

PLEASE NOTE: Your setup may vary. Not all screens are shown. See Müller Operator's Manual for safety information and additional setup/operating information.

MENU STRUCTURE FOR LIQUID RATE CONTROLLER



Master Switch

•Master Switch to turn on and off system when physical Master Switch is not enabled



Configuration

- Advance Settings
- •Speed Settings
- Distance Measurements
- Section Configuration
- Diagnostics



Гank

Refilling TankEmptying Tank



Rate Adjustment

- •Rate Target Selection
- •Auto/Manual
- •Rate Increase/



Road Mode

•Road Mode function is used for safe transport on public roads



Next Page

•Displays further function icons





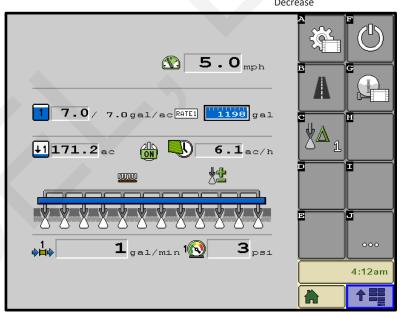
Counters

•This opens a screen with counters.



Sections

 Opening and closing section valves from left to right or from right to left



System Information

Müller-Elektronik' technology is a very flexible control platform with many capabilities. This quick start setup guide will show you the necessary steps to setup your display to control AgXcel's Fertilizer Pump Systems. Follow the general directions in your Müller's User Manual (especially under Configuration and Liquid Rate Control). This manual will show you the specific numbers and settings to use with your AgXcel Fertilizer Pump System.

Virtual Terminal (VT)

When your Müller ISO Liquid Rate Controller is correctly connected, it will be discoverable in your monitor's Virtual Terminal section. Select the Virtual Terminal icon, which can be in different areas of the controller.

- •From the "Home" screen, press the "VT" or "ISO" icon on the bottom of the screen, which will take you to the Virtual Terminal screen.
- •Once on the **Virtual Terminal** screen, your Müller ISO module will be detected. Once detected, it will load your current configurations. If this is your first time setting up, it will display a message letting you know that system has not been configured.

PO Box 1611 Kearney, NE 68848 877.218.1981 www.agxcel.com



SYSTEM CONFIGURATION

System configuration is where you will set the Müller ISO to be compatible with the AgXcel fertilizer system. AgXcel has found the best settings to work with their fertilizer pump systems. Please carefully follow each step to set up your controller.

Setting up for Single Product

- Locate your Müller ISO system password located in your user manual. This password is used to unlock the Advanced Configuration settings. If you cannot locate it, please contact your Müller dealer.
- From the Home screen, press the Configuration icon.
- You will then be able to see the locked Advanced Configuration icon.
- Once pressed, the screen will display the area to insert your password



Enter the following settings in:

Number of Products: 1 Number of Booms: 1

Product 1 Control Type: PWM

Bypass: Unchecked
Tank Control: Unchecked

 Once done, press the 3-dot icon to go to the next page of the Advance Configuration.



(Next Page Icon)

TC Machine Description: This setting is user preference. (If unsure, leave it set to default Auto.)

Maximum Speed: This setting is user preference. (This value is the max speed that the control system will operate and will trigger "Road Mode" if you exceed it)

Snap to Rate: 10%

Simulation: Unchecked

(Placing a checkmark on "Simulation" puts the ECU for demo

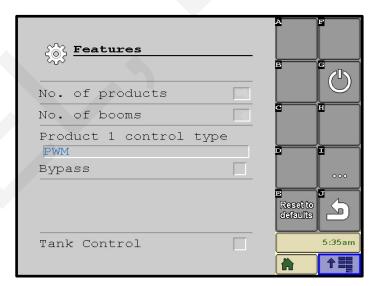
purposes)

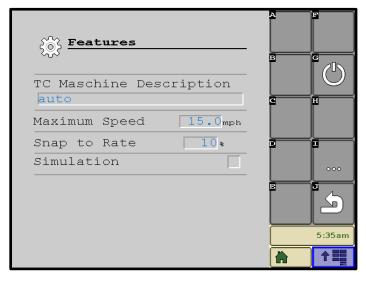


(Configuration Icon)

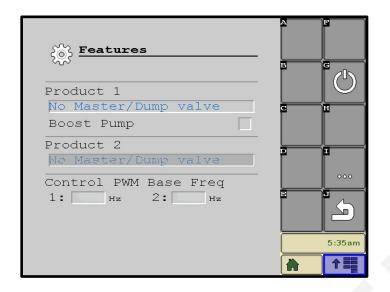


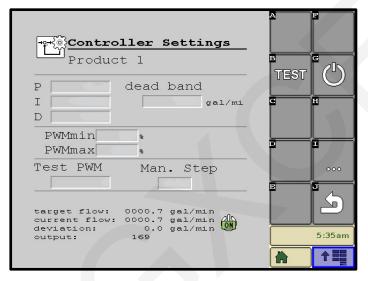
(Advanced Configuration Icon)











Advance Configuration (Features) Continued

 Press the 3-dot icon to go to the next page of the Advance Configuration.

Product 1 Master/Dump Valve: No Master/Dump Valve (When Dump Valve is selected, the valve will remain open when not applying)

Boost Pump: Unchecked

(Put a checkmark if the system is setup for use of a booster pump)

Control PWM Base Freq:

GX5 (hydraulic)... 150 Hz GX2 (electric)......150 Hz GX40 Synergist....150 Hz

> Press the 3-dot icon to go to the next page of the Advance Configuration.

Product 1 Controller Settings*:

P: GX5 (hydraulic) 3.0 GX2 (electric) 3.0 GX40 Synergist 3.0	I: GX5 (hydraulic) 3.0 GX2 (electric) 3.0 GX40 Synergist 3.0
D: GX5 (hydraulic) 0.5 GX2 (electric) 0.5 GX40 Synergist 0.5	Dead Band: GX5 (hydraulic) 3% GX2 (electric) 0.0 GX40 Synergist 0.0
PWM Min: GX5 (hydraulic) 10% GX2 (electric) 10% GX40 Synergist 10%	PWM Max: GX5 (hydraulic) 100% GX2 (electric) 100% GX40 Synergist 100%

P: This is a portion of the loop that is proportional to the amount of time the error is present

I: This is the portion of the loop that accumulates previous errors. It is the "memory" of the control loop. For each loop cycle, the integrator adds the current error to the previous integrator value.

Dead Band: The allowable value that NO controlling/corrections will be made to the control valve. A low number may result in oscillation around the target rate. High number may result in not achieving the target rate.

Minimum/Maximum Time: Min/ms is the value the output will start from no matter how much correction is needed. Max/ms is the max value the output will reach once saturation of the output has been reached

^{*}These settings are adjusted as needed.



• Once completed, Press the Back Icon to return to the Configuration screen.



(Back Icon)

Configuration 1/4

Enter the following settings in:

Application Type: Liquid Fertilizer (gal)

Target Rate: User Preference **Delta Target Rate:** User Preference

Delta Target Rate: This number reflects the amount of change to the rate each time Delta Target Rate is increased or decreased is pressed

 Once done, press the 3-dot icon to go to the next page of the Advance Configuration.



(Next Page Icon)

Configuration 2/4

• Enter the following settings in:

Tank Size: User Preference **Meter Cal:** Please see Chart below

Pressure Sensor*: If a pressure sensor is installed, please select "Analog" option. If an electric pressure sensor is not installed, please select "Not Installed" option.

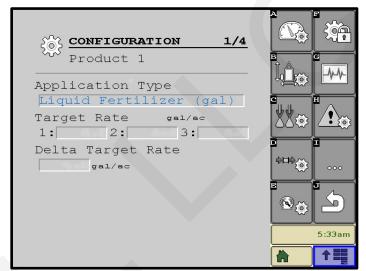
*When using AgXcel's optional Pressure Transducer Kit PN 53491

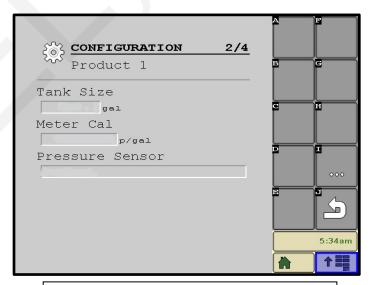
 Once done, press the 3-dot icon to go to the next page of the Advance Configuration.



(Next Page Icon)

	FM750 Reg
M	licro-Trak Cal Number - 145 (SprayMate, Auto-X)
	Pulses Per Gallon - 72.50 (JD, AGL, Trimble)
	Pulses Per 10 Gallon - 725 (Raven)
	FM750 LF
M	licro-Trak Cal Number - 466 (Spraymate, Auto-X)
	Pulses Per Gallon - 233 (JD, AGL, Trimble)
	Pulses Per 10 Gallon - 2330 (Raven)

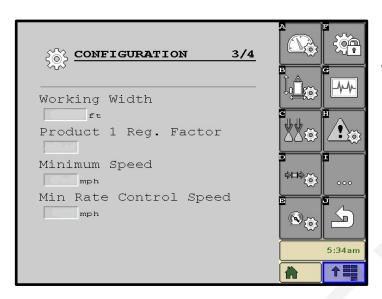




Orion Magnetic Flow Meter Calibration Numbers

FLOW RANGE (GPM)	PULSES PER GALLON
0.08 - 1.6	22710
0.13 - 2.6	22710
0.3 - 5	11355
0.6 - 13	4542
1.3 - 26	2271
2.6 - 53	1135





Configuration 3/4

Enter the following settings in:

Working Width: This would be the total width of the implement

Product 1 Reg. Factor:	Minimum Speed
GX5 (hydraulic) 10 GX2 (electric) 10 GX40 Synergist 10	GX5 (hydraulic) 0.5 GX2 (electric) 0.5 GX40 Synergist 0.5
Min Rate Control Speed	
GX5 (hydraulic) 0.5 GX2 (electric) 0.5 GX40 Synergist 0.5	

CONFIGURATION 4/4 Lock at last Jump Start mph Ext. Master Switch Work Switch 5:34am

Ext. Master Switch: User Preference. If Master Switch is not present, select None.

(If an External Master Switch is selected, the onscreen master softkey will be removed. Choose the option for your setup from the pop-up screen:

Momentary Switch, Latching (Low=in work), Latching (High=in work)

Configuration 4/4

Enter the following settings in:

Lock at Last: Unchecked

(Lock at Last setting should be checked if you want to keep the pump running while the planter is up. This allows for quicker return to the Target Rate when you start applying again. Only use this if you have a return line back to the tank. This can cause high pressure if no return is plumbed. Warning: If Lock at Last is enabled and there is no return line plumbed, flow will not be able to stop. The Master Switch will not have the ability to turn off product flow.)

Jump Start: Unchecked

(Check the Jump Start feature if you want to start applying before the implement is up to speed. Enter the speed that corresponds to the rate you want to apply at when pressing the Jump Start button. Enter the amount of time in seconds you want Jump Start to control the application rate while tractor achieves the desired speed. This option allows operator to start applying from a stop position and allow tractor to get up to operating speed.)

Work Switch: User Preference. If Work Switch is not present, select None

(To setup the Work Switch, press the selectable area.. Choose the option for your setup from the pop-up screen:

Latching (Low=in work), Latching (High=in work), ISOBUS Tractor, Case IH Planter Status)



SECTIONS CONFIGURATION

A section refers to a part of the implement in which all the nozzles are supplied with liquid from a section valve. Closing the section valve switches off the section. The implement has as many sections as it has section valves which can be switched off. The first section is always on the left in the direction of travel. The second is on its right.

Entering the Number of Sections

 From the Run Screen, press the Configuration icon



(Configuration Icon)

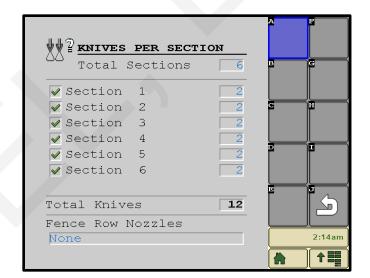
 Then press the Sections Configuration icon



(Section Configuration Icon)

- The Sections screen will appear (shown on right). If the section number is unchecked, the system will disable the specific section, and it can't turn on from the Run Screen. This feature allows the operator to disable the sections that aren't going to be used.
- Enter the number of sections in the Total Sections field.
- Enter the number of rows in each section.
- Fence Rows: None
- Press the back icon

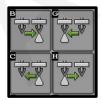
*Note: The ECU will indicate that it needs to be restarted. You can restart the system now that you are at the conclusion of the set-up process.



*Note: Please note with using AgXcel's integration Harness PN 56410 the following configurations are possible:

- 1 Product Configuration: Have up to 8 Sections
- 2 Product Configuration: Have up to 6 Sections

Icons for Sections on Run Screen:



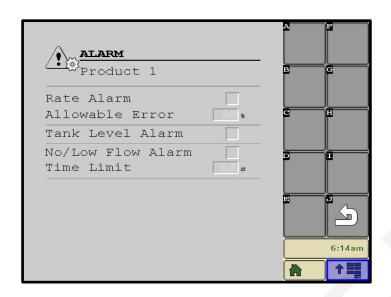
Open or close the section valves from left to right or from right to left.

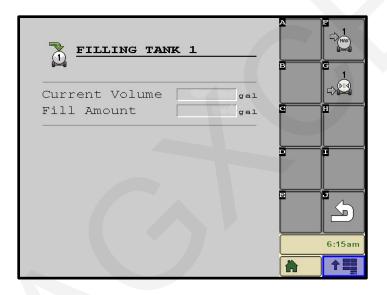


Open or close the section valves if you have 4 sections or less



ALARM CONFIGURATION





Empty Tank Icon: Press when the tank is completely empty.

Press the Alarms
 Icon on the side



(Alarms Icon)

Product Rate Alarm: Checking this value will activate an alarm to alert the operator if application is outside of the specified Target Rate.

Allowable Error: Adjusting this value sets the percentage of Target Rate error before the operator receives a warning.

Tank Level Alarm: Checking this value will activate an alarm to alert the operator when the tank level is low.

No/Low Flow Alarm: Checking this value will activate an alarm to alert the operator when the Actual Rate is greater than 25% of the Target Rate. If the system has a dump valve, this feature can protect the pump and keep it from burning up.

Entering the Fill Amount in the Tank

 Press the Tank Filling Icon on the side menu



(Tank Filling Icon)

You must input the amount of product in your tank prior to starting to operate for the system to correctly display tank content

Current Volume: This will display the current gallons that are present in your tank. (Tank size is set up in page 2 of configuration).

Fill Amount: This is the amount that will be added to the tank level.



Max Tank Icon: Press when the tank is completely full



DIGITAL PRESSURE CONFIGURATION

If a pressure sensor is installed, please select "Analog" option on the configuration screen on page 4 of this guide. To adjust the pressure sensor settings, press the Configuration Icon. Once pressed then press the Pressure Calibration button. Be sure to use an accurate pressure gauge to compare the system against the pressure sensor. Pressure sensor settings are not available until the Pressure Sensor Analog option is selected in the product set up.

 From the Run Screen, press the Configuration icon



(Configuration Icon)

 Press the Pressure Calibration icon



(Pressure Calibration Icon)

Pressure Sensor: Select the name of the product for the

Pressure Sensor

Offset: 0.00 v

(The offset setting allows adjustment to the voltage range.

The range can be increased or decreased).

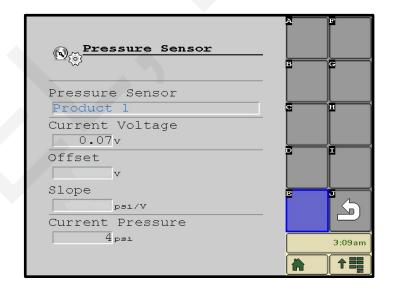
Slope: 0.00 psi/V

(The Slope value shows psi/V for the pressure sensor. 1 volt =

20psi).

Current Pressure: This value is the current pressure reading

from the Pressure Sensor.



AgXcel's Pressure Transducer Kit (Optional) - PN# 53491

The AgXcel fertilizer application system can be configured with an *optional* pressure transducer feature. This optional kit will allow the user to display pressure on screen in cab, However, pressure monitoring is an important tool in system setup and system troubleshooting and can assist in ensuring that the liquid application system is operating properly, and this may be attained with a standard analog gauge or a pressure transducer.



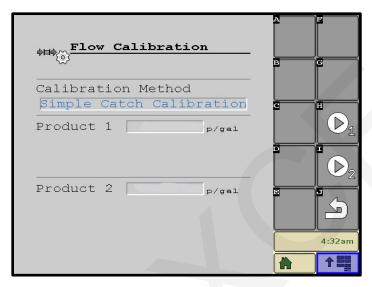


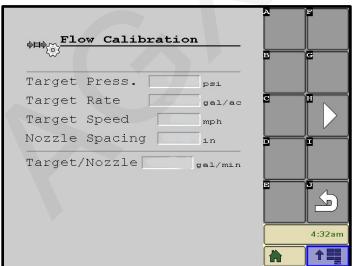
CALIBRATING FLOW METER - SIMPLE CATCH

The Simple Catch Calibration method allows the user to calibrate the flow meter without moving the vehicle. For safety reasons, this method cannot be used when the product type is anhydrous. The simple catch test is completed in calibration screens and done statically. The user starts application and catches flow from a single nozzle for 1 minute or a measured time interval. The system converts the catch amount to a gal/min value and enters it in the calibration screens.

Because the number of pulses per gallon can change during the lifespan of a flow meter, calibration must be carried out in the following cases:

- Prior to initial startup
- · At the start of each session
- If you notice that there are deviations between the actual applied amount and the displayed amount
- When you have exchanged or repaired the flow meter





 From the Run Screen, press the Configuration icon



(Configuration Icon)

 Press the Flow Cal Icon. Once pressed, the Flow Calibration Screen will appear



(Flow Cal Icon)

- Confirm the Calibration Method is set to Simple Catch Calibration.
- Press the Play icon to begin the calibration for Product 1 or Product 2.
- The Flow Calibration screen will appear.
- Enter the values for Target Pressure, Target
 Rate, Target Speed, and Nozzle Spacing.
- Press the Play icon to proceed.



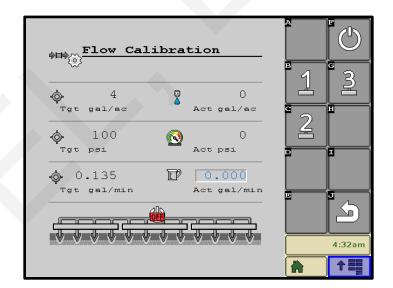
CALIBRATING FLOW METER – SIMPLE CATCH CONTINUED

- The Flow Calibration Control screen appears
- Setup a container(s) on the implement to catch the product that will be applied during the calibration. Activate/Deactivate the sections you want to apply during the catch test with the section control icons.
- Press the Master ON/OFF icon to start application. Apply product for 1 minute.



(Master On/Off Icon)

- Press the Master ON/OFF icon to stop application.
- Enter the applied amount in gallons in the Actual Amount line. Once this amount is entered, the Meter Cal value will be updated. The user can accept the updated value with by pressing the check mark or press "X" to return to calibration start screen without updating the Meter Cal Value.
- Press the Back Arrow to exit the screen.
- You have now calibrated the flow meter.





AGXCEL LIQUID SYSTEM FREQUENTLY 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 possible 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 needs 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 hydraulic valve is NOT in manual override. 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 hydraulic flow.

I am trying to achieve 12 GPA but my system will only go up to 8 GPA on my GX5 Hydraulic 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 highest 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
 - 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
 - ◆ 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
- 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

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AGXCEL LIQUID SYSTEM FREQUENTLY ASKED QUESTIONS (FAQ) CONTINUED

AgXcel GX5 Hydraulic System

- What is your system pressure? If system pressure is too high (90PSI or above) this will prevent you from achieving your highest 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
 - ◆ 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
 - 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 hydraulic pump's 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 is jumping 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.

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

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AGXCEL LIQUID SYSTEM FREQUENTLY ASKED QUESTIONS (FAQ) CONTINUED

- Can affect the performance of your system check valves, not enough pressure and all your check valves may not OPEN.
- High Pressure RECOMMENDED GX2 Electric = 25PSI GX5 Hydraulic = 70PSI
- ◆ Too high of pressure can also affect the performance of your system as this can cause too much restriction in the manifold tubes and too much resistance will slow the rate down.
- RULE OF THUMB FOR PRESSURE
 - ♦ AgXcel GX2 Electric systems = 15PSI 25 PSI
 - ♦ AgXcel GX5 Hydraulic systems
 - Low Range = 15PSI 40 PSI
 - Medium Range = 20PSI 50PSI
 - High Range = 40PSI 80PSI
 - ◆ For High-Speed Planters check out the AgXcel GX30i VRT Solution

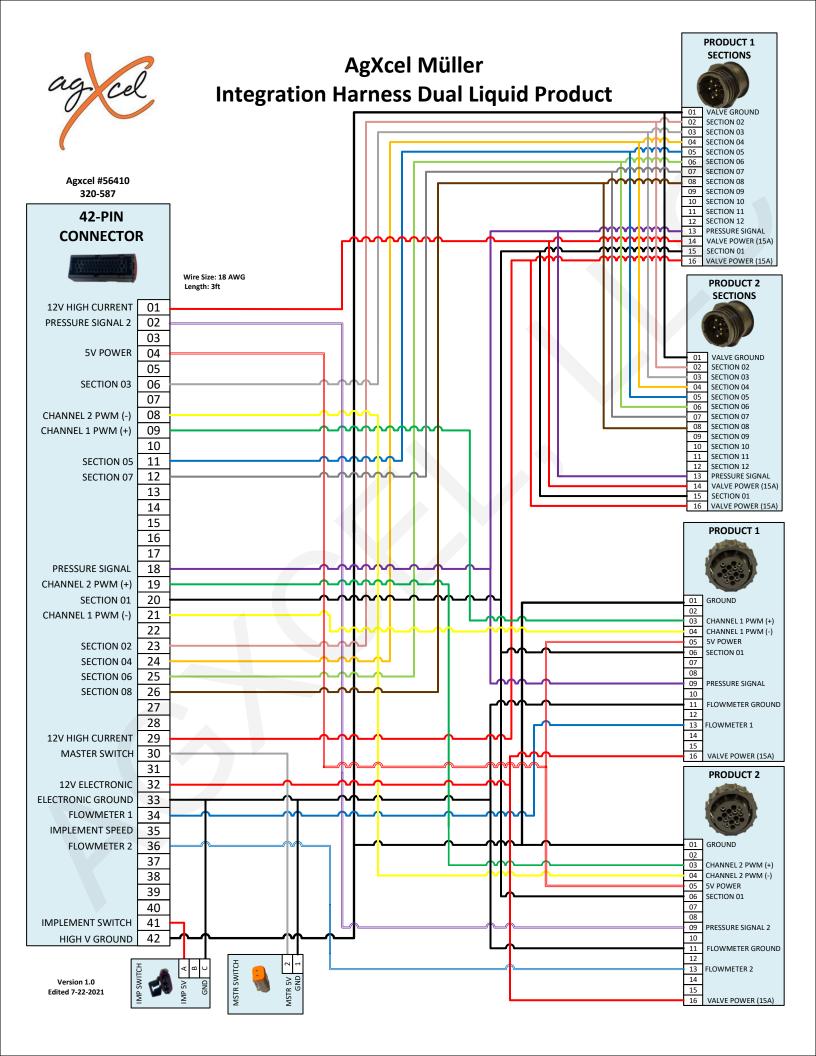
How do I raise and lower my pressure when required?

- 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.

TIP - Many times the system may have difficulty priming, or if a flow meter has not detected flow and you want the system to continue running so as to prime. Go to Diagnostics > Tests > Calibrate PWM Limits

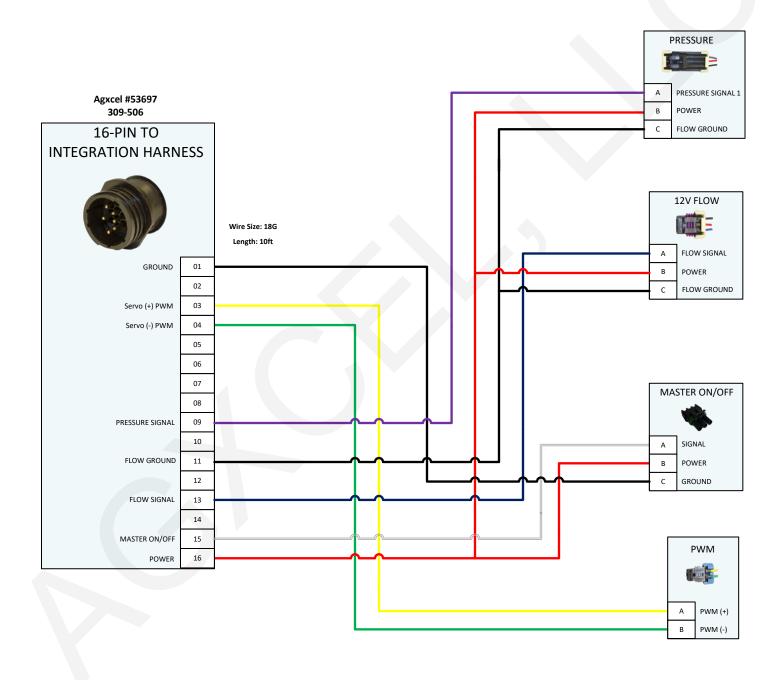
- 1. Time for Auto Mode Testing
- 2. Once again, enter a Test Speed
- 3. Press the AUTO button
- 4. Ensure that the height switch is down or unchecked
- 5. Turn the Master ON
- 6. You can now monitor system flow vitals and ensure that all outlets of liquid are flowing
- 7. Once again, check sections if sections are being used
- 8. System testing is complete Turn OFF the Master Switch

AgXcel System Performance Settings - To ensure the best performance of your AgXcel system especially at Start Up, setting the PWM Start Up % can be fine-tuned. PWM Start Up % sends voltage to the pumps at the % that has been set. This can assist in the priming cycle to get the pumps running quicker. Once the pumps jump up to the % set, then it will begin its cycle to lock into the required target rate setting.





AgXcel Channel Integration Harness (PWM,Flowmeter,Pressure)



Version 1.1 Revised 08-15-22



AgXcel 6-Section Boom Harness

