396-3787Y1

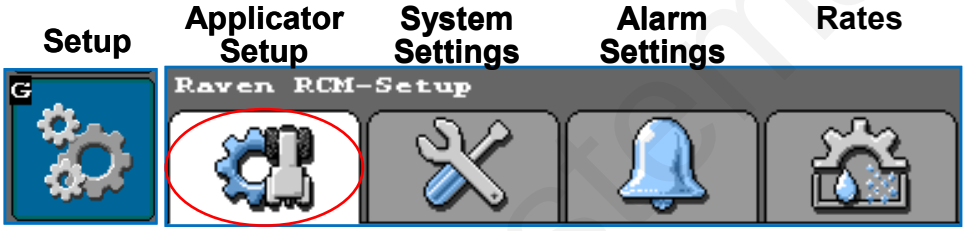
QuickStart setup instructions for Raven RCM and SureFire harness for 2 Liquid Products

213-00-3467Y_

Below are typical SureFire Liquid Fertilizer System setup screens. ***Your setup may vary. Not all screens are shown.***

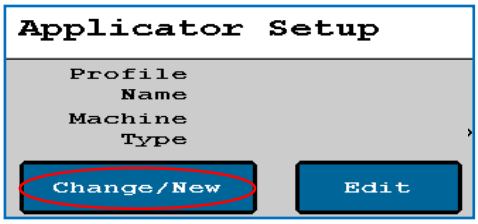
Read the Raven RCM Operation Manual for safety information and additional setup/operating information.

1. Navigate to the **Setup Wizard**.



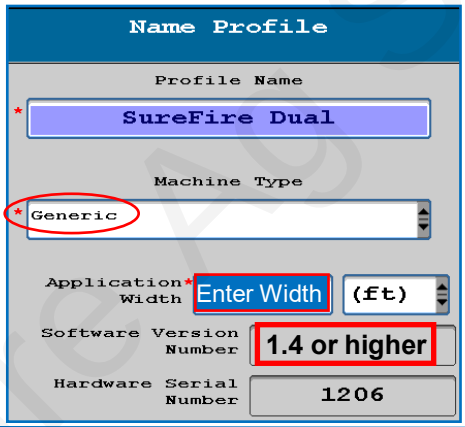
For the initial setup, start a new profile. The Raven RCM allows you to store 8 profiles. Be prepared to wait during this phase of the setup process.

2. Start a **New Profile.**

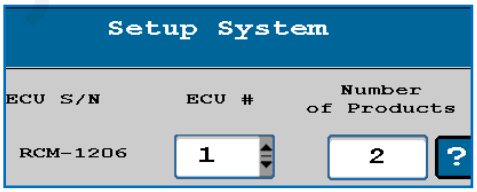


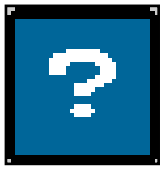
You will see this icon at times. Be patient.

3. Enter a **Profile Name. Machine Type > Generic**



4. Number of Products = 2

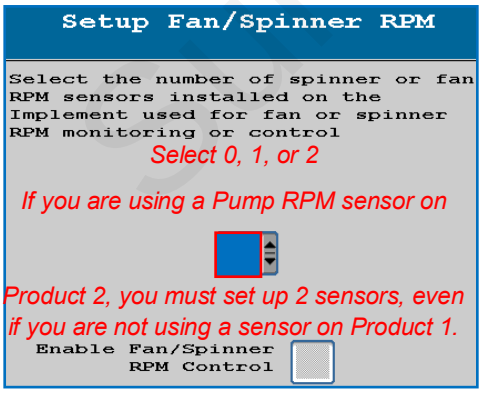




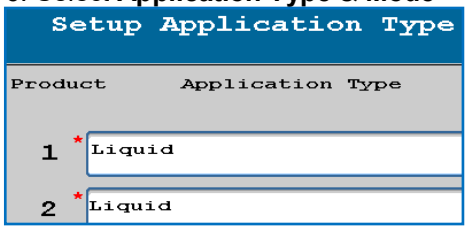
Many setup screens have this "?".

This will take you to a Help Screen with valuable information.

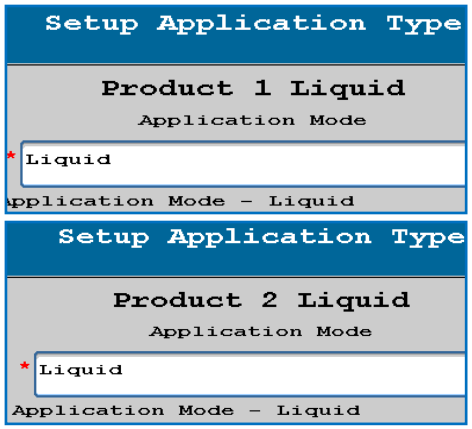
5. Fan/Spinner RPM-Use for pump RPM sensor on hydraulic pump. Product 2 uses RPM Sensor # 2 on the SureFire harness.



6. Select **Application Type & Mode**



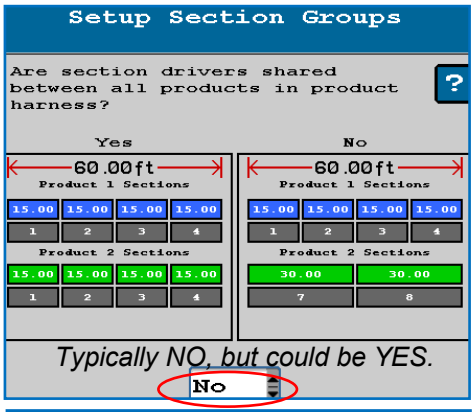
If you are applying a Dry product, one or both products could be set up as Granular Fertilizer, with an appropriate Application Mode for that setup.

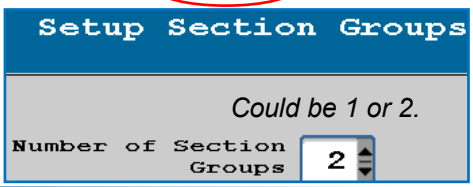


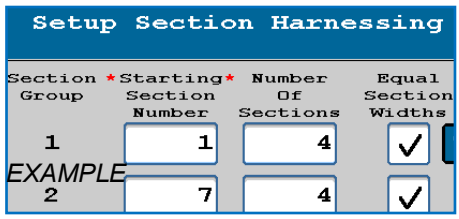
See the Raven RCM Operation Manual for safety information and additional setup/operating information.

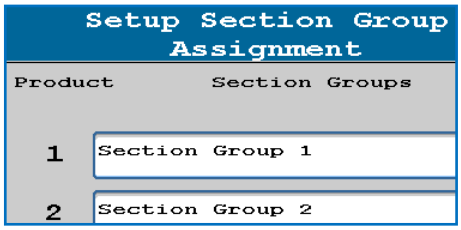
QuickStart setup instructions for Raven RCM and SureFire: 2 Liquid Products

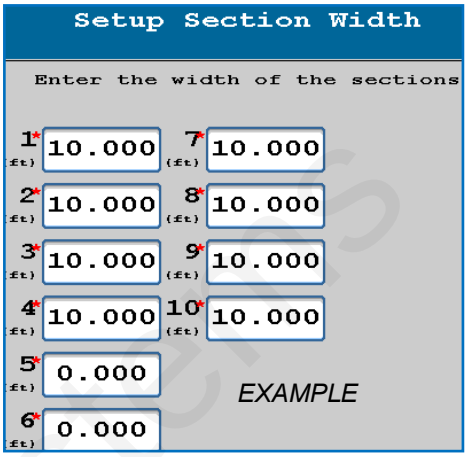
7. Section Group Setup—*Typical setup—Product 1 is Sections 1-6. Product 2 is Sections 7-12. Other setups possible. For a typical dual product setup, you will say NO to sharing section drivers. However, when using a Spartan injection pump that is going into a mixing chamber, say YES to sharing section drivers with the main product.*





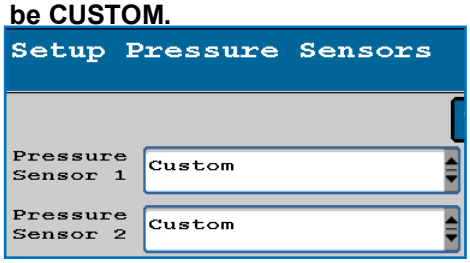


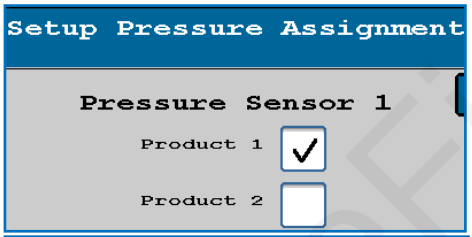


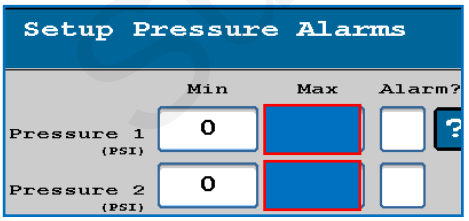


Typical setup shown. Many different section setup combinations are possible. The SureFire harness has Sections 1-6 on one connector and Sections 7-12 on another connector. You could set up each product with 12 sections and share section drivers.

8. SureFire Pressure Sensors will be CUSTOM.

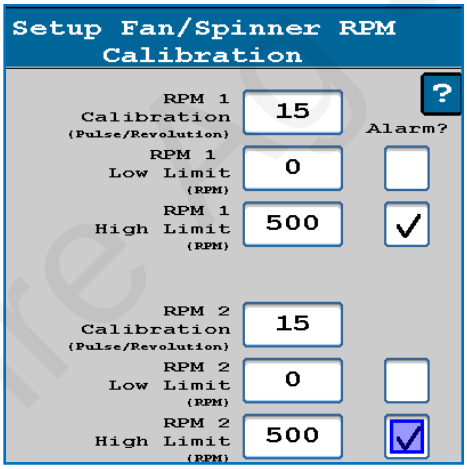


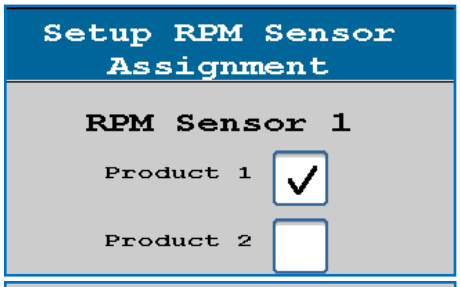


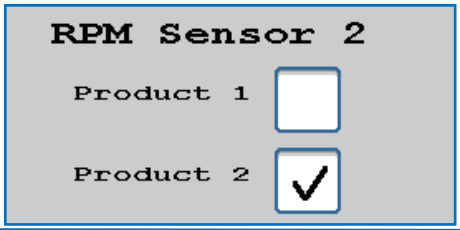


*Checking the Alarm box sets a control limit and the pressure will not go beyond that. With a hydraulic pump or Spartan, set **MAX** at **85** and check the box.*

9. Pump RPM setup-for hydraulic pumps with RPM sensors







RPM Calibration for SureFire Pump RPM sensor is 15 pulses/rev.

Set up as needed for your system. Product 2 will be RPM Sensor 2 on the SureFire harness.

If using a Pump RPM sensor, you will set up a *Display Setting* on the Run Screen with the Pump RPM readout (described later).

For hydraulic pump, set **RPM High Limit at 500** and check the box to limit the speed of the pump. This can be raised to 550 if needed.

Read the Raven RCM Operation Manual for safety information and addi-

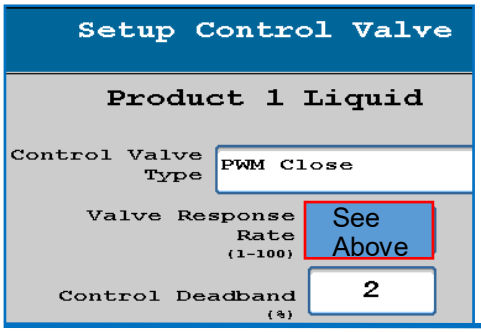
10. Control Valve Setup *(start with the numbers indicated for your system)*

Valve Response Rate: For software 1.4 or higher *(Adjust as needed in field)*

PumpRight (hydraulic)	**1**
Tower (electric)	**20**
Catalyst and Spartan	5

Control Deadband: Start at 2

If pump is slow responding to rate or speed changes, increase **Valve Response Rate** If product oscillates around rate going across the field, reduce **Valve Response Rate.**

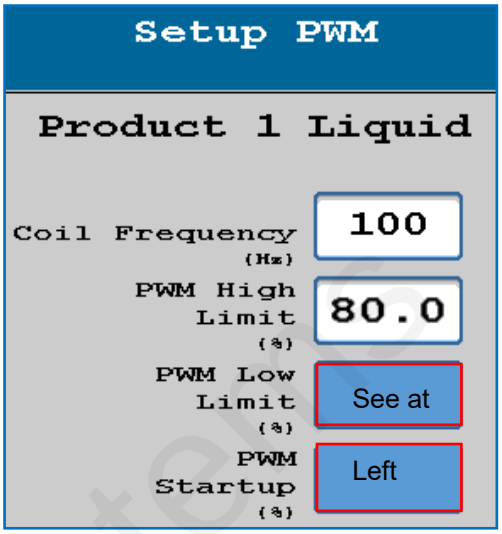


Low Limit *(Adjust in field as needed)*

PumpRight (hydraulic)	25
Tower (electric)	8
Spartan	5

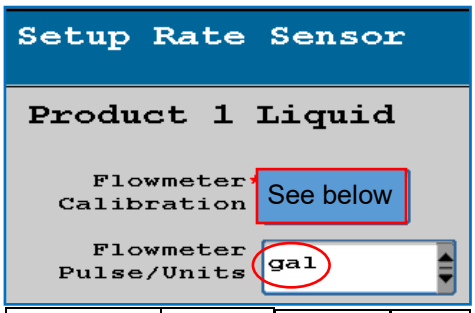
PWM Startup *(Adjust in field as needed)*

PumpRight (hydraulic)	40
Tower (electric)	20
Spartan	5



Fine-tune PWM Low Limit and High Limit at Diagnostics > Tests > Calibrate PWM Limits

11. Enter appropriate Flowmeter Cal.



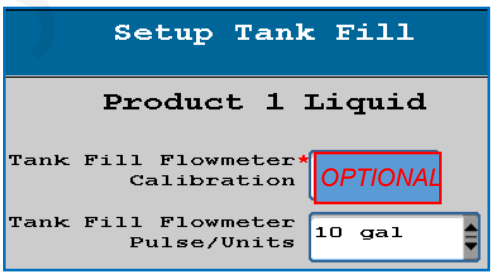
Flowmeter Size (GPM)	Pulses/ **Gal**	*Spartan model #*	*Puls/ **fl oz***
0.08-1.6	*22710*		
0.13-2.6	3000		
0.3-5.0	3000	*115*	*1700*
0.6-13	2000	*125*	*890*
1.3-26	2000	*135*	*450*
2.6-53	2000	*145*	*220*

SureFire Electromagnetic Flowmeters. Verify pls/gal on Serial Number label.

12(a). Tank and Fill Flowmeter setup

Check **Tank Fill Monitor** box if using a fill flowmeter.

12(b). Fill Flowmeter Cal setup



Then enter **Tank Fill Flowmeter Calibration**

SFA 3" Fill Flowmeter	130
SFA 2" Fill Flowmeter	300

(Units are 10 gal on SureFire Tank Fill flowmeters .)

13. Set **Rates** as desired.

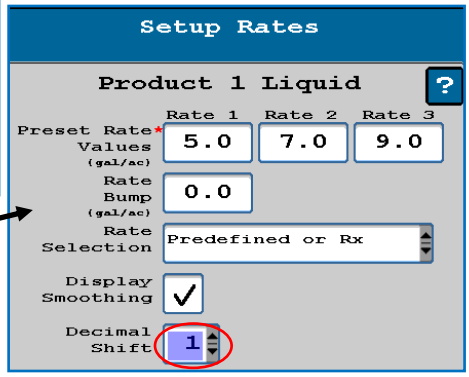
You must enter at least one rate.

Check **Display Smoothing**

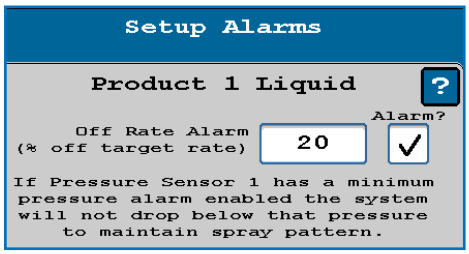
Set the **Decimal Shift** box at **1.**

Set **Decimal Shift at 2** for rates such as 0.25 gal/ac.

For high rates, Decimal Shift may be set at 0.



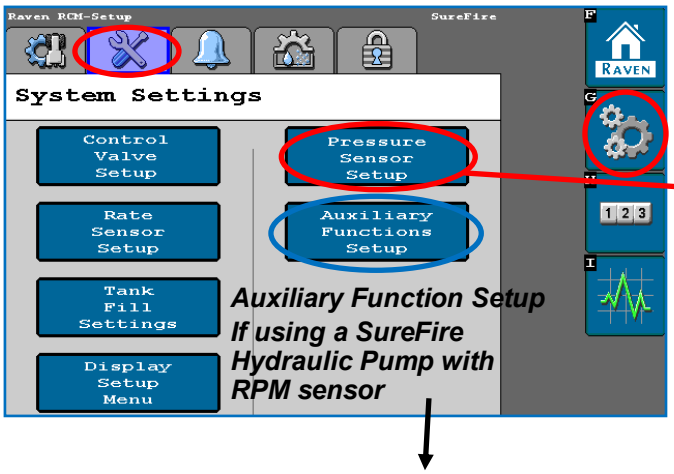
14. Set **Off-Rate Alarm** as desired.



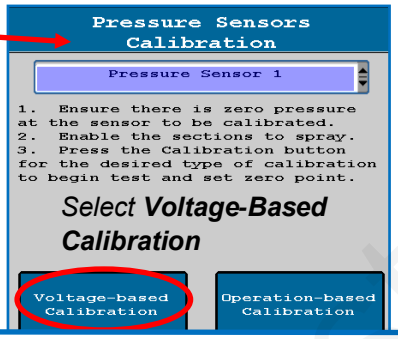
Set up Product 2 in a similar fashion to the Product 1 setup.

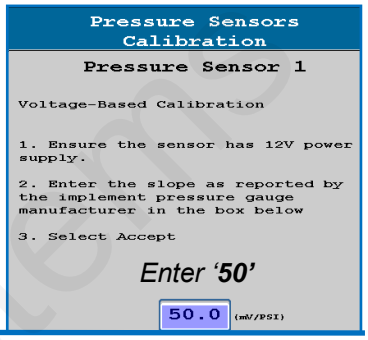
Read the Raven RCM Operation Manual for safety information and additional setup/operating information.

15. Pressure Sensors must be calibrated. See the boxes below for the procedure. Enter **50.0 mv/PSI** for SureFire 0-100 PSI sensor. *If you have 2 sensors, both must be calibrated. Be sure there is no pressure against the sensor when calibrating. Unplug the sensor during the calibration process. More on Pressure Sensor Diagnostics later.*

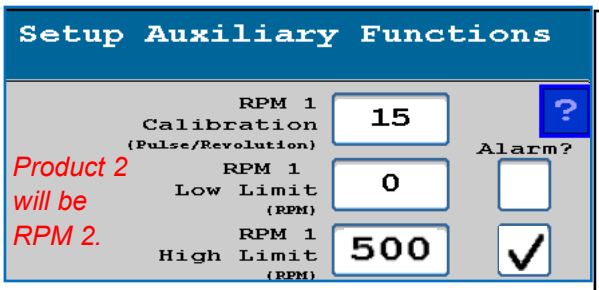


SureFire recommends putting the Pressure Sensor reading in your **Display Settings** on the Run Screen (see next page). For complete information on how the sensor is operating, go to **Diagnostics > System Information > Pressure Sensors.** 0 Pressure Voltage should be 0.00 V.





16. If using a Pump RPM sensor on a SureFire PumpRight Hydraulic Pump

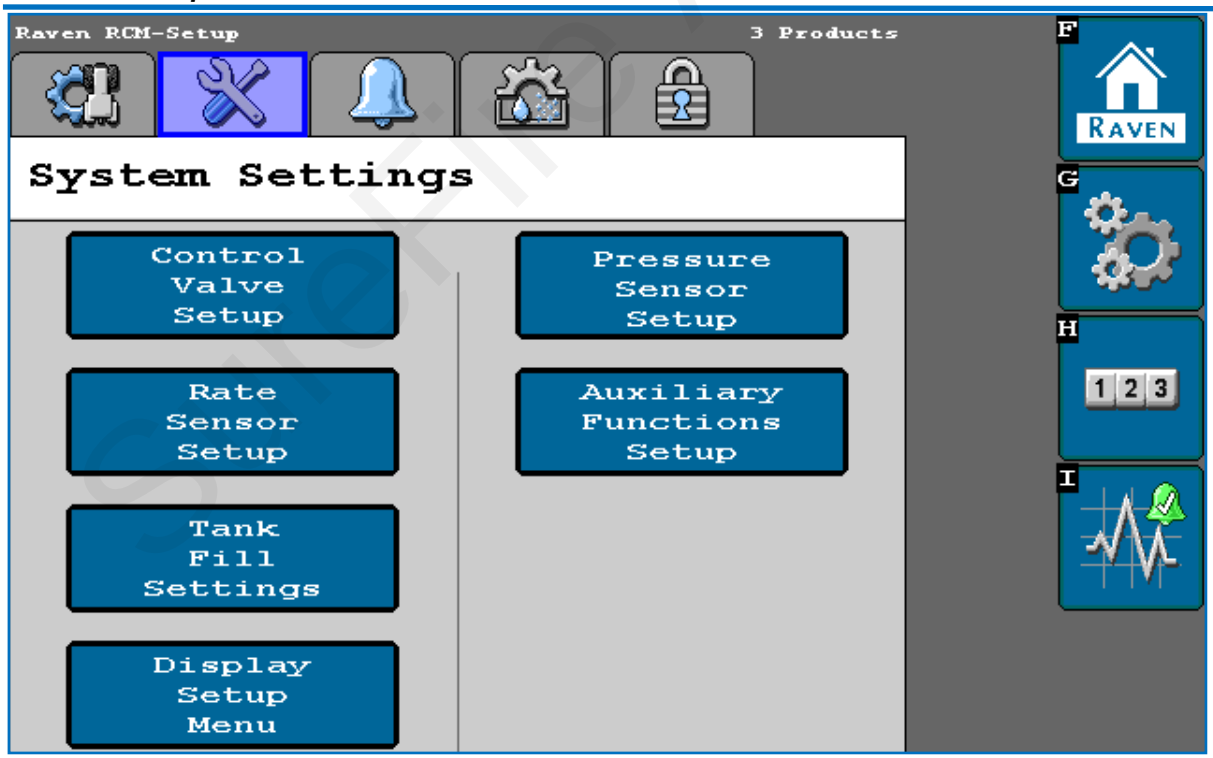


(The SureFire hydraulic pump with an RPM Sensor is 15 pulses/rev as shown above.

This QuickStart sheet does not cover every possible setup. Your setup may be different. See the Raven RCM Operation Manual for safety information and complete setup and operating instructions.

SureFire harnesses for the Raven RCM are designed for specific operating setups. Pinouts on the Raven RCM change depending on the Profile Setup and the number of products. See the wiring harness diagram for your harness.

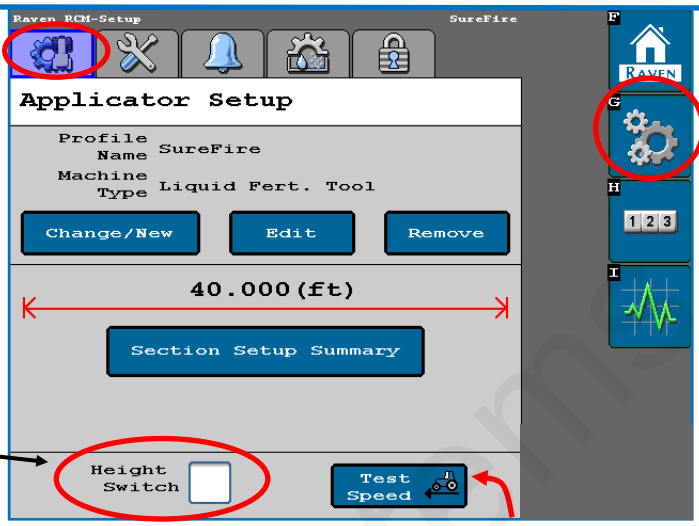
More information is available at www.surefireag.com/support.



Read the Raven RCM Operation Manual for safety information and additional setup/operating information.

Implement Height Indicator Setup

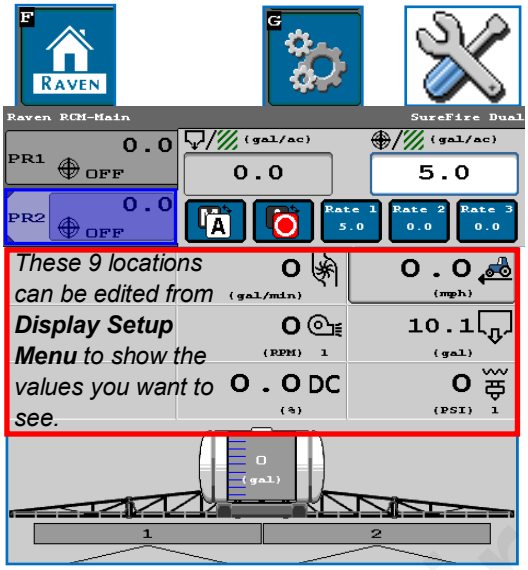
Setup **Applicator Setup**

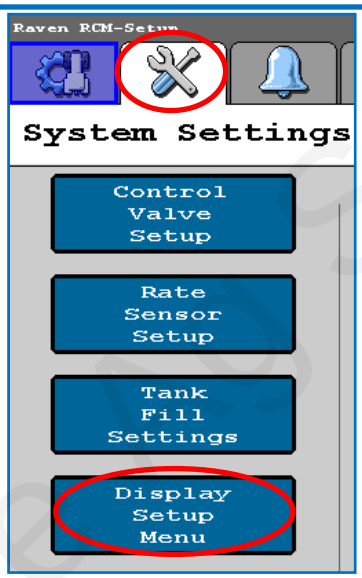


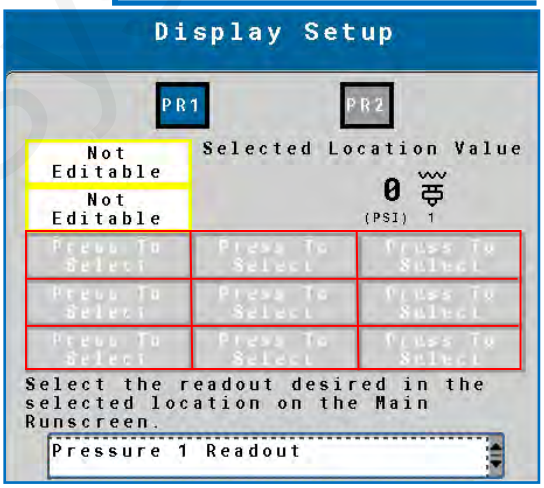
Check the **Height Switch** box if you are using a Mercury Switch or Finger Style Switch for Implement Height Indication.

Test Speed will be used later when testing the system.

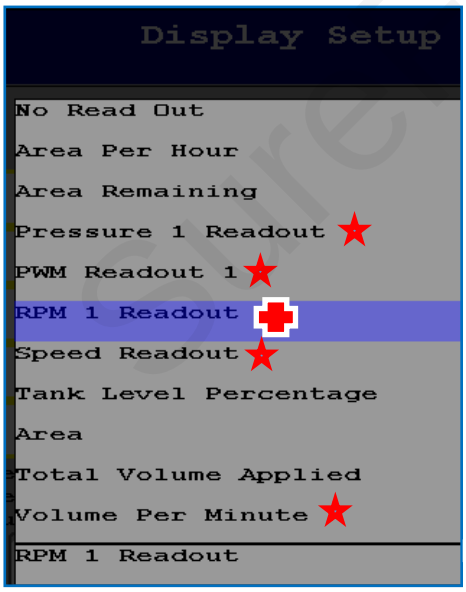
Run Screen Display Setup







Display Setup Menu



Control Valve Setup Menu

- Valve Response Rate
- Control Deadband
- PWM Setup (Coil Frequency, High Limit, Low Limit, PWM Standby)

Auxiliary Features Setup Menu

- RPM Calibration Pulse/Rev
- RPM Low Limit
- RPM High Limit
- RPM Sensor Assignment

★ *Recommended for all systems*

✚ *Recommended for hydraulic pump systems with Pump RPM sensor*

Navigation

Main

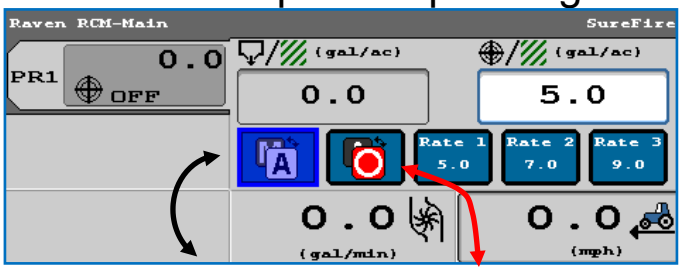
Setup

Totals

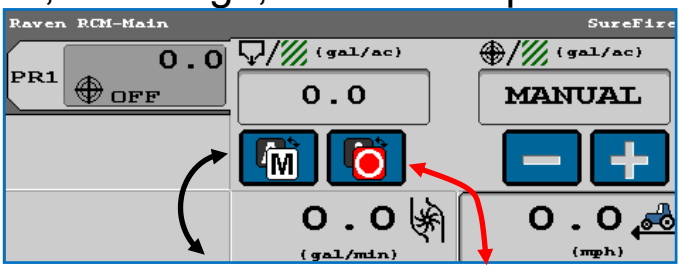
Diagnostics

Read the Raven RCM Operation Manual for safety information and additional setup/operating information.

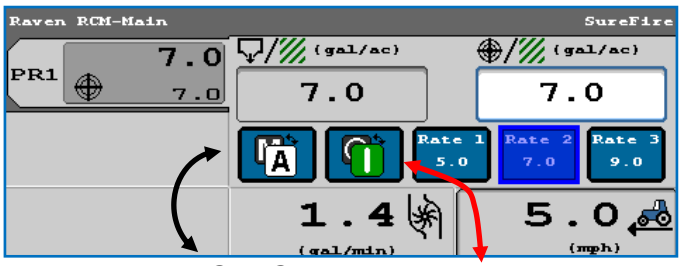
Advanced Setup and Operating Information, Run Page, Initial Startup



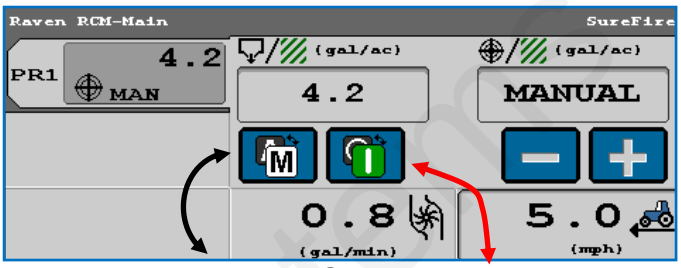
AUTO MODE / DISABLED



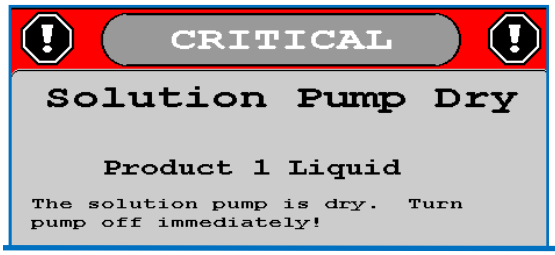
MANUAL MODE / DISABLED



AUTO MODE / ENABLED



MANUAL MODE / ENABLED



If flow or pressure is not immediately detected, the **Solution Pump Dry** warning will come up and the system will shut down.

***Solution Pump Dry** is NOT a problem for SureFire electric pumps or for SureFire PumpRight hydraulic diaphragm pumps. It is a problem for centrifugal pumps.*

Initial Operation in MANUAL mode: (See Optional Manual Pump Operation below)

1. *Fill the system with water. For first time startup, open air bleed valve until a steady stream comes out.*
2. *Enter a **Test Speed** by pressing on the **Speed (mph)** window or at **Setup > Applicator Setup**.*
3. *Navigate to **MANUAL MODE** as shown above (toggle between Auto and Manual with the Auto/Manual button).*
4. **ENABLE** system (toggle between Enable / Disable with the Enable / Disable button).
5. *Height switch must be DOWN (or uncheck Height Switch box).*
6. *Turn on **Master Switch**. Press and hold + to increase flow.*
7. *Monitor Flow (gal/min), PSI, DC, Pump RPM (if using Hydraulic pump with RPM sensor).*
8. *Go to **Switch Box**. Turn Sections OFF and ON.*
9. Turn Master Switch OFF.

OPTIONAL MANUAL PUMP OPERATION:

Go to Diagnostics > Tests > Calibrate PWM LIMITS. Here you can manually run the pump without the system shutting down if it doesn't read flow immediately. Turn on Master Switch, Start the test, hold + button to increase pump speed.

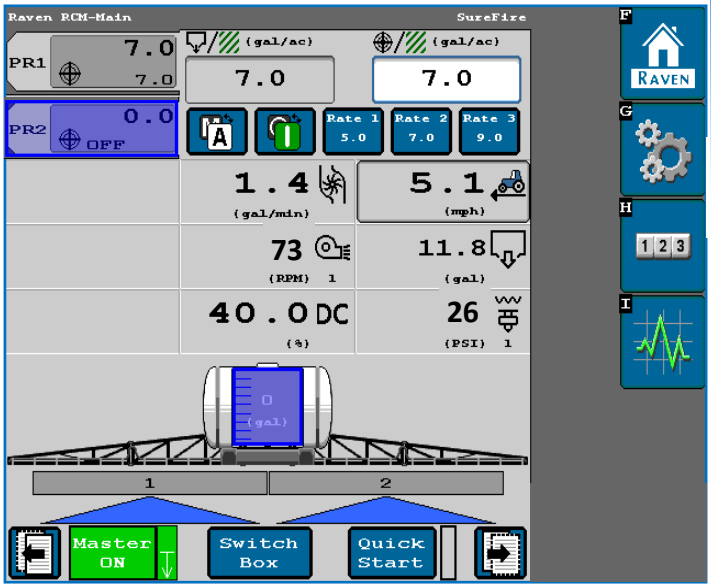
Initial Operation in AUTO mode: (Could also do Nozzle Flow Check).

1. *Enter a **Test Speed** by pressing on the **Speed (mph)** window or at **Setup > Applicator Setup**.*
2. *Toggle system to **AUTO / ENABLED.** Select a Rate.*
3. *Height switch must be DOWN (or uncheck Height Switch box).*
4. *Turn on **Master Switch**.*
5. *Monitor Actual Rate (gal/ac), Flow (gal/min), PSI, DC, Pump RPM.*
6. *Go to **Switch Box** (above). Turn Sections OFF and ON.*
7. *Turn Master Switch OFF. (NOTE: Pressure will be much less with water than with heavier, thicker fertilizer.)*

When testing with water, there may not be enough pressure to open all the check valves, so all of the rows may not be flowing.

Read the Raven RCM Operator's Manual for safety information and additional setup/operating information.

Main Screen / Run Page



Diagnostics

Diagnostics > *System Information* Menu

- Hardware / Software
- Switchbox
- Delivery System
- Section Status
- System Voltages
- Working Parameters
- Switches / Status
- Pressure Sensors
- Bin Level Sensors
- RPM Sensors
- Tank Fill Monitor

Diagnostics > *Tests* Menu

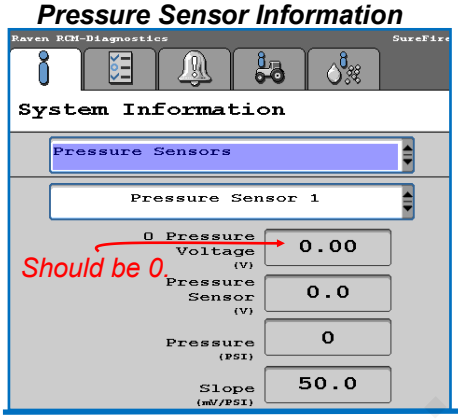
- Nozzle Flow Check
- Rinse Cycle
- Control / Section Test
- Calibrate PWM Limits

System Summary

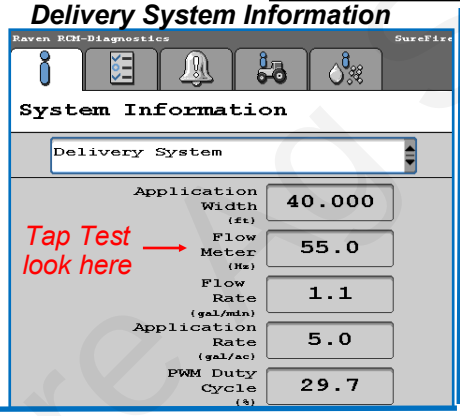
Product Summary

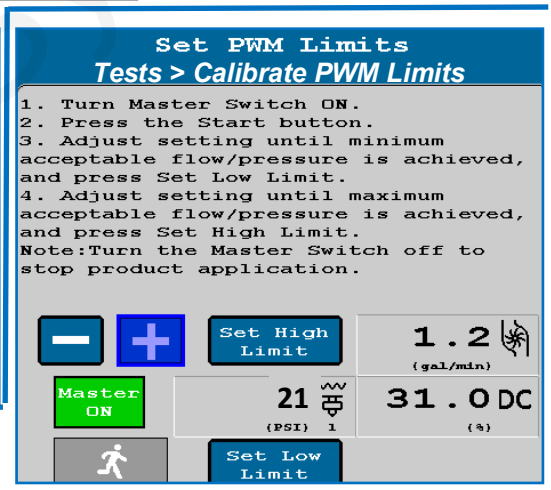
Frequently Used System Information Screens

Pressure Sensor Information

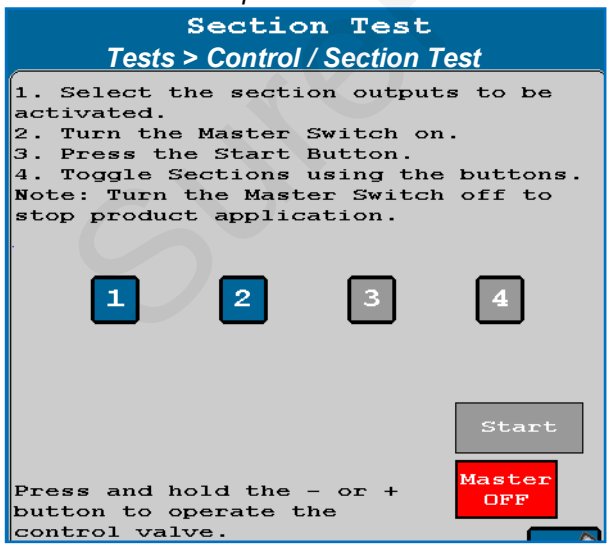


Delivery System Information

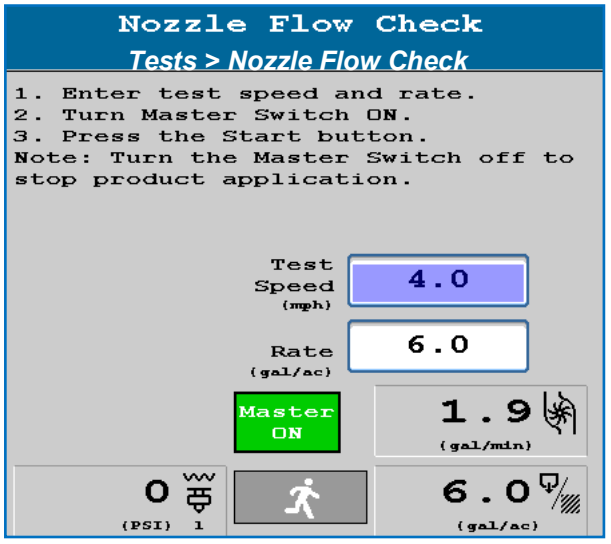




These tests can be run at initial system startup or for troubleshooting. Similar tests can also be run from the Run Page using Manual and Auto Mode with a Test Speed.



When testing with water, the system pressure will be much less than it will be with a fertilizer product. There may not be enough pressure to open all the check valves, so some rows may not flow.



Read the Raven RCM Operator's Manual for safety information and additional setup/operating information.

TROUBLESHOOTING TIPS:

1. Pump Won't Run—Start the Calibrate PWM Limits Test. Press (+) to run the PWM Duty Cycle (DC) to 100%. With a voltmeter check voltage at the 2-pin PWM connector at the EPD or hydraulic valve solenoid. You should have 12-13 volts. If there is voltage here, but the pump won't run, check the pump using the following tests:

Electric Pump—Start Calibrate PWM Limits Test to open Section Valves. Unplug the two big connectors that plug into the black EPD module on the pump tower. Plug these together. This will take power from the battery directly to the pump(s). The pump(s) should run full speed.

Hydraulic Pump—On the hydraulic valve block, pop up the Manual Override button (red knob on top of solenoid). If unit has been in the field, you may need to loosen the dirt to move the knob. In cab, turn hydraulic flow to very low. Start Calibrate PWM Limits Test to open Section Valves. Engage hydraulics. Pump should begin turning. Slowly increase hydraulic flow to speed up pump.

2. Pump runs and liquid flows, but display is not reading flow. Unplug the flowmeter. With a voltmeter, check for 12 volts between pins 1 (black) and 2 (red) of the connector that plugs into the flowmeter. (You may have to remove the red keeper to get access to the pins with your voltmeter. Be careful not to break the sides of the red keeper.) You should also have 4-5 volts between pins 1 (black) and 3 (red).

If the voltage is OK, conduct a tap test. Have one person on the display go to Diagnostics > System Information > Delivery System, watching Flow Meter (Hz). The second person will tap repeatedly between pins 1 and 3 on the flowmeter connector with a bent paper clip or short piece of wire. As the person taps, the display should show some numbers on Flow Meter (Hz).

If the voltages are good, and the tap test shows on the display, but the system does not read flow when liquid is flowing, the flowmeter is not working.

3. PWM Startup—For best startup performance, set the PWM Startup at or slightly above the DC% that the system will be running at in the field.

For more information, see the SureFire Manual for your Raven RCM system at www.surefireag.com/support.

Read the Raven RCM Operator's Manual for safety information and additional setup/operating information.

Using the Quick Start button:

Use the Quick Start button to get the system primed and ready to apply when entering a field or starting in a field corner. Turn on the Master Switch, push Quick Start, the system will begin applying as if the Speed is 3 mph. Start driving. The Auto Rate Control will take over when the speed reaches the Minimum Application speed. Quick Start runs for 15 seconds. For additional time, push Quick Start again.

Virtual Terminal (VT), Universal Terminal (UT), and Task Controller (TC)

VT or UT software allows the display to show the ISOBUS Implement (the Raven RCM) on the display screen. This usually comes with the display, but be sure the software is installed if the display has not previously been used as a Virtual Terminal.

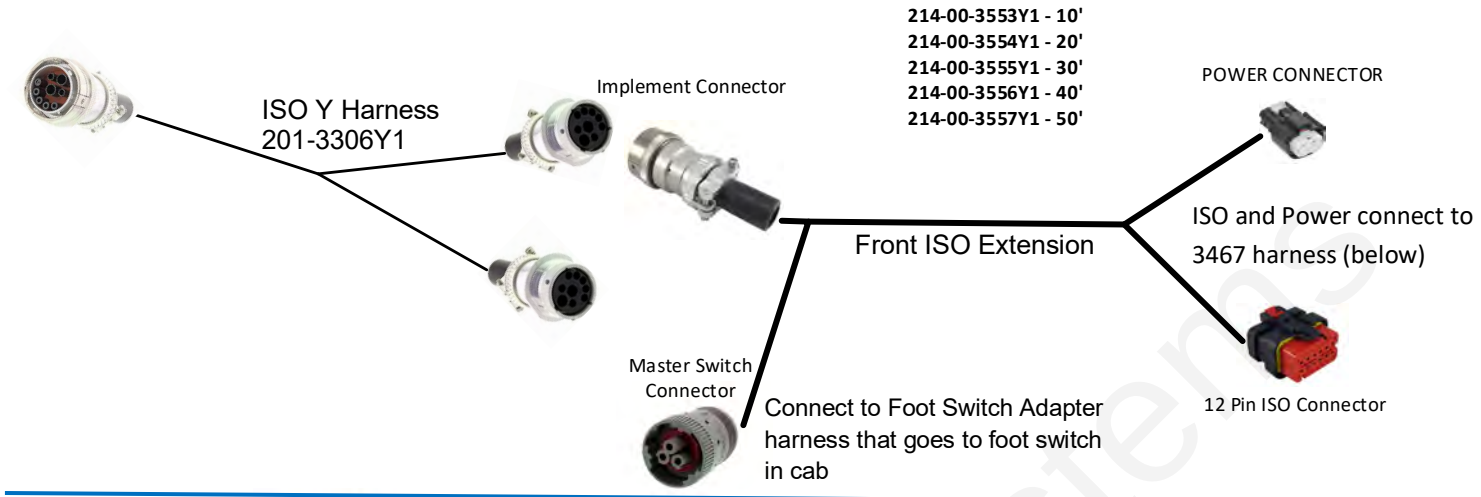
Task Controller software is necessary to do Section Control, Variable Rate Application using prescriptions, and/or As-Applied Mapping. Task Controller is typically purchased from the display manufacturer as an Unlock.

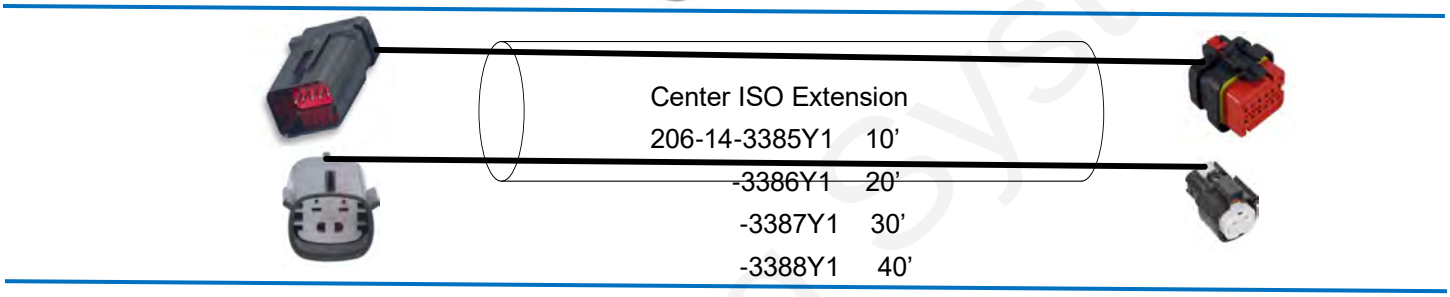
See the Task Controller documentation from your display manufacturer for more information on setup and operation.

⚠ WARNING The operator is responsible for knowing and understanding the safe operation of this equipment. Systems with hydraulic equipment require additional safety precautions to prevent serious injury and/or death. See the full SureFire Manual and the *Raven RCM Operator's Manual* for important safety information and setup and operating instructions. See www.surefireag.com/support for the SureFIre manual.

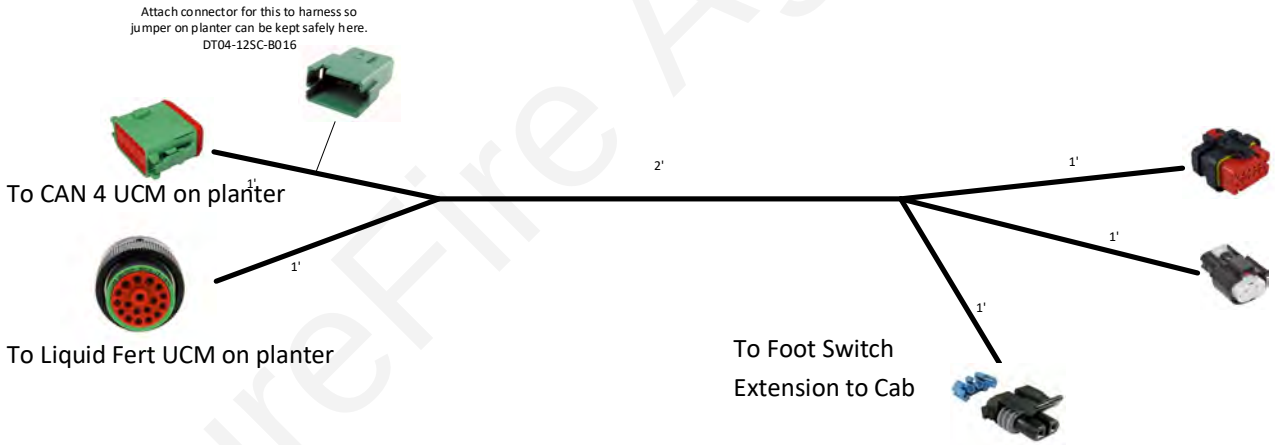
Harness Layout Below and on the next page are the harnesses in a typical setup. Your layout may vary.

A layout could begin with a Center ISO Extension if there is a connection for that on the implement.





Harness Option for Case 2000 Series Planter to Raven RCM 213-05-3873Y1



Plugging in the Raven RCM:

1. Plug the 35-pin and 23-pin connectors from the SureFire adapter harness (213-00-3467Y2) into the RCM.
2. Plug the 12-pin ISO and 2-pin Power connector on the long leads of the 213-00-3467Y2 harness into the ISO and Power connectors shown above. Plug in an ISO terminator to the short ISO lead, or connect next ISO module.
3. The RCM must have a foot switch in the cab. Make the necessary connections to connect the foot switch.
4. Plug in the Implement Height Switch if it is being used.
5. Plug in the final Product and Section harnesses.

213-00-3467Y_ 2-product harness

PRODUCT 2
12 pin Deutsch Female
DT06-12SA

Imp Height Switch
WP TOWER 3-PIN

PRODUCT 1
12 pin Deutsch Female
DT06-12SA

25A

15A

15A

POWER CONNECTOR
Molex MX (Female), 2 PIN
Part# 19432-0014

SECTIONS 7-12
14 pin Deutsch
HDP24-18-14PE

SECTIONS 1-6
14 pin Deutsch
HDP24-18-14PE

12 Pin ISO Connector
Ampseal 16 (Female)
12 Pin, Part# 776437-1

Pressure

POWER CONNECTOR
Molex MX (Male), 2 PIN
Part# 19433-0014

12 Pin ISO Connector
Ampseal 16 (Male)
12 Pin, Part# 776438-1

Flowmeter

207-3462Y2 Final Product Cable

12-pin Deutsch connector plugs into one of the Product connectors above.

Final product cable for Tower electric pump system could be 207-3461Y1.

Pump

PWM

+12V DC	1	RED
GND	2	BLK
Flow Signal	3	BLU
Pressure	4	PUR
PWM (+)	5	YEL
PWM (-)	6	
Fill Flow	7	DRK BLU
Pump RPM	8	ORG
Bin Level	9	
Open	10	
Section 1	11	
Section 2	12	

Fill Flowmeter

Pump RPM