

RAVEN CONTROL MODULE

AgXcel Quick Start Setup



PLEASE NOTE: YOUR SETUP MAY VARY!

The screenshots in this guide represent a typical AgXcel Liquid Fertilizer System setup.

See the Raven SGM Operator's Manual for safety information and additional setup and operating information.

Raven SGM (Sensor Gateway Module) Setup Guide

To enable the SGM to work with the RCM two RCM setting must be configured correctly. If you are setting up the RCM & SGM for the first time then the RCM should prompt you to enter your profile settings.

SETUP BLOCKAGE SENSORS

- Check the “Enable Blockage Monitoring System” box during the RCM setup
- Section Sensors Setup - with Section Control
 - Starting Sensor
 - Starting Row for the Section
 - Number of Sensors
 - Number of Rows in the Section

The screenshot shows the 'Setup Blockage Sensors' window. At the top, the title is 'Setup Blockage Sensors'. Below the title, there is a checkbox labeled 'Enable Blockage Monitoring System' which is checked. At the bottom of the window, there is a 'RAVEN' button and two navigation icons (back and forward).

The screenshot shows the 'Setup Blockage Sensors' window with the 'Product 1 Liquid' section selected. It displays a table with two columns: 'Starting Sensor' and 'Number of Sensors'. The table has two rows of data.

Section	Starting Sensor	Number of Sensors
1	1	4
2	5	4

At the bottom of the window, there is a 'RAVEN' button and two navigation icons (back and forward).

- Section Sensors Setup - With No Section Control
 - Put 1 as the starting sensor
 - Put the number of rows as your number of sensors

If you have already setup your RCM then you'll have to go back and edit the RCM profile. Return to the Virtual Terminal selection screen and click on the Raven RCM Virtual Terminal.



SETUP BLOCKAGE SENSORS Cont.

- Click on **Setup Tab** (Cog Wheels), then the **Setup Tab** (Tractor) and press the **Edit** button.



Raven RCM-Setup 6X7/30 1 Prod 8R

Applicator Setup

Profile Name GX7/30 1 Prod 8R
Machine Type Liquid Fert. Tool

Change/New **Edit** Remove

20.000 (ft)

Section Setup Summary

Precision Farming Setup

Enable Wireless ☐ Test Speed

- Keep going through the RCM setup until you are brought to the "Setup Blockage Sensors" pages (2 total).
- Enable Blockage Monitoring System:** Check this box to use the SGM with the RCM.
- If you entered your number of sections earlier in the RCM profile setup, you will also need to match that section setup with this SGM section setup page. **Note:** Number of Sensor means number of rows per section.

Setup Blockage Sensors

Enable Blockage Monitoring System ☒

Setup Blockage Sensors

Product 1 Liquid

Section	Starting Sensor	Number of Sensors
1	1	4
2	5	4

SETUP

When first connecting the Raven SGM, you will be prompted to enter the profile information.

Name Profile

- **Profile Name:** Enter your desired name of the profile (such as the name of the fertilizer, the implement model, etc.)
- **Application Type:** Set to "Liquid"
- Check the "Rate Controller Communication" box

If you do not have section control, enter the "Number of Sections" as "1".

Section Setup

- **Number of Sections:** Enter the number of sections for your pump setup. If you do not have any section valves, enter 1.
- **Row Spacing:** Enter the spacing of the rows here.
- **Number of Sensors:** Enter the total number of rows you are monitoring flow with.

SETUP

RATE SENSOR SETUP

- **Flowmeter Calibration:**
 - For the AgXcel Magnetic Flowmeter enter 38000.
- **Flowmeter Pulses / Unit:**
 - Enter gal.
- **Outside Rows 0.5X Rate:**
 - Only check this box if the outside rows are going to apply at 1/2 rate from the center rows.
- **Outside Rows 1.5X Rate:**
 - Only check this box if the outside rows are going to apply rate plus 50% more from the center rows.

Sensor Voltage Setup

- The Raven SGM is designed to work with 12 volts:
 - Set the sensor voltage to 12 volts

SETUP

SETUP SUMMARY

Ensure the settings have been entered correctly in this “Setup Summary” page for your setup.

Setup Summary

Profile Name

AgXcel

Application Type

Liquid

ECU Mode

Rate Controller Communication

Sections

2

Application Width

20.0 (ft)

Rows

8

Row Spacing

30.0 (in)

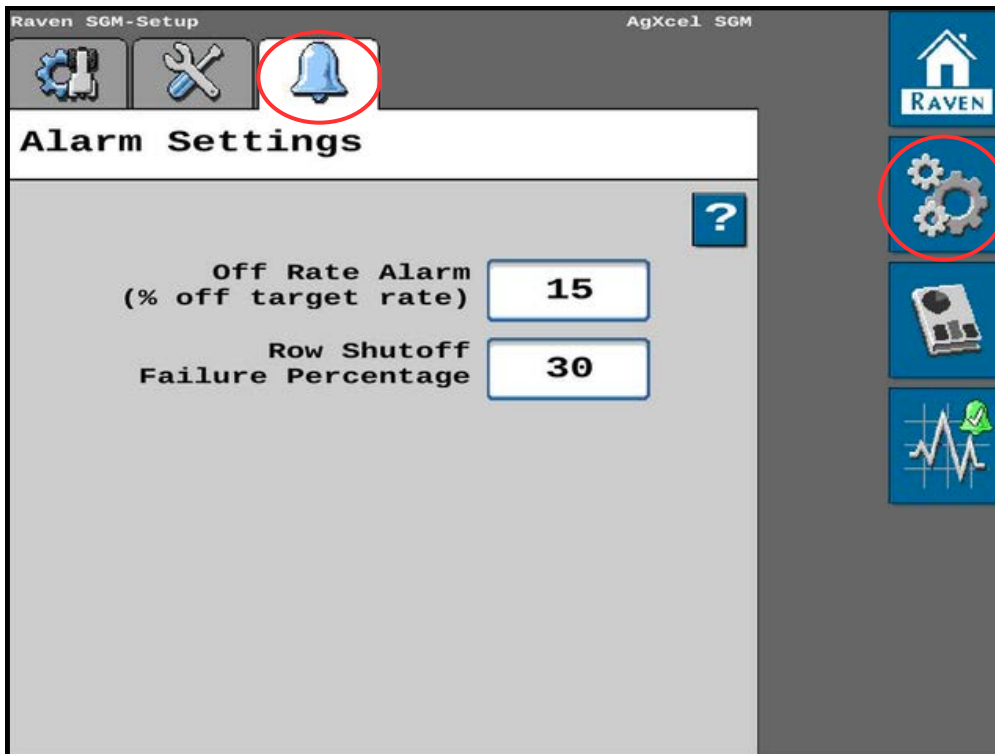
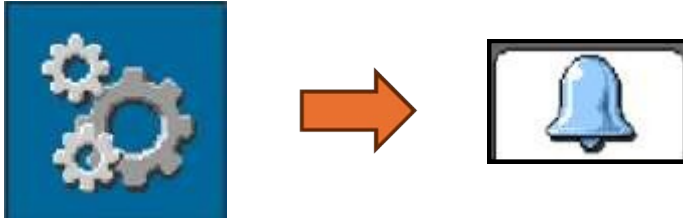


RAVEN



SETUP - ALARMS

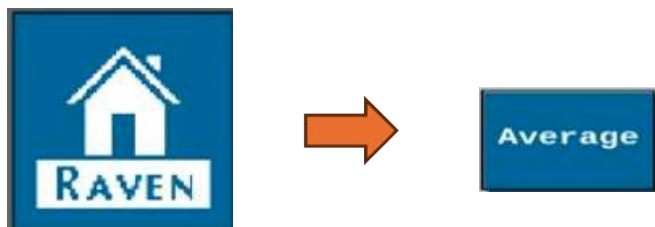
ALARM SETTINGS



- **Alarm Settings Tab**
 - Alarm setting parameters are required for blockage notifications.
- **Percentage off target before alarm sounds:**
 - Recommended Percentage = 15
- **Percentage flow below target before row is considered shut off:**
 - Recommended Percentage = 30

SETUP - HOME

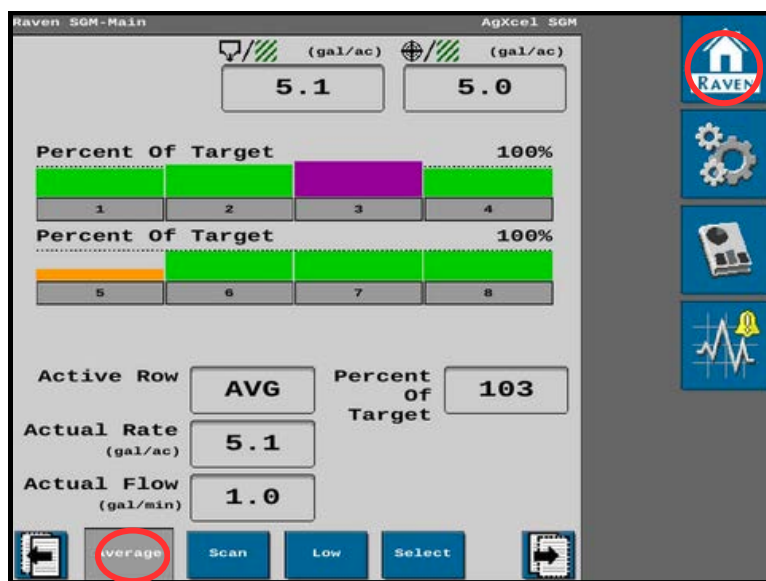
AVERAGE SETTINGS



- **Row Indicators**
 - Green = On Target
 - Purple = Over-Applying
 - Orange = Under-Applying
 - Blank with Red Row Number = No Flow



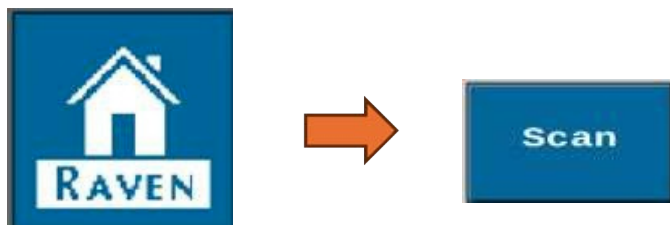
Selecting **Average** at the bottom left of the page will show the average flow rate for all rows.



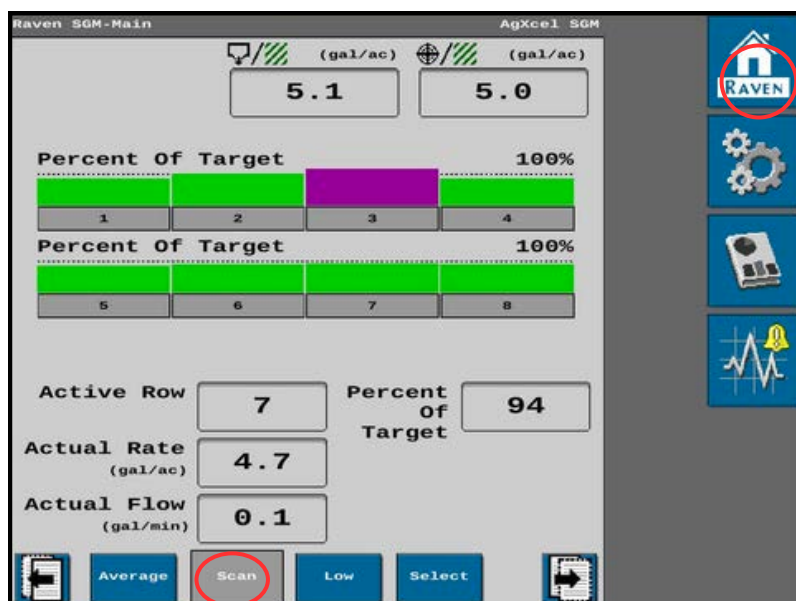
- **Active Row:**
 - Shows AVG if you have selected Average at the bottom of the home page.
- **Actual Rate:**
 - Shows the average flow rate being applied.
- **Actual Flow:**
 - Shows the average flow per minute rate of the applied product.
- **Percent of Target:**
 - Shows the average percentage rate your overall flow rate is off by.
 - As shown, this user is over applying by 3%.

SETUP - HOME

SCAN SETTINGS



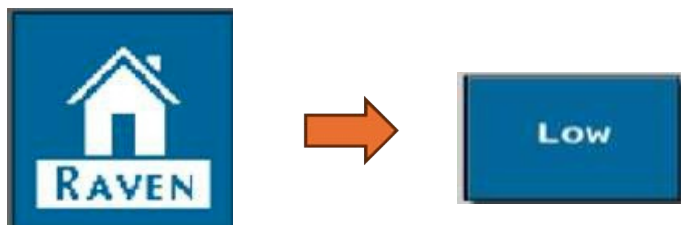
Selecting **Scan** at the bottom of the page will allow the SGM to automatically display the flow rate of each row at the bottom of the home page. Every seven seconds, the displayed row information will switch.



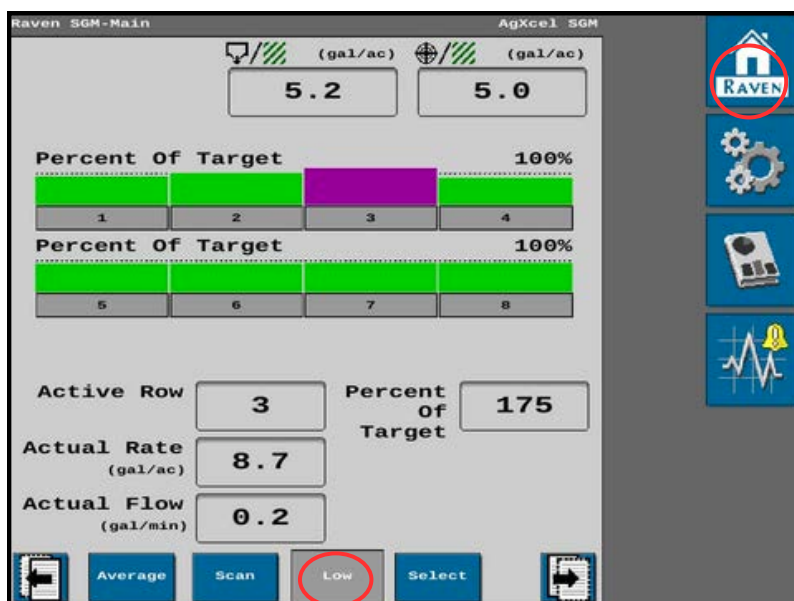
- **Active Row:**
 - Shows the current row being monitored.
- **Actual Rate:**
 - Shows the current flow rate being applied by the active row.
- **Actual Flow:**
 - Shows the current flow per minute rate of the current active row.
- **Percent of Target:**
 - Shows the current percentage rate that the active row flow rate is off by.
 - As shown, this user is under applying by 6% on row 7.

SETUP - HOME

LOW SETTINGS



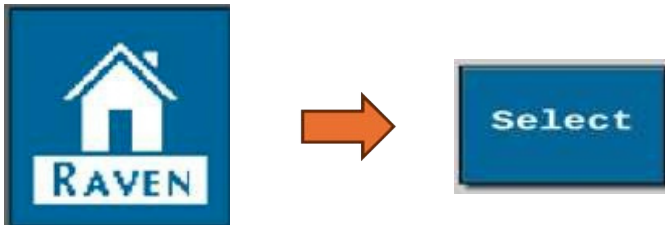
Selecting **Low** at the bottom of the page will allow the SGM to automatically display the flow rate of the row applying off of the targeted rate by the largest percentage at the bottom of the home page.



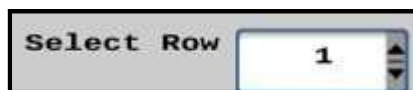
- **Active Row:**
 - Shows the current row being monitored.
- **Actual Rate:**
 - Shows the current flow rate being applied by the active row.
- **Actual Flow:**
 - Shows the current flow per minute rate of the current active row.
- **Percent of Target:**
 - Shows the current percentage rate that the active row flow rate is off by.
 - As shown, this user is over applying by 75% on row 3.

SETUP - HOME

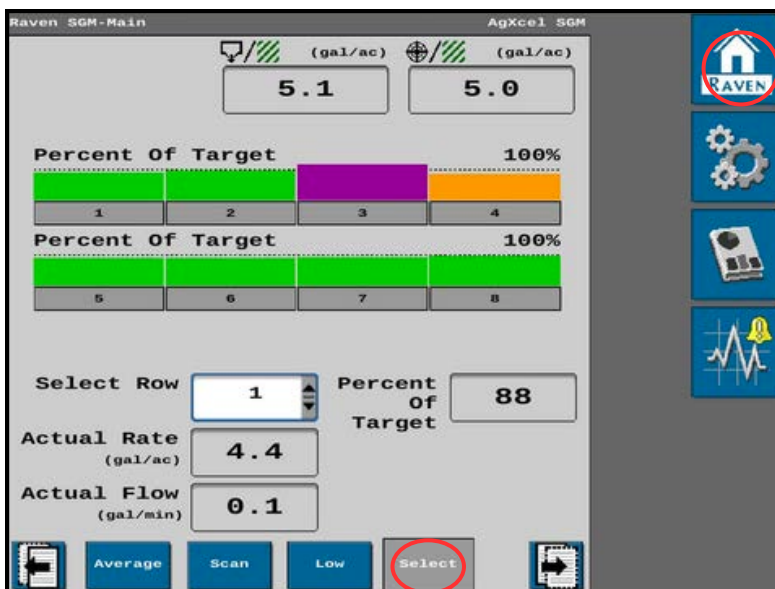
SELECT SETTINGS



Selecting **Select** at the bottom of the page allows you to select which row you want to monitor at the bottom of the home page.



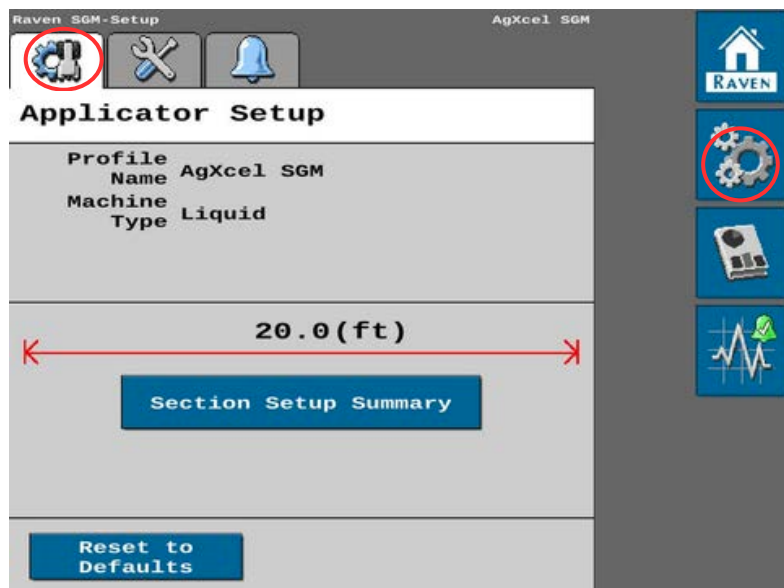
"Select Row" row selection list.



- **Active Row:**
 - Shows the current row being monitored.
- **Actual Rate:**
 - Shows the current flow rate being applied by the active row.
- **Actual Flow:**
 - Shows the current flow per minute rate of the current active row.
- **Percent of Target:**
 - Shows the current percentage rate that the active row flow rate is off by.
 - As shown, this user is under applying by 12% on row 1.

SETUP

APPLICATOR SETUP



Section Setup Summary: Press this to see the current summary of the section setup in use.

Reset To Defaults: Unlike the RCM, the SGM does not allow you to save profiles. If you need to change the number of rows, spacing, or sections, you will need to reset the settings and enter them again to change any of these options listed.

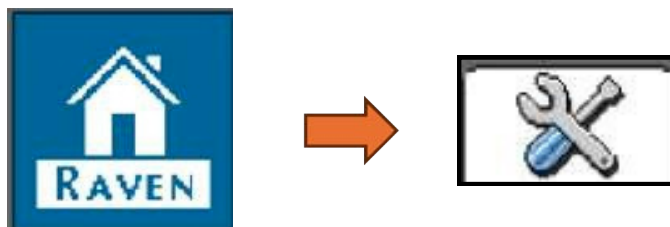


Shown in the **Section Summary** are the two sections & the number of sensors (aka rows) per section.

This example shows two sections with four sensors per section.

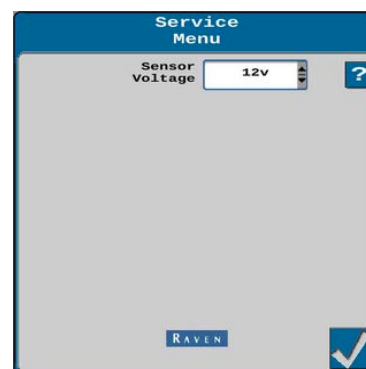
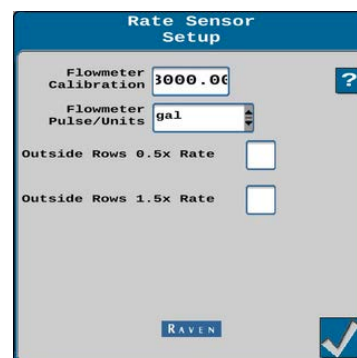
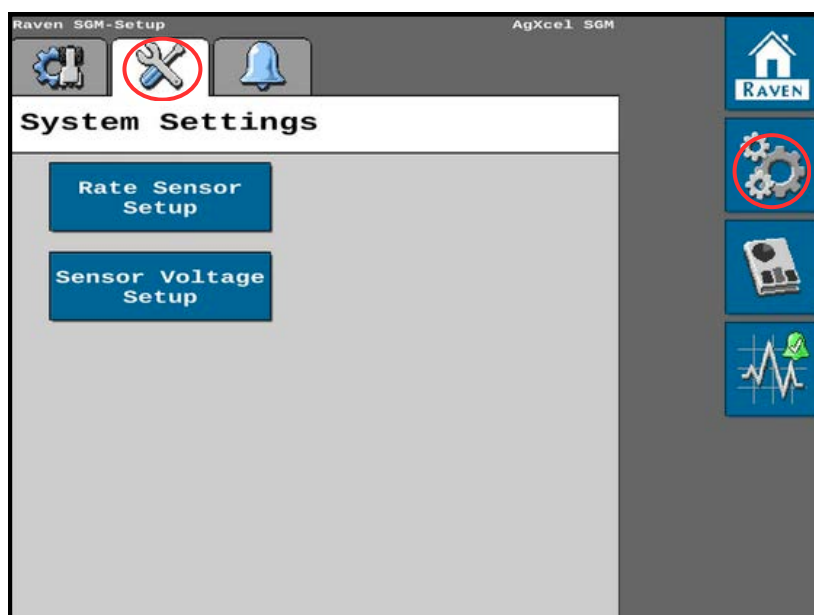
SETUP

SYSTEM SETUP



After the initial setup, the following settings can be changed if needed.

- **Rate Sensor Setup**
 - **Flowmeter Calibration**
 - If you lower the Flowmeter Calibration number, then the SGM will display less flow.
 - And if you raise the Flowmeter Calibration number, the SGM will display more flow.
 - **Flowmeter Pulse/Units**
 - "gal" should be used with the recommended flowmeter calibration number.
 - **Outside Rows 0.5X Rate**
 - Select if you are applying at 50% less rate on the first and last rows.
 - **Outside Rows 1.5X Rate**
 - Select if you are applying at 50% more rate on the first and last rows.
 - **Sensor Voltage Setup**
 - Sensor Voltage: leave this at 12V



SETUP

ROW DETAILS

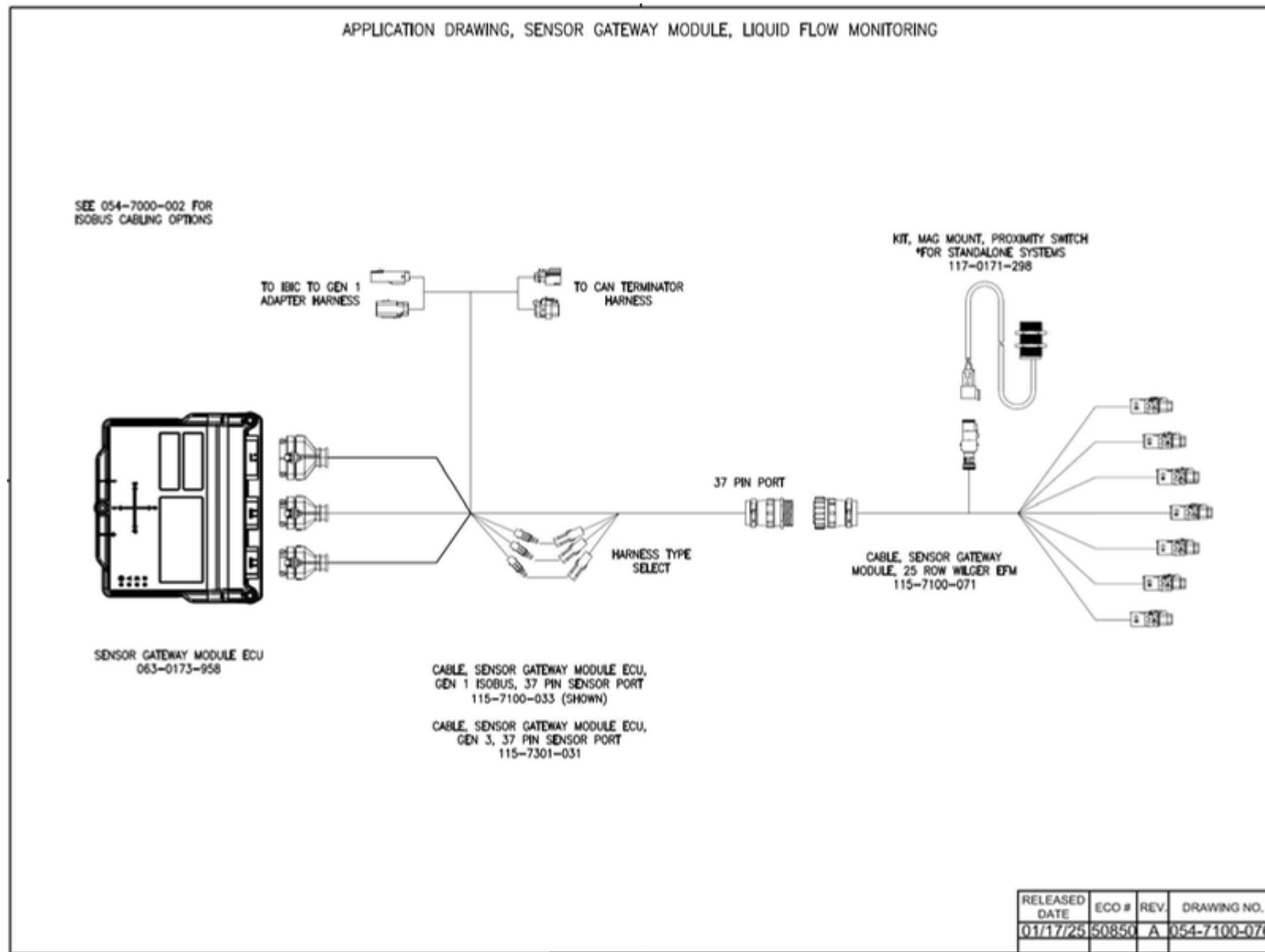


This page may be used to view the exact flow rate of each row and displays the following:

- Actual Gallons per Acre per Row
- Actual Gallons per Minute per Row
- Percentage of Target Flow
 - 89% of target is under-applying by 11%
 - 104% of target is over-applying by 4%
- Scroll up and down this list with the up and down arrows to the right.

Raven SGM-Row Details				AgXcel SGM	
Row Details					
Row	Actual Rate (gal/ac)	Actual Flow (gal/min)	Percent Of Target		
1	4.5	0.1	89		
2	5.2	0.1	104		
3	8.8	0.2	176		
4	4.5	0.1	90		
5	4.5	0.1	89		
6	4.7	0.1	93		
7	4.6	0.1	93		
8	4.8	0.1	96		

SGM WIRING DIAGRAM



FLOWMETER OPTIONS

There are two kinds of flowmeters that are commonly used with the SGM. The **Multiflow Magnetic Flowmeter**, or the **Turbine Flowmeter**.

The **Magnetic Flowmeter** is recommended for lower rate applications such as infurrow fertilizers. Since the magnetic flowmeters have no moving parts in them, unlike a turbine flowmeter, debris and particles do not plug the flowmeters. These magnetic flowmeters are preferred when using biological fertilizers, carbon fertilizers, humic acid fertilizers, viscous or molasses type fertilizers, and any other fertilizer with particles present. These magnetic flowmeter are also great for higher rate Nitrogen applications as well.

The **Turbine Flowmeters** are recommended for higher rate Nitrogen applications or for infurrow fertilizers that are clean and have no particles or debris present.



Multiflow Magnetic Flowmeter



Turbine Flowmeter

The **Multiflow Magnetic Flowmeter** can be used in conjunction with a sight glass manifold or wet boom manifold. The Multiflow Magnetic Flowmeter can also be used as a manifold itself, meaning that you will not need an existing manifold. You have the ability to use the Multiflow Magnetic Flowmeters as the manifold.

The **Turbine flowmeters** can be used in conjunction with a sight glass manifold or a ORS manifold. An ORS manifold is grouped similarly to how a sight glass manifold would be grouped, but there are no visual sight glasses. The only way to monitor flow with an ORS manifold would be with the turbine flowmeters in this scenario.

Refer to your manifold setup chart included in your packet for the recommended plumbing scenario for your setup.

MAGNETIC FLOWMETER HARNESSING

Each flowmeter will have a Y cable included. Each end of the Y cable will need to plug into the one Multiflow Flowmeter. Ensure that the two wire side of the Y cable is plugged into the left side of the flowmeter with the silver 12VDC sticker. Then the 4 wire side of the Y cable will plug into the right side of the Multiflow Flowmeter. The left side is for 12V power while the right side is for row signals.

Each Y cable will connect the the Raven 115-7100-071 harness. Each lead is labeled with rows that lead is responsible for. Ensure each Y cable is connected to the proper row placement on the 115-7100-071 harness.



Multiflow Magnetic Flowmeter



Multiflow Magnetic Flowmeter Harnessing



Turbine Flowmeter



Turbine Flowmeter Harnessing

Each Y cable for the turbine flowmeters has four leads, meaning that one lead is for one flowmeter. For example, a 16 row planter will have four of these Y cables. Each lead is labeled (1, 2, 3, 4) as the first and last flowmeter for each Y cable. Each lead will plug into the back of the turbine flowmeter.

Each Y cable will connect the the Raven 115-7100-071 harness. Each lead is labeled with rows that lead is responsible for. Ensure each Y cable is connected to the proper row placement on the 115-7100-071 harness.



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