GX 12HP REVOLUTION

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Quick Start Instructions for AgXcel's GX12HP Revolution

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AgXcel shall not be responsible or liable for accompanying or significant reparations or a loss of expected benefits or profits, loss or delay of work, or inaccuracies of data arising out of the use, or inability to use, this system or any of its components. AgXcel shall not be held responsible for any modifications or repairs made outside our facilities, nor damages resulting from inadequate maintenance of this system.

CAUTION

Read this document carefully before installing, testing and using the AgXcel GX12HP Revolution injection system.

- Follow all safety information presented within this document.
- Keep safety labels in good condition. Replace missing or damaged safety labels as necessary and verify labels are included on replacement parts or new equipment components.
- If you require assistance with any portion of the installation or service of this solution contact your local AgXcel Dealer or contact AgXcel directly.

Chemical Handling and Safety

Chemicals used in agricultural applications may be harmful to your health or the environment if not used responsibly. Review the safe, effective, and legal use and disposal of agricultural chemicals with the chemical supplier.

- Always follow safety labels and instructions provided by the chemical manufacturer or supplier.

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GX12HP Installation Requirements

CAUTION – The GX12HP is capable of injecting up to 280 PSI

The installation of the GX12HP unit is very versatile however for the best performance please follow the best practices below.

A. **Mounting the Unit** – The GX12HP may be mounted in any location on the tool bar or implement. However, the unit must be secured, and must be mounted level. Ensure that it is not in a location where rock, mud, or debris will directly hit the unit as these could damage the outer casing of the pump or flow sensor.

B. **Tank Feed** – When installing the GX12HP unit on the implement ensure that the distance between the chemical tank and the GX12HP is no longer than 10ft. This will ensure that the unit does not have to work harder to draw the chemical from the tank. This will allow for easier flushing of the unit. Less chemical will be in the tank to pump line.

C. **Injection Feed** – when deciding on an injection point, ensure that the distance from the GX12HP unit to the injection point is no longer than 8ft. This regulated distance allows for less pressure drop and strain on the pump unit itself.

a. **Check Valve**- it is also critical to install a check valve on the injection feed line at the injection point. This will prevent feedback into the pump.

Check Valve

D. **Chemical Mixer** – a standard chemical mixer in the line

E. **High Pressure** – The GX12HP is a high-pressure injection unit with the ability to inject up to 280 PSI. However, AgXcel highly recommends the following precautions

a. Pressure Sensor
b. Pressure Spike Valve
c. Manual Pressure Guage

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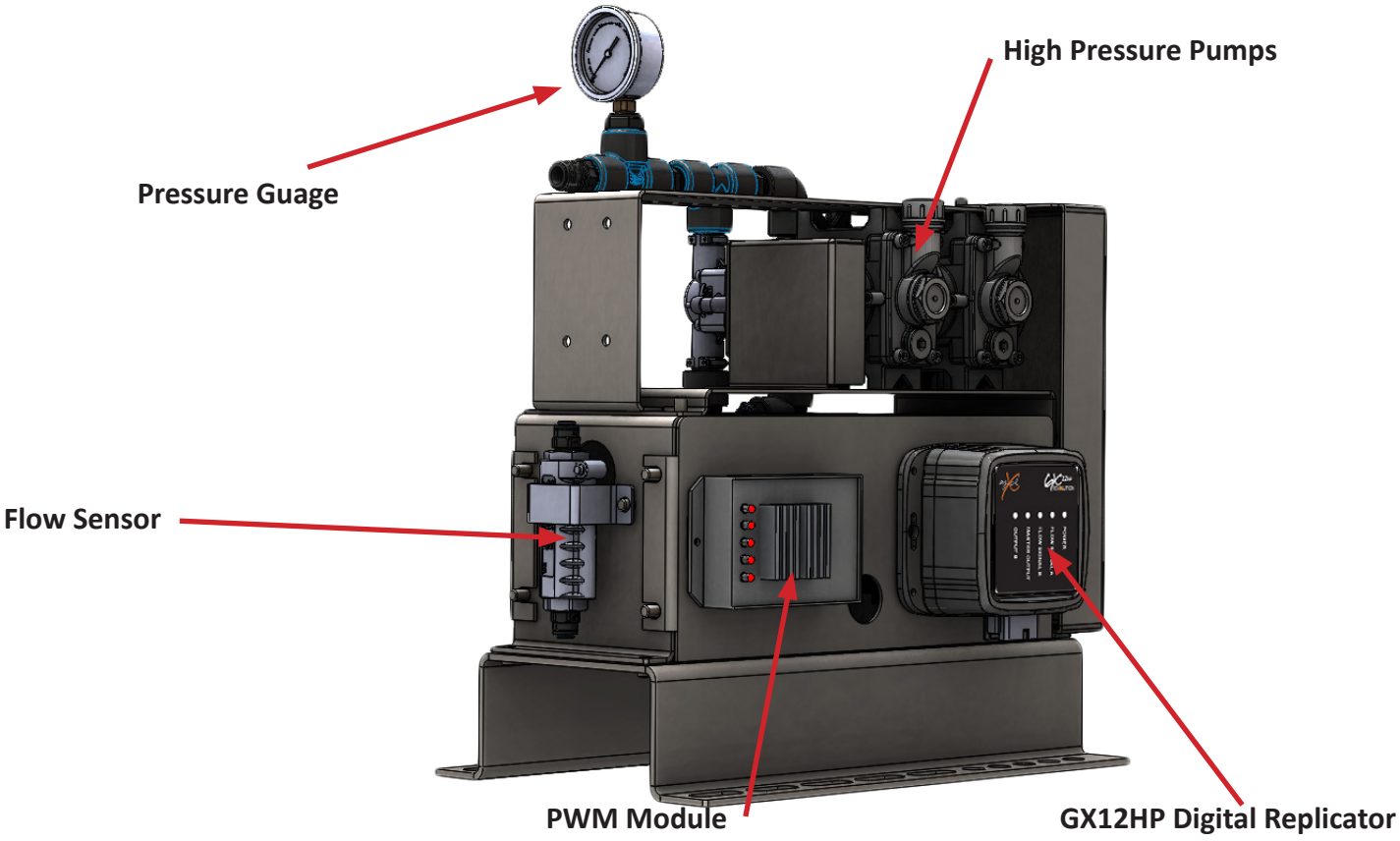
GX12HP Unit Breakdown



GX12HP Digital Replicator

- **POWER**
- **FLOW SIGNAL A**
- **FLOW SIGNAL B**
- **MASTER OUTPUT**
- **OUTPUT B**

Precision Liquid Fertilizer Solutions

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Quick Start Setup Instructions for John Deere's GS2 & GS3 Rate Controller

PLEASE NOTE: ***Your setup may vary.*** Not all screens are shown. See JD JDRC Operator's Manual for safety information and additional setup/operating information.
Please ensure you have the latest firmware installed!

MENU STRUCTURE FOR LIQUID RATE CONTROLLER
SET UP: Implement

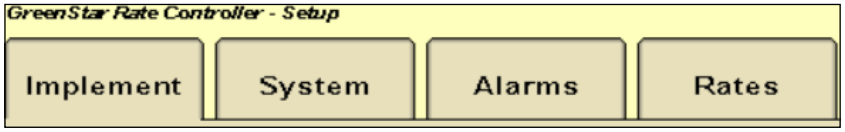
SETUP
- Implement
- System
- Alarms
- Rates

TOTALS
- Current
- Job Summaries
- Lifetime Totals

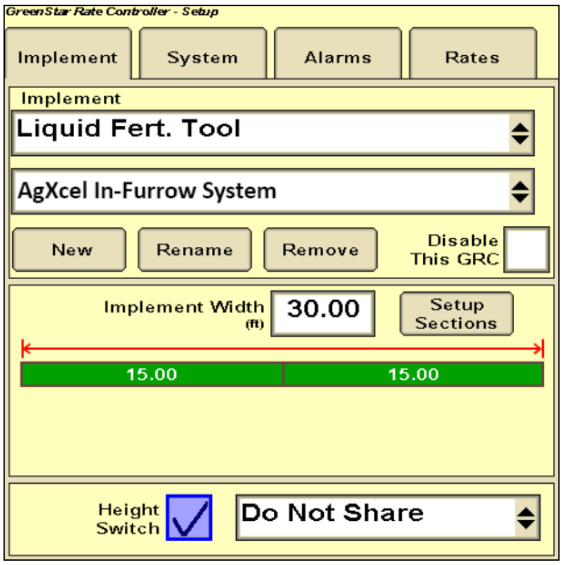
DIAGNOSTICS
- Readings
- Tests

Here you will enter the type, name, total width and section width for your implement you will be using for this operation. In this section of the setup, you will be configuring the details of your implement to prepare it for liquid management.

1. **Navigate to the Liquid Rate Controller Module**



2. Select the Implement Tab to set up your Implement
3. Choose Implement type "Liquid Fertilizer Tool" **Note:** "Pull Behind Sprayer" may be selected on previous GS versions and does not require an implement switch.
4. Enter your preferred name for the implement where "AgXcel" is shown.
5. Enter your Implement Width in Feet
6. If you are going to setup your implement into multiple sections, press the Setup Section button.
7. Setup the width of each section when the screen pops up after pressing the Setup Sections button.
8. **IF USING HEIGHT SWITCH:** Check the box at the bottom of this screen. You must then choose one of these choices:



Receive Status: On a planter, set it to this status to use the Seed Controller's height signal. (Some Seed Controller / Rate Controller combinations may not allow sharing of the height switch.

Do Not Share: On a single product fertilizer applicator, set it to this setting.

Note: On previous versions of GS2/GS3 software, a height switch was required for a Liquid Fertilizer Tool. However, on this version you can leave the Height Switch box unchecked and no height switch is required.

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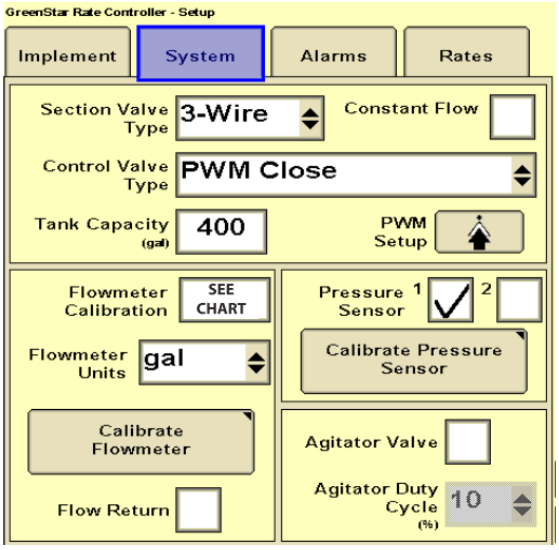
Quick Start Setup Instructions for John Deere's GS2 & GS3 Rate Controller

SET UP: System

System setup is where you will set the GS2/GS3 to be compatible with the AgXcel fertilizer system components. In this section of the setup, this is where you will configure the John Deere Liquid Rate Controller to manage the AgXcel fertilizer system.



1. Section Valve Type: 3-Wire
2. Control Valve type: PWM Close ("Close" means when the rate is zero or all sections are off, the controller will stop the pump)
3. Flow Return: NOT Checked
4. Flowmeter Calibration: See Chart Below
5. Flowmeter Units: gal
6. Constant Flow: NOT Checked
7. Agitator Valve: Not Checked
8. Pressure Sensor: Check if using optional electronic pressure sensor.
9. PWM Setup (use the numbers indicated for your system)

*****NOTE***** Even though the Flowmeter Units is set to read in gallons, AgXcel has manipulated the controller to really read in ounces with the Flowmeter Calibration number that has been set. For example, if you enter the rate 32 Gal/Acre, your controller will really be applying 32 Oz/Acre.

Control Valve Calibration (Adjust as needed) *

GX5 (hydraulic).....4012
GX2 (electric).....9911
Synergist.....533
GX12HP.....311

Coil Frequency:

GX5 (hydraulic).....100
GX2 (electric).....100
Synergist.....150
GX12HP.....100

High Limit: 255

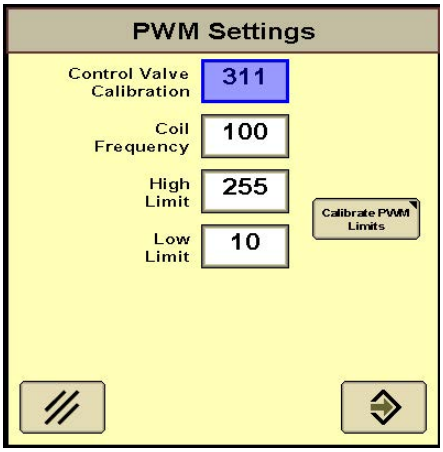
Low limit (Adjust in the field as needed) **

GX5 (hydraulic).....60
GX2 (electric).....0
Synergist.....16
GX12HP.....10

Number of Pumps	Flow Calibration Number
1 Pump	84
2 Pumps	42
3 Pumps	28
4 Pumps	21

*The GS2/GS3 Control Valve Calibration can be changed to optimize performance on your specific equipment. The 4-digit number is formatted (X)XYZ. Increase (X)X to make the system respond quicker. If set too high, the actual rate will oscillate around the target. Y is the output deadband and Z is the control deadband. Generally, leave these two digits low. Read your GS2 Operators Manual for more information. For example, to slow your response speed, move the number from 311 to 211, changing the valve response from 99 to 80. AgXcel has found the fastest setting has the best performance for each system.

**The Low Limit may be set higher if the system continues to present an error of "Solution Tank Dry." Slowly increment the Low Limit by 5,10,15 and 20 being the highest. If you set this number too high, you may not be able to achieve lower rates. Caution must be used when raising this number.



WARNING: When receiving the "Solution Tank Dry" warning, it does not always warrant changing the "Low Limit" number. Other causes could be, fertilizer tank is low, flow meter is bad, pumps are not turning on, or bad harness connection. First ensure that liquid is NOT flowing when changing this number.

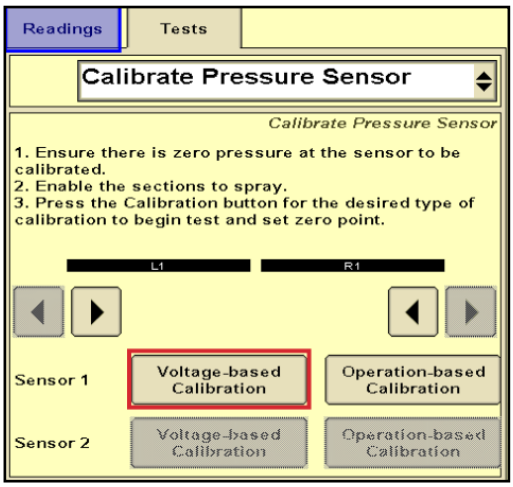
For AgXcel GX40 Synergist, divide pulses/gal by 128 and use fl. oz. as flowmeter units!

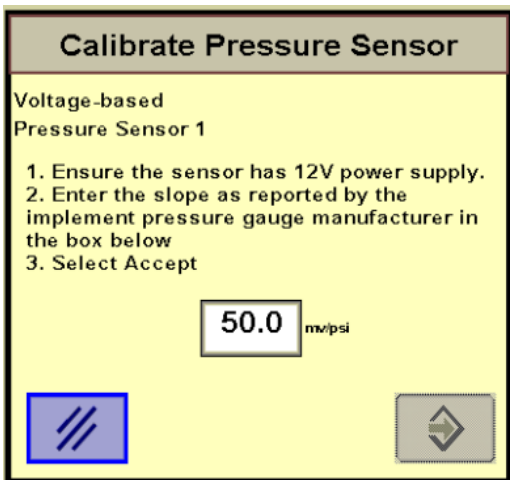
Quick Start Setup Instructions for John Deere's GS2 & GS3 Rate Controller

SET UP: System Cont. – Pressure Sensor Calibration*

*(When using optional Pressure Transducer Kit P/N 53491)

1. On the System Setup screen, press "Calibrate Pressure Sensor" to open this screen.
2. Select Voltage-based Calibration
3. On the Screen that opens, enter 50.0 mv/psi
4. Press the button on the lower right to return to the System Setup screen.





Tip: If the system has been running, there may be pressure in the system due to the check valves. In that case, simply unplug the sensor while this setup is being done so it will calibrate the zero point correctly.

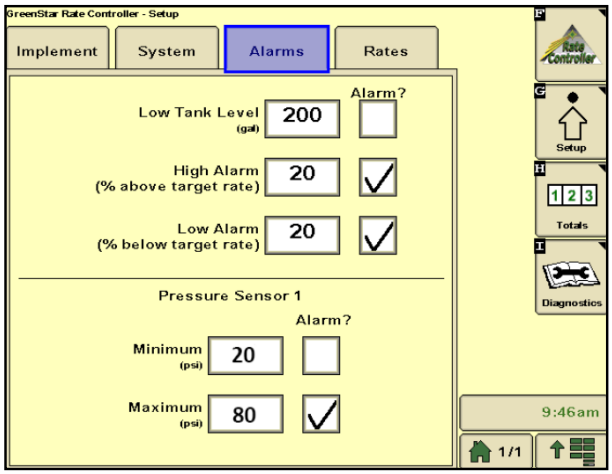
SET UP: Alarms

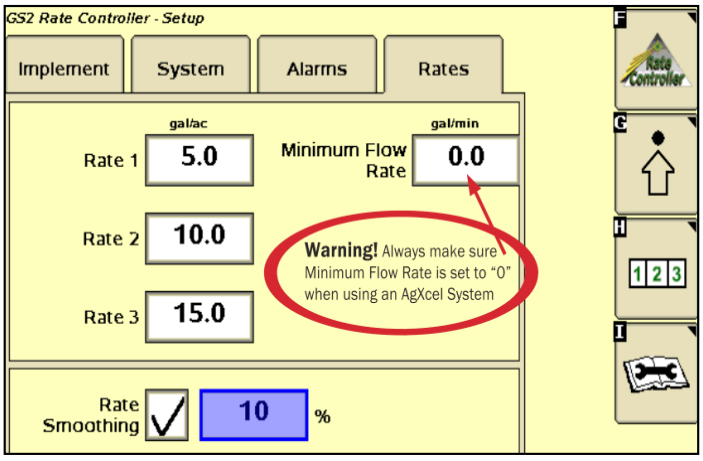
5. Customize your alarms and settings on this page.

SET UP: Rates

Enter your desired application rates here.

6. Enter up to 3 rates.
7. AgXcel recommends checking the rate Smoothing box and entering 10%
8. AgXcel recommends leaving minimum flow rate at 0.0. If greater than zero, this is the minimum flow in gallons per minute that the system will **NEVER** go lower than.



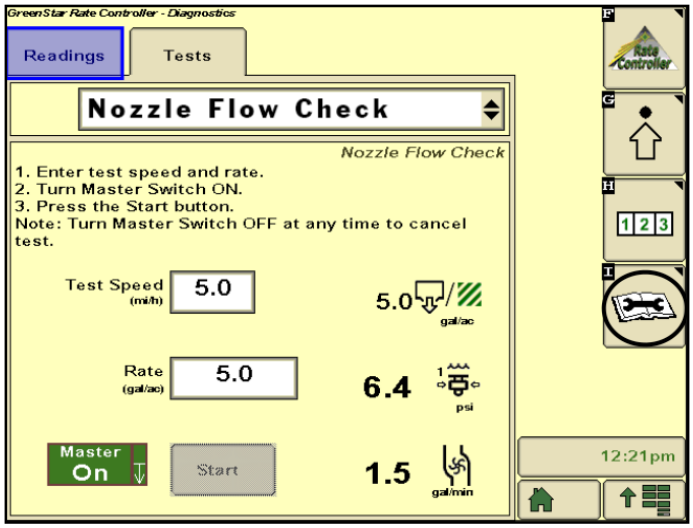


Quick Start Setup Instructions for John Deere's GS2 & GS3 Rate Controller

INITIAL OPERATIONS INSTRUCTIONS

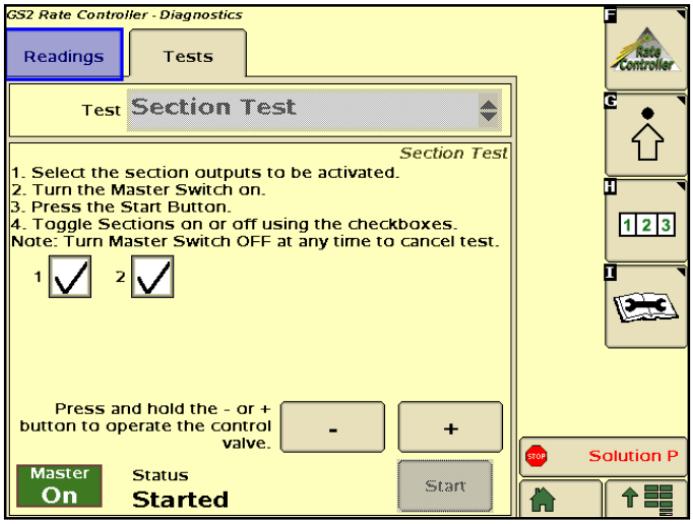
The following diagnostic tests are critical to ensuring that your AgXcel solution functions properly and is ready for field use. AgXcel recommends that you perform these steps with **WATER.**

1a. Diagnostic – Tests – Section Test



1. **Go to the Section test** (Diagnostics > Tests > Section Test.) Section test essentially functions like a MANUAL mode where you have direct control pump and valves.
2. **Turn the Master switch on.**
3. **Test section valves** by checking and unchecking boxes. Check boxes to open valves.
4. **Press the "+" button and hold it.** The pump(s) should begin running (it takes lots of individual taps of this button to cause a visible effect.)
5. **Is the water being pumped?** If system is not primed, remove the end cap from a flow indicator manifold or otherwise open the system. This will allow air to be expelled and the pump to prime and fill system.
6. **With pump running and water flowing**, push "1,2,3" buttons. Look at the flow in GPM. Is there a reading there? If not, is the system primed with water flowing to each row? If water is flowing but no reading, check the flowmeter calibration and wiring harness connections.
7. **Press the wrench icon**, now push the "-" button. Go back to the "1,2,3" screen. Did the flow in GPM decrease?
8. **Make sure the GS2/GS3 flow readout** in GPM can be increased and decreased with the "+" and "-".

1b. Diagnostic – Tests – Nozzle Flow Check



1. **Go to the Nozzle Flow Check** (Diagnostics, Tests, Nozzle Flow Check.) This test will operate the system as if it were running in the field as a speed and application rate you enter.
2. **Test Speed:** Enter your typical field operating speed.
3. **Rate:** Enter your typical application rate.
4. **Turn the Master switch on.**
5. **Pump** will turn on and begin applying the entered rate.
6. **Observe the system.** Are the flow and pressure on the screen stable and reasonable? Is the flow reasonable and equal from each application point?
7. **Repeat this test** at minimum and maximum values for both Test Speed and rate. Remember heavier fertilizer will have higher pressures at a given flow than water.

AgXcel John Deere Green Star GS2/3 Integration
Harness 37 round pin to Twin-16 round pin Y connector

WIRE SIZE – 18 AWG

LENGTH – 3 FT

AgXcel #53593
309-524

37 Pin Round AMP Male pins in male body (with threads for swivel nut)

Valve Ground	1
Valve Ground	2
Valve Power	3
Section 1	4
Section 2	5
Section 3	6
Section 4	7
Section 5	8
Section 6	9
Section 7	10
Section 8	11
Section 9	12
Section 10	13
	14
	15
	16
	17
	18
Section 12	19
Section 11	20
Flow Ground	21
Flow Signal	28
Pressure Signal	31
	35
Power	36
Power	37

Sections

16 Pin Round – AMP Male pins in male body with threads for swivel nut

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

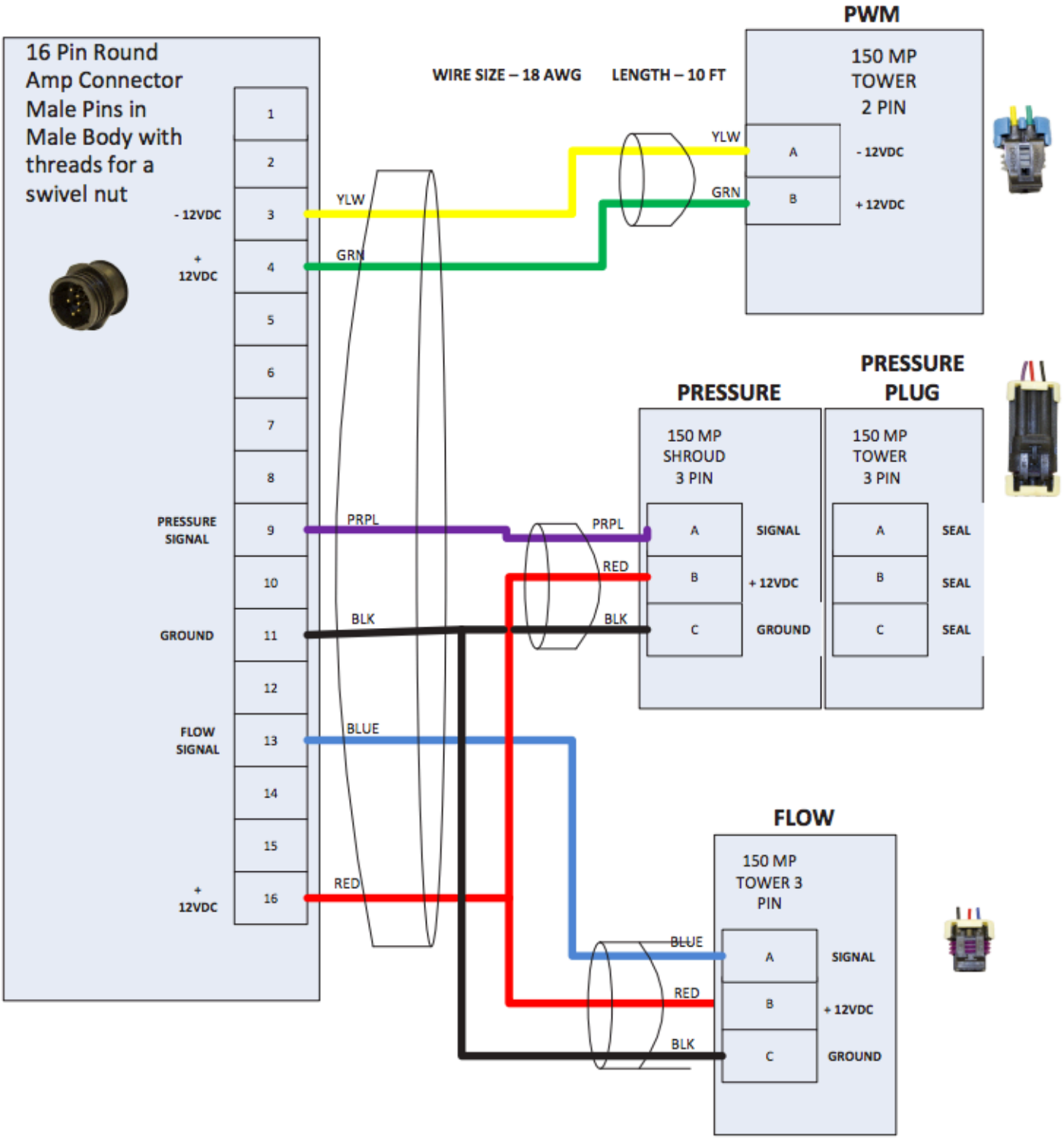
Pump

16 Pin Round – AMP Female pins in Female body with threads for swivel nut

1	GROUND
2	
3	Servo -/ PWM
4	Servo +/PWM
5	
6	Section 1
7	
8	
9	Pressure Signal
10	
11	Flow Ground
12	
13	Flow Signal
14	
15	
16	Power

PINK
GRN
YLW
BLK
BLUE
PRPL
RED
RED
PINK
PRPL
BLUE

AgXcel PWM Integration Harness, PWM, Flow Meter, Pressure



Quick Start Instructions for AgXcel's GX12HP Revolution

AgXcel's PWM Motor Driver

AgXcel has developed a state of the art driver that can handle even the harshest demands and environments in controlling its line of precision liquid application solutions. The on-board circuit technology can intelligently manage system resources which enables high demanding performance when controlling 12v electric pumps.

- GREEN – Power indicator that can alert when 12v is present or when voltage has dropped below superior performance levels
- BLUE – Complete monitoring of EMD PWM signal. Informs the user or proper signal strength and appropriate duty cycle
- YELLOW – Temperature control module that protects the unit from current spikes or high current heat
- RED – complete management and monitoring of motor current. This enhancement allows for the proper circuit current for electric motors
- ORANGE – intelligently monitors the appropriate voltage to electric pumps and closely monitors pumps performance

Quick Start Instructions for AgXcel's GX12HP Revolution

GX12HP Revolution Digital Replicator

The GX12HP system is designed to regulate the flow of chemical into a stream of a carrier line. The GX12HP has the ability to measure chemical using system technology and software programing with the use of a proximity sensor in which signals are captured and used to calculate flow of chemical from a positive displacement pump. In order to ensure that there is a constant flow of liquid, a sensor is used to detect pressure/flow.

There are 4 LED's on the GX12HP processor

- ***GREEN*** – When ON determines that the unit us receiving 12v
- ***YELLOW*** – Flow Signal A-B
  1. When ON solid, shows that the processor is detecting flow
  2. When OFF the processor is NOT detecting flow or flow has dropped below 0.03 gpm
  3. When flashing – Rate is fluctuating between the lowest detectable range
- ***BLUE*** – Master Output
  1. When OFF – signal on the proximity sensor is not being detected
  2. When Flashing – signals are being detected and managed
- ***WHITE*** – When Flow Sensor is Flashing then signals are being processed. This LED is used when the flow sensor is disconnected

When the system is functioning correctly, the GREEN LED will be in the ON SOLID state, the YELLOW LED will be in the SOLID ON state and the BLUE LED will be flashing ON/OFF continuously demonstrating that there is flow.