SEEDMASTER – 2025

TOOLBAR – ULTRAPRO II – NOVA TANK

OPERATOR'S MANUAL

SEED MASTER™

CONTENTS

INTRODUCTION

Thank you for purchasing a new SeedMaster unit. 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 problems arise, SeedMaster Manufacturing's dealership network can provide clarification and correction. It is important that all SeedMaster units maintain a solid reputation.

SeedMaster Manufacturing would like to take this opportunity to thank you, our valued customer, and our valued dealer, for showing your confidence in purchasing and representing a quality SeedMaster product.

SAFETY

Please be SAFE! Carefully read and understand all safety alerts and warnings in this manual and all safety decals on the SeedMaster drill and tank. Ensure that anyone who is going to use the SeedMaster drill and tank reads and understands the Operator's Manual. We recommend that only mature and well-trained or experienced people 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 SeedMaster drill and tanks. Ensure that minimum safe working distances are always maintained from any obstruction.
- 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. Be aware that when the hydraulics are activated, rotation may start unexpectedly at any time.
- We recommend that all maintenance and adjustments on the seeder be made when the implement wings are lowered.

- Store and transfer gasoline, 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.
- Always keep safety decals and signs clean and legible. 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 freely before going onto roads.
- Do not transport at speeds higher than that recommended on tires and hubs (25 mph or 40 kph).
- Check all transport wheel nuts after the initial 10 hours of use and periodically thereafter. (See PAGE 9).
- Use proper tire inflation pressures (SEE TIRE TORQUE AND PSI SPECS, PAGE 9).

TIRE TORQUE AND PSI SPECS

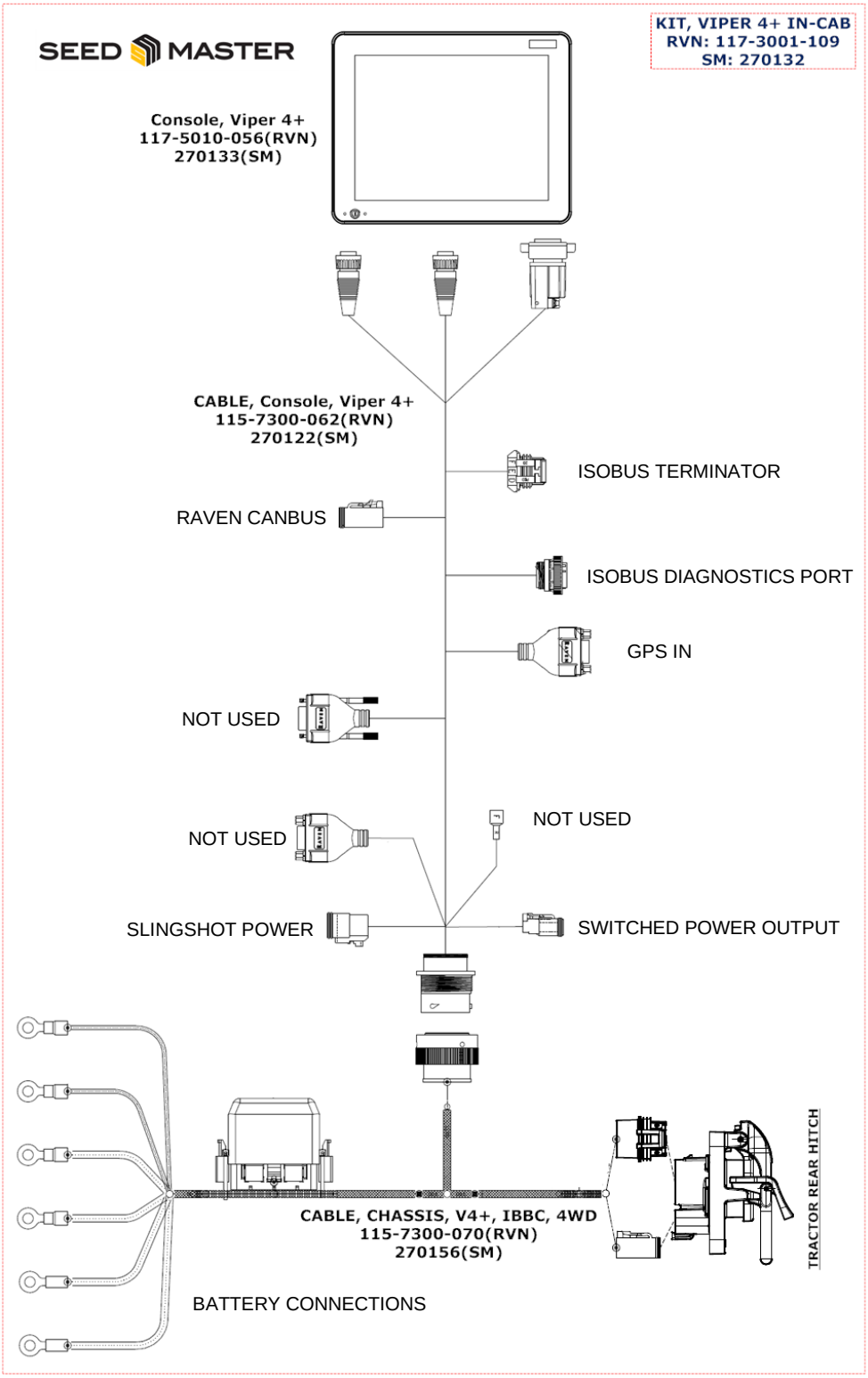
TIRE SIZE	TORQUE REQUIREMENTS (FT. LBS.)	MAXIMUM PRESSURE RATING (PSI)
12.5L15 (10 PLY)	200	44
12.5L15 (Hwy)	200	90
380/55-16.5	200	72
31x13.5	200	60
750/65R26	450	35
800/65R32	450	35
1050/50R32	450	35
Dual 710/70R38	750	23

NOTE: All tires require re-torque after the initial 10 hours of in-field use. Subsequent checks should happen every 100 hours. Higher torque values may require a torque multiplier.

SEEDMASTER 6012 ULTRAPRO II 360 WITH NOVA 520

IN-CAB ELECTRICAL HOOKUP

RAVEN VIPER 4+ IN-CAB HOOKUP



TOOLBOX

SeedMaster offers a factory option toolbox to hold any spare parts, tools, or accessories to keep your seeding operation moving. It is located on the “A-Frame” support beam in the middle of the hitch. The toolbox has a seal to help reduce the amount of dust and foreign material from contaminating or soiling the contents. Beside the toolbox is a container that contains your machine-specific manuals. This container is dust and water tight to ensure that your manuals stay intact in any weather or field conditions.

For machines with tow-between distribution, or a front-mounted tank, the toolbox will be located at the top of the “A-frame” beside the main-frame castor.

NOTE: Do not stand or walk on the toolbox!

TRACTOR HYDRAULIC HOOKUPS

SEEDMASTER MACHINE HYDRAULIC HOSES

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: Red Tagged Lines – The two ½" Direct Opener Lift & Lower hydraulic lines with red colour bands are the opener lift and lower lines. These lines are connected to one tractor remote. The hose with 1 red band is opener down pressure. The hose with 2 red bands is pressurized to raise the openers. The openers are held up in transport with a Pilot Operated Check Valve. This maintains the pressure on the opener up pressure circuit for long transport and to facilitate unhooking under lift pressure. Leave the pressure engaged to operate the Smart Openers. **NOTE***: See page 18 for operation instructions.*

SYSTEM PRESSURE HOSES: Green Tagged Lines - The two 1/2" hydraulic lines with 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, the 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 ONFRAME: There may be one or two ¾" fan pairs. If you are running a configuration with a single fan, the hoses will be tagged with 1x orange (pressure) and 2x orange (return). If you are running a configuration with dual fans, 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).

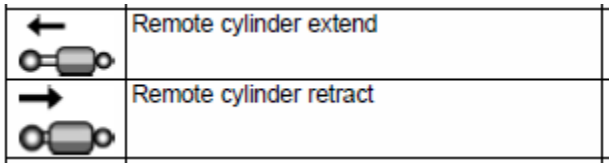
SEED AND FERT FAN HOSES NOVA: If you are running a NOVA Cart the seed fan hoses will be tagged with 1x yellow (pressure) and 2x yellow (return) and the fertilizer fan will be tagged with 1x blue (pressure) and 2x blue (return).

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 CARDS

SeedMaster machines come in several different configurations. Please refer to your configuration below. Ensure that you are hooking the pressure and return hoses to the appropriate remotes on your tractor: Pressure to Retract, Return to Extend.



ToolBar (TXB ONLY) 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 UNUSED			
SCV 4 UNUSED			
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

OnFrame UPII 350/360/550 Only Hydraulic

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	

NOVA Only Hydraulic Hookup

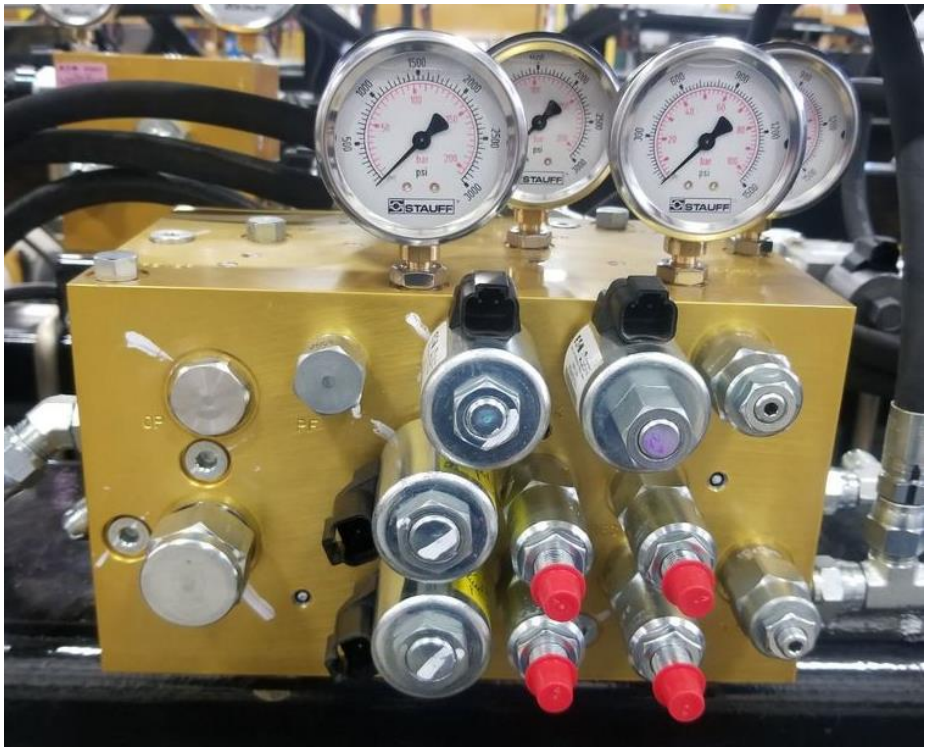
TRACTOR REMOTE	HOSE PAIR PRESSURE	RETURN	HYDRAULIC FUNCTION
SCV 1 SEEDMASTER	1 RED ½" Line	2 RED ½" Line	OPENER PRESSURE
SCV 2 SEEDMASTER	1 GREEN ½" Line	2 GREEN ½" Line	SYSTEM PRESSURE
SCV 3 SEEDMASTER	1 YELLOW ¾" LINE	2 YELLOW ¾" LINE	SEED FAN NOVA
SCV 4 SEEDMASTER	1 BLUE ¾" LINE	2 BLUE ¾" LINE	FERT FAN NOVA
SCV 5 UNUSED			
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

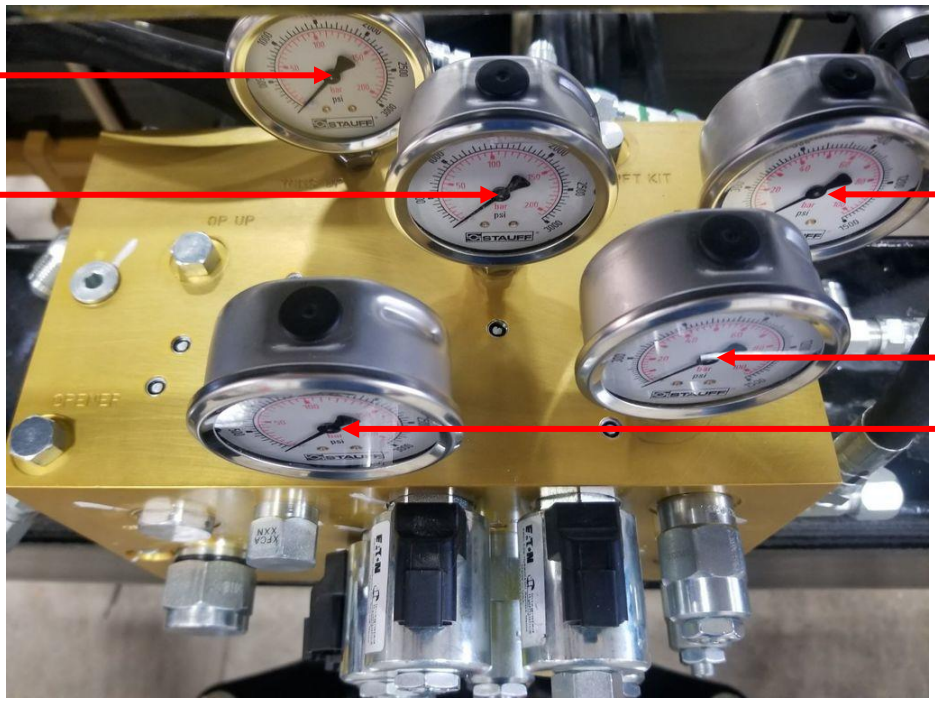
OnFrame UPII 350/360 and Nova Hydraulic

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 YELLOW ¾" LINE	2 YELLOW ¾" LINE	SEED FAN NOVA
SCV 5 SEEDMASTER	1 BLUE ¾" LINE	2 BLUE ¾" LINE	FERT FAN NOVA
CASE DRAIN SEEDMASTER		½" CASE DRAIN LINE	

MAIN HYDRAULIC BLOCK DETAILS

HYDRAULIC BLOCK GAUGES

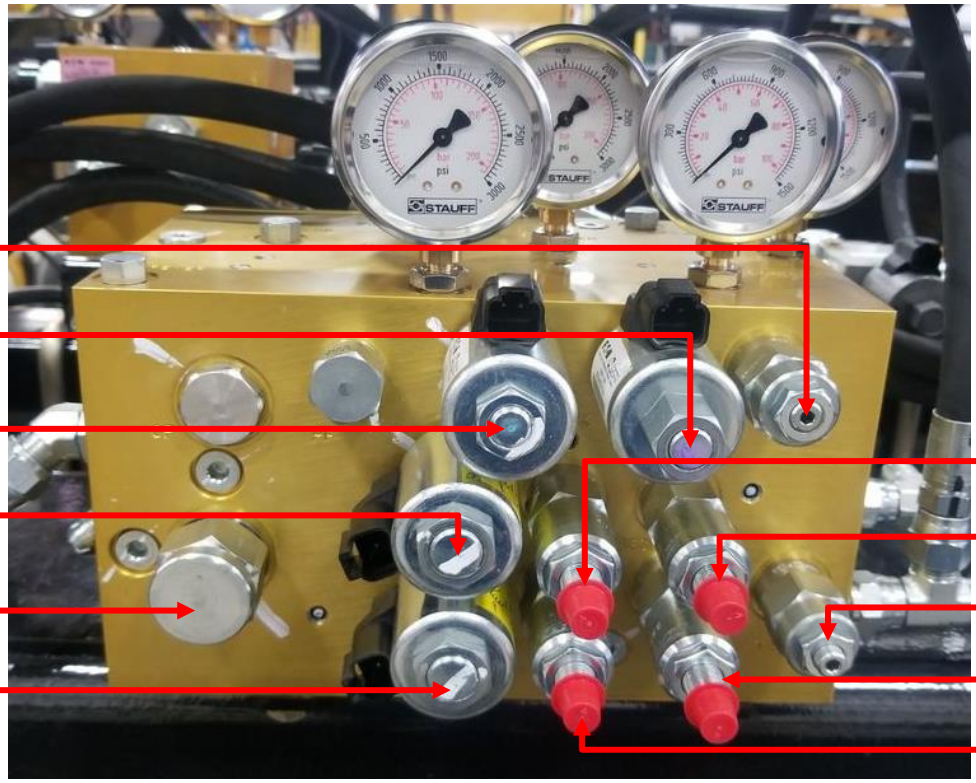




MAIN BLOCK GAUGES

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 the hydraulic metering motors.
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, LIFT KIT, RAVEN (METERING) 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 range.

MAIN BLOCK VALVES, SOLENOIDS, AND PWMS



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 atmosphere.
WING-DOWN PRESSURE: 180 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.**
RAVEN (METER) SUPPLY PRESSURE: 2000 psi
LIFT KIT: 200 psi
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

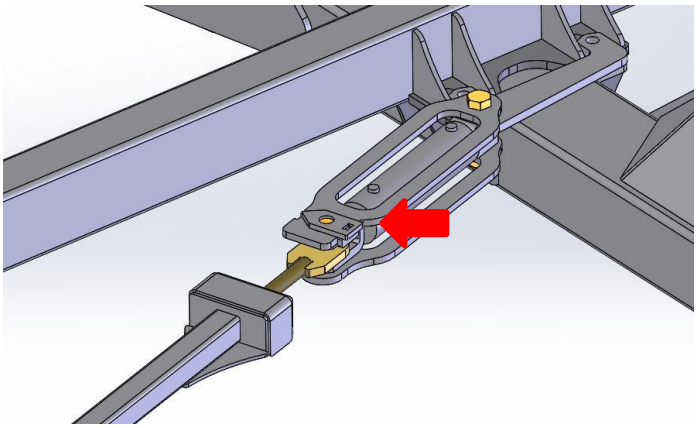
Setting Wing-Down Procedure (WING-DOWN PRESSURE)
The Wing-Down pressure is the amount of hydraulic pressure being applied to the inner and outer wing circuits; the oil supply is supplied from the system pressure. Wing-Down Pressure is required so the wings will contour while travelling through the field. SeedMaster requires ***Net Wing-Down Pressure***. To determine your net value, subtract your wing-up pressure from your current wing-down pressure (ie. 380 PSI wing-down – 200 PSI wing-up = 180 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.

Active Wing Brace Check
The Active Wing Brace supports the wing sections of the frame. While in the field, a hydraulic cylinder pulls the rear of the wing section forward counteracting draft while seeding. The hydraulic pressure comes from the opener cylinder hydraulic circuit. The higher the pressure is set to the active wing brace circuit, the more it will pull the rear wing square. When the packing pressure is increased, so is the amount of pull on the brace to a set maximum.



- **Adjusting the wing brace**: Start by unfolding the SM drill and activating the system pressure. Next, pressure the openers down with the opener pressure switch and adjust the shank down hydraulic pressure to 1000psi, activating the active wing braces. After the system has been completely pressurized, inspect each wing brace cylinder indicator. They should be fully retracted against the plate limiter. If not, please adjust the length of the active wing brace using the threaded link. The braces should be periodically checked to ensure proper adjustment. This will ensure your frame integrity remains true and helps increase the longevity of your machine.

Meter Drive Pressure Setting Procedure (RAVEN METER SUPPLY PRESSURE)
The Meter Drive Pressure is the amount of hydraulic pressure allowed to the hydraulic metering drives. The torque to the metering drives increases as the pressure increases. Do not exceed 2200 psi. The oil supply **for RAVEN METER SUPPLY PRESSURE** is supplied from the system pressure.

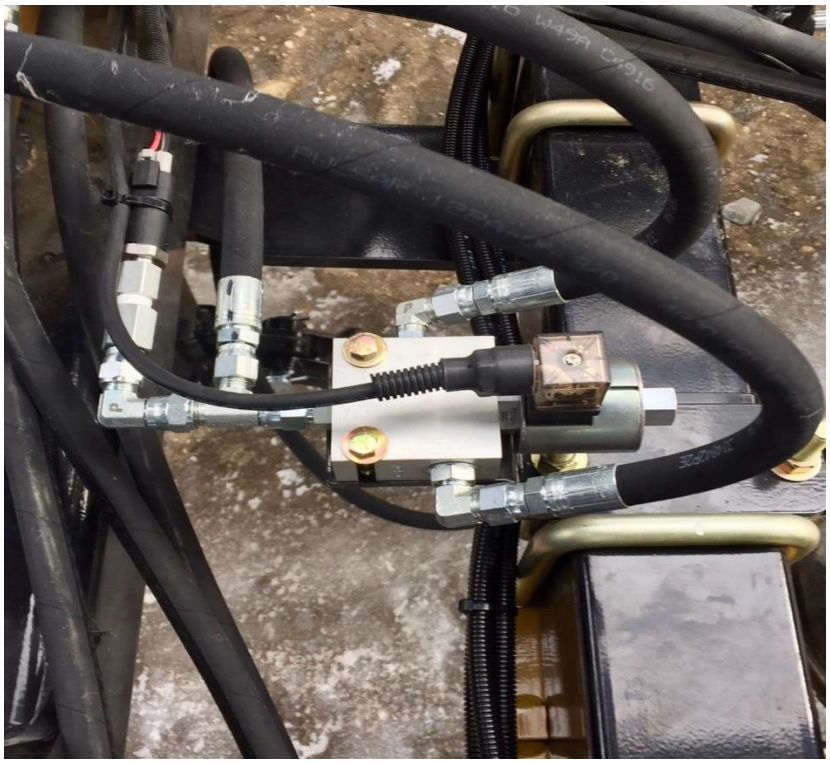
- To adjust the **RAVEN METER SUPPLY PRESSURE**, loosen the jam nut on the cartridge in port **RAVEN** on the main block. Turn the cartridge in to increase the pressure and out to decrease the pressure. When the desired pressure is set, re-tighten the jam nut.

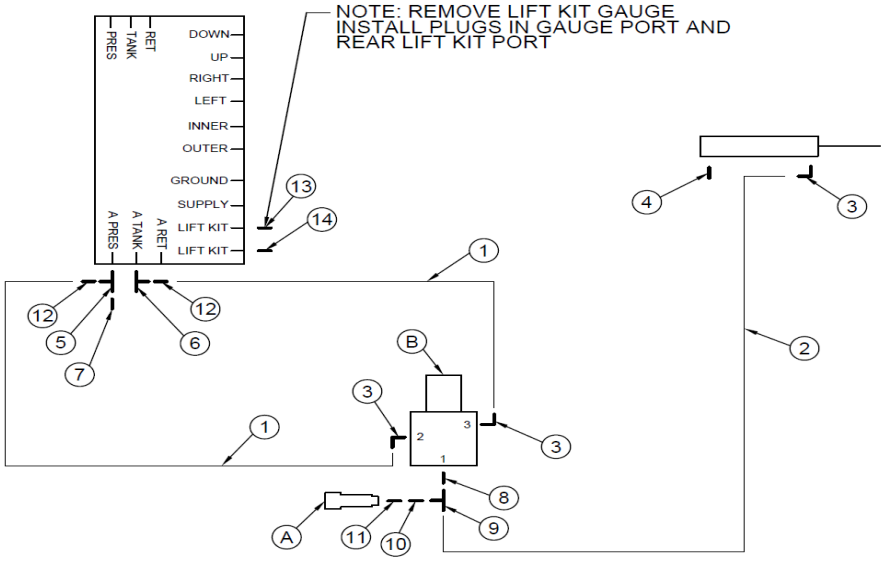
LIFT KIT

LIFT KIT: The Lift Kit is designed to decrease the weight on the main frame front caster wheels during field operation. It is hydraulically operated utilizing supply oil from the main hydraulic block's system pressure. The Lift Kit increases floatation by redistributing weight from the front caster wheels of the drill forward to the tractor hitch and backwards to the rear of the drill. The reduced weight and draft on the drill then adds weight and traction to the rear of the tractor. It also reduces stress on the hitch and frame of the drill when seeding in wet conditions.

Setting Lift Kit Procedure (Auto-PWM)

- See page 32 for in-cab pressure readout, pressure adjustment, and operating modes for this feature.

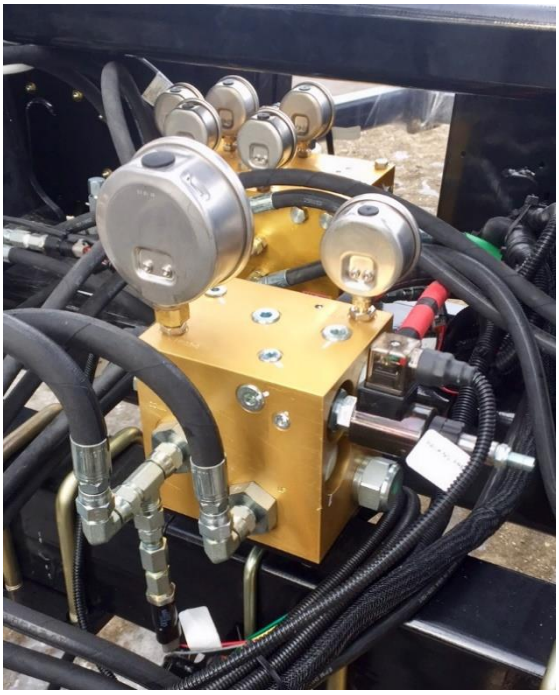




SMART OPENERS HYDRAULIC BLOCK DETAILS AND OPERATION

SMART OPENERS HYDRAULIC BLOCK

The Smart Openers block contains the main functions of your SeedMaster 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 Smart Openers block is located on the first rank behind the main block. For it to operate, you will leave the connected tractor hydraulic remote engaged during field operation. This continuous flow should be run with the least amount of flow required to raise and lower the openers. Tractor SCV flow can be decreased until the openers become slow to raise and lower. Recommended maximum 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 AND BUILD PRESSURE TO YOUR PRESET VALUE.

LIFT:

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

LOWER:

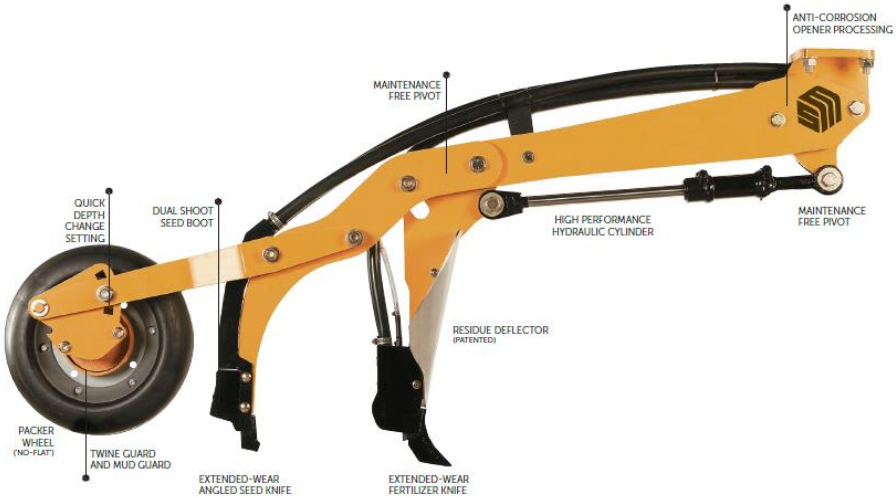
5. CYCLE MASTER FOOT SWITCH FROM OFF TO ON AND LEAVE THE MASTER SWITCH “ON” OPENERS WILL LOWER AND BUILD PRESSURE TO YOUR PRESET VALUE.

SEEDMASTER OPENERS AND KNIVES

STANDARD OPENER

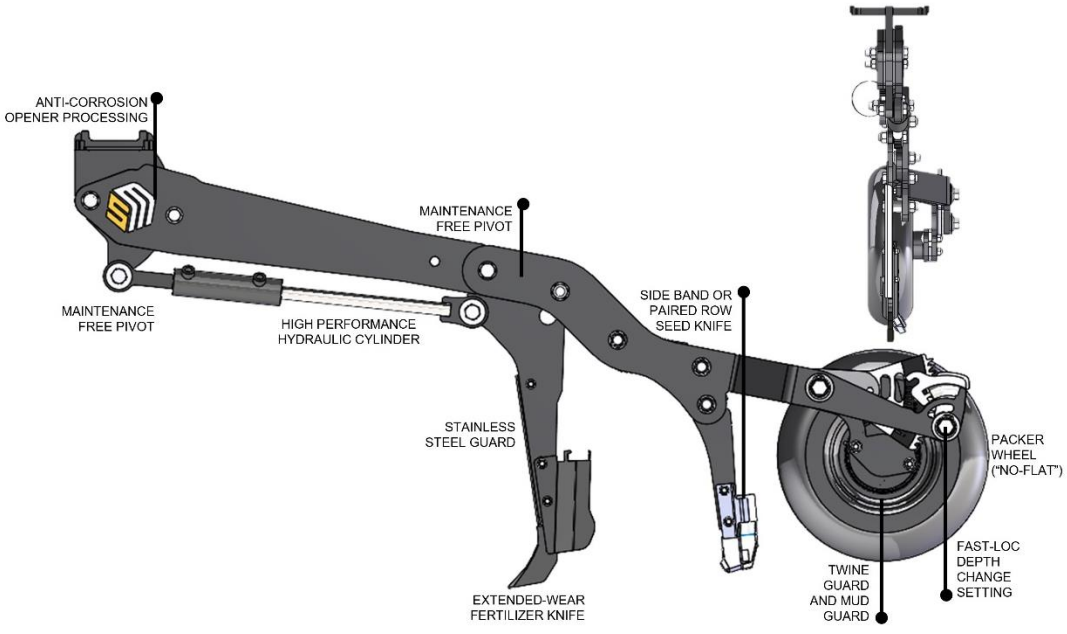
SeedMaster openers are installed on the toolbar in a “mirrored” configuration. Due to the angled seed carbides, this requires “left” and “right” seed knives. The openers are preset for seed and fertilizer depth. The seed depth is factory set at ¾” below the packed surface and the fertilizer depth is factory set approximately ¾” 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 ¼” changes in depth, with the inverted notch being the factory pre-set depth of ¾”.



INLINE OPENER

SeedMaster has developed an opener that alters the placements of the fertilizer and seed arms in relation to each other. The standard opener as mentioned above employs an offset configuration where the fertilizer arm is located 1 ½” to the side of the seed arm. The inline opener brings the fertilizer and seed arms “in line” with each other. This configuration requires the use of different style seed knives. They are detailed in the next section.



INLINE OPENER SEED KNIFE OPTIONS

To ensure seed and fertilizer separation on an inline opener configuration, different style seed knives are required. There are two styles to choose from: Side Band, and Paired Row. Due to the “mirrored” opener configuration on SeedMaster toolbars, “left” and “right” Side Band seed knives are required. The side band knife places the seed in much the same manner as the traditional offset opener. The paired row will place the seed in two bands on both sides above the fertilizer band.

Side Band Front View

Side Band Rear View

Paired Row Rear View

Paired Row Side View

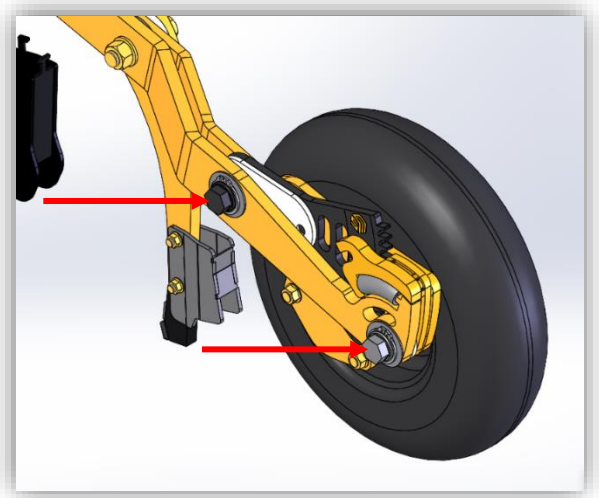
QUICK DEPTH ADJUST TOOL

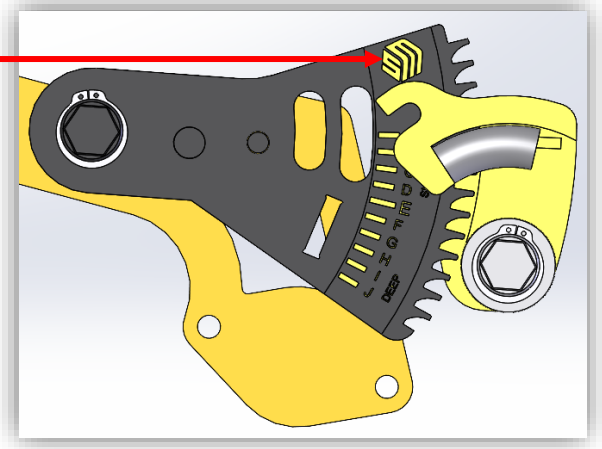
To change depth using the SeedMaster Quick Depth Adjust Tool, begin by selecting your desired depth on the tool. The measurements are scribed onto the side of the stainless depth gauge and run from 0” to 1 ½”. Then, as shown in Figure 1, simply loosen the nut on the slotted portion of the hub plate to allow the packer hub to rotate freely, hook the Quick Depth Adjust Tool into the hub plate, and rotate the tool until the stainless depth gauge contacts the bottom of the packer arm. Tighten the nut, and your desired depth is now set for that opener.

FIGURE 1

FAST-LOC DEPTH ADJUSTMENT

SM Icon	3/8
A	7/16
B	1/2
C	5/8
D	11/16
E	3/4
F	15/16
G	1
H	1 1/16
I	1 1/8
J	1 1/4
K	1 3/8
L	1 1/2
M	1 9/16
N	1 5/8
O	1 3/4





To change depth using the Fast-Loc Depth Adjustment, you require two 1⅛" wrenches. Using the first wrench, rotate the spring-loaded depth guide backwards to release it from the adjustment plate's teeth. Then, with the second wrench, rotate the adjustment plate up or down as pictured above. Using the decal on the side to determine the appropriate setting, move the plate up or down to your desired depth. Return the spring-loaded depth guide into the teeth of the adjustment plate and your depth will be set for that opener.

The decal's depth measurements begin with "SM Icon" at approximately ⅜" below the packed surface and increase by ⅛" with each setting. To achieve the unlabeled depths, move the adjustment plate one tooth at a time past the labeled depths.

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.

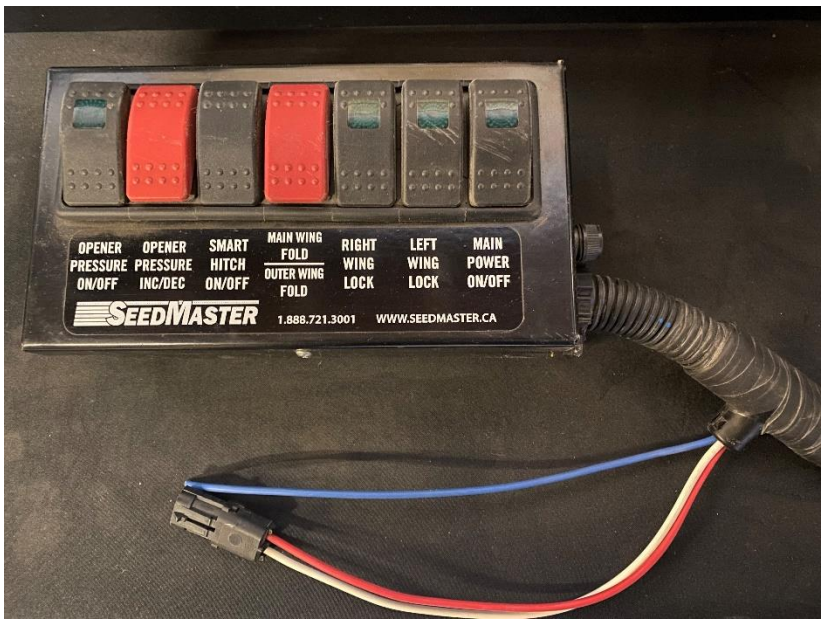
Warning: Avoid turning your drill very short. The opener is designed to seed primarily in straight lines. A sharp turn will cause the openers to be dragged sideways, resulting in an improper seeding job and undue stress on the openers. Never turn so short that the inside openers move straight sideways or backwards.

Always store the drill for extended periods of time in the unfolded wing position. This is to prevent water getting into the packer tire and wing wheel bearings. This is very important for winter storage.

MANUAL SWITCH BOX INSTALLATION AND OPERATION

INSTALLATION

The SeedMaster Manual Switch Box consists of 7 switches, a 20-amp fuse, and a wiring harness.



1. Place the electrical box in the cab at a convenient location.
2. Mount the box at the chosen location by opening the box and fastening the back panel at a desired location in the tractor cab.
3. Use a 14-gauge wire to provide ground to the white wire. This can be from the battery, or from your tractor's switched power.
4. Use a 14-gauge wire to provide 12-volts to the red wire. This can be from the battery, or from your tractor's switched power.
5. Run the harness through the cab to the hitch. Connect the plugs at the hitch to the mating plugs on the drill.

BLUE AUXILIARY WIRE

If you are using our switch box in combination with a third-party metering system, you may be able to link the two using the blue auxiliary wire **(provided both are operating at 12 volts)**. This allows the operator to activate only one switch for a headland turn. There are two different ways the blue wire can be used:

1. Use the blue wire to apply 12-volt signal to activate a relay for 3rd party metering devices. Power is supplied to the blue wire when the opener pressure on/off switch is activated from the SeedMaster control box.
2. If you are using another manufacturer's 12-volt product metering system, you can use the blue wire to signal the SeedMaster Manual Switch Box "opener pressure on/off switch". This is done by back-feeding 12-volt power to the blue wire. If this is your choice, always leave the switch in the off position.

NOTE: The blue auxiliary wire is not a ground. It may or may not be used depending on the seeding system installation.

SWITCH BOX OPERATION

SWITCH FUNCTIONS

1. **Main Power On/Off** – this switch applies and removes the main power to the switch box and will light up green in the “on” position. The switch box can be wired directly to the battery, or to your tractor’s switched power. The switched power must be able to handle a minimum of 30 amps of current. It is important to shut this main power off when shutting down the tractor.
2. **Left Wing Lock** – use this switch to lock the left wing in the folded, partially folded, or unfolded state. It will light up green when on. This switch must be off during field operation, or the left wing will not contour to the land.
3. **Right Wing Lock** – use this switch to lock the right wing in the folded, partially folded, or unfolded state. It will light up green when on. This switch must be off during field operation, or the right wing will not contour to the land.
4. **Main Wing Fold/Outer Wing Fold** – this is a dual acting switch. Press the switch up to activate the main wing unfold solenoid. Press down to activate the outer wing unfold solenoid. This button needs to be held until the desired wing(s) have finished the unfold process.
5. **Smart Hitch On/Off** – this switch activates the Smart Hitch if your drill is equipped with one. When not in use, or if not equipped, leave this switch off.
6. **Opener Pressure Inc/Dec** – toggle the switch up to increase opener down pressure, toggle it down to decrease. To ensure that the Opener Pressure Relief Valve does not become jammed, toggle this switch in 1-2 second bursts only.
7. **Opener Pressure On/Off** – after the openers are lowered into the ground, this switch is activated to allow the openers to maintain soil penetration and terrain following attributes. Before raising the openers, the switch needs to be turned off. It will light up green when on.

UNFOLDING AND FOLDING WINGS

1. Ensure the hydraulic remote supplying system pressure to the block is activated and locked into constant flow. The pressure needs to be adjusted from your tractor to fall within 2500-2900 PSI.
2. Press and hold “Main Wing Fold/Outer Wing Fold” in the ***UP*** position (Main Wing Unfold). 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.
3. Press and hold “Main Wing Fold/Outer Wing Fold” in the ***DOWN*** position (Outer Wing Unfold). Once the wings have completed unfolding, immediately release the switch. Holding the switch after the outer wings have contacted the ground can damage frame components.
4. If needing to partially unfold the drill, the wing lock buttons can be used. Release the unfold button you are using and turn on the lock to the wing you want to be stopped and held. When ready to resume unfolding, turn off the switch.

   NOTE: Always ensure that the wing lock switches are turned off after use. Failure to disengage will result in the wings not contouring to the land.
5. To fold, ensure the openers are raised all the way up. Return that remote to neutral.
6. Reverse the flow on the system pressure to the block. You may need to increase the flow from the field operation setting. The outer wings will begin to fold first, then the main wings.

FIELD OPERATION

1. Turn on “Main Power On/Off”. The switch will be green when powered on.
2. Ensure the SCV supplying system pressure to the block is activated and locked into constant flow. The pressure needs to be adjusted from your tractor to fall within 2500-2900 PSI.
3. Once your drill has been unfolded from the transport position, you are ready to begin seeding.
4. Using the SCV connected to your opener lift/lower lines, lower the openers into the ground. Set this SCV at a flow of 75% to ensure the lift and lower speeds are adequate and set a timer to help ensure that the SCV returns to neutral after the openers have lowered.
5. When the openers begin to build pressure on the Opener Down Pressure gauge, return the SCV to neutral if it is not set up as timed.
6. Turn on the “Opener Pressure On/Off” switch. The switch will be green when powered on.
7. When entering a headland, turn the “Opener Pressure On/Off” switch off.
8. Lift the openers with the SCV connected to your opener lift/lower lines.
9. Complete the turn.
10. Repeat steps 4, 5, and 6 to resume seeding.

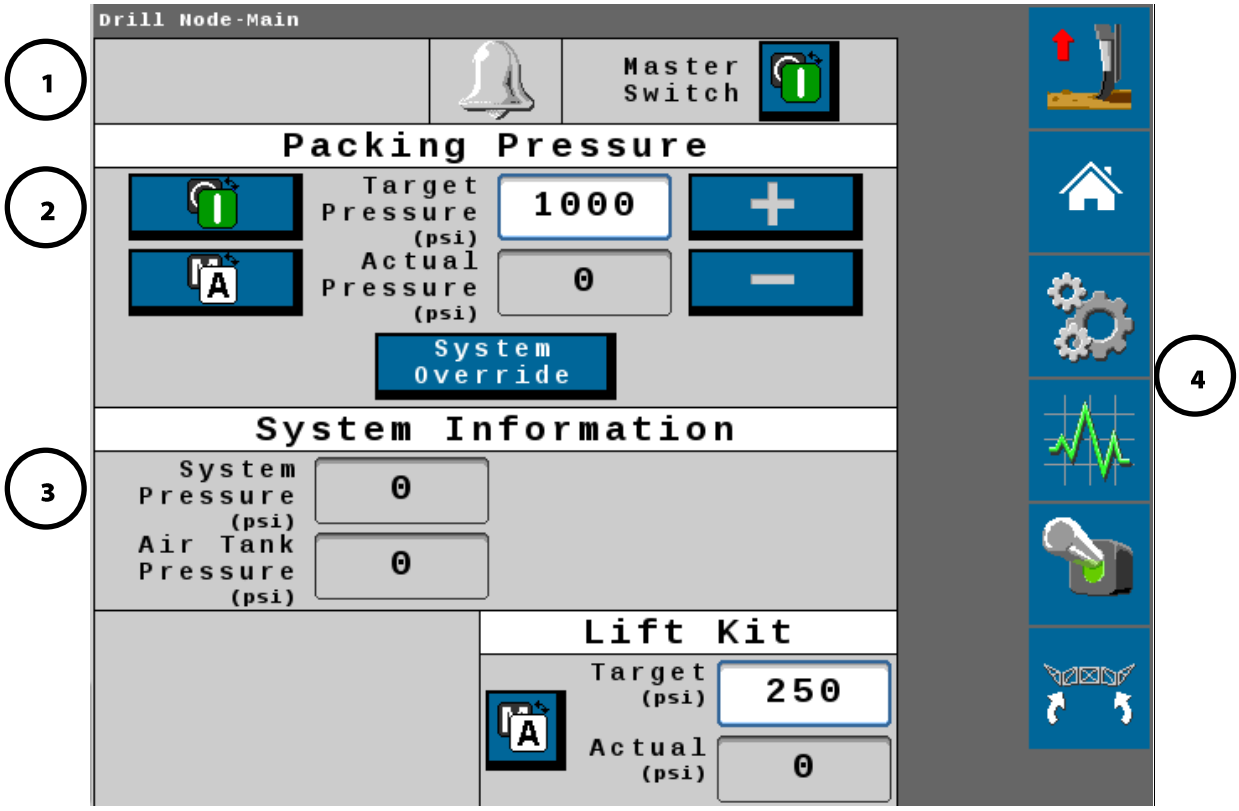
NOTE: Always ensure the Opener Pressure On/Off switch is in the “off” position before attempting to lift the openers. Failure to do this will result in the wings lifting, and the openers dropping prematurely.

ISOBUS TOOLBAR FUNCTIONS

HOME SCREEN LAYOUT

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

TXB SOFT KEY



1. **Status Area:** This area shows the current status of the Master Switch and System Alarms.
2. **Packing Pressure Area:** This area will allow you to toggle the packing pressure from **OFF** to **ON** and switch between **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 starting on page 30.
3. **System Information Area:** This area will allow for a quick view of different pressures and Lift Kit status.
4. **Soft Key Area:** Touch soft keys to access different settings and functions.

ISO TOOLBAR QUICK START PROCEDURE

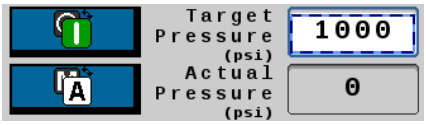
Before you go to the field, please review the steps below to ensure your ISO Toolbar is field ready.

1. **Turn safety switch ON:** Before turning the safety switch on, please ensure the toolbar 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 tractors hydraulic remote for system pressure. The System Pressure will be displayed in the System Information Area. *NOTE: System Pressure must operate with a pressure greater than 2600psi and less than 3000psi. Ensure tractor remote is set to constant flow. Adjust flow as necessary to avoid fluctuation.*

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 Wings first then the Outer Wings. *NOTE: The buttons need to be held down during the unfolding process.*

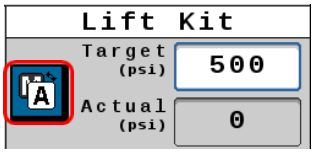
4. **Set Packing Pressure:** Ensure that the packing pressure is set to your desired mode. Recommended mode is AUTO, but field conditions may require Manual mode. After setting the mode to Auto, the desired packing pressure must be set. The recommended starting point is 1000psi. ***NOTE:*** *PACKING 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 max flow is 75%.*

6. **Test Openers Function UP/DWN:** You will need to note what your master switch configuration is. The machine comes from factory with a foot switch, so the system is set on foot switch. ***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 with engaging the Master Switch by stepping on the foot pedal. After engaging the master, the openers will go to the ground and start building pressure. You will see the Master Switch Icon turn green. To lift the openers, step on the foot switch to disengage the packing pressure. ***NOTE:*** *If the openers are not going up and down your hydraulic pressure on the tractor's 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 that the Opener transport shipping bolts may need to be removed.*

7. **Review Lift Kit Mode**: Touch the Settings button in the Soft Key Area to access the Lift Kit settings page. Touch the status button to toggle between "Auto" and "Manual". Factory default is set to 200psi.

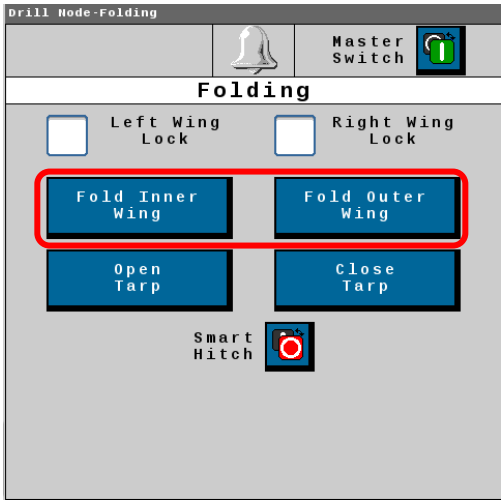


UNFOLDING, FOLDING, AND WING LOCKS

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 ensuring the openers are completely lifted before 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.



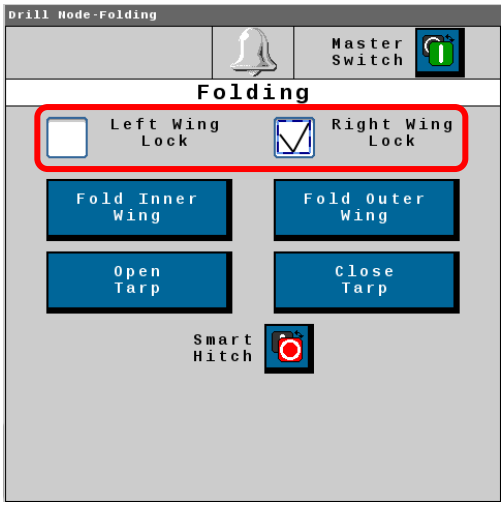
1. Touch and hold the **FOLD INNER WING** button to unfold the inner wings. Ensure that the wings have completely finished unfolding before moving to the next step.
2. Touch and hold the **FOLD OUTER WING** button to unfold the outer wings.
3. Once the wings are unfolded, touch the home button and touch **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

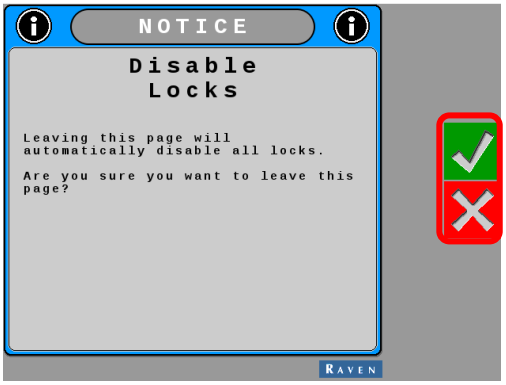
Left Wing Lock Check Box: When the wings are unfolding, or folding up, use the check box to lock the left wing into its current position. Uncheck the check box to unlock the wing.

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  , 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  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. Ensure the openers are raised out of the ground by disengaging the master switch. This is done by stepping on the foot pedal.
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. Depending on the size of your machine, 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. ***For the 24’ UltraPro II drill, you are required to lock a manual ball valve to lock up the wings. This is located on the front wing-fold cylinder directly behind the main hydraulic block.***

NOTE: THE OPENER HYDRAULIC CIRCUIT IS EQUIPPED WITH A PILOT OPERATED CHECK VALVE THAT WILL HOLD THE OPENERS UP FOR TRANSPORT. HOWEVER, IF TRANSPORTING OVER A LONGER PERIOD, PERIODICALLY OBSERVE THE OPENERS AND MANUALLY ENSURE THEY STAY IN THE RAISED POSITION.

ENSURE WINGS ARE CLEAR OF ANY OBJECTS THAT COULD CAUSE HARM TO YOU OR ANYONE ELSE. DO NOT LEAVE CONSTANT PRESSURE ENGAGED TO THE 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 & MASTER SWITCH CONFIGURATION

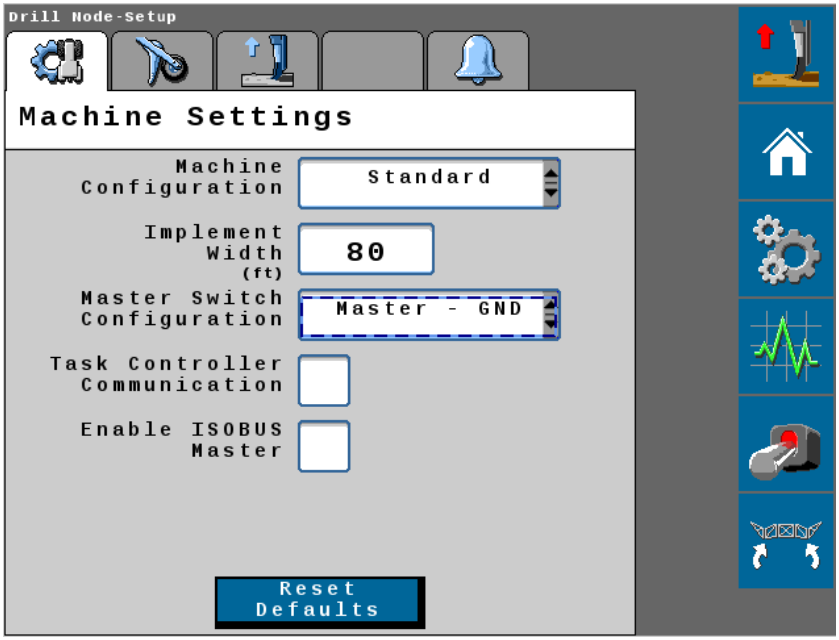
Machine Settings Setup

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 "**Standard**" machine configuration for your drill.

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 in the white box to choose the method of choice. The factory default setting is "**Master – GND**" to enable the In-cab Foot Switch.



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

Master Switch – GND: Your SeedMaster machine comes standard with a Foot Switch to enable and disable the packing pressure. This is the factory default setting. 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 packing pressure. Use this setting when the ISO Toolbar uses +12v to enable, these were only found on SM16 machines. Press the foot switch to enable/disable the packing pressure.

Remote Master: The Packing Pressure can be enabled or disabled by a third party +12v 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 DCM can communicate to the Task Controller. This is for future use. Please leave this setting *UNCHECKED*.

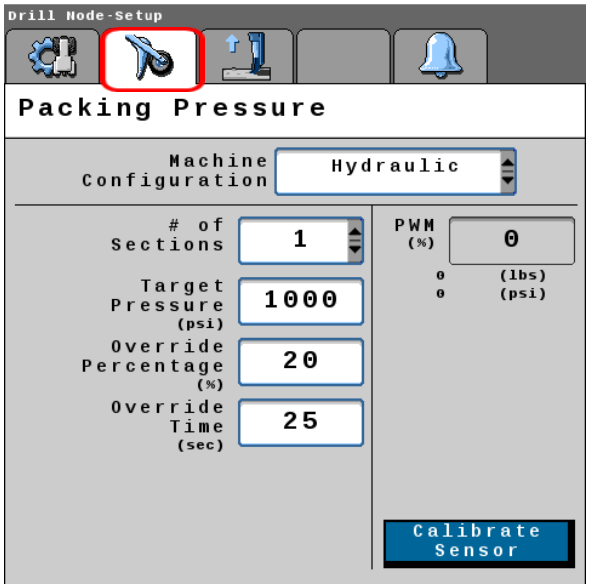
Enable ISOBUS Master: The DCM has the ability to utilize the ISOBUS Master Switch, this is used in conjunction of the Task Controller Communication and is for future use. Please leave this setting *UNCHECKED*.

PACKING PRESSURE SET UP AND 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 is OFF.

Packing Pressure Setup

To access the packing pressure setup page, touch the Settings Soft Key found in the Soft Key Area, then touch the Packing Pressure tab.



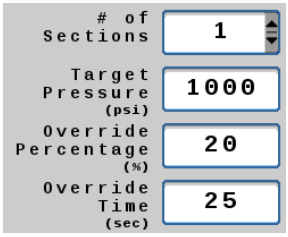
Machine Configuration – There are two packing pressure options from which to choose.

Hydraulic Mode: Choose this option if your machine was configured with a pressure transducer only at time of sale. The transducer is plumbed into the opener down circuit to display the toolbar packing pressure.

PFS Mode: This mode requires the Packing Force Sensor load cell to be installed on the machine. It reads the actual packer tire down force in pounds. Choose this mode if your drill was configured this way at time of sale.

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

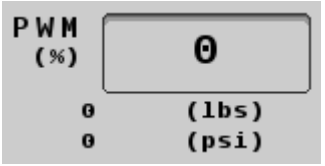
Target Pressure setting: The target pressure will be the desired amount of packing pressure in PSI or LBS of down force to the openers. For example, if the desired amount of packing pressure is 1000psi, touch the white box to the right of Target Pressure and enter 1000.



Pressure Override % setting: This setting will reduce the amount of packing pressure to the openers to 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. The factory default setting is 30 seconds.

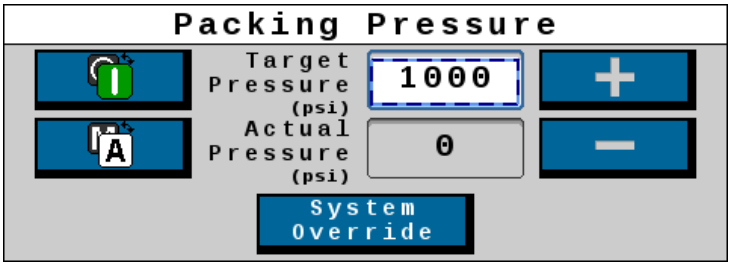
Calibrate Sensor Button: With the openers raised and the hydraulic remotes disengaged, press the “Calibrate Sensor” button to zero out the sensor.



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.



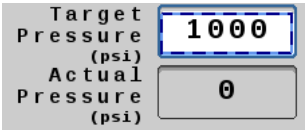
Off/Manual/Auto settings: The system is equipped with a PWM valve for controlling the hydraulic pressure to the openers when they are in the down position.

OFF: When the safety switch is “Off”, the PWM will not control the packing pressure.

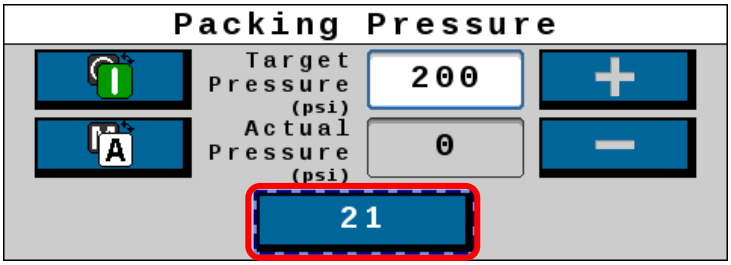
MANUAL: When “M” is selected, this puts the packing pressure into manual mode. Use the plus and minus arrows to increase or decrease the amount of down pressure to the openers.

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 to 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 timer, simply touch the System Override button again and it will start the timer from the top of the set amount of time.

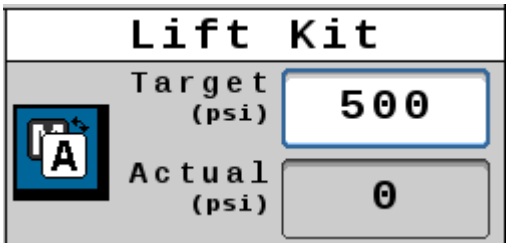


You can also touch the System Override Soft Key in the top right-hand corner of the page. Touching this soft key will initiate the System Override. Touching this icon again will cancel the timer and normal packing pressure will resume.

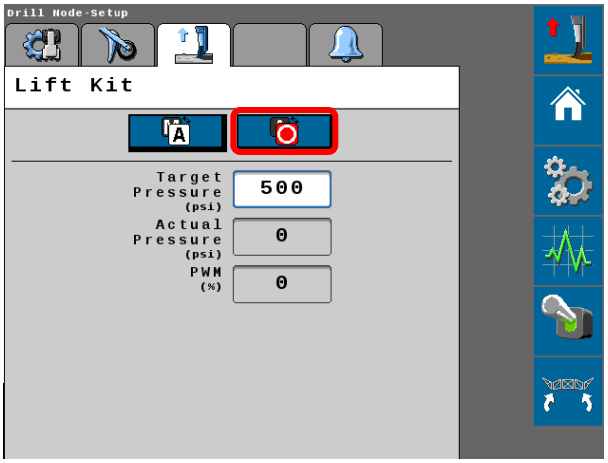
***NOTE**: When the packing pressure override is enabled it will increase the Lift Kit pressure to 1500psi.*

LIFT KIT PRESSURE SET UP AND OPERATION

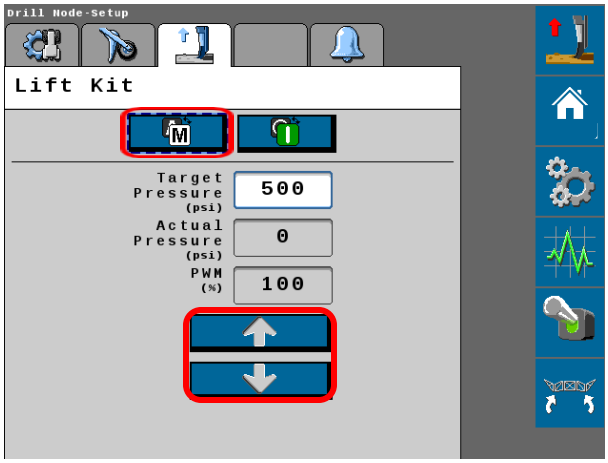
SeedMaster Toolbars are equipped with a hydraulic pressure transducer enabling in-cab viewing of the Lift Kit hydraulic pressure. The Toolbar is also equipped with a PWM valve for controlling the Lift Kit pressure. The Lift Kit's hydraulic pressure can be controlled automatically or manually from the comfort of the cab.



Touch the Settings soft key to access the Lift Kit Settings. Use this menu to change the modes of operation.



OFF MODE



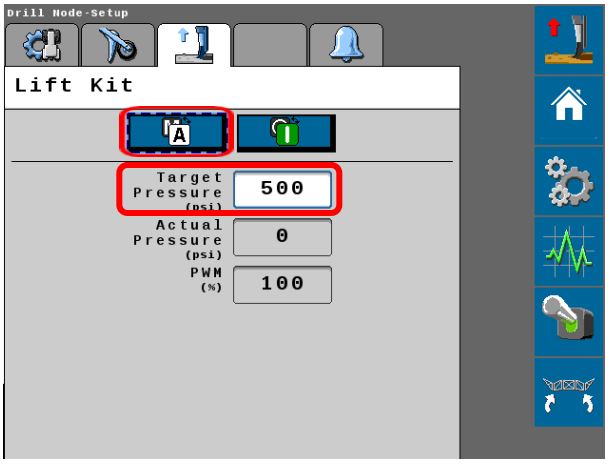
MANUAL MODE

LIFT KIT MODES

OFF MODE: When set on OFF mode, the lift kit functions are disabled.

MANUAL MODE: When set on MANUAL mode, the lift kit will display the Lift Kit's pressure and is adjusted manually from cab by touching the up or down arrow.

AUTO MODE: When set on AUTO mode, the Lift Kit pressure will be adjusted automatically to the users set target pressure. Enter the psi value into the Target Pressure area. Auto mode also features an alarm. If the actual pressure is not on target an alarm will sound. The factory setting is 200 psi.



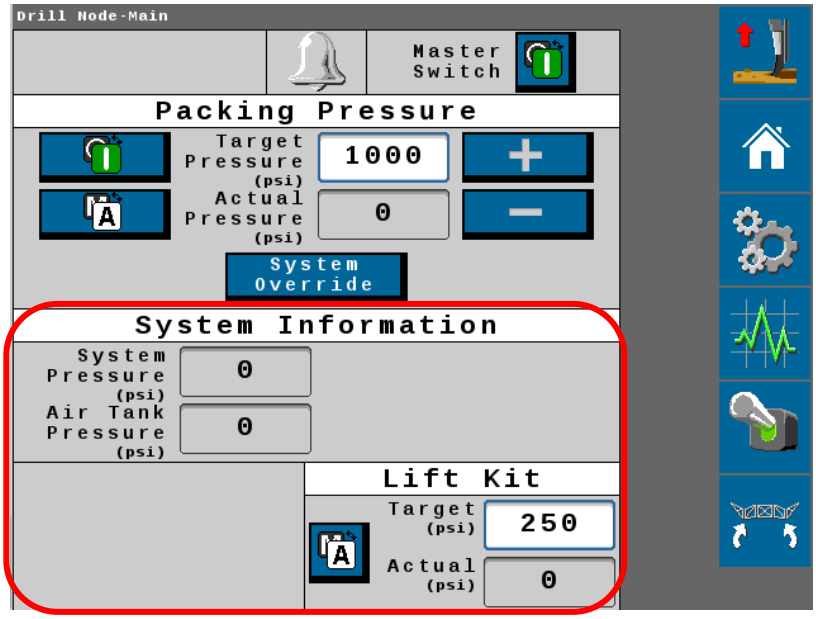
AUTOMATIC MODE

***NOTE:* After each monitor power cycle, depending on software versions, the Lift Kit may need to be activated from the DCM settings as shown above. Please ensure that the On/Off safety switch is turned on if you want the lift kit active during operation.**

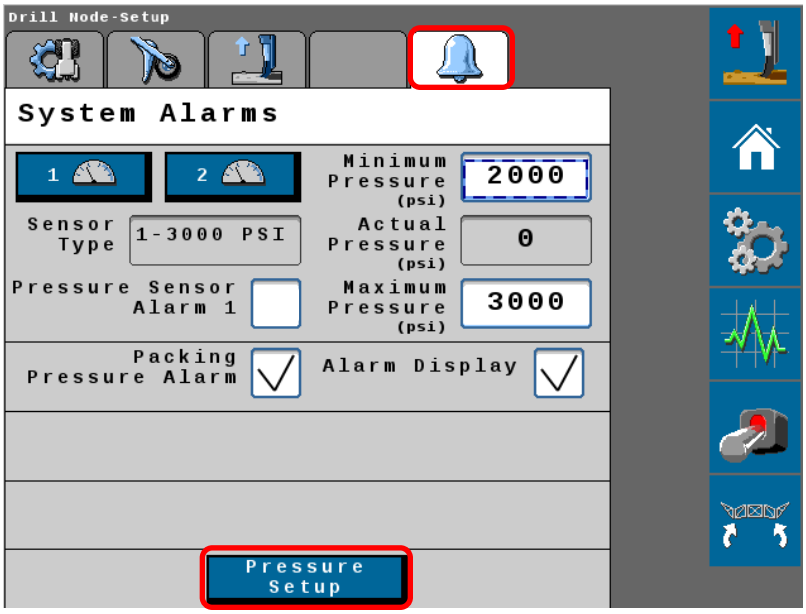
SYSTEM INFORMATION HOME PAGE SET UP

The System Information area on the home page displays the System Pressure and the Air Tank Pressure (if equipped with SeedMaster Zone Command).
Follow the steps below to set up the parameters for your pressure sensors. Please note that your SeedMaster machine will need to be equipped with the corresponding pressure transducer to monitor the pressure.

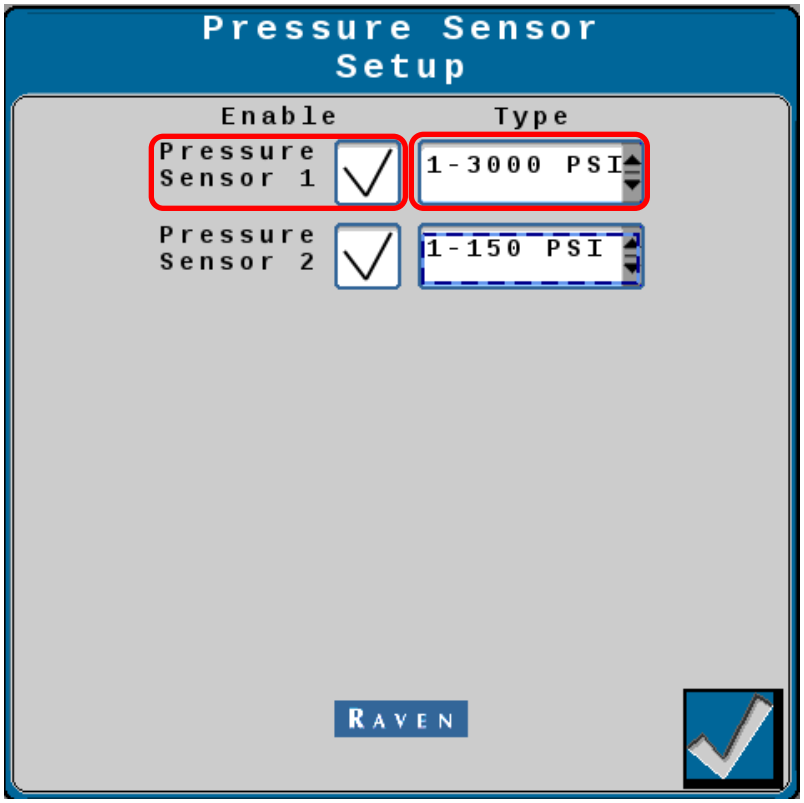
1. Touch the Settings Soft Key to access the System Alarms page.



2. Touch the System Alarms tab at the top right of the page. Ensure Packing Pressure Alarm, and Alarm Display have checkmarks. Then, choose Pressure Setup at the bottom of the page to access the sensors required and their corresponding pressures.

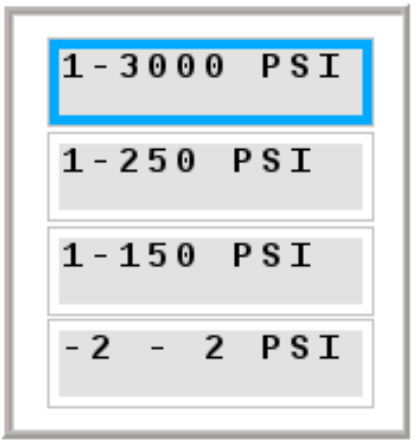


3. For Sensors 1 and 2, a checkmark box is available to enable the sensor on the System Information area. Touch the “Type” drop-down menu to change the sensor to the appropriate style for the sensor display.



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

5. For Air Tank Pressure, choose the “1-150 PSI” sensor.

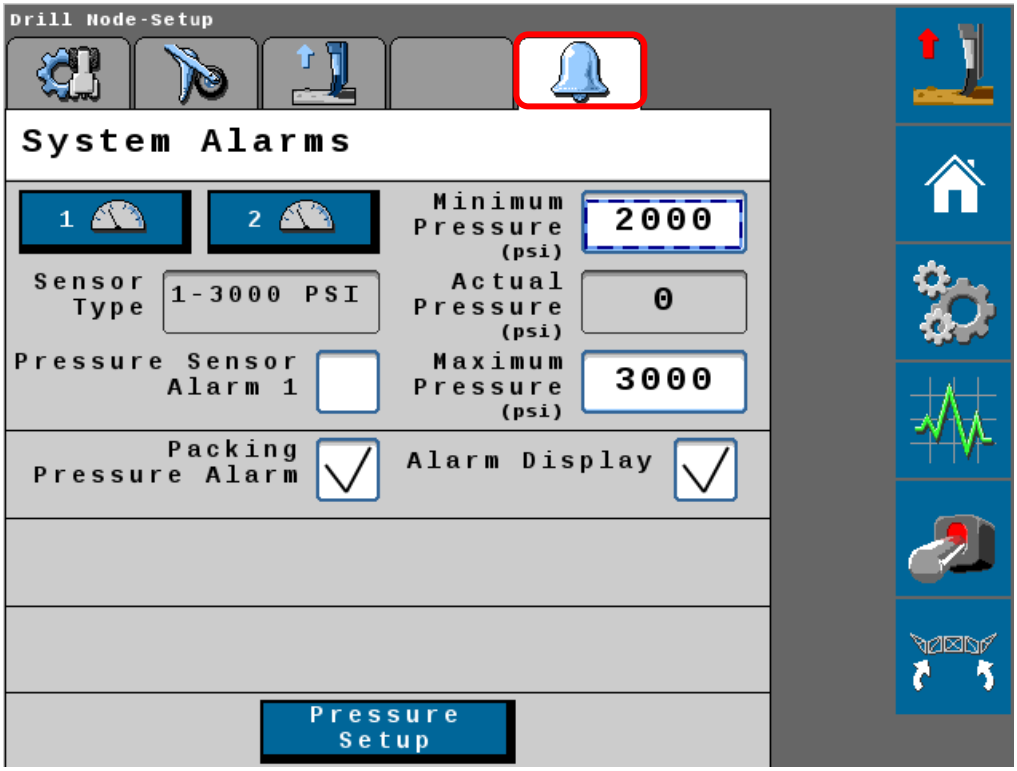


SYSTEM ALARMS

The system is equipped with alarms to warn the operator of any potential issues 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, touch the corresponding checkbox. To disable an alarm, remove the checkmark. 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 set 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 Maximum Pressure. 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 for System Pressure is 2500 PSI. For Air Tank Pressure, the minimum should be set to 30 PSI.



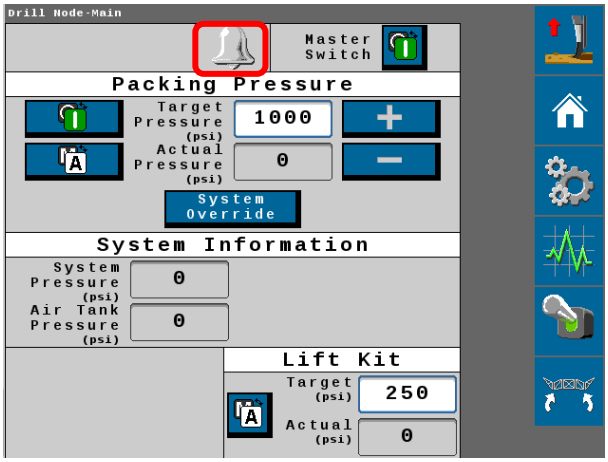
After the alarms have been set, touch the home button to return to the operating home page.

SYSTEM DIAGNOSTICS PAGE

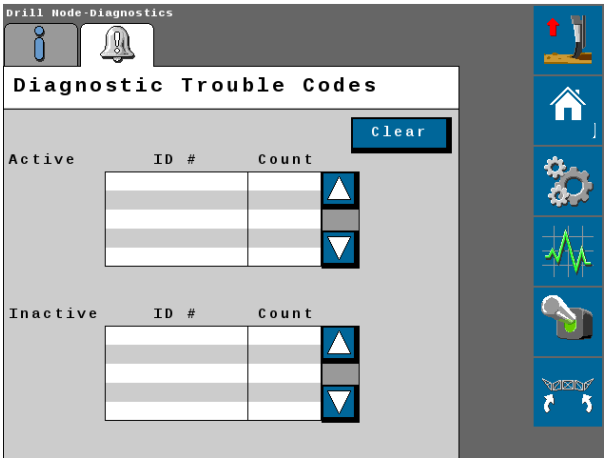
Touch the System Diagnostic Soft Key to access the Diagnostics page. From a drop-down menu, the Diagnostics page will display the DCM Firmware version and any installed load cell voltage for diagnosing any potential issues. This page also houses a Service Menu for SeedMaster and Dealer use during a service call or visit.

ACTIVE ALARM PAGE

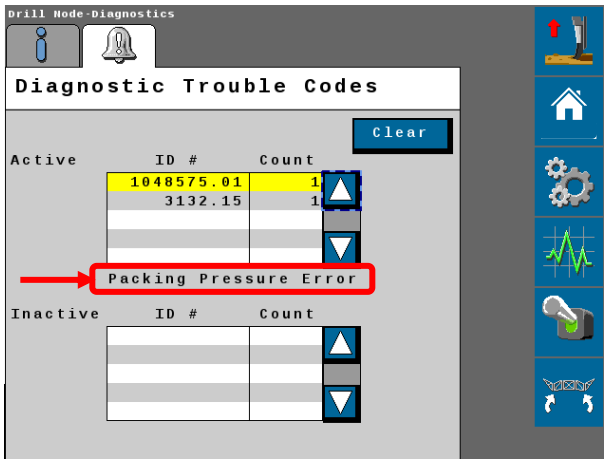
If the color around the bell changes to yellow, this means that there is an active alarm. If you touch on the bell, it will display the Active Alarms Page. The listed trouble codes can be manually highlighted to observe their description and specifically identify the triggered alarm. Touch the Home button to return to the home page after the alarm has been observed.



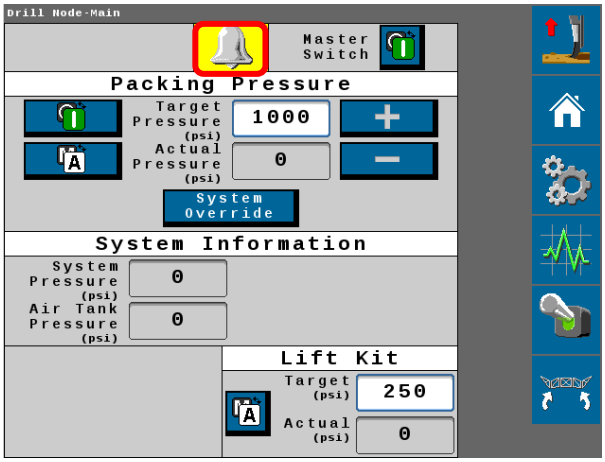
NO ALARM ON HOME PAGE



NO ACTIVE ALARMS ON ALARM PAGE



PACKING PRESSURE ALARM IS TRIPPED



ACTIVE ALARM PRESENT ON HOME PAGE

ULTRAPRO II ONFRAME TANKS (UPII)

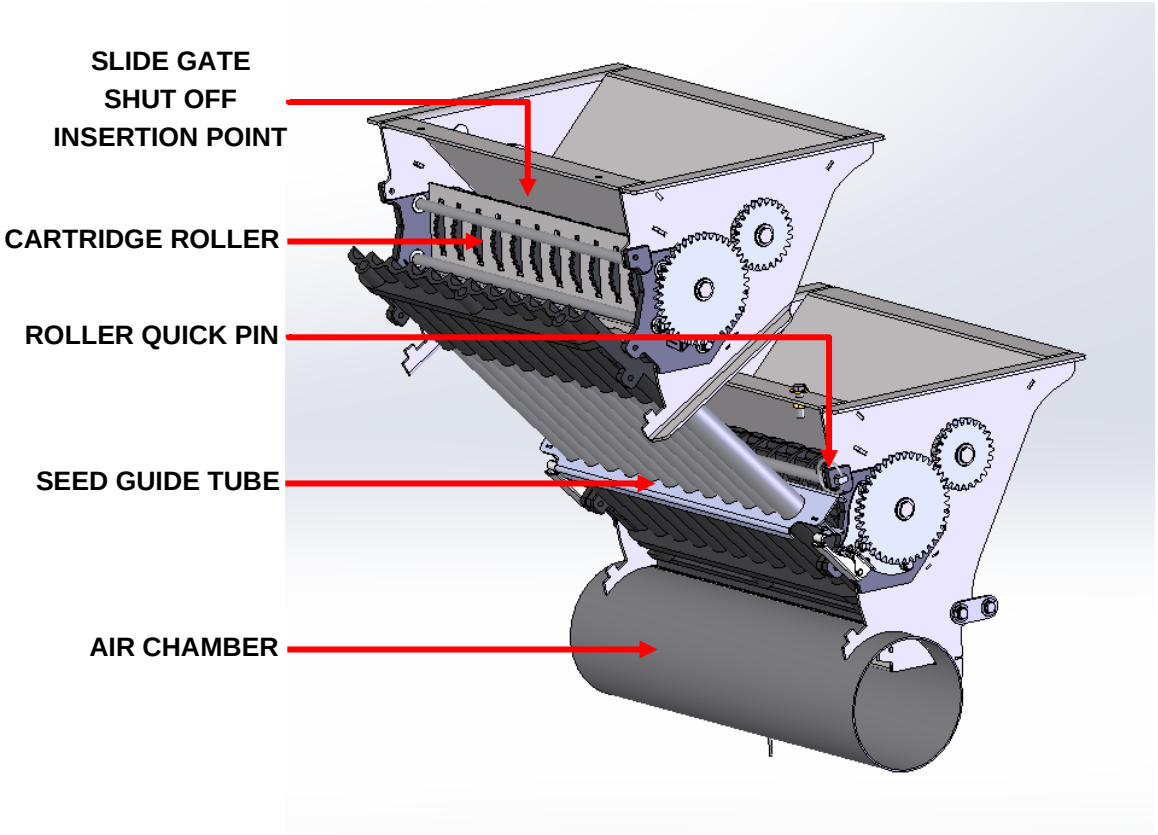
ULTRAPRO II ZONE COMMAND METER BOX (UPII)

The UltraPro II Meter is the next generation in SeedMaster metering. The mechanical adjustments of the Zone Command Meter Box will be pre-set at the factory.

NOTE: It is the owner's responsibility to ensure that Zone Command is functioning properly. SeedMaster is not responsible for misses or skips in product application.

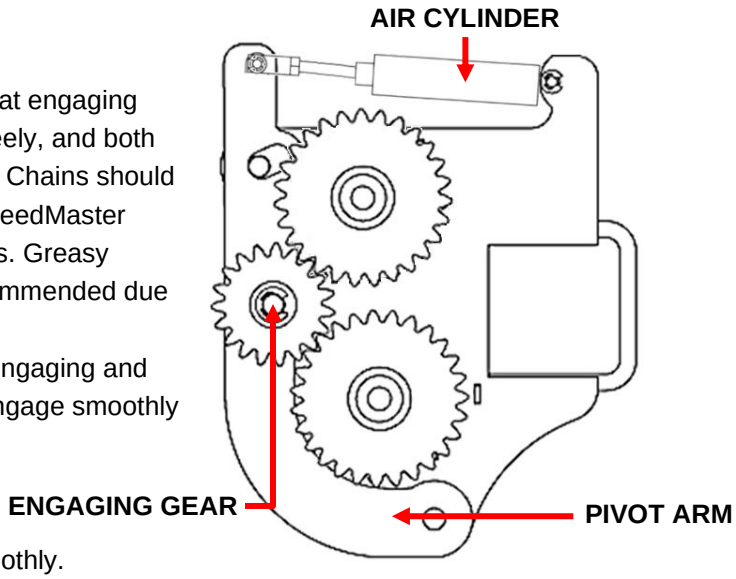
Periodic checks of moving components are necessary to ensure long term trouble-free operation. Please follow the instructions below:

UPII Dual Tank Configuration



***Note**: Zone Command components are also shown in the SeedMaster Tank Parts Manual.*

Zone Command Check



1. Manually extend the air cylinder rod so that engaging gear is disengaged. Ensure gear turns freely, and both the air cylinder and pivot arm pivot freely. Chains should properly tensioned and lubed utilizing a SeedMaster approved lubricant available through parts. Greasy lubricants such as Fluid Film are not recommended due to the attraction of dirt.
2. The pivot arm is designed with limits for engaging and disengaging. This will allow the gear to engage smoothly and prevent binding and excessive wear.
3. The air cylinder clevis can be adjusted to increase or decrease gear engagement to ensure the gears run smoothly.
4. Test the Zone Command by pulling on the air cylinder rod and letting go of the rod. The cylinder should retract on its own to the seeding position. If it has a tight pivot point, it may cause the pivot arm to not return to the seeding position.
5. Ensure that all quick keeper pins are installed into the roller cartridges and seed guide tube, this will keep the meter rollers retained and in the proper drive position.

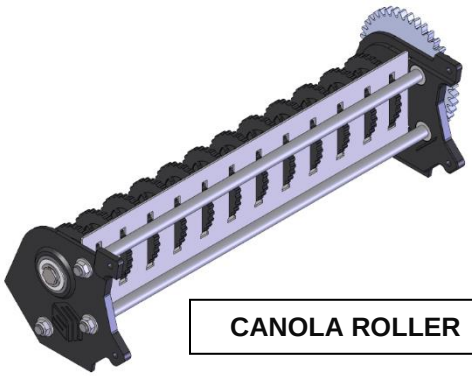
UPII CALIBRATION PROCEDURE PRE-SETUP

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.*

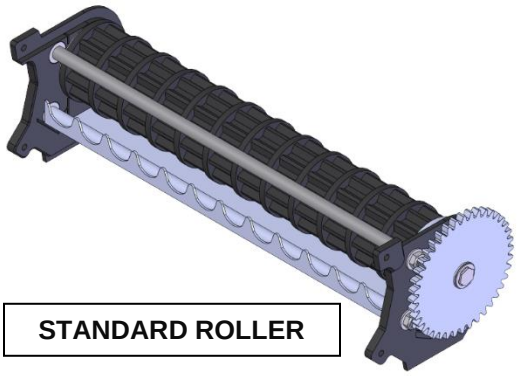
⚠CAUTION Hoppers must contain material. Use Zone Command controls to dispense product from the desired metering section. Be prepared to catch the material from one metering section in a container so it can be weighed at the end of the calibration.

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 other coarse products.



CANOLA ROLLER

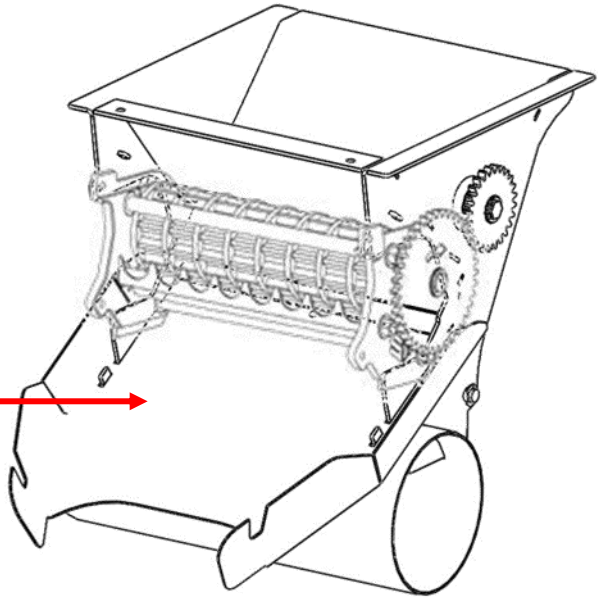


STANDARD ROLLER

METER BOX WITH CATCH TRAY

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

NOTE: *See page 62 for the step-by-step calibration procedure.*



UPII FAN PRESSURE GUIDELINES

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

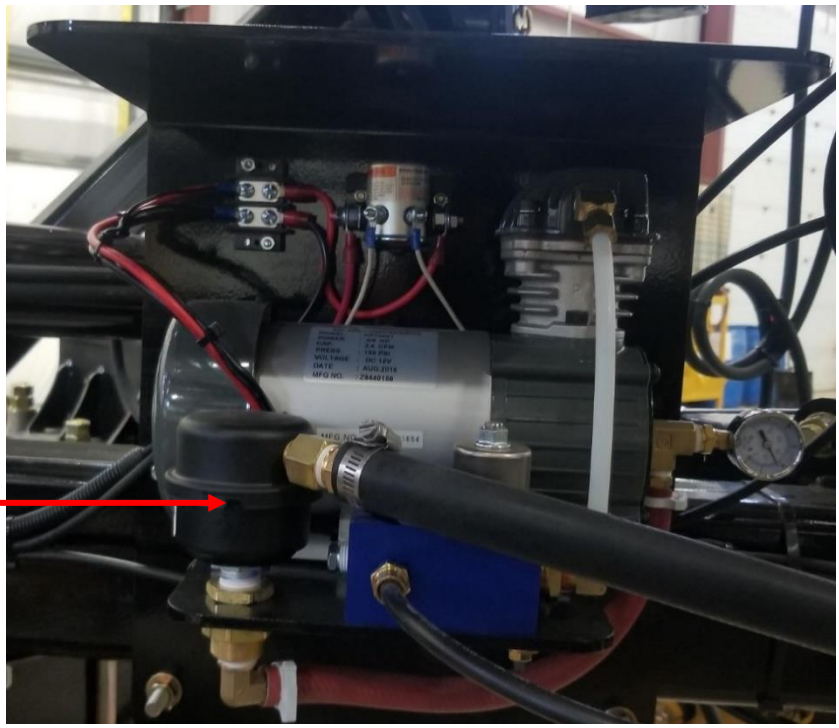
Pressure too LOW - causes potential plugging in lines.
Pressure too HIGH - product bounces or blows out of furrow.

ZONE COMMAND AIR COMPRESSOR

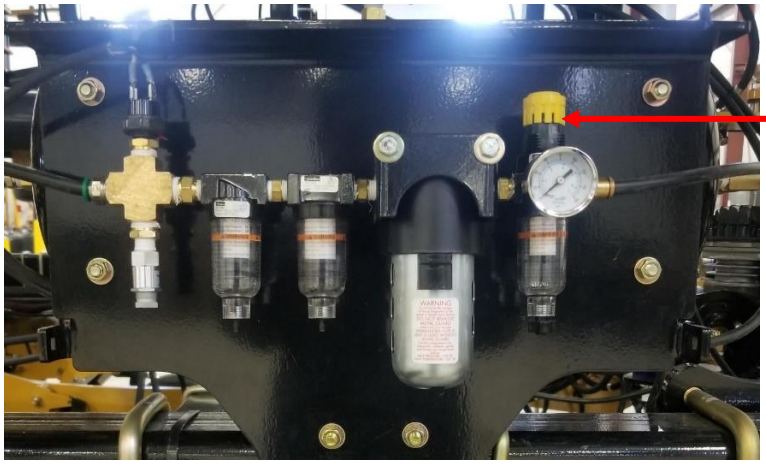
SeedMaster's Zone Command is controlled pneumatically. To provide an air supply, the drill is equipped with a compressor and air tank. The compressor is set to turn off when the pressure in the tank reaches 105 psi, and to turn on when the pressure falls below 85 psi. A regulator is used to reduce the tank pressure for the air cylinders. This regulator is factory set to 65 psi.

NOTE: The air compressor will only start when the monitor is powered on. Ensure that the compressor builds up to proper operating pressure and shuts off.

If the compressor will not shut off, inspect the air system for leaks. Increased or infinite run times can damage and shorten the lifespan of the compressor.



Zone Command Air Compressor



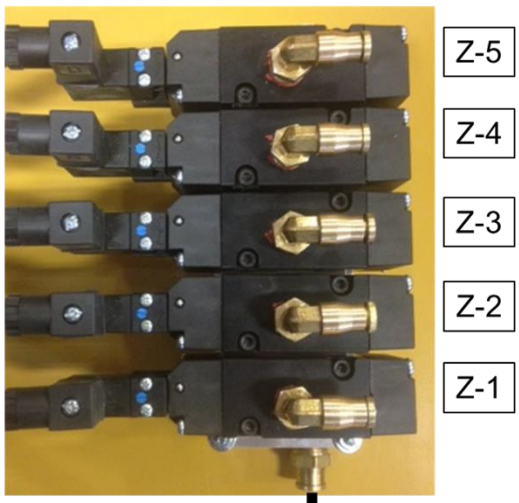
NOTE: Check the air inlet filter on the compressor daily and replace as necessary. Ensure that the air filter is dry and not dirty, or damage to the compressor will result. Desiccant beads should be inspected every 50 hours of use or after prolonged use in humid conditions. When the beads' color has changed, they need to be replaced.

ZONE COMMAND AIR SYSTEM

AUTO TANK DRAIN

Air Regulator

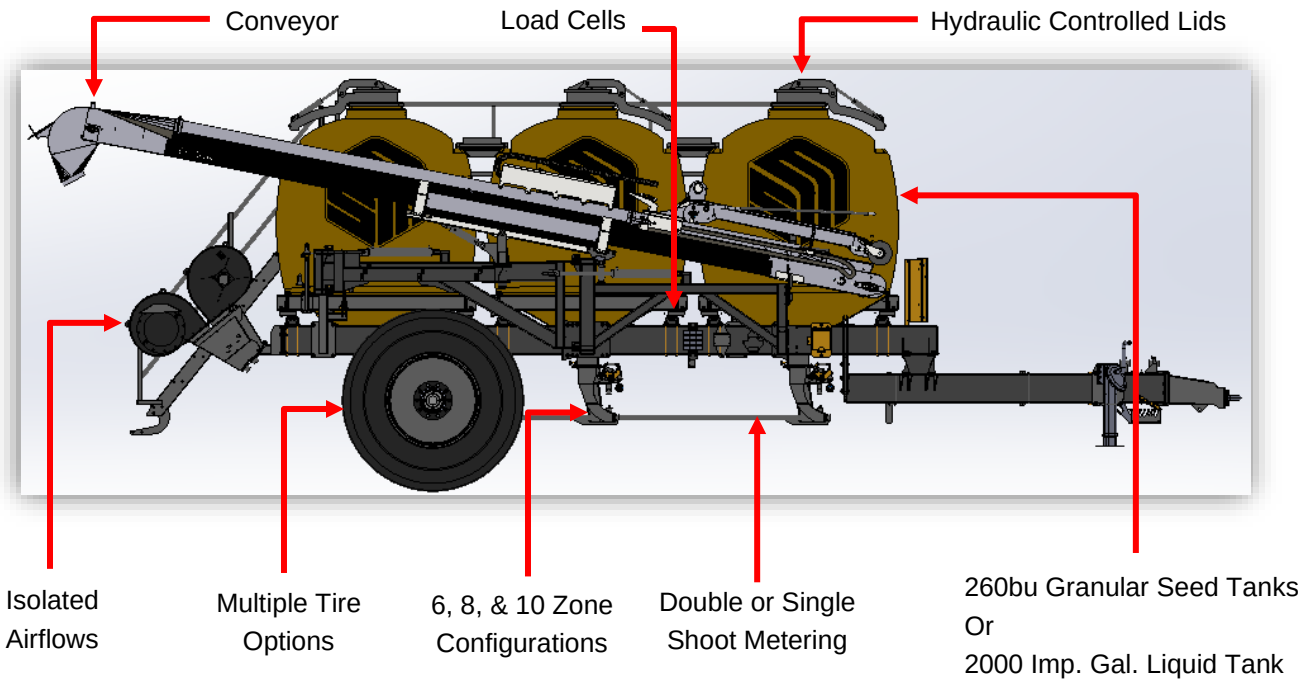
Solenoid Air Bank



Zone Command Air Components

NOVA TANK

There are many different configurations of the NOVA tank. The image below illustrates a 780 NOVA and some of the many options and features the NOVA has to offer. This section of the operator's manual will explain the key features and the settings for the NOVA tank.



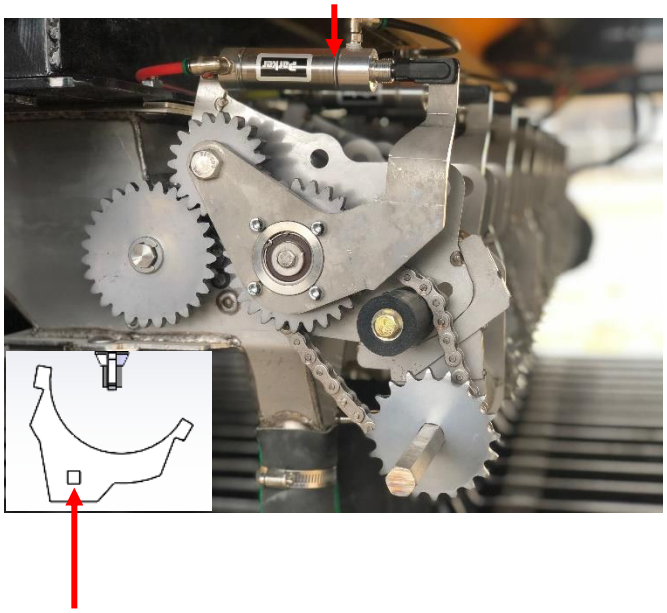
780 NOVA DUAL SHOOT

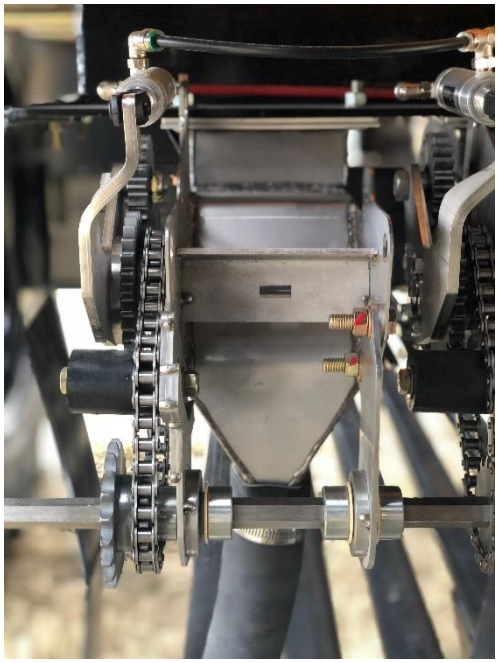
NOVA ZONE COMMAND / METER BOX

Nova carts are set up as either a 6, 8, or 10 zones depending on drill size. The number of meter boxes is typically the number of zones being operated as each meter is expelling product to an individual air stream and tower. The meter boxes are engaged and disengaged with an air cylinder. If an air cylinder is to fail, it will fail to the engaged position. Each meter is set up with a sprocket selection to adjust the amount of product between tower outlet differences of 2 runs or greater. This selection is not used as a high/low range, but to reduce the percentage of error between towers and each run. The 8 run manifold will be configured to the 15-20 tooth sprockets on the side of the meter box to the main shaft and the 6-run manifold will be configured to the 20-15 tooth sprockets on the side of the meter box to the main shaft. The 7-run manifold will be used when zones are all equal widths and will be configured to the 20-15. Example: (70-12 with 10 zone Nova).

NOTE: Over time, the Zone Command Air Cylinder clevis may need adjustment to ensure that it does not over-engage. It is important to adjust to make sure the gears have only tooth-to-tooth contact. Metering chains should also be checked periodically for proper lubrication and tension. Chains should be lubed utilizing a SeedMaster approved lubricant available through parts. Greasy lubricants such as Fluid Film are not recommended due to the attraction of dirt.

Air Cylinder for engaging and disengaging the meter's Zone Command





In the image above, the meter box is configured for the 15-20 tooth sprocket

Note: The meter box housing has a removable plate which encloses the roller ends. This roller clean-out plate can be removed to clean build up product from metering box and roller. The roller clean-out plate can be accessed through the bottom clean-out gate.

PNEUMATIC CONNECTIONS

Connect the ⅜" air hose at the Nova hitch to the push-on fitting located on the drill. A minimum of 65 psi pressure from the on-frame air compressor is required to operate Zone Command. See "Zone Command Air Compressor" in the "Ultra Pro II On Frame Tanks" section of manual for more information.

DISTRIBUTION MANIFOLD

SeedMaster utilizes a stainless-steel distribution manifold available in multiple configurations. The new manifold is more resistant to blockages in large seed sizes vs other manifold designs. It uses a 2.5” inlet pipe that has a steel choke insert welded inside. It is a two-piece design with the head being clamped onto the inlet with an exhaust style clamp. The manifold is available in a 6, 7, 8, 9, 10, 11, or 12 outlet configurations allowing SeedMaster to offer a larger list of drill sizes with various row spacing.

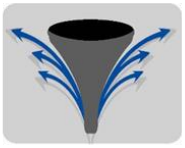
8 RUN DISTRIBUTION MANIFOLD

10 RUN DISTRIBUTION MANIFOLD

This manifold design uses two types of rubber inserts for guiding product in the manifold head. There is a flat insert that is used for fertilizer and a gradual point insert that is used for seed.

- ✓ The flat insert provides excellent division at high rates of fertilizer.
- ✓ The inserts are easy to change so they can be swapped to suit the application.

FERTILIZER INSERT



- ✓ The Cone shaped inserts optimize the separation of the seed.
- ✓ Low seed rates provide even division and distribution.

SEED INSERT

NOVA PRODUCT SELECTION

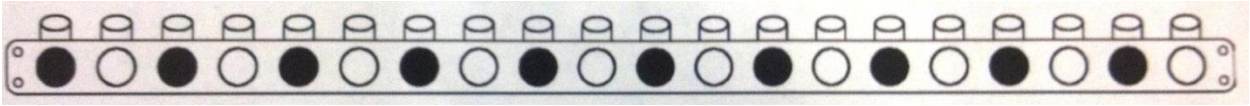
Under the dual-shoot, 10 zone Nova, there are 10 metering boxes per tank and 20 hoses. 10 **black** hoses lead to the fertilizer towers and 10 **white** hoses lead to the seed towers.

Other Nova configurations per tank are:

- Single-shoot, 10 zone (10 meters, 10 hoses)
- Dual-shoot, 8 zone (8 meters, 16 hoses)
- Single-shoot, 8 zone (8 meters, 8 hoses)

SEED AND FERTILIZER RUNS, DUAL SHOOT, 10 RUN NOVA

Under each tank in a dual-shoot configuration, you will be able to choose to connect the meter to either fertilizer or seed runs. The seed runs start on the left side of the cart (looking from behind) and alternate between seed and fertilizer. Likewise, the fertilizer runs start on the right and alternate with seed runs.



SEED

FERTILIZER

SEED AND FERTILIZER RUNS LOOKING FORWARD FROM BACK OF CART

The 3 large tanks can be adjusted to provide product to either seed or fertilizer knives in a dual-shoot configuration. If you would like to dispense product from a tank to the seed runs, connect the far-left run to the far-left meter, and then work your way across, connecting meters to every second run. If you would like to dispense product from a tank to the fertilizer runs, connect the far-right run to the far-right meter, and work your way across, connecting meters to every second run.

NOTE: Ensure that the runs that are not connected have a plug firmly installed with an airtight seal. Failure to create an airtight seal may cause an uneven seeding condition.

Always meter a small amount of product in a stationary position to ensure that each product is delivered in the desired seed or fertilizer knives.

To change from seed to fertilizer or from fertilizer to seed, take all the yellow or black plugs out and replace them with the corresponding meter's flexible tube. Insert the yellow or black plugs where you disconnected flexible tubes.

Product Run Selection

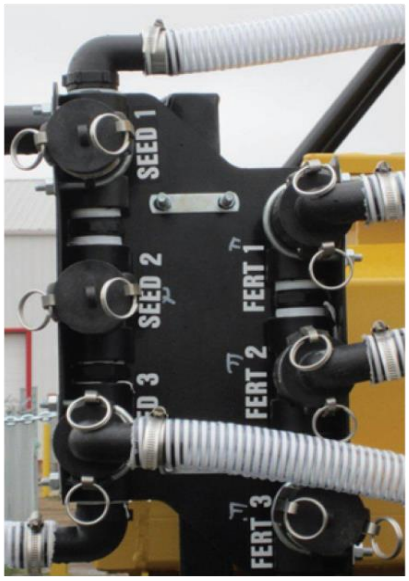
Fans on Air Splitter

NOTE: The fan connected to the top of air splitter is the seed fan and the lower fan is the fertilizer fan. The air splitter air gates are adjustable to safeguard against any product "siphoning".

WARNING: The product delivery lines CANNOT be removed while the fans are running. This will cause a large product loss at a rapid rate.

NOVA PRESSURE AND TOP-UP AIR

When a tank is selected to meter to the seed or fertilizer knives, the top-up air must be set to match the proper fan to ensure that tank pressures are balanced. When the tank is metering to the seed knife, the top-up air must come from the seed fan. When the tank is metering to the fertilizer knife, the top-up air must come from the fertilizer fan.



NOTE: When you change the product selection at the tank, do not forget to switch the top-up air at the same time. The connections require a proper seal to ensure that there is no air loss.

NOVA FAN PRESSURE GUIDELINES

Before starting for the day, run the fans for a minimum of 10 minutes to dry moisture out of the hoses and distribution manifolds.

Use the following table as a *guide* for setting Nova fan pressures.

NOTE: AIR PRESSURES AND RPM'S ARE INICATED WITH NO PRODUCT FLOWING				
Product	**Application Rate Lbs/ac**	**Drill Size Range Feet**	**Air Pressure Ounces**	**RPM (HIGH FLOW) BLACK FAN**
Fertilizer	50 to 100	50 to 100	9 to 11	3350 to 3600
Fertilizer	100 to 200	50 to 100	11 to 13	3600 to 3950
Fertilizer	200+	50 to 100	13 +	4000 +
Wheat	80 to 130	50 to 100	12 to 14	3775 to 4075
Barley	70 to 100	50 to 100	11 to 13	3600 to 3950
Canola	2 to 5	50 to 100	7	3000
Flax	40 to 55	50 to 100	9 to 11	3350 to 3600
Peas	150 to 200	50 to 100	15 to 17	4100 to 4400

Pressure too LOW - causes potential plugging in lines.

Pressure too HIGH – product bounces or blows out of furrow.

INDIVIDUAL METER INSPECTION

It is possible to inspect meter parts while the tank is full of product.

1. Shut off hydraulics to fans and metering.
2. Remove slide-gate cover.

SLOT

SLOT COVER

3. Note internal wings are aligned with external wings for ease of assembly.
4. Loosen wing nut and turn exterior wings until parallel with the slot.

SLIDE-IN GATE

BOTTOM COVER

5. Insert slide-gate and open meter bottom cover (approximately 1 gal. of product will fall out).
6. Inspect metering.
7. Close bottom meter cover (ensure a good seal) and remove slide-gate.
8. Reinstall slot cover, tightening wing nut while holding external wings in vertical position.

NOTE: ***Poor quality fertilizer or other foreign materials may cause uneven metering or damage to meter components. Screening of all products going into the Nova is highly recommended. The slot cover requires a proper seal to ensure there is no air loss.***

WORK LIGHTS

There are three work lights on a Nova cart. One is located at the walkway, another is located at the signal light bracket, and one is installed at the conveyor. The switch for the work light is mounted on the driver side of the Nova below the catwalk. NOTE: Monitor must be turned on for lights to operate.

WORK LIGHT SWITCH

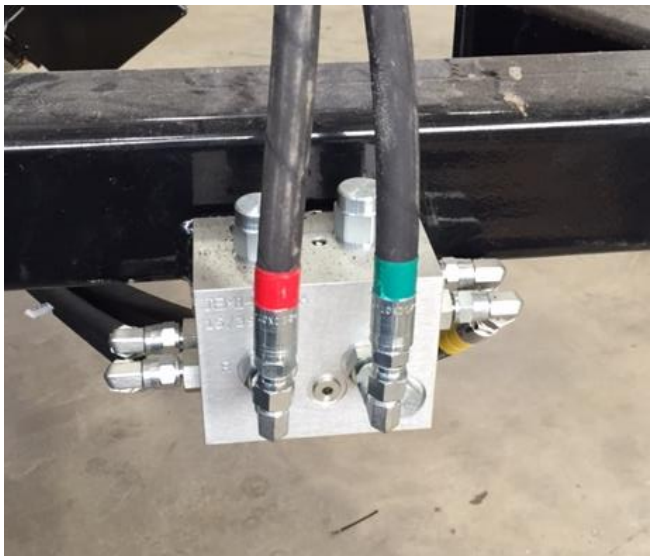
Note: *Protected by 10-amp fuse found on the main cable that plugs to the tractor at the front of the machine.*

LID OPERATION

The lids are designed to be held closed with hydraulic pressure when fans are in use (lid cylinders are being supplied with oil pressure to keep the lids closed).

Near the back of the cart (under the walkway), there is a selector valve. This valve will automatically select the fan that is running at a higher RPM. For example, if you are seeding canola, you should have the fan RPM turned down on the seed fan. This valve will automatically select the fertilizer fan to ensure there is sufficient force to keep a tight seal on the lids.

Note*: Ensuring a maximum seal is maintained on lids is extremely important for accurate metering rates. Periodically inspect and replace the seals.*



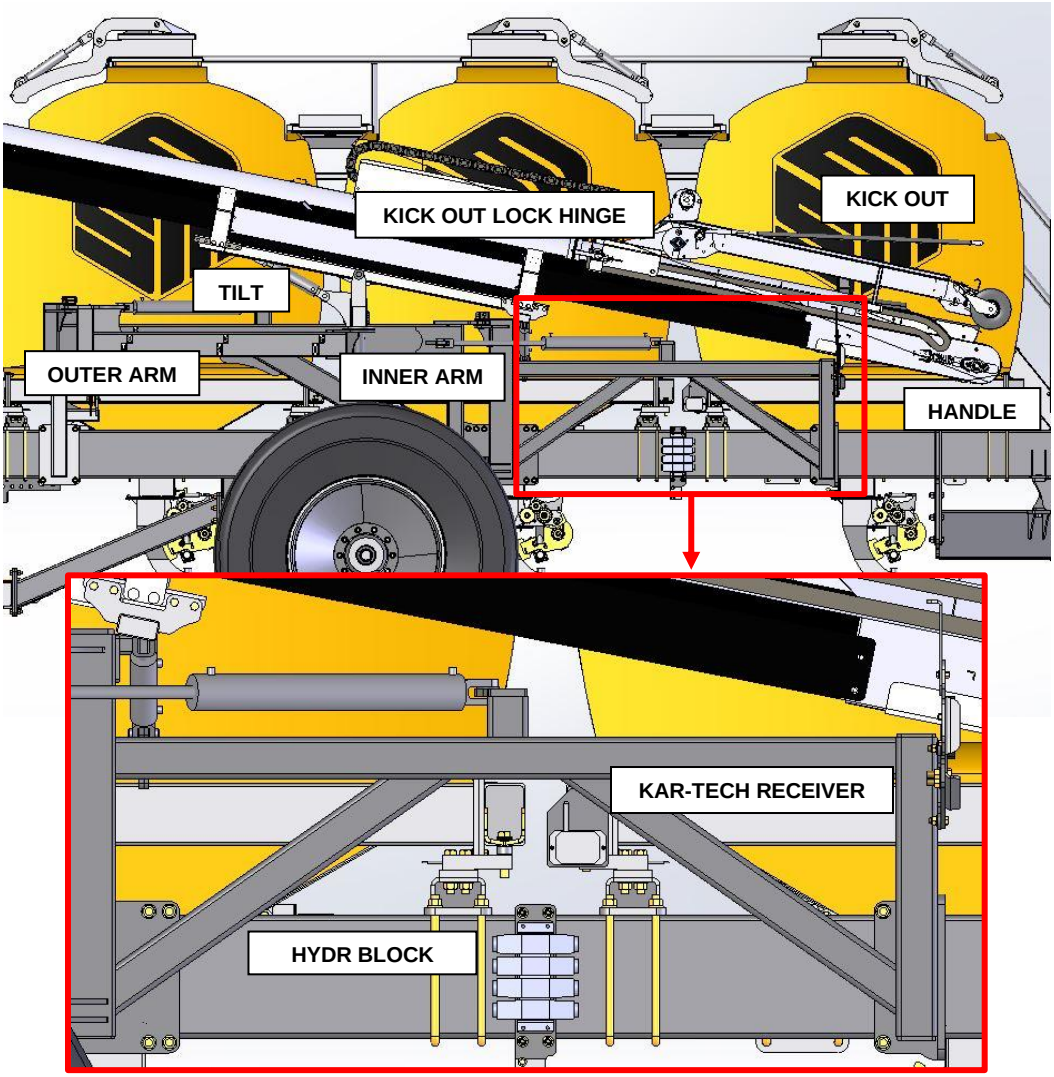
LID SELECTION VALVE

To open the lids, reverse the hydraulic remote for the fan that is pressurizing the lids. There is a check valve on the fan return which will prevent the fan from turning backwards. All the lids will open at once.

⚠CAUTION **The lid selector valve will lock the lids from opening or closing when the fans are shut off. *DO NOT ENTER TANKS WITHOUT PROPER SAFTEY EQUIPMENT AND OTHER PERSONNEL PRESENT. NEVER ENTER WHILE METERS ARE RUNNING OR FANS ARE ENGAGED IN SEEDING MODE. TANKS ARE SAFEST TO ENTER WHEN THE TRACTOR HYDRAULICS USED TO OPEN THE LIDS ARE LEFT LOCKED ON TO THE OPENING POSITION. THIS ENSURES THAT THE LIDS DO NOT CLOSE WHILE A PERSON IS INSIDE THE TANK.***

NOVA CONVEYOR OVERVIEW

Like lid operation, you must reverse the hydraulic flow of the oil to the seed fan (pressure to yellow tagged hose) to operate the conveyor. This flow pressurizes the conveyor hydraulic block allowing conveyor movement and hydraulic motor operation. You may see the lids open and arm lock release when you reverse the fan flow depending on the position of lid selector valve.



NOVA CONVEYOR CONTROLS

The Nova Conveyor is controlled with the Kar-Tech Wireless Remote and Receiver.
Its functionality includes:

1. Move Conveyor Inner and Outer Arms in and out.
2. Tilt Conveyor up and down.
3. Move Kick Out up and down.
4. Turn Belt On or Off.

E-Stop

The conveyor is equipped with an E-Stop functionality programmed into the Kar-Tech Remote. In case of emergency and all conveyor functions need to be stopped, press the RED power button on your remote. This will halt all conveyor operation. To resume, turn the remote on again or re-cycle power to the receiver and re-engage the conveyor functions as they were before stopping.

KAR-TECH WIRELESS REMOTE

To use the Kar-Tech Wireless Remote, it needs to be powered on first. Simply hold the red POWER button for at least 2 seconds, release, and the LED lights will turn on. The transmitter is designed with a power saving feature which turns the transmitter off after 15 minutes of inactivity.

ARM MOVEMENTS: Press and hold the corresponding button to move the arms, and tilt. ***NOTE****: The MAIN ARM and 2ND ARM IN or OUT functions can be operated simultaneously by pressing the two buttons at the same time. These functions are disabled while the belt is running.*

KICK OUT: Press and hold the corresponding button to move the Conveyor Kick Out.

BELT: To turn the belt on or off, press the BELT ON/OFF button.

LIGHTS: To turn the work lights on or off, press the LIGHTS ON/OFF button.

SYNCHRONIZING THE REMOTE TO THE RECEIVER

Each remote and receiver is synchronized together during assembly. If a new transmitter is needed, synchronizing is required:

1. Make sure both the remote and receiver are powered off.
2. Press and hold the red POWER button on the remote for more than 10 seconds. The red and green LED will start to blink.
3. Apply power to the receiver.
4. Wait for a few seconds until only the green LED begins to blink on the remote.
5. The remote and receiver are now synchronized.

Should an operator require more than one remote to work with a single receiver, the second remote will need to be “cloned”. If this is required:

1. Make sure both remotes and the receiver are off.
2. On transmitter A, press and hold the red POWER button for more than 10 seconds then release. The LEDs will start to blink.
3. On transmitter B, press and hold both 2ND ARM buttons along with the red POWER button for 5 seconds and then release. The LEDs will start to blink.
4. Wait for a few seconds until only the green LED double blinks on both remotes.
5. Turn both remotes off.
6. Synchronize one of the remotes to the receiver using the “Synchronizing the Remote to the Cart Receiver” instructions above.
7. Both remotes and the receiver are now synchronized.

CONVEYOR OPERATION

1. Reverse hydraulic flow of the oil to the seed fan. Ensure that the lids have opened, and the Arm Lock has released the conveyor from the locked position.
   ***NOTE**: Remove any transport brackets or bolts before use.*
2. Press the TILT “up” button to lift the bottom of the Conveyor out of the transport cradle.
3. Using the MAIN and 2ND ARM “out” buttons (or a combination of both), start to move the Conveyor away from the Nova Tank.
4. Once the Conveyor is away and clear of any obstructions, use the TILT “down” button to bring the bottom side of the Conveyor into arms reach.
5. Using the MAIN and 2ND ARM “out” buttons (or a combination of both), start to move the Conveyor spout in position of the desired tank to fill.
6. Once the spout is positioned, use the TILT “down” button to gently place the Conveyor on the ground. It will rest on the clean out.
7. Position truck as necessary.
8. Unlatch the kick out Lock Hinge to allow the kick out to move down.
9. Press the KICK OUT “down” button to move the Kick Out into position. ***Ensure the Kick out is all the way down before use.***
10. Ensure truck chute/gate and kick out are aligned so product will flow onto the conveyor belt.
11. Start the Conveyor belt by pressing the “BELT ON/OFF” button.
    ***NOTE**: If the speed of the conveyor belt needs to be reduced, simply start closing the manual hand belt speed valve until the desired belt speed is reached.*
12. Before filling, ensure the Bin has been zeroed out. ***Perform this operation only if the bin is completely empty.***
13. Begin filling by opening the truck chute/gate.
14. When the desired amount of product is in the bin close the truck chute/gate. Bin weight can be viewed from the Viper 4+ or remote tank monitor.
15. Allow conveyor to run for 5 – 10 seconds after closing the chute/gate to ensure the belts are free of product. To stop the belt, press the “BELT ON/OFF” button.
16. If filling another bin or putting the conveyor into transport, press the KICK OUT “up” button and run the Kick out up to transport position and lock in.
17. Then press the TILT “up” button to bring the conveyor off the ground.
18. Using the MAIN and 2ND ARM buttons move the conveyor back into transport or fill position into another bin.

ISOBUS RCM FUNCTIONS

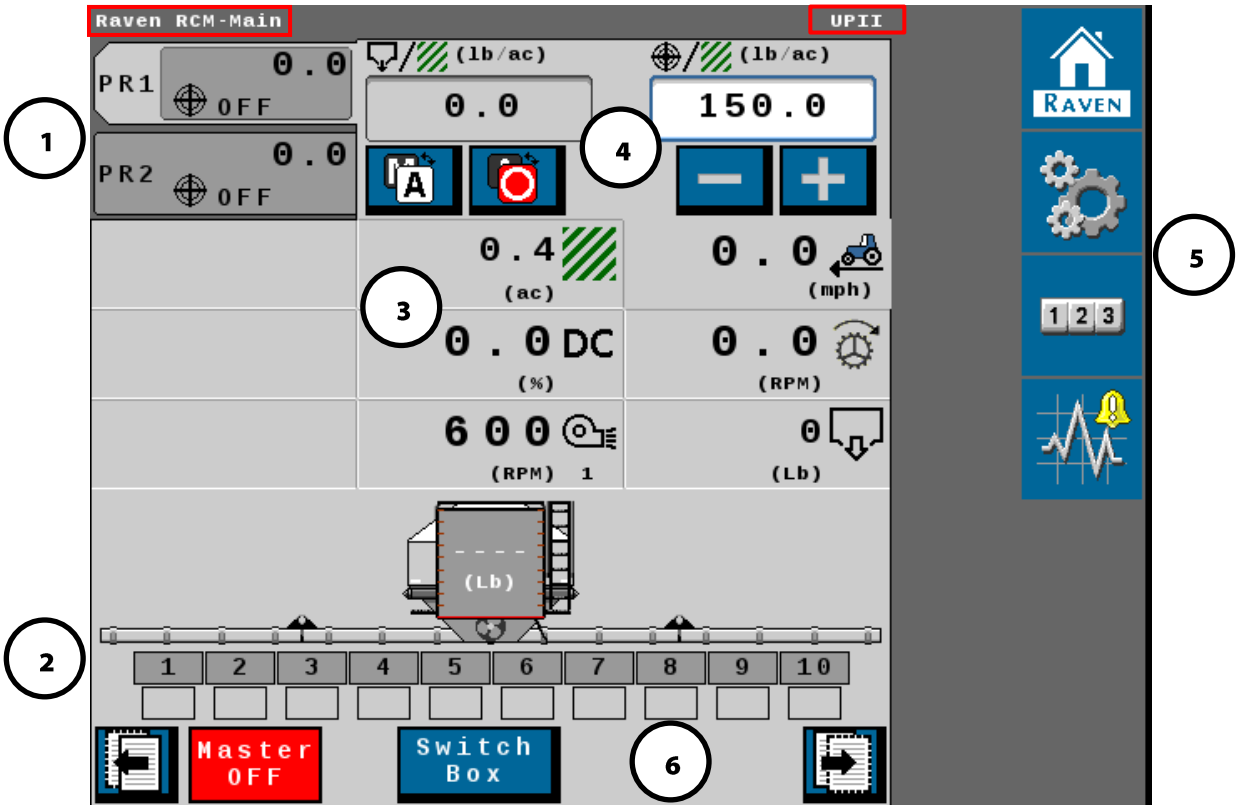
HOME SCREEN LAYOUT

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 Universal Terminal (UT) and task control for as-applied documentation, prescription rate, and section control. ISOBUS RCM will control your SeedMaster multi-product On-Frame Tank or NOVA Air Cart via the installed Universal Terminal. To access the RCM Tank Functions, touch the ISOBUS RCM soft key on your UT display. See your UT's operator's manual for more information on locating UT soft keys.

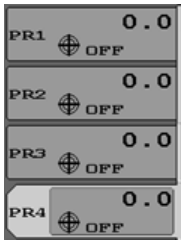
RCM SOFT KEY

DISPLAYS THE NAME OF THE CURRENT PAGE

RCM PROFILE NAME

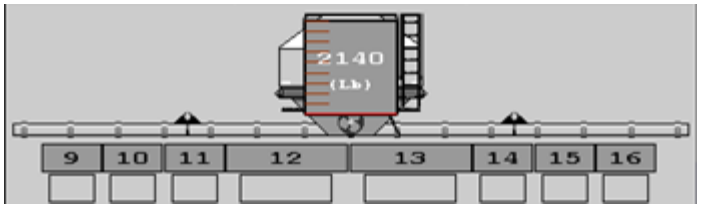


1. **Product Area: D**isplays the products that are set up for the specific RCM. Each product displays the state of the product. It will display "**Off**" when the product is off, it will display the target rate when it is "**On**" and set to "**Auto**" and will display "**MAN**" when it is on and set 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.

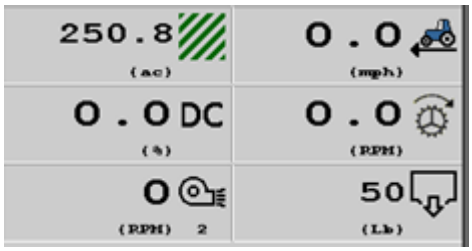


ACTIVE PRODUCT

2. **Tank Area: D**isplays 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 green 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 Switch Box button, and the Quick Start button.

ISO RCM QUICK START PROCEDURE

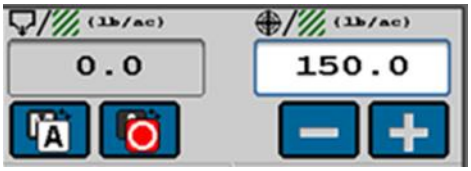
Before you go to the field, please review the steps below to ensure your ISO RCM is field ready.

Step 1. Review ISO Toolbar Quick Start Procedure (PAGE 26)

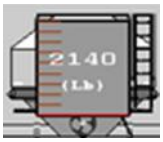
Step 2. Turn Product Master ON/OFF Switch ON for each product being applied: Before turning the switch on, please ensure the machine is free of any persons, animals, or objects that could damage your equipment. Touch the RED safety switch. The Safety Switch will turn green indicating that the system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

Step 3. Review the Calibration Weight: The Calibration Weight value indicates the number of pounds per motor 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 62) s**ection 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 72 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 the zone is engaged.

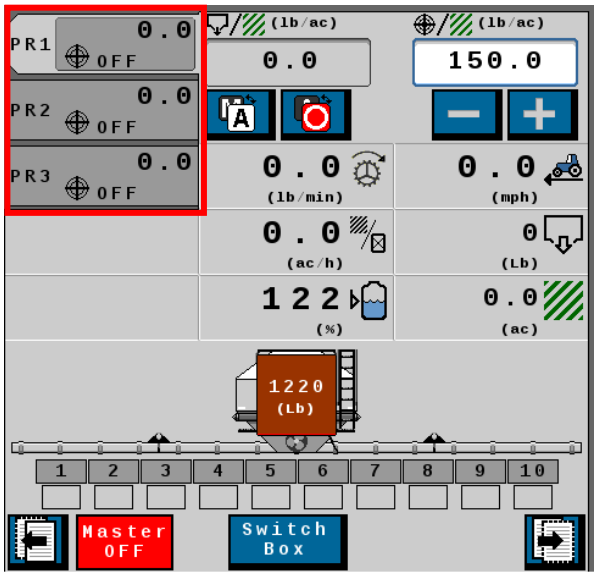
Step 8. Review Fan RPM: Fan RPM is located in the Display Menu Area. Ensure that each active product has a Fan RPM.

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.

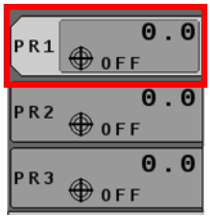
RCM MAIN (HOME) PAGE

PRODUCT SELECTION

The product selection area displays the products that are 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. 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.

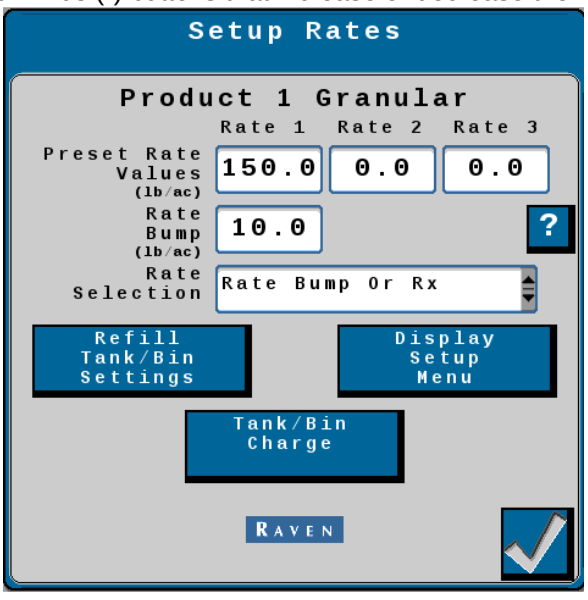


Setup Rates Page



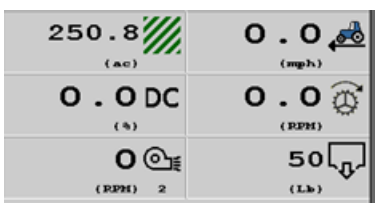
The Rates Setup page allows the operator to change the rate settings after creating a profile with the setup wizard. Touch on the active product to access this set up page. Three predefined preset rate values can be set for quick rate changes on the fly. To have the predefined rates displayed on the 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 and is also accessible by touching the bin. See the next page for more details.

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

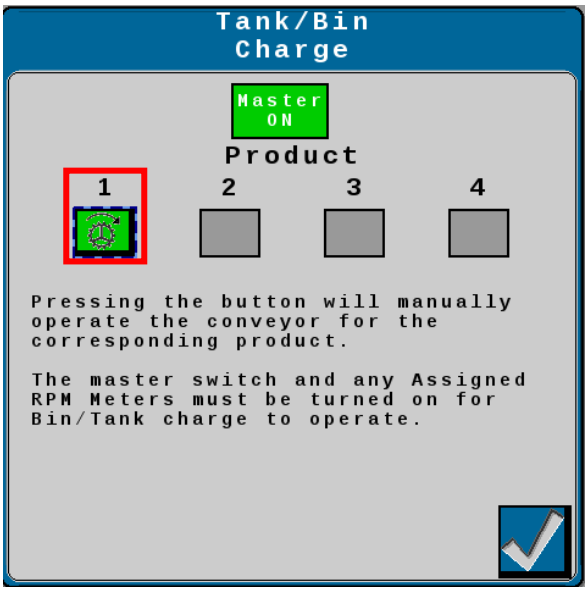


Touch the **Tank/Bin Charge** button to access the Tank/Bin Charge function page. See the next page for more details.

TANK/BIN CHARGE PAGE

Use this page to quickly charge the meter roller.

1. Engage the master foot 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 foot 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 Product Master 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.

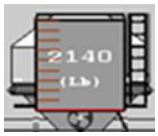
NOTE: <u>Both the remote master (foot switch) and the product master switch must be toggled on to apply product</u>.

RATES AREA

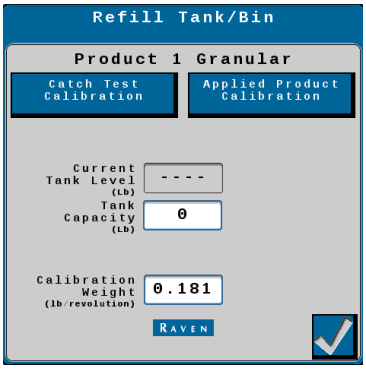
The application rates area displays the actual and target rate information as well as the currently selected units in which the information is displayed.

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.

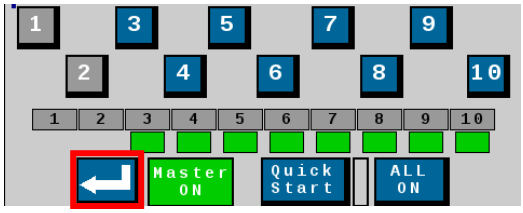


To perform a product calibration test, touch the "**Catch Test Calibration**" button. Please see the "**CATCH TEST CALIBRATION PROCEDURE**", (PG.62) for more info.

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.66 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:

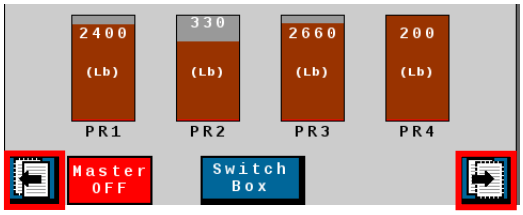
Disabled - Manually disabled by Section Switchbox buttons. The square block below section number is clear.

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

Active - Section is applying. The 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

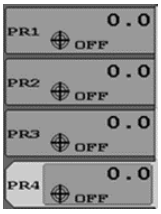
The Quick Start button is available after activating the system for a product. If operating multiple products, select the desired products and enable the system. Then, select the "Quick Start" button for each product. Selecting a "Quick Start" button turns on all sections only for the active product and applies the product at target rate. When selected, "Quick Start" overrides the Section Control and machine speed threshold for 5 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 5 seconds.

CATCH TEST CALIBRATION PROCEDURE

Your SeedMaster tank 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 Catch Test Calibration, see page 91.

CALIBRATION PROCEDURE

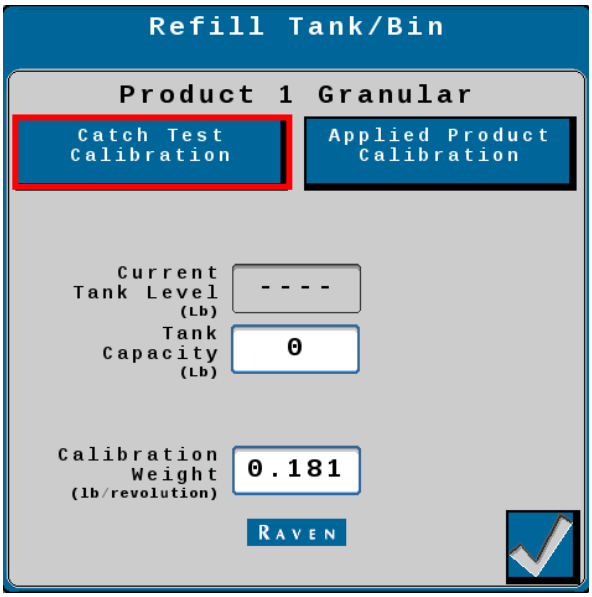
1. Zero the digital scale and tare the weight of the pail you will be using to catch product.
2. Prepare the meter that you will be catching out of by placing the pail underneath the catch tray.
3. Shut the **MASTER SWITCH OFF** (Foot Switch). If turned on, the calibration soft keys will be greyed out.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



SELECT ACTIVE PRODUCT

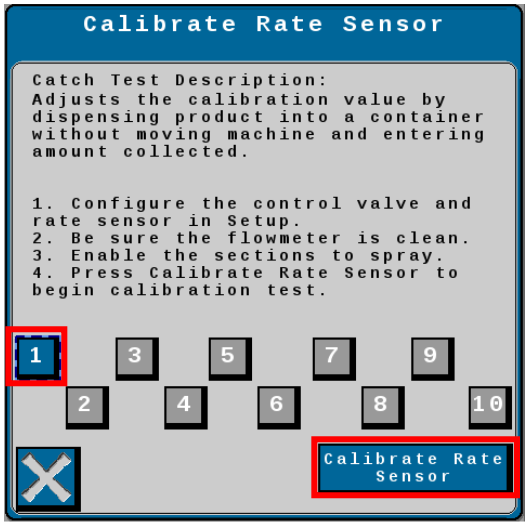
REVIEW INITIAL CALIBRATION SETTINGS

6. Enter the Current Tank Level Reading into the Tank Capacity area.
7. Enter the Calibration Weight. A starting Calibration Weight can be found with the SeedMaster App. The Estimated Cal Weight will be calculated as a starting point.
   ***NOTE**: Please see the "SEEDMASTER APP" Chapter for more information.*
8. After the settings have been reviewed, touch "Catch Test Calibration".

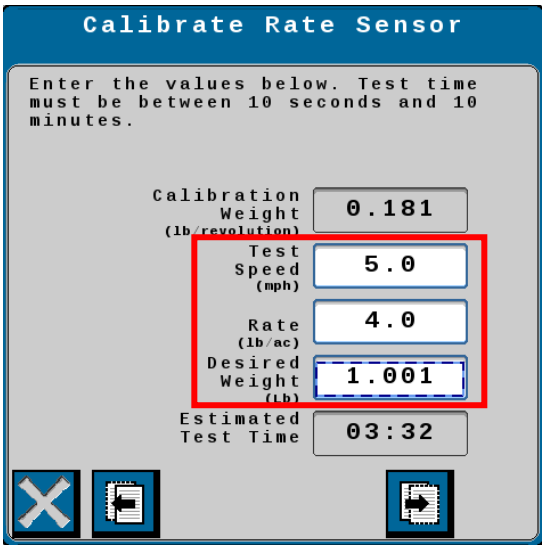


9. After touching "Catch Test" a warning screen will appear saying that product will be expelled. Please read the warning before touching the green check mark. **Note:** ***If buttons are greyed out, turn off master switch***.

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 set up under Zone 1 on the left side of the machine. After selecting the zone to catch from, touch “Calibrate Rate Sensor”.



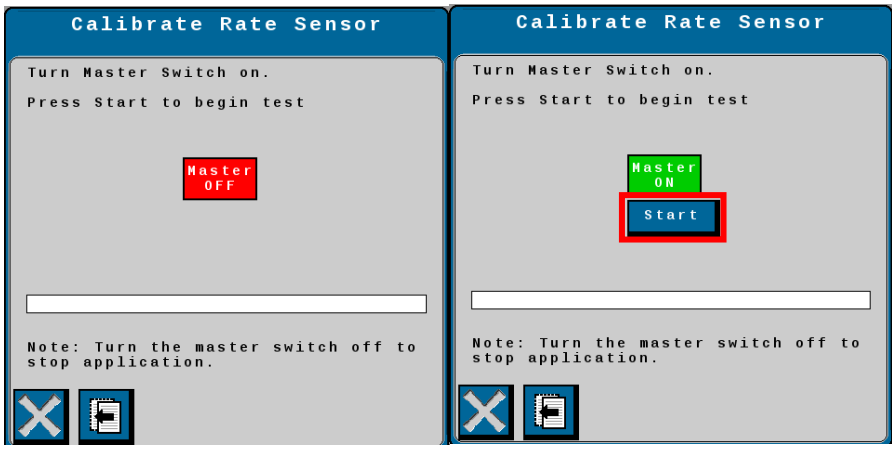
12. Enter the following values:
    a. **Test Speed** = 5
    b. **Rate (lb/ac)** = Desired Rate for the product being metered in the field.
    c. **Desired Weight (lb)** = The amount of product to be caught into the catch pail.



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

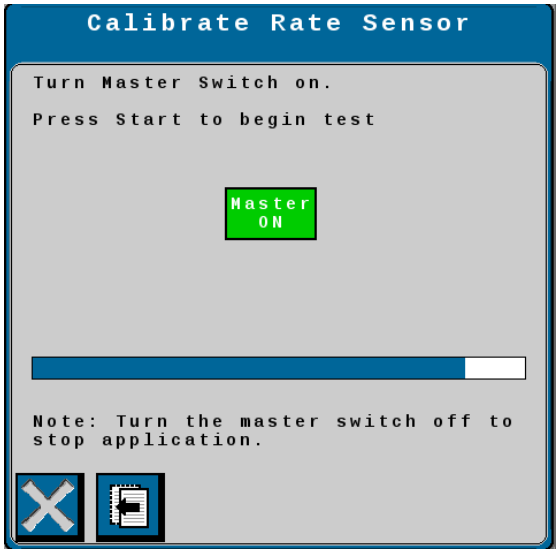
NOTE: The Estimated Test Time must be under 10 minutes. If the test time is greater than 10 minutes, decrease the Desired Weight (the amount of product being caught).

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



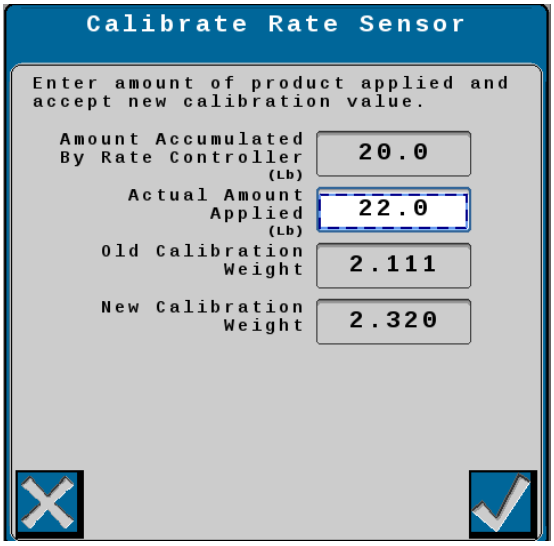
***NOTE**: Ensure the system pressure is engaged so that the metering drive motors have hydraulic pressure. Also, note that the meters will begin to expel product after touching the start button.*

16. A blue bar will display during the calibration. This indicates the progress of the calibration. When the calibration time has 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 foot switch to stop the meter from spinning. This will complete the catch process and advance the calibration process to the next screen. Please cancel the calibration process and start over if the 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 newly calculated calibration weight. Please review these values for inaccuracies. If the results are acceptable, then touch the check mark to accept the new calibration weight value. **NOTE**: *The calibration number will change automatically to the new calibration number.*



18. Shut Master Switch OFF (Foot Switch)

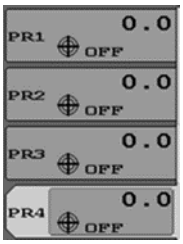
IT IS RECOMMENDED TO COMPLETE AT LEAST 2 TO 3 CATCH CALIBRATIONS PER PRODUCT TO ENSURE ACCURACY. PRODUCTS SUCH AS CANOLA SHOULD BE CALIBRATED NO LESS THAN 3 TIMES. IF THE CALIBRATIONS ARE INACCURATE FROM ONE TO THE NEXT, PLEASE INSPECT THE METERING COMPONENTS AND START THE CALIBRATION OVER.

APPLIED PRODUCT CALIBRATION PROCEDURE

SeedMaster Machines equipped with Load Cells are capable of Auto Calibration on granular products. The Applied Product Calibration (SmartCal) feature will maintain a high metering 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 lightweight, low-rate product such as canola takes more area to dial in.

***NOTE**: **Before using the SmartCal feature, it is HIGHLY recommended to perform a <u>Scale Calibration (PG. 72)</u> before filling the tanks, as well as a <u>Catch Test Calibration (PG. 62)</u> 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

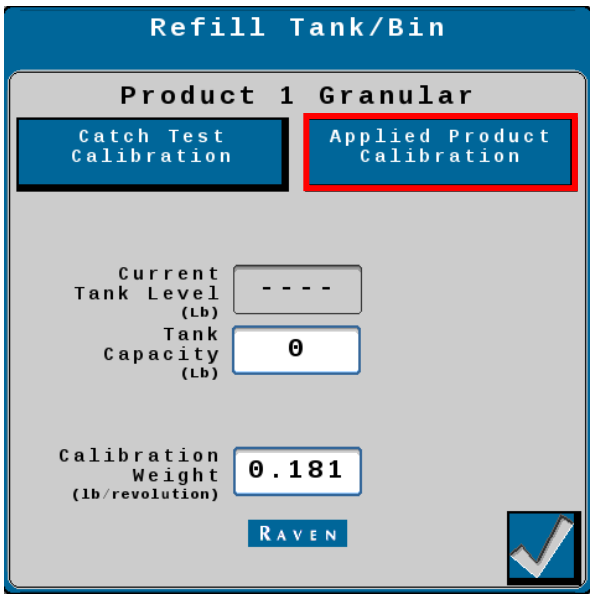


SELECT ACTIVE PRODUCT

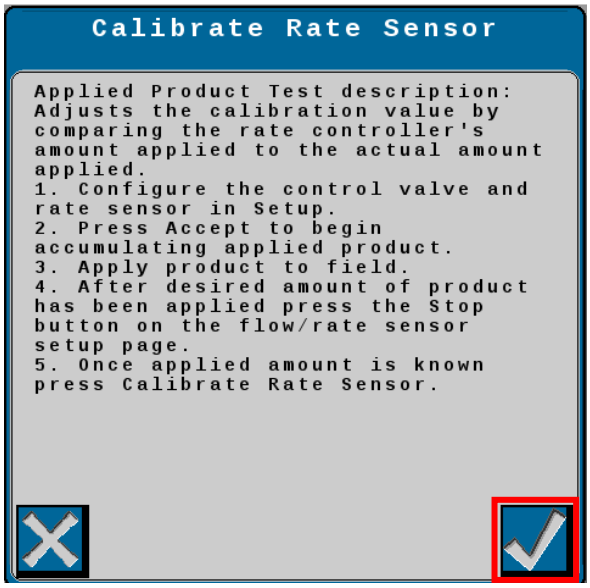
1. Shut the MASTER SWITCH OFF (Foot Switch) and park the machine as level as possible. Ensure the scales are still before proceeding.
2. Select the product that the applied product calibration will be performed on.
3. Touch the Tank in the middle of the screen.

REVIEW INITIAL CALIBRATION SETTINGS

4. Enter the Current Tank Level Reading or maximum product weight into the Tank Capacity area.
5. Enter the Calibration Weight. A starting Calibration Weight can be found with the SeedMaster App. The Estimated Cal Weight will be calculated as a starting point. Skip this step if you have performed a catch test calibration.
   ***<u>NOTE</u>**: Please see the "SEEDMASTER APP" Chapter for more information.*
6. After the settings have been reviewed, touch "Applied Product Calibration".



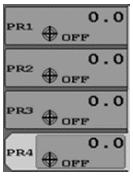
7. Please read / review the Applied Product test description. Then touch the check mark to begin an applied product calibration.



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.

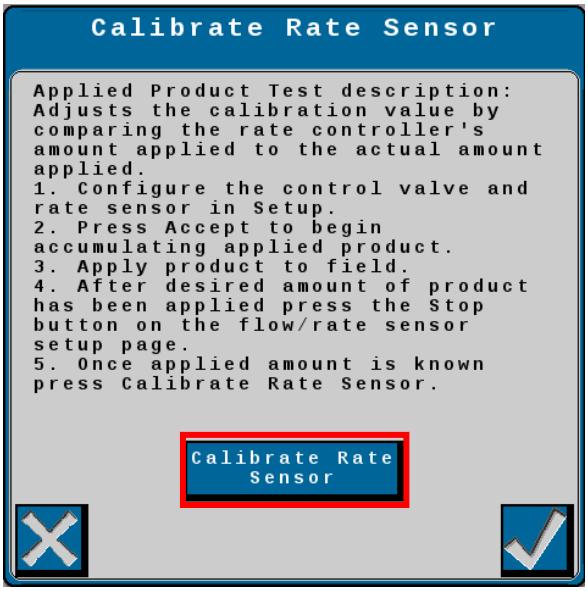
NOTE: It is important that the machine is in the field and ready to apply product before initiating an Applied Product Calibration.

11. Return to the home screen and continue to apply product as per usual.
12. After applying a recommended minimum of 15 acres for higher rate products 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.
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.

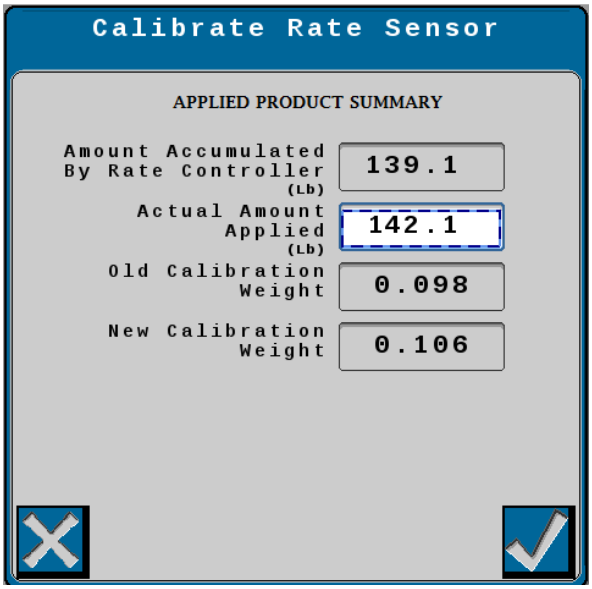


SELECT ACTIVE PRODUCT

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. If the Applied Product Calibration is more than 10% different from the Catch Test Calibration, it is recommended to inspect the meters and load cells to ensure accuracy.

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 switch to an existing profile.

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

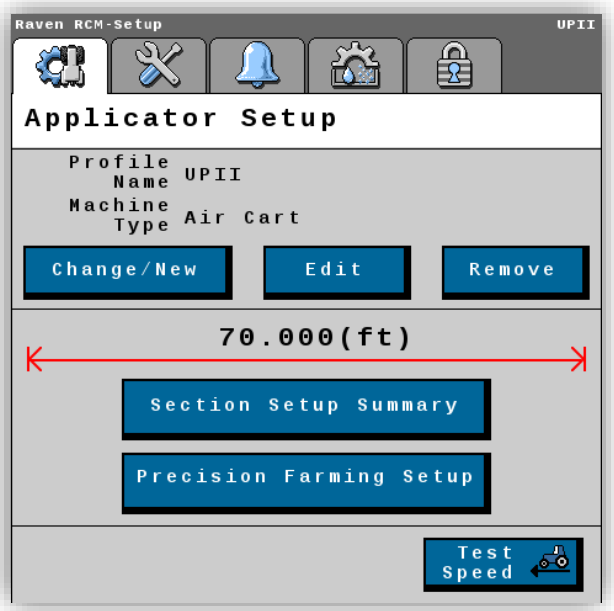
NOTE: This will walk you through the entire setup wizard. You cannot back out of this process and must complete it to exit. See the set-up wizards beginning on page 80 for instructions.

- **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.

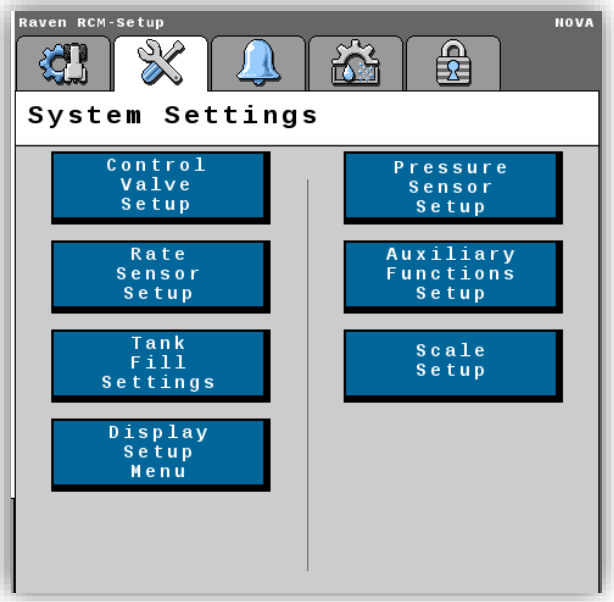
- **Precision Farming Setup Button:** This is not used.

- **Test Speed Button:** Use the test speed to simulate 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 PAGE 71 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.

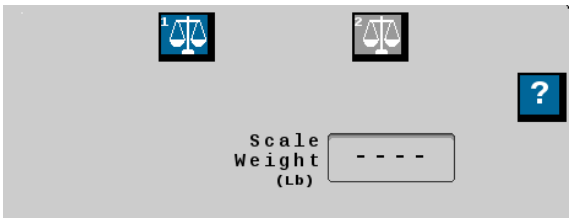
- Pressure Sensor Setup Button: Touch here to access pressure sensor settings.

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

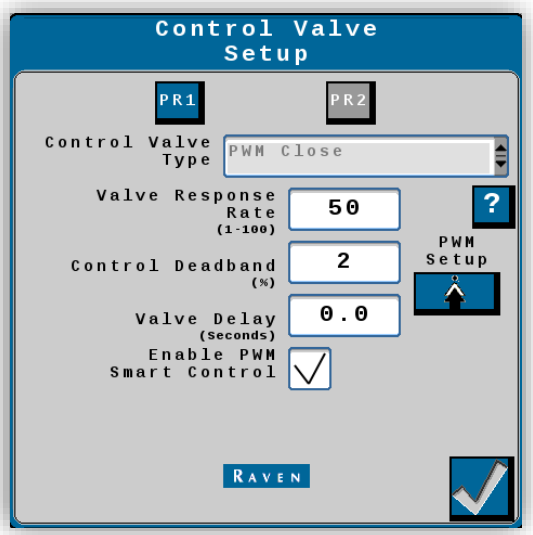
- Auxiliary Functions Setup Button: Access the FAN RPM calibration values from here. This page allows for setting a Low and High RPM limit for the fans. The RPM Assignment Setup button lets you view what product is assigned to each fan.

***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 on page 72 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 the target rate. Factory default is 50.

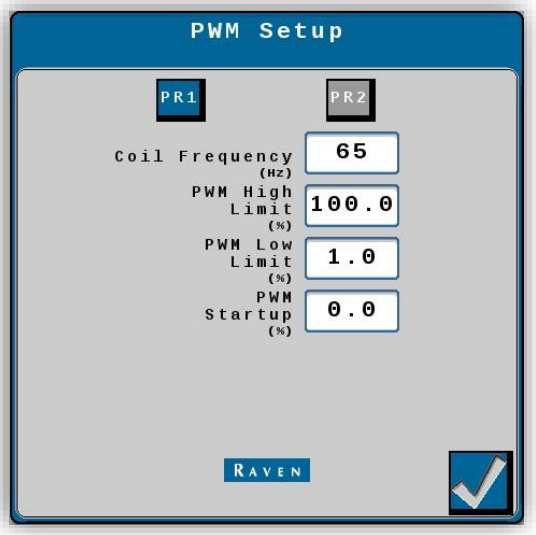
Control Deadband (%): Enter percentage of rate tolerance for control valve. For example, if 2% is entered, the rate controller attempts to adjust the flow rate until the actual rate is within 2% of the target rate. Factory default is 2%.

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

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

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. Factory default is 65.

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

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

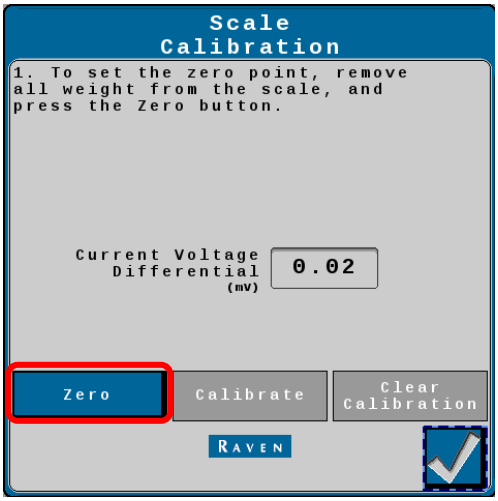
- PWM Startup (%): Duty cycle rate controller commands when the valve is opened. Factory default is 0.

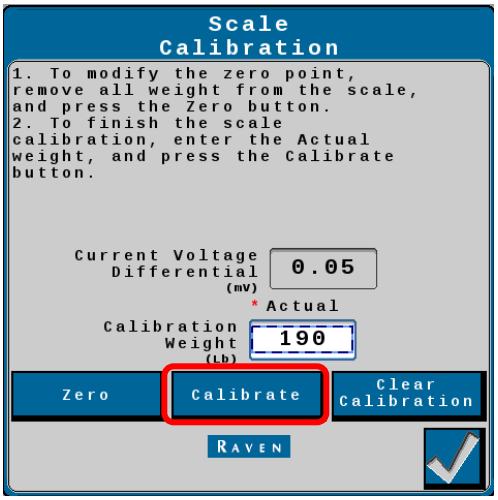
SCALE CALIBRATION

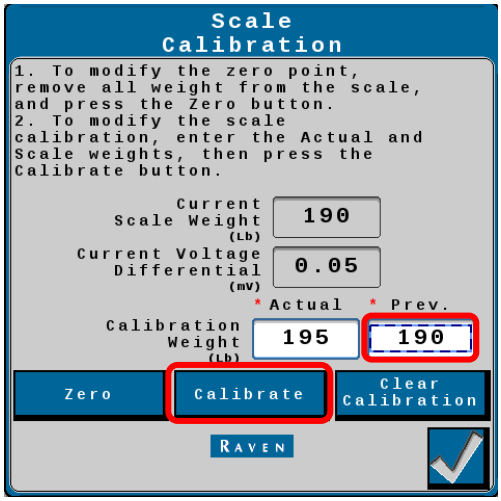
1. Touch the “Settings” soft key.
2. Touch the “System Settings” tab.
3. Touch “Scale Setup” button.
4. Choose the scale being calibrated.
5. Touch the “Scale Calibration” button.
6. Ensure the tank is empty. Touch the “Zero” button.
7. Touch the check mark to zero the bin.
8. Put an accurate, verified 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.



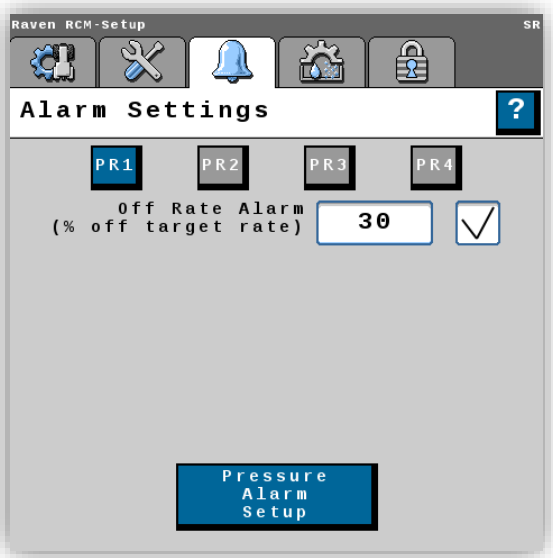




ALARM SETTINGS TAB

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. Factory default is 30%.

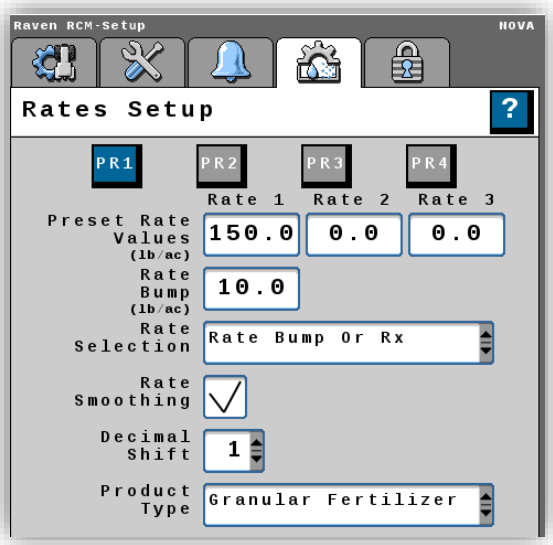


RATE SETUP TAB

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

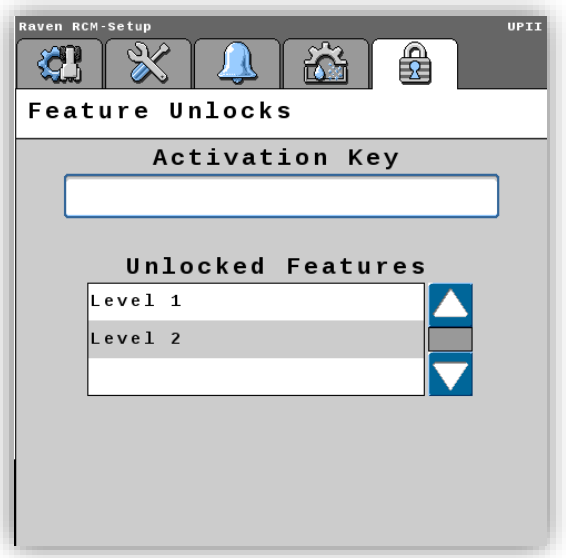
Select the Rate Selection from the drop-down Menu to choose the rate type displayed on the main run page.

- **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 set up 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.
- **UT Rate Entry**: Enter the desired rate.
- Ensure the Rate Smoothing check box is selected.



FEATURE UNLOCK TAB

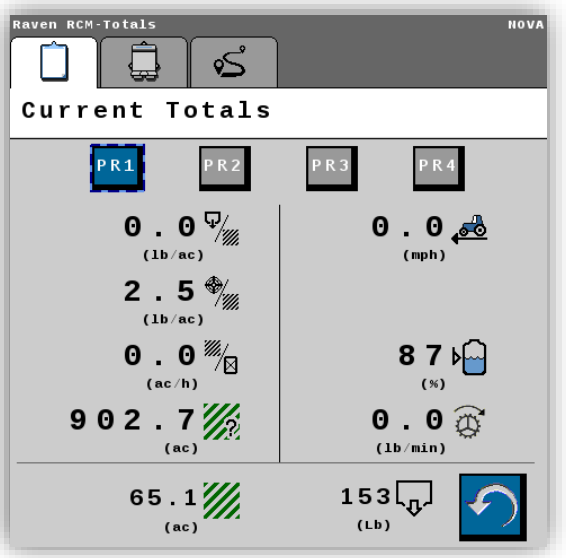
The Feature Unlocks tab allows you to unlock various features of the RCM. ***Note: SeedMaster RCMs require a Level 2 unlock. This is included with your purchase.***



RCM TOTALS PAGE

CURRENT TOTALS TAB

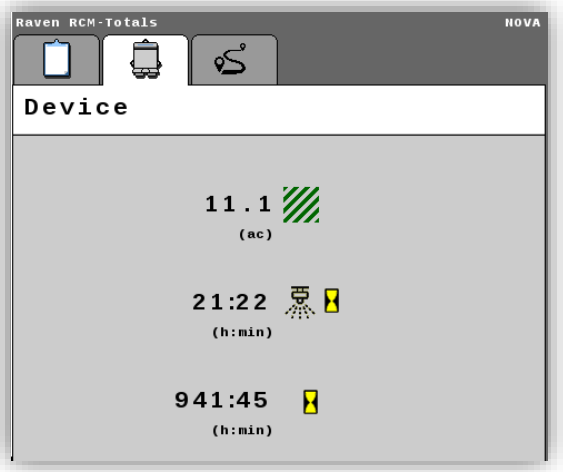
The Current Totals tab displays instant values of each product. Select the product to view from the Product Selection buttons at the top of the tab. To zero current totals, select the Reset Counter button.



DEVICE TAB

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

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



DISTANCE TAB

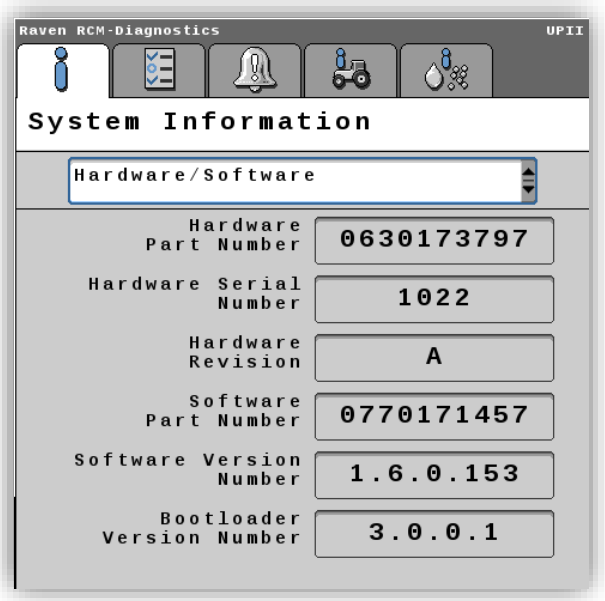
The Distance tab shows distance values that increase as the implement drives forward.

- 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 TO 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.

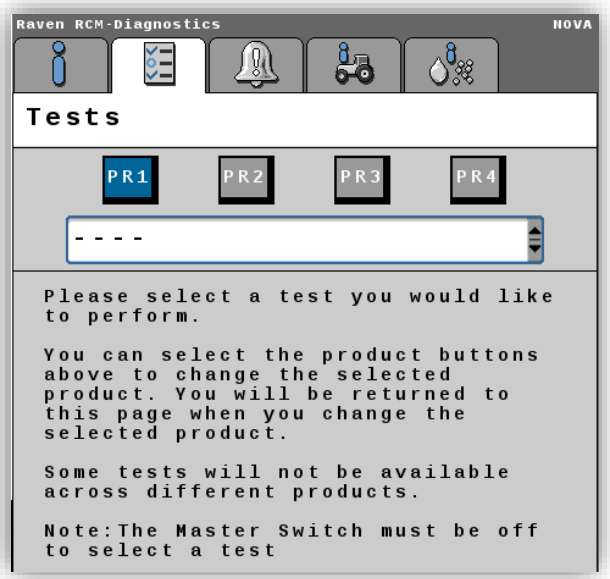
TESTS TAB

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 tests above, please follow the onscreen instructions.

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



DIAGNOSTICS TROUBLE CODES TAB

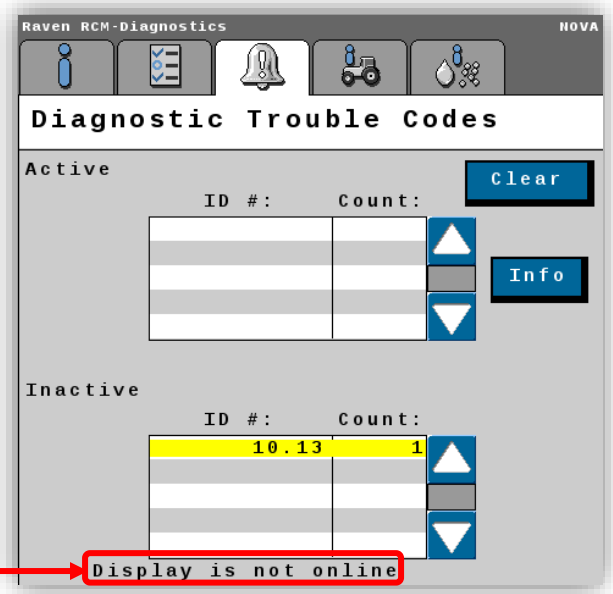
This tab is used for troubleshooting active system errors and displaying inactive errors.

- 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.

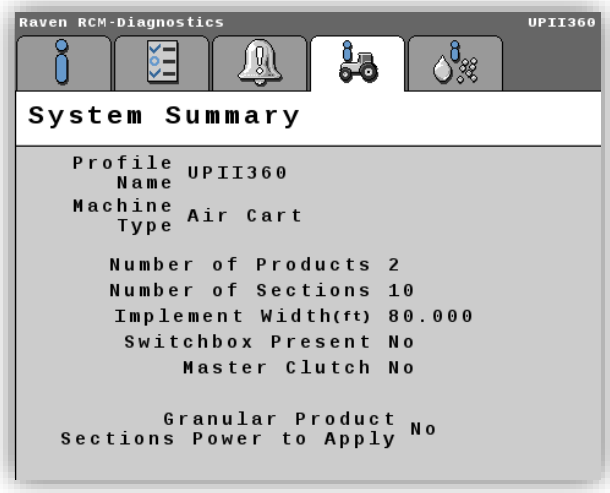
NOTE: A description of the highlighted code is shown below each table.

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



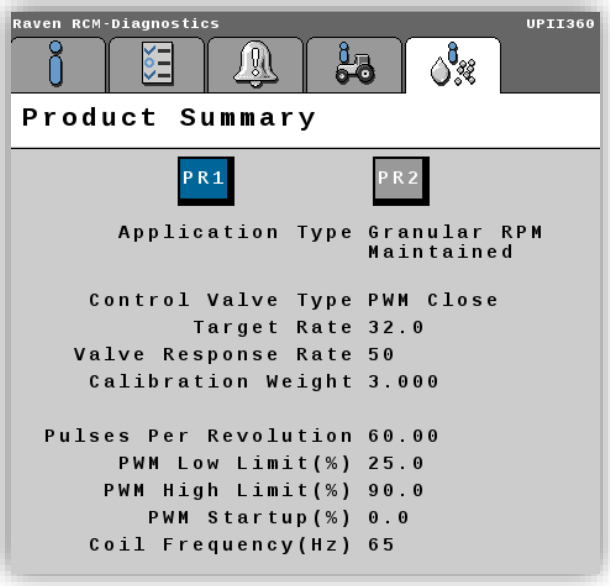
SYSTEM SUMMARY TAB

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.

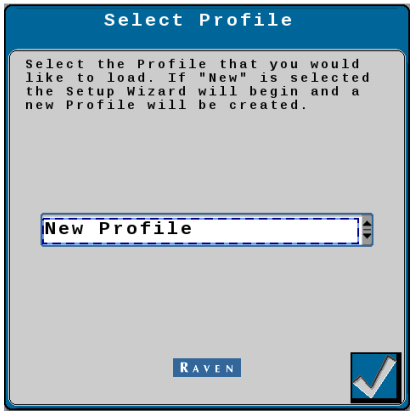
GRANULAR PRODUCT CONTROL SETUP (DEALER OR SEEDMASTER ASSISTED ONLY)

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

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

Applicator Setup

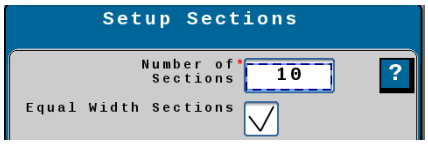
4. Touch the **Change/New button,** the setup wizard will begin.
5. Touch the drop-down box and select new and then touch the **Check Mark**.



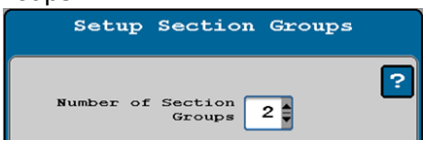
6. Enter a **Profile Name.**
7. Touch the **Drop-Down** Box for Machine Type and select **Air Cart.**
8. Enter the Application Width of the toolbar then touch the next button. 

9. **Always enter 4** for the number of Granular Products, then number the ECUs where 1 is the first ECU inline. Touch next.
10. Touch the **drop-down** box and choose **1 or 2** for the number fans installed. **Enable Fan/Spinner RPM Control** remains unchecked. Touch next.
11. Touch each **drop-down** box and select **Granular Fertilizer** or **Granular Seed (lb)** for each product or **Not Installed** if the product does not exist. Touch next.

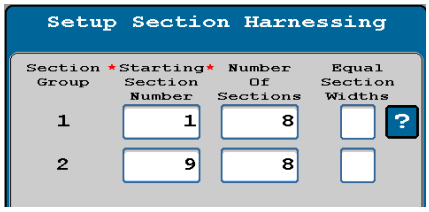
12. Set the application type for each product by touching the **drop-down** and selecting **Granular RPM Maintained** for the Application Mode. Do this for each product and touch next.
13. Leave Aux-N Enabled **unchecked**.
14. If the Machine shares all the section drivers. Choose **YES** and then touch next.
    ***NOTE**: If the sections don't share all drivers skip to step 19.*
15. Enter the number of zones for the Number of Sections. If the sections are equal width, leave the check mark on for this setting. The **Master Clutch** and **Granular Product Sections Power to Apply** will remain with NO check marks. Touch next.



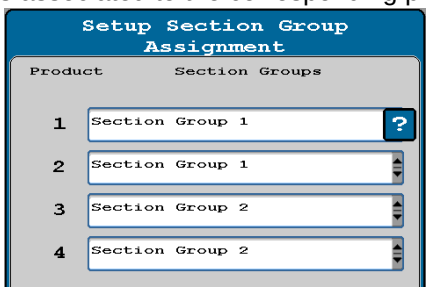
16. The section widths for each section will be displayed. Each section is X amount of feet. Review and confirm. Touch next.
17. There are **NO** Auxiliary Drivers installed. Touch next.
18. Section Summary will display the products and sections and the assigned driver and switch review. Touch **next**. Note: You may have two pages for the summary. Skip to step 25.
19. If the Machine **DOES NOT** share all the section drivers, choose NO and then touch next.
20. Enter the number of Section Groups.



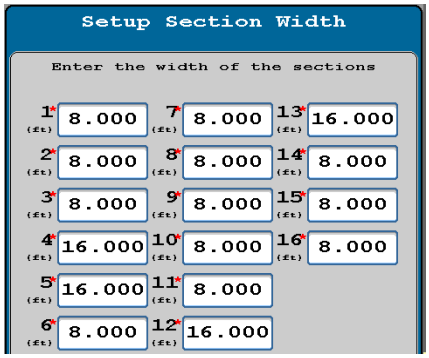
21. An example of the section group mapping will be displayed. Review the guide then touch next.
22. Enter the Starting Section Number and Number of Sections associated with the starting number. Touch **next**.



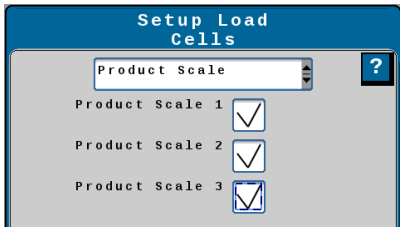
23. Select the section group that is associated to the corresponding product.



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



25. 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.



26. If your scale calibration numbers are known, you can enter them here. If they are not, touch next.
27. There are NO pressure sensors installed. Leave each pressure sensor defaulted to None and then touch **next**.
28. There are NO height switches installed. Leave the box defaulted to None and touch next.
29. Enter 2 into the Fan RPM 1 / RPM 2 Calibration Box. RPM 1 Low and High Limits will remain at 0. Touch next.
30. 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.
31. You will now set up the product control for each product. The 6 configuration pages will have the same settings entered for each product. 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 = 65
        - ii. PWM High Limit = 100
        - iii. PWM Low Limit = 1
        - iv. PWM Startup = 0.0
    - **c. SETUP Rate Sensor PAGE**
        - i. Calibration Weight = 2.000 ***(CALIBRATION REQUIRED)***
        - ii. Pulses / Revolution = 60.00
    - **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 = 5
        - iii. Rate Selection = Rate Bump or Rx
        - iv. Display Smoothing = YES checkmark
        - v. Decimal Shift = 1
    - **f. SETUP Alarms PAGE**
        - i. Off Rate Alarm = 30 with checkmark
        - ii. Shaft Sensor Alarm = NO checkmark

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.

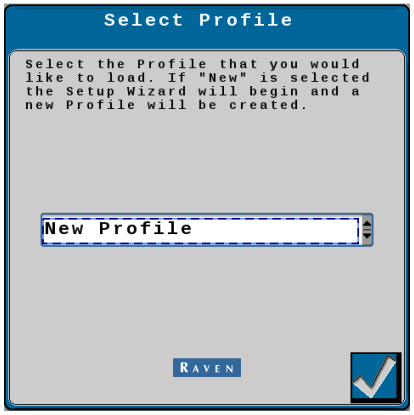
SINGLE LIQUID PRODUCT CONTROL SETUP (DEALER OR SEEDMASTER ASSISTED ONLY)

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

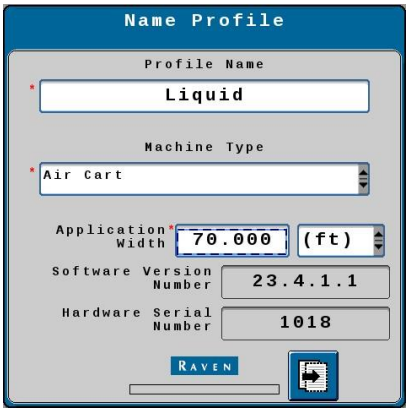
2. Touch the **Settings** soft key. 
3. Touch the **Applicator Setup** tab**.**

Applicator Setup

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

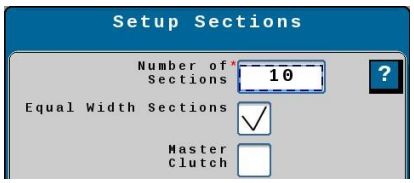


6. Enter a **Profile Name.**
7. Touch the **Drop-Down** Box for Machine Type and select **Air Cart.**
8. Enter an Application Width of the toolbar then touch the next button. 



9. **Always enter 4** for the number of products, then number the ECUs where 1 is the first ECU inline. Touch next.
10. Leave the fan set up as zero for a single Liquid Product.
11. Select application type **Liquid** for Product 1, and **Not Installed** for Products 2-4. Touch next.
12. Set the application type by touching the **drop-down** and selecting **Liquid** for the Application Mode. Touch next.

13. Leave Aux-N Enabled **unchecked**.
14. Enter the number of zones for the Number of Sections. If the sections are equal width, leave the check mark on for this setting. The Master Clutch will remain with NO check mark. Touch next.



15. The section widths for each section will be displayed. Each section is X amount of feet. Review and confirm. Touch next.
16. There are **NO** Auxiliary Drivers installed. Touch next.
17. Section Summary will display the products and sections and the assigned driver and switch review. Touch **next**.
18. Leave Scale Setup set to **None**.
19. If you have Pressure Sensors installed for your system, choose the appropriate style from the drop-down menu and touch **next**.
20. There are NO height switches installed. Touch next.
21. You will now set up the product control. There are 6 configuration pages. Touch next after every page.
    - **a. SETUP CONTROL VALVE PAGE**
        i. Control Type = PWM CLOSE (VERIFY YOUR VALVE TYPE AND CHOOSE THE APPROPRIATE ONE)
        ii. Valve Response Rate = 50
        iii. Control Deadband = 2
        iv. Valve Delay = 0
        v. Enable PWM Smart Control = YES checkmark
    - **b. SETUP PWM PAGE (SKIPPED IF PWM NOT CHOSEN)**
        i. Coil Frequency = 65
        ii. PWM High Limit = 100
        iii. PWM Low Limit = 1
        iv. PWM Startup = 0.0
    - **c. SETUP RATE SENSOR PAGE**
        i. Flowmeter Calibration = (Value located on your Flowmeter)
        ii. Pulses / Units = 10 gal.
    - **d. SETUP TANK / BIN PAGE**
        i. Tank Fill/Level Sensor (Choose if installed)
        ii. Tank Capacity = (Enter your tank's capacity)
        iii. Current Tank Level = (Enter current volume if not empty)
        iv. Low Tank Level = (Enter a volume if you want a warning)
        v. Alarm = Check if a Low-Level warning is desired
        vi. Max Tank Fill PWM = 100%
    - **e. SETUP RATES PAGE**
        i. Preset Rate Values: Rate 1 = 25, Rate 2 = 0, Rate 3 = 0
        ii. Rate Bump = 1
        iii. Rate Selection = Rate Bump or Rx
        iv. Display Smoothing = YES checkmark
        v. Decimal Shift = 1
    - **f. SETUP ALARMS PAGE**
        i. Off Rate Alarm = 30 with checkmark
        ii. Minimum Flow Rate = Enter your desired value

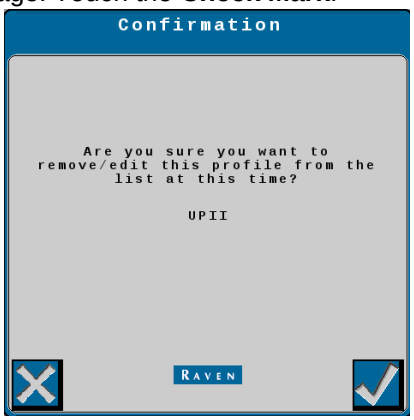
The setup for the liquid product is complete. Please review the setup summary page then touch next.

EXISTING RCM LIQUID PRODUCT CONTROL SETUP (DEALER OR SEEDMASTER ASSISTED ONLY)

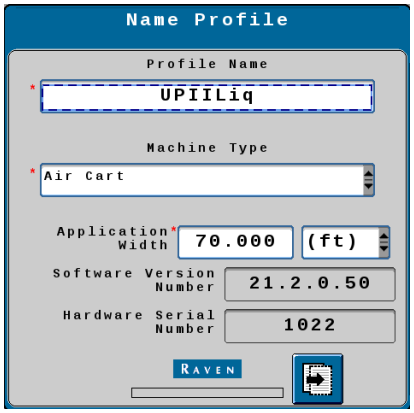
1. Touch the **RCM** working set button. 

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

4. Touch the **Edit button,** the setup wizard will begin.
5. Review the confirmation message. Touch the **Check Mark**.



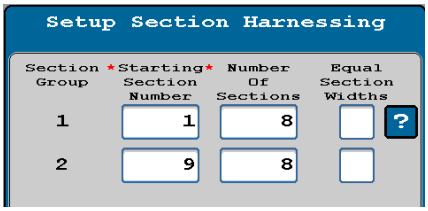
6. Enter a **Profile Name.**
7. Review the Machine Type and ensure **Air Cart** is selected**.**
8. Confirm the Application Width of the toolbar then touch the next button. 



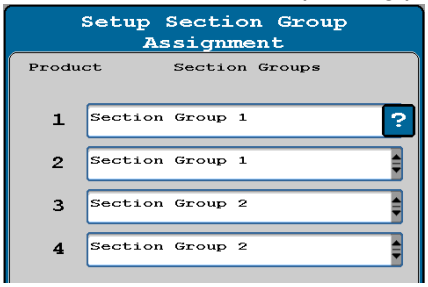
9. **Confirm 4** is entered for the number of products, then number the ECUs where 1 is the first ECU inline. Touch the next button.
10. Review and confirm **1 or 2** for the number fans installed. **Enable Fan/Spinner RPM Control** remains unchecked. Touch next.
11. Touch each **drop-down** box and select **Granular Fertilizer** or **Granular Seed (lb)** for each granular product, **Liquid** for a liquid product, or **Not Installed** if the product does not exist. Touch next.

12. Set the application type for each product by touching the **drop-down** and selecting **Granular RPM Maintained** for granular products, and **Liquid** for liquid products. Do this for each product and touch next.
13. Leave Aux-N Enabled **unchecked**.
14. The Machine **WILL NOT** share all the section drivers. Choose **NO** and then touch next.
15. Enter the number of Section Groups. The **Master Clutch** and **Granular Product Power to Apply** will remain with NO check marks. Touch next.

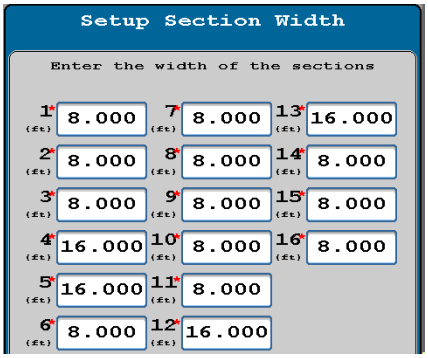
16. An example of the section group mapping will be displayed. Review the guide then touch next.
17. Enter the Starting Section Number and Number of Sections associated with the starting number. If the sections are equal width, leave the check mark on for this setting. Touch **next**.



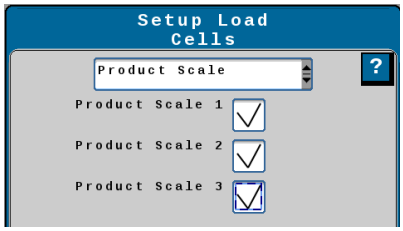
18. Select the section group that is associated to the corresponding product.



19. Review the widths of each section then touch next.



20. 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.
21. 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.



22. If your scale calibration numbers are known, you can enter them here. If they are not, touch next.
23. There are NO pressure sensors installed. Leave each pressure sensor defaulted to None and then touch **next**.
24. There are NO height switches installed. Leave the box defaulted to None and then touch next.
25. Enter 2 into the Fan RPM 1 / RPM 2 Calibration Box. RPM 1 Low and High Limits will remain at 0. Touch next.
26. RPM 1 / RPM 2 sensor Assignments will be displayed. Enter a check mark for each granular product. Touch next.
27. You will now set up the product control for each product. The 6 configuration pages will have the same settings entered for each granular product (liquid differences in brackets). Touch next after every page.
    a. **SETUP CONTROL VALVE PAGE**
        i. Control Type = PWM CLOSE **(VERIFY YOUR LIQUID VALVE TYPE AND CHOOSE THE APPROPRIATE ONE)**
        ii. Valve Response Rate = 50
        iii. Control Deadband = 2
        iv. Valve Delay = 0
        v. Enable PWM Smart Control = YES checkmark
    b. **SETUP PWM PAGE (SKIPPED IF PWM IS NOT CHOSEN WITH LIQUID PRODUCT)**
        i. Coil Frequency = 65
        ii. PWM High Limit = 100
        iii. PWM Low Limit = 1
        iv. PWM Startup = 0.0
    c. **SETUP Rate Sensor PAGE**
        i. Calibration Weight = 2.000 ***(CALIBRATION REQUIRED)***
        ii. Pulses / Revolution = 60.00
        iii. Flowmeter Calibration = Value located on flowmeter **(liquid only)**
        iv. Flowmeter Pulse / Units = 10 gal. **(liquid only)**
    d. **SETUP Tank / Bin PAGE**
        i. Tank Fill / Level Sensor = Select appropriate sensor if installed **(liquid only)**
        ii. Tank Capacity = 0 **(Enter in gallons for liquid)**
        iii. Current Tank Level = Enter value in gallons if not empty **(liquid only)**
        iv. Low Tank Level = 0 **(Enter in gallons for liquid if alarm is desired)**
        v. Low Bin Level Sensor = NO checkmark
        vi. Max Tank Fill PWM = 100% **(liquid only)**
    e. **SETUP Rates PAGE**
        i. Preset Rate Values: Rate 1 = 150 **(25 liquid)**, Rate 2 = 0, Rate 3 = 0
        ii. Rate Bump = 10 **(1 liquid)**
        iii. Rate Selection = Rate Bump or Rx
        iv. Display Smoothing = YES checkmark
        v. Decimal Shift = 1
    f. **SETUP Alarms PAGE**
        i. Off Rate Alarm = 30 with checkmark
        ii. Shaft Sensor Alarm = NO checkmark
        iii. Minimum Flow Rate = Enter value in gallons if required to maintain rate accuracy **(liquid only)**

The setup 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

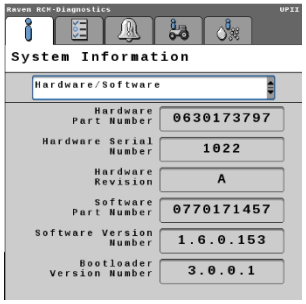
Use the Remote Tank Monitor to view tank weights, zero out tank weights, and calibrate products. Before filling a tank with product, ensure it is empty and zero it. While filling, you can view the tank weight in real time to gauge how much product is in the tank. This allows for filling to a pre-determined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

SELECT ACTIVE RCM

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.

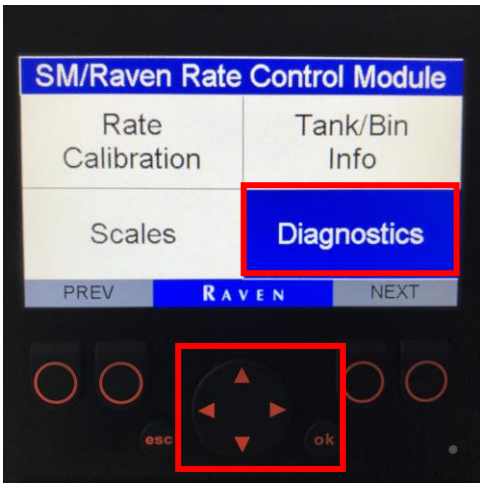
VIEWING RCM SERIAL NUMBER

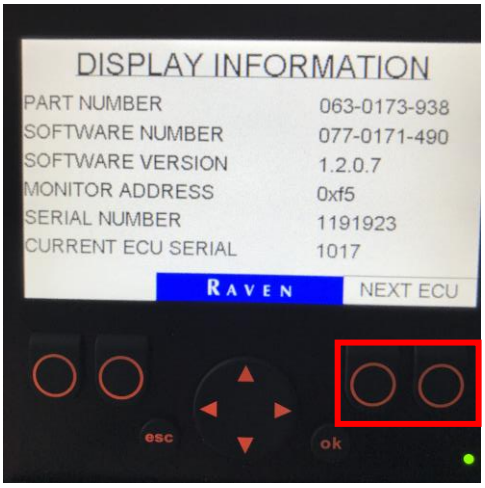
1. Choose the RCM working set from the in-cab monitor for the desired Tank.
2. Touch the Diagnostics button on the right side and the Serial Number will be displayed.
   NOTE: *For more information view the "RCM DIAGNOSTICS PAGE" in the ISOBUS RCM FUNCTIONS section of this operator's manual, PAGE 76.*



TOGGLING BETWEEN RCMS (UPII, NOVA, LIQUID)

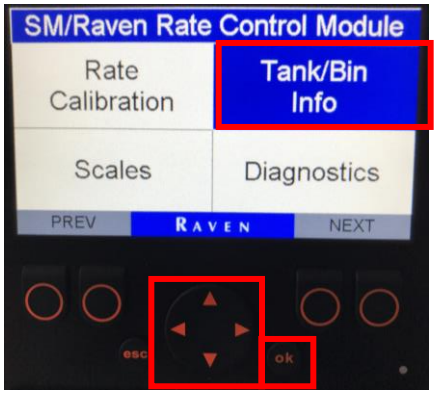
1. Power on the remote monitor by pressing the "**esc**" button on the front of the monitor.
2. Using the UP/DOWN or LEFT/RIGHT arrows, highlight the box "**Diagnostics**" box blue.
3. Press "**ok**" to enter the Diagnostics Info screen.
4. Press either button below "**Next ECU**" to toggle between RCMs.
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.*



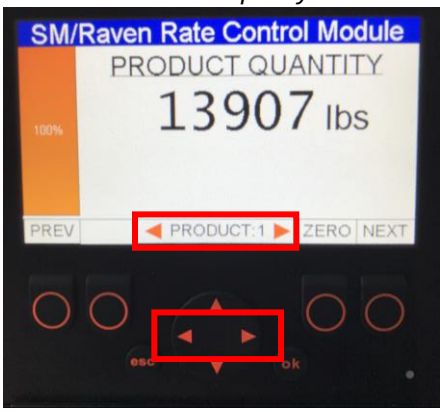


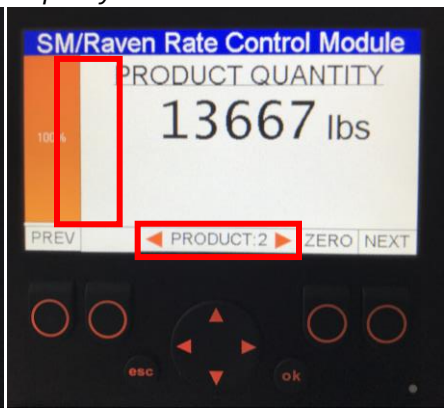
READ AND ZERO TANK WEIGHT VIA TANK/BIN INFO

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.

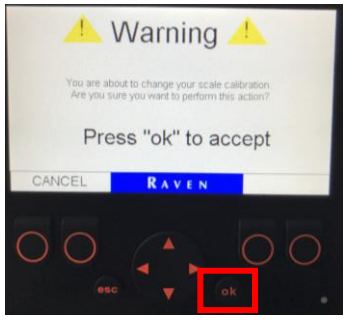


4. The weight of the previously selected product will be displayed.
5. To change the selected product, press the LEFT/RIGHT arrows.
   NOTE: *The percentage on the right side will display the percentage of product in the tank based on the Tank Capacity. The Tank Capacity is set from the In-Cab monitor.*

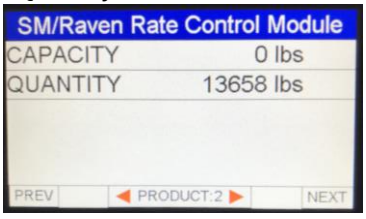




6. To zero out the product weight, press the button directly below "**ZERO**". Then, press **ok** to accept that the tank will be zeroed out. Press **CANCEL** to cancel the operation.



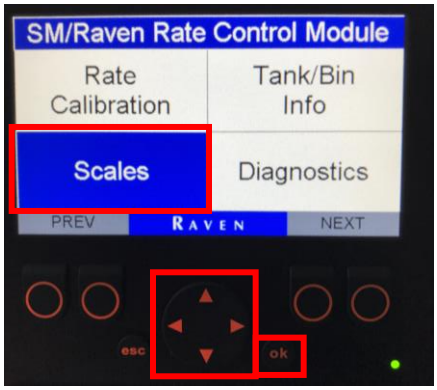
7. Press the NEXT or PREV buttons to toggle screen view. The toggled view will display text only for the Capacity and Quantity.



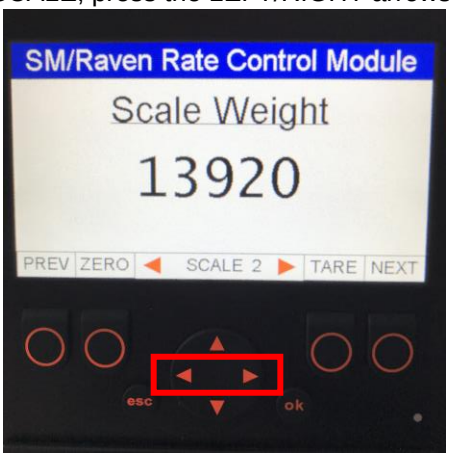
8. Press the "**esc**" button to return to the main menu.

READ AND ZERO TANK WEIGHT VIA SCALE

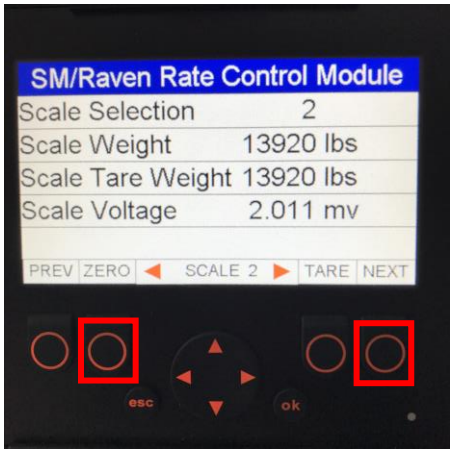
1. Power on the remote monitor by pressing the "**esc**" button on the front of the monitor.
2. Using the UP/DOWN or LEFT/RIGHT arrows, highlight the "Scales" box blue.
3. Touch "**ok**" to enter the Scales Info screen.



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



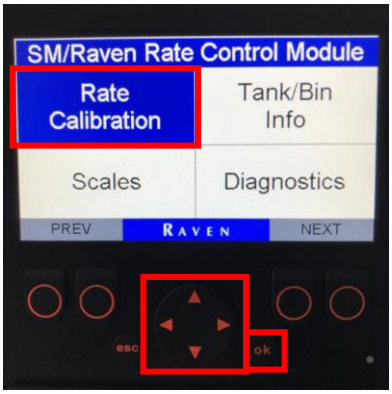
6. To Zero out the product weight, press the button directly below "**ZERO**". Then, press **ok** to accept that the tank will be zeroed out. Press CANCEL to cancel the operation.
7. **The TARE option is NOT USED on a SeedMaster Machine. Please ignore this option.**
8. Press the NEXT or PREV buttons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



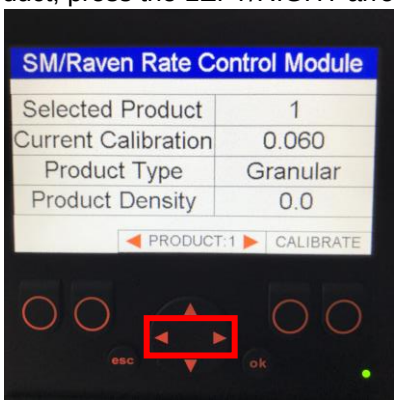
9. Press the "esc" button to return to the main menu.

REMOTE CATCH TEST CALIBRATION PROCEDURE

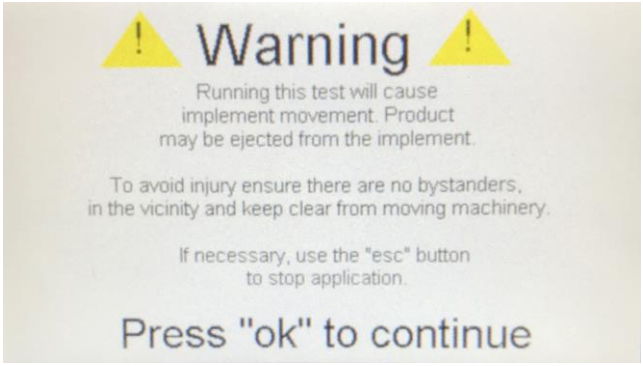
1. Power on the remote monitor by pressing the “**esc**” button on the front of the monitor.
2. Using the UP/DOWN or LEFT/RIGHT arrows, highlight the box “Rate Calibration” blue.
3. Touch “**ok**” to enter the “Rate Calibration” info screen.



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

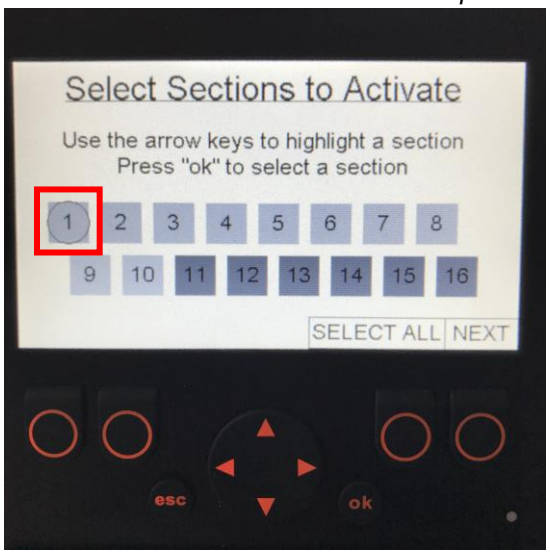


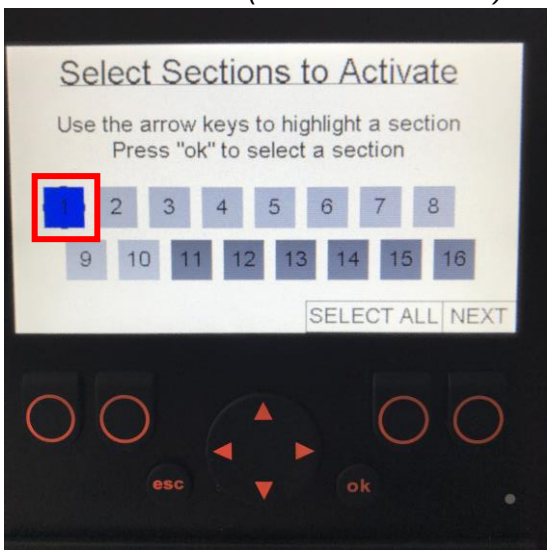
6. The display will show what product is selected, the current calibration value, product type, and product density. The product density can be ignored.
7. After confirming the product that is to be calibrated, press either button below the text that says “**CALIBRATE**”.
8. A warning will be displayed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



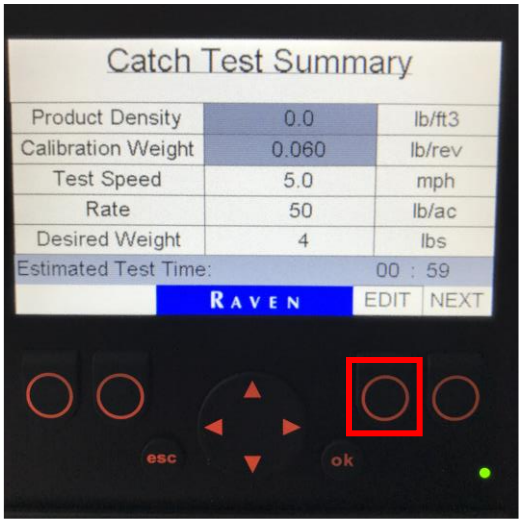
NOTE: Before continuing to the next step of the calibration process, please ensure that the System Pressure Hydraulic Remote is engaged and that the Zone Command has air pressure. The meter will not turn over if there is no system pressure. If there is no air pressure ALL ZONES WILL BE ENGAGED, and ALL METERS WILL TURN causing product build up in the drop tubes. After confirming the above continue to step 10.

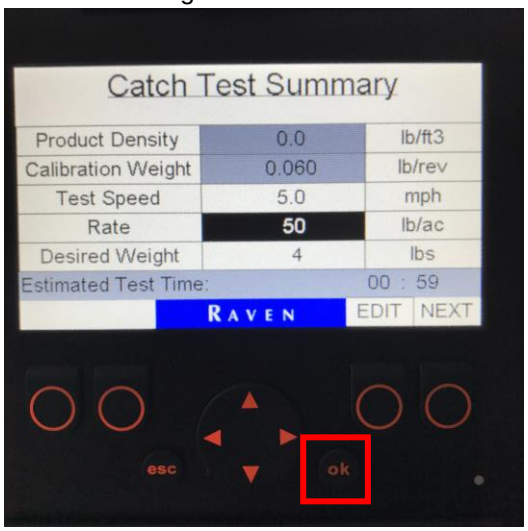
10. After selecting “ok”, the “**Select Sections to Activate**” page will be displayed.
11. Use the arrow keys to highlight a section, then press “**ok”** to select a section. A circle around the number will represent the current section that is selected. After pressing the “**ok**“ button, the section 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)*



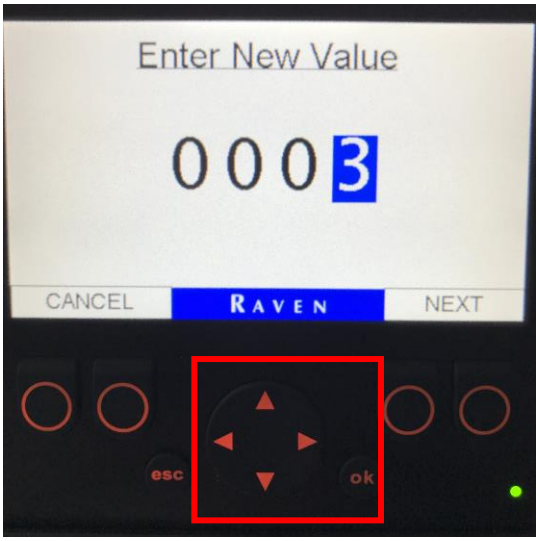


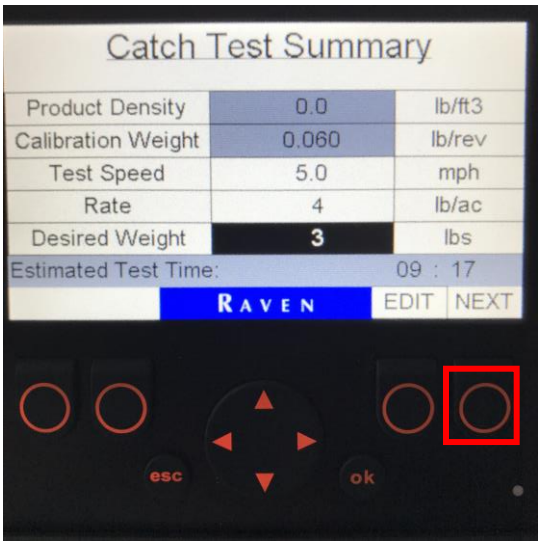
13. The **Catch Test Summary** page will be displayed. The test speed will default to 5mph. This is a sufficient test speed for calibrating and will not need to be changed. Please review the Rate and Desired Weight.
    ***NOTE**: Set the rate to the actual rate that will be applied in the field. The 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”. T**hen 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.



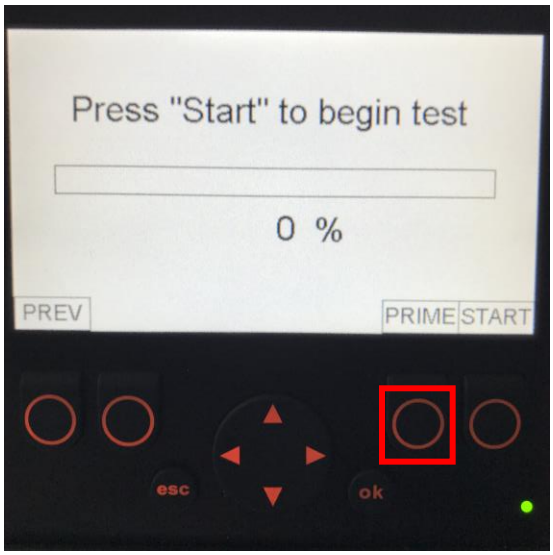


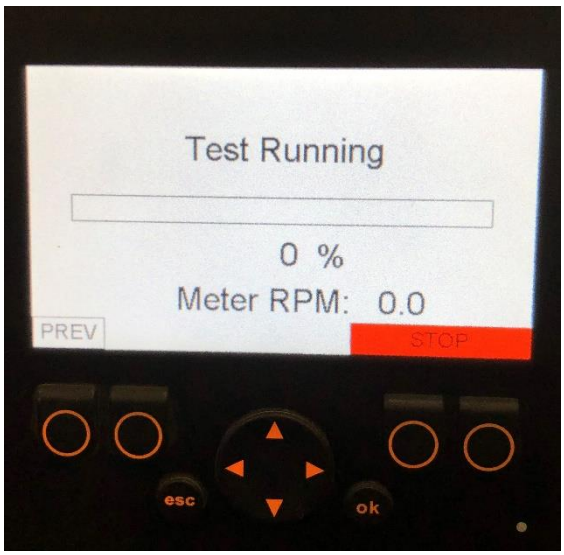
16. Using the LEFT/RIGHT and UP/DOWN arrow enter a new value for the Rate or Desired weight. When the desired value is entered press the "**ok"** button. The Catch Test Summary will be displayed with the new values. If the values are satisfactory, continue by pressing the NEXT button.
    ***NOTE**: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





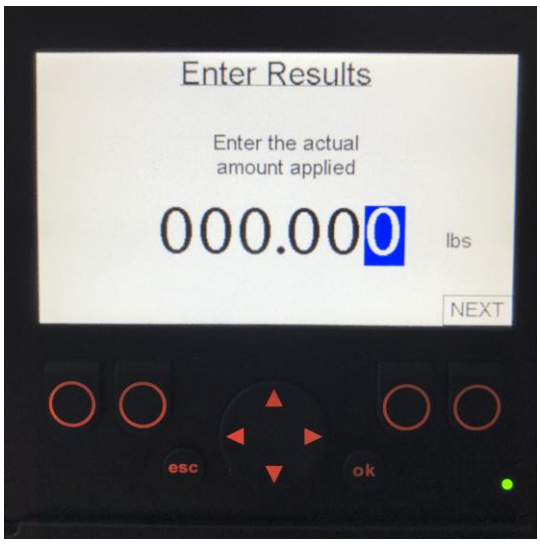
17. If no product has been metered though the meters, please use the "**PRIME"** button to prime the meters. Repeat as necessary. Please make sure the pail is empty before proceeding to the next step.

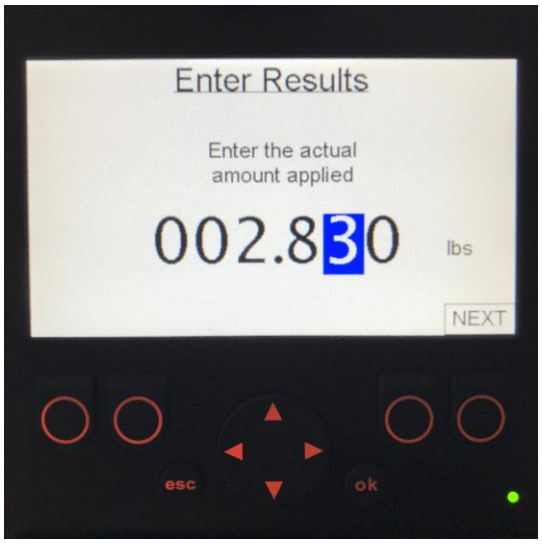




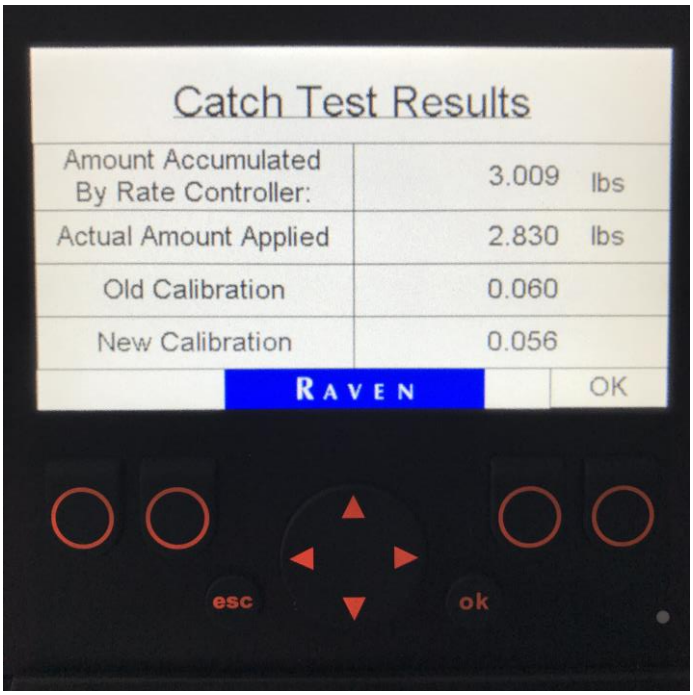
18. Press the START button to begin metering product into the pail. The test will begin and display the Meter RPM in addition to the catch test's progress.
19. If the product being expelled does not fit in the pail, press the STOP button to stop the catch test. Then, continue to the next step. Please 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 through 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 the In-Cab Monitor.
7. Check Remote Tank Monitor operation.
8. If the problem still exists unplug and plug back in the Remote Tank Monitor from the main harness and repeat steps 1 through 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**:

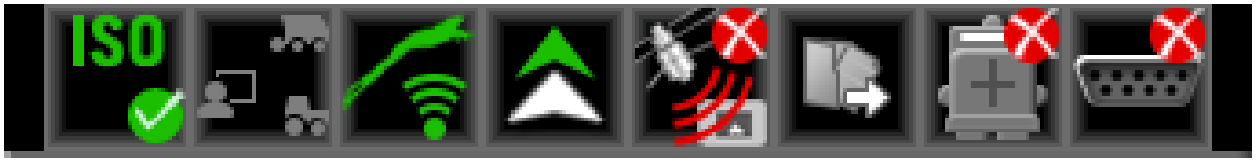
1. Close any active jobs by selecting the home icon in the lower, right corner of the display.
2. Touch the administrator or user panel.

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 not covered under warranty.

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.

Fleet Analytics. This indicates the communication status of Raven Fleet Analytics such as fuel rate, engine load, and fuel level. SeedMaster does not utilize this function at this time and the icon will remain grey.

Slingshot®. The status of a Slingshot Field Hub or Wireless Network is displayed. A red "X" will display on this indicator if the monitor is not connected to a network. When a network is connected, 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 an 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.

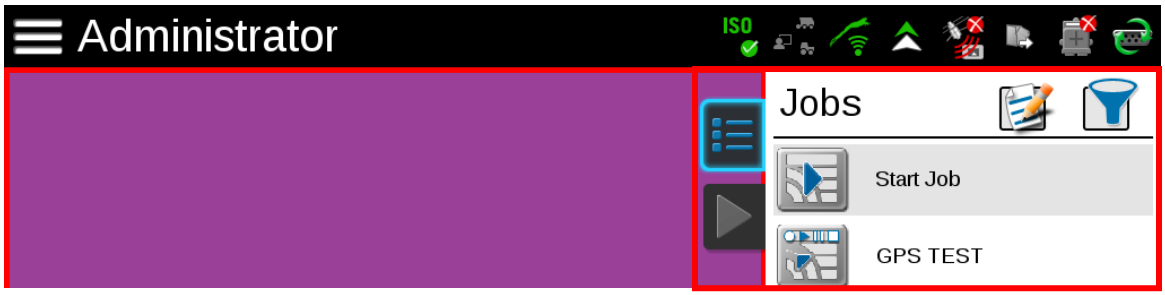
File Transfer. The status header displays the status of wireless file transfers with a Slingshot® Field Hub. If a file transfer is in progress, the file transfer indicator will display a green "in progress" status.

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).*

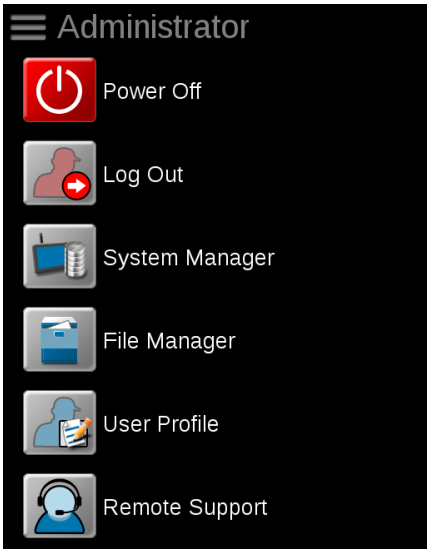
UT (Universal Terminal) PANEL

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 Off

Touch the power off 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.*

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 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.

User Profile

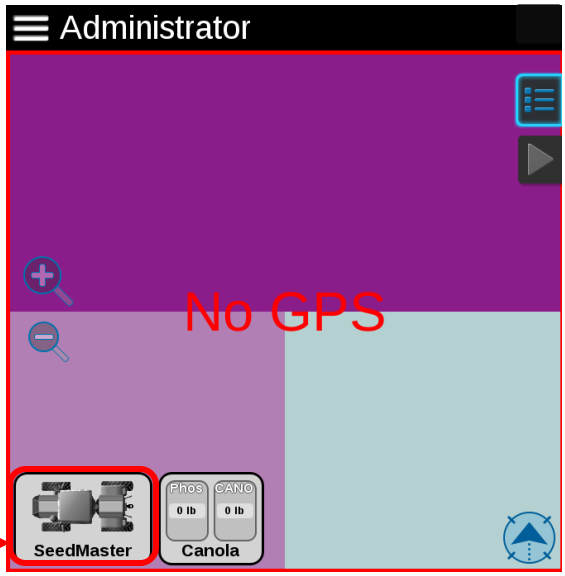
User profiles may be created for each operator to save user preferences such as language and displayed units. This will maximize each user’s comfort level while operating the equipment. Each user profile may also be assigned a unique Personal Identification Number (PIN) to secure the device from unauthorized 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.

Remote Support

The Viper 4+ can be accessed remotely by SeedMaster and SeedMaster dealers to help diagnose any issues regarding the monitor or the components connected to it. For a full procedure on Remote Support, please see “WiFi or Tethered Remote Support” on page 118.

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

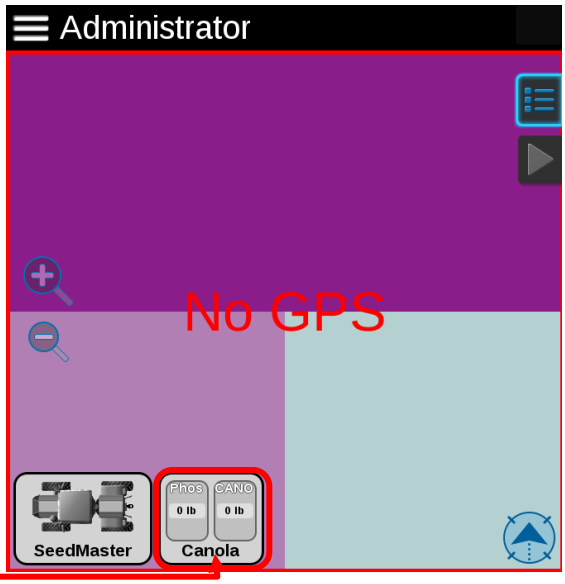
A machine configuration saves vehicle or tractor calibration information, implement geometry for each configured implement, and CANBUS system information. If a configuration is completed for a specific implement, the device will automatically identify and select the matching configuration on startup. 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 set up, 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.

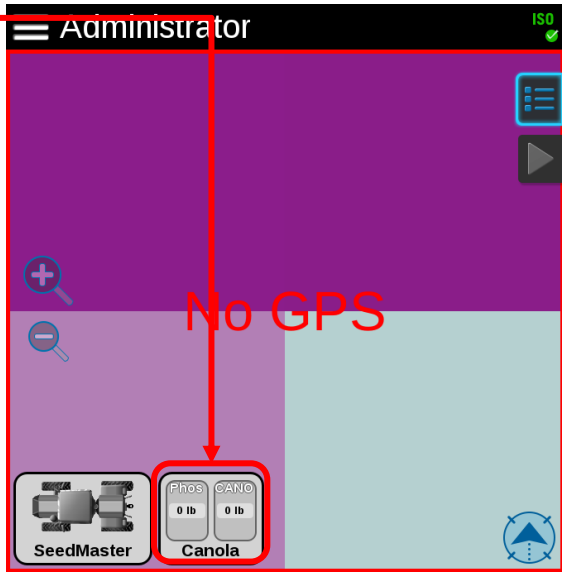
10. Touch the Add button to add Farm data. 
11. There are several data fields that can be added to the Farm Info. Add Farm info as desired. The more information the better. Touch the check mark when complete. 
12. Touch the Field Panel to add Field data.

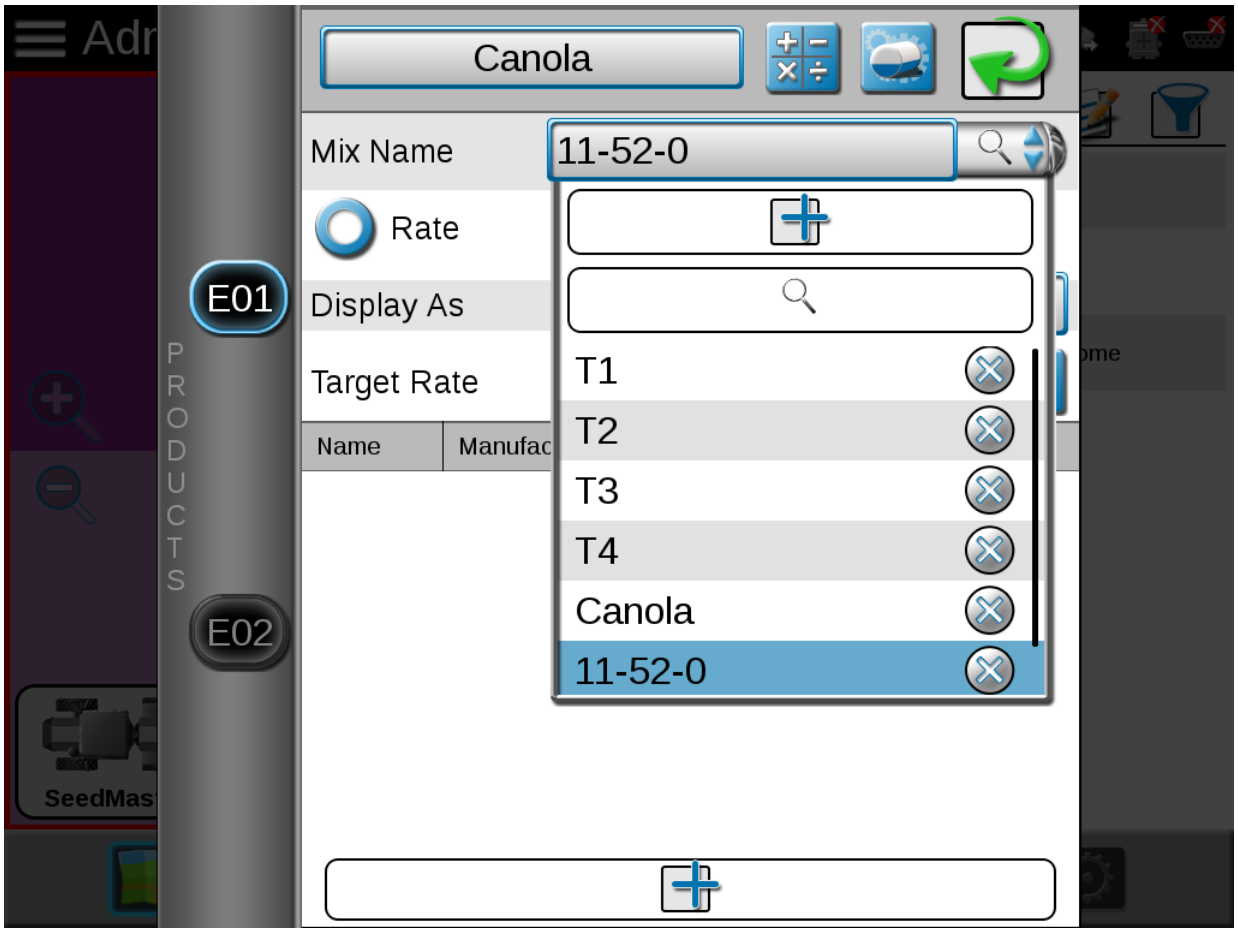
13. Touch the Add button to add Field data. 
14. There are several data fields that can be added to the Field Info. Add Field info as desired. The more information the better. Touch the check mark when complete. 
15. After adding the Grower/Farm/Field information touch the check mark to confirm. 
16. 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, 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. (E01, E02, E03, or E04).
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.





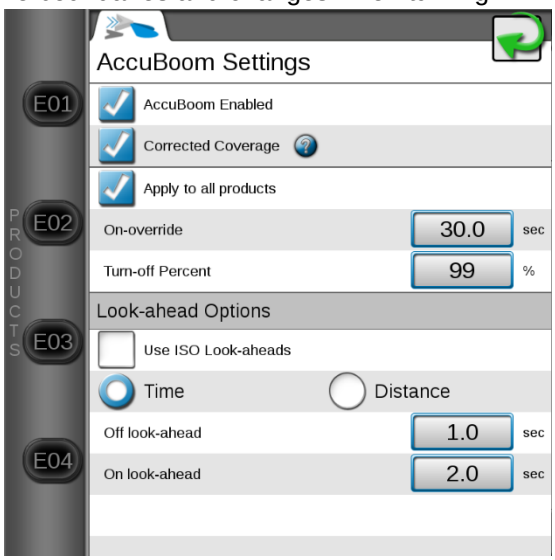
AUTO ZONE COMMAND LOOK AHEAD TIME SETUP

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.


AccuBoom

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. The 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. **Use ISO Look-Aheads:** The monitor can be configured to use look ahead times set on the RCM in “Precision Farming Setup”. This is for future use and should be left unchecked.
7. **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.*
8. **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.
9. **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.



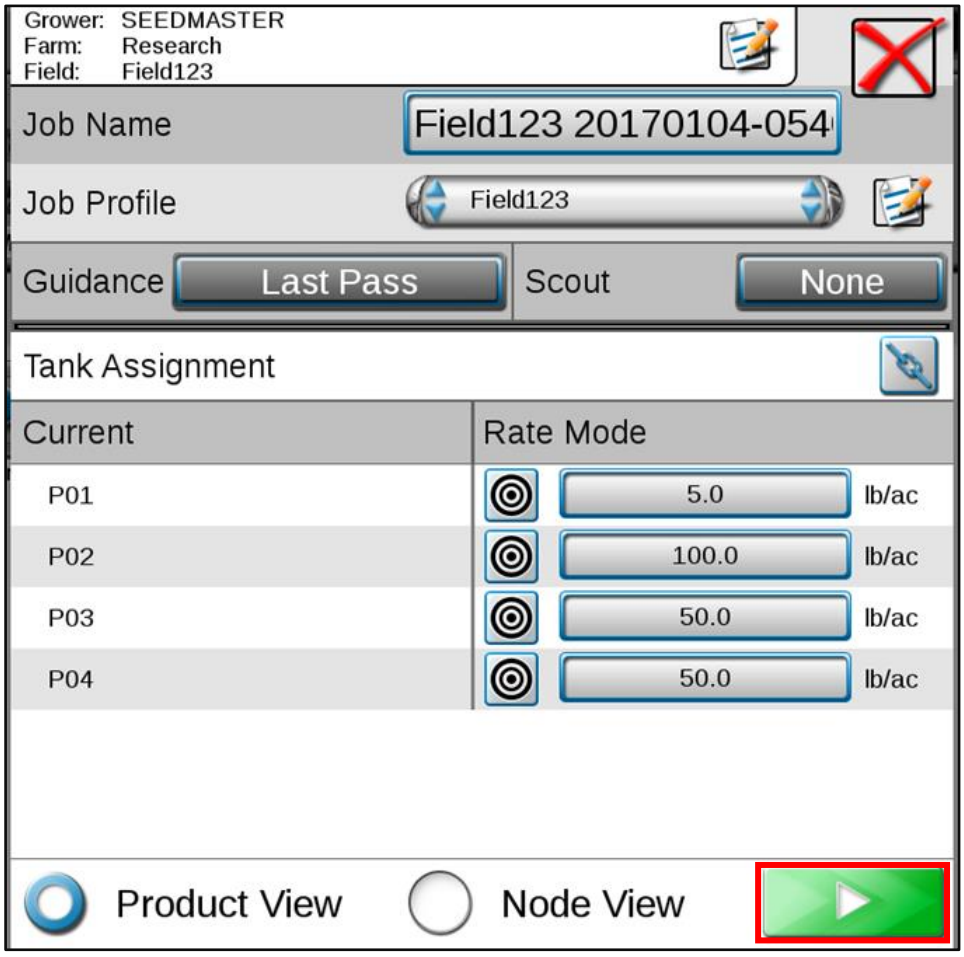
Factory Default Look ahead times: Use the chart below as suggested starting look ahead times. ***It is not SeedMaster’s responsibility for skips or misses. Please ensure that you always have product being delivered to unapplied areas when seeding.***

TANK TYPE	TURN-OFF	TURN-ON
NOVA TANK	2.5 SECONDS	6 SECONDS
ULTRAPRO II	2.5 SECONDS	4 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.

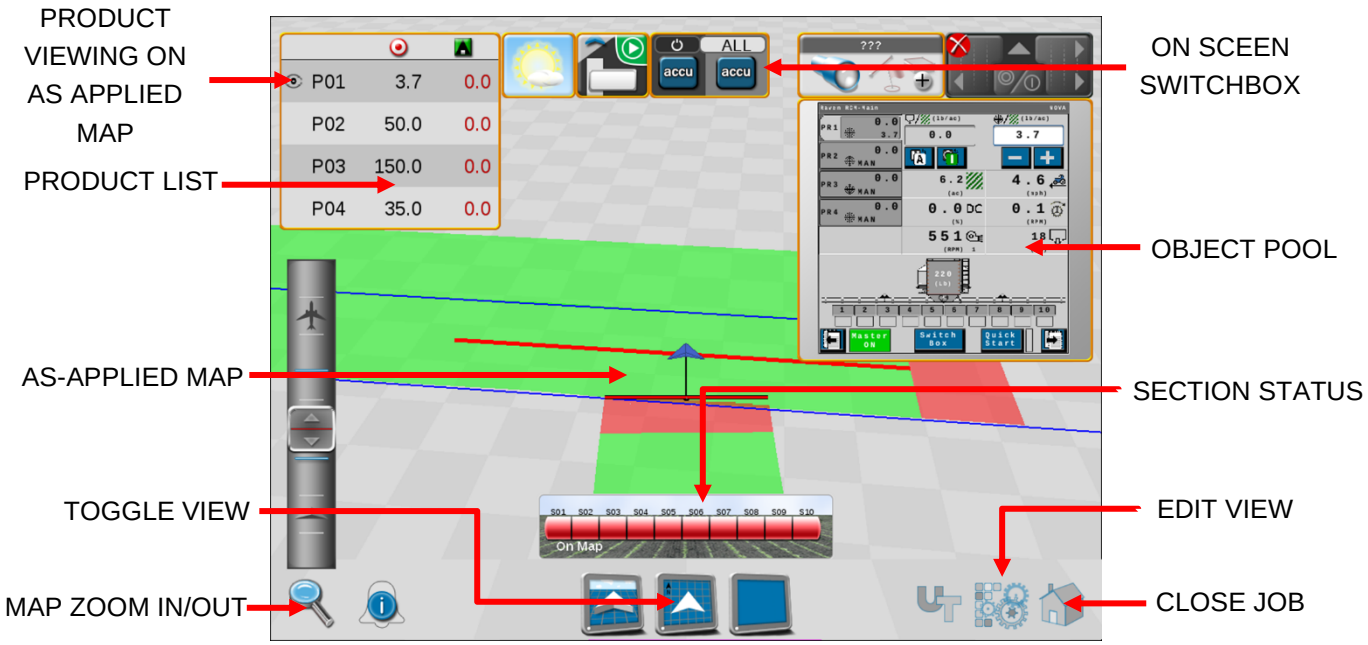
1. Review ISO TXB Quick Start Procedure (**PAGE 26**).
2. Review ISO RCM Quick Start Procedure (**PAGE 58**).
3. Review AutoZone Command Look Ahead Time Setup (**PAGE 103**).
4. Choose the correct Product Profile.
    a. Touch the Product Profile Panel.
    b. Choose the Product Profile for the specific field.
    c. If you need to create a Product Profile, see **PAGE 102** 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 101** 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

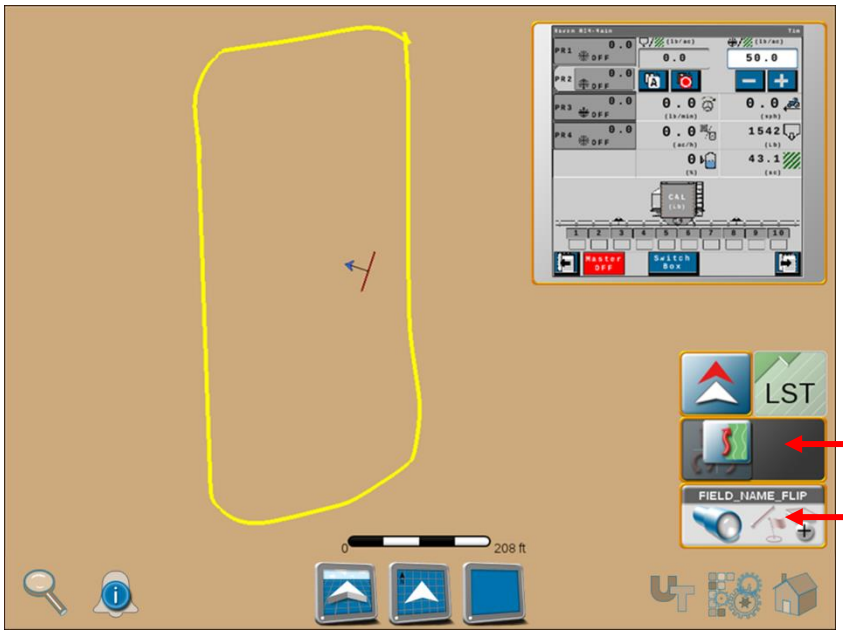
There are 3 different operator run screens: 3D Guidance, Field Review, and Widget View. After starting a job, you can easily toggle each view by touching the three icons located on the bottom in the middle of the screen. The icons from left to right are 3D Guidance View, Field Review map, and Widget View.

GUIDANCE VIEW



WIDGET VIEW

FIELD REVIEW MAP



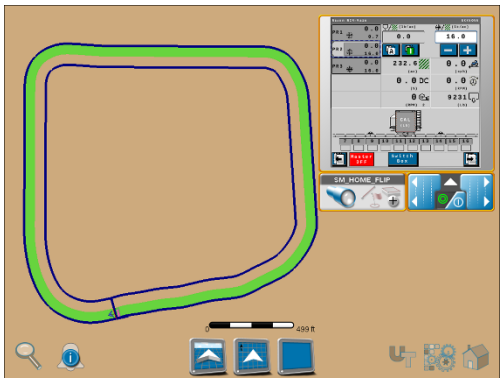
MANAGING SCREEN LAYOUTS

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. 

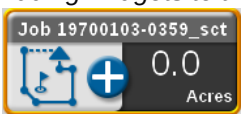
CREATING A FLIP MAP AND BOUNDARY FOR FIELD

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

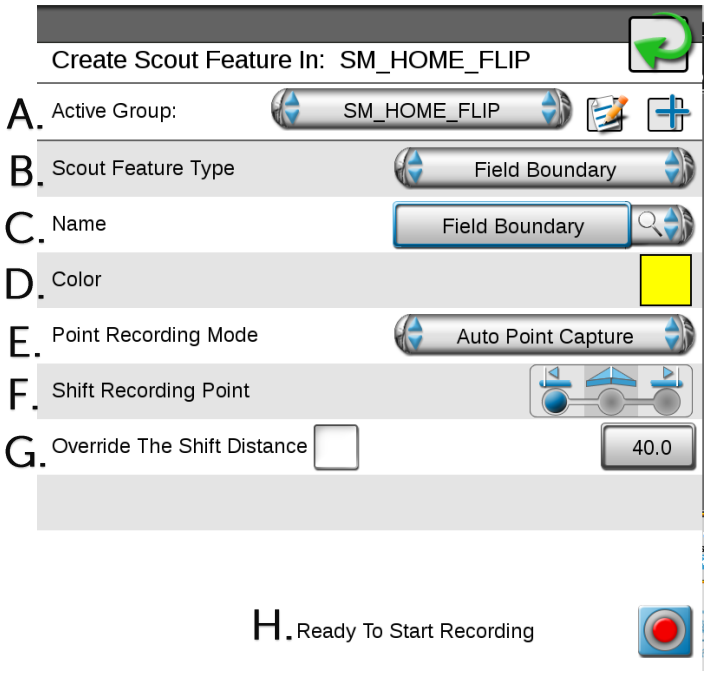


1. From the run screen, touch the Scouting Widget.

   ***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.

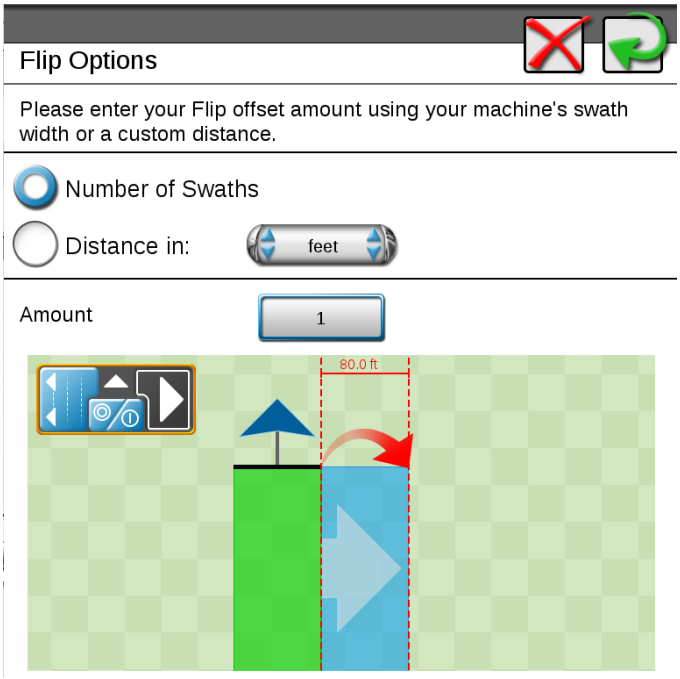
FLIP WIDGET OFF

FLIP WIDGET ON

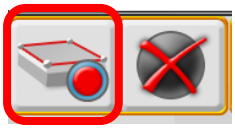
NOTE: If the FLIP widget is not on your run screen you will need to add it. Please see the chapter for Managing Screen Layouts.

4. Set how many virtual passes you would like to create. The FLIP widget will default 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.

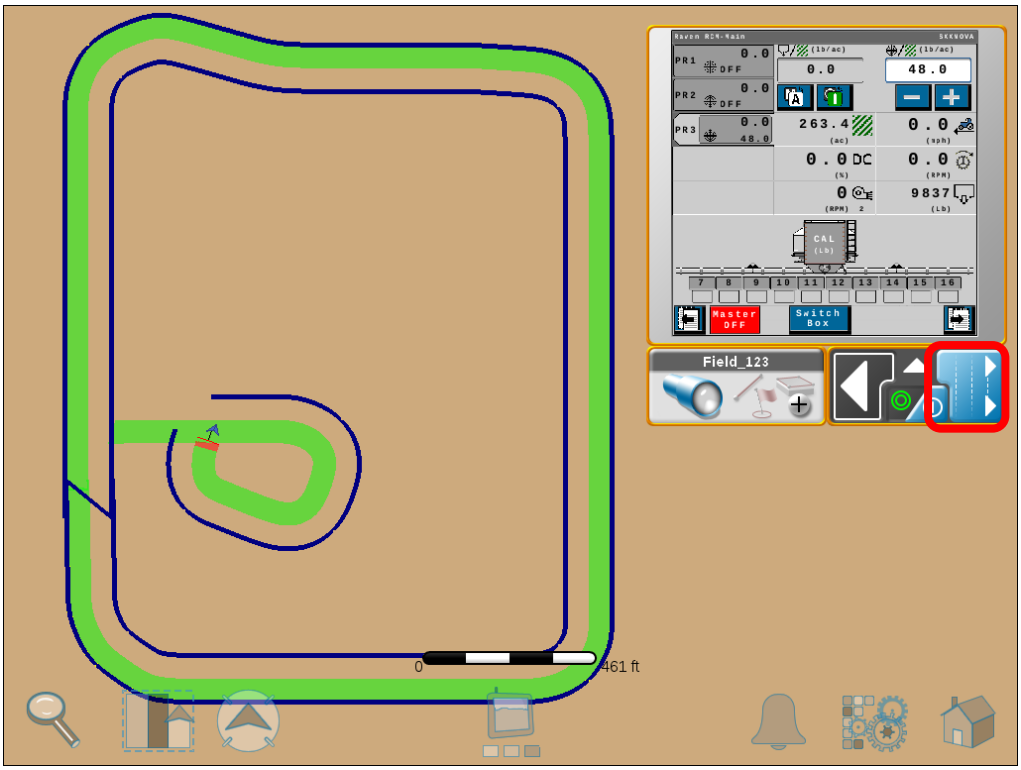
CREATING AN INSIDE FLIP MAP

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**

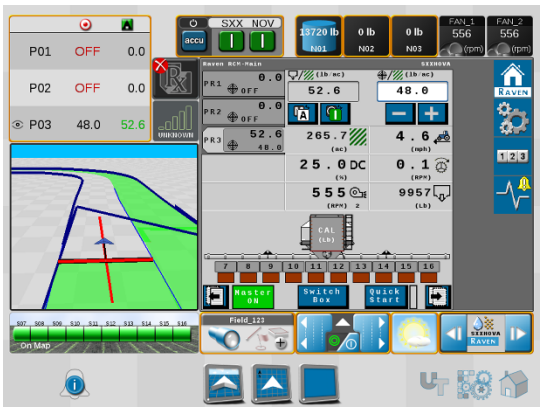
2. Drive around the object until you reach the previously applied area. Once all the zones are off, stop the machine.
3. Touch the FLIP LEFT or FLIP RIGHT button to complete the inside FLIP Map.
4. Repeat as necessary.



SEEDING THE VIRTUAL PASS

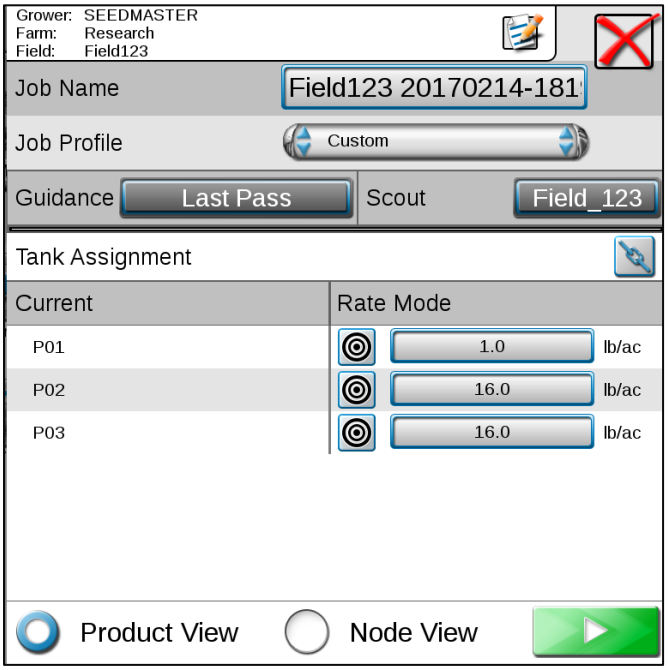
After completing the field or around an object, the virtual pass will need to be seeded. To override FLIP, the on-screen switch box will need to be set to on.

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



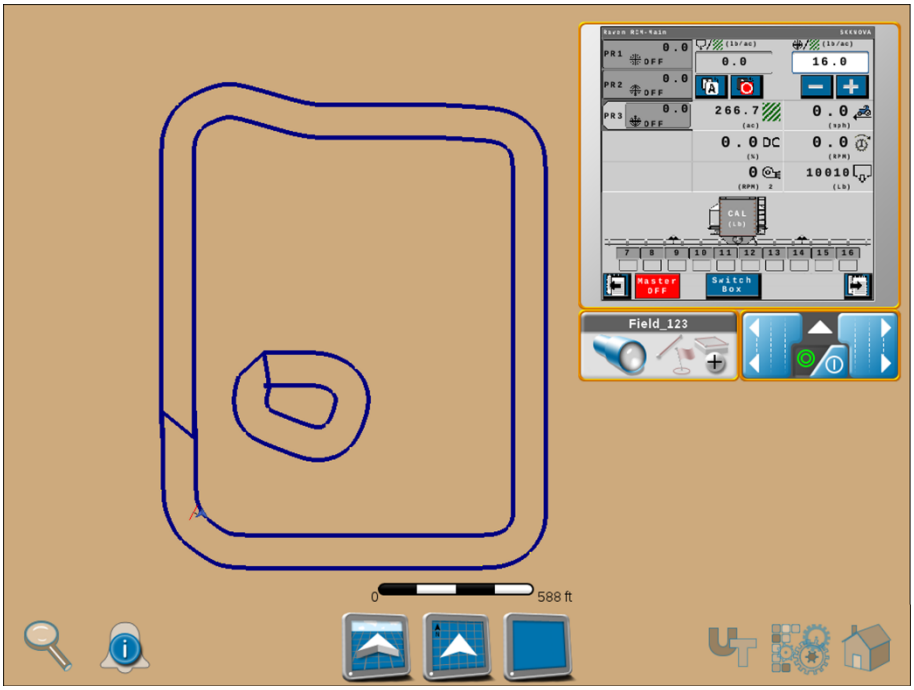
LOADING A PREVIOUSLY CREATED FLIP MAP

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.

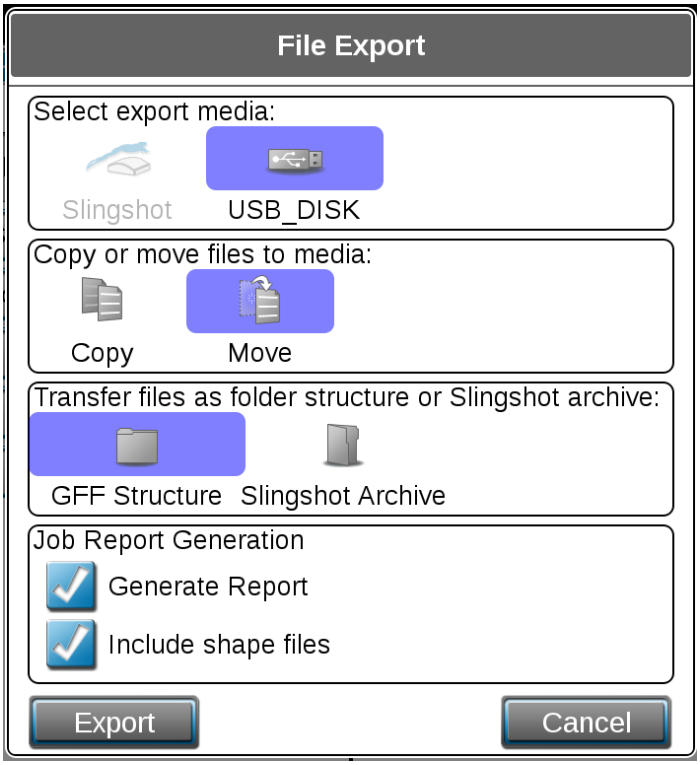
All Viper 4+ job files are stored in memory. The storage location for these files is of a fixed size and will hold a large, but limited number of files. File maintenance should be conducted on a regular basis to ensure enough storage space is available for future jobs.

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 on 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. 

Serial Devices

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

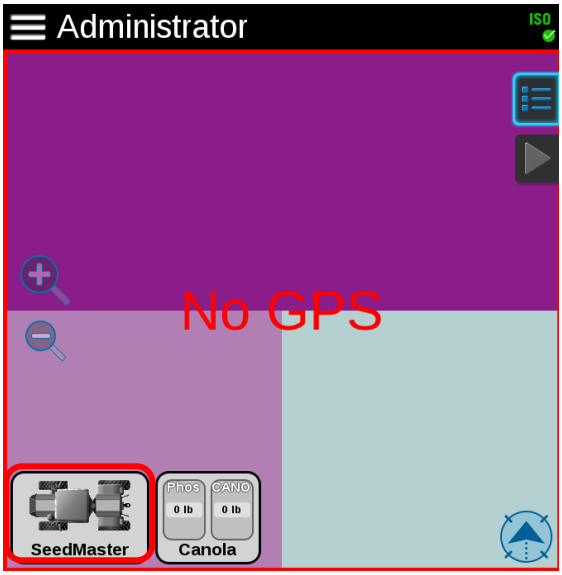
NOTE: *There are Commonly used 3rd Party GPS Patch Cables. Please contact your GPS supplier to obtain the correct patch cable.*

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.

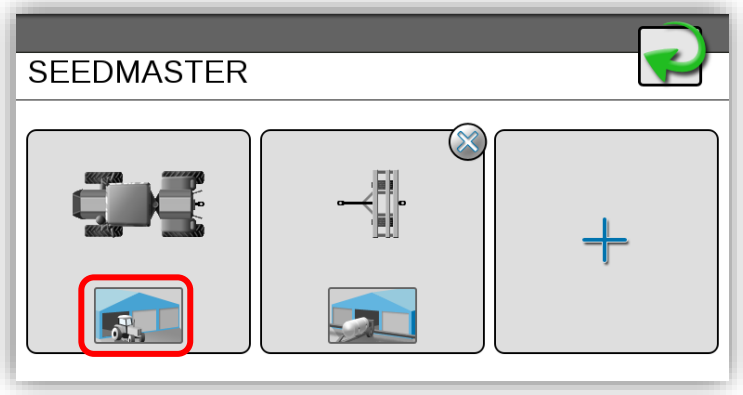
SETTING THE TRACTOR MEASUREMENTS

The Viper 4+ and RCM are set up for your specific SeedMaster machine from factory. The Viper 4+ ***IS NOT SET UP*** for your specific tractor pulling your SeedMaster machine. ***It is important to configure the tractor measurements to ensure proper mapping. Failure to do so will result in inaccurate as applied mapping and sectional control.*** 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 all the machine measurements to ensure correct as applied mapping.

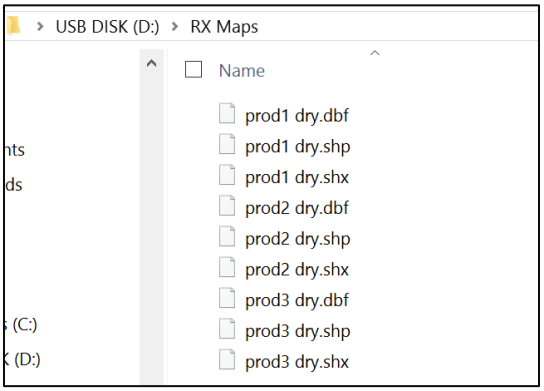
10. Touch the Green check mark to finish setting up the tractor.
11. Touch the Green check mark to exit the Machine Garage.
12. Touch the Green check mark to exit the Tractor Machine Setup.

NOTE: The TXB implement Tongue and Hitch Lengths should be set to 275 inches for Tongue and 164 inches for Hitch.

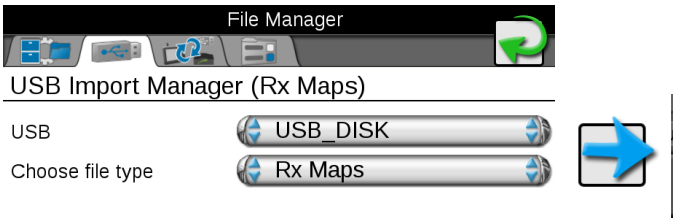
IMPORTING PRESCRIPTION MAPS

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. Please refer to "System Manager" and "Unlocked Features" to understand your monitor's Rx capabilities.*

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 with the RX map. See below.

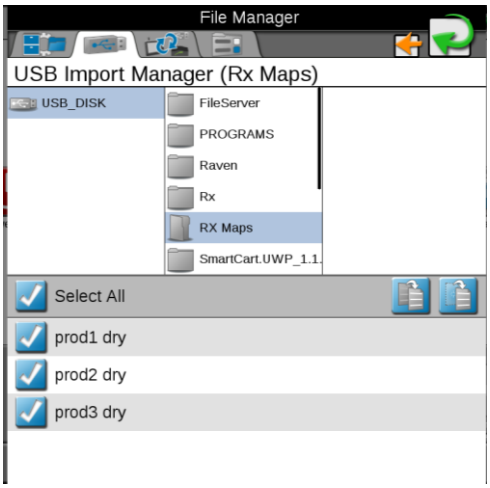


4. Insert the USB Drive into the Viper 4+.
5. Go to the Administrator Panel on the Viper 4+.
6. Touch the File Manager button.
7. Touch the USB Drive Tab.
8. Touch the drop-down menu for "USB" and choose your USB drive.
9. Touch the drop-down menu for "Choose file type" and choose "RX Maps".
10. Touch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

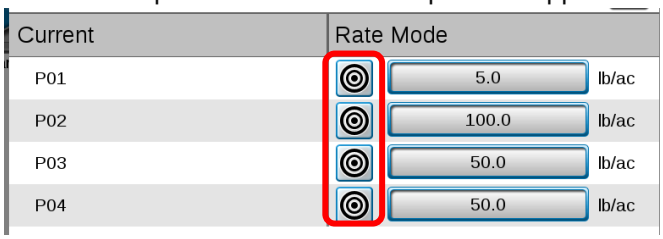
14. Touch the check mark to confirm the RX Map import.
15. A pop-up window will appear when the files have been successfully imported. Touch OK to finish.
16. Touch the green arrow to return to the main screen.



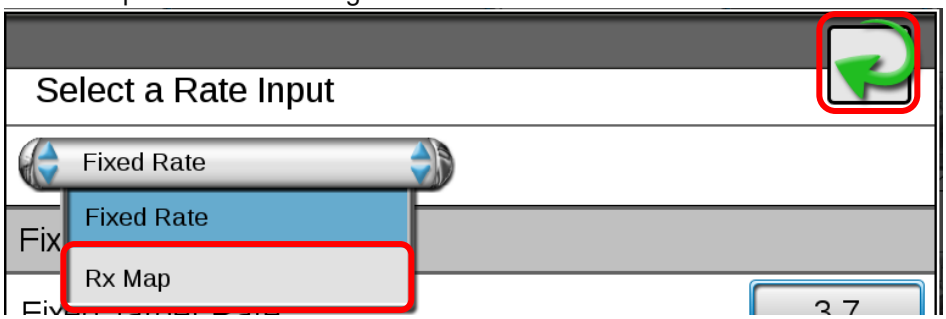
LOADING RX MAPS WITH A JOB

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.

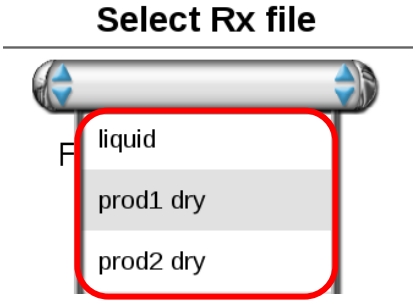
1. Determine what product the RX map will be applied to.
2. Touch the target icon for the product that the RX map will be applied to.



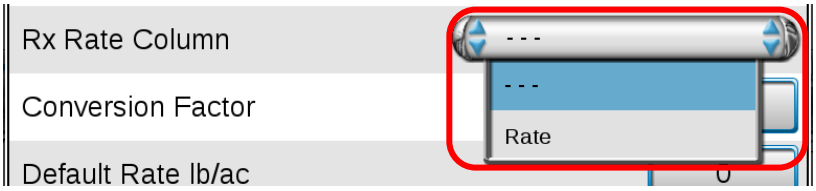
3. Touch the drop-down menu below “Select a Rate Input”.
4. Select “Rx Map”. Then touch the green arrow.



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

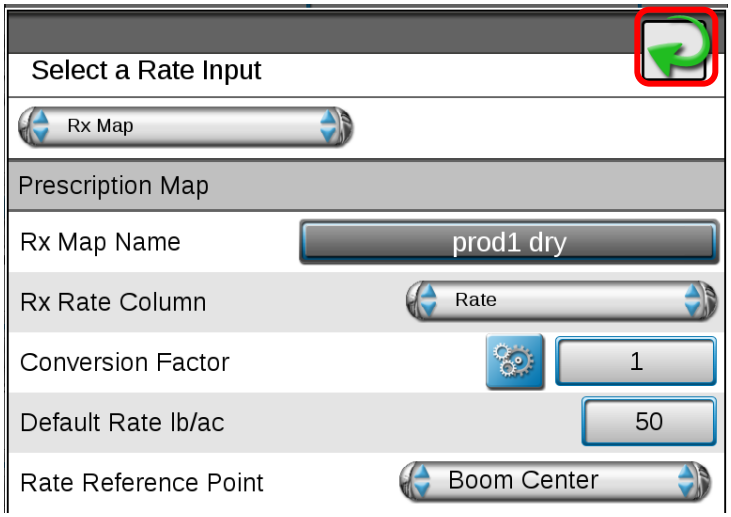


6. After selecting the RX map, touch on the drop-down menu for “RX Rate Column”. Then choose the desired Rate.

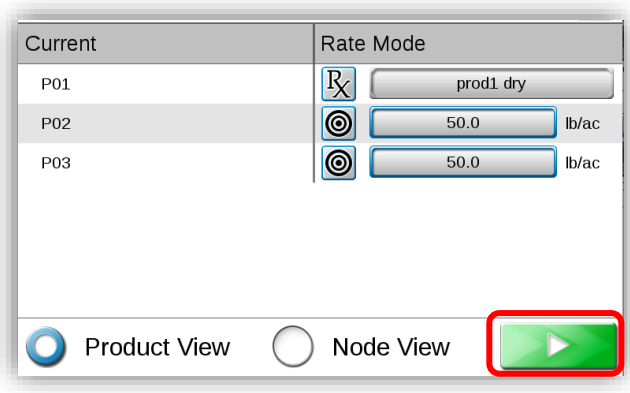


7. The conversion factor for the RX map is set to 1 for a ratio of 1 to 1. If you desire to cut the rates in half for the RX Map enter .5.
8. The Default Rate for applying outside of the RX map is set to 0. If desired, change this to your own desired default rate.

9. The rate reference defaults to the center of the machine.
10. The RX map is ready for application. 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 Control Module (DCM) or SeedMaster Rate Control Module(s) (RCM(s)). Please follow the procedure below to update either the RCM(s) or DCM.

Downloading the ECU Hex Files

1. Go to www.seedmaster.ca.
2. Go to the “Support” tab, then click on “Software Downloads”.
3. Under the “ISOBUS DRILL DCM & RCM” heading, click on the latest software package.
4. The software will begin to download to your “Downloads” folder in File Explorer.
5. After the software has download navigate to the “Downloads” folder in File Explorer.
6. Right click on the Software Package then click “Extract All”.
7. Verify the folder it is extracting to and click “Extract”.
8. Insert a USB drive.
9. Open the unzipped folder and navigate to the .hex file for the ECU that is being updated.
10. Right Click and copy the .hex file.
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, 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 the 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 select it.
8. Touch the blue right arrow.
9. If the file(s) were copied successfully to the USB, 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 safely remove the USB drive.

Installing the new ECU Firmware

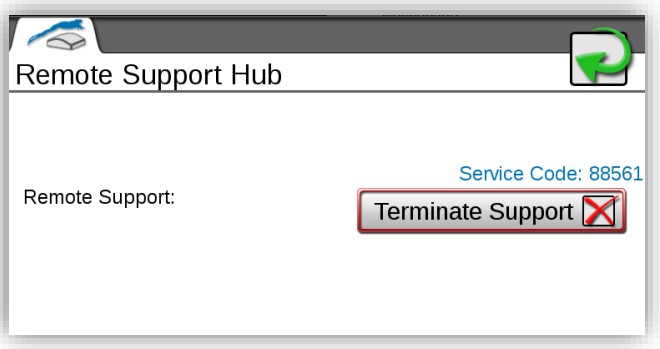
1. Touch “Administrator”.
2. Touch “System Manager”.
3. Touch the tab that shows a blue computer screen.
4. Select the ECU that is being updated to highlight it blue.
5. Touch the drop-down Menu below “Versions Available”. Then choose the latest version.
6. Touch the green down arrow to apply the update.
7. Wait for the software to install. After the installation 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.

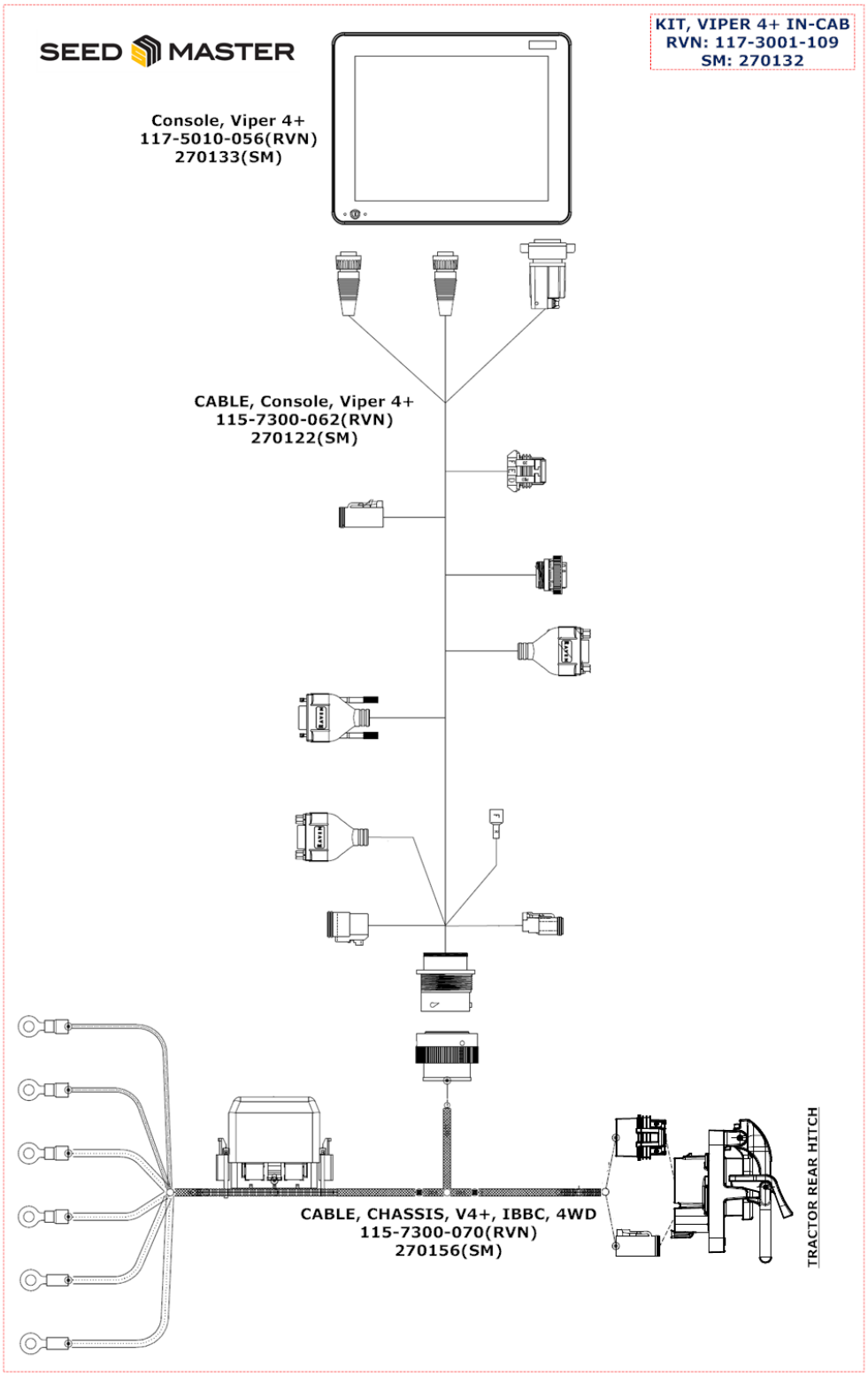
3. Swipe left to the second page**.**
4. Touch the "**Networking**" icon.
5. Enable the Wi-Fi Connection by touching the drop-down box and selecting "**Client**".
6. Wait about 30-60 seconds. If your network does not appear, touch the refresh button. If it still does not appear, please ensure that you 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 **"Remote Support"**.
14. Touch the "**Request Support"** button.



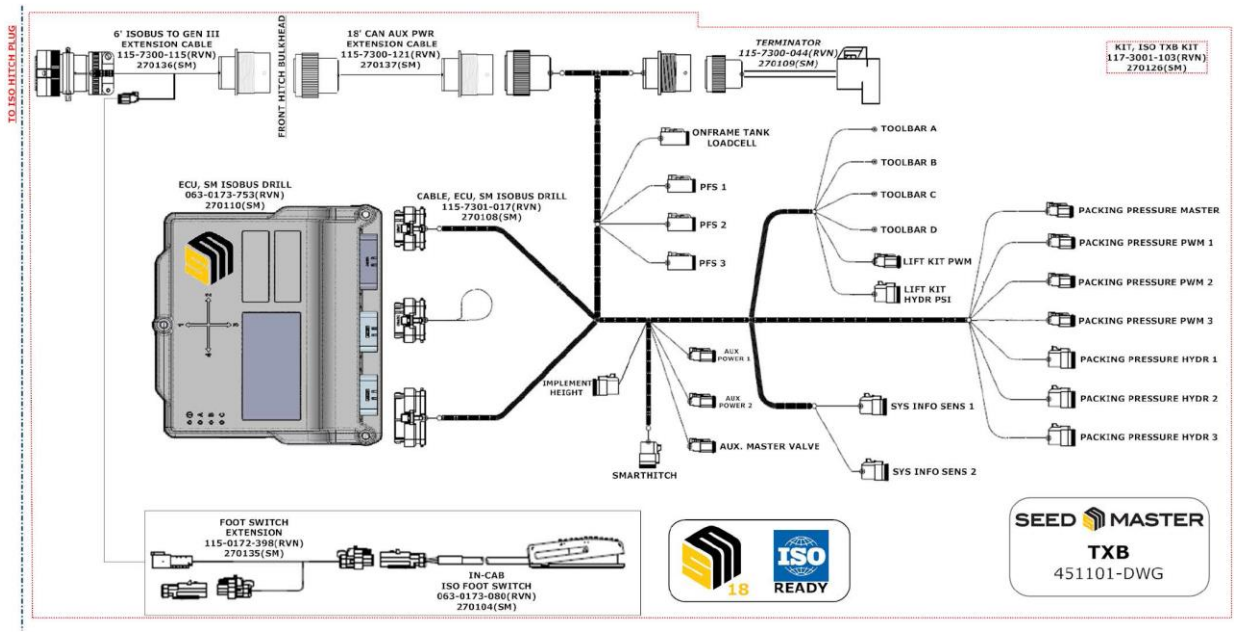
15. Touch "**Yes**" to agree to the terms and conditions.
16. A service code will be displayed above the Terminate Support Button.
17. To end the Remote Support Session, touch the "**Terminate Support**" Button.

SYSTEM ELECTRICAL DRAWINGS

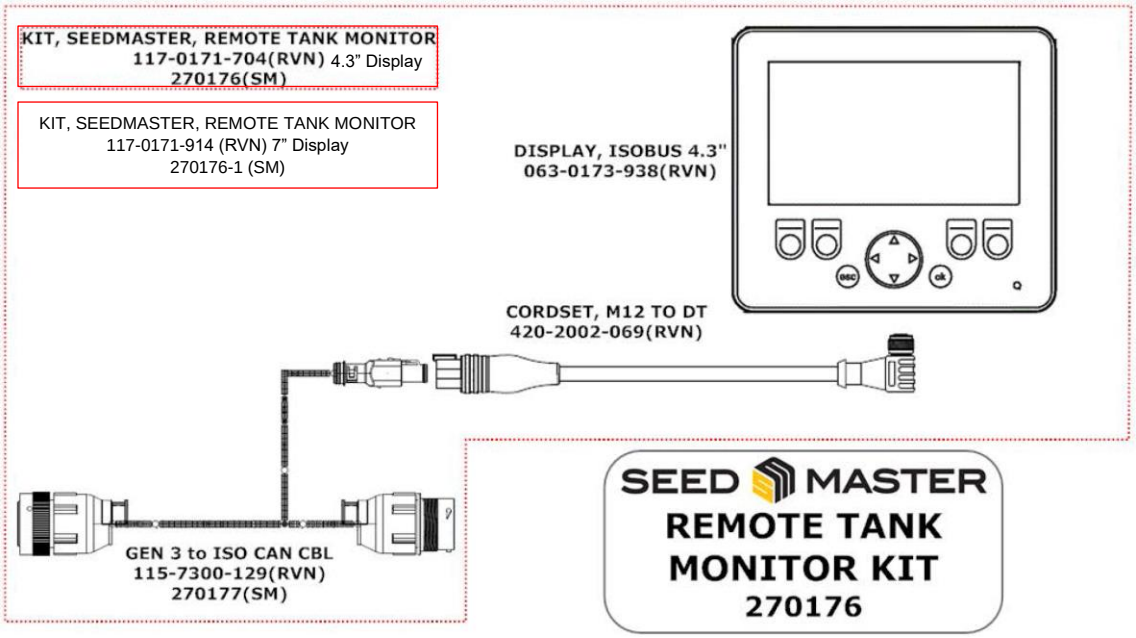
IN-CAB VIPER 4+



ISO TXB ONLY



REMOTE TANK MONITOR



MAINTENANCE CHECKLIST

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Tire Pressure				
Inspect tire conditions and pressures	Refer to Operator's Manual for proper tire pressure			
Wheel Bolt/Nut Torque				
Check torque for wheel bolt/nut	Refer to Operator's Manual for proper torque specifications. Please use a torque wrench only			
Transport Hub				
Grease each hub every 100 hours	Transport wheels have grease zerks			
Transport Caster				
Grease each caster on main pivot every 100 hours	Transport casters have grease zerks			
Grease each caster on walking beam pivot every 100 hours	Walking casters have grease zerks			
Transport Caster Adjustment				
Adjust the main frame caster wheels, pull the machine forward	Main frame casters will be adjusted to caster firmer than wing caster wheels. Wing caster wheels should turn freely (by hand) after adjustment. If they do not, loosen the bolts equally until they pivot freely			
With the caster positioned (driving forward), loosen all four jam nuts on the caster pivot point bolts				
Tighten the two rear bolts until they are snug ensuring left and right bolts are tensioned equally				
Back the machine up so the caster is turned forward (reverse the drill)				
Tighten the two front bolts until they are snug ensuring left and right bolts are tensioned equally				
Tighten the top jam nuts locking everything into place				
Frame Connection and Components				
Check the following:				
• All Frame Components				

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
• Frame Fasteners				
• U-bolts				
• Hydraulic cylinders				
• Lift Kit cables and components (if applicable)				
• Active Wing Brace to ensure brace is properly adjusted and limited (if applicable)	Refer to Operator's Manual For adjustment			
• Packing Force Sensor (if applicable)				
• Check that all components work at proper hydraulic pressure and speeds	Refer to your Operator's Manual for proper hydraulic pressures			
Hitch Tongue, Pintle Hitch and Keeper Bolts				
Inspect all hitch pins for excess wear, stress, and grease bull-pull style	Replace any stressed or worn-out components.			
Inspect hitch fasteners				
Inspect keeper bolts				
Pivot Pins and Keeper Bolts				
Inspect wing folds. Apply grease to greaseable pins.	Replace any stressed or worn-out components. Refer to the Parts Book for parts breakdowns			
Check all keeper bolts				
Link Pins and Retainers				
Inspect link pins, wing fold pins, cylinder pins, and retainers	Replace any stressed or worn-out components. Refer to the Parts Book for parts breakdowns			
Inspect keeper roll pins and cotter pins				
Opener Components				
Inspect openers and check for loose fasteners	Refer to the Parts Book for parts breakdowns			
Adjust main pivot and fertilizer pivot to account for any wear	Ensure proper pivoting while limiting side movement			
Spin each packer wheel and check for mud or failed bearings				

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Zone Command Air Compressor Air Filter				
Remove and clean daily in dusty conditions	A pre-filter upgrade kit can be installed for very dusty conditions (SeedMaster part # 408890). This pre-filter will allow the air compressor to draw from inside the electrical panel box. Please note this is an upgrade which can be purchased through a SeedMaster Certified dealer			
Air Compressor System				
To test complete the following:	**If applicable			
• Connect all wire connections				
• Power on				
• Check that the air compressor starts and builds pressure				
• Ensure that the air compressor shuts off after building 105 psi				
• Inspect for any leaks or air loss				
Air Tank/Regulator/Return Air Filter				
Drain air compressor air tank	Drain is located on the bottom of the air tank			
Drain second valve	Valve is located at the bottom of the air regulator			
Clean return air filter	Located below the product tanks			
Zone Command				
Test function of engaging arms. Clean and lubricate the air cylinder rods	Manually extend the air cylinder that disengages the Zone Command arm and engaging gear. Arm and gear should move freely back to the engaged position.			
	Test this manually by hand when the machine is stationary verifying proper alignment and engagement of drives. Refer to the Operator's Manual			

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Ensure air regulator is set to 65 psi				
Hydraulic and Electric Metering				
Check that the hydraulic drive chains are aligned between both common drive shaft and metering box	Misalignment can cause meter binding and premature wear			
Check that the hydraulic chain tensions are not adjusted too tightly	Tight chains can cause meter binding and premature wear			
Check that the electric meter motor mounting hardware	Fasteners too loose and too tight can cause meter binding			
Check that all sprockets are securely fastened and aligned properly				
Once metering has been serviced, perform the Hydraulic/Electric Metering Stationary Tests to confirm proper operation	Stationary Tests are available on the SeedMaster website and Dealer Portal			
Fan Inspection				
Verify that fan case drain is routed directly back to tractor tank with no restriction	Improperly routed case drains will result in fan seal failure.			
Inspect all product delivery fans				
Ensure fan blade is:				
• Aligned, turns freely				
• free of any dirt and build up				
• Inspect the fan delivery lines				
Ensure that each line is free of:				
• moisture and product build up				
• any type of obstruction				
High flow fans utilize grease zerks on the main drive shaft bearings.	These grease points are outlined in the Bulletin "High Flow Fan Service" at seedmaster.ca			

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Tank and Lid Seals				
Open tank lid using tractor hydraulics and ensure lid seal is in good condition	You will see an indentation where the lid seal contacts the lid frame			
Close the lids and with fans running inspect the tank and lids for any air loss	Refer to the “Nova Inspection” document available on the website and Dealer Portal			
Product Delivery Lines and Towers				
Inspect tower for blocks or restriction				
Inspect primary and secondary lines for wear and air loss				
Inspect towers and caps for wear and air loss				
Conveyor				
Check that conveyor is cleaned out, washed, lubricated, and operation verified	The clean-out doors can be removed and left off allowing moisture to drain out and are located on the bottom of the conveyor			
Nova Tanks				
Check that there is no product remaining in the tanks or meters				
Remove bottom clean-out doors on all Nova meter boxes	The clean-out doors can remain off the meter boxes while the tank is sitting so it does not build up condensation inside the meters or tanks			
Thoroughly clean and wash the inside and outside of the tanks				
With clean-out doors removed from the meter boxes, remove the bolt-in clean out plates on the inside of the meter box below the roller using a 7/16” wrench	Clean beside the meter roller thoroughly ensuring all debris or product is removed between the end of the roller and meter body			
Clean around the meter box rollers				
Grease bearings on Common Drive if applicable				
Run the fans to blow out any product that may be sitting in the distribution pipes after tank cleanout	Refer to the “Nova Inspection” document available on the website and Dealer Portal			

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Ultra SR				
Check that there is no product remaining in the tanks or meters				
Thoroughly clean and wash the inside and outside of the tanks				
Remove the meters and clean them thoroughly				
Thoroughly inspect all High Current electrical connections:	Clean and tighten all ground and power connections			
• High Current connection at hitch	Verify all connections are clean, tight, and properly connected.			
• High Current Junction Box on inner frame rail under tanks				
• Fuse Panel (if equipped)				
• Inline Fuses (if equipped)				
• Boost Boxes				
• Connections at meter motors				
Thoroughly inspect the Residue Management System:				
• Remove any debris from the shafts and tines (ie. twine)				
• Check tine wear				
• Check bushing wear				
• Check Flex couplings for wear and fastener torque				
Washing machine before storage				
Use hot water, soap, and thoroughly wash and rinse. Using compressed air, dry all moving components and use proper post wash lubrication	The clean-out doors can remain off the meters while the tank is sitting so it does not build up condensation inside the meters or tanks			

DESCRIPTION	NOTES	OK	N/A	REPLACE OR REPAIR
Storage				
To lubricate metering components, utilize a synthetic chain lube (ie. Royal Purple) to the drive chains, sprockets, and any appropriate moving components				
Keep drill unfolded when stored for extended period of time				
Relieve all the hydraulic pressures, including the opener cylinders.	All hydraulic cylinder rods should be properly coated with Fluid Film to prevent corrosion			
Free return lines should be left uncapped to ensure no pressure can build during storage				
Indoor storage is ideal				
All monitors should be removed from tractor and machine to be stored indoors during winter months	Viper 4+, Remote Tank Monitor			

NOTES