

QSG RAVEN RCM 2 PRODUCT *AgXcel Quick Start Setup*



PLEASE NOTE: YOUR SETUP MAY VARY!

The screenshots in this guide represent a typical AgXcel Liquid Fertilizer System setup. See your equipment operator's manual for safety information and additional setup and operating information. Please ensure you have the latest firmware installed!

Applicator Setup Screen

1. Navigate to the Applicator Setup Screen



For the initial setup, start a new profile. The Raven LRC allows you to store 8 profiles.

2. Name Profile

Press Change/New & enter
Profile Name, Machine Type,
Application Width

For dual product applications, your Machine
Type needs to be Generic

3. Enter the number of ECU's you will be using and number of products

4. Select LIQUID for Product 1 & Product 2

SECTION SETUPS

5. Setup Section Groups

When using section valves for both products, ensure you select NO for Shared Section Groups

Setup Section Groups

Are section drivers shared between all products in product harness? ?

Yes 60.00ft **No** 60.00ft

Product 1 Sections

15.00	15.00	15.00	15.00
1	2	3	4

Product 2 Sections

15.00	15.00	15.00	15.00
1	2	3	4

Yes RAVEN

Ensure that the Starting Section Number for Product 1 is 1 and Product 2 is 9. Then enter the number of sections per product. If the number of rows per section is equal, then check the Equal Section Widths box.

Setup Section Harnessing

Section Group	Starting Section Number	Number Of Sections	Equal Section Widths
1	1	3	☒
2	9	3	☒

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Enter 2 for Number of Section Groups. This means that there are two products that will be using section valves.

Enter how many sections you have and ensure the "Master Clutch" in unchecked.

Setup Sections

Number of Sections 3 ?

Equal Width Sections ☒

Master Clutch ☐

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If the section widths are entered automatically, ensure the correct distance is entered per section.

Setup Section Width

Enter the width of the sections

1* 6.667 (ft)

2* 6.667 (ft)

3* 6.667 (ft)

9* 6.667 (ft)

10* 6.667 (ft)

11* 6.667 (ft)

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PRESSURE SECTION SETUPS

6. The AgXcel Pressure Sensor will be setup as a Custom sensor if you purchased an AgXcel Pressure Sensor. Calibration will be done later. Product 2 will be set up as Pressure Sensor 3.

The max pressure is 100
PSI for AgXcel transducers

7. If you are using an AgXcel provided height switch, you will want to select Digital NPN

CONTROL AND PWM SETUP

AgXcel does not recommend Enabling PWM Smart Control

8. Control Valve Setup (use the number indicated for your system)

Valve Response Rate: *(Adjust as needed)*

GX5 (hydraulic diaphragm)....100

GX5 (hydraulic centrifugal)....15

GX2 (electric).....100

GX12HP.....80

If the pump is slow to respond to rate changes or speed changes, increase the Valve Response Rate 10hz at a time. If the product surges around the rate, then reduce the Valve Response Rate.

9. Control Deadband: 2

For best startup performance, set the PWM Startup at or slightly above the normal operating PWM Duty Cycle (DC%). When the pump starts it will go immediately to that Duty Cycle and then will have just a minor adjustment to lock on to the Target Rate. **IF THE PUMP STARTS TOO FAST, LOWER THE PWM STARTUP.**

Average Operation:
37.1 DC%

10. Coil Frequency:

GX5 (hydraulic diaphragm)....100

GX5 (hydraulic centrifugal)....122

GX2 (electric).....100

11. PWM High Limit:

GX5 (hydraulic diaphragm)....100

GX5 (hydraulic centrifugal)....100

GX2 (electric).....100

12. Low Limit *(Adjust in field as needed)*

GX5 (hydraulic diaphragm)....20

GX5 (hydraulic centrifugal)....15

GX2 (electric).....0

13. PWM Startup *(Adjust in field as needed)*

GX5 (hydraulic diaphragm)....15

GX5 (hydraulic centrifugal)....15

GX2 (electric).....10

RATE SENSOR, TANK / FILL, RATES, & ALARM SETUP

14. Enter appropriate Flowmeter Cal number

Orion 2 Magnetic Flowmeters		Orion 3 Magnetic Flowmeters		Orion 2+ Magnetic Flowmeters	
0.08 - 1.6 GPM	22710	0.04 - 1.6 GPM (DN3)	75712	0.053 - 5.3 GPM	11355
0.13 - 2.6 GPM	22710	0.08 - 3.17 GPM (DN4)	37854	0.53 - 53 GPM	1135
0.3 - 5 GPM	11355	0.26 - 10.5 GPM (DN7)	11356	2.11 - 211 GPM	284
0.6 - 13 GPM	4542	0.52 - 21 GPM (DN10)	4245		
1.3 - 26 GPM	2271	1.45 - 58 GPM (DN17)	2063		
2.6 - 53 GPM	1135				

CAUTION: When choosing pulses/gal, be sure to choose the "gal" unit, NOT the "1 gal" unit.

15. Tank & Fill Setup

Enter your tank information and when you want a notification when your tank level is low

16. Set Rates & Rate Smoothing

Rate bump will be the value at which the target GPA rate is adjusted when manually changing rates in the field.

Check the Decimal Shift box to enter rates with one more decimal point (such as 0.25 GPA).

17. Set Off Rate Alarm as desired

Set the desired off rate percentage at which the liquid controller will alarm you if you are off of your target rate. 20% is default and recommended.

The Minimum Flow Rate box will not be present if a pressure sensor has been assigned to this product. **Keep Minimum Flow Rate at 0.**

NOW REPEAT THE SAME SETUP INSTRUCTIONS FOR PRODUCT 2

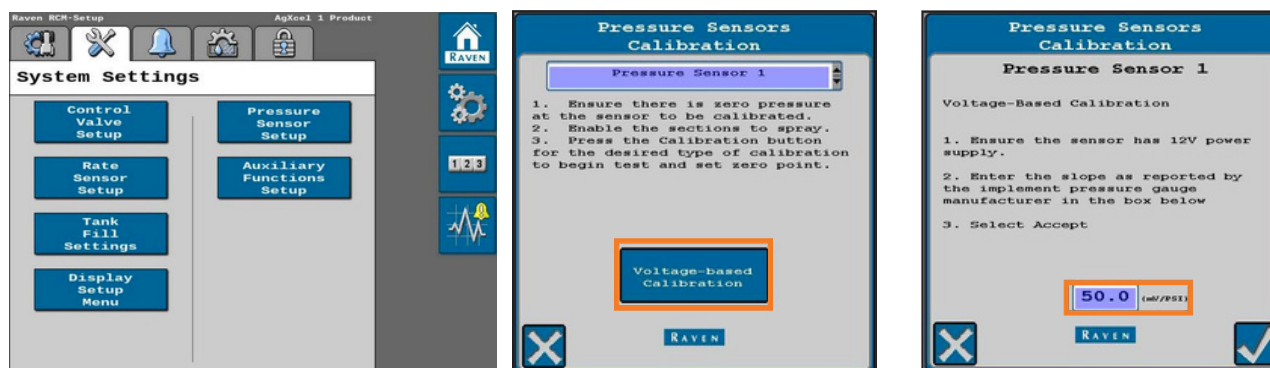
PRESSURE SENSOR / ADVANCED TUNING SETUP

18. Pressure Sensor

When using an AgXcel pressure sensor, the steps must be performed below. AgXcel uses a 0 - 100 PSI pressure transducer and a calibration number of **50.0 mv/PSI** is to be used. To ensure that the sensor is properly calibrated, please make sure that the M12 connector with a **GREEN** lit LED is **DISCONNECTED** from the sensor, this will ensure that the sensor does not detect any pressure in the system. 0 Pressure = 0.00 V.

For complete information on how the **Sensor** is operating, go to:

Diagnostics > Readings > Pressure Sensors. 0 Pressure Voltage should be 0.00 V .



19. Advance Tuning

Many times the Control Valve Settings need to be adjusted further to ensure proper function. Therefore, additional fine tuning using the Raven LRC under the Advance Tuning section is required. For the AgXcel GX2 or GX5 systems, the PIDS values must be modified. For more in-depth details of this feature press the ? button.

Only change these settings if you notice that your pump system is always surging above and below your target rate.

Default Settings are:

P = 50 D = 50

I = 20 S = 50

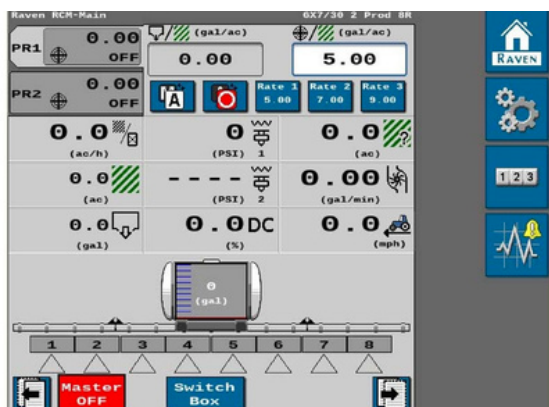
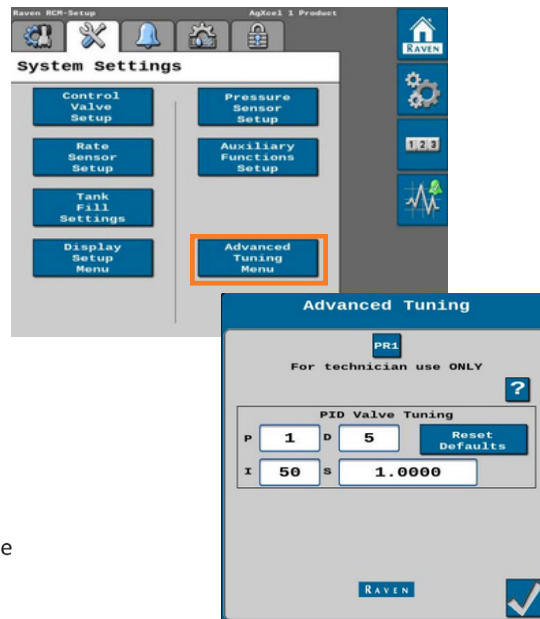
PID Valve Tuning for AgXcel GX2 & GX5 Electric System:

Set P = 1 D = 5

Set I = 50 S = 1

Setting P = 100 and S = 100 will ensure the quickest response from the AgXcel GX2 Electric System

Press and HOLD the SETTINGS tab for about 10 seconds until the Advanced Tuning button displays



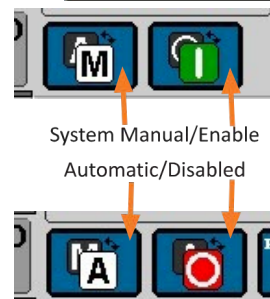
Ensure that you have these options selected:

Volume Per Minute

Speed Layout

Task Area

Pressure Readout (if you have a Pressure Transducer)



TROUBLESHOOTING

Why am I Over-Applying?

- Ensure that your PWM Low Limit setting is lower than the current Duty Cycle. This setting can be found in your System Settings under Control Valve Setup. If your PWM Low Limit is set too high, then the liquid controller will not allow the pump to apply at a lower Duty Cycle than the set low limit.
- Ensure that your Minimum Flow Rate is set to 0. This setting can be found in your System Settings under Rate Sensor Setup.
- If you are using the GX5 Hydraulic Pump, ensure that the manual override valve is set in the close position. If the manual override is opened, then the GX5 pump will ignore the commands from your liquid controller and will only apply fluid based off of your hydraulic flow.

Why am I Under-Applying?

- Ensure that the pump system pressure is not too high, such as over 40 PSI. If your pump system pressure is too high, then you may have an obstruction in your pump or in your plumbing after the pump.
- Ensure that your disk orifice or microtube size is not too small. When the weather is colder, fertilizer can become more viscous, meaning that the pump is creating more pressure so the thicker liquid can be pushed through the same smaller size disk orifice or microtube.
- Ensure that your filter is not fully plugged or partially plugged.
- Ensure all ball valves from the tank to the pump are fully opened.
- Ensure you are not pulling in air from anywhere on the pump or before the pump. Ensure that all poly fittings have plumbers tape, all clamps are tight, all gaskets are in place, no poly fittings are cracked or damaged, all filter cups are screwed on tight and the oring is present and not damaged on the cup.
- If you are using a GX5 Hydraulic Pump, ensure you are providing enough hydraulic flow to the GX5 pump.
- Ensure that your PWM High Limit is set at 100. This setting can be found in your System Settings under Control Valve Setup. If your PWM High Limit is set too low, then the liquid controller will not allow the pump to apply at a higher Duty Cycle than the set high limit.
- If you are using the GX5 Hydraulic Pump, ensure that the manual override valve is set in the close position. If the manual override is opened, then the GX5 pump will ignore the commands from your liquid controller and will only apply fluid based off of your hydraulic flow.
- Ensure that your pressure is higher than at least 10 PSI (check valve size dependent). If you are using a 4LB check valve (blue top), then you will need a minimum of 10 PSI to open all of the check valve. If you are using a 10 PSI check valve (black top), then you will need a minimum of 20 PSI to open all of the check valves. Not creating enough pressure can cause uneven flow to each row and also potentially cause your pump system under apply.

TROUBLESHOOTING

Why is my flow rate surging?

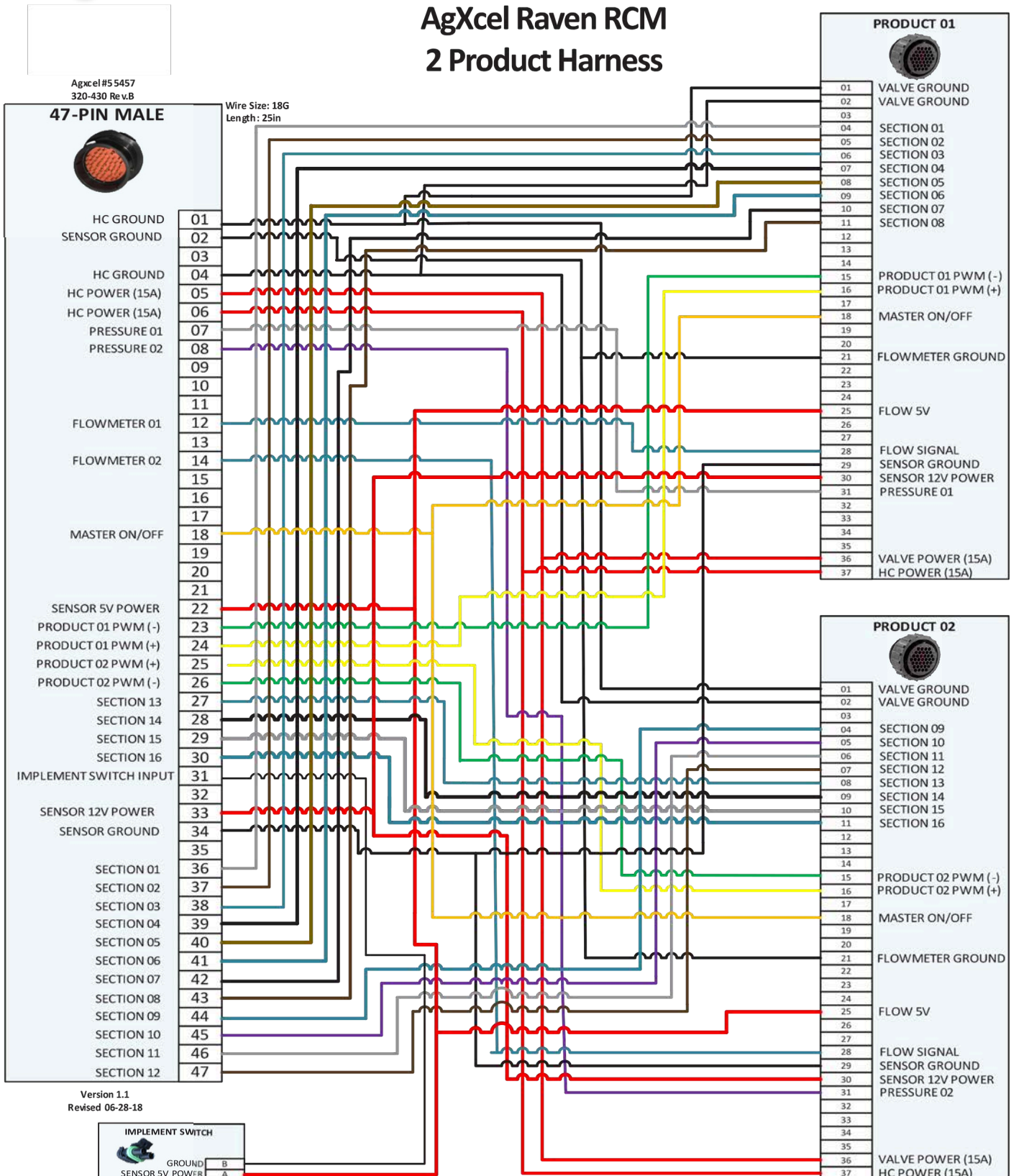
- Ensure that the Display Smoothing box is checked. This can be found in your Rates Setup tab.
- Lower your Valve Response Rate Setting. This setting can be found in your System Settings under Control Valve Setup. The higher the value of this setting is, the more aggressive the pump system will be. The more aggressive the pump system is, the more the pump can surge, but having a higher valve response rate also means that the pump is able to respond faster to changes in your flow rate. But if the valve response rate is too low, then the pump can become too slow and take too long to reach your target rate.
- Adjust your PIDS values. These settings can be found in the Advanced Tuning Menu. See page X to access the Advanced Tuning Menu. Refer to the on screen information found in the question mark button to assist with changing these values.
- Ensure that your pressure is higher than at least 10 PSI (check valve size dependent). If you are using a 4LB check valve (blue top), then you will need a minimum of 10 PSI to open all of the check valve. If you are using a 10 PSI check valve (black top), then you will need a minimum of 20 PSI to open all of the check valves. Not creating enough pressure can cause uneven flow to each row and also potentially cause your pump system under apply.

What should my system pressure be?

- AgXcel Pump Systems are not pressure based, especially when they are controlled with a Liquid Rate Controller. However, pressure can affect the performance of the pump system if the pressure is too low or too high. It is recommended to not apply under 10 PSI if you are applying fertilizer infurrow and not above 40 PSI. For a Nitrogen application, it is recommended not to apply below 20 PSI but no need to apply over 60 PSI.

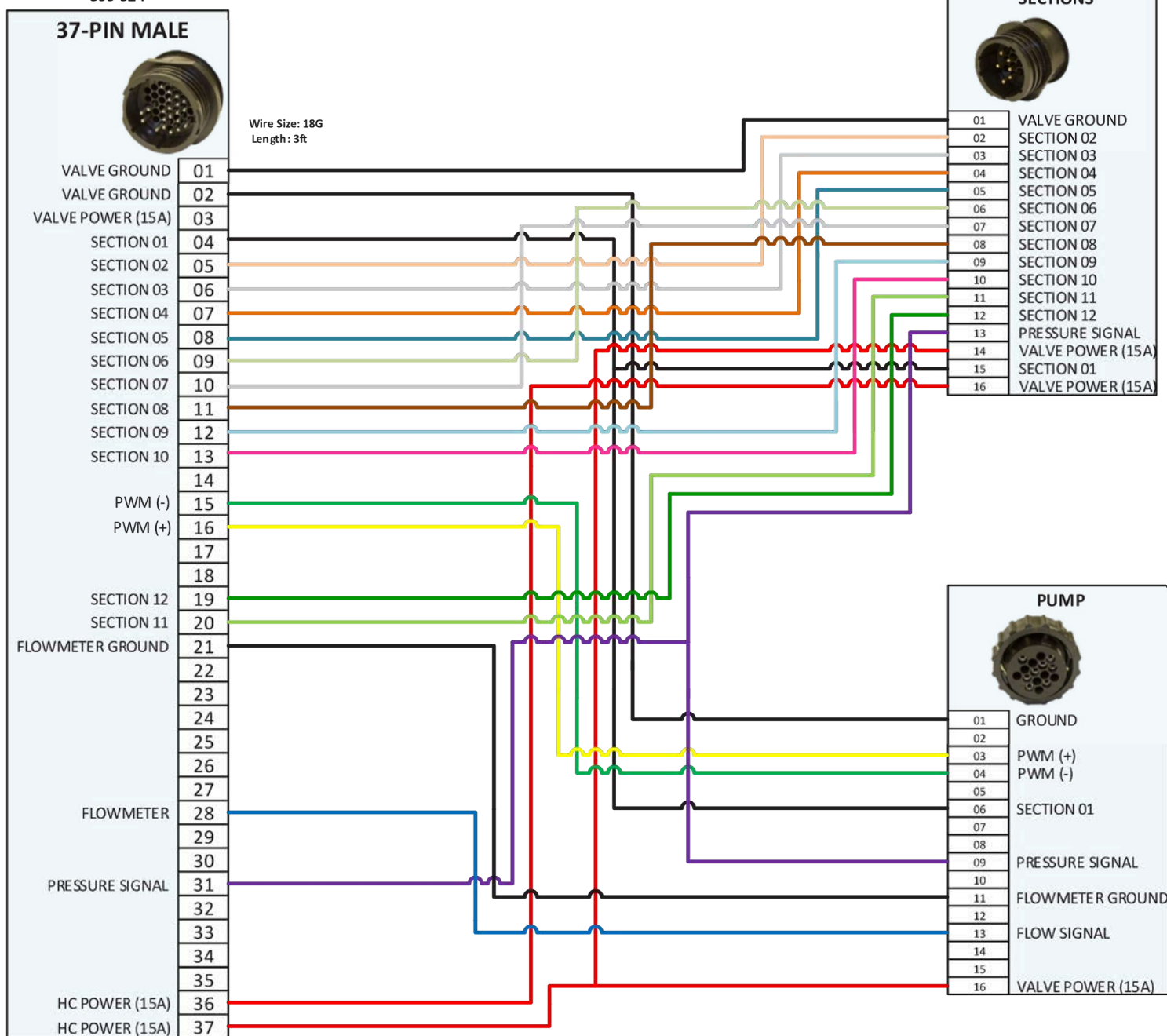
Why is my controller tells me I am applying the correct amount, but I am actually applying more/ less at the rows?

- If your flowmeter calibration number is incorrect, your liquid controller can still tell you that you are applying the correct amount of fertilizer, even though you are actually applying an incorrect amount of fertilizer. Ensure that your flowmeter calibration number is the same as what was provided on your pump system manual. This number will be located on a sticker on the manual.
- If you have the correct flowmeter calibration number entered that was provided by AgXcel, then you will need to manually change the flow calibration number. You can either preform a Catch Test Calibration which can be found in your System Settings under Rate Sensor Setup, or you can manually adjust the flow calibration number yourself. If you raise the flowmeter calibration number, then you will apply more fertilizer. If you lower the flowmeter calibration number, then you will apply less fertilizer.
 - To quickly find what your flowmeter calibration number should be, take the amount of fluid you caught at the row and divide that by the amount of fluid that you should have caught at the row. So if you over applied by 20%, then you can reduce your flowmeter calibration number by 20%. Then do another catch test to ensure you are applying at the correct rate. Or if you under applied by 20%, then you can raise your flowmeter calibration number by 20% and do a catch test to ensure you are applying at the correct rate.



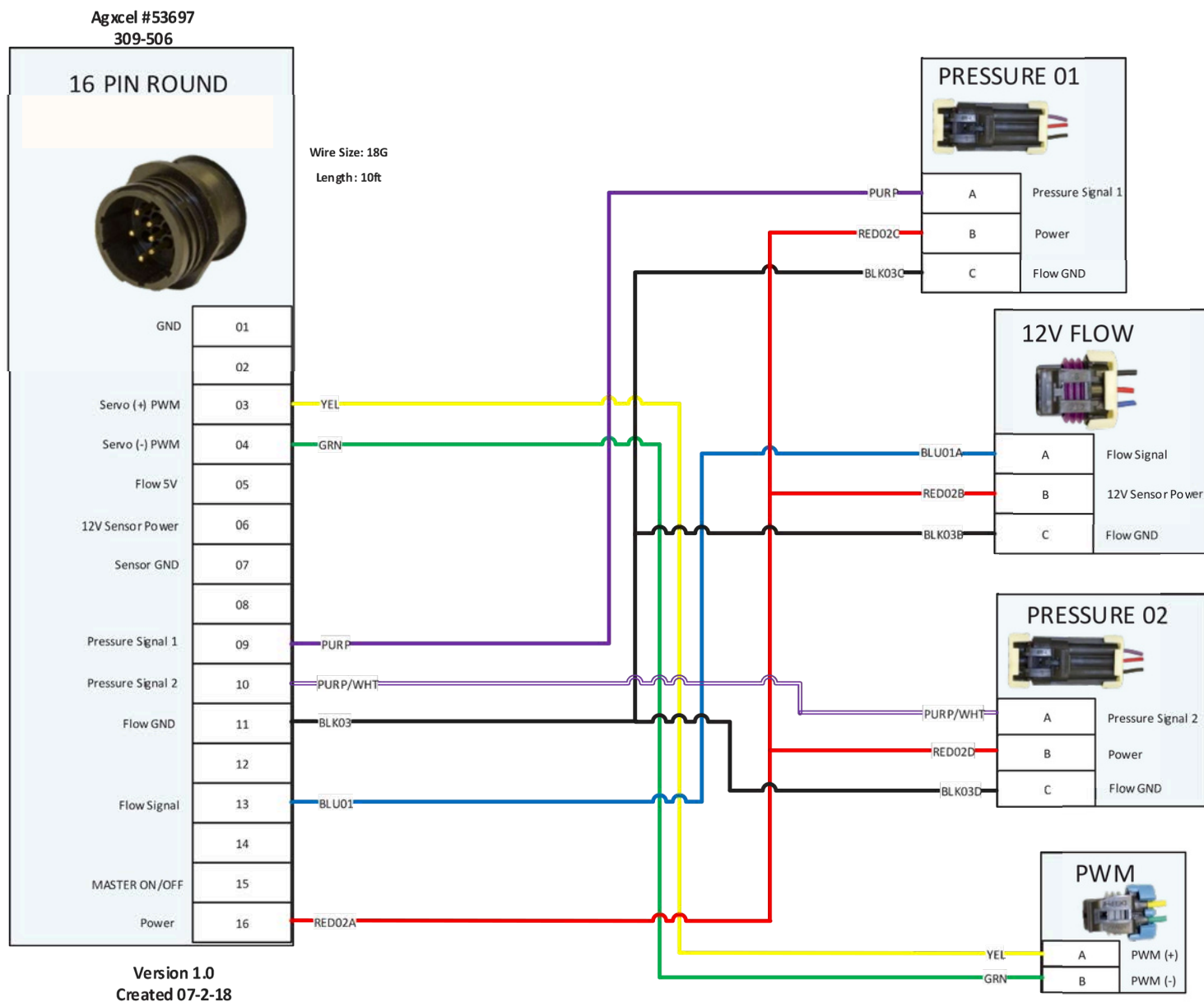
AgXcel Raven Integration Harness 37-Round Pin to Twin 16-Round Pin "Y" Connector

Agxcel #53593
309-524

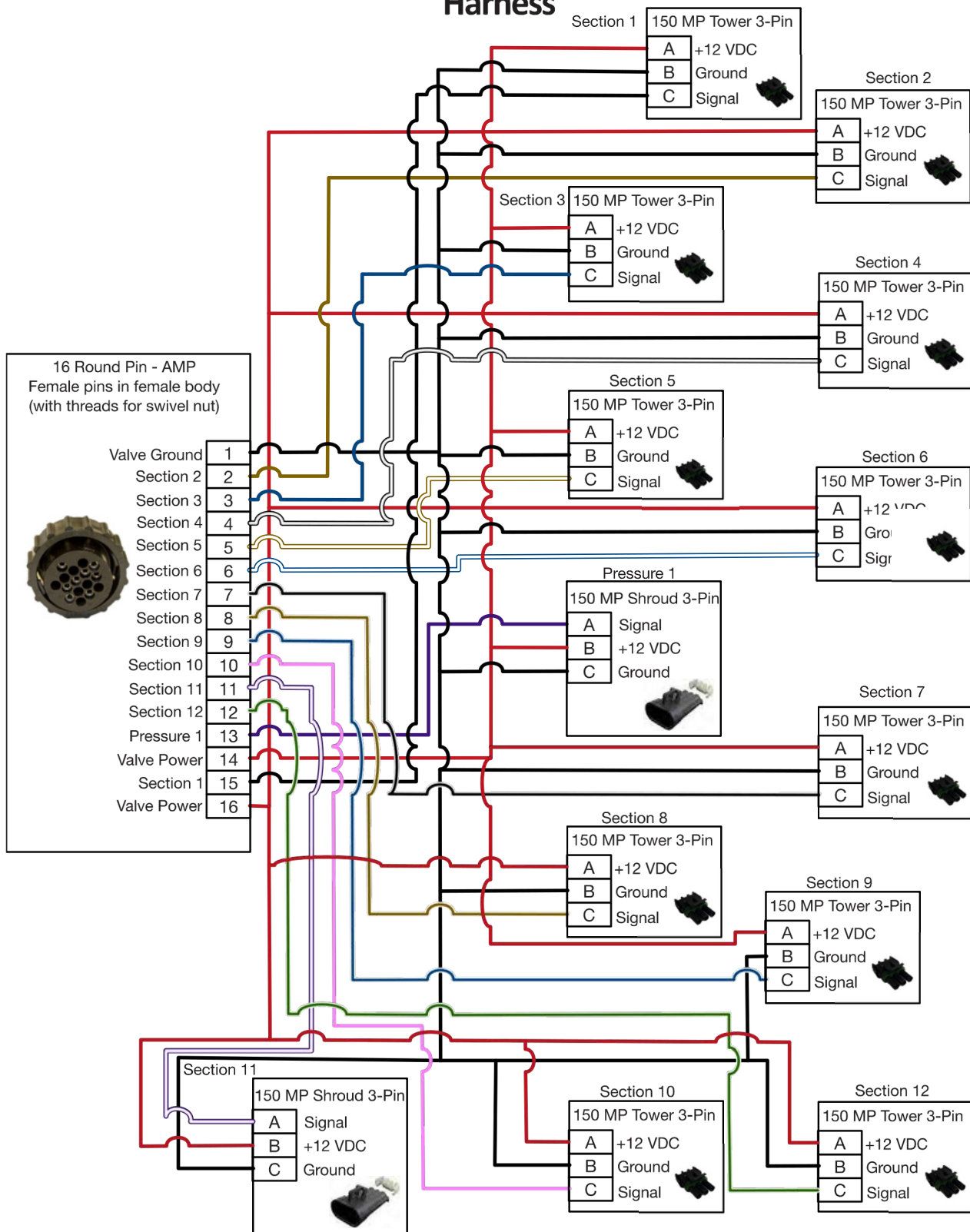


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AgXcel Channel Integration Harness (PWM, Flowmeter, Pressure)



AgXcel Section Harness





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