
CROPTIVA
SEN-1
15:07:00
02-25-2025
Air Temp
26.5 ℃
Humid
90.2% RH
CO2
1064 PPM
Lights
300 µmol/m²/s
EC Fan
80%
100%
VPD
1.17 kpa
Outlet 1: Dehumid
Outlet 2: CO2 Up
Outlet 3: Cooling
Outlet 4: AC Exhaust Fan
Relay 5: Recycle Timers
Relay 6: Scheduled Timers
Feed
EC 5.1 mS/cm
pH 7.2
23.2 ℃
Sensors & Devices
Historical data
System Settings
Outlet 2
Outlet 1
8-amp max
Outlet 2
8-amp max
Outlet 3
8-amp max
Outlet 4
*14-amp max
RELAY 5
RELAY 6
DRY CONTACT OUTPUT
Outlet 3
Outlet 2
Outlet *4
*Special High-power Outlet 14-amp-max
SENTRY
MULTI-FUNCTION ENVIRONMENTAL CONTROLLER
Relays 5 6
Sensors & Devices
Internet
SD

Table of Contents

Introduction

Congratulations, and welcome to the world of Croptiva!!! At Croptiva, we strive to provide our customers with intelligent and easy to use products that can completely change their lives. Our products are simple to use, and easy to own. Our controller products offer slick looking touch-screen User-Interfaces that we designed to be intuitive (NOT complicated), along with our competitive pricing and features that today's customers demand.

You have made a great choice by making the SENTRY / SEN-1 "Hybrid" grow-room / tent controller part of your automated grow-room or grow-tent. Within the instructions you will find useful and important information and tips on how to install and use the SENTRY controller. ***NOTE: Before you begin to use the SENTRY, please familiarize yourself with all of its features in order to be able to get the most from it.***

SENTRY / SEN-1 Hybrid grow-controller

Do not let its appearance fool you into thinking the SENTRY is a basic controller… it features some very advanced options that makes it more powerful than other controllers costing 2-3 times more. **The SENTRY is the world's first "hybrid" grow-area / grow-tent controller.** It features a built-in touchscreen providing a clear and concise method to display all current conditions, and to allow the user to change settings easily. It has 4 built-in power outlets and two relay outputs so it can be used right out of the box to control grow tents and small grow areas. But it also has advanced "UNIVERSAL" rs485 internal network ports (uses standard RJ12 cable) to allow up to 11 optional sensors and control modules to be added to control larger and more complicated grow spaces. Everything about the SENTRY was engineered to make the user's life easier and to allow them to get the most from their grow room or grow tent, with the least amount of effort.

The SENTRY has been designed to provide accurate and flexible control options for user's that want a modern and easy-to-use solution to control ALL aspects of their growing operation... **both environmental and irrigation functions are controlled by a single controller.** The SENTRY is equally at home controlling small integrated grow-rooms, as well as pre-fab Grow-tents. We combined 4 easy to use pre-wired power outlets and 2 "auxiliary" dry-contact / relay outputs built right into the Sentry. Those standard 6-outputs allows devices like humidifiers, lights & fans to be powered directly from the SENTRY, while larger HVAC units or commercial dehumidifiers can be wired directly to the SENTRY auxiliary outputs. PLUS… if that is not enough, you can add several types of expansion device control modules to customize and further expand your control system.

The SENTRY comes complete with everything some growers would need in order to control a small grow-area. The included SAIR-1 precision 4-in-1 environmental sensor measures Temperature, Humidity, CO2, VPD and a photocell detects Day or Night operation. Separate Day and Night settings provide precise control 24/7.
The SENTRY can activate lights, fans, humidifiers, dehumidifiers, HVAC or mini-split AC units, CO2 and more. The user can customize the SENTRY by selecting the devices they want to control using the built-in touchscreen.

Apps / Remote access

These days no controller would be complete without an option for the user to keep track of conditions when they are away from their grow room / tent. The SENTRY comes with a free mobile app that provides easy access and remote control so the user is never really "away" from their grow area. The app provides live conditions from the sensors inside the grow area, will sent SMS user-alerts if a problem is detected and allows the user to make changes to their settings remotely. The app also records and displays historical data so that the user can visually verify their room or tent is working at optimum conditions.

Simply connect your SENTRY to your router or internet switch (Ethernet Cat 5/6 cable), then download the Croptiva App. Register an account and create a password and then you can start adding all of your Croptiva controllers to your account so you can begin to manage the controllers remotely 24/7!

Details MATTER!

NOTE: The image or right is only one example configuration. Each of the 4 outlets are selectable by the USER!

Croptiva created the SENTRY to be an expandable / Hybrid Grow controller that comes complete with a precision 4-in-1 air sensor.

You can use it right out of the box or… add optional expansion modules and sensors to the control system to monitor and control EVERYTHING within your grow room or grow tent.

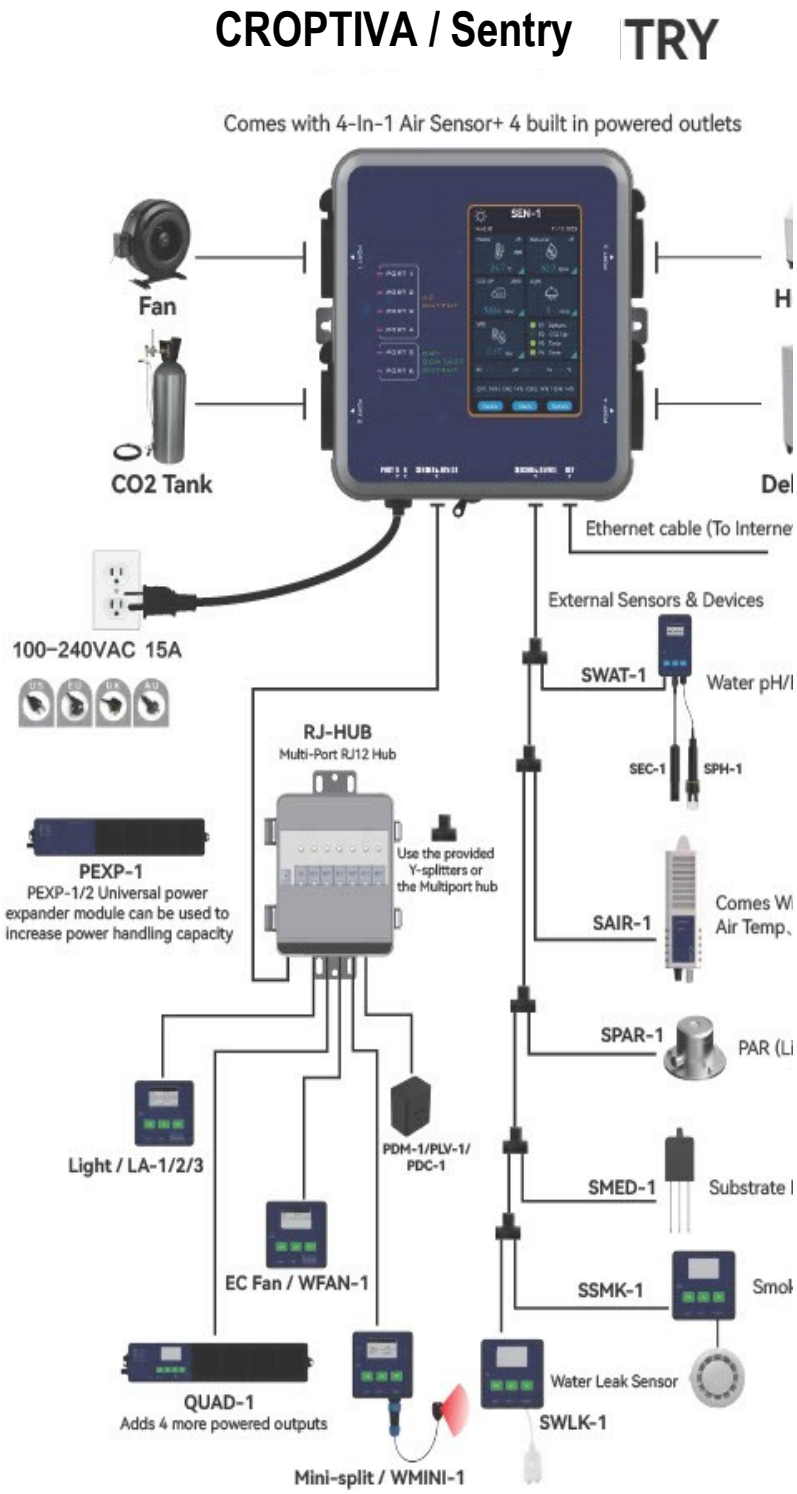
The SEN-1 / SENTRY controller provides the option to monitor up to 12 different environmental & Irrigation parameters and control up to 14 separate devices / equipment.

With all of the 6 available sensors connected, the SENTRY can monitor: air Temperature, Humidity, CO2 (ppm), Light (ppfd), VPD, water pH, EC & temp, substrate moisture (VWC), substrate EC & temp… plus it can detect smoke in the grow area or a water leak on the floor… providing critical data 24/7, along with safety and piece-of-mind… Truly an all-in-one solution!

There are many optional external device control modules that can be connected to the SEN-1 controller in order to expand the system.

Those optional modules include EC fan, Mini-split AC, 0-10v Lighting, 24-volt and dry-contact modules.

The SEN-1 also has two-built-in dry-contact relays to allow control of commercial Dehumidifiers, humidifiers or a cooling HVAC unit right from the SEN-1.



When using the SENTRY system from Croptiva, controlling a small grow-room has never been easier.

Available optional sensors / device modules

The SENTRY control system consists of the SENTRY Main controller which features 6 built-in control outputs, and the option to connect additional sensors and control modules to expand the SENTRY to control up to 14 devices.
NOTE: Each SENTRY can have ONE of each of the sensors or Device modules connected.

Item / product	Type	Description	Details
*Main SENTRY	Controller	Main controller	Comes with the main SENTRY & 4-in-1 Air sensor. * Can control 6 devices / outputs
*SAIR-1	Sensor	4-in-1 / Air	Main high-accuracy sensor measures temperature, humidity, CO2, VPD + photocell
SPAR-1	Sensor	PAR (light)	Optional PAR sensor measures light level and can control lights based on PPFD
SWAT-1	Sensor	pH / EC module	This sensor module uses a pH and EC probe to measure water pH, EC and water temp
SMED-1	Sensor	Substrate-grow media	VWC / moisture sensor to measure the substrate moisture, EC and temp
SWLK-1	Sensor	Water leak	This water leak sensor can detect water leaks on the floor, trigger an alert and shut off leaking device
SSMK-1	Sensor	Smoke detector	The smoke detector will alert the user to smoke in the growing area, can also shut down ventilation
** SPH-1	Probe	pH water probe	Commercial-grade PH probe used with the SWAT-1 to measure water pH
** SEC-1	Probe	EC/Temp water probe	EC & Temp probe used with the SWAT-1 to measure water EC and temp
QUAD-1	Device / Module	4-outlet, universal	Offers 4 plug-in outlets to easily expand the SENTRY. Each of the 4 outlets are user-configurable
WFAN-1	Device / Module	EC fan control	Can control 2 EC type fans separately *Compatible with EC fans w/ PWM or 0-10v control
WMINI-1	Device / Module	Mini-split AC control	Wireless mini-split AC control module, provides Day / Night control for most mini-splits
LA-1 / LA-2	Device / Module	Lighting control	0-10V single or 4-channel lighting control module, single-channel or 4-channel spectrum control
ALM-1	Alarm Module	External Alarm	Audio-visual Alarm module will activate based on user-settings + alarm conditions
***PDM-1 / 2 / 3	Device / Module	Plug-in, 120 or 240v	Provides a single additional plug-in outlet. 120v or 240v with country specific outlets
***PLV-1 / PDC-1	Device / Module	Low-volt / dry-contact	Plug-in style low-volt module (24vac), or single dry-contact (NO/NC) module
PEXP-1	Power Exp Module	4-outlet expansion module	A simple power expansion module that can be triggered by any 120/240v outlet. Allows larger equipment to be controlled. *Does not connect directly to the SEN-1 RJ communication, uses the provided power supply “trigger” cable to activate.

**** The SENTRY controller comes with the SAIR-1 4-in-1 sensor.***
***** These probes work with the SWAT-1 Water Sensor Module.***
****** You can select ONE of the PDM or PDC or PLV modules.***

Installation

Preparation for installation:

Installing the SENTRY starts by identifying which type of devices you want to be able to control using the SENTRY, and also which sensors you want to use. If you are a grow tent user with a single LED, and your setup only requires a couple small devices like a fan, humidifier / dehumidifier, irrigation pump and LED, the SENTRY and the 4-in-1 air sensor that comes with the SENTRY might be all you need. The four built-in power outlets are there for easy installation and there might be no need to purchase additional devices.

Or maybe you have a small size grow room with 10-50 grow lights, you are using CO2 and want to use a mini-split AC for cooling and a commercial dehumidifier for dehumidification. You may also like the idea of monitoring the pH and EC of the nutrient water being fed to your plants AND maybe you want to monitor the grow substrate moisture and EC. For safety sake, you also want to be able to quickly detect and respond to water leaks on the floor, or smoke detected within the grow area. The SENTRY can be scaled-up to do all of those things simply by adding a couple more sensors and control modules.

So you can see the SENTRY is capable of controlling a simple fresh-air cooled grow tent, and by adding a few optional sensors and control modules the SENTRY can become a full grow room controller able to control a large HVAC unit, a mini-split AC, a commercial dehumidifier and more. Since the SENTRY can by expanded over time as needed, it is a good idea to consider those possible upgrades as you are preparing to install the SENTRY control system. ***NOTE: Before using the SEN-1 for the 1st time, it is recommended to connect the SEN-1 to your internet and update the firmware. Refer to Firmware update for details.***

Installation:

Once you have determined where to mount the SENTRY so that it will not be exposed to water or high moisture / humidity levels, you can use the included mounting brackets and hardware to secure the controller to a wall or other supporting surface. Remember for best results, you will need to connect the controller to a 15-amp dedicated power supply (either 120 or 240vac depending on location / country), so position the controller so that it can be connected directly to a power supply outlet

NOTE: Do NOT use extension cords to power the SENTRY controller.

TIP #1 If you will be using some of the optional device / control modules and sensors, and you want to install those items within the grow space carefully consider where those products will best be mounted. Consider positioning sensors where they will receive the "average" readings and try to avoid placing sensors close to air outlets from dehumidifers, mini-split ACs, or similar devices which could affect the sensor readings.

TIP#2 Croptiva uses "universal" expansion communication ports. That means each of the optional device & sensor can be connected to the SAME RJ12 communication cables that are connected to the SENTRY controller. That makes installation MUCH simpler. To make it even easier there are two RJ12 communication ports on the SEN-1 controller and both ports can be used for sensors AND device modules. When connecting from one sensor or device module to the next, you can use the provided 5ft and 15ft RJ12 cables and the 3-way Y-splitters… OR you can use the RJ-HUB Multi-port communication hub. The multi-port hub allows multiple sensors & device modules to be connected back to the SENTRY controller without the need for all of the Y-splitters. Using the RJ-HUB results in a clean installation with the least amount of problems and since the RJ-HUB is rated IP66, (waterproof) having NO exposed RJ12 cables / ports means more robust connections.

TIP#3 When connecting each of the optional sensor and device modules to the SEN-1 using the RJ12 cables, each module will AUTOMATICALLY link. No addressing is required. The SEN-1 will show each of the connected modules and sensors that are connected by touching the Sensors & Devices button.

NOTE: The "External Alarm" output will briefly activate when a new module or sensor is connected. See Sensors & Devices / Device Modes to setup one of the outputs to activate as an External Alarm.

Connections to the SENTRY

Main controller: The main SENTRY controller has been designed to resist moisture, but it is NOT waterproof. As such it should be located and installed in a location that is not exposed to water or high-levels of humidity to ensure many years of problem-free operation. When used to control a grow tent, mounting the controller on a wall next to the tent, or hanging it outside the tent itself is a great solution. If you will be using the SENTRY inside a self-contained grow room space, it is best to install the main controller outside of the room and to run the cables inside the room to connect to your lights, sensors and control-device modules.
NOTE: If you choose to install the main controller inside the growing area, select a location that will prevent the SENTRY from being splashed with water or subjected to high humidity.

Plug-in receptacles / Outputs 1-4: There are 4 pre-wired 120v or 240v power receptacles (outlets) on the sides of the SENTRY controller. The user can connect devices like lights, fans, pumps, humidifiers, CO2 etc. directly to those power outlets. Three of the 4 power outlets have a maximum of 8-amps, while the lower right outlet is a special high-power output that can have a maximum of 14 amps. Just remember a maximum of 15-amps total can be safely controlled by the SENTRY controller. The single #14AWG power cable provides power to the SENTRY and a 15-amp circuit breaker on the bottom of the SENTRY provides over-load protection.
NOTE: If the equipment amperage is more than 15-amps combined, the QUAD-1, 4-outlet Smart strip adds up to 4 separate controlled devices. The EXP-1 is a 4-outlet / single-output, low-voltage triggered" power expansion module. The QUAD-1 and the EXP-1 each controls up to 15-amps of equipment.

Dry-contact / output 5&6: There are two built-in hard-wired connections on the bottom of the SEN-1. They are dry-contact outputs that the user can use to control devices that require a dry-contact closure to activate. The user can assign each of the 2 dry-contact outputs to do one of 11 different functions. Some commercial humidifiers & dehumidifers, HVAC units and other auxiliary devices require a single dry-contact output for control purposes**.** To connect to the dry-contacts, you can remove the 4-pin terminal block from the enclosure and secure your low-volt wires to the terminals then reinsert the terminal block. (Maximum current / volts on dry-contacts = 1-amp @30v) ***NOTE: When connecting commercial dehumidifiers and HVAC units to the SENTRY, refer to the "SPECIAL CONTROL OPTIONS" section of these instructions.***

RJ12 ports &cables: There are 2 "universal" RJ12 ports on the bottom of the SENTRY labeled "SENSOR & DEVICES" which can be used to connect to all of your sensors and external device / control modules. Unlike some other controllers that require separate sensor and device / control module RJ connections, we have made the RJ12 ports UNIVERSAL meaning the user can connect sensors AND devices to the same RJ12 cables. Each sensor and device module comes with a standard RJ12 cable set consisting of a 5ft, 16ft cable and Y-splitter cable. You can also get the extension cable kit RJ-KIT, which has a 5ft, 16ft cable and Y-splitter. The Y-splitters can be used to "daisy-chain" connect from one sensor / device to the next one. Croptiva also offers a multi-port RJ12 "powered" hub (RJ-HUB) to provide a centralized "hub" to connect sensors and devices to, replacing the multiple Y-splitters with a cleaner and more effective cable connection system.

AUTOMATIC Addressing: When connecting each of the optional sensor and device modules to the SEN-1 using the RJ12 cables, each module will AUTOMATICALLY link. No addressing is required. When a new module or sensor is connected, or disconnected, it might take up to 30-60 seconds for the module to appear or show "offline". The SEN-1 will show each of the connected modules and sensors that are connected by touching the Sensors & Devices button. On those pages you can see each of the optional device module and sensors that have been connected, as well as their current connection status. (Green = Connected, Red = Disconnected)

Sensors: The sensors that are used with the SENTRY are connected using standard RJ12 cables. One of each type of 6 different sensors can be connected to the SENTRY by connecting the sensors to one of the two available RJ12 ports. When a new sensor is connected it will AUTOMATICALLY be linked to the main controller and be assigned a unique address within the controller. ***NOTE: Once the sensors are connected to the SENTRY controller, the controller will alert to the user if a sensor is disconnected or faulty.***

Connections to the SENTRY (continued)

External Device / control modules: The optional device / control modules are connected to the main SENTRY controller using the same RJ12 cables (and universal connection ports) as the sensors use. Croptiva has created "universal" RJ12 ports that can communicate simultaneously with sensors and device modules to make connecting all of the external modules and sensors easier. When a new device module is connected to the main controller using Y-splitters or the multi-port powered hub, the module will automatically link to the SENTRY and have a unique address assigned. ****NOTE: Once the devices are connected to the SENTRY controller, the controller will alert to the user if a device module is disconnected or faulty.***

Ethernet / (NET) network connection: If you will be using the provided app that works with Croptiva controllers including the SENTRY, you will use the single RJ45 / 8-wire port on the bottom of the controller to connect to your router or an internet switch. Once the controller is connected to a live internet source, it will automatically connect to Croptiva's secure AWS server, no internet configuration is required. To use the remote access, simply download the Croptiva app and register an account using your email. You will create a unique user password and verify the account. ****NOTE: To add a new SENTRY to your app user account, touch the "+" tab on the main app screen to add a new controller, and follow the prompts.***

User settings / IMPORTANT!!!: All of the user-settings that are entered by the user will be retained FOREVER in non-volatile memory even if power is interrupted. The SEN-1 uses a super-capacitor to retain the correct time of day in the case of a power failure. **THERE IS NO BATTERY TO HAVE TO REPLACE.**
****NOTE: If the controller is powered down for more than 72 hours, the internal time-clock may have to be reset.***

All user settings remain until changed by the user by accessing the settings directly on the controller touchscreen, or through the App. If the user changes a setting on any page, the "SAVE" icon at the bottom will begin to flash to remind them to SAVE the new setting. Settings are not actually changed within the controller until the user selects "SAVE" and then confirms "YES" at the bottom of each screen. Even if you think it is saved, touching the "SAVE" icon and then confirming "YES" will ensure the change is accepted.

****Note: A factory reset can be completed on the SEN-1 that will return all of the settings to the original factory settings. See System Settings.***

Basic operating principle

When designing the SENTRY controller, Croptiva was focused on producing a flexible and highly-precise control system, without over complicating the processes of using it. All of the features have been designed to be easily accessed without the need for complicated menus to navigate. Like all new things, until you understand how the device actually works… it could seem complicated. So we gathered some of the most commonly asked questions below.

What is the SENTRY? The SENTRY is what is considered an "all-in-one" controller because it can control all devices found in a standard grow tent or small grow room using a single controller. That means that all of the environmental AND irrigation control requirements are combined into a single controller that does it ALL. So instead of trying to use two or more separate controllers, the SENTRY conveniently places all of the functions together in one place… making it easy and much less complicated for the person using it.

How does the SENTRY work? The way the SENTRY works is simple. There are 6 built-in outputs the user can connect their equipment to. To expand the SENTRY's capability, the user can install multiple types of external device control modules that can control more equipment. You can also have ONE of each type of 6 different sensors connected. All of the sensors then provide live data to the SENTRY "brain" for each of the parameters being measured. The SENTRY "brain" then uses the sensor data to allow you to control all of the devices connected to the controller. The sensor data is also provided to view as a graph and to see daily highs and lows.

What is the User-Interface / UI. The "window" into the SENTRY is the built-in touch screen User-Interface. Using the touch screen (or the Croptiva app) the user can customize their SENTRY by selecting what each device controls, and the settings for their room temperature, humidity, Co2 level, lighting levels, irrigation cycles and more. The user can select one of 11 different control "modes" for each of the 14 device / control outputs on the SENTRY. Those modes include temp up / down, humid up / down, CO2 up / down, 2 types of timers, exhaust fan, light control and even an external alarm output. Once the user selects what they want each of the outputs on the controller to do, all that is left is to enter your operating settings and high-low alarm settings. ***NOTE: the SENTRY also offers the Croptiva mobile app providing remote access to all of the user settings… so wherever you are, you are never out of touch.***

How do the setpoints work? The SENTRY controls the entire grow tent, or grow room as a single space. That simplifies user-settings and allows us to offer a single setpoint for each parameter being measured and controlled. For example, there is a single "Day temperature target" setpoint. That is the target temperature you want to maintain during the day. If you have cooling devices, they will activate if the temp goes above the target, and if you run a heater, the heater would activate when the temp dropped below the target. There are user-selectable "deadband" settings for Cooling / Heating which prevent both devices from operating at the same time, and to also eliminate "quick-cycling" of each device. The same type of setting is provided for Humidity control & CO2 control. ***NOTE: VPD is measured by the temperature and humidity sensors and is then displayed as a VPD reference. There is no VPD setpoint, but there is a VPD Leaf temp offset if you prefer to display VPD based on measured leaf temp differential.***

What kind of timers are offered? Besides the environmental settings for Air Temperature, Humidity and CO2, there are settings for each timer being used, and 2 types of timers scheduled and recycling. Each timer is an independent "device" and the settings for that timer only affect that device. There are separate timer settings for Day and Night (when using the Recycling timer mode). Or you can set up to 15 individual ON/OFF time events each day when using the Scheduled timers mode. ***NOTE: There are also timer settings to control your standard (old style) and newer variable lights LED or HID (0-10v type dimming control).***

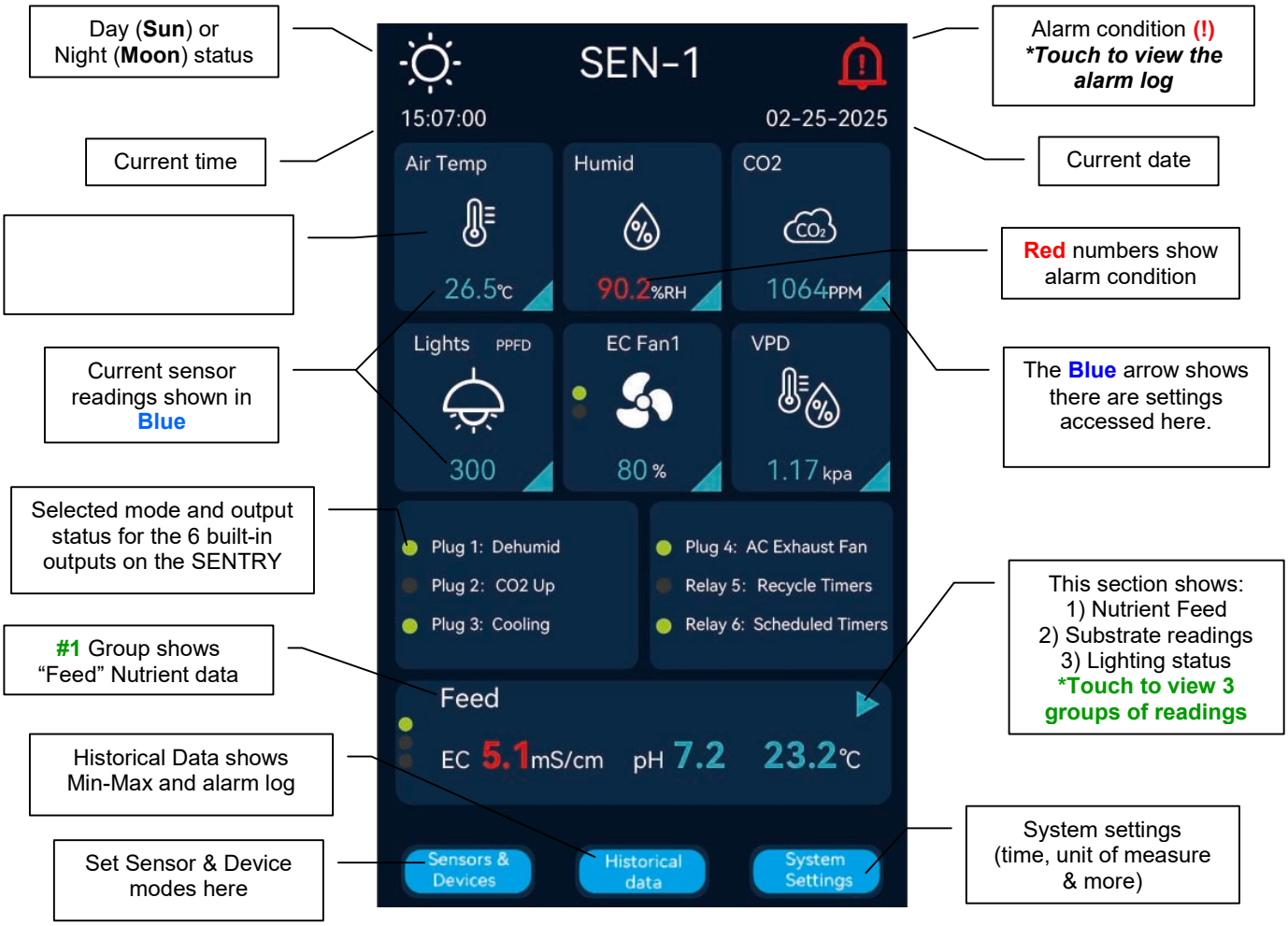
Basic operating principle (continued)

Can the SENTRY control my HIDs or LEDs? The light control settings work with LED or HID lighting fixtures that use a 0-10v dimming control signal. Depending on whether you are using the single channel, or 4-channel light adapter module, you will be able to select how your lights operate based on time, safety high-temp dimming-shutdown, sunrise-sunset ramping, spectrum control (4-channel LEDs) and more.
NOTE: If you are using older style lights that do not have a low-volt connection, the SENTRY can still control them using the "Lights" mode settings on the selected powered outlet.

Can I control the speed of EC type fans? To be clear, the SENTRY can control standard type AC voltage exhaust / circulation fans when the fan is plugged into an optional device module or one of the 4 power outlets on the SEN-1 controller. The SENTRY can also control (2) separate EC type fans. Adding the WFAN-1 module provides two separate channels of 0-10v control for your EC fans. In case you have not heard, EC type fans have amazing capabilities including the ability to run from 0-100% speed without "noise or chatter", they are super-efficient compared to normal shaded-pole centrifugal fans, and because they are speed-controllable, they can be quieter to operate. The SENTRY can control each of the EC fans using a variable speed control based on measured temperature, humidity, CO2. The user can also select the minimum and maximum fan speed to operate each fan. As the temperature, humidity (or CO2) increases the fan speed will also increase. The user can combine functions like temperature and humidity together to create a very efficient and effective "fresh-air" cooling and dehumidification strategy using EC fans alone. The EC fans can also be set to simply operate at a "fixed" speed during the day and a separate speed at night**.**

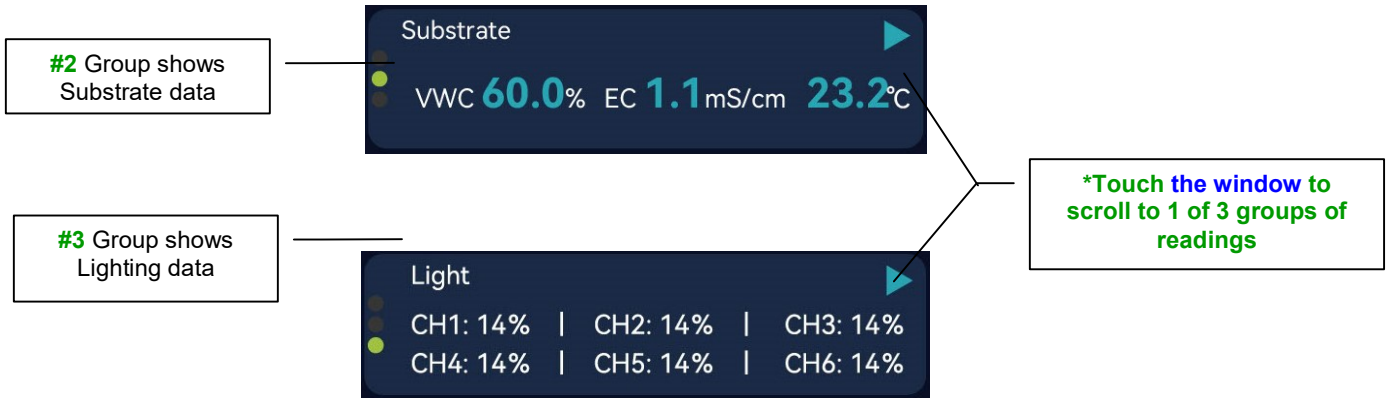
The HOME page

There are multiple "pages" within the SENTRY that will allow you to view and change settings. Let's start by familiarizing yourself with the HOME page. You can access ALL of the other pages and settings from the home page. There are multiple sections that display a wide variety of data on the Home page.



***NOTE: A green "dot" indicator indicates that device is currently turned on.**

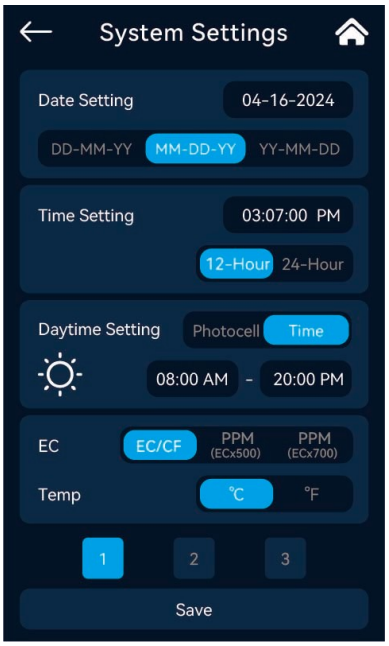
Additional data can be accessed by touching the Blue arrow tabs.



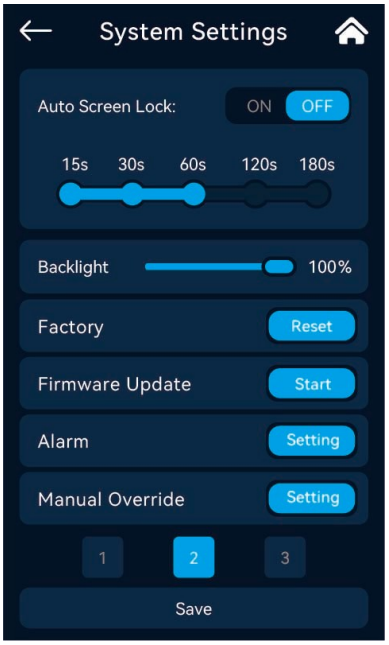
System Settings

Selecting **"System Settings"** from the Home page brings you to the 1st of 3 pages for the System Settings. Theses 3 pages contain all of the internal settings for the SENTRY as well as the QR code needed to add the controller to your app / account. Touch the page #1, 2 or 3 at the bottom to scroll to each page.

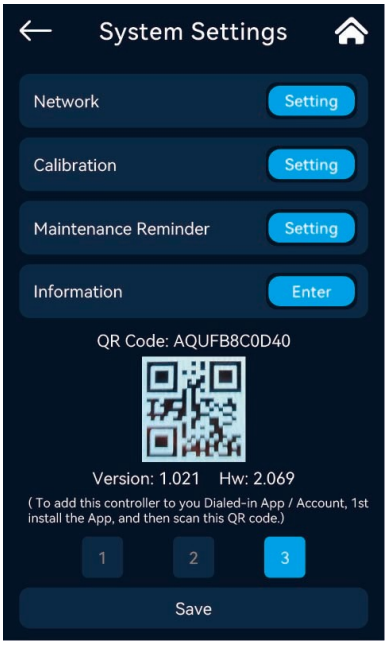
Page 1



Page 2



Page 3



***NOTE: 1) When changing the System Settings, make sure you select "Save" after the changes are made.**
2) You can return to the Home page by touching the Home symbol in the top right corner.

System settings Page #1
1) Select the current date and time options. You can select to view 12hr mode (AM/PM) or 24 hour mode.
2) Choose to use the photocell to determine Day/ Night or set times to determine the start of the Day and Night cycles.
3) Select the unit of measure for water EC (EC or PPM) and Temperature (F or C).

System settings Page#2
1) The user can allow the screen to remain on 24/7, or have it "sleep" when inactive. Select the Auto Screen Lock function and then select the Time Delay for the screen to "sleep". Touching the screen wakes it up.
2) The Backlight brightness can be adjusted by the user with the slider.
3) The unit can be returned to Factory settings and reset settings. *Sensor and Devices are remembered until the user deletes each Sensor or module. Removing and installing a new Device or Sensor will automatically replace the previous Device or Sensor.
4) Firmware updates to the SENTRY can provide new functions and improvements. See Firmware Updates.
5) The Alarm settings can be accessed using the Alarm Tab. User can select the alarms they want to activate with separate Day and Night setpoints.
6) Manual Override allows the user to manually test each device output.

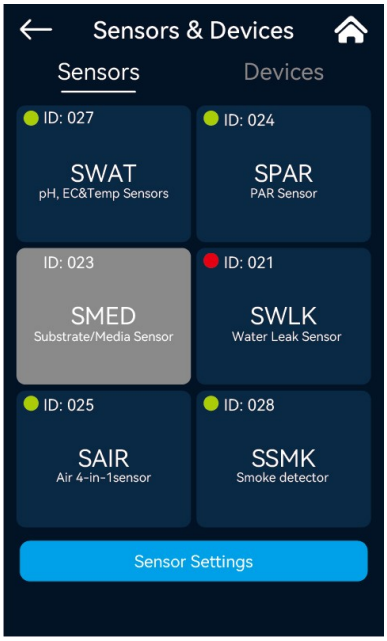
System settings Page#3
1) There are some Network settings to allow Static or DNS addressing. *Network settings are pre-set. Do not change these settings unless required.
2) Some sensors can be re-calibrated. Select Calibration to access options for calibration. See calibration section.
3) Maintenance Reminders can be set by the user for common tasks. The reminders will trigger a message to be shown
3) The QR Code / Serial # / current firmware version is shown on the bottom of page #3 of the system settings.

Sensors & Devices

Selecting **"Sensors & Devices"** from the Home page brings you to the 1st of 2 pages called Sensors. You can select to view either Sensors or Devices by selecting each at the top of the page. Let's take a look at the Sensor pages first.

Sensor pages

Sensors & Device page



When you select "Sensors" you will see the page on the right. You can have 1 of each type of sensor connected to the controller.

When you connect a new sensor to the SEN-1 controller it automatically recognizes and links to the sensor. The small "dot" in the upper left corner of each sensor will show the current status of the sensor.

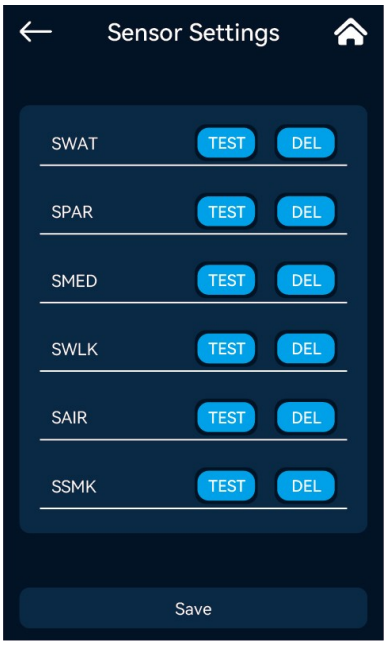
Gray area = Sensor has NEVER been connected. Until each sensor is connected the section will remain Grayed-out, no LED shown.

Green dot = Sensor is connected and currently communicating with the SEN-1 controller. This means the sensor readings can be seen on the controller screen and app.

Red dot = If the sensor was previously connected and linked, but has lost communication with the main controller, a Red dot will be shown. When a sensor losses communication, some devices will not operate, so the problem must be resolved. ***NOTE: Check the RJ cable connection, try plugging the sensor directly into one of the RJ ports, replace the sensor if it is found to not be communicating.***

Sensors Settings

Sensors settings page



If you touch the Test & Delete tab on the previous page, it will bring you to the page on the right that provides two functions allowing you to test or delete a sensor from the system.

Sensor Test: Some of the sensors have a built-in Test function that allows the sensors communication to be tested, and will flash an LED on the sensor to verify it is working. Pressing the sensor "TEST" button will initiate the test.

Sensor Delete: If the user wants to replace or remove a sensor from their system, they can use the sensor "DEL" button. When a sensor has been deleted, another sensor or replacement can be installed simply by plugging in the new sensor.

IMPORTANT: If you will be removing a sensor from use, you should "Delete" it from the sensor list here to prevent unwanted / false alarms for a disconnected sensor.

Device pages

When you select to view the Device at the top of the Sensor & Device page, it will bring you to the Devices main page. The control modules that are connected to the SENTRY are shown on this single page. It shows which of the Devices are connected to the controller, and provides access to the settings for each of the Devices.

* The small "dot" on each Device icon tells the user the current status of each of the device modules. ***NOTE: The SEN-1 module is the Sentry controller.***
Grey dot = Module has not been registered / connected
Green dot = Module is registered and connected
Red dot = Module registered, but currently offline / disconnected.
NOTE: Check the RJ cable connections, try plugging the module directly into one of the RJ ports. Replace the module if it is found to not be communicating with the SEN-1.

* There are 4 built-in plug type outlets and 2 built-in dry-contact relay contacts (normally-open) that are available to the user.
Touching the SENTRY icon will access the settings for those 6 built-in outputs.

* The other optional device modules will also be shown and indicated by a small green LED showing that module is connected. ***NOTE: If the small dot / LED is Grey or Red that means the device is currently not connected.***

* You can access the settings for each module by simply touching the tab for each device. Each icon with a blue arrow will open a new page where you can select the Mode for each of the outputs for each optional device module.

Main Device Page

Device Outputs

When you select / open one of the Device modules, you will see a page that looks like the one below.
NOTE: On the left side of the page are the status indicators for each output. A Green LED means the output is on, a Red LED means it is OFF.

* The example on the right shows the 6 built-in outputs on the SENTRY. The top 4 are the plug-in receptacles on the sides of the SENTRY, the bottom 2 are the two hard-wired dry contact outputs on the bottom of the SENTRY.

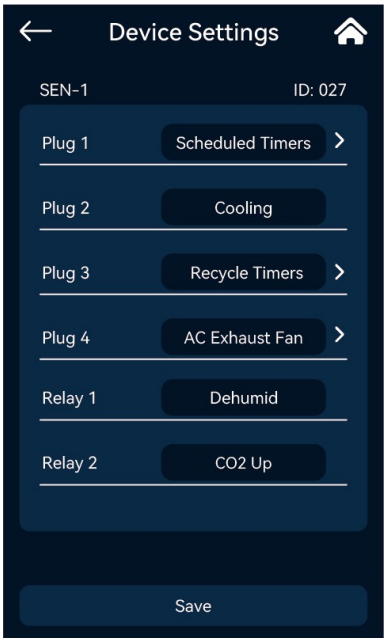
* Each of the 6 outputs can be selected to perform a specific task and to control a specific device connected to the SENTRY. Touching the dark Blue shaded area will bring up the Mode Selection page. The user can select a different mode for each output. **"Unassigned"** means the output has no current mode selected.

* In this example the 4 plug-in outputs are selected to be a Schedule Timer, a Cooling device, a Recycling timer and an AC Exhaust fan. The #1-2 Relays are set to control a Dehumidifier and a CO2 device.

* Some of the outputs have a small Arrow pointing to the right to indicate that output has more settings the user can customize.
Refer to the Timers, Lights and Fan section of this manual for more details.

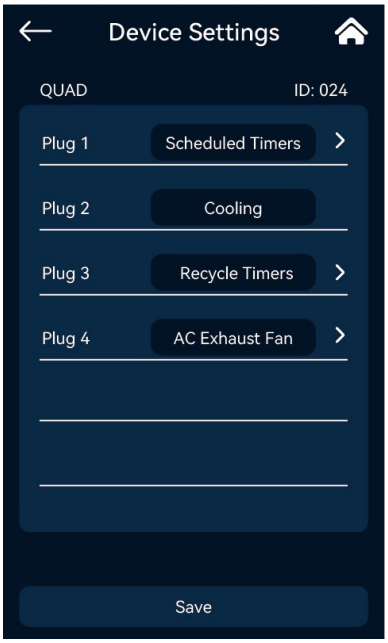
NOTE: The MAIN settings are accessed by touching the individual Temperature, Humidity, CO2, EC Fan & Lights icons on the Home screen.

SENTRY Built-in Outputs



Device outputs (continued)

Quad-1 Outputs

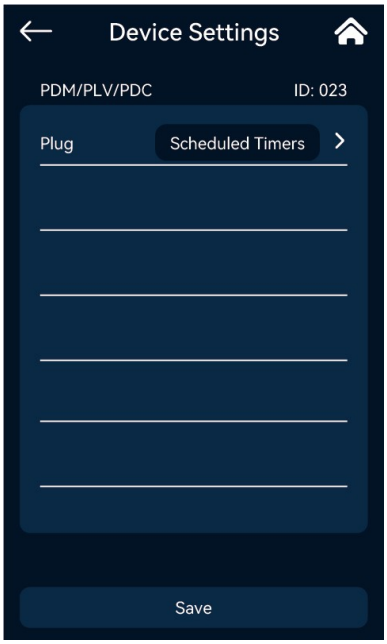


You might also want to add the optional QUAD-1 / 4-output expansion module or one of the single-output plug-in style device modules.

The QUAD-1 setting page will look like the image on the left. On the QUAD-1 you are able to select what you want each of the 4 plug-in outlets to do.

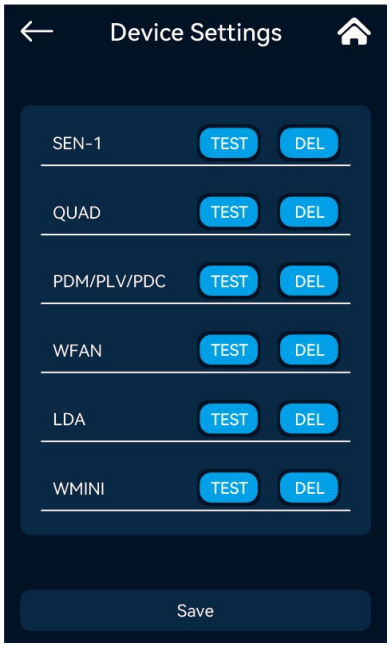
The PDM module page shown on the right provides a single plug-in style device module that can control 1 additional device @ 120v (PDM-1) or 240v (PDM-2/3) or one of the PLV-1 low-volt or PDC-1 dry-contact modules.

PDM-PLV-PDC Outputs



Device Test & Del (Delete) Tab

Device Test & Delete



If you touch the Test & Delete tab at the bottom of the previous page, it will bring you to the Device Settings page on the right that provides two functions allowing you to test or delete a device from the system.

Device Test: Some of the device modules have a built-in Test function that allows the sensors communication to be tested, and will flash an LED on the sensor to verify it is working. Pressing the Device "TEST" button will initiate the test.

Device Delete: If the user wants to replace or remove a device module from their system, they can use the Device "DEL" button. When a device module has been deleted, another device module or replacement can be installed simply by plugging in the new module.

NOTE: ALL of the optional connected modules can be accessed on this page including the Lighting, EC Fan & Minisplit AC device modules.

IMPORTANT: If you will be removing a module from use, you should "Delete" it from the device list here to prevent unwanted / false alarms for a disconnected module.

Selecting Device "modes"

On the previous page, we showed how to access the Device modules and to see the current selected "Mode" for each Device (Output) on the SENTRY. Next we show you how to change and select the modes you want to use.

It is easy to change the mode for each of the available outputs on the SENTRY. When you touch any device / output icon, it will bring you to the page shown below, the Device Mode Selection Page. On this page you can select one of **11 different "Modes"** for each of the outputs / devices on the SENTRY. Each Mode does a specific task and allows the user COMPLETE flexibility when setting up their SEN-1 controller.

There are 11 available modes to assign to each output.

Device Mode Selection Page

Heat: Controls a heater based on the **S**ystem **T**emperature **S**etting. **(STS)**

Cool: Controls a cooling device like a fan or AC based on **STS**.

Humid: Controls a humidifier based on the **S**ystem **H**umidity **S**etting. **(SHS)**

Dehumid: Controls a dehumidifier or fan based on the **SHS**.

CO2 Up: Controls a CO2 device using the "Day" CO2 setpoint. **(SCS)**

CO2 Down: Controls a fan to reduce CO2 w/ Day-Night setpoints. **(SCS)**

Scheduled Timers: Device outputs can be selected to operate devices based on time, and controlled by multiple "scheduled" timed events. Up to 25 timed events can be entered per 24 hour day, on each output / device.

Recycle timers: Devices can be controlled using a "repeating" recycle timer. The Recycle timer settings includes separate Day and Night settings, as well as to control devices "ON" time by hours, min and seconds, and the "OFF" time by hours and minutes. You can also select how many "cycles" you want to occur.

Lights: If you are using older style lights that do not have a remote dimming / control option, you can still control them by using the "Light" mode. There you can select the On & Off time, as well as the high-temp shutdown temperature for added safety.

AC Fan: Allows a standard fan to be used for cooling, dehumidify or CO2 down.

Alarm buzzer: Can activate an optional audio-visual alarm module or even integrate with a third-party alarm system. This mode will sound the alarm in situations selected by the user within the alarm setting pages.

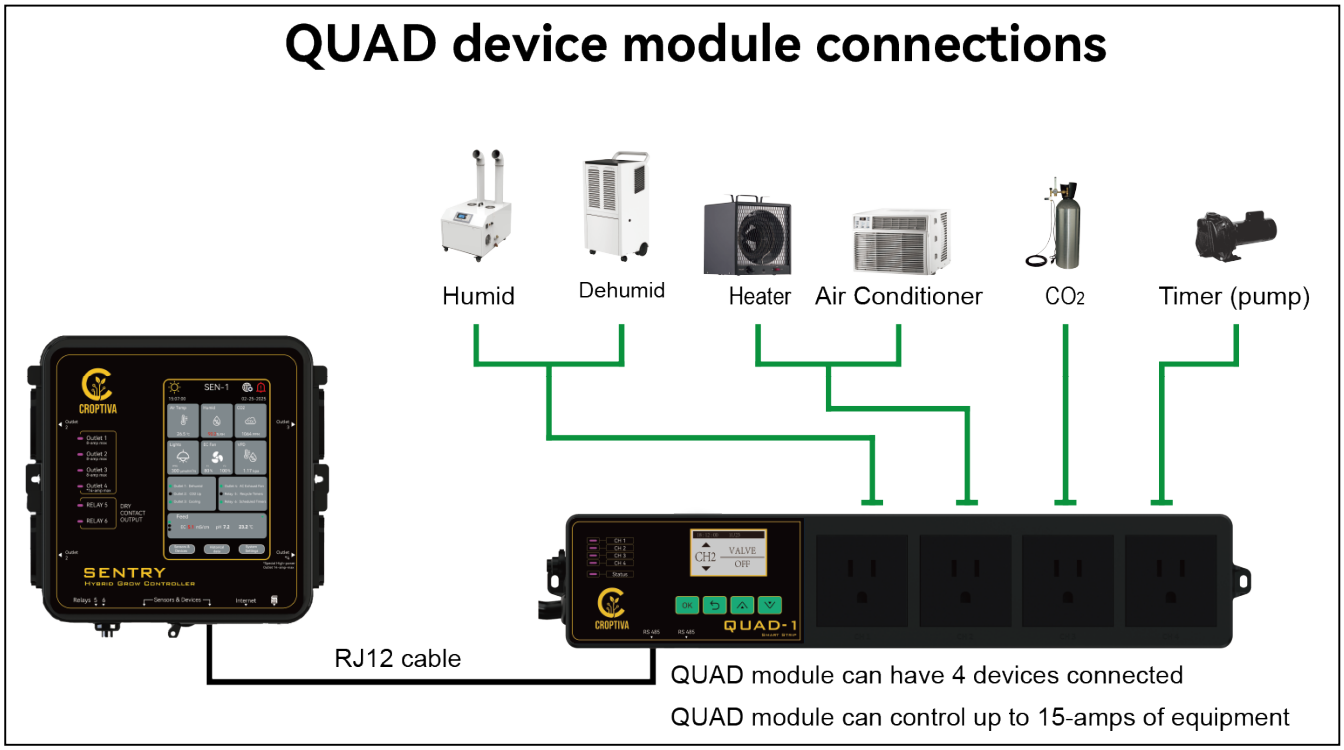
NOTE: Make sure to save your selection by touching YES / SAVE at the bottom.

NOTE: You can always change the mode for any of the device outputs simply by touching the current selected "mode" for the output to deactivate it. Then touch the "new" mode button you want to assign to the output, and then touch YES to save.

Devices – QUAD-1 module

QUAD expansion module: The QUAD expansion module is a simple yet powerful way to expand the SEN-1. The QUAD-1 provides (4) additional power outlets that can be used to control a variety of equipment and devices as shown below in the example diagram. Each outlet can handle up to 10-amps. The maximum total amperage should not exceed 14-amps. The QUAD module's 15-amp power cable and internal resettable 15-amp overload protection provides ample capacity and built-in safety.

NOTE: The user can select 1 of 11 different "modes" for each outlet. Refer to the Device Modes for details.



Lighting control

Croptiva recognizes that one of the most rapidly changing aspects of indoor and greenhouse production is how to best use supplemental lighting in order to maximize quality AND quantity. LEDs have changed EVERYTHING! For example, LEDs can now be positioned above OR below the plant canopy or BOTH. An optional PAR sensor that measures PAR light levels can be added to the system to automatically operate your lights at a specific PPFD / umol/s2 setting. LEDs can also have multiple "channels" that allow them to have tunable "spectrums" that can vary the amount of Red, Far-red, UV & Full-spectrum light the fixture emits. The Sentry controller provides control options for all of these new LED functions. Whether you are using a single LED in a tent, or 160+ HIDs in a large room, the Sentry controller can handle your lighting control needs.

The LA-1/2 Lighting adapters

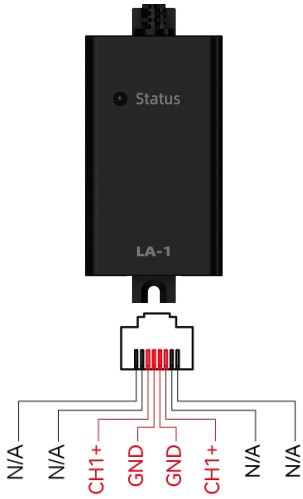
Croptiva has created multiple Lighting Adapters modules that allow the Sentry controller to communicate with most brands of LEDs and HID lights that can be controlled using the industry standard 0-10v analog signal.
NOTE: The LA-1 is a single channel light adapter and the LA-2 is a 4-channel adapter.

LA-1 / Single-channel Light adapter

The LA-1 lighting adapter is the standard single-channel, 0-10volt adapter that allows 0-10v type lights to be controlled. The LA-1 generates a 0-11.5v signal to tell the lights when to turn On and Off, as well as to provide adjustable power settings. The LA-1 adapter plugs into the SEN-1 Sensor / Devices RJ port. A standard RJ45 connection port on the bottom of the LA-1 connects to the lights being controlled. As long as the lights you are operating have a RJ cable connection (RJ-9, RJ11, RJ14 or RJ45) and are compatible with 0-10v control, they can be plugged into the RJ45 port.
NOTE: Before connecting your lights ensure they are compatible with 0-10v signal. Also confirm that the lights are "Dim-to-off" type lights.

RJ45 port: The diagram on the right shows the pin-out connections on the LA-1 RJ45 output port. ***Only the center 4 pins are used.***

LA-1 light adapter

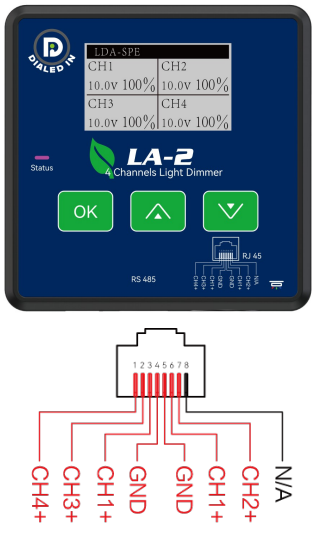


LA-2 / 4-channel Light adapter

The LA-2 lighting adapter is a 4-channel, 0-11.5volt adapter that allows 0-10v type lights to be controlled. Having 4 channels allows you to control LEDs that have "spectrum control", OR you can also control up to 4 groups of single channel lights. The LA-2 plugs into the sensor/device port on the SEN-1. A standard RJ45 port on the bottom of the LA-2 connects to the lights being controlled. Even though the LA-2 was designed to operate multi-channels or groups, the RJ45 port has been configured to work with standard single channel 0-10v lights. As long as the lights you are operating have a RJ type cable connection and are 0-10v, it can be plugged into the RJ45 port. ***NOTE: Before connecting your lights ensure they are compatible with 0-10v signals and confirm that the lights are "Dim-to-off" type lights.***

RJ45 port: The diagram on the right shows the pin-out connections on the LA-2 RJ45 output port. The user can either make a custom RJ45 cable to connect to multi-channel 0-10v lights or they can use the supplied RJ45 to 8-pin terminal break-out cable. The break-out cable allows multiple channels or groups of lights to be hard-wired to the LA-2. Consult the light manufacturer for details

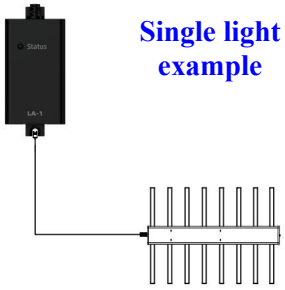
LA-2 light adapter



Lighting connection examples – Single light

- First connect the LA-1 adapter to the SEN-1 controller by connecting the RJ12 cable. The LA-1 cable can be plugged into either of the Sensor / Device RJ ports on the SEN-1 controller.
- When controlling a single light, a single RJ cable will be connected from the LA-1 adapter RJ45 port, to the light RJ port. The example shows a LED light. HID lights that use a 0-10v signal can also be controlled.

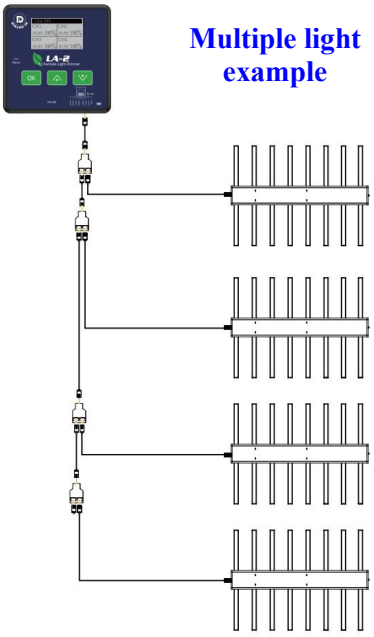
NOTE: The LA-1 adapter outputs 30ma @ 0-11.5v. It can control about 30 lights. When using multiple lights, the connections will look like the Multiple light example diagram below.



Single light example

Multiple lights

- The diagram on the right shows 4 LEDs connected to the LA-2 module using standard RJ cables or Y-splitters if required.
- If using LEDs that are capable of spectrum control, ensure the pin-out diagram on the previous page matches the LEDs.
- When connecting multiple lights (LED or HID), do not exceed 30ma on each channel on the LA-1 or LA-2 adapter. Check with the light manufacturer when connecting more than 40 light fixtures to verify the 0-10v "load" in (ma) for each light.
- The LA-2 has 4 separate channels that be used to control LEDs that have 0-10v spectrum control.
- The LA-2 could also be used to control up to 4 different "groups" of lights. Each group connected to one of the four 0-10v channel on the LA-2. *Groups can be run as a single large group.
- When controlling multiple groups of lights, use the provided break-out cable adapter to connect each of the 0v and 10v+ channels.
- The LA-2 can operate approximately 120 light fixtures maximum (30 lights per channel when operating single channel lights)



Multiple light example

NOTE: The LA-2 adapter outputs 4x 30ma @ 0-11.5v. When controlling multiple light groups, DO NOT mix different types of light fixtures (Use only all HID OR LED).

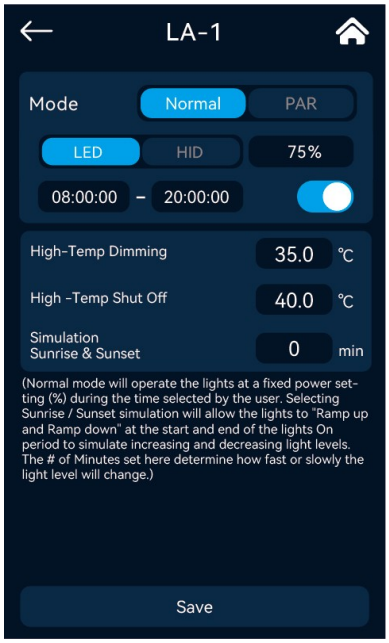
Settings – Variable lighting / *LA-1 adapter

When controlling a single light, or a single group of lights using the LA-1 adapter, you have 2 control options. 1) The "Normal" light control mode uses timers and standard lighting control settings to control when the lights will turn On/Off, and power % the lights will operate at. This is the simplest way to control your LEDs or HIDs. 2) The other option is to add the optional PAR sensor to your control system. Timers are still used to determine when the lights will turn On/Off. When the SPAR-1 sensor is connected, it allows the SEN-1 controller to automatically provide the exact amount of light (umol/s2) based on your desired PPFD.
NOTE: The SPAR-1 PAR sensor reads light level in umol/s2 and will display the current PPFD. The SPAR-1 sensor can be used "passively" to monitor the light level without actively controlling the lights.

IMPORTANT!

The SEN-1 protects your room and crops from high temperatures. If the temp gets above your "Dimming" setpoint, the lights will dim 10% for each 1 degree above the Dimming setpoint. If the temperature continues to rise and reaches the "Shut-off" temp, the lights will be turned off, until the area cools, and an alarm will trigger. ***NOTE: A minimum 5'F / 3'C difference between the Dimming & Shut-off settings is recommended.***

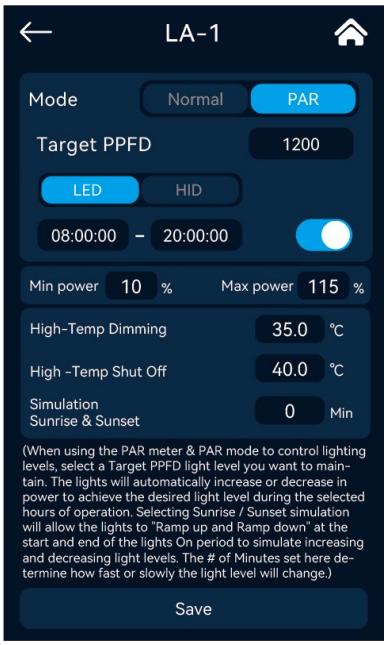
Normal settings page



"Normal" light settings / LA-1

To access the light settings, touch the Lights Icon on the Home page. You will see the page on the right. Normal mode is selected in this example. First you will select the times you want to operate the lights. Here the lights are set to turn On at 8am and turn Off at 8pm or 08:00 / 20:00. The small "switch" on the right of the time settings enables the lights to operate. In the example, the user has selected to use LED lights and has set them to operate at 75% power.
NOTE: The HID mode adds a pre-set 15-minute "hot-start" delay time to protect your HID lamps.
The SEN-1 can also simulate natural Sunrise and Sunset. The timer controls how quickly the lights "ramp up / ramp-down" in power. You can select from 0 to 30 minutes. Zero min = Sunrise/Sunset disabled.

"PAR" settings page



"PAR" light settings / LA-1

When using the optional SPAR-1 sensor to control your lights you will select the PAR mode as shown in the example on the right. The settings and options are almost identical to the "Normal" control mode described above. The main difference is instead of selecting a Power % setting for the lights, you will instead select the "Target" PPFD in umol/s2 you want to operate the lights at. When using the SPAR-1 sensor, the sensor should be positioned at the top of the plant "canopy" to measure light level at the top of the plants. The controller then automatically increases or decreases the power the power t o the lights in order to achieve your desired PPFD level. This process works equally well indoors using only artificial lighting, or in greenhouses using natural light supplemented by artificial lighting.
When using PAR control, you can also select the minimum and maximum power you want the lights to operate at. The Min power setting is helpful if your lights internally turn off when they are set below a certain power %. The Max power setting can prevent the area from getting too warm, and also to reduce the overall power used by your lights.

Settings – Variable lighting / *LA-2 adapter

The LA-1 & LA-2 adapters are identical in the way they work. The only difference is the LA-2 has 4 configurable channels. Using the LA-2 adapter, you can control a LED(s) with Spectrum control, or control up to 4 separate groups of lights. The LA-2 offers 4x 0-10v channels, and each channel can be controlled together, or separately.
Note: Refer to the previous section on the LA-1 adapter for the standard settings that the LA-2 also offers.

IMPORTANT!

The SEN-1 protects your room and crops from high temperatures. If the temp gets above your "Dimming" setpoint, the lights will dim 10% for each 1 degree above the Dimming setpoint. If the temperature continues to rise and reaches the "Shut-off" temp, the lights will be turned off, until the area cools, and an alarm will trigger.
NOTE: A minimum 5'F / 3'C difference between the Dimming & Shut-off settings is recommended.

"Normal" light settings / LA-2

The example on the right shows the LA-2 Main page when selected to be in "Normal" mode. Most of the settings you see are the same as on the LA-1.

HID/LED Mode: Select the type of lights you will be using, HID or LED.
NOTE: The HID mode adds a pre-set 15-minute "hot-start" delay time to protect your HID lamps.
Channel Controls: Touching the Channel control tab will open a new page where you can select a unique name for each of the 4 channels, as well as to determine how those channels will be controlled by the SEN-1.
Channel Output: To set the power % setting for each of the 4 channels available on the LA-2, simply touch any of the windows showing the current channel power setting. There you can enter your desired setting.
Scheduled Timers (Master): The "Master" timer on this page can be used to activate all channels simultaneously.
Sunrise / Sunset (Master): Each channel selected to link to the "Master" will follow the Sunrise / Sunset ramp up and ramp down.

Note: Refer to the previous LA-1 page for the commonly shared "Normal" settings for the LA-1 and LA-2.

Normal settings page

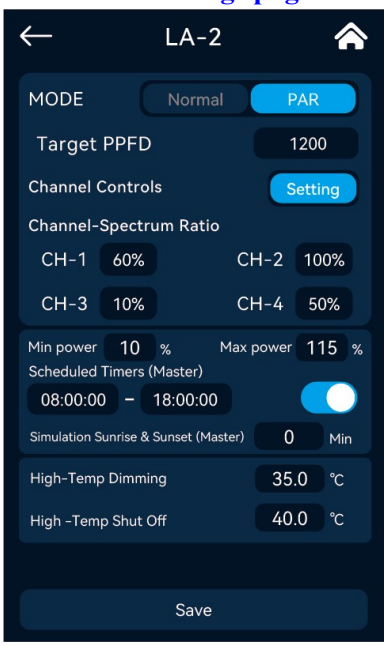
"PAR" light settings / LA-2

The example on the right shows the LA-2 Main page when selected to be in "PAR" mode. Most of the settings you see are the same as on the LA-1. However there is a new section called Channel Controls and Channel Settings.

HID/LED Mode: Select the type of lights you will be using, HID or LED.
NOTE: The HID mode adds a pre-set 15-minute "hot-start" delay time to protect your HID lamps.
Channel Controls: Touching the Channel control tab will open a new page where you can select a unique name for each of the 4 channels, as well as to determine how those channels will be controlled by the SEN-1.
Channel Output: To set the power % setting for each of the 4 channels available on the LA-2, simply touch any of the windows showing the current channel power setting. There you can enter your desired setting.
Scheduled Timers (Master): The "Master" timer on this page can be used to activate all channels simultaneously.
Sunrise / Sunset (Master): Each channel selected to link to the "Master" will follow the Sunrise / Sunset ramp up and ramp down.

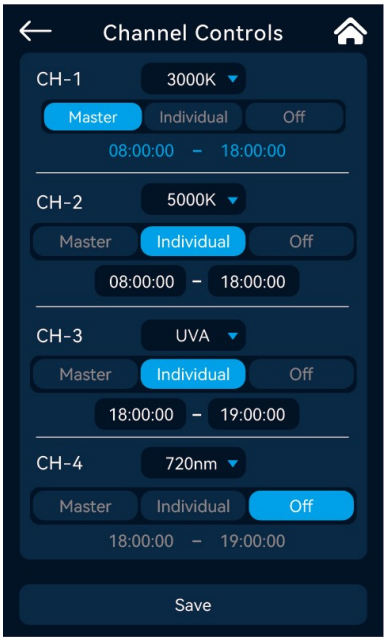
Note: Refer to the previous LA-1 page for the commonly shared "PAR" settings for the LA-1 and LA-2.

"PAR" settings page



4-Channel Control settings / LA-2 *Spectrum Control

Channel settings page



To access the 4 channel settings on the LA-2, touch the Channel Controls tab on the LA-2 main page, it brings you to the page shown on the right. The first thing you can do is to select an appropriate channel "name" from the drop down menu for each channel you will be using. In this example, we have selected Channel 1 to control 3000K diodes, CH 2 = 5000K diodes, CH 3 = UVA diodes and CH 4 = 720nm (Far-red) diodes. They are many options to choose from within the drop down menu, select the name that best matches your LED fixtures channel configuration for each "color" of diodes being used.
Once you have re-named each of the channels you will be using, you have 3 choices to make for how each channel will be controlled.
Master: When you select Master, that specific channel's On / Off time will be controlled by the "Master" timer on the LA-2 Main page.
Individual: If you want a channel to have it's own On / Off settings, select "Individual" and a set of timer will appear for that channel.
Off: If you are not using a channel, or want to disable it you can select the channel to be Off.

Note: Although you can select and use the PAR control mode when using Spectrum control, you must remember that if you select power settings that are too low, the combined light output from the light might not be high enough to reach the Target PPFD setting, or you spectrum output could change with higher or lower power %. It is best NOT to select PAR and Spectrum control together.

4-Channel Control settings / LA-2 *Up to 4 Group Control

The LA-2 adapter can be used to control up to 4 separate groups of lights that have 0-10v control. As mentioned above in LA-2 Spectrum control, if you are using the LA-2 for Group control you can still choose unique names for each of the 4 channels being controlled by the LA-2 within the Channel Controls tab. When controlling multiple "groups" of lights with the LA-2, you can name each group. Group 1, 2, 3 or 4. Once you have re-named each of the channels you will be using, you have 3 choices to make for how each channel will be controlled.
Master: When you select Master, that specific channel's On / Off time will be controlled by the "Master" timer on the LA-2 Main page.
Individual: If you want a channel to have it's own On / Off settings, select "Individual" and a set of timer will appear for that channel.
Off: If you are not using a channel, or want to disable it you can select the channel to be Off.

When controlling multiple groups of lights, you will need to connect each group of lights to the LA-2 adapter using the provided break-out adapter. Refer to the LA-2 instructions on how to properly connect your lights.

Note: It is NOT recommended to use PAR control mode when also using multiple lighting group control. The PAR sensor will only be measuring light from a single point that might not represent the actual light.

1-Channel Control settings / LA-2 *Single Group Control

The LA-2 adapter can be used to control up to about 120 lights that have 0-10v control. Each of the 4 channels can be connected to up to 30 lights each. If running all 4 channels together, you would select all channels to operate in "Master" mode as described above. With all 4 channels selected to be in Master mode, all 4 channels will be operated at the same time and treated as 1 large "group".
Note: Each of the 4 channels can still be operated at different light levels (light power %).

Settings - Temperature, Humidity & CO2

The user settings for Temperature, Humidity and CO2 are accessed simply by touching the small blue triangle in the lower right corner of the Temp, Humid or CO2 window on the Sentry Home page. That will open one of the pages shown below. All of the devices connected to the Sentry controller will follow these System settings.

Temperature settings

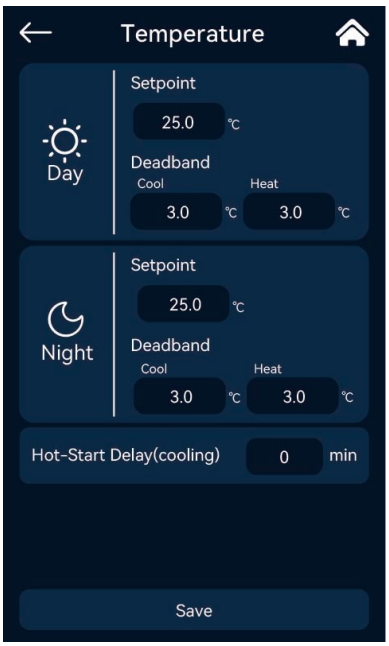
The Sentry controller provides separate temperature settings for Day and Night as well as other options like Hot-start delay and separate deadband settings for Cool and Heat.

Temperature setpoint: The user can select their Day and Night temperature settings in F or C. Simply enter your "Target" temperature settings here. ***NOTE: Refer to System setting page #1 to change from C to F or F to C.***

Deadband settings: Deadband is the difference (+ or – from the target setting) in temperature that determines when the temp device will be activated. Normal deadband settings would be 2-3 degrees.
NOTE: Do not set the deadband lower than 2-3 degrees to prevent "quick-cycling" on/off of device being controlled.

Hot-start delay: Most cooling devices that use compressors (AC units) normally have a built-in time delay to prevent short-cycling the compressor. Rapidly turning an AC on / off is not good for the compressor. The user can add additional start –up delay time here.

Temperature settings page



Humidity Settings

There are Day & Night humidity settings, Hot-start delay, High-temp shutoff & deadband settings for Humidify & Dehumidify.

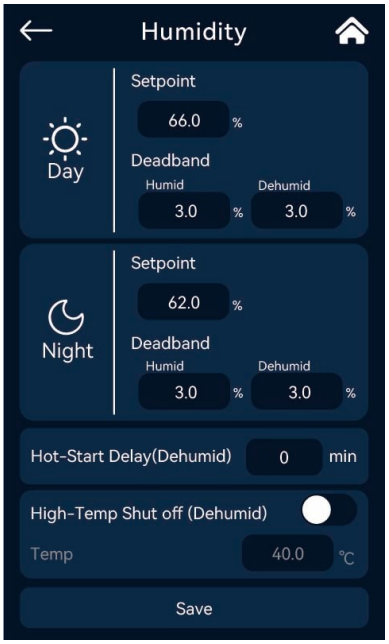
Humidity setpoint: The user can select their Day and Night humidity settings. Simply enter your "Target" humidity settings here.

Deadband settings: Deadband is the difference (+ or – from the target setting) in humidity that determines when the humid/dehumid device will be activated. Normal deadband settings would be 3-4% Rh.
NOTE: Do not set the deadband lower than 3' to prevent "quick-cycling" on/off of device being controlled.

Hot-start delay: Dehumidifiers that use compressors normally have a built-in time delay to prevent short-cycling the compressor. Rapidly turning a dehumid on / off is not good for the compressor. The user can add additional start –up delay time here.

High-temp shutdown (dehumidifier): Dehumidifiers generate heat as they operate. If the temperature within the grow area gets too hot user can choose to disable the dehumidifier at a specific temperature to reduce the heat load.

Humidity settings page



Using CO2?

The SEN-1 can control compressed CO2 regulators or CO2 generators to increase CO2 levels. CO2 levels are normally operated between 750-1250PPM in most circumstances. Supplemental CO2 is only activated during the Day mode. The Sentry controller can also control a fan that can be used to remove CO2 from the grow area if CO2 levels are too high. The CO2 "down" fan operation can be operated during the Day, Night, or 24-hours.

CO2 settings

The Sentry controller provides separate CO2 settings for Day and Night as well as other options like Fuzzy-logic, Interlocking CO2 / Fan operation, and separate deadband settings for CO2 Up & CO2 Down.

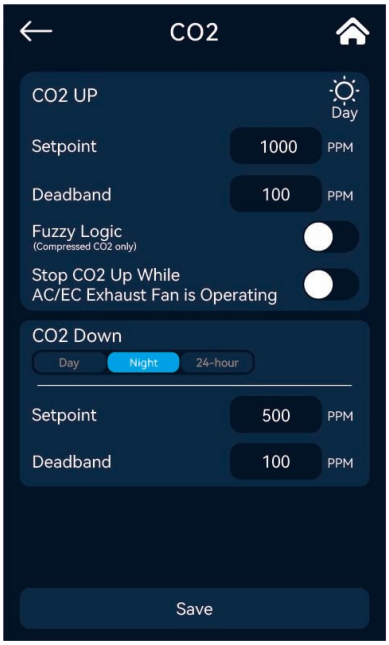
CO2 Up Setpoint: Supplemental CO2 is automatically controlled ONLY during the Day. CO2 "UP" is disabled when the controller is in the Night Mode. Simply enter your "Target" CO2 setting here.

CO2 Up Deadband : Deadband is the difference (+ or – from the target setting) in PPM that determines when the CO2 "UP" device will be activated. Normal deadband settings would be 50-150 PPM.

Fuzzy-Logic: The Fuzzy-logic mode CAN ONLY BE USED WITH COMPRESSED CO2 TANKS. When Fuzzy-logic is selected, the Sentry may quickly turn the CO2 device On / Off in short durations as it uses "Fuzzy-logic" to minimize CO2-PPM overshoot to conserve CO2. ***NOTE: DO NOT select Fuzzy-logic if using a LP or NG fired CO2 generator.**

Stop CO2 UP / CO2-Fan Interlock: The user can choose to disable the CO2 "UP" function if they are using exhaust fans for cooling / dehumidification. When selected, the CO2 will turn off when the fans are operating to conserve CO2.

CO2 settings page / Night



CO2 settings page / 24-hour

The CO2 "DOWN" settings can be selected to operate a fan during the Day, Night or 24 hours. The top image shows the user has selected the "NIGHT" CO2 Down mode. The image to the right shows the same page when the user has selected 24-hour mode. The only difference is when 24-hour mode is selected, the user can select different maximum CO2 PPM settings for the day and night. ***NOTE: Day only CO2 Down mode can also be chosen.***

CO2 Down Setpoint: If you do not want CO2 to go above a certain PPM level, or if you want to "purge" the remaining CO2 when the lights turn off, enter the CO2 limits. Simply enter your "Maximum / highest allowable" CO2 setting here.

CO2 Down Deadband : Deadband is the difference (+ or – from the CO2 Maximum setting) in PPM that determines when the CO2 "DOWN" exhaust fan will be activated. Normal deadband settings would be 100-300 PPM.

Settings – EC Fans

One of the simplest way to control the temperature AND the humidity inside of a closed growing area like a grow tent or small room is to use EC type fan as Exhaust (and/or) Intake fans. EC fans are EXTREMLY efficient when compared with normal AC type fans. More importantly, EC type fans allow full speed control from 0-100% which allows the SEN-1 controller to precisely control the speed of the EC fans in order to accurately control the heat and humidity generated within the closed growing area. The fan speed increases as the temp or humid rises with separate settings for Day and Night. ***NOTE: The SEN-1 / WFAN-1 module controller can control (2) sets of EC fans that use a standard PWM or 0-10v signal for speed control.***

Another way to use EC fans within a growing space is for air circulation using EC fans for internal air movement throughout the plant canopy. Proper air circulation within the growing space is critical. Too much air movement can be as detrimental as not enough air movement. The Sentry allows you to control the speed of your EC circulation fans with separate settings for Day and Night.

To use the EC fan control feature on the SEN-1 controller, you will simply add the WFAN-1 module to your controller system. That module plugs directly into the Sensor / Device port on the SEN-1. Once the WFAN-1 module is connected, the SEN-1 can control 2 sets of EC type fans at the same time to allow the user to choose what works best for them. One EC fan can be set-up to operate based on Temp / Humid, the other EC fan can be set-up to act as circulation fans. Or maybe you have a separate Intake and Exhaust fan… those can be set-up with a slight "lead-lag" speed so that a negative pressure is maintained within the growing space.

WFAN-1 module and connections

The WFAN-1 module connects to the Sensor / Device RJ12 port on the SEN-1. Multiple EC fans can be "daisy-chained" together and controlled by one of the two PWM or 0-10v control signals on the WFAN-1 module. You can use 2-wire low-voltage multi-conductor cable to connect your EC fans to the WFAN-1 module.
NOTE: Do not connect more than (15) EC fans to each channel on the WFAN-1 module.

Each of the two control channels on the WFAN-1 module can control 1-15 EC Fans. When multiple fans are connected together, all of the fans will operate at the same speed. The diagram printed on the lower right corner shows the pin-out connections for the WFAN-1 module.
NOTE: Before connecting your fans, ensure that the fans you want to use have a standard PWM or 0-10v signal for speed control.

WFAN-1 EC Fan module

EC Fan connections

EC Fan, controlled by 0-10V signal

Settings – EC Fans (continued)

There is not a more energy efficient way to provide fresh air for cooling and dehumidification in a closed grow area, than to use 1 or 2 EC fans. Controlling EC fans with the SEN-1 controller is easy, and the options we have provided allow each user to customize how they want to use their EC fans. Even if you are NOT using EC fans for primary cooling, new EC fans are also very effective at providing internal air circulation. Old-school oscillating fans often fail, and are not as efficient at moving air as EC fans. Operating some fans at full power simply provides too much airflow and energy, with no added benefit to the plants. Controlling EC fans at a precise speed from 0-100% speed…. allow YOU to choose the exact amount of air flow needed.

EC Fan settings

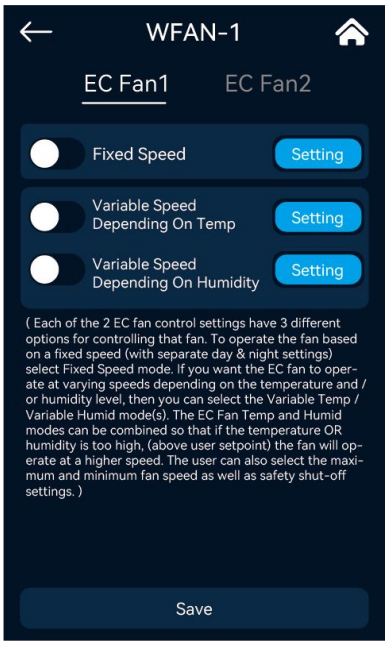
To access the EC fan setting pages, simply touch the EC Fan icon on the Main page of the SEN-1 controller, the page to the right will be shown. You can see at the top there are 2 fans that can be controlled with the WFAN-1 module, EC Fan1 and EC Fan2. On each page you can select the "mode" you want to operate the fan, and the fan settings.

Fixed Speed: This mode simply operates the fan based on a Day / Night setting that you select. This mode cannot be combined with other modes.

Variable Speed (Temperature): Grow lights produce a lot of heat that must be removed. You can control the speed of the EC fan based on the temperature in the grow area. The SEN-1 controller will continuously vary the fan speed to keep the temperature close to the temperature Target setting. This mode CAN be combined with the Humidity mode.

Variable Speed (Humidity): Plants produce a lot of humidity that must be removed. You can control the speed of the EC fan based on the humidity in the grow area. The SEN-1 controller will continuously vary the fan speed to keep the humidity level close to the humidity Target setting. This mode CAN be combined with the Temperature mode.

EC Fan Main page



EC Fan Fixed Speed

When you select "Fixed" Speed mode, the page on the right will be shown. You can select the settings for Day / Night fan speed. You can also select the "minimum" temperature and humidity levels. If the temperature or humidity goes below your setpoints, the fan will turn off.

Speed: Enter the speed of the EC fan for the Day and Night here.

Low-temp shutoff : To ensure the air in the grow area does not get too cold, you can choose a minimum temperature level in this setting. If you set this setting to the minimum number possible, the fan will operate constantly without interruption.

Low-humid shutoff : To ensure the air in the grow area does not get too dry (low humidity), you can choose a minimum humidity level in this setting. If you set this setting to the minimum number possible, the fan will operate constantly without interruption.

Low Shut-Off: The Low temp / humid shutoff can be disabled to allow the fans to operate continuously.

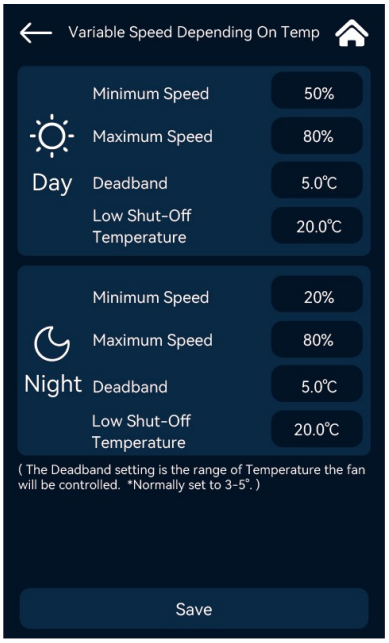
Fixed Speed settings page

Settings – EC Fans (continued)

If you want to use your EC Fan(s) for cooling and / or dehumidification, you will select the Variable Speed Temperature and / or Humidity modes. When you select these modes, the fan speed will automatically increase or decrease based on the Temp and / or Humidity levels. Within the settings for these modes, you can also select the minimum and maximum operating speeds for the fan, as well as a low-temp / low-humid shut-off setting. Separate settings are provided for Day and Night operation to provide proper temperature and humidity changes.

EC Fan Variable Speed / Temperature

Variable / Temp settings page



When you select "Variable Speed Depending on Temp" mode, you will see the page on the right.

Minimum Speed: The minimum speed can be set by the user. If the fan must operate 24/7 even when the temperature is below the Target temp setting, choose the speed the fan will remain operating. Setting to 0% will allow the fan to turn off when it reaches the temperature setpoint.

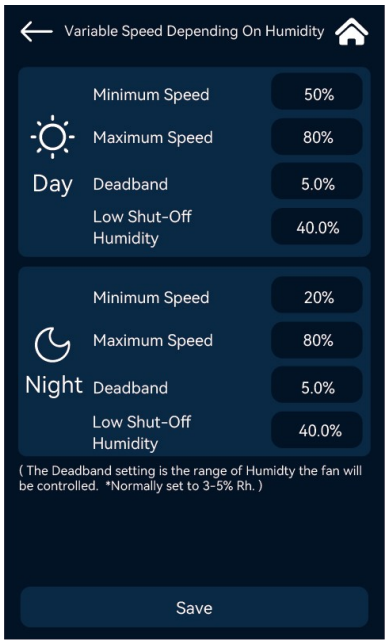
Maximum Speed: If the user does not want the fan to operate above a certain % / speed, they can select the highest allowable % here.

Deadband: The deadband setting = the number of degrees the fan will be allowed to vary its speed. Example: Target temp 80'F, deadband setting 5F, minimum speed 20%, maximum speed 80%. The fan will "ramp-up" speed from 20-80% when the temp ranges from 80' to 85'.

Low-temp shutoff: To ensure the air in the grow area does not get too cold, you can choose a minimum temperature level in this setting.
NOTE: If you NEVER want the fan to turn off, set the "Low Shut-off Temp/Humid" settings to the lowest possible settings.

EC Fan Variable Speed / Humidity

Variable / Humid settings page



When you select "Variable Speed Depending on Humidity" mode, you will see the page on the right.
Minimum Speed: The minimum speed can be set by the user. If the fan must operate 24/7 even when the humidity is below the Target humidity setting, choose the speed the fan will remain operating. Setting to 0% will allow the fan to turn off when it reaches the humidity setpoint.

Maximum Speed: If the user does not want the fan to operate above a certain % / speed, they can select the highest allowable % here.

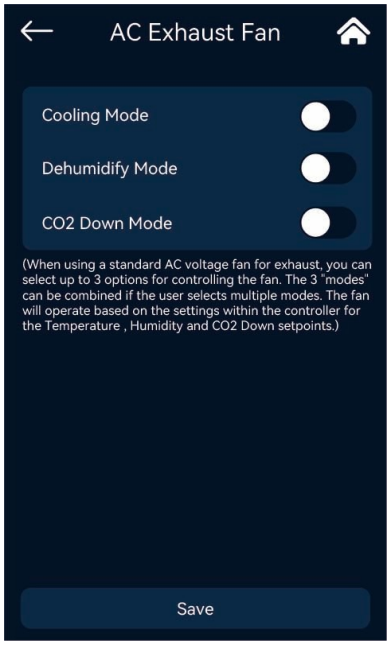
Deadband: The deadband setting = the number of degrees the fan will be allowed to vary its speed. Example, Target humid 60%, deadband setting 5%, minimum speed 20%, maximum speed 80%. The fan will ramp-up in speed from 20-80% if the humid ranges from 60' to 65%.

Low-humidity shutoff: To ensure the air in the grow area does not get too dry, you can choose a minimum humidity level in this setting.
NOTE: If you NEVER want the fan to turn off, set the "Low Shut-off Temp/Humid" settings to the lowest possible settings.

Settings – AC Exhaust Fans

“Standard” AC type fans): When using standard AC voltage fans (shaded pole or other) the user can select to use the AC Fan Mode. Standard fans can be used to exchange air within a growing space, or for internal circulation. When controlling these types of fans connected to one of the SENTRY power outlets (or expansion modules) the SENTRY will turn the fan On and Off based on Target setpoints the user can select for temperature, humidity, CO2 PPM and by time. ***NOTE: Refer the pages 13- 15 Device Mode Selections for more info about how to assign each outlet / output function before attempting to enter these settings.***

AC Fan settings page



When selecting the AC Fan mode for a specific outlet on the SEN-1, plug-in or an expansion module, you can select how that fan will be activated.

Pressing the right arrow next to the AC Fan Mode on the Device Mode page will bring up the page on the right. This page shows the 3 options that can be selected. Each option links that AC Fan selected by the user to respond based on information coming from one of the integrated sensors inside the SENTRY 4-in-1 sensor. ***NOTE: The user can select more than one option to control their AC Fan.***

Cooling Mode: The Cooling mode will activate the AC fan whenever the temperature goes over the SENTRY Target setpoint. (Temperature + Temp deadband). Example, if the user’s temp setting is 80’F with a deadband of 3’F, when the temperature exceeds 80+3 = 83’F, the AC Fan will be turned on. The fan will continue to run until the temperature drops back down 3’F (the deadband setting) to 80’F and then the fan will be shut off. This process repeats to allow the fan to control the temperature. ***NOTE: Do not set the deadband lower than 2-3’ to prevent “quick-cycling” on/off of the fan.***

Dehumidify Mode: The Dehumidify mode will activate the AC fan whenever the humidity level goes over the SENTRY Target setpoint. (Humidity + Humid deadband). Example, if the user’s temp setting is 65% with a deadband of 3% Rh, when the humidity exceeds 65+3 = 68%, the AC Fan will be turned on. The fan will continue to run until the temperature drops back down 3% (the deadband setting) to 65% and then the fan will be shut off. This process repeats to allow the fan to control the humidity. ***NOTE: Do not set the deadband lower than 2-3% to prevent “quick-cycling” on/off of the fan.***

CO2 Down Mode: Occasionally a user may want to reduce the CO2 level within the grow space using an exhaust fan. (CO2 + CO2 deadband). Example, if the user’s night CO2 setting is 600 ppm with a deadband of 50 ppm, if the CO2 level exceeds 600+50 = 650 PPM the AC Fan will be turned on. The fan will continue to run until the CO2 drops back down to 600 PPM or below and then the fan will be shut off. This process repeats to allow the fan to control the CO2. ***NOTE: There are separate settings for the Day and Night CO2 levels.***

NOTE: When connecting and controlling “Standard” AC voltage fans, the SENTRY controller will turn them On and Off, there is no speed control on the AC type fans.

If you want to have variable speed control for your fans, you can use the WFAN-1 module to control EC type fans EC Fans can be speed controlled by the SENTRY. See EC Fan Settings for details.

Settings – Schedule Timers

The 6 outputs built into the SEN-1 controller and optional plug device modules can be configured to perform 11 different functions. Those functions include timer control for the devices connected to each outlet / output. To control devices and equipment by "time" the SENTRY has included two types of timers to choose from, Scheduled and Recycling. First we will look at Schedule timers. Schedule timers allow the user to specify an exact Time of Day and timer "On" Duration for up to 18 timed events each day.
NOTE: Refer the pages 13- 15 Device Mode Selections for more info about how to assign each outlet / output function before attempting to enter these settings.

Scheduled timer Main page

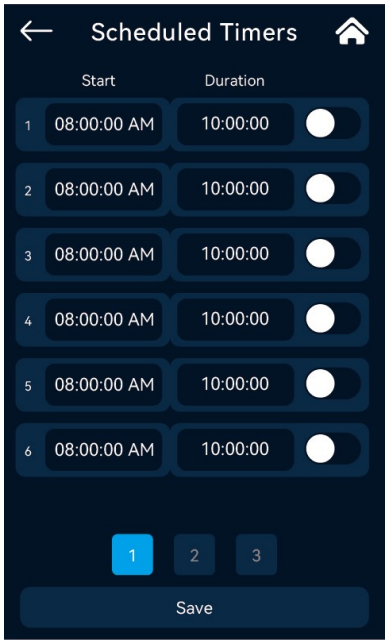
Scheduled timer settings

All of the assignable devices / outputs on the SEN-1 controller are accessed from the Sensors/Devices tab on the Main page The page on the right will be shown when you have assigned an outlet / output on the controller or expansion module to be a Scheduled timer.
NOTE: Refer to pages 13-15 to learn how to assign each device.

Operation Day of Week: Schedule timers allow the user to select specific days of the week they want the timer to operate. This is helpful when a timed event needs to occur on specific days. If you want the timed event to occur every day, simply select all 7 days.
Main Irrigation Device: Timers that control irrigation pumps or valves can be linked to the optional SWLK-1 leak sensor. If the leak sensor detects a water leak, an alarm is triggered locally and on the app, and if this option is selected, the device connected to this output will be turned off until the leak is resolved.

NOTE: If you select a device to be a Main Irrigation Device, the leak sensor will shut off that device if a leak is detected and the device will remain off until the leak is fixed and the leak sensor detects no leak.

Schedule timers page 1 of 3



Setting the Schedule timers

When you touch the "Timer Settings" tab on the previous page, you will see the page on the right appear. This first page shows the first (6) settings available for this device output. There are a total of 18 timers that can be selected, the other timers are shown when you touch the page 2 and 3 tabs.

Start: Specify the exact time of Day you want the timed event to "Start".

Duration: The 2nd setting on each line determines how long the device will be turned On for.

Timer Selection: The small blue "switch" to the right of each timer setting allows the user to activate, or de-activate each timer setting.

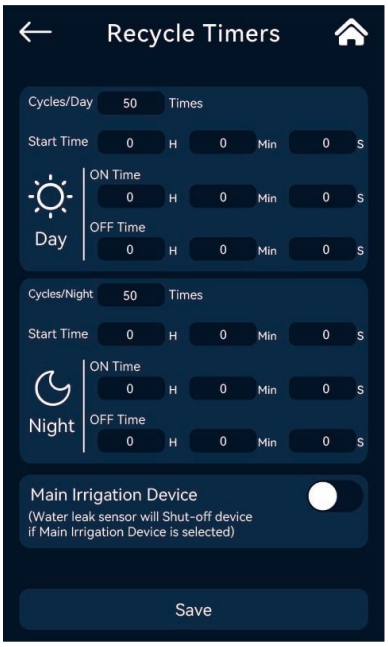
NOTE: If you select a device to be a Main Irrigation Device, the leak sensor will shut off that device if a leak is detected and the device will remain off until the leak is fixed and the leak sensor detects no leak.
THIS MEANS THAT YOUR PLANTS MAY NOT GET WATER IF THE LEAK IS NOT RESOLVED QUICKLY.

Settings – Schedule Timers (continued)

The 6 outputs built into the SEN-1 controller and optional plug device modules can be configured to perform 11 different functions. Those functions include timer control for the devices connected to each outlet / output. To control devices and equipment by "time" the SENTRY has included two types of timers to choose from, Scheduled and Recycling. Let's take a look at the Recycling timer settings. Recycling timers are timers that repeat on a specific schedule you determine. They are easy to use and can adjusted quickly providing great flexibility when used for irrigation or ventilation events that have to re-occur.

Settings – Recycle Timers

Recycling timer settings



All of the assignable devices / outputs on the SEN-1 controller are accessed from the Sensors/Devices tab on the Main page The page on the right will be shown when you have assigned an outlet / output on the controller or expansion module to be a Recycle timer**.** Each Recycling timer controlled device can have separate settings for the Day and Night.
NOTE: Refer to pages 13-15 to learn how to assign each device.

Cycles/Day: The recycling timer can be selected to operate (turn On) multiple times each 24-hour "Day", or just once. The Cycles/Day setting allows the user to decide how many times the timer will trigger before it is disabled until the next "Day".
NOTE: The user can select to only operate the device during the Day or Night by entering a "0" within the Cycles/Day setting.

Start Time: Here you can specify the exact Time of Day you want the timer to begin to Recycle On / Off. Enter the time you want the first On event to take place.

On Time: This is the amount of time you want to activate (Turn ON) the device controlled by this timer. You can select the amount of time in hours, minutes and seconds. (Minimum 3 sec, Maximum 96 hours)

Off Time: This is the amount of time you want to de-activate (Turn OFF) the device controlled by this timer. You can select the amount of time in hours, minutes and seconds. (Minimum 3 sec, Maximum 96 hours)

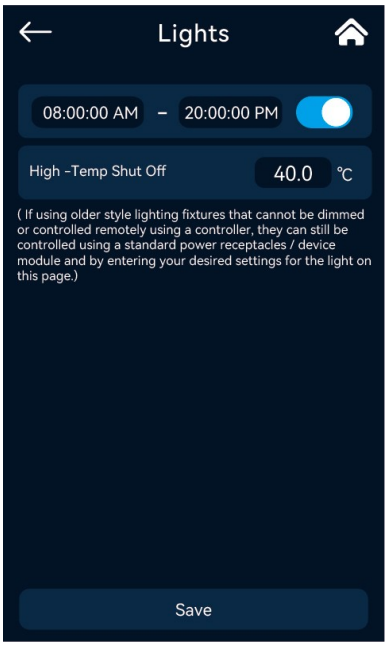
Main Irrigation Device: Timers that control irrigation pumps or valves can be linked to the optional SWLK-1 leak sensor. If the leak sensor detects a water leak, an alarm is triggered locally and on the app, and if this option is selected, the device connected to this output will be turned off until the leak is resolved. This can prevent some flooding situations.

NOTE: If you select a device to be a Main Irrigation Device, the leak sensor will shut off that device if a leak is detected and the device will remain off until the leak is fixed and the leak sensor detects no leak.
THIS MEANS THAT YOUR PLANTS MAY NOT GET WATER IF THE LEAK IS NOT RESOLVED QUICKLY.

Settings – Lights On/Off control

Some older style lights DO NOT have a 0-10v option to control the brightness or to turn them On & Off. Those lights can still be controlled by the SEN-1 using the Lights control mode. The older style light can then be plugged into one of the built-in outlets on the SEN-1 controller, or they can be plugged into the optional QUAD-1 expansion module, or even the PDM module.

Lights (Old style) page



Lights (Old style) settings

The page on the right will be shown when you have assigned an outlet / output on the controller or expansion module to control an older style light fixture that cannot be dimmed or controlled with a 0-10v signal.
NOTE: Refer to Devices / Device modules to learn how to assign each device mode.

Light On / Off time: There are two timer setting that control when the light will be turned On and Off. The first timer determines when the light will turn On, the 2nd timer determines the Off time.

Lights Enable / Disable: To temporarily turn off the lights, you can disable the lights by moving the selector switch to the left.

HID/LED Mode: Select the type of lights you will be using, HID or LED.
NOTE: The HID mode adds a pre-set 15-minute "hot-start" delay time to protect your HID lamps.

High-Temp shut off: To prevent the growing area from getting too hot, you can select the temperature that you want to shut off the lights to reduce the heat within the area. If the temp reaches this Maximum limit, an alarm will be triggered on the controller and within the app. The lights will be automatically turned off until the temperature drops 3'F / 1.5'C to a safe level.

Controlling MULTIPLE Lights (Older style lights)

To control MULTIPLE older style lights, you can use the PEXP module which has 4x 120/240v outlets, or to control even more lights you can use 3rd party "master lighting controllers" that can be activated with a single 120/240v "Trigger" signal.

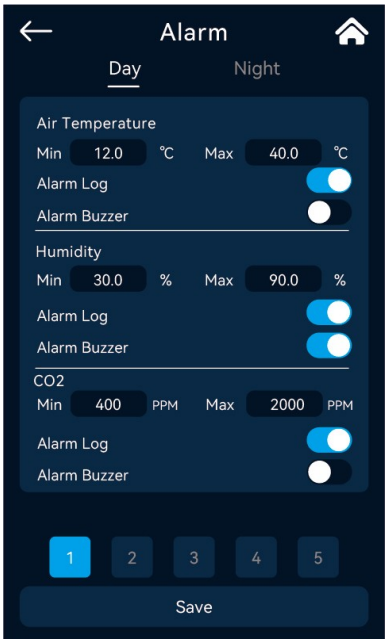
The SEN-1 can provide a "trigger" signal to your lighting expansion module from one of the powered outlets, or you can use one of the optional PDM, PDC or PLV device modules. The device module you will be using to activate the "trigger" cable on the expansion module can be set-up per the settings shown above.

NOTE: Ensure you are using the correct voltage / device module when operating the "trigger" on a 3rd party master lighting controller.

Settings – Alarm Settings

The Sentry's first priority is to continuously control all of the connected devices. It's 2nd priority is to constantly monitor the sensors connected to the Sentry controller. It compares all of the measured parameters like Air Temperature, Humidity, VPD, VWC, pH, EC, CO2… to preset Minimum and Maximum "Alarm" limits determined by the user. If the controller detects a problem within the room, it will trigger an Alarm condition. You can select the settings for those Alarm settings and also decide how the Sentry will notify the user.
NOTE: The Alarm settings are located within the System Settings on page #2. From the Home page, touch the System Settings icon, then go to the 2nd page and touch the Alarms icon.

Alarm settings page 1



Alarm settings / Air Temp-Humid-CO2-VPD

To access Alarm page (Home page- System Settings – Page 2 –Alarm)

The page on the right will be shown when you access the Alarm settings. On page 1 of the Alarm settings you will see the first of 14 Alarm settings that can be selected.

To access the settings on pages 2-5, touch each of the "page" icons at the bottom of the page.

There are separate Day and Night Alarm setpoints for Air temperature, Humidity, CO2 and VPD. Select the Day or Night at the top of page 1 & 2 to access all of the settings.

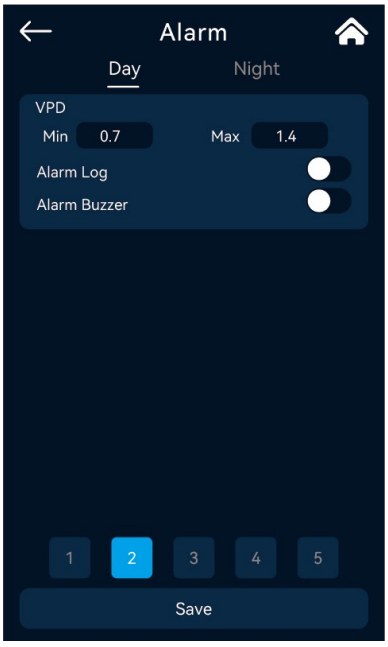
Air Temperature: Select the Min and max allowable air temperature.

Humidity: Select the Min and max allowable Air humidity (Rh) level.

CO2 level (PPM): Select the Min and max allowable CO2 level.

Air VPD: Select the Min and max allowable air VPD level. (page 2)

Alarm settings page 2



Alarm Notifications:
Each Alarm condition also allows the user to decide "how" they will be notified of Alarm condition.
NOTE: If you do not want to monitor one or more of the alarm conditions, leave both selector switches OFF. ALL alarm conditions will still be shown on the Alarm Log, but the Alarm "Bell" icon and the External alarm will not turn on when both options are selected Off.

Alarm Log: By selecting "Alarm Log", the Alarm will be sent through the App as a notification, and on shown on the SEN-1.

Alarm Buzzer: Selecting Alarm Buzzer will activate the optional "External alarm" audio-visual alarm module.

Alarm settings / Water Temp – EC - pH

To access Alarm page (Home page - System Settings – Page 2 –Alarm)

Page 3 of the Alarm settings you will see the settings for the optional SWAT-1 sensors that measure Water temperature, EC and pH. Those sensors can be installed in a stock tank with nutrient water, or connected inline with existing nutrient dosing plumbing to monitor your feed water.

Water Temperature: Select the Min and max allowable water temperature.

Water EC: Select the Min and max allowable EC level.

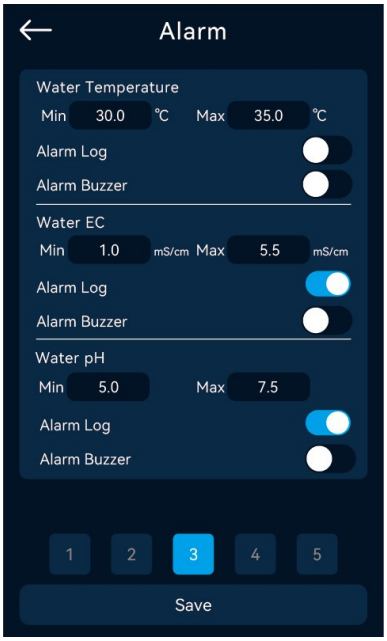
Water pH: Select the Min and max allowable pH level.

Alarm Notifications:
Each Alarm condition also allows the user to decide "how" they will be notified of Alarm condition.
NOTE: If you do not want to monitor one or more of the alarm conditions, leave both selector switches OFF. ALL alarm conditions will still be shown on the Alarm Log, but the Alarm "Bell" icon and the External alarm will not turn on when both options are selected Off.

Alarm Log: By selecting "Alarm Log", the Alarm will be sent through the App as a notification, and on shown on the SEN-1.

Alarm Buzzer: Selecting Alarm Buzzer will activate the optional "External alarm" audio-visual alarm module.

Alarm settings page 3



Alarm settings / Water Temp – EC - pH

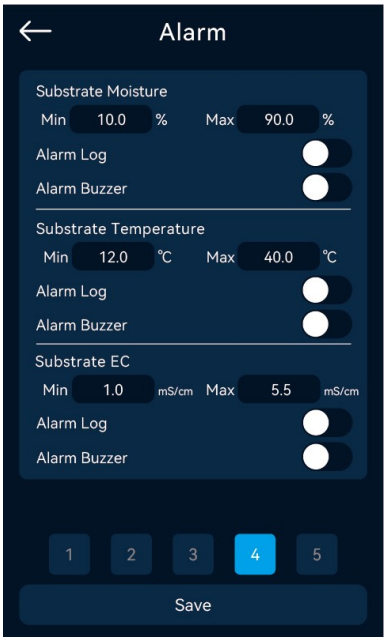
Page 4 of the Alarm settings shows the settings for the optional SMED-1 sensor that measure your grow substrate's VWC (moisture), EC and temp. The sensor is inserted directly into a sample plant's substrate / grow media, and will constantly monitor irrigation events, dry-back and substrate EC & temperature.

Substrate moisture: Select the Min and max allowable substrate VWC / moisture level in %.

Substrate Temp: Select the Min and max allowable substrate temp.

Substrate EC: Select the Min and max allowable substrate EC level.

Alarm settings page 4



Alarm settings / Smoke – Water Leak – Sensors & Devices (offline)

To access Alarm page (Home page - System Settings – Page 2 –Alarm)

Page 5 of the Alarm settings has the "special" Alarm conditions that the SEN-1 watches for. These alarm conditions do not require a Minimum / Maximum setting. The user will decide what will happen if these Alarm conditions are detected by the controller, and what actions will be taken.

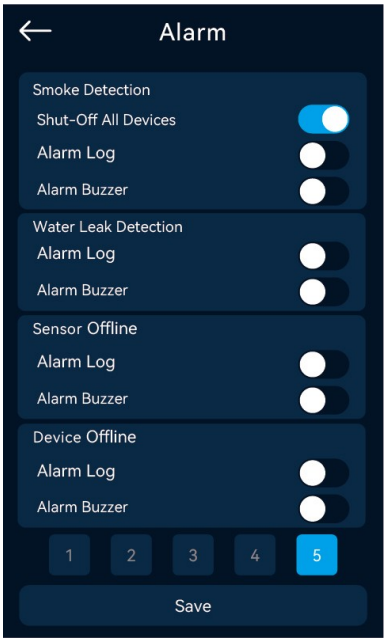
Smoke Detection: If you are using the optional SSMK-1 Smoke detector sensor, you can select what happens if smoke is detected within the area. For safety, some regulations require that the equipment within the area is turned OFF in the event of Smoke / Fire. Selecting "Shut-Off All Devices" will disable all of the connected equipment until the Smoke detector is cleared.

Water Leak Detection: When using the optional SWLK-1 water leak sensor, if a leak is detected you can select which notifications to occur. ***NOTE: You can also "assign" one of more irrigation devices to be disabled to prevent flooding. Refer to the Timers section to learn more about using the leak sensor to disable a pump or solenoid valve, "Main Irrigation Device".***

Sensor Offline: The SEN-1 controller constantly monitors the data coming from each of the connected sensors, if a fault or problem occurs, loss of communications etc, the controller can notify you.

Device Offline: The SEN-1 controller constantly monitors all of the optional Device modules that are connected to the SEN-1. If a fault or problem occurs, loss of communications etc, the controller can notify you.

Alarm settings page 5



Using the APP / External Alarm & ALM-1 function for Alarm notifications

Anytime a new Alarm condition is detected, the SEN-1 will show the **RED BELL** symbol in the upper right corner of the Home screen. Touching the bell will then open the alarm Log. (The alarm log can also be accessed by touching the Historical Data button)
NOTE: If the optional ALM-1 External Alarm is installed, when a new alarm is detected and displayed, the External Alarm output will be turned on to activate the ALM-1 audio-visual alarm. Touching the RED BELL symbol on the Home screen will instantly silence the alarm and allow time for the problem to be addressed.

The alarm settings are NOTHING without also having intelligent methods to immediately notify users to a potential problem. Croptiva provides multiple options to allow each user to determine how each alarm will be handled.

1) One option is to receive IM using the APP. If the user selects "APP" notification, when a new alarm condition occurs, the SEN-1 will notify the user registered to the APP. The SEN-1 and APP has been designed to repeat the alarms every 15-minutes if the alarm condition remains.

2) Another option is to assign one of the SEN-1 outputs to be an External alarm output to activate the ALM-1 module. The ALM-1 module is a 24vdc audio-visual alarm module. When an alarm condition is triggered, if that alarm condition is selected to activate the External Alarm, the ALM-1 would be flashing / beeping.
NOTE: If the optional ALM-1 External Alarm is installed, when a new alarm is detected and displayed, the External Alarm output will be turned on to activate the ALM-1 audio-visual alarm. Touching the RED BELL symbol on the Home screen will instantly silence the alarm and allow time for the problem to be addressed.

Croptiva's intelligent alarm functions allows each customer to choose to assign only certain alarm conditions like the Smoke and Water Leak sensors to activate the ALM-1 / External Alarm. Optionally, some or ALL of the other alarm conditions can be selected to activate the External Alarm so that anytime a critical problem is detected, the user will be notified right away.

Historical Data / Alarm log

As discussed in the previous Alarm section, the Sentry is constantly watching out for problems. Sometimes the problems are recorded when no one is present. The Alarm log provides a list of the most recent Alarm conditions recorded so that the user can address the problems when possible.

The Sentry also records the Minimum and Maximum recorder values for all connected sensors. That quickly allows the user to check how the area performed. Those recorded values can be reset by the user when needed.
NOTE: The Historical data (Min-Max values) and Alarm Log are accessed directly from the Main page. You can view the Alarm Log, or the Min-Max recorder data at the top of the Historical Data page shown below.

Alarm Log page

Alarm Log

Recent Alarms will be shown on the page to the right. Older alarms are replaced with the newest alarms so that the list is always current. You can also scroll Left – Right at the bottom of the page to see older Alarms. Once an alarm is triggered, it will not repeat for 15-minutes. If after 15-minutes the condition remains, the alarm will be triggered again.

NOTE: Occasionally while viewing the Alarm log you might find the Alarm Log is trying to update and may not show all recent alarms. To refresh the log touch the "Min-Max" icon and then go back to the Alarm Log to see all of the stored alarms.

NOTE: For a list of all of the alarm messages, their meanings and how to resolve problems, refer to Alarm codes.

Historical Data / Min-Max recorded data

The pages here contain all of the recorded sensor data. Data is saved until the user reset the recoded values.
(Home page – Historical Data – Min-Max (24 hours)

Touch the Min-Max (24-hours) icon at the top of the Historical Data page to view.
NOTE: There are 2 pages of Min-Max historical data to view. Select the pages at the bottom of the page.

You can view these recorded values and then reset them daily. That allows you to quickly review the "high and low" recorded values and the time the value was recorded over the past 24-hours.

Min-Max page 1

Min-Max values / Air Temp - Humid - CO2 – PAR - VPD

Temp: Min / Max recorded Air temperature (F or C)

Humid: Min / Max recorded Air humidity (Rh)

CO2: Min / Max recorded CO2 level (PPM)

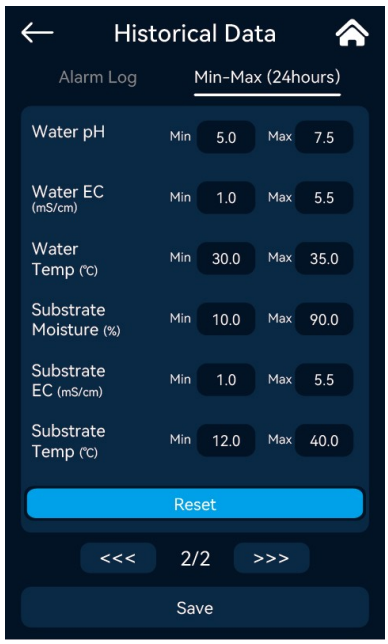
PAR: Min / Max recorded Light level (PPFD / umol/s2)

Temp: Min / Max recorded Vapor Pressure Deficit (kpa)

NOTE: Press reset to reset the recorded values.

NOTE: Switch from Page 1 & 2 at the bottom using the arrows.

Min-Max page 2



Min-Max values / Air Temp - Humid - CO2 – PAR - VPD

Water pH: Min / Max recorded water pH (pH)

Water EC: Min / Max recorded Air water EC (mS/cm)

Water Temp: Min / Max recorded water temperature (F or C)

Substrate Moisture: Min / Max recorded substrate VWC (pore)

Substrate EC: Min / Max recorded substrate EC (mS/cm)

Substrate Temp: Min / Max recorded substrate temperature (F or C)

NOTE: Press reset to reset the recorded values.

Maintenance - Reminders

Instead of trying to remember all of the things that need to be done for your plants on a regular basis, Croptiva has incorporated the Maintenance Reminders. Some of the most common tasks are listed for the user to use as helpful reminders. The length of time, (days / weeks) between reminders are up to the user to decide. The user chooses how the reminders will be displayed. When a reminder event occurs, the SEN-1 will show an Alert on the controller, and / or though the App. When the task is complete, the user can reset the reminder.
NOTE: To access the Maintenance pages: (Home page - System Settings – Page 3 – Maintenance Reminder)

User selectable Maintenance Reminders

The page on the right will be shown when you access the Maintenance Reminders. There are (3) pages of different "tasks" that you can select from. To activate a reminder, "push" the selector switch to the right.

Page 1

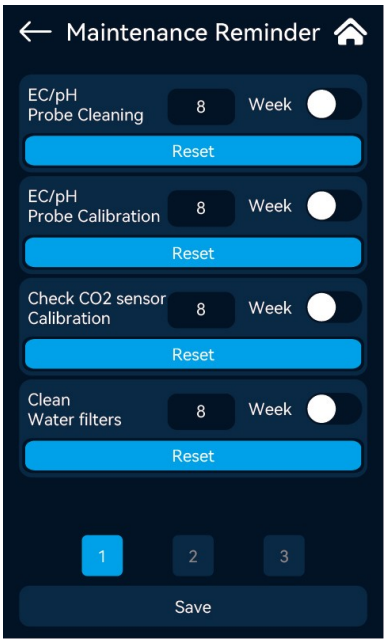
EC / pH Probe Cleaning: Probes should be checked for debris or build-up approximately every 4-6 weeks.

EC / pH Probe Calibration: Probes should be calibrated approximately every 4-12 weeks.

Check CO2 Sensor Calibration: If your sensors are kept clean and dry (not abused), CO2 sensors do not need frequent calibration. All CO2 sensors experience some "annual drift". Checking and recalibrating the CO2 sensors every year (52 weeks) is a good practice.

Clean Water Filters: If you have water filters or traps that need to be cleaned out, set your reminder here.

Reminders page 1



Page 2

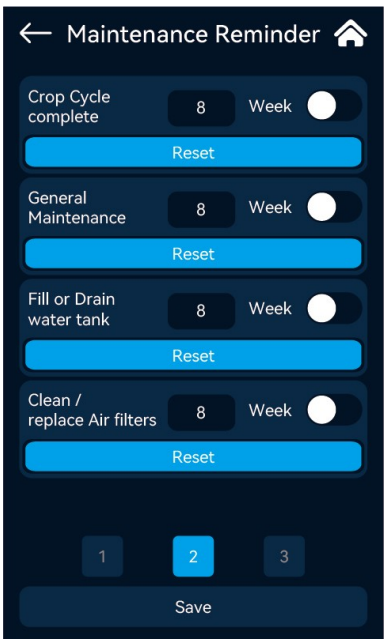
Crop Cycle complete: You can select when the crop will be completed. Use the "Reset" to start the reminder cycle.

General Maintenance: Can be a "custom" reminder that you create for a specific purpose.

Fill / Drain Water tanks: If you have to top-off or drain and fill water tanks on a regular basis, you can set this reminder.

Clean / Replace Air Filters: If you have air filters that need to be replaced or cleaned out, set your reminder here.

Reminders page 2

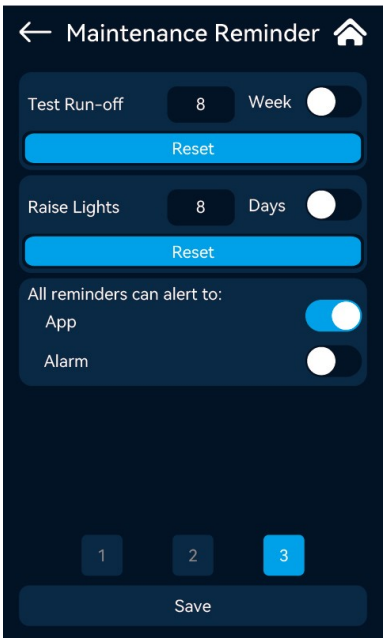


Maintenance – Reminders (continued)

User selectable Maintenance Reminders (continued)

Page 3

Reminders page 3



Test Run-off: Testing the water "run-off" at regular intervals provides a critical "window" into the health of the root zone and grow media.

Raise Lights: Plants can grow vertically at fast rates. To make sure the plants do not get too much light, too close to the lights, this reminder can be set to make sure you are paying attention to the light level and spacing between your plants and the lights.

All Reminders Alert: The user can choose how the reminders will be displayed. When a reminder event occurs, the SEN-1 will show an Alert on the controller, and / or though the App. When the task is complete, the user can reset the reminder.

Manual Override – Auto mode

Normally all of the power outlets built into the SEN-1 and all of the optional device modules will be operating in Automatic mode. That simply means that the SEN-1 controller is "automatically" controlling the On / Off cycle of each device by using the settings entered by the user. There are some times when the user might want to test one of more devices, or "Force" a device to remain off. The Manual Override function allows the user to "override" the automatic control. BE CAREFUL when using the manual override because the controller is no longer controlling that device.
NOTE: To access the Manual Override pages: (Home page - System Settings – Page 2 – Manual Override)

Manual Override Main page

Using the Manual Override page

The Main page on the right will be shown when you access the Manual override function from page #2 of System Settings. You can access each of the device outputs by selecting the blue triangle for the device you want to override.

SEN-1: There are (6) outputs on the SEN-1 main controller.

WMINI: The mini-split AC module does not requiring testing, but the AC could be turned off.

WFAN: You can override each of the two EC fans connected to the WFAN module.

QUAD: There are (4) outputs on the QUAD expansion module.

LA: The lights connected to the LA module can be manually controlled.

PDM/PLV/PDC: The optional plug-in module has a single output.

SEN-1 Manual Override page

SEN-1 manual override

The page on the right will be shown when you select the SEN-1 from the Manual Override Main page. ***NOTE: On the left side of the page you see the status indicators for each output. A green LED means the output is on, a red LED means the output is OFF.***
There are a total of (6) outputs on the SEN-1, (4) plug-in and (2) dry-contact outputs. Each of the outputs has the Manual override option.
NOTE: BE CAREFUL when using the Manual Override because the controller is NOT controlling the devices connected when override is used.

Auto: The default setting for ALL outputs is the Auto mode. Leave all of the devices in this mode unless monitoring the manual override functions.

M-ON: M-ON = Override Manual On. Only use this Manual On mode for testing and do not forget to return it to Auto mode after testing.

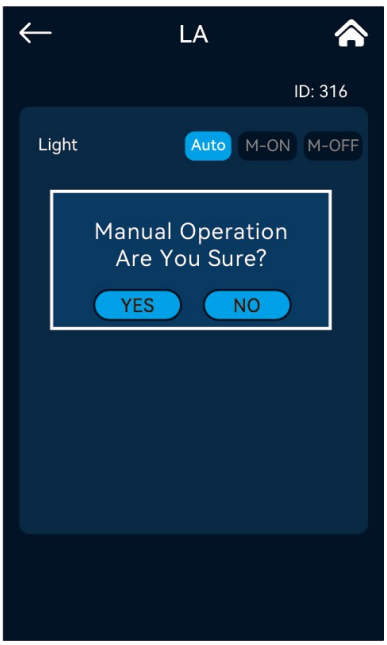
M-OFF: M-ON = Override Manual Off. You can select to turn a device OFF using the override. If the device is critical to normal operation, leave the device in Auto mode.

Manual Override (continued)

Optional Device modules manual override

The Manual Override function allows the user to "override" the automatic control. BE CAREFUL when using the manual override because the controller is no longer controlling that device.
NOTE: To access the Manual Override pages: (Home page - System Settings – Page 2 – Manual Override)

LA Manual Override page



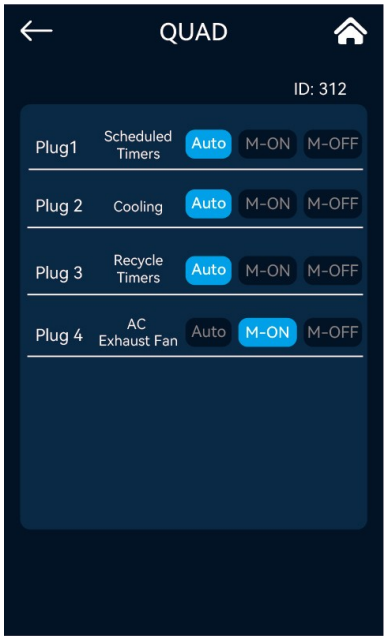
*** NOTE: When changing from Auto to Manual Override, you will be asked to confirm the operation.**

Auto: The default setting for ALL outputs is the Auto mode. Leave all of the devices in this mode unless monitoring the manual override functions.

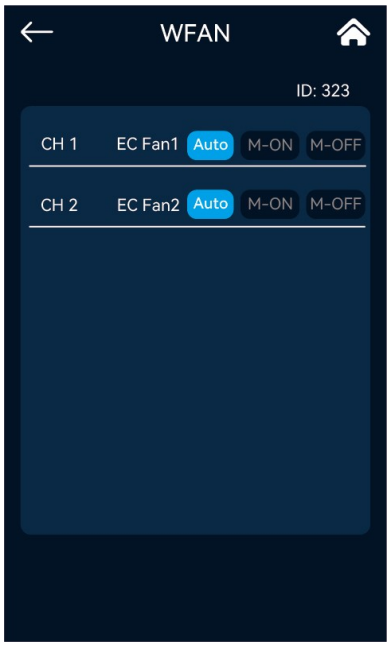
M-ON: M-ON = Override Manual On. Only use this Manual On mode for testing and do not forget to return it to Auto mode after testing.

M-OFF: M-ON = Override Manual Off. You can select to turn a device OFF using the override. If the device is critical to normal operation, leave the device in Auto mode.

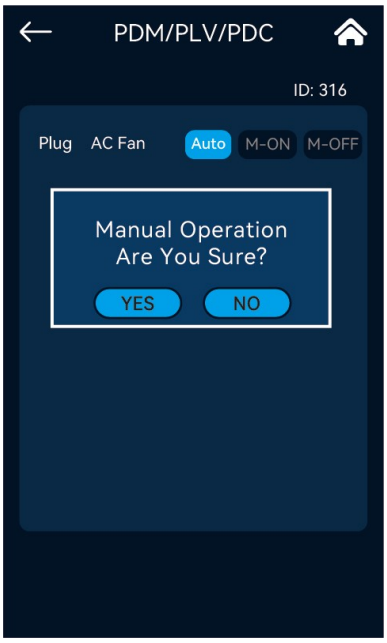
QUAD Override Main page



WFAN Manual Override



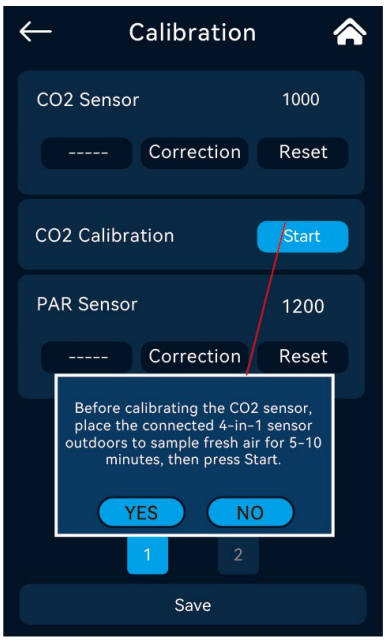
Plug-in Manual Override page



Calibration - Sensors

Most of the sensors used with the SEN-1 controller DO NOT require any calibration. But some of the sensors might need to be calibrated by the user. There are correct ways to calibrate the sensors, and the proper steps MUST be taken in order to provide accurate calibration.
NOTE: To access the Calibration pages: (Home page - System Settings – Page 3 – Calibration)

Calibration page 1



Calibrating the CO2 sensor

Calibration page 1 will be shown when you access the Calibration page from page #3 of System Settings. Page 1 has the CO2 and PAR sensors. Page 2 has the Water pH / EC sensor calibration.

CO2 PPM sensor: If your sensors are kept clean and dry (not abused), CO2 sensors do not need frequent calibration. However all CO2 sensors experience some "annual drift". Checking and recalibrating the CO2 sensors every year (52 weeks) is a good practice.

To Check the CO2 sensor: If you are unsure if your CO2 sensor is reading the PPM level correctly, you can perform a sensor "test" and then calibrate the sensor if necessary.
1) You will need to temporarily place the 4-in-1 SAIR-1 sensor outdoors where it can be exposed to "ambient / outdoor" levels of CO2 of approximately 425 PPM. The sensor must be powered and connected to the SEN-1 controller while checking the CO2 sensor. Use longer RJ cables to allow the sensor to be placed outside a window or door.
2) Leave the sensor connected to the SEN-1 controller and running for about 15-20 minutes to allow it time to stabilize. (Do not breathe on or around the sensor while it is stabilizing)
3) After waiting 15-20 minutes, check the reading from the CO2 PPM sensor on the SEN-1 controller screen. It should be reading between 390-460PPM. If it is, then the sensor is performing correctly and DOES NOT need to be calibrated.

Calibrating the CO2 sensor: If the sensor was reading below 390 or above 460 PPM, you can choose to recalibrate the sensor.
1) Make sure the sensor is outdoors and AWAY from all people, pets.
2) Leave the sensor connected to the SEN-1 controller and running for about 5-10 minutes to allow it time to stabilize.
3) To start the calibration process, press the Start and then the YES buttons as shown on the right.
4) Do not go near the sensor while the calibration is in process. When calibration is complete, the sensor will begin reading again and should read between 390 and 460 PPM.

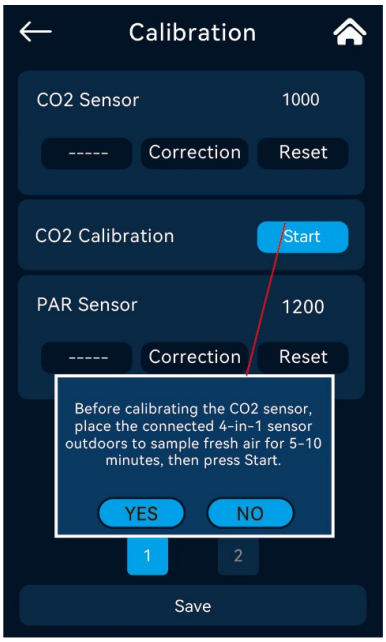
Correction & Reset: If you have a 2nd CO2 sensor you want to use as a reference to re-set the Croptiva CO2 sensor, you can use the Correction feature to "match" the CO2 readings from the 2 sensors. The other option is to Reset the CO2 calibration to its original factory settings.
***NOTE: The CO2 sensor can also be returned to its factory calibration by using the "Reset" button**.*

Calibration – Sensors (continued)

NOTE: To access the Calibration pages: (Home page - System Settings – Page 3 – Calibration)

Calibrating the PAR sensor

Calibration page 1



The 2nd sensor on page #1 of Calibration is the optional PAR sensor.

PAR sensor: The optional PAR sensor should be kept clean and dry. If you will be spraying anything in the area, use the provided cover to protect the sensitive light filter / element from being permanently discolored or damaged. Normally the PAR sensor will NOT require calibration. However, we have provided that option if the user choose to calibrate the SPAR-1 sensor using another PAR sensor as the "reference" value.
NOTE: In order to calibrate the PAR sensor, you must have another PAR sensor that you are sure is providing accurate reference readings. The PAR sensor will be calibrated using the other sensor as a reference so if it is wrong, the new calibration will also be wrong.

To Check the PAR sensor: If you are unsure if your PAR sensor is reading the PPFD / light level correctly, and you have another PAR sensor you will be using as a reference, you can perform a sensor "test" and then enter a "correction" to calibrate the SPAR-1 sensor if necessary.
1) You will need to temporarily place the PAR sensors under a light source that is consistent.
2) Place BOTH PAR sensors as close together as possible. They both need to be receiving the same amount of light.
3) If the light readings are +/- 5% of each other, the PAR sensors are probably reading correctly and are within the +/- tolerance. If the readings are widely different and you are SURE the reference sensor value is correct, you can choose to calibrate the SPAR-1 sensor.

Calibrating the PAR sensor: If you want to calibrate the SPAR-1 sensor, leave the two PAR sensors side-by-side.
1) The SPAR-1 current sensor is shown on the page on the right. Using the reference PAR sensor reading (PPFD), enter the "new" calibration number (PPFD) you want to show as the current reading on the SEN-1.
2) Press Correction and then enter the new PPFD reading you want to use.
3) The new adjusted PPFD will be shown.
NOTE: The PAR sensor can also be returned to its factory calibration by using the "Reset" button.

Calibration – Sensors (continued)

NOTE: To access the Calibration pages: (Home page - System Settings – Page 3 – Calibration – Page 2)

Calibrating the pH / EC sensors

The best way to calibrate the pH / EC sensors is by using the SWAT-1 module instead of using the SEN-1. The SWAT-1 has a LCD display and 3 buttons allowing easier calibration because the SWAT-1 is ALWAYS close to the probes that need to be handled during calibration. Refer to the SWAT-1 instructions for details. If you still want to calibrate using the SEN-1, continue reading below.

In order to calibrate the EC & pH sensors, you must first have the correct "calibration solution". We suggest using pH 4.0 and 7.0, and EC 1.41mS/cm.

To calibrate the EC sensor: Ensure the probes are free of debris and rinsed with clean water.
1) You can first do a "zero" calibration by removing all liquid from the probe / tip and leaving the probe in open "air". Press the EC (0) Calibration button to calibrate the probe to 0.
2) Next, prepare your sample of 1.41 mS/cm calibration solution.
3) Place the EC probe into the calibration solution and mix slowly to ensure full saturation. Allow time for the reading to stabilize.
NOTE: If the reading shown on the calibration page is close enough to your calibration solution, you may not have to perform the calibration.
4) To calibrate the probe, select the 1.41 mS/cm value, and then press Calibrate.

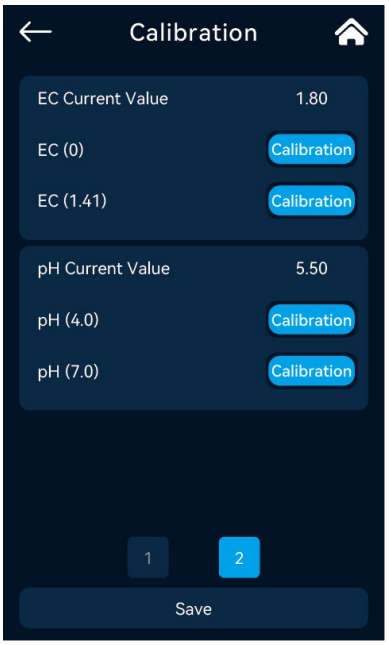
NOTE: If the sensor will not calibrate correctly, or will not remain in calibration for very long, the sensor could be failing and needs to be replaced.

To calibrate the pH sensor: Ensure the probes are free of debris and rinsed with clean water. It is best to do a "2-point" calibration of the pH sensor. First calibrate at 7.0, then at 4.0.
1) First do the 7.0 calibration. Prepare your sample of 7.0 pH calibration solution.
2) Place the pH probe into the calibration solution and mix or shake to ensure full saturation.
NOTE: If the reading shown on the calibration page is close enough to your calibration solution, you may not have to perform the calibration.
3) To calibrate the probe to 7.0, push the 7.0 pH Calibration button. When complete the reading on the page should be 6.9-7.1 pH.
4) For best accuracy, you can now rinse off the probe and repeat the calibration process for the 4.0 solution.
5) To calibrate the probe to 4.0, push the 4.0 pH Calibration button. When complete the reading on the page should be 3.9-4.1 pH.

NOTE: If the sensor will not calibrate correctly, or will not remain in calibration for very long, the sensor could be failing and needs to be replaced.

NOTE: When installing a new sensor or replacing a sensor, it is always a good idea to check the calibration of the sensor before putting it in use. After installation, check calibration regularly by setting the Calibration reminder.

Calibration page 2



Critical issue / pH Probes

Do NOT allow the pH probe to dry-out!!!

All pH probes will fail prematurely if they are allowed to dry-out. All pH probes come from the manufacturer with a special storage liquid to protect the pH tip from drying out.

*** When placed in a water tank, make sure the probes are at the bottom, and the tank never goes empty.**

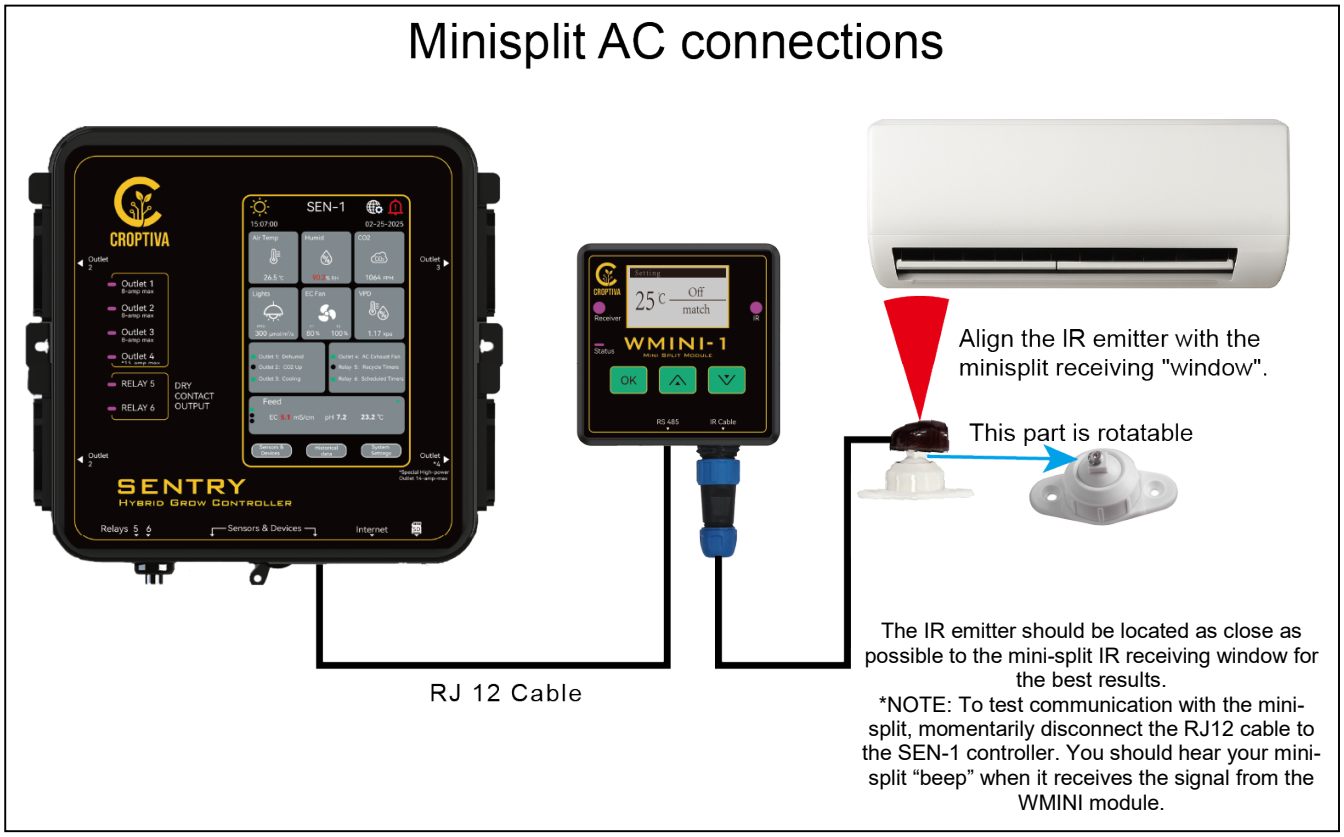
*** Use the provided storage cap (and correct storage solution) for long-term pH probe storage.**

****EC probes CAN be allowed dry-out without damage.**

Special Functions – Minisplit ACs

A great solution for cooling and also dehumidification is using a Minisplit type of AC unit. Minisplit Air Conditioning units come in many sizes, are easy to install and very energy efficient. The SEN-1 can control a Minisplit AC by providing separate Day and Night temperature settings that the Minisplit will operate at. Normally you will have a higher temperature during the Day when the lights are On, and a cooler temperature at night when the lights are off.

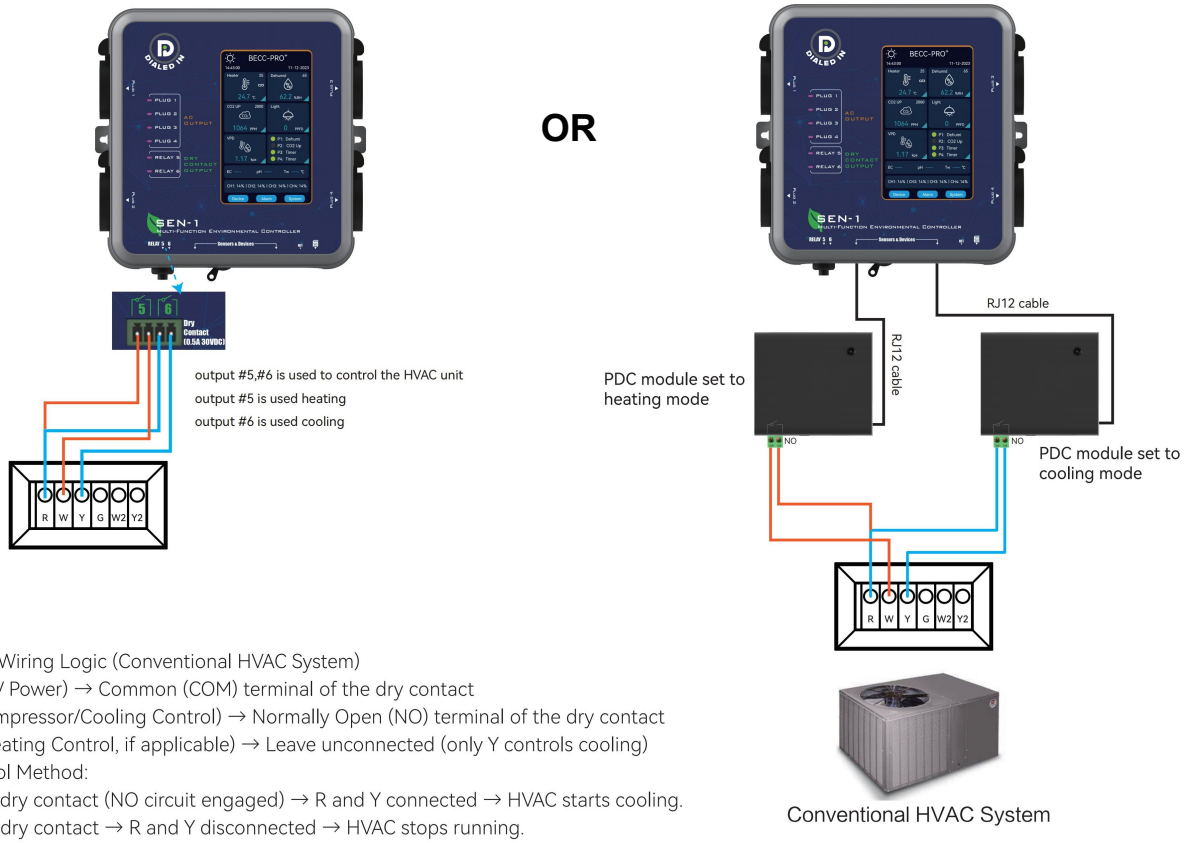
The optional WMINI-1 device module communicates with most brands and types of Minisplit AC units that come with a hand-held IR remote control. The WMINI-1 uses a small IR emitter to send the Day and Night temperature settings from the SEN-1 directly to the Minisplit unit. Before using the WMINI, you must first "teach" the module the correct IR signals using the hand held remote control that came with your mini-split.
NOTE: Refer to the WMINI-1 instructions for more details how to install and use the WMINI-1.



Special Functions – HVAC cooling

The SEN-1 controller has (2) built-in dry-contact outputs that can be used to control various equipment and devices that require a dry-contact relay closure to control the device. One device that can be controlled using one of the dry-contact outputs is a HVAC system. The HVAC unit must be a single-stage AC unit that uses a standard low-voltage 24v thermostat to control it. Compatible HVAC units have a 24VAC control circuit which allows the SEN-1 to turn the HVAC unit on & off.
The 2x built-in "dry-contacts" on the bottom of the SEN-1 controller act as control switches. When the SEN-1 "calls" for the HVAC unit to operate, the dry-contact "switch" will close the circuit activating the HVAC unit. See the details of the wiring connections below. Connecting a "cool-only" AC unit requires using only a single dry-contact, if you want to also control Heat, you will use a 2nd dry-contact connection. The examples on the following pages provide multiple options.
NOTE: Most HVAC circulating fans will automatically operate when the "cooling" circuit is activate. So the FAN wire from the HVAC unit (terminal G) should not need to be connected to the SEN-1, or it can be "jumped" to the cooling terminal Y.

HVAC connections

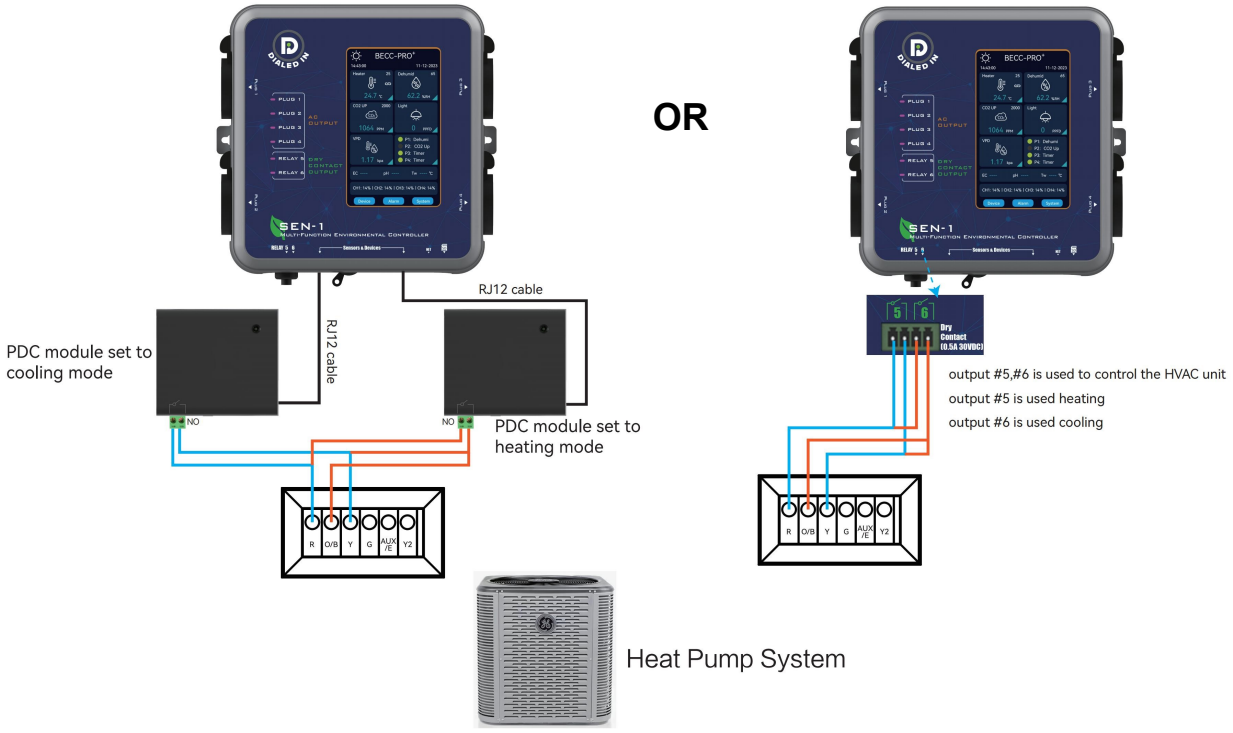


Basic Wiring Logic (Conventional HVAC System)
R (24V Power) → Common (COM) terminal of the dry contact
Y (Compressor/Cooling Control) → Normally Open (NO) terminal of the dry contact
W (Heating Control, if applicable) → Leave unconnected (only Y controls cooling)
Control Method:
Close dry contact (NO circuit engaged) → R and Y connected → HVAC starts cooling.
Open dry contact → R and Y disconnected → HVAC stops running.

Special Functions – HVAC cooling (continued)

Heatpump type HVAC units utilize a change-over valve to reverse the flow of refrigerant when operating in "heat" mode. The wiring connections are slightly different for heatpumps and can vary from unit to unit.
NOTE: Refer to your heatpump documentation to confirm correct wiring of the change-over valve.

Heat-pump connections



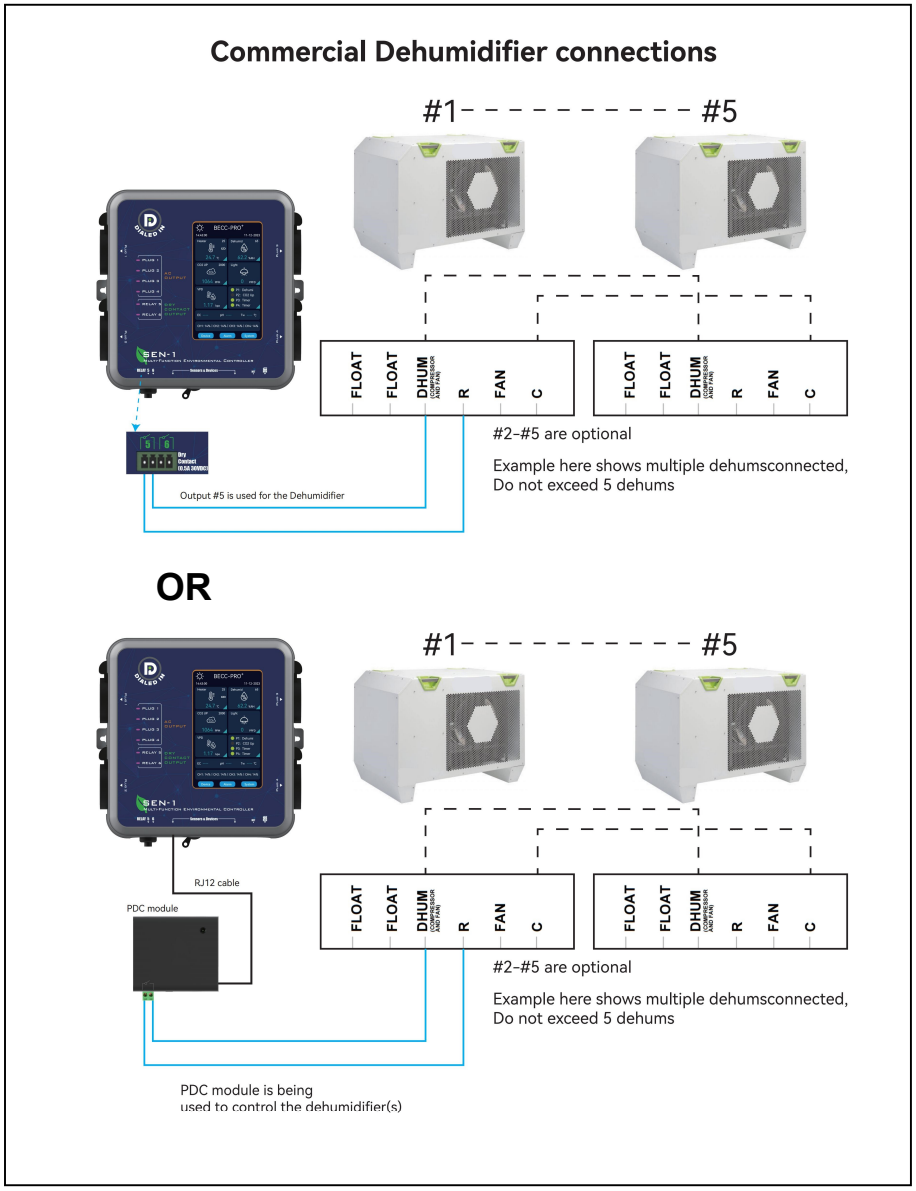
Heat Pump System (Requires Cooling/Heating Mode Switching)
If the HVAC is a heat pump (with O/B terminal), first confirm the O/B terminal's polarity (heating or cooling mode), then use R and Y to control operation:
Step 1: Determine O/B Mode
Check the equipment manual to confirm whether the O/B terminal activates heating (Heat) or cooling (Cool) when energized.
Typical configurations:
O/B connected to 24V (linked to R) → Heating mode
O/B disconnected → Cooling mode
Step 2: Wiring Scheme
R (24V) → COM of dry contact
Y (Compressor Control) → NO of dry contact
O/B (Mode Selection) → Choose based on requirements:
For heating: Permanently connect O/B to R (constant power).
For cooling: Leave O/B disconnected.
Control Outcome:
Dry contact closed (Y energized) → Compressor starts, operating in the preset O/B mode (cooling or heating).
Dry contact open → System shuts down.

Special Functions – Commercial Dehumidifier

The SEN-1 controller has (2) built-in dry-contact outputs that can be used to control various equipment and devices that require a dry-contact relay closure to control the device. That means that commercial dehumidifiers can be controlled using the SEN-1 controller.

Most large capacity commercial dehumidifiers require too much power to control them using the power supplied to the dehumidifier. If you are using Anden, or Quest or Canadri dehumidifiers, they are compatible. As long as your commercial dehumidifier has a low-volt control option, the SEN-1 can control it. Commercial dehumidifiers that are compatible will have a terminal block to connect a low-voltage cable and an "External humidistat" connection. The SEN-1 acts as an External Humidistat. See the details of the wiring connections below.

NOTE: Most commercial dehumidifiers circulating fans will automatically operate when the "dehum" circuit is activated. So the FAN wire from the dehumidifier should not need to be connected to the SEN-1. EXAMPLE below shows Anden connections.



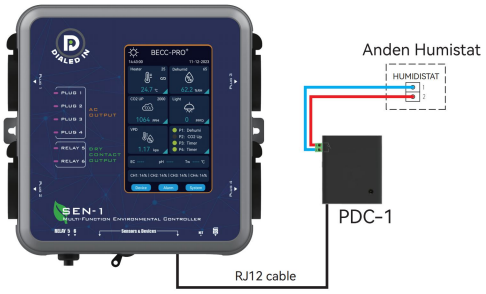
Special Functions – Commercial Humidifier

The SEN-1 controller has (2) built-in dry-contact outputs that can be used to control various equipment and devices that require a dry-contact relay closure to control the device. That means that commercial humidifiers can be controlled using the SEN-1 controller.

Most large capacity commercial humidifiers require too much power to control them using the power supplied to the dehumidifier. Those types of humidifiers normally use a low-volt signal from an external humidistat in order to control when it will be on or off. If you are using Anden type AS steam humidifiers, they are compatible. As long as your commercial humidifier has a low-volt control option, the SEN-1 can control it. Commercial humidifiers that are compatible will have a terminal block to connect a low-voltage cable and an "External humidistat" connection. The SEN-1 acts as an External Humidistat. See the details of the wiring connections below.

Commercial Humidifier connections

Set PDC-1 to Humid mode



Control commercial Humidifiers like the Anden AS series steam humidifler

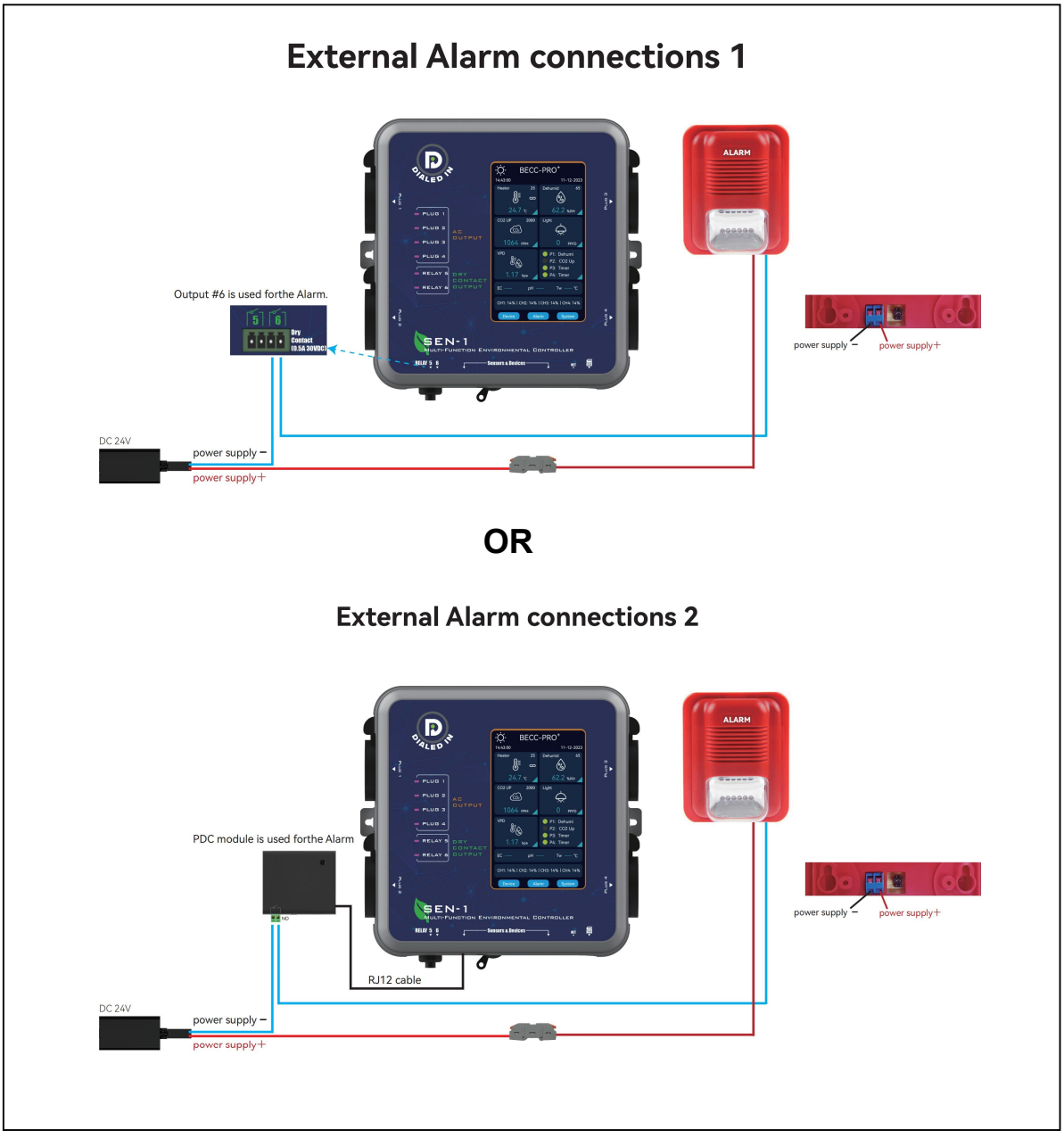
OR

Set #5 to Humid mode

Control commercial Humidifiers like the Anden AS series steam humidifler

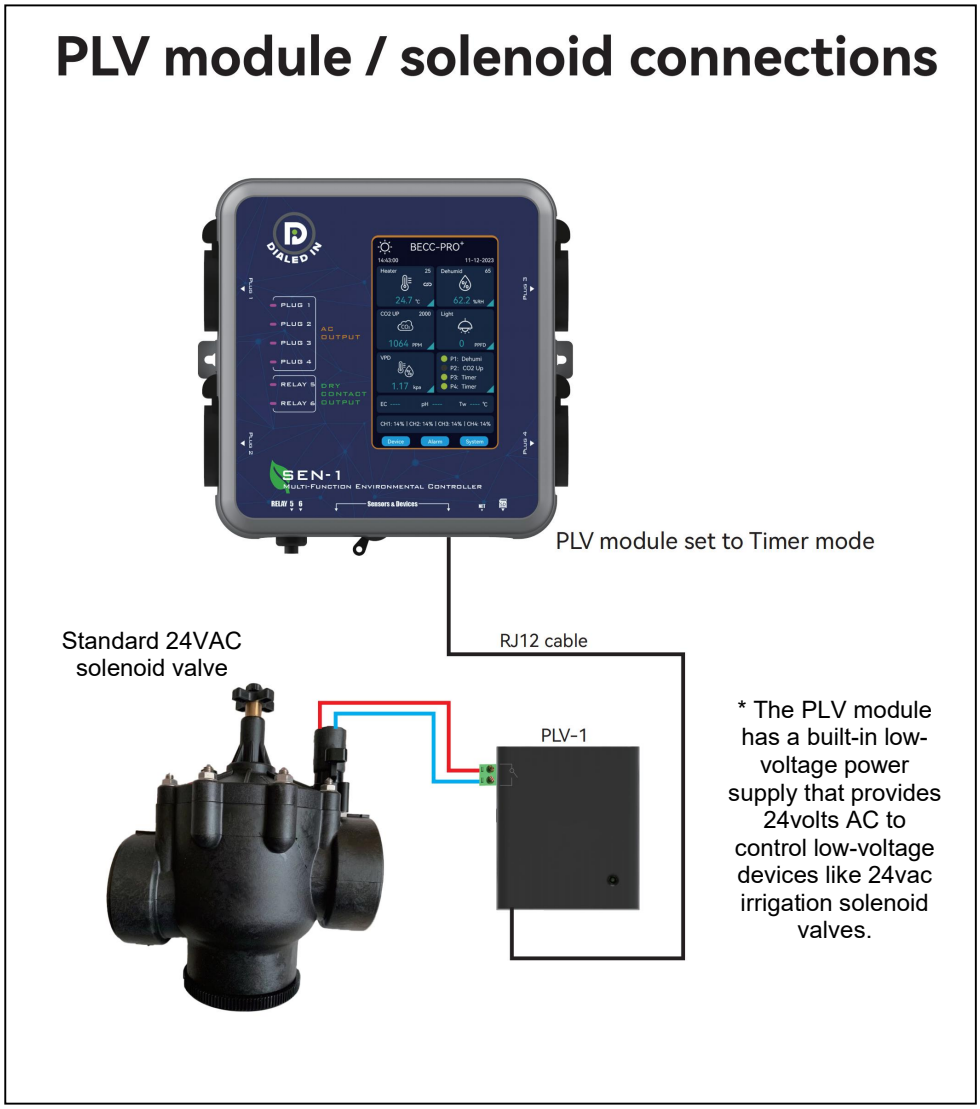
Special Functions – External Alarm module

The SEN-1 controller has (2) built-in dry-contact outputs that can be used to control various equipment and devices. You can use one of those dry-contact outputs to activate an External “audio-visual” alarm. The optional ALM-1 Alarm module will connect to the SEN-1 and sound an alarm / flash a strobe-light if an alarm condition occurs. You can select which of the alarms will trigger the audio-visual alerts.
NOTE: See options below for connecting the optional ALM-1 External alarm module.



Special Functions – Low-voltage irrigation solenoid

Sometimes you just need to be able to power / activate a small electrical solenoid valve, or maybe turn on a low-voltage relay coil etc. The PLV-1 module is designed to control any device that requires a 12-24v AC or DC signal to activate. The example below show s the PLV-1 connected to a standard 24vac solenoid valve commonly used to control irrigation / fertigation. There are many other uses for the PLV-1 device module.
NOTE: See options below for connecting the optional PLV-1 to your irrigation valve.



Special Functions – Leaf-temperature offset (VPD)

The SEN-1 normally calculates the VPD / Vapor Pressure Deficit by using the "Air" temperature and relative humidity readings coming for the 4-in-1 SAIR sensor. The other option provided is to calculate the VPD based on Leaf temperature. ***NOTE: Using the Leaf temperature offset does not change how the SEN-1 controls Temperature or Humidity, it only changes the VPD calculation and displayed VPD on the controller.***

VPD calculation (option)

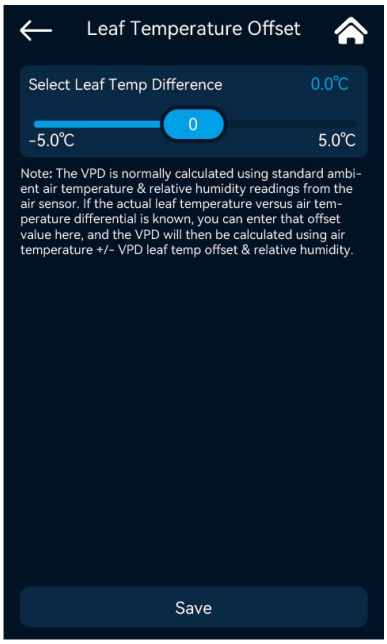
Most users have gotten used to using the actual Air temperature and Rh Humidity level when calculating the VPD within the growing space. While this method is widely accepted, some customers wish to calculate the VPD based on the plant "Leaf" temperature.

If you have an accurate reading of the Leaf temperature using an Infrared temperature probe, you can use that temperature and the current temperature from the Air sensor to apply an "offset" that will be used when displaying the VPD reading.

For example…

If the leaf temp is 2'C less than the current Air temperature, you would enter a -2.0' setting. If the leaf temperature is 2'C higher than the current Air temperature, you would enter a setting of +2.0'.

VPD Leaf temp offset



App install & linking controllers

One of the most important features of the SEN-1 controller is it's ability to be remotely accessed when using the FREE Croptiva App. The App can be downloaded from the Play store or Iphone store. Once you have installed the App, you will have access to the remote control features and improved Historical data charts etc. We take security of the App and your data seriously, so we exclusively use Amazon Servers to host the App and to maintain user privacy.
NOTE: To access the System App / page: (Home page - System Settings – page 3)

Ethernet connection

Before you can use the SEN-1 App, you must first connect your SEN-1 controller to your Internet / Ethernet using a RJ45 Ethernet cable connected to your router or Internet switch. A "hardwired" connection provides the most consistent connection. There is no built-in WiFi. When the SEN-1 is connected to your internet, you will see the Internet symbol appear on the Home page.
NOTE: there are 3rd party Wireless internet modules / adapters that can be used. Some Internet range extenders that have a RJ45 port can also be used.

Download the APP

Once you have your SEN-1 connected to the Internet, you can download the App and then create a user account for yourself. Search for the Croptiva App and install it. You will be asked to create an account and password. Once you have created an account, you can start to add your SEN-1 controller(s) to you personal account.

Network Settings

The Network settings on the SEN-1 are pre-configured. Only change the Network configuration when necessary. *Changing the settings could affect connectivity, a factory reset will return the SEN-1 to it's default settings.

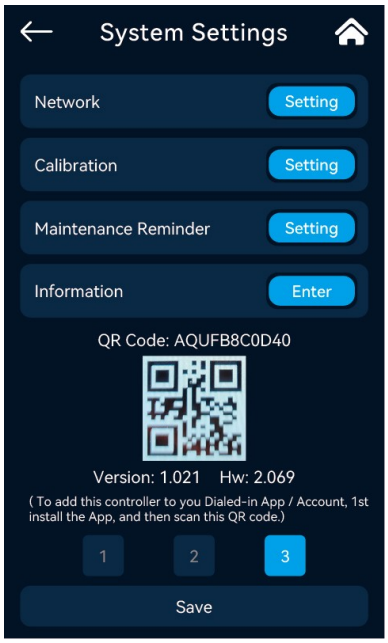
Link controllers to your account

Once you have created your account, you can add controllers to the App.
1) Navigate to the page shown on the right by going to the Home page – System settings – Page 3.
2) On the App, select to "Add controller" (+).
3) You can then simply scan the QR code shown on Page #3 of the System settings with your smart phone or tablet. Scanning the code will automatically add the controller to your secure account so that YOU can see information live and make changes to the settings.
NOTE: If you cannot scan the QR code, you can also enter the QR code # into the window provided on the App.

When the controller has been added to the App, you will see it appear on the controller list. You can now re-name each controller on your list with a unique name.

To access each controller on the list, simply touch that controller and the App will open up a new page showing the Home page on the selected controller. From there you can navigate around the App, just like you can with the touchscreen built into the SEN-1.

System Settings page



App Controller list

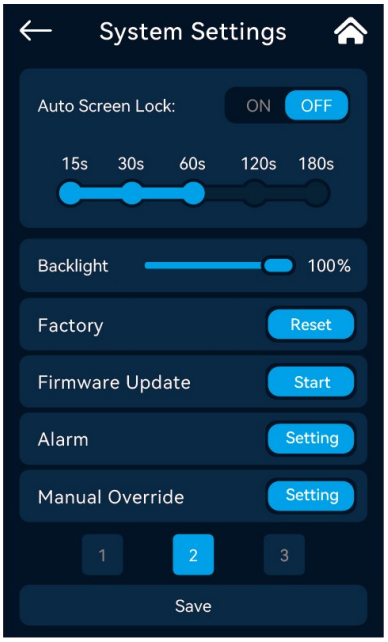
Insert image of App controller list page

Firmware updates / Factory reset

Occasionally Croptiva will release new "IMPROVED" firmware for the SEN-1 controller. Those firmware updates might address critical improvements, or offer new / advanced settings that will provide a better user-experience. Go to the Croptiva.com website to see the most recent versions of firmware available. There are 2 methods to update firmware.
NOTE: To access the System Firmware / Factory reset page: (Home page - System Settings – page 2)

Firmware update

System Settings page 2



In preparation for ONLINE updating the firmware on the SEN-1 controller:

1) Ensure a *microSD memory card is inserted in the microSD card slot on the bottom of the SEN-1. (*Standard microSD card provided with the SEN-1)

2) To complete the online firmware update, ensure that the Internet connection symbol is showing the controller is connected to the internet.

2) The controller will temporarily shut down and the devices controlled by the SEN-1 will momentarily NOT be controlled while the firmware update is in process. Ensure the room is prepared for the brief shutdown.

3) Select Firmware Update. If an update is loaded, the screen will read "Ready Update". To update, select YES. The SEN-1 will update the firmware.

4) When you see the SEN-1 re-boot and show the Home screen, the update is complete.

5) When the firmware update is complete, the controller will return to normal operation. All of your settings will still be in place.
NOTE: If there are any problems after the firmware update, cycle power OFF / ON to the SEN-1.

In preparation for microSD updating the firmware on the SEN-1 controller:

1) If the SEN-1 is not connected to the Internet, you can use a computer and the included microSD card to update the firmware.

2) Remove the microSD card from the SEN-1. Using an appropriate adapter, insert the card into your computer.

3) Go to the firmware update page at Croptiva.com. Find the SEN-1 update file and copy it to the microSD card.

4) Turn off power to the SEN-1 and then re-insert the microSD card. Turn power back on and the firmware will automatically update the SEN-1.

5) When you see the SEN-1 re-boot and show the Home screen, the update is complete.
NOTE: If there are any problems after the firmware update, cycle power OFF / ON to the SEN-1.

Factory reset

NOTE: Doing a factory reset will reset ALL of the settings within the SEN-1 controller. Write your settings down before doing the reset. After the factory reset is complete, you can re-enter your settings.

If you want to return the controller to its original factory settings:

1) Press "Reset" within the Factory update page, then confirm to start the factory reset.

2) The controller will be "offline" and the devices controlled by the SEN-1 will momentarily NOT be controlled while the factory reset completes. Ensure the room is prepared for the brief shutdown.

3) When the factory reset is complete, the unit will reset and you can begin to enter all new settings.

Troubleshooting

Some of the most common issue / questions are discussed below. If you cannot find the answer you are looking for here, go to Information and there you can find QR codes that will provide videos and additional troubleshooting tips.

Problem / Question	Solution
The SEN-1 controller has no power.	The SEN-1 has a built-in circuit breaker on the bottom of the unit. Make sure that circuit breaker is ON. Check power going to the controller.
The circuit breaker on the bottom of the SEN-1 controller keeps turning off.	The SEN-1 can control up to 15-amps of power devices. If the breaker is tripping, too much power / current is connected to the SEN-1 controller. You can use one of the optional PDM, QUAD or PEXP expansion modules to power devices.
There is no readings coming from the SAIR 4-in-1 sensor, and the controller will not activate any of the devices.	Check the sensor connection / RJ cables. If the 4-in-1 sensor is not communicating, the SEN-1 will automatically shut-off all devices for protection.
One or more optional device modules or sensors are not working.	All of the devices and sensors can be connected to either of the RJ ports on the SEN-1. If there is a problem, try connecting each device / sensor 1 by 1 until you find the problem. Check the RJ cables and splitters.
I cannot register my SEN-1 controller to the App.	Make sure you the SEN-1 is connected to your internet and you see the Internet connection symbol on the Home page.
I do not see the Internet symbol shown on the SEN-1 Home page.	The SEN-1 should be connected to your Route or Internet switch using a CAT 5/6 cable. There is no built-in Wifi… if using a Wifi adapter, the adapter might be incompatible.
One or more of the sensor readings does not seem correct.	The SEN-1 uses only professional grade sensors however, some of the sensors can be calibrated by the user. If the sensor has failed entirely and no reading is shown, check the connections first, then check the sensor. *Refer to the Calibration section.
My lights DO NOT have a 0-10 volt control option, can I still control them?	YES. You can control older style lights that do not have a low-volt control option. You will have to turn power On / Off to those lights. Refer to Lights On-Off control (old-style)
My 0-10v lights will dim down, but not turn off when connected to the LA-1 or LA-2.	Some lights are not “dim-to-off”. If the lights cannot be turned off using the 0-10v signal, use the PEXP-1 power expansion module.
My 0-10v lights are not always being controlled correctly.	Make sure you do not have too many lights connected to the LA-1 adapter, about 30 max. (The LA-2 can control 4x30=120 lights) Try connecting a single light to the LA-1 adapter and try to control it. If it works, you might need to reduce the number of lights being connected to the LA-1 adapter.
I need to control a commercial Dehumidifier with the SEN-1.	Commercial dehumidifiers can be controlled by the SEN-1 by using one of the 2 provided dry-contact outputs, or by using the optional PDC device module. Refer to Commercial Dehumidifier example.
I need to control a large AC unit / HVAC with the SEN-1.	Standard single-stage, HVAC units can be controlled by the SEN-1 by using one of the 2 provided dry-contact outputs, or by using the optional PDC device module. Refer to HVAC cooling example.
When I look at the time-clock displayed on the Home screen, it seems to skip seconds.	The internal time-clock is not affected by the updated time displayed on the Home page of the touch-screen. The time is correct.
The real time-clock is slowly loosing or gaining a few seconds over several weeks.	The time-clock is accurate to within 90 seconds per year on average. You can check and reset the time annually if required.
Does the SEN-1 have a battery that needs to be replaced?	NO. The SEN-1 uses a super-capacitor instead of a battery. If the SEN-1 is not powered for more than 72 hours, the 24-hour time-clock may have to be manually reset.

Alarm codes / how to resolve problems

The SEN-1 will display several types of alarm messages if a problem is detected with the controller hardware or within the growing space. Suggestions actions to take provide some of the simpler solutions. Refer to the video link on the following page for more detailed troubleshooting tips.

Alarm name	Interlock between control devices	Action to take
Smoke Detection	Optional: Disable all device	Verify if the smoke alarm was activated by smoke. Check if the smoke detector's wiring is disconnected. When no danger or problem remains, reset the alarm and continue normal operation.
Water Leak Detection	Optional: Disable valve or pump Cycle	Check for water leaks. If no leaks are found, inspect whether the leak sensor probe is in contact with water or if its contacts are short-circuited. When problem is resolved, reset the alarm to continue normal operation.
Sensor Offline	All devices turn OFF	One of the sensors has lost communication with the SEN-1. Check whether the RJ12 connections are loose or corroded by water leakage. Replace the RJ12 cable/Y-splitter and try connecting a different sensor. Verify if the sensor's indicator light illuminates or flashes. If the sensor still will not work, the sensor might need to be replaced.
Device offline	N/A	One of the device modules has lost communication with the SEN-1. Check whether the RJ12 connections are loose or corroded by water leakage. Replace the RJ12 cable/Y-splitter and try connecting a different module. Verify if the device module's indicator light illuminates or flashes. If the module still will not work, the module might need to be replaced.
Air Temperature (High or Low)	Over Max temp: Lights, dehumidifier OFF Below Min temp: Cooling, fans OFF	Check whether the cooling/heating equipment is functioning properly. Verify the user-provided connections between the device module and the cooling/heating equipment is intact and correct. Ensure the capacity of your selected AC or fan is large enough to overcome the heat added by your lights and other equipment within the grow space. When using the Minisplit AC module, test the IR/infrared emitter is operational and properly aligned with the air conditioner. *Changing temp settings on the SEN-1 will cause the minisplit to respond with a "beep".
Air Humidity (High or Low)	Over Max Humidity: Humid, fans OFF Below Min Humidity: DeHumid, fans OFF	Check whether the humidification and / or dehumidification equipment are functioning properly. Verify the user-provided connections between the device module and the humid/dehumid equipment is intact and correct. Ensure the capacity of your selected dehumidifer or fan is large enough to overcome the humidity added by your plants.
CO2 (High or Low)	Over Max CO2: PPM up disabled	Check whether the CO_2 generation device or CO2 solenoid is functioning properly and whether the CO_2 gas cylinder still has gas. Check for CO2 leaks as small leaks can allow dangerous amounts of CO2 to accumulate. If using an exhaust fan to reduce CO2, make sure it is working properly.
VPD (High or Low)	N/A	The VPD is calculated using the actual temperature and humidity measurements coming from the SAIR-1 sensor. Check whether the temperature and humidity settings are correct. Verify if the temperature and humidity are within the normal range. Confirm the readings coming from the SAIR-1 sensor are correct.

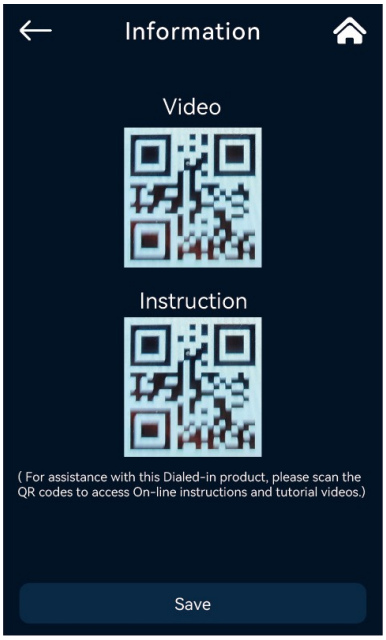
Alarm codes / how to resolve problems (continued)

Alarm name	Interlock between control devices	Action to take
Water Temperature (High or Low)	N/A	Check if the water temperature alarm settings are properly configured. Verify the actual water temperature (take an on-site measurement using another probe) If the readings are incorrect, diagnose potential EC sensor malfunction by swapping the EC probe with another EC probe.
Water EC (High or Low)	N/A	Check if the water EC alarm settings are properly configured. Inspect EC electrode for contamination or air bubbles. Verify the actual water EC (take an on-site measurement using another probe). Perform routine probe maintenance on the EC probe: Clean the probe surface (use soft brush). If the readings are incorrect, diagnose potential EC sensor malfunction by swapping the EC probe with another EC probe.
Water pH (High or Low)	N/A	Check if the water pH alarm settings are properly configured. Check if the pH probe is properly connected to the SWAT-1 module. Inspect the pH probe for physical damage (e.g., cracked glass bulb, dried electrolyte). Perform routine probe maintenance on the EC probe: Clean the probe surface (use soft brush). Validate accuracy of the probe using pH=7 and pH=4 buffer solutions. If the readings are incorrect, diagnose potential EC sensor malfunction by swapping the EC probe with another EC probe.
Substrate Moisture (High or Low)	N/A	Verify full insertion of the substrate sensor into the side of your grow medium about 1/3 of the way up from the bottom of your container. Check for sensor looseness (prevent false readings due to movement). To test the sensor, removing the sensor from the medium should result in readings between 0-8%. Placing the sensor in a cup of nutrient water should result in a reading of between 70-100%. If the readings are incorrect, diagnose potential substrate sensor malfunction by swapping the substrate probe with another substrate probe.
Substrate Temperature (High or Low)	N/A	Verify full insertion of the substrate sensor into the side of your grow medium about 1/3 of the way up from the bottom of your container. Check for sensor looseness (prevent false readings due to movement). If the readings are incorrect, diagnose potential substrate sensor malfunction by swapping the substrate probe with another substrate probe.
Substrate EC (High or Low)	N/A	Verify full insertion of the substrate sensor into the side of your grow medium about 1/3 of the way up from the bottom of your container. Check for sensor looseness (prevent false readings due to movement). If the readings are incorrect, diagnose potential substrate sensor malfunction by swapping the substrate probe with another substrate probe.

Information

The Sentry controller has been designed to be easy to use, but there a many settings and options to choose from which can be confusing for first time users. BEFORE using the SEN-1 controller, familiarize yourself with all of its available features. We have provided an easy way to access the user instructions and tutorial videos online. Simply go to the Information page and you can scan QR codes that will take you directly to those resources.
NOTE: To access the Information page: (Home page - System Settings – Page 3 –Information)

Information page



Additional sources

You can also use the FREE Apps to assist you in setting up and maintaining your control system.

If you have a specific problem that cannot be solved using our online information and troubleshooting, Croptiva techs are available to assist.

Email: support@croptiva.com

Phone: 877-607-7770

Specifications

Model	**Sentry / SEN-1**
Product Dimensions	8”x7.5”x3.1” / 203x191x79mm
Protection Level	IP20
Certifications	ETL, FCC
Operating Temperature	0-50℃ / 32-122℉
Operating Humidity	≤90%, Non-Condensing
Operating Voltage	AC 100-240V 50/60Hz
Maximum Input Current	15A Total
Maximum Output Current	8A Per AC Port (Port1-Port3)
Maximum Output Current	14A Per AC Port (Port4) (High amperage)
Normally Open (NO) Dry Contact (x2)	≤ 30V; Load Current: ≤1A (Port5 and Port6)
Touch Screen	5-inch LCD; Resolution: 800 x 480
Internet Port	RJ45 (Ethernet)
Sensor and Device Port	6P6C RJ12 x 2, Output: 24vdc 400mA
Maximum RJ cable runs	500ft / 152m
Certifications	CE, FCC
***Available optional devices and sensors.** ***Maximum Number of Sensor and Device Modules: 1 Each**	● AC Remote Station (WMINI-1) ● EC Fan “Dual” Controller (WFAN-1) ● Smart Module (QUAD-1) ● Light Controller (LA-1/2) ● AC Station (PDM-1,2,3 or PLV or PDC) ● EC/PH Module (SWAT-1) ● EC & Temp Probe (SEC-1) ● pH Probe (SPH-1) ● 4 IN1 sensor (SAIR-1) ● PAR sensor (SPAR-1) ● Moisture Monitoring (SMED-1） ● Smoke Detector (SSMK-1) ● Water Detector (SWLK-1)

Our team thanks you for choosing Croptiva!
Please review the following terms and conditions of our Limited Product Warranty.

⏳ Warranty Duration

Coverage begins on the original date of purchase and remains valid for:

- **Three (3) years** for all CROPTIVA Controllers and Devices
- **One (1) year** for Sensors including Probes

Warranty coverage ends if the product is sold or transferred to another party.

☑ What's Covered

This warranty covers defects in materials or workmanship that existed at the time of purchase and arise under normal operating conditions. If a defect is confirmed within the warranty period, CROPTIVA will, at its discretion:

- Repair the product using new or refurbished parts
- Replace the product or any non-serviceable part with a functionally equivalent substitute

If a specific part is discontinued or unavailable, a comparable replacement will be provided.

✕ What's Not Covered

CROPTIVA is not responsible for repair or replacement costs resulting from:

1. Accidental damage, misuse, neglect, or improper handling not aligned with CROPTIVA instructions
2. Installation or assembly not performed according to CROPTIVA guidelines
3. Damage from external sources (e.g., shipping, weather)
4. Unauthorized repairs or modifications
5. Defaced or missing serial numbers

⚙ Warranty Scope

CROPTIVA guarantees that the mechanical and electronic components of its products are free from defects in materials and workmanship under normal use for the specified warranty period. If a defect arises and is not due to misuse or user error, CROPTIVA will repair or replace the product at its discretion.

If a full replacement is issued, the warranty for the replacement product will continue for the *remainder of the original* warranty period.

🔗 Third-Party Hardware Disclaimer

CROPTIVA disclaims all liability—express or implied—for third-party hardware compatibility or performance. While we strive to ensure our products work with third-party systems, we cannot guarantee functionality due to changes, updates, or modifications made by third-party manufacturers.

🛠 To Request Warranty Service

To request warranty service, please email CROPTIVA at support@croptiva.com. Describe the problem and provide the serial number of the product in question along with any other details that might be helpful.