 on the left side of the machine. After selecting the zone to catch from, touch "Calibrate Rate Sensor".



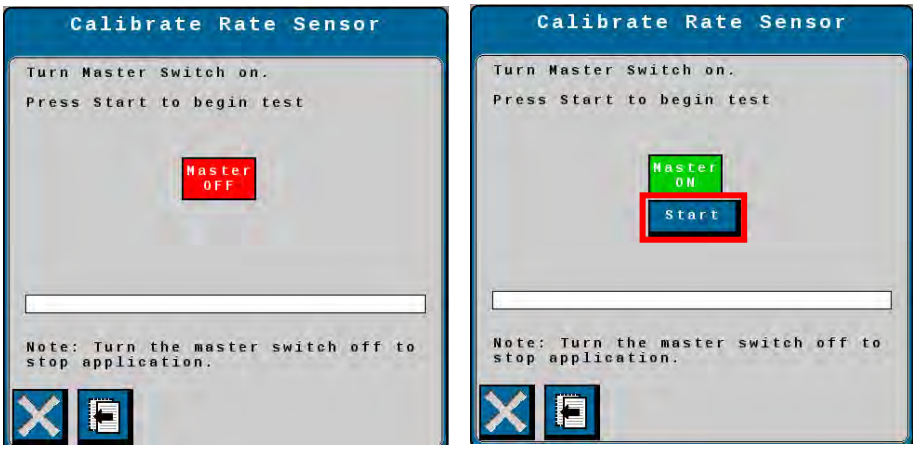
12. Enter the following values:
    a. **Test Speed** = 5
    b. **Rate (lb/ac)** = Desired Rate for the product being metered in the field.
    c. **Desired Weight (lb)** = The amount of product to be caught into the catch pail.



13. After entering the Test Speed, Rate and Desired weight, touch the next button pointing to the right. 

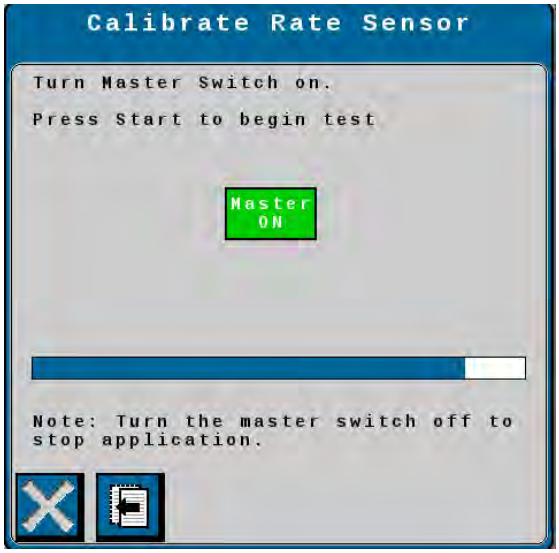
NOTE: The Estimated Test Time must be under ten minutes. If the test time is greater than 10 minutes, decrease the Desired Weight (the amount of product being caught).

14. Turn the master switch on by pressing the foot switch.
15. Touch the Start button.



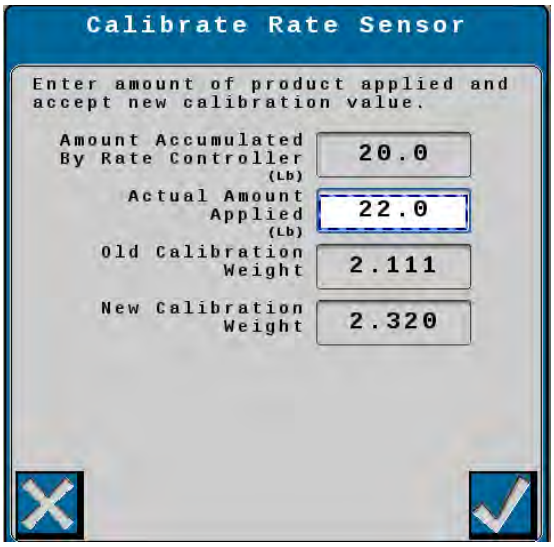
NOTE: The meters will begin to expel product after touching the start button.

16. A blue bar will display during the calibration. This indicates the progress of the calibration. When the calibration time is expired, the meter will shut off automatically.



NOTE: If the product needs to be shut off at any time during the calibration progress simply press the master switch to stop the meter from spinning. This will compete the catch process and advance the calibration process to the next screen. Please cancel the calibration process and start over if catch sample is inaccurate or light.

17. After the catch time expires, the calibration will advance to the last calibration screen. This screen displays the accumulated weight computed by the Rate Controller. Below the computed weight is where the actual weight accumulated will be entered.
    a. Weigh the product that was caught (ensure that the scale being used is accurate and the weight of the pail is removed from the total weight).
    b. Enter the weight reading in the Actual Amount Applied.
    c. The old calibration weight value will be displayed along with the new calculated calibration weight. Please review these values for inaccuracies. If the results are acceptable, then touch the check mark to accept then new calibration weight value.
    NOTE: *The calibration number will change automatically to the new calibration number.*



18. Shut Master Switch OFF by pressing the foot switch.

NOTE: IT IS RECOMMENDED TO COMPLETE AT LEAST 2 TO 3 CATCH CALIBRATIONS PER PRODUCT TO ENSURE ACCURACY. PRODUCTS SUCH AS CANOLA SHOULD BE CALIBRATED NO LESS THAN 3 TIMES. IF THE CALIBRATIONS ARE INACCURATE FROM ONE TO THE NEXT, PLEASE INSPECT THE METERING COMPONENTS AND START THE CALIBRATION OVER.

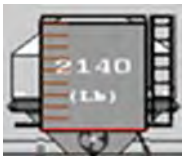
APPLIED PRODUCT CALIBRATION PROCEDURE (SMARTCAL)

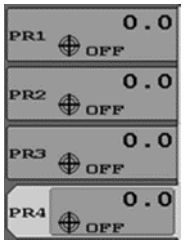
SeedMaster Ultra SR machines are equipped with Load Cells are capable of an Auto Calibration on granular products. The SmartCal Auto Calibration feature will maintain a high accuracy on granular products. Auto Calibration software continuously reads the actual weight reduction in each tank and compares that to how much weight should be reduced with a perfect calibration. It then makes the necessary metering adjustments up or down and spins the rollers faster or slower to move it closer to perfect. The SmartCal feature will become more accurate with more acres because an increasing amount of ground-truth data is fed into the system. A heavy, bulky product such as granular fertilizer going down at a high rate gives the system enough feedback so that it auto calibrates quickly and accurately. A light weight, low rate product such as canola takes more acres to dial in.

NOTE: Before using the SmartCal feature, it is HIGHLY recommended to perform a catch test calibration on each product. The initial product calibrations will determine the Cal Weight for the products being metered. This will allow for a more accurate SmartCal.

APPLIED PRODUCT CALIBRATION PROCEDURE

1. Shut the **MASTER SWITCH OFF** (Foot Switch) and park the machine as level as possible. Ensure the scales are still before proceeding.
2. Select the product that the applied product calibration will be performed on.
3. Touch the Tank in the middle of the screen.

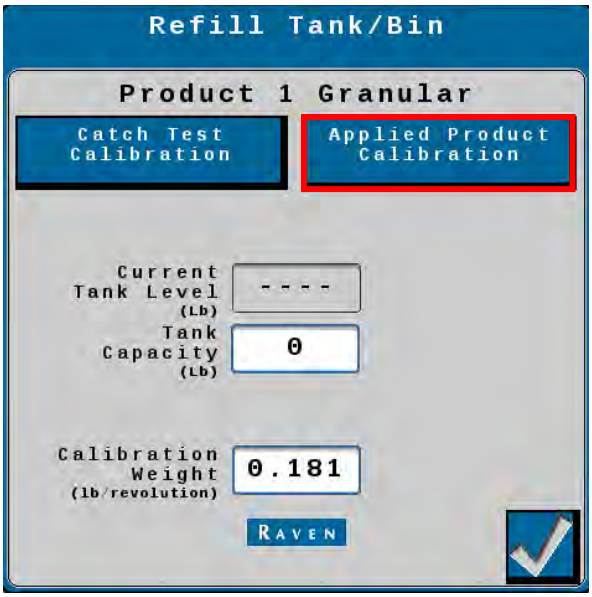




SELECT ACTIVE PRODUCT

REVIEW INITIAL CALIBRATION SETTINGS

4. Enter the Current Tank Level Reading or maximum product weight into the Tank Capacity area.
5. Enter a Calibration Weight. This Estimated Cal Weight will be used as a starting point. Skip this step if you have performed a catch test calibration.
6. After the settings have been reviewed, touch "Applied Product Calibration".

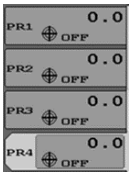


7. Please read / review the Applied Product test description. Then touch the check mark to begin an applied product calibration.

8. The SmartCal (Applied Product) calibration is now active.
9. Touch the Check Mark to exit.
10. Multiple Applied Product calibrations can be done at the same time. Simply repeat 2 to 10 for each product.

NOTE: It is important that the machine is in the field and ready to apply product before initiating an Applied Product Calibration.

11. Return to the home screen and continue to apply product as per usual.
12. After applying a minimum of 15 acres for higher rate product and/or 50 acres for lower rate products, return to the Applied Product Calibration screen.
13. Park the machine as level as possible and turn OFF the master switch. Ensure the scales are still before proceeding.
14. Select the correct product.
15. Touch the tank in the middle of the screen.
16. Touch Applied Product button.



SELECT ACTIVE PRODUCT

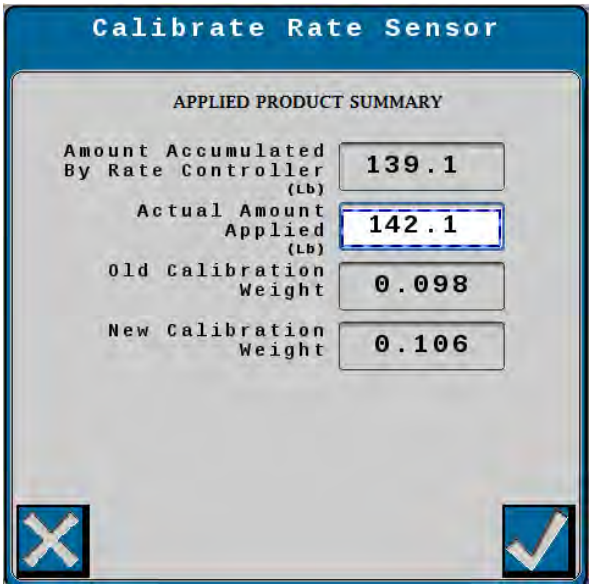
17. Touch the "Stop Accumulating" button. The amount of product that was accumulated will display in the button.

NOTE: If the button just says Accumulating, this means the master switch has not been shut off.

18. The Applied Product Test description will appear on the screen. Please read through the description before continuing.

19. Touch the Calibrate Rate Sensor button.

20. The Applied Product Summary page will be displayed. Review the values on this page. If the values are acceptable, touch the check mark to accept the new calibration weight. To discard the new calibration weight, touch the X and this will stop the calibration process.

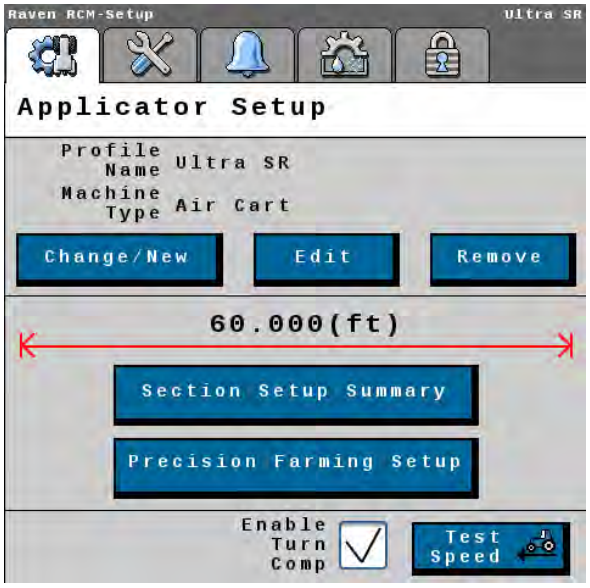


21. After accepting or discarding the new Calibration Weight you will return to the Setup Rate Sensor page. Touch the check mark to return to the home page or touch the Applied Product button to initiate another calibration.
22. If multiple Applied Product Calibrations were being performed, please repeat steps 15 to 22.

Note: You can initiate a SmartCal at any time while you are in a job and perform as many SmartCals on the product(s) as you feel necessary.

RCM SETUP PAGE

APPLICATOR SETUP TAB



- View Profile and machine type information

- **Change/New Button**: Touch this button to create a new machine profile. If there are multiple profiles created already, you can change to an existing profile.

- **Edit Button**: Touch the edit button to edit the current selected profile.

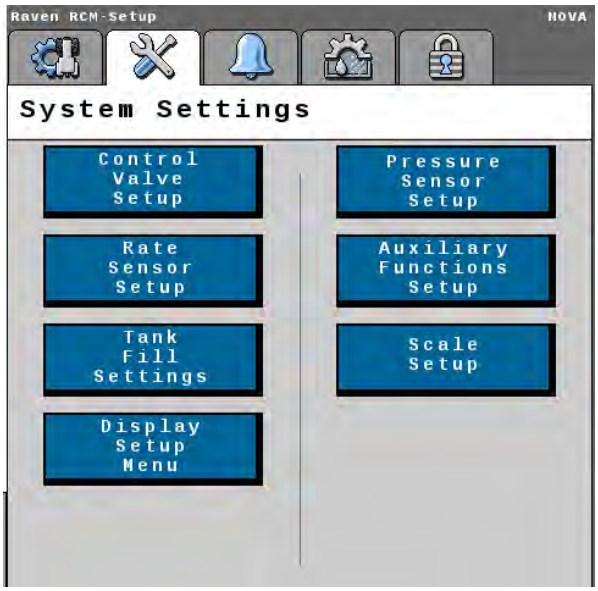
NOTE: This will walk you through the entire setup wizard.

- **Remove Button:** Touch the remove button to delete the current selected profile.

- **Section Setup Summary Button**: Touch this button to review each product's section widths, the wired signal driver, and switch number that each section is assigned to.

- **Test Speed Button:** Use the test speed to simulate a ground speed. This is used to turn the meters when standing still.

SYSTEM SETTINGS TAB



- **Control Valve Setup Button:** Touch the control valve button to access settings for the control valve including the valve response rate, Control Deadband, and PWM settings. SEE CONTROL VALVE SETUP PAGE FOR MORE INFORMATION.

- **Rate Sensor Button:** Access the Product Density, Calibration Weight, and Pulses/Revolution setting. These are also available from the main page. Also, access to the Catch Test and Applied Product pages is here.

- **Tank Fill Settings Button**: Set the Tank Capacity from this page. It also includes the ability to set a Low Tank Level Alarm.

- **Display Setup Menu Button:** Change the selected readout desired in the selected location on the Main Run screen.

- **Pressure Sensor Setup Button**: Touch here to access pressure sensor settings.

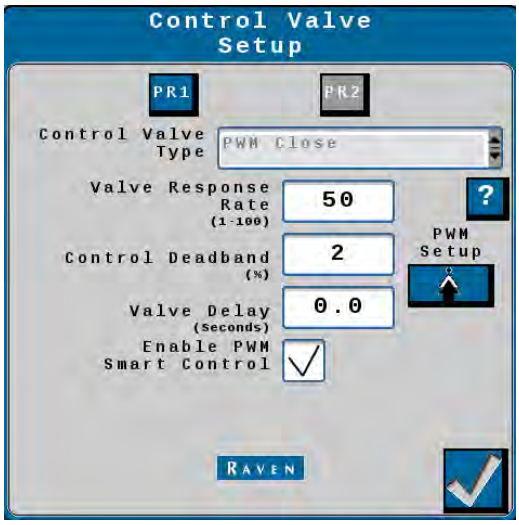
NOTE: SeedMaster does not use pressure sensors on granular products.

- **Auxiliary Functions Setup Button:** Access the FAN RPM calibration values from here. This page allows for setting a Low and High RPM limit for the fans. The RPM Assignment Setup button lets you view what product is assigned to each fan.

NOTE: If the product stream for the fan changes, you must edit the profile to change the RPM Sensor Assignment for the product being changed.

- **Scale Setup Button:** View the weight of each product scale. You can zero the scale from here. If the scale needs to be calibrated, touch the Scale Calibration button. See Scale Calibration for more information.

CONTROL VALVE SETUP PAGE



- **Control Type**: This is set during setup wizard process and can only be changed if you edit the profile.

- **Valve Response Rate (1-100):** Enter value for aggressiveness of rate controller as it approaches target rate. A value too high may lead to oscillation. A value too low may take a long time to reach target rate.

- **Control Deadband (%):** Enter percentage of rate tolerance for control valve. For example, if 2% is entered, the rate controller attempts to adjust the flow rate until the actual rate is within 2% of the target rate.

Valve Delay: This is the length of time that the valve waits to react after an adjustment change is called for. The default is 0.

Enable PWM Smart Control: This allows the PWM to return to its previous setting after shutting down.

PWM Setup Button: Touch this button to access the PWM Valve Setup Page: See below.

PWM VALVE SETUP PAGE

- **Coil Frequency**: Frequency of pulses sent to PWM valve. SeedMaster Factory setting is 200.

- **PWM High Limit (%):** Maximum PWM percent the rate controller allows the system to reach when the product is applying. SeedMaster Factory setting is 100.

- **PWM Low Limit (%):** Minimum PWM percent the rate controller allows the system to reach when the product is applying. SeedMaster Factory setting is 1.

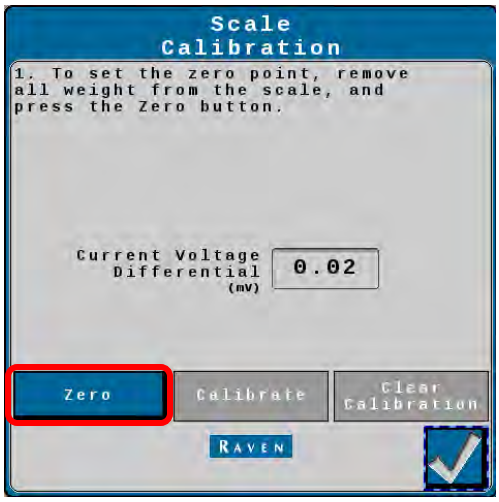
PWM Startup (%): Duty cycle rate controller commands to when the valve is opened. SeedMaster Factory setting is 0.

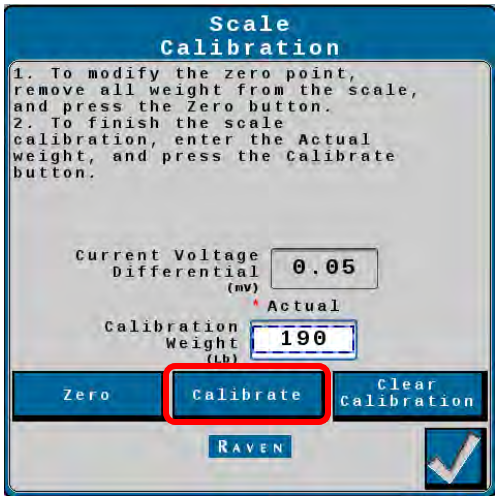
SCALE CALIBRATION

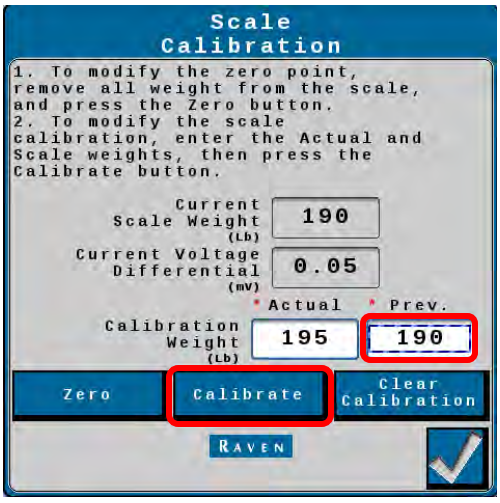
1. Touch the "Settings" soft key.
2. Touch the "System Settings" tab.
3. Touch "Scale Setup" button.
4. Choose the scale being calibrated.
5. Touch the "Scale Calibration" button.
6. Ensure tank is empty. Touch the "Zero" button.
7. Touch the check mark to zero the bin.
8. Put an accurate, verified weight on or in the bin.
9. Enter that accurate, verified weight. Touch the "Calibrate" button.

NOTE: The (mv) must change by 0.025 to calibrate the scales. Add weight to increase the mv. Recommended minimum is 200 lbs.

10. Touch the check mark to calibrate the bin.
11. Ensure the "Current Scale Weight" is accurate.
12. If the scale reading is off, enter the "Current Scale Weight" into the Prev. box.
13. Touch the "Calibrate" button.
14. Touch the check mark to calibrate the bin.
15. Touch the check mark to finish scale calibration for the selected bin.
16. Repeat from step 4 if other scales require calibration.
17. Touch the check mark to exit Scale Setup.



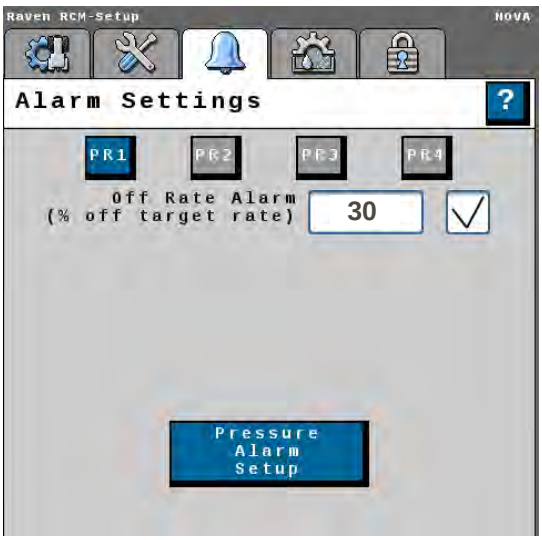




ALARM SETTINGS TAB

The Alarm Settings tab allows the operator to change alarm settings after creating a profile with the setup wizard.

- Enter the desired Off Rate Alarm percentage.

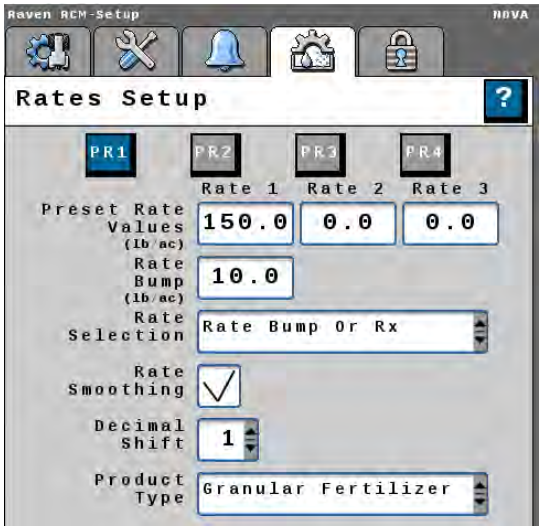


RATE SETUP TAB

The Rates Setup tab allows the operator to change the rate settings after creating a profile with the setup wizard.

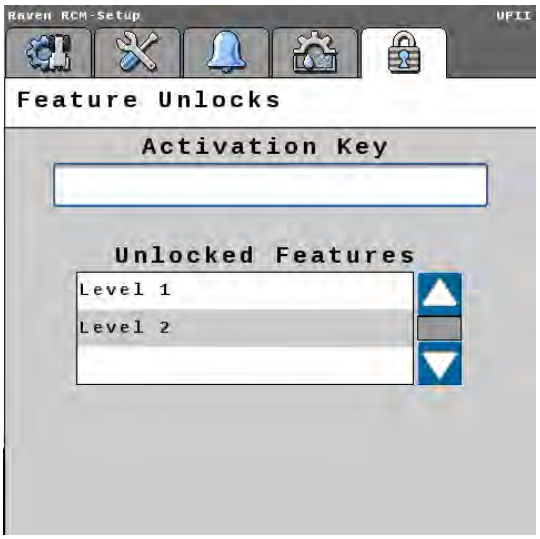
Select the Rate Selection from the drop-down Menu to choose the rate type displayed on the main run page.

- **Predefined or RX**: Displays selection buttons for Preset Rate Values. Enter up to three Preset Rate values. Rate 1 Preset value is required. If a job is setup with a prescription map, the target rate will be generated from the map.
- **Rate Bump or RX:** Displays plus (+) and minus (-) buttons that increase or decrease the target rate by the Rate Bump Value. Enter the Rate Bump. If a job is set up with a prescription map, the target rate will be generated from the map.
- **VT Rate Entry**: Enter the desired rate.
- Ensure the Rate Smoothing check box is selected.



FEATURE UNLOCK TAB

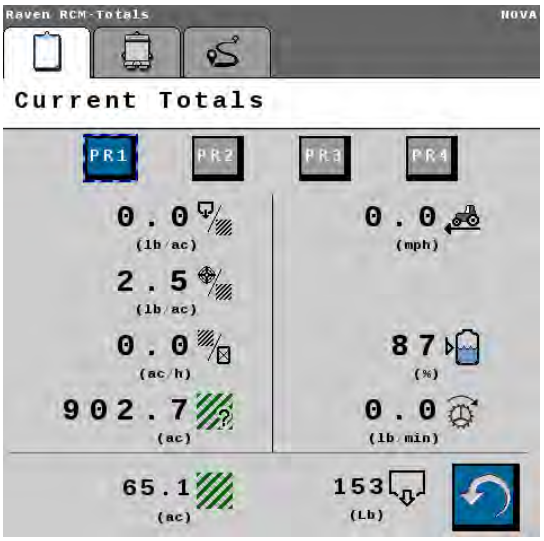
The Feature Unlocks tab allows you to unlock various features of the RCM. ***Note: Ultra SR RCMs require a Level 3 unlock. This is included with your purchase.***



RCM TOTALS PAGE

CURRENT TOTALS TAB

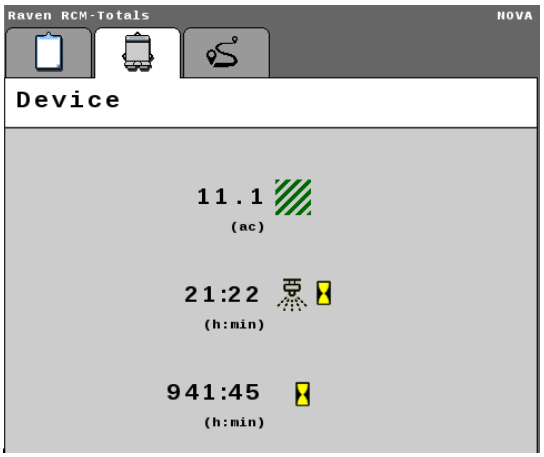
The Current Totals tab displays instant values of each product. Select the product to view from the Product Selection buttons at the top of the tab. To zero current totals, select the Reset Counter button.



DEVICE TAB

The Device tab displays totals for the lifetime of the current profile.

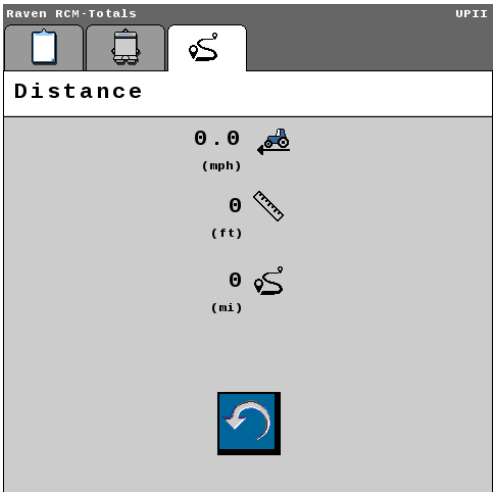
- Total Area (Device)
- Time Spent Applying
- Total Hours



DISTANCE TAB

The Distance tab shows distance values that increase as the implement drives forward.

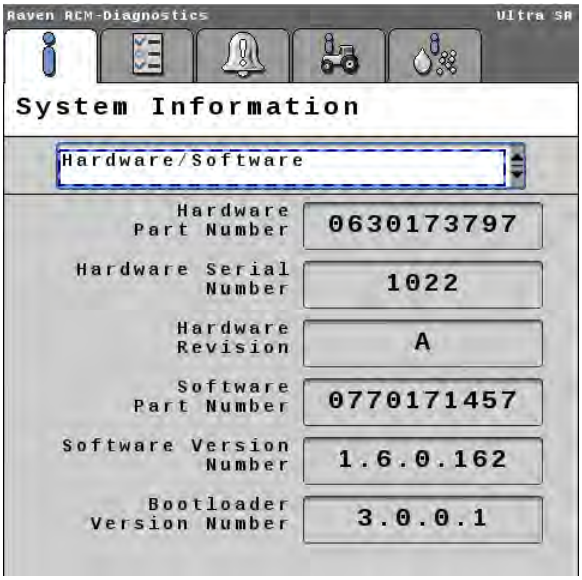
- The first value shows machine speed (mph)
- The second value shows smaller increments (ft or m).
- The third value shows larger increments (mi or km).
- To zero current distance data, select the reset counter button.



RCM DIAGNOSTICS PAGE

SYSTEM INFORMATION TAB

The System Information Tab displays hardware and software information about the RCM.



SELECT ONE OF THE FOLLOWING FROM THE DROP-DOWN MENU FOR VIEW INFORMATION

Hardware/Software: Displays the manufacturer's information for the Raven Rate Control Module hardware and software.

Switchbox: Displays if an external switchbox is present and the status of the switches.

Delivery System: Shows application information for the selected product.

Section Status: Shows if each section valve is currently open or closed.

System Voltages: Shows voltage and current information for the Raven Rate Control Module.

Working Parameters: Displays the implement width, current speed, and speed source.

Switches/Status: Displays the status of the Master switch.

Pressure Sensors: Displays voltage and pressure information for each pressure sensor.

Bin Level Sensors: Displays whether each bin level sensor is covered or uncovered.

RPM Sensors: Shows the signal detected by each RPM sensor.

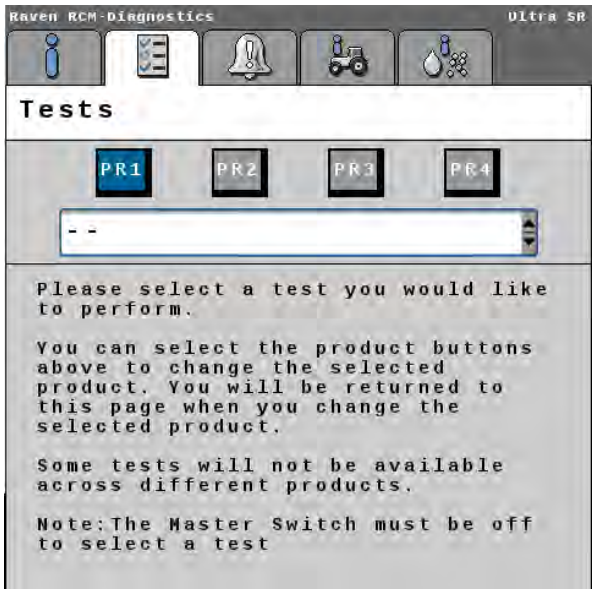
Tank Fill Monitor: Displays the fill rate and volume detected by the tank fill monitor.

Task Totals: Shows the area covered and volume applied for the current task.

TESTS TAB

The RCM has built in system tests. The following tests can be performed on each product:

- Spreader/Air Cart Check
- Control/Section Test
- Calibrate PWM Limits
- Bin/Tank Cleanout
- Demonstration Mode
- Diagnostic Loop Back Test



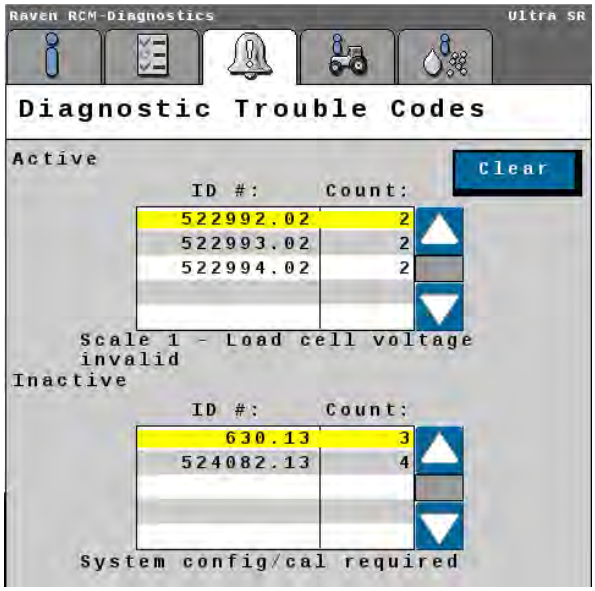
If performing any of the test above, please follow the onscreen instructions.

NOTE: The Master Switch must be off to select test.

DIAGNOSTICS TROUBLE CODES TAB

This tab is used for troubleshooting active system errors and displaying inactive errors.

- Current trouble codes appear in the Active table. The DTC Identification number and occurrence count is listed.
- Resolved trouble codes appear in the Inactive table. The DTC Identification number and occurrence count is listed.

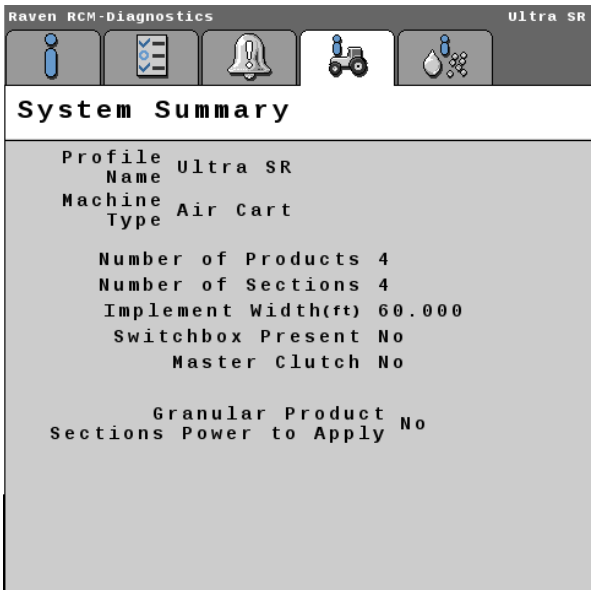


Use the up and down arrows to scroll through the list of trouble codes. A description of the highlighted code is shown below each table.

If desired, press the Clear button to erase all the trouble codes listed in the Inactive table.

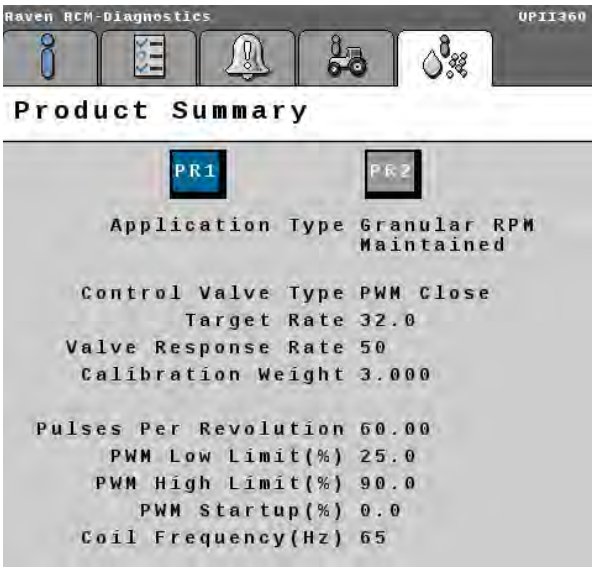
SYSTEM SUMMARY TAB

This tab displays the machine setup summary.



PRODUCT SUMMARY TAB

This tab displays the configured products setup summary.



GENERAL TROUBLESHOOTING

Symptom	Problem	Solution
Unexpected application rate.	Incorrect rate type selected (gal/min or gal/acre).	Select the correct rate type.
Product does not shut off.	Valve does not respond to commands.	Select the correct valve type.
2-Wire valve selection is not available.	Dual boom is selected.	Disable dual boom.
	More than seven sections are selected.	Assign fewer than eight sections.
Implement section is not turning on or off.	Incorrect section valve type selected.	Select correct section valve type.
Application is erratic.	Calibration number is not set correctly.	Enter the correct calibration number.
Trouble code is displayed for high pressure.	System pressure is too high.	Select flow return in the system setup.
Trouble code is displayed for unexpected flow.	Constant flow is disabled when using a constant flow system with boom valve closed.	Select constant flow in system setup.
Flow is not applying at desired rate.	Incorrect application rate.	Ensure 10 gal/10L unit is used.
	Minimum Flow rate feature causes over-application in areas where machine speed is low enough to activate Minimum Flow Rate.	Set minimum flow rate to zero to disable feature.
System detects implement is down for an extensive period of time.	Height switch is disabled.	If height switch indicator does not match machine operation, service height switch.
Unexpected chemical flow detected.	Controller attempts to close section valves, but detects flow on a sprayer or liquid fertilizer system.	Shut off solution pump.
Unable to setup minimum and maximum alarms.	Minimum and maximum alarms are disabled.	Ensure pressure sensor is installed and configured.
Unable to set values.	System not allowing changes values or settings.	Ensure Master Switch is off.
Unexpected anhydrous ammonia flow detected.	Controller attempts to close On/Off valve, but still detects flow.	Select button to turn off control valve.
	Controller attempts to close all valves, but still detects flow.	Follow instructions on Warning page on display.
Pressure sensors are not configured.	Pressure sensor 2 is not an option.	Ensure both sensors are configured.
Not able to activate system.	Master Switch indicator is orange.	Cycle master switch.
Unwanted minimum flow rate activation.	Over application in low speed areas.	Set minimum flow rate to zero to disable function.

PRODUCT CONTROL SETUP WIZARD (Dealer or SeedMaster assisted only)

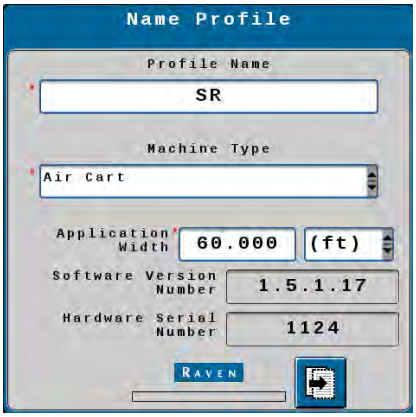
1. Touch the **RCM** working set button. 

2. Touch the **Settings** soft key. 
3. Touch the **Applicator Setup** tab.

Applicator Setup

4. Touch the **Change/New button,** the setup wizard will begin.
5. Touch the drop-down box and select **New** and then touch the **Check Mark**.

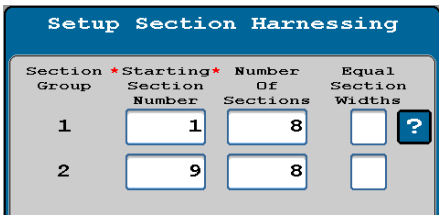
6. Enter a **Profile Name.**
7. Touch the **Drop-Down** Box for Machine Type and select **Air Cart.**
8. Enter an Application Width of the toolbar then touch the **next** button. 



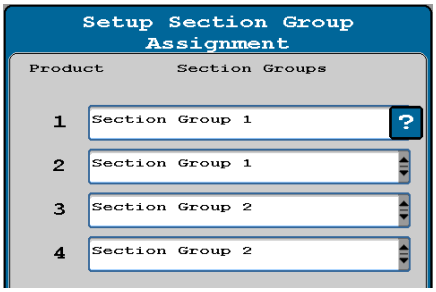
9. **Always enter 4** for the number of Granular Products, then number the ECUs where 1 is the first ECU inline.
10. After entering the Number of Products, touch the **next** button.
11. Touch the **drop-down** box and choose **2** for the number of fans installed. Touch **next**.
12. Touch each **drop-down** box and select **Granular Fertilizer** for each product or **Not Installed** if the product does not exist. Touch **next**.
13. Set the application type for each product by touching the **drop-down** and selecting **Granular Meter Per Section** for the Application Mode and touch next.

14. **Enter 4 for Number of Meters** and check "Equal Width Meters". Do this for each product and touch **next** each time.
    NOTE: If the sections don't share all drivers skip to step 16.
15. Section Summary will display the products and sections and the assigned driver and switch review. Touch **next**. Note: You may have two pages for the summary. Skip to step 22.
16. If the Machine **DOES NOT** share all the section drivers, choose NO and then touch **next**.
17. Enter the number of Section Groups.

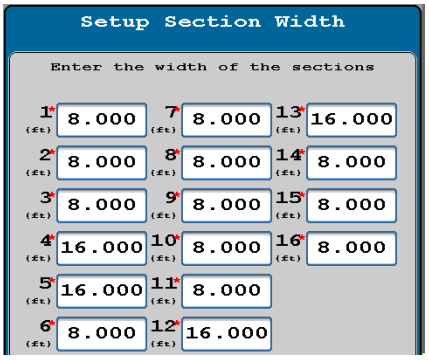
18. An example of the section group mapping will be displayed. Review the guide then touch **next**.
19. Enter the Starting Section Number and Number of Sections associated with the starting number. Touch **next**.



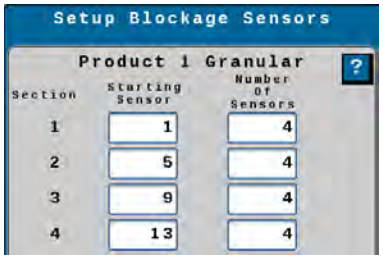
20. Select the section group that is associated to the corresponding product.

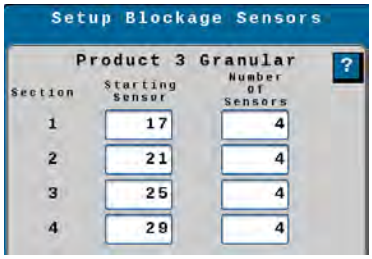


21. Enter the widths of each section then touch next and review summary and touch **next**.

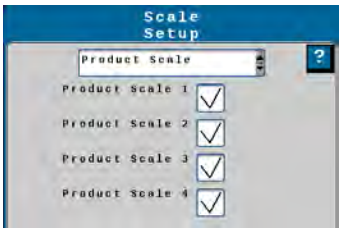


22. Place a checkmark in "Enable Blockage Monitoring System", touch next.
23. Enter the starting sensor number followed by the number of sensors for each section, then touch next. *NOTE: Products 1 & 2 will share sensor settings, and Products 3 & 4 will share sensor settings.*





24. Touch the **drop-down** box for the Load Cells Setup and then select **Product Scale**. Place a check mark beside each Product Scale. After all checks are entered, touch **next**.



25. There are NO pressure sensors installed. Leave each pressure sensor defaulted to None and then touch **next**.
26. There are NO height switches installed. Leave the box defaulted to None and then touch next.
27. Enter *2* into the Fan RPM 1 / RPM 2 Calibration Box. RPM 1 Low and High Limits will remain at 0. Touch **next**.
28. RPM 1 / RPM 2 sensor Assignments will be displayed. There should be a check mark defaulted for each product. Review and ensure that each product has a check mark. Touch **next**.
29. The setup wizard will now setup the product control for each product. They all have 6 configuration pages. Each product will have the same settings entered. Touch next after every page.
    a. SETUP CONTROL VALVE PAGE
        i. Control Type = PWM CLOSE
        ii. Valve Response Rate = 50
        iii. Control Deadband = 2
        iv. Valve Delay = 0
        v. Enable PWM Smart Control = YES checkmark
    b. SETUP PWM PAGE
        i. Coil Frequency = 200
        ii. PWM High Limit = 100
        iii. PWM Low Limit = 1
        iv. PWM Startup = 0.0
    c. SETUP Rate Sensor PAGE
        i. Pulses / Revolution = 275.20
    d. SETUP Tank / Bin PAGE
        i. Tank Capacity = 0
        ii. Low Tank Level = 0
        iii. Low Bin Level Sensor = NO checkmark
    e. SETUP Rates PAGE
        i. Preset Rate Values: Rate 1 = 150, Rate 2 = 0, Rate 3 = 0
        ii. Rate Bump = 10
        iii. Rate Selection = Rate Bump or Rx
        iv. Rate Smoothing = YES checkmark
        v. Decimal Shift = 1
    f. SETUP Alarms PAGE
        i. Off Rate Alarm = 30 with checkmark
30. The setup for the first product is complete. Repeat the settings above for each product until the setup wizard gets to the setup summary page. Please review the setup summary page then touch **next**.

REMOTE TANK MONITOR (OPTION)

Use the Remote Tank Monitor to view tank weights, zero out tank weights, and calibrate products. Before filling a tank with product, ensure it is empty and zero it. While filling, you can view the tank weight in real time to gauge how much product is in the tank. This allows for filling to a pre-determined weight. After filling the tanks, each tank will need to be calibrated for the product type inside the specific tanks.

SELECT ACTIVE RCM (ECU)

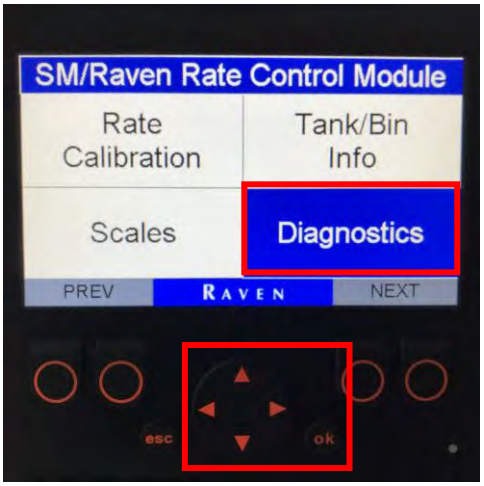
Some SeedMaster machines may be equipped with multiple RCMs. If the system consists of multiple RCMs, it will need to be determined what RCM is on the On-Fame Tank and what RCM is on the NOVA Tank. The Remote Tank Monitor determines the RCMs by serial number. If it is uncertain of the location of the RCM, the serial number can be viewed from the in-cab monitor.

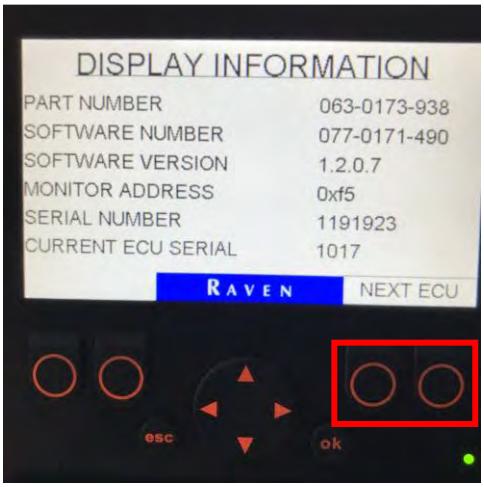
VIEWING RCM SERIAL NUMBER

1. Choose the RCM working set from the in-cab monitor for the desired Tank.
2. Touch the Diagnostics button on the right side and the Serial Number will be displayed.
   NOTE: *For more information view the "RCM DIAGNOSTICS PAGE" in the ISOBUS RCM FUNCTIONS section of this operator's manual, PAGE 55.*

TOGGLING BETWEEN RCMs

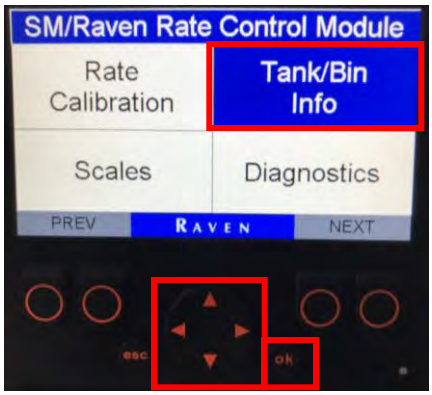
1. Power on the remote monitor by pressing the "**esc**" button on the front of the monitor.
2. Using the UP/DOWN or LEFT/RIGHT arrows, highlight the box "**Diagnostics**" box blue.
3. Press "**ok**" to enter the Diagnostics Info screen.
4. Press either button below "**Next ECU**" to toggle between RCMs.
5. Once the desired RCM is chosen, press the "esc" button to return to the main menu.
   ***NOTE**: The Serial # is physically found on the face of the RCM located in its panel box.*



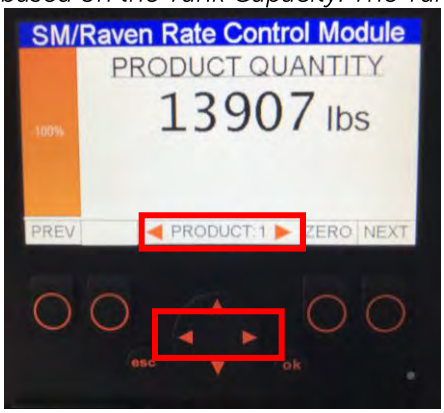


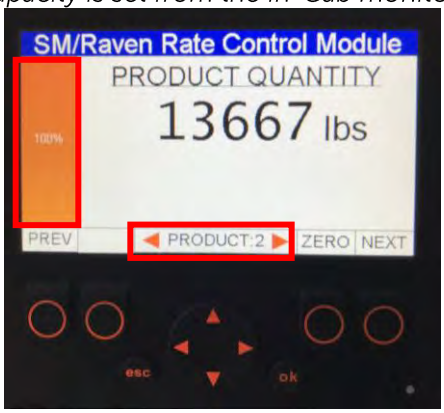
READ AND ZERO TANK WEIGHT FROM REMOTE MONITOR VIA TANK/BIN INFO

1. Power on the remote monitor by pressing the "**esc**" button on the front of the monitor.
2. Using the UP/DOWN or LEFT/RIGHT arrows, highlight the "**Tank/Bin Info**" box blue.
3. Touch "**ok**" to enter the Tank/Bin Info screen.

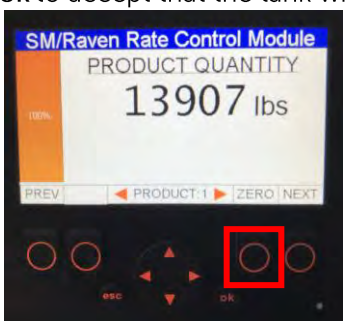


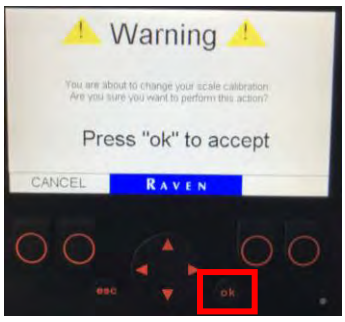
4. The weight of the previously selected product will be displayed.
5. To change the selected product, press the LEFT/RIGHT arrows.
   NOTE: The percentage on the right side will display the percentage of product in the tank based on the Tank Capacity. The Tank Capacity is set from the In-Cab monitor.





6. To zero out the product weight, press the button directly below "**ZERO**". Then, press **ok** to accept that the tank will be zeroed out. Press **CANCEL** to cancel the operation.



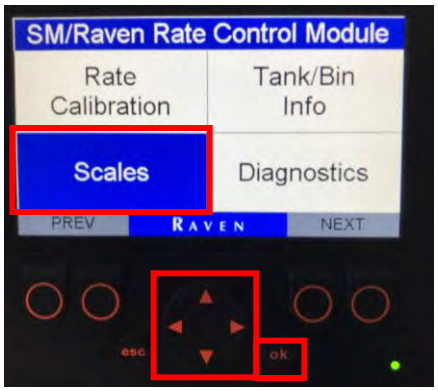


7. Press the NEXT or PREV buttons to toggle screen view. The toggled view will display text only for the Capacity and Quantity.

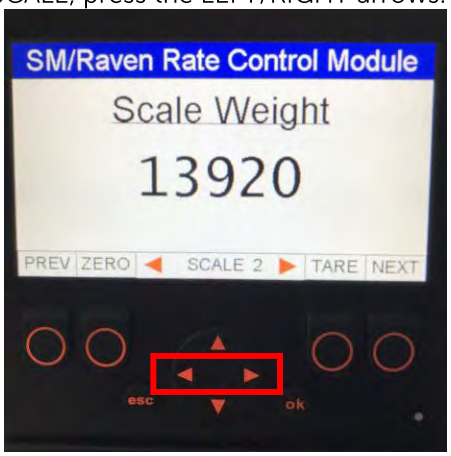
8. Press the "**esc**" button to return to the main menu.

READ AND ZERO TANK WEIGHT FROM REMOTE MONITOR VIA SCALE

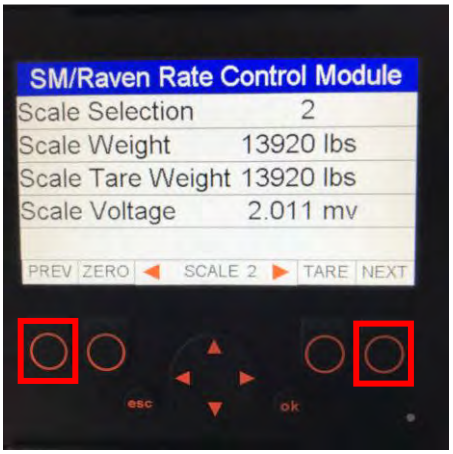
1. Power on the remote monitor by pressing the "**esc**" button on the front of the monitor.
2. Using the UP/DOWN or LEFT/RIGHT arrows, highlight the "Scales" box blue.
3. Touch "**ok**" to enter the Scales Info screen.



4. The weight of the previously selected SCALE will be displayed.
5. To change the selected SCALE, press the LEFT/RIGHT arrows.



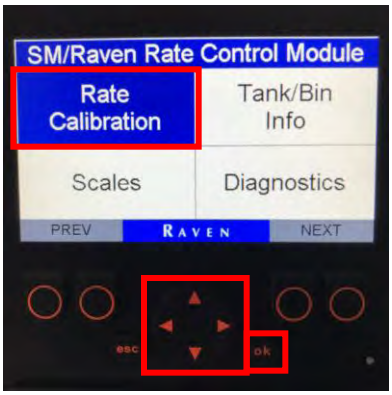
6. To Zero out the product weight, press the button directly below "**ZERO**". Then, press **ok** to accept that the tank will be zeroed out. Press CANCEL to cancel the operation.
7. **The TARE option is NOT USED on a SeedMaster Machine. Please ignore this option.**
8. Press the NEXT or PREV buttons to toggle screen view. The toggled view will display the selected scale, scale weight, and scale voltage.
   NOTE: Ignore the TARE WEIGHT Screen View.



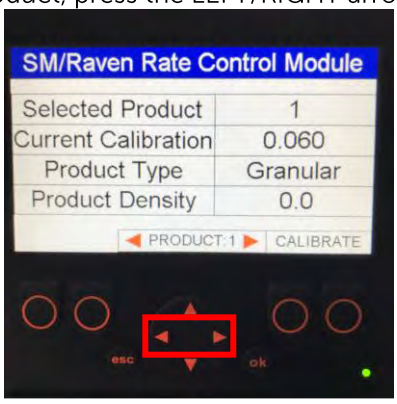
9. Press the "esc" button to return to the main menu.

RATE CALIBRATION VIA THE REMOTE TANK MONITOR

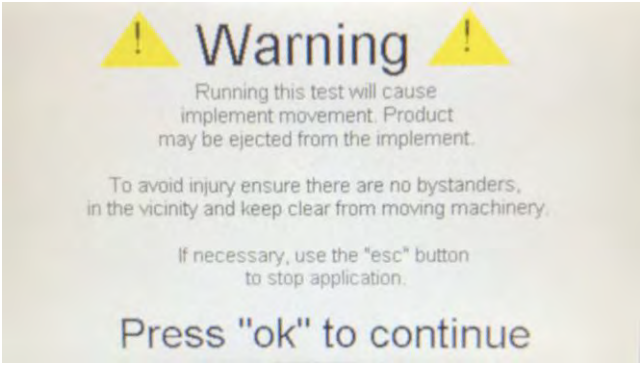
1. Power on the remote monitor by pressing the "**esc**" button on the front of the monitor.
2. Using the UP/DOWN or LEFT/RIGHT arrows, highlight the box "Rate Calibration" blue.
3. Touch "**ok**" to enter the "Rate Calibration" info screen.



4. The Calibration Information of the previously selected product will be displayed.
5. To change the selected product, press the LEFT/RIGHT arrows.

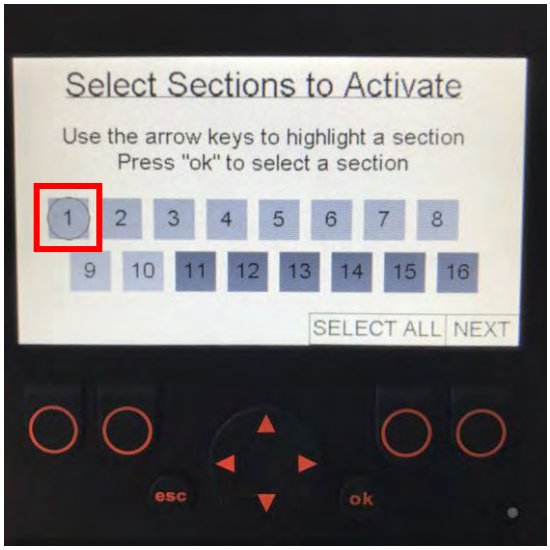


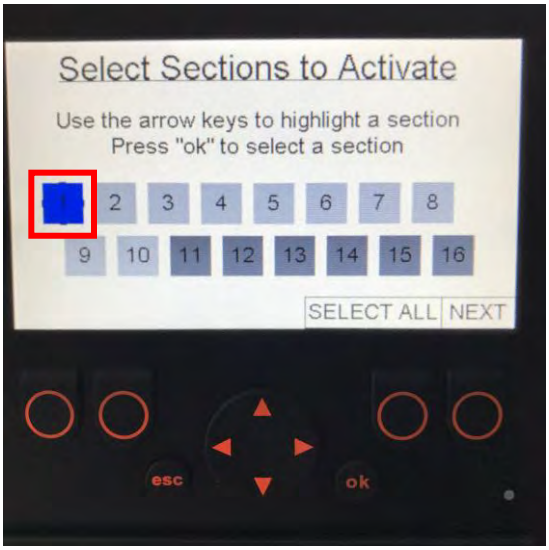
6. The display will show what product is selected, the current calibration value, product type, and product density. The product density can be ignored.
7. After confirming the product that is to be calibrated, press either button below the text that says "**CALIBRATE**".
8. A warning will be displayed that indicates that product will be metered from the meters.
9. Press "**ok**" to continue or press the "**esc**" button to exit the calibration.



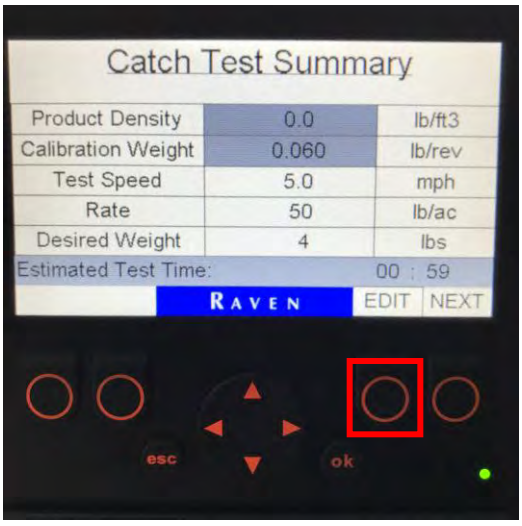
NOTE: Before continuing to the next step of the calibration process, please ensure all objects and people are clear. After confirming the above continue to step 10.

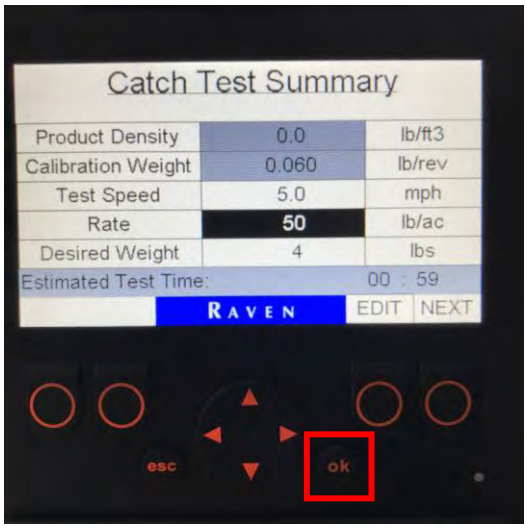
10. After selecting "ok", the "**Select Sections to Activate**" page will be displayed.
11. Use the arrow keys to highlight a section, then press "**ok"** to select a section. A circle around the number will represent the current section that is selected. After pressing the "**ok**" button, the section will highlight blue. Section numbering begins on the left of the machine.
12. After confirming what section the product will be caught from, press the "**NEXT"** button.
    NOTE: Before continuing to the next step please ensure that a catch pail has be setup underneath the zone or section that the product will be metered from. (#1 is on the left side)



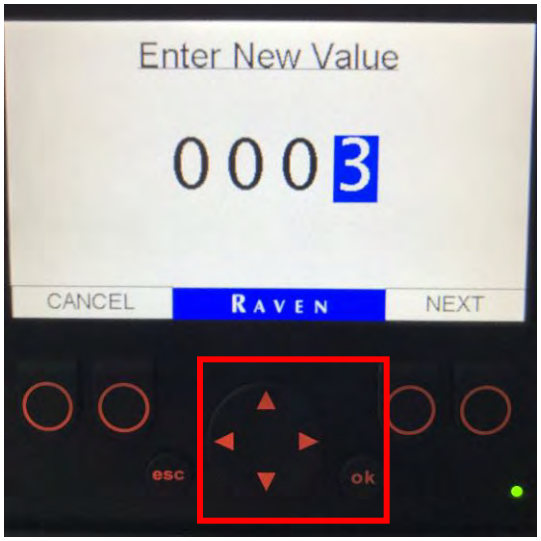


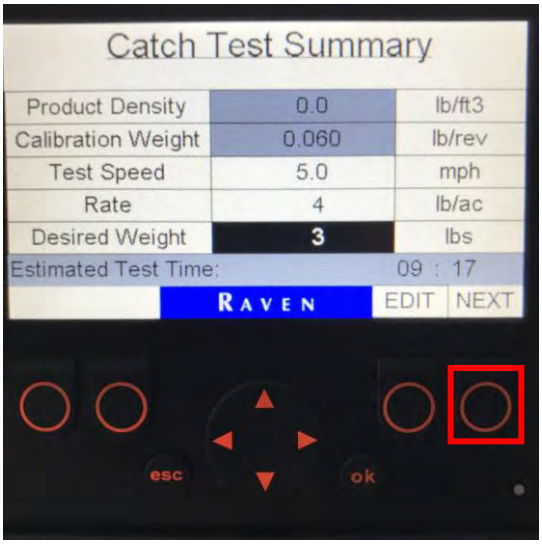
13. The **Catch Test Summary** page will be displayed. The test speed will default to 5mph. This is a sufficient test speed for calibrating and will not need to be changed. Please review the Rate and Desired Weight.
    NOTE: Set the rate to the actual rate that will be applied in the field. The desired weight will be determined by either the size of the catch pail or the estimated test time.
    FOR HIGH RATE PRODUCTS: A 5-gallon pail can hold roughly 20 lbs of product. If using a 5-gallon pail, a desired weight of 20 can be used.
    FOR LOW RATE PRODUCTS: The estimated test time needs to be below 10 mins. If it is greater than 10 mins, lower the desired weight by 1-pound increments.
14. To change the Rate or Desired Weight, press the button below "**EDIT"**. Then use the UP or DOWN arrow buttons to highlight the value to be changed in black.
15. Once the value is highlighted black, press the **ok** button to change the value.



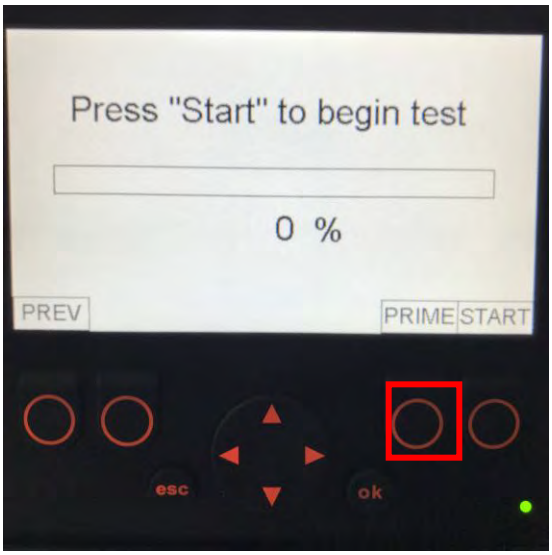


16. Using the LEFT/RIGHT and UP/DOWN arrow enter a new value for the Rate or Desired weight. When the desired value is entered press the "**ok**" button. The Catch Test Summary will be displayed with the new values. If the values are satisfactory, continue by pressing the NEXT button.
    NOTE: If the Estimated Test Time is greater than 10 mins, the NEXT button will not appear. Adjust the calibration values accordingly.



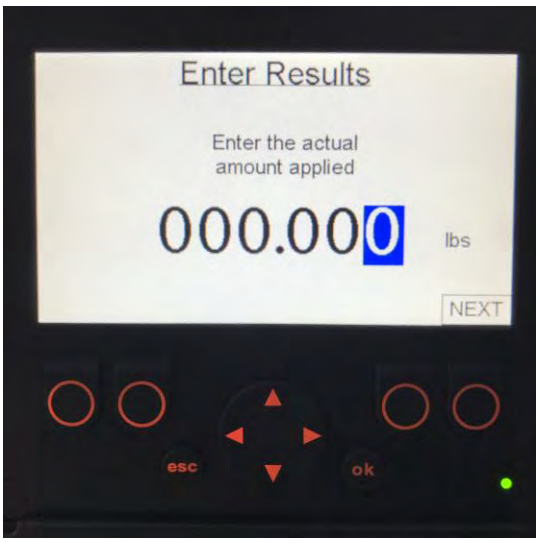


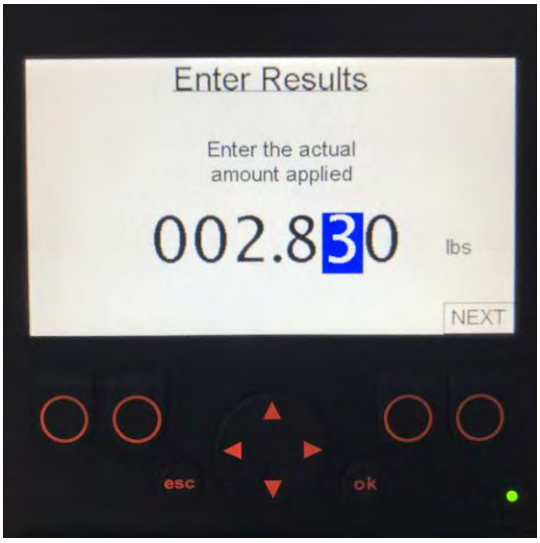
17. If no product has been metered though the meters, please use the "**PRIME**" button to prime the meters. Repeat as necessary. Please make sure the pail is empty before proceeding to the next step.



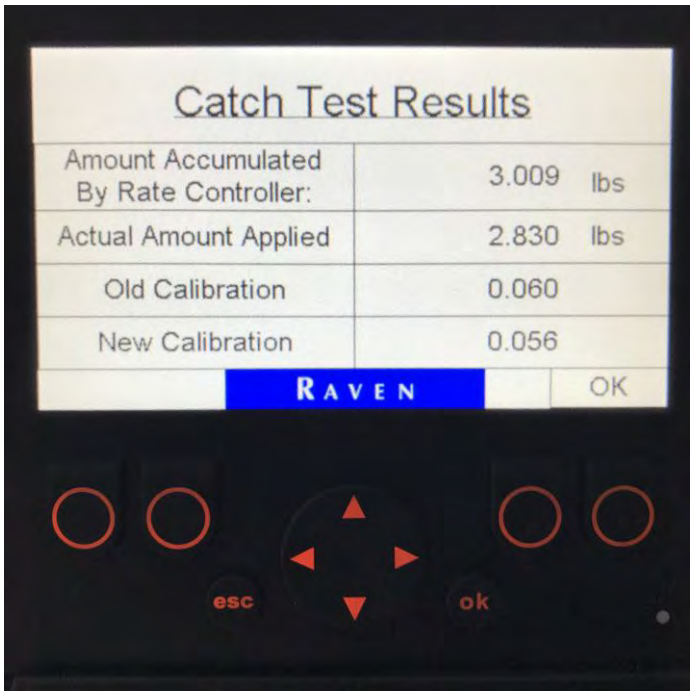
18. Press the START button to begin metering product into the pail. The test will begin and display the Meter RPM in addition to the catch test's progress.
19. If the product being expelled does not fit in the pail, press the STOP button to stop the catch test. Then, continue to the next step. Please note that the meter will shut off when the test reaches 100%.

20. After the meter has stopped, remove the pail from the catch position and weigh how much product was expelled.
    NOTE: If using a digital scale please remember to tare the weight of the pail or weigh the pail beforehand. This allows the weight of the pail to be subtracted from the total weight.
21. Using the LEFT/RIGHT and UP/DOWN arrows, enter the actual amount of product applied. When the desired value is entered, press the "**ok**" button.





22. The Catch Test Results will be displayed. To accept the results, press the "**ok**" button. To cancel the results, press the "**esc**" button.



23. Repeat steps 5 thru 22 to repeat the calibration or to perform on a different product.
24. When the calibrations are complete, press the "**esc**" button to return to the main menu.

REMOTE TANK MONITOR TROUBLESHOOTING

MAIN MENU IS GREYED OUT

If the main menu is greyed out, either the RCM(s) are offline or the current ECU (RCM) is not selected. Ensure the desired RCM is selected.

1. Press the "**esc**" button on the front of the monitor to exit to the main menu.
2. The "**Diagnostics**" box will be highlighted blue.
3. Press "**ok**" to enter the Diagnostics Info screen.
4. Press either button below "**Next ECU**" to toggle between RCM's.
   NOTE: If the "CURRENT ECU SERIAL" displays "0" this means that an RCM is not selected.
5. Once the desired RCM's is chosen, press the "esc" button to return to the main menu.

RED LED BLINKING RED

If the Remote Tank Monitor screen is black and the LED light in the bottom right hand corner is blinking red, the monitor did not boot up in sequence.

1. Turn Tractor OFF.
2. Turn In-Cab Monitor OFF.
3. Ensure that all electronics are powered down.
4. Check the IBBC connector at the back of the Tractor.
5. Start Tractor.
6. Turn on In-Cab Monitor.
7. Check Remote Tank Monitor operation.
8. If problem still exists unplug and plug back in the Remote Tank Monitor from the main harness and repeat steps 1 thru 7.
9. If unsuccessful, contact your SeedMaster Dealer for assistance.

VIPER 4+

POWER BUTTON AND STATUS

To power up the monitor, press the power button once. The power status indicator will flash red and then should illuminate green. If the status indicator stays red or does not illuminate, contact your SeedMaster dealer for assistance.

***Note**: Do not connect any USB drives or devices to the monitor during the power up sequence.*

VIPER 4+ BUILT-IN SELF TEST

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

To perform a Viper 4+ self-test:

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

DEVICE SHUT DOWN

***Proper shut down is critical to device health*. When finished using the Viper4+ device:**

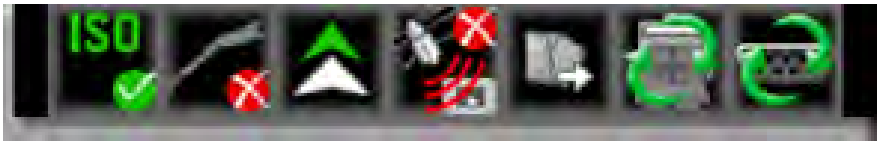
1. Close any active jobs by selecting the home icon in the lower, right corner of the display.
2. Touch the administrator or user panel.

3. Touch the shutdown icon. Then touch Yes to confirm shut down.

NOTE: The monitor should ALWAYS be shut down properly before turning off your tractor. Failure to do so can result in corrupt files and improper monitor function.

VIPER 4+ MAIN SCREEN NAVIGATION

STATUS HEADER



The status of various features or other system components connected to the field computer are displayed in the upper, right corner of the monitor display.
This area allows the equipment operator to quickly check communication or processes in progress at a glance and, if necessary, take action to address any issues before beginning the day's operations.
The following status indicators will be displayed in the status header:

ISOBUS Communications. This status display indicates the status of ISOBUS communication with ECUs, working sets, implements, etc. This status will only be shown if an ISOBUS ECU is detected by the ROS device.

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

Forward/Reverse. The forward/reverse status indicator shows if the machine is traveling forward or reverse.

GPS. This indicator displays the status of the position solution. This indicator will display:

a. Green if the status of GPS is okay.
b. Yellow if an error or cautionary condition has been encountered.
c. Red if GPS is non-functional.

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

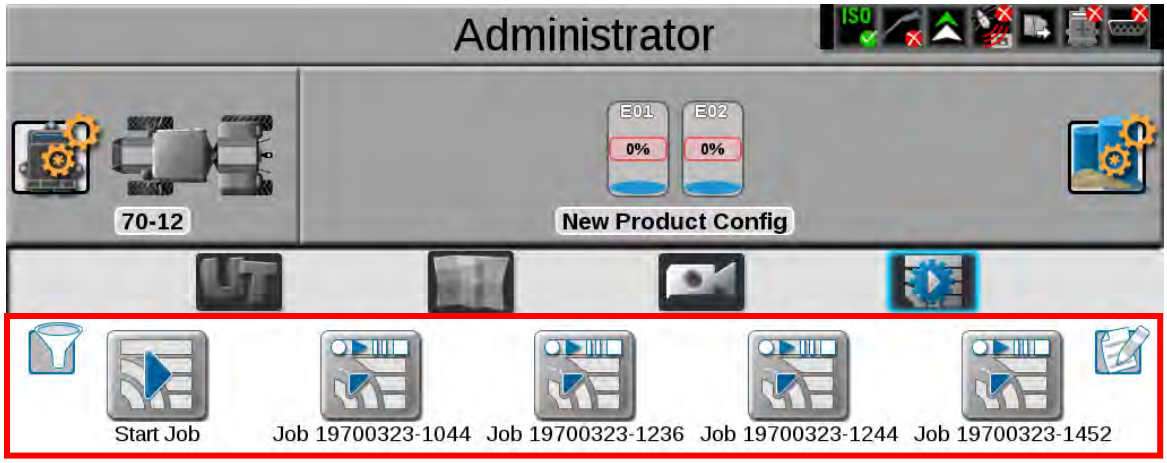
File Transfer. The status header displays the status of wireless file transfers with a Slingshot® Field Hub. If a file transfer is in progress, the file transfer indicator will display a green "in progress" status.

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

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

JOB PROFILE PANEL

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



On initial bootup the Viper4+ will load the Job Profile screen. To access the Job Profile screen, touch the Job Profile icon.

The Job Profile panel allows you to do the following:

a. Start a NEW or EXISTING Job.
b. Create a NEW or EDIT a Job Profile.
c. Sort or Filter Jobs and Job Profiles.

JOB PROFILE CONFIGURATION

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

JOB PROFILE SELECTION

When the equipment arrives at the field, the operator selects the preconfigured job profile, verifies the job settings, enters the target product rate or rates, selects any modifications to the guidance or scout information, and selects start to begin application. The job profile panel also displays any previous jobs started using a preconfigured profile. To resume a previous job operation, select the specific job file, verify the job settings, and select start. The V4+ also provides utilities to help sort and filter the items displayed in the job profile panel. This helps the operator quickly locate and select the correct profile or previous operation.

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

UT (Universal Terminal) PANEL

The UT panel provides access to the ISOBUS **working set** displays and ECU options or features. Use this panel to access features such as the Raven ISO Product Control, Raven, or various third-party features connected to the ISOBUS communication network.

***Note**: The UT panel will be available in the lower, left corner of the main panel display only if an ISOBUS compatible ECU is detected by the device.*

ADMINISTRATOR OR USER PANEL

Touch "Administrator" at the top of the display to access the Administrator or User Panel and the following utilities:

Power Down

Touch the power down icon to shut down the device. It is recommended to shut down the device using this icon prior to removing power by switching the vehicle ignition off.

Log Out

Touch the log out icon to exit the current user profile. Use this function when leaving the equipment for short periods, at the end of a shift, or when switching operators to secure the management system from unauthorized access or operation of the control system.

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

User Profile

User profiles may be created for each operator to save user preferences such as language and displayed units. This will maximize each user's comfort level while operating the equipment. Each user profile may also be assigned a unique Personal Identification Number (PIN) to secure the device from unauthorized access, modification, or operation. In addition to securing the system from unauthorized use, the monitor saves active user profile information with each job report. If multiple operators will be using the same machine during a specific field operation, the job report will display each user profile active during the job. The system administrator may also review the specific field areas in which each operator was logged in and operating the equipment.

System Manager

Access the system manager utility within the administrator or user panel to perform software updates and CAN node firmware updates. Product software and documentation updates may be made available periodically on the SeedMaster MFG web site: www.seedmaster.ca. ***Please ensure to only use updates found on the SeedMaster website.***

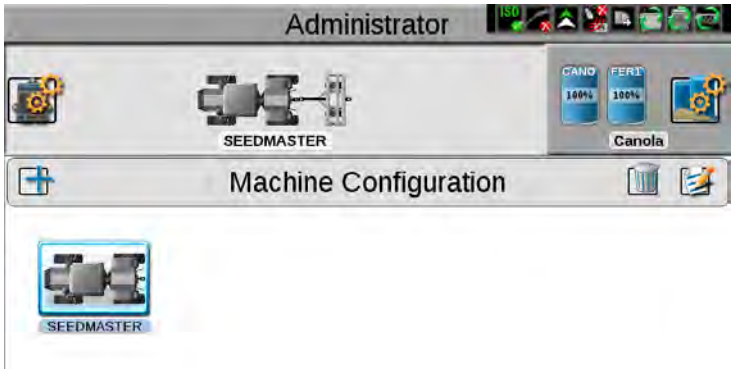
File Manager

Access the file manager to perform file maintenance, access utilities for exporting and transferring job files and other data to and from the device, and to view the transfer history for previous job data.

Do not store job and field information on the device for long term reference or archiving. Perform file maintenance regularly and remove files associated with completed jobs or field operations to ensure memory resources are available for new operations as needed. Archive and back up job and field information on a home or office PC to ensure the data is securely archived and backed up.

MACHINE CONFIGURATION PANEL

The Machine Panel contains the following utilities for selecting and configuring the various types of vehicles and equipment with which the ROS device will be operated:



CAN System Configuration

A machine configuration saves vehicle or tractor calibration information, implement geometry for each configured implement, and CANBUS system information. If a configuration is completed for a specific implement, the device will automatically identify and select the matching configuration on start up. It will also alert the operator if a CAN component in the saved profile is not detected.

Machine Configuration and Implement Garage

In some instances, a machine configuration may match more than one equipment set up such as a tractor used with a plow, swather, hay rake, or a rock picker. If desired, create profiles for each of these implements to allow the device to save geometry and guidance settings for each specific implement. When a set up matching these configurations is detected, the device allows the operator to select the saved machine configuration to quickly set up the field computer for the day's operations. It also allows a system administrator or operator to access other saved configurations via the machine or implement "garage" to modify or remove profiles to keep the device updated for the equipment currently in the fleet or machine shed.

PRODUCT CONFIGURATION PANEL

The product configuration panel provides the following utilities for setting up control channels for common product applications, tank mixes, or seed varieties which the device will use to control input or application:

Product Configuration

Product Configuration allows the operator to set up a profile for common applications for upcoming field operations. This saves control channel and product or mix information for various application or product types and allows the operator to reselect profiles to quickly resume or restart an application or operation for various fields. New product configurations may be created using existing products entered into the system or via the AgX product database pre-loaded on the device.

Product Configuration Selection

Once a product configuration is setup, the product may be selected to quickly set up the device for operation, resume operation, or repeat the same operation in a different field. Simply select the product configuration, verify and adjust mix ratios as necessary for accurate job reporting, and get to the field tasks at hand.

CREATING JOB PROFILES

Use Job Profiles for each field. The Job Profile can be used year after year. It stores field data, scouting information (FLIP Maps), AB Lines, and Grower/Farm/Field (GFF) information.

1. Touch the Job Profile Icon. 
2. Touch the Configure Job Profile Icon. 
3. Touch the Add Button at the bottom of the screen.

4. Enter a Profile Name for the Field (Field Name).
5. Touch the Edit button to add the Grower/Farm/Field Information. 
6. Touch the Edit button again to add Grower/Farm/Field data. 
7. Touch the Add button to add Grower Information. 
8. There are several data fields that can be added to the Grower Info. Add Grower info as desired. The more information the better. Touch the check mark when complete. 
9. Touch the Farm Panel to add Farm data.

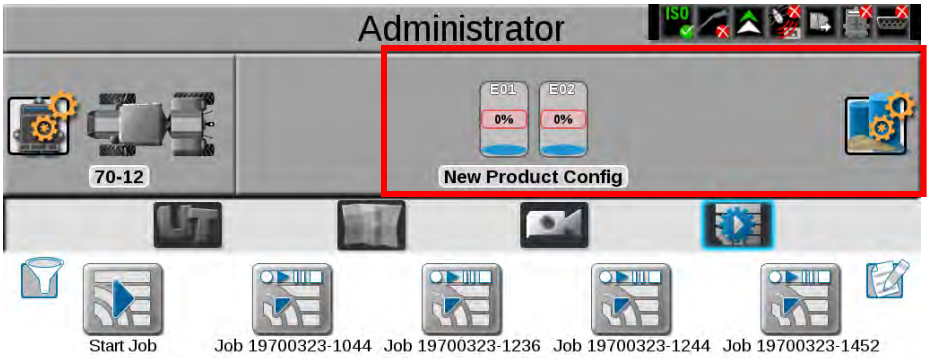
10. Touch the Add button to add Farm data. 
11. There are several data fields that can be added to the Farm Info. Add Farm info as desired. The more information the better. Touch the check mark when complete. 
12. Touch the Field Panel to add Field data.

13. Touch the Add button to add Field data. 
14. There are several data fields that can be added to the Field Info. Add Field info as desired. The more information the better. Touch the check mark when complete. 
15. After adding the Grower/Farm/Field information touch the check mark to confirm. 
16. For general settings choose Last Pass for Guidance.
17. If FLIP maps are set up you can add the appropriate FLIP map to the scout setting. This will preload FLIP maps when starting a job.
18. Touch the check mark when complete, the Job Profile is created. 
19. Touch the check mark to exit. 

CREATING PRODUCT PROFILES

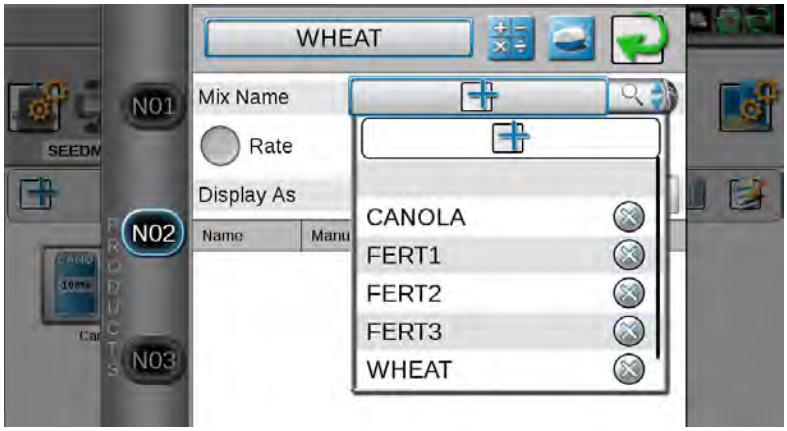
Create Product Profiles for common applications for upcoming field operations. The product configuration saves the control channel and the product information for various product types. It allows the operator to reselect profiles, to quickly resume, or restart an application or operation for various fields.

1. Touch the Product Profile Panel.



2. Touch the Add button.

3. Enter a Product Configuration Name. Then, touch the check mark
4. Name each product. Select the product from the left-hand side. (N01, N02, N03, or N04).
5. To add product names, touch the Mix Name add button.
6. Type in the name of the product.
7. The product list saves the names of products as they are added. To choose an already added product name, touch the magnifying glass in Mix Name.
8. Touch the green check mark to finish naming the products.



AUTO ZONE COMMAND LOOK AHEAD TIME SETUP

To access the Auto Zone Command Setup (Section Control Setup) page:

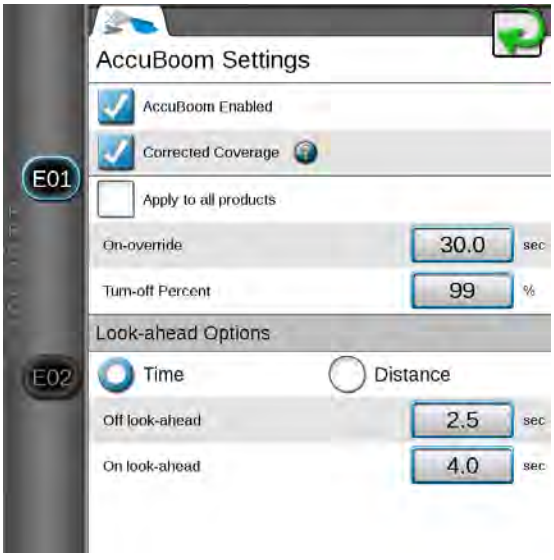
1. Touch the Can System Configuration Icon on the main screen to begin setting up the system.
2. The CAN configuration icons screen will be displayed. Touch on the AccuBoom Icon.
3. The AccuBoom Settings page will be displayed.
   a. Confirm there is a check mark in "AccuBoom Enabled"
   b. Confirm there is a check mark in "Corrected Coverage"
   c. If all the Products share the same section drivers, place a check mark in "Apply to all products".
   d. If products don't share section drivers remove the check mark from "Apply to all products"
4. **Set On-override time:** The On-override feature allows the operator to momentarily apply product to a previously applied area while in a job. The override feature is useful to ensure product application in small unapplied areas near irregular headlands and previously applied areas. Enter the number of seconds to override automatic section control and apply product after the "OVERRIDE" button is pressed from within a job. Default setting is 30 seconds.
5. **Set Turn-off Percent:** This value controls the percentage of the section width that must be inside a previously applied area for the section to turn off. The default value is 99%. This would require that 99% of a section (zone) to be in a previously applied area before the Auto Zone Command system would turn off that zone. *SeedMaster recommends leaving this value at 99%.*
6. **Set Look ahead based on Time:** Depending upon the type of valve used to control products, control valves may take several seconds to adjust when opening or closing. To help compensate for the valve response time and lag due to filling or emptying product supply lines, the look-ahead values allow the Viper 4+ to begin adjusting control valves for map zones and previously applied areas.

***Note**: The look-ahead times should always be entered as positive values.*

7. **Set Turn-Off Look-Ahead**: Enter the number of seconds ahead of the vehicle (based on vehicle speed) which the Viper 4+ will scan for zone boundaries and changes when turning product application off.
8. **Set Turn-On Look-Ahead**: Enter the number of seconds ahead of the vehicle (based on vehicle speed) which the Viper 4+ will scan for zone boundaries and changes when turning product application on.

Factory Default Look ahead times: Use the chart below as suggested starting look ahead times. ***It is not SeedMaster's responsibility for skips or misses. Please ensure that you have product being delivered to unapplied areas always when dispersing product.***

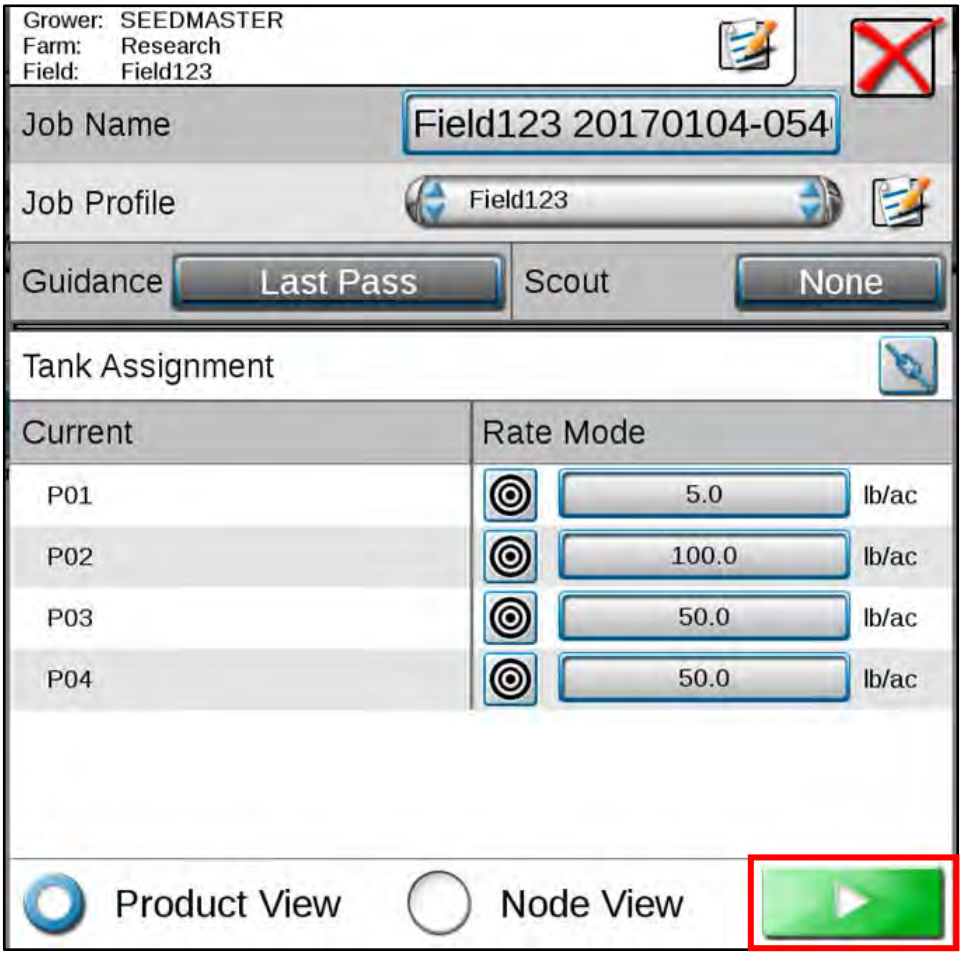
TANK TYPE	TURN-OFF	TURN-ON
ON-FRAME	1 SECOND	2 SECONDS



VIPER 4+ JOB QUICK START PROCEDURE

Before you go to the field please review the steps below to ensure your Viper 4+ is field ready.

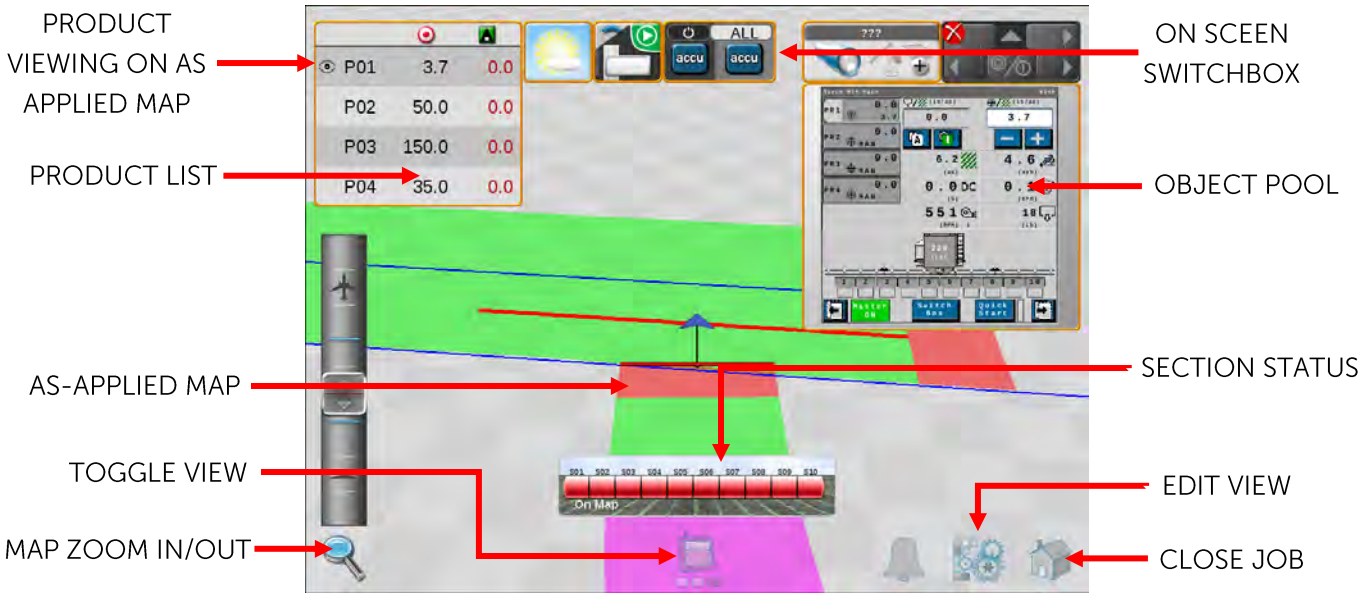
1. Review ISO SR Quick Start Procedure (**PAGE 19**).
2. Review ISO RCM Quick Start Procedure (**PAGE 37**).
3. Review AutoZone Command Look Ahead Time Setup (**PAGE 77**).
4. Choose the correct Product Profile.
    a. Touch the Product Profile Panel.
    b. Choose the Product Profile for the specific field.
    c. If you need to create a Product Profile, see **PAGE 76** for more information.
5. Touch the Job Profile Icon. 
6. Choose the correct Job Profile **OR** just touch "Start Job" if not using Job Profiles.
    a. If you need to create a Job Profile, see **PAGE 75** for more information.
7. Review Job settings.
    a. Review Grower/Farm/Field Information (if applicable).
    b. Job Name: Enter the name of the Job.
    c. Job Profile: Review or edit Job Profile information.
    d. Guidance: Last Pass
    e. Scout: None or if using FLIP Maps, choose the appropriate FLIP Map.
    f. Rate Mode: Set the Rate for each product.
    g. Touch the Play Button when ready to open the Job.



VIPER 4+ RUN SCREENS

There are 3 different operator run screens: 3D Guidance, Field Review, and Widget View. After starting a job, you can easily toggle each view by touching the computer icon located on the bottom in the middle of the screen. A selection widget will pop up. The icons from left to right are 3D Guidance View, Field Review map, Browser Page (if V4+ is connected to the internet), and Widget View.

GUIDANCE VIEW



WIDGET VIEW

FIELD REVIEW MAP

MANAGING SCREEN LAYOUTS

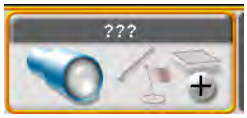
Each run screen layout can be modified or created. If modifying the run screen, it is recommended that a new personalized run screen is created. Follow the procedure below to create a new screen layout.

1. From the operating run screen, touch the widget settings button.
2. Choose the layout view by either swiping left or right. The name of the view will appear at the top of the screen.
3. Touch the add view button. 
4. Enter a name for your view and touch the check mark.
5. Touch the pencil and paper to edit the layout. 
6. Touch the Widget Add Button to add widgets. There are a variety of widgets to choose from. Scroll left or right to browse the widgets.
7. To add a widget, simply touch and hold the widget for 3 seconds. The widget will be added to the run screen.
8. Touch, hold, and drag the widget around to your desired location on the screen. To delete a widget, tap on it then touch the red trash can located in the top left corner of the widget.
9. When all desired widgets have been added, touch the widget finish or back button. Then touch the green check mark to complete the widget layout editing. 

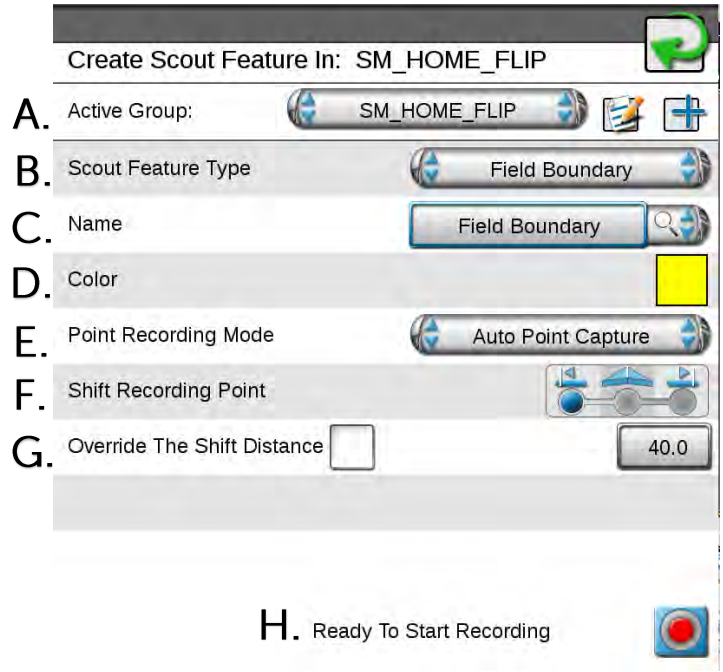
CREATING A FLIP MAP AND BOUNDARY FOR ENTIRE FIELD

Follow the procedure below to create a flip map and boundary for an entire field.

1. From the run screen, touch the Scouting Widget. *NOTE: If the scouting widget is not on your run screen you will need to add it. Please see the chapter for Adding Widgets to the run screen.*



2. After touching the Scouting Widget, a window will pop up. Follow the steps below to set up the FLIP MAP.



   a. **Name the Active Group**: Touch the + sign and name the FLIP map the field name with FLIP at the end.
   b. **Set the Scout Feature Type:** Leave as "Field Boundary".
   c. **Name**: Leave as "Field Boundary".
   d. **Color**: Touch the grey color box and select the yellow color.
   e. **Point Recording Mode**: Leave as "Auto Point Capture".
   f. **Shift Recording Point**: Select **RIGHT** if traveling **counterclockwise** or select **LEFT** if traveling **clockwise.**
   g. **Override the Shift Distance**: Leave unchecked.
   h. **Ready to Start Recording:** After setup is complete touch the record button.

3. After setting up the field boundary you will need to enable FLIP. Turn on the FLIP widget by touching the circles in the middle.

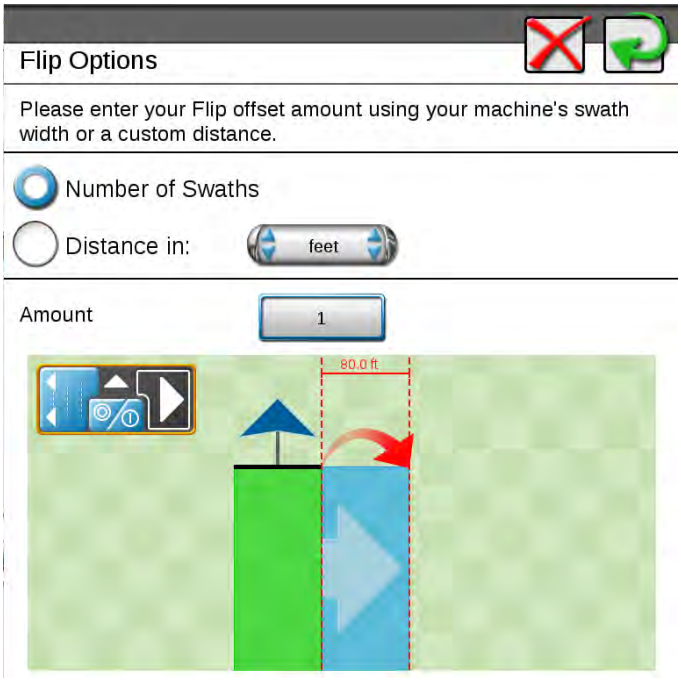
FLIP WIDGET OFF

FLIP WIDGET ON

NOTE: If the FLIP widget is not on your run screen you will need to add it. Please see the Managing Screen Layouts on page 80.

4. Set how many virtual passes you would like to create. The FLIP widget will default it to one virtual pass. To change this, touch and hold on the FLIP widget. If you would like to shrink the virtual pass, touch the "Distance in" and enter the width of the virtual pass.
   For example, on 80 feet enter 70.
   When finished touch the green arrow.
5. Enable FLIP LEFT or FLIP RIGHT. If you are doing the headland clockwise, you will touch FLIP RIGHT. If you are doing the field counterclockwise, you will touch FLIP LEFT.

FLIP RIGHT ENABLED



6. After enabling FLIP, touch the record button on the Field Boundary Widget.

7. Complete the first headland pass. Stop moving, then touch the Save Boundary button and Save FLIP map button.

   NOTE: If at any time it is necessary to lift and turn out touch the pause button.

FIELD BOUNDAY & FLIP MAP SAVE BUTTONS

FIELD BOUNDARY & FLIP map is now complete. The name of the FIELD BOUNDARY will appear in the Scout Widget and the FLIP widget is ready for Inside FLIP maps.

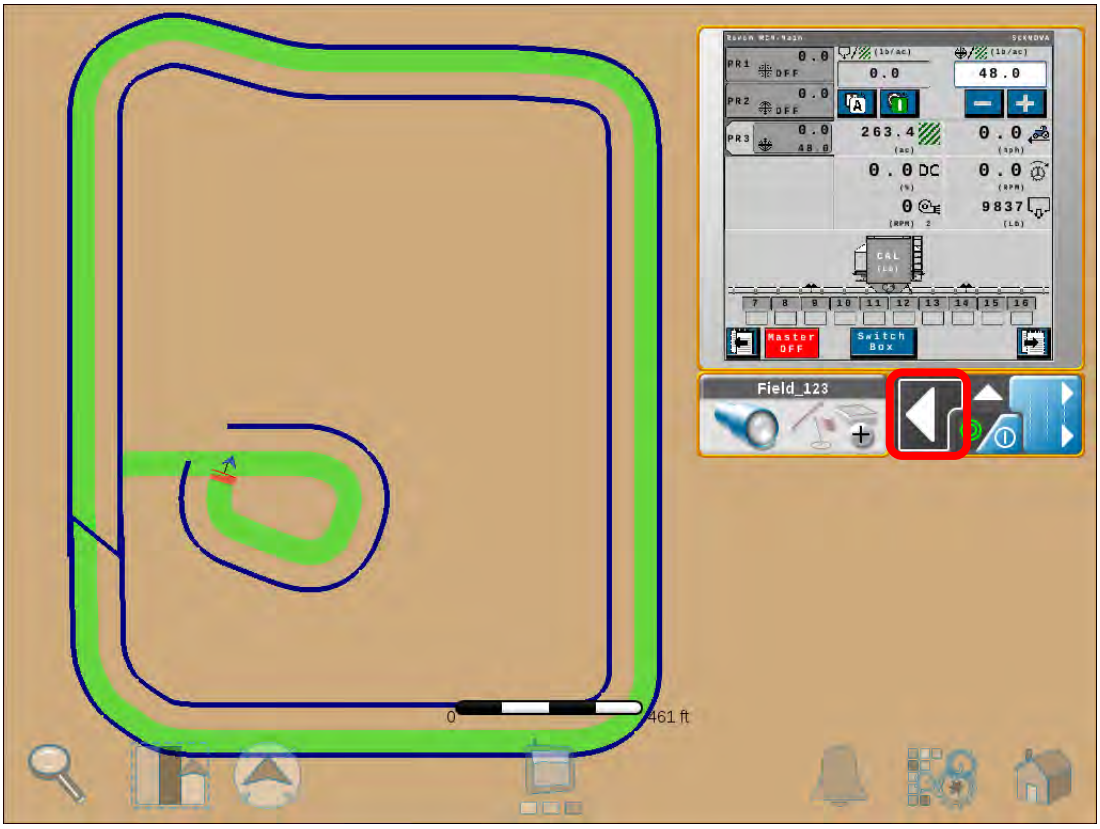
CREATING AN INSIDE FLIP MAP

Once the outside FLIP & Boundary are created, it is possible to create a FLIP Map inside the field boundary.

1. To begin creating an inside FLIP map simply touch FLIP LEFT or FLIP RIGHT. If you are going around the object clockwise, touch FLIP LEFT. If you are going around the object counterclockwise, touch FLIP RIGHT.

FLIP LEFT  FLIP RIGHT

2. Drive around the object until you reach the previously applied area. Once all the zones are off, stop the machine.
3. Touch the FLIP LEFT or FLIP RIGHT button to complete the inside FLIP Map.
4. Repeat as necessary.



SEEDING THE VIRTUAL PASS

After completing the field or around an object, the virtual pass will need to be seeded. To override FLIP, the on-screen switch box will need to be set to on.

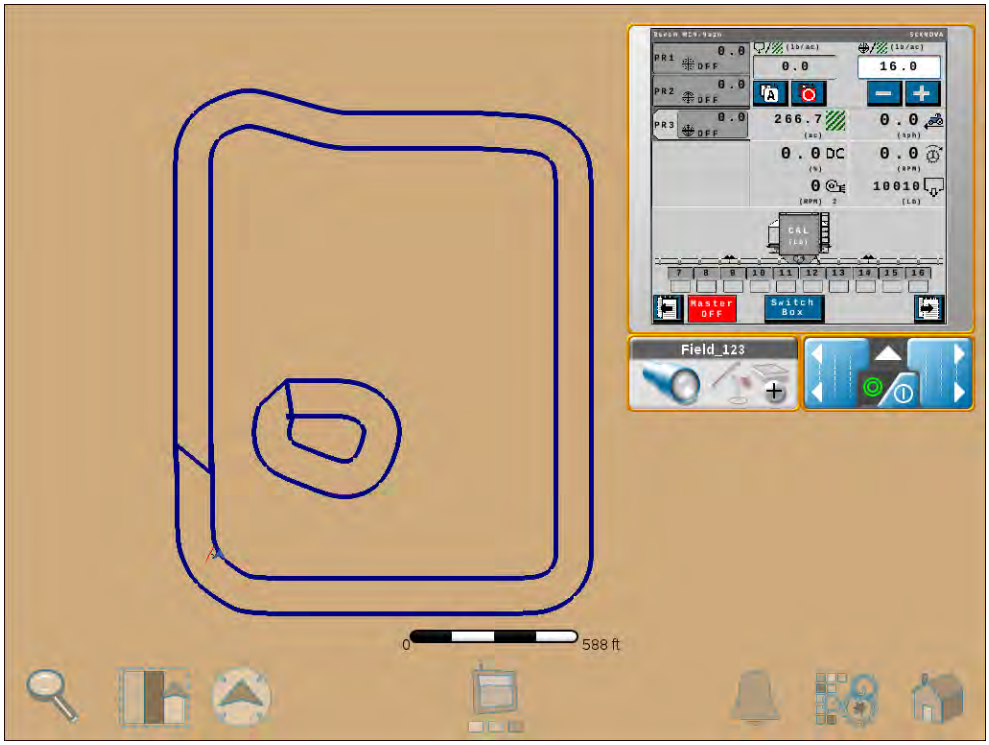
1. Touch the Master accu button.
2. Touch the green on button.
3. When finished change it back to accu.

LOADING A PREVIOUSLY CREATED BOUNDARY & FLIP MAP

1. Start a new job.
2. Touch Scout and choose the appropriate FLIP map for the field.

3. Touch Play.
4. The FLIP map will load automatically.
5. Turn FLIP ON.

FLIP WIDGET OFF FLIP WIDGET ON



VIPER 4+ FILE MAINTENANCE

File Maintenance can be defined as the process of archiving specific files from the Viper 4+ and deleting files that are no longer needed. It is recommended that the user perform this maintenance at the end of each day. If this is not possible, maintenance should be performed at least once a week.

File maintenance ensures that the Viper 4+ system can perform at optimal efficiency by removing files that are no longer needed. Regular file maintenance also safeguards valuable information from being lost if a file is damaged or corrupted since files will be archived on a personal computer or laptop for future reference.

All Viper 4+ job files are stored in memory. The storage location for these files is of a fixed size and will hold a large, but limited number of files. File maintenance should be conducted on a regular basis to ensure sufficient storage space is available for future jobs.

Files can be loaded onto the Viper 4+ or downloaded from the Viper 4+ using an external USB drive. Insert the USB drive into the USB connector located in the left side of the Viper 4+.

Note: Do not leave the USB flash drive in the USB connector while operating the machine. Insert the USB flash drive into the USB connector only to perform file maintenance.

Transferring Files to a USB Drive

1. Insert a USB drive into the Viper 4+.
2. Touch the Administrator Panel.
3. Touch the File Manager Button.
4. Select the Files to be copied to the USB drive or select all to transfer all files.
5. Touch the File Transfer button.
6. Touch the USB_DISK button.
7. Touch the Move Button.
8. Touch the GFF Structure Button.
9. Place check marks in the Generate Report and Include shape files selections.
10. Touch the Export Button.
11. The files will be deleted from the Viper 4+. Touch Yes to continue.
12. After the File Transfer is complete touch the OK button.

Deleting Files from the Viper 4+

1. Touch the Administrator Panel.
2. Touch the File Manager Button.
3. Select the Files to be deleted from the Viper 4 or select all to delete all files.
4. Touch the Trash Can button.
5. Touch Yes to confirm the deletion of the files.

3RD PARTY GPS

The Viper 4+ system requires a GPS differential correction from a GPS receiver. The GPS receiver that connects to the Viper 4+ is required to output the correct NEMA strings. The NEMA strings required are:

1. GGA @ 10hz
2. VTG @ 10hz
3. RMC or ZDA @ 1HZ
4. Minimum BAUD Rate Setting of 19200bps.

Obtain the correct patch cable and connect to the Viper 4+ main console harness (connection is labeled DGPS, it is a 9pin Male RS232 connector). Ensure the 3rd party GPS receiver has been correctly configured. It is a simple procedure on the Viper 4+ to connect the GPS receiver.

To access the Serial Devices page:

1. Touch the Can System Configuration Icon on the main screen to begin setting up the system.
2. The CAN configuration icons screen will be displayed. Swipe the pages left until you see the Serial Devices Icon. Touch the Serial Devices Icon.

3. The Serial Device Settings page will be displayed.
4. Touch the Serial Devices Reset / Redetect button. 

The Viper 4+ will search for the installed GPS receiver. If it's not found check your connections and GPS receiver setup. If found the GPS icon in the top right will go green.

NOTE: *There are Commonly used 3rd Party GPS Patch Cables. Please contact your GPS supplier to obtain the correct patch cable.*

Please refer to your 3rd party GPS receiver manual or Dealer for instructions on setting up NEMA strings and outputting GPS.

Note: If you are connecting to a Raven DGPS receiver, the receiver will be configured to output the correct NEMA strings to your Viper 4+ Field Computer. Raven DGPS receivers are also available for purchase. Please contact your dealer for more details.

SETTING THE TRACTOR MEASUREMENTS

The Viper 4+ and RCM are set up for your specific SeedMaster machine from factory. The Viper 4+ **IS NOT SETUP** for your specific tractor pulling your SeedMaster machine. ***It is important to configure the tractor measurements to ensure proper as-applied mapping.*** Follow the procedure below to set up the tractor.

1. Touch the Machine Configuration Panel.
2. Touch the edit icon.

3. The setup will take you to the Machine/Implement Garages. Touch the Tractor garage button to edit the tractor measurements of the tractor pulling your SeedMaster machine.

4. The setup will take you to the Machine Garage. Touch the add new Machine Button to add the tractor type pulling your SeedMaster machine. 
5. Choose the Tractor Type: Traditional, Track, or Articulated (Swipe left).
6. After choosing the tractor type, name the Tractor. IE. MY4WD.
7. Enter any General Information if desired.
8. Touch the blue arrow pointing to the right. Measure and enter ALL measurements for the tractor.
9. Touch the blue arrow pointing to the right. Measure and enter ALL measurements for the tractor on page 2.
   NOTE: It is important to measure and enter the all machine measurements to ensure correct as applied mapping.
10. Touch the Green check mark to finish setting up the tractor.
11. Touch the Green check mark to exit the Machine Garage.
12. Touch the Green check mark to exit the Tractor Machine Setup. 

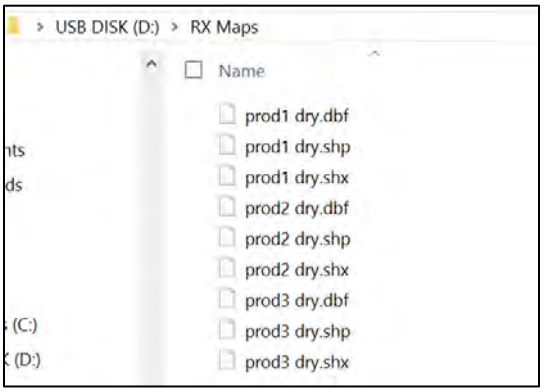
NOTE: The TXB implement Tongue and Hitch Lengths should be set to 500 inches for Tongue and 25 inches for Hitch.

IMPORTING PRESCRIPTION MAPS

The RX map shape file needs to be loaded onto a USB drive before importing them to the Viper 4+.

***NOTE**: THE Viper 4+ needs to be unlocked for RX maps before they can be applied.*

1. Insert a USB drive to your PC.
2. Create a folder called RX Maps on the root of the USB drive.
3. Copy the RX files to the RX Maps folder. There will be 3 files associated the RX map. See below.



4. Insert the USB Drive into the Viper 4+.
5. Go to the Administrator Panel on the Viper 4+.
6. Touch the File Manager button.
7. Touch the USB Drive Tab.
8. Touch the drop-down menu for “USB” and choose your USB drive.
9. Touch the drop-down menu for “Choose file type” and choose “RX Maps”.
10. Touch the blue arrow pointing to the right.

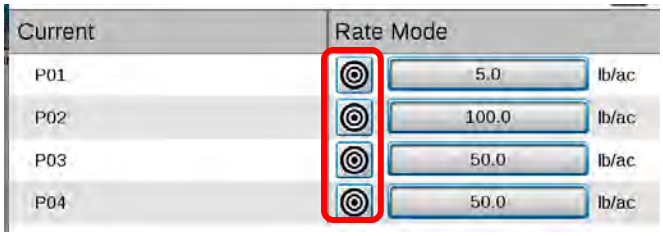
11. Navigate to the RX Maps folder.
12. Choose the RX maps to import or Select All.
13. After selecting the RX maps, touch the import button.

14. Touch the check mark to confirm the RX Map import.
15. A pop-up window will appear when the files have been successfully imported. Touch OK to finish.
16. Touch the green arrow to return to the main screen.

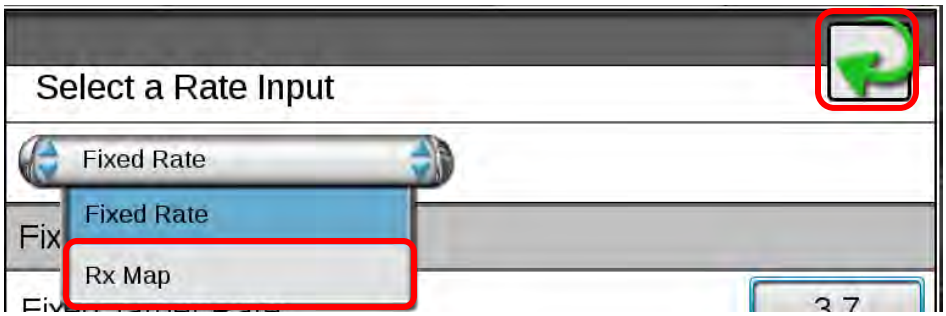
LOADING RX MAPS WITH JOB

After initially starting a job, select the prescription (Rx) rate mode to apply product according to a prescription map stored on the Viper4+ and load it into the job profile or active job operation. This mode allows the Viper 4+ to automatically adjust the target rate for field areas as designated by the prescription map.

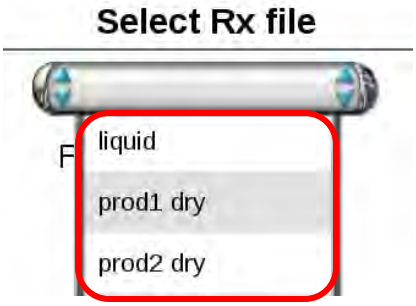
1. Determine what product the RX map will be applied to.
2. Touch the target icon for the product that the RX map will be applied to.



3. Touch the drop-down menu below "Select a Rate Input".
4. Select "Rx Map". Then touch the green arrow.



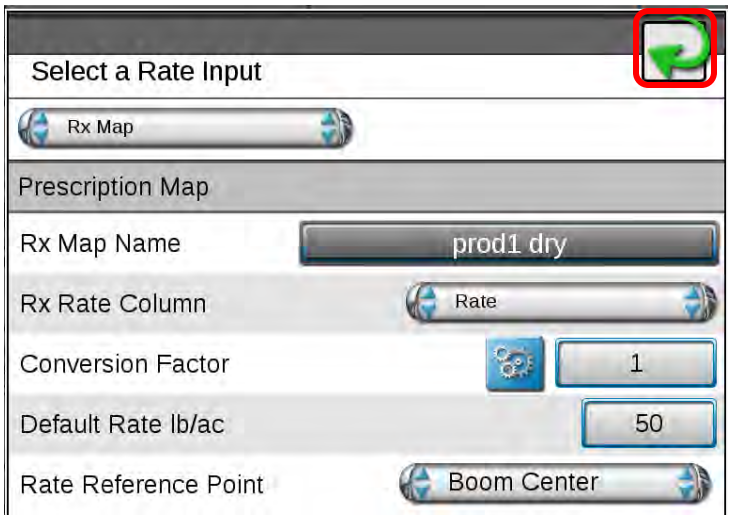
5. Touch on "RX Map Name" and choose the RX associated to that product.



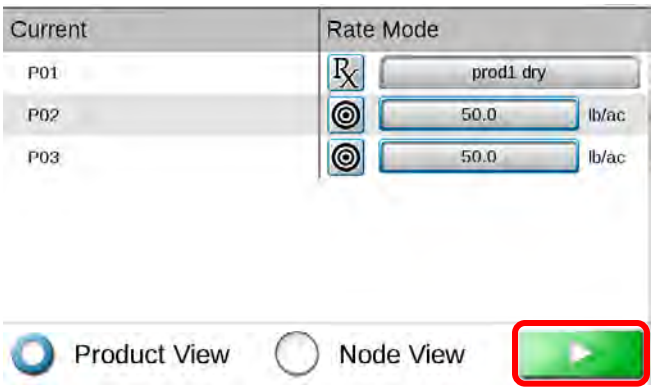
6. After selecting the RX map, touch on the drop-down menu for "RX Rate Column". Then choose the desired Rate.

7. The conversion factor for the RX map is set to 1 for a ratio of 1 to 1. If you desire to cut the rates in half for the RX Map enter .5.
8. The Default Rate for applying outside of the RX map is set to 0. If desired, change this to your own desired default rate.

9. The rate reference defaults to the center of the machine.
10. The RX map is ready for applying. Touch the green arrow to continue to job setup.



11. If multiple RX maps are being applied, please repeat the above steps.
12. When finished, touch the play button to open the job.



NOTE: THE RX MAP WIDGET CAN BE ADDED TO THE RUN SCREENS FOR RX MAP SETTINGS DURING JOB OPERATION

UPDATING ECUs VIA VIPER 4+

The Viper 4+ can update the SeedMaster Drill ECU or SeedMaster RCMs. The Viper 4+ will need to be updated to version 2.7 before this functionality is available. To update the Viper 4+ to v2.7, please visit SeedMaster's webpage to download and install the newest software. Once the Viper 4+ is updated, please follow the procedure below to update either the RCM(s) or Drill ECU.

Downloading the ECU Hex Files

1. Go to www.seedmaster.ca.
2. Go to the "Service" tab, then click on "Software Downloads".
3. Under the "ISOBUS DRILL ECU & RCM" heading, click on the latest software package.
4. Save the software package to your desktop.
5. After the software has downloaded, navigate to the desktop.
6. Right click on the Software Package, then click "Extract to ISO_ECU_SOFTWARE_PACKAGE_###".
7. Open the Unzipped folder and navigate to the ECU that is being updated.
8. Open the folder containing the .hex file for the ECU.
9. Right-click and copy the .hex file.
10. Insert a USB drive.
11. On the root directory of the USB drive, right-click and paste the .hex file.
12. Repeat steps 8 to 11 if you are updating multiple ECUs.
13. Once the .hex files are copied to the USB, safely remove the USB drive.

Copying the .hex file to the Viper 4+

1. Plug the USB drive with the .hex files on it into the Viper 4+.
2. On the Viper 4+, touch "Administrator".
3. Touch "File Manager".
4. Touch the tab that looks like a USB Drive.
5. Touch the drop-down menu to the right of "USB" and choose the USB drive that was just inserted.
6. Touch the drop-down menu to the right of "Choose file type".
7. Scroll down to "Node Update" and choose "Node Update".
8. Touch the blue right arrow.
9. If the file(s) were copied successfully, they will be listed on the bottom of the screen.
10. Place check marks beside the .hex files to be copied to the Viper 4+.
11. Touch the button that has the two grey pieces of paper with the arrow.
12. An import screen will pop up. Touch the green check mark to confirm the import.
13. Touch OK after the files are successfully transferred. Then, touch the green back arrow and remove USB drive.

Installing the new ECU Firmware

1. Touch the "System Manager" button.
2. Touch the tab that shows a blue computer screen.
3. Select the ECU that is being updated to highlight it blue.
4. Touch the drop-down Menu below "Versions Available". Then choose the latest version.
5. Touch the green down arrow to apply the update.
6. Wait for the software to install. After the install is complete, repeat as necessary.

WIFI OR TETHERED REMOTE SUPPORT

The Viper 4+ can connect to a Wi-Fi network or Tethered Hotspot to perform remote support.

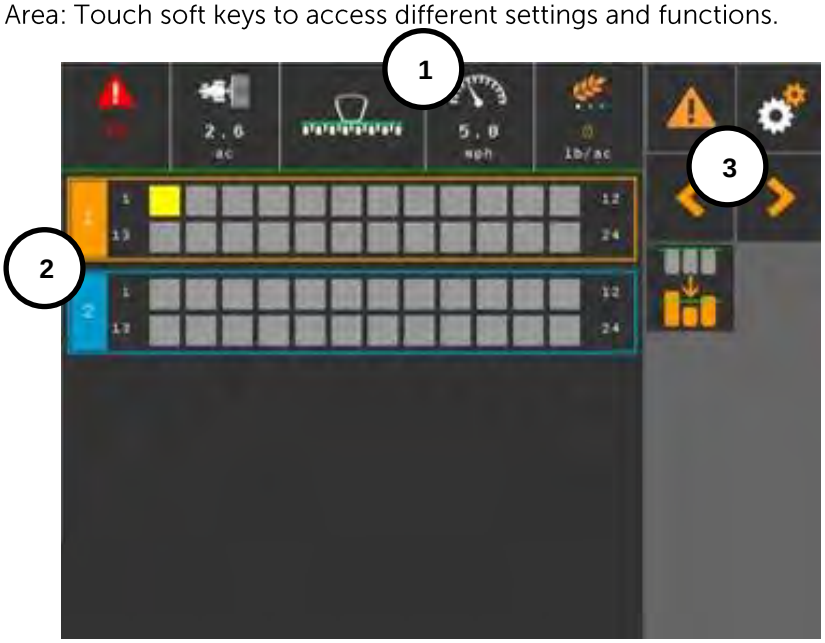
NOTE: To ensure the feature works correctly, the Viper 4+ must first be registered on the Slingshot Website using the monitor's serial number. Make sure the Wi-Fi antenna included with your Viper 4+ is installed on the back of the monitor.

1. Ensure you are in range of a Wi-Fi network or that you have enabled a Hotspot connection from your mobile device. Refer to your mobile device's operator's manual on how to enable a Hotspot.
2. On the Viper 4+ monitor, touch the "**CAN System Configuration**" icon.

3. Swipe left to the fourth page.
4. Touch the "**Networking**" icon.
5. Enable the Wi-Fi Connection by placing a check mark in the box to the left of Enable.
6. Wait about 30-60 seconds. If your network does not appear, touch the refresh button. If it still does not appear, please ensure that you are in range of a Wi-Fi network or your Hotspot is enabled. Also, check to ensure the antenna is installed on the back of the Viper 4+.
7. Once your network is visible, touch on the network name.
8. Place a check mark in the Connect Automatically box.
9. Touch the "**Connect**" button.
10. Enter the Password for the Wi-Fi network or Hotspot, then touch the **check mark.**
11. After the connection is made, the Viper 4+ is ready for Remote Support.
12. Touch the **"Administrator"** panel.
13. Touch **"System Manager"**.
14. Touch the "**Slingshot"** tab (Frog and Field Hub Tab).
15. Touch the "**Request Support"** button.
16. Touch "**Yes**" to agree to the terms and conditions.
17. A service code will be displayed above the Terminate Support Button.
18. To end the Remote Support Session, touch the "**Terminate Support**" Button.

DIGITROLL BLOCKAGE MONITOR

1. Status Area: This area will show the current status of different components of the machine including the System Alarms, acre tally, Master Switch Status, ground speed and estimated rate.
2. Sensor Status: This area will display a blocked run or sensor error (red), dirty sensor or no flow (grey), over or under flow sensor (yellow) and no blocked runs (green).
3. Soft Key Area: Touch soft keys to access different settings and functions.



BLACKEYE SENSORS

RED SENSOR – BLOCKED OR COMMUNICATION ERROR
- Check for blocked run
- Clean sensor
- Unplug sensor and plug back in & Refresh System

ORANGE SENSOR – CAN COMMUNICATION
- Refresh Sensor or clean sensor

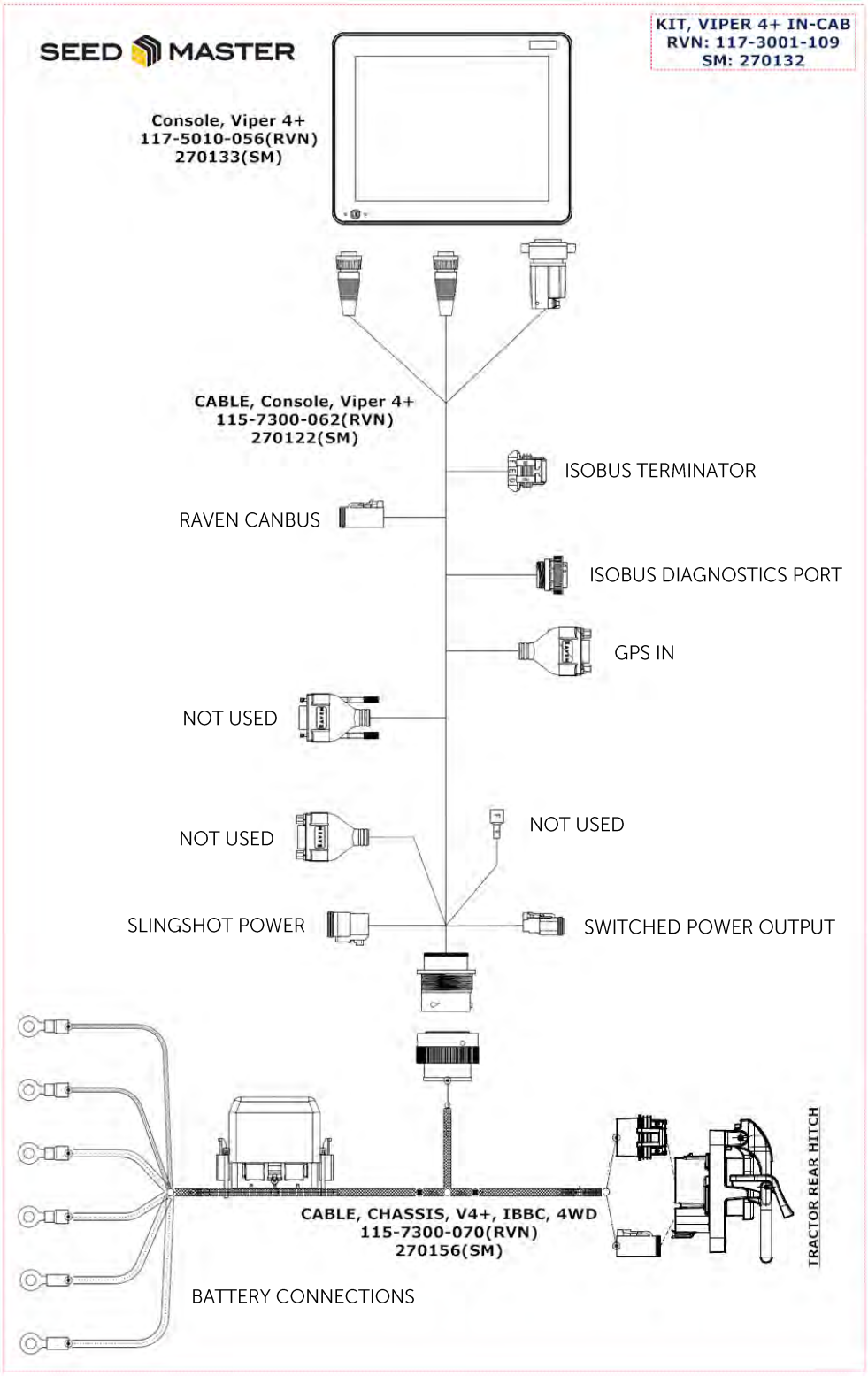
GREEN SENSOR – GOOD
- Double check sensor by passing an object by the photo eyes the sensor will flicker green.
  - IF sensor doesn't flick green, tap side of sensor

NO LED LIT – BAD
- Change sensor

BLUE SENSOR FLICKERING LED – FIRMWARE UPDATE IN PROGRESS

SYSTEM ELECTRICAL DRAWINGS

IN-CAB VIPER 4+



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