Manual

Hardware Parameters:

① Power Supply Voltage: 7~28V

② Power Consumption Requirement: 20W (30W for screens above 15.6 inches)

③ Main Controller Chip: STM32, with a main frequency of 72M, 20KB RAM, 128KB Flash, running RTOS operating system

④ Supports 16-channel output, 4-channel high-speed pulse input, 2-channel ADC, 1-channel RS485, and 1-channel voice interface

Currently, there are two standard configurations (with circuit diagrams attached):

1) 16-channel transistor output

2) 8-channel transistor + 4-channel relay output

⑤ Supports RTC (Real-Time Clock)

⑥ Supports voice control (voice module is optional)

⑦ Screen: Diwen industrial-grade touchscreen. Currently supported sizes include:

4.3", 5", 7", 8", 10.1", 15.6", 18", etc.

Supports decoder control

Supports GPIO expansion module

Supports precise EC/PH fertilizer mixing

Software Parameters:

① Supports 4 fertilizer suction channels

② Supports 56 partitions

③ Supports grouping and cyclic irrigation

④ Supports automatic EC/PH control

⑤ Supports neutral WeChat mini-program control, with customizable company logo and name

⑥ Front-end and back-end separation, all API interfaces open (HTTP protocol)

⑦ Supports OTA (Over-The-Air) function for automatic system firmware upgrade

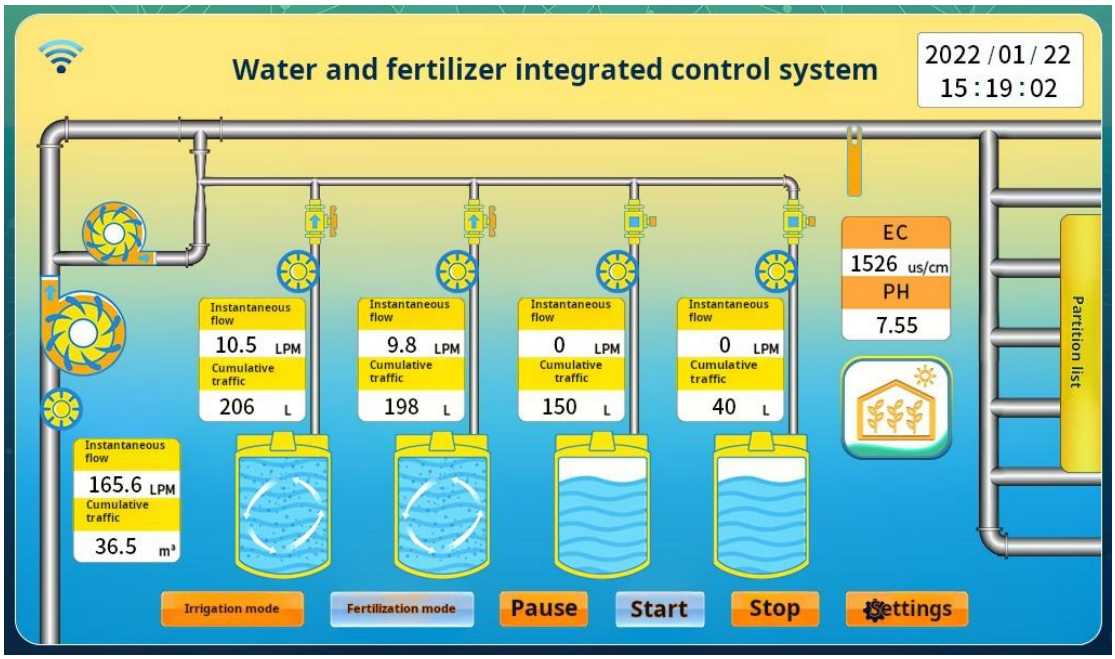
⑧ Supports independent server/mini-program deployment for key clients

⑨ Screen programs are fully open, allowing users to customize personalized interfaces

⑩ Supports remote GPIO point configuration

For more software functions, refer to the following diagrams:

Screen 1



② Water pump switch: Touch this area in manual mode to start/stop the water pump. An impeller rotation animation will be displayed when starting.

③ Fertilizer pump switch: Touch this area in manual mode to start/stop the fertilizer pump. An impeller rotation animation will be displayed when starting.

④ Main pipeline flowmeter: Default support for Hall pulse flowmeters

⑤ Fertilization valve switch: Touch this area in manual mode to open/close the fertilization valve

⑥ Fertilization channel flowmeter: Default support for Hall pulse flowmeters

⑦ Mixing tank status: Touch this area in manual mode to start/stop the mixing motor

⑧ EC/PH display

⑨ Zone list: Touch this area to jump to the valve list (Screen 2)

⑩ Irrigation mode/fertilization mode switch

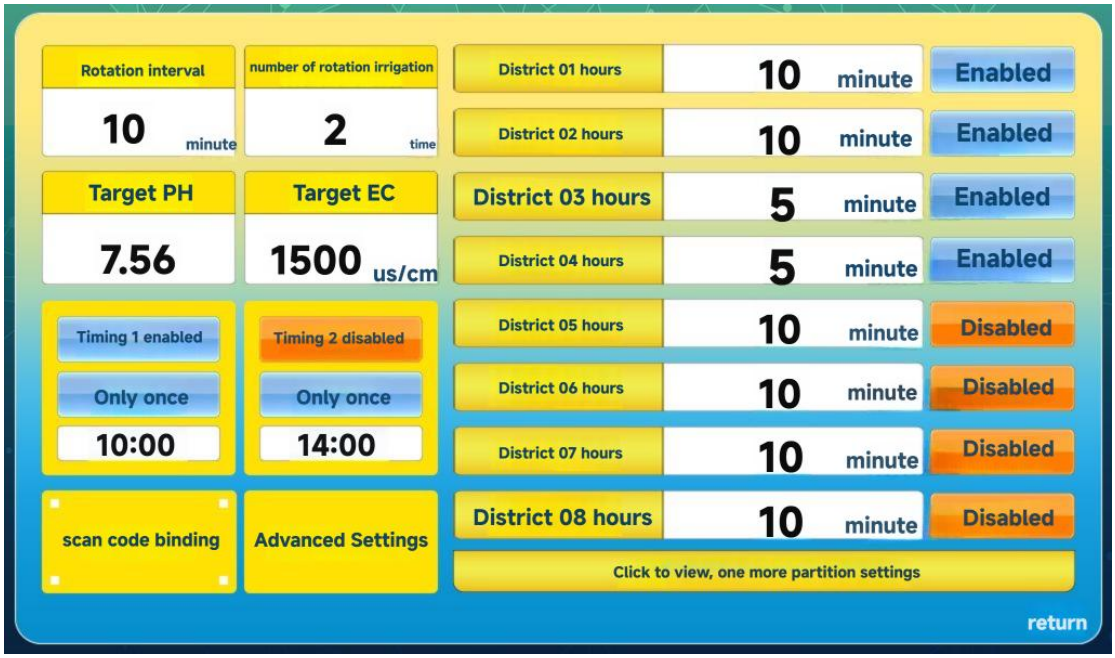
⑪ Start/stop/pause

⑫ Settings button: Touch this area to jump to the settings page (Screen X)

⑬ Greenhouse control button: Touch this area to jump to the greenhouse control page (Screen X)

Screen

2



① Wheel irrigation interval and frequency

② Target EC and target pH setting

③ Timer switch

④ Timer mode: If set to "Only Once", the timer will automatically turn off after triggering once.

⑤ Timer time setting

⑥ QR code binding: Jump to the QR code binding page

⑦ Advanced settings

1) Enter password 8888 to jump to the advanced settings interface (Screen X)

2) Enter password 9999 to jump to the factory settings interface (Screen X)

3) Enter password 0000 to jump to the device lock interface (Screen X)

⑧ Zone irrigation duration setting

⑨ Zone enable/disable

⑩ More zones: Jump to the settings interface for additional zones (Screen X), supporting up to 56 zones

Business process for wheel irrigation function:

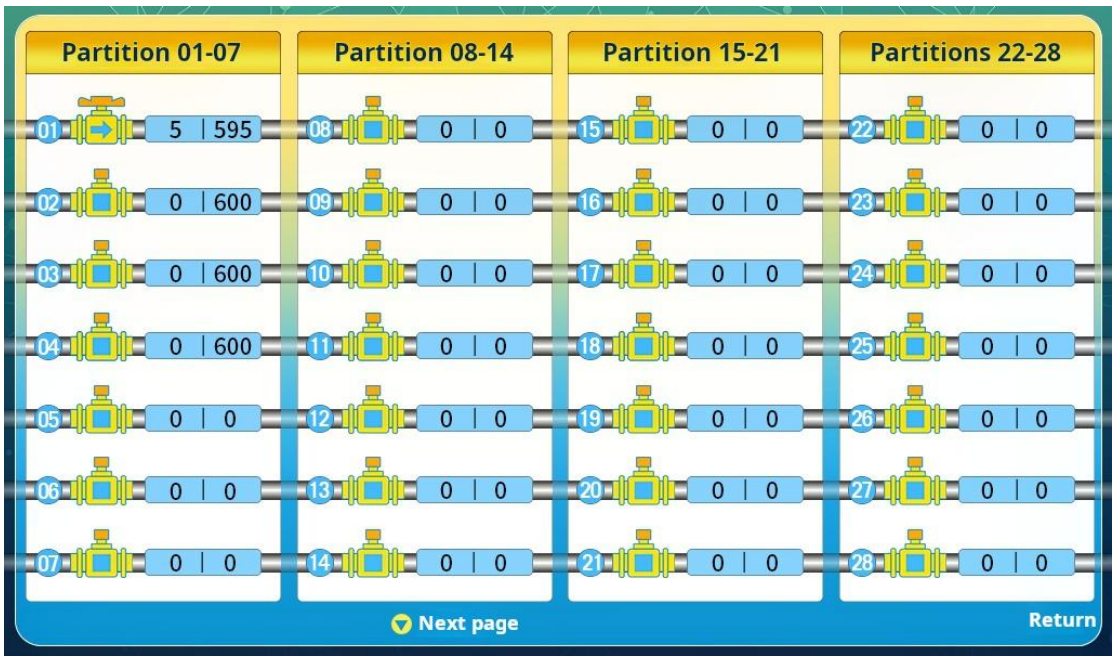
Manually press the start button on the home page or trigger the timer. The system will irrigate each zone in sequence according to the enable status and irrigation duration of each zone until all enabled zones complete irrigation. If the wheel irrigation frequency is greater than 1, the system will wait for a certain period (wheel irrigation interval) and then perform another round of irrigation until the set frequency is reached, after which the system status will switch to stop. During wheel irrigation, pause and temporary termination of the irrigation process are available.

Screen 3

More partition settings

Screen

4

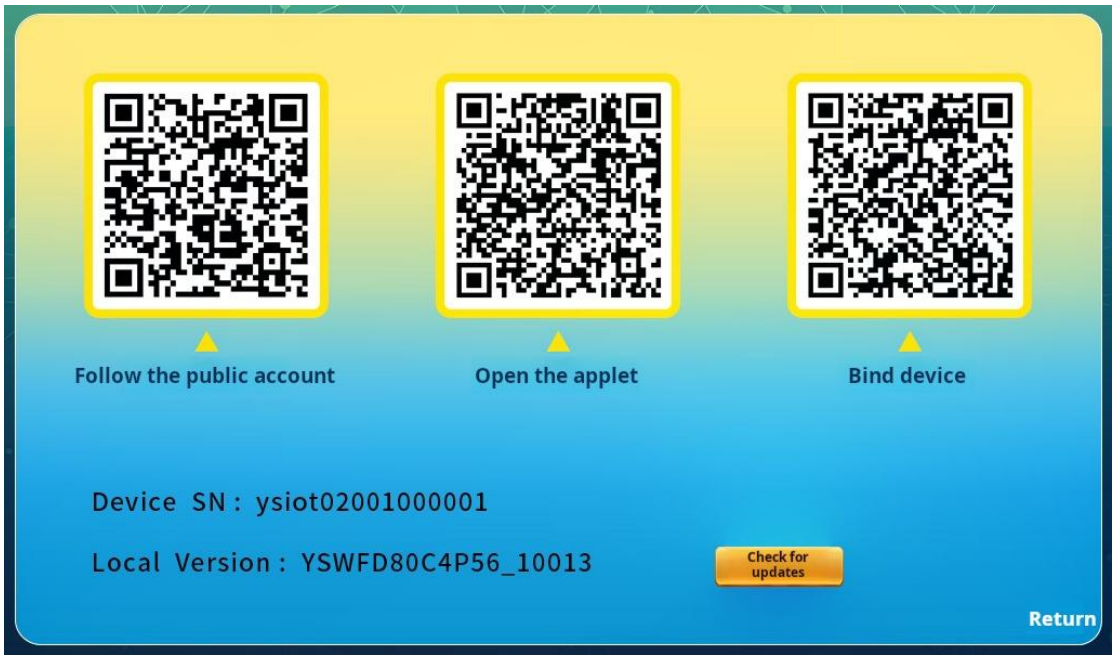


① The status of the zone solenoid valve can be touched to open/close in manual mode.

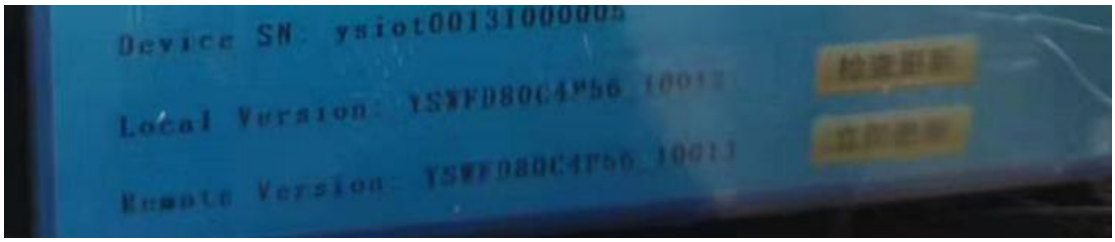
② During wheel irrigation, the used time and remaining time of the current zone irrigation are displayed.

Screen

5



To Wang Juan, a partial view should be placed here, showing the "Remote Version" and "Update Now" buttons.



① Device Name

1) The 1st to 5th digits are the customer code. Users can apply for independent codes, and the mini-program can display the customer's company name based on the code.

2) The 6th to 10th digits are the device type.

3) The 11th to 16th digits are the device SN.

② Local version of the device

③ Check for updates: Can manually check. If there is a new version on the server, it will prompt ④.

④ Server version. If the server version is higher than the local version, ⑤ "Update Now" will appear.

⑤ Update Now: Touch to enter the firmware update process. With a good network, the system upgrade can be completed in about 1 minute.

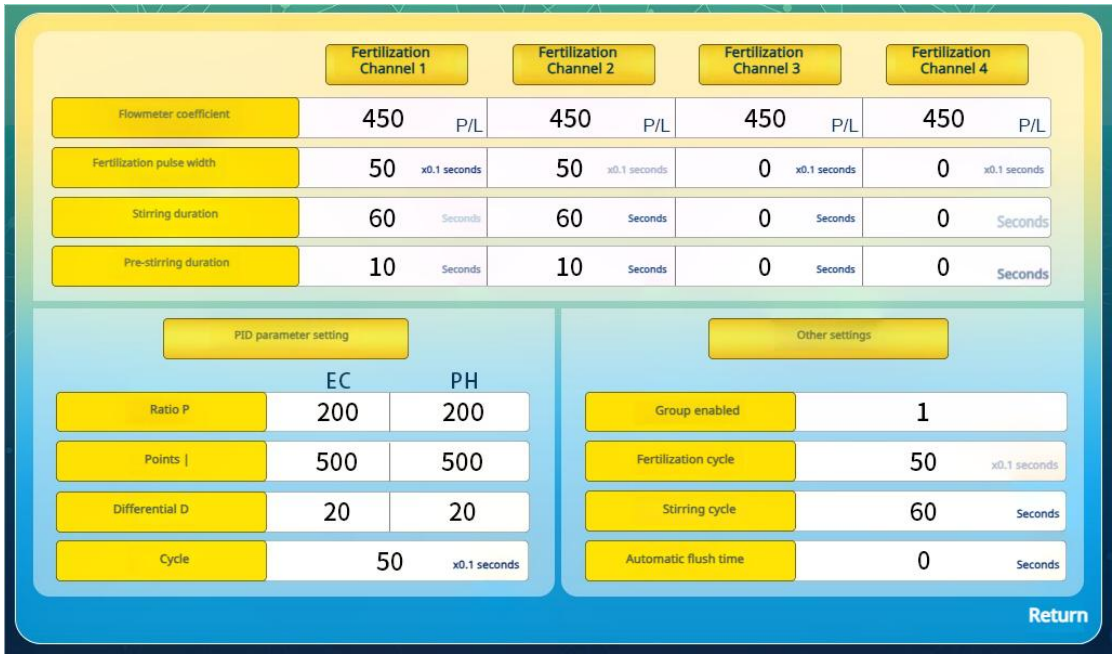
⑥ Follow the official account to customize and display your own official account.

⑦ Open the mini-program (the mini-program is neutral and can set your own company name).

⑧ Bind the device: Scan this code in the mini-program to bind the device.

Screen

6



① Flowmeter coefficient setting (i.e., the number of pulses generated per liter of water flow), please consult the flowmeter manufacturer for details.

② Fertilization pulse width: Used in conjunction with ⑩ fertilization cycle. The fertilization pulse width must be shorter than the fertilization cycle, which refers to setting the time ratio of fertilizer valve opening and closing within a unit time to control the fertilization flow.

③ Stirring duration: Used in conjunction with ⑩ stirring cycle. The stirring duration must be shorter than the stirring cycle, which refers

to setting the time ratio of stirring motor starting and stopping within a unit time.

④ Pre-stirring duration: When greater than 0, the stirring motor will start first before executing the rotational irrigation to ensure uniform mixing of fertilizers.

⑤ Set relevant PID parameters for automatic fertilizer mixing.

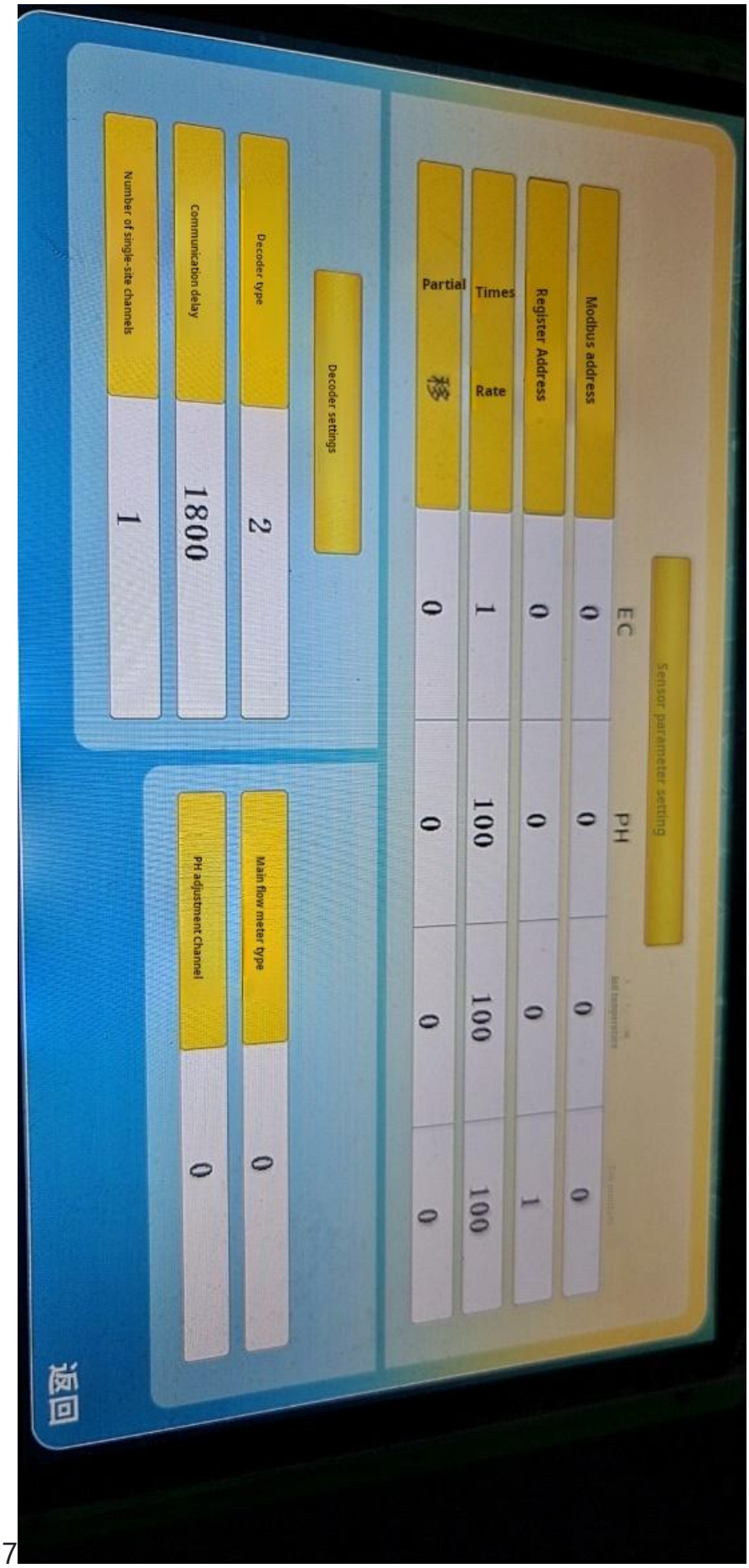
⑥ Group startup: Setting it to 1 enables the grouping function. For the introduction of the grouping function, please refer to the instructions in screens x~x.

⑦ Fertilization cycle

⑧ Stirring cycle

⑨ Automatic flushing time: After completing the rotational irrigation process, if the fertilization mode is enabled, the system will automatically irrigate with clean water to flush the pipelines.

Screen 7


Sensor parameter setting
EC
PH
Modbus address
0
0
0
0
Register Address
0
0
0
1
Times
1
100
100
100
Partial
0
0
0
0
Decoder settings
Decoder type
2
Communication delay
1800
Number of single-site channels
1
Main flow meter type
0
PH adjustment Channel
0
返回

① Sensor parameter settings, Modbus address, register address, scaling factor, offset, etc.

Note: Modbus address 1 cannot be used.

② Decoder types:

0: Solenoid valve directly connected via onboard GPIO

1: Bus decoder

2: Wireless decoder

3: Universal input/output expansion module

When using a decoder/expansion module, the default Modbus address is 1.

③ Communication delay: Set the communication delay of the decoder (in milliseconds).

Take various decoders of our company as examples:

- Low-power LoRa decoder: Delay set to 1800 ms (doubled if using a repeater)
- Long-distance decoder (PA): Delay set to 250 ms
- Bus decoder: Delay set to 300 ms

④ Number of channels per station: Default is 1.

This needs to be set when using a decoder to control multiple solenoid valves.

Example:

When set to 2, a decoder with 2 or more channels is required.

- Channel 1 of Decoder 1 corresponds to Zone 1
- Channel 2 of Decoder 1 corresponds to Zone 2
- Channel 1 of Decoder 2 corresponds to Zone 3
- Channel 2 of Decoder 2 corresponds to Zone 4

And so on.

⑤ Main flow meter type: Default 0 uses a pulse flow meter.

RS485-compatible flow meters can be built in as needed.

Continuous updates will follow.

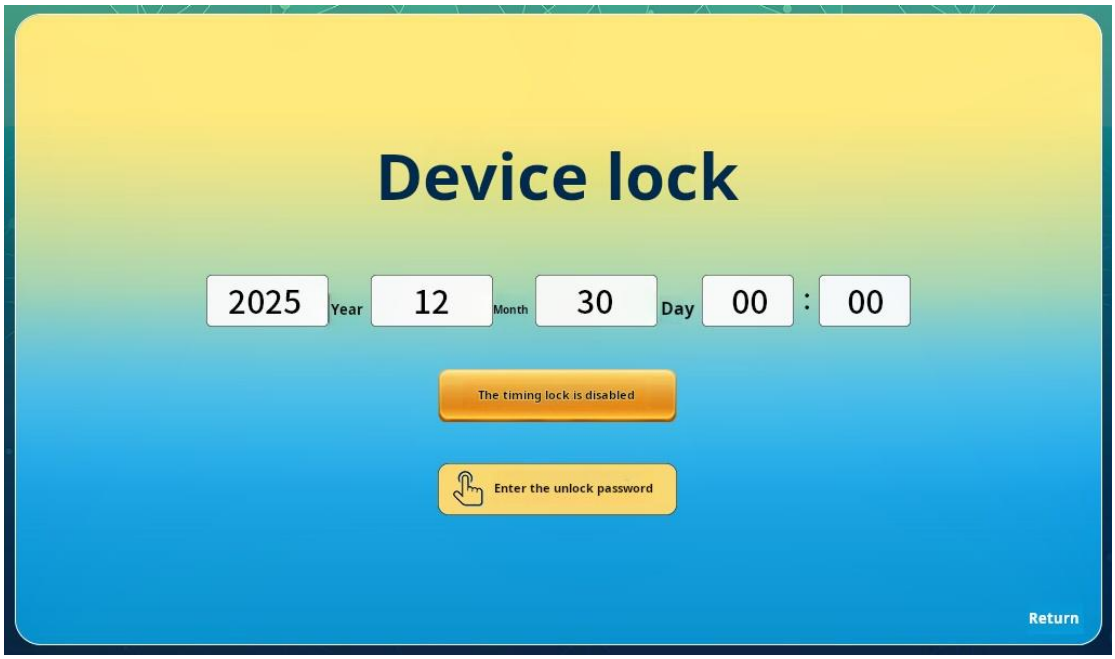
⑥ Acid addition channel: Default 0 disables pH automatic adjustment.

For pH automatic adjustment, set a value between 1–4, corresponding to fertilization channels 1–4 as acid adjustment channels.

At this point, pH automatic adjustment can be enabled.

Screen

8



Used to assist users with payment reminders, etc.

① Set the timing for device locking (the locking function must be disabled first before setting)

② Enter the unlock password

1) Entering 20220120 (year - month - day of the day) can activate the timing device locking.

2) Entering the unlock password (which needs to be obtained from the administrator) can cancel the device locking.

We hope this function is not used frequently (smiley face).

If you need to unlock, please contact the administrator to obtain the password (key clients can be provided with a password calculation tool).

Screen

8

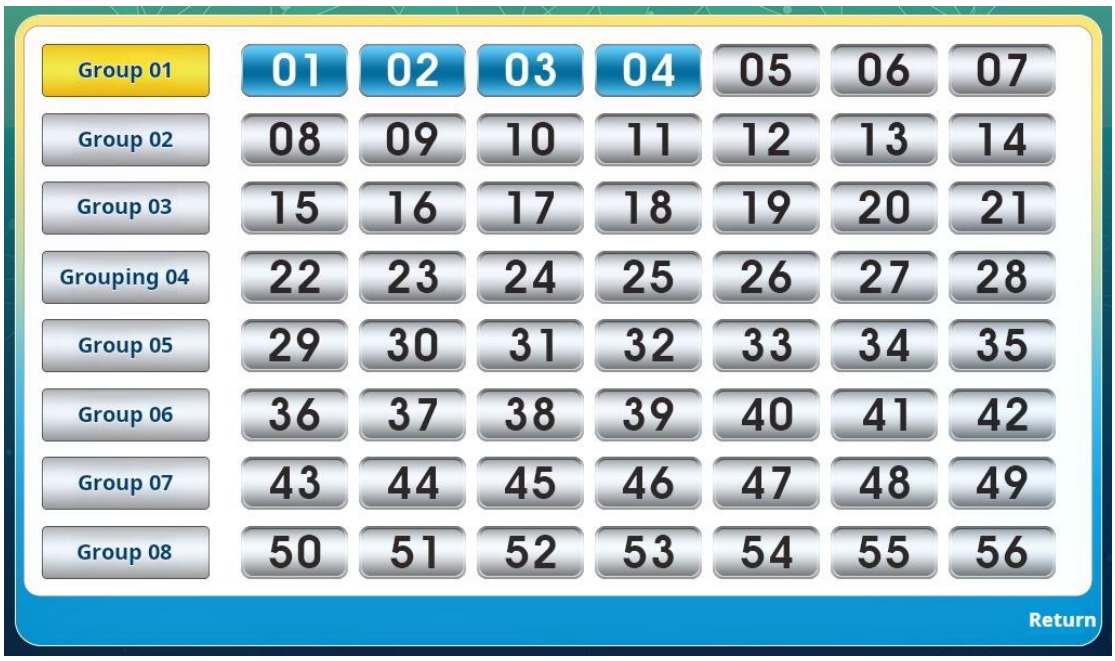
This screen shows the system settings interface when grouping is enabled, and its function is similar to Screen 2.

During the rotation irrigation process, the solenoid valves are controlled in the form of groups.

① Group settings: Touch here to jump to the group settings (Screen x).

Screen

9

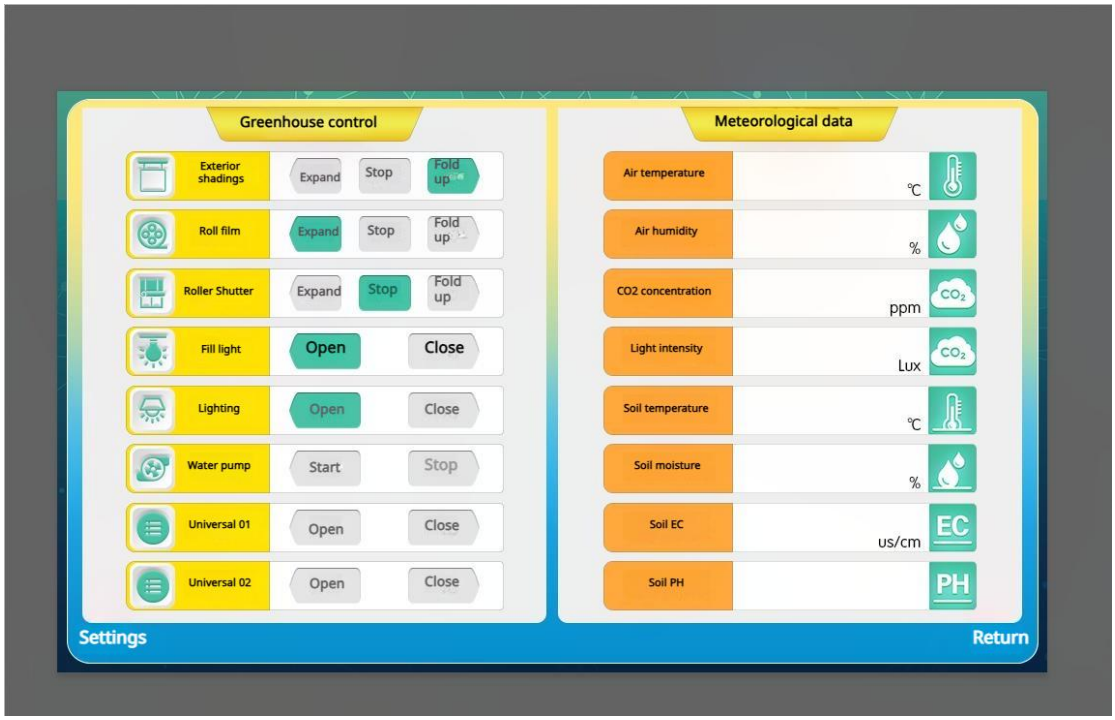


① Switch between group displays of 1 to 8

② Set the partitions included in each group (arbitrary settings allowed)

Screen

10



Here is the English translation of the text:

① The objects to be controlled can be edited arbitrarily (supporting up to 8 channels; customization is required for more than 8 channels).

② Click "Greenhouse Control" to set the number of objects to be controlled.

Enter **11220803** to set a total of 8 channels for greenhouse control, with the first 3 channels being bidirectional control (**1122** is the fixed command header).

③ The number of sensors to be displayed can be edited arbitrarily (supporting up to 8 parameters; customization is required for more than 8 parameters).

If greenhouse control is used, the general input/output expansion module is used by default for control (the 8-channel module is used by default).

The fixed module address starts at **150 (0x96)**.

- Addresses 1–8: 150
- Addresses 9–16: 151
- And so on.

④ Click "Meteorological Data" to set sensor parameters.

Enter **22330801** to set 8 sensor parameters for display, with a refresh cycle of 1 minute (**2233** is the fixed command header).

⑤ Click "Air Temperature" to set relevant parameters for the air temperature sensor.

1) Enter **33440100** to set the Modbus address of the air temperature sensor to **100**.

2) Enter **44550001** to set the register address of the air temperature parameter to **1**.

3) Enter **55660001** to set the number of registers for the air temperature parameter to **1**.

4) Enter **66770001** to set the decimal places of the air temperature parameter to **1**.

5) Enter **77880050** to set the offset of the air temperature parameter to **+50**.

6) Enter **88990050** to set the offset of the air temperature parameter to **-50**.

⑥ Use the same method to set parameters for other sensors.

Screen 11

(For Wang Juan: Follow the default numbers and parameters in the image I provided, and ensure consistency with the previous page.)

① Set the automatic control mode for external shading

1) Disable: No automatic control

2) Time control: Automatically execute according to the time set in ②

3) Sensor control: Click the icon to switch the type of sensor, and it can be arbitrarily switched to execute according to the parameters of a certain sensor

② Deployment/retraction time: Set the time points for deployment/retraction

③ Deployment value/retraction value:

Sensor thresholds corresponding to deployment and retraction can be set

When the deployment value is greater than the retraction value:

- When the sensor value is greater than the deployment value → execute the deployment action
- When the sensor value is less than the retraction value → execute the retraction action

When the deployment value is less than the retraction value:

- When the sensor value is greater than the retraction value → execute the retraction action
- When the sensor value is less than the deployment value → execute the deployment action

FCC Warning

15.19 Labeling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

15.21 Information to user.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement:

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.