

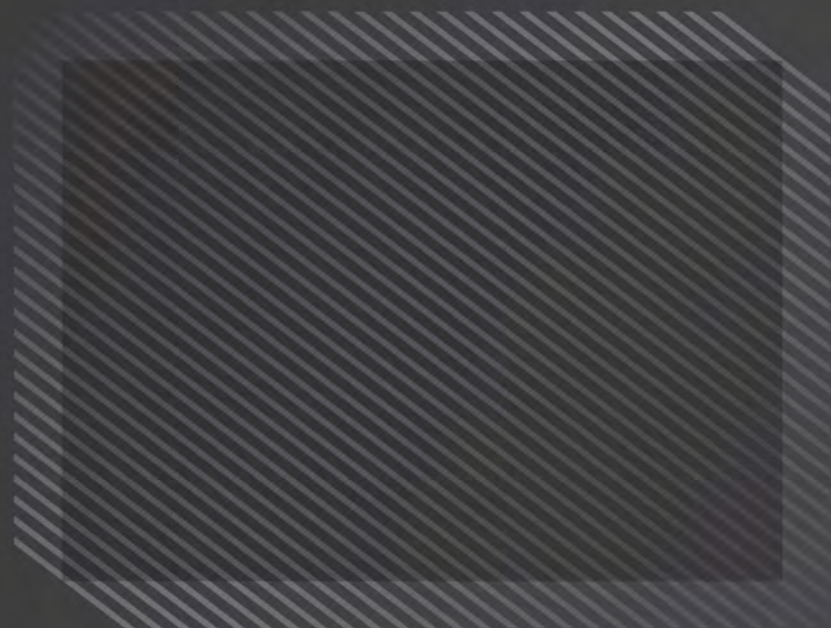
JOHN DEERE / 2630 DISPLAY

QUICK START GUIDE

for ETS SoilWarrior®



ENVIRONMENTAL
TILLAGE SYSTEMS





INTRODUCTION



This quick start guide will lead you through Grower/Farm/Field, Implement, Product, Guidance, and Mapping setup.

GS3 Main Setup: Steps 1 – 8

GS3 Main setup will guide you through the setup process to use the SoilWarrior®. It is used on a regular basis (e.g. when changing fields or products). Check the boxes next to the items that you would like to configure. It is very important to complete all 8 steps of this setup. A partial setup will create documentation performance issues.

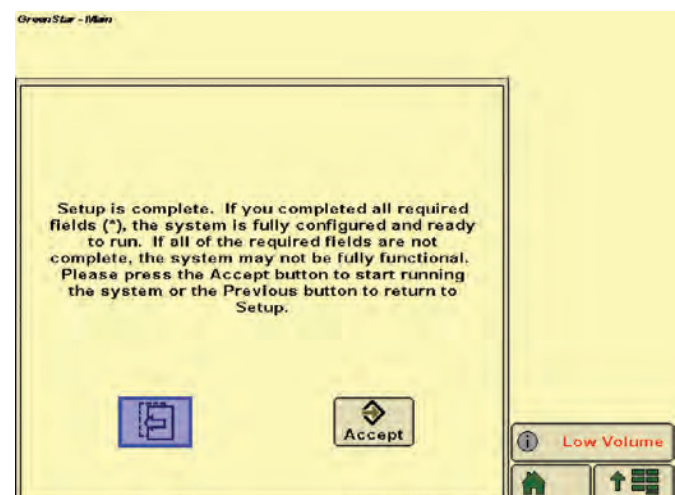
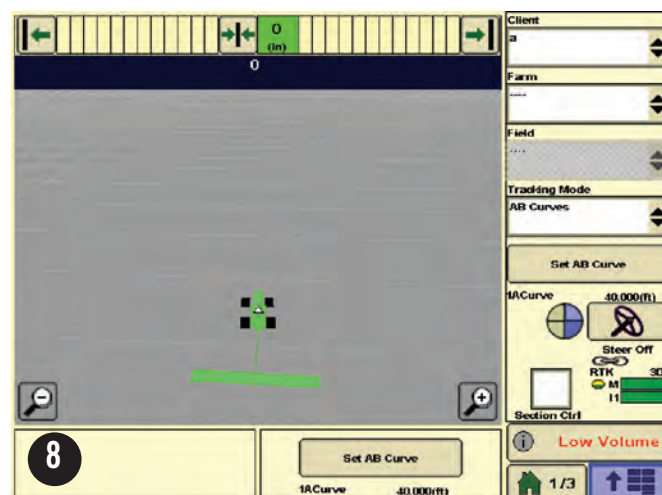
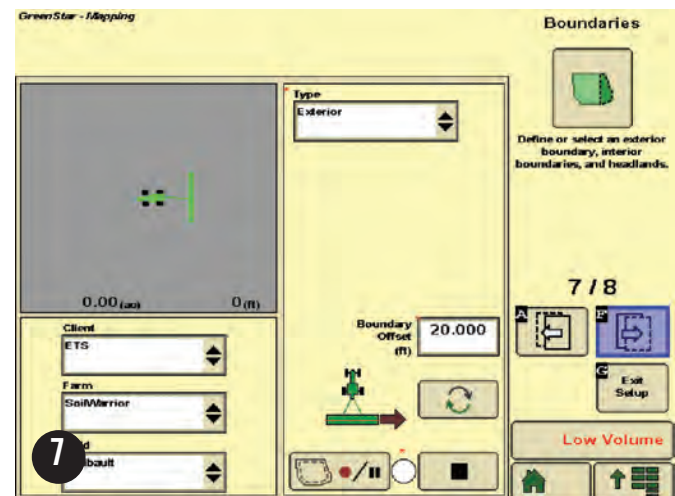
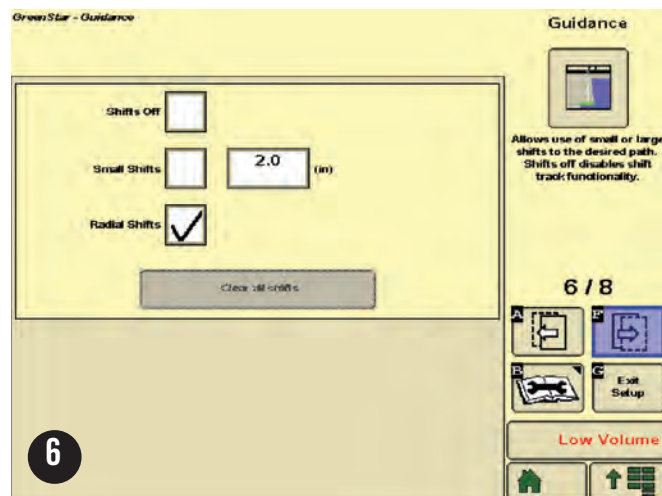
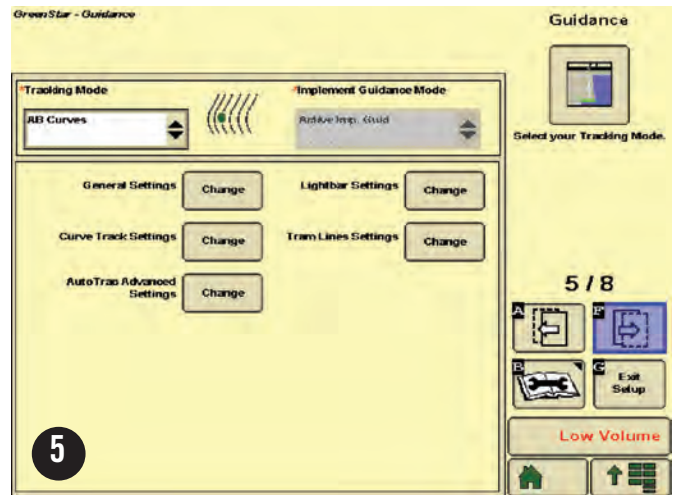
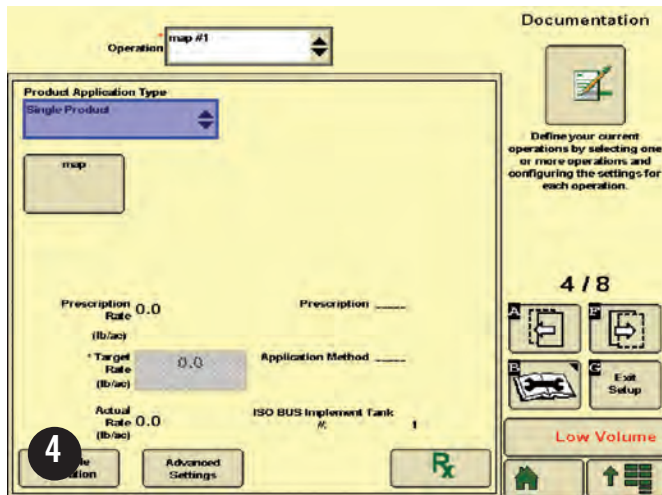
Utilize the images below to guide you through setting up the 2630 for the SoilWarrior®.

NOTE: To save your maps, you must enable documentation. You can also load the prescription file for each product/tank into the documentation menu.

NOTE: If any questions are not answered with this guide, please refer to your John Deere Operator Manual.



INTRODUCTION



1 IMPLEMENT AND TANK SETUP

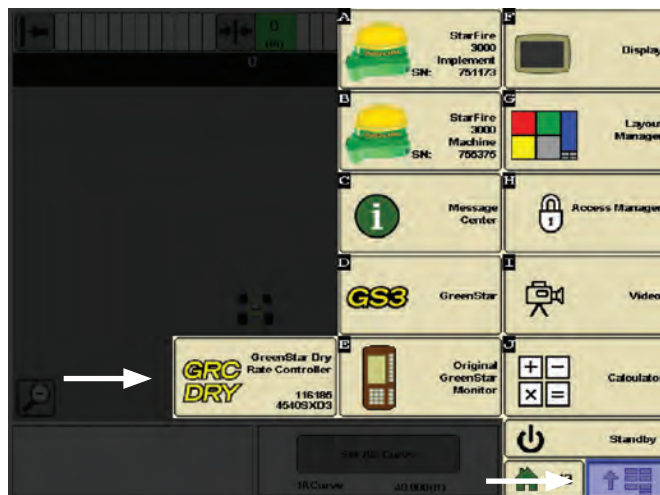
IMPORTANT : Do not fill with fertilizer until setup of the GRC is complete and a test CFR and PWM Calibration has been completed.



Open the **App Drawer** (bottom right button).



Select **GRC Dry**.

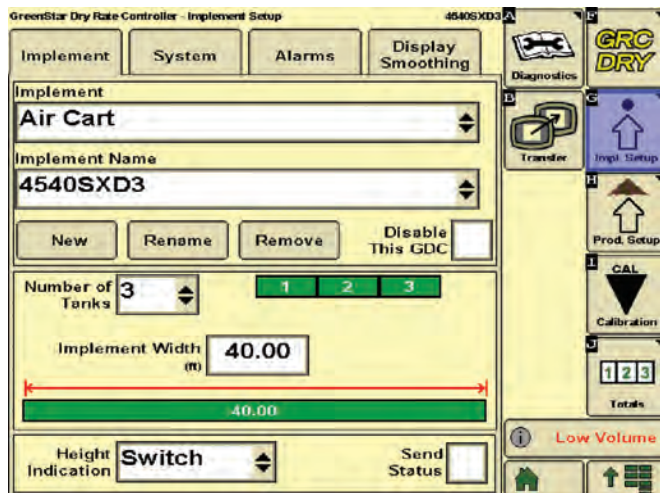


Within the **GRC Dry** menu, select the **Impl. Setup** button on the right.

Ensure master switch is off before proceeding.

Under the first tab labeled **Implement**, complete the following:

1. Under **Implement** select **Air Cart** from the drop down menu.
2. Name the implement. We recommend using your SoilWarrior® model number (e.g. 4540SND-A).
3. Choose the number of tanks your SoilWarrior® is equipped with.
4. Enter your implement width (in feet).
5. Under Height Indication, select **Switch** from the drop down menu.
 - a. Leave **Send Status** unchecked if only one rate controller installed.
 - b. If there are 2 rate controllers (Dry + Liquid) select **Receive** if the implement switch is connected to the dry rate controller harness.
 - c. Select **Send Status** for the rate controller to which the implement switch is connected.





1 IMPLEMENT AND TANK SETUP

The next tab under Implement Setup, labeled **System**, is where you configure each tank of your SoilWarrior®.

Select the icon labeled **Tank 1 System**. Some of the parameters will be the same across the entire SoilWarrior® platform, others are make and model specific. *Refer to the 2015 ETS Operator's Manual for your specific settings.*

Depending on how your SoilWarrior® is equipped, there could be multiple fans.

1. Select **Fan Setup**.
2. Check mark **Fan Speed Sensor Installed**.
3. The **Fan Speed Sensor Calibration** value should be set at 2.

Tank 1 Setup

1. **Meter Control Valve Type** will be PWM Close.
2. **Meter Speed Sensor Calibration** will be 360.
3. **Tank Capacity** varies (*refer to the 2015 ETS Operator's Manual*).
4. **Tank Capacity Units** will be bu.
5. Check mark **Tank Level Switch Installed**.
6. Push the **PWM Settings** button next to Meter Control Valve Calibration. Input the following in the newly opened window:
 - a. **Control Valve Calibration:** 2513
 - b. **Coil Frequency:** 122
 - c. **High Limit:** 135 — *use only for initial setup.*
You must **Calibrate PWM Limits** prior to operation on each channel.
 - d. **Low Limit:** 35 — *use only for initial setup.*
You must **Calibrate PWM Limits** prior to operation on each channel.
 - e. Press **Accept** to complete tank setup.

NOTE: Repeat Tank Setup for each additional tank on your SoilWarrior®.

The screenshots show the following screens in sequence:

- Implement Setup - System Tab:** Shows tabs for Implement, System, Alarms, and Display Smoothing. The System tab is active, showing settings for Tank 1 and Tank 2. Tank 1 System is selected. Below, Fan Setup is set to None, and Clutch Setup is set to Main Clutch.
- Fan Setup Screen:** Shows 'Fan Speed Sensor Installed' checked, 'Fan Speed Sensor Calibration' set to 2, and '2nd Fan Speed Sensor Installed' unchecked.
- Tank 1 Setup Screen:** Shows 'Meter Control Valve Type' set to PWM Close, 'Meter Control Valve Calibration' set to PWM Settings, 'Meter Speed Sensor Calibration' set to 360, 'Tank Capacity (bu)' set to 135, 'Tank Capacity Units' set to bu, and 'Tank Level Switch Installed' checked.
- PWM Settings Screen:** Shows 'Control Valve Calibration' set to 2513, 'Coil Frequency' set to 122, 'High Limit' set to 163, and 'Low Limit' set to 39. A 'Calibrate PWM Limits' button is visible.

1 IMPLEMENT AND TANK SETUP

The next tab under Implement Setup, labeled **Alarms**, is where you configure how and when the 2630 will alarm you on Tank Level and Application Rate accuracy.

1. Select the icon labeled **Tank 1 Alarms**.
2. Check mark the **Alarms** box to turn on the selected alarms.

The screenshot shows the 'Alarms' tab in the 'Implement Setup' menu. It features a table for configuring alarms for Tank 1 and Tank 2. The table has columns for 'Application Rate (% +/- of Target Rate)', 'Low Tank Level (%)', and 'Tank Level Switch'. Both tanks are set to 10% for application rate and low tank level, with the tank level switch enabled. Below the table is a 'Fan Alarms' section with a 'Fan Speed (% +/- of target RPM)' set to 20. The right sidebar contains navigation icons for Diagnostics, GRC DRY, Impl. Setup, Prod. Setup, CAL, Calibration, Totals, and Bin 2 Level.

| | Application Rate (% +/- of Target Rate) | Low Tank Level (%) | Tank Level Switch |
|---------------|--|-----------------------|-------------------|
| Tank 1 Alarms | 10 | 10 | Enabled |
| Tank 2 Alarms | 10 | 10 | Enabled |

Fan Alarms

Fan Speed
(% +/- of target RPM) 20

Application Rate is a % error + or - of your target rate.

Ex: With a target rate of 100 lbs/acre, the alarm set at 10% will be triggered if the application rate is below 90 lbs/acre or above 110 lbs/acre.

Low Tank Level is a % of remaining product in the tank. The alarm is triggered when the specified percentage of product is reached.

Tank Level Switch indicates actual level in each tank. When the product level is below the sensor, the alarm is triggered.

The screenshot shows the 'Tank 1 Alarms' configuration screen. It has a section titled 'Alarm?' with three rows: 'Application Rate (% +/- of Target Rate)' with a checked box and a value of 10, 'Low Tank Level (%)' with a checked box and a value of 10, and 'Tank Level Switch' with a checked box. At the bottom are 'Cancel' and 'Accept' buttons. The right sidebar shows navigation icons for Bin 2 Level and other setup options.

Tank 1 Alarms

Alarm?

Application Rate (% +/- of Target Rate) ☒ 10

Low Tank Level (%) ☒ 10

Tank Level Switch ☒

Cancel Accept

The next tab under Implement Setup is **Display Smoothing**.

Display Smoothing removes on-screen rate fluctuations within the % indicated. This does not affect hydraulic drive performance.

The screenshot shows the 'Display Smoothing' tab in the 'Implement Setup' menu. It features two sections: 'Rate Smoothing' and 'Speed Smoothing'. The 'Rate Smoothing' section has two rows for Tank 1 and Tank 2, each with a checked box and a value of 10%. The 'Speed Smoothing' section has a 'Fan' row with a checked box and a value of 10%. The right sidebar contains navigation icons for Diagnostics, GRC DRY, Impl. Setup, Prod. Setup, CAL, Calibration, Totals, and Bin 2 Level.

Rate Smoothing

Tank 1 ☒ 10 %

Tank 2 ☒ 10 %

Speed Smoothing

Fan ☒ 10 %

2 PRODUCT SETUP



Within the **GRC Dry** menu, select the **Prod. Setup** button on the right.

Within the **Prod. Setup** menu you will be able to set up each product you intend to apply. Under the first tab labeled **Product Information**, input the following:

1. Product Name

- **New** – create new product.
- **Rename** – rename the current product.
- **Remove** – delete the current product.

2. Once you have the product you wish to configure set up, choose the appropriate **Product Type** from the drop down menu.

3. Set the **Application Units** as lbs (per acre).

4. In the **Target Fan Speed** field, input 5000 (RPM) for any active products. Refer to page 52 of *Operators Manual* for fan speed settings.

5. Input the **Product Density** – refer to the *Product Density Scale* found in the toolbox on the SoilWarrior® for the exact value or refer to the weight ticket provided by your fertilizer supplier.

6. **Rate Mode** – select one of the three following options from the drop down menu.

- **Manual** for manual rate control.
- **Map Based** for VRT/Rx – which you need to load into the DRC.
- **Predetermined** for preset fixed rates. You can select up to three rates.

7. Manual Rate Change Increment

- Amount the rate will increase/decrease by for each manual change.

NOTE: Repeat steps 1–7 for additional product setups.

2 PRODUCT SETUP

Under the second tab labeled **Product Tank Setup**, you will assign the created products to a tank.

1. Choose the tank to which you would like to assign a product.
2. From the **Product Name** drop down menu, select a product.
3. Set the **Target Fan Speed** to 5000 RPM for the first tank and check mark **Assign Product to Fan 1**. Refer to page 52 of Operators Manual for fan speed settings.

NOTE: Only one product needs to be assigned to a fan. If there are two fans, assign another product to fan 2.

Calibrate CFR (Cubic Feet per Revolution)

Input the default CFR value using the supplied chart (also found in the 2015 ETS Operator's Manual). Make sure to select the correct number of rolls and size of the meter system. See Calibration Procedures in this guide for more details on CFR calibration.

The number of rolls is on a per tank basis. Each tank must be calibrated. To calculate the number of meter rolls on your SoilWarrior, divide the number of row units by 2.

Example: 12-row machine, 12 rows/2 = 6 rolls

4. Press **Accept** to complete Product Tank Setup.

NOTE: This calibration will require a catch test on each tank. Details are found in the next section.

Once product setup is complete, review the information under the **Product Summary** tab to confirm the products are set up correctly and assigned to the correct tank.

CFR Settings for Ag Leader & John Deere Systems

| No. of Rolls | Roll Size 7 | Roll Size 10 |
|--------------|-------------|--------------|
| 1 | 0.005 | 0.006 |
| 2 | 0.009 | 0.013 |
| 3 | 0.014 | 0.019 |
| 4 | 0.018 | 0.026 |
| 6 | 0.028 | 0.039 |
| 8 | 0.037 | 0.051 |
| 12 | 0.055 | 0.077 |

3 CALIBRATION PROCEDURES



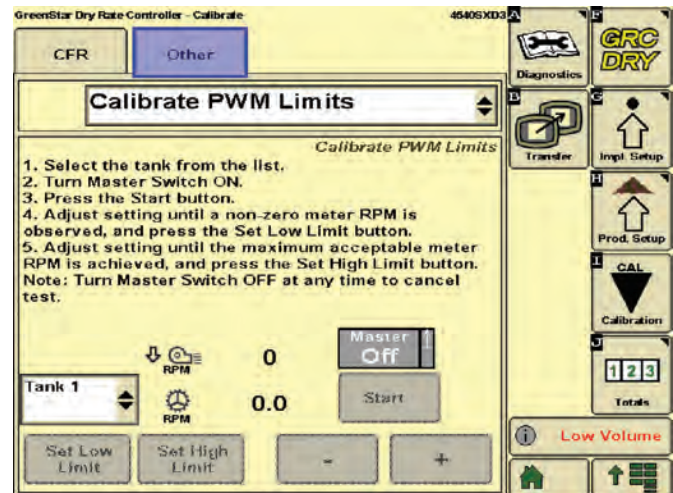
Within the **GRC Dry** menu, select the **CAL** button on the right.

PWM Limit

Select the **Other** tab, then select **Calibrate PWM Limits** from the dropdown menu.

This calibration is required for each motor installed on your SoilWarrior®. Complete the following:

1. Start tractor and activate the hydraulic drive circuit.
2. Set SCV flow for the fertilizer drive circuit to 20% flow or 6.0 on John Deere tractors (as outlined on page 49 of your ETS Operators Manual).
3. Place throttle above 1650 rpm.
4. **Calibrate PWM Limits** by following the onscreen instructions.
5. Set **Low Limit** to approximately 2 RPM. Do not set lower than 1 RPM.
6. Set the **High Limit** RPM between 65-80 RPM.



NOTE: Repeat procedure for all tanks.

NOTE: Make sure when the Low and High Limits are complete, the RPMs settle to 0 before proceeding.

NOTE: Not completing this calibration will create an inconsistent PWM operation.

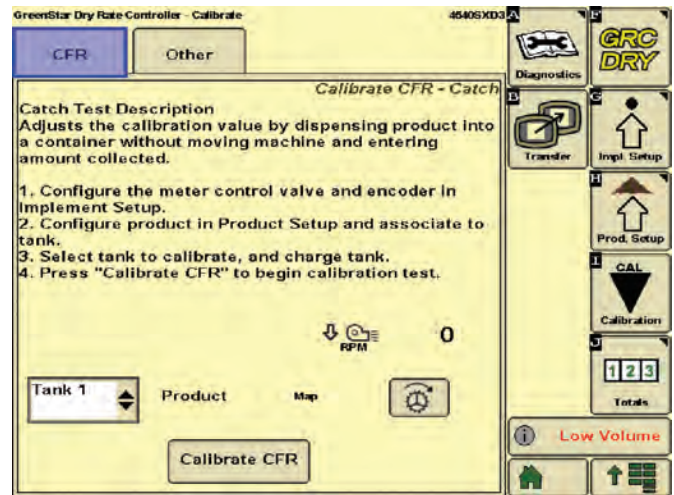
3 CALIBRATION PROCEDURES

CFR (Cubic Feet Per Revolution)

Select the first tab labeled **CFR**. Be sure to prime the meter rolls with correct product to assure a quality calibration. Set the target speed and target rate to replicate running live in the field, and set the desired weight to 25 lbs. If running prescription or VRT rates, use the average rate for the calibration test.

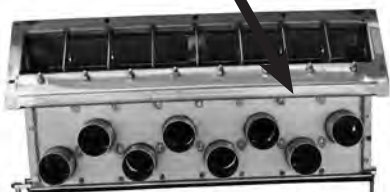
Once product is dispensed, weigh the meter cal bag with the dispensed product and input in the actual amount dispensed and press calibrate. The system will correct the CFR cal number.

If there is a significant difference in CFR, review the calibration procedure to ensure that the settings, meter roll size, product flow plugging and product density are correct.

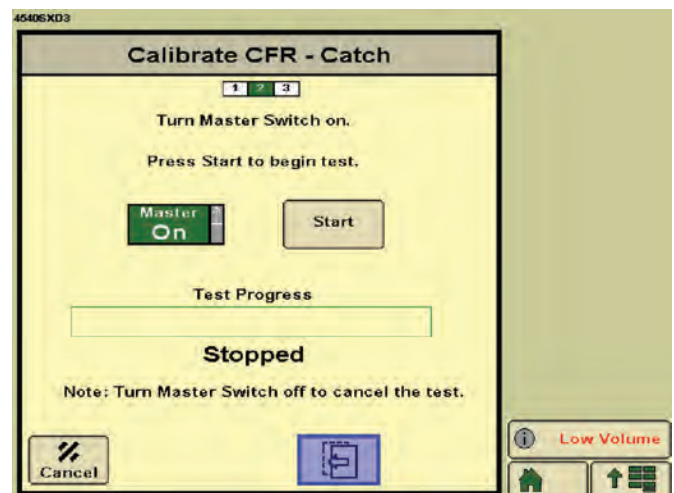
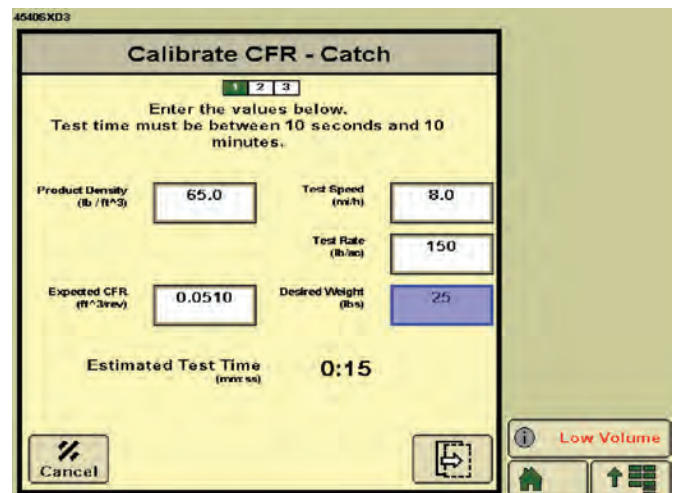


NOTE: The master switch must be turned on to perform the calibration tests. Use caution when performing the calibration catch tests. Parts on the metering system will occur.

NOTE: This CAL will dispense product. Remove the collector bottom insert to allow product to flow out of the meter.



Ensure no foreign matter is dispensed when doing CFR calibration.



NOTE: It is recommended that you do a minimum of two calibration tests to achieve the highest level of accuracy. In some cases you may have to perform a third calibration test. It is also recommended that you perform this calibration test each time you change products.

4 GPS SETUP



Open the **App Drawer** (bottom right button).

Select **StarFire 3000 Machine**.

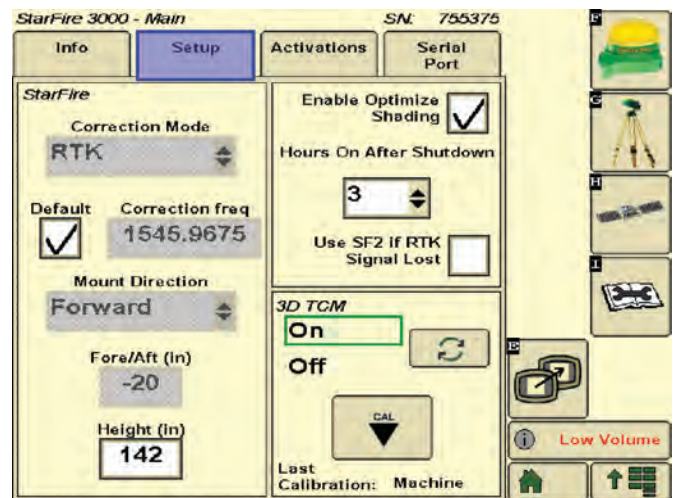


Implement GPS setup is required for the SoilWarrior® when equipped with Active Implement Guidance. *ETS recommends using RTK correction signals.*

Verify you have GPS configured correctly by going through the tabs shown in the images.

NOTE: Refer to your John Deere manual for questions regarding GPS setup.

NOTE: Heights and Offsets must be measured for your tractor and SoilWarrior®. Measurements shown are examples only.

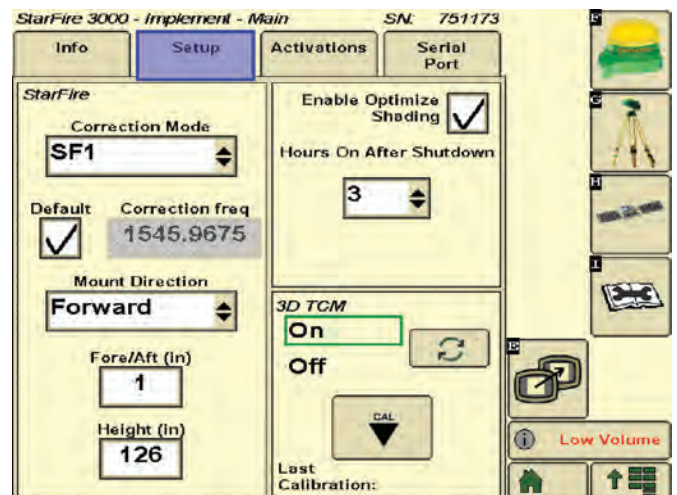


If the SoilWarrior® is equipped with Active Implement Guidance, then there are two StarFire 3000 receivers with the SoilWarrior®.

On the John Deere terminal, you will see both receivers. One is labeled **Machine**, the other is labeled **Implement**.

SF1 is a John Deere GPS corrected signal, and commonly refers to RTK.

NOTE: Correction mode must be in RTK to use Active Implement Guidance.



5 IMPLEMENT MEASUREMENTS



Open the **App Drawer** (bottom right button).



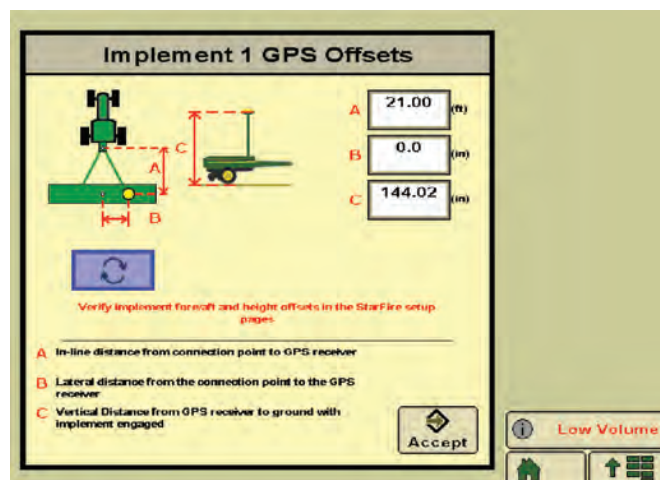
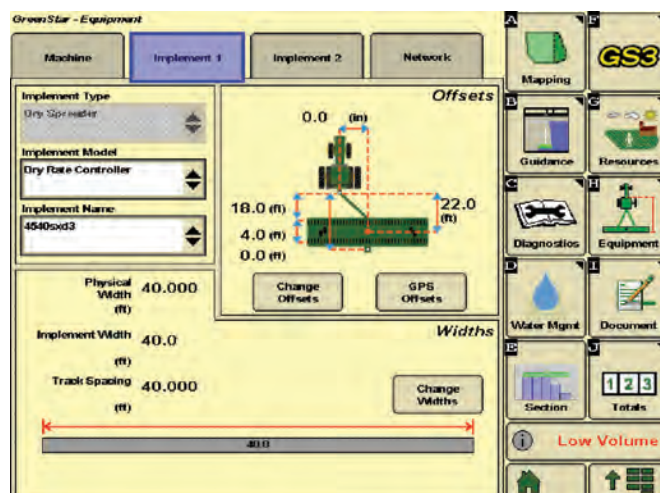
Select **GS3**.



Within the **GS3** menu, select the **Equipment** button on the right.

Entering correct implement measurements ensure mapping/coverage and section control will perform as desired.

Under the second tab labeled **Implement 1**, follow the on-screen images and enter the correct measurements specific to your SoilWarrior® and tractor.



6 ACTIVE IMPLEMENT GUIDE



Open the **App Drawer** (bottom right button).



Select **Application Controller**.



Within the **Application Controller** menu, select the **Impl. Setup** button on the right.

NOTE: Your John Deere tractor must be equipped with an app controller to utilize active implement guidance. If you are unsure of whether or not you have it, consult your John Deere dealer.

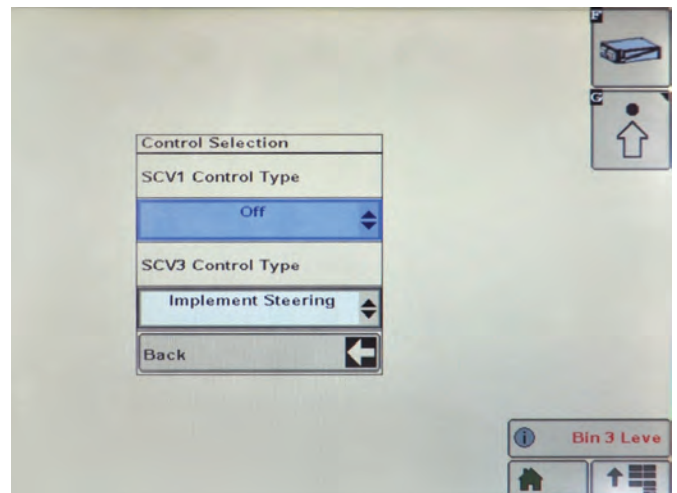
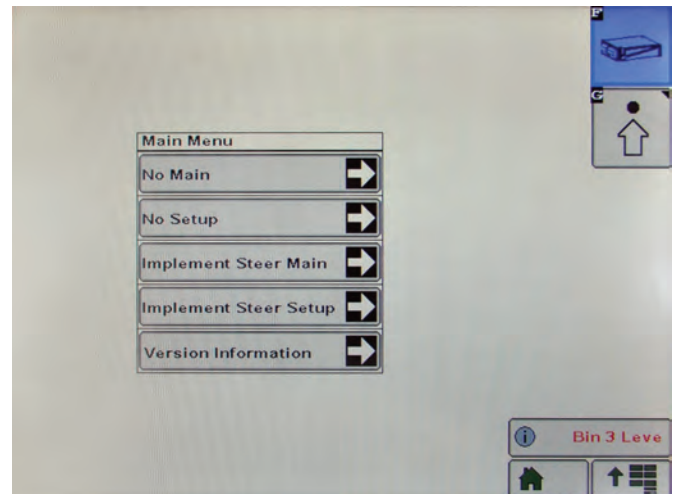


Implement guidance calibration sets the angle sensor on the SoilWarrior® for max left, right, and center steer movements. Use the following images and directions to set up your active implement guidance.

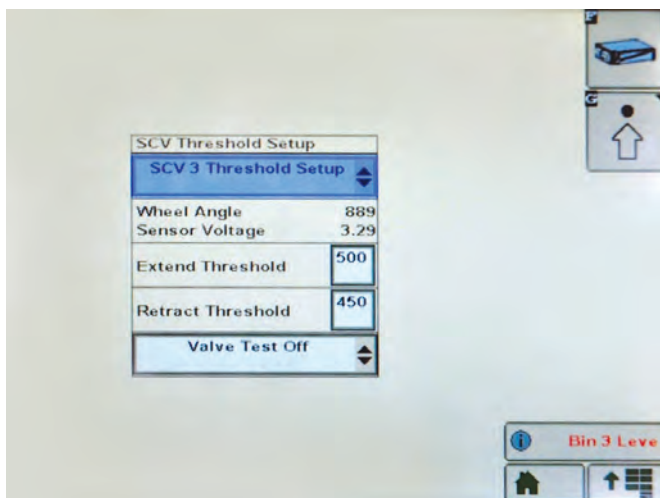
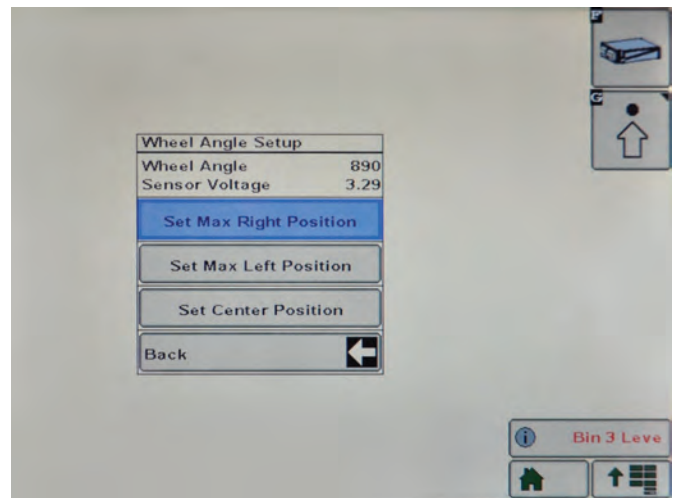
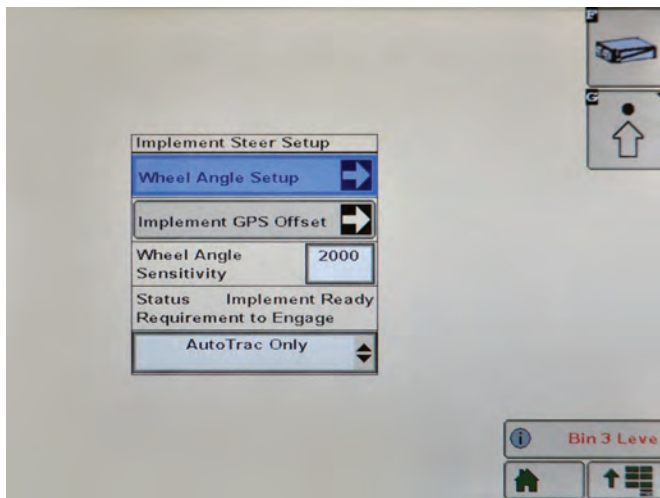
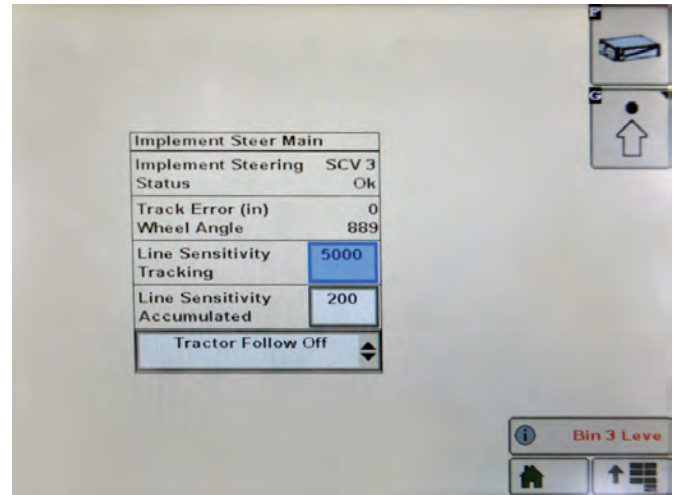
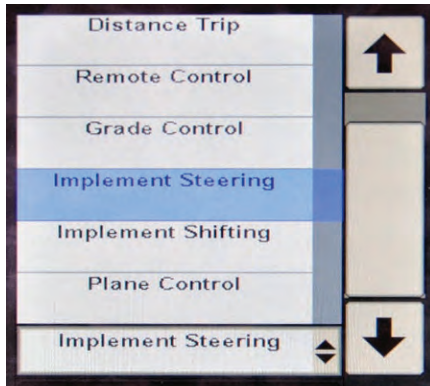
These settings are for the steering movement needed for a specific direction. To steer the cart to the left, the hydraulic steering cylinder will retract and the cylinder will extend to steer the cart to the right.

1. Set right first by extending the cylinder, press **Set Max Right Position** and note the voltage.
2. Retract the cylinder completely, press **Set Max Left Position** and note the voltage.
3. Add the right and left voltage and divide by two. Using the steering cylinder set the voltage to this value. Press **Set Center Position**.

Confirm this position by measuring from a fixed point on the outer toolbar to the center of the hitch of the SoilWarrior® on the left, and then measure from the same toolbar position on the right side to the same center position on the hitch. These measurements should be within .125". Set a sample AB line and test in both direction to determine correct pass to pass settings.



6 ACTIVE IMPLEMENT GUIDE



NOTE: Set the threshold with a starting value of 500. In-field functionality may require adjusting this value up to a value less than 950.

7 ISOBUS RUN-BLOCK SETUP



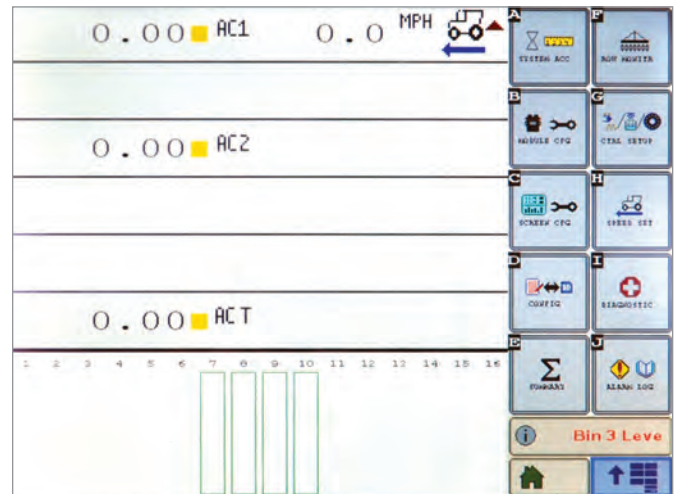
Open the **App Drawer** (bottom right button).

Select **IntelliAG PDC** (if equipped).

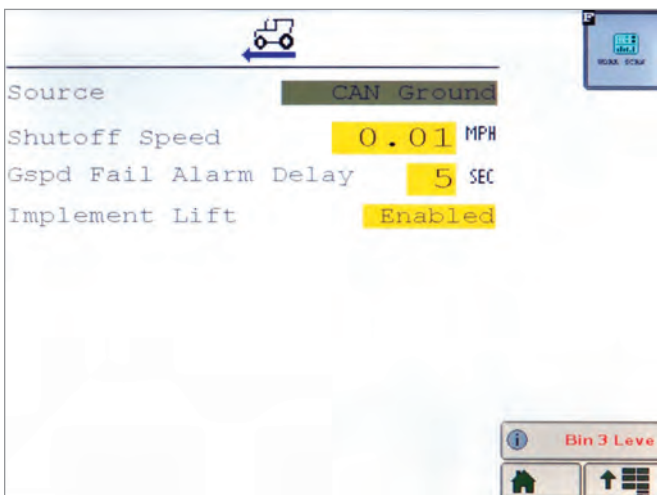
Configuration of the PDC controller consists of a module, row, and alarm setup.

Once in the **IntelliAG** menu, the menu buttons are found on the right. The PDC is pre-programmed for your SoilWarrior®. The following is a check of the functions to assure your SoilWarrior® is communicating with the system correctly.

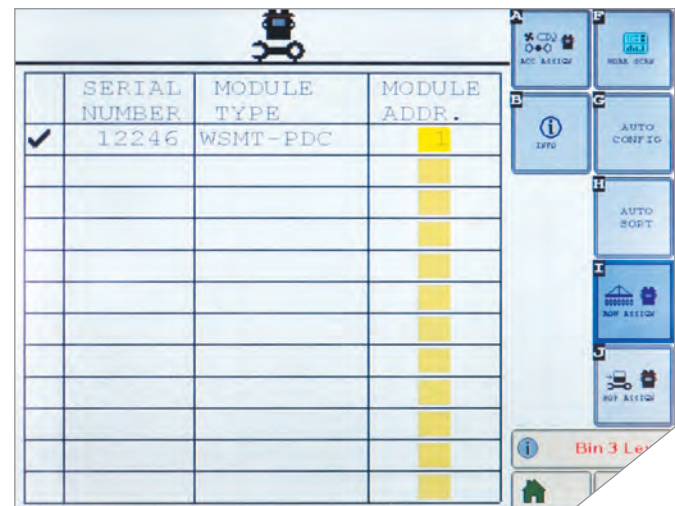
IMPORTANT: DO NOT press Auto Sort or Auto Config.



Work Scan Screen



Speed Set Screen



Module Assignment Screen

7 ISOBUS RUN-BLOCK SETUP

☒ - OFF
☒ - POPULATION
☒ - BLOCKAGE

ROW WIDTH 30.0 IN
 AUTO UPDATE WIDTH Enabled
 IMP WIDTH 450 IN

ON(-)/OFF(X) PATTERN
 EVERY ROW ON -----

POP(_)/BLOCK(B) PATTERN
 EVERY ROW BLOCKAGE BBBB

1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16

Bin 3 Leve

Sensor reading type

☒ - OFF
☒ - POPULATION
☒ - BLOCKAGE

ROW WIDTH 30.0 IN
 AUTO UPDATE WIDTH Enabled
 IMP WIDTH 450 IN

ON(-)/OFF(X) PATTERN
 EVERY ROW ON -----

POP(_)/BLOCK(B) PATTERN
 EVERY ROW BLOCKAGE BBBB

1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16

Bin 3 Leve

Disable function

Press the **Sensor Detect** button to allow the PDC to check the presents of each sensor. The *hour glass* icon will indicate the test is in process. When the hour glass disappears, all sensors were detected. In the event that the system does not see all sensors, the sensor number not detected will appear for service.

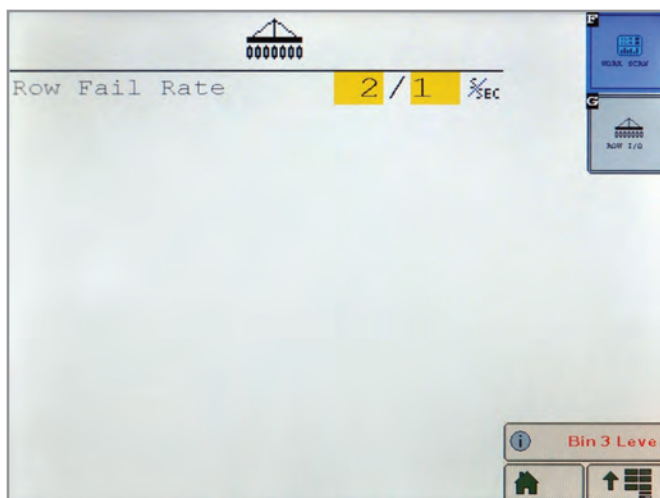
| MODULE | # OF | ROW |
|--------|----------|------|
| ADDR. | Type | ROWS |
| 1 | WSMT-PDC | 16 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Bin 3 Leve

7 ISOBUS RUN-BLOCK SETUP

When applying low rates (less than 60 pounds total), you may have to adjust the **Row Fail Rate** to allow the system to read the particles at a less frequent rate. Field settings of 1/5 seconds on 30 pounds per acre have allowed the system to function correctly.

IMPORTANT: Be sure to reset back to 2/1 when rates above 75 total pounds per acre are applied.



The main **Work Scan** screen will be the only screen you will need to monitor for run blockage while in the field. A *green outline bar* will show all the sensors turned on or present. If a run plugs, a *stop sign* will appear versus a *solid green bar* when product is flowing.

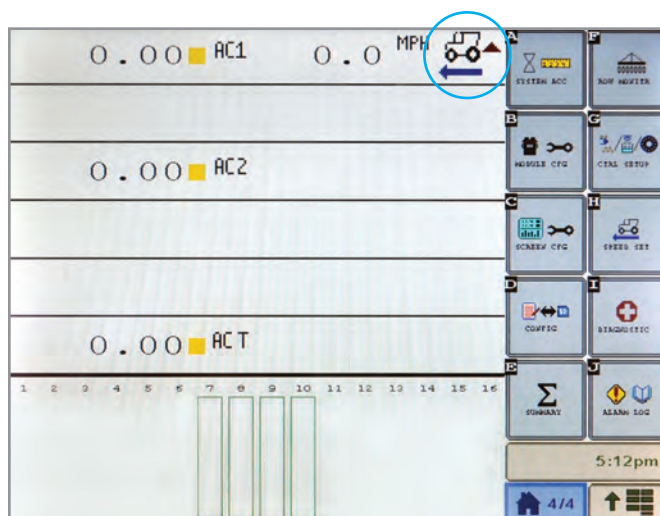
The PDC has an implement switch that allows the system to know when you turn around with the toolbar up and there is no product flow — this signal allows the alarms to be deactivated. Note the *red triangle* pointing up on the **Work Scan** screen showing the switched position.

When the toolbar is lowered, the triangle will turn down and be green — showing that the system is currently monitoring the product flow.



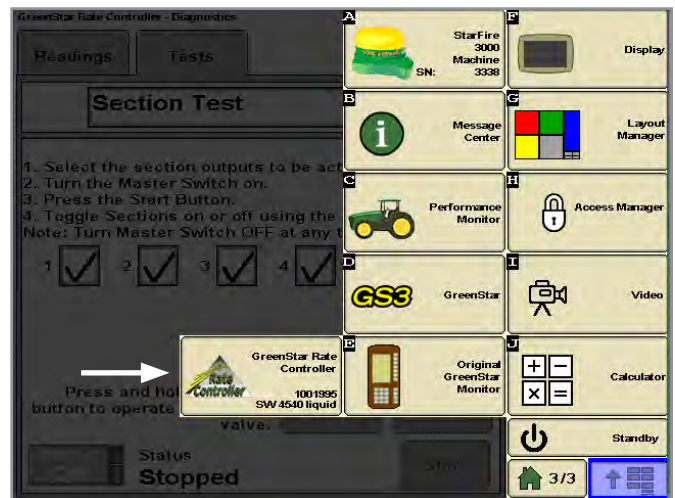
NOTE: Upon first time configuration setup, if there is no coverage mapping on the John Deere 2630, do the following:

With GPS engaged, Dry Rate controller on and running, open the app drawer and select the ISOBUS PDC. From the ISOBUS PDC virtual terminal, chose the CTRL Setup button. No other buttons need to be pushed in the CTRL Setup window. Then touch Work Scan to go back to the main PDC menu. Now you can go back to the Coverage map on the 2630 and coverage logging should be working properly.



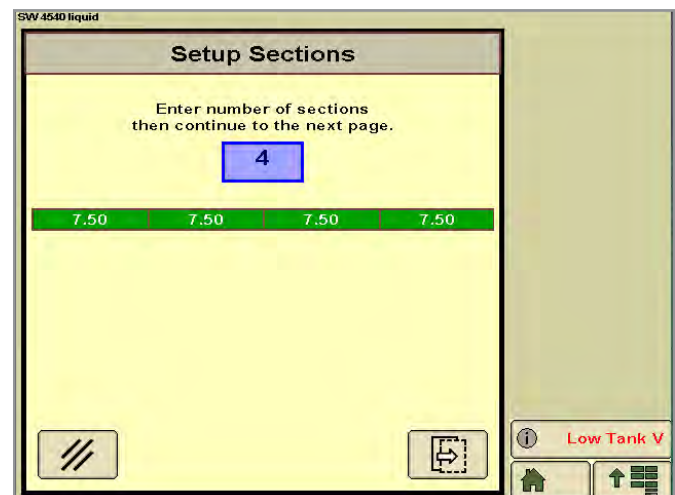
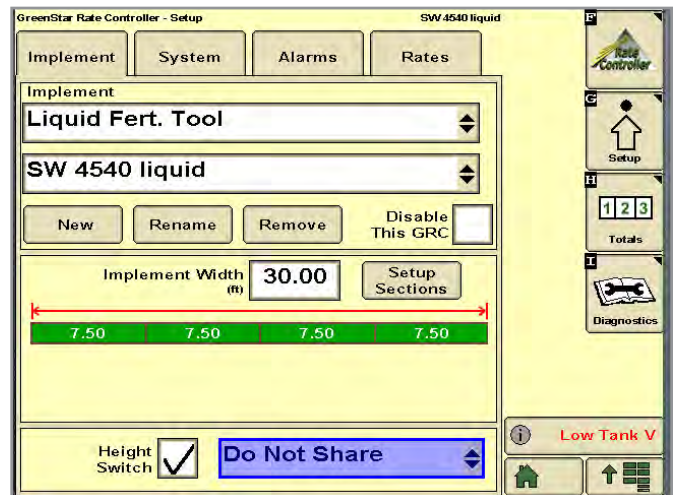
8 LIQUID RATE CONTROLLER SETUP

Navigate to JD Rate Control or Liquid Rate Control in Menu.



Implement Tab

1. From the dropdown menu under the Implement tab, select **Liquid Fert. Tool**. The next drop down menu is used to name the implement. Select New if no machine has been entered and name the SoilWarrior. See example naming in screenshot.
2. Input the implement width of the SoilWarrior and then select **Setup Sections**. In the Setup Sections window, enter the total number of sections installed and the width per section.
3. Check the **Height Switch** box if implement switch is installed on machine.
4. Select **Do Not Share**.
 - Share if two controllers are on the same CAN bus (i.e. liquid and dry).



8 LIQUID RATE CONTROLLER SETUP

System Tab

1. Select 3-Wire or as configured.
2. Select Standard or as configured.
 - Found on control valve on front of tank.
3. Enter tank capacity.
4. Control valve calibration is found on **sticker of control valve** on machine.
 - Typically a 4-digit number (ex: 2513).
5. Flowmeter calibration is found on **tag on flow meter**.
 - Typically a 3-digit number (ex: 720).
5. Flowmeter units is also found on tag on flow meter.
6. Fill in all boxes that apply to your unit (i.e. Flow Return, Agitator Valve, etc.)

NOTE: This is ETS's standard configuration. Your machine may be different.



Alarms Tab

ETS recommends the user input their own customized alarms. Defaults are shown.

8 LIQUID RATE CONTROLLER SETUP

Rates Tab

Rate 1, 2 & 3

1. Enter desired rates to apply. Rate 1 is most used as it is the default.
 - These will be shortcuts to pre-defined rates. Manual rate adjustment is also an option from the run screen.

CAUTION: The Minimum Flow Rate GAL/MIN is the sustained flow to keep fluid running through the nozzles independent of speed. It is recommend to use between .1 and 1 GAL/MIN. This will affect application rates at operating speed if it is set too high.

Calibrate Flow Meter

Select Setup Tab.

Select Calibrate Flow Meter button OR Diagnostics.

Select Test Tab.

Select **Calibrate Flowmeter Catch** in dropdown box.

1. Press Calibrate Flow Meter button.
2. Fill in boxes with information. Use most common rate and average tillage speed.
3. Run catch test.
4. Fill in actual volume caught from each nozzle.
 - Notice the new calibration value. This is also updated on the Setup System Tab.
5. Repeat until caught values are within an acceptable margin of error.

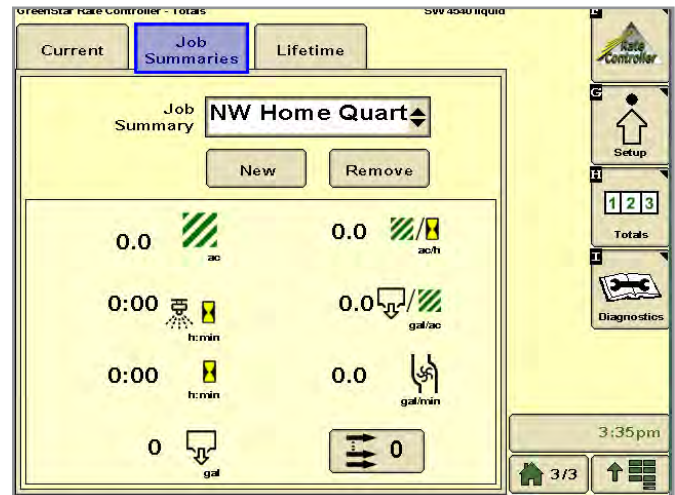
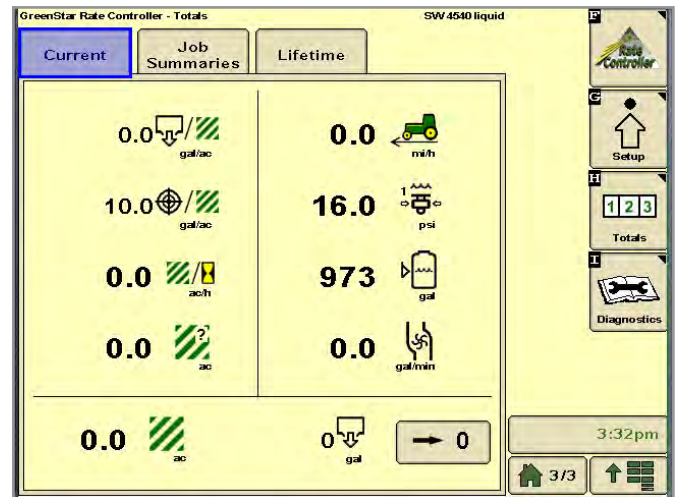
8 LIQUID RATE CONTROLLER SETUP

Totals

Current - Values while applying product. Not all values need to be present depending on your individual machine configuration.

Job Summaries - Applied value for a specific job.

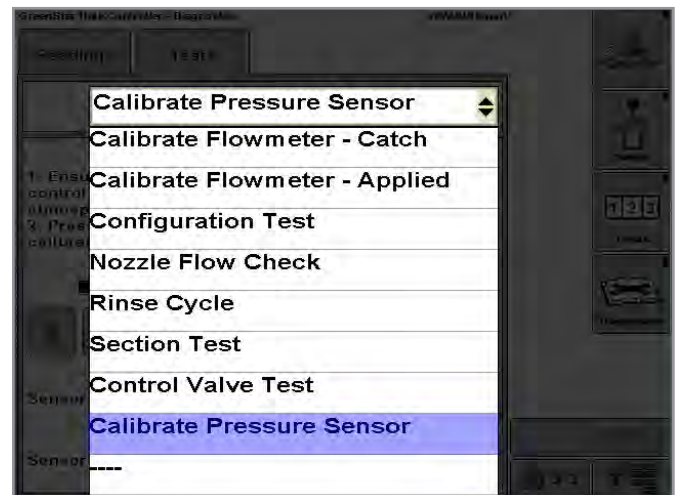
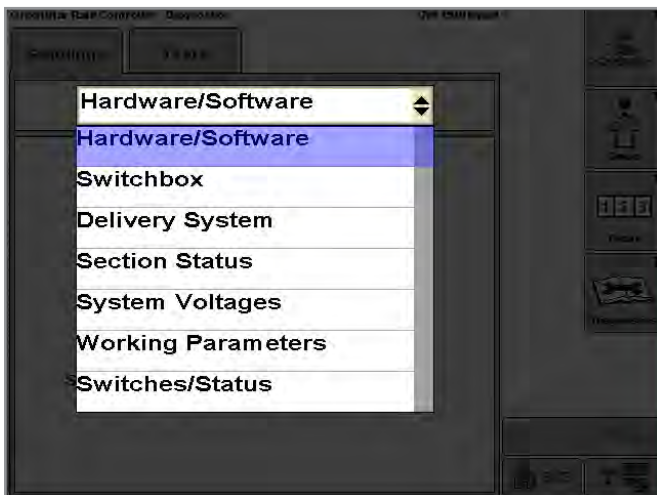
Lifetime - Applied value for the lifetime of the control module.



Diagnostics

Readings - These are live readings to help diagnose system voltages, switch and valve functions, etc.

Tests - Allows you to check and test function of each item in the drop down menu.





ENVIRONMENTAL
TILLAGE SYSTEMS

85 Prairie Ave SW, Faribault, MN 55201 / 507.332.2231 / service@soilwarrior.com / soilwarrior.com