vDrive®

vDrive Operator's Guide
For Gen 3 20|20 Displays

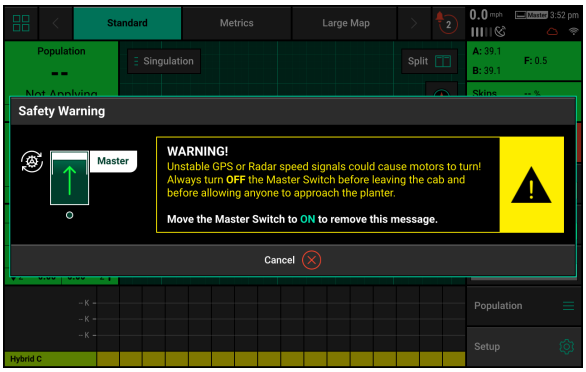
Precision Planting®

955701_5 2/15/21

Contents

Safety Warning

Once any control product is configured on the 20|20 display, the system will require a Cab Control Module (CCM) and will prompt the user to toggle the Master Plant switch on the CCM before any control products can be used. This warning is triggered any time the system is booted up, and when the system has traveled for more than half a mile.



Note: This Safety Warning will only appear in 2020.1.x and newer software.

If a CCM is not installed, the cancel button can be used to bypass this warning. No control systems will operate until the Master Plant switch is toggled. This icon will be present in the status button in the top right if the Safety Warning was bypassed using the cancel button.

System Setup and Operation

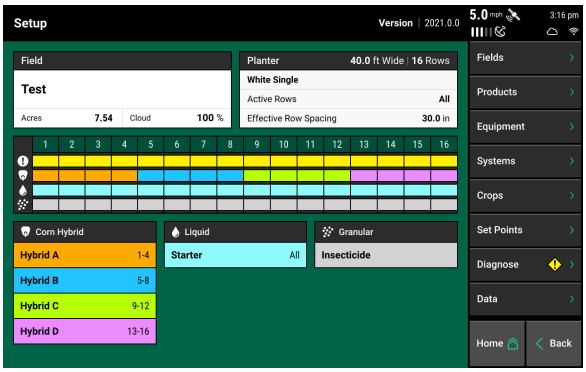
There are four requirements for the vDrive system to function:

1. vDrive must be configured on the 20|20 monitor.
2. There must be a Speed source.
3. The Master Plant Switch on the Cab Control Module must be in the up position.
4. The planter must be lowered.
5. **2020.1.x and newer software:** vDrive must be enabled.

Configuring Monitor for vDrive

Step 1:

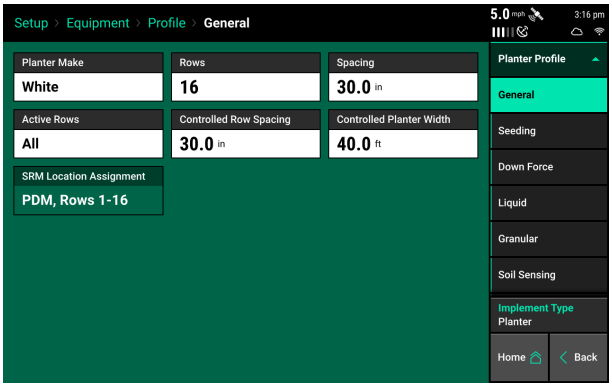
Set vDrive as the drive type. Navigate to the planter setup page by selecting, “Setup” – “Equipment”.

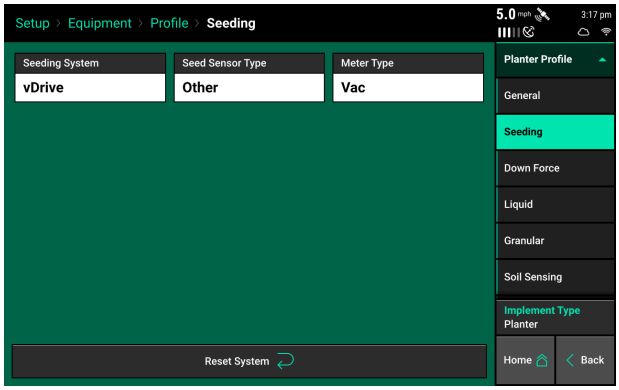


Step 2:

Select the Seeding tab under Planter Profile.

Note: On 2020.0.x and older software, Drive type will be available under the main planter profile page.





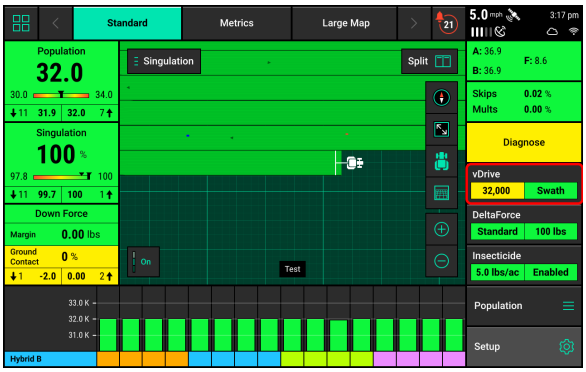
Step 3:

Press on the “Drive Type” button and then select “vDrive”.

Note: If the monitor is not connected to a planter or if it is not communicating with any vDrive motors, vDrive will be yellow after selecting it, indicating the monitor is not able to communicate with any vDrives.

Step 4:

On the home screen the vDrive control button will appear on the right hand side of the screen in the “Standard” and “Metrics” tabs. It will display population and swath information. Use this button to access the vDrive control page. For more information, see the vDrive Control section below



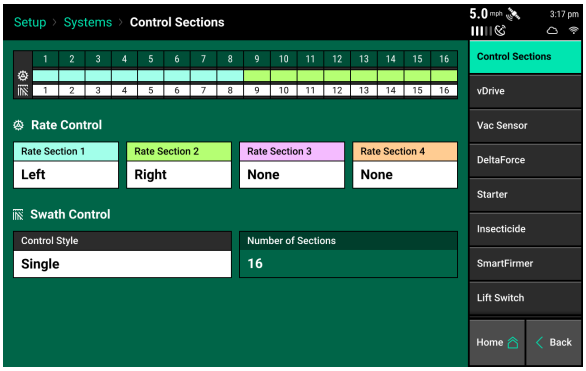
Control Sections Setup

Navigate to Setup — Systems to configure the Control sections of this implement. The Control Sections will apply to all rate control products configured on this monitor. This includes seeding control, liquid fertilizer control, and granular fertilizer control.

Note: This section only applies to 2020.1.x and newer software, for 2020.0.x and older software, proceed to the next section of the manual.

Rate Section Setup

Setup the “Rate Control”. Rate Control Setup allows the operator to determine which rows to set to certain rates. The monitor can control up to 4 different rate sections at once. Each rate section can be assigned a different target rate or prescription attribute. A rate section can be any combination of rows.

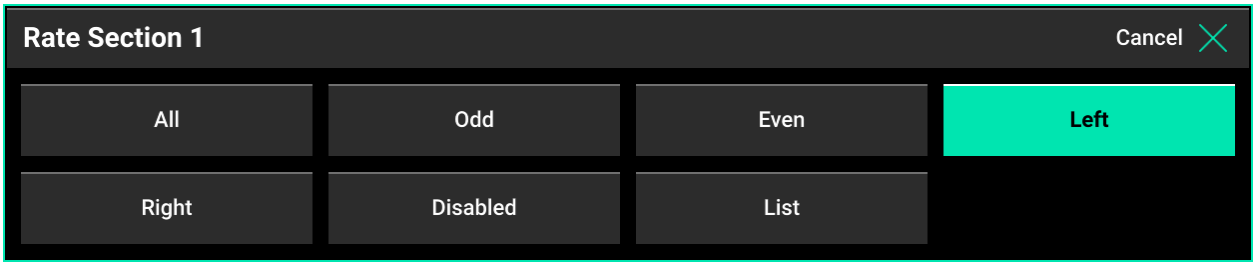


Note: Any rows **not assigned** to a rate section **will not operate or pass health checks.**

If all rows will be controlled with the same rate or the same prescription attribute only one rate section needs to be configured. If only one rate section will be used select “Rate Section 1” and then select “All”. Use multiple rate sections when controlling different rates between rows or sections.

To setup a rate section, select one of the four Rate Sections. Assign appropriate rows to the rate section. This may be Odd, Even, Left, Right or List. When selecting “List”, define which rows are to be used by touching those rows numbers so they turn green.

Note: Ensure that all rows are assigned to a rate section. Any row not assigned to a rate section will not operate.



Swath Setup

Set up the Swath Control. Swath Section Setup allows the operator to divide the planter into different swath sections. There are four different options for Swath Control.

Note: If setting up multiple Swath Sections, they **do not** have to be the same as Rate Sections.

Disabled — Rows with not shut off seeding when entering an area that is already planted.

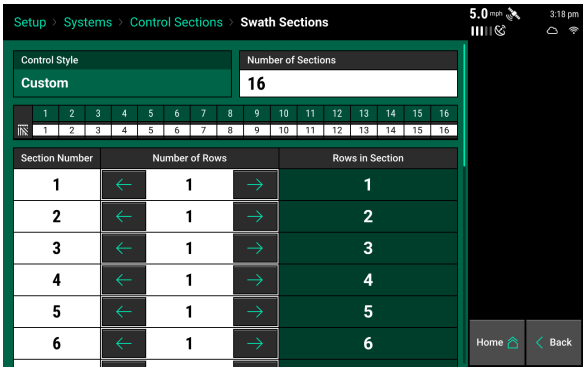
Single Row — Each row will shut off individually as that row enters an area that is already planted.

Dual Ends — The outside two rows on each end of the planter are linked together. The inside rows are single row swath. Generally used with WAAS GPS correction.

Custom — If one of the pre-set settings is not acceptable, a custom setting can be selected. This will allow the operator to group any rows together for swath control.

Custom Swath Setup

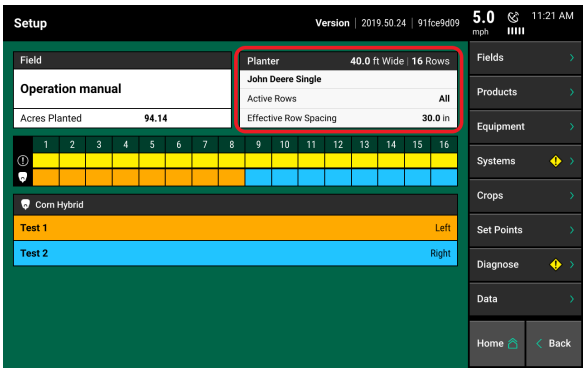
If Custom is Selected:



1. Select the total number of sections to set up.
2. For each section select the number of rows by pressing on the white box in the Number of Rows column and manually enter a value or by using the arrows to increase or decrease the number of rows in a section number
3. The Rows in Section will auto-populate as the Number of Rows is determined.
4. If a section does not have rows assigned to it, that section number will be ignored.

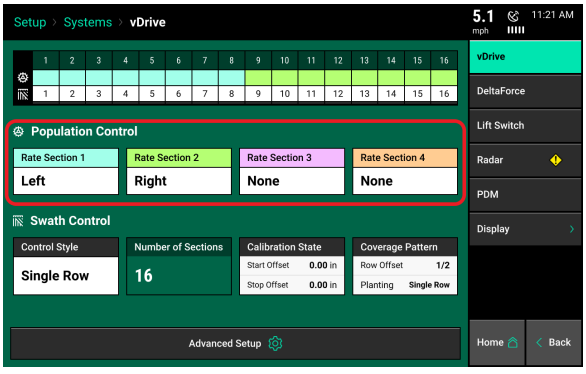
vDrive Setup — 2020.0.x and Older Software

Step 1:
Navigate to "Setup" — "Systems" — "vDrive". After pressing the Setup button ensure that the correct planter is displayed in the Planter Information box If this information is not correct, then select the Equipment and set the planter up correctly. Once the planter information is correct; press the "Systems" button to begin the setup process.



Step 2:
Setup the "Population Control". Population Control Setup allows the operator to determine which rows to set to certain populations. The monitor can control up to 4 different rate sections at once. Each rate section can be assigned a different population or seeding prescription attribute. A rate section can be any combination of rows.

Note: Any rows **not assigned** to a rate section **will not plant or pass health checks.**

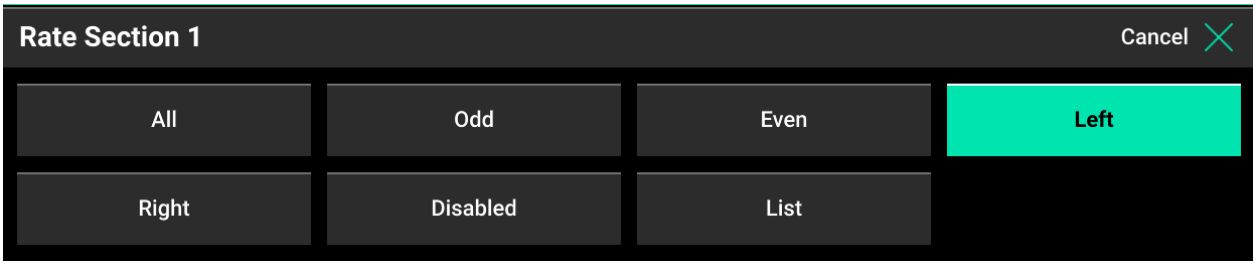


Step 3:

If all rows have the same population rate or the same seeding prescription attribute only one rate section needs to be configured. If only one rate section will be used select “Rate Section 1” and then select “All”. Use multiple rate sections when controlling different population rates between rows or sections.

To setup a rate section, select one of the four Rate Sections. Assign appropriate rows to the rate section. This may be Odd, Even, Left, Right or List. When selecting “List”, define which rows are to be used by touching those rows numbers so they turn green.

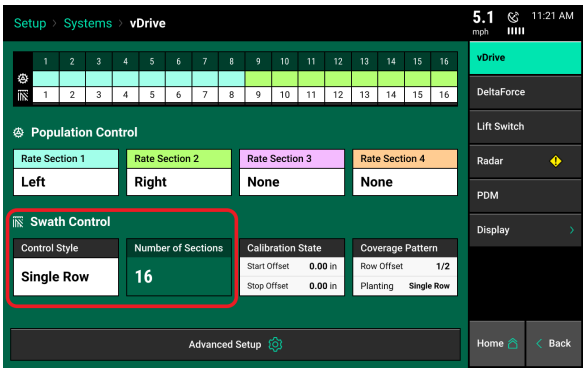
Note: Ensure that all rows are assigned to a rate section. Any row not assigned to a rate section will not plant.



Step 4:

Set up the Swath Control. Swath Section Setup allows the operator to divide the planter into different swath sections. There are four different options for Swath Control.

Note: If setting up multiple Swath Sections, they **do not** have to be the same as Rate Sections.



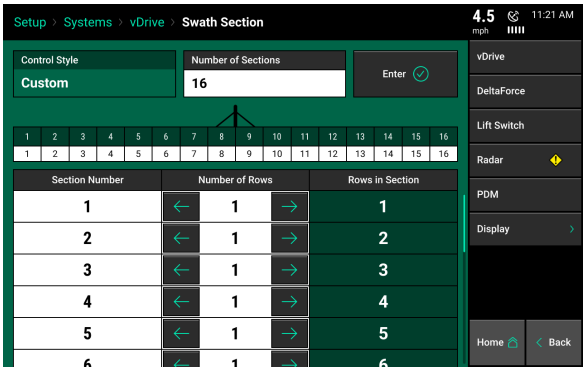
Disabled — Rows with not shut off seeding when entering an area that is already planted.

Single Row — Each row will shut off individually as that row enters an area that is already planted.

Dual Ends — The outside two rows on each end of the planter are linked together. The inside rows are single row swath. Generally used with WAAS GPS correction.

Custom — If one of the pre-set settings is not acceptable, a custom setting can be selected. This will allow the operator to group any rows together for swath control.

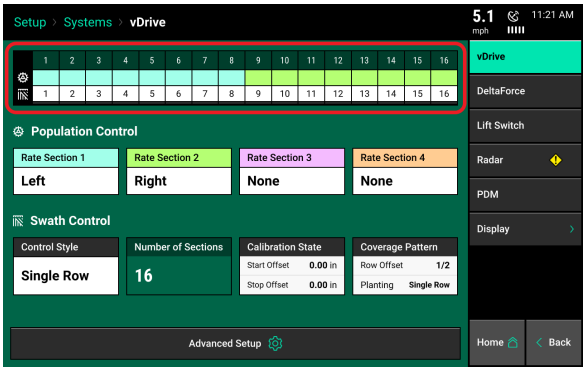
Step 5:
If Custom is Selected:



1. Select the total number of sections to set up.
2. For each section select the number of rows by pressing on the white box in the Number of Rows column and manually enter a value or by using the arrows to increase or decrease the number of rows in a section number
3. The Rows in Section will auto-populate as the Number of Rows is determined.
4. If a section does not have rows assigned to it, that section number will be ignored.

Step 6:

After configuring both the Population and Swath Control, make sure that the system is configured correctly by viewing row assignments on the vDrive setup page.

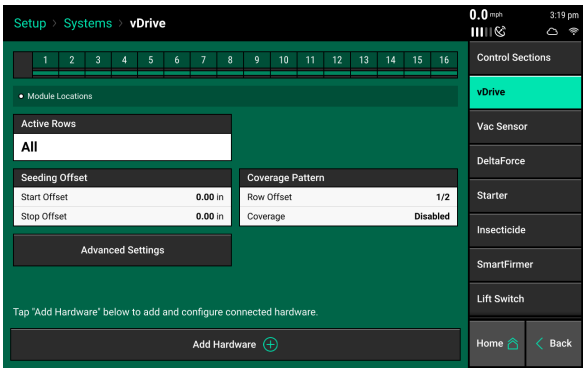


The Gear Icon indicates the Rate Sections that have been configured and what rows they correspond to. Colors beneath row numbers correspond to a color of a rate section. A row not assigned a color is not part of a rate section.

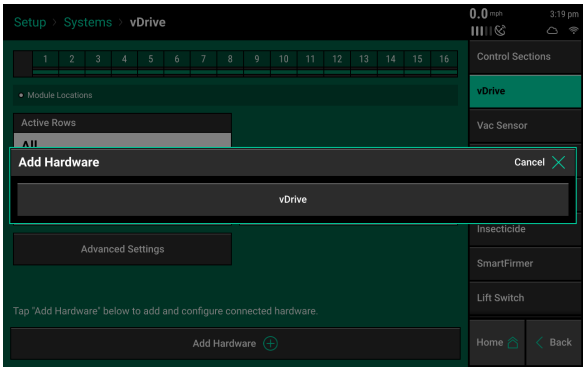
The Swath Icon indicates the Swath Sections that have been configured and what rows they correspond to. Rows assigned to the same number are all part of the same swath section and with swath on and off together. Any row that does not have a number below it is not part of a swath section and will not swath off.

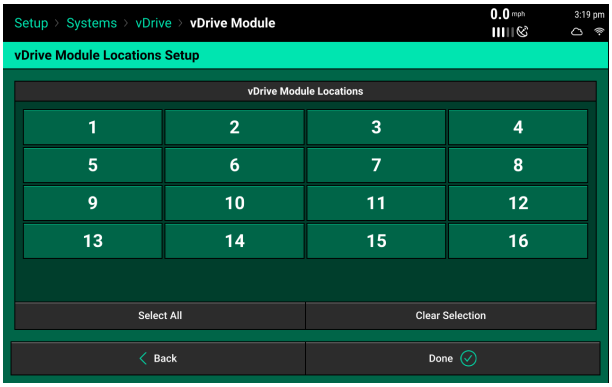
vDrive Setup — 2020.1.x and Newer Software

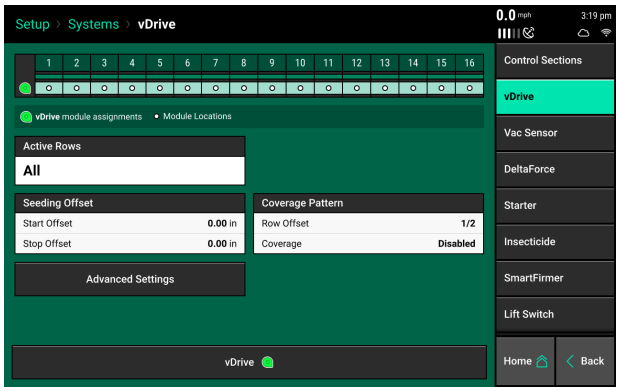
Navigate to Setup — Systems — vDrive to configure your vDrive system.



Select ‘Add Hardware’ to add vDrive control rows to the planter. Select what rows have vDrive installed.







vDrive Active Rows

vDrive rows can be disabled if they are not currently in use but are still installed on the planter.

Swath Control

The Swath Control configuration allows the user to adjust the control of the vSet Select system for swath control. This includes both Calibration State and Coverage Pattern. For a complete guide on adjusting the vDrive system for Swath control, refer to the section of the manual on vDrive Swath Calibration.

Seeding Offset — The Seeding Offset adjusts the start and stop swathing delay of the vDrive motor. Only adjust these values based on actual in ground seeding, and after validating GPS offsets.

Coverage Pattern — The Coverage Pattern allows the user to configure how the swath system will react to coverage. This can include an additional offset at the headlands.

Advanced

Automatic Unjamming — When enabled, the vDrive will automatically try to remove any debris that stops the motor and restart planting.

vDrive Swath Output Mode — vDrive Swath Output mode can be used with a vDrive swath output harness. This output harness can be used to control other swath devices or indicator lights. Available modes are: Always On, On While Planting, Off While Planting, and Always Off.

Quick Start Delay — The Quick Start Delay can be changed to adjust the start delay when using the Quick Start button on the home screen.

WaveVision Updates — This setting will disable or enable firmware updates to the WaveVision seed tube sensor.

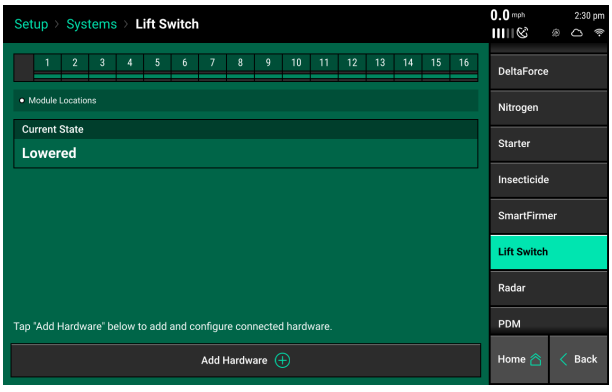
Primary Speed Source — The primary speed source defines what speed source the vDrive control system will use by default until it is flagged as unstable.

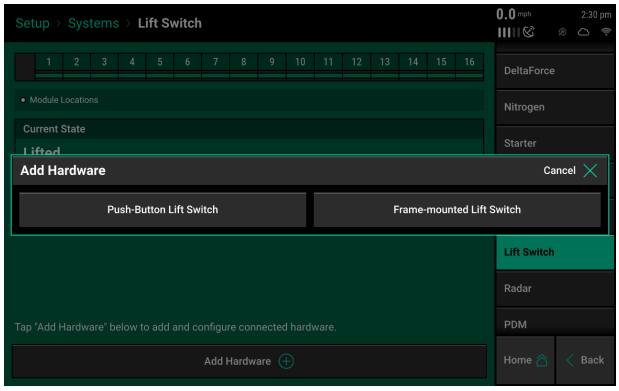
Lift Switch

One of the requirements for all control products to function is for a lift switch to be installed, and reading lowered.

Configure the connected lift switches by selecting ‘Add Hardware’. Select the type of lift switch (es) plugged in. A summary of lift switch locations will be displayed at the top of the screen.

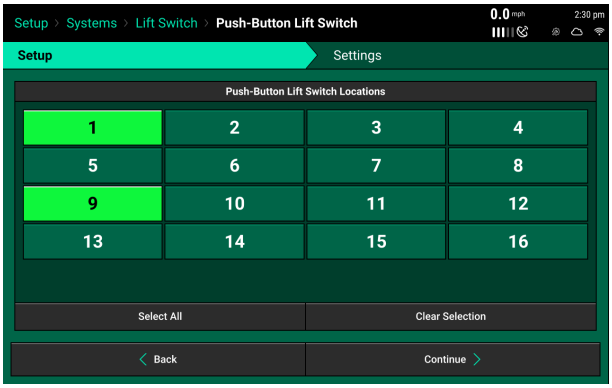
Note: Configuration of lift switch row locations is only required on 2020.1.x and newer software.

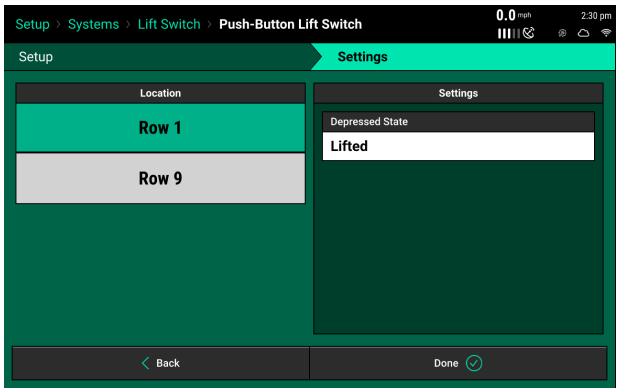




Push Button Lift Switches

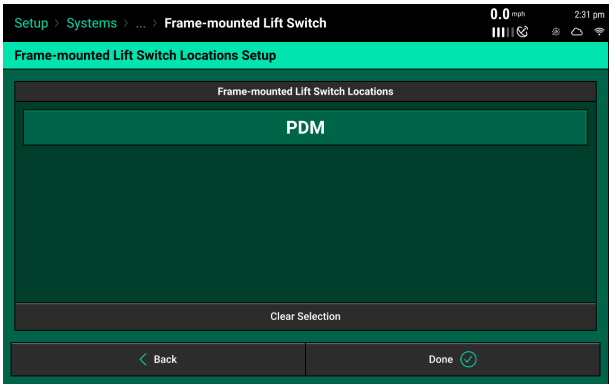
Select what rows have push button lift switches installed, then press ‘Continue’. In the settings page, select if the push button is depressed (pushed in) when lifted or lowered. A calibration will not need to be performed for push button lift switches.

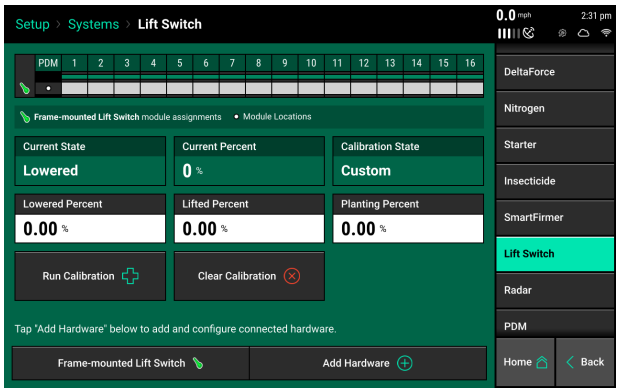




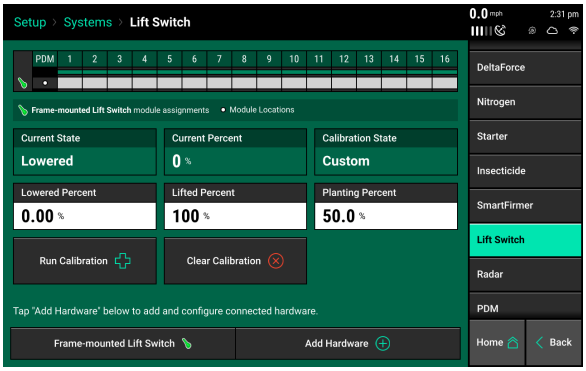
Frame Mounted Lift Switches

For a frame mounted switch, configure the plug in location as the PDM. Once the PDM is selected as the location, the system will then need to be calibrated for lifted and lowered position.





Calibrate Lift Switch

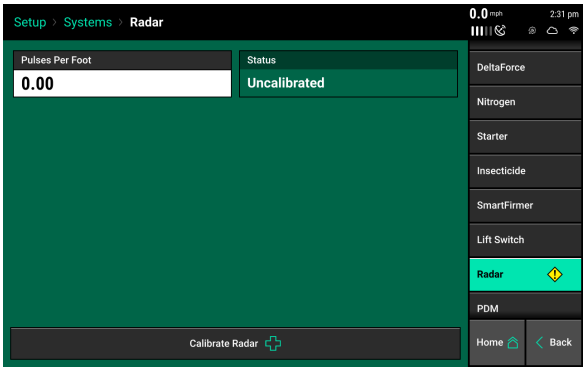


To complete the Lift Switch calibration, press the "Run Calibration" button at the bottom of the screen. Follow the on-screen instructions for the different positions the planter must be in. The results will then be displayed on the main Lift Switch Page. For issues with the lift switch not calibrating or functioning correctly, see the Troubleshooting Guides for Lift Switches in the Dealer Service Manual. After a calibration has been completed, verify the system is reading the lift switch correctly by watching the "Current State" information on the Lift Switch page. Ensure the "Current State" is correct when lowering and lifting the planter.

Manual entry of values can be done by selecting the "Lowered Percent", "Lifted Percent", or "Planting Percent" buttons and entering a value.

To clear out the current calibration press the "Clear Calibration" button located at the bottom of the screen.

Radar



Receiving a speed reading from a tractor mounted radar is recommended when running a control product. The Radar Status page allows the operator to calibrate the radar.

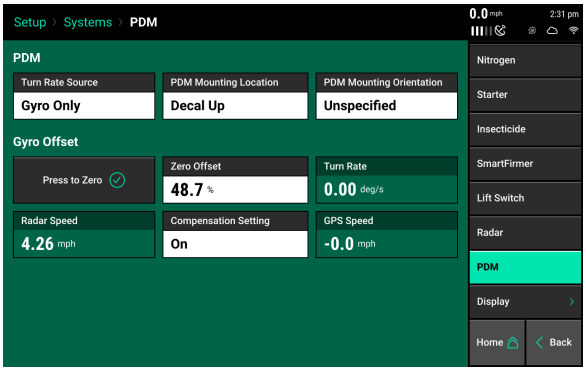
Select the "Calibrate Radar" button at the bottom of the screen and then follow the onscreen instructions.

The calibration process will require a good GPS signal as well as having the operator drive straight for at least 300 feet at a constant speed of 4 mph or greater.

If the Pulses Per Foot is already known, enter this value manually be selecting the "Pulses Per Foot" box.

PDM

The Power Distribution Module [PDM] must be configured in order for control products that connect through the SRM infrastructure to operator properly.



Turn Rate Source - Select the input source for calculating turn compensation when planting through curves. Select between “Gyro then GPS”, “Gyro Only”, and “GPS Only”. “Gyro Only” is the recommended setup.

Note: For the system to be able to recognize forward acceleration quickly and start seeding correctly, the position of the Gyro inside of the PDM must be known. Ensure that the PDM Mounting Location and PDM Mounting Orientation are set correctly. Otherwise performance will be degraded.

PDM Mounting Location - Determine if the PDM is mounted with the decal on the PDM facing up or if the decal on the PDM is facing down.

PDM Mounting Orientation - Determine the orientation of the fuses. The orientation is based on the operator sitting in the cab. Fuses can be orientated either: Forward, Right, Backwards, or Left.

“Press to Zero” - use this button to zero the gyro. The gyro should always be zeroed when setting up a new system. There will be a Zero Offset percentage recorded after the gyro has been zeroed. Make sure the planter is straight behind the tractor when zeroing the gyro. If the turn compensation seems to be off or if getting warnings about the gyro, re-zero the gyro.

Zero Offset - Displays the zero offset set when the Gyro was zeroed.

Turn Rate - Displays the radius of a turn in degrees per second, of the turn that is being read from the gyro while turning. This is the degree that will be used for turn compensation.

Compensation Setting - Press on this button to adjust the turn compensation.

On - This is the RECOMMENDED and default setting for all SRM systems. In this setting, both control and monitoring will be based on the speed of each individual row. For example; all rows will keep a consistent seed spacing around curves.

Control Only - Each row will control to its own calculated speed and will keep consistent seed spacing. However, the reporting will only show a population based on the center of the planter. There will be a higher population on the outside rows and lower population on the inside rows of the curve.

Monitor Only - Control for all rows will be based on the center of the planter. However, reporting will show a population based on the distance each individual row traveled. Resulting in a higher population for the inside rows and lower populations for the outside rows.

Off - both control and monitoring will be based on the speed of the tractor. Seed Spacing will be closer on the inside of the curve and further apart on the outside of the curve.

Radar Speed - displays the speed being read from the Radar. Press on this button to be directed to the Radar Status page.

GPS Speed - displays the speed being read from GPS. Press on this button to be directed to the GPS Communication page.

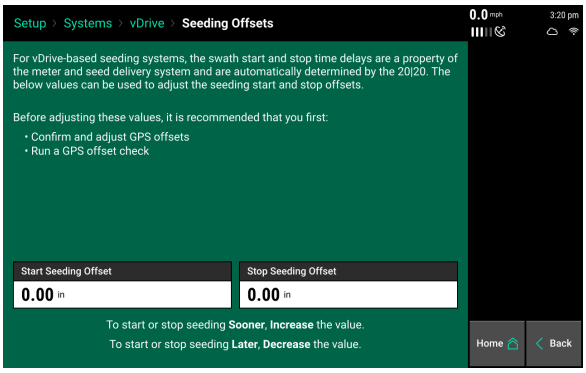
vDrive Swath Calibration

vDrive Swath Calibration settings can be found by navigating on the display through Setup — Systems — vDrive.

Calibration State

If the vDrive system is not starting or stopping at the appropriate time, the Calibration State can be used to improve the timing

Confirm GPS offsets and run a GPS Offset Check prior to adjusting the Start and Stop Seeding Offsets.



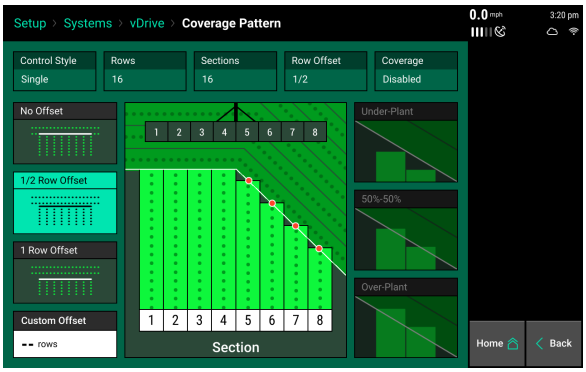
Always dig seeds to verify that the GPS offset measurements are working correctly.

Adjust the Start Seeding Offset to change where the system will begin dropping seeds. Find the distance from where the seeding is actually starting to where it should start by digging. Enter this distance in inches. Negative numbers will move the seeding backwards while positive numbers will more it forwards. Do the same with the Stop Seeding Delay for where the seeding should stop.

The Start Seeding Offset and the Stop Seeding Offset can be adjusted independently of each other. Enter the distance to adjust the offset in inches. Increase the value to start or stop seeding sooner and decrease the value to start or stop seeding later. The range of distances that can be entered is -120 – 120 inches.

Coverage Pattern

Define how the motors operate when entering and leaving already planted areas. Select the offsets and coverage pattern that is optimal for your specific operation.



On the left hand side of the screen select a Row Offset. This is the distance from the headlands that seeds start and stop. On the right hand side of the screen select a coverage pattern. This is used when rows are tied together in swath sections.

Single row swath sections can adjust the offset, but not the coverage pattern (since each row is acting independently of each other for swath control).

If any swath section has more than one row, then both the offset and coverage pattern can be adjusted.

<u>Select an Offset:</u> (Left side of the screen)

No Offset – The planter will place the last seed when stopping and the first seed when starting right at the beginning of the headland.

½ Row Offset – The planter will stop/start seeding half the distance of the planter's row spacing from the headland.

1 Row Offset – The planter will stop/start seeding 1 row from the headland.

Custom Offset – You manually set the distance away from the headlands the planter will start/stop seeding.

<u>Select the Coverage:</u> (Right side of the screen)

Note: "Section" refers to the swath sections that were setup for the Swath Control Style. Each section will control independently of each other.

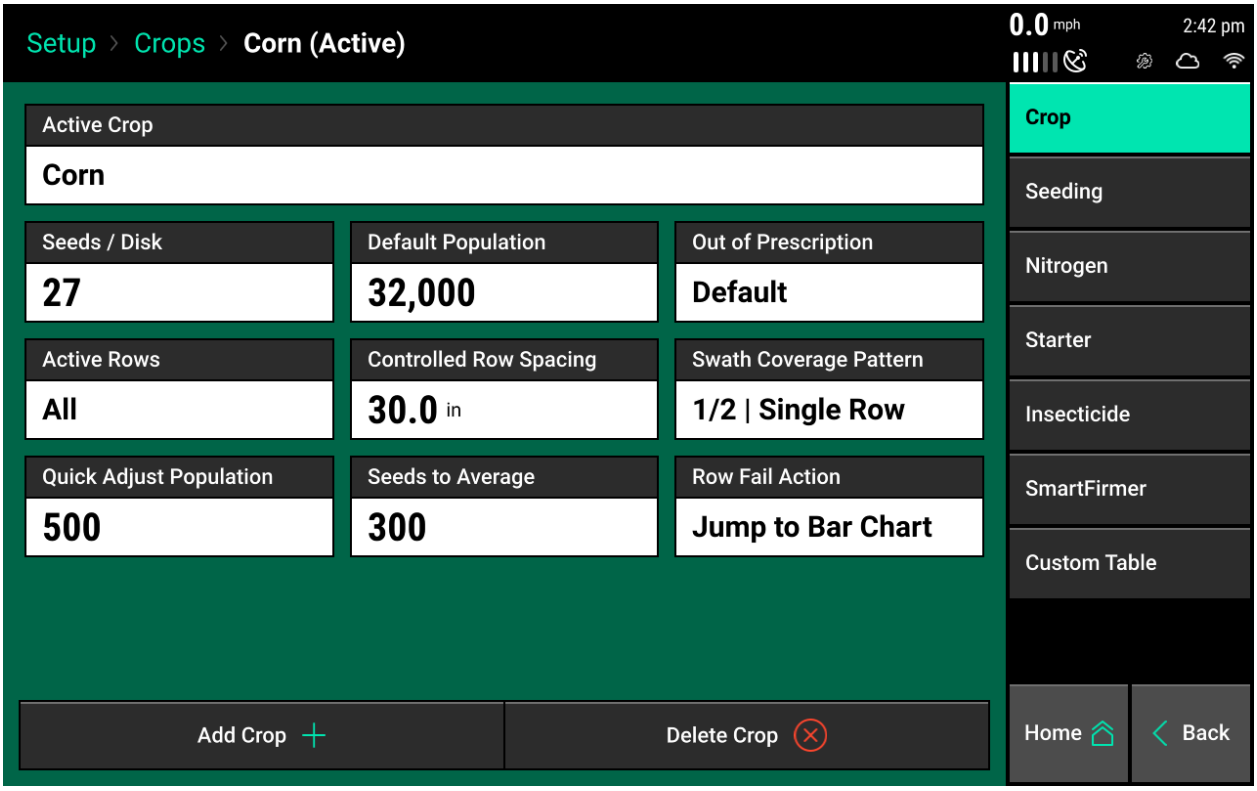
Underplant – The section will shut off when the first row in the section hits the offset point.

50%-50% - The section will shut off when the middle of the section hits the offset point.

Overplant – Will shut off the section when the last row in the section hits the offset point

Configure Crop Type

For the system to plant correctly, the crop type must be correctly configured. Select “Setup” – “Crops”. Configure each crop type. The information configured on the crops page is saved by crop type.



Active Crop – Select the appropriate crop type by pressing “Active Crop” . If the crop type being planted is not available, select “Add Crop” to choose from all available options.

Seeds/Disk – Select the correct Seeds Per Disk for the disk being used in the meters. If the seeds per disk are not setup correctly, the applied population will be incorrect.

Default Population – Enter a default population that will be used if the system is not given a commanded population. Additionally, select what the system will plant if it goes outside of a seeding prescription that is active. Select “Default” (the default population is used when outside of the prescription) or “Current” (use the same population that was being planted prior to exiting the prescription).

Out of Prescription - When planting with a prescription script and are outside of that prescription, this allows you to plant at the default population set point or continue with the current prescription rate.

Active Rows - Select the rows that will be planted with this crop. Rows not selected will be disabled.

Controlled Row Spacing - the “spacing” between the rows of the planter.

Swath Coverage Pattern – Links to coverage pattern setup in vDrive setup menu.

Quick Adjust Population – Determines the amount of seeds the population is adjusted by when pressing the + or – button for seeding rate adjustments in the vDrive Control.

Seeds to Average - Seeds to Average determines on how many seeds are used in the rolling average for calculating population, singulation, spacing, and SRI. Set this to about 1% of the population for the crop (i.e. for corn, 300 seeds – 1% of 30,000 – is a good setting.

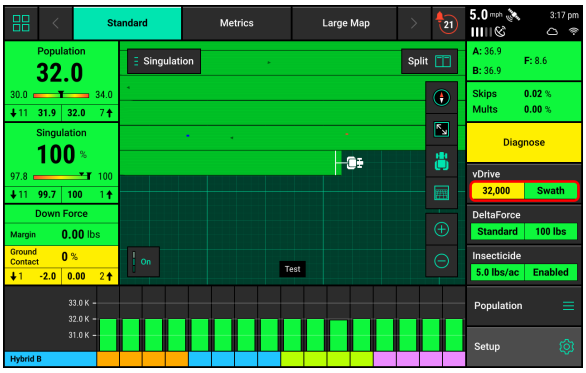
Row Fail Action - Select this option to change the display action when a row failure occurs.

Add Crop – Add a crop type to the quick crop selection. The added crops will be available to be selected as the Active Crop. Added crop types will also be available in the Products menu when assigning hybrids.

Delete Crop - Delete crop types from the quick selection menu. Deleted crops will not be available when pressing the Active Crop button nor will they be available when assigning hybrids.

vDrive Control

The vDrive Control button is located on the right hand side of the home screen. This button will display the status of the two functions of vDrive: Population and Swath Control



vDrive Control Button Population Legend

Disabled – The vDrive system is disabled. Enable it under the control screen to plant.

Variable – A seeding prescription is assigned and the vDrive system is in variable rate mode.

Multiple – the vDrive system is in manual mode and there are multiple rate sections configured

Rate Off: Unable to plant because the master plant switch being in the down position.

A Number is Displayed – the vDrive system is in manual mode with only a single rate section. The number that is displayed is the commanded manual population rate for that rate section.

Green: System is functional and has a commanded rate

Yellow: There is a prescription assigned to the active field, but the system is set to plant a manual rate.

Red: Unable to plant.

vDrive Control Button Swath Legend

Disabled – The vDrive system is disabled. Enable it under the control screen to plant.

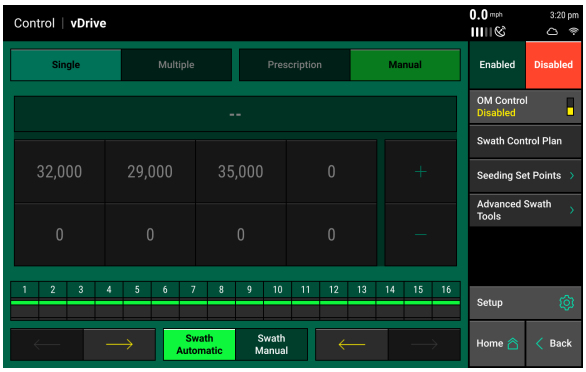
Green: Swath Control is enabled and set to automatic mode

Yellow: Swath Control is enabled and set to manual mode

Red: Swath Control is disabled due to the swath switch being in the off position on the Cab Control Module or the planter is swathed off due to coverage.

Enabling vDrive

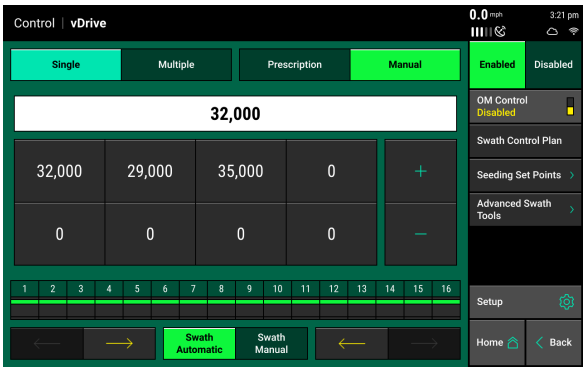
In 2020.1.x and newer software, the vDrive system will have to be enabled on the control screen before planting. Enable control to use the vDrive system.



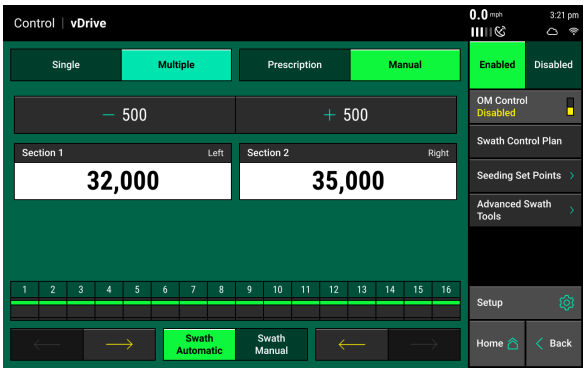
Population Control

Press the vDrive button to access the Control Screen. To manually assign or adjust the seeding population rate, select “Manual” at the top of the screen. If multiple rate sections were configured in vDrive setup, select between “Single” or “Multiple”. If a single rate section was configured, use “Single”.

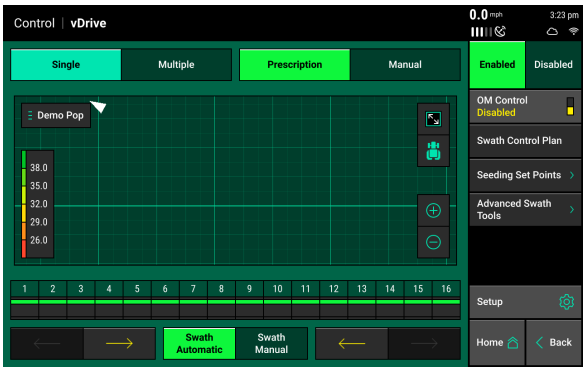
Single – Assigns the same population rate to all rows. Select a preset population from the list of population set points displayed on the screen (configure this list using the “Edit Set Points” button on the right hand side of the screen) and use the + or - buttons to increase the rate by 500 seeds (or the amount that the “Quick Adjust Population” was set to in the Crops setup), or tap on the white box displaying the current population to manually enter a rate.



Multiple - Assign a different population to each Rate Section that was configured during the vDrive Setup. Use the + and – buttons to adjust the populations up or down the same amount for each Rate Section, or tap on each population to manually enter a new population for each Rate Section. The + and – buttons will adjust by the amount set for the “Quick Adjust Population” in the Crops menu.



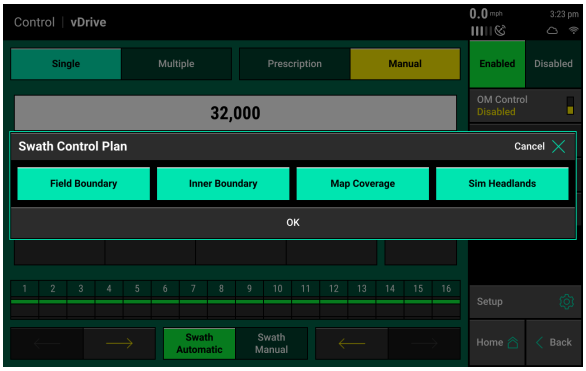
If a seeding prescription is assigned to the active field, Variable mode will be selected as the default setting. When in Variable mode, the system will control to the seeding prescription. To move from Variable mode to Manual mode, select “Manual” at the top of the screen. This ignores the assigned seeding prescription and continues to plant at the assigned manual rate. Manual will turn yellow on both the vDrive Control page and the Home Screen if a manual rate is selected when there is also a seeding prescription assigned to the active field.



Swath Control

The vDrive Control screen includes controls for Swath. If the Swath Control switch on the CCM is in the up position, use the vDrive Control screen to configure the automatic swath settings and to switch back and forth between manual and automatic swath control mode. When Swath Automatic is selected, press on “Swath Control Plan” to configure what the vDrive motors will swath to.

Items in the Swath Control Plan that are outlined and in bold are active components of the Swath Control Plan. The planter will automatically swath on and off to these components while planting. The system will control to the options highlighted in green.



Field Boundary – Swath rows off if they go outside of the field boundary that has been assigned to the active field.

Inner Boundary - Swath rows off if they go inside of an inner boundary that has been assigned to the active field as part of a boundary file.

Map Coverage - Swath rows off that cross into an area of the field that has already been planted.

Simulated Headlands - Swaths rows off to an offset from the field boundary to allow headlands to be planted last. Simulated Headlands must be configured before the system will use them for swath control.

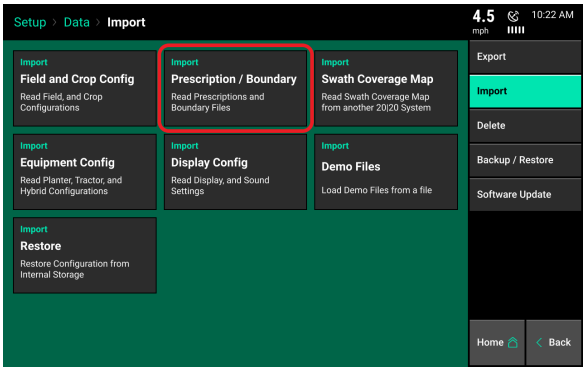
At the bottom of the vDrive Control page, operators can switch between Automatic and Manual swath control. Rows can be manually swathed off from either side of the planter by pressing the arrows. Additionally, the boxes representing rows on the planter can be manually swathed off/on by pressing-holding-swiping any of the boxes. Boxes that are yellow are swathed off.

Swath control can also be manually controlled from the home screen. The manual control can be used instead of the Dashboard Mini Chart [DMC] at the bottom of the home screen. Add the Swath Control bar when editing the home screen. When editing the home screen select Swath in the Dashboard Minichart options. See the 20|20 Operator's Guide for more information on editing the home screen. When using swath control on the home page, press and hold a finger on top of a box. When it turns yellow continue to drag the finger across all rows to swath them off. A yellow box indicates the row is swathed off. Press "Reset" to switch back to Automatic mode

Prescriptions and Boundaries

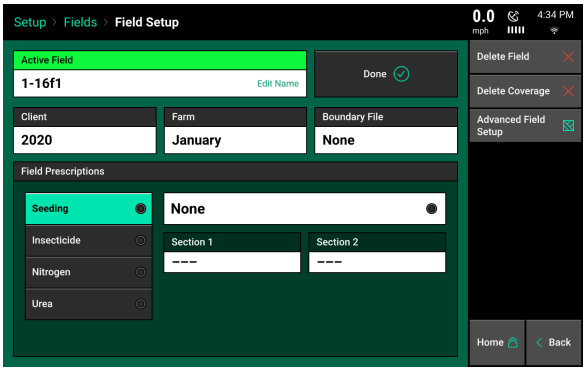
Importing Files onto the Display

When importing Prescriptions and Boundaries onto the display, both the Prescriptions and Boundary files must be in the form of a shape and include at minimum the .shp, .shx, & .dbf file extensions. Load all of the files on the root drive of the UBS drive or in a folder titled "Sendto2020". Insert the USB drive into the side of the display. Then select "Setup" – "Data" – "Import" – "Prescription/Boundary"



Assigning Prescriptions and Boundaries to a Field Name

Once Prescriptions/Boundaries have been imported into the display, they must then be assigned to the appropriate field names. To assign to a field select "Setup" – "Fields" – Select either the Active Field or another Field name (selecting a different Client or Farm name may be required to locate the appropriate Field name). The Field Setup page has options to assign both a Boundary and Prescription.



Note: 2020.0.x and Older Software Only: Only one prescription can be assigned to each individual field. Prescriptions can be for seeding, liquid, and/or insecticide. To combine multiple types into one prescription, create separate attributes for seeding, liquid, and insecticide. If no seeding prescription is assigned, a manual rate must be selected in the vDrive Control Page.

Note: A field can have either a Boundary or a Seeding Prescription, both a Boundary and Seeding Prescription, or neither assigned to it. A boundary file is only used for swathing off rows on the planter if they go outside of the boundary. A boundary file can have both an exterior and interior zones.

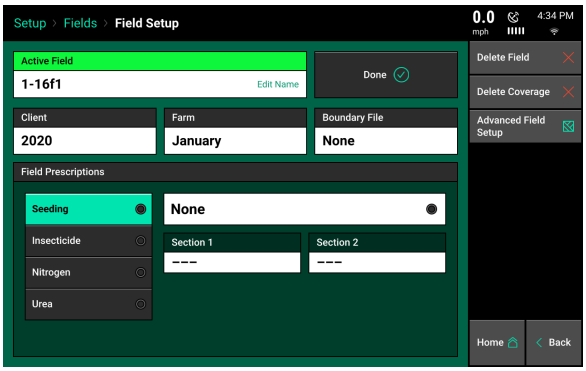
Note: The option to assign a prescription will only be available if vDrive is configured as the Drive Type and a rate section has been configured.

Boundary:

To assign a Boundary File to the selected field, press the "Boundary File" button. This will display ALL shapefiles that have been imported into the display. Ensure that the appropriate boundary file is selected. After selecting the boundary file name, an attribute can be selected. It is not necessary to select an attribute for a boundary file.

Note: Boundary files that have been recorded by the display can also be assigned to the field using the same process.

Seeding Prescription:



To assign a Seeding Prescription to the selected field, press the "Seeding Prescription" button. This will display ALL shapefiles that have been imported into the display. Choose the appropriate prescription for the field name. After selecting the prescription name, an attribute MUST be selected for each rate section that has been setup for the planter. An attribute is based on a defined product and contains a single defined rate for each management zone and is defined/named during the creation of the prescription. A different attribute can be selected for each rate section (allowing each rate section to be controlled by a different attribute/seeding rate), or the same attribute can be selected for each rate section.

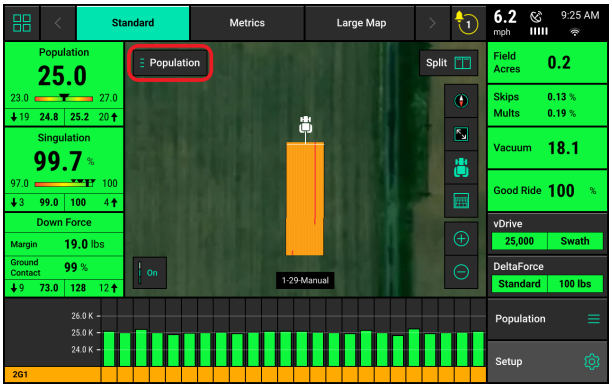
The name of the prescription assigned to the field will be displayed in the Seeding Prescription box while the Attribute names assigned to rate sections will be displayed in the Attribute box.

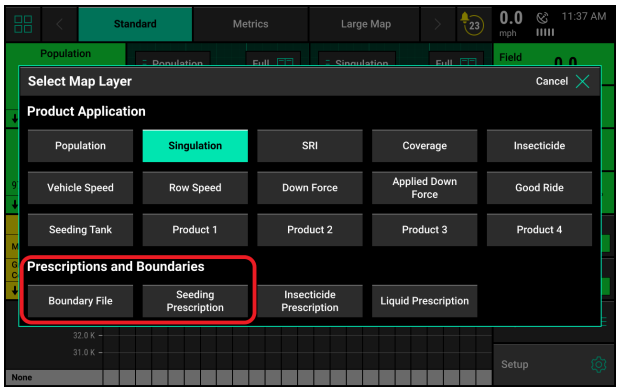
Prescription & Boundary Processing Modes

Under the Advanced Field Setup screen there is an option to adjust the Prescription Polygon Processing Mode. While this mode can be adjusted, the “Standard” setting is the default setting and is the processing mode most commonly used. Changing the mode to “All Exterior” adjusts the way the monitor reads the polygons that create the different zones. They are changed so the display reads all the zones as exterior polygons (ignores interior polygons). This polygon processing mode should only be changed if there are issues with the display correctly reading the prescription or boundary file.

Viewing the Boundary and Prescription

Boundary and Prescription files that have been assigned to a field can be viewed on the home screen for the active field. Select the current Map Type displayed at the top of the page to see a list of all available map types. Scroll to the bottom of the list and locate the two map types called Boundary File and Seeding Prescription. Select these map types to display the Seeding Prescription map or Boundary map assigned to the active field on the home screen.

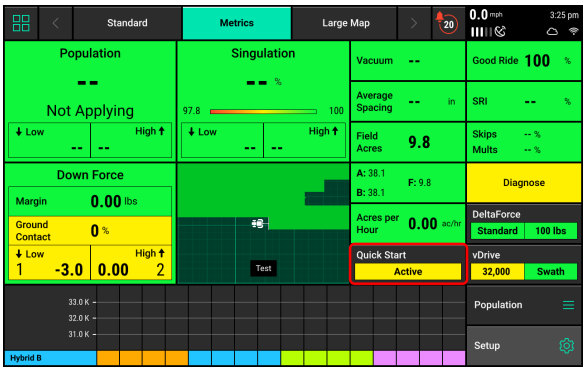




vDrive Quick Start

The vDrive Quick Start button allows the operator to start spinning the meters while stopped. This will allow the operator to start moving while the meters are already spinning, helping to avoid any skips in the field. Press the button once to begin a countdown. When the countdown reaches zero, the meters will begin to spin. They will spin at a simulated speed of 3 mph and will continue to spin for seven seconds or until the speed of the planter is greater than 3 mph. The default time when the button is pressed is 2 seconds until the motors begin to spin. This time can be adjusted in the Quick Start Delay located in the vDrive Advanced Setup Page.

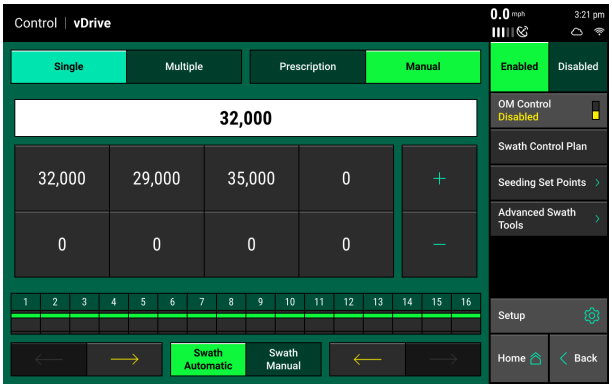
The Quick Start button will be white and say Inactive when not in use. When it is pressed it will turn yellow and will begin to countdown to zero. When it changes to say “Active” (flashing between green and yellow) the meters will begin to spin.

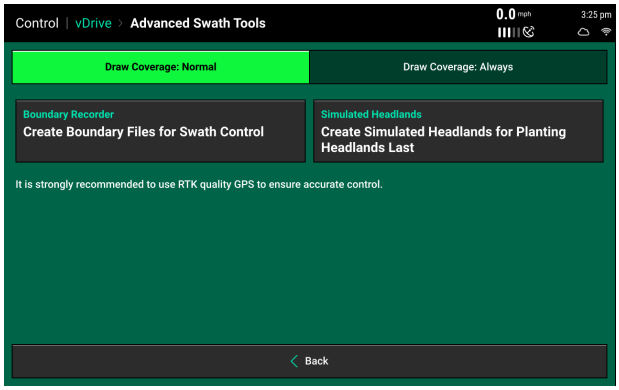


The vDrive Quick Start button must be added to the home screen before it can be used. Add the quick start button when editing the home page

Advanced Swath Tools

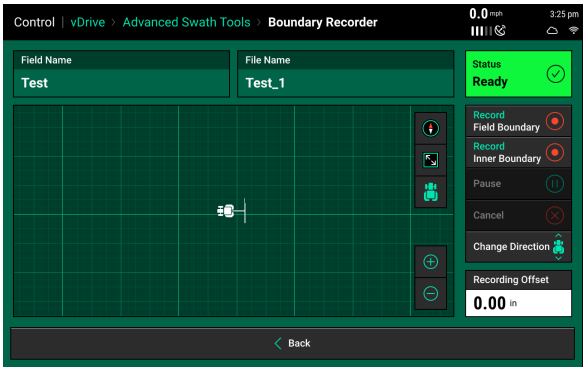
Pressing the “Advanced Swath Control” button on the vDrive, vSet Select, or mSet Control screen gives access to two Advanced Swath Tools. These tools should only be used with RTK quality GPS to ensure accurate performance. Using poorer quality GPS can result in drifting boundaries and inaccurate clutch control.





Boundary Recorder

Pressing the “Boundary Recorder” button takes you to the Record Swath Boundaries screen. The boundaries that are recorded are for Swath Control only.



Record Field Boundary — Press this to start recording an outer field boundary. Once the recorder has started, this button will change to ‘End Field Boundary’.

Note: Pressing End Field Boundary will snap a line between the beginning and end locations of the recording.

Record Inner Boundary — Press this to start recording an inner field boundary. Once the recorder has started, this button will change to ‘End Inner Boundary’.

Note: Pressing End Field Boundary will snap a line between the beginning and end locations of the recording.

Pause/Resume — Use the Pause/Resume button to drive around an area while not drawing a boundary. The system will snap a line between the Pause and Resume locations.

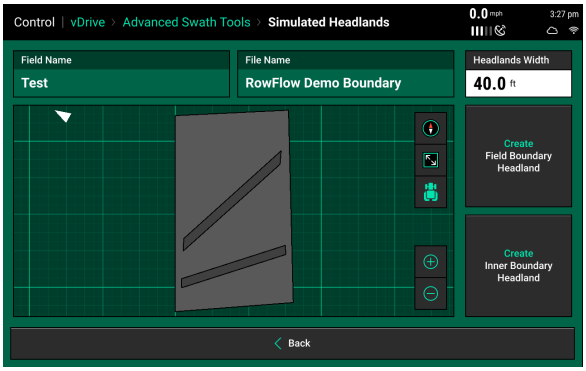
Cancel — Cancel will discard all boundary drawing and editing that has been accomplished.

Change Direction — Change direction will flip the planter 180 degrees.

Recording Offset — Use the recording offset to offset the boundary draw line from the center of the tractor.

Simulated Headlannds

Pressing the ‘Simulated Headlands’ button on the Advanced Swath Tools page brings you to the Simulated Headlands screen. This feature offsets the field boundary for planting them last.



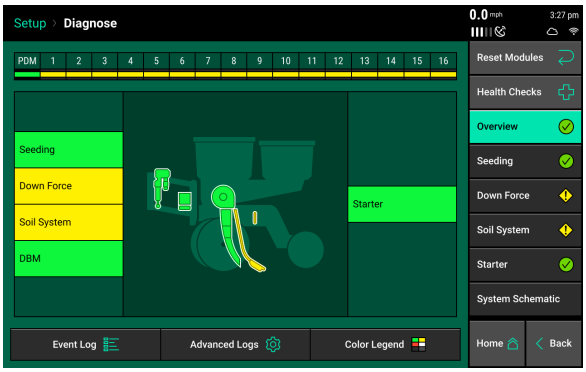
Default Headlands Width — The default headland with designates the width of the Inner and Field Boundary simulated headland.

Create Field Boundary Headland — Selecting ‘Create Field Boundary Headland’ will simulate a boundary around the Field boundary.

Create Inner Boundary Headland — Selecting ‘Create Inner Boundary Headland’ will simulate a boundary around the Inner boundary sections of the field.

vDrive Diagnostic Information

Prior to planting ensure that all planter diagnostic information is ok. Select “Setup” – “Diagnose”. Everything should be green on the diagnose page. Select “Color Legend” to view an explanation of what each color indicates.



Note: Modules may be updating during initial connection. Once updates are complete, all modules should be green. If the modules are not green, confirm that the number of rows and planter setup is correct. If still experiencing issues, refer to the Dealer Service Manual .

Color Legend:

Green - the system is working correctly and communications are good.

Yellow – a Device or sub-component is not 100%

Red – Device has failed, or is expected, but not detected.

White – Device is detected, but is not expected.

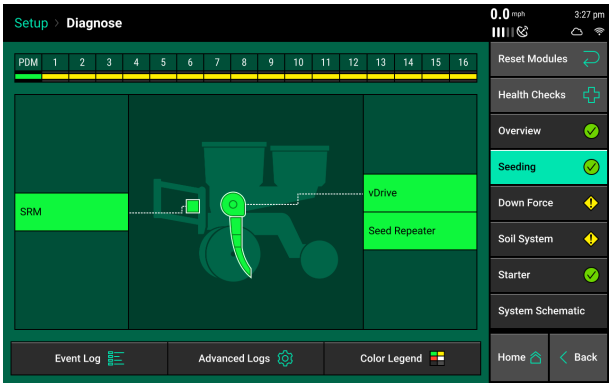
Black – Row has been disabled in the planter configuration.

Gray – Device is being detected, updating firmware, or unreachable.

vDrive Level 2 Diagnose Page

Select the Seeding system on the Diagnose page, then the vDrive button to verify that all information looks good on the vDrive level 2 diagnose page.

Note: On 2020.0.x and older software, press vDrive directly from the main Diagnose page.



Population Actual - This is the measured population the meter is actually planting reported by the seed tube sensors. Rows that say “Not Apply” indicates these rows are not planting.

Population Command - The target population you want to plant.

RPM Actual - The actual RPM of the vSet meter.

RPM Command - The RPM of the meter needed to reach the target population.

Stability - Measures the variance of the drag on the motor. The higher the stability percentage the smoother the vDrive motor will be turning.

Supply Volts - The amount of volts being sent to the vDrive motor. Average range of supply volts - 12-15 volts

Drive Amps - The amperage the vDrive is pulling while in operation.

Standard operating range of current draw at 5mph

- Corn - .4-.6 amps
- Beans - .7-.9 amps

Duty Cycle - The percent of time that power is commanded on where the on/off cycles are occurring at 35 kHz.

Information about the Lift State (Raised or Lowered), Radar & GPS Speed, what the Forward Acceleration is, the Master Plant Switch (On or Off), and the Turn Rate being measured by the PDM is displayed at the bottom of the page.

vDrive Light Status

The vDrive motors themselves give diagnostic information by using the red LED light.

Light Pattern	**Meaning**
No Light ( )	Device is not powered
Solid Light (____)	Device is being updated
Fast Blink (5Hz) (……)	Device is powered, but lost communication
Steady Blink (1 Hz) (- - - -)	Device is powered and is communicating
Erratic Blink (..–..–.)	Device is powered, but never communicated

vDrive Health Checks

Always perform a health check on the vDrive system after installation or sitting for long periods of time.

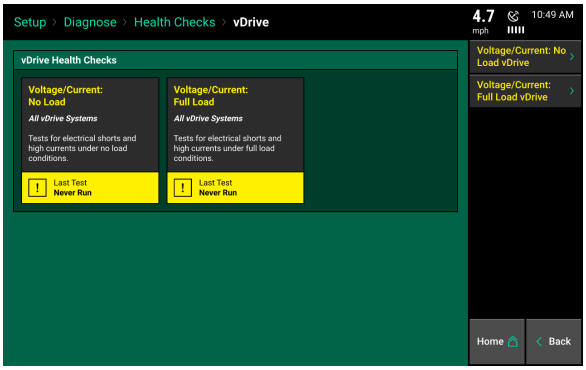
For 2020.0.x or earlier systems:

Perform any health checks in yellow before planting. Access the vDrive health check page by selecting “Setup” – “Diagnose” – “Health Checks” There are two vDrive Health Checks that can be run.

Voltage Current No Load: vDrive motors will cycle to assess performance of the electrical and mechanical systems. It will test for electrical shorts and high currents under no load conditions. No seed or vacuum is required for this test.

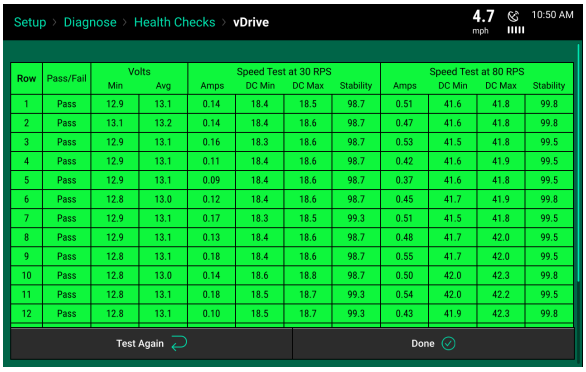
Voltage Current Full Load: vDrive motors will cycle to assess performance of the electrical and mechanical systems while vacuum is engaged and seed is present. It will test for electrical shorts and high currents under full load conditions. Seed and vacuum are required for this test.

Select each test to run and follow the on screen instructions when performing the tests.



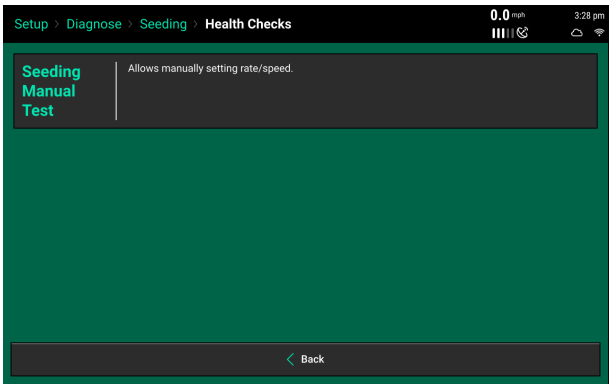
A report card will be given for each row after completion of each Health Check.

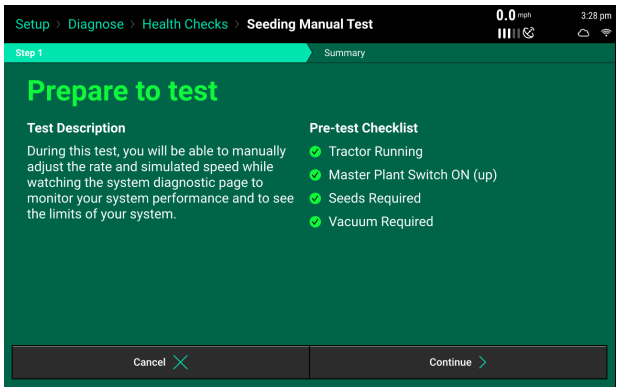
Note: For assistance with diagnosing failed health checks, see the Troubleshooting Diagrams in the Dealer Service Manual.



For 2020.1.x or later systems:

To check the health of the vDrive (Seeding) system, perform a “Seeding Manual Test.” Access the health checks page by selecting “Setup” – “Diagnose” – “Health Checks.” Follow the recommendations on the Seeding Manual Test page to initiate the health check.





As the Seeding Manual Test is running, it gives the ability to adjust both the rate of population and speed. Use these adjustments to diagnose any issues in the vDrive system that might arise.

Note: For assistance with diagnosing failed vDrive rows, see the Troubleshooting Diagrams in the Dealer Service Manual.