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by
INNOVATIVE®
tool and design inc.

MASTER ENVIRONMENTAL CONTROL C-1

Instruction Manual

Innovative Tool and Design,Inc.
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I.Overview of Master Environmental Control C-1

- Master Environmental Control C-1 is the most complete and intelligent environment control system that applies to professional indoor growth on the market. Featuring with CO_2 3-in-one sensor (Temp/ Humid/-CO_2/Light), Temperature and humidity sensor(with photocell), master controller, LDA-1 Light adapter and AC station control modules, it can control up to 2 channels of light (using LDA-1 adapter), 8 sensors (4 CO_2 3-in-one sensors and 4 humid and temp sensors), 4 temperature control devices, 4 humidity control devices and 4 CO_2 Generators.

- Independent day and night control parameters can be set to maintain the optimal environmental conditions around the clock for the crops to grow indoors. Master Environmental Control C-1's 3-in-one sensor helps you to monitor temperature, humidity, and CO_2 level. You can install the additional sensors to you help you better control and monitor the growing environment of the plants.

- You can easily set up daily lighting and specially designed light management in a convenient manner. Master Environmental Control C-1 allows you to select the type of light (LED or HID) to be controlled and can simultaneously employ 2 channels of independent or interlocked light control logic in different modes to create multiple lighting layouts and growth spectra required for plant growth. This system can efficiently monitor the temperature of the lighting system in operation, to which it can control accordingly with advanced functions like auto-dimming, overheat shutdown, sunrise, and sunset simulation.

- The Master Environmental Control C-1 has 10 control signals (24V AC) output for different devices. By connecting to the connector panel board in the distribution box, the signal line (24V AC) can control devices like Air Conditioner, Heater, humidifier, dehumidifier, and non-dimmable light lines. The independent AC station can also be connected through Mobus RS485 to control CO_2 supplement devices. Or it can control the air conditioner, heater, humidifier, dehumidifier, and other devices through Mobus protocol RS485. Master Environmental Control C-1 is an intelligent and flexible control system that provides growers a complete indoor gardening solution for maximum yield.

WARNINGS:

1. Follow all local and national electrical codes for installation requirements.

2. Master Environmental Control C-1 is specially designed for indoor use only. Please use our Master Environmental Control C-1 accessories to ensure its best performance.

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I. Specifications of Master Environmental Control C-1

Master Environmental Control C-1

Product name	Master Environmental Control C-1
Input Voltage	AC 120V 60Hz 0.5A (can be customized) AC 220~240V 50Hz 0.5A (can be customized)
AC signal output (PORT)	10-channel signal output: AC24V/50mA
Other signal output ports (RJ12)	RJ12 x 4, 4-channel RS485 communication Signal line output: DC24V, 1.0A
Operating Environment	5℃ to 40℃；Relative humidity 80% no frosting; Indoor Use Only
Network port	RJ45
Dimensions	14” H x 17” W x 4” D (excluding length of power cable)
Power cord length	≈2m/6.5ft
Net weight	6.6 lbs
Gross weight	9.3 lbs
Package size	370x330x145mm / 14.6"x13.0"x5.7" (1 unit/box)
Accessories	4x Self-tapping screws 4x Ring Expansion Screw 1x 4 in 1 Sensor(CO2, Humidity, Temp & Light) 1x AC Station Module 1x Light Control Module 1x Y-splitter 2x RS485 communication extension cable 5.0m

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4 in1 Sensor
(CO_2, Humidity, Temp & Light)

Main parameters	Default values
Gas detected	CO_2
Working voltage	DC24V
Working current	30mA
CO_2 range	0~6000ppm
CO_2 accuracy	±(30ppm+3%)
Humidity range	0-100%RH
Humidity accuracy	±2%RH
Temperature range	32~158°F ／0~70 ℃
Temperature accuracy	±32.9°F / ±0.5 ℃
Maximum quantity	4pcs per unit
Communication mode	RS485 [Modbus-RTU]
Light Sensor	Photocell

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AC Station socket module

Light control module

Main parameters	Default values
Input Voltage	AC120V 60Hz
Output Voltage	AC120V/60Hz/MAX8A
Maximum power	<1200W
Communication terminal	RJ12 connector
Indicator	Green LED
Maximum connections quantity	32pcs
Communication Mode	RS485(Modbus-RTU)

Main parameters	Default values
Input Voltage	DC24V
Output Voltage	0~10V (DC)
Communication terminal	RJ12 connector
Indicator	Green LED
Maximum connections per channel	20pcs
Communication Mode	RS485(Modbus-RTU)

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Pressure-Type Stage Sensor

(Optional accessories)

Main parameters	Default values
Power supply	DC 24V
Output	RS485
Range	0~5m water column
Pressure type	Gauge Pressure
Compensation temperature	14~158°F / -10~70℃
Operating temperature	-4~185°F / -20~85℃
Medium temperature	-4~185°F / -20~85℃
Storage temperature	-4~185°F / -20~85℃
Overload pressure	150%FS
Long-term stability	±0.2%FS / year

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II. Warnings & Cautions

- Save these instructions. These safety and operating instructions must be kept in a safe place for future reference.
- Heed all warnings. All warnings on this product and in the instructions must be observed closely.
- Follow all instructions. All operating instructions must be followed.
- If the instructions as provided by the manufacturer are not followed, May result in damage to the product.
- Install your controller at least 8 ft away from any devices that produce large amounts of electronic noise, such as electronic ballasts or ozone generators.
- Please cut off the power when wiring.
- Please read this manual carefully before operating the Master Environmental Control C-1 .
- Do not place metal objects such as paper clips and tools in the controller to prevent an electrical shock hazard.
- Before plugging in the Master Environmental Control C-1 , check whether the voltage of the socket is consistent with the parameter described.
- After the equipment is installed, perform the start-up test before operating it properly.
- DO NOT use this controller near a water source. The controller is not water-proof or shock-proof, and as such should not be exposed to direct water contact or extremely high moisture.
- DO NOT attempt repair. Any factory serviceable parts of this controller are only to be repaired or replaced by the manufacturer or other authorized agencies.
- If the power cable insulation is broken, please stop using the product. Immediately unplug the controller and contact the retailer from whom you purchased the unit.
- The controller is equipped with a circuit breaker for short-circuit or over-current situations. The circuit breaker will automatically shut down the product at once.
- Do not block any ventilation openings.
- This product is a Safety Class I Controller. The main plug should be inserted in a power socket outlet only if provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous and is prohibited.

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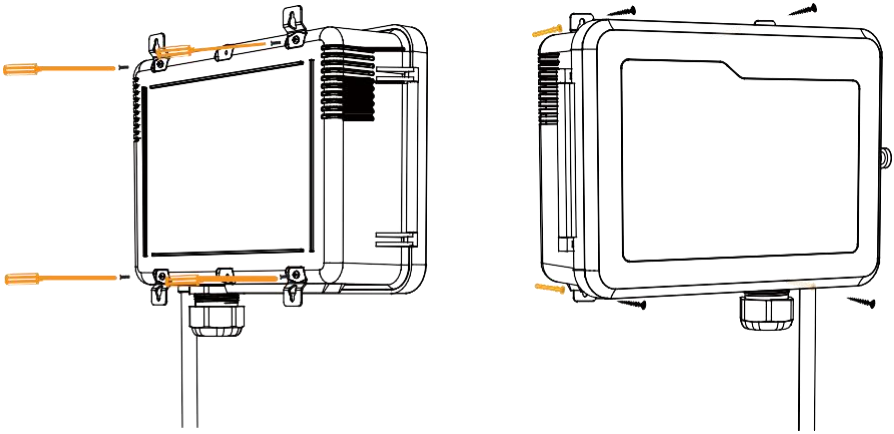
III. Installation Instructions

1. Install the Master Environmental Control C-1

Please install the controller at the place you are easily work with. You need to leave some space for air ventilation use. Please keep controller away from flammable and explosive materials, such as gasoline.



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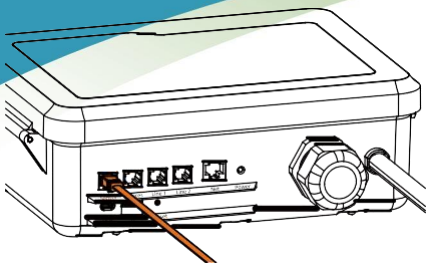
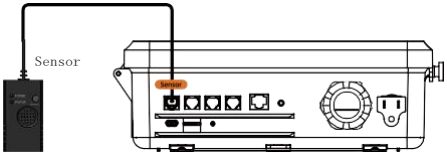
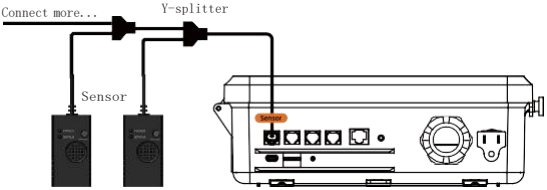
2. Sensor Connection Instructions

Connect the sensor module to the “Sensor” port.





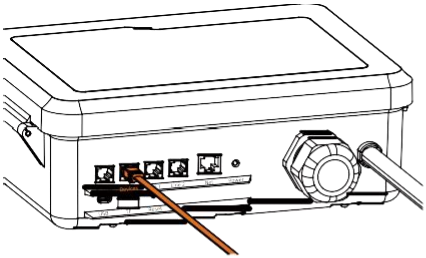
Method 1: Connecting a single sensor.

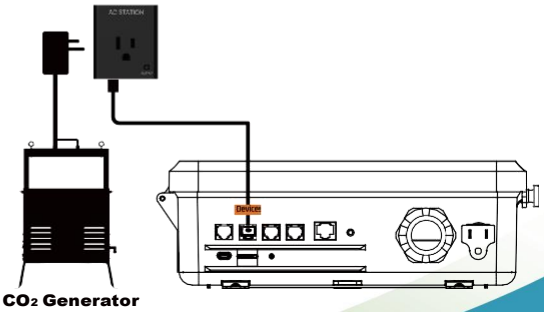


Method 2: Multiple sensors are connected through the Y-splitter branch.

3. Devices Connection Instructions

Connect the devices module to the “Devices” port.





Method 1: Connecting a single device.

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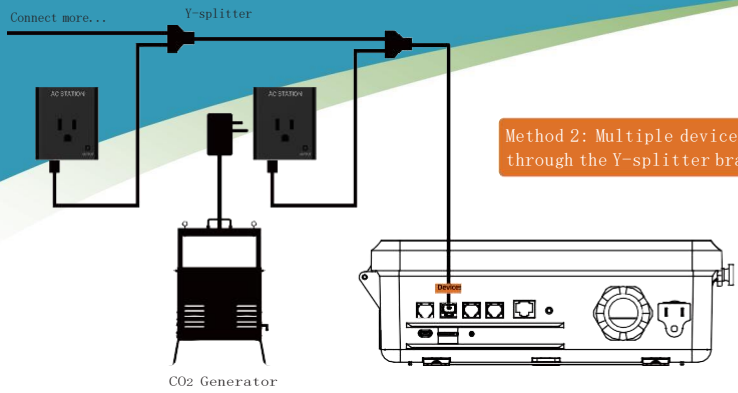
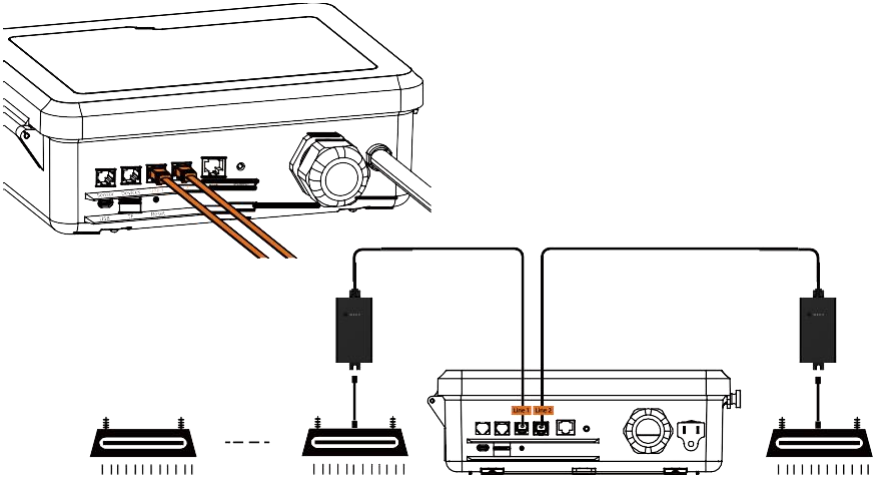


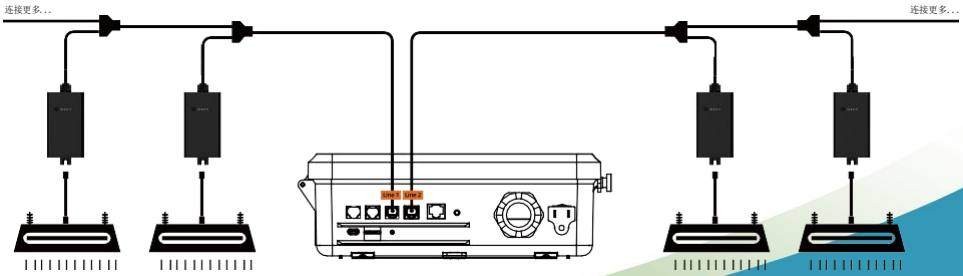
Method 2: Multiple devices are connected through the Y-splitter branch.

4. Lighting Equipment Connection Instructions

Connect the lighting equipment to the “Line 1” and “Line 2” port.



Method 1: Connecting a single main control light module and sub-control light module



Method 2: Multiple lighting module are connected through the Y-Splitter branch.

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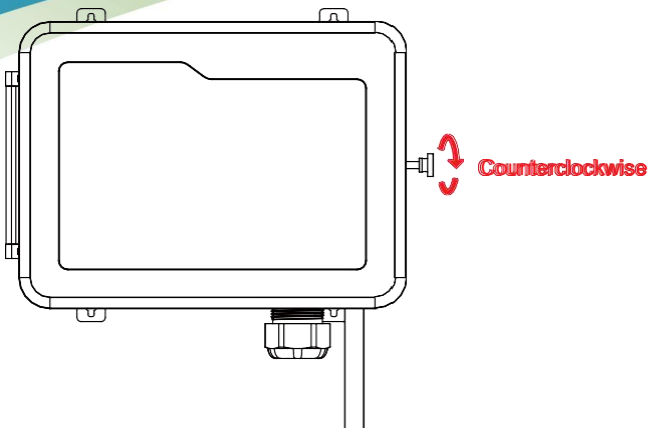
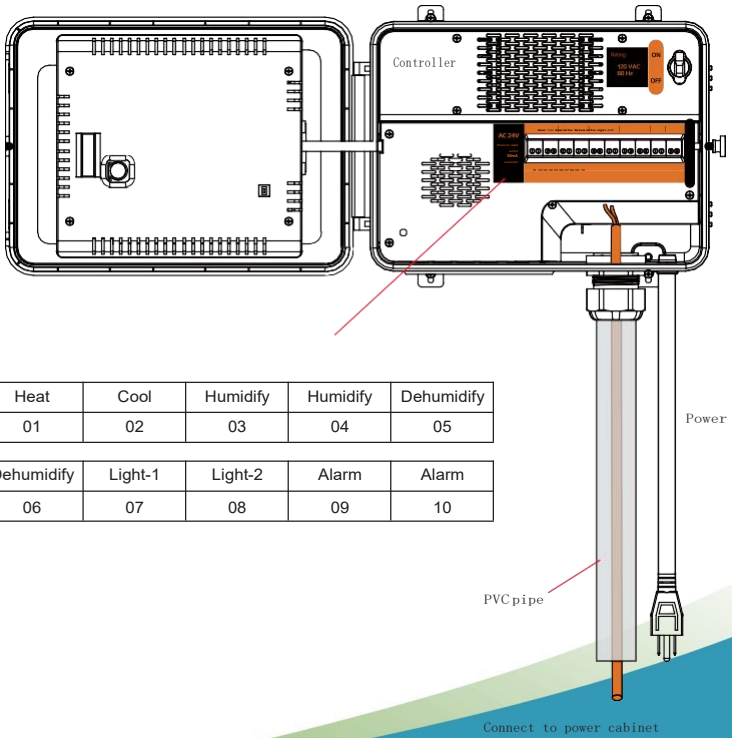
5. Inner connection(AC24V) instruction

1). Loose the screw.



2). Connect a PVC threading pipe at at the bottom of the controller and lock it tightly. Then pass the equipment signal line through the PVC pipe, lock the terminal, and then insert the terminal into the corresponding identification interface inside the controller, the end of the signal line connects to the corresponding interface in the power distribution cabinet.



Heat	Cool	Humidify	Humidify	Dehumidify
01	02	03	04	05

Dehumidify	Light-1	Light-2	Alarm	Alarm
06	07	08	09	10

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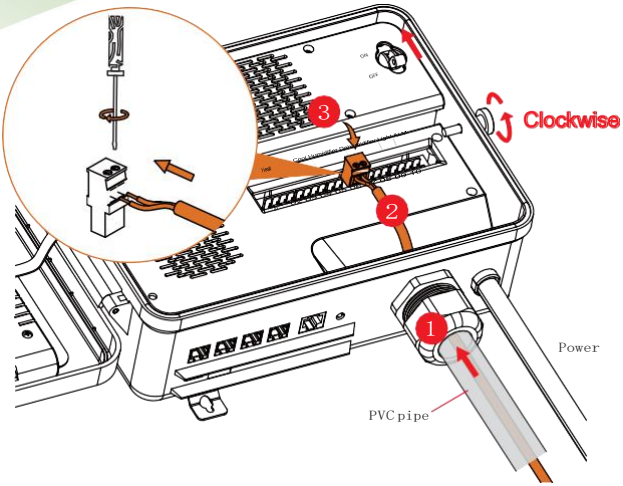
For example: Connecting to humidifier



Connect to power cabinet

① Connect a PVC threading pipe at at the bottom of the controller and lock it tightly;
② Leave the Humidifier signal pipe though PVC pipe, lock the terminal;
③ Insert the terminal into the "Humidifier" identification interface inside the controller, the end of the signal line connects to the corresponding interface in the power distribution cabinet.

3).Connect to power after all the connection are ready. Press the knob at "On", close the cover, screw tight.

Note:

1. Connect the Master Environmental Control C-1 to the power supply (Please refer to the parameter table to ensure that the parameters of the power supply are consistent); set the required parameters on the properly before using it.

2. The operation status of controller will be displayed on the screen, lease learn each signal well before using.

3. Make sure that the probes (CO_2 sensor probe, and temperature and humidity sensor) are connected to the probe socket on the bottom of the Master Environmental Control C-1 , and check if the connector is properly inserted. Place the probe of the light sensor in the place to be measured, with its front side facing the light source unobstructed.

WARNING: Do not disassemble the Master Environmental Control C-1 .
Please read the manual first. In case of any questions, consult your dealer.
(To ensure safety, please read this manual carefully and follow the instructions before installation. If you have any questions, please contact us or consult with your dealer).

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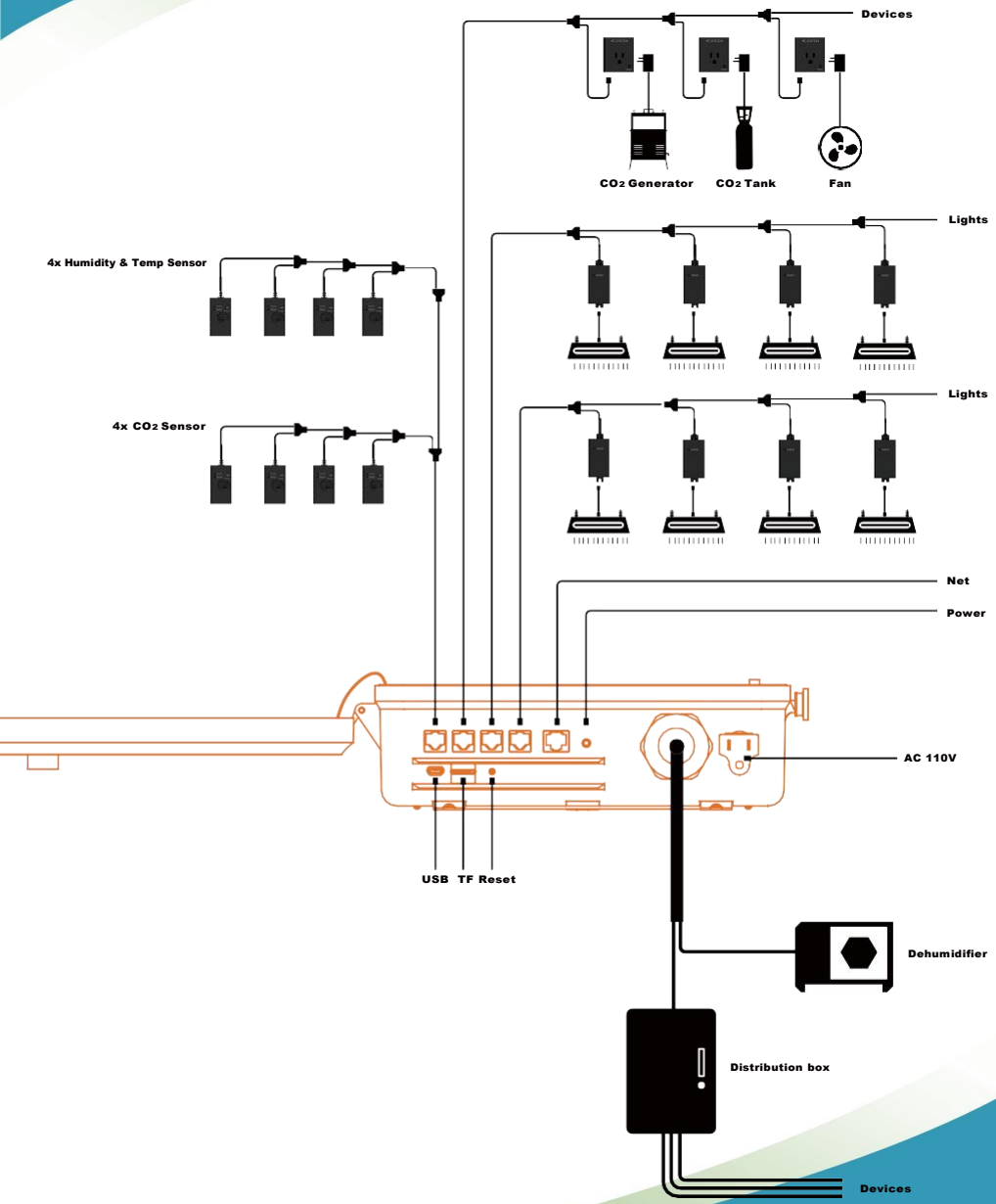
IV.Installation Diagram



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Connection Guide

Basic configuration in the standard working environment with a grow area of 200m³		
Equipment	Quantity	Purpose
Master Environmental Control C-1	1	
CO_2 four-in-one sensor	1	Monitoring CO_2 parameters (Relative CO_2 concentration value), relative temperature value, relative humidity value, and light parameters
Temperature, Humidity and Light three-in-one Sensor	1	Monitoring the relative temperature value, relative humidity value, and light parameters
AC Station Module	1	Used to control the CO_2 output device (TANK or generator)
LDA-1 Light Control Module	2	Used to control the CO_2 output device (TANK or generator)
RS485 Cable	Several	Extension lines for connecting each terminal

Note: Before installing the equipment, the user needs to consider the number of sensors and related devices that need to be equipped based on the actual conditions of the planting area, for the heavy current (110V-380V) devices in the circuits should be installed in the distribution box first.

1. Connect the sensor module to the Sensor port in series.
2. Connect the AC Station socket module to the Device port in series.
3. Connect the LDA-1 light control module to the LINE-1 port, which is the main light control line.
4. Connect the LDA-1 light control module to the LINE-2 port, which represents the auxiliary light control line.
5. Connect the internal 10-channel port to the corresponding configuration in the distribution box or related equipment that supports AC24V signals.
6. Before the connection, it is necessary to check if the positive and negative poles of the output line are correct.

After the circuit connection is completed, plug in the power and turn on the device.

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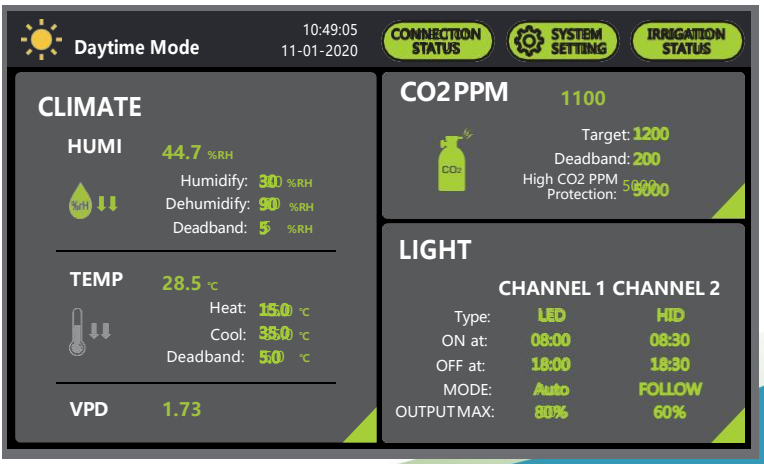
V. Interface Instructions

Turn on the controller, the loading interface will be shown directly on the display. After the loading is completed, the relevant information of the environment will be displayed on the homepage.

Function Description

Home Page

After the corresponding sensors are connected to the controller, the real-time data of the related devices are displayed on the interface, including VPD, humidity, temperature, CO_2, light, day and night.



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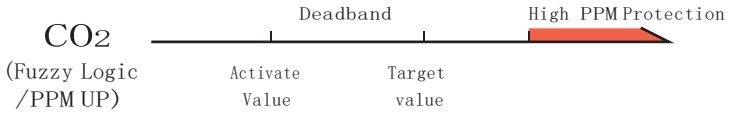
CO_2 Control

The PPM-UP mode, Fuzzy Logic mode and manual shutdown mode are available on the device.

By analyzing the CO_2 data read by the sensor, the relative CO_2 concentration in the environment can be controlled and adjusted. The CO_2 control mode is composed of a generator [PPM UP] mode and TANK [Fuzzy-Logic] mode. When the CO_2 concentration is lower than the start value, it will start the output of the relevant devices (AC24V output and AC Station module); If it is higher than the end value, it will stop the output of the relevant devices.

When the CO_2 concentration in the environment reaches the corresponding range, the output action of the corresponding equipment will be stopped to achieve the goal of controlling CO_2 concentration in the environment.

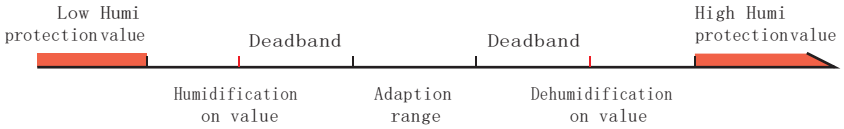


Humidity control

The device can be set to humidify mode, dehumidify mode, synchronous humidify and dehumidify control mode and idle mode.

After analysis of the humidity data read by the sensor, the humidity in the environment can be controlled and adjusted. The humidity is controlled within a range. That is, when the humidity is below the humidification value, the humidifier (AC24V output) will be started, and when it is above the initial value, the dehumidifier (AC24V output) will be started.

After the humidity of the environment is within the corresponding range, the output of the corresponding device is stopped to control the humidity in the environment.



Temperature control

The heating mode, cooling mode, synchronous heating, and cooling mode and idle mode.
After analysis of the temperature data read by the sensor, the ambient temperature can be controlled and adjusted. The temperature can be controlled within a range. When the temperature is below the heating value, the heater (AC24V output) will be started; when it is above the initial value, the cooler (AC24V output) will be started.

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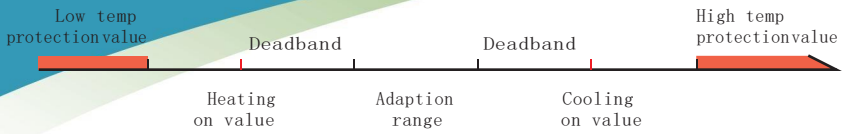
After the ambient temperature is within the corresponding range, the output of the corresponding device will be stopped to realize ambient temperature control.



Day and night Setting

All sensors are equipped with a light sensor, which is used to determine whether the controller works during the day or night. In this document, the daytime is defined as the time when the remote sensor senses the light, and the nighttime is defined as the time when the light is not sensed in the room. The actual time of the day does not affect the day or night mode controlled by Master Environmental Control C-1.

When there are multiple probes, and the sensing status of different probes is inconsistent (for example, one of the senses the day and the other two senses at night), it is decided by a simple majority. The sensor of day and night judges that the light intensity coefficient is determined by the device and does not need to be set by the user.

The Master Environmental Control C-1 is preset with default day and night control parameters (shown in the Factory Defaults and Control Limits section of this document) so that it can be used immediately out of the box. The Master Environmental Control C-1 controller will display the date symbol in the upper left corner of the day/night mode.

Day mode control: The Master Environmental Control C-1 controller outputs signals to the corresponding device by monitoring the relative humidity, temperature, and CO_2 concentration in the room based on the day control parameters, thus maintaining them at the required level in the environment.

Night mode control: The Master Environmental Control C-1 controller outputs signals to the corresponding device by monitoring the relative humidity, temperature, and CO_2 concentration in the room based on the night control parameters, thus maintaining them at the required level in the environment.

In night mode, only the CO_2 concentration monitoring and alarming are available, and the corresponding output device will not be activated to save CO_2.

Light dimming adapter control

The Master Environmental Control C-1 controller is equipped with two channels of independent or interlocked light control logic; meanwhile, the main supplementary light line and the auxiliary supplementary light line are available. In the Master Environmental Control C-1 system, a maximum number of 20 light dimming adapter modules (LDA-1) are equipped per channel.
The LED-type and HID-type light are available. Moreover, there is an automatic high ambient overtemperature detection mechanism (high-temperature shutdown function), which can turn off the light when the temperature is excessively high.

Automatic nutrient dosing and irrigation mode

Master Environmental Control C-1 controller is capable of running in conjunction with PHEC-B2 equipment, which is called Hydro-Plus mode. In this mode, the automatic nutrient dosing, automatic water make-up, water level detection (EC, pH, water level, and water elevation), automatic irrigation, automatic liquid dispensing switch, and high-water temperature alarm can be set.

VI. Operation Instructions

1. Power on

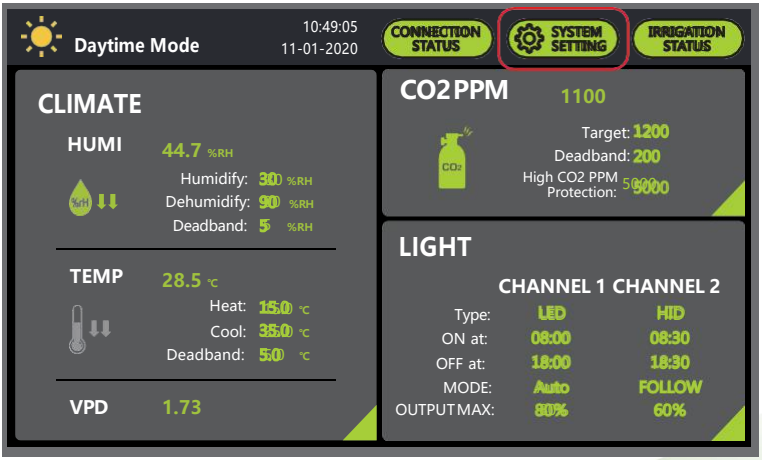
Turn on the , the LOGO will be automatically displayed in the interface, waiting for the data to be automatically updated. After the update is complete, the monitoring interface will be shown.

After the devices are turned on, the real-time data of related devices will be displayed in the interface, including VPD, humidity, temperature, CO_2, light, day, and night.

The day and night status is displayed in the upper left corner of the interface, and the current time and date are displayed in the top middle position of the interface. The time is shown in the format of HH: MM: SS and the date are shown in the format of MM-DD-YYYY.

The day and night status is determined by a light sensor on the probe, which can detect the light intensity.

2. System Setting



Press the system setting icon to enter the setting interface.

In this interface, the system version, day and night time, date setting, time setting, 12/24-hour time format, alarm signal output, temperature unit, automatic backlight switch, and backlight brightness can be set.
You can navigate to other related interfaces via the interface on the right side.
Time format: Set the date format as MM-DD-YYYY and the time format as HH: MM: SS.

12/24-hour time format: 12-hour and 24-hour time format are available.
Alarm signal output: Enable and disable the alarm signal output.
Temperature unit: Set the temperature unit, in Fahrenheit or Celsius.
Automatic backlight switch: Enable the automatic backlight; waiting for 60 seconds, when the backlight will be automatically turned off, and the screen saver will be shown.
Backlight brightness: Move the slider to adjust the brightness of the screen from 20% to 100%.

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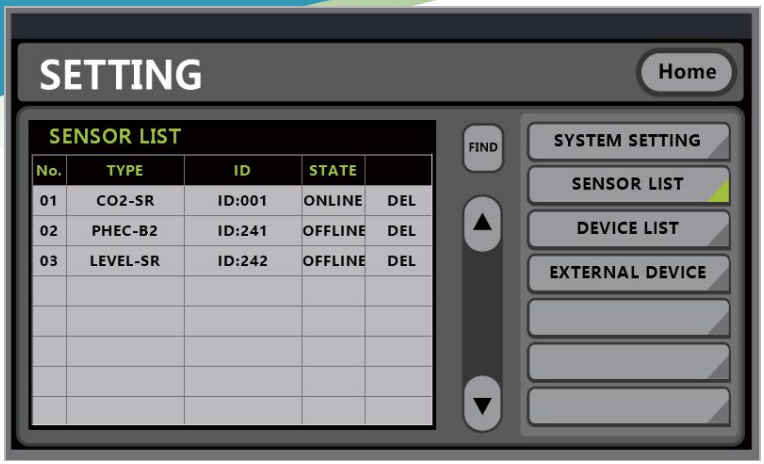
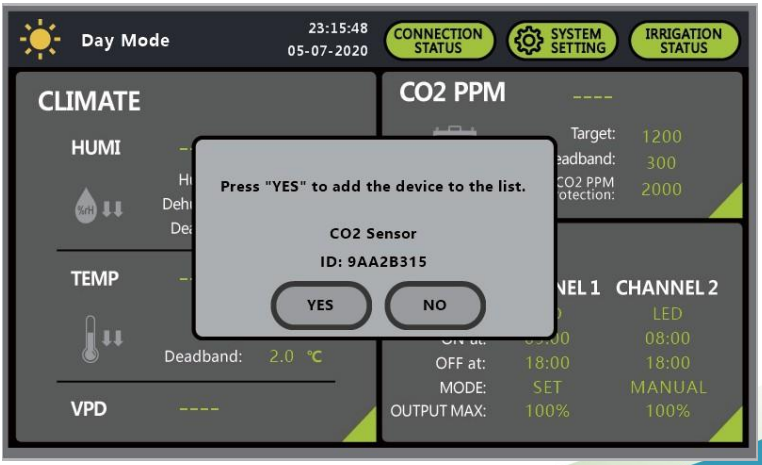
(2.1) Sensor and device list



In the sensor or device list interface, all registered devices will be displayed, which are distinguished and shown by device names, such as CO_2-SR, HT-SR, PHEC-B2, LEVEL-SR, AC-CO_2, LDA-1, etc. The device ID, connection status (online/offline) will be displayed simultaneously.
In this interface, you can choose to find unregistered devices.

(2.2) Adding sensors or devices

In this interface, you can delete or find new devices.
After the unregistered CO_2 sensor, H&T sensor, AC Station module, and LDA-1 module are inserted into the port or after the Find button is pressed, the device-related prompt dialogue box will automatically pop up.



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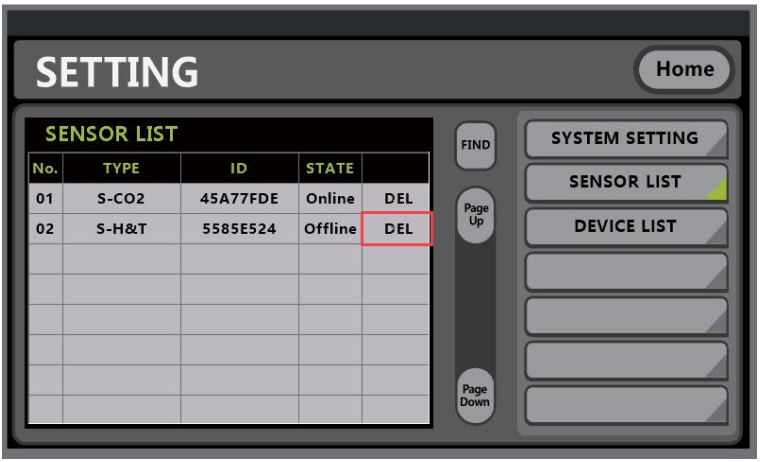
After the relevant device data are found, the dialogue box will be displayed as shown in the interface above, in which the device type and ID will be present; if the user presses the YES button, the relevant device data will be added to the device list; if the user presses the NO button, the device will not be added to the device list.

The RS485 port for the sensor is the Sensor port.
The RS485 port for the device is the Device port.
The RS485 port for the LDA-1 device is the Light LINE-1 or Light LINE-2 port.

(2.3) Deleting sensors or devices

In the list interface below, you can press the DEL button to delete the device data with the corresponding ID.



Press the YES button in the pop-up dialogue box to delete the device data from the device list, or press the NO button to exit; after deleting the device, go back to the device list interface.

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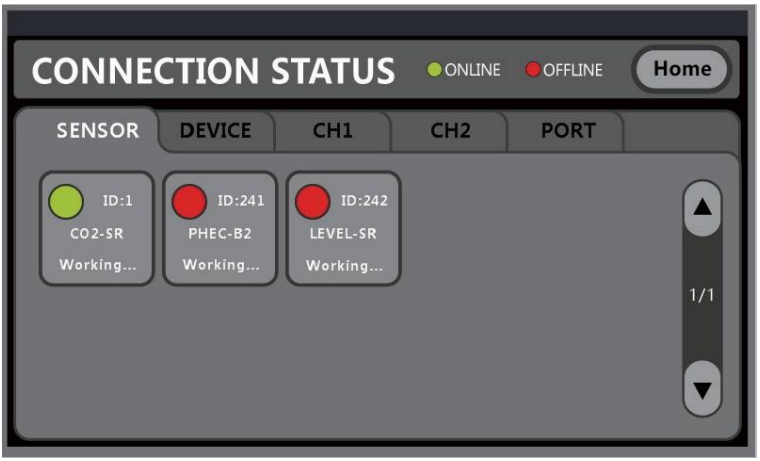
3. Device Status

In the main setting interface, press the "CONNECTION STATUS" to enter the device status interface. The devices displayed in the interface are SENSOR, DEVICE, CH1 light line 1, CH2 light line 2, and PORT.



The corresponding online status of the port is also displayed in the interface:

If the device is not registered, it will not be displayed.
If the device is registered and connected, the status indicator will be green.
If the device has been registered but not connected, the status indicator will be red.

4. Home Page

In the Home Page, the real-time data of VPD, humidity, temperature, and CO_2 are displayed.
In the upper left corner, the humidity value, humidification on value, dehumidification on value, and the corresponding Deadband value are displayed.
In the lower-left corner, the temperature value, heating on value, cooling on value, and the corresponding Deadband value are displayed.
In the upper right corner, the target value of CO_2, Deadband value, and high CO_2 PPM protection value are displayed.
In the lower right corner, the light type, on time, off time, working mode and brightness output are displayed.

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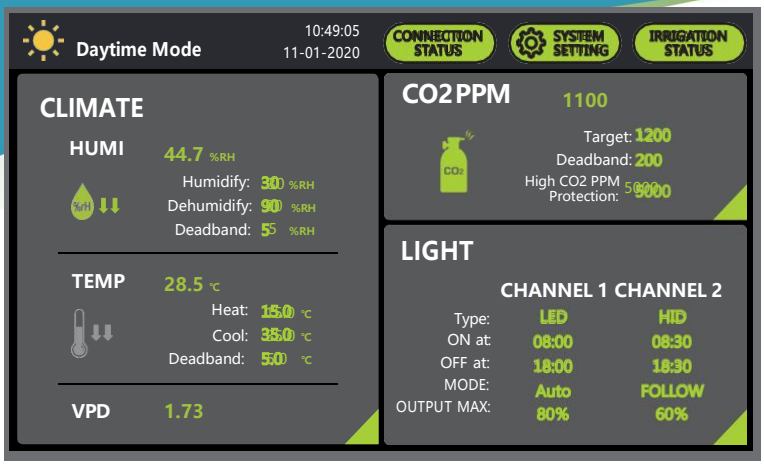

5. CO_2 Setting

In the CO_2 setting interface, the real-time data of the currently connected sensor are displayed, as well as the device's CO_2 parameters set, such as working mode, high CO_2 PPM protection value, target value, Deadband value, the interlocked status of CO_2 &Cooling and CO_2& Dehumidification.

(5.1) CO_2 Target value setting

In this section, you can set the CO_2 target value in the box behind [Target], Deadband value in the box behind [Deadband], and high CO_2 PPM protection value in the box behind [High CO_2 PPM Protection]

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[Target] value: 400-4000. The target value needs to be lower than the high CO_2 PPM protection value.
[Deadband] value: 50-1000. The target value plus the deadband value needs to be lower than the high CO_2 PPM protection value.
[High CO_2 PPM Protection] value: The value shall be lower than 9999, and the target value needs to be higher than the CO_2 target value.

When the value entered exceeds the setting range, a dialogue box saying “Data out of range.” will be displayed in the interface.
After the values are set, the Save button will light up. At this time, press the Save button to save the data, after which a dialogue box will pop up prompting you to save the data; the data modified will not take effect unless they are saved.

(5.2) Default parameters

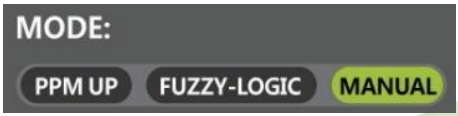
Working Mode	Parameter type	Default parameters
PPM UP Mode	Target value (ppm)	1200
	Deadband value (ppm)	300
	High CO_2 PPM protection value (ppm)	2000
FUZZY-LOGIC Mode	Target value (ppm)	1000
	Deadband value (ppm)	100
	High CO_2 PPM protection value (ppm)	2000
Default working Mode		OFF Mode
Interlock Setting	Interlocked with dehumidification (with fan on)	OFF State
	Interlocked with cooling (with fan on)	OFF State

(5.3) Day and night setting

The device will not start the CO_2 regulation at night.

(5.4) Working mode setting

On the left side of the interface, the working mode of the device is displayed, which are PPM-UP mode, FUZZY-LOGIC mode, and MANUAL mode.



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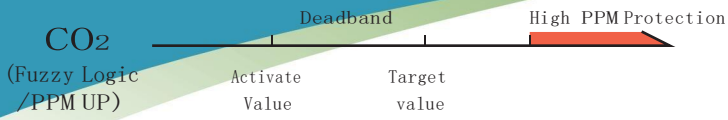

In PPM-UP mode, the device will turn on the AC-Station (CO_2) module when the current value is lower than [TARGET]-[DEADBAND] value, and immediately turn off the AC-Station (CO_2) module after the [TARGET] value is reached.

In FUZZY-LOGIC mode, the device will turn on the AC-Station (CO_2) module when the current value is lower than [TARGET], and immediately turn off the AC-Station (CO_2) module when the [TARGET] + [DEADBAND] value is reached.

In MANUAL mode, the device does not perform any automatic CO_2 regulation action.

(5.5) Current working status display

When performing actions, the current device will display the specific working status of the device. In different modes, different icons are used to display the current working status.

Icon	Mode	Status
	PPM UP	OFF
	PPM UP	ON
	FUZZY LOGIC	OFF
	FUZZY LOGIC	ON

(5.6) Interlock settings

When performing actions, the working status of CO_2 and cooling may be inconsistent when using different equipment, that is, when the fan is on for cooling, the CO_2 will not be achieved with fan. Therefore, in the above scenarios, it is necessary to enable the interlocked CO_2 and cooling function.

When performing actions, the working status of CO_2 and dehumidification may be inconsistent when using different equipment, that is, when the fan is on for dehumidification, the CO_2 regulation will not be achieved with fan. Therefore, in the above scenarios, it is necessary to enable the CO_2 and dehumidification interlock function.

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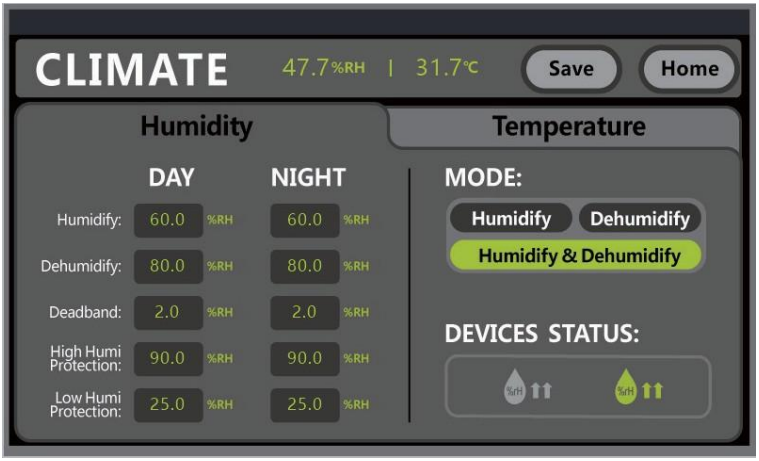
6. Humidity parameter setting interface

In the humidity parameter setting interface, the current real-time data and the working status of the device are displayed in the upper part.

If the device is not equipped with temperature and humidity module, the relevant data of temperature, humidity and CO_2 three-in-one module can be used; meanwhile, the humidity parameters of the device will be displayed, such as working mode, low humidity protection value, high humidity protection value, target value, and deadband value.

After the data are set, the Save button will light up. At this time, press the Save button to save the data, after which a dialogue box will pop up prompting you to save the data; the data modified will not take effect unless they are saved.



(6.1) Humidity Setting

In this section, you can set the target value in the box behind [Humidify], target value in the box behind [Dehumidify], deadband value in the box behind [Deadband], low humidity protection value in the box behind [Low Humi Protection], high humidity protection value in the box behind [High Humi Protection] respectively in the day and night mode.

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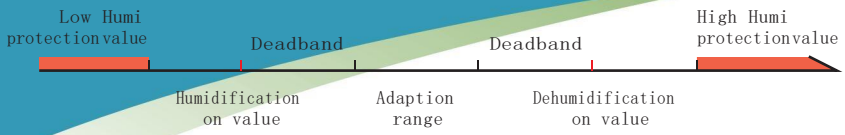

[Humidify] target value: When the current humidity of the device is lower than this value, then the humidification will be started. The target value set needs to be lower than the high humidity protection value minus the deadband value, and needs to be higher than the low humidity protection value.
[Dehumidify] target value: When the current humidity of the device is higher than this value, then the dehumidification will be started. The target value set needs to be higher than the low humidity protection value plus the deadband value, and needs to be lower than the high humidity protection value.
[Deadband] value: The value set needs to be lower than (Dehumidification target value-Humidification target value)/2 and the value needs to be greater than 0.
[Low Humi Protection] value: The value set needs to be lower than the [Humidify] target value.
[High Humi Protection] value: The value set needs to be higher than the [Dehumidify] target value.

After the [Humidify] + [Deadband] value is reached, the humidification output port is turned off immediately.

In Dehumidify mode, the device will turn on the dehumidification output port when the current value is higher than [Dehumidify] value, and immediately turn off the dehumidification output port when the humidity value is lower than [Dehumidify]-[Deadband] value.

In Humidify & Dehumidify mode, the device will turn on the humidification output port when the current value is lower than [Humidify] value, and immediately turn off the humidification output port when the humidity value is higher than [Humidify] + [Deadband] value. The device will turn on the dehumidification output port when the current value is higher than [Dehumidify] value, and immediately turn off the dehumidification output port when the humidity value is lower than [Dehumidify]-[Deadband] value.

(6.2) Displaying current working status

When performing actions, the current device will display the specific working status of the device.
In different modes, different icons are used to display the current working status.

Icon	Mode	Status
	Humidify Humidify&Dehumidify	OFF
	Humidify Humidify&Dehumidify	ON
	Humidify Humidify&Dehumidify	OFF
	Humidify Humidify&Dehumidify	ON

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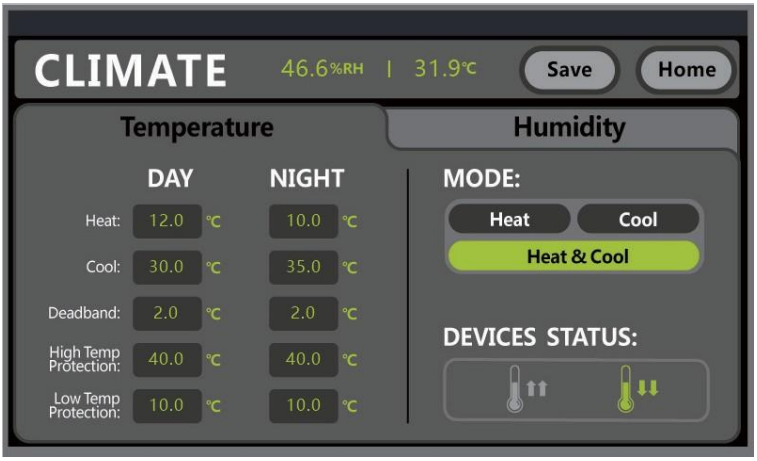
(6.3) Interlock setting

In the case where the CO_2 and the dehumidification are interlocked, when the CO_2 regulation is performed, the cooling is enabled, and the CO_2 regulation will be stopped, so the dehumidification will be executed first.

7. Temperature parameter setting interface

In the temperature parameter setting interface, the current real-time data and the working status of the device are displayed in the upper part of the device.

If the device is not equipped with a temperature and humidity module, the relevant temperature and humidity data of the 3 in 1 module will be used;
Meanwhile, the temperature parameters of the device will be displayed, such as working mode, low temperature protection value, high temperature protection value, target value and deadband value.



(7.1) Temperature Setting

The [Heat] target value, [Cool] target value, [Deadband] value, [Low Temp Protection] value and [High Temp Protection] value in this section are set respectively in day and night mode.

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[Heat] target value: When the current temperature of the device is lower than this value, then the heating is started. The target value set needs to be lower than the high temperature protection value minus the deadband value, and needs to be higher than the low temperature protection value.
[Cool] target value: When the current temperature of the device is higher than this value, and the cooling is started. The target value set needs to be higher than the low temperature protection value plus the deadband value, and needs to be lower than the high temperature protection value.
[Deadband] value: The value set needs to be lower than (Cool target value minus heat target value)/2 and the value needs to be greater than 0.
[Low Temp Protection] value: The value set needs to be lower than the [Heat] target value of cooling & humidification.
[High Temp Protection] value : The value set needs to be higher than the [Cool] target value of heating.

After the data are set, the Save button will light up. At this time, press the Save button to save the data, after which a dialogue box will pop up prompting you to save the data; the data modified will not take effect unless they are saved.

(7.2) Default parameters

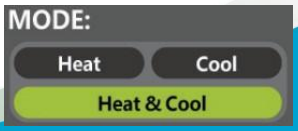
Working M ode	Parameter Type	Default Parameter
Day Mode	Heating on value	12.0 ℃/53.6°F
	Cooling on value	30.0 ℃/ 86°F
	Deadband	2.0 ℃/ 35.6°F
	Low humidity protection value	10.0 ℃/ 50°F
	High humidity protection value	35.0 ℃/ 95°F
Night Mode	Heating on value	12.0 ℃/ 53.6°F
	Cooling on value	30.0 ℃/ 86°F
	Deadband	2.0 ℃/ 35.6°F
	Low humidity protection value	10.0 ℃/ 50°F
	High humidity protection value	35.0 ℃/ 95°F
Default working Mode	Heat mode	OFF state
	Cool mode	OFF state
	Heat & cool mode	OFF state

(7.3) Day and night setting

Different parameters need to be set in different light environments.

(7.4) Working mode setting

On the left side of the interface, the working modes of the device are shown, which are Heat mode, Cool, Heat & Cool mode.



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Press the Heat and Cool buttons, and they will turn from gray to bright, indicating that the corresponding working status is on.

In Heat mode, the device will turn on the humidification output port when the current value is lower than [Heat] value, and immediately turn off the heating output port when the real-time temperature value is higher than [Heat] + [Deadband] value.

In Cool mode, the device will turn on the dehumidification output port when the current value is higher than [Cool] value, and immediately turn off the cooling output port when the real-time temperature value is lower than [Cool]-[Deadband] value.

In Heat & Cool mode, the device will turn on the humidification output port when the current value is lower than [Heat] value, and immediately turn off the heating output port when the real-time temperature value is higher than [Heat] + [Deadband] value. The device will turn on the dehumidification output port when the current value is higher than [Cool] value, and immediately turn off the cooling output port when the real-time temperature value is lower than [Cool]-[Deadband] value.

(7.5) Displaying current working status

When performing actions, the current device will display the specific working status of the device.
In different modes, different icons are used to display the current working status.

Icon	Mode	Status
	Heat Heat&Cool	OFF
	Heat Heat&Cool	ON
	Heat Heat&Cool	OFF
	Heat Heat&Cool	ON

(7.6) Interlock setting

When performing actions, the working status of CO_2 and cooling may be inconsistent when using different equipment, that is, when the fan is on for cooling, the CO_2 regulation will not be achieved with fan. Therefore, in the above scenarios, it is necessary to enable the CO_2 and cooling interlock function.

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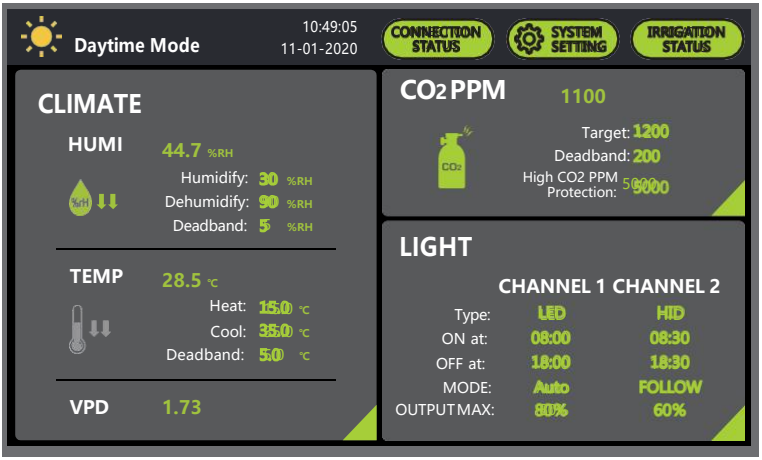
8. Light Setting

On the home page, the current type of the light and the status of each channel.
The device is provided with two light channels, each of which can be connected to 20 light dimming adapter (LDA-1) modules at most to control the HID or LED lamps.
The channel 1 is set for the main line light control, and the channel 2 light is set for the auxiliary line light control.



(8.1) Channel 1 setting

The light parameters to be set are listed below:

[LIGHT MODE]: LED, HID;
[ON Time at]: 8:00;
[HID Delay]: 3min ~ 180min;
[Sun R/S]: 0 ~ 60min;
[OFF TEMP]:
10.0℃ ~ 70℃; 50~158°F

[Output Max]: 50% ~ 115%;
[OFF Time at]: 18:00;
[Mode]: LIGHT AUTO MODE, LIGHT SET MODE and MANUAL MODE;
[DIM TEMP] for 50% overheat: 10.0℃ ~ 70℃; 50~158°F

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(8.2) Main line light parameter setting

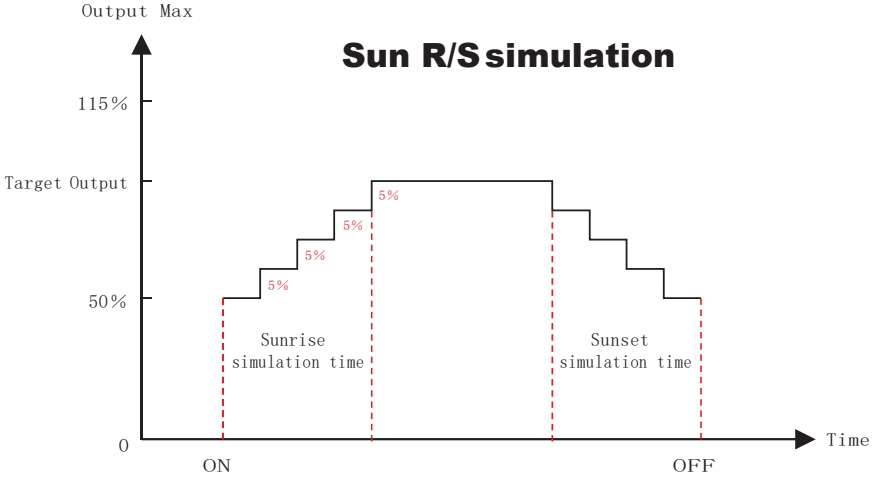
The light module is automatically turned on and off based on the time status set for day and night. The light intensity can be set in the interface, with a minimum light intensity of 10% and a maximum light intensity of 115%.

(8.3) HID delay parameter setting

After setting the delay of the HID lamp in the interface, when the device is turned off, the delay time required to wait for the response is enabled again, which is from 3min to 180min.

(8.4) Sun r/s parameter setting

In the interface, the Sun R/S mode can be enabled and disabled as appropriate, that is, a fixed off time can be set. If the time set is longer than 1 minute, the light intensity is switched by 5% each time; if the time set is less than or equal to 1 minute, the light intensity is switched by 10% each time. If the time is set to 0, it means that the status of sun r/s is not displayed.



(8.5) Channel 2 Setting

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The light parameters to be set are listed below:

[LIGHT MODE]: LED, HID;
[ON Time at]: 8:00;
[HID Delay]: 3min ~ 180min;
[Sun R/S]: 0-60min, following the main line setting;
[OFF TEMP]: 10.0 ~ 70 ℃/50~158°F following the main line setting;
[Output Max]: 50% ~ 115%;
[OFF Time at]: 18:00;
[Mode]: SEPARATE MODE, LIGHT SET MODE, FOLLOW MODE and MANUAL MODE;
[DIM TEMP] for 50% overheat: 10.0 ℃ ~ 70 ℃/50~158°F following the main line setting;

(8.6) Following mode of auxiliary line light

In the following mode of auxiliary line light, the relevant parameters of the main line will be executed. The light intensity can be set in the interface, with a minimum light intensity of 10% and a maximum light intensity of 115%.

(8.7) Separate mode of auxiliary line light

In the separate mode of auxiliary line light, the relevant parameters of the auxiliary line will be executed.

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How Do You Get Service?
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2. Use of the parts not assembled or installed in accordance with the instructions of THEPROTECTOR.
3. Use of parts or accessories other than those produced or recommended by THEPROTECTOR.
4. External sources such as transit damage or weather.
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