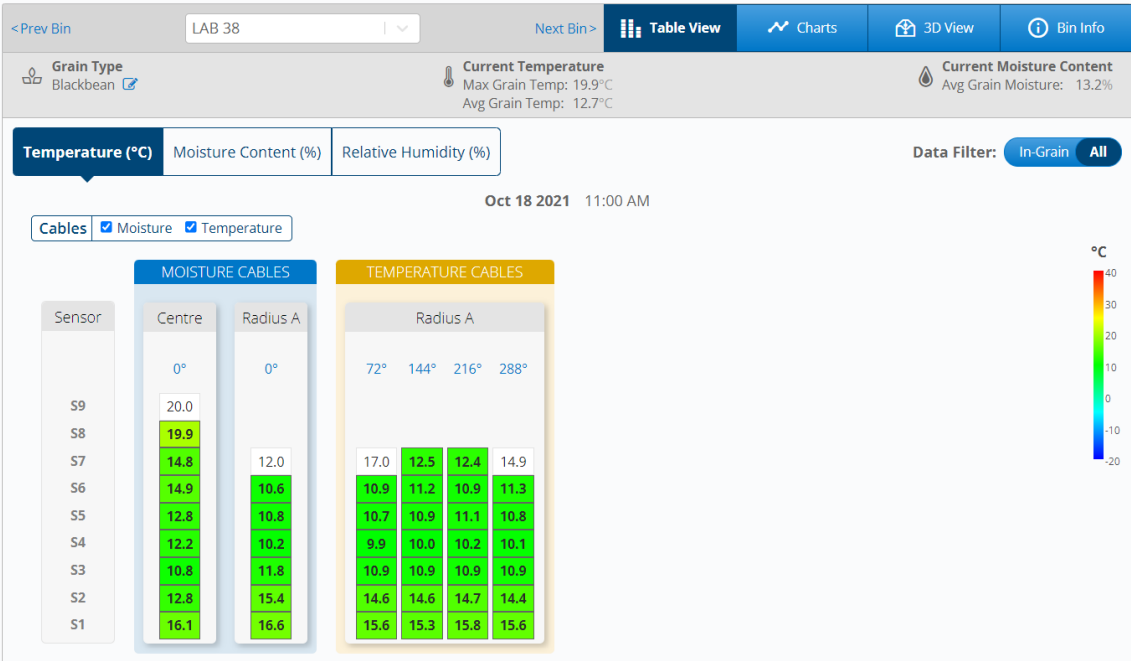


# Features and System Use

## 4.3.1 Bin Data

### Table View

The Table view allows for a simple display of the cable data that is easy to read and understand. By selecting a bin, the data is organized with a list of cables displayed across the top of the table view and with the cable sensors displayed down the left-hand column. The cables are displayed based on the placement of each cable in a bin when initially configured.



For bins that have moisture cables installed, in addition to being able to view temperature data the humidity data and moisture data are also available to be displayed. For moisture data to appear a Grain Curve must be selected. To add a Grain Curve, go to **System Settings** → **Bins** → (Select Bin) **Grain Info** → **Edit**.

**Note:** Getting a grain level indication in a structure can take 15-hours to achieve upon the initial filling of the structure. During this 15-hour period the automated fan control function can only be used if the **Override Disclaimer** is acknowledged by the grain manager. This Disclaimer is located on the **Fans Settings** page. (shown below)

**Important!** To avoid damage, ensure there is grain in the bin before enabling Automated Fan Control.

The system may take up to 24 hours to determine grain level before starting.

**Override and begin immediately. (Do not wait for grain level)**

**Grain Level Confirmation**

OPI Blue relies on an algorithm to compute which sensors are buried in the grain mass and thus verify that the bin does contain grain, allowing for safe operation of fans and heaters. You are about to override this safety feature, acknowledging:

- 1. Grain levels and inventory may not be viewable immediately in OPI Blue;**
- 2. Safety risks to equipment and personnel.**

I acknowledge that running fans or heaters in an empty bin can cause serious damage or physical injury, as well as incorrect conditioning of grain. I confirm that I have visually inspected this bin, and deem the bin to be in a state to safely operate fans and/or heaters.

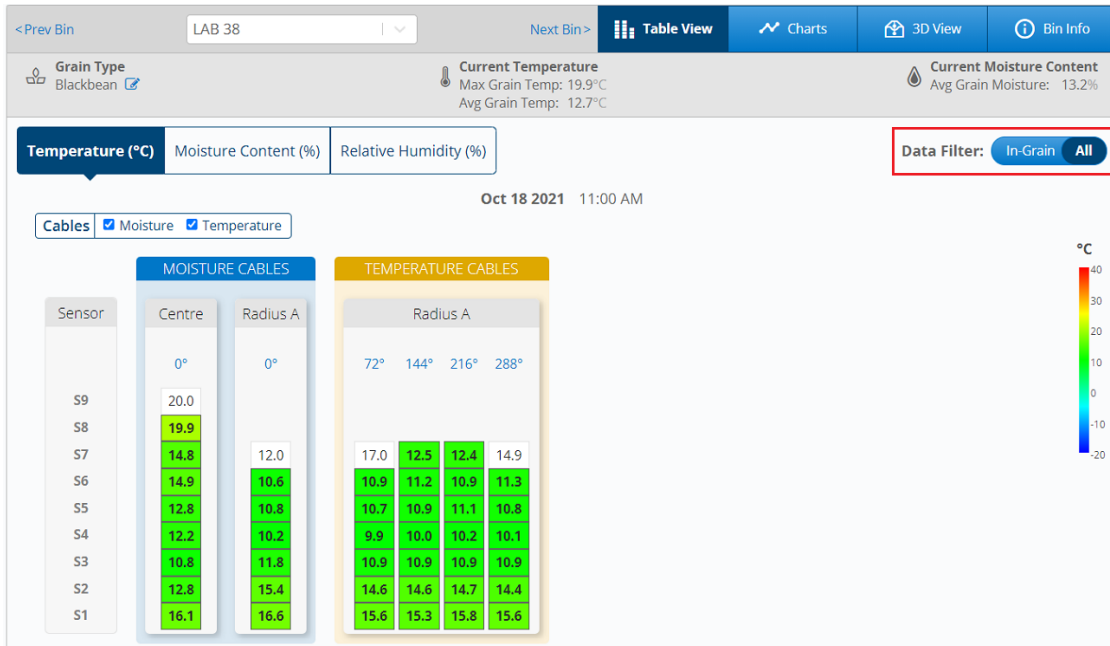
**I have read and acknowledge the disclaimer.**

Apply these settings to other bins

Yes No

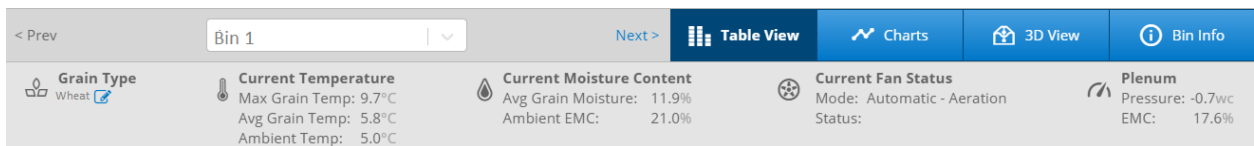
Save

Cancel



**Note:** By default, the cable data will be displayed for all cable sensors. Using the **Data Filter** toggle switch (highlighted in red) the system can be configured to display all sensor data or only the data from the sensors that the system has determined are in

Across the top of the **Table View**, **2D Graph**, **3D View** and **Bin Info** screens there is useful information displayed with regards to the current bin that has been selected. This information is informative when it comes to the current conditions inside the bin, **Current Temperature**, **Current Moisture Content**, **Current Fan Status** and **Plenum Pressure** (If automated fan control enabled). In addition, the current Ambient Temperature and Ambient EMC is displayed which provides valuable information in determining when the fan(s) should be turned ON or OFF in manual mode.



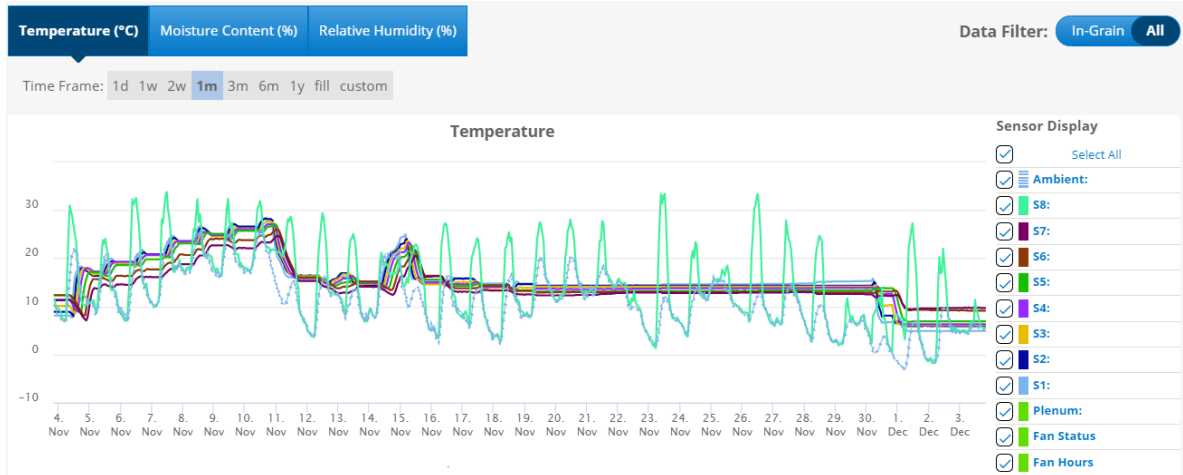
**Note:** Using the **Quick Edit** function icon provides an easy means to edit **Bin Info**, **Grain Info**, **Parameters** and **Alarm Details**.

## Charts

The Charts page will display data in a graphical form for a selected bin across a site. Unlike the Table View which displays current temperature and moisture readings, the graphed data is the logged historical readings. By selecting a cable, you will see the data displayed in the graph over a chosen duration of time. (1-Day, 1-Week, 2-Weeks, 1-Month, 3-Months, 6-Months, 1-Year, From Fill Date or a Custom Date)

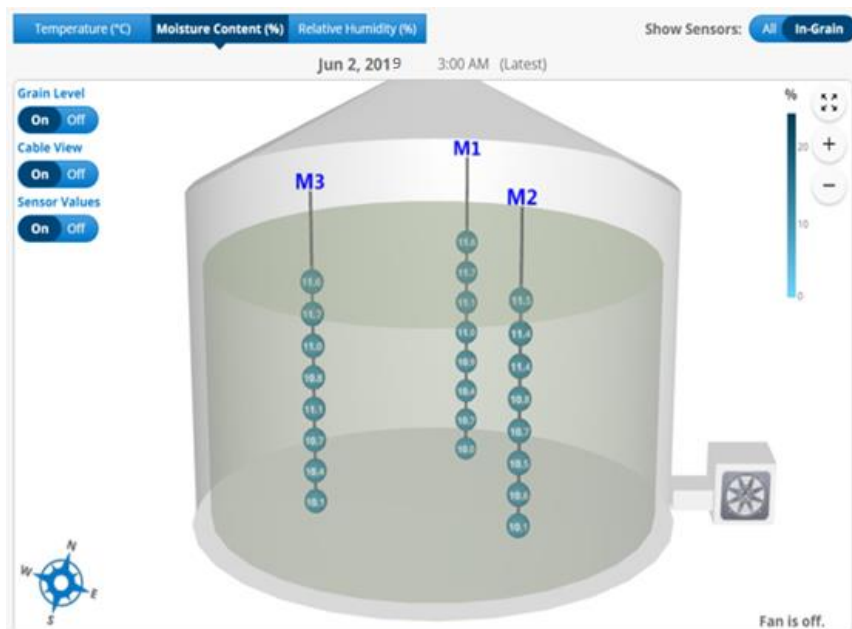
This historic data is especially helpful when it comes to watching trends over time. You can easily see if there are any sensors within a bin that are increasing in temperature and deal with it accordingly prior to it becoming a

hotspot. The graph also provides the visibility to see what is occurring throughout a bin with regards to moisture and temperature management on a cable by cable basis.



### 3D View

The 3D View provides a graphical 3D view of the bin, cables/sensors in addition to a visual display of the grain level within the bin. There are three toggle switches on the left-hand portion of the screen that enable the **Grain Level**, **Cable View** and **Sensor Values** to be turned ON/OFF depending on the user preference. Using the **Show Sensors** toggle switch the data displayed inside each sensor can also be turned ON/OFF to display all sensor data or only the data from the sensors that are determined within the grain.



## Bin Info

The **Bin Info** tab enables you to see **Bin Details**, **Alarms**, and **Fan Control History** depending on the chosen link.

[Bin Details](#) | [Alarms](#) | [Fan Control History](#)

**Description:** Bin 1  
**Grain Type:** Rice  
**Fill Date:** Aug 7 2019  
**Price/bu:** \$0.00  
**Total Value:** \$0  
**Grain Level:** 37726 / 41000 bu  
**Grain Level Source:** Auto detect

[Edit](#)

## Alarms

### Active Alarms

No active alarms for this bin.

### Alarm History

**Bin "BH - 1": Control Mode switched to Manual for Bin "BH - 1".**

Raised Dec 11 2019 3:36 PM

Dismissed by: John Smith · Dec 12 2019 6:50 AM; a year ago

Solved Dec 11 2019 3:36 PM; a year ago

**Bin "BH - 1": Control Mode switched to Manual for Bin "BH - 1".**

Raised Dec 4 2019 11:30 AM

Dismissed by: John Smith · Dec 4 2019 4:28 PM; a year ago

Solved Dec 4 2019 11:30 AM; a year ago

## Fan Control History (only visible if fan control is in place)

[Bin Details](#) | [Alarms](#) | [Fan Control History](#)


Previous day  Next day

Fan Events  Heater Events  Control Events

Time	Type	Details
Dec 3 2020 2:35 AM	<b>AERATION INFO</b>	A14. Fan OFF; Plenum wet-basis emc (0.15) > target emc upper-bound 0.14.
Dec 3 2020 2:30 AM	<b>AERATION INFO</b>	A23.2 Fan OFF (Cooling); expected fan on plenum temperature (5.55C = ambient air temperature 5.00C + fan warming 0.55C) is greater than average grain temperature less offset (5.31C - 2.77C = 2.54C); turning fans on at this time would not cool the grain.
Dec 3 2020 2:20 AM	<b>AERATION INFO</b>	A14. Fan OFF; Plenum wet-basis emc (0.15) > target emc upper-bound 0.14.
Dec 3 2020 2:10 AM	<b>AERATION INFO</b>	A23.2 Fan OFF (Cooling); expected fan on plenum temperature (5.34C = ambient air temperature 4.79C + fan warming 0.55C) is greater than average grain temperature less offset (5.31C - 2.77C = 2.54C); turning fans on at this time would not cool the grain.

### 4.3.2 Site Summary

The **Site Summary** page can be accessed through the menu. This page provides the user with a customizable one stop shop where key data can be viewed in a table format for the selected **Site** and bins associated with the site. Clicking (tap on mobile device) the **Customize** button enables the ability to select the various data headers that are determined to be most important to you by placing or removing a checkmark beside each.











**Note:** The **Site Summary** table can be filtered by clicking to the right of the column header to display the data in ascending or descending order. Using the **Quick Edit** function  provides an easy means to edit **Bin Info**, **Grain Info**, **Parameters** and

Site

Smith Farms

**Customize**

Name  Fill Date  Grain Type  Level  Bushels  Value  Average Grain Moisture  Ambient EMC  Max Grain Temp  Max Temp Setpoint  Rate of Rise Setpoint

Name	Fill Date	Grain Type	Level	Bushels	Value	Average Grain Moisture	Ambient EMC	Max Grain Temp	Max Temp Setpoint	Rate of Rise Setpoint
BH - 8 	2019-09-06	Rice	13%	5369bu	\$0	N/A	21.0%	8.3°C	37.8°C	Off
BH - 3 	2019-09-13	Rice	70%	28615bu	\$0	11.9%	21.0%	12.8°C	37.8°C	Off
BH - 6 	2019-09-06	Rice	79%	32540bu	\$0	15.3%	21.0%	11.0°C	37.8°C	Off
BH - 7 	2019-02-28	Rice	93%	38180bu	\$0	12.2%	21.0%	14.5°C	37.8°C	Off
BH - 5 	2019-09-06	Rice	61%	24913bu	\$0	13.1%	21.0%	11.5°C	37.8°C	Off
BH - 2 	2019-09-05	Rice	92%	37726bu	\$0	12.0%	21.0%	11.8°C	37.8°C	Off
BH - 4 	2019-09-06	Rice	90%	36872bu	\$0	12.5%	21.0%	17.1°C	37.8°C	Off
BH - 9 	2019-09-06	Rice	93%	38180bu	\$0	12.1%	21.0%	17.6°C	37.8°C	Off
BH - 10 	2019-09-06	Rice	76%	31177bu	\$0	13.3%	21.0%	11.6°C	37.8°C	Off
BH - 1 	2019-08-06	Rice	92%	37726bu	\$0	11.9%	21.0%	9.7°C	37.8°C	Off

### 4.3.3 Alarms

**Note:** The alarm settings for each bin are setup during the **Create Bin** process. However, they can be adjusted if need after the fact. To change the Temperature Alarm setpoints go under **System Settings** → **Bins** → (Select Bin) **Alarm Details** → **Edit**.

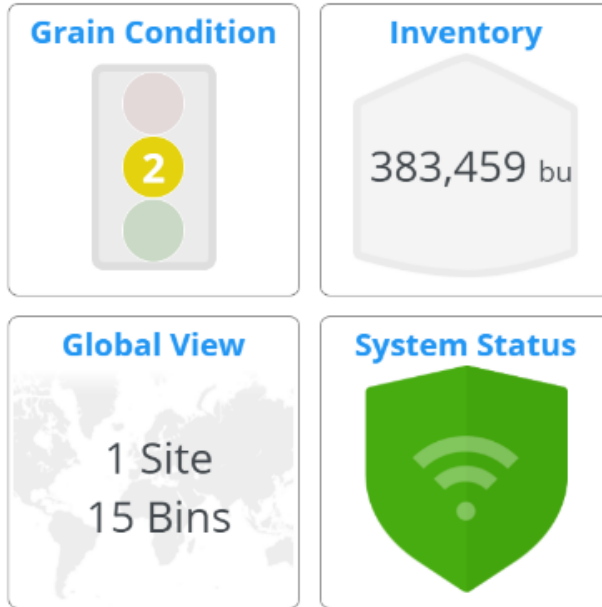
There are seven specific alarm notifications that will show up in the system and that can be sent by SMS and email notification if configured by the user. Two alarms focus on the temperature of the grain, while the other three are system alarms.

1. **High Temperature** (High-Temperature threshold set by user.)
2. **Rate of Rise Temperature** (Rate of Rise threshold set by the user.)
3. **Gateway Connection Lost**
4. **Gateway Lost Line Power and Battery Backup Voltage is Low**

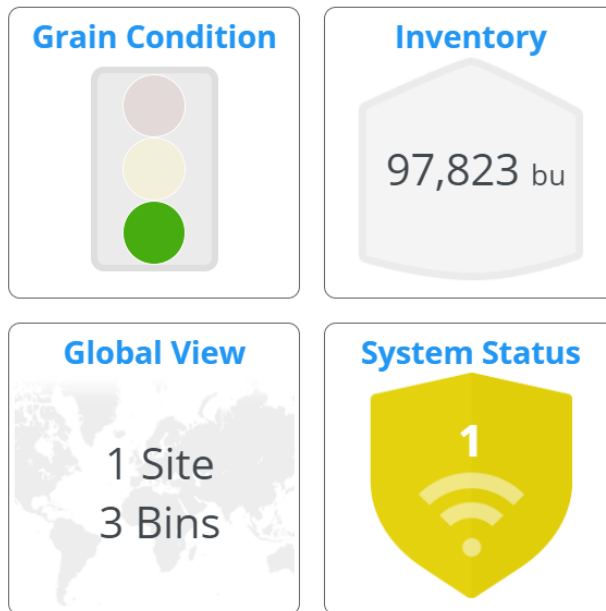


5. **Node Battery Voltage is Low**
6. **Loss of Power to a Fan Node**
7. **Fan Automation Switch to Manual Mode** (due to an issue.)

**Note:** There are several ways in which you can view the alarms within the system. The simplest way is on the Home screen when you log into the system. If there are any **Grain Condition alarms** (High Temperature and/or Rate of Rise Temperature) they will be displayed within the Traffic Light symbol. **Red** light means there are active Temperature Alarms that have not been acknowledged to this point. **Yellow** light indicates that there are active Temperature Alarms that are active; however, they have been acknowledged. If there are multiple alarms in a state a number will appear in the corresponding traffic light color indicating how many alarms are in that state. **Green** light provides a visual reference that there are no Grain Condition alarms. The same color coding is used identify **System Status alarms** on the Home screen. By clicking the alarm condition, you will see which bin it is associated with. If it is a **System Status Alarm** it will take you to the System Status page to view it.



Two acknowledged **Grain Condition** alarms displayed.



One acknowledged **System Status** alarm displayed.

**Note:** Any alarms that are **red** (active/unacknowledged) or **yellow** (active/acknowledged) will be visible on the alarm icon in the top right-hand corner regardless of the screen you are on. Tapping the Alarms Icon will display what the alarm is and provide the options to dismiss or view the alarm. By viewing the alarm condition, you will be taken directly to the location of the alarm for viewing.

The screenshot shows a mobile application interface. At the top is a yellow header bar with the word "Home" on the left and "Chat Support" and "Alarms" (with a notification icon showing 7) on the right. Below the header, there are two alarm cards. The first card is for "Bin 'Bin 1 Main Yard'" and states "Grain temperature has risen by 11.4°C (20.6°F) over the past 7 days." It was raised on Nov 9 2020 at 4:14 PM and solved on Nov 13 2020 at 9:14 AM, 21 days ago. It has "Dismiss" and "View" buttons. The second card is for "Bin 'Bin 29 Main Yard'" and states "Grain temperature has risen by 7.8°C (14.0°F) over the past 7 days." It was raised on Oct 9 2020 at 8:20 AM and solved on Nov 28 2020 at 10:20 AM, 6 days ago. It also has "Dismiss" and "View" buttons.

Two acknowledged alarms displayed by clicking on the alarm icon in the top right portion of the header. You have the option to investigate further by clicking the **View** button.

#### 4.3.4 Grain Condition

The Grain Conditioning screen provides an overhead view of all the bins broken down on a site by site basis. (If multiple sites exist) These bins can be filtered in several different ways to enable customized overviews specific to the user. Once the specified filters have been selected the bins matching the criteria will be displayed under the site map.

**Hide Filters**

Sites	Bins	Grain Type
<input checked="" type="checkbox"/> Display all <input checked="" type="checkbox"/> Frank's & Charlie's Yards <input checked="" type="checkbox"/> Main Yard	<input checked="" type="checkbox"/> Display all <input checked="" type="checkbox"/> Bins with Alarms <input checked="" type="checkbox"/> Remaining Bins  <input type="text" value="Select"/>	<input checked="" type="checkbox"/> Display all <input checked="" type="checkbox"/> Soybean <input checked="" type="checkbox"/> Oat <input checked="" type="checkbox"/> Wheat <input checked="" type="checkbox"/> Blackbean <input checked="" type="checkbox"/> Canola <input checked="" type="checkbox"/> Corn

The overhead view provides a representation of how the bins have been laid out at the specified site. Each bin is color coded to provide a quick visual reference as to the condition based on alarm status. In addition, the amount of color within a bin represents the grain level within the structure. The grain level is either determined by the system or a manual value entered by the user. For a further explanation of the color coding or grain level status the **Legend** link is in the bottom left corner and can be referenced.

**Legend**

The filled portion of each pie chart represents how full the bin is, based on level and capacity. The alarm status of each bin is represented by green, yellow, or red coloring of the label and fill.

**Note:** for empty bins, only the color of the label will indicate the alarm status.

*examples:*

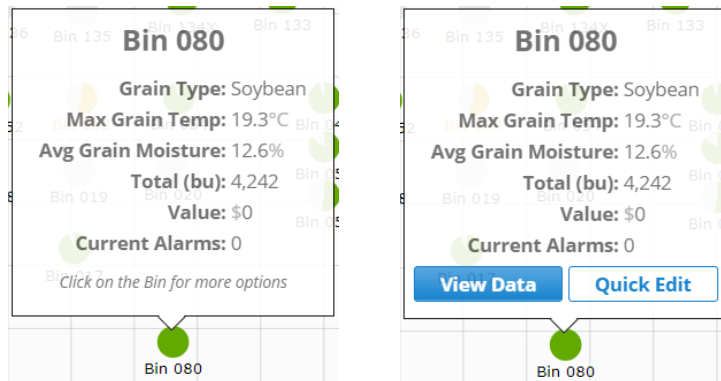
- The bin is 90% full and has no alarms.
- The bin is 65% full and has alarms which have been either dismissed or solved already.
- The bin is 40% full and has alarms which have not been dismissed or solved yet.
- The bin is currently empty.

[Show Legend](#)

Bin Name	Grain Type	Total (bu)	Value (\$)	Max Temp (°C)	Avg MC (%)
----------	------------	------------	------------	---------------	------------

If data from a specific structure is desired, simply move your cursor over that structure (tap for mobile) and a tool tip will appear containing a small summary of key data for that structure. Clicking structure will bring up the

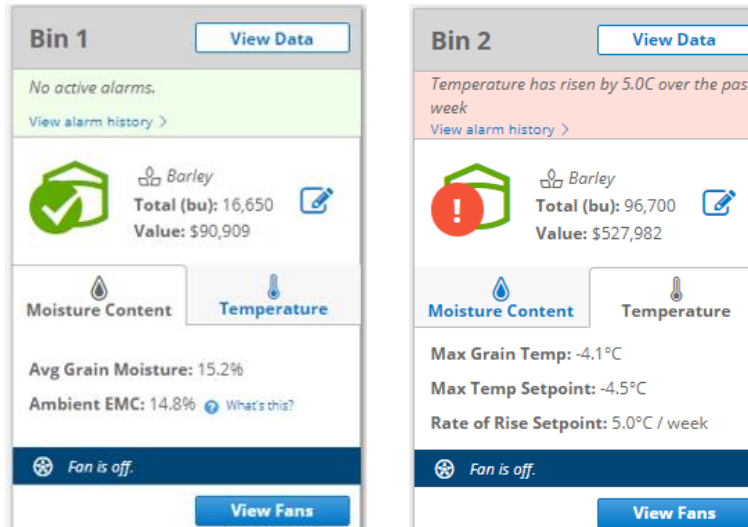
**View Data** (takes to the **View Data** page) and **Quick Edit** (pop-up for editing structure information) buttons.




The **Grain Condition** tiles provide an overview of the current condition of the grain within the structure. If there are moisture and temperature cables in the structure, there will be a tab visible for each. The moisture tab will display the **Current (Average) Moisture**. The Temperature tab will show the **Maximum Grain Temperature Reached** as well as the **Maximum Grain Temperature Set** (This will be the Maximum Temperature alarm set point the user has set.)

If a Weather Station is installed at the site, the **Ambient EMC** will also be displayed. If you are looking to do a deeper dive into the data, tapping the **View Data** button will open up the **Bin Data** where the **Table View**, **2D Graph**, and **3D View** can be explored.

If a bin has any active alarms they will be displayed. Tap the **View Alarm History** link to view additional information pertaining to the active alarm or to view previous historical alarm information.



At the bottom of each of the bins that have fan control, the current fan status will be displayed. To drill down further to make changes to the fan status, tap the **View Fans** button to open the **Fan Control** page.

**Note:** Using the **Quick Edit function**  provides an easy means to edit **Bin Info**, **Grain Info**, **Parameters** and **Alarm Details**.

### 4.3.5 Inventory

By selecting the Inventory option from the menu, you will be able to view any inventory data displayed by **Site**, **Grain Type**, **Bushels** and **Value** (if the price/bushel had previously been entered).

**Note:** Inventory can either be manually entered or the system can auto determine the grain level using the temperature data from the cables.

Inventory			
BY GRAIN TYPE		BY SITE	
Type	Bushels	Value	
Barley	100,743	\$ 539,445.74	▼
Wheat	234,017	\$ 1,698,633.79	▼
Canola	49,131	\$ 540,439.17	▼

Page 1 of 1

The filter option provides the ability to filter by one or more grain types as well as if there are multiple sites one or more site can be selected. Place a checkmark in the desired selections you want to filter by and then tap the **X** to close the pop-up box.

Filters
✕

**Grain Types**

Barley
  Canola
  Rice
  Oat
  Wheat

**Sites**

Crossfield Farms
  Saskatoon Farms
  Data Simulator

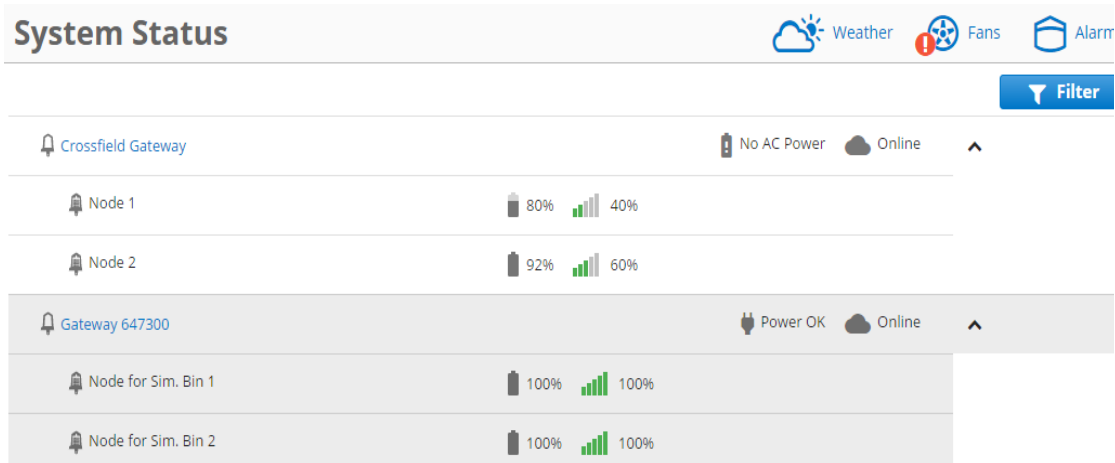
### 4.3.6 Global View

The Global View displays any sites that have been set up on managegrain.com. All sites added during the initial set up will be displayed on the Global Map with a red stick pin marker and the site name displayed. Either the Map or the Satellite view can be used to display the site's location.



### 4.3.7 System Status

The System Status shows important vitals from the system. It provides the ability to display all sites currently installed or to select one or more specified sites. Place a checkmark in the desired selections you want to filter by and then tap the **X** to close the pop-up box.



**Note:** The following are the displayed icons on the System Status screen.

Icon	Cable Nodes
	This provides a visual indication with regards to the battery charge percentage of a particular Cable Node.
	This indicated the communication signal strength between the Cable Node and the Gateway. 3 to 5 <b>Green</b> bars is considered good.
Gateways	
	Indicates that the Gateway is connected and has A/C power.
	Indicates that the Gateway is online and connected to the server.
	Indicates that there is no A/C power to the Gateway. The Gateway can still be online using the supplied battery backup.
	Indicates that the Gateway is unable to establish a connection to the server. Could be a power disruption or cellular or internet issue.

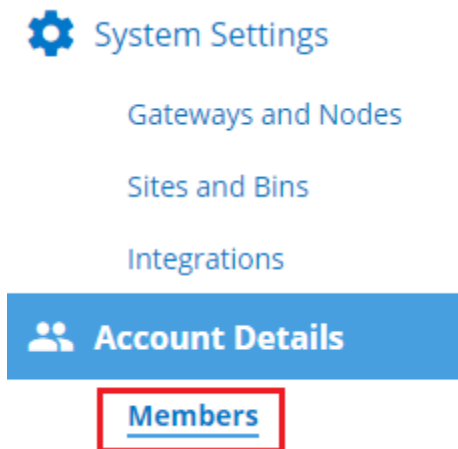


### 4.3.8 Permissions

Within the OPI Blue user interface you have the ability to “grant” permissions which **can only be given to another registered OPI Blue account (email)**. The purpose is to enable greater flexibility and simplicity for dealers to be able to support their customer base without the need to request a username or password from them.

Once permissions have been granted the party receiving permission will immediately be able to access the end users’ account. The access will include full read/write ability. This access can be granted permanently or on an as needed basis.

1. From the menu select **Members**



2. Click the **Add Members** button.



3. The **Add Member** popup box will appear. Enter the **Email Address** of the account you are looking to grant permission to access your account.  
**Reminder:** The email address must be that of another registered OPI Blue user.

## Add Member

**Smith Farms**

E-mail address

Role / Access Level

[Cancel](#)

- From the dropdown menu select the **Role/Access Level** the of the account that you are looking to grant permission to access your account. **Note:** The **Manage** role gives the user the ability to view and make changes on your account. The **View-Only** role gives the user the ability to view only and not make any changes on the account.

Role / Access Level

Select...|▼

Manage

View-Only

- Click the **Add** button to grant permission to the desired email address.

E-mail address

Role / Access Level

[Cancel](#)

6. It will show as successful upon completion. **Note:** The email address being granted permissions to access the account will

**Success**

kentw@opisystems.com has been added as a member to **Smith Farms**

An e-mail notification will be sent within the next few minutes.

If they have not yet created an OPI Blue account, they will be asked to create one.

[OK](#)

**Note:** Permission to access the account is granted immediately. Any accounts that have been granted permission will be listed in the **Member** page on the account.

7. If you are looking to remove an account that you had granted permissions to previously. Go back to the **Members** page and simply click on the **Remove** button.

**Smith Farms** [+ Add Member](#)

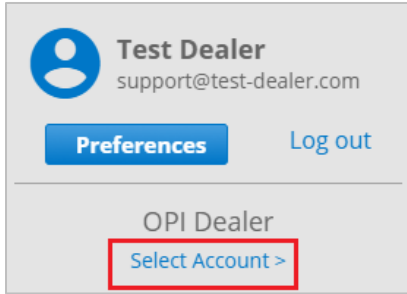
Current Members:

User Email	Role	Actions
kentw@opisystems.com	Manage	<a href="#">Remove</a>
jsmith@gmail.com	Owner	-

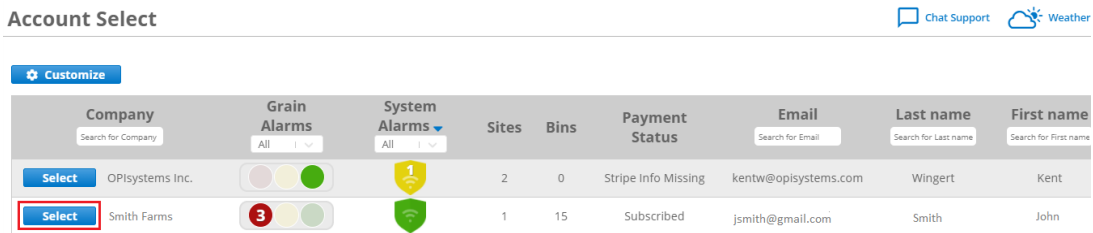
You may grant other users access to your account by adding them as members.

## Permissions - Accessing a Site

1. If you have been granted permissions to any other accounts, you will be able to view these accounts by clicking on **Select Account** located at the top of the menu on the left-hand side. All accounts in which permissions has been granted will be listed on the Select Account page.



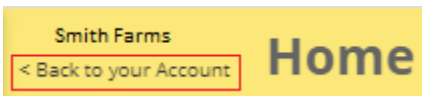
2. On the **Account Select** page, click on the **Select** button to access the desired account.



**Note:** The customer’s Account Details and Payment functionality section from the menu will not be visible to anyone accessing another account when using permissions. This is to ensure the integrity of the account personal details and ensure they cannot be changed by anyone but the account holder themselves.

## Exit Customer’s Site

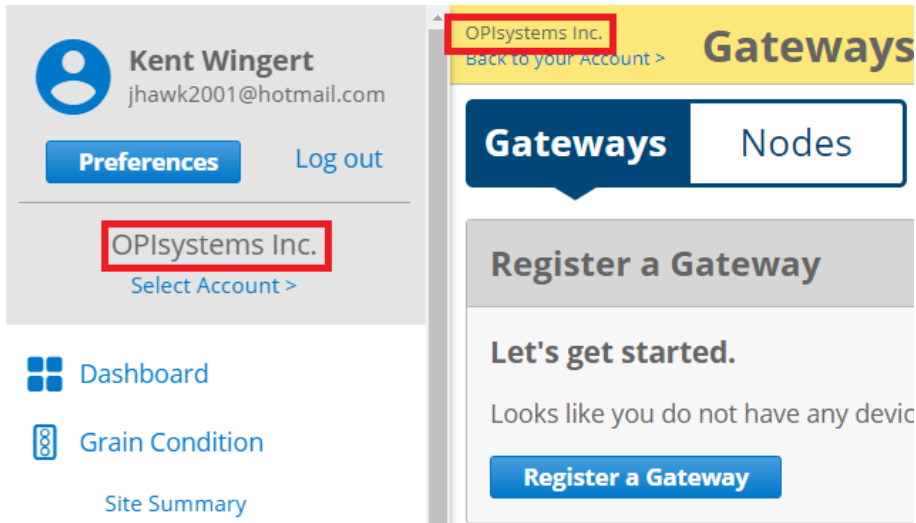
3. When finished in the customer account, click **Back to your Account** located in the left-hand side of the top banner.



## Best Practices

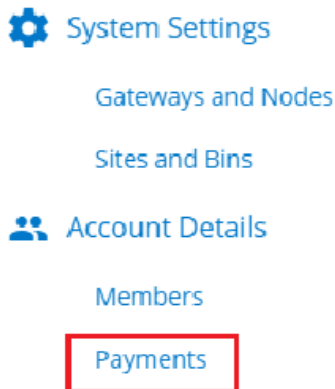
**Note:** When accessing another account, it is critical that you **regularly verify** which system you are in especially when you are making changes to the other account. It is easy to lose track and incorrectly apply changes to the wrong account.

The account being accessed is always identified in two locations on the screen for verification.



### 4.3.9 Payments

The OPI Blue system is a subscription-based system that includes an annual fee. To simplify the billing and payment processing a **Payments** page has been included within the system. It can be accessed by locating it on the menu.



This payment function is meant to provide a secure confidential method to make your annual subscription payment. The **Payments** page and is broken down into three sections.

## Section 1

Shows the current subscription, expiry date and a breakdown of the charges.

You account is subscribed and in good standing.  
Your next billing date: Dec 19 2020  
Your subscription is set to end at: Dec 19 2020

Your current subscription is composed of the following items:

Service	Price	Quantity
Cellular Connection	250 \$ / connection / year	0
OPI Blue Gateway (with fan control)	600 \$ / gateway / year	1
OPI Blue Gateway (without fan control)	250 \$ / gateway / year	0
Your Subscription Total:	\$600 + applicable taxes	

## Section 2

Enables you to add (first time) or change a secured payment method (credit card) on file

You have no card on file - please add a card.

Your card on file ends with: xxxx

[Add a Payment Method](#)

[Change Your Payment Method](#)

To add your credit card information on file.

1. Click on the [Add a Payment Method](#) button.
2. A popup will appear. Enter your credit card number in the first field. Your expiry date (MM/YY) in the second field. Lastly, enter the CVC number in the third field.

OPIsystems Inc.  
Authorize a new card  
kentw@opisystems.com

Card number

MMYY CV3

Change Payment Method

3. Once all the information has been entered in the appropriate field, click the **Change Payment Method** button to save the information on file.

### Section 3

Will show the upcoming subscription amount to be charged when your current subscription is nearing its expiry date.

Service	Price	Quantity
OPI Blue Gateway (without fan control)	250 \$ / gateway / year	0
OPI Blue Gateway (with fan control)	600 \$ / gateway / year	2
Cellular Connection	250 \$ / connection / year	0
Your Subscription Total:	\$1200 + applicable taxes	

\*Taxes: If you hold a tax exemption certificate, please email your exemption ID to taxes@opisystems.com, clarifying which sales taxes you are exempt from. If you are outside Canada or the USA, and your country is subject to import duties on software services, please be sure to declare these services with your tax authority.


**Note:** The subscription fee will be processed annually on the credit that has been put on file. You can update/change your credit card information as required by following the steps outlined above.

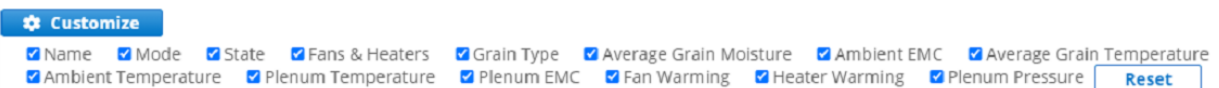
# Fan Control

## 4.4.1 Manual Fan Control

Reaching the **Fan Control** page can be accomplished in two ways; the **Fan Control** link located on the menu or by the **View Fans** button located on each individual bin that has fan control with the **Grain Condition** page.

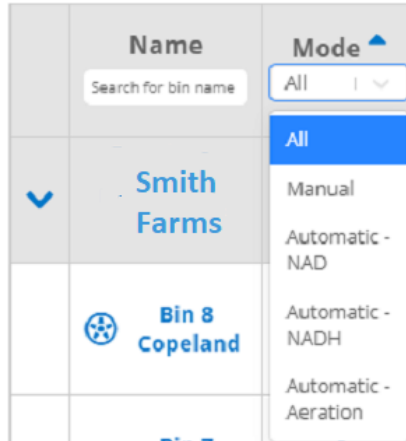
Controlling your fans can be accomplished through one centralized location on the Fan Control page. With your OPI Blue system you have the flexibility to run your fans manually or switch to automated control with Aeration, Natural Air-Drying, and Natural Air Drying with Heat algorithms.

The information is broken down into the most pertinent fan control information. Clicking the  at the top left corner will allow you to customize what information is display based on your preferences. Placing a checkmark beside the items you want displayed and leaving those you don't without one.



There are 4 columns that can be used to filter the data. **Name**, **Mode**, **State** and **Grain Type**. The ability to filter is especially useful for larger sites that have many bins across the site making it easier and faster to locate the specific information you are looking for.













If you are looking for a quick and simple way to turn your fan(s) and heater(s) ON in manual mode.



**Note:** Manually controlling the fans (Turn ON/OFF) is a simple process with a few basic guidelines.

Actions Button	Result	Status
	Pushing the <b>Start Fan</b> button turns the fan ON.	 <b>Turning On...</b> will be displayed until the fan has fully turned ON. Once the fan has turned ON the indicator will turn green and the fan run time will be displayed. 
	Pushing the <b>Fan Timer</b> allows for a set number of desired fan run time hours to be entered.	5 hour(s)  Once the desired number of hours has been entered pushing the <b>Start Fan</b> button turns ON the fans. A countdown timer will appear, and the fans will continue to run until that set duration runs out.
	Pushing the <b>Stop</b> button turns the fans OFF.	 <b>Turning Off...</b> will be displayed the fan has fully turned OFF. Once the fan has turned OFF the  <b>Off</b> indicator will be displayed.

## 4.4.2 Natural Air Drying (NAD)

**Note:** Natural Air Drying (NAD) is an efficient control algorithm used within the OPI Blue system that enables effective in bin drying. You the user sets the moisture target you are looking to achieve and the allowable target moisture and temperature ranges in which the fans should run. This eliminates inefficiencies and energy waste.

**Note:** A grain level indication in a structure can take 24-hours to initially be achieved when grain is first put into a bin. During this 24-hour period the automated fan control function cannot be used as the system assumes the bin is empty. The level is determined using the data from the temperature sensors on the cables. This process takes time for the system to determine if a temperature sensor is in or out of the grain. On the **Fan Settings** page you can **override** this functionality and to have the fan(s) run in an automated mode without a grain lever determined.

Using the Automated Fan Override functionality requires placing a checkmark in the box.

**Important!** To avoid damage, ensure there is grain in the bin before enabling Automated Fan Control.

The system may take up to 24 hours to determine grain level before starting.

**Override and begin immediately. (Do not wait for grain level)**

Review and be sure you understand the disclaimer. If you still would like to proceed place a checkmark to acknowledge the disclaimer and click the **Save** button.

**Important!** To avoid damage, ensure there is grain in the bin before enabling Automated Fan Control.

The system may take up to 24 hours to determine grain level before starting.

**Override and begin immediately. (Do not wait for grain level)**

#### Grain Level Confirmation

OPI Blue relies on an algorithm to compute which sensors are buried in the grain mass and thus verify that the bin does contain grain, allowing for safe operation of fans and heaters. You are about to override this safety feature, acknowledging:

1. **Grain levels and inventory may not be viewable immediately in OPI Blue;**
2. **Safety risks to equipment and personnel.**

I acknowledge that running fans or heaters in an empty bin can cause serious damage or physical injury, as well as incorrect conditioning of grain. I confirm that I have visually inspected this bin, and deem the bin to be in a state to safely operate fans and/or heaters.

**I have read and acknowledge the disclaimer.**

Apply these settings to other bins

Yes  No

Save

Cancel

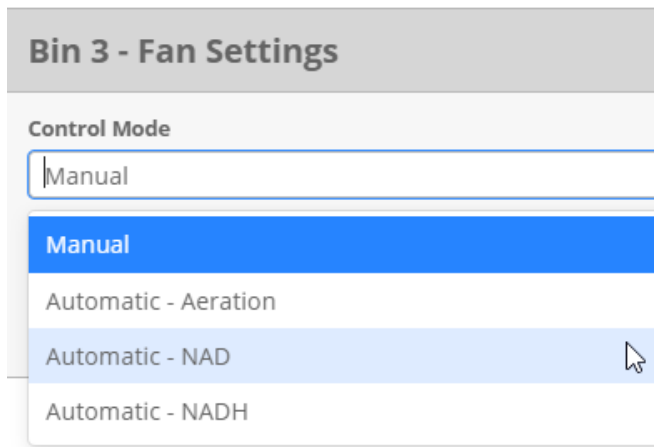
**Note:** One other thing to understand is that for any of the automated fan control algorithms to work you set a **Target EMC** and **Target Temperature**. With each using the sliders you also create a **Target EMC Range** and **Target Temperature Range**.

The conditions must be met for both the **Target EMC Range** and **Target Temperature Range** for the fan(s) to turn ON. When conditions do not fall within these ranges the fan(s) will turn OFF or remain OFF.

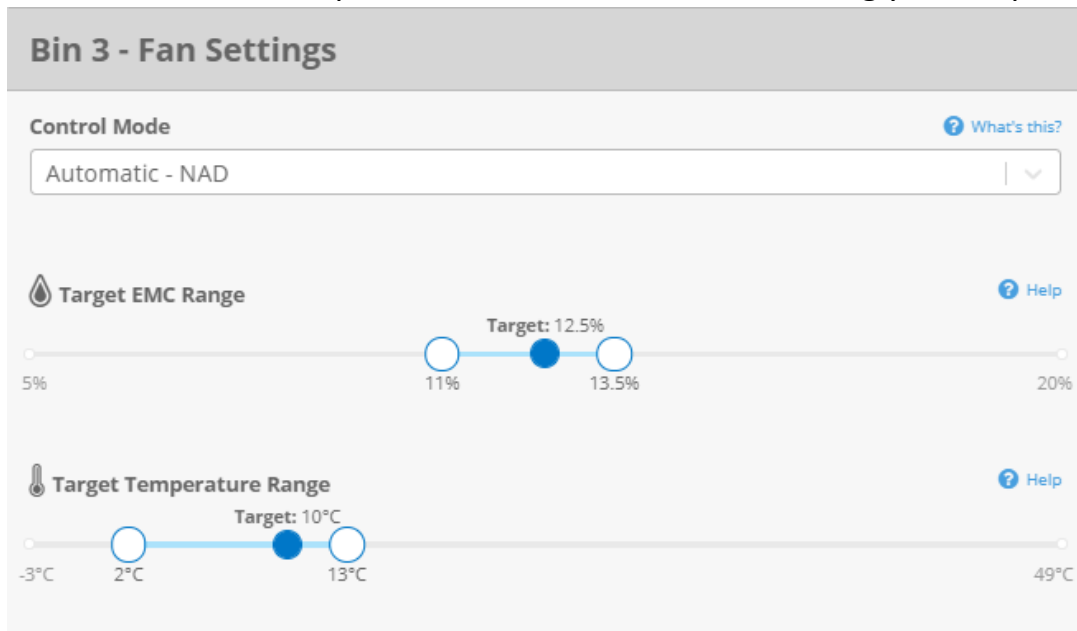
1. On the **Fan Control** page to setup Natural Air Drying (NAD), click on the manual wrench icon.



- From the **Fan Settings** page use the dropdown menu to select the desired fan mode, **Natural Air Drying (NAD)**.



- Use the sliders to set your **Target EMC** (Target EMC Range) and your **Target Temperature** (Target Temperature Range) and click [Save](#). The fan(s) for this bin will now operate in an automated mode using your setpoints.

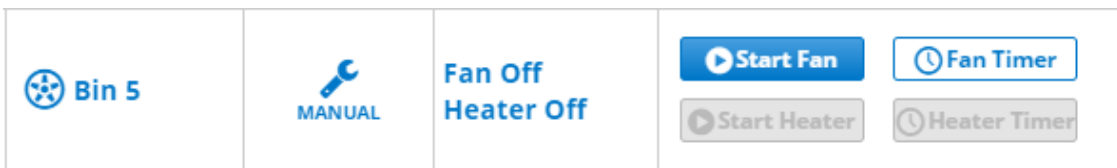


### 4.4.3 Natural Air Drying (NADH)

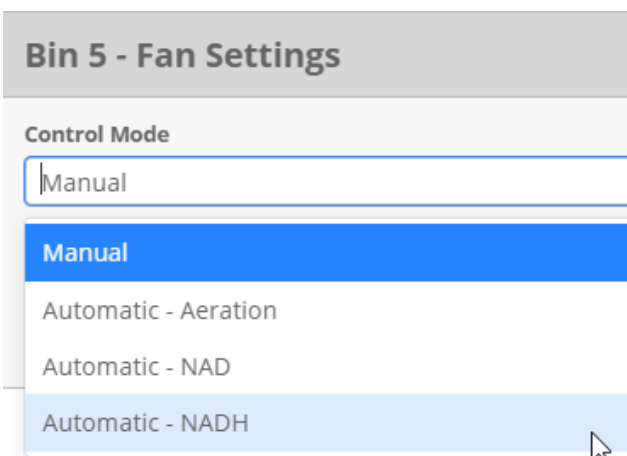
**Note:** Natural Air Drying with Heat (NADH) is an efficient control algorithm that enables effective in bin drying with the use of supplemental heat. You set the moisture target you are looking to achieve and the allowable target moisture and temperature ranges in which the fans should run. This eliminates inefficiencies and energy waste.

**Note:** To use the NADH control algorithm you must have heaters installed. The NADH mode will only appear for the bin(s) that have a heater install on them. If there is no heater you will not see the NADH option available.

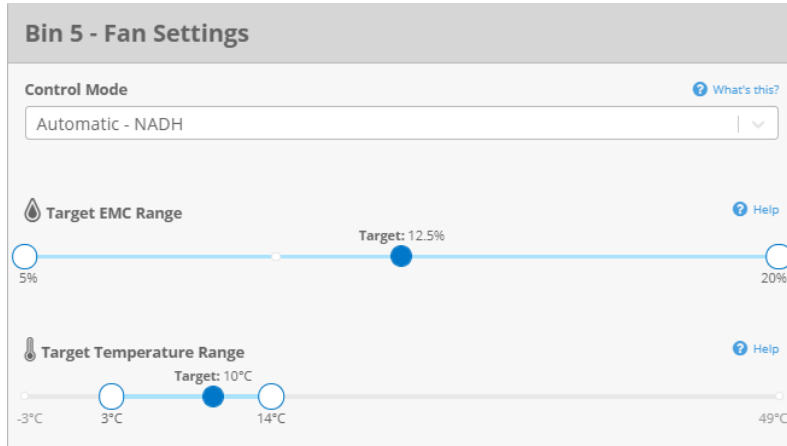
1. On the **Fan Control** page to setup Natural Air Drying (NADH), click on the manual wrench icon.



2. From the **Fan Settings** page use the dropdown menu to select the desired fan mode, **Natural Air Drying with Heat (NADH)**.



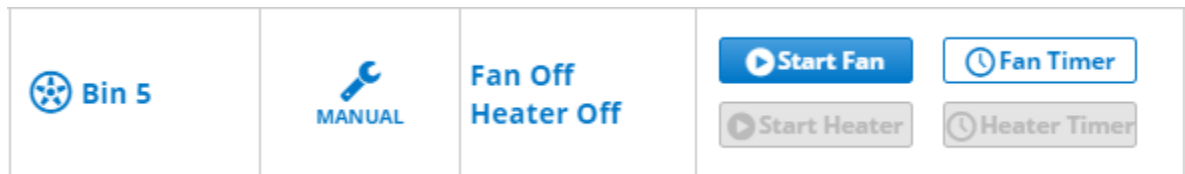
- Use the sliders to set your **Target EMC** (Target EMC Range) and your **Target Temperature** (Target Temperature Range) and click **Save**. The fan(s) and heater(s) for this bin will now operate in an automated mode using your setpoints.



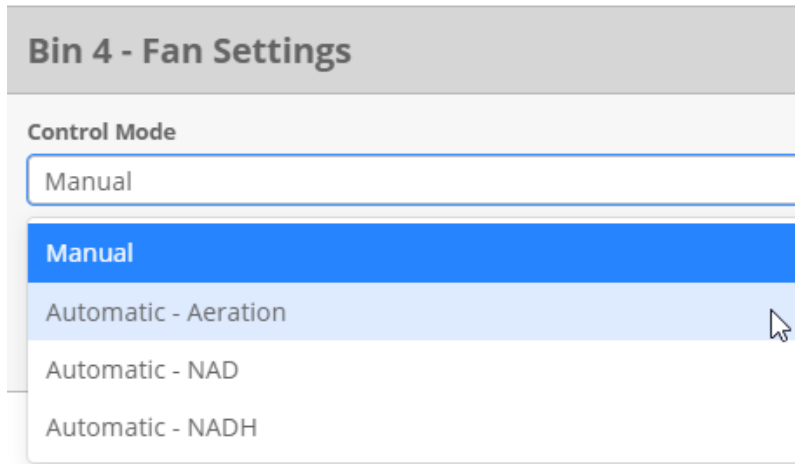
#### 4.4.4 Aeration

**Note:** Aeration is the control algorithm used within the OPI Blue system once you have reached your desired target moisture. Aeration is about cooling and maintaining the grain at a uniform temperature throughout the entire grain mass. Achieving your target moisture in conjunction with a cool uniform temperature throughout the grain will enable safe storage of your grain over longer periods of time.

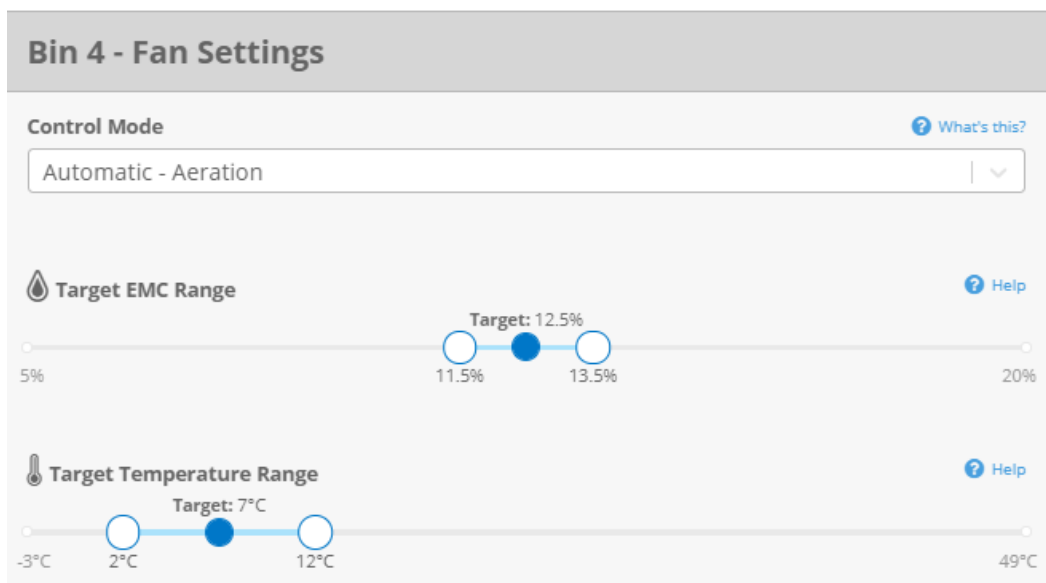
- On the **Fan Control** page to setup Aeration, click on the manual wrench icon.



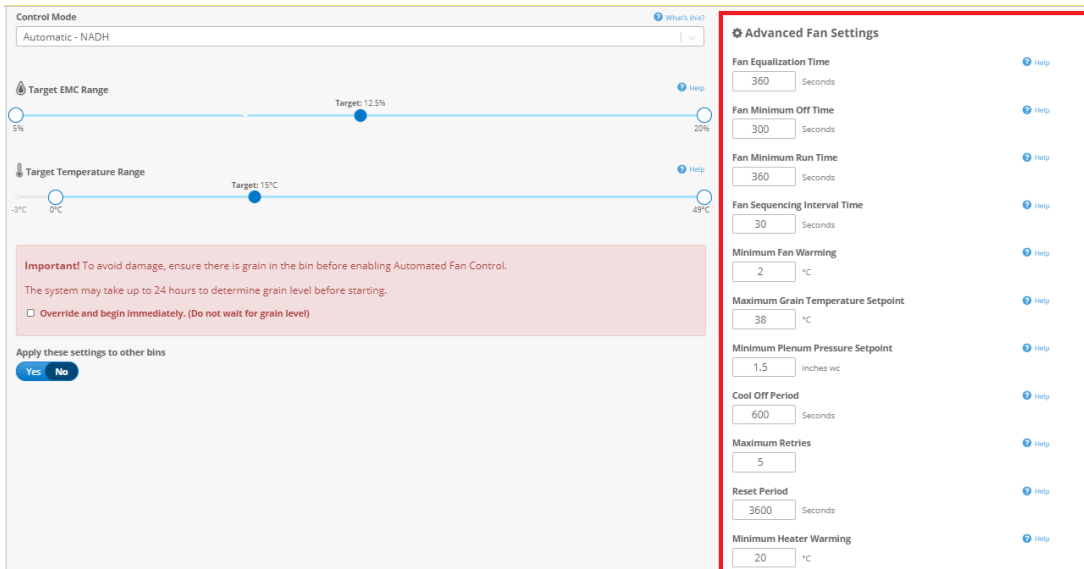
- From the **Fan Settings** page use the dropdown menu to select the desired fan mode, **Aeration**.



- Use the sliders to set your **Target EMC** (Target EMC Range) and your **Target Temperature** (Target Temperature Range) and click **Save**.



There are also **Advanced Fan Settings** that can be accessed on the right-hand side of the **Control Mode** screen. The **Advanced Fan Settings** visible depends on the Fan Control mode selected. See the Advanced Fan Settings section to get a better understanding of each of these settings and what they mean.



#### 4.4.5 Advanced Fan Settings

All **Advanced Fan Settings** are user configurable. Each setting has a default value; however, depending on user specific needs there may be situations where these values will need to be changed. Not all advanced setting are visible for each automated fan mode.

Advanced Fan Setting	What Does It Do?
<p><b>Fan Equalization Time</b></p> <p><input type="text" value="360"/> Seconds</p>	<p>The <b>Fan Equalization Time</b>, is an allotted time after the fan(s) have turned ON to allow the plenum conditions to become equalized with ambient potential conditions.</p>
<p><b>Fan Minimum Off Time</b></p> <p><input type="text" value="300"/> Seconds</p>	<p>The <b>Fan Minimum Off Time</b>, is the minimum amount of time allotted that a fan must remain OFF before it can be turned ON again in an automated fan control mode. This prevents the fan(s) from cycling OFF/ON when conditions are right</p>



	on the edge of a targeted EMC or Temperature set range.
<b>Fan Minimum Run Time</b> <input type="text" value="360"/> Seconds	<b>Fan Minimum Run Time</b> , like the Fan Minimum Off Time this is an allotted amount of time a fan(s) will remain ON in an automated fan control mode. This prevents the fan(s) from cycling OFF/ON when conditions are right on the edge of a targeted EMC or Temperature set range. It must be equal to or greater than the fan Equalization Time.
<b>Fan Sequencing Interval Time</b> <input type="text" value="30"/> Seconds	<b>Fan Sequencing Interval Time</b> is the minimum amount of time the system will wait between activating multiple fans.
<b>Minimum Fan Warming</b> <input type="text" value="2"/> °C	<b>Fan Warming Value</b> is a measured temperature value in the Plenum due to the heat compression when the fan(s) are ON. It can be measured at the Plenum or have a manual value set.
<b>Grain Temp Offset (°C)</b> <a href="#">? Help</a> <input type="text" value="3"/>	<b>Grain Temperature Offset</b> is the difference required below the grain temperature to trigger the fan(s) to turn ON. This prevents the fan(s) from running when there is no grain in the structure.
<b>Maximum Grain Temperature Setpoint</b> <input type="text" value="38"/> °C	<b>Max Grain Temp Setpoint</b> is the maximum high temperature setpoint any sensor can reach within the grain mass before the

	system triggers the fan(s) to turn ON. <b>Aeration only.</b>
<b>Maximum Grain Temperature Spread Setpoint</b> <input type="text" value="12"/> °C	<b>Max Grain Temp Spread Setpoint,</b> is used to indicate the maximum allowable temperature spread within the grain mass. If the maximum temperature spread is exceeded the fan(s) will turn ON to drive the grain mass to a more uniform temperature throughout. <b>Aeration only.</b>
<b>Minimum Air Temperature</b> <input type="text" value="0"/> °C	<b>Minimum Air Temp</b> is the minimum allowable air temperature in which the fan(s) can be turned ON in order to avoid vents from freezing.
<b>Minimum Plenum Pressure Setpoint</b> <input type="text" value="1.5"/> inches wc	<b>Plenum Pressure Setpoint,</b> this is the minimum static pressure feedback setpoint that must be reached after the Fan Equalization period has been reached. The Plenum Pressure feedback provides validation that the fan(s) have physically turned ON when the system has called for them. If the minimum Plenum Pressure Setpoint is not reached after the Fan Equalization period has been reached an error message will appear and the automated fan control mode will be switched to manual mode.
<b>Cool Off Period</b> <input type="text" value="600"/> Seconds	<b>Cool Off Period</b> should an automated mode be interrupted preventing fan((s))/heater(s) from

	running as expected the control system will wait with fans/heaters OFF for this length of time (in seconds) before retrying them.
<b>Maximum Retries</b> <input type="text" value="5"/>	<b>Maximum Retries</b> is the number of retries an automated mode will attempt prior to failing over to manual mode. If maximum retries is zero any alarm resulting in the interruption of an automated control mode will result in a switch to manual fan control.
<b>Reset Period</b> <input type="text" value="3600"/> Seconds	<b>Reset Period</b> is the number of seconds without a fan control automation interruption required to reset the fail counter to zero.
<b>Minimum Heater Warming</b> <input type="text" value="20"/> °C	<b>Minimum Heater Warming</b> is the expected temperature rise at the plenum during the first heater ON cycle. If the measured Heater Warming value is found to be different than the initial value after the Heater Equalization Time has finished, then the new Heater Warming value is used for subsequent heater ON situations.
<b>Heater Equalization Time</b> <input type="text" value="600"/> Seconds	<b>Heater Equalization Time</b> is the time in which fan and heater are ON waiting for the plenum sensor to reach its ultimate temperature biased on Ambient and Heater Warming.

<p><b>Maximum Heater EMC</b></p> <input type="text" value="20"/>	<p><b>Maximum Heater EMC</b> the heater will not be run if calculated Heater EMC exceeds this value.</p>
<p><b>Maximum Heater Temperature</b></p> <input type="text" value="38"/> °C	<p><b>Maximum Heater Temperature</b> is a maximum set temperature that when reached results in the heaters being shut OFF. This is a preventative measure to prevent damage to the grain that can occur when exposed to too high a temperature. <b>NADH only.</b></p>
<p><b>Minimum Ambient Temperature</b></p> <input type="text" value="0"/> °C	<p><b>Minimum Ambient Temperature</b> is a set temperature value in which a warning will appear to notify the user the risks of running the fans below freezing.</p>
<p><b>Minimum Heater Temperature Rise</b></p> <input type="text" value="6"/> °C	<p><b>Minimum Heater Temperature Rise</b> is the minimum calculated temperature increase at the plenum that must be achieved in order to validate that the heater(s) are physically running as expected when the system has called for them to be ON. <b>NADH only.</b></p>
<p><input type="checkbox"/> <b>Fallover to NAD?</b></p>	<p><b>Fallover to NAD</b> occurs if NADH automated control is interrupted exceeding the maximum number of retries. If not selected and the maximum number of retries is exceeded the operation will revert to manual. <b>NADH only.</b></p>
<p><b>NAD Fallover Cool Off Period</b></p> <input type="text" value="3600"/>	<p><b>NAD Fallover Cool Off Period</b> is a preset NAD setting for after a fan control failure in which the system</p>

	will wait with fans/heaters off for this length of time (in seconds) before retrying. <b>NADH only.</b>
<b>NAD Failover Maximum Retries</b> <input type="text" value="5"/>	<b>NAD Fallover Maximum Retries</b> is a preset NAD setting for the maximum number of retries before failing over to NAD mode. When maximum retries is zero any panic will result in a switch to manual fan control. <b>NADH only.</b>
<b>NAD Fallover Reset Period</b> <input type="text" value="3600"/>	<b>NAD Fallover Reset Period</b> is a preset number of retries an automated mode will attempt prior to failing over to manual mode. If the maximum number of retries is zero any alarm resulting in the interruption of an automated control mode will result in a switch to manual fan mode.

### 4.4.6 Fan Control Analysis

The **Fan Control Analysis** can provide a user with a visual means to getting a better understand of when fan(s) and heater(s) are made of a particular bin. It is best used when selecting a week or less timeframe to minimize the over exposure to the data that can be presented.

You can view the following information in a graph form. Turn the data ON/OFF by selecting the data you want to display by clicking on the following information located underneath the graph section at the bottom of the screen.

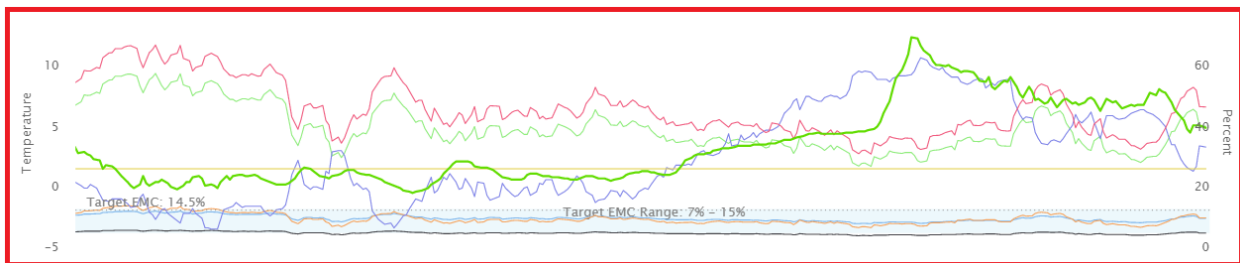
1. Calculated Fan ON Plenum EMC

2. Calculated Heater ON Plenum EMC (if heater(s) are installed on a bin)
3. Calculated Fan ON Plenum Relative Humidity (RH)
4. Calculated Heater ON Plenum Relative Humidity (RH)
5. Ambient Temperature
6. Ambient Relative Humidity (RH)
7. Minimum Fan Warming
8. Minimum Heater Warming
9. Plenum Temperature

The data is broken down into four sections.

### Section 1

Shows data based on the calculated plenum conditions, your set target EMC as well as your target EMC range.



### Section 2

Any fan or heater control ON or OFF automated decision will be shown in this section.



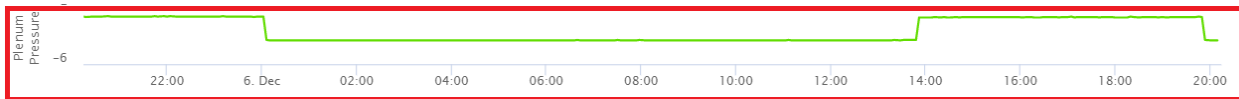
### Section 3

The fan and heater status are displayed here. **Green** bar indicates when the fan is ON and a **Red** indicates when the heater has come ON. Blank spaces indicate where the fan and/or heater or both are OFF.



### Section 4

Displays the measured pressure value from the plenum sensor for the selected data range.



Once the desired data you wish to see has been selected, moving your cursor over the graph area will display the data selected for that specific data and time.

