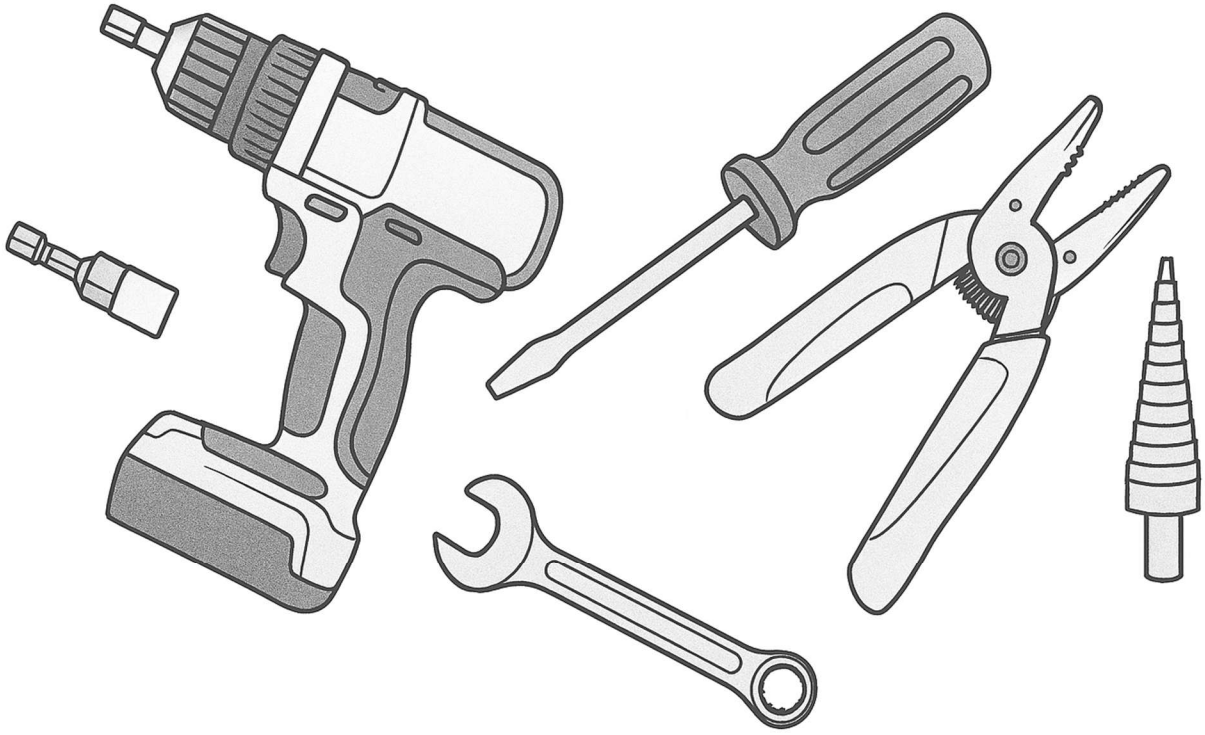
OPI EPIQ

Installation and Configuration Manual

Required Tools

1. 7/16” wrench
2. 1/8” flathead screwdriver
3. 3/8” Nut Driver and Compatible Cordless Drill
4. 1 1/8” Through-Saw or Step Bit and Compatible Cordless Drill
5. Wire Stripper with #14 and #20 AWG Positions



Primary Node Installation

Box Contents

Open the box containing the Primary Node and confirm that all contents are present:

- Primary Node
- Magnetic Foot Mount
- 3 X Self-tapping Screws
- 2 X Antenna Sleeves
- 1 X LTE Antenna
- 1 X Wi-Fi Antenna

Figure 1. Box Contents

Identify Optimal Installation Location

The optimal installation location will be on the southern half (or the northern half if you are in the southern hemisphere) of the bin roof to maximize sunlight for solar charging. The Node should be located on the bin/silo roof or catwalk where it has the best exposure to the sun and is installed in a location that will not interfere with loading/unloading equipment where it can be damaged. If the Primary Node is to be line-powered, it should be in a position where the power cable can be run easily up the side of the bin wall and along the bin roof to the Node location.

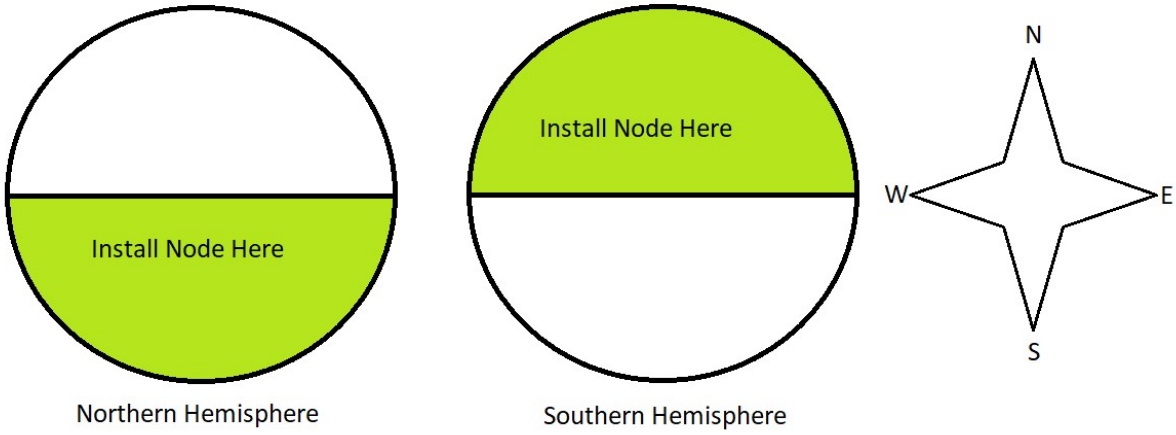


Figure 3. Bird's Eye View of Bin-Roof

Install the Primary

1. Place the Primary Node at the optimal installation location using the magnetic foot mount to secure it. Adjust the foot mount so the bottom of the foot mount is aligned with the downward slope of the bin roof, facing due south. You may secure the foot mount in place with a self-tapping screw; however, it is not necessary. The magnetic foot mount provides a secure installation without needing a self-tapping screw in most cases.

Figure 4. Node installed on Bin Roof

2. Using your 7/16” wrench, secure the Primary Node on the foot mount. Once secured to the bin/silo roof, the angle of the Cable Node can be adjusted to provide the best exposure to sunlight. This will ensure at the optimal angle for the solar panel to be most effective year-round. Once the angle has been set use the 7/16” wrench to lock in the angle by tightening the “Foot Mount Adjustment Bolt”. Best practice is to match the angle of the Primary Node to the Latitude of your location. Additionally, if you are in the northern United States or Canada, you can add 10 degrees to the angle to increase efficiency during the winter months and improve snow runoff. For example, if I am installing a Primary Node in Calgary, Alberta, Canada, the Latitude is approximately 50 degrees. Since I am adding 10 degrees here, I would install the node with an angle of 60 degrees.

Figure 5. Adjustment Bolt on Bottom of Node

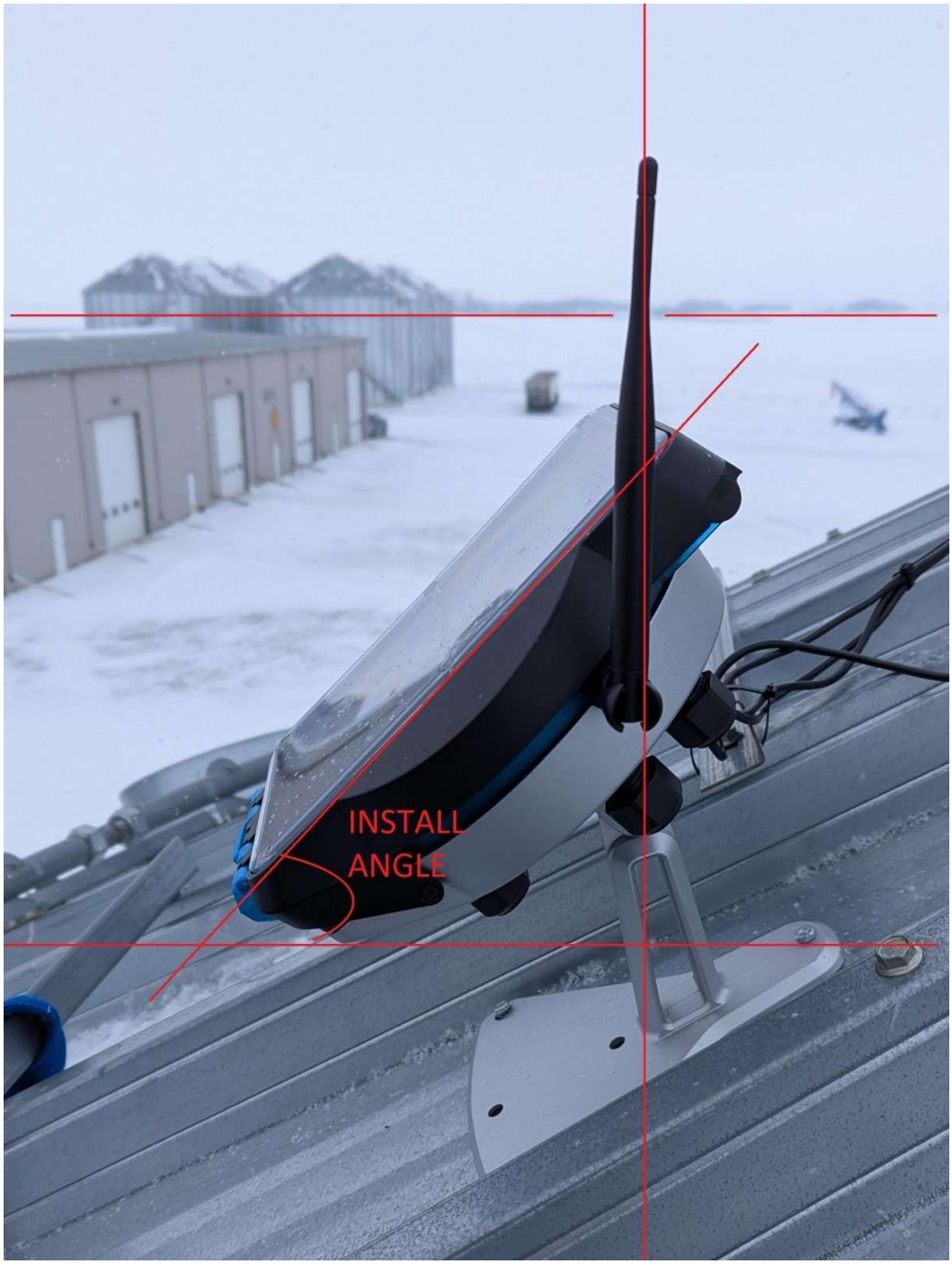


Figure 6. Node Installation Angle for Solar Panel Alignment

3. Before installing the antenna, please note that the antenna is a fragile piece of equipment that is susceptible to damage if not handled delicately and intentionally. To install the antenna:

- Straighten the antenna so they are in a horizontal position. Bend it using the rotating joint at the base of the antenna near the connection side.
- Rotate the antenna clockwise to adjust the position and keep them securely tightened. After they are tight, rotate them until they are aligned such that bending them will position the antenna into an upright 90 degrees.
- Place the first boot piece onto the antenna with the “Top” label facing up and move it into position where it secures the antenna into the port on the side of the node. The boot has “grooves/teeth” on the end of it which will “catch” and secure it into position on the node.
- Move the antenna into an upright vertical position
- Place the second boot piece on the antenna and slide it down to the base of the antenna. Connect booth boot pieces together following the grooves on the pieces until you feel a click and the parts are securely connected.

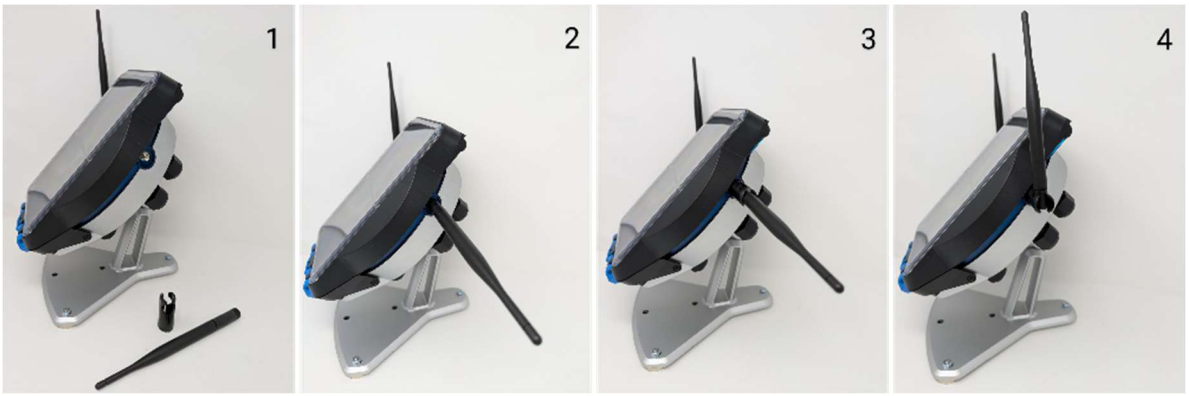


Figure 7. Antenna Locking Procedure

4. Once the Primary Node is installed, open the lid of the node by unclipping the latch. Keep one hand on top of the solar panel as you open the latch as it is spring loaded, and the lid will open on its own. The Primary Node will remain open until you close it.

Figure 8. Node Latch

Figure 9. Node Lid Open

5. Activate the node by setting the “Solar” (bottom right of the PCB) switch to “ENABLE” and then pressing the “Wake” button (bottom left of the PCB). You will know the Primary Node is successfully awake when the LED indicator “halo” emits a blue light for 30 seconds after activation.

Figure 10. Solar Switch and Node Wake Button

6. Once the Primary Node is awake, you will see the BLUE LEDs down each side of the Cable Node flashing to indicate it is awake and ready to be provisioned.

7. If you have installed sensing cables and peripheral equipment (weather station, HGQS, expanders, etc.) with INT2 cable runs completed already, you can now wire them to their respective terminals inside the primary node. If not, then manually close the node lid and secure the latch into place to ensure a weathertight seal.

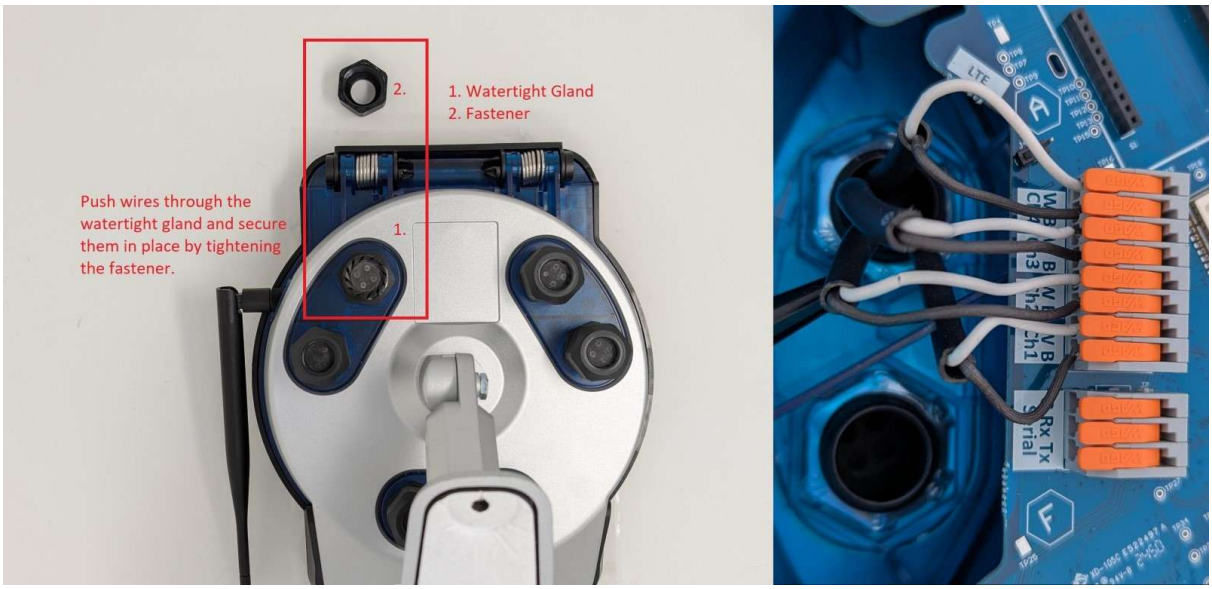


Figure 11. Example of wiring sensing cables and peripheral hardware INT2

Secondary Node Installation

Box Contents

Open the box containing the Secondary Node and confirm that all contents are present:

- Secondary Node
- Magnetic Foot Mount
- 3 X Self-tapping Screws
- Wi-Fi Antenna and Antenna Sleeve

Figure 1. Box Contents

Identify Optimal Installation Location

The optimal installation location will be on the southern half (or the northern half if you are in the southern hemisphere) of the bin roof to maximize sunlight for solar charging. The Node should be located on the bin/silo roof or catwalk where it has the best exposure to the sun and is installed in a location that will not interfere with loading/unloading equipment where it can be damaged. If the Primary Node is to be line-powered, it should be in a position where the power cable can be run easily up the side of the bin wall and along the bin roof to the Node location.

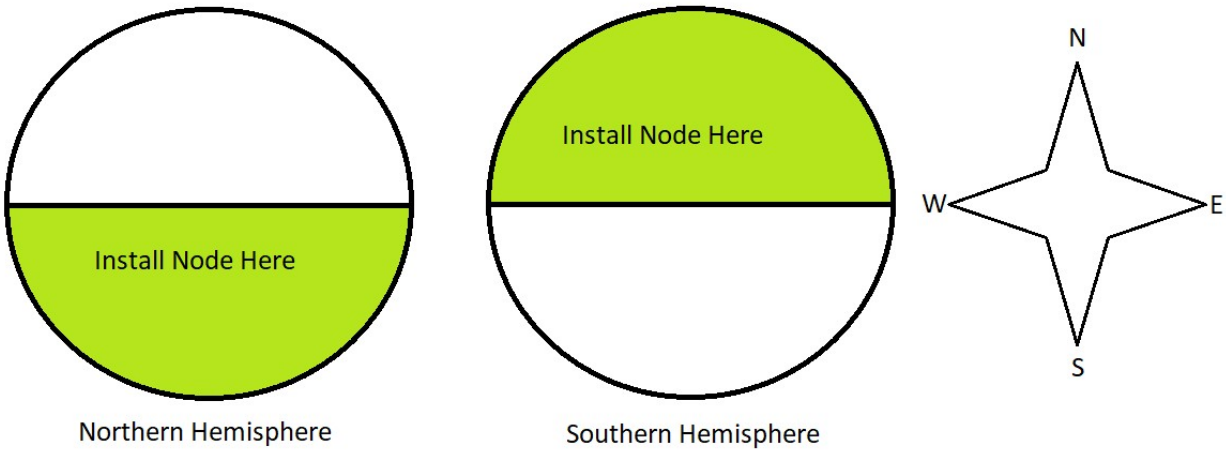


Figure 3. Bird's Eye View of Bin-Roof

Install the Secondary

1. Place the Secondary Node at the optimal installation location using the magnetic foot mount to secure it. Adjust the foot mount so the bottom of the foot mount is aligned with the downward slope of the bin roof, facing due south. You may secure the foot mount in place with a self-tapping screw; however, it is not necessary. The magnetic foot mount provides a secure installation without needing a self-tapping screw in most cases.

Figure 4. Node installed on Bin Roof

2. Using your 7/16” wrench, secure the Primary Node on the foot mount. Once secured to the bin/silo roof, the angle of the Cable Node can be adjusted to provide the best exposure to sunlight. This will ensure at the optimal angle for the solar panel to be most effective year-round. Once the angle has been set use the 7/16” wrench to lock in the angle by tightening the “Foot Mount Adjustment Bolt”. Best practice is to match the angle of the Primary Node to the Latitude of your location. Additionally, if you are in the northern United States or Canada, you can add 10 degrees to the angle to increase efficiency during the winter months and improve snow runoff. For example, if I am installing a Primary Node in Calgary, Alberta, Canada, the Latitude is approximately 50 degrees. Since I am adding 10 degrees here, I would install the node with an angle of 60 degrees.

Figure 5. Adjustment Bolt on Bottom of Node

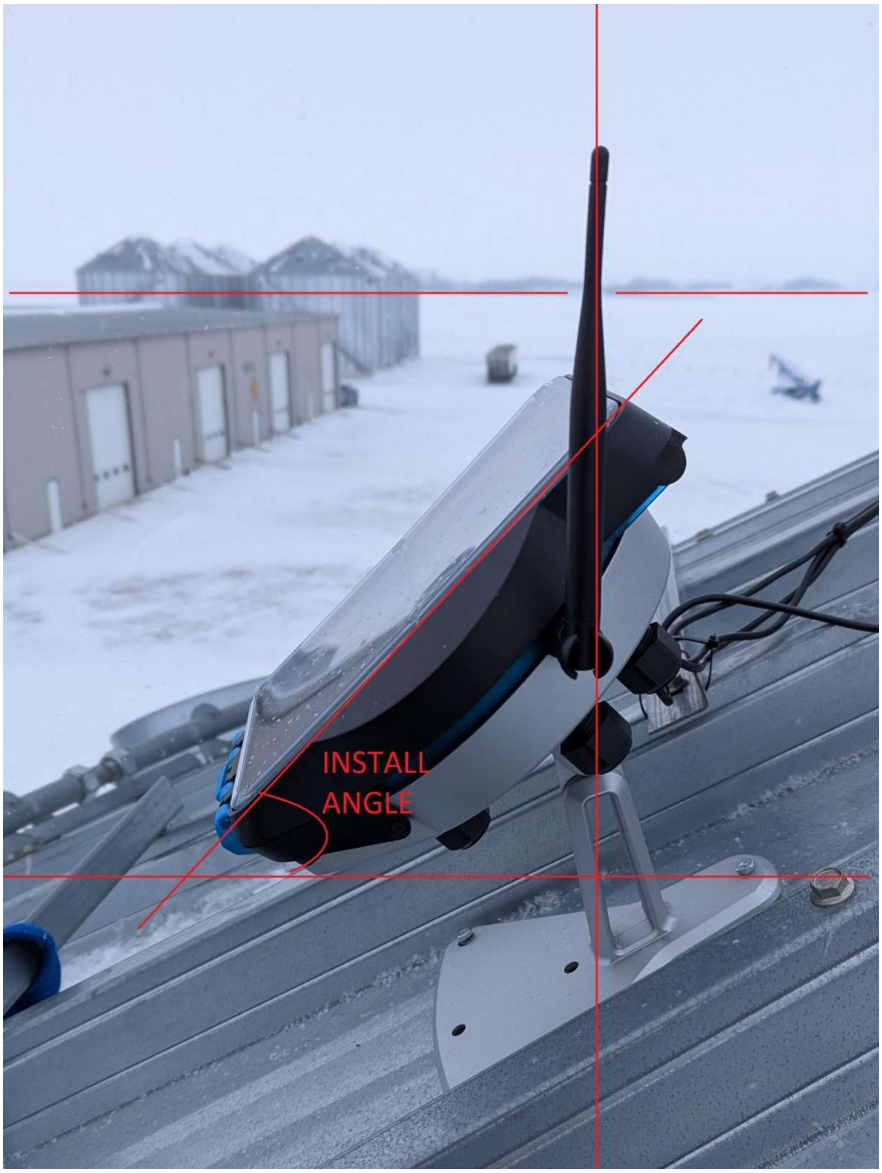


Figure 6. Node Installation Angle for Solar Panel Alignment

3. Before installing the antenna, please note that the antenna is a fragile piece of equipment that is susceptible to damage if not handled delicately and intentionally. To install the antenna:

- Straighten the antenna so they are in a horizontal position. Bend it using the rotating joint at the base of the antenna near the connection side.
- Rotate the antenna clockwise to adjust the position and keep them securely tightened. After they are tight, rotate them until they are aligned such that bending them will position the antenna into an upright 90 degrees.
- Place the boot onto the antenna and move it into position where it secures the antenna into the port on the side of the node. The boot has “grooves” on the end of it which will “catch” and secure it into position on the node.
- Bend the antenna back to a vertical position inside the black sleeve now that they are aligned. **Do this by holding the sleeve with one hand to brace the antenna against improper movement and bending the antenna with the other hand so it locks securely in a vertical 90 degrees upright position.**

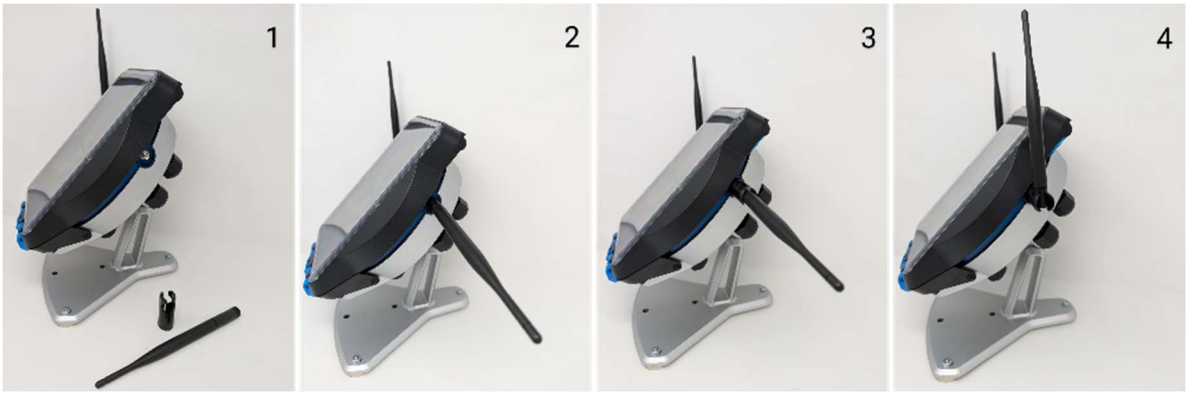


Figure 7. Antenna Locking Procedure

4. Once the Secondary Node is installed, open the lid of the node by unclipping the latch. Keep one hand on top of the solar panel as you open the latch as it is spring loaded, and the lid will open on its own. The Secondary Node will remain open until you close it.

Figure 8. Node Latch

Figure 9. Node Lid Open

5. Activate the node by setting the “Solar” (bottom right of the PCB) switch to “ENABLE” and then pressing the “Wake” button (bottom left of the PCB). You will know the Primary Node is successfully awake when the LED indicator “halo” emits a blue light for 30 seconds after activation.

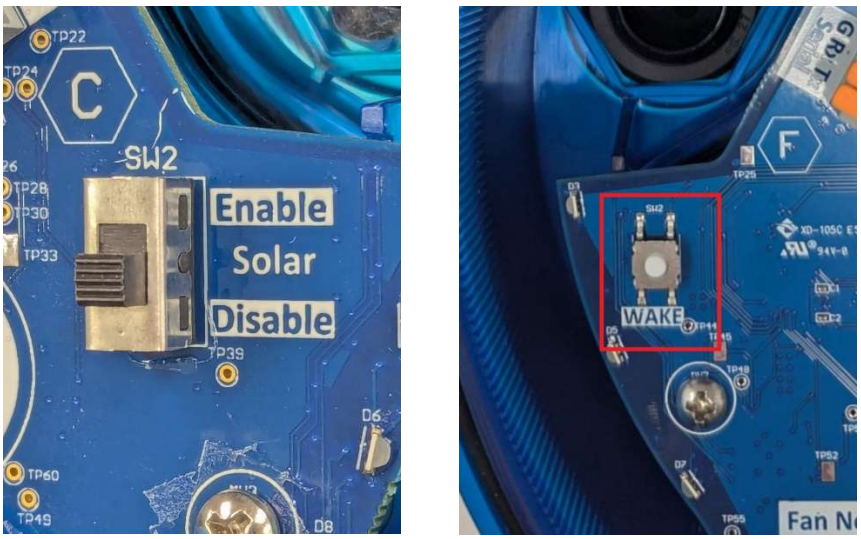


Figure 10. Solar Switch and Node Wake Button

Figure 11. Node Wake Button

6. Once the Secondary Node is awake, you will see the BLUE LEDs down each side of the Cable Node flashing to indicate it is awake and ready to be provisioned.

7. If you have installed sensing cables and peripheral equipment (weather station, HGQS, expanders, etc.) with INT2 cable runs completed already, you can now wire them to their respective terminals inside the primary node. If not, then manually close the node lid and secure the latch into place to ensure a weathertight seal.

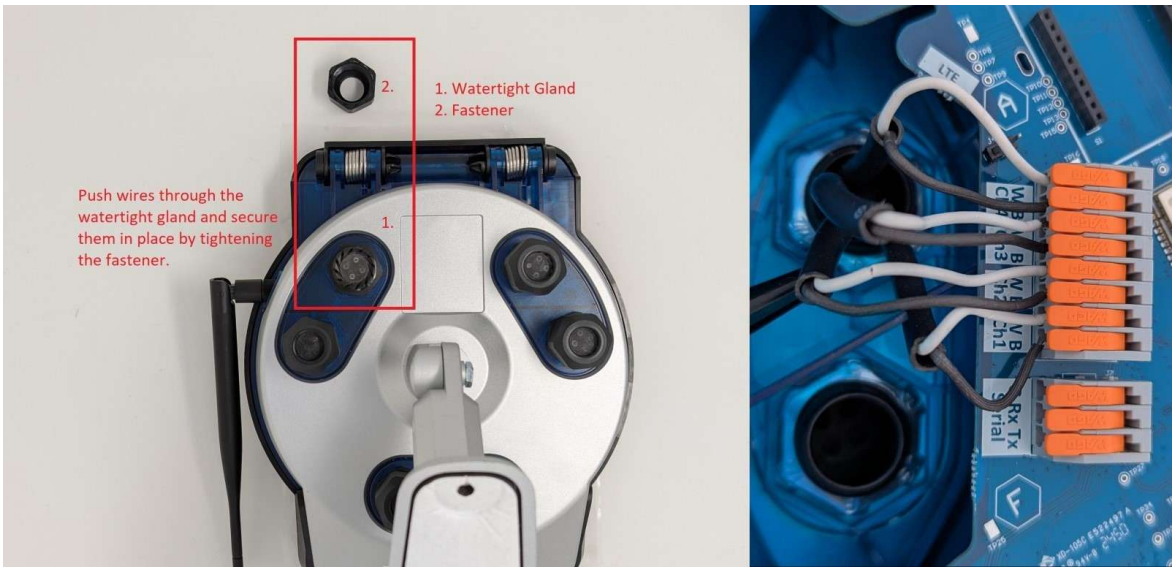


Figure 12. Example of wiring sensing cables and peripheral hardware INT2

Expander Installation

Box Contents

Open the box containing the Cable Node Expander and confirm that all contents are present:

- Cable Node Expander
- Magnetic Foot Mount

Figure 1. Box Contents

Identify Optimal Installation Location

The optimal installation location will be close to the existing Primary/Secondary Node that is already installed on the bin structure. This is because the Cable Node Expander requires a wired connection to the Primary/Secondary Node.

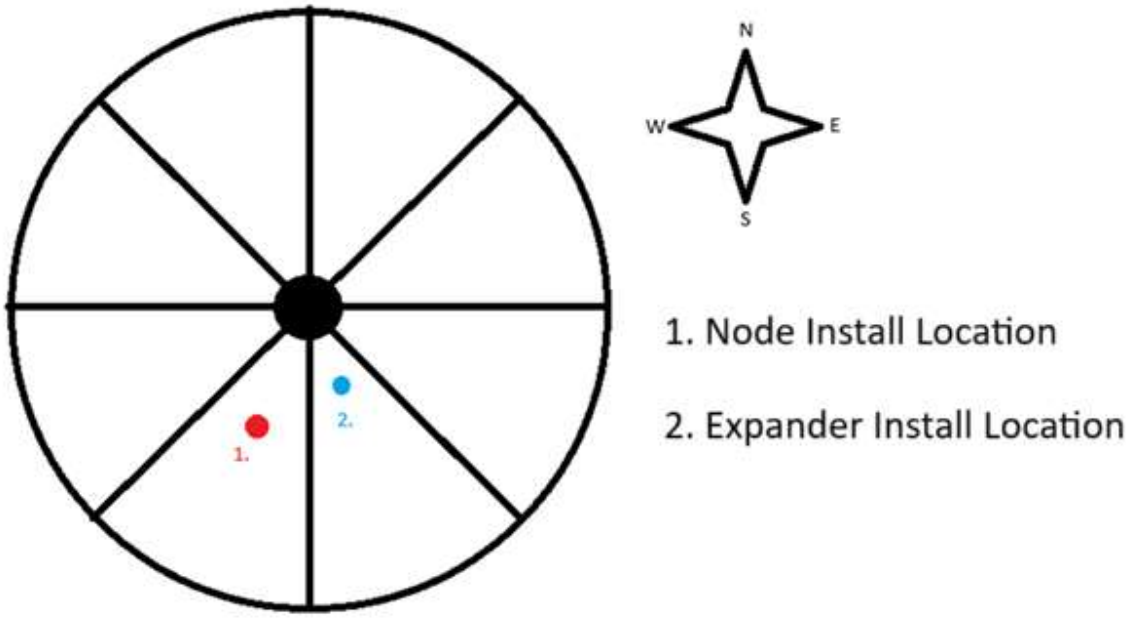


Figure 2. Bird's Eye View of Bin-Roof

Install the Expander

1. Place the Cable Node Expander at the optimal installation location using the magnetic foot mount to secure it. Adjust the foot mount so it lines up where the bottom of the foot mount is aligned with the downward slope of the bin roof. You may secure the foot mount in place with a self-tapping screw; however, it is not necessary. The magnetic foot mount provides a secure installation without needing a self-tapping screw in most cases.

Figure 3. Node installed on Bin Roof

2. Once the Cable Node Expander is installed, open the lid of the node by unclipping the latch. Keep your hands and face clear of the Cable Node Expander as once the latch is unclipped the node will open on its own. The Cable Node Expander will remain open until you close it.

Figure 4. Expander Lid Open

3. Run the 3-wire cable up through the access port on the bottom of the Cable Node Expander. Once it is secure, establish a connection to the terminal on the Cable Node Expander circuit board.

Figure 5. Access Port

4. Close the lid and clip the latch back into place on the Cable Node Expander. Tighten to secure the access port on the bottom of the cable node expander board.

Figure 6. Node Clasp

5. Secure a 1’ length of 3-wire cable with a drip loop to the foot mount of the Cable Node Expander.

Figure 7. Drip Loop

6. Run the 3-wire cable along the bin roof to the Primary/Secondary Node installation location, securing the wire with p-clips and self-tapping screws every 3’.

Figure 8. Wiring

7. Once the 3-wire cable reaches the Primary/Secondary Node, secure a 1’ length of communication cable with a drip loop to the foot mount of the Primary/Secondary Node.

Figure 9. Drip Loop

8. Open the lid of the node by unclipping the latch. Keep your hands and face clear of the Primary/Secondary node as once the latch is unclipped the node will open on its own. The Primary/Secondary Node will remain open until you close it.

Figure 10. Node Lid Open

9. Run the other end of the 3-wire cable up through the access port on the bottom of the Primary/Secondary Node. Once it is secure, establish a connection to the terminal on the Primary/Secondary Node circuit board.

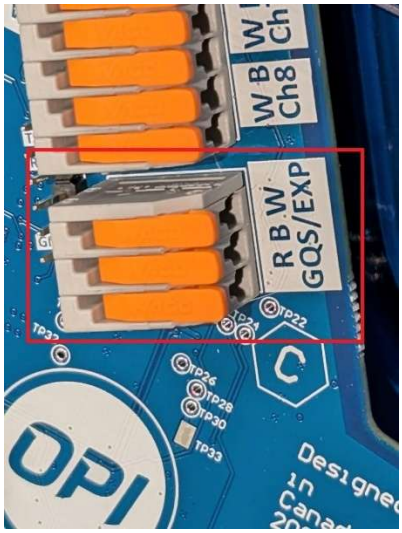


Figure 11. Connection Point on Node PCB

10. Once again, close the lid and clip the latch back into place on the Primary/Secondary Cable Node. Tighten to secure the access port on the bottom of the Primary Cable Node.

Headspace Grain Quality Sensor Installation

Box Contents

Open the box containing the HGQS and confirm that all contents are present:

- HGQS
- Self-tapping screws

Figure 1. Box Contents

Identify Optimal Installation Location

The optimal installation location is ideally near the Node installation location to reduce the amount of cable that needs to be secured to the roof of the bin with screws and p-clips. Additionally, the HGQS needs to be installed on the bin roof in a place where the probe is unlikely to be covered by grain in the bin. Installing the HGQS as close as possible to the bin lid achieves this.

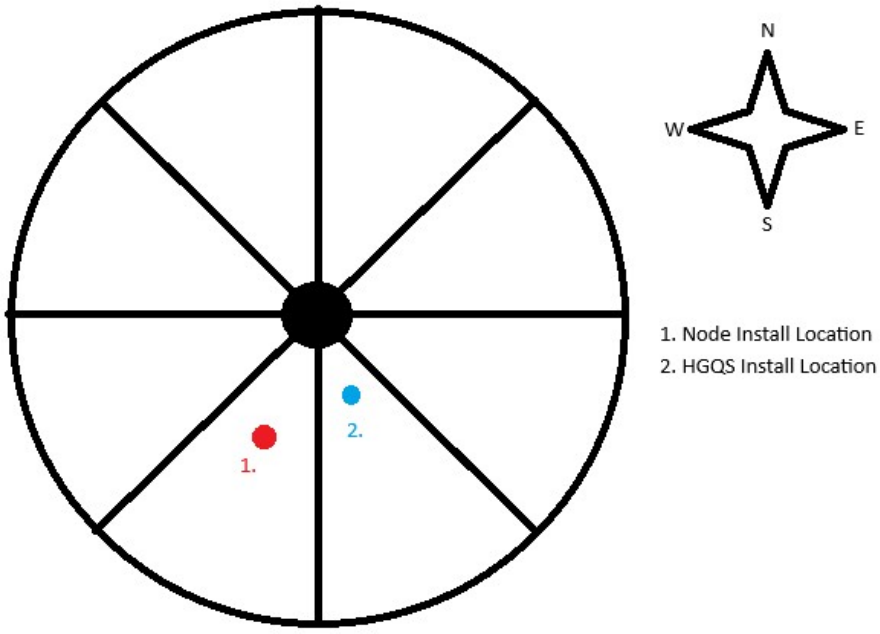


Figure 2. Illustration of optimal installation location

Install the Headspace Grain Quality Sensor (HGQS)

1. Take the HGQS to the installation location. Drill a 1 1/8” hole using either a step bit or an appropriately sized hole-saw. Place the HGQS probe through the hole and secure it in place with the provided self-tapping screws using a 5/8” Nut Driver.
2. Run the 3-wire cable from the HGQS to the Primary/Secondary Node, securing it every 3’-4’ with p-clips and self-tapping screws.

Figure 3. Wiring Picture with Self Tapping Screws and P-Clips

3. Secure 1’ of the 3-wire cable to the foot mount at the bottom of the Primary/Secondary Node in a drip loop.

Figure 4. Drip Loop

4. Open the lid of the node by unclipping the latch. Keep your hands and face clear of the Primary/Secondary Node as once the latch is unclipped the node will open on its own. The Primary/Secondary Node will remain open until you close it.

Figure 5. Open Node

5. Feed the 3-wire cable up through the access port on the bottom of the Primary/Secondary Node. Once it is secure, establish a connection to the terminal on the Primary/Secondary Node circuit board.

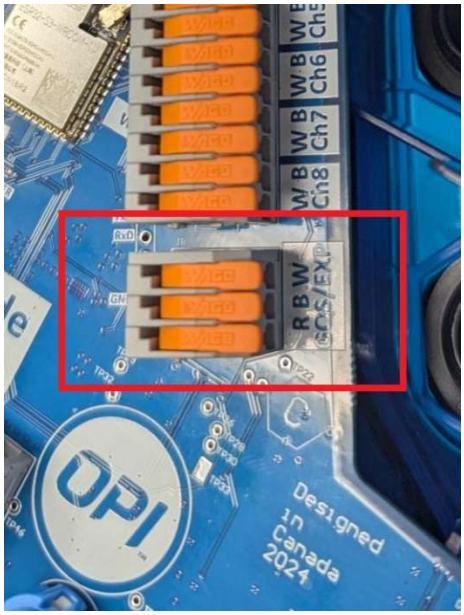


Figure 6. Node PCB showing connection point

6. After the 3-wire cable is secured in the terminal, manually close the node lid and secure the latch into place to ensure a weathertight seal.

Figure 7. Closed Node Showing Secure Clasp

Weather Station Installation

Box Contents

Open the box containing the Weather Station and confirm that all contents are present:

- Weather Station
- Foot Mount
- Self-Tapping Screws and Bolt

Figure 1. Box Contents

Identify Optimal Installation Location

The optimal installation location is in the bin yard within proximity to the bin structures storing the end-user's grain. **NOTE:** The weather station cannot be installed using the foot mount on the bin structure itself as the metal bin structure can radiate heat as they experience daytime heating from exposure to sunlight. Also avoid installing the Weather Station near large bodies of water, beside a fan exhaust, or in a position where it will interfere with equipment like an auger.

Install the Weather Station

1. Take the weather station to the installation location. Line up the foot mount on the installation location and then secure it in place with the provided self-tapping screws.

Figure 2. Installed Weather Station

2. Rotate the Weather Station on the top of the foot mount until it is aligned in a totally vertical orientation. Secure the Weather Station in place by tightening the bolt connecting the base of the Weather Station to the foot mount.

Figure 3. Foot Mount Adjustment Bolt

3. Secure 1’ of the INT2 cable to the foot mount at the bottom of the Weather Station in a drip loop.

Figure 4. Drip Loop

4. Run the INT2 wire from the Weather Station to the Primary/Secondary Node, securing it every 3’ to 4’ with p-clips and self-tapping screws. **NOTE:** Connecting a Weather Station to a Primary/Secondary Node works on monitoring systems only. When you have EPIQ+ with fan control the weather station needs to be wired to the Fan Control Node.

Figure 5. INT2 Secured on Bin Roof With P-Clips

5. Open the lid of the node by unclipping the latch. Keep your hands and face clear of the Cable Node Expander as once the latch is unclipped the node will open on its own. The Node will remain open until you close it.

Figure 6. Node Latch

Figure 7. Node Lid Open

6. Feed the INT2 wire up through the access port on the bottom of Node. Once it is secure, establish a connection to the terminal on the Primary/Secondary Node circuit board. You can secure the Weather Station in any terminal labelled W B CH1 to W B CH8; however, it is recommended to use CH8 so that the other channels can remain open for sensing cables.

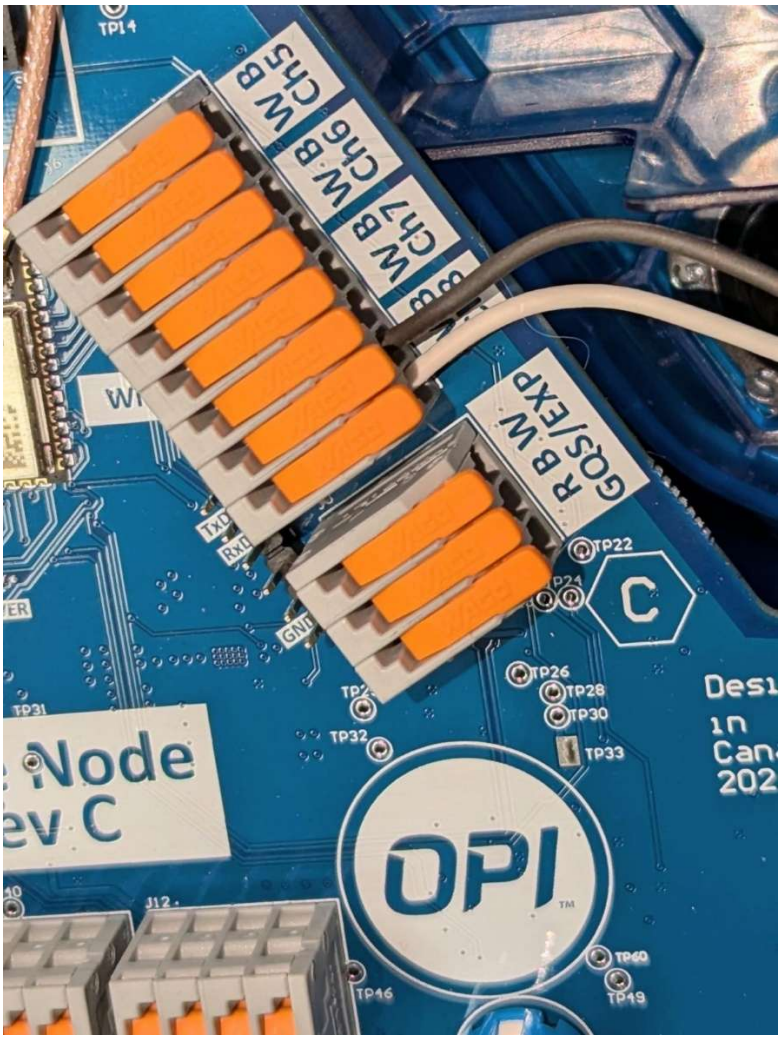


Figure 8. Node PCB Showing Connection Points

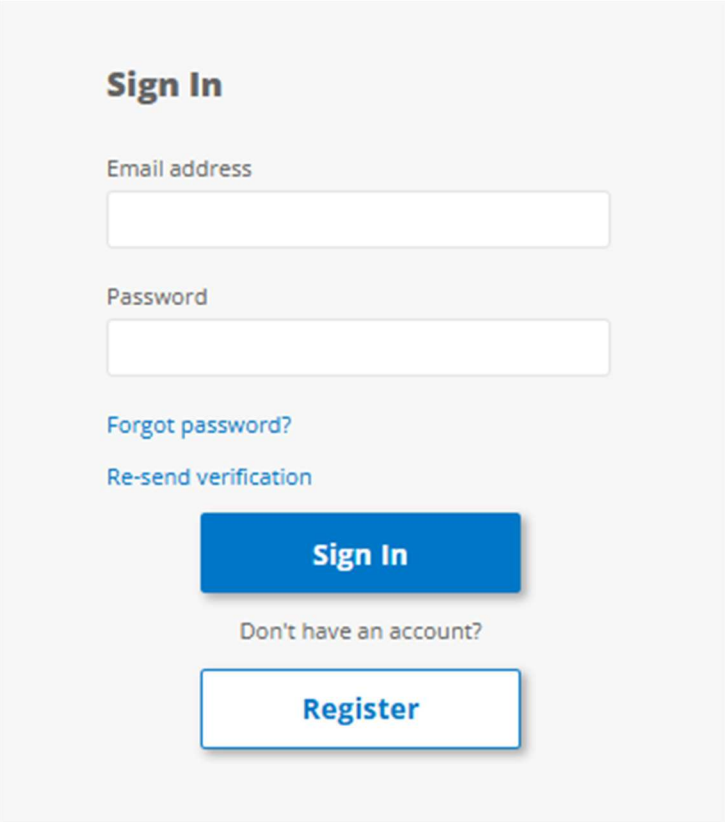
7. After the Secondary Node is activated, manually close the node lid and secure the latch into place to ensure a weathertight seal.

Figure 9. Node Latch

OPI EPIQ Configuration

Log In or Register

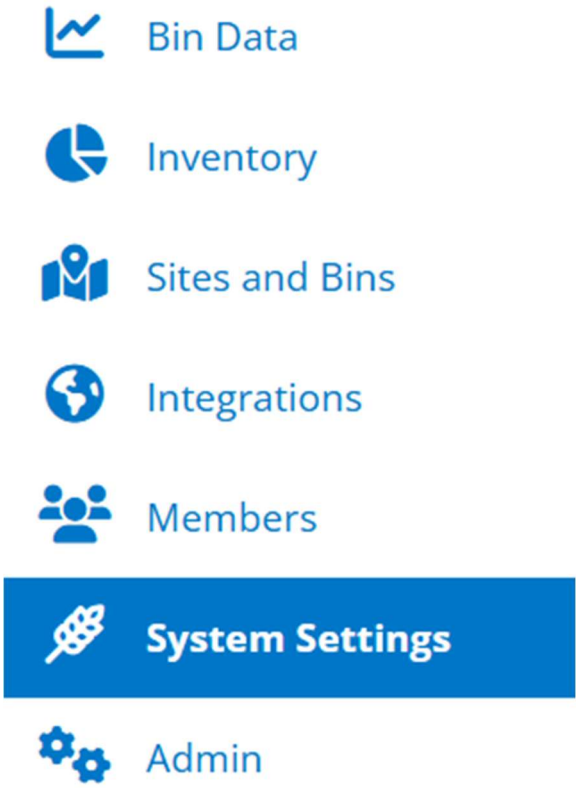
- Navigate to www.managegrain.com.
- Log in to your account.
- If you don't have an account, click **"Register"** and follow the prompts.



Create Your Site (Bin Yard) and Bin Structure(s)

Skip this step if you've already created your Site (Bin Yard) and Bin Structures.

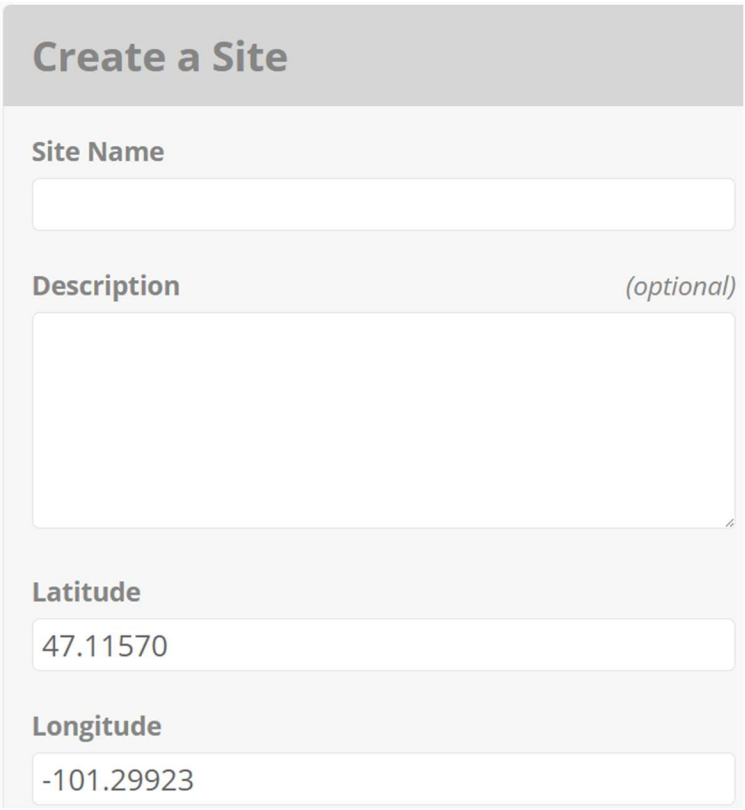
1) Create Your Site
   - Click the **white gear with a blue outline** icon labeled **"System Settings"** on the left menu.



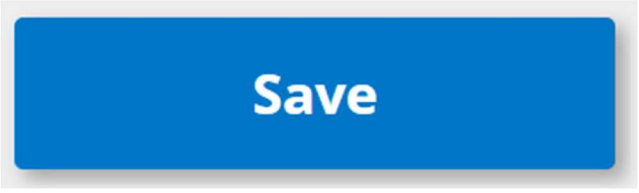
   - At the top of the page, click on **"Sites"**

- Click **“Create a Site”** (top right)

- Fill in the required fields (Site Name, Latitude, and Longitude).



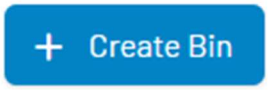
- Then click on **“Save”**



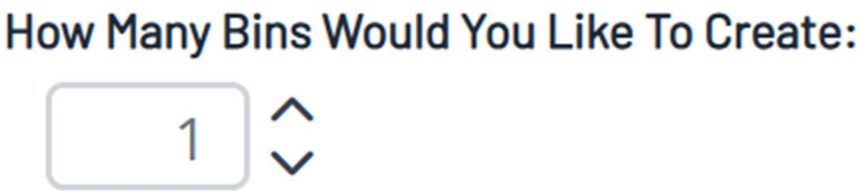
2) Create your Bin(s)

- After the site is created, click on **“Bins”** at the top of the page.

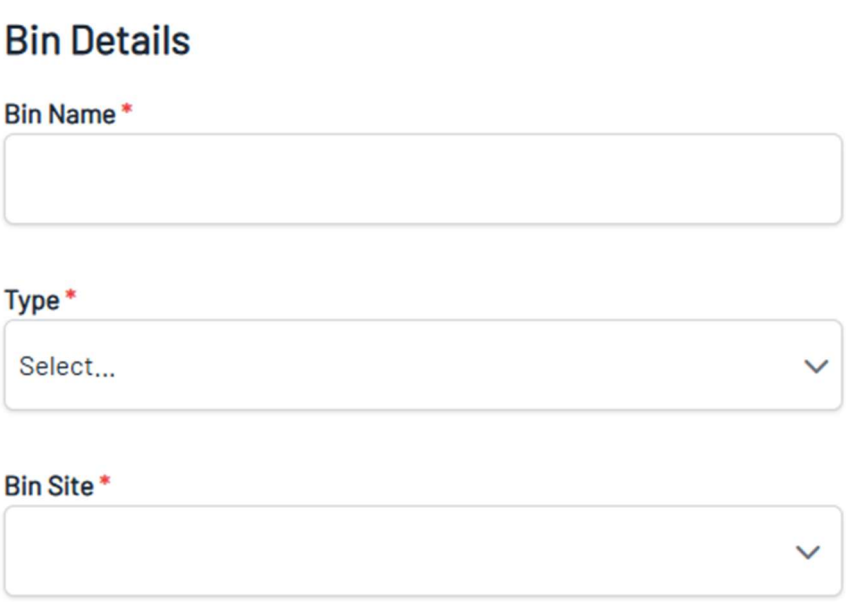
- Click **“Create a Bin”** (top right).



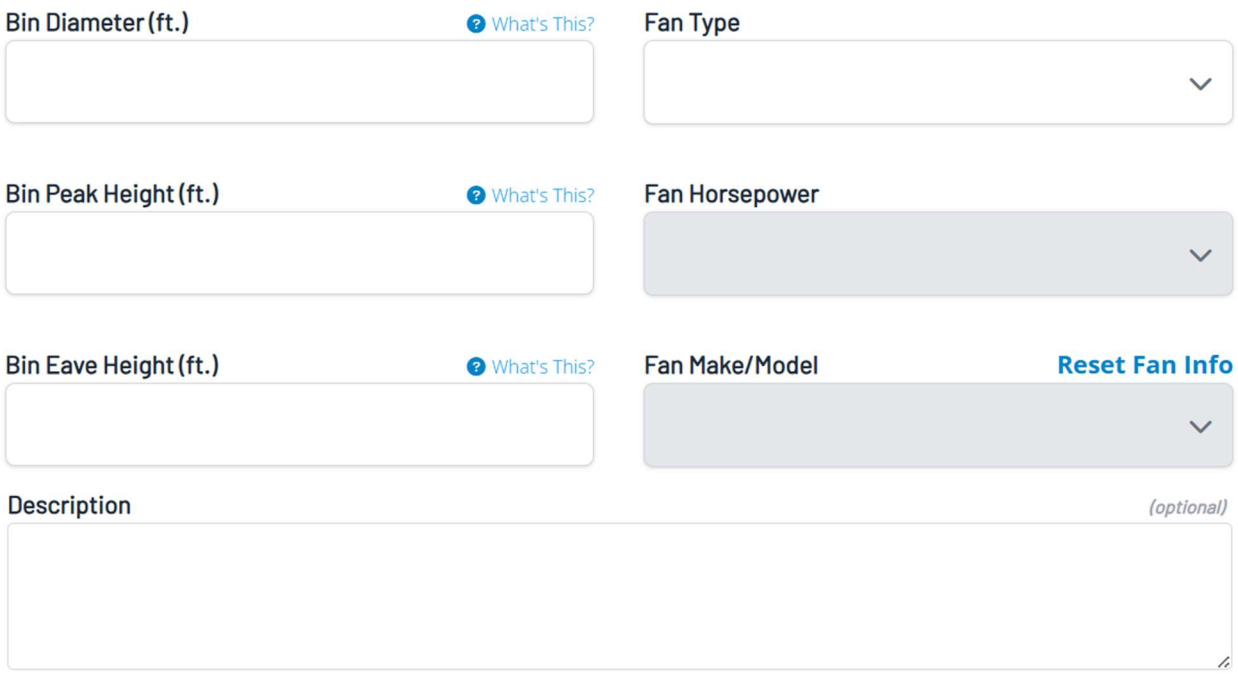
- Choose the number of bins you would like to create



- Fill in the required information marked by an asterisk (Bin Name, Type, and Bin Site)



- Fill the optional information about the bin structure (Bin Diameter, Bin Peak Height, Bin Eave Height, Fan Type, Fan Horsepower, Fan Make/Model, and Description). It is not mandatory for creating a bin.



- Click **"Create Bin(s)"** at the bottom of the page:

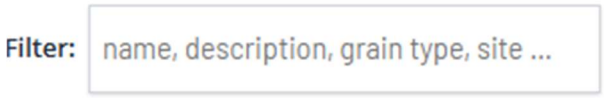
- Repeat the process to create all your grain bins as necessary.

Prepare your existing OPI Blue Bin(s)

Only complete this step if you are replacing existing OPI Blue hardware. Skip this step if this is a new installation.

- At the top of the page, click on **"Nodes"**.

- Use the search bar labelled **“Filter”** or scroll to find the OPI Blue hardware (Cable Node(s) and/or Fan Control Radios).

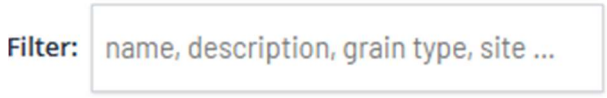


- Click **“Unregister”** on the right-hand-side of the screen.

- Click **“Confirm”** to remove unregister the node.

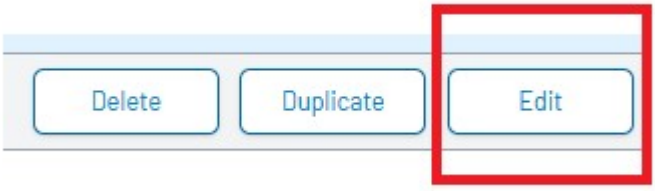
- Repeat as necessary on remaining OPI Blue Bins.
- Next, click on **“Bins”** at the top of the page.

- Use the search bar labelled **“Filter”** or scroll to find the existing **“OPI Blue Bin(s)”**.



- Click on **“Grain Info”**.

- Click on **“Edit”** on the right-hand-side of the page.



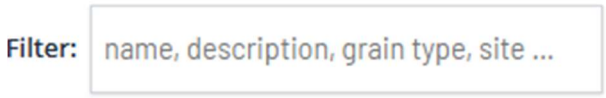
- Click on **“Reset Curve”** next to **“Grain Curve”**.

- Next, click on **“Save and Close”**.

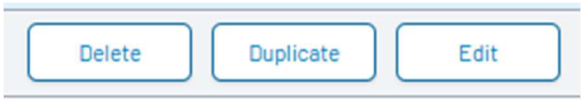
- Repeat as necessary on any remaining OPI Blue Bins.

Add your Primary Node to your “Primary Bin”

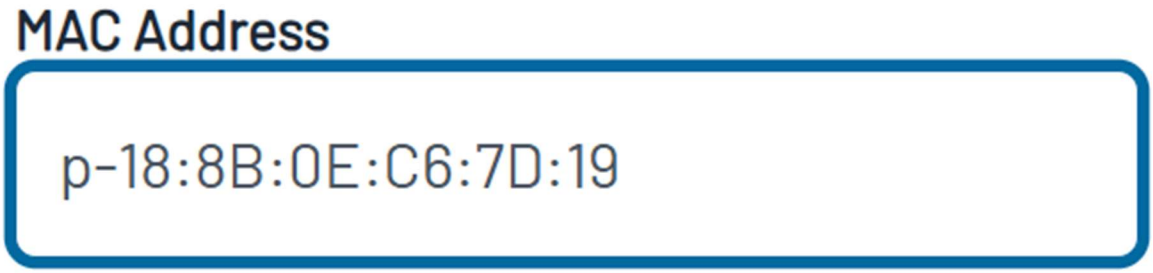
- Use the search bar labelled **“Filter”** or scroll to find the bin with the Primary Node.



- Click **“Edit”** (top right corner).



- Scroll down to the **“MAC Address”** field at the bottom and type **“p-”** followed by the **MAC Address** of the Primary Node.



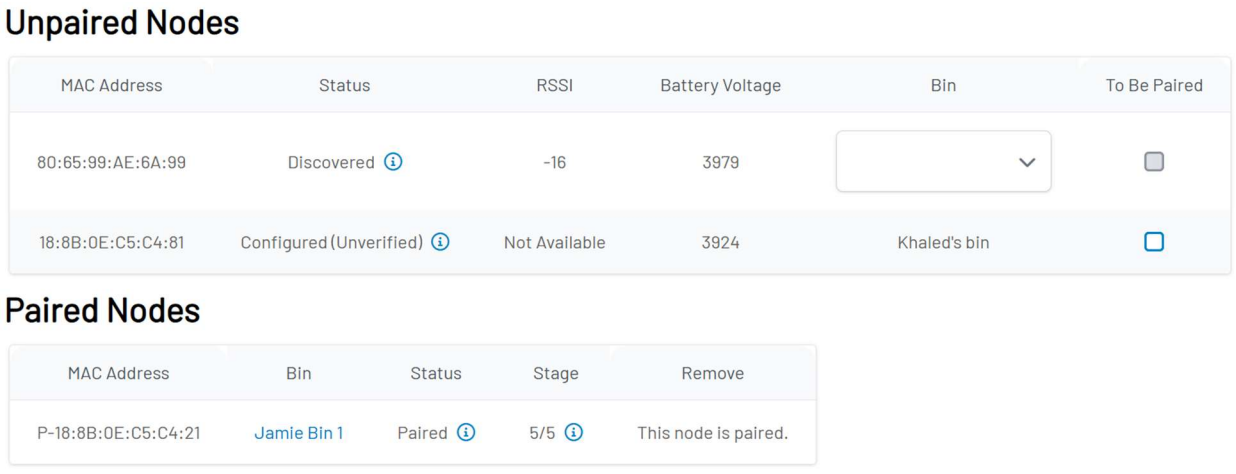
- Click **“Add Hardware”**.

- At the bottom of the page, click **“Save and Close”.**

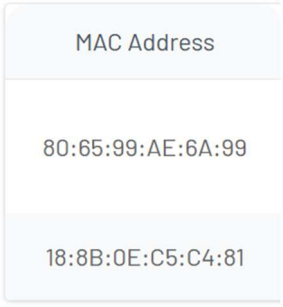
Provision the Nodes (Primary + Secondaries)

- Navigate to the **Primary Node** and click **“Hardware”**.

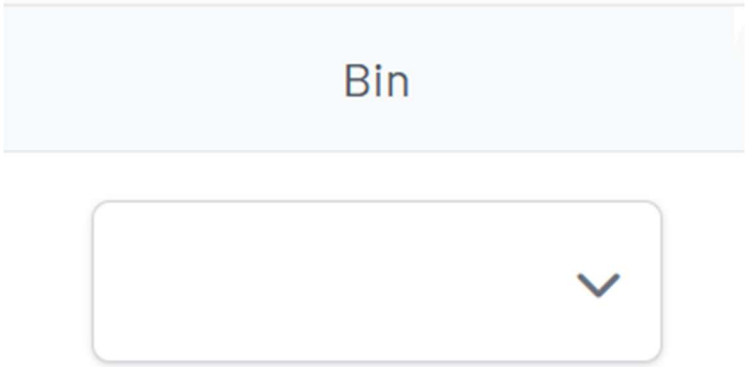
- You’ll see two sections: **Paired Nodes** and **Unpaired Nodes**.



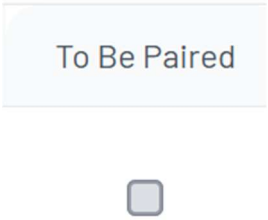
- Find each **Unpaired Secondary Node**, and for each one:
  - Use the **MAC address** to identify it.



  - Use the **“Bin”** dropdown to assign it to the correct bin.

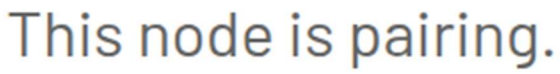


  - Check **“To Be Paired”**.

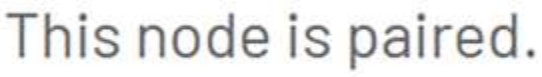


- Once all nodes are assigned, click **“Connect Hardware”** to provision them.

- The Nodes will now display a status of **“This node is pairing”**.



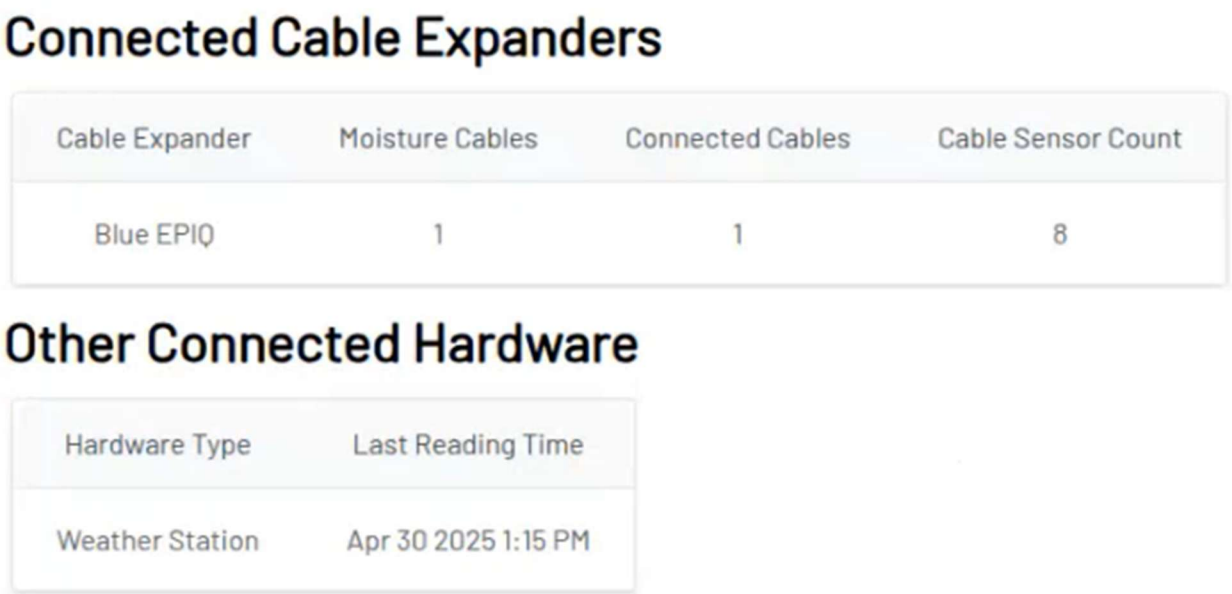
- The provisioning is complete when all nodes display a **“This node is paired.” status.**



Confirm Hardware Assignments

- On the same settings page, navigate to each bin you have created, then click the **“Hardware”** tab.

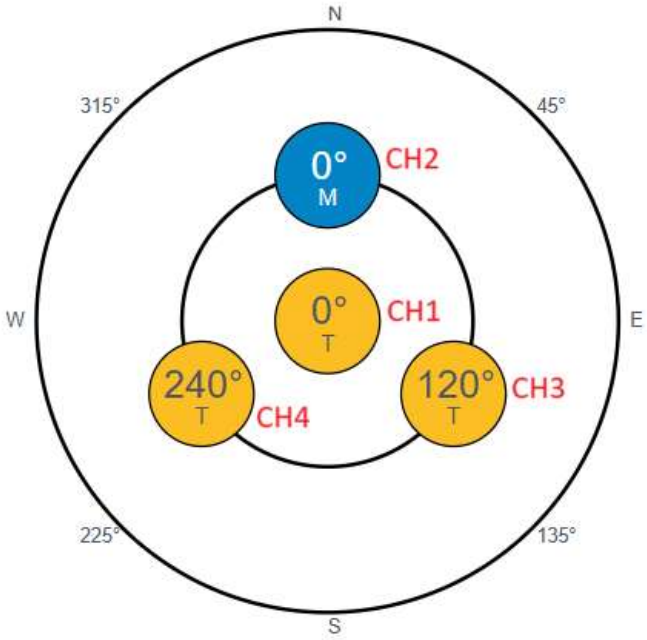
- All hardware that is connected to the selected bin will be displayed:
    - **Temperature/Moisture cables** and any connected **Cable Expanders** will show under **"Connected Cable Expanders"**.
    - Any connected **Grain Quality Sensors/Weather Stations** will show under **"Other Connected Hardware"**.



Confirm Cable Mapping

- Click on **“Cables”** in each Bin Structure.

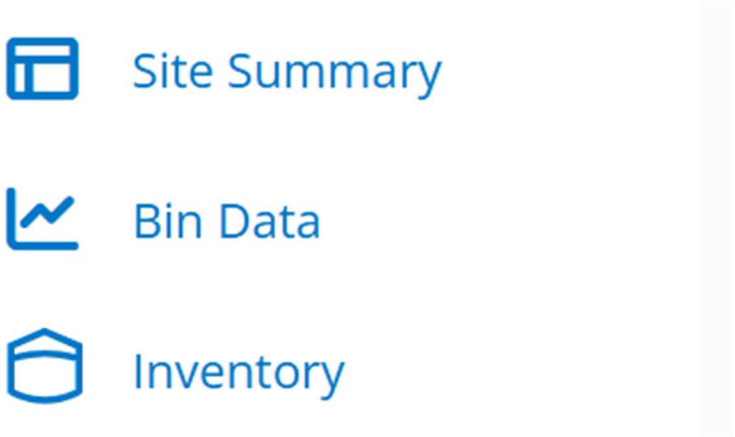
- This shows the cable positions and order, based on wiring with **channel 1** being the center cable, **channel 2** being the first cable in the first radius in the northernmost position, and the remaining cables being assigned **clockwise** from there.



NOTE: The sensing cables will be assigned based on the **physical wiring** of the lead wire from the cables into the Primary/Secondary Node **terminals**. The default rules are that **channel 1** is the assumed **center cable**. **Channel 2** is the **first cable** in the **first radius** of cables inside the Bin Structure which is located as the northernmost cable installed in that radius. From there the cables get assigned in a **clockwise direction**.

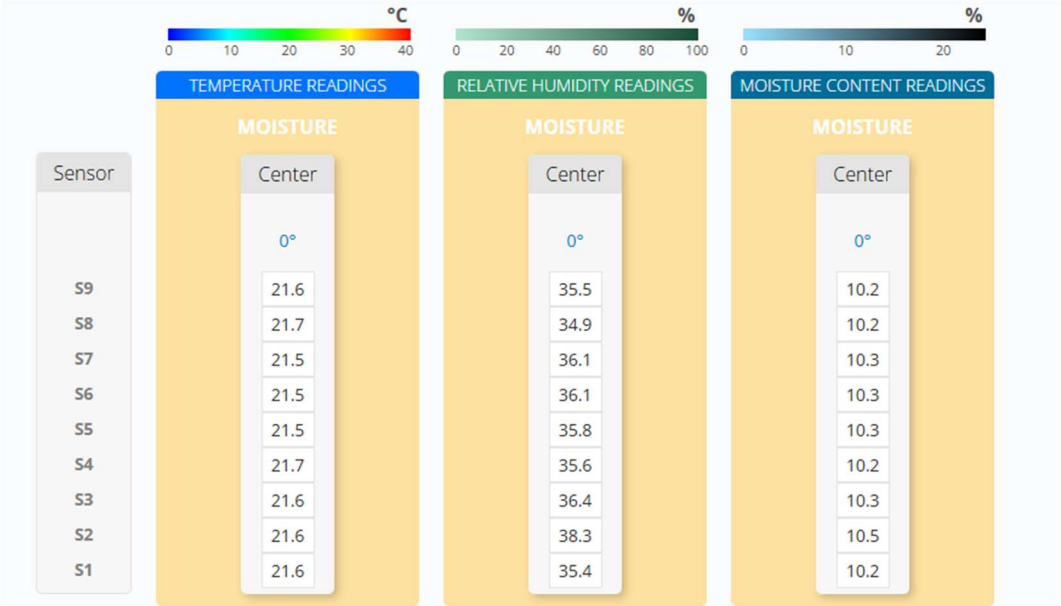
Validate the Cable Readings

- Click on **“Bin Data”** on the menu on the left-hand side of the page.



- Navigate to the Bin Data for the bins you have created by selecting the name of the bin from the dropdown menu:

- Validate that the Cables assigned to the Bin Structure are reporting cable data here in the **Table View**:

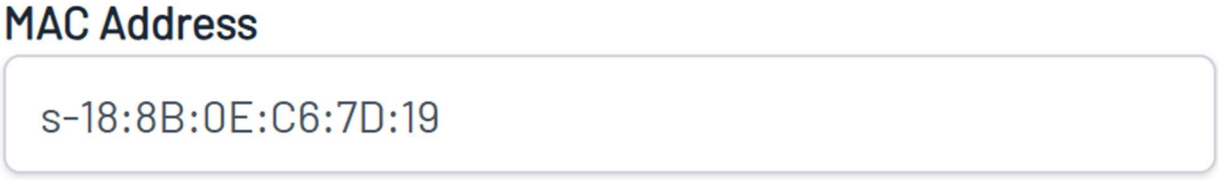


Adding Additional Secondary Nodes to an Existing Site (Bin Yard)

If you are adding a Secondary Node to an existing site (for example you built a new bin), you can provision Secondary Nodes one at a time:

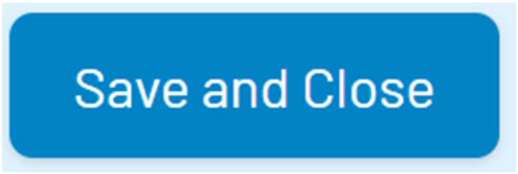
- Open the Bin Structure and click **"Edit"**.

- In the **MAC Address** field, type **"s-"** followed by the MAC address of the Secondary Node.



- Click **“Add Hardware”**

- **Click “Save and Close”**



The Secondary Node will **automatically** provision the next time the Primary Node connects to the server (about once per hour).

Help and Support

- Call us at 1-800-661-1055 for technical support
- Get help online by submitting a support ticket at https://knowledge.opisystems.com/en/knowledge/kb-tickets/new
- Find your answer in our online knowledgebase at https://knowledge.opisystems.com/en/knowledge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