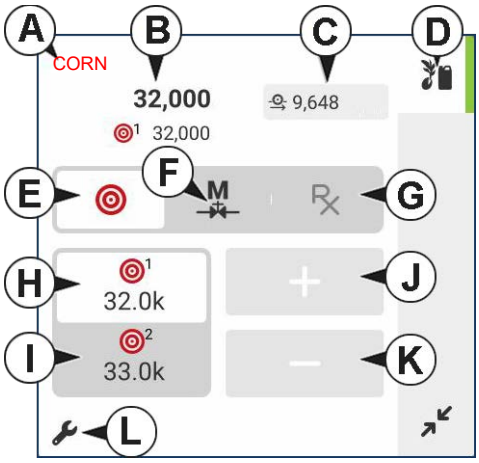
Product Control Toolbox

During SeedCommand® Run Time operations, the Product Tabs are shown in the right-hand side of the Map screen. Press the Product Tabs, and an extended view shows the Rate buttons, Manual Valve Control button, Prescription button, Rate increase and decrease buttons, and the Rate Setup button, all of which are described below.



A. Product

B. Target Rate

C. Actual Rate

D. Product Tab

E. Target Rate Control

F. Manual Rate Control

G. Prescription Map Control

H. Rate 1 Button

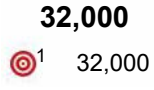
I. Rate 2 Button

J. Rate Increase Button

K. Rate Decrease Button

L. Rate Control Settings

Variety—The Product Control Toolbox can show rates for multiple varieties, depending upon the particular planting configuration. Press the area of the box that shows a particular variety, and a green bar highlights that variety. The Rate 1 and Rate 2 are then shown on the Rate buttons.



Target Rate — The Target Rate is desired planting rate.

NOTE!: In some conditions, the Target Rate may increment more quickly than the Actual Rate.

Actual Rate — is communicated by the shaft rotation sensor.

Manual Valve Control—The Manual Valve Control button allows operators to specify the position of the control valve. Operators use this option to clean out equipment at the end of the day.

Prescription Rate

Rate 1 — The Rate 1 setting represents preset planting rates that allow operators to quickly change between desired target rates for each individual product.

Rate 2 — The Rate 2 setting represents a preset planting rates that allow operators to quickly change between desired target rates for each individual product.

Increase — Increase target rate and when in manual control, button increases meter rate.

Decrease — Decrease target rate and when in manual control, button decreases meter rate.

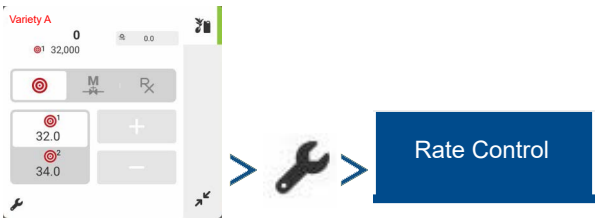
Pressing once on 

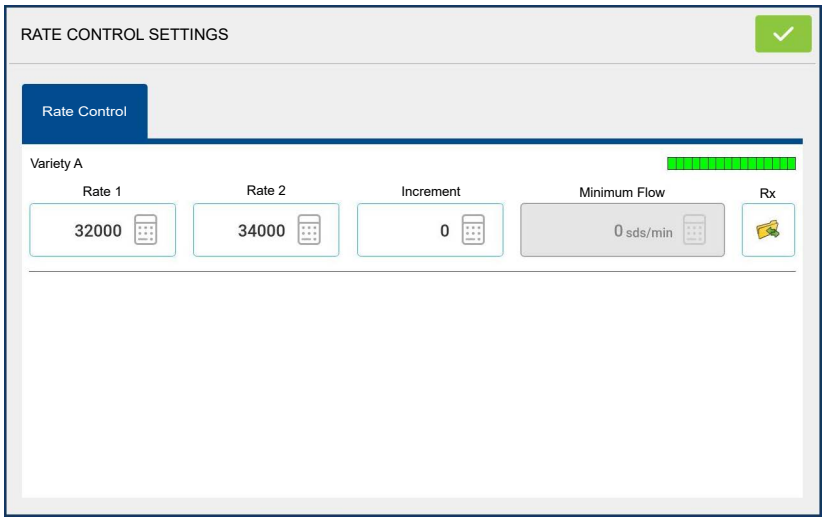
/ 

increments the rate according to the user-defined amount on the Rate Control Settings screen.

Rate Setup button—The Rate Setup button opens the Rate Control Settings screen.

Rate Control Settings





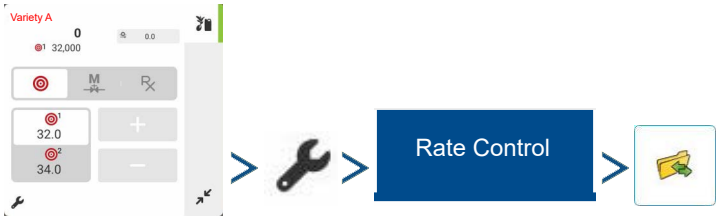
• The Rate 1 and Rate 2 settings represent preset application rates that allow operators to quickly change between desired target rates for each individual product.

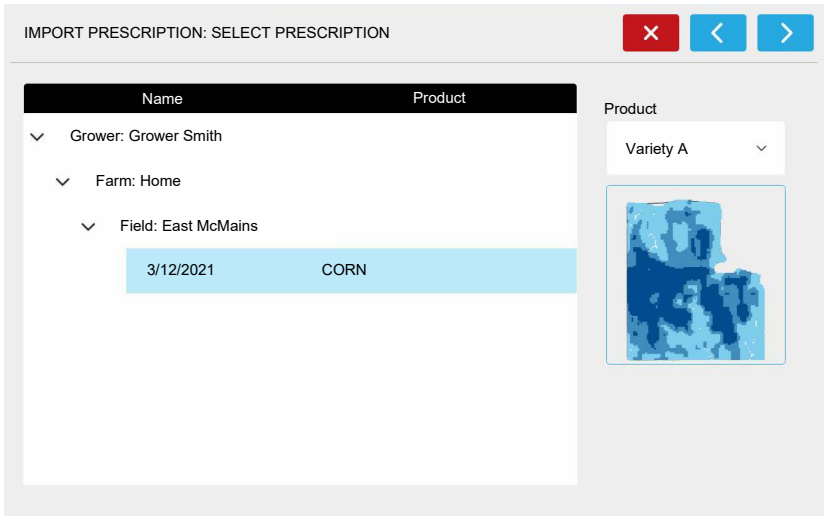
Press to enter the desired amount.

• The Increment button allows operators to specify the increase or decrease amounts for a specified rate when using + / − on the Product Control Toolbox. Press to enter the desired increment.

• To load a map-based prescription file, press .

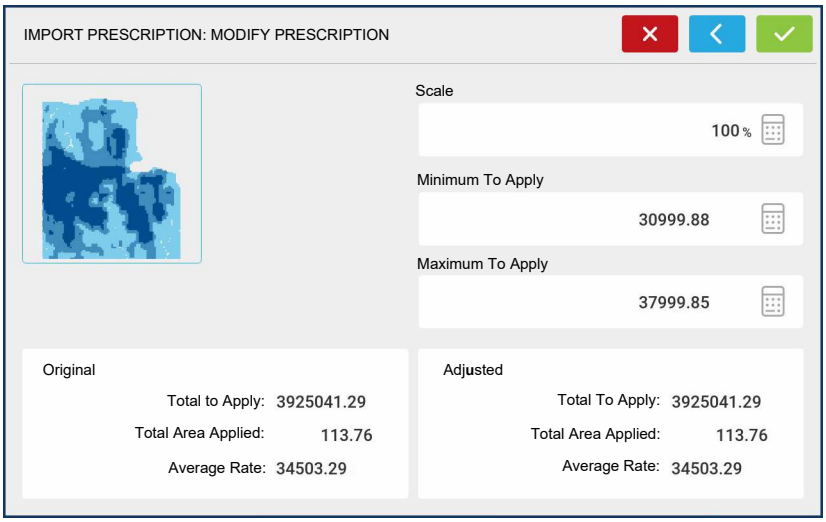
Loading Prescriptions





1. Using an inserted USB or AgFiniti Cloud, search for and highlight the correct .agsetup, .irx , or shape file and press .

2. Select the prescription in the Select Prescription screen, and select the correct controlling product from the Product dropdown box. A preview prescription map is displayed. Press .



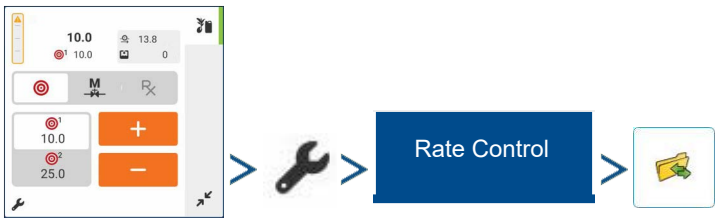
3. In the Modify Prescription Screen the prescription scale, minimum to apply, and maximum to apply can be changed. As the three parameters are changed, the adjusted total to apply and average rate will update accordingly.

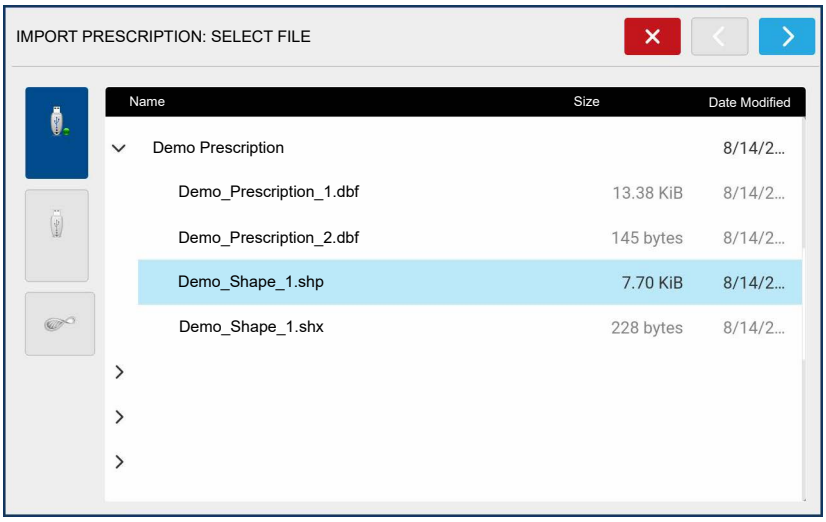
4. Press the ✓.

5. After returning to the Mapping Screen, the prescription will appear on the map while in a North Oriented view.

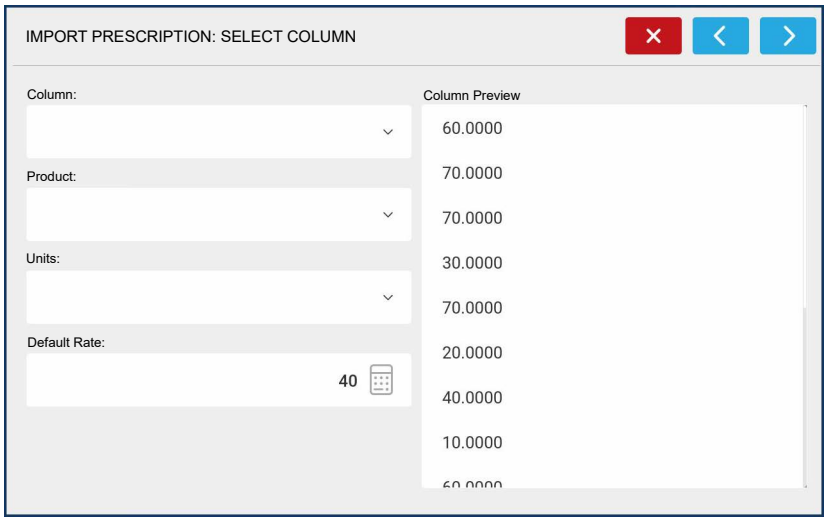
Shape File Conversion

What is commonly called a shape file is actually a collection of different files. All three of the files are required and must be present on the USB drive for the system to use shape files for variable rate product application. A single shape file can contain recommendation rates for multiple products.





1. Using an inserted USB or AgFiniti Cloud, search for and highlight the correct .agsetup, .irx , or shape file and press >.



2. **Select Column From Shape File**—Select the column that contains the product target rate. The list on the right side of the dialog shows sample data from the selected column.

3. **Select Units**—Select the controlling units for product application.

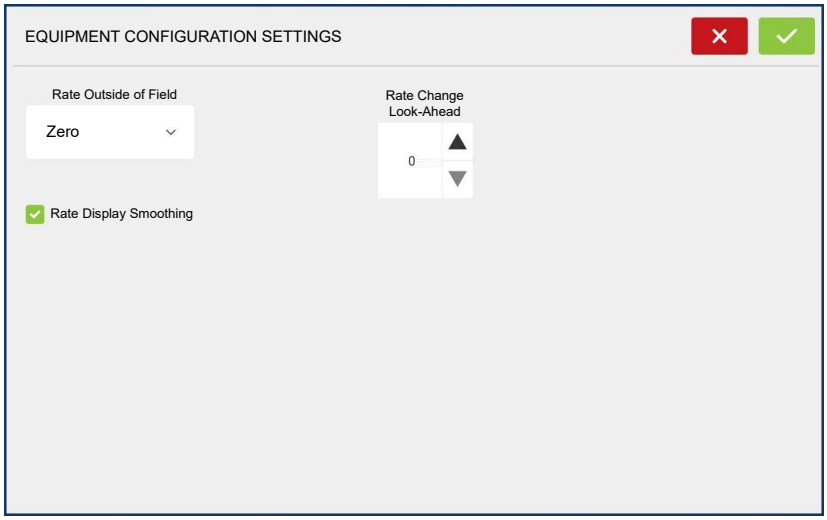
4. **Default Rate Setting**—The system assigns a default rate. Use the on-screen keypad to edit the value if desired.

NOTE!: Select the product and units that the shape file prescription was made for. Selection of the wrong data column or unit will result in misapplication of product.

ATTENTION!: The only time the default rate is used by the system during product application is if the Rate Outside of Field selection is set to "Rx default". This setting is located in the Equipment Settings portion of configuration setup. If the Rate Outside of Field selection is set to "Rx default", the default target rate will be used when the vehicle exits the area covered in the prescription map.

Equipment Settings

Equipment Settings



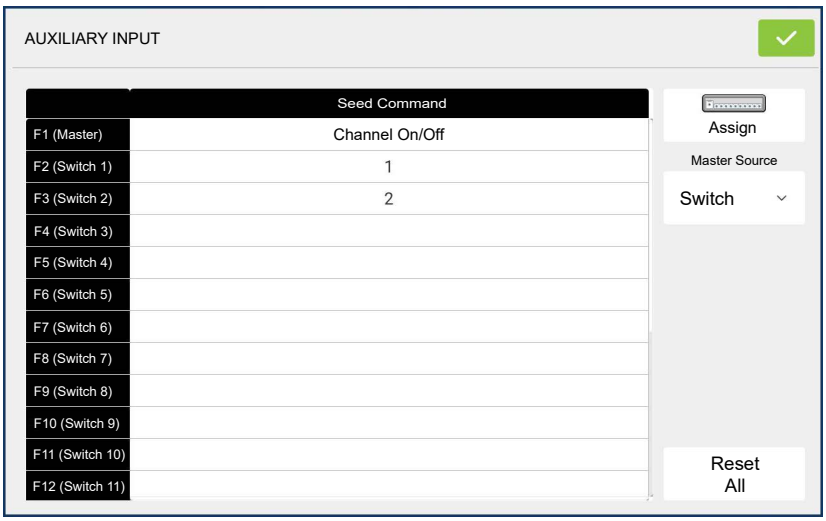
Rate Outside of Field—This setting will define how product will be controlled when leaving a field boundary.

- **Zero**—This will stop planting.
- **Last Good**—This will continue planting at the last known rate.
- **Rx Default**—When using a prescription, this will apply at the Default Rate (or outside of boundary rate) as defined by the prescription file.

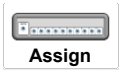
Rate Display Smoothing—Determines how the feedback from the control channel rate sensor will be displayed on the map screen. When de-selected, the system will display raw feedback from the rate sensor. When checked, the system will display target rate when the planting rate is within 10% of the target rate setting.

Rate Change Look-Ahead—This setting compensates for any latency in the control system when changing between different product flow rates during variable rate planting. The typical setting range for this is 0-1 seconds. This setting can be thought of as a “look ahead” value when using a variable rate prescription. The display will send the signal to change rates before hitting a transition line so that the applied rate is correct when crossing into the new management zone.

Auxiliary Input



From the Auxiliary Input screen, the operator can customize the switches to the planter drives, if desired.

1. Press 

2. Highlight the desired switch to assign a function to it.

3. Select appropriate function(s) (planter drives for this operation) to assign to the desired switch. Chain icons within each function will "link" once pressed to indicate they are assigned. If a function has a "broken link" then it is not assigned. If a switch has a "X" then it is not assigned to a function. Press the  to save the setup.

NOTE!: Even if no specific functions are assigned to the Master switch, the Master switch will still serve as the total system on/off switch.

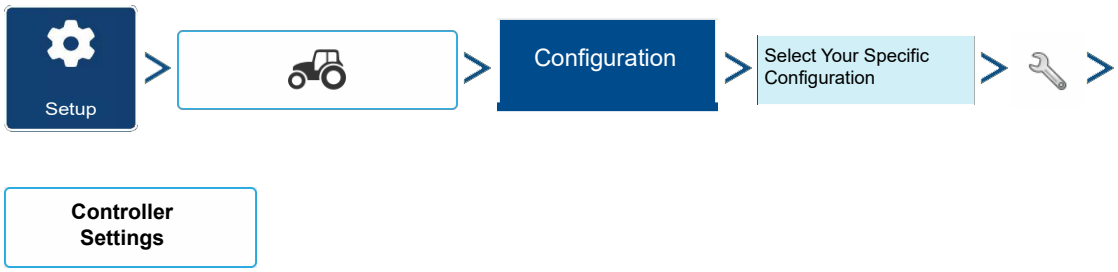
Hydraulic Seed Rate Control

The Hydraulic Seed Control Module allows operators to control up to three hydraulic motor drives with the display. Configure the Hydraulic Seed Rate Control module in the following order.

1. **Enter Controller Settings**—Include the Max Meter Speed, Gear Ratio and Minimum Allowable Ground Speed. See Controller Settings for Hydraulic Seed Rate Motor Drives on page 13.
2. **Prime the Hydraulic Seed Meter**—Fill seed meter with seed to avoid skips. See Priming Seed Rate Meters on page 7.
3. **Meter Calibration**
   a. Enter Meter Calibration Number. This number, representing seeds per revolution, is set according to the number of seed dropped per one revolution of the seed meter.
   b. Perform a Seed Meter Calibration. A new calibration should be performed if as-applied seed rate does not match actual population planted. See Calibrating Seed Rate Meters on page 8.

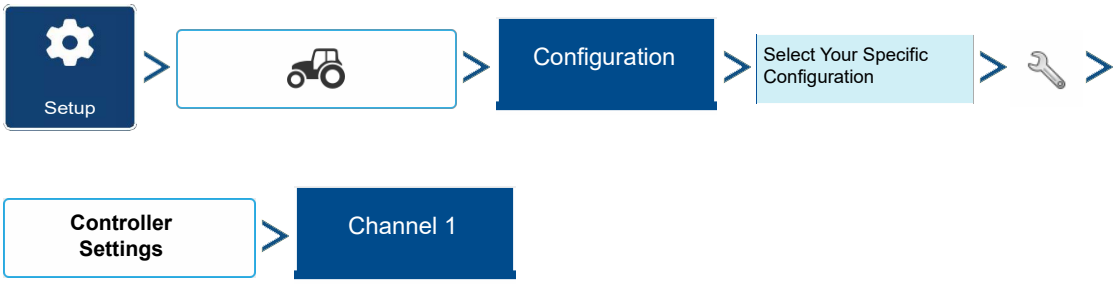
Controller Settings for Hydraulic Seed Rate Motor Drives

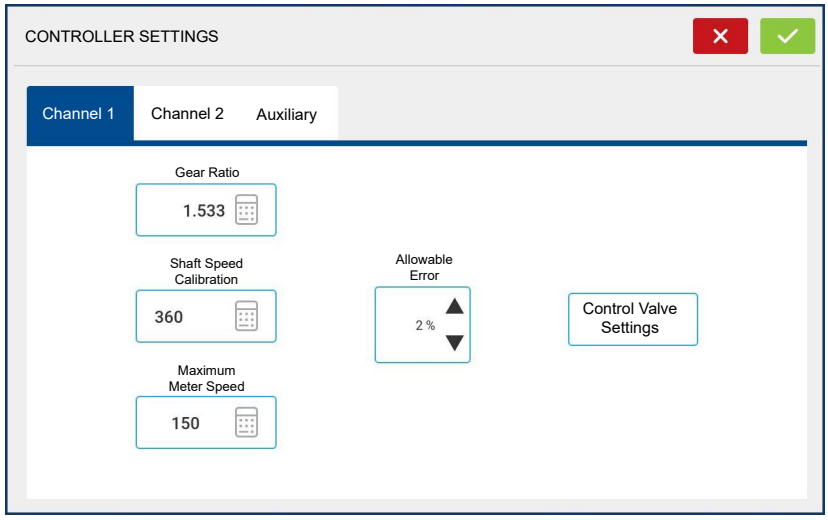
After creating an Operating Configuration for the Hydraulic Seed Meter Controller, make settings changes in the Controller Settings screen, which shows valve settings for hydraulic flow and pulses per revolution.



The Controller Settings screen consists of at least two tabs: the Channel Tabs, shown for each channel being controlled; and the Auxiliary Tab.

Channel Tab settings





Gear Ratio—The number of time the hydraulic drive sprocket turns to achieve 1 revolution of the seed meter. This ratio is typically provided by the planter manufacturer. Otherwise use the formula in the examples to calculate Gear Ratio. See Gear Ratio Calculations for Seed Rate Motors on page 18. Carry decimal to the nearest 0.001.

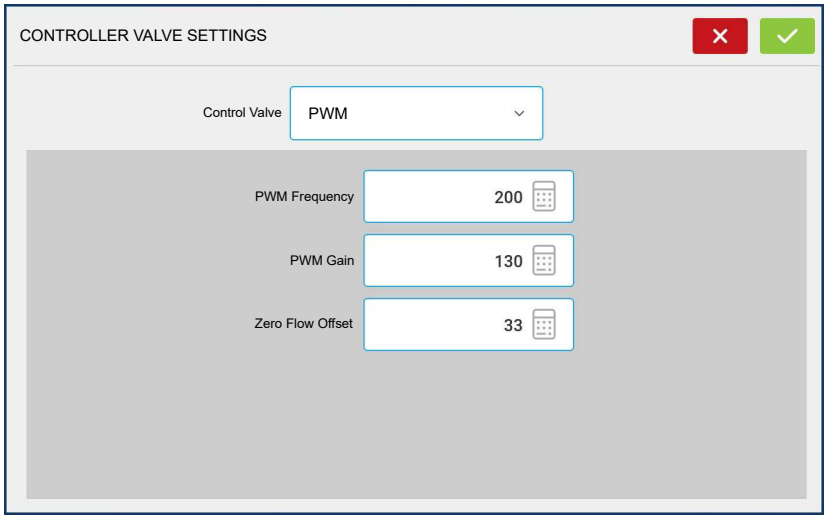
Shaft Speed Calibration—Calibration number representing the pulses that equal one revolution of the hydraulic motor.

Maximum Meter Speed—Setting determines the maximum RPM of the seed meter.

Allowable Error—Determines the percent of error that is allowed prior to the product control system making any flow rate changes.

Control Valve Settings—This button summons the Control Valve Settings screen. The appearance of the Control Valve Settings screen varies, depending upon whether planter's control valves are PWM Valves or Servo Valves.

Control Valve Settings - PWM

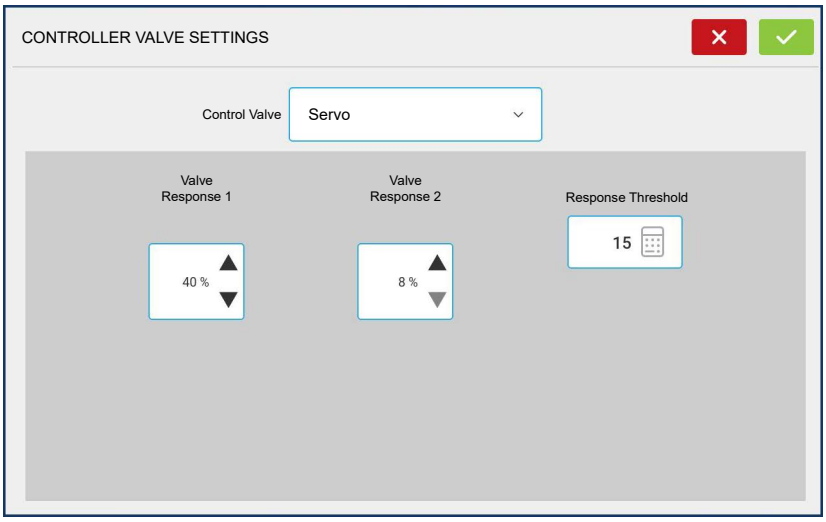


PWM Frequency—The frequency at which the PWM control valve is pulsed. Settings can be found from the manufacturer of the valve.

PWM Gain—Determines how aggressively the control valve responds when making rate change adjustments. The higher the value the more aggressive the system response.

Zero Flow Offset—Represents the maximum duty cycle that is sent to the control valve without producing any hydraulic flow from the PWM valve. Using too high of a Zero Flow Offset value can cause the product control system to not properly control flow rates at low rates. See the PWM valve manufacturer's information for recommended settings.

Control Valve Settings - Servo

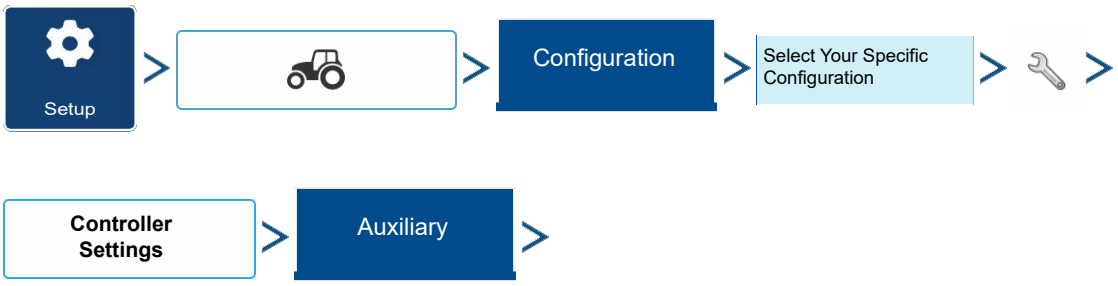


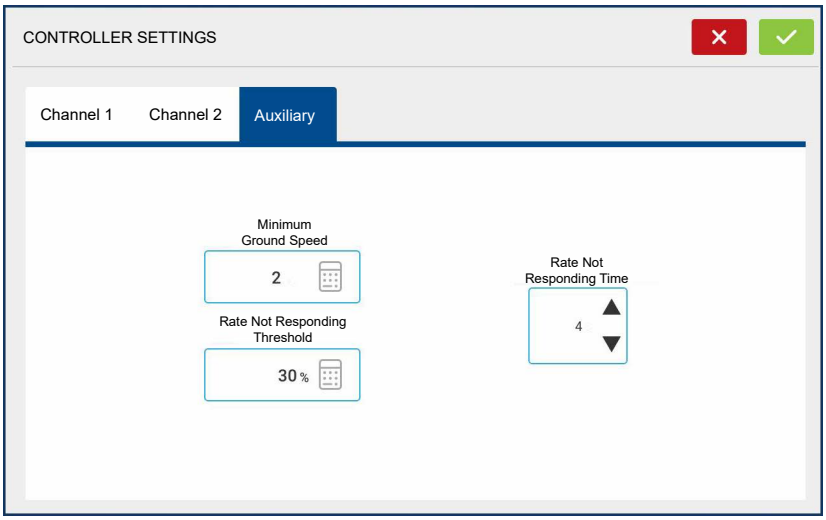
Valve Response 1—Determines the speed of the servo valve when product control error exceeds the Response Threshold setting.

Valve Response 2—Determines the speed of the servo valve when product control error is less than the Response Threshold setting.

Response Threshold—Determines the system responsiveness to rate change.

Auxiliary Tab settings





Minimum Ground Speed—The planter will plant at this simulated ground speed, until displayed ground speed is above this value. This fixed ground speed compensates for delays in acquiring an initial ground speed when starting from a stand still. Planting at the minimum ground speed will occur when either of the following conditions are met:

a. Wheel motion is detected. Requires wheel motion sensor.
b. Jump start switch is depressed. Required jump start switch kit.

Rate Not Responding Threshold—The percentage of seed rate error that triggers the alarms.

Rate Not Responding Time—The amount of time that the error occurs before the alarm sounds.

Hydraulic Seed Controller Settings for Specific Planters

NOTE!: The settings, provided below, should be a good starting point for control Look-Aheader settings. However, always take the time to calibrate the seed meters, check for proper seed placement in the field, and make system setting adjustments as needed. Do not rely solely upon the appearance of the On-Screen map. The on screen map will not show gaps and overlaps caused by incorrect GPS Offsets or AutoSwath Look-Ahead settings.

Planter Brand	Control Valve Configuration	PWM Frequency	PWM Gain	Zero Flow Offset	Gear Ratio	Pulses/Rev.
John Deere Planters	PWM	175	110	40	2.374 (chain) 2.417 (ProShaft)	360
White Planters	PWM	200	90	30	5.5	360
Case IH Planters	PWM	100	90	40	6.803	360
Dickey-John Hydradrive	PWM	200	300	36	Need to Calculate	360

Kinze Planters	**3600/3660** 2009-2018	**3600/3605/** 2019 and newer	**3600/3605/ 3660/3665**	**3700/3705**	
	Vacuum	Vacuum	Mechanical	Vacuum	Mechanical
Shaft Speed Cal	360	360	360	360	360
Control Valve Configuration	PWM	PWM	PWM	PWM	PWM
Max Meter Speed	150	150	150	150	150
Gear Ratio	2.947	2.947	1.533	1.47	1
PWM Frequency	200	200	200	200	200
PWM Gain	60	130	130	130	130
Zero Flow Offset	45	33	33	33	33
Allowable Error	2%	2%	2%	2%	2%

Kinze Planters	**3800**		**4900/4905**	
	Vacuum	Mechanical	Vacuum	Mechanical
Shaft Speed Cal	360	360	360	360
Control Valve Configuration	PWM	PWM	PWM	PWM
Max Meter Speed	150	150	150	150
Gear Ratio	2.267	1.533	1.47	1
PWM Frequency	200	200	200	200
PWM Gain	130	130	130	130
Zero Flow Offset	33	33	33	33
Allowable Error	2%	2%	2%	2%

Hydraulic Seed Meter Calibration Numbers

Prior to calibrating the Hydraulic Seed Meter, the numbers that appear in the Meter Calibration box in the Planter Control window should be similar to the numbers that appear below. If they are not, the seed meter may be working incorrectly, or the Gear Ratio may be incorrect. Contact Technical Support for further assistance.

NOTE!: Check the operator's manual for more specific information on other seed disk options.

Planter brand and type	Corn	Soybeans	Cotton Standard Rate	Sorghum
John Deere				
Vacuum: Standard	30	108	64	45
Vacuum: ProMAX™	40			
Vacuum: Precision Planting eSet®	30			
Vacuum: VenHuizen AccuVac Kit	40			
Mechanical: Finger	12			
Mechanical: Brush Meter		56		
Case IH				
Vacuum	48	130	80	80
Cyclo®	36	240		
KINZE				
EdgeVac®	39	60	54	60
Mechanical: Finger	12	60	30	60
White				
	30	60		
Great Plains				
Mechanical: Standard	12	110	120	102
Mechanical: Twin Row	6	100		135

Gear Ratio Calculations for Seed Rate Motors

The Gear Ratio is a setting that appears on the Controller Tab for Hydraulic Seed Control Module. It is the ratio of the revolutions of the hydraulic drive as compared to one revolution of the seed meter. This setting is used to determine how fast the Seed Rate Motor should operate to achieve the proper RPM of the seed meter during planting operations.

To manually enter a Gear Ratio in the Controller Settings window, calculate the Gear Ratio based on information provided below and on the following pages. The Gear Ratio number is calculated by multiplying all the gear ratio combinations, from the Seed Rate Drive Motor to the Seed Meter.

Seed Ratio Calculation Example Procedure

The example outlined below assumes a single planter drive motor.

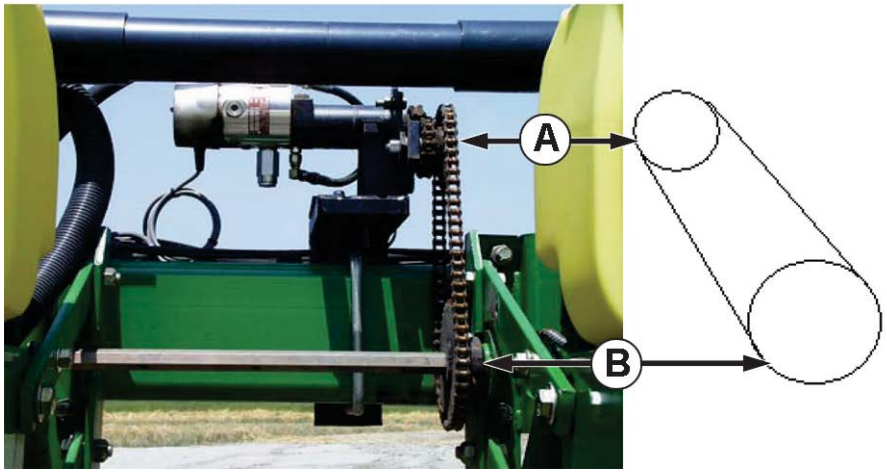
1. Beginning with the Seed Rate Motor, count the number of teeth on the drive sprocket. Then count the number of teeth on the driven sprocket.
2. Divide the number of teeth on the driven sprocket by the number of teeth on the drive sprocket. This is the ratio of the Seed Rate motor.
3. Repeat the process for each sprocket combination in the drive system back to the meter.
4. Take the ratio of the Seed Rate Motor and multiply it by the ratio of the other sprocket combinations.
5. Repeat this process for multiple hydraulic drives. Enter the gear ratio for each motor under the appropriate tab.

NOTE!: Enter the number into the other channels for additional motor drives if they have the same total gear ratio.

NOTE!: Gear Ratio is the number of revolutions of the motor to turn the seed meter one revolution.

Gear Ratio Drawing - For Single Motor Drive

Seed Rate Drive Setting (Calculating drive gear ratio)



A. Seed Rate Motor (Drive) 18 Tooth Sprocket

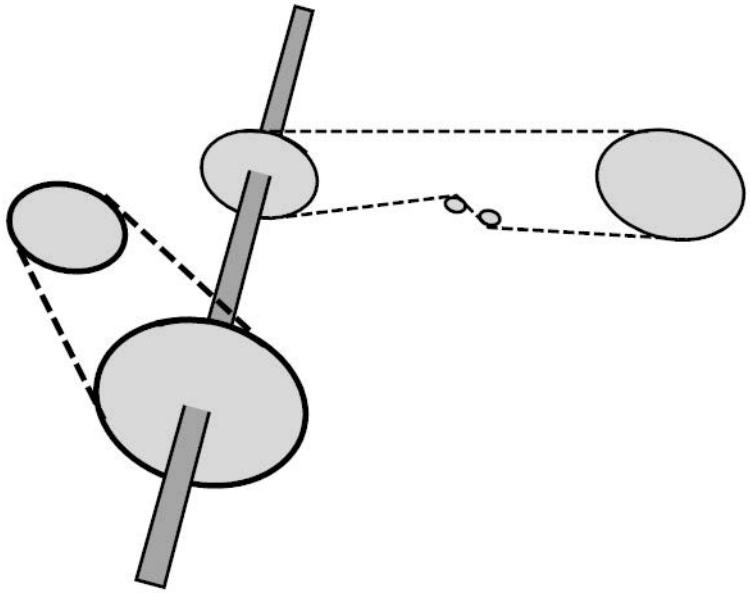
B. Planter Drive Shaft Sprocket (Driven) 29 Tooth Sprocket

$$\frac{\text{Number of Teeth on the Driven Sprocket}}{\text{Number of Teeth on the Drive Sprocket}} = \text{Gear Ratio}$$

$$\frac{29}{18} = 1.611$$

NOTE!: Each drive combination (Driven/Drive) from Seed Rate Motor Drive to Seed Meter shaft sprocket needs to be factored for the Total Gear Ratio.

Gear Ratio Drawing - For Multiple Drive Combinations



$$\frac{\text{Planter Drive Sprocket}}{\text{Seed Rate Motor}} \times \frac{\text{Seed Meter Shaft}}{\text{Planter Drive Shaft}} = \text{Gear Ratio}$$

$$\underset{\text{Driven/Drive 1}}{\frac{29}{18}} \times \underset{\text{Driven/Drive 2}}{\frac{28}{19}} = \underset{\text{= Gear Ratio}}{\frac{812}{342}} = 2.374$$

Carry the Decimal place to the nearest 0.001 for accurate results.

Seed Ratio Calculation Example Procedure for Shaft Drives

This example assumes a single drive motor. Step 5 notes that this process has multiple steps for more than one hydraulic drive.

1. Beginning with the Seed Rate Motor, count the number of teeth on the drive sprocket. Then count the number of teeth on the driven sprocket.
2. Divide the number of teeth on the driven sprocket by the number of teeth on the drive sprocket. This is the ratio of the Seed Rate motor.
3. Repeat the process for each sprocket combination in the drive system back to the meter.
4. Take the ratio of the Seed Rate Motor and multiply it by the ratio of the other sprocket combinations.
5. Repeat this process for multiple hydraulic drives. Enter gear ratio for each motor under the appropriate tab.

NOTE!: Enter the number into the other channels for additional motor drives if they have the same total gear ratio.

Drive Ratios		
Planter Brand	**Driven**	**Drive**
Case IH Planters	2	2
John Deere Planters	3	2
White Planters	11	5

NOTE:! These values are for the shaft only. Drive/Driven value between the Seed Rate Motor and Planter Drive Sprocket must still be determined.

Gear Ratio Drawing Shaft Drives

John Deere Planter Example

$$\frac{\text{Planter Drive Sprocket}}{\text{Seed Rate Motor}} \times \frac{\text{Seed Meter Shaft}}{\text{Planter Drive Shaft}} = \text{Gear Ratio}$$

$$\underset{\text{Driven/Drive 1}}{\frac{29}{18}} \times \underset{\text{Driven/Drive 2}}{\frac{3}{2}} = \underset{\text{= Gear Ratio}}{\frac{87}{36}} = 2.417$$

Carry the Decimal place to the nearest 0.001 for accurate results.

NOTE!: If determining shaft ratios for any shaft not listed in the table above, rotate input shaft (driver) 10 times. Count how many times the output (driven) shaft turns. Divide the number of turns of the input shaft by the number of turns of the output shaft.

Troubleshooting

Hydraulic Seed Control: Zero Flow Offset Variation

Zero Flow Offset is an operator-entered setting. Zero Flow Offset represents the maximum duty cycle that is sent to the control valve without producing any hydraulic flow from the PWM valve. Using too high of a Zero Flow Offset value can cause the product control system to not properly control low rates. Zero Flow Offset may vary somewhat by system and by operating conditions. On the tables on the following pages, problems and causes relating to Zero Flow Offset are listed. Use the Confirmation Techniques to determine if this is a problem; and then follow the appropriate solution.

Problem: Hydraulic drive is not shutting off properly

Possible Cause: Zero Flow Offset is set too high

Confirmation Techniques:

a. Put the problematic drive in Manual Valve control from the Map screen.

- Master switch will need to be On and Implement Switch triggered in order for the drive to turn

b. Press the Up arrow once to start turning the drive, then press the Down arrow three times.

- If the Zero Flow Offset is set appropriately, the drive will shut off on the third down button press.

c. If the drive is still turning after the third Down button press, the Zero Flow Offset is too high.

d. Decrease the Zero Flow Offset setting by increments of 1 or 2.

e. Repeat the above steps until the drive stops turning on the third Down button press. The Zero Flow Offset will then be set once this is achieved.

Problem: Hydraulic drive is slow to begin turning

Possible Cause: Zero Flow Offset is set too low

Confirmation Techniques:

a. Put the problematic drive in Manual Valve control from the Map screen.

- Master switch will need to be On and Implement Switch triggered in order for the drive to turn

b. Press the Up arrow once to start turning the drive, then press the Down arrow three times.

- If the Zero Flow Offset if set appropriately, the drive will shut off on the third down button press.

c. If the drive stops turning before the third Down button press, or doesn't start on the Up button press, the Zero Flow Offset is too low.

d. Increase the Zero Flow Offset setting by increments of 1 or 2.

e. Repeat the above steps until the drive stops turning on the third Down button press. The Zero Flow Offset will then be set once this is achieved.

NOTE!: Zero Flow Offset should never be less than 25. If 25 still seems as if this number is too high, there must be some other problem. Contact Technical Support for further assistance.