PGA Bin Sensors

Account Credentials:
Email:
Temporary Password:

https://pga.grainanalyzers.ca/login

User Manual

V8.7

⚠️ Warranty Notice:

Any **modification, alteration, or replacement of the supplied wiring**, including changes to the **power supply connections, sensor cables, communication lines, or internal wiring**, will **immediately void the product warranty**.

Prairie Grain Analyzers systems are carefully tested and certified using the provided wiring configuration to ensure proper performance and safety.

Please **use all components exactly as delivered**. If your installation requires any **custom wiring, alternate power configuration, or special connection setup**, contact **Prairie Grain Analyzers** before making any changes. Our technical team will review your requirements and provide approved instructions or accessories to maintain full warranty coverage.

Set Up

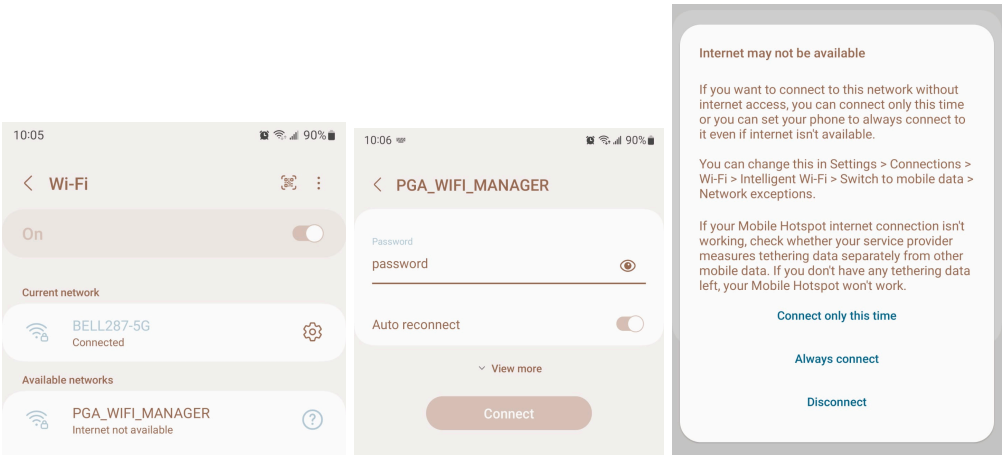
A. Hardware

1. Adjust the position of the antennas upright.
   ❕ Check if the cable glands are tight enough to prevent water from entering in the box.
2. ❕ Ensure the lid is securely closed at all times to protect the battery and circuit boards.

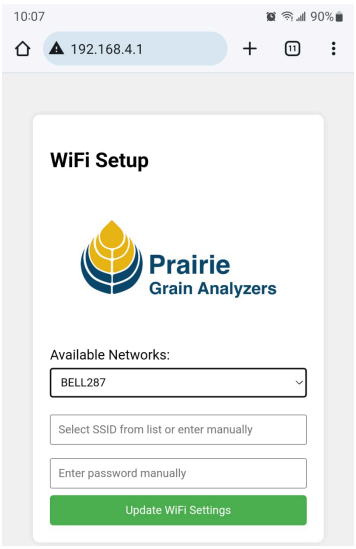
B. WiFi Connection

Note: If your phone is currently connected to Wi-Fi, please disconnect and disable auto-reconnect. Then try connecting the PGA Bin Sensors Master Unit to Wi-Fi. If not done, the network list may not appear properly.

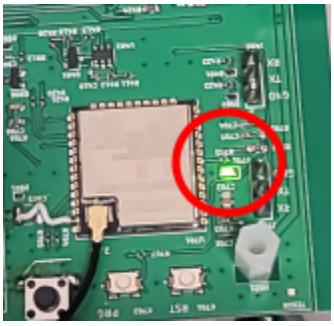
1. Have your WiFi credentials ready on paper, including the network name and password, as there is a limited time frame of about 2 minutes for entering this information.
2. Turn on the Master and use your mobile phone or computer to connect to the WiFi network:
   Network name: **PGA_WIFI_MANAGER**
   Network password: **password**
   Then click either “connect only this time” or “always connect”.



3. Next, click “sign in to the network” or launch your web browser and navigate to this URL: **192.168.4.1**. Alternatively, scan the QR code provided below and input your WiFi credentials**. If the list of available networks doesn't appear, try refreshing the page a few times.**



4. There will be a green light at the bottom left corner of the board if network connection is successful.



Mobile Hotspot

5. If you are using a mobile phone to provide a hotspot, please note that the mobile hotspot will stop working if the mobile phone is connected to a different WiFi.
    a. Remember your mobile hotspot name and password
    b. Follow steps 1-3 above and input your mobile hotspot information
    c. Turn on your mobile hotspot and check for the green light in step 4

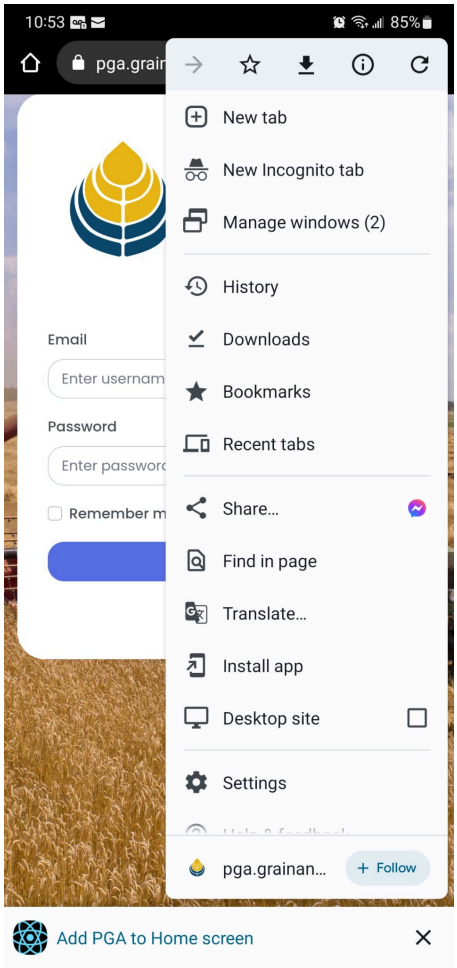
To modify or reset the WiFi credentials, press and hold the black push button for 3 seconds, then follow steps 1 to 4 as mentioned earlier. This process will erase the existing WiFi credentials, requiring you to enter them once again. Please note that once the WiFi credentials are saved, the device will automatically reconnect when within range. There is no need to reset the WiFi every time. **Please select Forget Network if it doesn't work the first time and try again.**

C. Website and Account

Please contact Prairie Grain Analyzers to set up your account on the PGA Bin Sensors website.

If a temporary login has been created, it will be on the first page of this user manual.

The website can be found at https://pga.grainanalyzers.ca/login or scan the QR code below:



To download the web-app, open your browser menu and select *add to home screen* or *install app*.

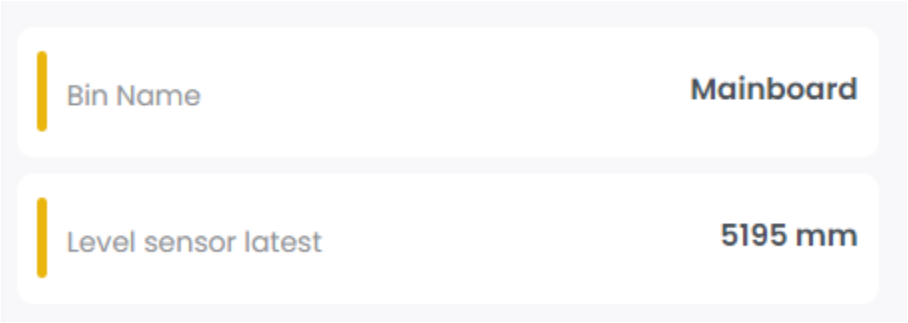
D. $C0_2$/Lidar Configuration

Installation

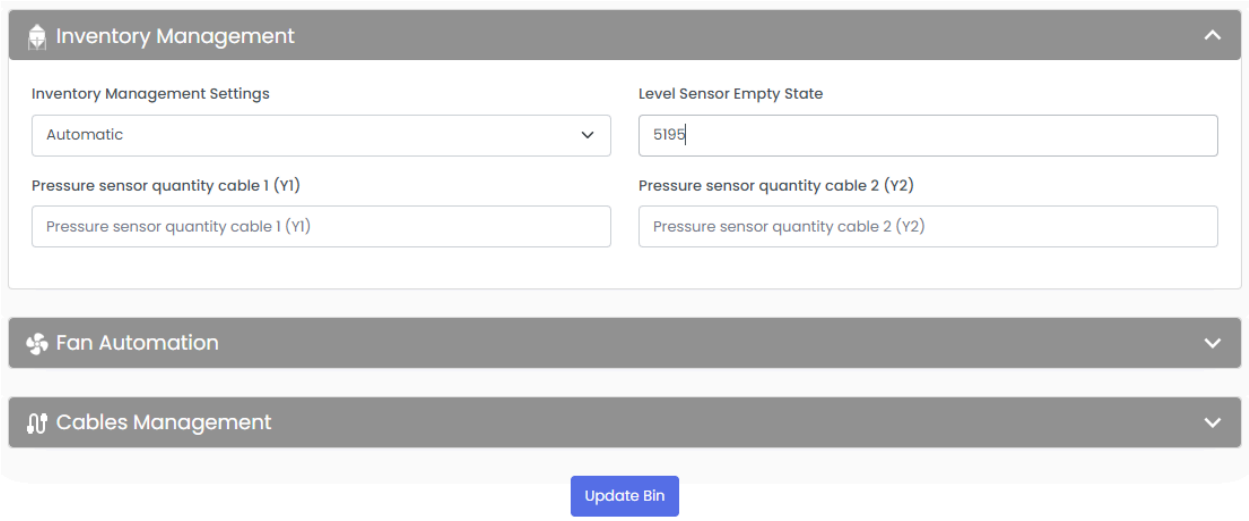
- Connect the 8 pin cable to the master/ remote unit and the $C0_2$/Lidar unit
- Mount the $C0_2$/Lidar unit by hanging the hook on the edge manhole

Calibrating the Lidar level sensor

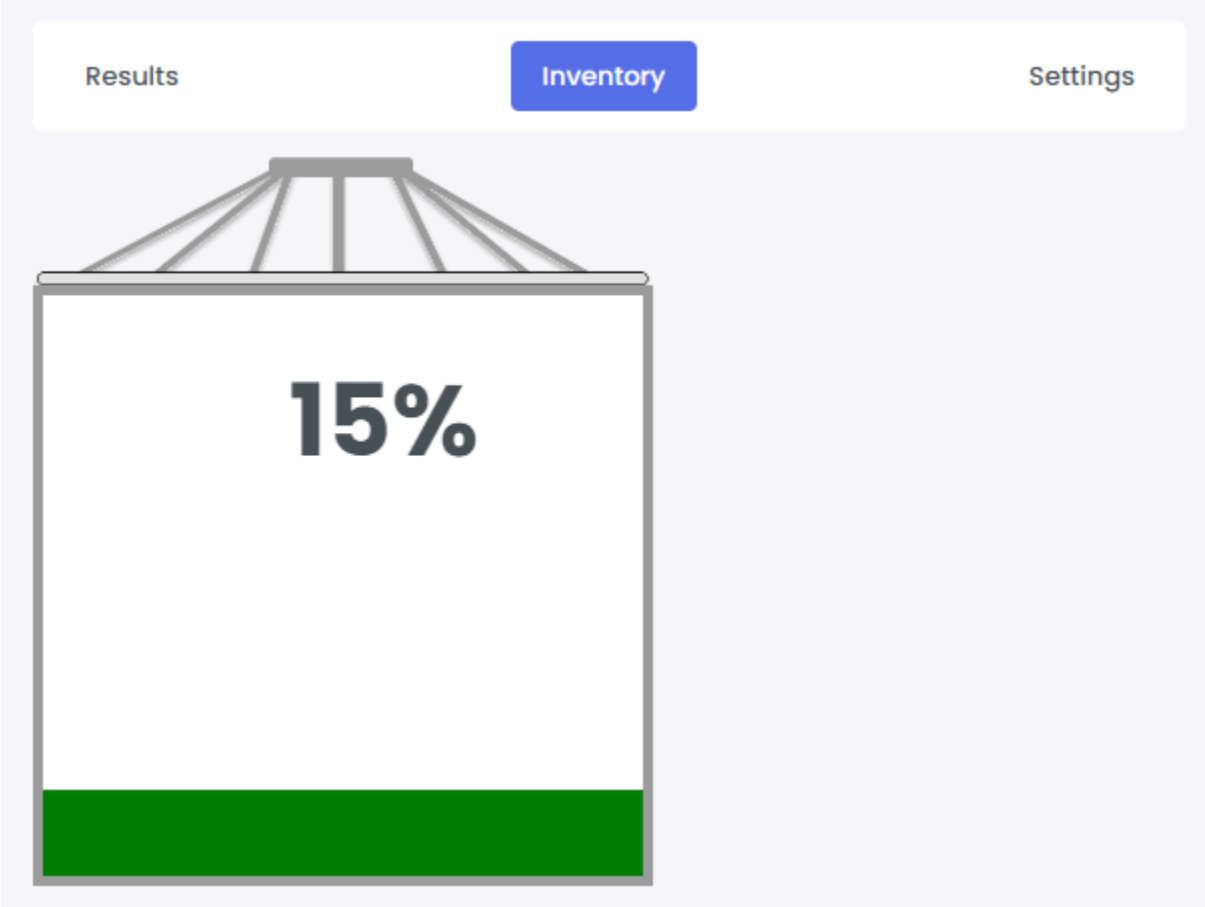
- While the bin is empty, note the reading for *Level sensor latest* on the Results page



- Enter this number in the Settings > Inventory Management > Level Sensor Empty State. Then click the blue Update Bin button to apply the new changes



- On the Inventory screen, you can track the bin inventory from manually logging it or automatically from the lidar sensor or pressure sensor.



E. Fan Control Configuration

- Connect 6 pin fan control cable to the PGA bin monitoring box and the PGA fan control box.

- Refer to the fan control installation manual or consult a certified electrician to connect the fan control box to the fan.
- For instructions on controlling the fan via the web app, see page 15 of the Fan Automation section.

F. Ambient Sensor Configuration

- Connect the ambient sensor box to the channel 8 port (J208 on the master or remote board) of the bin sensor box using an interconnect cable.

G. Moisture/Temperature Cable Configuration

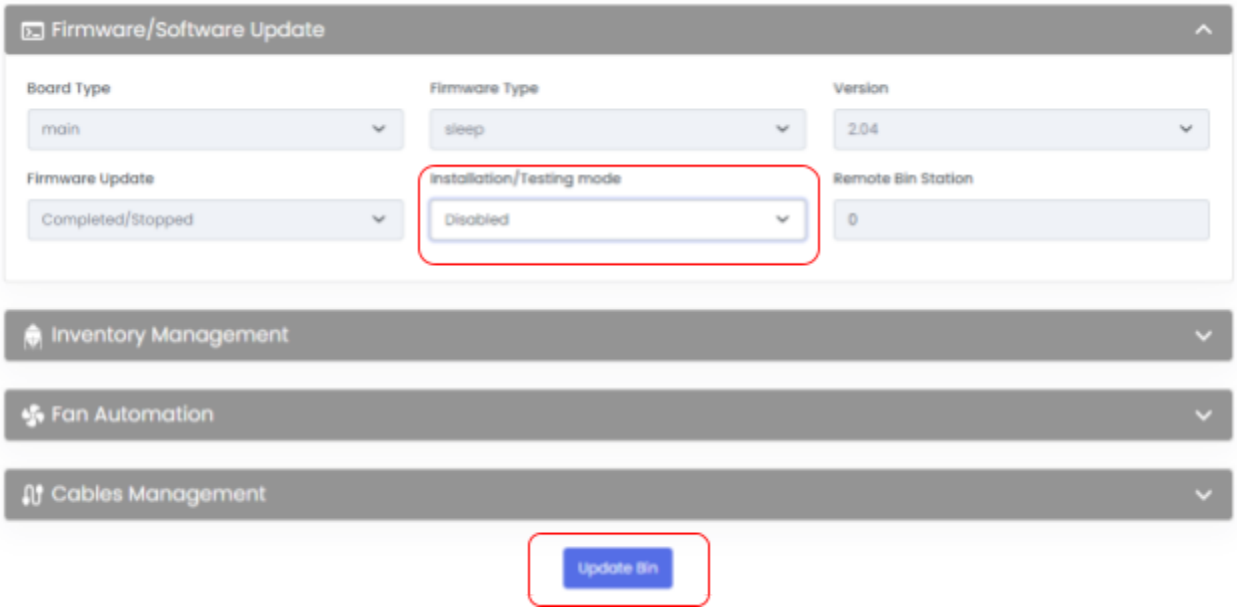
- Each PGA bin sensor box has 8 cable ports at the back.
- Each port can support up to 40 sensors.
- The box can handle a total of 8 cables, which can be distributed across the ports.
- Multiple cables in a y-cable or junction box can be plugged to a port as long as it conforms to the sensor and cable quantity limitations (8 cables per box and 40 sensors per port).
- If the number of cables or sensors exceeds the allowed limit per port, please add a BTC connector and connect the additional cables to another port.

H. Remote and Master Connection

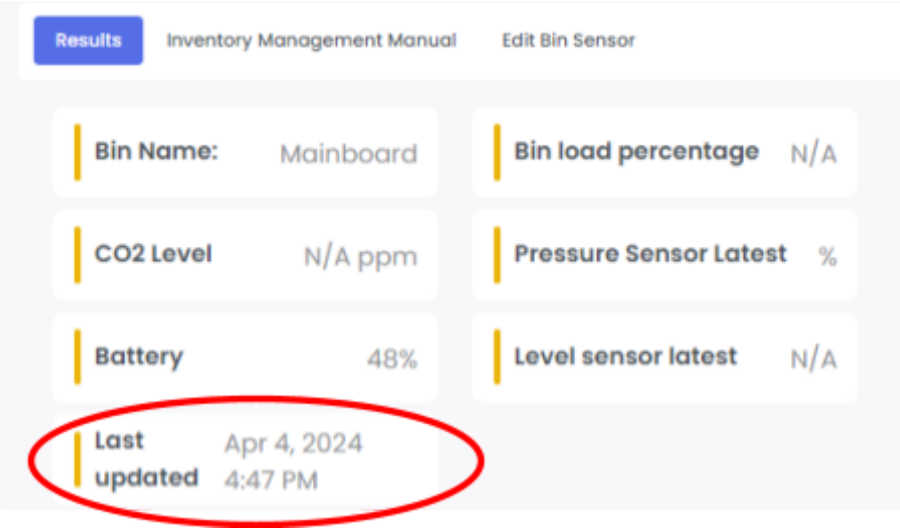
Please follow these step by step instructions to ensure proper communication between the boards:

1. Please make sure that the master unit is connected to a network as described in section B above.
2. Login to your PGA Bin Sensors account and navigate to the master/mainboard unit. Go to the Edit Bin Sensor settings ->

Firmware/Software Update -> Installation/Testing Mode -> Enable -> Update Bin.



3. If there are any Remotes paired to the Master/Mainboard Unit, turn them on and wait for data to come in to verify that it's connected together. Navigate to the Remote's Bin Page, go to the Results tab and refresh the page after a few minutes. It is transmitting data if the *Last Updated* Date and Time is recently updated.



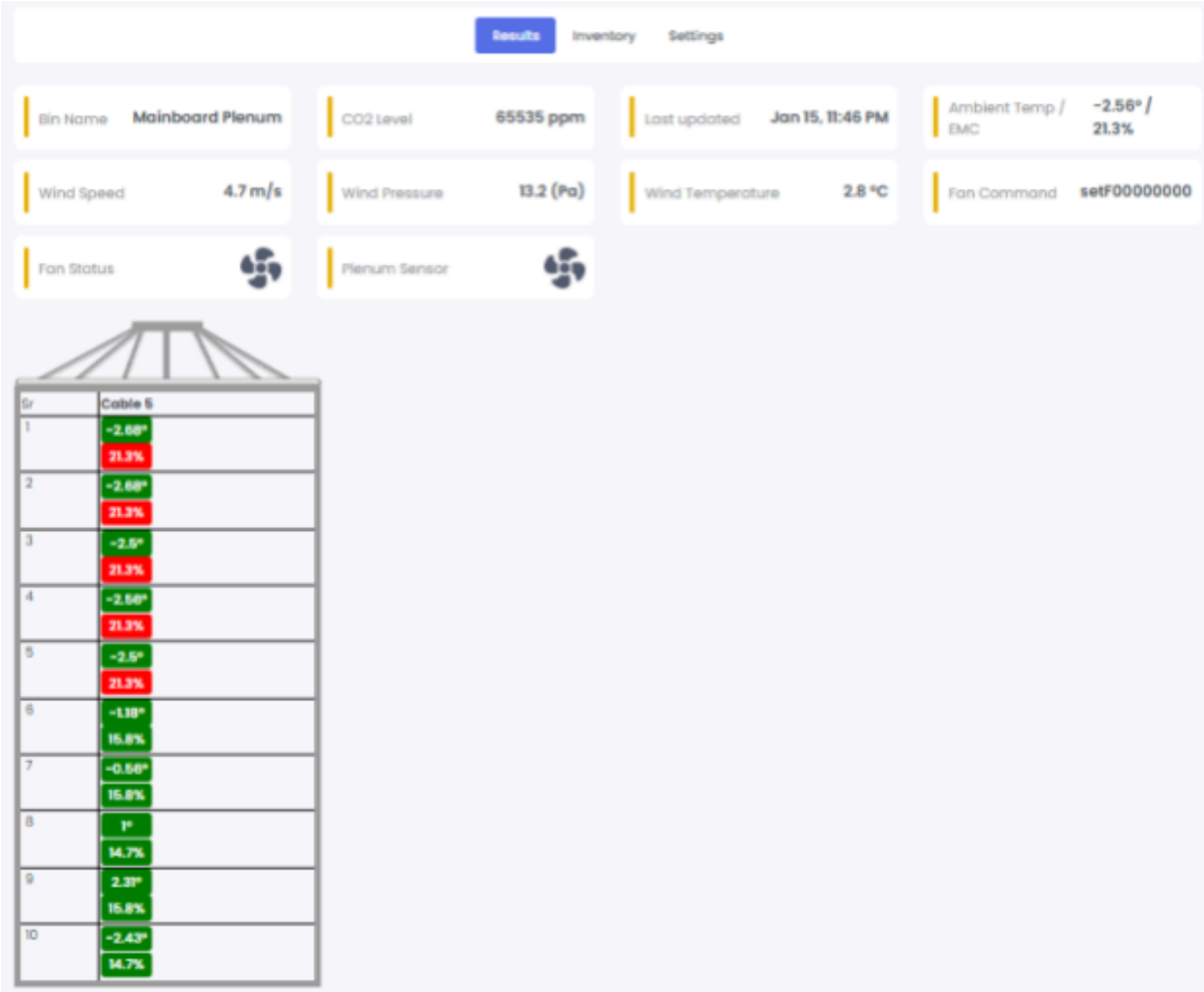
4. After confirming that both the master and remotes are successfully transmitting data, proceed with their installation on the bins.
5. When installing PGA Bin Sensors boxes, make sure masters and remotes paired together are close to each other or within line of sight.

If a remote fails to transmit data after installation, please adjust or relocate it to a different location.

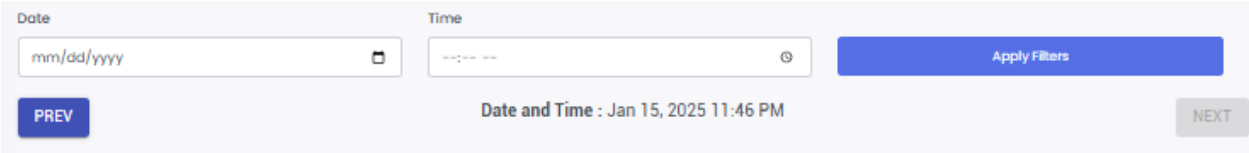
6. Connect temperature/moisture cables to the ports at the back of the box. Please make sure that the temperature/moisture cables are not grounded.
7. Connect solar panels.

8. After everything is connected, disable the installation mode. Go to the Edit Bin Sensor settings -> Firmware/Software Update -> Installation/Testing Mode -> Disable -> Update Bin.
9. Repeat the steps for other master-remote pairs.

Web-App



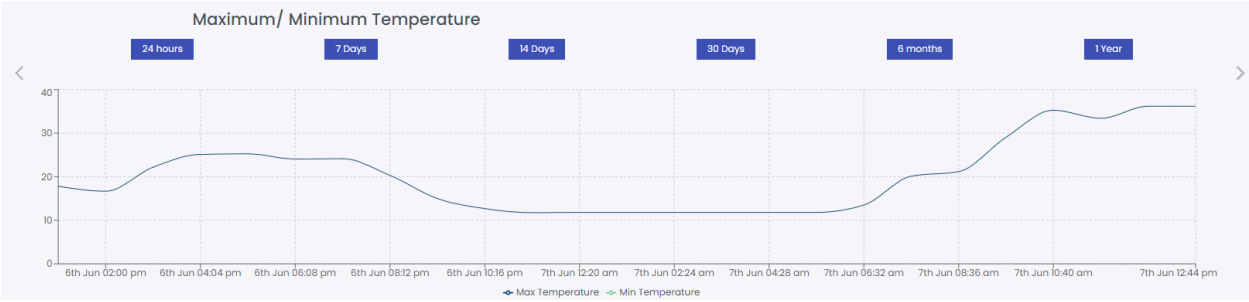
Date and Time



- Select date and time, then click on the Apply Filter button to go back to previous readings.

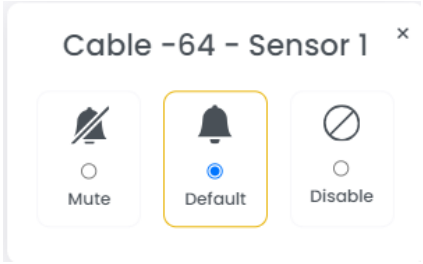
Graph

- View the maximum/minimum temperature per cable, battery, C02, and other trends in a graph

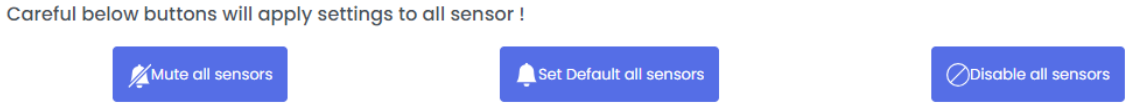


Mute and Disable Sensors

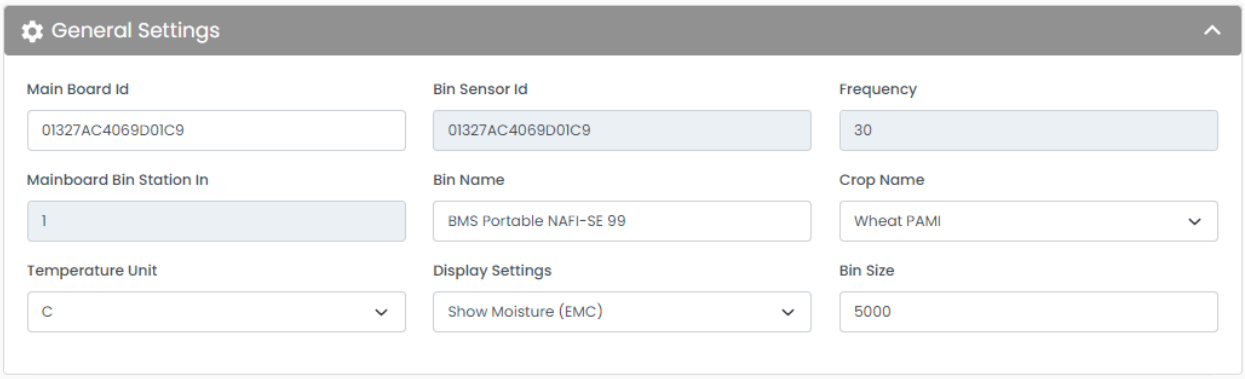
- Click on a sensor to
  - Mute: turn off notifications for this sensor only
  - Default: clear any settings
  - Disable: disable this sensor. Graphs, fan control, and other functions will not be affected by this sensor when disabled. No notifications will be sent.



- The **Mute All Sensors**, **Disable All Sensors**, and **Set Default for All Sensors** buttons are located in the **Settings** menu.



General Settings



- Bin Name: display name of the bin can be renamed here
- Crop Name: temperature & humidity to moisture conversion charts, this will be the default crop for all cables in this bin monitoring box unless changed in the cable management section
- Temperature Unit: choose between Celsius or Fahrenheit
- Display Settings: choose between displaying relative humidity or moisture
- Bin Size: note the size of the bin

Please click the UPDATE BIN button to save settings.

Alerts

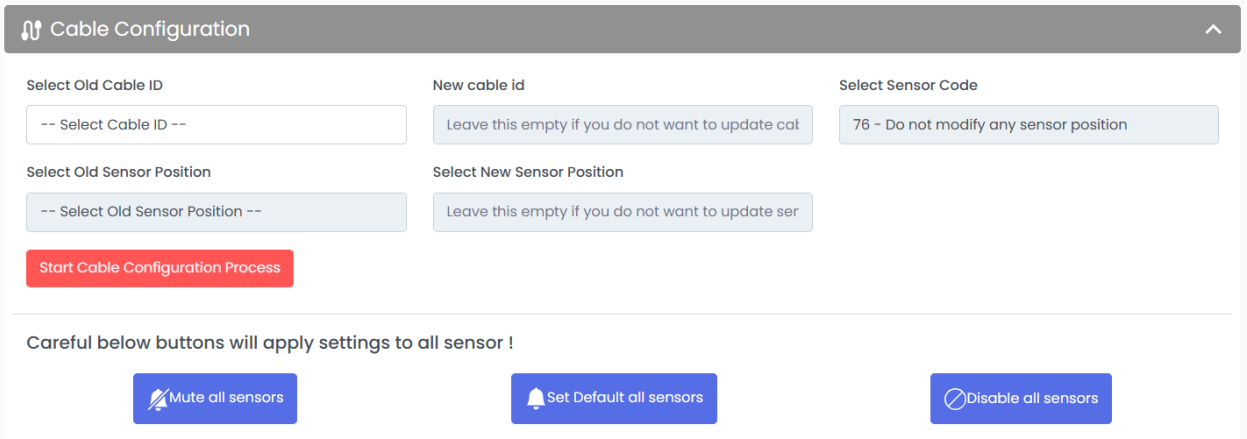
Send text, email, and push notifications.

- Temperature Alerts: Receive an alert if any temperature in the bin exceeds the set threshold.
- C02 Alerts: Receive an alert if the C02 reading in the bin exceeds the set threshold.
- Temperature Difference: Receive an alert if the temperature in the bin rises by the set temperature difference within the number of days specified in the time alert field.

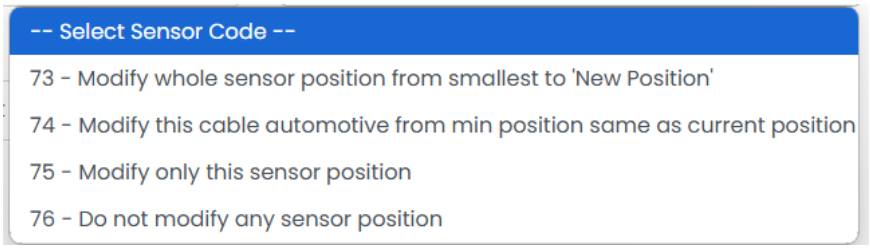
- Time Alert: The time period (in days) during which the system checks the temperature rise as defined by the Temperature Difference setting. An alert will also be sent if there are no readings within the Time Alert period.

Please click the UPDATE BIN button to save settings.

Cable Configuration

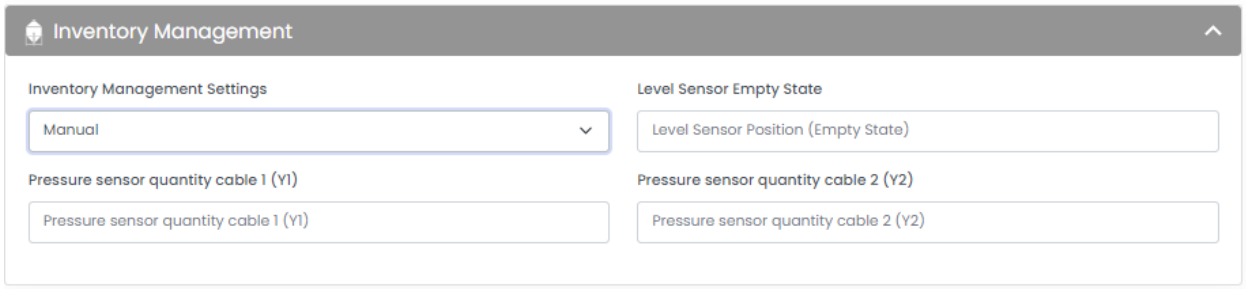


- Change cable ID of a single cable
  - Select an existing cable from the *Select Old Cable ID* list.
  - Enter the new cable id
  - Select Sensor Code - 76
  - Leave other fields blank and click the Start Cable Configuration Process
  - Wait 2 cycles for the changes to take effect
- Change sensor position number in a single cable
  - Select an existing cable from the *Select Old Cable ID* list.



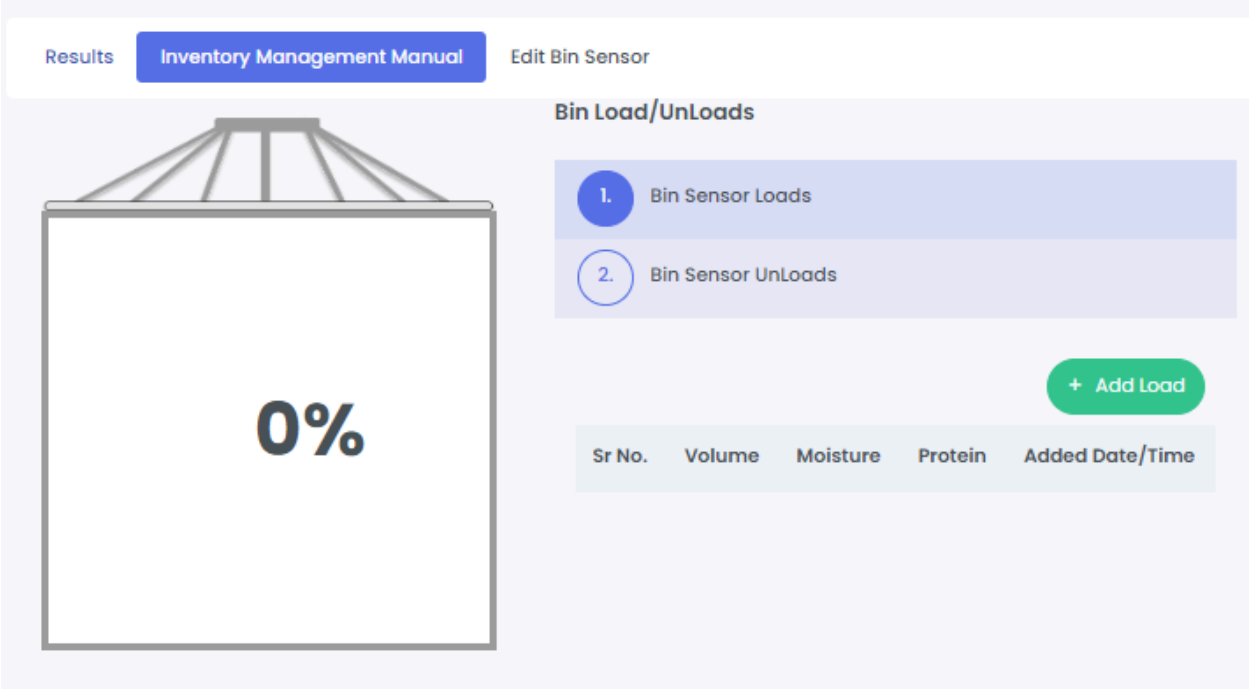
  - Select the appropriate sensor code
  - Leave other fields blank and click the Start Cable Configuration Process
  - Wait 2 cycles for the changes to take effect

Inventory Management



Manual

Manually log inventory of the bin. This keeps track of the volume, moisture, protein, date, and time of the load being put in and taken out of the bin.



Automatic

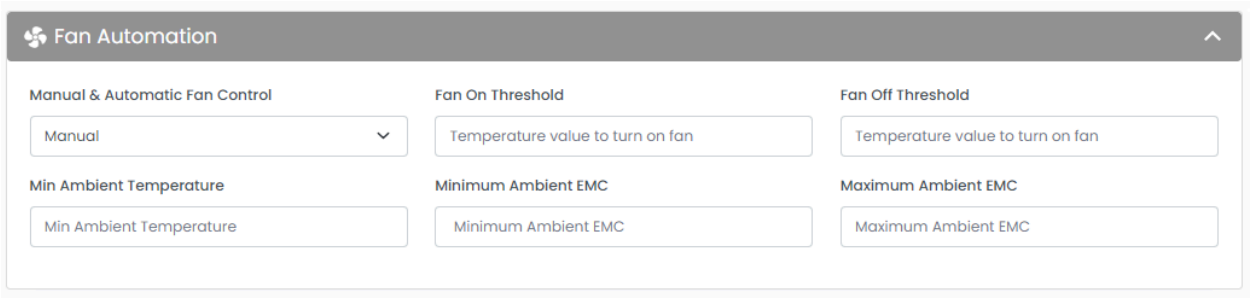
Bin volume percentage is automatically calculated using the PGA level sensor or the PGA pressure sensor cable.

- Level Sensor Empty State: obtain *level sensor latest* data reading when the bin is empty. Enter the value here to calibrate the empty state of the bin

- Pressure Sensor Quantity Cable 1 (Y1): enter the quantity of pressure sensors in the PGA Pressure Sensor cable.
- Pressure Sensor Quantity Cable (Y2): averages with cable 1 to obtain a better estimate of the bin volume. Enter 0 if only one pressure cable is used.

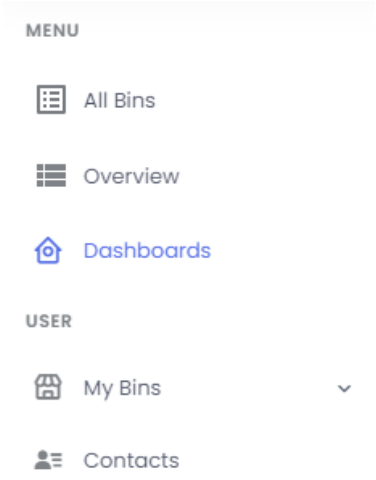
Please click the UPDATE BIN button to save settings.

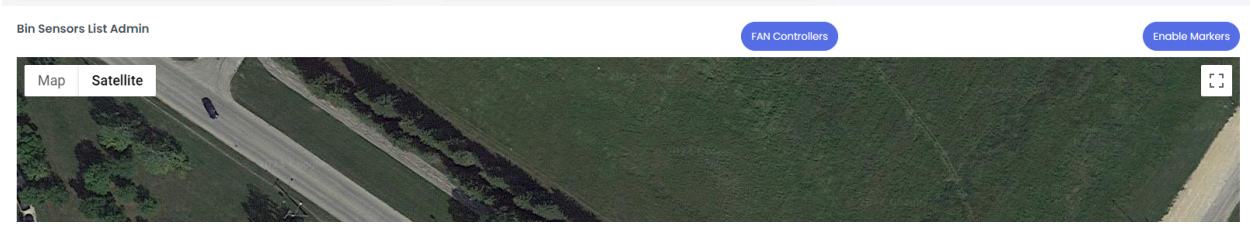
Fan Automation



Manual Fan Control

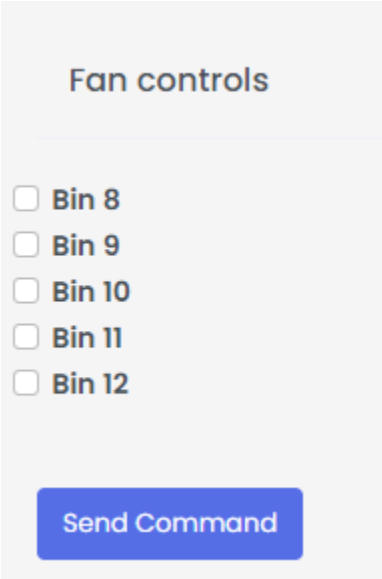
- Navigate to Dashboards on the side menu and select a system group



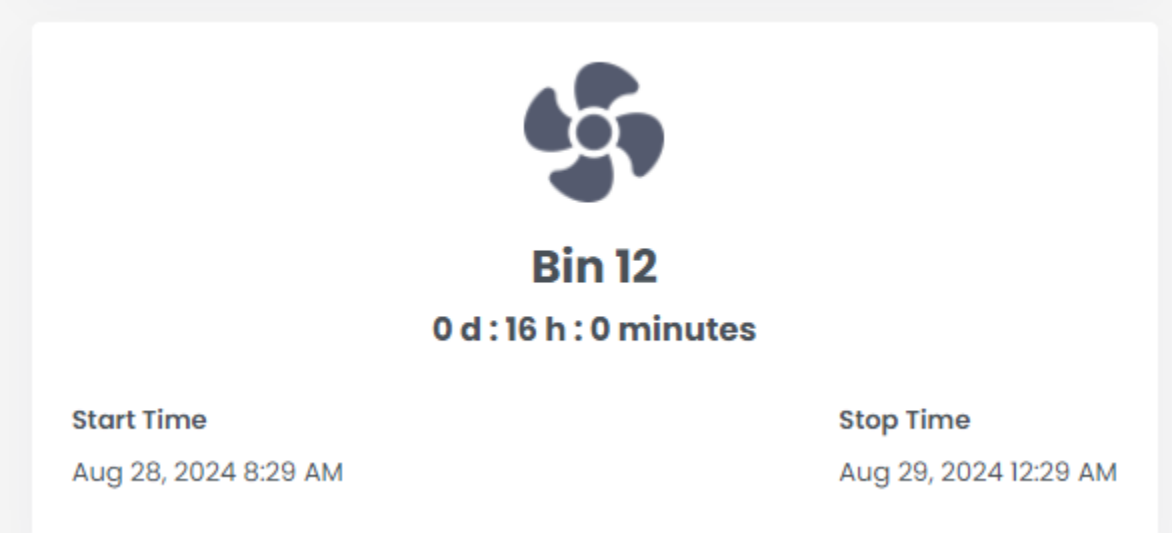


- Scroll down to the maps area and select Fan Controllers

- To turn on fans, check the boxes for the desired bins and click **Send Command**.
- To turn off fans, uncheck the boxes and click **Send Command**.



- Fan status, including run-time, will be displayed below.



Automatic Fan Control

- Fan On Threshold: if any temperature data goes above this value, fan will turn on

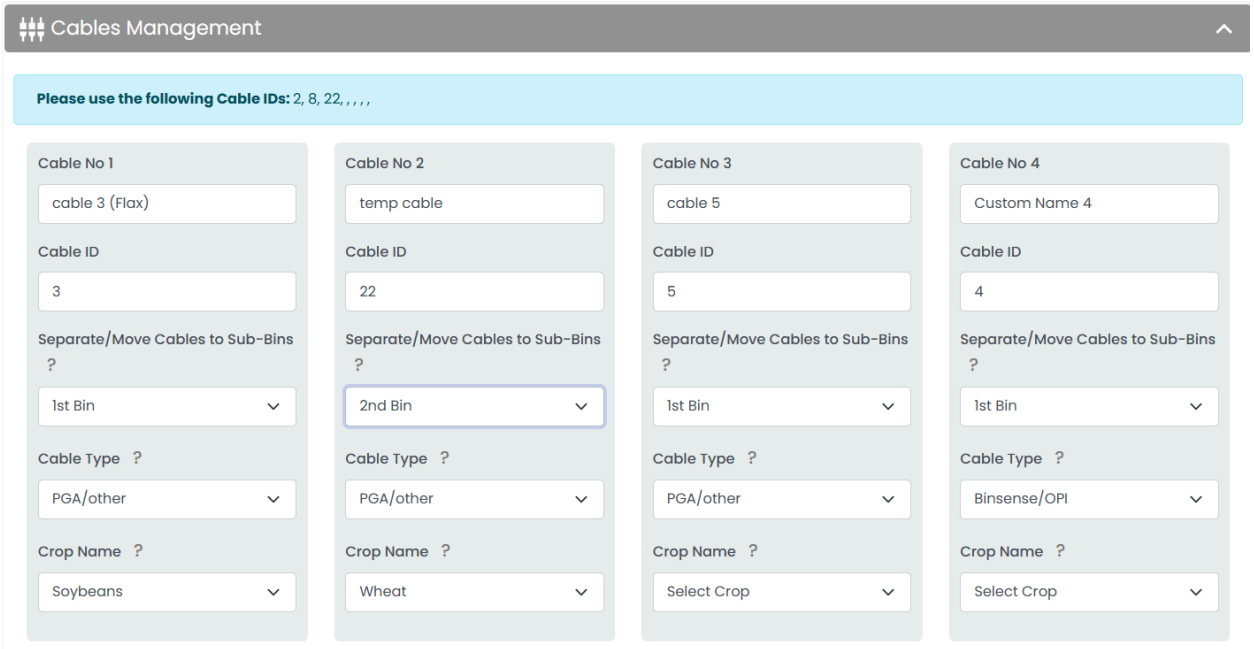
- Fan Off Threshold: if all temperature data falls below this value, fan will turn off

Advanced Settings: connect an ambient temperature/ humidity sensor to the Channel 8 port [J208]

- Min Ambient Temperature: the lowest air temperature where the fans are allowed to run. if the air temperature is lower than this setting, fan will not run
- Minimum Ambient EMC: ambient EMC lower than allowed EMC: fan will not run
- Maximum Ambient EMC: ambient EMC higher than allowed EMC: fan will not run

Please click the UPDATE BIN button to save settings.

Cables Management



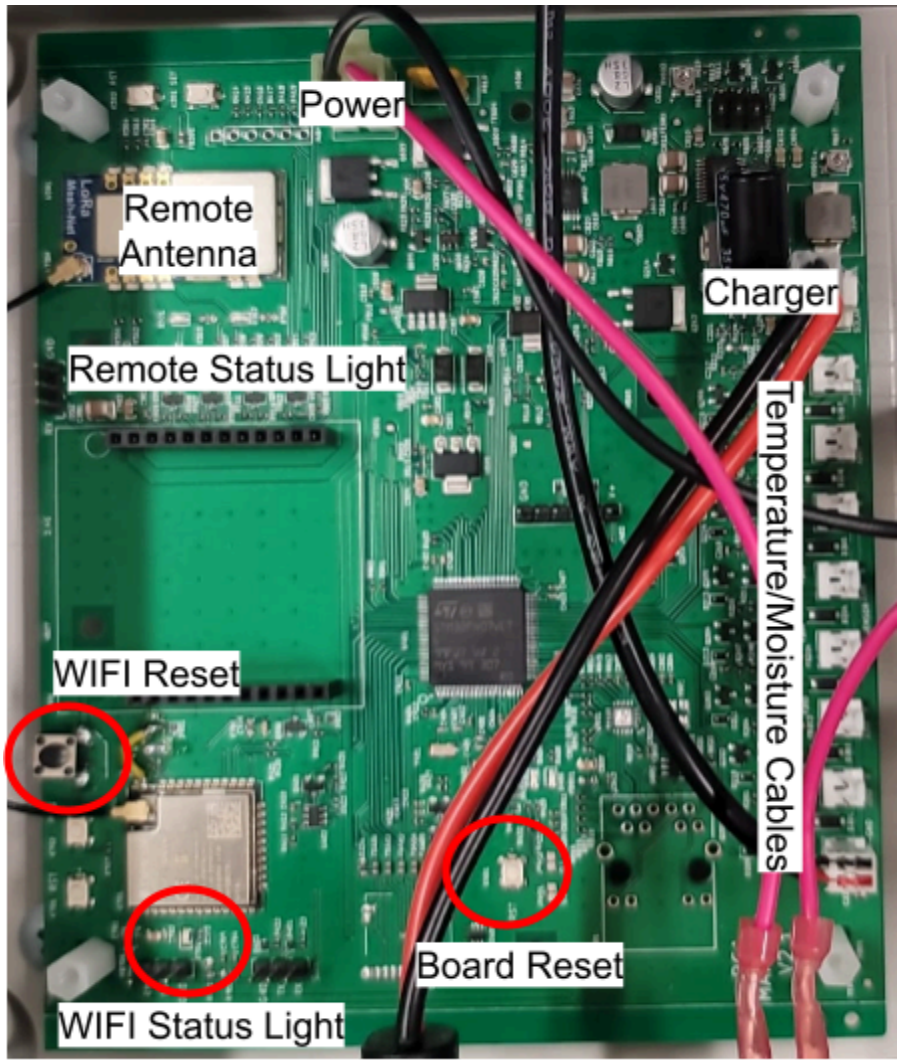
- The available cable IDs read by the board are displayed in the blue banner.
- Cable No #: rename the display name of the cable
- Cable ID: enter a cable ID
- Separate/ Move Cables to Sub-Bins:
    - Separate cables to sub-bins or move cables around if multiple bins are being managed by a single bin monitoring box.
    - Up to 8 sub-bins can be created.
- Cable Type:

    - PGA/other: displays sensors from top to bottom
    - Binsense/OPI: displays sensors from bottom to top
- Crop Name: change the EMC chart of the moisture sensor only for the selected cable. If no crop is selected, it will take the crop selected in the general settings by default.

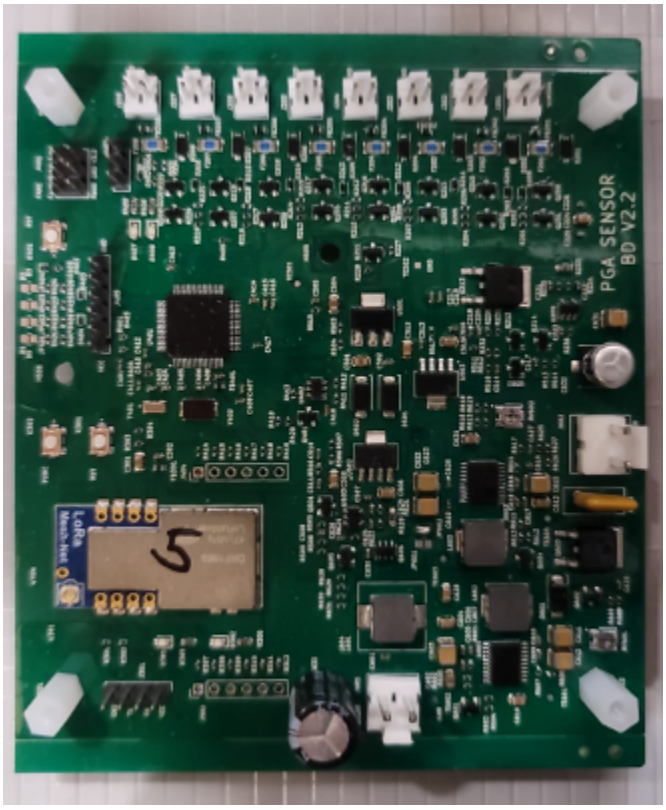
Please click the UPDATE BIN button to save settings.

Parts

A. Master Unit/ Mainboard



B. Remote Unit/ Sensor board



C. Enclosure


Master To Remote
WIFI


Solar Panel
Power Switch
Prairie Grain Analyzers Inc.
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e: info@grainanalyzers.ca

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