

# Plant Factory Field Version Intelligent Control System Manual



GP-PFLC-02B01

# Contents

1. Overview	02
2. Field version plant factory controller port diagram	03
3. Master controller	05
4. Temperature and humidity meter	24
5. Shipping list	25

# 1. Product introduction

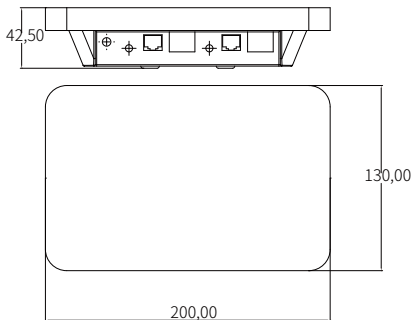
## 1.1 Overview

Plant factory field version control system is a simple version of 0-10V output control (KWT-PFLC-02B01) plant lighting control system developed by our company. This system mainly consists of master controller and 0-10V control board, and the temperature and humidity meter developed by our company to measure temperature and humidity, so as to provide data support for the control of light, temperature and humidity during plant growth. The master controller uses 24 bit true color touch screen to realize man-machine interaction, making the control operation more simple and convenient. 0-10V control board receives the signal of the control board to switch and adjust the light of lamp.

Master controller model:

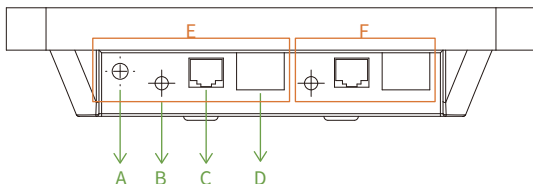
GP-PFLC-02B01: communication control with 0-10V control board.

## 1.2 Product Picture

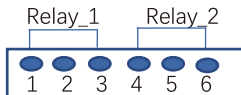


## 2. Field version plant factory controller port diagram

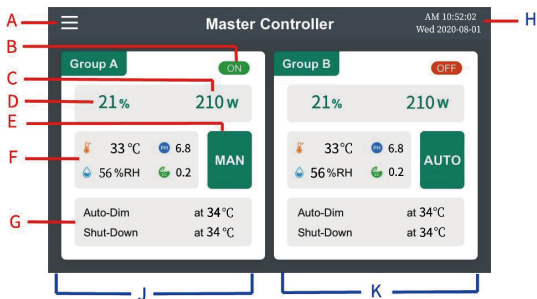
### 2.1 Hardware port diagram



Mark	Description
A	DC input 5V-12V
B	3.5MM audio input port, for connection with temperature and humidity meter
C	RJ11 port, for 0-10V control line connection
D	Provide two external ON/OFF switching signals Set ON/OFF for two-way switches, see 3.2.10 Group A is perfectly symmetrical with Group B
E	Group A
F	Group B, whose function is completely symmetrical with zone A



## 2.2 Front page interface introduction diagram



Mark	Description
A	Menu key, press this key to enter the menu page
B	The current lamp ON/OFF state
C	The power when the current lamp is on
D	The percentage of the lit lamp
E	The operation control mode: Manual or Auto
F	The current ambient values, such as temperature, humidity. Note: PH, EC are not supported.
G	The temperature of the lamp on and off set by the current system, as specifically described in 3.2.10
H	The current system time
J	Group A
K	Group B (same function as Group A)

Note: This page is only display page, there is feedback only after press “Menu” key.

## 3. Master controller

### 3.1 Electrical parameters

The master controller is the brain of the control system, with data acquisition, storage, processing and forwarding functions, mainly for regular temperature and humidity data reading , control command transmission, data communication, human-computer interaction, etc. Its main electrical indicators and port definitions are shown in the following table:

Item		Technical parameters	Remark
Electric parameters	Power supply	DC 5V--12V	
	Working current	≤ 0.5A@ DC 12V	
Port	Power	DC-005 power socket	Power DV port
	PJ-313*2	Audio port	For temperature and humidity meter
	RJ11*2	0-10V communication port	For connection between the controller and the 0-10V conversion board
	KF141*2	Spring terminal	For external control
Structure	L*W*H	200mm*130mm*42.5mm	
Other parameters	Product weight	0.71kg	
	Working temperature	-25~ 70 °C	
	Storage temperature	-40~ 85 °C	
	Relative humidity	< 95% (No condensation)	

## 3.2 Function introduction

The master controller uses 7-inch 24-bit true color resistive touch screen to achieve human-computer interaction. The main functions and the interface operation are briefly described.

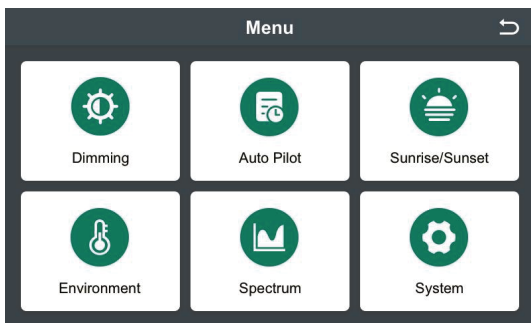
### 3.2.1 Main interface


The main interface is divided into two completely symmetrical two areas: Group A and Group B, showing the relevant state of the current lamp and the status of the environment.



Click the “☰” key in the upper left corner to enter the menu pag.

### 3.2.2 Menu page



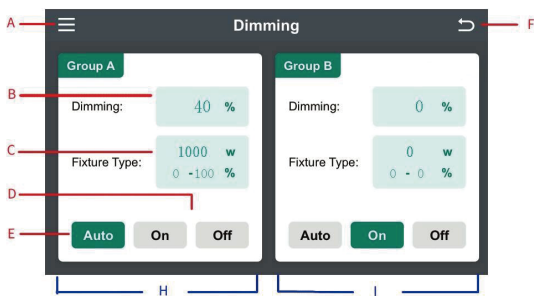
Click the “” key in the upper right corner to return to the home page.

Click the function keys below to enter the corresponding settings page, as follows:

Function Button	Button Instruction
Dimming	mainly sets the current output percentage, working mode (manual or auto), as specifically described in 3.2.3.
Auto Pilot	Pilot: set the relevant parameters in auto mode, as specifically described in 3.2.7.
Sunrise/Sunset	set the sunrise and sunset relevant parameters, as specifically described in 3.2.9.
Environment	set the external on-off port parameters and the temperature value of the light on and off control, as specifically described in 3.2.10.
Spectrum	set the relevant seasonal parameters (this function is not valid).
System	set system parameters, such as time setting, temperature unit selection, lock screen etc., as specifically described in 3.2.11.



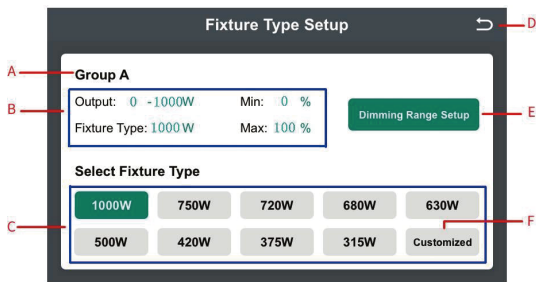
### 3.2.3 Dimming page



The Dimming page can set the output percentage of the current lamp, and the auto/ manual mode, and display the currently used lamp power supply parameters.

Mark	Description
A	Menu key, press this key to enter the menu page
B	The percentage of the lit lamp
C	Display the current lamp control power supply parameters, click to enter the lamp control power supply parameter setting page, as specifically described in 3.2.4
D	Manual mode selection key, highlighted after pressing, highlight is effective. As long as one of the On or Off key is highlighted, the current working mode is manual
E	The selection key of the automatic mode, highlighted after pressing, highlight is effective, and the current mode is selected as auto mode
F	Return key, to return to the previous page
H	Group A
I	Group B (same function as Group A)

### 3.2.4 Fixture Type Setup page

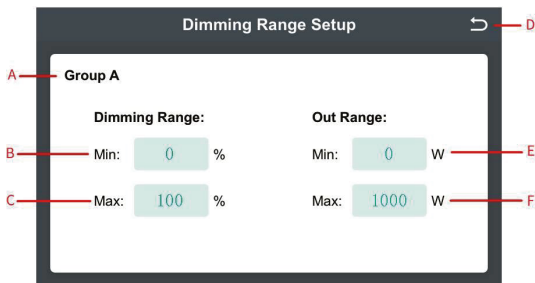


This is the settings page for Group A, the same as Group B, except that the mark pints are different, so only Group A is introduced.

Mark	Description
A	The currently set area. Group A means area A, and Group B means area B
B	Displays the output settings of the lamp control power supply, and the maximum and minimum output percentages
C	Quickly set the power of the current lamp control power supply, click the corresponding key to act, and when the key is highlighted, it means that the setting is successful. You can also set the unique power supply power, click the F marker key and enter the corresponding power to set the corresponding parameters
D	Return key, to return to the previous page
E	Set the output settings of the lamp control power supply, and the maximum and minimum output percentages. Correspond to the marker points in Group B, as specifically described in 3.2.5
F	Custom settings for power supply power, as specifically described in 3.2.6

Note: the blue box was added for labeling purposes, and there is no blue box on the actual interface.

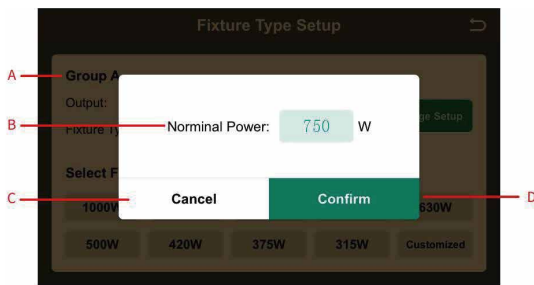
### 3.2.5 Dimming Range Setup interface



This is the settings page for Group A, the same as Group B, except that the mark pints are different, so only Group A is introduced.

Mark	Description
A	The currently set area. Group A means area A, and Group B means area B
B	Set the percentage when the lamp control power supply outputs at the minimum power
C	Set the percentage when the lamp control power supply outputs at the maximum power
D	Return key, to return to the previous page
E	Set the minimum power that the lamp control power supply can output (it can not exceed the power of the power supply, if yes, it will be changed to the maximum power by force)
F	Set the maximum power that the lamp control power supply can output (it can not exceed the power of the power supply, if yes, it will be changed to the maximum power by force)

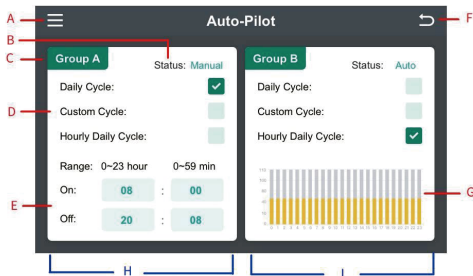
### 3.2.6 Customized interface



This is the settings page for Group A, the same as Group B, except that the mark pints are different, so only Group A is introduced.

Mark	Description
A	The currently set area. Group A means area A, and Group B means area B
B	Set the power of the lamp control power supply
C	Cancel key, this value is invalid, and return to the previous page
D	Confirm key, this value is valid, and return to the previous page

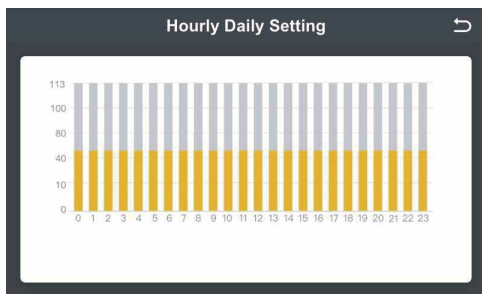
### 3.2.7 Auto Pilot interface



This page is to set which automatic control mode is used in the corresponding area, two modes can be set: Hourly Daily Cycle and Hourly Daily Cycle, for which Custom Cycle is not valid. On this page, if the checkbox of the corresponding area is highlighted, it indicates the machine is working in this mode.

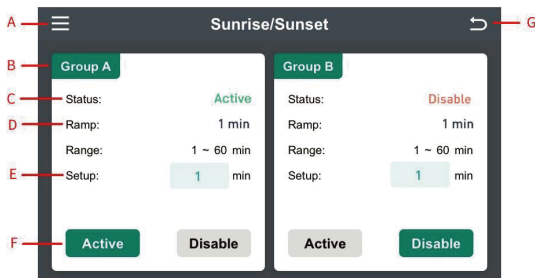
Mark	Description
A	Menu key, press this key to enter the menu page
B	Display the current controller operation control mode: Manual or Auto
C	Area mark. Group A means area A, and Group B means area B
D	Mode selection, click on the small box behind, if the box is highlighted, the corresponding automatic control mode is selected, and it will switch to the corresponding setting option page, for example: the Group A in the figure above is the Daily Cycle setting page, and the Group B is the Hourly Cycle setting page
E	Daily Cycle setting page (the functions of Group A and B are the same): turn on the light at On time, and turn off the light at Off time
F	Return key, to return to the previous page
G	Hourly Cycle setting page (the functions of Group A and B are the same): this area only displays the bar chart corresponding to the percentage of each hour. Click this area to set the percentage of fixed output per hour. After the setting is complete, the lamp control output percentage within each hour is based on the set percentage
H	Daily Cycle page in Group A
I	Hourly Cycle page in Group B

### 3.2.8 Hourly Daily Setting interface



The return key is in the upper right corner, used to return to the previous page. Each bar in the middle can be dragged to set the corresponding percentage. Hourly Daily Cycle settings are associated with setting parameters for each corresponding area.

### 3.2.9 Sunrise/ Sunset interface



The functions of Group A and Group B are the same, so only Group A is introduced:

Note: Sunrise and Sunset function works for all modes. If dimming in manual mode, please turn off the sunrise and sunset function, or there will be a conflict.

Mark	Description
A	Menu key, press this key to enter the menu page
B	Area mark. Group A means area A, and Group B means area B
C	Status display, which shows whether the sunrise and sunset features in the current area are active.
D	Display the slope of sunrise and sunset in the current area
E	Set the slope of sunrise and sunset in the current area
F	Active and Disable keys: click the corresponding key to set the sunrise and sunset function of the current area. The setting is successful when highlighted. Active indicates that the sunrise and sunset functions are active. Disable indicates that the sunrise and sunset functions are disabled
G	Return key, to return to the previous page


### 3.2.10 Environment interface



The Environment page can set parameters for two parts: one is Light and one is Relay, the left half of the above figure is the Light setting page, and the right half is the Relay setting page. The functions of Group A and Group B are the same, and the corresponding parameters can be set separately.

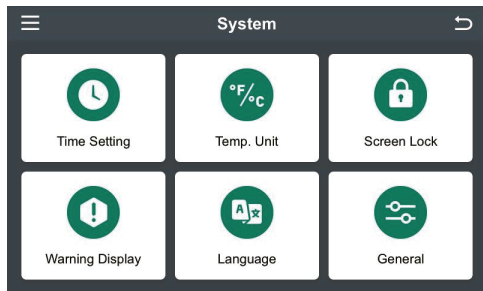
Mark	Description
A	Menu key, press this key to enter the menu page
B	Light and Relay setting page switching key, click the corresponding key to switch to the corresponding setting page.
C	Status display. When on the Light page, Active indicates that Light temperature control function is active, and Disable indicates that it is disabled. When on the Relay page, Relay On indicates that two external on-off switches are controlled by the temperature below, Relay Off indicates that two external on-off switches are not controlled by the temperature below
D	Range on the Light page: the temperature range E and F can set
E	“Auto-Dim Ta” temperature: when the Light function is Active, and the temperature exceeds the “Shut-Down” setting, the system will turn off the lamp by force, other settings will not turn on the lamp until the temperature drops below the “Auto-Dim Ta” temperature, the lamp will be allowed to turn on.
F	“Shut-Down” temperature: when the Light function is Active, and the temperature exceeds the “Shut-Down” setting, the system will turn off the lamp by force, other settings will not turn on the lamp
G	(Light setting page) Active and Disable keys: it is effective when highlighted, press to select the corresponding function. Active indicates that the Light function is active and the system determines the on and off of the lamp based on the temperature, Disable indicates that the Light function is disabled.(Relay setting page) Active and Disable keys: it is effective when highlighted, press to select the corresponding function. Active indicates that the Relay function is active and the system performs actions of external on-off switch based on the temperature, Disable indicates that the Light function is disabled.
H	Return key, to return to the previous page
I	Status display. When on the Light page, Active indicates that Light temperature control function is active, and Disable indicates that it is disabled. When on the Relay page, Relay On indicates that two external on-off switches are controlled by the temperature below. Relay Off indicates that two external on-off switches are not controlled by the temperature below





Mark	Description
J	<div style="text-align: right; margin-bottom: 10px;"> <span style="margin-right: 20px;">Relay_1</span> <span>Relay_2</span> </div>  <p>1, 2, 3 belong to the first Relay control  4, 5, 6 belong to the second Relay control  The two temperatures set on this line belong to the first Relay control, which can control 1, 2, and 3 Two cases:</p> <ol style="list-style-type: none"> <li>1. Off Ta is less than On Ta: (the temperature is too high and the cooling device needs to be turned on).  When the temperature is greater than On Ta, 2 and 3 are connected, and 1 is disconnected.  When the temperature is less than Off Ta, 2 and 1 are connected, and 3 is disconnected.</li> <li>2. Off Ta is greater than On Ta: (the temperature is too low and the heating device needs to be turned on).  When the temperature is less than On Ta, 2 and 3 are connected, and 1 is disconnected.  When the temperature is greater than Off Ta, 2 and 1 are connected, and 3 is disconnected.</li> </ol> <p>Note: After each external on-off switch acts, it will take 30 minutes to restart the temperature judgment.</p>
K	<p>The two temperatures set on this line belong to the first Relay control, which can control 4,5, and 6 Two cases:</p> <ol style="list-style-type: none"> <li>3. Off Ta is less than On Ta: (the temperature is too high and the cooling device needs to be turned on).  When the temperature is greater than On Ta, 5 and 6 are connected, and 4 is disconnected.  When the temperature is less than Off Ta, 5 and 4 are connected, and 6 is disconnected.</li> <li>4. Off Ta is greater than On Ta: (the temperature is too low and the heating device needs to be turned on).  When the temperature is less than On Ta, 5 and 6 are connected, and 4 is disconnected.  When the temperature is greater than Off Ta, 5 and 4 are connected, and 6 is disconnected.</li> </ol> <p>Note: After each external on-off switch acts, it will take 30 minutes to restart the temperature judgment.</p>

Mark	Description
L	<p>(Light setting page) Active and Disable keys: it is effective when highlighted, press to select the corresponding function. Active indicates that the Light function is active and the system determines the on and off of the lamp based on the temperature, Disable indicates that the Light function is disabled.</p> <p>(Relay setting page) Active and Disable keys: it is effective when highlighted, press to select the corresponding function. Active indicates that the Relay function is active and the system performs actions of external on-off switch based on the temperature, Disable indicates that the Light function is disabled.</p>

### 3.2.11 System interface

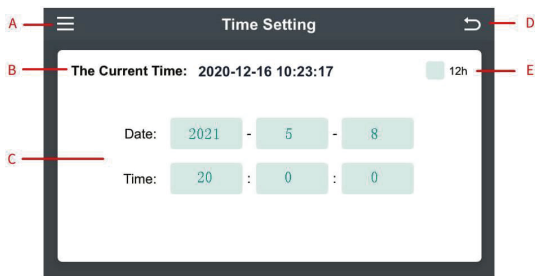


Click the “” key in the upper left corner or the return key in the upper right corner to return to the menu page.

Click the “” key below to enter the corresponding setting page, as follows:

Function Button	Button Instruction
Time Setting	enter to set system time.
Temp Unit	enter to select the current temperature unit
Screen Lock	enter for lock screen related settings.
Warning Display	enter to set the system alarm remind, as specifically described in 3.2.15
General	enter to restore factory setting, view the device version introduction, etc.

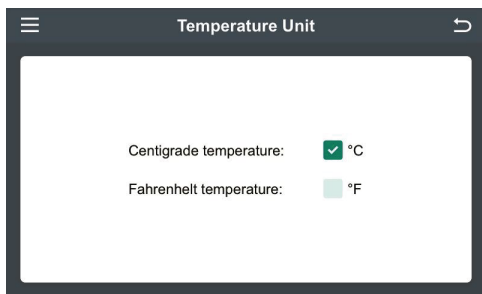
### 3.2.12 Time Setting interface



The Time Setting page can set the current time or set the current display mode to 24-hour clock or 12-hour clock.

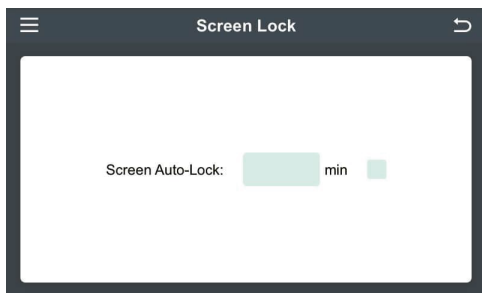
Mark	Description
A	Menu key, press this key to enter the menu page
B	Display the current time
C	Set the system time
D	Return key, to return to the previous page
E	Click here, if the box is highlighted, it indicates that the time is in 12 hours, and if the box is gray, it indicates that the time is in 24 hours

### 3.2.13 Temp Unit interface



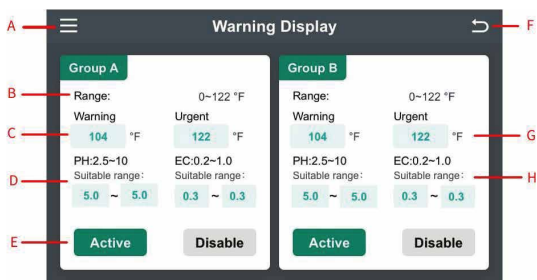
Click the corresponding key to set the temperature display unit of the current controller. It takes 2S for data processing.

### 3.2.14 Screen Lock interface



This page is used for Screen Lock settings. If box on the right is gray, it indicates that the Screen Lock is not required, and if the box is highlighted, it indicates that the lock screen function is enabled, and the Screen Auto-Lock is in Min.

### 3.2.15 Warning Display interface



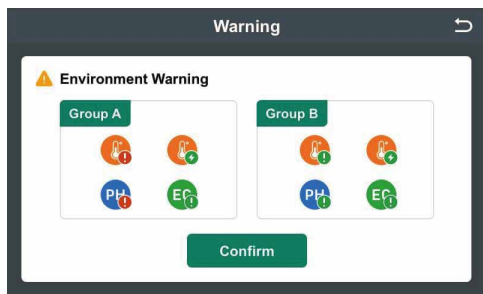
This page is used to set the normal range of abnormal display temperature points and related environmental parameters. An exception page (3.2.16) is displayed when the temperature is out of range or too high.

The functions of Group A and Group B are the same, so only Group A is introduced.

Mark	Description
A	Menu key, press this key to enter the menu page
B	The temperature range Warning and Urgent temperatures can set
C	If exceeding Warning temperature, the abnormal reminder page (3.2.16) will display the corresponding icon and issue an alarm sound
D	Set the normal range of PH: if exceeding the range, the abnormal reminder page(3.2.16) will display the corresponding icon and issue an alarm sound. (Note: the setting is invalid without this sensor)
E	Active and Disable key: it is effective when highlighted. Active: enable anomaly alert detection in the corresponding area, Disable: this function is disabled.
F	Return key, to return to the previous page



Mark	Description
G	Urgent temperature: if exceeding this temperature, the abnormal reminder page (3.2.16) will display the corresponding icon and issue an alarm sound.
H	Set the normal range of EC: if exceeding the range, the abnormal reminder page(3.2.16) will display the corresponding icon and issue an alarm sound. (Note: the setting is invalid without this sensor)



### 3.2.16 Warning interface



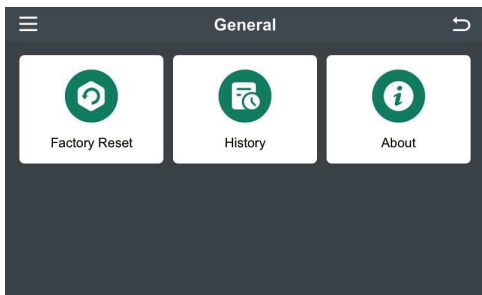
The functions of Group A and Group B are the same, so only Group A is introduced.

Mark	Description
	Warning temperature
	Urgent temperature
	PH (not supported)
	EC (not supported)

Mark	Description
	if the corresponding icon has a green exclamation point in the lower right corner, it is normal.
	if the corresponding icon has a red exclamation point in the lower right corner, it is abnormal.

When the abnormal page is displayed, there is always an alarm sound. Click the “” key or “” key in the upper right corner to exit the page and handle the abnormal items. After 30S, all the items to be tested will be tested again.

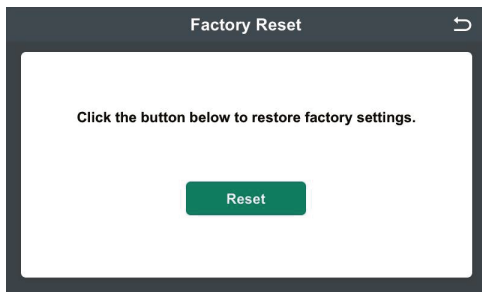
### 3.2.17 General interface




Click the key to enter the corresponding page:

Function Button	Button Instruction
Factory Reset	enter to restore factory setting.
About	enter to view information about the version of this controller.

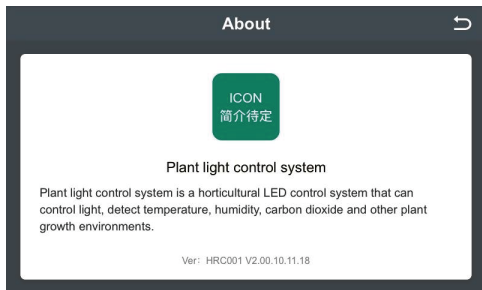
### 3.2.18 Factory Reset interface



The “” key in the upper right corner to return the previous page.

Function Button	Button Instruction
Reset	when pressed, do not perform any operation (easy to cause system confusion). Wait for about 7S, the system will automatically jump back to the previous page, indicating that the factory settings are restored successfully.

### 3.2.19 About interface





### 3.3 List of undeveloped functions

The undeveloped functions of the plant controller are shown in the following table:

List of function keys to be developed		
No.	Category	Remark
1	Language	Only English mode is supported, Chinese selection key is temporarily invalid
2	History	There is no record-saving function
3	Spectrum	There is no seasonal parameter control function
4	EC、PH sensor	The display and control of the values of these two sensors is not supported

## 4. Temperature and humidity meter

The temperature and humidity meter uses a standard audio cable port for power supply and data output, and provides real-time temperature and humidity data of the environment for the master controller.



Item		Technical parameters	Remark
Electric parameters	Power supply	DC 3.3V±0.2V	
	Working current	≤ 10mA	
Port	PJ-313	Temperature and humidity power input, temperature and humidity data output	DC 3.3V input Temperature and humidity
	RJ11*2	0-10V communication port	For connection between the controller and the 0-10V conversion board
	KF141*2	Spring terminal	For external control
Structure	L*W*H	200mm*130mm*42.5mm	
Other parameters	Working temperature	-25~ 70 °C	
	Storage temperature	-40~ 85 °C	
	Relative humidity	< 95% (No condensation)	

## 5. Shipping list

The list of shipped parts is shown in the table below:

NO.	Accessory name	QTY
1	Plant controller	1 unit
2	RJ11 network cable (1.5 m)	2 roots
3	Power adapter	1 unit
4	Temperature and humidity meter	2 pcs
5	Mounting accessories(screws)	1 set
6	Manual	1 pc