

MENU STRUCTURE FOR LIQUID RATE CONTROLLER



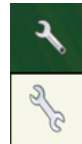
Home

- Support
- System Information
- Event Setup



Map

- Field Display
- Target Rates
- Flow Display



Config Selection

- User Config.
- Equip. Config.
- System Config.

System Information

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



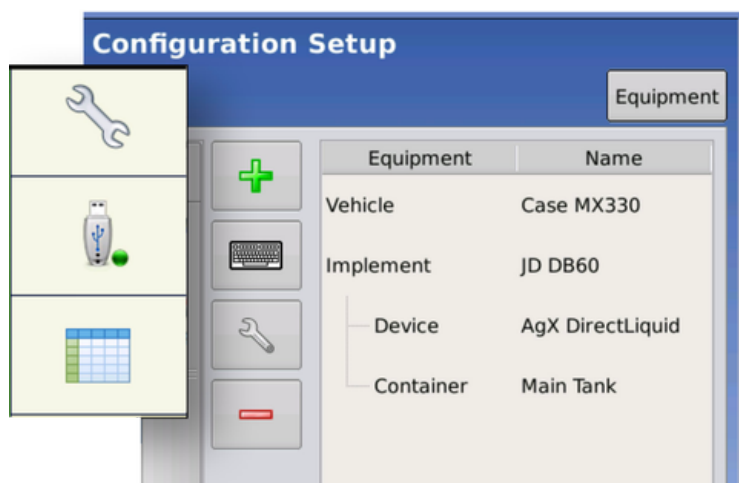
Integra & InSight Users

Information in this manual is applicable to the InSight except for screen-shots shown in the **Setup & Operation**. The **Calibration** and **Setup** values in this section **DO apply to the InSight**. However, the InSight has a completely different screen layout and menu structure that is not shown in this manual. Use your AgLeader manual to navigate, then enter the appropriate numbers from the AgXcel manual.

Configuration – Setup

In the **Setup** menus, you will set the AgLeader display to work properly with the AgXcel Fertilizer Pump System. Carefully follow these steps to first make the proper settings. Then, run the tests shown to verify your fertilizer system is ready to go to the field.

- From the “**Home**” screen, press the “**Wrench**” icon on the top right, which will take you to the **Configuration Setup** screen.
- Once on the **Configuration Setup** screen, choose “**Equipment**” on the top right of the screen.



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!

Configuration Setup

Configuration – Setup cont.

- Next, choose the **Implement** tab in the middle and touch the green “+” button to add a new implement.
- On the **Choose Implement Type** screen, you will need to select **Application** when setting up any AgXcel Fertilizer Pump Systems.
- Next, select the **tractor** being used with the **implement** and press the right arrow button.
- After the **tractor** has been selected, you can select an **existing implement** such as a planter or press the green “+” button to add a **new implement**.
- When adding a **new implement**, the **Implement Wizard** screen will appear where the user can define the **Make and Model** of the implement. When the information is displayed correctly, press the right arrow button.
- Next, add how the implement **attaches** to the tractor and press the right arrow button.
- On the **Application Channels** screen, press the “+ **Liquid Application**” button on the top right of the screen.
- Select the appropriate **liquid rate controller** and press the right arrow button.
- Choose a **name** and **capacity** of the **tank** being used on this implement. Press the right arrow button to continue.
- On the **Section Count Screen**, enter the number of sectional valves if applicable and press the right arrow button.

Setup

Vehicle Implement Controller

All Implements

+ Agxcel 15

+ Gx3

+ Gx4

+ Gx5

+ Gx6

+ Gx7

+ Gx8

+ JD 550

Choose Implement Type

Tillage Create a tillage implement.

Planting Create a planting implement.

Application Create an application or strip-till implement.

Header Create a harvest combine header.

Tile Plow Create a tile plow implement.

Implement Wizard: Attachment Type

Implement Attachment Type

Rear Drawbar

Implement Wizard: Application Channels

Type	Controller	Channel	Container
			+ Liquid Application
			+ Direct Injection
			+ Granular Application

Equipment Setup Wizard: Rate Controller

Select Application Rate Controller

AgX DirectLiquid

Equipment Setup Wizard: Container

Container Name	Capacity	Units
Main Tank	500	gallons

Equipment Setup Wizard: Section Count

Enter Number of Boom Sections

4

TIP: DO NOT enter the number of individual rows. For most implements, enter the number of swath sections that can be independently turned on and off.

Configuration Setup

Configuration – Setup cont.

- Select the appropriate **implement swath width** and press the right arrow button.
- Verify the width of each section on the **Section Configuration Screen** and press the right arrow button to confirm it.
- Enter the **distance from the hitch to the application point or row unit** and press the green check mark to complete the setup.

Section	Swath Width (ft)
1	15.0000
2	15.0000
3	15.0000
4	15.0000

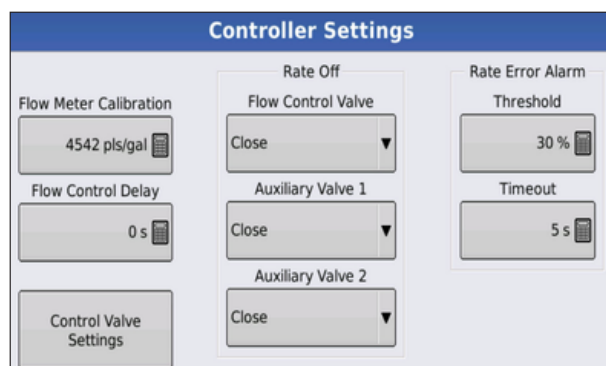
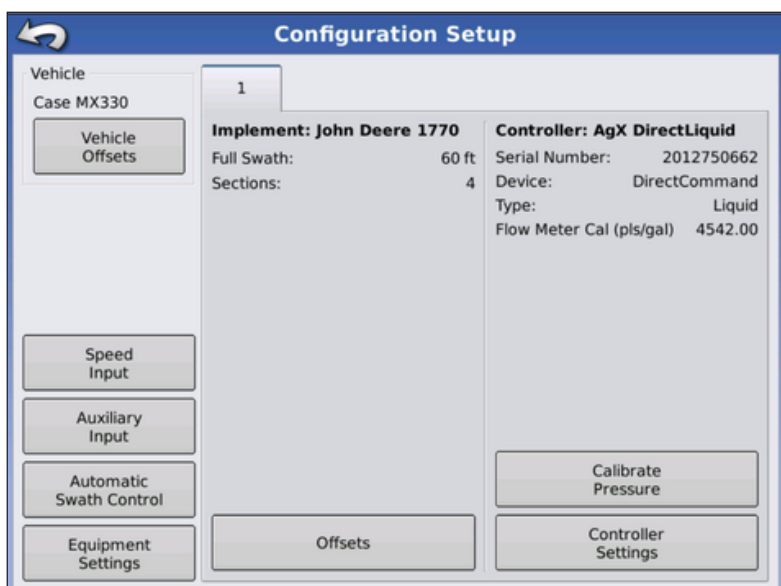
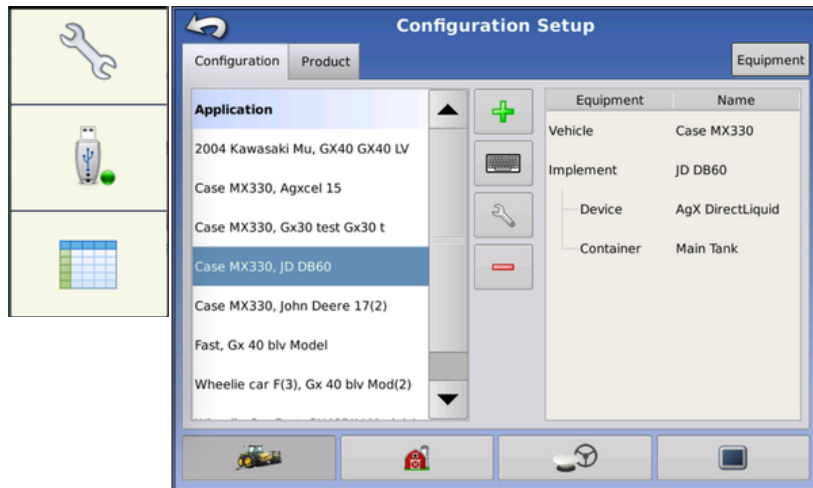
- It will return you back to the **Application Channels Screen** where you can add additional applications to the implement. **For example**, if an in-furrow application set-up has been completed and a 2x2 application needed to be added the “+ Liquid Application” button would be pressed and the set-up process would be repeated for the 2x2 system.
- When all applications have been set up correctly, press the **right arrow button**.
- Set up **OptRx sensors** if applicable and press the right arrow button.
- A pull behind tank can be configured on the **Hitch Point Configuration Screen**. Once configured, press the right arrow button.
- Finally, enter the **implement’s name** and press the green check mark to complete the set-up.
- When completed the implement should appear on the **Setup Screen** under the “Implement” tab.

Type	Controller	Channel	Container
Liquid	AgX DirectLiquid		Main Tank

Configuration Setup

Configuration – Setup & Calibrate

- From the **Home Screen**, choose Setup (Wrench icon)
- The **Setup Screen** will appear. Choose the “**Configuration**” tab.
- From the **Controller Menu**, select the controller you want to change or use the **Add** button to create a new controller.
- Select the **Wrench** icon in the mid-dle of the **Configuration Screen**.
- From this menu, choose the **Controller Settings** button. This will enter the controller menu where the parameters must be set to accurately control your AgXcel Fertilizer Pump System.
- The AgLeader can store multiple configurations. The controller settings used for each configuration are listed on the right of the **Configuration Setup** screen. Use Configuration settings to change these items. You will want to set items in the vehicle, implement, and product screens. Consult your manual or AgLeader dealer for assistance with those settings.
- On the **Controller Settings Screen**, set the settings as shown:



Flow Control Delay:
All Systems.....0

Flow Control Valve:
All Systems.....Close

Threshold:
All Systems.....30%

Auxiliary Valve 1:
All SystemsClose

Auxiliary Valve 2:
All SystemsClose

Timeout:
All System5 secs

*Note: The Flow Meter .08 – 1.6 is exclusively used for the GX40 Synergist to attain such low volumes. The flow meter calibration is 22710.

Flow Meter Calibration*:
See *AgXcel's Flow Meter Guide*

Flowmeters

ORION 2+ MAGNETIC FLOWMETER MODELS



Orion 2+ Magnetic Flowmeters:

- 0.053 - 5.3 GPM.....11355
- 0.53 - 53 GPM.....1135
- 2.11 - 211 GPM.....284

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

ORION 3 MAGNETIC FLOWMETER MODELS



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

Control Valve Settings	
Control Valve	PWM 12 volt ▼
PWM Frequency	100 [calculator icon]
PWM Gain	9999 [calculator icon]
PWM Standby	50 [calculator icon]
Zero Flow Offset	5 [calculator icon]
Allowable Error 3 % ▲▼	

*Note: PWM Standby setting is not used if Flow Control Valve is set to Close, but still needs to be set.

**Note: Zero Flow Offset can be set higher if system is slow to reach Target Rate when starting. Can be set lower if pump will not go slow enough for low rates.

Press the Control Valve Settings button on the Control Settings screen. This will bring up the Control Valve Settings Screen. Set the settings as shown:

Control Valve:
PWM 12 volt

PWM Frequency:
GX5 (hydraulic diaphragm)...100
GX5 (hydraulic centrifugal)...122
GX2.....100

PWM Gain:
GX5 (hydraulic diaphragm).....2500
GX5 (hydraulic centrifugal).....150
GX2 (electric)..... 9999

PWM Standby*:
All Systems.....50

Allowable Error:
All Systems.....2%

Zero Flow Offset**:
GX5 (hydraulic diaphragm).....20
GX5 (hydraulic centrifugal).....20
GX2 (electric).....10

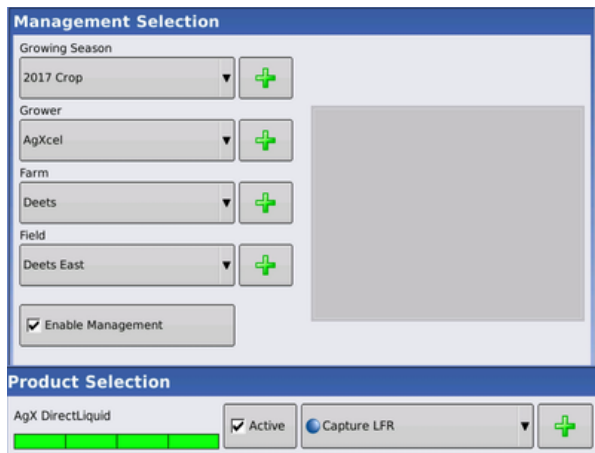
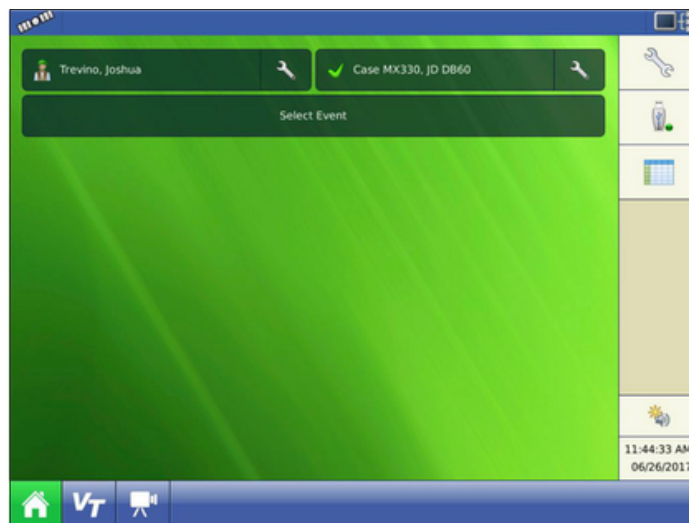
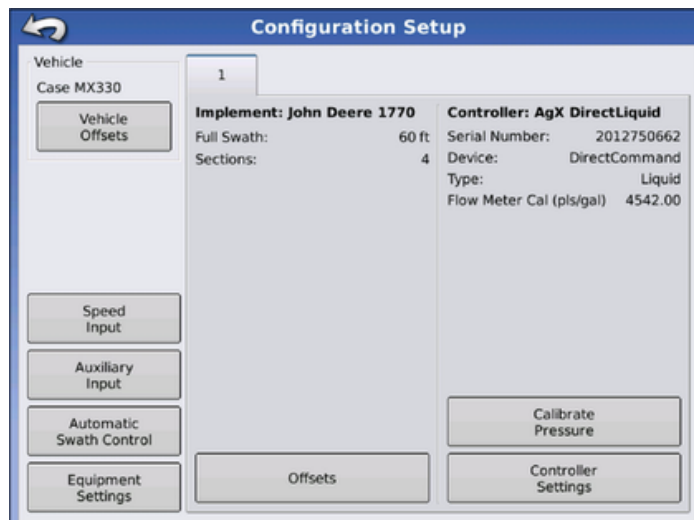
Pressure Calibration

Configuration – Pressure Calibration

- The AgXcel harness includes a connection for an electronic pressure sensor.* The sensor is identified as “Main Pressure” in the AgLeader display.
- From the **Configuration** Setup screen, choose **Calibrate** Main Pressure.
- Enter values in the calibration
- **Note: The pressure sensor is an optional feature!*

Configuration – Calibration

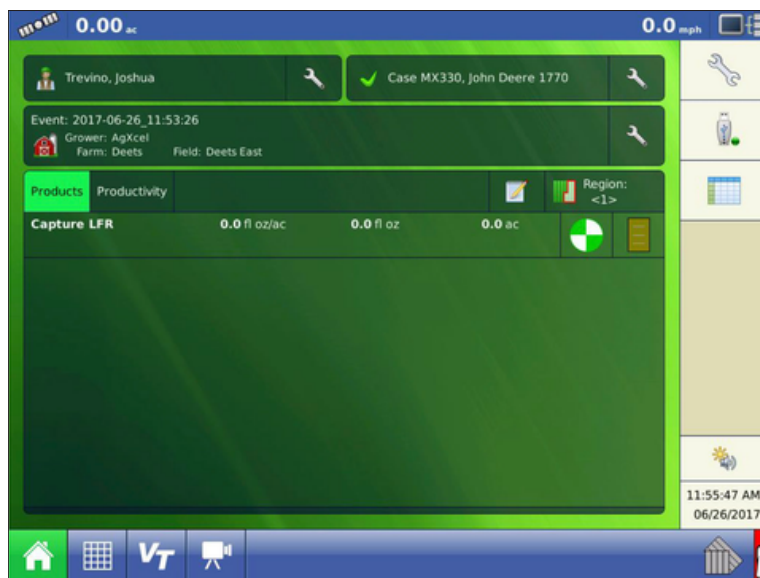
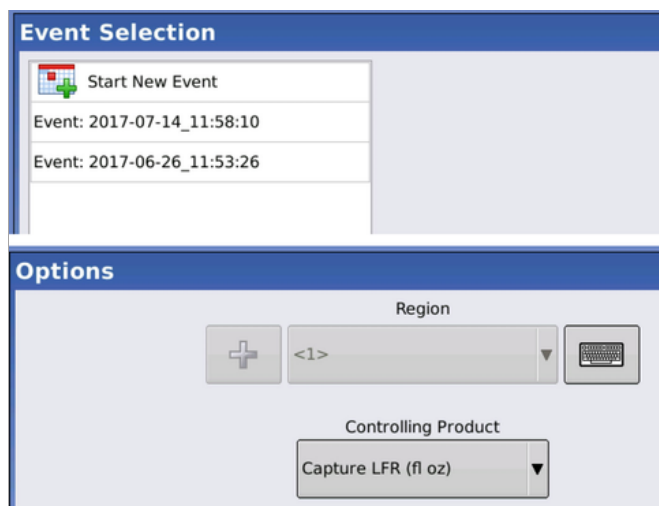
- *AgXcel highly recommends you perform these exact steps with water to verify that your AgXcel System is correctly installed and ready for field use.*
- On the **Home** screen, select your **Operator** and your **Equipment** that you will be using
- Press the **Select Event** button
- Select **Growing Season, Grower, Farm, & Field** from the drop-down box or add new selections by pressing the green “+” button. Press the right arrow button.
- On the **Product Selection** screen, select the product being used from the drop-down box or press the green “+” key to create a new product. When completed press the right arrow button.



Pressure Calibration

Configuration – Calibration cont.

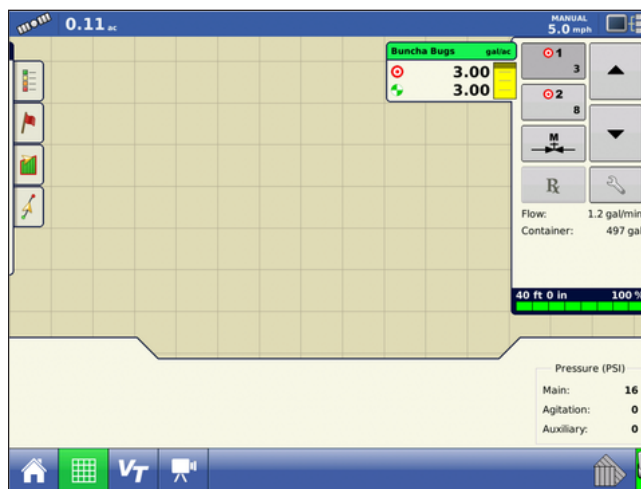
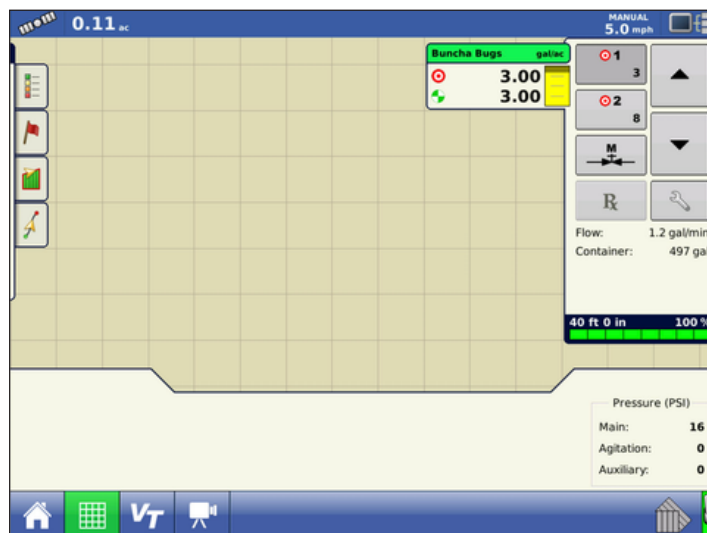
- You can select a previous event that has been created or you can create a new event by pressing the **Start New Event on the Event Selection Screen.**
- Finally, select the region and the **controlling product**. When this is complete, select the green check mark button to finish setting up a new field.
- The **Home** Screen will now have an Operator, Equipment, and Event selected and loaded.
- Press the **Grid icon (Map)** on the bottom left of the **Home** Screen.
- **Note:** To simulate speed to test flow without moving, you must go to the **Configuration Setup** screen. Press the **Wrench** icon next to your selected equipment. Press the **Speed Input** on the left to enter your simulated speed in mph.



Pressure Calibration

Configuration – Calibration cont.

- To **adjust rates**, touch the tab where the rate information is displayed.
- Rates 1 and 2** can be selected or a variable rate prescription can be loaded. Press the Wrench button on the right side of the rate screen.
- The **Rate Controller Settings** screen will appear. From this screen both Rate 1 and Rate 2 can be entered along with the minimum flow. Press the **Minimum Flow** button.
- Once pressed the minimum flow threshold can be set. **AgXcel recommends the minimum flow be set to "0"**.
- After rates and minimum flow are set, return to the main operation screen to conduct a **catch test**.
- Enter the **manual mode** by pushing the "M" button under the Rate 1 and Rate 2 buttons. You can tell when you are in manual mode when the "Target Rate" says "OFF".
- On the switch box, turn the **master switch ON**. Turn section switches on and off to check proper section valve operation. Leave all section valves "ON".
- Use the up arrow on the right side of the screen to increase flow. **Does "Flow Rate" display a flow rate? Is it stable after the system is primed? Do the increase and decrease buttons increase and decrease the flow?**
- Next, **perform a catch test** using either automatic rate 1 or 2 while utilizing the simulated speed set earlier. The simulated speed should be displayed in the upper right-hand corner of the screen.
- This is also a good time to ensure the rate adjusts when the section valves are turned on and off through the switchbox.**



TROUBLESHOOTING

Why am I Over-Applying?

- Ensure that your Minimum Flow Rate is set to 0. This setting can be found in your Rate Controller Settings where you change your preset target rates.
- 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 Threshold set at 10%. This can be found under Configuration Setup > Controller Settings > Rate Error Alarm.
- Lower the PWM Gain. This setting can be found in Configuration Setup > Controller Settings > Control Valve Settings. The higher this value 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 PWM Gain is too low, then the pump can become too slow and take too long to reach your target rate.
- 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.

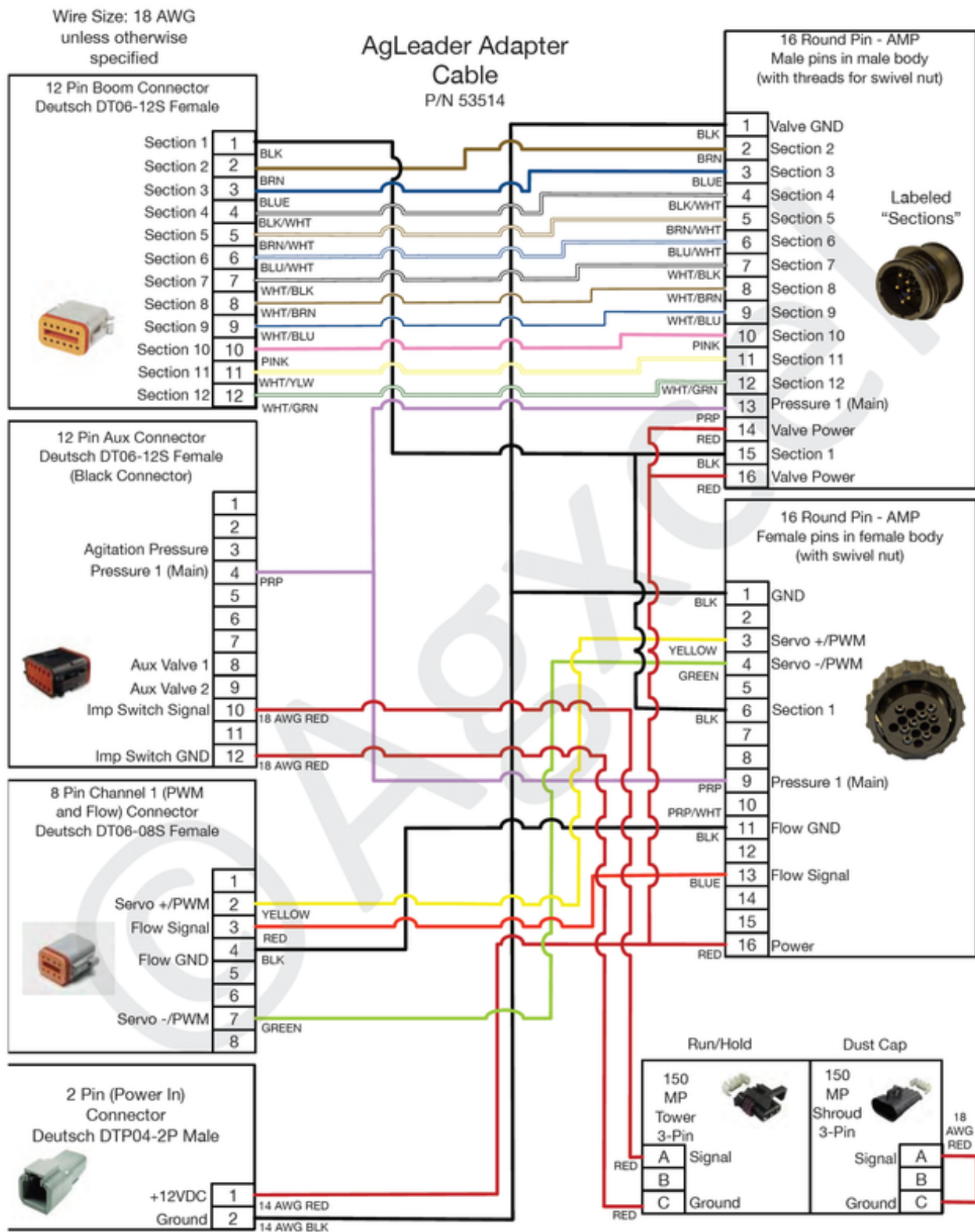
What should my system pressure be?

- 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.

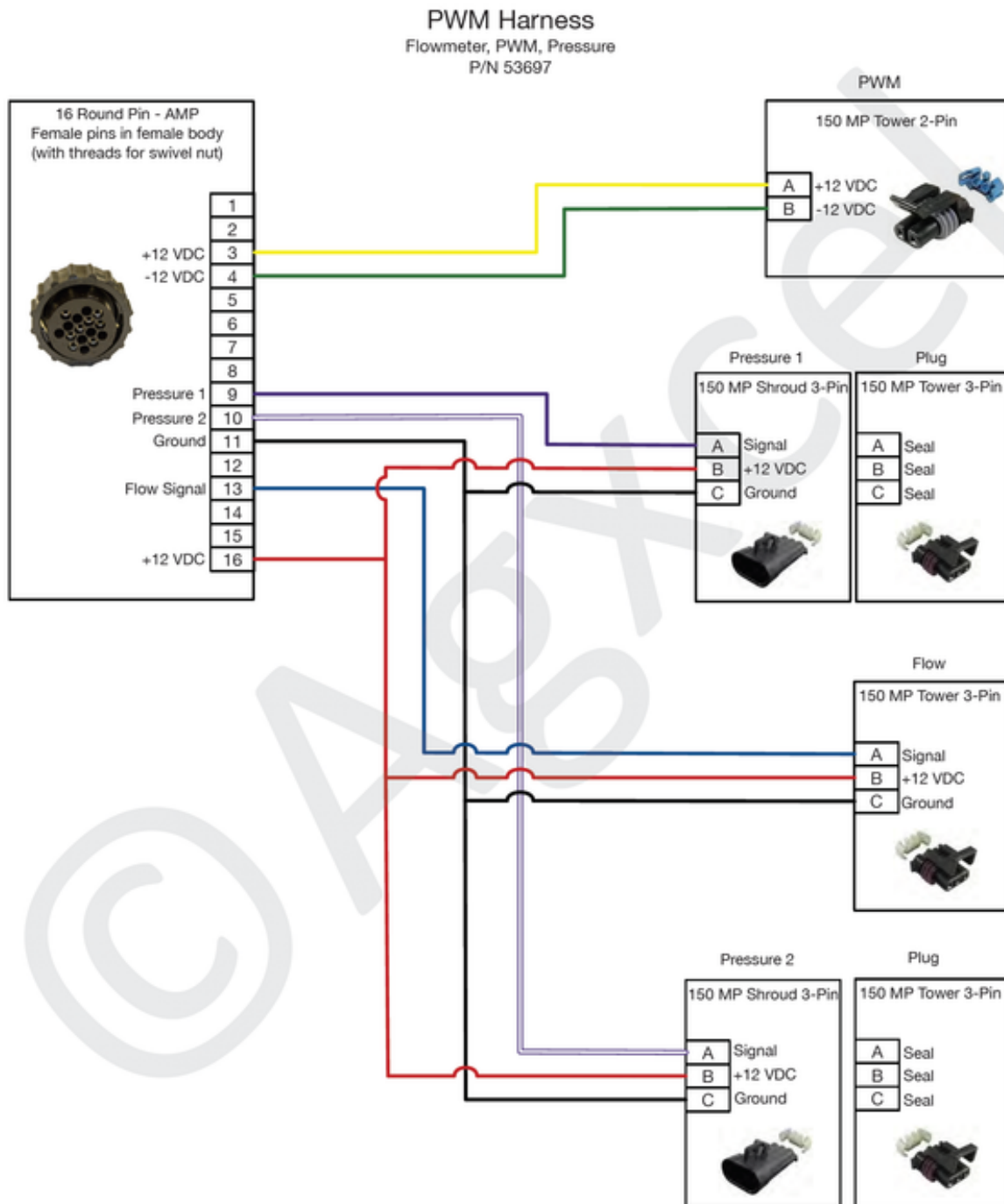
Why is my controller tells me I am applying the correct amount, but I am actually applying more/ less at the rows?

- 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.

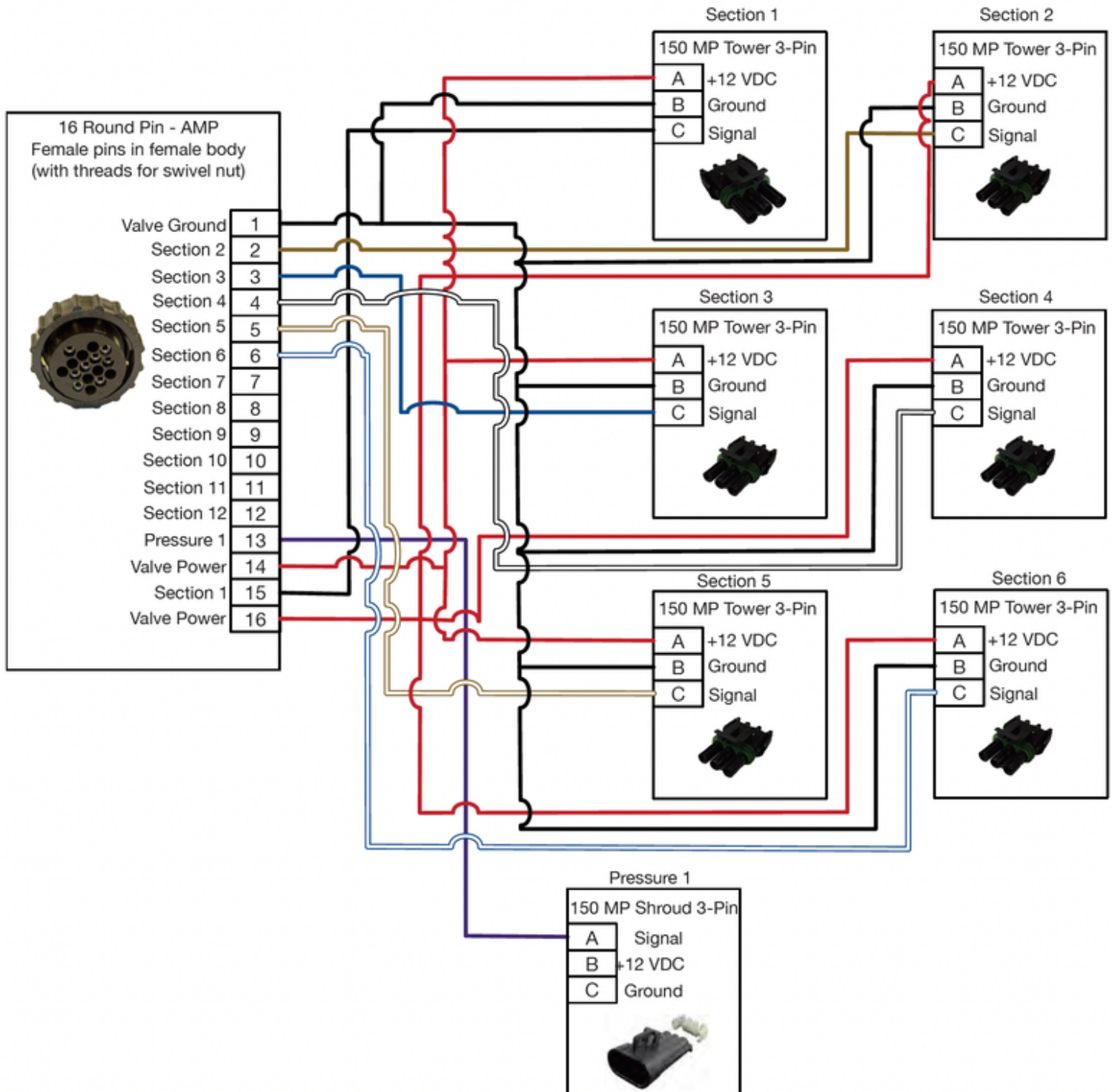
AgLeader Direct Command Harnessing



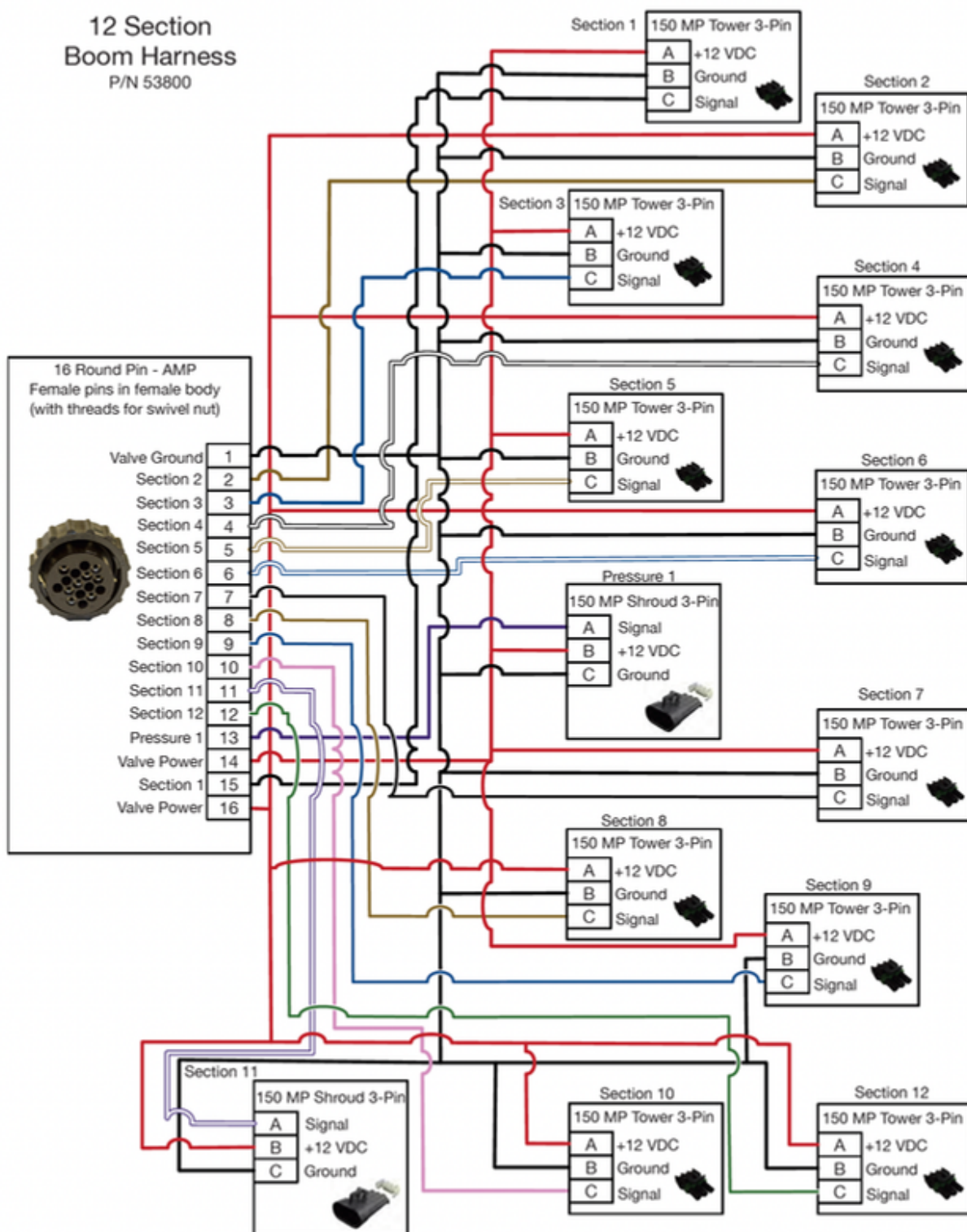
AgLeader Direct Command Harnessing



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