Precision Liquid Fertilizer Solutions

www.agxcel.com
where precision meets the soil...
877.218.1981

Quick Start Setup Instructions for Raven RCM & AgXcel Harness for 1 Liquid Product

PLEASE NOTE: Your setup may vary. These screen shots represents a typical AgXcel Liquid Fertilizer System setup. See the Raven LRC Operator's Manual for safety information and additional setup and operating information.

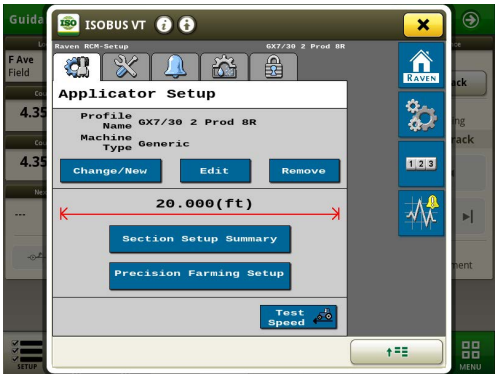
1. Navigate to the Applicator Setup Screen

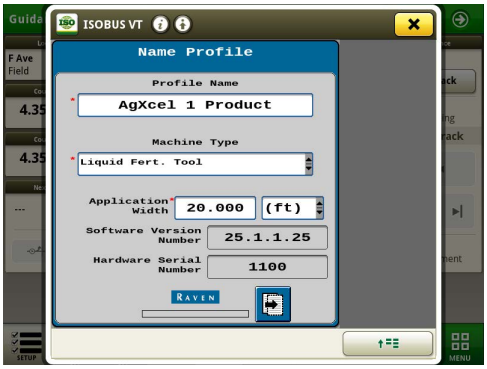
For the initial setup, start a new profile. The Raven LRC allows you to store 8 profiles.

2. Name Profile

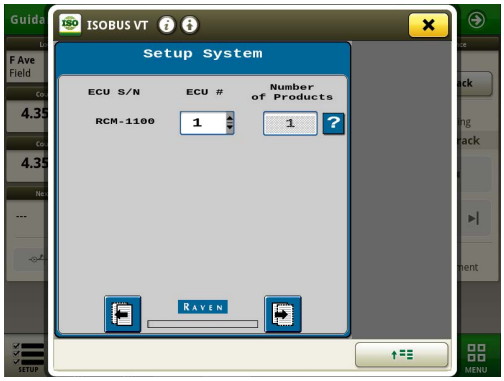
Press Change/New & enter Profile Name, Machine Type, Application Width

For single product applications, your Machine Type needs to be Liquid Fert. Tool

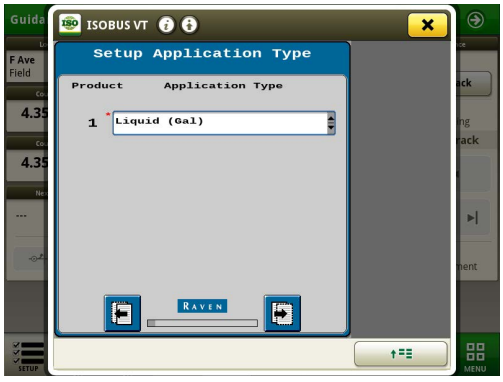


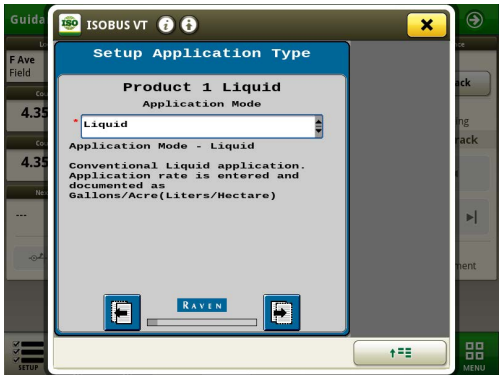


3. Enter the number of ECU's you will be using and number of products



4. Select LIQUID for Product 1





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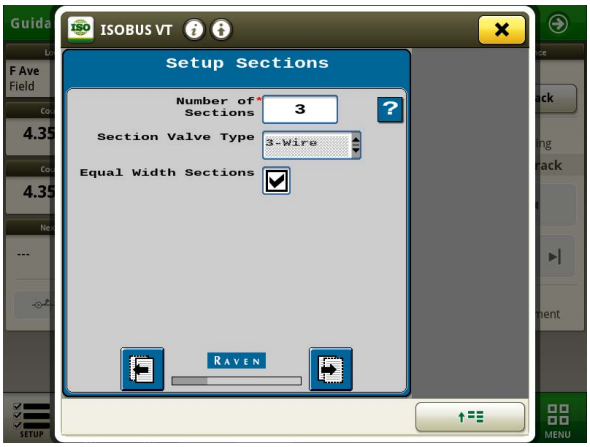
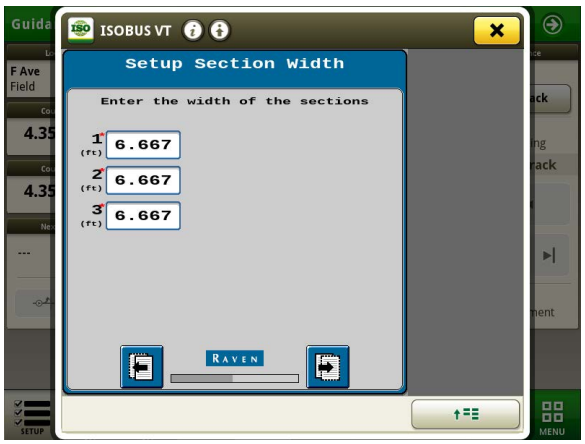
5. Setup Section Groups

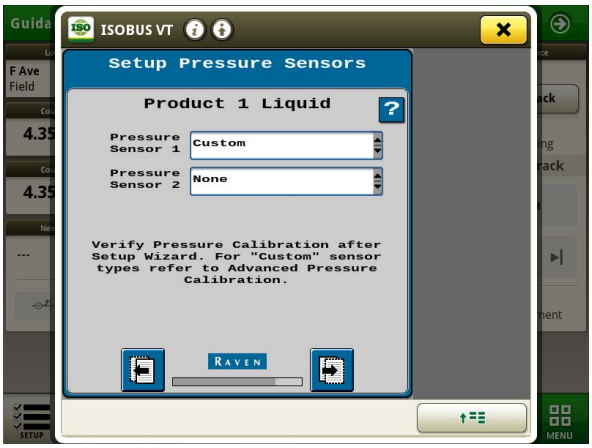
Enter how many sections you have and ensure the “Master Clutch” in unchecked.

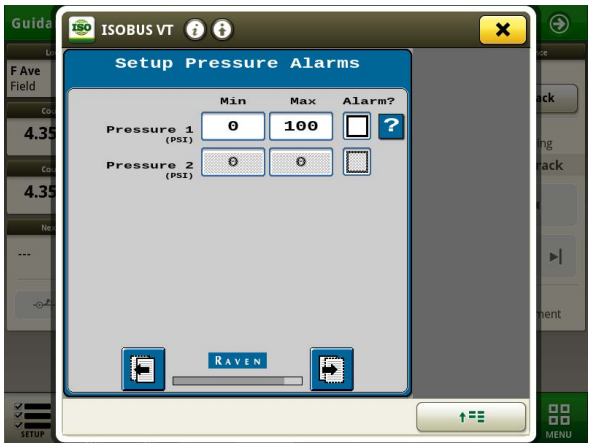


Also enter the correct width for each section



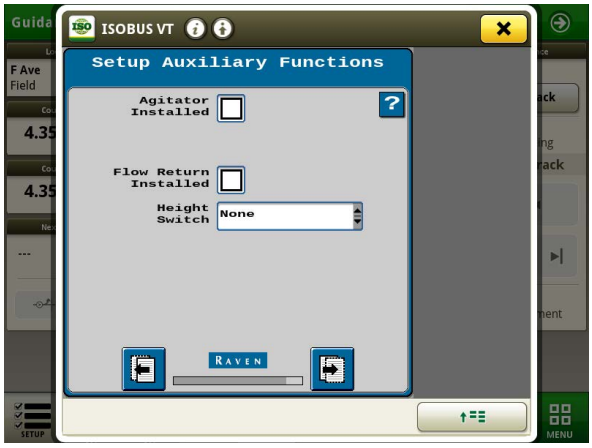
6. The AgXcel Pressure Sensor will be setup as a Custom sensor if you purchased an AgXcel Pressure Sensor. Calibration will be done later.





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



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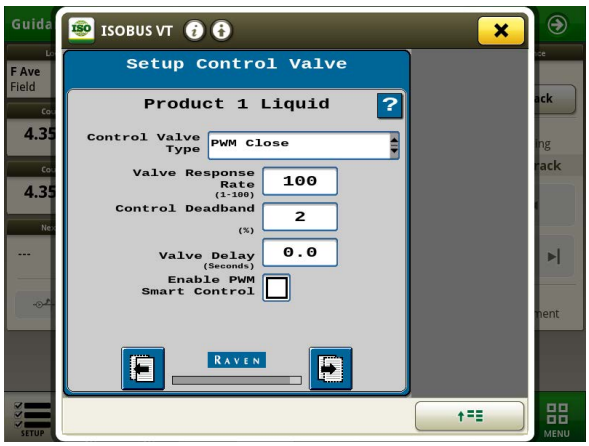


AgXcel does not recommend Enabling PWM Smart Control

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

10. Coil Frequency:

GX5 (hydraulic diaphragm)....100
GX5 (hydraulic centrifugal)....122
GX2 (electric).....100

11. PWM High Limit:

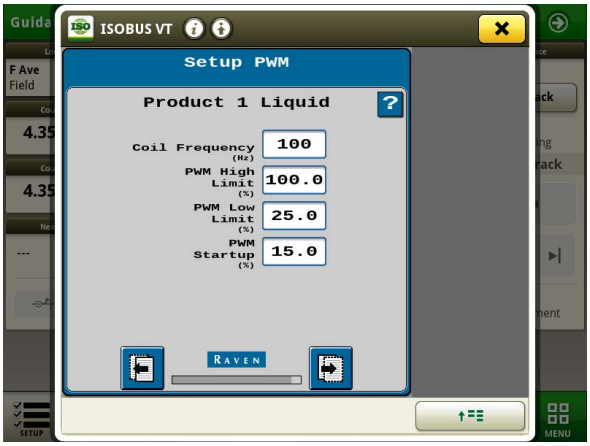
GX5 (hydraulic diaphragm)....100
GX5 (hydraulic centrifugal)....100
GX2 (electric).....100

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



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%

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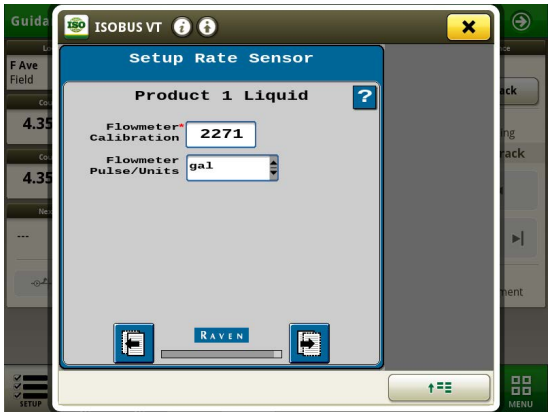
14. Enter appropriate Flowmeter Cal number



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

Orion 2 Magnetic Flowmeters

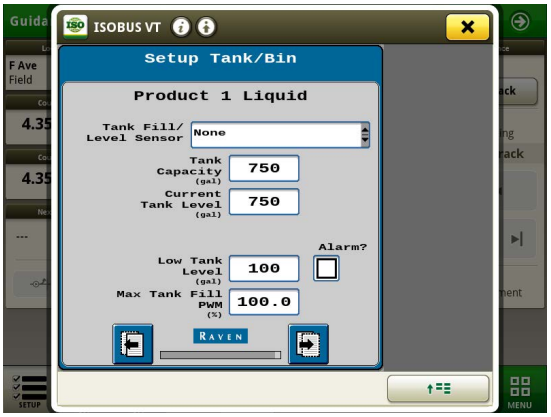
0.08 - 1.6 GPM	22710
0.13 - 2.6 GPM	22710
0.3 - 5 GPM	11355
0.6 - 13 GPM	4542
1.3 - 26 GPM	2271
2.6 - 53 GPM	1135

Orion 3 Magnetic Flowmeters

0.04 - 1.6 GPM (DN3)	75712
0.08 - 3.17 GPM (DN4)	37854
0.26 - 10.5 GPM (DN7)	11356
0.52 - 21 GPM (DN10)	4245
1.45 - 58 GPM (DN17)	2063

Check the yellow sticker on your manual packet for your flow calibration number or the side of the flowmeter

15. Tank & Fill Setup

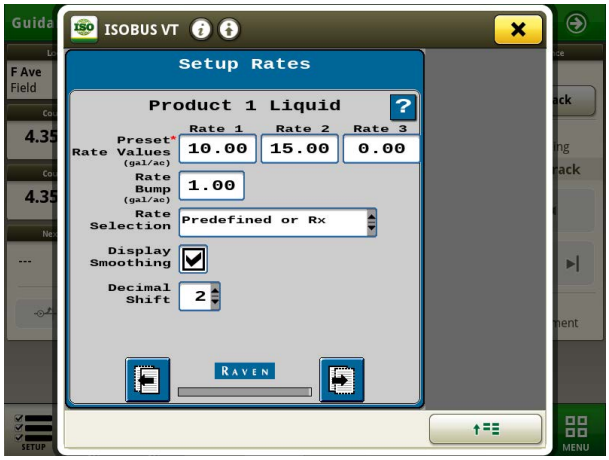


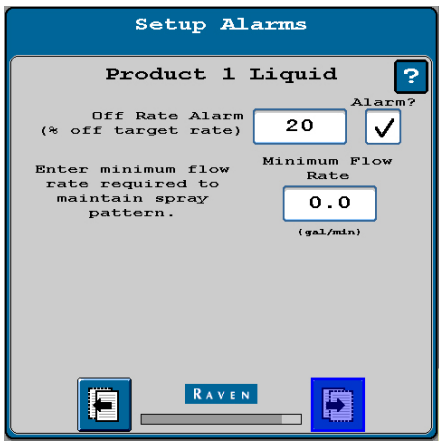
Enter your tank information and when you want a notification when your tank level is low

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.**

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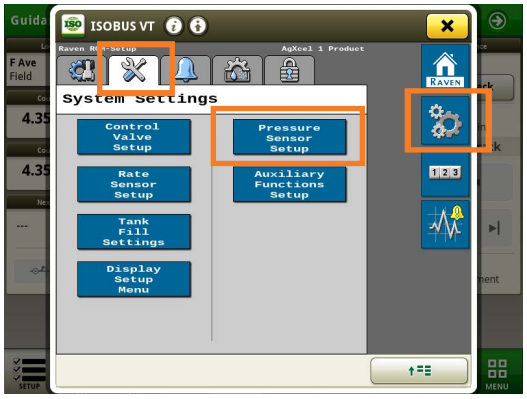
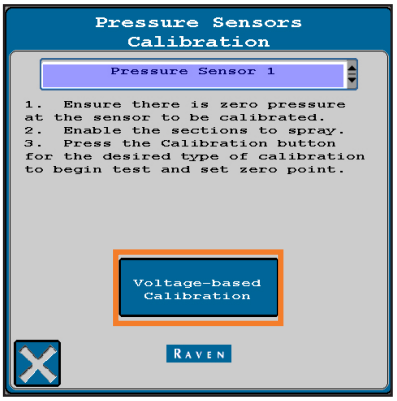
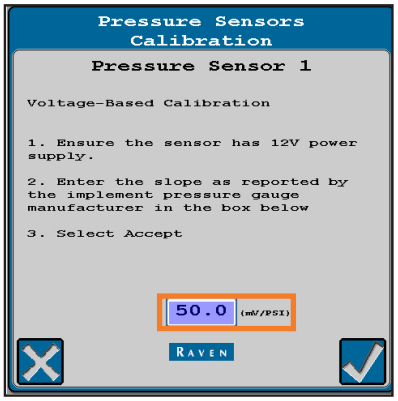
18. Pressure Sensor

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:

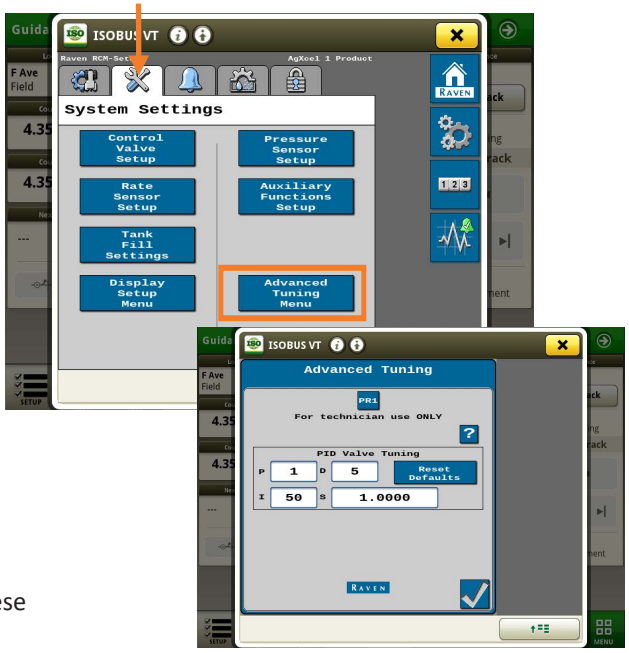
P = 50 D = 50
I = 20 S = 50

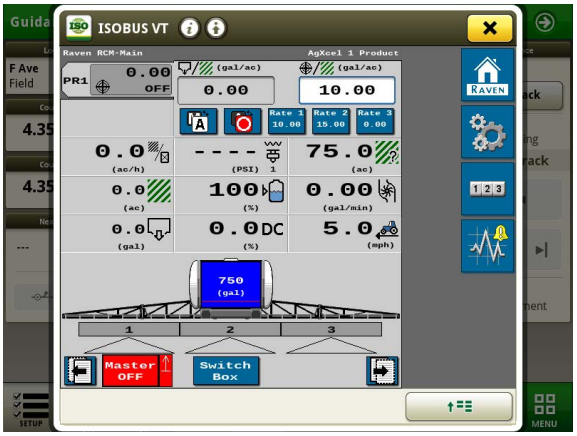
PID Valve Tunning for AgXcel GX2 & GX5 Electric System:

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





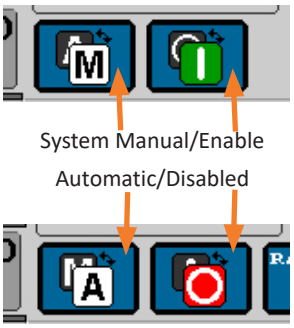
Ensure that you have these options selected:

Volume Per Minute

Speed Layout

Task Area

Pressure Readout (if you have a Pressure Transducer)



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AgXcel Liquid System Frequency Asked Questions (FAQ)

I am trying to achieve 5 GPA but my system will not go lower than 9 GPA.

• Make sure your PWM Low Limit is set to a number that is lower than your required lowest rate. This can be found in your Valve Control PWM settings on your console. If the PWM Low Limit is set too high you will not be able to achieve the lowest rate pos- sible if set other than 10. Many times setting the Low Limit to 0 will work just fine especially when running lower rates.

• With an AgXcel System always make sure your Minimum Flow rate is set to 0.0 GPM or your system will not drop below this rate. For example if the Minimum flow rate is set to 3 GPM your system will not drop below this setting so if your required GPA requires 2.1 GPM then your system will not achieve this rate given that you have set the Minimum Flow rate to 3 GPM.

• When using an AgXcel GX5 Hydraulic system, make sure the AgXcel silver hyd valve is NOT in manual over- ride. Check to ensure that the RED knob on top of the valve is pressed down by turning the knob clockwise while pressing the RED knob down. This will lock the PWM valve down so that the electronic solenoid can control the hyd flow.

I am trying to achieve 12 GPA but my system will only go up to 8 GPA on my GX5 Hyd system or I am trying to achieve 8GPA and can only achieve 5 GPA on my GX2 electric system.

AgXcel GX2 Electric System

• What is your system pressure? If system pressure is too high (50PSI or above) this will prevent you from achieving your high- est rate possible. High system pressure with an electric system can put the electric pump head into bypass mode and will not allow for full flow.

• Check the following areas to lower your pressure

1. Select a larger orifice or Micro Tube with a larger hole, this will allow for easier flow of liquid through the system and can increase over all flow and GPA

2. Check your system filters and make sure they are clean. This should be a practice each morning before using the system

• AgXcel GX2 Electric Systems can achieve up to about 5.9 GPM with dual electric pumps. Check your total GPM requirements and ensure that you are within range

• When using a Dual Pump System – unplug 1 pump and ensure that the other pump is working. Perform this test with both pumps and if one pump sounds weak replace it immediately

Quick Start Setup Instructions for Raven RCM & AgXcel Harness for 1 Liquid Product

Continued.....

• Ensure that your PWM High Limit is set to 100. Many times an Auto Tune will set this to a lower number so make sure this is set to 100

• If you controller has this option, make sure the PWM Duty Cycle is within range

• Check all your boom widths and make sure that all are set correctly

AgXcel GX5 Hyd System

• What is your system pressure? If system pressure is too high (90PSI or above) this will prevent you from achieving your high- est rate possible. High system pressure with a hydraulic system set 100 PSI bypass spike valve to open and you could begin to lose volume

• Check the following areas to lower your pressure

1. Select a larger orifice or Micro Tube with a larger hole, this will allow for easier flow of liquid through the system and can increase over all flow and GPA

2. Check your system filters and make sure they are clean. This should be a practice each morning before using the system

• Check your total GPM requirements and ensure that you are within range of the GX5 hyd pumps recommended GPM

• Ensure that your PWM High Limit is set to 100. Many times an Auto Tune will set this to a lower number so make sure this is set to 100

• If you controller has this option, make sure the PWM Duty Cycle is within range

• Check all your boom widths and make sure that all are set correctly

My rate is fluctuating and is almost locking in but just around.

• Make sure that your Rate Smoothing is checked and set to 10. You can typically find this setting under your System Controller settings. Rate Smoothing allows the system to lock into the rate if the rate is within 10% of the required rate. Many times liquid temperature can affect the performance of the system ‘

• Make sure your pressure is enough to fully OPEN every check valve on the implement. A good rule of thumb is to ensure that pressure is higher than 15 PSI when using 4lb, 5lb and especially 10lb check valves

Quick Start Setup Instructions for Raven RCM & AgXcel Harness for 1 Liquid Product

How do I know where my pressure should be?

- AgXcel systems are not pressure based especially when they are controlled with a Liquid Rate Control Module. HOWEVER, pressure can affect the performance of the system if the pressure is too low or too high. Many users feel that the higher the pressure then the less chance they have to plug an orifice. Although this statement holds value it can also have a major effect on system performance

- **Low pressure – RECOMMENDED 15PSI is the lowest**

1. Can affect the performance of the pump and may cause it to surge which affect the accuracy of your flow

2. Can affect the performance of your system check valves, not enough pressure and all your check valves may not OPEN and this may affect the accuracy of your system

- **High Pressure – RECOMMENDED – GX2 Electric = 25PSI GX5 Hyd = 70PSI**

1. Too high of pressure can also affect the performance of your system as this can cause too much restriction in the mani- fold tubes and too much resistance will slow the rate down

- **RULE OF THUMB FOR PRESSURE**
    - AgXcel GX2 systems = 10PSI – 20 PSI
    - AgXcel GX5 Hyd systems
        - Low Range = 15PSI – 40 PSI
        - Medium Range = 20PSI – 50PSI
        - High Range = 40PSI – 80PSI
    - All these ranges are OK for the AgXcel GX5 system
    - For High Speed Planters check out the AgXcel GX30 VRT Solution

How do I raise and lower my pressure when required?

- If your pressure is too HIGH then increase the size of your orifice and or Micro Tube to a larger hole size

- If your pressure is too LOW then change the size of your orifice or Micro Tube to a smaller hole size

AgXcel Raven RCM
2 Product Harness

Agxcel #55457
320-430 Rev.B

Wire Size: 18G
Length: 25in

47-PIN MALE

HC GROUND	01
SENSOR GROUND	02
	03
HC GROUND	04
HC POWER (15A)	05
HC POWER (15A)	06
PRESSURE 01	07
PRESSURE 02	08
	09
	10
	11
FLOWMETER 01	12
	13
FLOWMETER 02	14
	15
	16
	17
MASTER ON/OFF	18
	19
	20
	21
SENSOR 5V POWER	22
PRODUCT 01 PWM (-)	23
PRODUCT 01 PWM (+)	24
PRODUCT 02 PWM (+)	25
PRODUCT 02 PWM (-)	26
SECTION 13	27
SECTION 14	28
SECTION 15	29
SECTION 16	30
IMPLEMENT SWITCH INPUT	31
	32
SENSOR 12V POWER	33
SENSOR GROUND	34
	35
SECTION 01	36
SECTION 02	37
SECTION 03	38
SECTION 04	39
SECTION 05	40
SECTION 06	41
SECTION 07	42
SECTION 08	43
SECTION 09	44
SECTION 10	45
SECTION 11	46
SECTION 12	47

Version 1.1
Revised 06-28-18

PRODUCT 01

01	VALVE GROUND
02	VALVE GROUND
03	
04	SECTION 01
05	SECTION 02
06	SECTION 03
07	SECTION 04
08	SECTION 05
09	SECTION 06
10	SECTION 07
11	SECTION 08
12	
13	
14	
15	PRODUCT 01 PWM (-)
16	PRODUCT 01 PWM (+)
17	
18	MASTER ON/OFF
19	
20	
21	FLOWMETER GROUND
22	
23	
24	
25	FLOW 5V
26	
27	
28	FLOW SIGNAL
29	SENSOR GROUND
30	SENSOR 12V POWER
31	PRESSURE 01
32	
33	
34	
35	
36	VALVE POWER (15A)
37	HC POWER (15A)

PRODUCT 02

01	VALVE GROUND
02	VALVE GROUND
03	
04	SECTION 09
05	SECTION 10
06	SECTION 11
07	SECTION 12
08	SECTION 13
09	SECTION 14
10	SECTION 15
11	SECTION 16
12	
13	
14	
15	PRODUCT 02 PWM (-)
16	PRODUCT 02 PWM (+)
17	
18	MASTER ON/OFF
19	
20	
21	FLOWMETER GROUND
22	
23	
24	
25	FLOW 5V
26	
27	
28	FLOW SIGNAL
29	SENSOR GROUND
30	SENSOR 12V POWER
31	PRESSURE 02
32	
33	
34	
35	
36	VALVE POWER (15A)
37	HC POWER (15A)

IMPLEMENT SWITCH

GROUND	B
SENSOR 5V POWER	A

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

Agxcel #53593
309-524

37-PIN MALE

Wire Size: 18G
Length: 3ft

VALVE GROUND	01
VALVE GROUND	02
VALVE POWER (15A)	03
SECTION 01	04
SECTION 02	05
SECTION 03	06
SECTION 04	07
SECTION 05	08
SECTION 06	09
SECTION 07	10
SECTION 08	11
SECTION 09	12
SECTION 10	13
	14
PWM (-)	15
PWM (+)	16
	17
	18
SECTION 12	19
SECTION 11	20
FLOWMETER GROUND	21
	22
	23
	24
	25
	26
	27
FLOWMETER	28
	29
	30
PRESSURE SIGNAL	31
	32
	33
	34
	35
HC POWER (15A)	36
HC POWER (15A)	37

SECTIONS

01	VALVE GROUND
02	SECTION 02
03	SECTION 03
04	SECTION 04
05	SECTION 05
06	SECTION 06
07	SECTION 07
08	SECTION 08
09	SECTION 09
10	SECTION 10
11	SECTION 11
12	SECTION 12
13	PRESSURE SIGNAL
14	VALVE POWER (15A)
15	SECTION 01
16	VALVE POWER (15A)

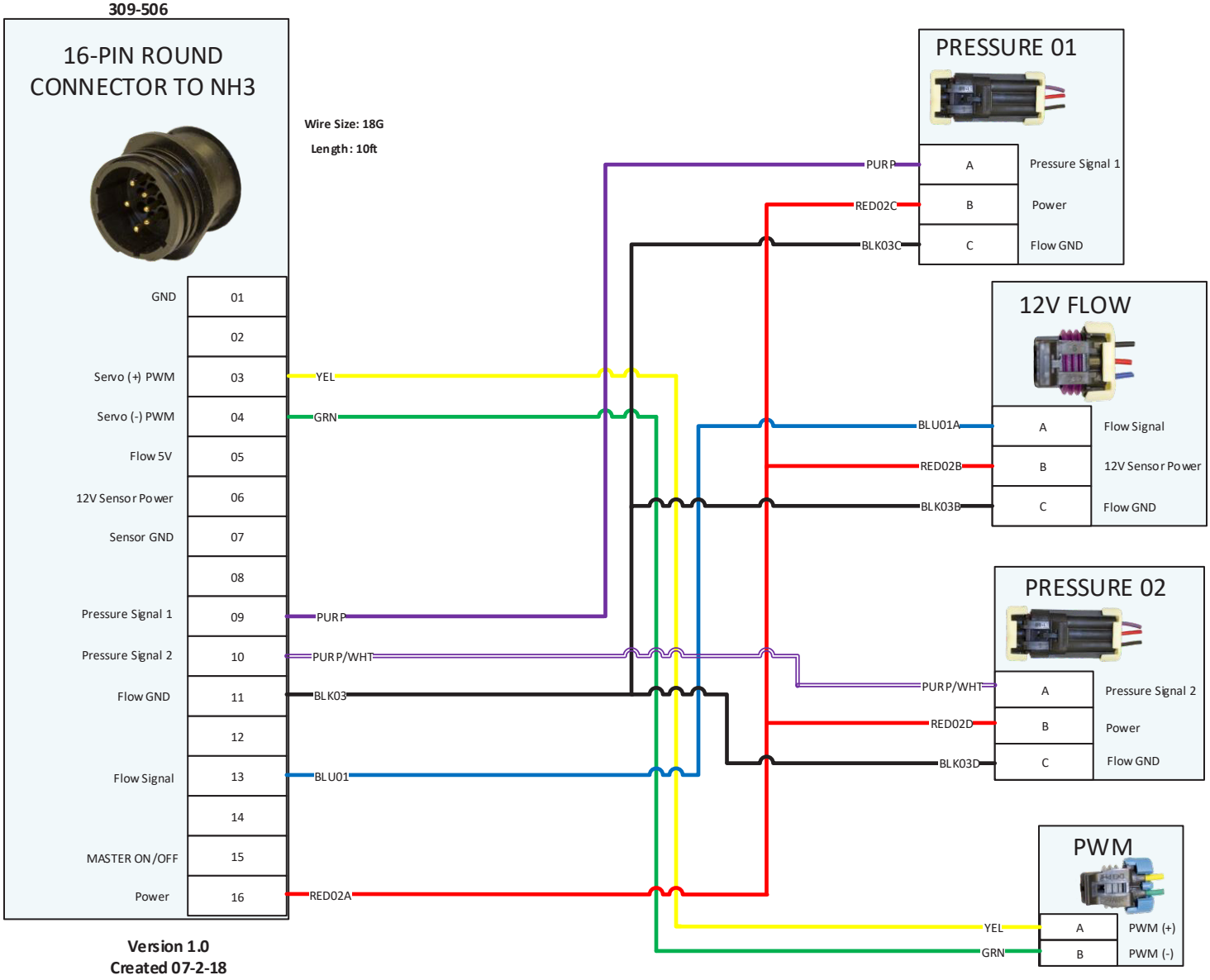
PUMP

01	GROUND
02	
03	PWM (+)
04	PWM (-)
05	
06	SECTION 01
07	
08	
09	PRESSURE SIGNAL
10	
11	FLOWMETER GROUND
12	
13	FLOW SIGNAL
14	
15	
16	VALVE POWER (15A)

Revised 1.1
Created 07-02-18

AgXcel Channel Integration Harness
(PWM, Flowmeter, Pressure)

Agxcel #53697
309-506



Version 1.0
Created 07-2-18

AgXcel Section Harness

16 Round Pin - AMP
Female pins in female body
(with threads for swivel nut)

Valve Ground	1
Section 2	2
Section 3	3
Section 4	4
Section 5	5
Section 6	6
Section 7	7
Section 8	8
Section 9	9
Section 10	10
Section 11	11
Section 12	12
Pressure 1	13
Valve Power	14
Section 1	15
Valve Power	16

Section 1
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 2
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 3
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 4
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 5
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 6
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Pressure 1
150 MP Shroud 3-Pin
A Signal
B +12 VDC
C Ground

Section 7
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 8
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 9
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 11
150 MP Shroud 3-Pin
A Signal
B +12 VDC
C Ground

Section 10
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal

Section 12
150 MP Tower 3-Pin
A +12 VDC
B Ground
C Signal