

# SeedSense®

## **SeedSense Operator's Guide For Gen2 20/20 Displays**

## Precision Planting®

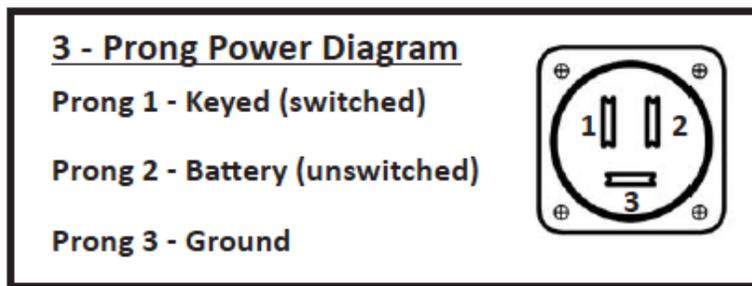
# Contents

System Requirements .....	3
Quick Start Guide .....	4
Display Overview .....	5
Gen1 20/20 SeedSense Monitor .....	5
Gen2 20/20 SeedSense Monitor (iPad Ready) .....	6
Cab Installation.....	7
Dashboard Buttons .....	8
Measurement Detail Screens .....	14
Plant Tab .....	18
Systems Tab .....	26
GPS Setup.....	26
Display Settings.....	32
Crops Tab.....	38
Diagnose Tab .....	42
Data Tab.....	44

# System Requirements

## Power Supply

The 20/20 system uses both a switched power source and a constant unswitched power source. By using the constant source, the system will maintain power to save data and safely shut down if the ignition is suddenly shut off. By using the switched or keyed source, the 20/20 will turn itself off to keep from draining the battery if the system is left on after the ignition is shut off. If you are only supplying constant power, when you turn on the 20/20 you will only see a blank grey screen. If this happens, you have two options. One, you can correct the problem by fixing the switched power leg of the 12V receptacle, or two, you can move the terminal plug on the 20/20 tractor harness from the white to the red spade. By doing this, your 20/20 will no longer shut itself down automatically when you turn the ignition off, so, if you do not turn the 20/20 off, you risk draining your battery.



## Fuse Protection

To protect the 20/20 from damage, always use a minimum of a 30 Amp fuse or circuit breaker on the power supply circuit.

## Seed Tube Sensors

In order to calculate and report accurate information, the SeedSense requires either a Precision Planting WaveVision Sensor or a Dickey-john-style 3/4", three light sensor.

# Quick Start Guide

## Step 1:

### Cab Installation

Begin installing your 2020 SeedSense by mounting the display unit in the cab. Next, connect the display unit to the tractor cable and the tractor cable to power. Now connect the GPS receiver to the tractor cable and mount the GPS receiver to the cab roof. Run the tractor cable out the back of the tractor down to the planter hitch.

## Step 2:

### Smart Connector Installation

Now that you have installed the cab components, mount the Smart Connector to the planter and connect the tractor cable and planter harness to the Smart Connector.

## Step 3:

### Row Unit Module Installation

With the Smart Connector mounted to the planter and connected with the planter harness, go to the row units that you are going to equip with a Row Unit Module (RUM). Mount the RUM on the row unit as described on page 70 and following.

## Step 4:

### Down Force Sensor Installation

Next mount the Smart Pin or Smart Link Down Force Sensors on the same rows that have Row Unit Modules installed.

## Step 5:

### Power Up and Setup

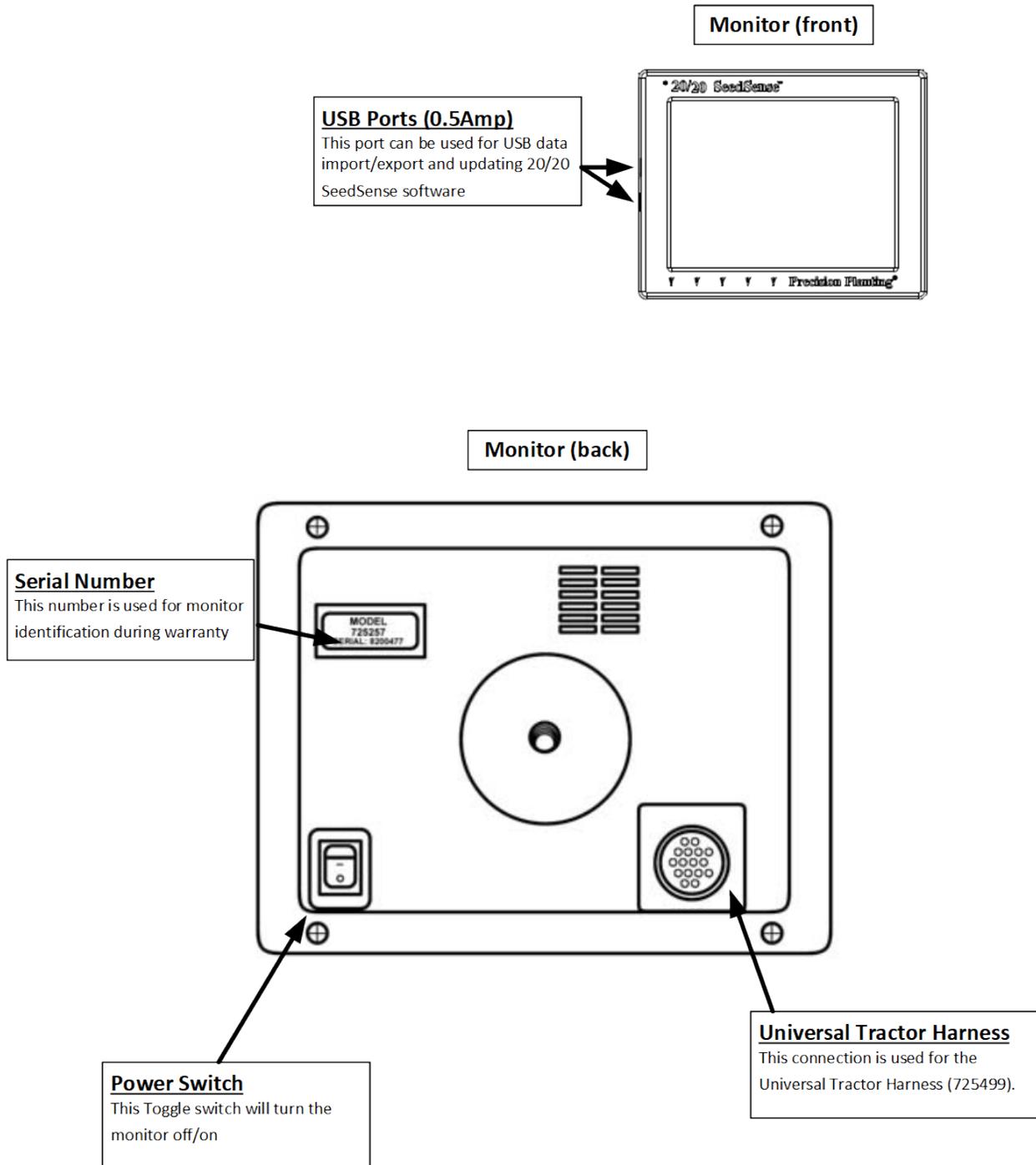
Once the 20/20 is installed, flip the power switch on the back of the display unit and allow several seconds before you will see the screen display the boot information. Once the system is powered up and booted up, you will need to configure your planter so that the 20/20 will accurately display information. To do this press **SETUP** on the right side of the screen and then press the **PLANTER** button on the left side of the screen under the **PLANT** tab. Enter your planter's configuration, specifically **MAKE**, **ROWS**, **ROW SPACING**, and **ACTIVE ROWS**. Under **SETUP**, you will also need to press **POPULATION** and enter a target population.

**To receive the full value from your display, it is recommended that you fully configure the 20/20 SeedSense as described in the Setup section of this manual.**

# Display Overview

## Gen1 20/20 SeedSense Monitor

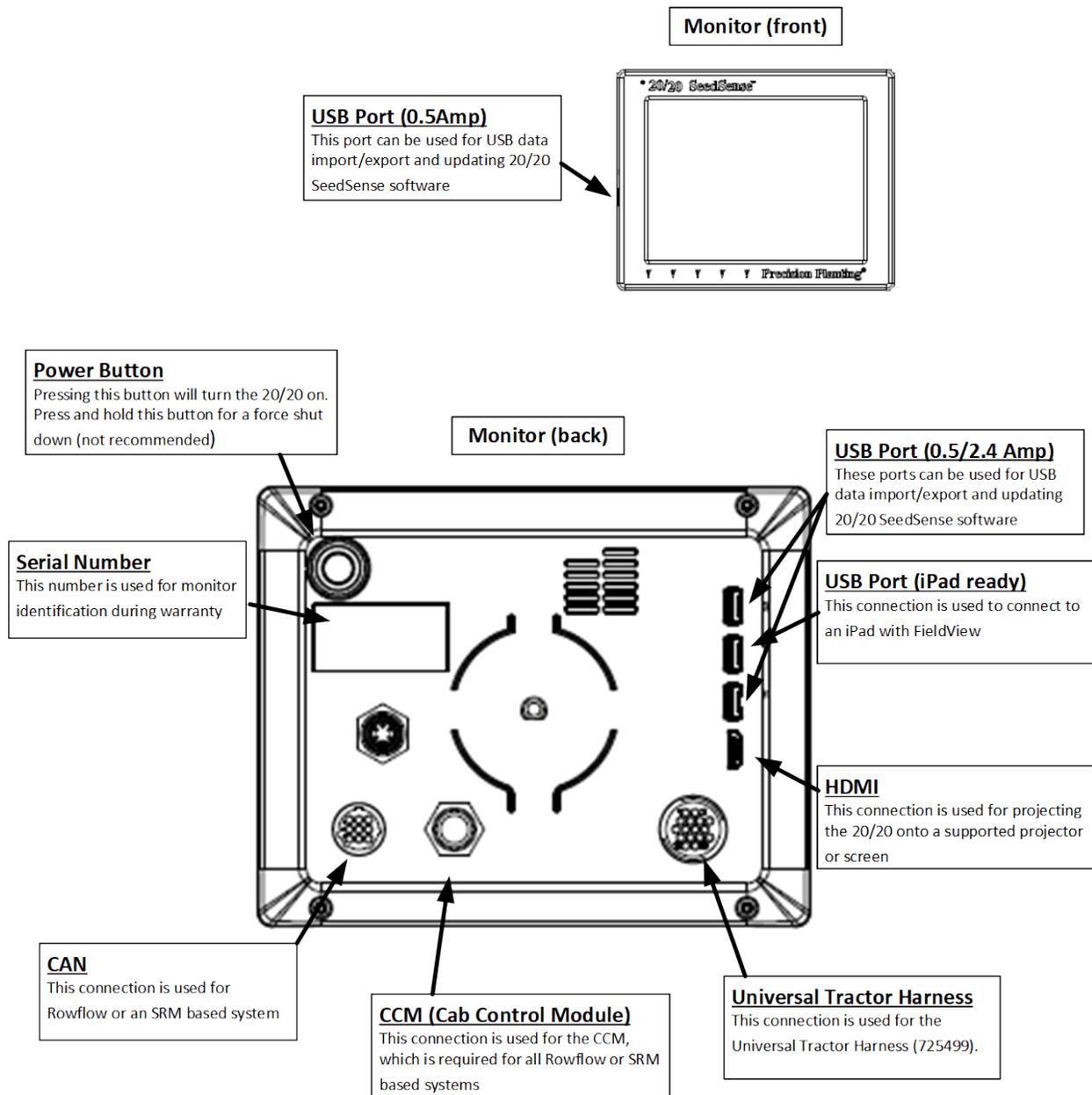
Serial Number Range 821XXXX, 820XXXX  
725257



# Gen2 20/20 SeedSense Monitor (iPad Ready)

Serial Number Range 822XXXX

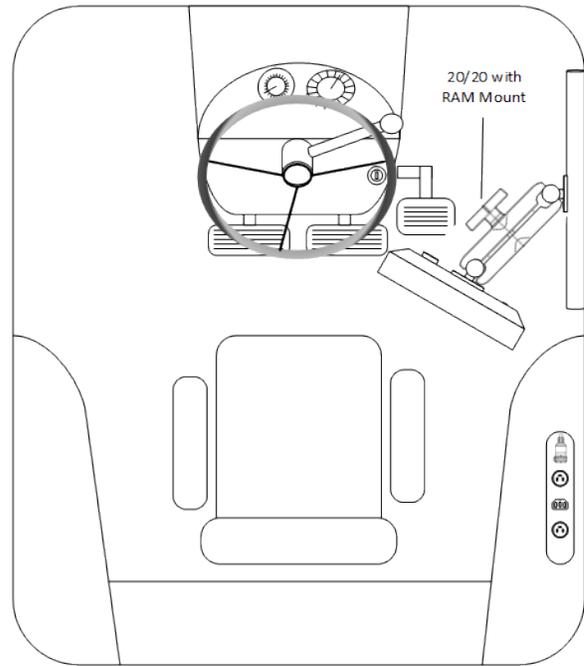
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# Cab Installation

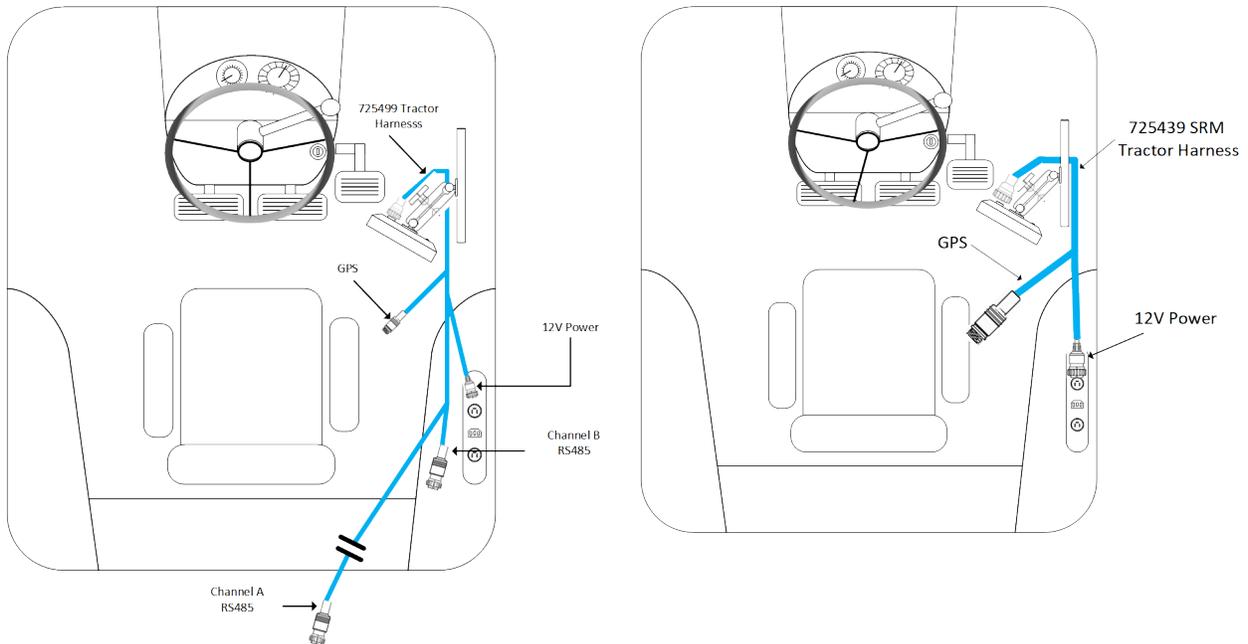
## Step 1:

Install the 20/20 Display Unit in the cab of the tractor. Mounting locations will vary from tractor to tractor. There are several mounting options available for the 20/20. The diagram to the right depicts the 20/20 with a RAM mount.



## Step 2:

Connect the 725499 or 725439 SRM Base Tractor to the 20/20 Display Unit.



## Step 3:

Connect the 725499 or 725439 SRM Base Tractor Harness to the power source in the cab.

## Step 4:

Connect the 725439 or 725499 harness to a GPS adaptor to tie into a 5 hz GPS system. See the GPS setup guides in the Tech Docs section of [cloud.precisionplanting.com](http://cloud.precisionplanting.com) for specific instructions for connecting and configuring GPS.

# Dashboard Buttons

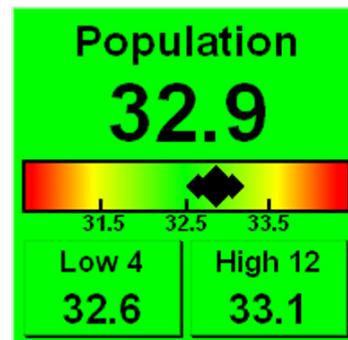
## Dashboard

The dashboard screen pictured at left is the home screen for the 20/20 SeedSense. The dashboard screen displays the current planter average for the measurements taken by the 20/20 SeedSense in an easy to read, easy to navigate format.



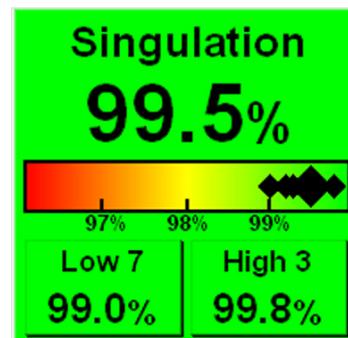
## Population

The large black number at the top of the population button indicates the planter average population in thousands of seeds. The rainbow chart displays the planter average (large black diamond) and individual rows (small diamond). The small numbers under the rainbow chart indicate the target population and the alert limits that you set. The two boxes at the bottom display the current low and high rows for population.



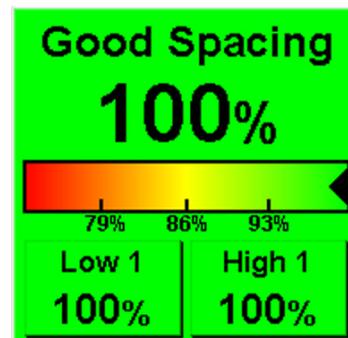
## Singulation

The large black number at the top of the singulation button indicates the planter average singulation. This is the percentage of seeds properly singulated by your meters. The rainbow chart and the low and high row buttons, like those under population, display rows that vary from the planter average.



## Good Spacing

The large black number at the top of the Good Spacing button indicates the percentage of seeds properly spaced according to the set parameters. The default spacing parameter is 4" and can be changed in the setup menu. The rainbow chart and the low and high row buttons show how individual rows vary from the planter average.



## Down Force

The Down Force button displays three values. The low and high row readings display the average weight carried by the gauge wheels on these two rows. Margin displays the average amount of excess weight over what is needed to achieve depth. Use the margin to predict how much down force could be removed and still maintain depth. Ground Contact displays the percentage of time when at least some weight is being carried by the gauge wheels and that proper depth is being achieved.

Down Force	
Low 7 137 avg	High 1 142 avg
Margin	<b>111 lbs</b>
Ground Contact	<b>100%</b>

## Skips and Multiples

This button breaks down the percentage of improperly singulated seeds showing what percentage are skips and what percentage are multiples.

Skips <b>0.4%</b>
Mult's <b>0.1%</b>

## Acres

This button displays the values for the three acre counters. Acre Counters A and B are individually resettable counters that can be used to track whatever increment of acres you choose. Field Acres tracks acres planted in the current field. They are indicated on this button as A (Acre Counter A), B (Acre Counter B), and F (Field Acres). Press the button for further details on all three acre counters or to reset Acre Counter A or B.

Acres
A: <b>15.4</b>
B: <b>15.4</b>
F: <b>30.8</b>

## Vacuum

Vacuum displays the vacuum pressure for a vacuum planter equipped with SeedSense vacuum sensors. Up to two readings may be displayed simultaneously as "left" and "right".

Vacuum
<b>19.2</b>

### **Hex Shaft**

Hex Shaft displays the speed of the hex shaft relative to its expected speed given actual planter speed and target population. This reading may indicate wheel slippage in ground drive systems and radar calibration errors in hydraulic drive systems. It is not a parameter to manage by itself. Rather, it is a tool to diagnose population problems or drivetrain issues.



### **Good Ride**

The Good Ride button displays the percent of time when ride quality is sufficient not to interfere with seed spacing. This measurement provides assistance in diagnosing spacing errors. Poor spacing is typically caused by either a bumpy row unit ride or a jerky meter drive system. Good Ride is not a parameter to manage by itself. Rather, it is a tool to diagnose spacing problems.



### **Loss/acre**

Each skip, multiple, and misplaced seed is assigned a yield loss. When you input the current price of corn (in the setup menu), "Loss/acre" calculates how much these errors are costing you. The point where "Good" turns to a dollar value and where the button turns yellow and red is configurable in the setup menu.



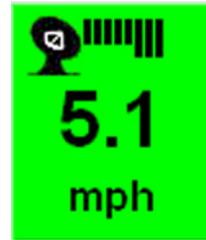
### **Seed Spacing**

Seed Spacing indicates the average spacing of seeds in the seed trench. It is calculated by dividing a number of seeds by the distance traveled while planting those seeds. It is not an indication of accuracy. Rather, it is an average.



## Speed

This box displays your planter speed according to the GPS receiver. Above the speed, a satellite dish icon indicates that the receiver is functioning and each bar indicates a satellite in view. For best results, you should see at least one of the longer bars on the right.



## Date and Time

The Date and Time button displays current date and time information as determined by the GPS receiver. If the GPS receiver is not supplying this information, you may manually enter the correct date or time by pressing the button.



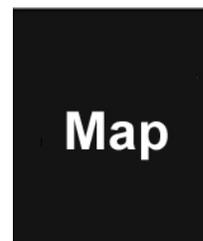
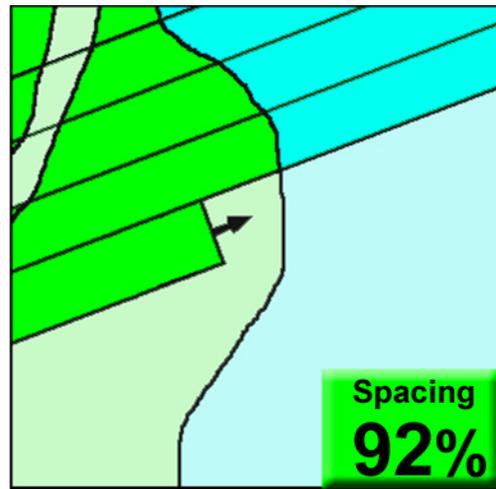
## Seed Release Index

The SRI button displays the planter average Seed Release Index. Seed Release Index measures the consistency of seed drop. The lower the number, the more consistent the seed drop. SRI readings in the field will be significantly higher than SRI readings on a test stand.



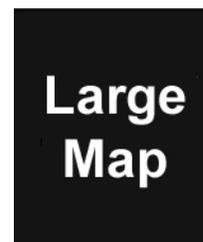
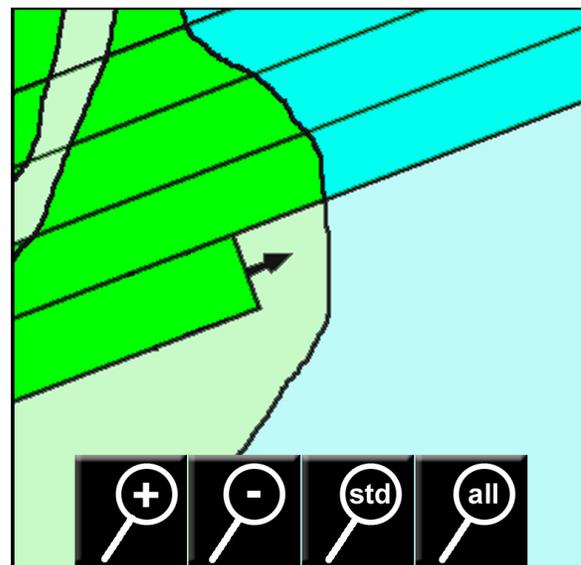
## Small Map

Pressing the 'Map' button allows you to display a coverage map in the area normally occupied by the Good Spacing button. The good spacing value is now displayed as a small green button in the bottom right corner of the map.



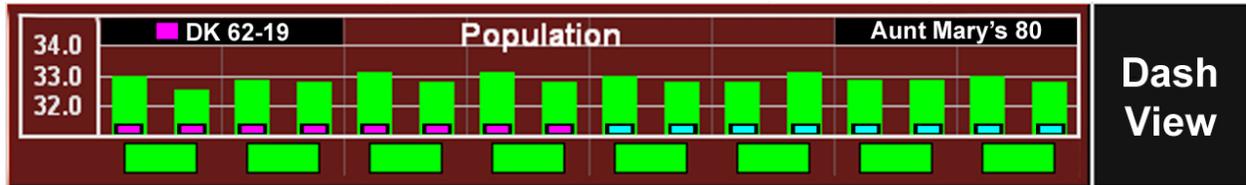
## Large Map

Pressing the small map or the button 'Large Map' will open a larger coverage map. When operating in this mode, the configurable column is changed by default to include Population, Singulation, and Spacing buttons. These cannot be altered. The large map also includes four zoom options. The magnifying glass with the plus sign zooms in. The magnifying glass with the minus sign zooms out. The magnifying glass with "std" zooms to a standard view with the planter centered in the map. The magnifying glass with "all" zooms out to view the entire field. Because this map covers so much valuable information, it is recommended that this view only be used occasionally to view coverage while operating most of the time in the classic or small map view.



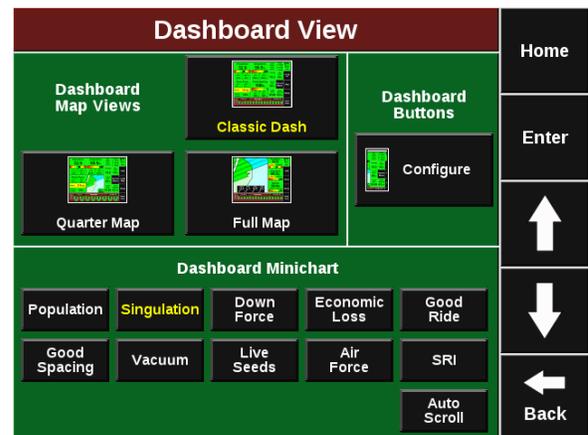
## Dashboard Mini Chart (DMC)

The Dashboard Mini Chart shows a bar chart for one of the measurements of the 20/20 SeedSense. When population is displayed, the top left corner of the DMC displays the active hybrid with a color that corresponds to the rows on which that hybrid is active. If multiple hybrids are active, the hybrid displayed will alternate among the active hybrids every two seconds. The active field is displayed in the top right of the population DMC.



## Dash View

Pressing the 'Dash View' button takes you to the Dashboard View page. Here, you can navigate among the three dashboard viewing options (classic, small map, and large map). You may also designate which values are displayed in the configurable columns. Finally, you may also select which chart to view in the Dashboard Mini Chart. Pressing any one of the buttons will return you to the Dashboard screen with the newly selected chart in the DMC. Pressing 'Auto Scroll' enables or disables the auto scroll feature. When enabled, the Dashboard Mini Chart automatically scrolls through the various charts for a designated number of seconds. When disabled, the same chart remains displayed until a different chart is manually selected.



## Measurement Detail Screens

You can also view more detailed information for each measurement displayed on the Dashboard Screen. To see more detailed information on a given measurement, press that measurement's button on the Dashboard. You will then be able to view a bar chart showing the values for that measurement on each row of your planter. Rows that are performing within acceptable parameters have green bars while yellow and red bars indicate poor performance. You can also move between these screens by using the up and down arrows on the right side of the screen.

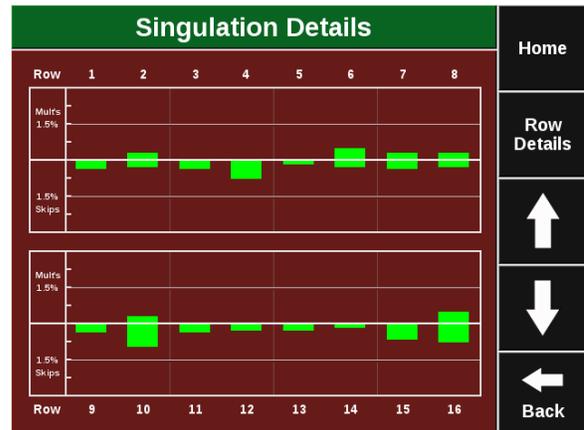
### Population Details

The Population Details Screen is accessed by pressing the Population button on the Dashboard. This screen displays a bar chart showing the population being planted by each row. Pressing 'Change Zoom Level' alters the range of numbers displayed on the left side of the screen.



### Singulation Details

The Singulation Details Screen is accessed by pressing the Singulation button on the Dashboard. This screen displays a bar chart showing each row's singulation performance. Bars above the center line indicate multiples while the bars below the lines indicate skips.



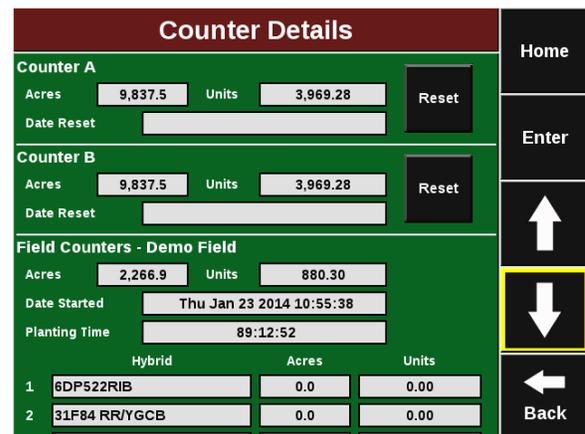
## Good Spacing Details

The Good Spacing Details Screen is accessed by pressing the Good Spacing button on the Dashboard. The top of the screen displays a bar chart showing each row's spacing performance. At the bottom of the screen is the Live Seeds Display which shows the seeds as they leave the indicated row. The row can be changed by using the up and down arrows on either side of the indicated row number. Green plants indicate properly singulated and spaced plants. Red plants are multiples while yellow plants are misplaced. Red circles with an X indicate a skip.



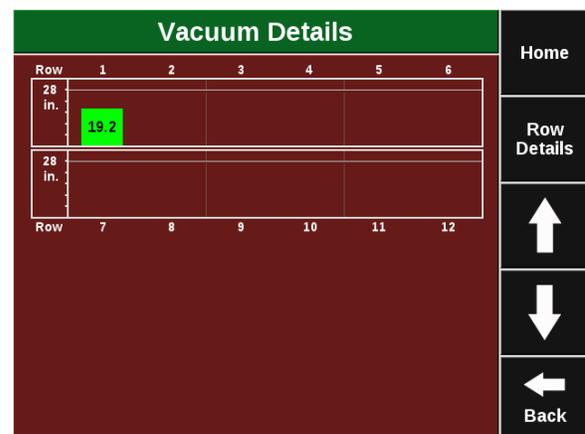
## Counter Details

The Counter Details Screen is accessed by pressing the Field Acres button on the Dashboard. This screen displays information for the Field Acres counter which is tied to the field you are currently planting as well as the independently set Counters A and B. To reset either Counter A or Counter B, press the reset button next to the counter. Each counter counts both acres and units of seed. The Field Counter also breaks down acres and units of seed by hybrid or variety.



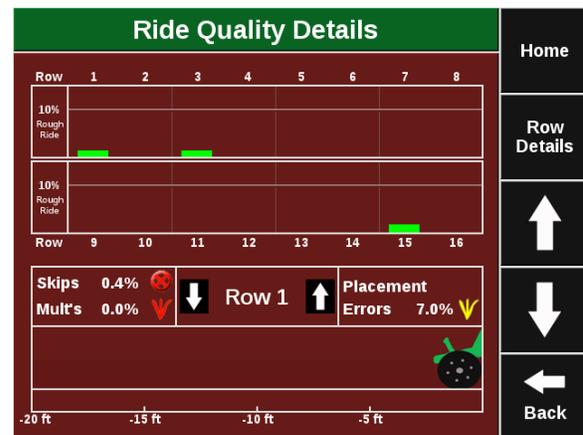
## Vacuum Details

The Vacuum Details Screen is accessed by pressing the Vacuum button on the Dashboard. This screen displays the vacuum pressure reading for each row of your vacuum planter equipped with a 20/20 vacuum sensor. This screen will be especially useful if you have more than two vacuum sensors since the Dashboard button can only display two vacuum readings.



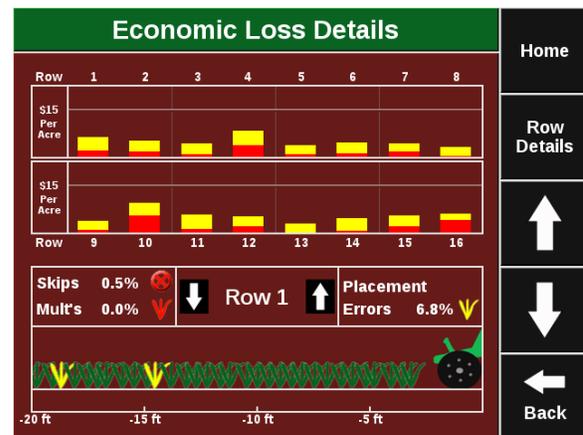
## Ride Quality Details

The Ride Quality Details Screen is accessed by pressing the Ride Quality button on the Dashboard. This screen displays a bar chart showing the ride quality reading for each row equipped with a Row Unit Module (RUM). This screen also includes a Live Seeds Display just like the one on the Good Spacing page. This allows you to compare ride quality and the actual planting performance of a row unit.



## Economic Loss Details

The Economic Loss Details screen is accessed by pressing the Loss/acre button on the Dashboard. This screen displays a bar chart showing the economic loss for each row. On this screen the bars have two colors. The red portion of the bar indicates loss due to singulation errors while the yellow portion of the bar indicates loss due to placement errors. This screen also includes a Live Seeds Display just like the one on the Good Spacing page. This allows you to compare economic loss and the actual planting performance of a row unit



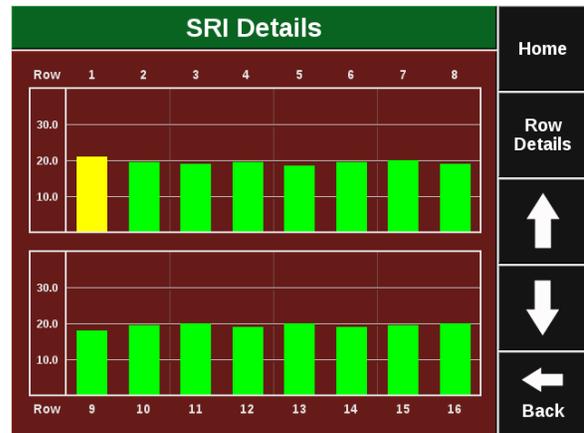
## Down Force Details

The Down Force Details screen is accessed by pressing the Down Force button on the Dashboard. This screen displays a bar chart showing the down force margin and ground contact for each row equipped with a Smart Pin or Smart Link Down Force Sensor. Average values are displayed at the bottom of the screen.



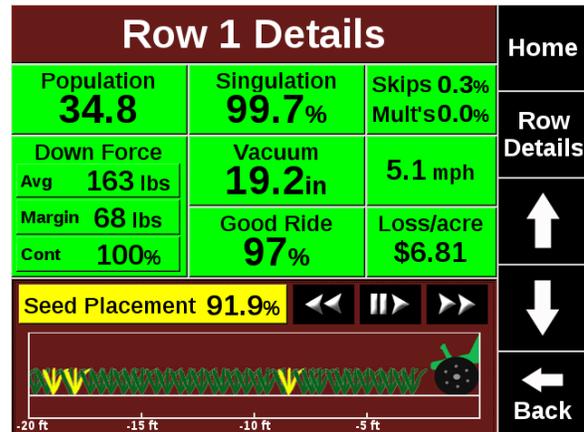
## SRI Details

The SRI Details screen is accessed by pressing the SRI button on the Dashboard. This screen displays a bar chart showing the Seed Release Index value for each row on the planter. The chart can be used to compare the SRI of various rows for diagnosing spacing performance on each row.



## Row Detail Screens

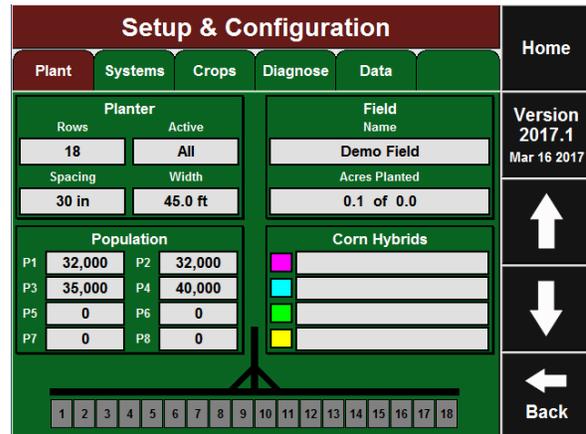
You can also view more detailed information for each planter row individually. Row detail screens may be accessed in a variety of ways. First, you can press a low or high row button on the dashboard screen. Second, from a bar chart screen you can press a particular row's bar and be taken to that row's detail screen. The third way to access row details from any bar chart or row details screen is to press the Row Details button on the right side and select the row you would like to view.



# Plant Tab

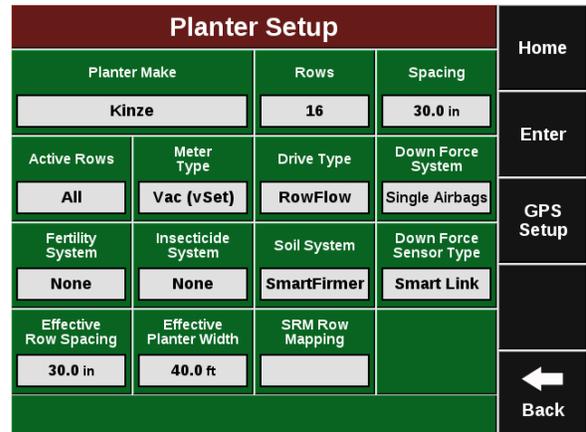
## Plant Tab Overview

The Plant tab contains most of the general setup to configure the planter and will show a generic planter bar at the bottom with the row numbers and assigned hybrid colors



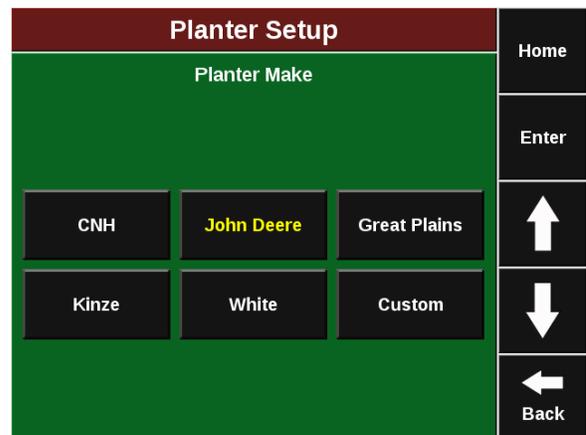
## Planter Setup

Under the Plant tab, Select the 'Planter' quadrant. This page contains all of the general setup for the planter. The Effective Row Spacing and Effective Planter width are both automatically displayed from the Planter number of Rows, Row Spacing and Active Rows



## Planter Make

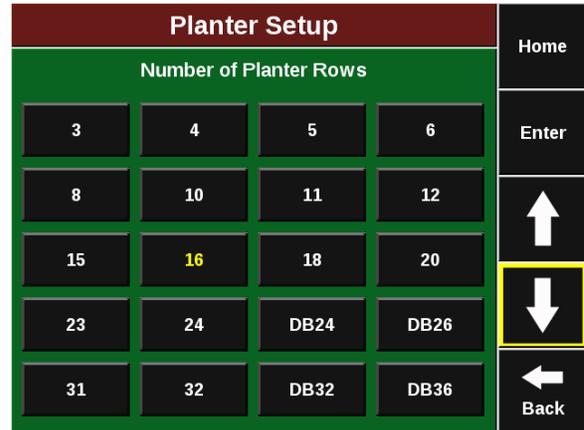
Select the 'Planter Make' button. Choose the appropriate make for your planter. If the planter make is unavailable, Custom can be selected



### Number of Planter Rows

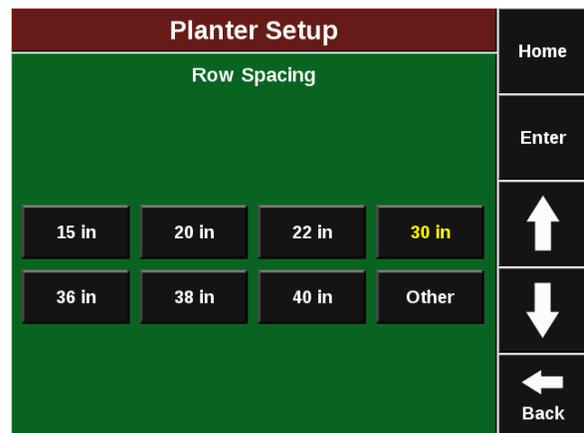
Select the 'Rows' button. Choose the number of physical rows on your planter. There may be some options that define Year of planter and/or Bar configuration.

**Note:** If this is a split row planter, enter the number of total rows on the planter bar. Switching between number of active rows will be done by selecting 'Active Rows'.



### Row Spacing

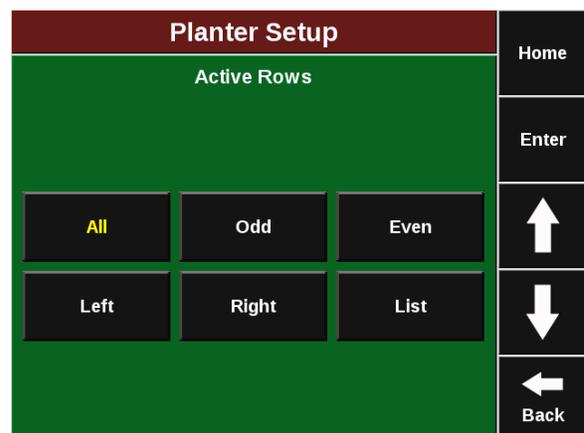
Select the 'Spacing' Button. Choose the row Spacing used if all rows of the planter are active and planting. Other can be used to enter in a custom measurement.



### Active Rows

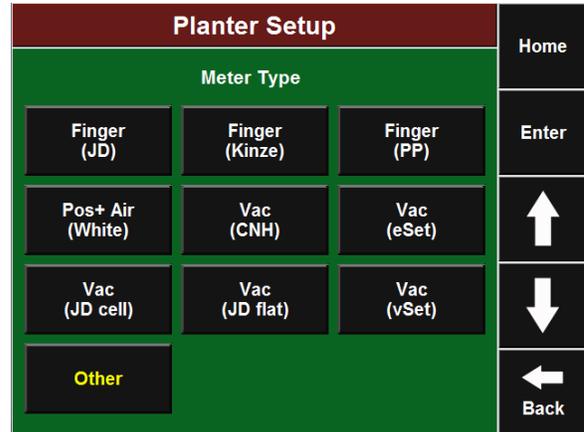
Select the 'Active Rows' button. Define what planter rows will be active while planting. List can be used to specify individual rows to ignore.

**Note:** If this is a split row planter, refer to the Crops tab section on how to tie Active Rows to each crop the system will plant



## Meter Type

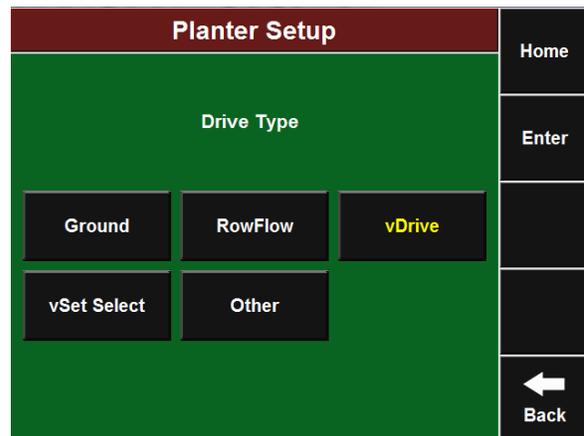
Select the 'Meter Type' button. Select the type of seeding meter installed on the planter.



## Drive Type

Select the 'Drive Type' button. Select the planter drive type from the list.

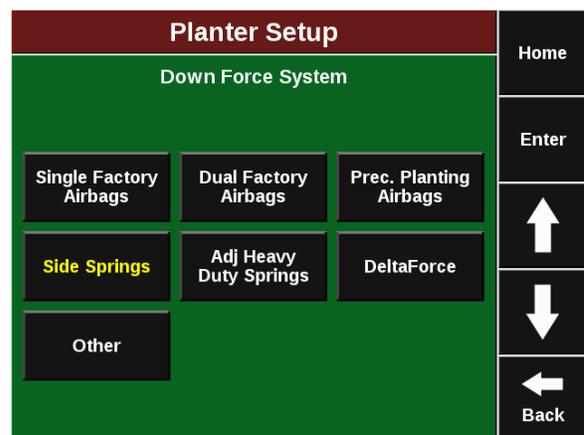
**Note:** Selecting the drive type will enable control products to configure. Refer to that specific control product operators guide for the configuration steps.



## Down Force System

Select the 'Down Force System' button. Select the down force system that is installed on the planter from the list provided. Select Lift Force system as well if prompted.

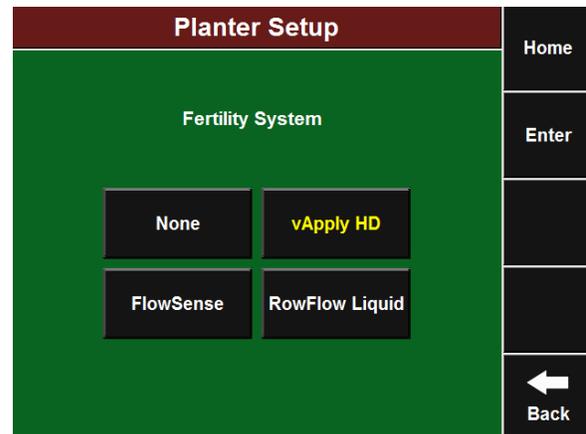
**Note:** Selecting the Down Force system will enable control products to configure. Refer to that specific control product operators guide for the configuration steps.



## Fertility System

Select 'Fertility System' to enter what Fertility system is installed on this planter

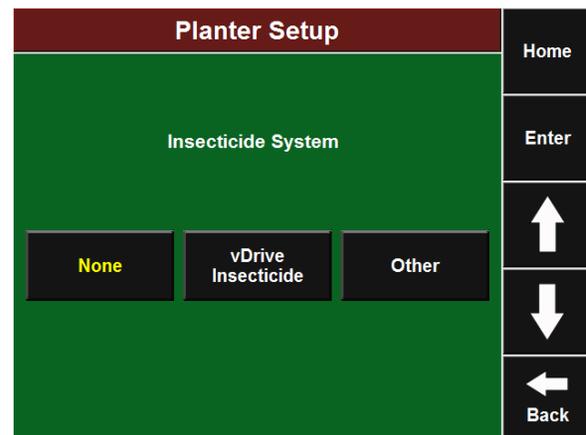
**Note:** Selecting the Fertility system will enable control products to configure. Refer to that specific control product operators guide for the configuration steps.



## Insecticide System

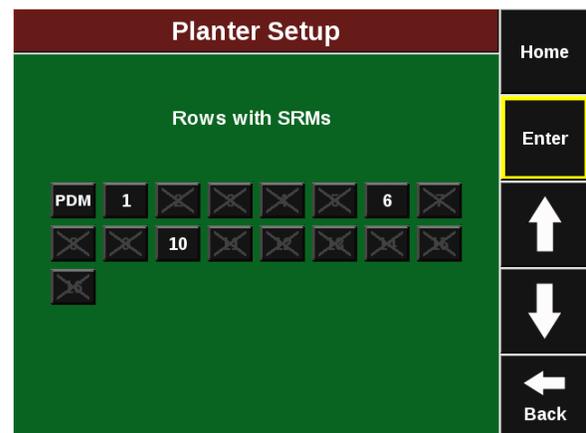
Select 'Insecticide System' to enter what Insecticide system is installed on this planter

**Note:** Selecting the Insecticide system may enable control products to configure. Refer to that specific control product operators guide for the configuration steps.



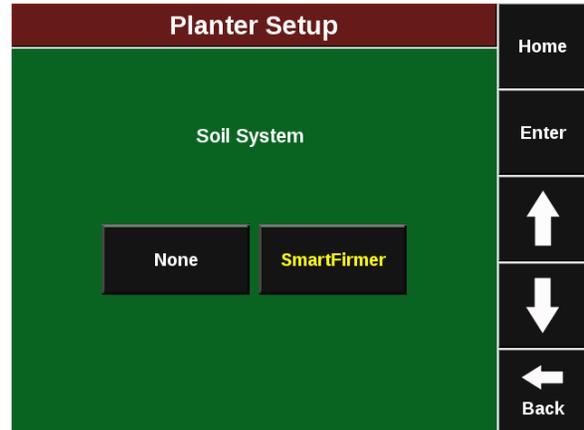
## SRM Row Mapping

SRM mapping can be used if SRMs are not installed across the entire planter. If this is needed, select which rows have an SRM installed on it.



## Soil System

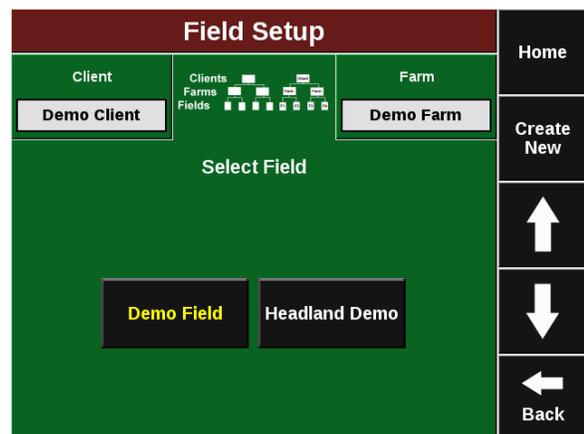
Select the Soil System installed if SmartFirmer is installed on this planter.



## Field Setup Overview

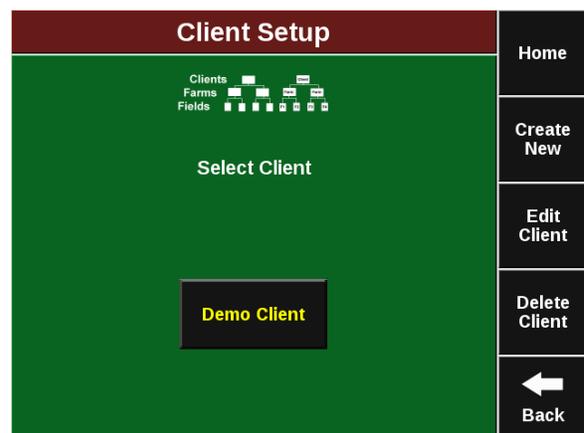
Field Setup is accessed by selecting on the 'Field' quadrant of the Plant tab. This is the location where each individual field can be organized into a Client/Farm structure and individual Prescriptions and Boundaries can be assigned to each field.

**Note:** For how to import a Client/Farm/Field structure from a USB external drive, go to the [Data Import, page 45](#) section of this manual



## Editing and Creating a Client/Farm/Field Structure

Once the 'Field' quadrant is selected on the Plant tab, the existing Clients that exist will appear. The active Client will appear in yellow. Creating a new Client, Editing a Client name or Deleting a Client can be achieved by selecting the corresponding button on the right side of the screen. Once a Client is created, create a farm and field under that client name. Continue this process for each field.



## Field Setup

Select a Client/Farm/Field. This will open the Field Setup for the selected field. Seeding and liquid prescriptions can be assigned here along with boundary files. To permanently delete the field, select 'Delete Field'. Coverage map is the swathing map shown on the 2020 SeedSense and can be deleted by selecting 'Delete Coverage Map'.

**Note:** Some Prescription and boundary options will only be available if a corresponding control product is configured

Field Setup			Home
Client / Farm	Field Name	Entrance	Enter
Demo Client	Demo Field	0.00000 0.00000	
Demo Farm			Delete Field
Field Number	Tillage	Field Acres	
		0.0	Delete Coverage Map
	vApply HD Prescription	Seeding Prescription	
			Back
	Attribute Nitrogen	Attribute	
		Boundary File	
		Demo_Field_B02	

## Selecting a Prescription or Boundary File

If a Boundary or Prescription is going to be used with a Drive control product such as vDrive or RowFlow, Select the corresponding section under the Field Setup. This will allow the Prescription or Boundary file to be selected. Once the correct file name has been selected, select 'Enter'.

**Note:** For how to Import a Prescription/ Boundary, refer to the [Data Import, page 45](#) section of this manual

Field Setup		Home
Select Prescription File		Enter
** None ** (No Prescription Map)		
Demo_Field_AME.xml		↑
Demo_Field_B00		
Demo_Field_B01		↓
Headland Pop		
RowFlow Demo Boundary		←
RowFlow Demo Pop		
		Back

## Selecting a Prescription or Boundary Attribute

Select the correct Attribute in the Prescription/ Boundary File. A single attribute can be used or a different attribute per Motor. Select 'Enter' to save changes.

**Note:** To ensure that the correct attribute is selected, contacting the adviser that created the prescription/boundary file may be required

Field Setup		Home
Select Seeding Prescription Attribute		Enter
** None **		
Population		↑
		↓
		←
Single Attribute	Specific Attribute per Motor	
		Back

## Making a Field Active

To ensure that the field specific boundary and prescription is active and the field data is saved to the appropriate field name, select the appropriate Client, Farm and Field name. To make this field active, Select ‘Make Active’ on the right side of the screen.

Field Setup			Home
Client / Farm	Field Name	Entrance	Make Active
Demo Client	Good Planting	0.00000 0.00000	
Demo Farm			Delete Field
Field Number	Tillage	Field Acres	
01		0.0	
	vApply HD Prescription	Seeding Prescription	Delete Coverage Map
	Attribute Nitrogen	Attribute	Back
	--	--	
	--	--	
	--	Boundary File	
	--		

## Population Setup

From the Plant Tab, Select the ‘Population’ quadrant. Select Single Setting on the right if one population is being targeted. Select Multiple Settings if Variable Rate planting will be used. If multiple populations are being planted at once, Select Specific Rows (Seed Corn). Enter in the expected Population into each available ‘Set Point’ box.

Population Setup				Home
Set Point 1	Set Point 2	Set Point 3	Set Point 4	Single Setting
29,000	32,000	35,000	0	
Set Point 5	Set Point 6	Set Point 7	Set Point 8	Multiple Settings
0	0	0	0	
Set Point 1 Rows	Set Point 2 Rows	Set Point 3 Rows	Set Point 4 Rows	Specific Rows (Seed Corn)
--	--	--	--	
				Back

## Hybrid/Variety Setup Overview

To Select and assign a hybrid/variety to the rows, select the ‘Hybrid’ quadrant on the Plant Tab. The monitor allows for up to four Hybrids/ Varieties to be assigned to the planter at one time. Changing the active crop and editing the available crops can be accessed by selecting ‘Change/Edit Crop’ on the right side of the screen.

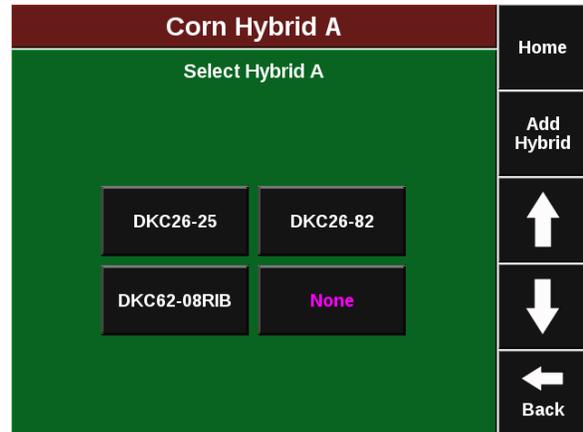
Corn Hybrid Setup					Home
Plant	Systems	Crops	Diagnose	Data	Change/Edit Crop
Corn (Active)					
Hybrid A	Hybrid B	Hybrid C	Hybrid D		
80,000 / unit	80,000 / unit	80,000 / unit	80,000 / unit		
					Back

### Select a Hybrid/Variety

To select a Hybrid/Variety, Press on any of the Hybrid boxes (Hybrid A-B). This will allow the selection of any previously used Hybrids/ Varieties.

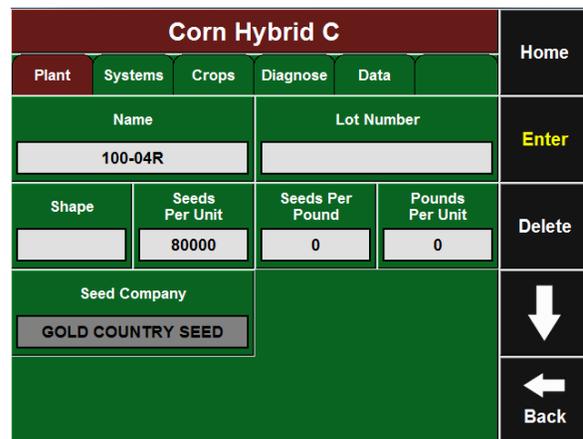
#### Note:

To add a new Hybrid/Variety to the list, Select ‘Add Hybrid/Variety’.



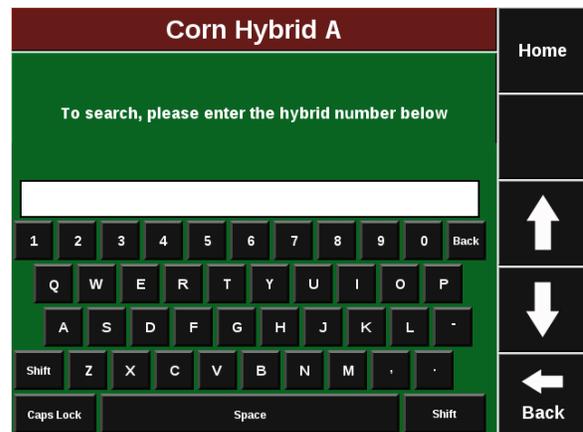
### Assigning a Hybrid/Variety Details

Once a Hybrid/Variety is selected, details can be entered such as lot number, seeds per pound and shape. To Delete the hybrid, Select ‘Delete’. Select ‘Enter’ to proceed and enter the Rows this hybrid will be planted on.



### Adding a new Hybrid/Variety

Once Add Hybrid/Variety is selected, search for the Hybrid/Variety abbreviation. Select ‘Enter’ to add the new Hybrid/Variety. If none is found, an ‘Add Custom’ button will appear to the right.



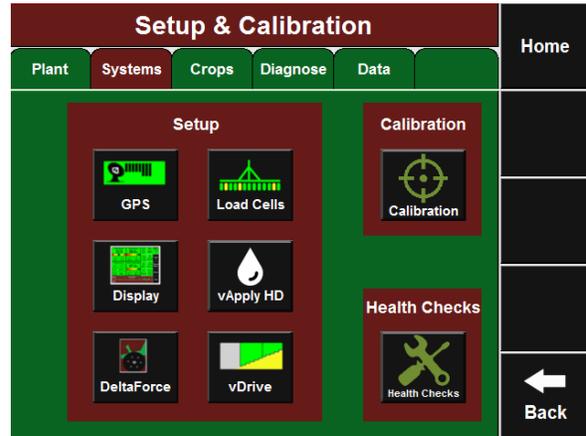
# Systems Tab

## Systems Tab Overview

The Systems Tab contains Setup for GPS, Display, and any Control Products that are installed. The Calibrations and Health Checks for all products installed can be accessed from this tab as well.

**Note:** The available buttons on this page will change depending upon what control products are configured and installed.

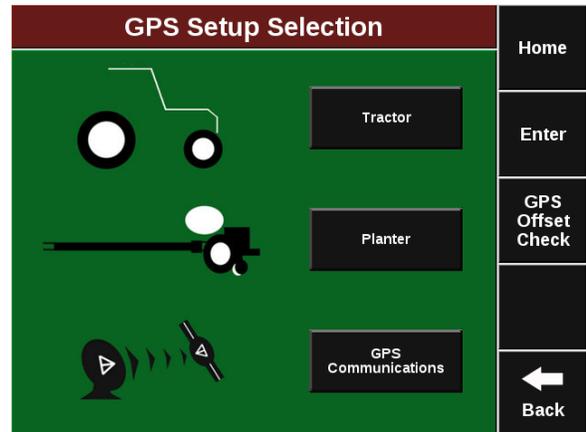
**Note:** Refer to each individual product manual for how to utilize the Calibration and Health Checks buttons.



## GPS Setup

### GPS Setup Overview

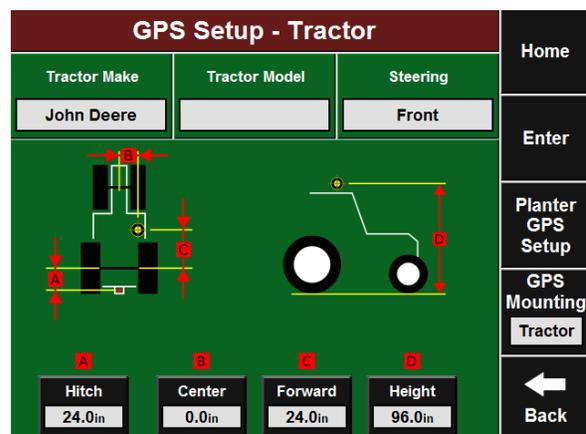
Press 'GPS Setup' under the Systems tab to access GPS setup. The Tractor measurements, Planter measurements, and GPS communication status can be accessed on this page. A GPS offset check can also be accessed on the right side of the screen. This offset check will verify the measurements entered against actual distances.



### Tractor GPS Measurements Overview

Selecting the Tractor button under GPS setup will open the Tractor measurements page. Enter in the Tractor Make, Tractor Model and Steering type. There is also an option for GPS mounting on the Tractor or on the Planter on the right side of the Screen. The yellow target references the GPS output location from the GPS globe.

**Note:** Some GPS systems do not output the location of the actual GPS globe. Verify the GPS output location with the GPS manufacturer.



## Front Steering Tractor GPS Measurements

If Front Steering is selected as the steering type, a similar tractor diagram will appear.

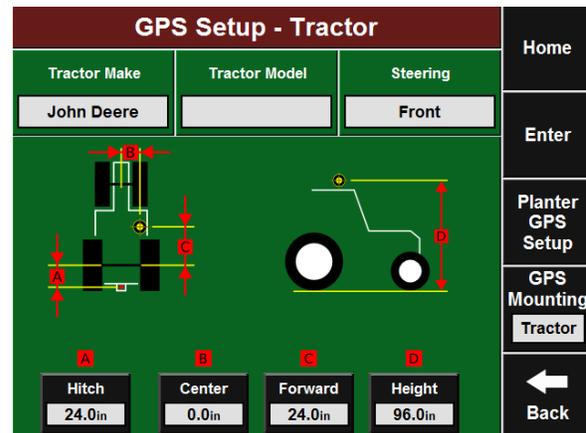
**Hitch — A:** Measure from the pivot location at the hitch to the rear fixed axle.

**Note:** If this is a 3 pt hitch, enter 0. If this is a 2 pt hitch, measure to the pivot location on the planter tongue.

**Center — B:** Measure the Left/Right offset of the GPS output location from the center of tractor. Switching sides can be accomplished by pressing ‘Flip’.

**Forward — C:** Measure from rear fixed axle to GPS output location. Switching front/back can be accomplished by pressing ‘Flip’.

**Height — D:** Measure from the ground to the height of the GPS output location.



## Track Steering Tractor GPS Measurements

If Track Steering is selected as the steering type, a similar tractor diagram will appear.

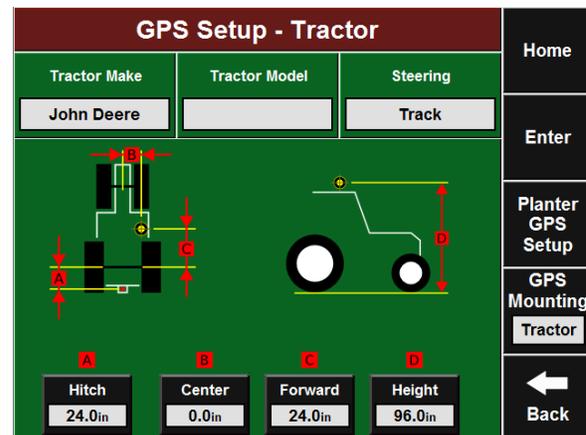
**Hitch — A:** Measure from the pivot location at the hitch to the track pivot (normally right in front of the tractor seat)

**Note:** If this is a 3 pt hitch, enter 0. If this is a 2 pt hitch, measure to the pivot location on the planter tongue.

**Center — B:** Measure the Left/Right offset of the GPS output location from the center of tractor. Switching sides can be accomplished by pressing ‘Flip’.

**Forward — C:** Measure from track pivot to GPS output location. Switching front/back can be accomplished by pressing ‘Flip’.

**Height — D:** Measure from the ground to the height of the GPS output location.

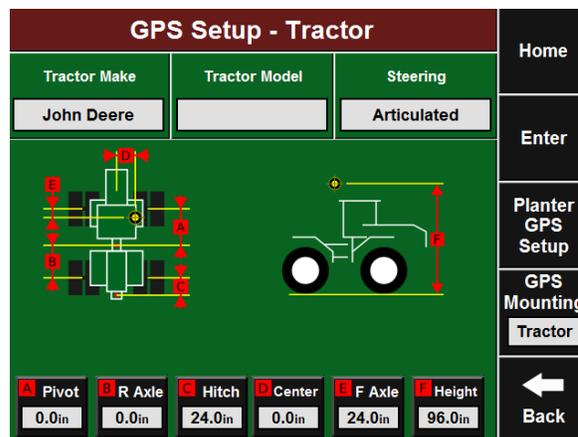


## Articulated Steering Tractor GPS Measurements

If Articulated Steering is selected as the steering type, a similar tractor diagram will appear.

**Pivot — A:** Measure from front fixed axle to articulation point.

**Rear Axle — B:** Measure from articulation point to rear fixed axle.



**Hitch — C:** Measure from the pivot location at the hitch to the rear fixed axle

**Note:** If this is a 3 pt hitch, enter 0. If this is a 2 pt hitch, measure to the pivot location on the planter tongue.

**Center — D:** Measure the Left/Right offset of the GPS output location from the center of tractor. Switching sides can be accomplished by pressing 'Flip'.

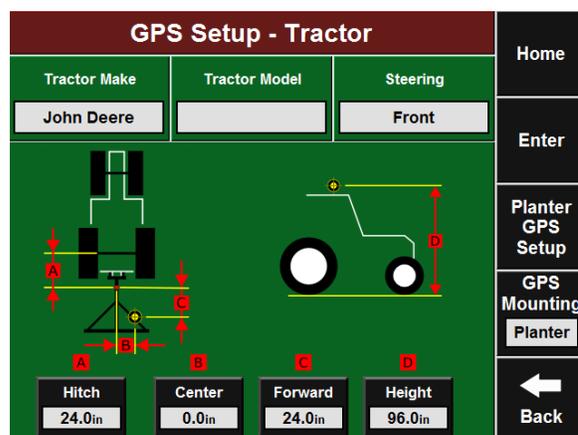
**Front Axle — E:** Measure from front fixed axle to GPS output location. Switching front/back can be accomplished by pressing 'Flip'.

**Height — F:** Measure from the ground to the height of the GPS output location.

## Planter Mounted GPS Tractor Measurements

Selecting the GPS Mounting button and changing it to 'Planter' will change the GPS measurements to allow for a planter mounted receiver.

**Note:** Verify GPS output location from GPS manufacturer. The output location is not always the actual GPS receiver mounted on the planter.



**Hitch — A:** Measure from the pivot location at the hitch to the rear fixed axle

**Note:** If this is a 3 pt hitch, enter 0. If this is a 2 pt hitch, measure to the pivot location on the planter tongue.

**Center — B:** Measure the Left/Right offset of the GPS output location from the center of tractor. Switching sides can be accomplished by pressing 'Flip'.

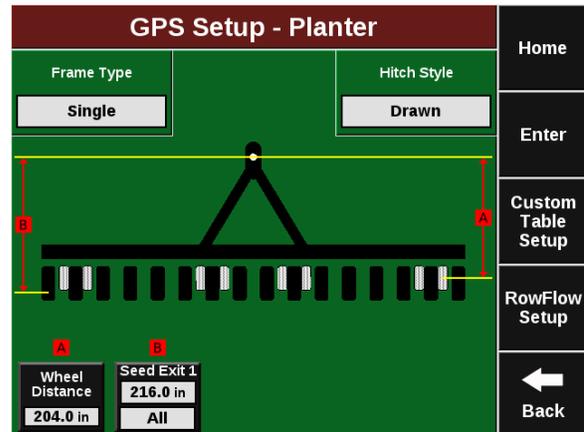
**Forward — C:** Measure from the pivot location at the hitch to the GPS output location.

**Height — D:** Measure from the ground to the height of the GPS output location.

### Planter GPS Measurements Overview

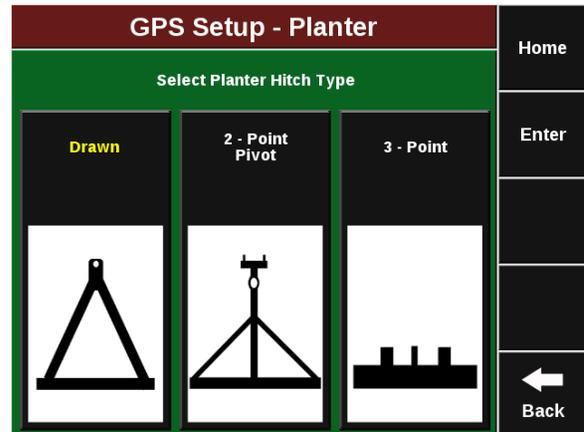
Selecting the Planter Setup under GPS brings up the Planter GPS measurements page. Select the 'Frame Type' and 'Hitch Style' for the planter.

**Note:** Custom Table setup is available on the right side of the Screen. This allows for custom offset measurements to be entered for every row.



### Planter GPS Measurements Hitch Style

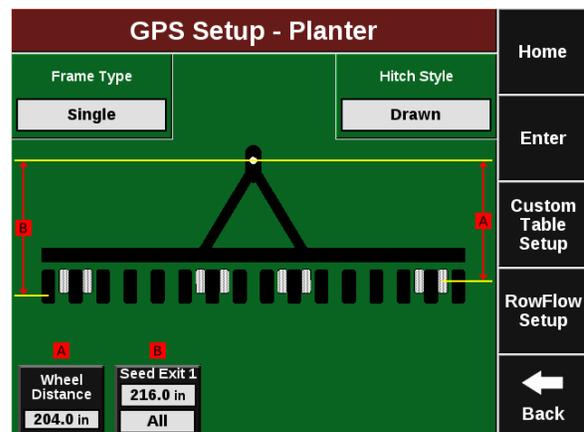
Selecting the hitch style is crucial for mapping. Each option will change the reference point for each seed tube exit measurement. If 3-Point is selected, all measurements will be from the rear axle of the tractor.



### Planter GPS Measurements Single Frame

**Wheel Distance — A:** Measure from the pivot location at the hitch to the transport tires.

**Seed Exit 1 — B:** Measure from the pivot location at the hitch to the Seed Tube exit location.

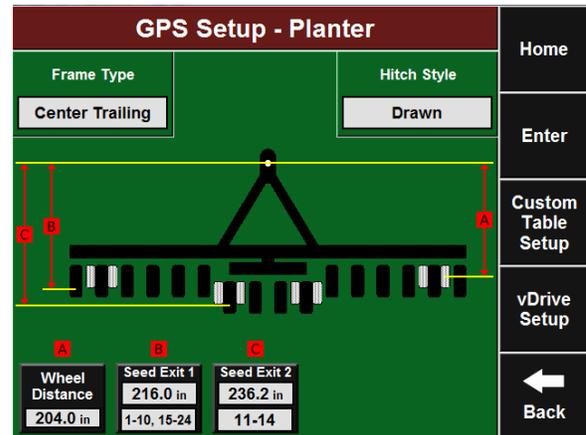


## Planter GPS Measurements Center Trailing Frame

**Wheel Distance** — **A:** Measure from the pivot location at the hitch to the transport tires.

**Seed Exit 1** — **B:** Measure from the pivot location at the hitch to the Seed Tube exit 1 (wings) location. Verify the correct row numbers are selected for the Seed Tube exit 1.

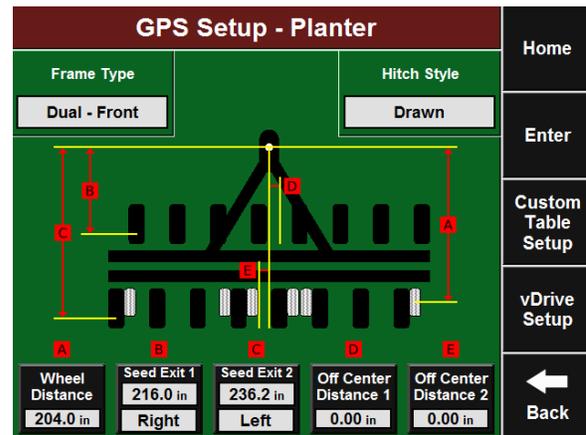
**Seed Exit 2** — **C:** Measure from the pivot location at the hitch to the Seed Tube exit 2 (center) location. Verify the correct row numbers are selected for the Seed Tube exit 2.



## Planter GPS Measurements Dual Front Frame

**Wheel Distance** — **A:** Measure from the pivot location at the hitch to the transport tires.

**Seed Exit 1** — **B:** Measure from the pivot location at the hitch to the Seed Tube exit 1 (front) location. Verify the correct row numbers are selected for the Seed Tube exit 1.



**Seed Exit 2** — **C:** Measure from the pivot location at the hitch to the Seed Tube exit 2 (rear) location. Verify the correct row numbers are selected for the Seed Tube exit 2.

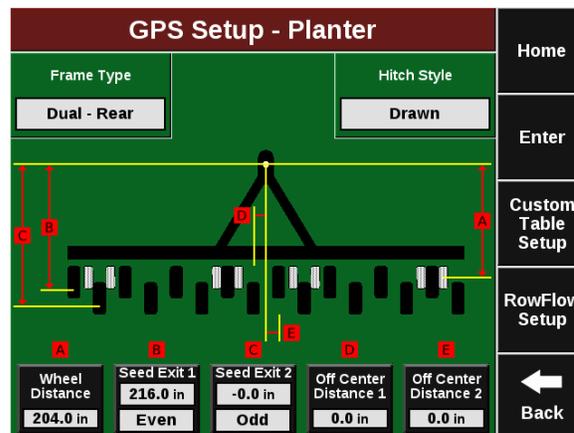
**Off Center Distance 1** — **D:** Measure the distance from the center line of the Tractor to the center of the forward rows.

**Off Center Distance 2** — **E:** Measure the distance from the center line of the Tractor to the center of the rear rows.

**Note:** Measurement D & E can be saved as a crop specific setting in the [Crops Tab, page 38](#) under each active crop.

**Wheel Distance** — **A:** Measure from the pivot location at the hitch to the transport tires.

**Seed Exit 1** — **B:** Measure from the pivot location at the hitch to the Seed Tube exit 1 (front) location. Verify the correct row numbers are selected for the Seed Tube exit 1.



**Seed Exit 2** — **C:** Measure from the pivot location at the hitch to the Seed Tube exit 2 (rear) location. Verify the correct row numbers are selected for the Seed Tube exit 2.

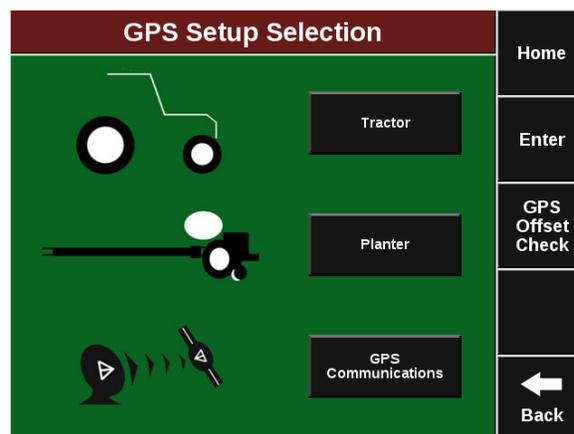
**Off Center Distance 1** — **D:** Measure the distance from the center line of the Tractor to the center of the forward rows.

**Off Center Distance 2** — **E:** Measure the distance from the center line of the Tractor to the center of the rear rows.

**Note:** Measurement D & E can be saved as a crop specific setting in the [Crops Tab, page 38](#) under each active crop.

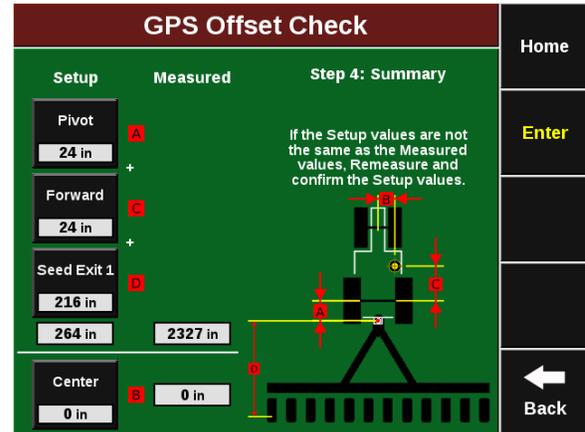
### GPS Offset Check Summary

Once the GPS measurements are entered, a GPS offset check is required to verify measurements. Select 'GPS Offset Check' on the GPS page under Systems Tab. The GPS Offset Check will require good GPS signal on flat ground.



## GPS Offset Check Results

Once the GPS Offset is complete, a summary page will appear. The Setup column shows the addition of the entered measurements with a total at the bottom. The Measured column shows the actual distance as displayed by the GPS Offset Check. If the difference between the Setup and the Measured values are greater than what would be expected with the GPS accuracy, verify all entered measurements and the GPS output location and run the GPS Offset Check again.

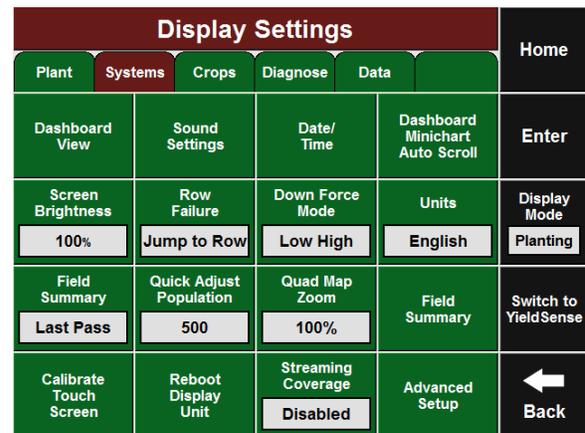


**Note:** The GPS Offset Check is not available for Articulated tractors.

## Display Settings

### Display Settings Overview

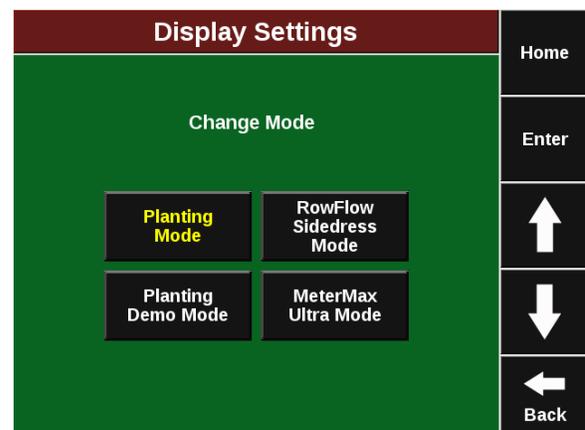
Select the 'Display' button on the Systems Tab to configure Display Settings.



### Display Mode

Select 'Display Mode' on the right side of Display Settings to view Display Mode. This allows switching between Planting Mode, RowFlow Sidedress Mode and MeterMax Ultra Mode

**Note:** Planting Demo Mode requires downloading and importing Demo Files from [cloud.precisionplanting.com](http://cloud.precisionplanting.com)



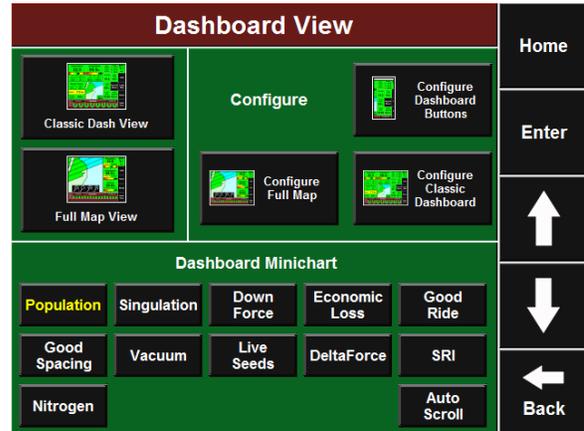
## Switching to YieldSense

Select the 'Switch to YieldSense' on the right side of the screen. This will change the software to harvest mode for YieldSense.



## Dashboard View

Select Dashboard View on Display settings and the Dashboard (Home Screen) settings can be configured.



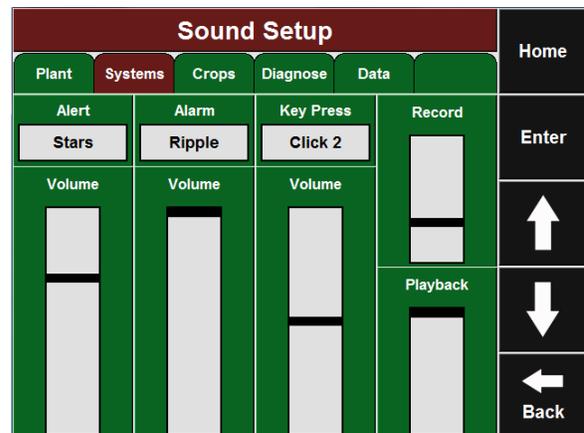
## Sound Settings

Select 'Sound Settings' to configure the Sound of the display. The volume can be controlled using the volume slider below each sound type. Selecting each sound type allows the selection of difference sound options. If a sound option is selected, a demo will play.

**Alert** This sound will play when an item is yellow on the Dashboard

**Alarm** This sound will play when an item is red on the Dashboard.

**Key Press** This sound will play when the touch screen is pressed



## Date/Time Setup

Select 'Date/Time' to setup the Time Zone and Season Start month. UTC time will automatically update from GPS.

Date/Time Setup				Home
Plant	Systems	Crops	Diagnose	Data
Time Zone	Time	Date	Season Start	Enter
Chicago	13:57:17	Nov 08 2017	January	
<small>Note: Most growers should use January for the season start setting. Only change this setting if you will be harvesting the crop in a different calendar year than when you planted it. For example, choose July if you plant in the Fall and harvest the following Spring.</small>				↑
				↓
				← Back

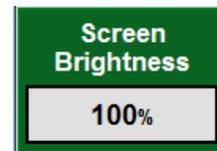
## Dashboard Minichart Auto Scroll

Select this button to configure what is displayed in the Dashboard mini chart at the Refer To bottom of the home screen. An auto scroll can also be configured to scroll through multiple metrics.



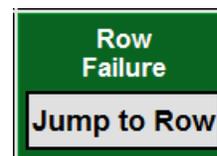
## Screen Brightness

Select this button to configure the Screen Brightness. Manual mode used the user selected brightness, Auto mode uses an ambient light sensor to change the brightness for day/night.



## Row Failure

Select this button to change the display action when a row failure occurs.



**Jump to Row** This option will go to Row Details when a row failure occurs.

**Jump to Dashboard** This option will go to the Population Dashboard when a row failure occurs.

**No Action** This option will cause no action to occur with a row failure.

### Down Force Mode

Select this option to configure the DownForce button on the Home Screen.

**Low High** This will show the Low and High rows of Downforce Average.

**Average** This will show the planter Average Downforce.

### Units

Select this option to change the units from English to Metric

### Field Summary

Configure this option to show a summary of the last pass or entire field after planter is lifted. The summary will appear on the Dashboard.

### Quick Adjust Population

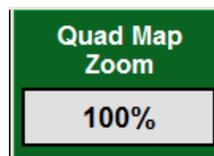
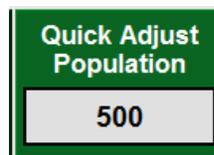
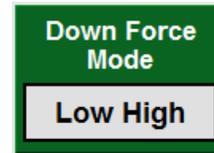
Select this option to change the Quick Adjust population on any Population control product.

### Quad Map Zoom

Select this option to change the default zoom level of the Dashboard map.

### Field Summary

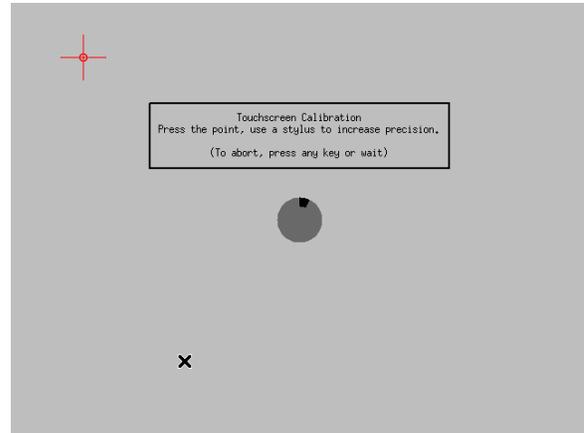
Select this to view a summary of the active field.



## Calibrate Touch Screen

Select this option under display settings to start the touchscreen calibration.

**Note:** The touchscreen calibration can also be started by pressing the touchscreen on any page for 15 seconds.



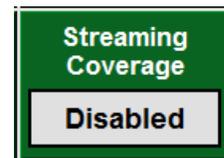
## Reboot Display Unit

Select this to reboot the monitor.



## Streaming Coverage

Select this option to Enable or Disable the coverage streaming through Climate FieldView.



## Advanced Display Setup

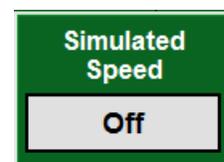
Select 'Advanced Display Setup' under Display Setup to see additional settings. Many of these options should not be changed without consulting with Precision Planting Product Support.

Advanced Setup				Home	
Plant	Systems	Crops	Diagnose	Data	
	Bad GPS Correction Use GPS Speed	Simulated Speed Off	Simulated GPS Data Disabled		Enter
	Aux Sensors	Language English (USA)	Enable Remote Support		↑
Pass Closure Mode Normal	Show Pass Lines Enabled		Unpair FieldView Account		↓
Reboot Display Unit	Restart Application	Restart Comm	Repair Data Storage		← Back

## Simulated Speed

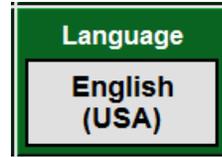
Select this option to enable a simulated speed. Simulated Speed will not start until seed drop is detected.

**Note:** This option will not start any motors.



## Display Language

Select this option to change the Language displayed on the 2020 SeedSense.



# Crops Tab

## Crops Tab Overview

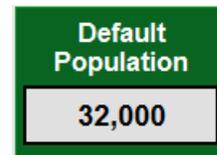
To configure monitor settings for each crop, select the ‘Setup’ button and then the Crops tab. All settings within this tab are saved under the active crop. As you change crops, the settings you enter will be saved under the respective crop that was active at that time. To Change or Add Crops, Press Change Crops on the right side of the Screen.

**Note:** Advanced Adjustments are only used for Serial Motor Setup for RowFlow

Crop Setup					Home
Plant	Systems	Crops	Diagnose	Data	
<b>Corn (Active)</b>					Change Crop
Seeds / Disk	Default Population	Active Rows	Swath Coverage Pattern		Edit Crop Name
27	32,000	All	0 Offset		Restore Defaults
Quick Adjust Pop	Seeds to Average	Offset Distance D	Offset Distance E		← Back
500	300	--	--		
Economic Adjustments	Limit Adjustments	Liquid Alerts	Advanced Adjustments		

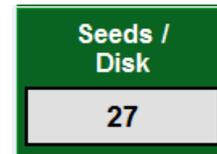
### Default Population

This is the Population that the motors will plant when operating in an area without a prescribed population.



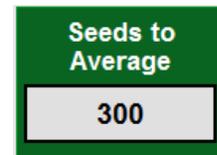
### Seeds/Disk

Seeds/Disk: This is the number of Cells/Fingers in the seed meter. The available options are determined by what meter is selected in the Planter Setup.



### Seeds to Average

Seeds to Average are a rolling window of seed data that is used to calculate Singulation, Good Spacing, SRI and Population. This should be set to about 1% of expected population.



### Active Rows

Active Rows: These are the planter rows you expect to plant in the selected crop. Common examples for split row planters are Odd/Even or Left/Right for Corn and All for Soybeans.



## Limit Adjustments

This button will include Singulation Limit, Smooth Ride Limit, Ground Contact Limit, and SRI limit which define when those buttons turn yellow on the dashboard screen. Enter the percent at which you would like the button to turn yellow. This will depend on accuracy of meters, tillage and ground conditions.

Limit Adjustments				Home
Corn (Active)				
Population Limit	Population Alarm	Singulation Limit	Smooth Ride Limit	Enter
2000	80.0%	98.5%	90.0%	
Spacing Limit	Ground Contact Limit	Misp. Seed Limits	SRI Limit	
93.0%	95.0%	2.20, 3.50"	20	
				← Back

## Misplaced Seed Limits

These two values determine when a seed is slightly misplaced and severely misplaced for Good Spacing and Economic Loss. Refer to the below graph for what setting should be selected.

### Step 1:

Select Row Width and Population from the Left half of the table

### Step 2:

Follow the row over to the right and select the setting that is displayed under the economic Misplaced Seed limits column. The minimum column should only be used to diagnose technical issues

**Note:** If the Seed Spacing is less than 2.5" or Seeds per Second is greater than 40, Good Spacing and Singulation will not be displayed

Row Width										Seed Spacing	Miles per Hour						Misplaced Seed Limits	
15	18	20	22	28	30	36	38	40	60		3	4	5	6	7	8	Econ.	Min.
209,088	174,240	156,816	142,560	112,011	104,544	87,120	82,535	78,408	52,272	2	26	35	44	53	62	70	NA	NA
167,270	139,392	125,453	114,048	89,609	83,635	69,696	66,028	62,726	41,818	2.5	21	28	35	42	49	56	NA	NA
139,392	116,160	104,544	95,040	74,674	69,696	58,080	55,023	52,272	34,848	3	18	23	29	35	41	47	1.5", 2.5"	1.5", 2.5"
119,479	99,566	89,609	81,463	64,007	59,739	49,783	47,163	44,805	29,870	3.5	15	20	25	30	35	40	1.5", 2.5"	1.5", 2.5"
104,544	87,120	78,408	71,280	56,006	52,272	43,560	41,267	39,204	26,136	4	13	18	22	26	31	35	1.5", 2.5"	2.0", 3.0"
92,928	77,440	69,696	63,360	49,783	46,464	38,720	36,682	34,848	23,232	4.5	12	16	20	23	27	31	2.0", 3.0"	2.2", 3.5"
83,635	69,696	62,726	57,024	44,805	41,818	34,848	33,014	31,363	20,909	5	11	14	18	21	25	28	2.2", 3.5"	2.5", 4.0"
76,032	63,360	57,024	51,840	40,731	38,016	31,680	30,013	28,512	19,008	5.5	10	13	16	19	22	26	2.5", 4.0"	2.8", 4.5"
69,696	58,080	52,272	47,520	37,337	34,848	29,040	27,512	26,136	17,424	6	9	12	15	18	21	23	2.8", 4.5"	3.2", 5.0"
64,335	53,612	48,251	43,865	34,465	32,167	26,806	25,395	24,126	16,084	6.5	8	11	14	16	19	22	3.2", 5.0"	3.5", 5.5"
59,739	49,783	44,805	40,731	32,003	29,870	24,891	23,581	22,402	14,935	7	8	10	13	15	18	20	3.5", 5.5"	3.8", 6.0"
55,757	46,464	41,818	38,016	29,870	27,878	23,232	22,009	20,909	13,939	7.5	7	9	12	14	16	19	3.8", 6.0"	4.0", 6.5"
52,272	43,560	39,204	35,640	28,003	26,136	21,780	20,634	19,602	13,068	8	7	9	11	13	15	18	4.0", 6.5"	4.5", 7.0"
49,197	40,998	36,898	33,544	26,356	24,599	20,499	19,420	18,449	12,299	8.5	6	8	10	12	14	17	4.5", 7.0"	4.5", 7.0"
46,464	38,720	34,848	31,680	24,891	23,232	19,360	18,341	17,424	11,616	9	6	8	10	12	14	16	4.5", 7.0"	4.5", 7.0"
44,019	36,682	33,014	30,013	23,581	22,009	18,341	17,376	16,507	11,005	9.5	6	7	9	11	13	15	4.5", 7.0"	4.5", 7.0"
41,818	34,848	31,363	28,512	22,402	20,909	17,424	16,507	15,682	10,454	10	5	7	9	11	12	14	4.5", 7.0"	4.5", 7.0"
Population										Inches	Seeds per Second							

## Economic Loss

This screen defines how economic loss is calculated. Press the Price Per Bushel to enter the current price per bushel for use in calculating economic loss. The three limits at the bottom of the screen define how the Loss/Acre button on the dashboard screen displays information. If the loss/acre is less than the Loss Good Limit, the button will be green and display the word ‘Good’. Once the loss passes the Loss Good Limit, the button remains green but displays the dollar value. Once the loss passes the Loss Alert Limit, the button turns yellow. When the loss passes the Loss Alarm Limit, the Loss/Acre button on the dashboard turns red.

**Note:** Economic Loss is only accurate for field corn.

## Liquid Alerts

The available options on this page is dependent upon what liquid product is installed. Modifying these settings will change when the respective alerts appear on the 2020 SeedSense and what action the monitor will take if an alert occurs.

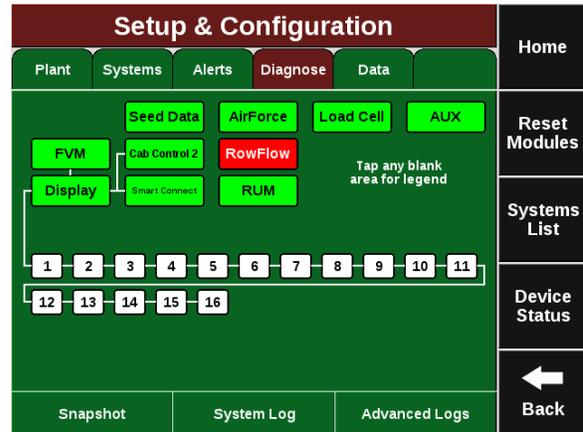
Crop Economics Setup				Home
Corn (Active)				Enter
Ears per Bushel	Price per Bushel	Ear Loss for Skip	Ear Loss for Multiple	
140.0	2.50	0.8	0.4	
Ear Loss for Misp. 3.5"	Ear Loss for Misp. 2.2"			
0.1	0.2			
Loss Good Limit	Loss Alert Limit	Loss Alarm Limit		
4.00	7.50	20.00		← Back

Nitrogen Alerts (vApply HD)				Home
Corn (Active)				Enter
Flow Alert	Flow Alarm	Tank Alert	Tank Alarm	
90% - 110%	70%	25%	10%	
Low Pressure	Row Fail Liquid			
10 psi	Jump to Liquid Bar Chart			← Back

# Diagnose Tab

## Diagnose Tab Overview

The Diagnose Tab is the primary location for troubleshooting issues. The schematic on this page shows each component of the 20/20 system including the display and any control products installed. The individual row status is also displayed under the system buttons.



Each Control device can be selected for a Level 2 diagnostic view of that product. Reset Modules on the Right side of the screen can be used to reestablish communication with the system during diagnostics. Three diagnostic tools are located at the bottom of the screen. The System Log records all pop-ups that occur on the display. Snapshot records measurements for 1000 seeds to create a snapshot of what is occurring in your 20/20 system and planter.

Advanced Logs provides access to a variety of logs which might be helpful in diagnosing system performance issues. Any blank area on the screen can be selected for a color legend.

**Green:** Device is working correctly, communication is good.

**Yellow:** Device or a sub-component is not 100% functional.

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

**White:** Unexpected. Device is detected but not expected.

**Black:** Disabled. Row has been disabled in planter configuration.

**Gray:** Not Ready. Device is being detected, updating firmware or unreachable.

## Seed Data Level 2

Selecting the ‘Seed Data’ button displays the Seed Tube Data page. This page shows a seed counter for each row on your planter along with seed tube metrics. This can be used to compare seed data between properly and improperly functioning rows to help determine the problem. To reset the counters to zero, press the ‘Reset’ button.

Row	Source	Seed Sensor	Pop Actual	Pop Cmd	Singulation	SRI	Seed Count (RESET)
1	Smart Connector	DEKEY John	34795	---	99.7%	21.5%	4,010
2	Smart Connector	DEKEY John	34573	---	99.2%	19.5%	4,021
3	Smart Connector	DEKEY John	35047	---	99.8%	20.0%	4,011
4	Smart Connector	DEKEY John	34462	---	98.9%	20.5%	4,003
5	Smart Connector	DEKEY John	34905	---	99.9%	19.0%	4,006
6	Smart Connector	DEKEY John	34905	---	99.4%	19.0%	4,010
7	Smart Connector	DEKEY John	35016	---	99.4%	20.0%	4,005
8	Smart Connector	DEKEY John	34905	---	99.5%	19.5%	4,009
9	Smart Connector	DEKEY John	34905	---	99.4%	18.0%	4,007
10-16	---	---	---	---	---	---	---

## Smart Connect Level 2

Pressing the Smart Connect button displays the Smart Connect Diagnose page. SC1 displays the Smart Connector that is plugged into Channel A, and SC2 displays the Smart Connector that is plugged into Channel B. Above the row unit numbers, there are additional boxes that display where a RUM is plugged in. Each RUM box that has an Aux Sensor or Load cell will display a letter to designate what is plugged in.

L = Lift Switch

P = Load Cell

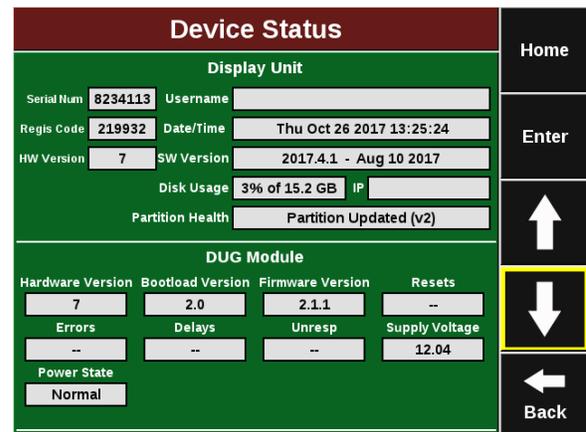
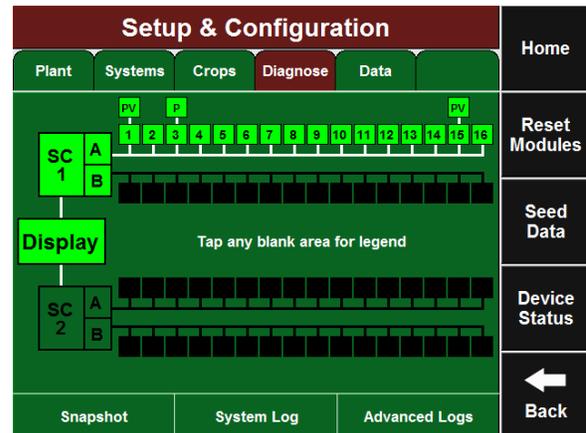
V = Vacuum

F = Liquid Flow

R = Liquid Pressure

### Device Status

Select the 'Device Status' button displays the status of the Display Unit, GPS, Smart Connectors, and RUMs.



# Data Tab

## Data Tab Overview

Features that assist you in importing information into your display unit or exporting information from your display unit are located under the Data Tab. Information is imported and exported through the USB ports on the left side of your monitor. All import and export functions are compatible with using a USB flash disk while some are also compatible with a USB cellular modem. Web Setup covers features related to internet setup via a USB cellular modem. Software Update is the feature that allows you to update your software without cycling power. The Backup/Restore option allows for the backup or restore of an entire monitor in one action

Setup & Configuration					Home
Plant	Systems	Crops	Diagnose	Data	
Export Save Data to a USB Drive or the Web		Import Read Data from a USB Drive or the Web			Version 2017.1 Mar 16 2017
Web Setup Requires a supported cellular modem and data plan		Software Update Update software from a USB Drive or the Web			↑
Delete Delete data from the system		Backup / Restore Backup or restore data from a USB Drive			↓
					← Back

## Exporting Configuration Data

Select the ‘Export’ button to open the Data Export page. Exporting Planting Configuration saves the planter, field, crop, and population settings to a USB drive. To export this data, insert your USB disk into the monitor and Select ‘Planting Config’. Select ‘Yes’ from the box to indicate that you do wish to export this information and then press OK to confirm that the process is complete. Exporting the System Config (display, sound, and down force settings) follows the same process.

Data Export					Home
Plant	Systems	Crops	Diagnose	Data	
Planting Config Save Planter, Field, Crop, and Seed Configurations		System Config Save Display, Sound, and Down Force Settings			Enter
Field Map Data Save Current Season Planting Field Map Data		Old Field Map Data Save Prior Seasons Planting Field Map Data			↑
Swath Coverage Map Share Swath Coverage Map with another 20/20 System.		Crop Config Save Field, Crop, and Seed Configurations			↓
Prescription and Boundary Save all imported prescription and boundary files to USB					← Back

## Exporting Field Map Data

Select the 'Field Map Data' button to open the current season's field map data. A list of all fields planted will be generated. To export this information first insert the USB drive. To transfer one field to your USB drive, select the field to highlight it and then select 'Transfer'. To transfer all fields, Select 'Transfer All'. Once you have transferred a field, you may either leave it in the system or you may delete it by going to the 'Delete' section of the Data tab. 'Old Field Map Data' stores undeleted field data from previous seasons. To export field map data from previous seasons, select this button and follow the same procedure as for current season data.

2017 Field Map Data				Home
Name	Acres	Size (KB)	Status	
Demo Field	0.0	2048	New Data	Transfer
F11	0.0	128	New Data	↑
demo	0.0	128	New Data	↓
YieldSenseV2	0.0	464	New Data	←
				Back
Transfer	Transfer All	Export All Harvest Data		

## Data Import

Select the 'Data Import' button under the Data Tab to open the Data Import page. Importing Planting Configuration changes your planter, field, crop and population settings to a configuration created in another display unit or the PC Setup Tool. To import this data, insert your USB drive into the monitor and select 'Planting Config'. Select 'Yes' and then press 'Ok' to confirm that the process is complete. Importing System Config(display, sound, and down force settings) follows the same process.

Data Import				Home	
Plant	Systems	Crops	Diagnose	Data	
Planting Config Read Planter, Field, Crop, and Seed Configurations		System Config Read Display, Sound, and Down Force Settings			Enter
Field Map Data Read Planting Field Map Data for use in Harvest Replay		Prescription/Boundary Read Prescriptions and Boundary Files			↑
Swath Coverage Map Read Swath Coverage Map from another 20/20 System.		Crop Config Read Field, Crop, and Seed Configurations			↓
					←
					Back

## Update Software

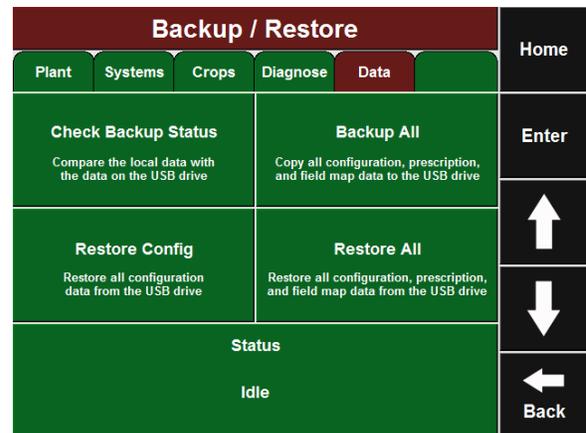
Select the 'Software Update' button under the Data Tab to open the Software Update Selection page. Download a software update from precisionplanting.com and save it to a USB drive. Take the USB drive and insert it into your Display Unit after pressing 'Software Update'. Any software updates stored on the USB drive will be displayed. Select the update you would like to run and press 'Enter'

Setup & Configuration		Home
Software Update Selection		
17.4.1 Full		Enter
		↑
		↓
		←
		Back

## Backup/Restore

This tool backs up all data and configuration files on the monitor to a USB drive using the Backup All feature. Restoring just the configuration can be done by using the Restore Config option.

Restore All will bring all of the data and configuration back onto the display. To check and see how much data needs to be backed up, Check Backup Status will tell you how much data hasn't been backed up since the last backup.



## Delete Data

Select the 'Delete' button under the Data Tab to open the Delete screen. From here, select the type of data you would like to delete. Now select the specific information you would like to delete. Once data is deleted in this manner, it cannot be recovered.

**Note:** Select the down to display a 'Delete All Data' option.

