

FlowSense™

FlowSense Installation Guide

Precision Planting®

Contents

System Requirements	3
CAN FlowSense Installation	5
CAN FlowSense Sequential Install (Gen2 Monitors Only)	6
AUX based FlowSense Installation.....	8
EM FlowSense Installation.....	10
Plumbing Installation.....	11

System Requirements

FlowSense is designed to monitor the liquid application rate of individual row units.

Note: FlowSense is not compatible with **RowFlow Liquid**.

- AUX FlowSense
 - AUX FlowSense will work with SRM or RUM (AUX port on SRM or RUM)
 - **All RUM systems are limited to 1 liquid product (AUX FlowSense) and 50 Rows of FlowSense total. Any planter over 28 rows will require 2 smart connectors.**
 - Requires additional RUMs and Harnessing for FlowSense on every row with additional sensors (Lift switch, Vacuum, etc) on Smart Connector Systems
 - Requires a Gen 2 Display and Gen 2 Smart Connector if installing on RUMs
 - If more RUMs are required than the number of planter row units, the Four Row RUM Expansion Harness Kit (725369) can be used to add additional RUMs.
- CAN FlowSense
 - CAN FlowSense is only needed when monitoring 2 products. **One single CAN FlowSense will handle 2 products (it has two FlowSense modules)**
 - Requires Expansion Hub with CAN Jumper Harness
 - Each port on the CAN FlowSense can be changed between High and Low flow by changing out the turbine.
- EM FlowSense
 - EM FlowSense will only work with the 20/20 Gen3 Monitor installed
 - Requires expansion hub with CAN jumper harnesses

Operating Ranges:

- Max sealing pressure - **100 psi**
- Flow range (low flow sensor) = **.07 - .90 GPM**
- Flow range (high flow sensor) = **.20 - 2.5 GPM**
- Minimum and Maximum FlowSense GPM do not match vApplyHD capabilities due to geometric efficiency differences.

Wetted Materials - PolyPropylene, Viton, Stainless Steel, Nylon

Fertility Products -

- Not compatible with Anhydrous Ammonia
- AUX and CAN FlowSense are not compatible with suspension fertilizers.

Note Suspension fertilizers are fluids in which solubility of the components has been exceeded and agitation is needed to keep the fertilizer “mixed up”. EM FlowSense IS compatible with suspension fertilizers.

Useful equations:

- **GPA** = (GPM × 5940) ÷ (MPH × Row Spacing (inches))
- **GPM** = (GPA × MPH × Row Spacing (Inches)) ÷ (5940)

Note: An 80 Mesh Screen or tighter filter is required to be installed between the pump and the distribution system to ensure that the system remains clean and free of debris for AUX and CAN Flowsense. For EM FlowSense, a 50 mesh filter is recommended.

AUX FlowSense Lights

The AUX FlowSense LED diagnostic light consists of a combined Red LED and a Green LED. The green LED will illuminate anytime the FlowSense has power. The red LED will illuminate when the FlowSense turbine signal is triggered (i.e. when the electromagnetic reading is positive).

As a result of the dual LED configuration and event functions, the following visual colors will result for the end user:

- Green or Orange will be indicated when FlowSense is plugged in and powered but no liquid flow is measured.
 - Green will show when plugged in and the flow sensor is in a position that isn't measuring a positive reading ("off")
 - Orange shows when plugged in AND the flow sensor is positioned in a location that is measuring a positive voltage ("on"). Orange is the result of both Green and Red LEDs being on at the same time and constant. This will be used to validate that FlowSense is plugged in and ready to run but may also indicate a stuck/clogged/jammed sensor if liquid is in fact flowing.
- Yellow is indicated when product is flowing. Yellow is the result of combining both the solid green LED (indicating power) and a rapidly pulsing red LED (indicating product flowing through the sensor).

CAN FlowSense Lights

The CAN FlowSense LED diagnostic lights consists of two yellow lights, one for port A, one for port B. Each light will pulse as the turbine spins.

There is also one red LED which displays FlowSense module communication with the SRM system.

Light Pattern	Meaning
No Light ()	Device is not powered
Solid Light (____)	Device is being updated
Fast Blink (5Hz) (.....)	Device is powered, but lost communication
Steady Blink (1 Hz) (- - - -)	Device is powered and is communicating
Erratic Blink (..-.-.)	Device is powered, but never communicated

CAN FlowSense Installation

One CAN FlowSense can monitor up to 2 liquid products per row or can monitor up to two rows of one product using CAN sequential mode. Refer to the next section for further details on CAN sequential mode.

Step 1:

Mount the FlowSense module using the provided two bolt holes with zip ties.



Step 2:

Locate the CAN Hub and run a CAN jumper from the CAN Hub to the FlowSense module. Multiple CAN jumper lengths are available. Refer to the FlowSense Operators Manual on how to assign port A/B to the desired product.



CAN FlowSense Sequential Install (Gen2 Monitors Only)

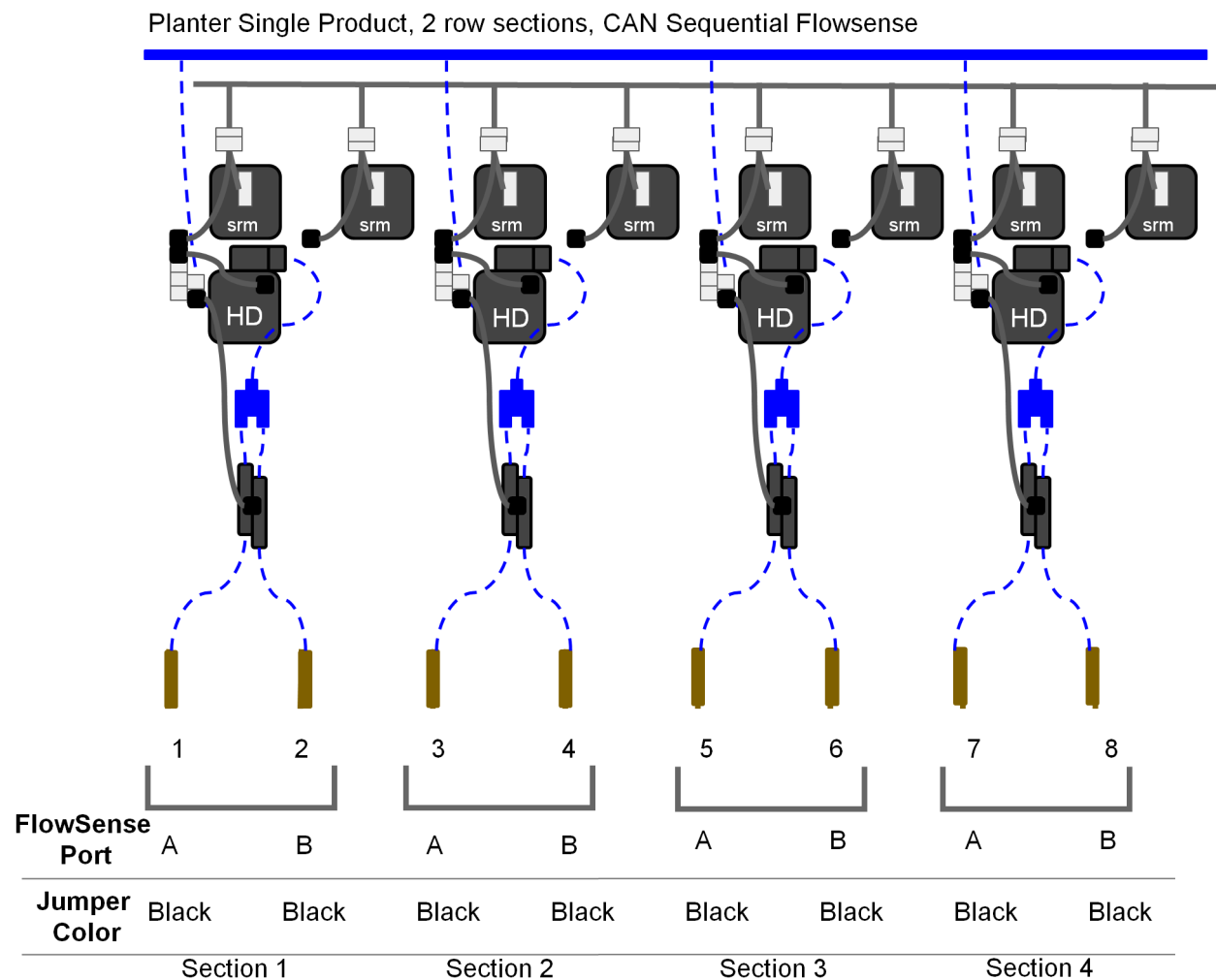
CAN Sequential Mode can be used in the vApplyHD Section setup to assign a CAN FlowSense port (either A or B) to a row that FlowSense is not plugged into. CAN Sequential Mode is only supported for vApplyHD Section control and can only support up to four rows per section.

FlowSense **MUST** always be plugged in to the same SRM as the vApplyHD it is monitoring. This may result in some FlowSense ports not being used.

With CAN Sequential Mode, the black CAN jumpers will plug into FlowSense for the first two rows in each section, and the brown CAN jumpers will plug into FlowSense for the second set of rows (3–4).

FlowSense CAN Sequential 2 Row Sections

FlowSense port A will automatically assign to the first row in the section and port B will automatically assign as the second row in the section. Refer to the diagram below for a basic 2 rows per section setup.



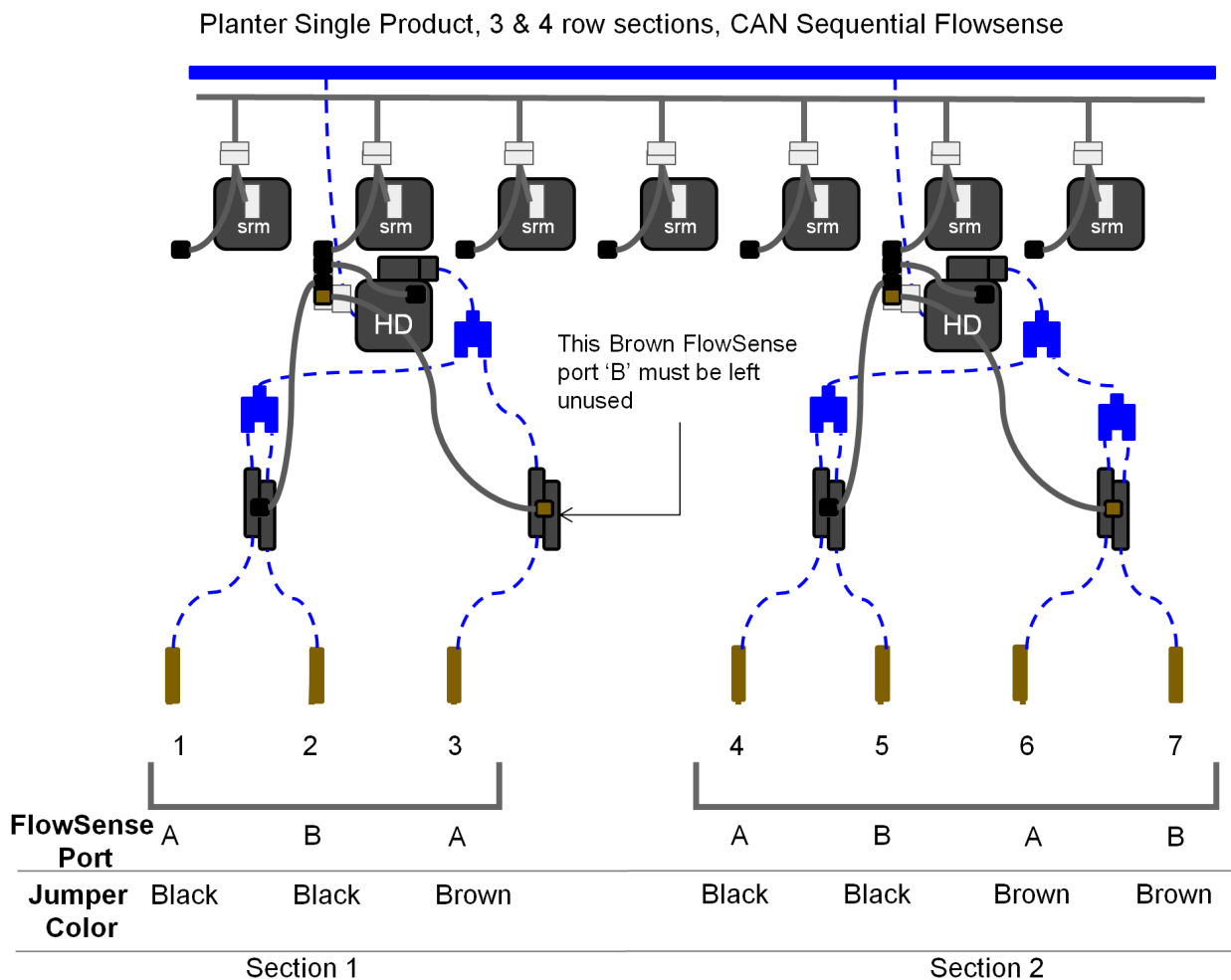
FlowSense CAN Sequential Mixed Row Sections

If FlowSense is being used with CAN Sequential mode in the 2020 SeedSense display, FlowSense **MUST** be plugged in to the same SRM as the vApplyHD it is monitoring.

Rows 1 and 2 of each section will be plugged into the FlowSense using a **black** CAN Jumper. (ports A/B respectively)

Rows 3 and 4 of each section will be plugged into the FlowSense using a **brown** CAN Jumper. (ports A/B respectively)

Note: In the below example the section one, brown jumper FlowSense port 'B' cannot be used for row 4 because it is not connected to the same SRM as the Second Section's vApplyHD module.

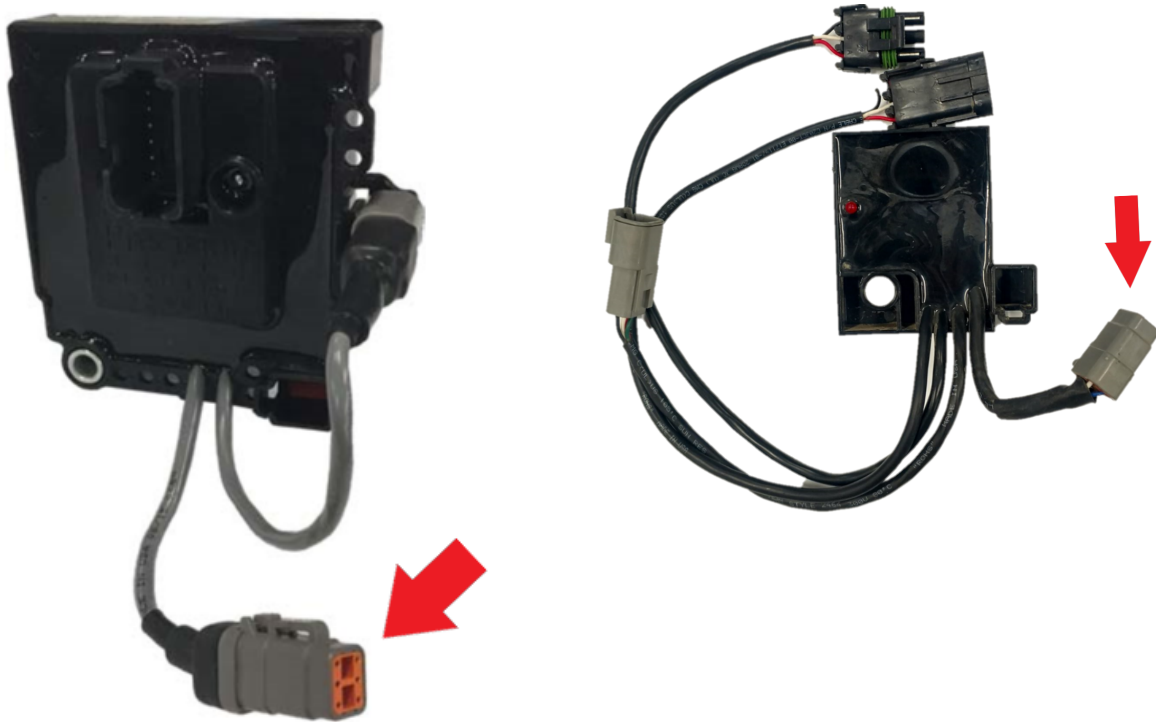


AUX based FlowSense Installation

Step 1:

Locate the AUX port on the RUM or SRM and remove it from the molded cap. If there is a lift switch or vac sensor already plugged into the AUX plug on the SRM, remove that connection temporarily.

Note: RUMs only support one AUX sensor per RUM. Refer to the section in this manual on System Requirements for additional information.



Step 2:

Plug the Y-harness from the FlowSense into the AUX plug.



Step 3:

If a secondary AUX sensor (FlowSense, Lift Switch, Vac Sensor) needs to be installed into the SRM, plug that AUX sensor into the other end of the FlowSense Y. If this is a RUM, add additional RUMs to the planter to accommodate additional AUX sensors.



Step 4:

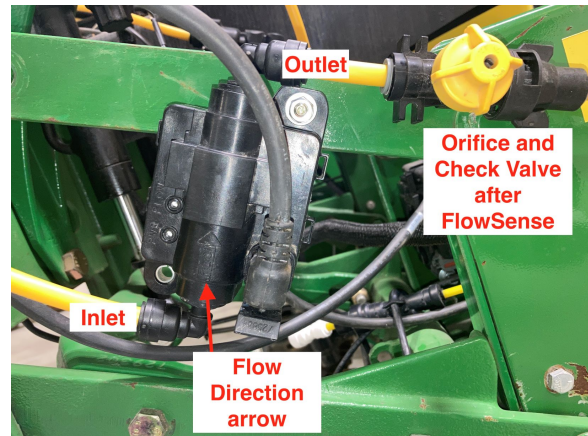
If there is no additional AUX sensor to install, plug the other end of the FlowSense Y-harness back into the SRM or RUM AUX plug.



EM FlowSense Installation

Step 1:

Mount the FlowSense using the provided two bolt holes with zip ties or bolts. It is preferred that the FlowSense be mounted vertically with the inlet at the bottom and the outlet at the top. This ensures that the FlowSense is full of product. There is an arrow molded into the EM FlowSense module indicating the direction of flow.



Step 2:

Locate the CAN expansion hub on the row and run a CAN jumper from the CAN hub to the FlowSense module. Multiple CAN jumper lengths are available. If more than one EM FlowSense is connected to the same row, use different color jumpers to identify the 2nd, 3rd, or 4th FlowSense on that row. The CAN jumper may connect to any location on the CAN hub.



Step 3:

It is required that an orifice plate or metering tube is located after the FlowSense. Size this appropriately for the desired flow rate. See the video on Product Resources for “Using the LiquidMax to find a good orifice.” There also needs to be a check valve located AFTER the FlowSense to keep it full of fluid. Many times the device holding the orifice plate may also include a check valve.

Step 4:

Each EM FlowSense device installed can use up to 0.25 amps. Calculate the additional power requirement and ensure that there is enough electrical capacity available on the planter. If necessary, add additional power supply capacity.

Plumbing Installation

FlowSense is designed with either $\frac{3}{8}$ " (High Flow) or $\frac{1}{4}$ " (Low Flow) PTC fittings that allow the sensor to be added directly into the existing tubing on your equipment. PTC adapters (listed below) are also available to easily connect to the installed tubing to the FlowSense if necessary.

Note: Low Flow FlowSense modules must have an orifice of .065" or smaller installed with it. In order to protect the sensor from high rate over spinning, it is shipped with a .065" orifice body already installed in it. If you are using your own orifice that is smaller, you may remove this orifice.



$\frac{3}{8}$ " Elbow (90deg) Stem Adapter (10pk)	724093
$\frac{3}{8}$ " PTC Stem to $\frac{3}{8}$ " Hose Barb, w/ Hose Clamp (10pk)	724045
$\frac{3}{8}$ " to $\frac{1}{4}$ " PTC Straight Union Adapter (10pk)	724087
$\frac{3}{8}$ " to $\frac{1}{4}$ " Straight Stem Adapter (10pk)	724042

To add FlowSense to the plumbing system, cut the tubing at a location that is conducive to connecting the FlowSense and insert FlowSense in the direction of flow as indicated by the arrows on the housing.

Note: It is recommended to connect FlowSense to the plumbing before the final check valve. This will prevent partial draining while not planting.

Note: It is also recommended that all systems have appropriately sized orifice plate or orifice tubing installed after the FlowSense. For sizing, see the video on product resources for “Using LiquidMax to find a good orifice”