



SmartBee Control System

User Guide

v 3.1

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About This Guide

This guide is intended for owners of SmartBee Control Systems.

In this guide, you'll find:

- An overview of the SmartBee Control System and its related concepts
- An introduction to system planning and installation
- How to use the system and software (Swarm Control™ web app)



IMPORTANT

For optimal safety and performance, please read this entire guide before attempting to install or use your SmartBee Control System.

Conventions Used in This Guide

Menus and menu items are shown in bold text, with a ">" between the menu name and menu item.



EXAMPLE

*"Select **Settings > Room Manager**" means to select the **Settings** menu and then select the **Room Manager** menu item.*

Field and button names are shown in bold text.

The Swarm Control web app can be used on a computer with a mouse or touchpad, or on a touch device such as a tablet or smart phone. In this guide, "click" is used as a generic instruction meaning to activate an on-screen item, whether you do so using a mouse, a touchpad, a keyboard, or by tapping the screen with your finger.

Active hyperlinks to web addresses or other documents are shown in [blue, underlined text](#).



NOTE

Supplementary information that you may find helpful.

The guide uses the following special format for special types of information:

Revision History

Table 1. Revision History

Title	Date	Version
SmartBee Controllers Getting Started	February 1, 2017	1.0.3
SmartBee Control System User Guide	February 1, 2017	3.1

Where to Find More Information

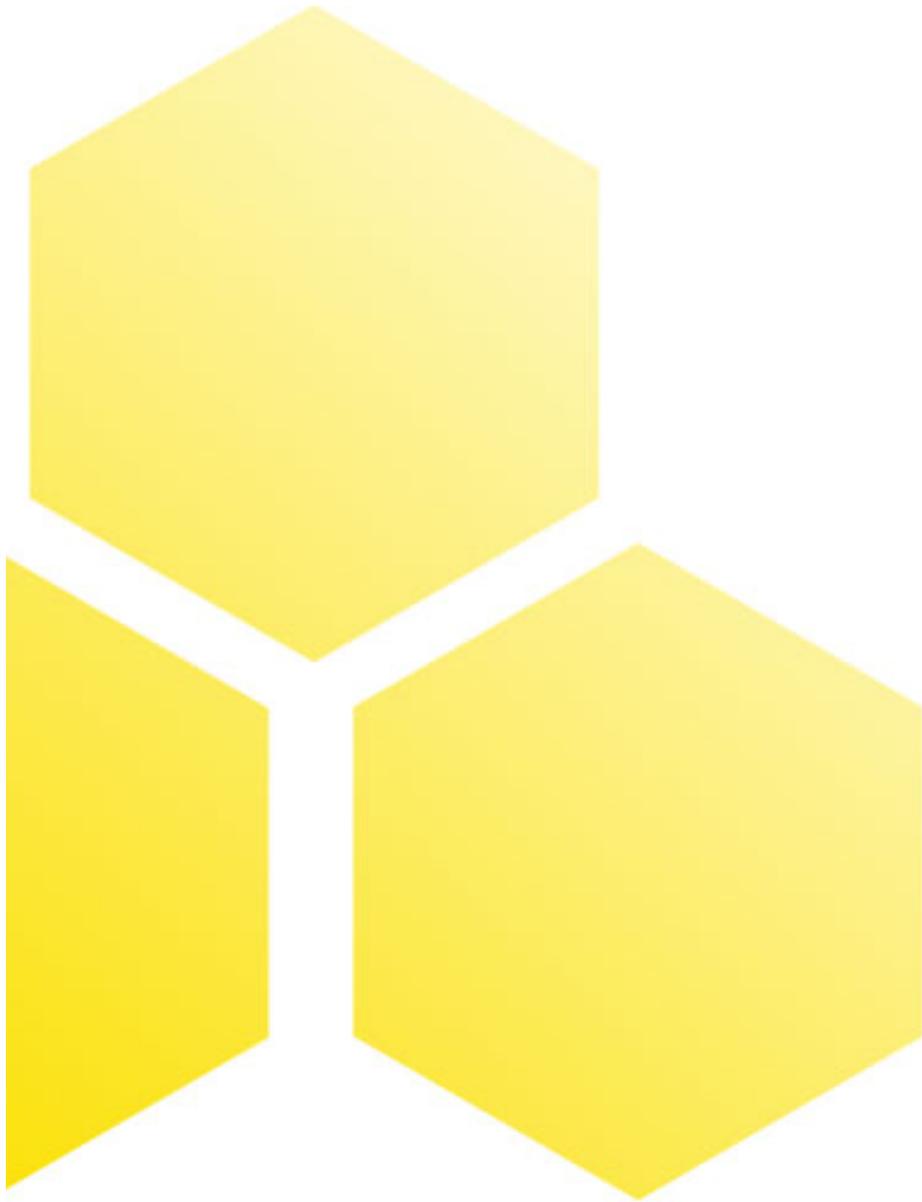
To learn more about the SmartBee Control System, please visit the [SmartBee Controllers website](#). On the [Downloads page](#), you can download SmartBee documents and helpful tools.

Visit the [SmartBee Controllers YouTube channel](#) to watch helpful How-To videos on topics such as sensor placement and reading sensor data.

If you have any questions, you can always give us a buzz at (888) 650-3797 or support@smartbeecontrollers.com.

1 Getting Started

Welcome! Let's get started with your new SmartBee Control System.



System Overview

The SmartBee Control System is a real-time, remote-access solution for your greenhouse or grow room, monitored and controlled from the palm of your hand! Simply configure your environmental thresholds, and when the SmartBee Control's "smart logic" process detects a problem, it sends you an alert and automatically takes corrective steps to resolve critical grow room events.

The SmartBee product line is an innovative gardening technology solution with real-time sensor monitoring, delivering the ability to control and track all areas of a grow room wirelessly, using a hand-held touch device such as a smart phone or tablet. The Smart Bee Control system links CO₂, temperature, humidity, lighting, and irrigation layers, and allows more system customization than any other product line on the market today.

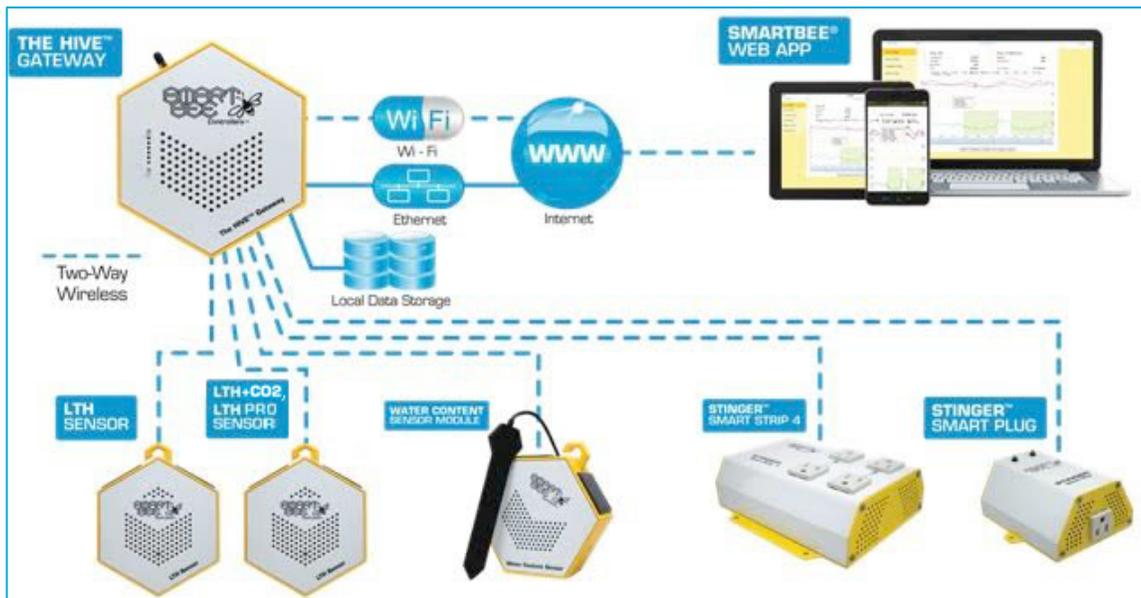


Figure 1. System overview

Watch a [short introduction video](#).

System Concepts

The Hive™ Gateway

The Hive Gateway [Hive] is the nucleus of your SmartBee Control system and the portal for all communication between your control devices and sensors, the Swarm Control web app, and your computer or mobile device.

The Hive serves as the main logic controller in your system, managing incoming real time sensor data and responding to correct environmental conditions that are outside of your defined thresholds, helping you to avoid costly operational and safety hazards.

**TIP**

To learn more about your Hive, watch the Hive video at https://youtu.be/Izo5pKs87xQ?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9.

Control Devices

The Stinger™ Smart Plug (SS1) and Stinger™ Smart Strip 4 (SS4) are called control devices because they allow the Hive to control—activate and deactivate—electrical appliances remotely over the wireless mesh network. Each circuit on an SS4 is considered to be a separate device.

For a control device to be controlled by the system, it must have an appliance type defined and be assigned to a room. The system will then control the appliances plugged into those control devices, in response to your room's sensor data.

**EXAMPLE**

LIGHTS appliance types will be turned on in response to your lighting schedule, *IRRIGATION_PUMPS* will be turned on in response to irrigation schedules, and *HEATER* and *COOLING* devices will be turned on in response to your temperature thresholds.

In each room, the system groups all appliances of the same type and controls them as a unit.

**EXAMPLE**

In your "Bloom" room you have three circuits that are assigned the COOLING appliance type and have fans plugged into them. Two of the circuits are on one Smart Strip 4 and the third is on a different SS4 across the room. Because they have the same appliance type, the system will activate and deactivate all three fans at the same time, even though they're plugged into different control devices.

**TIP**

To learn more about your control devices, watch the SS1 & SS4 video at https://youtu.be/7sSXWol_zf8?list=PLRG3ZemrqXwMcT-4FNL_euDz25_3FhU5_9.

Sensors

Sensor devices include the LTH (Light, Temperature, and Humidity), LTH+CO₂ (Light, Temperature, Humidity, and CO₂), LTH Pro (Light, Temperature, Humidity, CO₂, and PAR), and the WCSM (Water Content Sensor Module). Sensors are battery powered and transmit data through the wireless mesh network back to the Hive.

Sensors are assigned to a room. Once assigned, the sensor contributes its data to the room's sensor data, typically every 45 seconds. For each kind of sensor data (temperature, humidity, etc.), the average value of the readings from all the sensors in the room is calculated. This becomes the room's aggregate or average value for that type of sensor data. If the room has no sensors of a given type, the aggregate value will be NA.



TIP

To learn more about your sensors, watch these videos:

LTH/LTH+CO₂/LTH Pro sensors—

https://youtu.be/CHcymWfwUxg?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9

WCSM—https://youtu.be/AKITSpjKT14?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9

Rooms

The Hive uses the concept of a “room” to group sensors, aggregate their data, and use that data to control appliances. The Hive uses the room's control devices to control the room's appliances in response to the room's sensor data. A room also counts the days it has been active in order to show the current day of the plants' grow cycle.

Because a room simply groups a set of sensors, thresholds, and control devices, it doesn't need to correspond to a defined physical space. That is, you can have multiple rooms in your system that corresponds to the same physical space in your garden.



EXAMPLE

Let's say you have two light banks that you want to control independently. When the daytime garden temperature gets too high, you want one light to turn off but the other to stay on. If you assign both lights to the same room, they will be controlled as a group and turn on and off together. So instead you'd create two rooms, assign one light to each room, and then define the different lighting controls for each room.

Room Controls

Room controls are configuration settings that define:

- The acceptable environmental conditions for the room
- The daily lighting and irrigation schedules for the room
- Whether or not the Hive controls the appliances in the room

Each room has five sets of controls:

Table 2. Room control settings

Control Type	Thresholds	Deadband	Daily Schedule	Other Settings	Appliance Types Controlled
Temperature	Daytime high and low Nighttime high and low	5.4 °F	NA	NA	HEATER COOLING
Humidity	Daytime high and low Nighttime high and low	5%	NA	NA	HUMIDIFIER DEHUMIDIFIER
CO ₂	Minimum CO ₂ level	50 ppm	NA	CO ₂ alerts	CO2_EMITTER
Irrigation	High and low grow medium moisture levels	3%	Yes	Emergency irrigation	IRRIGATION_PUMP
Lighting	Overheat and cool-down temperatures	5 °F (user configurable)	Yes	Overheat deadband	LIGHTS

Thresholds

A threshold is a set point for a specific type of environmental condition in a room, such as temperature. Thresholds generally come in pairs that define the upper and lower values of an acceptable range.

The Hive uses thresholds to control appliances. For most room conditions, when the aggregate value reported by the room's sensors crosses a threshold, the Hive activates the corresponding appliance type until the aggregate value is back within the threshold range.



EXAMPLE

If the aggregate temperature rises above the upper temperature threshold, the Hive activates the cooling appliances in the room until the temperature falls below the upper threshold minus its deadband. Similarly, when the aggregate temperature falls below the lower threshold, the Hive activates the room's heating devices until the temperature rises above the lower threshold plus its deadband.

The irrigation control's upper threshold operates slightly differently. If the growing medium moisture level exceeds the upper threshold, no appliances are activated. Instead, regularly scheduled irrigation events are skipped until the moisture level drops below the upper threshold minus its deadband.

Deadbands

After the Hive activates an appliance type, it doesn't deactivate the appliances as soon as the aggregate sensor reading is back within your defined range. Instead, it leaves the appliances on a little longer, to make sure that the aggregate reading is safely within the acceptable range and appliances will not need to be reactivated too quickly.

To determine when to deactivate appliances, the system uses both your defined thresholds and predefined system deadbands. A deadband is an extra value added to or subtracted from your threshold to determine the actual aggregate sensor reading that must be reported before the Hive will deactivate your appliances. Different types of thresholds have different predefined deadbands:

- Temperature: 5.4 °F
- Humidity: 5%
- CO₂: 50 ppm
- Grow-medium moisture: 3%



EXAMPLE

Assume your upper temperature threshold is 78 °F. When the aggregate room temperature rises above 78 °F, the Hive activates your cooling appliances. It will deactivate those devices when the temperature drops below 72.6 °F [78 °F minus the 5.4 °F deadband].

Similarly, if your lower temperature threshold is 65 °F, the Hive activates your heating appliances when the aggregate room temperature drops below 65 °F. It will deactivate those appliances when the temperature rises above 70.4 °F [65 °F plus the 5.4 °F deadband].

Appliances

An appliance is any electrical appliance that is plugged into a Stinger circuit that is controlled by your SmartBee system. All circuits assigned to the same room and appliance type are controlled as a group.



EXAMPLE

Say you have three Stinger Smart Plugs in your garden. You assign all three circuits to the same room and the appliance type HEATER, then plug in your heating appliances. The system will turn on and off all three heaters as a group.

Planning

Planning your SmartBee system involves determining:

- Where your Hive, control devices, sensors, and appliances will be located in your garden
- The SmartBee “rooms” you’ll use to group your devices and appliances
- The optimal environmental conditions for each room
- The room controls needed to maintain those optimal conditions

Before planning, make sure that you understand the system concepts explained in the previous section. For help on where to place your SmartBee devices (and much more about each device), see these videos:

- Hive—https://youtu.be/lzo5pKs87xQ?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9
- Control devices (Stinger Smart Plug and Stinger Smart Strip 4)—https://youtu.be/7sSXWol_zf8?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9
- LTH/LTH+CO₂/LTH Pro sensors—https://youtu.be/CHcymWfwUxg?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9
- WCSM—https://youtu.be/AKITSpjKT14?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9

Here’s a sample layout that illustrates how devices and appliances might be placed.

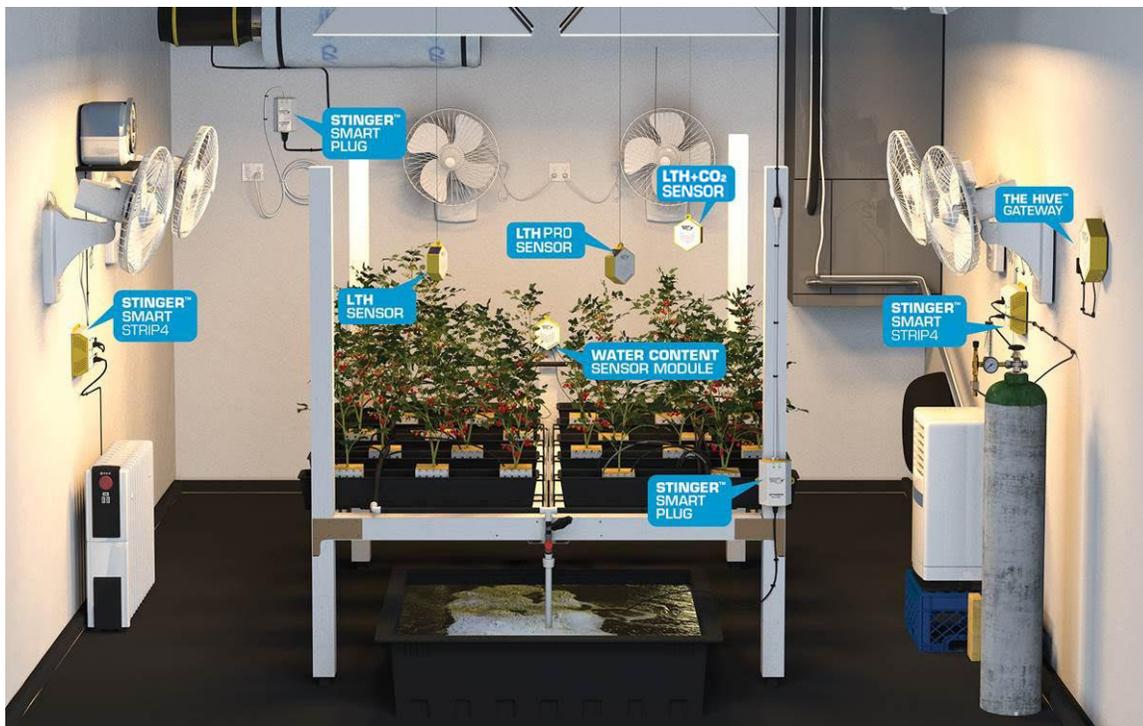


Figure 2. Sample system layout

Preparing Devices

When you've finished planning your system layout, it's time to prepare for installation. Preparation involves the following tasks, which must be completed in the order shown.

1. [Position Your Devices.](#)
2. [Activate Your Sensors.](#)
3. [Document Device Information.](#)

1. Position Your Devices

- a. Place the Hive, sensors, control devices, and appliances in the physical locations where they will be installed.



IMPORTANT

Do not wall-mount the Hive or any devices yet in case you need to move them later. During installation, you'll make sure that the Hive and all devices are communicating successfully before you physically install them.

- b. Plug in the Stinger control devices, but do not plug in your appliances.

2. Activate Your Sensors

- a. Locate the Power switch on the side of the sensor.
- b. Slide the switch to the ON position (toward the solar panels). LED 1 (left) will light.

Table 3. Sensor LEDs (LTH, LTH+CO₂, LTH Pro, WCSM)

LED No .	LED Name	Description
1 (Left)	No Network	On solid when the sensor is awake and not connected to your Hive. Blinks every four seconds when the sensor is asleep and not connected to your Hive. Off when the sensor is connected to your Hive (LED 3 will be on).
2 (Middle)	Status	On when the sensor is awake. Off when the sensor is asleep.
3 (Right)	Network	On solid when the sensor is awake and connected to your Hive. Blinks every four seconds when the sensor is asleep and connected to your Hive. Off when the sensor is not connected to your Hive (LED 1 will be on).

- c. Using the included mini-B USB 5V adapter, plug in the sensor and let it charge for 6 hours. Your sensors are now activated, charged, and can transmit data.

3. Document Device Information

After placing your devices and appliances, gather the device information that you'll need during installation to identify and configure devices and appliances in the Swarm Control web app. Such as the last four digits of the unique Radio ID on the device (example ...58A7) and the device location. *Do not plug in your appliances.*



TIP

If you're sure about which appliances you'll plug into which circuits on your Stinger control devices, labeling each circuit with its appliance type can help you to identify and use the correct circuits later.

Installing Your System

When you finish preparing your devices, you can begin installing your system. Installation involves the following tasks, which must be completed in the order shown.

1. [Activate the Hive Gateway](#) (below).
2. [Access the Swarm Control Web App](#) (page 19).
3. [Connect the Hive to Your Existing Network](#) (page 20).
4. [Update Your Hive](#) (page 20).
5. [Join Your Devices to the Hive Gateway](#) (page 20).
6. [Create Your Rooms](#) (page 20).
7. [Assign Devices to a Room](#) (page 21).
8. [Configure Room Controls](#) (page 21).
9. [Finalize Physical Installation](#) (page 21).
10. [Subscribe to Email Alerts](#) (page 21).

1. Activate the Hive Gateway

Activating the Hive involves powering it on.

1. Plug the included 5V power adapter into the Hive.
2. Plug the power adapter into a standard 110V power outlet.
Do not press any of the buttons on the Hive.
3. Wait for all five LED lights on the front of the Hive to turn solid green.
4. Wait three minutes before connecting to the Hive.

2. Access the Swarm Control Web App

Once you've activated your Hive, it's time to open the Swarm Control web app.

1. Load the Swarm Control Web App.
2. Log In.
3. Complete First Time Setup.

a. Load the Swarm Control Web App

Open a web browser, and type in <http://10.0.0.1>. This should load the Swarm Control web app and present a login page.

b. Log In

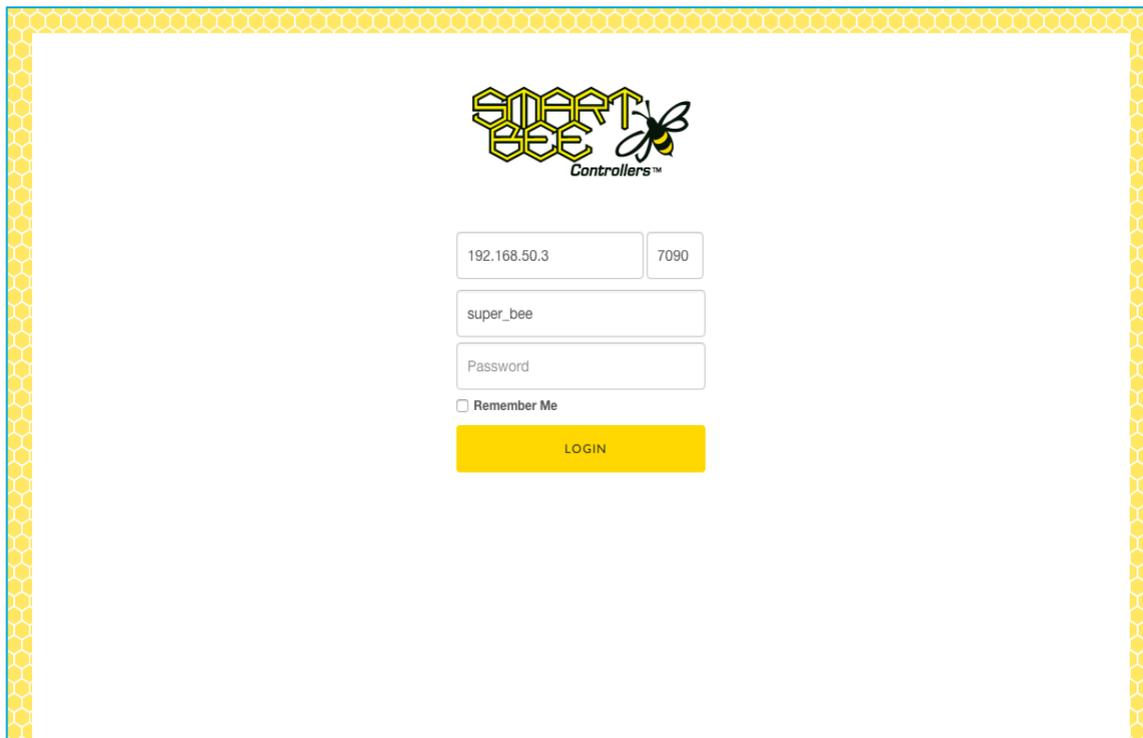


Figure 3. Swarm Control web app Login page

1. Leave the default URL and Port.
2. Enter the default login credentials.
Username: super_bee
Password: beeb833
3. Click LOGIN.

c. Complete First Time Setup

The first time you log in to your Hive, you'll see a welcome page.

1. Click **Get Started**. You'll be asked to set the system time.
2. On the system time page, if necessary, change the displayed date and time.
3. Click **Save Time**. You'll be asked to name your system.
4. On the system name page, enter a name for your Hive. This name is used as the sender name in email alerts sent from the Hive.
5. Click **Next**.

First-time setup is complete! You'll see the Dashboard, which is empty for now.

3. Connect the Hive to Your Existing Network

1. Through a Wi-Fi-enabled computer, tablet, or smart phone, find the network named "Smartbee-FFFFFF", where FFFFFFF are any six hexadecimal digits.

If you can't locate the Smartbee-FFFFFF network, press and hold the **Network** button on the Hive until LED 4 begins to blink. Wait several seconds until LED 4 is solid again. This reconfigures the Hive as a Wi-Fi hotspot. Wait for all five LED lights on the front of the Hive to turn solid green. Wait three minutes before connecting to the Hive.

2. Connect to this Wi-Fi network and enter the default password of "beebee833".
3. Wait up to a minute for connection to be fully established.
4. You're now connected to your Hive.

4. Update Your Hive

Follow the instructions in [Updating System Software](#) on page 65.

5. Join Your Devices to the Hive Gateway

Once you have access to the Swarm Control web app, you can tell the Hive to look for your devices. Follow the instructions in [Adding a Device](#) on page 42.

6. Create Your Rooms

After joining your devices to the Hive, you're ready to create the room(s) you'll use to group the devices. Follow the instructions in [Adding a Room](#) on page 25. For a refresher on the room concept, see [Rooms](#) on page 13.

7. Assign Devices to a Room

After creating a room, you need to add devices to it.



CAUTION

Remember that none of your appliances should be plugged in at this point in the installation. If you have plugged any appliances into any control devices, unplug the appliances now so that they don't turn on unexpectedly before installation is complete.

Follow the instructions in [Assigning a Device to a Room](#) on page 45.

8. Configure Room Controls

Once you've assigned devices to your room(s), it's time to configure the room controls that determine how the system responds to the environmental conditions in the room. Follow the instructions in [Configuring Room Controls](#) on page 26. For more on the room controls concept, see [Room Controls](#) on page 14.

9. Finalize Physical Installation

At this point, you've verified that your devices are communicating successfully with the Hive and won't need to be moved. You've also defined the room controls that will be used to control your appliances. It's time to complete the physical installation.

1. If you're going to hang any sensors, hang them now.
2. If you're going to wall-mount your Hive or devices, do so now. Each device includes a mounting template to help you determine screw placement.
3. Plug each appliance into its assigned circuit on your Stinger control devices.
4. Make sure that each appliance's on/off switch or control is set to ON. The system now controls when the appliance powers on and off.

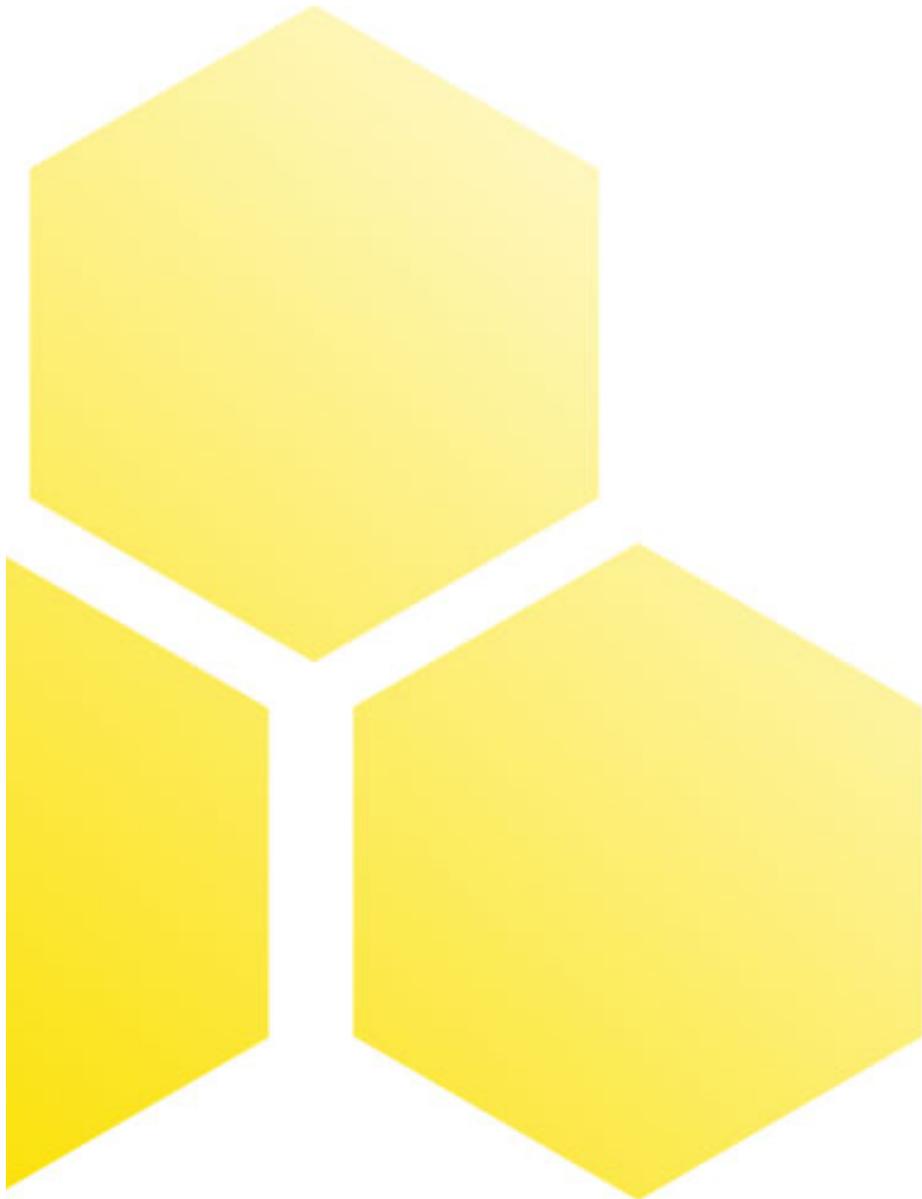
10. Subscribe to Email Alerts

If you want to receive notifications of important system events, you need to subscribe to Hive email alerts. Follow the instructions in [Subscribing to Alerts](#) on page 63.

2 Using Your System

This chapter provides step-by-step instructions for completing common tasks in your SmartBee Control system.

Other than [Logging In](#), the sections in this chapter assume that you are logged into the Swarm Control web app.



Logging In

1. If your Hive is still set up in Access Point (Hot Spot) mode, you can open a browser and type in <http://10.0.0.1> on any device.

OR

If your Hive has a network configuration other than Hot Spot mode, see [Network Discovery](#) on page 58.

The Swarm Control web app login page is displayed.

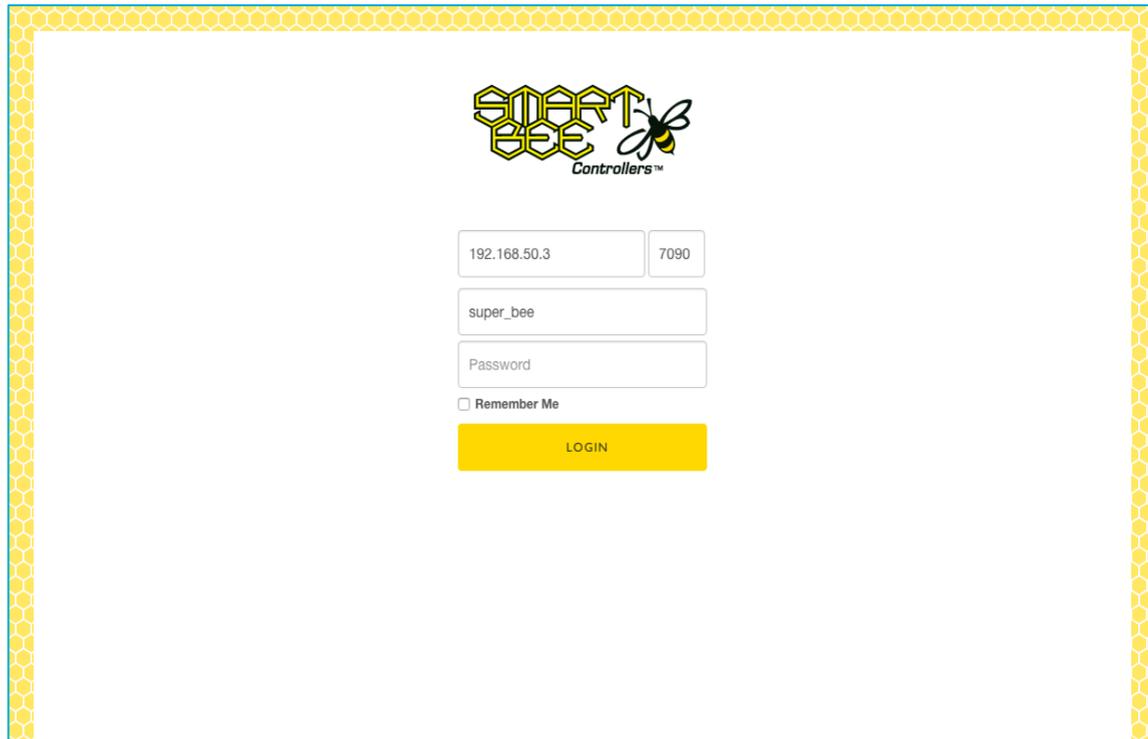


Figure 4. Swarm Control web app Login page

The URL and Port fields are automatically populated with the values you supplied the last time you logged in. Many users won't need to change these fields. If you have more than one Hive Gateway, or if you're connecting to the Hive over the Internet and through a firewall, you may need to change the URL and port.

2. Leave the default URL and Port.
3. Enter the default login credentials.

Username: super_bee

Password: beeb833

4. Click LOGIN.

Using the Dashboard

The Dashboard is the first page displayed when you log in to the Swarm Control web app. On any other page, you can open the Dashboard by clicking Dashboard at the top of the page.

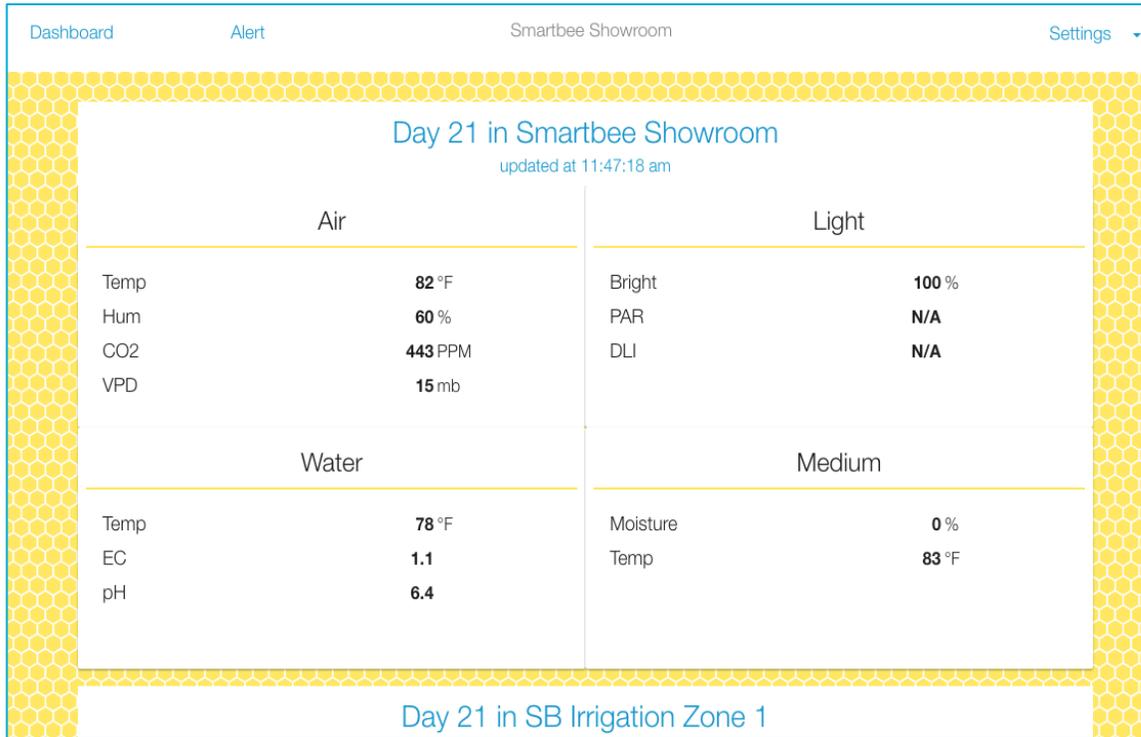


Figure 5. Dashboard page

The Dashboard shows a summary of the current state of every room in your SmartBee system.

Each room box lists the aggregate values reported from the sensors assigned to the room, or N/A if the room doesn't have the applicable type of sensor. These live values and the last update time are updated as the Hive receives new data from the sensors.

Managing Rooms

This section explains how to create, configure, and manage rooms in your SmartBee Control system. For more on the room concept, see [Rooms](#) on page 13.

Adding a Room

To add a room:

1. On any page in the Swarm Control web app, select Settings > Room Manager.
2. On the Room Manager page, click Add Room to display the new room fields.

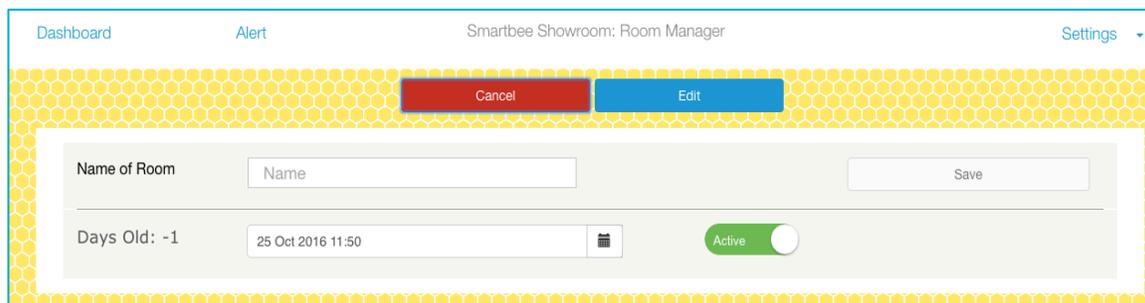


Figure 6. New room fields

3. Name of Room: Enter the room name.
4. By default, the Grow Cycleswitch is set to Active. This means that as soon as the room is created, the room's grow cycle counter will start and the room controls will be enabled. Leave the default Active setting.



IMPORTANT

If you switch the Grow Cycle to Inactive, the grow cycle counter won't start, the room won't collect sensor data, and any room controls you configure won't affect the control devices assigned to the room.

5. Click Save. Your new room is added to the room list.
6. Click Dashboard to return to the Dashboard page, where your new room is now displayed.



Inactive in New Room							
updated at 11:54:29 am							
Air		Light		Water		Medium	
Temp	N/A	Bright	N/A	Temp	N/A	Moisture	N/A
Hum	N/A	PAR	N/A	EC	N/A	Temp	N/A
CO2	N/A	DLI	N/A	pH	N/A		
VPD	N/A						

Figure 7. Dashboard page with one room

Configuring Room Controls

Once you've assigned devices to a room, it's time to configure the room controls that determine how the system responds to the environmental conditions in the room. For a refresher on room controls, see [Room Controls](#) on page 14.

1. On any page in the Swarm Control web app, click **Dashboard**.
2. On the Dashboard, click the room whose controls you want to configure.



The screenshot shows the Swarm Control web app dashboard for a room named 'Smartbee Showroom'. The page title is 'Inactive in New Room', updated at 11:54:29 am. The dashboard is divided into four columns: Air, Light, Water, and Medium. Each column contains a list of sensors and their current values, all of which are 'N/A'.

Air		Light		Water		Medium	
Temp	N/A	Bright	N/A	Temp	N/A	Moisture	N/A
Hum	N/A	PAR	N/A	EC	N/A	Temp	N/A
CO2	N/A	DLI	N/A	pH	N/A		
VPD	N/A						

Figure 8. Selecting a room on the Dashboard

You'll see the Room Details page for the selected room. For more on the Room Details page, see [Viewing Sensor Data \(Room Details\)](#) on page 39.

3. Continue with the instructions for the type of controls you want to configure:
 - [Configuring Room Thresholds](#) below.
 - [Configuring CO₂ Controls](#) on page 29.
 - [Configuring Irrigation Controls](#) on page 31.
 - [Configuring Lighting Controls](#) on page 35.

Configuring Room Thresholds

Room threshold controls determine when the system turns devices on and off in response to environmental conditions in the room (as reported by the room's LTH, LTH+CO₂, and LTH Pro sensors).

On the Room Details page, click **Temp Controls** or **Humidity Controls** in the left column. The **Temperature Controls** page or the **Humidity Controls** page is displayed.

Setting Temperature or Humidity Thresholds

Thresholds define the temperature or humidity range that you want to maintain in the room.

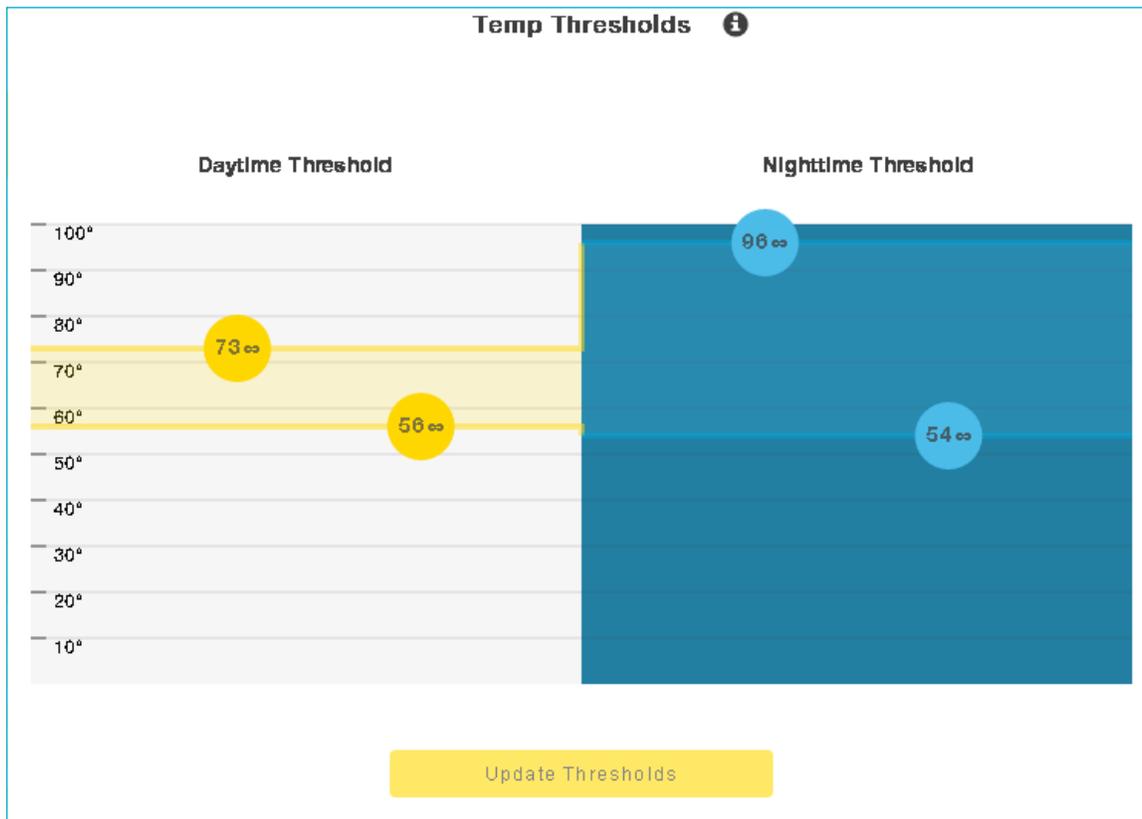


Figure 9. Temperature thresholds

Any control device circuit that is assigned to this room and has an appliance type of HEATER or COOLING will be turned on or off in response to the thresholds you define here (plus the deadband). Similarly, on the Humidity Controls page, any control device circuit that is assigned to this room and has an appliance type of HUMIDIFIER or DEHUMIDIFIER will be turned on or off in response to the thresholds you define on that page (plus the deadband). For more on thresholds, see [Room Controls](#) on page 14.

The daytime and nighttime periods are defined in your lighting schedule (see [Configuring Lighting Controls](#) on page 35).

The following steps refer to the thresholds on the Temperature Controls page. The thresholds on the Humidity Controls page work in the same way for high and low humidity.

1. In the Daytime Threshold area:
 - a. Drag the top circle to set the daytime high temperature for the room. Cooling devices will be turned on if the room temperature exceeds this threshold.
 - b. Drag the bottom circle to set the daytime low temperature for the room. Heating devices will be turned on if the room temperature drops below this threshold.
2. In the Nighttime Threshold area, set the nighttime high and low temperatures in the same way as the daytime temperatures.
3. Click Update Thresholds to save your changes.

Setting Notification Alerts

Use the Temperature Alerts page to set up notification preferences.

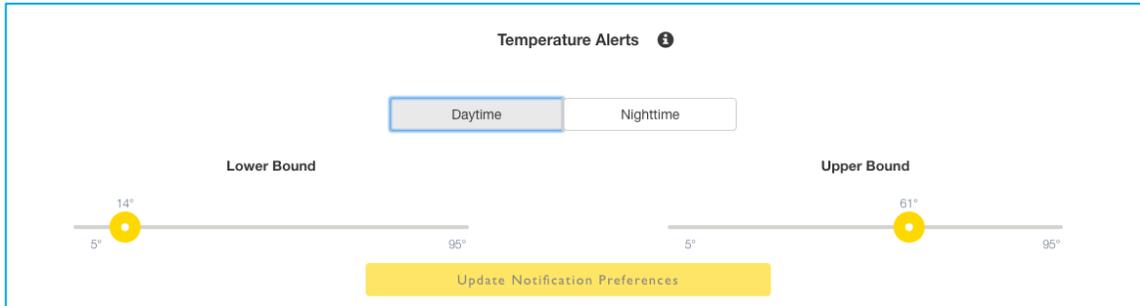


Figure 10. Temperature alert notifications

Follow these steps to set up the temperature parameters used for alert notifications.

1. Click Alert to display the Temperature Alerts page.
2. Select Daytime or Nighttime.
3. Move both sliders to the desired position.
4. Click Update Notification Preferences to save your changes.

Controlling Temperature or Humidity Appliances

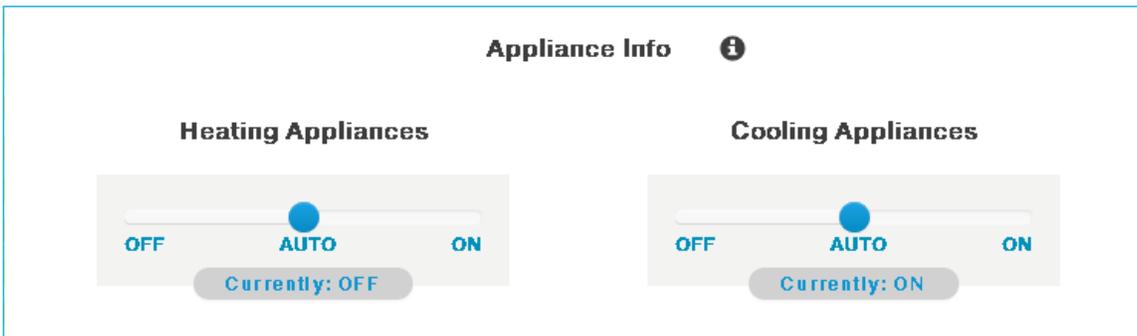


Figure 11. Control settings for heating and cooling appliances

The following steps refer to the controls on the Temperature Controls page. The controls on the Humidity Controls page work in the same way for humidifier and dehumidifier appliances.

In the Appliance Info area:

1. Heating Appliances: Drag the circle to the appropriate control setting for the heating appliances in this room.
 - a. AUTO: (default) The Hive Gateway turns the heating appliances on and off as required to keep the room temperature within your defined thresholds.
 - b. OFF: The heating appliances are turned off and are not controlled by the Hive. They will remain off until you turn them on.
 - c. ON: The heating appliances are turned on and are not controlled by the Hive. They will remain on until you turn them off.

2. **Cooling Appliances:** Select the control setting for cooling appliances in the same way as for heating appliances.

Configuring CO₂ Controls

CO₂ controls determine when the system turns CO₂ appliances on and off in response to the CO₂ levels in the room (as reported by the room's LTH+CO₂ or LTH Pro sensors).

On the Room Details page, click CO₂ Controls in the left column. The CO₂ Controls page is displayed.

Setting the CO₂ Threshold

The threshold defines the minimum CO₂ level that you want to maintain in the room.

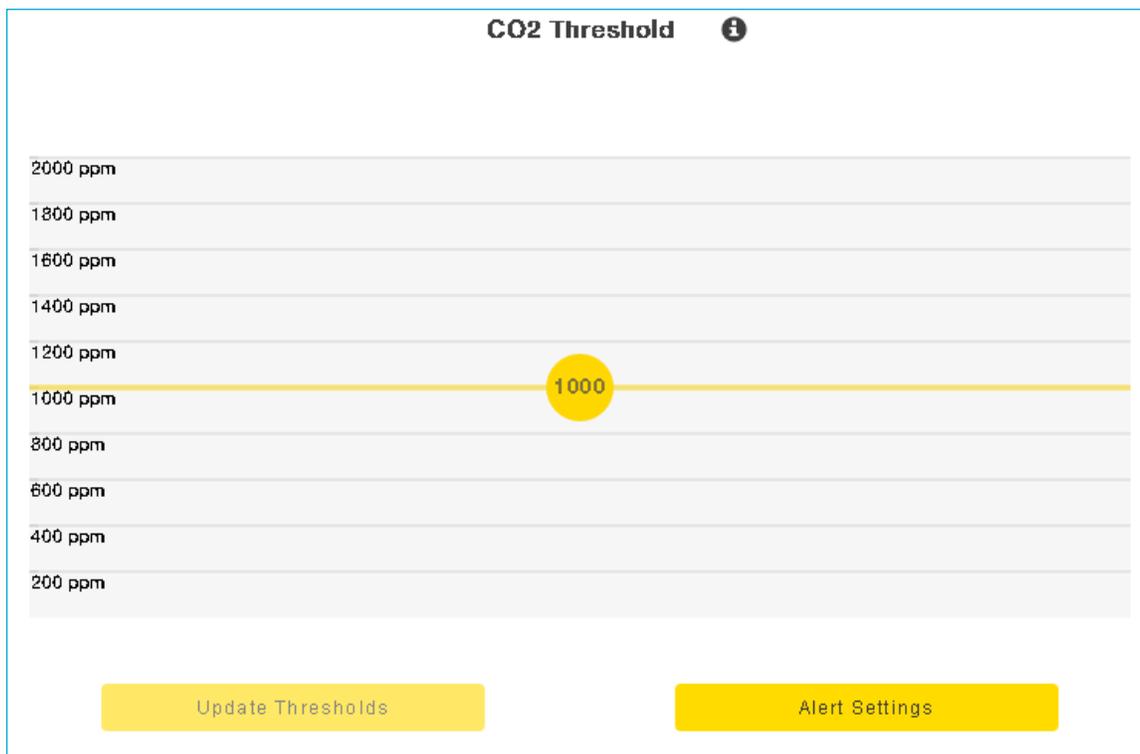


Figure 12. CO₂ threshold

Any control device circuit that is assigned to this room and has an appliance type of CO₂_EMITTER will be turned on and off in response to the threshold you define here (plus the deadband). For more on thresholds, see [Room Controls](#) on page 14.

In the CO₂ Threshold area:

1. Drag the circle to set the minimum CO₂ level for the room. CO₂ appliances will be turned on if the CO₂ level drops below this threshold and turned off again when the CO₂ rises above the threshold value plus deadband.
2. Click Update Thresholds to save your changes.

Configuring CO₂ Alerts

If you want the system to generate an alert if the CO₂ measurement drops below or exceeds specified levels:

1. Click Alert Settings. The page expands to show CO₂ alert settings.

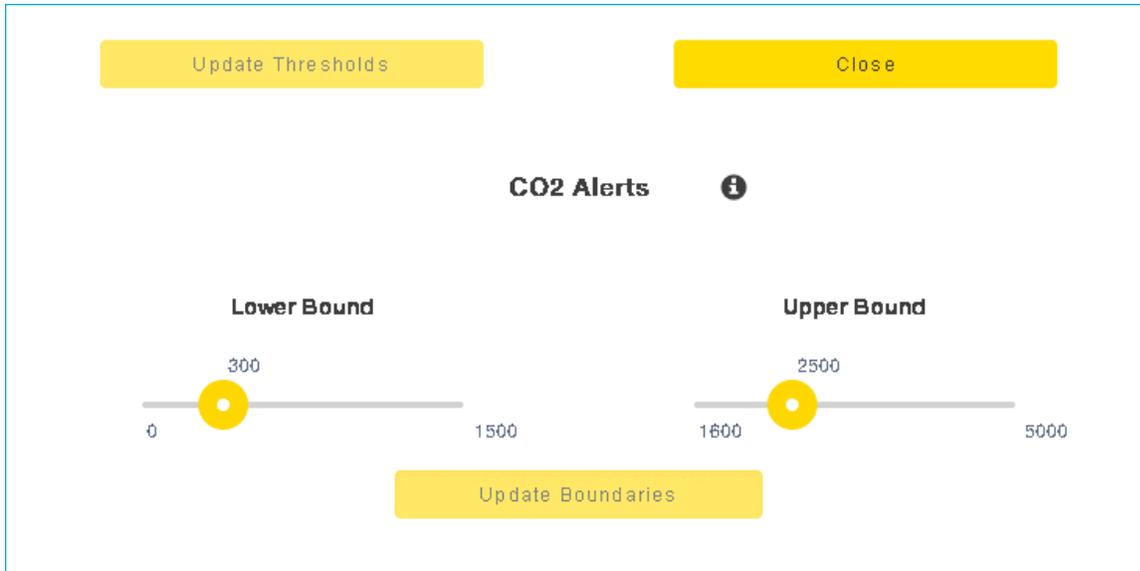


Figure 13. CO₂ alert settings

2. Lower Bound: Drag the circle to set the low CO₂ level. An aggregate CO₂ measurement below this level will trigger an alert.
3. Upper Bound: Drag the circle to set the high CO₂ level will trigger an alert.
4. Click Update Boundaries.
5. To hide the CO₂ Alerts area, click Close.

Controlling CO₂ Appliances

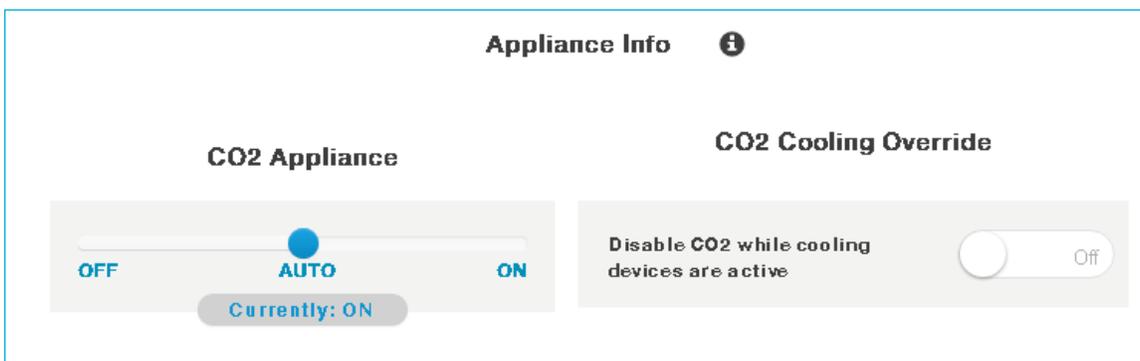


Figure 14. Control settings for CO₂ appliances

In the Appliance Info area:

1. CO₂ Appliance: Drag the circle to the appropriate control setting for the CO₂ appliances in this room.
 - AUTO: (default) The Hive Gateway turns the CO₂ appliances on and off as required to keep room CO₂ level above your defined threshold.
 - OFF: The CO₂ appliances are turned off and are not controlled by the Hive. They will remain off until you turn them on.
 - ON: The CO₂ appliances are turned on and are not controlled by the Hive. They will remain on until you turn them off.
2. CO₂ Cooling Override: Click the switch to turn the cooling override feature ON or OFF. When ON, the system won't turn on your CO₂ appliances while your cooling appliances are running. (CO₂ Appliance must be set to AUTO to allow the system to control your CO₂ appliances.)



TIP

The lighting schedule must be set in order for the CO₂ control to operate properly. CO₂ will not be emitted during nighttime.

Configuring Irrigation Controls

Irrigation controls determine when the system turns irrigation appliances on and off according to the irrigation schedules you create and in response to the aggregate grow-medium moisture level in the room (as reported by the room's WCSM probes).

On the Room Details page, click Irrigation Controls in the left column. The Irrigation Controls page is displayed.

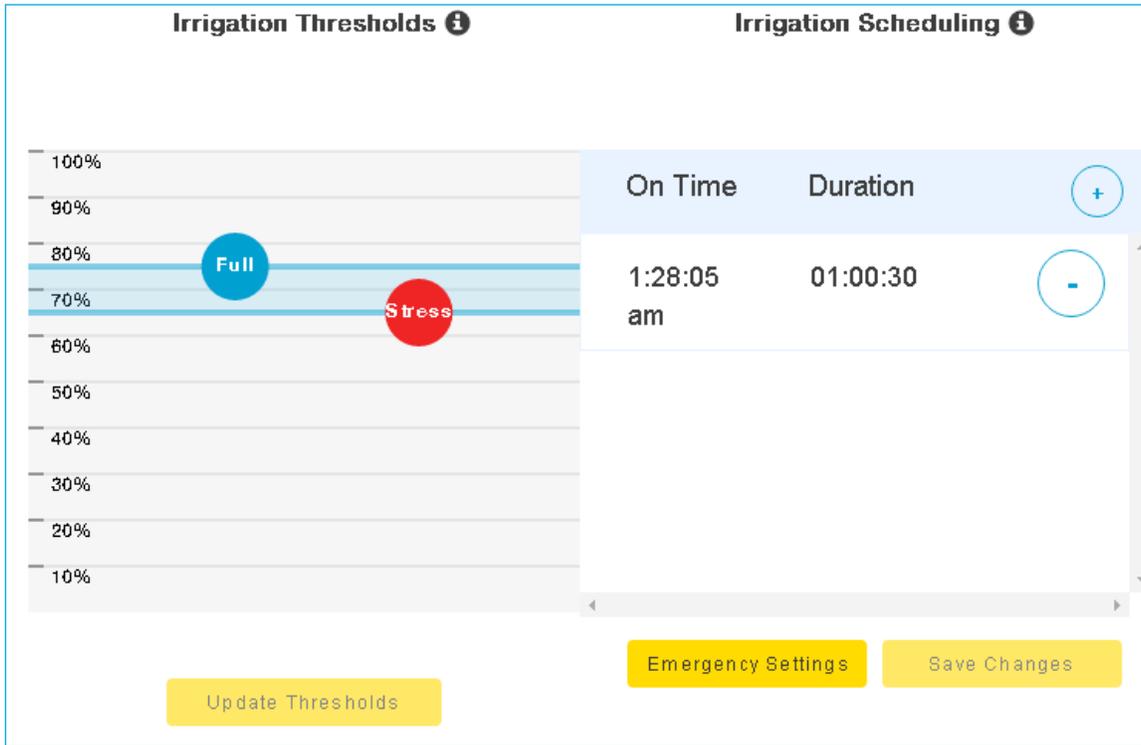


Figure 15. Irrigation thresholds

Setting Irrigation Thresholds

Thresholds define the grow-medium moisture range that you want to maintain in the room.

Any control device circuit that is assigned to this room and has an appliance type of IRRIGATION_PUMP will be turned on and off according to your irrigation schedules and in response to the thresholds you define here (plus the deadband). For more on thresholds, see [Room Controls](#) on page 14.

1. In the Irrigation Thresholds area:
 - a. Drag the Full circle to set the high grow-medium moisture level for the room. Above this level, the grow medium is too wet. Scheduled irrigation events will be skipped until the aggregate moisture level drops below this threshold (plus the deadband). If you want scheduled irrigation events to always occur, set the Full threshold to 100%.
 - b. Drag the Stress circle to set the low grow-medium moisture level for the room. Below this level, the grow medium is too dry. Emergency irrigation events will occur until the aggregate moisture level rises above this threshold (plus the deadband). To disable emergency irrigation, set the Stress threshold to 0%.
2. Click Update Thresholds to save your changes.

Adding Irrigation Schedules

1. In the Irrigation Scheduling area, click the plus sign (+) to add an irrigation schedule. The schedule popup box is displayed.

The screenshot shows a 'Add Irrigation Schedules' popup box. It features a title bar 'Irrigation Schedules'. Below the title bar, there are three columns labeled 'Hr', 'Min', and 'Sec'. Under 'Hr', there are three '+' buttons and one '-' button. Under 'Min', there are three '+' buttons and one '-' button. Under 'Sec', there are three '+' buttons and one '-' button. To the right of the 'Hr' and 'Min' columns are input fields containing '12' and '00' respectively. To the right of the 'Sec' column is an input field containing '00'. To the right of the 'Sec' column is a dropdown menu with 'AM' selected. Below the 'Hr' and 'Min' columns are three '-' buttons. Below the 'Sec' column is an input field containing '00'. Below the 'Hr' and 'Min' columns are input fields containing '00' and '00' respectively. Below the 'Sec' column is an input field containing '10'. To the right of the 'Hr' and 'Min' columns is a checkmark icon. To the right of the 'Sec' column is a back arrow icon. At the bottom of the box are two yellow buttons: 'Reset Schedules' and 'Save Changes'.

Figure 16. Add Irrigation Schedules popup box

2. Start Time: Set the time when the irrigation will start:
 - a. Click + or - to increase or decrease the hours, minutes, and seconds.
OR
Click the hours, minutes, or seconds field, then enter a number.
 - b. If necessary, click AM to change the time to PM.
3. Duration: Set how long the irrigation will last. The hours, minutes, and seconds fields work the same way as for Start Time.
4. Click Add. The schedule is saved and the fields are cleared.
5. Repeat steps 2 to 4 to add as many schedules as desired. Schedules cannot overlap.
6. When you're done, click Finished Adding Schedules. Your schedules are displayed on the Irrigation Controls page.

Deleting an Irrigation Schedule

In the Irrigation Scheduling area, click the minus sign (-) next to the schedule you want to delete.

Configuring the Emergency Irrigation Event

By default, the emergency irrigation event lasts for 1 minute and recurs every 15 minutes until the grow-medium moisture level rises above the Stress threshold (plus deadband). To change these default settings:

1. Click Emergency Settings. The Emergency Irrigation Settings popup box is displayed.

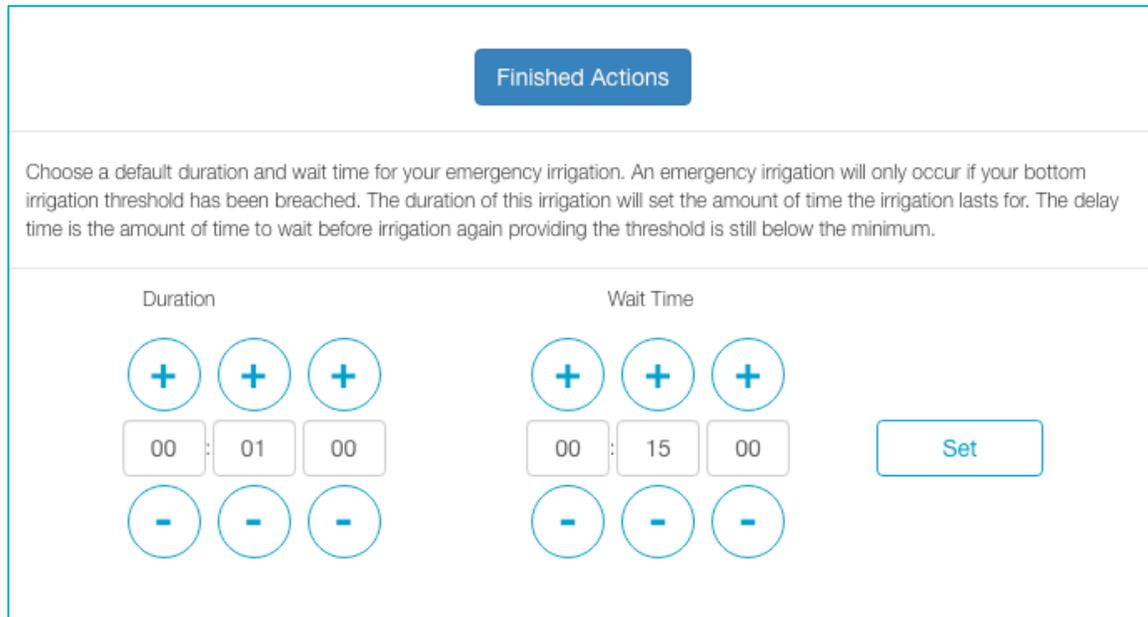


Figure 17. Emergency Irrigation Settings popup box

2. Duration: Set how long you want the irrigation to last:
Click + or - to increase or decrease the hours, minutes, and seconds.
OR
Click the hours, minutes, or seconds field, then enter a number.
3. Wait Time: Set how long the system will wait to start another emergency irrigation after the previous one ends. The hours, minutes, and seconds fields work the same way as for Duration.
4. Click Set.
5. Click Finished Updating to return to the Irrigation Controls page.

Controlling Irrigation Appliances

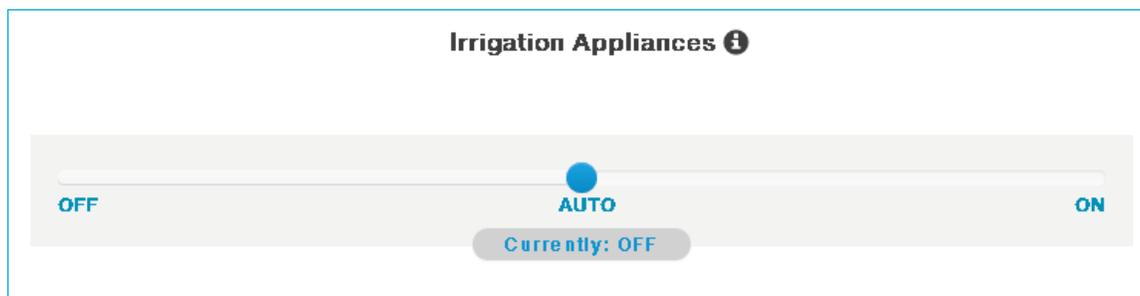


Figure 18. Control settings for irrigation appliances

In the Irrigation Appliances area, drag the circle to the appropriate control setting for the irrigation appliances in this room.

- **AUTO:** (default) The Hive Gateway turns the irrigation appliances on and off as required to keep the grow-medium moisture level within your defined thresholds.
- **OFF:** The irrigation appliances are turned off and are not controlled by the Hive. They will remain off until you turn them on.
- **ON:** The irrigation appliances are turned on and are not controlled by the Hive. They will remain on until you turn them off.

Configuring Lighting Controls

Lighting controls determine when the system turns lighting appliances on and off according to the lighting schedule and in response to the temperature aggregate in the room (as reported by the room's LTH, LTH+CO₂, and LTH Pro sensors).

On the Room Details page, click Lighting Controls in the left column. The Lighting Controls page is displayed.

Changing the Lighting Schedule

The lighting schedule defines the time period when the lighting appliances in the room will be turned on.

Any control device circuit that is assigned to this room and has an appliance type of LIGHTS will be turned on and off according to the lighting schedule.

1. In the Lighting Scheduling area, click the lock icon in the center of the circle to unlock the schedule.

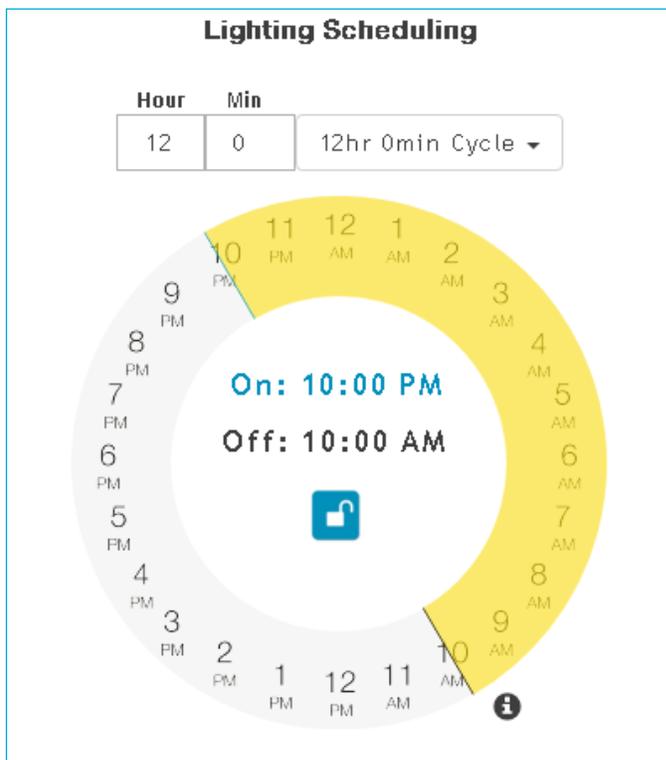


Figure 19. Setting the start time for a lighting schedule

2. Enter the hours and minutes for the length of the “daytime” period (when lights will be on).
OR

In the cycle drop-down list, select a predefined day length: 12 hours, 18 hours, or 24 hours.

3. In the time circle, click the time that you want the day to begin.

OR

Drag the day/night divider line to the time that you want the day to begin.

4. Click the lock icon to save the schedule and lock the controls.

Setting Lighting Overheat Thresholds

Overheat thresholds help prevent plant stress when heat generated from a room's lighting outpaces the room's cooling capabilities.

Any control device circuit that is assigned to this room and has an appliance type of LIGHTS will be turned off in response to the overheat threshold you define here. For more on thresholds, see [Room Controls](#) on page 14.

In the Lighting Overheat Thresholds area:

1. Drag the high temperature box (right) to set the high daytime temperature for the room. Lights will be turned off if the room temperature exceeds this threshold.
2. Drag the low temperature box (left) to set the cool-down temperature for the room. After an overheat shutoff, lights will be turned back on when the room temperature drops below this threshold.

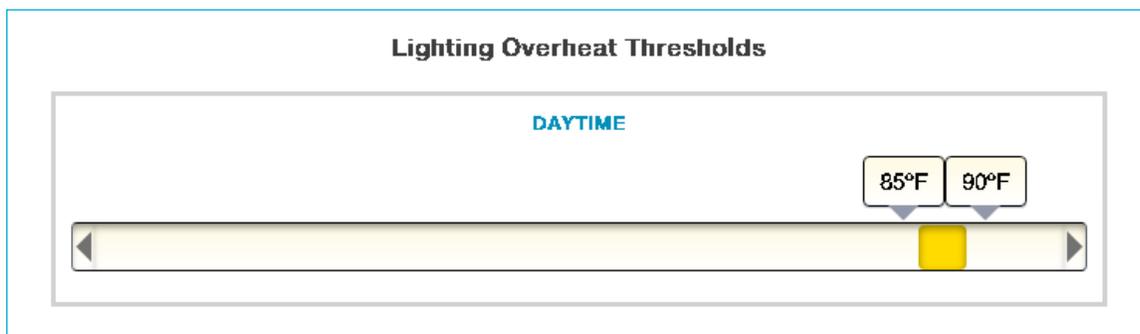


Figure 20. Lighting overheat thresholds

Controlling Lighting Appliances

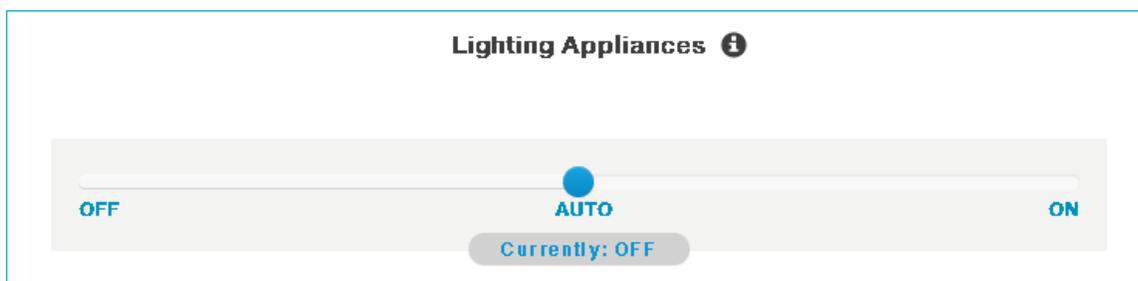


Figure 21. Control settings for lighting appliances

In the Lighting Appliances area, drag the circle to the appropriate control setting for the lighting appliances in this room.

- **AUTO:** (default) The Hive Gateway turns the lighting appliances on and off according to the lighting schedule and as required to keep the room temperature below the lighting overheat threshold.
- **OFF:** The lighting appliances are turned off and are not controlled by the Hive. They will remain off until you turn them on.
- **ON:** The lighting appliances are turned on and are not controlled by the Hive. They will remain on until you turn them off.

Changing Devices in a Room

To change the devices in a room, you can move a device from one room to another or change the device to Unassigned.

To reassign a device:

1. On any page in the Swarm Control web app, select **Settings > Device Manager** to open the Device Manager page.
2. In the left column, click the device you want to move. The device information is displayed in the main panel.

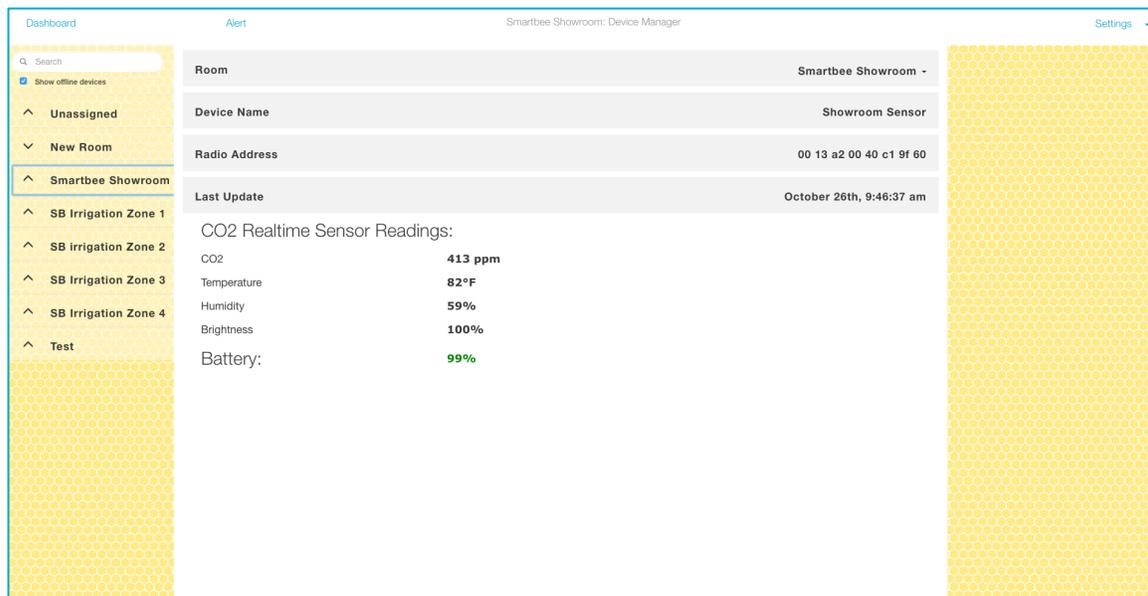


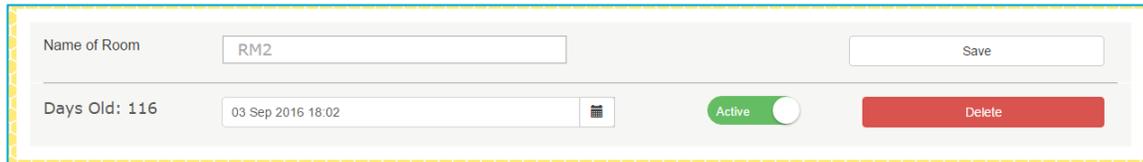
Figure 22. Moving a device to another room

3. **Room:** Select the room to which you want to move the device, or select Unassigned.

Managing Rooms

Renaming a Room

1. On any page in the Swarm Control web app, select Settings > Room Manager.
2. On the Room Manager page, click Edit to enable the room fields.



The screenshot shows a web form for editing a room. It has two rows of input fields. The first row is labeled 'Name of Room' and contains a text input field with 'RM2' and a 'Save' button. The second row is labeled 'Days Old: 116' and contains a date input field with '03 Sep 2016 18:02', a calendar icon, a green 'Active' toggle switch, and a red 'Delete' button.

Figure 23. Renaming a room

3. Name of Room: Enter the new room name.
4. Click Save.
5. Click Done.

Deleting a Room



CAUTION

Deleting a room is irreversible. All room control settings and historical sensor data will be lost.

1. On any page in the Swarm Control web app, select Settings > Room Manager.
2. On the Room Manager page, click Edit to enable the room fields.
3. Click Delete.
4. In the confirmation pop-up box, click Yes, I'm sure.
5. Click Done.

Understanding Sensor Data

Understanding what's actually happening in a room is the key to managing it.



TIP

We've put together a short How-To video that explains how to interpret sensor data and how you can use this information to optimize your SmartBee system and produce greater and more consistent yields. Watch it here: https://youtu.be/bKKE00gCMv4?list=PLRG3ZemrqXwMcT4FNL_euDz25_3FhU5_9.

Viewing Sensor Data (Room Details)

1. On any page in the Swarm Control web app, click **Dashboard** at the top of the page.
2. On the **Dashboard** page, click the room whose details you want to view. The **Room Details** page is displayed.

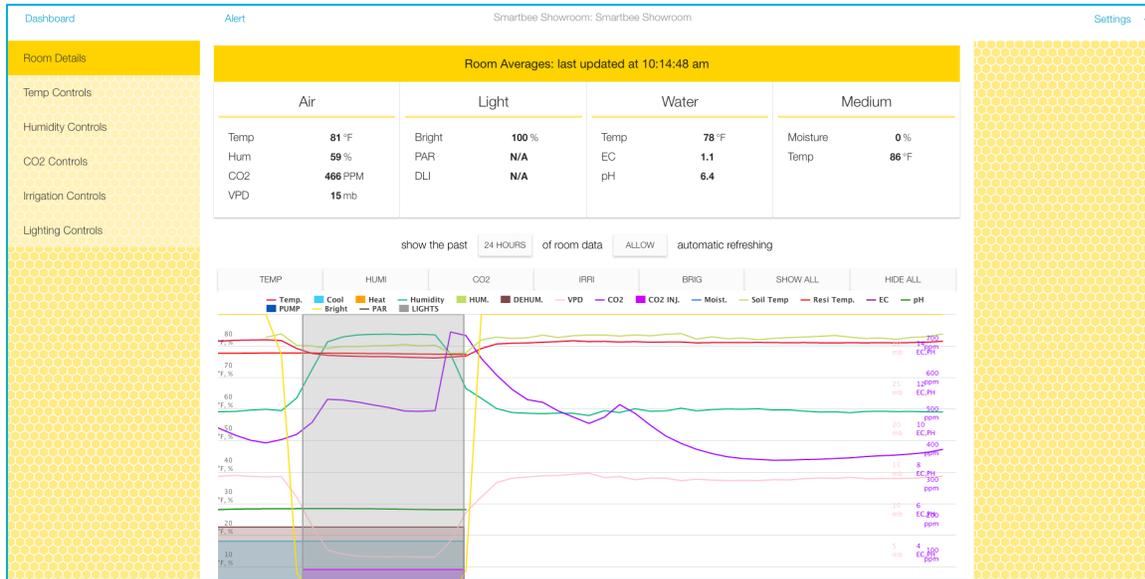


Figure 24. Room Details page

This page is where you land each time you enter a room. It shows the room’s current and historical sensor data and allows you to customize the data that is shown in the graph (see the next section). The ability to see what’s happening in a room lets you monitor how your garden is performing, especially when you’re not there.

The left column provides access to the individual control settings for the room. For more, see [Configuring Room Controls](#) on page 26.

Customizing Your View of the Sensor Data

By default, the graph on the Room Details page shows data for the last 24 hours and for all environment categories—Temperature, Humidity, CO₂, Irrigation, and Lighting. Looking at the viewer controls, you can tell that this is the data that you’re seeing because:

- The Last 24 Hours button is gray;
- The Show/Hide button says “Hide”; and
- All of the category buttons are gray.



Figure 25. Control buttons for the room details graph

A gray button means that the button is “on”; that is, the type of data indicated by the button is showing in the graph. A white button means the button is “off” and that type of data is not showing.

Changing the Time Period Shown

To change the time period for the room details graph, click one of the time period buttons above the graph.

At the bottom of the graph, the blue highlighted time bar indicates the time period being shown—in this case, 24 hours.

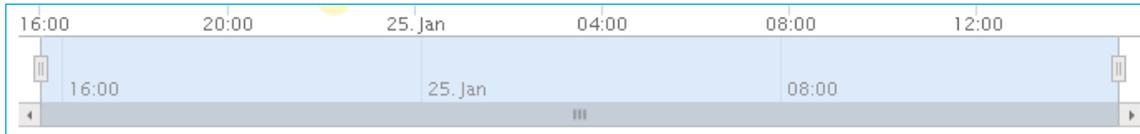


Figure 26. Time bar on the room details graph

You can further refine this period by dragging the handles at either end of the time bar to create a specific timeframe. This example shows an 8 hour timeframe.

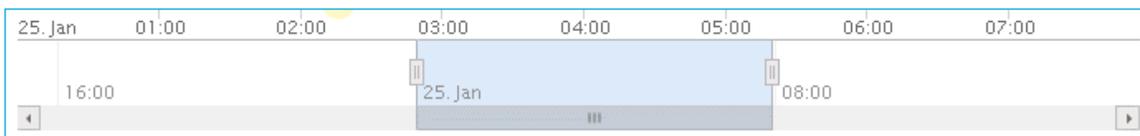


Figure 27. Custom timeframe selected

Once you've defined a timeframe, you can drag it (or use the scrollbar) to move it forward or backward within the selected time period.

Click Refresh Resolution to load additional data points (if available) for the selected timeframe.

Changing the Categories Shown

The category buttons above the room details graph determine what data is shown in the graph. Click any category button to show or hide data for that category.

Each category includes:

- One or more lines for the sensor readings in the category
- One or more square waveforms (boxes) that indicate when the appliances in the category were turned on



EXAMPLE

The following figure shows the Temperature category. The red line indicates the aggregate room temperature, while the blue box indicates when cooling appliances were turned on. If heating appliances had been turned on, the box would be orange.

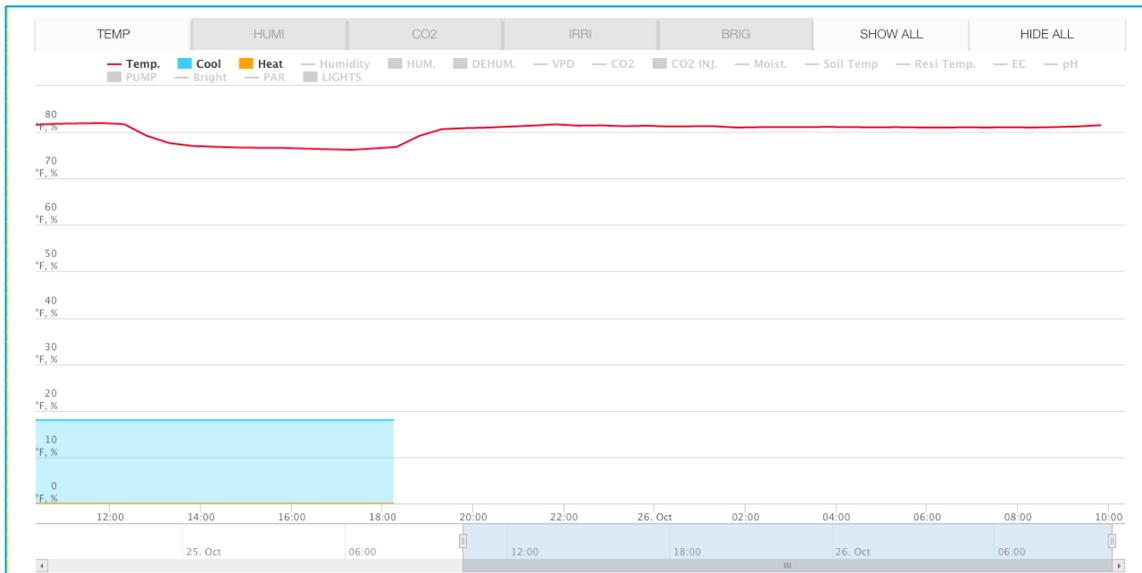


Figure 28. Temperature category

Hover your mouse pointer over (or tap) any point on the sensor line to see exact measurements at a given time.

Viewing multiple categories at once can help you make better gardening decisions by showing you how the conditions and appliances in one category affect the conditions and appliances in the other categories.

Managing Devices

This section explains how to manage the hardware devices in your SmartBee Control system.

Adding a Device

You can add multiple devices to your system at the same time.

a. Add the Device

To add a device:

1. Make sure that any control devices you want to add are plugged in.



CAUTION

To prevent your appliances from operating unexpectedly, do not plug appliances into the control devices until after adding and configuring the devices.

2. Make sure that any sensors you want to add are charged or plugged in and are in an “awake” state.
3. On any page in the Swarm Control web app, select Settings > Permit Join.

For two minutes, the Hive attempts to find sensors and control devices within its range. Alerts are displayed as devices are found.

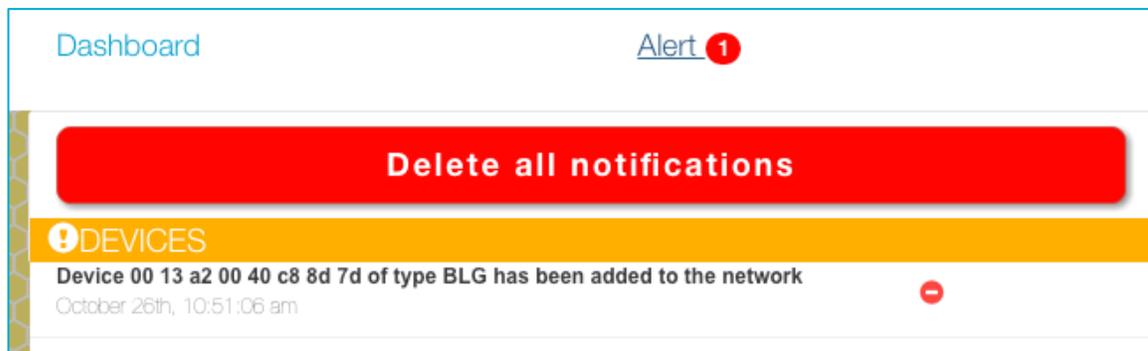


Figure 29. Device discovery alert category

After two minutes, continue with the instructions below to verify the device connections.

b. Check the Device to Verify the Device Connection

Once your devices are joined to the Hive, you need to verify the connections on the devices themselves to make sure that they are communicating with the Hive.

All devices have a green status LED that indicates network connectivity.

On a sensor, the status LED is on the right and blinks very slowly when the sensor is connected to a network.

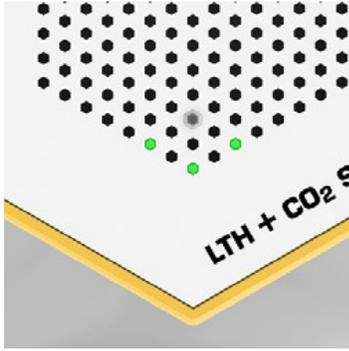


Figure 30. Network connection LED on a sensor

On a control device, the status LED is solid when the device is connected to a network.

On a Stinger Smart Plug, the status LED is on the front of the device.

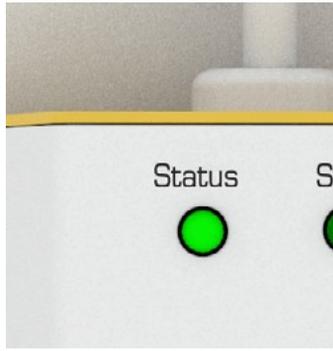


Figure 31. Network connection LED on a Stinger Smart Plug

On a Stinger Smart Strip 4, the status LED is behind the ventilation grill on the left side of the device.



Figure 32. Network connection LED on a Stinger Smart Strip 4

If the status LED on a device is off, see [Troubleshooting](#) on page 67.

c. Check the Web App to Verify the Device Connection

Once your devices are joined to the Hive, you need to verify the connections in the web app to make sure that the Hive is receiving data from your devices.

1. On any page in the Swarm Control web app, select Settings > Device Manager.

On the Device Manager page, you'll see a list of your unassigned devices at the top of the left column.

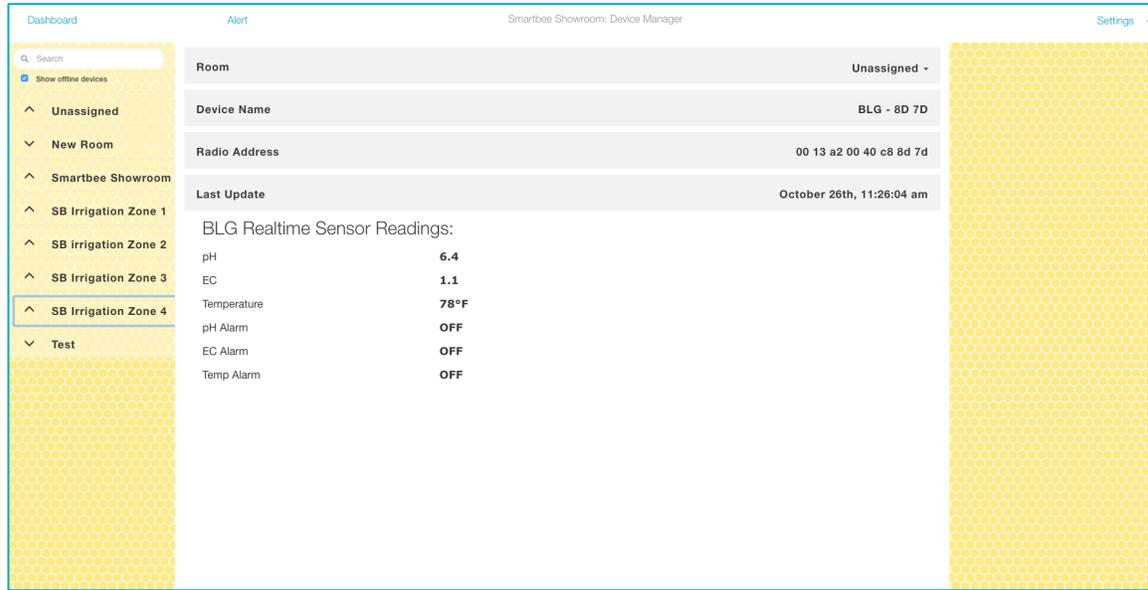


Figure 33. Device Manager page

2. Verify that each sensor and control device appears in the Unassigned devices list. To identify an individual device:
 - Match the radio address on the device sticker to a radio address shown in the list.
OR
 - Match the last four characters in the radio address on the device sticker to the four characters at the end of the device name in the list.



EXAMPLE

“A4 D1” on the sticker matches to “WCS - A4 D1” in the list.



IMPORTANT

Although each circuit on a Stinger Smart Strip 4 is considered a separate device, all four circuits on an SS4 use the same radio address and have the same device name followed by a circuit number, 1 to 4.

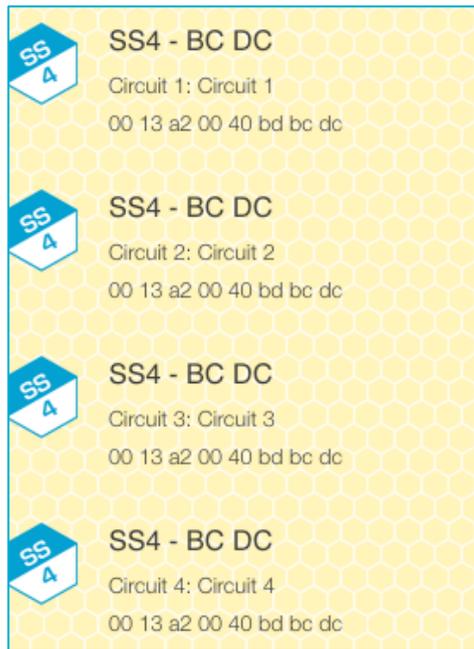


Figure 34. How circuits on a Stinger Smart Strip 4 appear in Device Manager



TIP

Another way to verify that a device is connected to the Hive is to look at the device discovery alerts in the Alert list. Match the radio address from the device sticker to the radio address shown in a discovery alert.

3. If a new device doesn't appear in the devices list, see [Troubleshooting](#) on page 67.

Assigning a Device to a Room

After joining a device to your system, you need to assign it to a room.

- Assigning a sensor to a room causes the system to combine data from that sensor with the data collected from other sensors assigned to the same room.
- Assigning a control device circuit to a room causes the system to activate or deactivate the circuit in response to room conditions. To be controlled by the system, a control device circuit must also have an appliance type defined.



CAUTION

To prevent appliances from operating unexpectedly, do not plug appliances into control device circuits until after you've assigned each circuit to a room.

To assign a device to a room:

1. On any page in the Swarm Control web app, select Settings > Device Manager to open the Device Manager page. All unassigned devices are listed at the top of the left column.



IMPORTANT

Each circuit on a Stinger Smart Strip 4 is considered a separate device and is assigned to a room and controlled independently of other circuits on the device. Thus, on one SS4 you could have a lighting controller on circuit 1 assigned to one room and a humidifier on circuit 2 assigned to another room.

2. In the Unassigned devices list, click the device you want to add to a room. Information about the selected device is displayed in the main panel.

Room	Unassigned -
Device Name	BLG - 8D 7D
Radio Address	00 13 a2 00 40 c8 8d 7d
Last Update	October 26th, 11:44:43 am
BLG Realtime Sensor Readings:	
pH	6.4
EC	1.1
Temperature	78°F
pH Alarm	OFF
EC Alarm	OFF
Temp Alarm	OFF

Figure 35. Assigning a device to a room



TIP

If you don't want the system to control a particular circuit, you can leave the circuit unassigned, ensuring that it appears in the Unassigned devices list at the top left of the Device Manager page. Alternatively, you could assign the circuit to a room but leave its Appliance Type as Undefined so that it's not controlled by the system. For instance, you might assign the circuit to the room that corresponds to the circuit's physical location so that it's listed with nearby devices. Or if the circuit is on a Smart Strip 4, you might assign it to the same room as the other circuits on the SS4 so that they're all listed together. Use the method that you find best for keeping track of uncontrolled circuits.

In the Room drop-down list, select the room for this device.

3. In Device Name, enter a meaningful name that will help you identify this device.



EXAMPLE

"LTH1 in Canopy" or "Aux Lighting 1"



TIP

Instead of naming devices based on their front-to-back or clockwise locations, consider naming them by type and number (LTH1, LTH2, etc.) and labeling the devices themselves. This can help you to both keep track of the devices and avoid needing to rename them if you ever reposition them within your garden.

4. If you're assigning a sensor to a room, that's it! Skip the remaining steps, which only apply to control devices.
5. Make sure that nothing is plugged into the control device circuit.
6. Verify that the system is controlling the circuit:
 - a. Click the Toggle Circuit switch to turn off the circuit, as shown below.



- b. Look at the control device to make sure that the circuit's LED light is off.
- c. Click the Toggle Circuit switch again to turn the circuit back on.
- d. Look at the control device to make sure that the circuit's LED light is on.

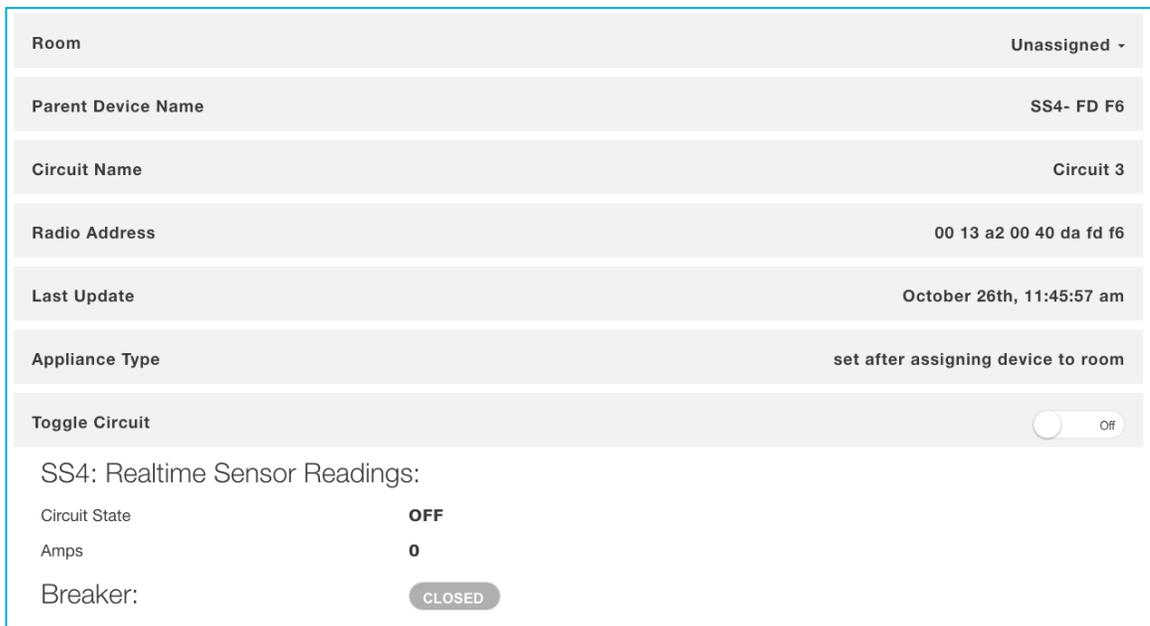


Figure 36. Toggle a circuit in Device Manager

7. In Appliance Type, select the type of appliance that will be plugged into the circuit.



IMPORTANT

Remember that the system groups all appliances of the same type in the same room and controls them as a unit.

Changing the Appliance Type for a Control Device

To be controlled by the system, a control device must have a defined appliance type and be assigned to a room.



IMPORTANT

In each room, the system groups all appliances of the same type and controls them as a unit.



EXAMPLE

If you have three circuits in your “Bloom” room that are assigned the COOLING appliance type and have fans plugged into them, the system will activate and deactivate all three fans at the same time, according to the Bloom room’s temperature controls.

1. On any page in the Swarm Control web app, select Settings > Device Manager to open the Device Manager page.
2. In the left column, click the control device circuit whose appliance type you want to change. The device information is displayed in the main panel.
3. In the Appliance Type drop-down, select the new appliance type. If you don’t want the system to control this circuit, select Unassigned.

Room	New Room ▾
Parent Device Name	SS4- FD F6
Circuit Name	Circuit 3
Radio Address	00 13 a2 00 40 da fd f6
Last Update	October 26th, 11:52:59 am
Appliance Type	Unassigned ▾
Toggle Circuit	
SS4: Realtime Sensor Readings:	
Circuit State	OFF
Amps	0
Breaker:	CLOSED

Unassigned ▾

- HEATER
- COOLING
- LIGHTS
- CO2_EMITTER
- HUMIDIFIER
- DEHUMIDIFIER
- IRRIGATION_PUMP
- Unassigned

Figure 37. Changing an appliance type

Controlling Unassigned Circuits

The system won't automatically control any control device circuit with an appliance type of Unassigned. But you can still remotely control an unassigned circuit, by manually toggling the circuit on or off in the web app.



NOTE

A circuit with an assigned appliance type can't be manually controlled because it's being controlled by the system.

To turn an unassigned circuit on or off:

1. On any page in the Swarm Control web app, select Settings > Device Manager to open the Device Manager page.
2. In the left column, click the unassigned control device circuit you want to turn on or off. The device information is displayed in the main panel.
3. Click the Toggle Circuit switch to turn the circuit on or off, as shown below.

The screenshot shows a 'Toggle Circuit' control at the top right, which is currently turned 'On'. Below it is a detailed view of a circuit with the following information:

Room	Unassigned -
Parent Device Name	SS4- FD F6
Circuit Name	Circuit 3
Radio Address	00 13 a2 00 40 da fd f6
Last Update	October 26th, 11:45:57 am
Appliance Type	set after assigning device to room
Toggle Circuit	<input type="checkbox"/> Off

Below the table, the 'SS4: Realtime Sensor Readings' section shows:

- Circuit State: **OFF**
- Amps: **0**
- Breaker: **CLOSED**

Figure 38. Toggle an unassigned circuit in Device Manager

Checking Sensor Battery Levels



IMPORTANT

Check your sensor battery levels regularly. It is strongly recommended that sensors remain plugged into an external power supply. If this is not possible, the battery must be fully recharged at regular intervals to maintain the battery's charge at greater than 50%. In brightly lit conditions, the solar panels on a sensor extend the life of its battery charge but don't eliminate the need to recharge the sensor. The battery charge level of a sensor can be viewed on the Device Manager page.



NOTE

The individual units should be plugged in ALL the time. Solar panels are for back up resources only.

1. On any page in the Swarm Control web app, select Settings > Device Manager to open the Device Manager page.
2. In the left column, a red battery icon is displayed under any sensor whose battery is below 30%.

Room	RM2
Device Name	CO2 - B5 06
Radio Address	00 13 a2 00 40 be b5 06
Last Update	January 9th, 3:34:58 pm
CO2 Realtime Sensor Readings:	
CO2	697 ppm
Temperature	73°F
Humidity	62.79%
Brightness	1%
Battery:	27%

Figure 39. Low battery icon

3. To see the exact battery level for a sensor, click the sensor in the left column. The device information is displayed in the main panel.

A green battery level is good (100 to 50%), orange indicates that recharging the battery is recommended (50 to 25%), and red (25 to 0%) means the sensor is close to shutting down. Connect an external power supply as soon as possible to maintain continuous operation of the sensor (see [Recharging Sensors](#) below).

Recharging Sensors

When the sensor battery level in the Swarm Control web app is below 50%, it's time to recharge the sensor.



IMPORTANT

In brightly lit conditions, the solar panels on a sensor extend the life of its battery charge but don't eliminate the need to recharge the sensor. For optimal performance, leave the sensors plugged in at all times.

To recharge a sensor:

1. On an LTH, LTH+CO₂, LTH Pro, or WCS sensor, make sure that the power switch on the side of the sensor is ON (positioned toward the solar panels).
2. Using the included AC adapter or mini-B USB 5V adapter, plug in the sensor and let it charge for up to six hours.

If the battery had some charge left, the sensor continues to operate during recharging. If the battery was completely depleted, it may take up to four hours of recharging before the sensor resumes operation.
3. After a few hours, check the battery level (see [Checking Sensor Battery Levels](#) on page 50). When the battery is at 100%, recharging is complete. The sensor has an internal battery protection circuit and charging circuit that protects the battery from overcharging.

Calibrating the Water Content Sensor

Water Content Sensor modules must be calibrated before they can be used.

To calibrate a WCS module:

1. Plug in the WCS sensor.
2. On any page in the Swarm Control web app, select Settings > Permit Join > Read Pop Up and click OK.
3. Locate the power switch on the side of the module, and place it in the ON position (towards the top).
4. Wait until you see the device displayed in Device Manager.
5. Click the sensor in the Device Manager List. Calibration buttons will display.
6. If you are instructed to Reset to Calibrate, then:
 - a. Turn the power switch to the OFF position (towards the bottom).
 - b. Wait 10 to 15 seconds.
 - c. Turn the power switch to the ON position (towards the top). Calibration buttons are now displayed in Device Manager.
7. Select the appropriate probe to calibrate from the Device Manager list.
8. Place the first probe all the way to the hexagon in the DRY grow medium of your choice.
9. Click LO.
10. Remove the probe from the DRY grow medium.
11. Place the probe all the way to the hexagon in fully saturated grow medium.

12. Click HI.
13. Repeat steps 7 thru 12 for all remaining probes.



TIP

The Water Content Sensor module is only able to be calibrated when the device is "Awake." To awaken the device, repeat Step 6 above and the calibration buttons will be become visible.

3 System Administration

This chapter provides step-by-step instructions for completing administration tasks in your SmartBee Control system.

The sections in this chapter assume that you are logged into the Swarm Control web app. If you have more than one Hive Gateway, make sure that you log in using the URL and Port for the Hive you want to work with.



Changing the Hive Gateway Name

The Hive Gateway name is used as the sender name in email alerts sent from the Hive. You chose this name during setup the first time you logged into the Swarm Control web app (see [c. Complete First Time Setup](#) on page 20).

To change the Hive name:

1. On any page in the Swarm Control web app, select Settings > Admin to open the Admin page.

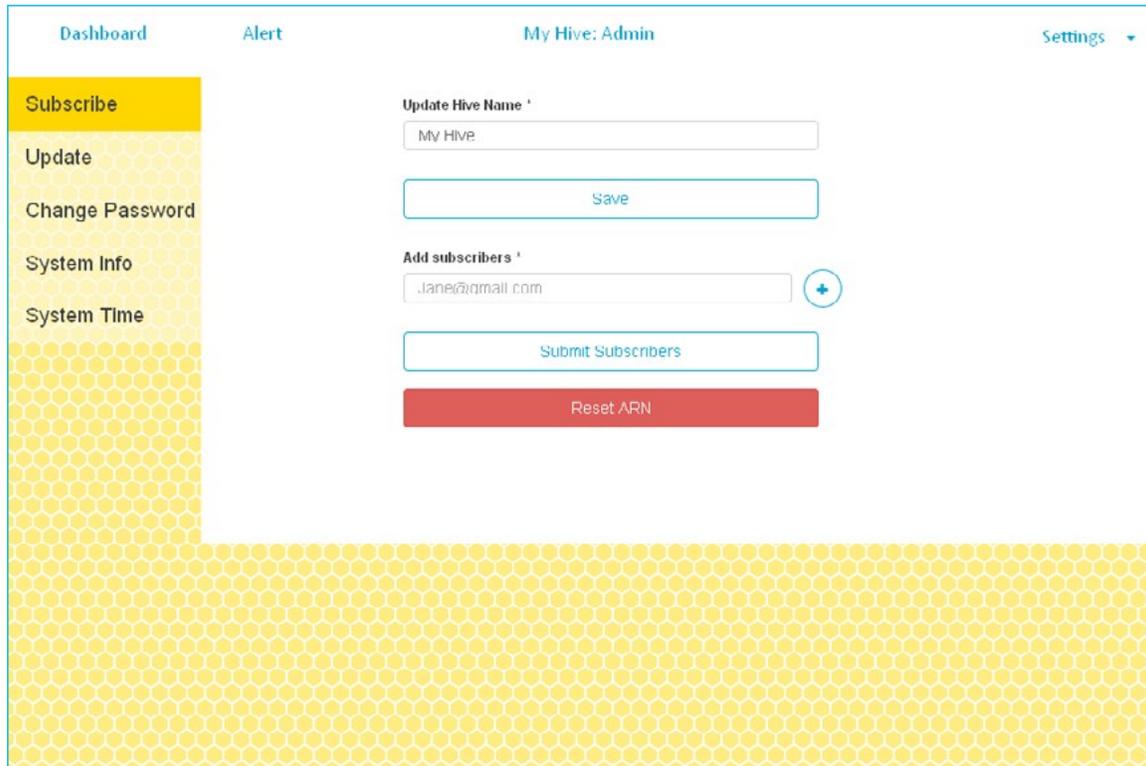


Figure 40. Admin page

2. Update Hive Name: Enter the new name for the Hive (up to 200 alphanumeric characters, including spaces).
3. Click Save.

Changing the System Date/Time

You set the system date and time during setup the first time you logged into the Swarm Control web app (see [c. Complete First Time Setup](#) on page 20).

To change the system date or time:

1. On any page in the Swarm Control web app, select Settings > Admin to open the Admin page.
2. In the left column, click System Time to display and set the system time fields.

Set the system time

26 Oct 2016 12:11 

[Save Time](#)

Set the system time

26 Oct 2016 12:11 

[Save Time](#)

12 : 11 PM

[Now](#) [Clear](#) [Date](#) [Close](#)

Set the system time

26 Oct 2016 12:11 

[Save Time](#)

October 2016

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
39	25	26	27	28	29	30	01
40	02	03	04	05	06	07	08
41	09	10	11	12	13	14	15
42	16	17	18	19	20	21	22
43	23	24	25	26	27	28	29
44	30	31	01	02	03	04	05

[Today](#) [Clear](#) [Time](#) [Close](#)

Figure 41. Set the system date and time

- To set the date and time to the current date and time, click Now.

OR

- a. To change the date, click the date to open a calendar, then select a new date.
- b. To change the time:
 - Click up arrow or down arrow to increase or decrease the hour and minute.

OR

Click the hour or minute field, then enter a number.

- Click PM to change the time to AM, or if AM is shown, click it to change it to PM.
4. Click Save Time.

Changing Your Hive Gateway Password

To change the Hive Gateway login password:

1. On any page in the Swarm Control web app, select Settings > Admin to open the Admin page.
2. In the left column, click Change Password to display the change password fields.

Current Password *

New Password *

Repeat New Password *

Save

First time login reset ⓘ

Reset first time wizard

Figure 42. Change Password page

3. Complete the fields.

Table 4. Password fields

Field	Description
Current Password	Enter the current password. If this is the default password, it is beeb833.
New Password	Enter the new password. <div style="border: 2px solid yellow; padding: 10px;"> IMPORTANT <i>Write this password down and keep it somewhere safe.</i></div>
Repeat New Password	Enter the new password again.

4. Click Save.

Changing the Hive Gateway's Network Connection

Out of the box, the Hive is configured as a Wi-Fi hotspot. If necessary, you can configure the Hive to join an existing Wi-Fi or Ethernet network.

To change the Hive Gateway's network connection:

1. On any page in the Swarm Control web app, select Settings > Network Setup to open the Network Setup page.
2. Continue with the instructions for the type of connection you want to configure:
 - Wi-Fi Connection: [Network Discovery](#)
 - [Ethernet](#) on page 60
 - [Hive Hotspot](#) on page 62

Network Discovery

You must now ensure that your current device (whether you're on your computer, phone, or tablet) is on the same network as your Hive, and find your Hive there. For example, if your Hive was in Access Point (Hot Spot) mode and you've now configured your Hive for your Home Network, connect your computer/phone/tablet to your Home Network.

If your Hive was on your Home Network and you configured it back to an Access Point (Hot Spot), you must connect your computer/phone/tablet to the Hive Hot Spot.

There are several ways to find your Hive:

- If you gave it a static IP address, you can type that into a browser to load the app.
- On Windows or Android: Please download the respective App Launcher: <http://smartbeecontrollers.com/support/downloads/>.
- On Mac OSX or iOS: Open a web browser window and type in: <http://smartbee.local>.

OR

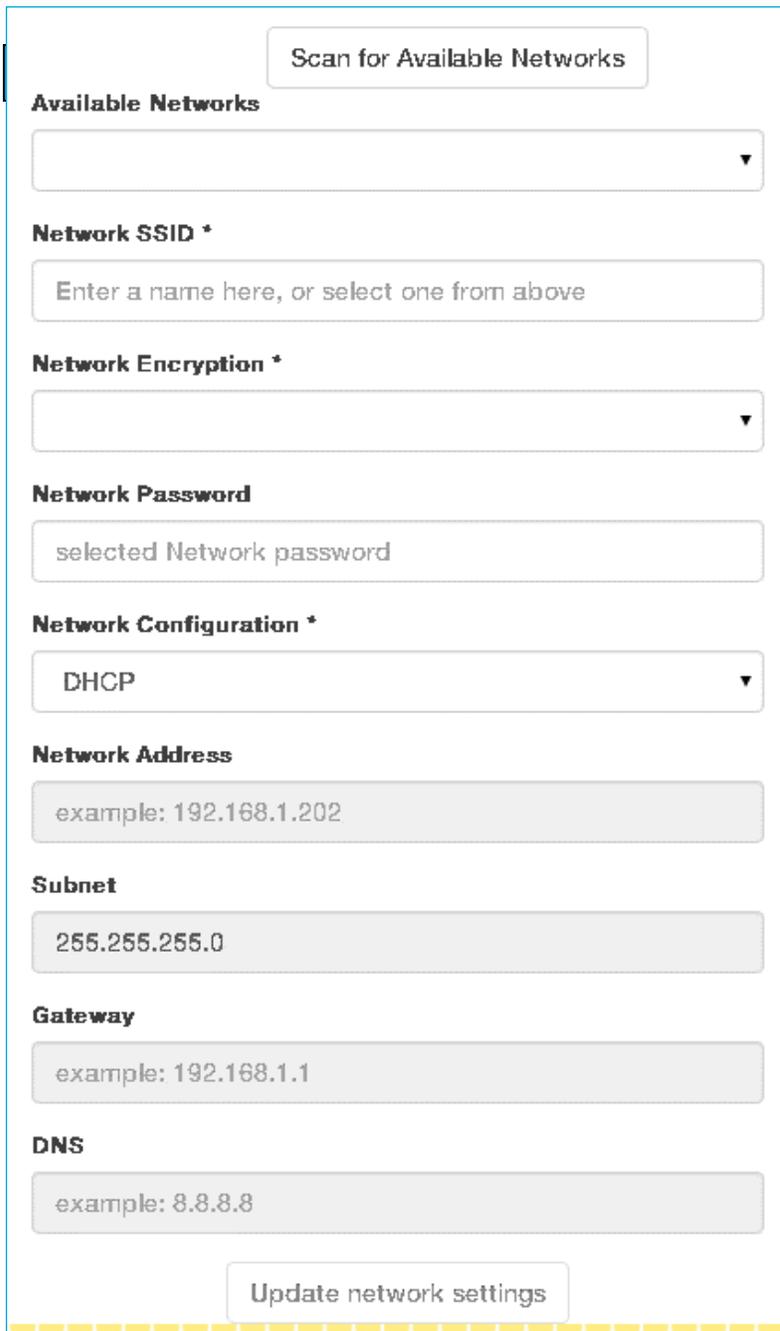
Login to your network's router and find the device named "smartbee", find the IP address, then type that into a browser.

- If your hive is in Hot Spot mode, you can always just type <http://10.0.0.1> into a browser.

When you find your Hive, you may login and go to Settings > Admin > System Info to find your IP address. This can be used in a browser, and will be useful if you set up your router to do external port forwarding.

The Hive can connect to your existing Wi-Fi network (802.11b/g/n using WPA).

1. In the left column on the Network Setup page, click WiFi if it is not already highlighted. The Wi-Fi fields are displayed.



The image shows a Wi-Fi connection configuration interface. At the top, there is a button labeled "Scan for Available Networks". Below it is a section titled "Available Networks" with a dropdown menu. The next section is "Network SSID *", which contains a text input field with the placeholder text "Enter a name here, or select one from above". This is followed by "Network Encryption *", another dropdown menu. The "Network Password" section has a text input field containing "selected Network password". Below that is "Network Configuration *", a dropdown menu showing "DHCP". The "Network Address" section has a text input field with "example: 192.168.1.202". The "Subnet" section has a text input field with "255.255.255.0". The "Gateway" section has a text input field with "example: 192.168.1.1". The "DNS" section has a text input field with "example: 8.8.8.8". At the bottom of the form is a button labeled "Update network settings".

Figure 43. Wi-Fi connection configuration

2. Complete the fields.

Table 5. Wi-Fi network connection fields

Field	Description
Available Networks	Select your network in the drop-down list. If your network doesn't appear in the list, click Scan for Available Networks, wait a few seconds, then check again.
Network SSID	If the network you selected in Available Networks broadcasts its SSID, it is automatically displayed here. If it doesn't, enter the SSID.

3. C E n c r y p t i o n N e t w o r k S e t t i n g s T h e	Network Encryption	Select the type of encryption used on the selected network. Secure: WPA or WEP, or Unsecured: Open.
	Network Password	Enter the password for the network.
	Network Configuration	DHCP is the default configuration and doesn't require you to enter any additional information.
		 <p>IMPORTANT</p> <p><i>We recommend that you assign a static IP address whenever possible. Although initial setup may be easier when using DHCP, the IP address can change later, which may cause problems with routing, network discovery, and port forwarding.</i></p>
		If you want to assign an IP address to the Hive, select STATIC and complete the remaining fields.
		 <p>TIP</p> <p><i>You may want to first use the DHCP configuration, then use the resulting network information (in Settings > Admin > System Info) to help you complete the fields required for STATIC configuration.</i></p>
	Network Address (STATIC only)	Enter the Hive's IP address.
Subnet (STATIC only)	Enter 255.255.255.0 for most home routers, or enter the subnet address you want to use.	
Gateway (STATIC only)	Enter your router's IP address.	
DNS (STATIC only)	Enter the DNS Server address. We recommend using Google's 8.8.8.8. Or you can use your router's IP address.	

gin page is displayed.

As the Hive attempts to find the new network, LED 4 will start to blink.

4. Wait for LED 4 to turn solid.
5. Log back into the web app.

Ethernet

The Hive can connect to your existing Ethernet network via a CAT-5 network cable.

1. Plug an Ethernet cable into the Hive.

- In the left column on the Network Setup page, click Ethernet. The Ethernet fields are displayed.

Network Configuration *

DHCP ▼

Network Address

example: 192.168.1.202

Subnet

255.255.255.0

Gateway

example: 192.168.1.1

DNS

example: 8.8.8.8

Update network settings

Figure 44. Ethernet connection configuration

- Complete the fields.

Table 6. Ethernet network connection fields

Field	Description
Network Configuration	<p>DHCP is the default configuration and doesn't require you to enter any additional information.</p> <div style="border: 2px solid yellow; padding: 10px; margin: 10px 0;">  <p>IMPORTANT</p> <p><i>We recommend that you assign a static IP address whenever possible. Although initial setup may be easier when using DHCP, the IP address can change later, which may cause problems with routing, network discovery, and port forwarding.</i></p> </div> <p>If you want to assign an IP address to the Hive, select STATIC and complete the remaining fields.</p> <div style="border: 2px solid yellow; padding: 10px; margin: 10px 0;">  <p>TIP</p> <p><i>You may want to first use the DHCP configuration, then use the resulting network information (in Settings > Admin > System Info) to help you complete the fields required for STATIC configuration.</i></p> </div>

4. C

Field	Description
Network Address (STATIC only)	Enter the Hive's IP address.
Subnet (STATIC only)	Enter 255.255.255.0 for most home routers, or enter the subnet address you want to use.
Gateway (STATIC only)	Enter your router's IP address.
DNS (STATIC only)	Enter the DNS Server address. We recommend using Google's 8.8.8.8. Or you can use your router's IP address.

Network Settings.

The login page is displayed.

As the Hive attempts to find the new network, LED 4 will start to blink.

5. Wait for LED 4 to turn solid.
6. Log back into the web app.

Hive Hotspot

The Hive ships in Access Point (AP) mode, which means that it's broadcasting its own Wi-Fi network and acting as a standalone Wi-Fi hotspot. You can connect directly to it with any Wi-Fi enabled device by connecting to its hotspot.

In hotspot mode, the Hive's defaults are:

- Network name: Smartbee-FFFFFF (where FFFFFFF are any six hexadecimal digits)
- Address: 10.0.0.1
- Password: beeb833
- WPA encrypted

If you change the Hive's network connection to Wi-Fi or Ethernet, you can return the Hive to hotspot mode here in Network Setup, or by using the Network button on the Hive itself.

1. In the left column on the Network Setup page, click Hive Hotspot. The Hive Hotspot fields are displayed.

Figure 45. Hive Hotspot connection configuration

2. Complete the fields.

Table 7. Hive hotspot connection fields

Field	Description
Network Name	Enter the name you want to use to identify the Hive hotspot network. The default name is Smartbee-FFFFFF, where FFFFFFF are any six hexadecimal digits. Maximum of 32 characters.
Network Encryption	By default, the hotspot network uses WPA encryption. We recommend that you keep your network secured. If you don't want to secure your network, select OPEN.
Network Password	If you want to use the default password (beeb8333), leave this field blank. Otherwise, enter the password you want to use to access the network. A password is not required on an OPEN network.

3. Click Set Access Point.

Subscribing to Alerts

The Swarm Control web app generates alerts when certain events occur in your system, such as emergency irrigations. If you want to receive these alerts outside of the web app, you need to subscribe to them. You can subscribe multiple email addresses to receive these alerts.



IMPORTANT

For you to receive email alerts, the Hive must be connected to a network via Wi-Fi or Ethernet, and that network must be connected to the Internet.

To subscribe to alerts:

1. On any page in the Swarm Control web app, select Settings > Admin to open the Admin page. The Subscribe fields are displayed by default.

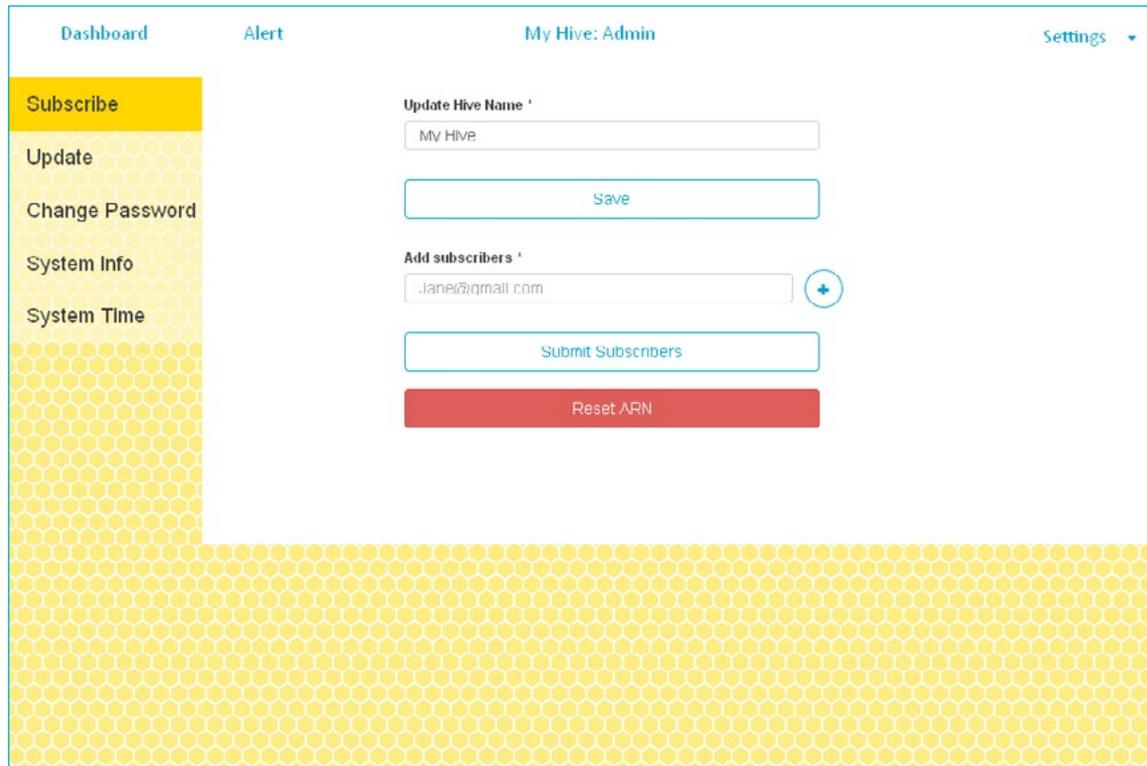


Figure 46. Subscribe page

2. Add subscribers: Enter the email address that you want to subscribe to system alerts.
3. Click +.
4. Repeat steps 2 and 3 for each additional subscriber.
5. To remove a subscriber, click – next to the subscriber’s email address.
6. When the subscriber list is complete, click Submit Subscribers. A confirmation email is sent to each subscriber.
7. Each subscriber must open the “AWS Notification - Subscription Confirmation” email and confirm their subscription.

Configuring Port Forwarding



CAUTION

Port forwarding is an advanced feature. For assistance, contact a local computer technician or IT support person.

External router ports can be configured to point to the Hive Gateway's ports so that the Hive responds to external traffic.

1. Log in to your router's administration interface.
2. Forward external port 80 (or an available external port of your choice) to the Hive's internal port 80. This is a standard web port to load the Swarm Control web app. If you use an external port other than 80, you must append that port to the address in the browser. For example, if your external IP address is 1.2.3.4, and you forward port 8080 to the Hive's internal port 80, you must type `http://1.2.3.4:8080` into a browser to load the web app.
3. Forward external port 7090 (or an available external port of your choice) to the Hive's internal websocket communication port 7090. If you choose an external port other than 7090, be sure to enter that port on the Login page.

Port 4455 may also be required for forwarding if receiving direct technical support from SmartBee.

Viewing System Information

Most users will need to view technical details about their SmartBee system only when asked for this information by SmartBee support.

To view system information:

1. On any page in the Swarm Control web app, select Settings > Admin to open the Admin page.
2. In the left column, click System Info.

Updating System Software

SmartBee periodically publishes system updates that update the Swarm Control web app and/or the server software on your Hive Gateway. You should attempt to update immediately upon purchase installation of a new Hive.

To check for system updates (must be connected to the Internet):

1. On any page in the Swarm Control web app, select Settings > Admin to open the Admin page.
2. In the left column, click Update.
3. On the Update page, click Check for Update.

You're Up To Date!

Current Version 1.3.0.5079

CHECK AGAIN!

In case you're not completely convinced yet

Figure 47. Update page

4. If an update is available, click Download.
5. Click Apply.

4 Troubleshooting

This chapter describes some common issues that SmartBee users experience and provides help for resolving them.

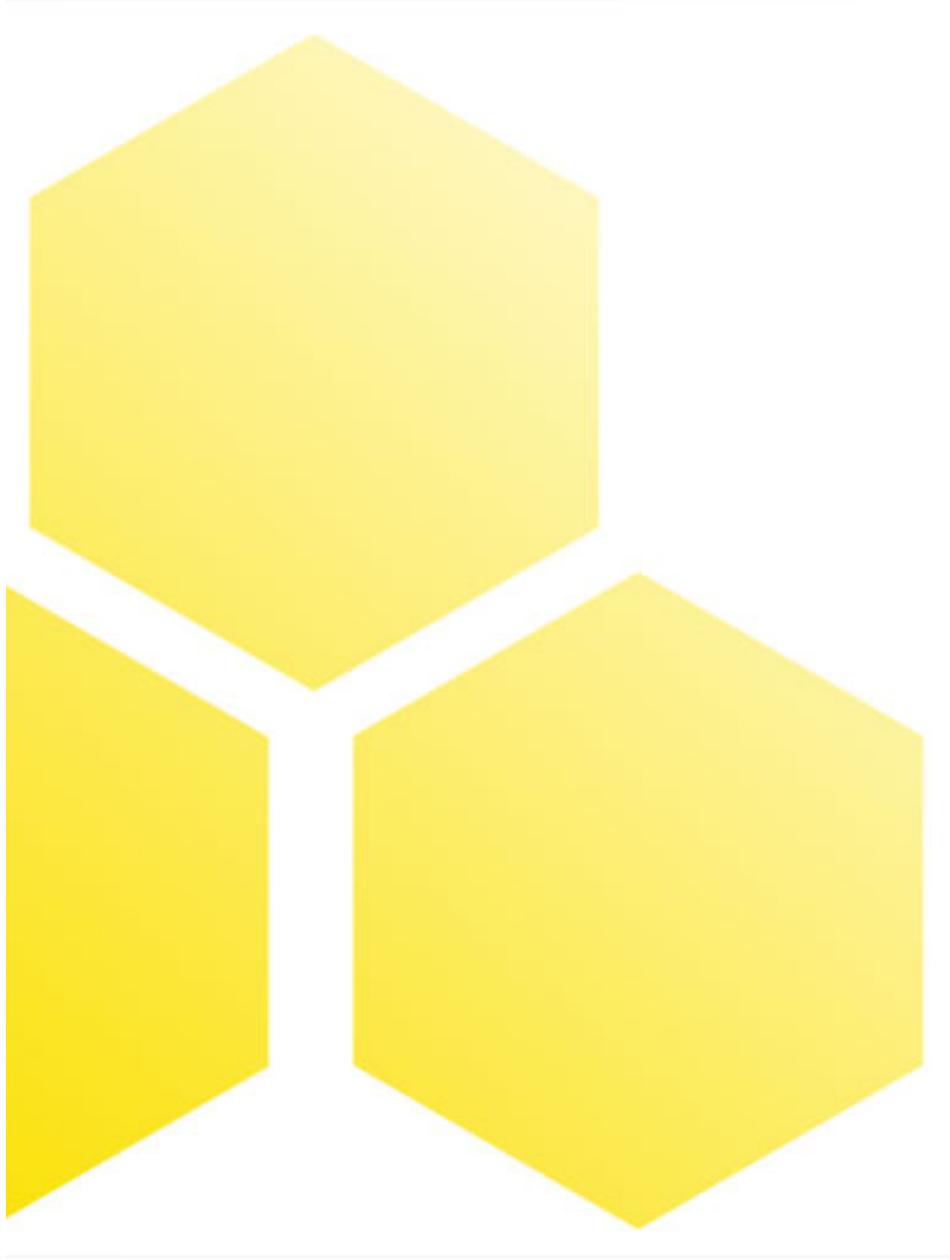


Table 8. Common issues, causes, and solutions

Issue	Cause	Solution
<p>The status LED on my device is off.</p> <p>My device doesn't appear in the Device Manager in the Swarm Control web app.</p>	<p>The device isn't connected to the Hive.</p>	<ol style="list-style-type: none"> 1. Make sure the sensor is charged or the control device is plugged in. 2. In the Swarm Control web app, select Settings > Permit Join to try to join the device to the Hive. 3. Verify that the device appears in the Unassigned devices list and that the status LED on the device is on. 4. If the device is still not connected, reset the device.
<p>I can't connect to my Hive.</p>	<p>The Hive is on a different network than the one you're using.</p>	<p>Ensure the device you're connecting with is on the same network as the Hive. If your device is a phone, ensure it is network connected and not just using data.</p>
	<p>The Hive's IP address has changed.</p>	<ol style="list-style-type: none"> 1. Find your Hive's new IP address: <ol style="list-style-type: none"> a. On iOS or OS X devices, open a browser and go to http://smartbee.local. OR On Windows or Android devices, start the SmartBee Launcher app. b. Log in to the Swarm Control web app. c. Select Settings > Admin. d. Click System Info. OR Log in to your router to find your Hive's IP address. 2. Replace all your old bookmarks. 3. Update any port forwarding rules you've created. 4. Consider assigning your Hive a static IP address through Settings > Network Setup or through your router.
	<p>The Ethernet cable was unplugged or the connection isn't working.</p>	<ol style="list-style-type: none"> 1. Make sure the Ethernet cable is plugged into the Hive and your router. 2. On the Hive, press the Network button. <p>LED 4 will begin to blink. If the connection succeeds, LED 6 will blink once, then LED 4 will turn solid. If connection fails, see When configuring the Hive's network, the Network LED first blinks slowly and then begins blinking rapidly below.</p>
<p>The Wi-Fi network your Hive was connected to has gone down or the credentials have changed.</p>	<p>Reset the Hive's network connection. This will reset it to the Hotspot configuration.</p>	
<p>When configuring the Hive's network, the Network LED first blinks slowly and then begins blinking rapidly.</p>	<p>The network connection attempt failed and the Hive is attempting to revert to its previous configuration.</p>	<p>If trying to connect via Ethernet:</p> <ol style="list-style-type: none"> 1. Make sure the Ethernet cable is plugged into the Hive and your router. 2. Make sure the Ethernet cable is working, or try using another cable. 3. Make sure your router is accepting new connections. <p>If trying to connect via a Wi-Fi network:</p> <ol style="list-style-type: none"> 1. Make sure you're using the correct Wi-Fi credentials. 2. Make sure the Hive is within network range of the Wi-Fi router.

Issue	Cause	Solution
<p>I receive frequent "Device Has dropped Offline" or "Failed to set device state" alerts.</p>	<p>Your ZigBee device network connectivity is poor.</p>	<div style="border: 2px solid yellow; padding: 10px; margin-bottom: 10px;">  <p>TIP</p> <p><i>Remember that your control devices (SS1 and SS4) act as range extenders. You may be able to reposition your control devices to create a stronger network.</i></p> </div> <p>For a single device:</p> <ol style="list-style-type: none"> 1. Power off the device and leave it off for 10 seconds. 2. Power on the device. 3. If possible, install a new range extender device in the area of network trouble, preferably between a strong area of your network and the problem device. <p>For multiple devices or if the problems persists:</p> <ol style="list-style-type: none"> 1. Power off all of your devices except the Hive. 2. Power on your control devices (SS1 and SS4), starting with the ones closest to the Hive. 3. Power on all sensors.

For more information, please contact us at (888) 650-3797 or support@smartbeecontrollers.com.