AG-5930 Ethernet Temperature & Humidity Sensor Manual

V2.1

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www.asiagrich.com

1 Overview

Please read this manual carefully before using the equipment
AG-5930 network temperature and humidity sensor is designed to measure temperature, relative humidity and dew point. In addition to monitoring the above parameters, the product also supports RS485 to Ethernet function, passive dry contact switch signal input and relay control output, which is convenient for users to use in various environmental monitoring scenarios.
The sensor has data storage function, and the maximum storage capacity of temperature and humidity data is 100000.
The sensor communication interface is Ethernet interface, which supports a variety of network protocols. The device adopts the form of external probe to avoid the influence of internal circuit on the accuracy of sensor measurement.

1.1 Safety Precautions

- To reduce the risk of equipment damage, follow the instructions.
- The equipment can only be repaired by professionals. There are no repairable parts inside the equipment.
- If the device does not work properly,do not use it. If you think the equipment is not working properly, please have a qualified service personnel check.
- It is forbidden to use when the shell is disassembled.
- Please use a power adapter or Poe that meets the requirements for power supply. Make sure the power cable is not damaged.
- Only network components that meet relevant standards are connected to the equipment.
- The equipment can only be installed in the specified area. Do not expose the equipment to temperatures higher or lower than permitted.
- The equipment is not suitable for chemical corrosion environment. Temperature and humidity sensors should not be in direct contact with water or other liquids.
- Do not disassemble the sensor panel unnecessarily to avoid mechanical damage to the sensor.
- The sensor has built-in lithium 3V lithium battery.

1.2 Preparation Before Use

1. Poe power supply equipment or dc12-48v power adapter
2. Ethernet communication is adopted for equipment communication. Please prepare RJ45 network cable.
3. To access the network, the device needs to set IP information to communicate normally. Please set the device IP and gateway correctly.

1.3 Equipment Appearance

1.4 Equipment Function Description

AG-5930 adopts 3.5-inch color LCD screen and supports webserver. The measured values can be read on the screen, web page or network. The device supports the following network communication protocols:

- Modbus TCP protocol
- SNMPv1 / V2 protocol
- UDP protocol
- MQTT protocol

The device supports temperature and humidity threshold alarm, switch signal change alarm, alarm information will be through the display screen, sound and light, communication protocol, web interface, e-mail and other ways of alarm.

Device settings can be done through web interface or sensor buttons.

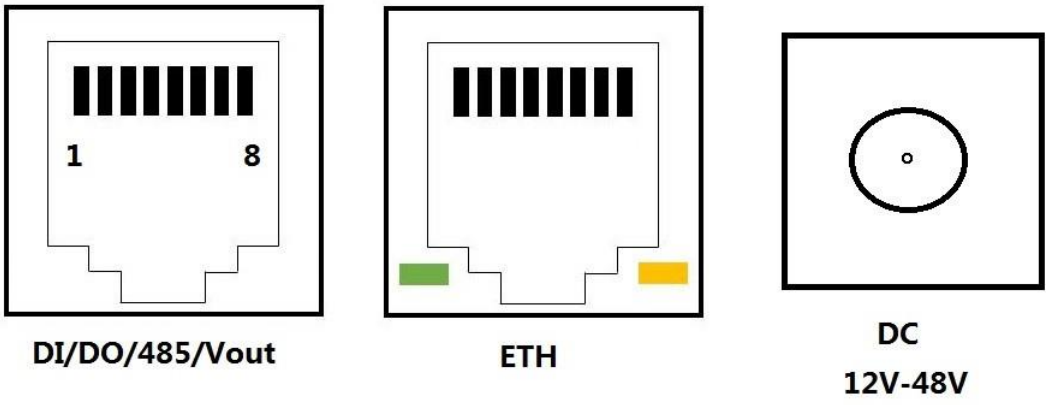
The device supports the power supply of dc12-48v power adapter and Poe power supply without Poe distributor.

The device supports DC12V out power supply. When using this function, the power supply higher than DC15V should be used to supply power to the sensor.

1.5 Basic Parameters

temperature	Accuracy: Range:	±0.5℃ -20-85℃
humidity	Accuracy: Range:	± 3% RH (typ.) 0-100%RH
Screen display	Screen size: Screen type:	3.5 inches TFT color screen
Switching value	Channels: Types:	2 way Passive dry contact
Relay	Channels: Alarm mode:	1 way custom
Serial port	Channels:	1 way
Power output	Power supply:	DC12V 0.5A
Overrun alarm	Alarm mode:	sound and light alarm, mail alarm
Communication	Protocol:	Modbus TCP / UDP / SNMP（V1、V2）/ MQTT
Data records	Records: Record interval:	100000 custom
Power Supply	Power supply:	DC12-48V / POE
Installation	Installation	Magnet or wall mount
Size	Shell size:	100*35*92mm

2 Interface Description



There are three interface under the device:

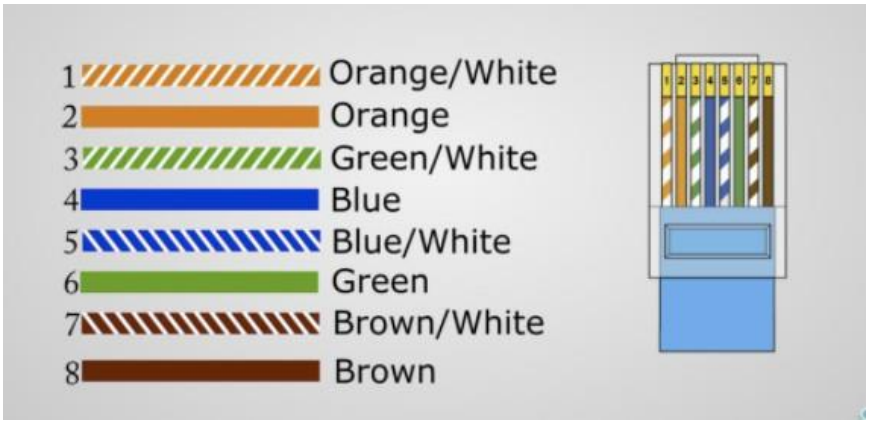
- Di / do / 485 / Vout interface
- Eth interface
- DC12V-48V

2.1 Di / Do / 485 / Vout Interface

The interface can input two way switching value, one way 485 signal, one way relay output control and one way DC12V out power supply.The wiring definition is shown in the following figure:

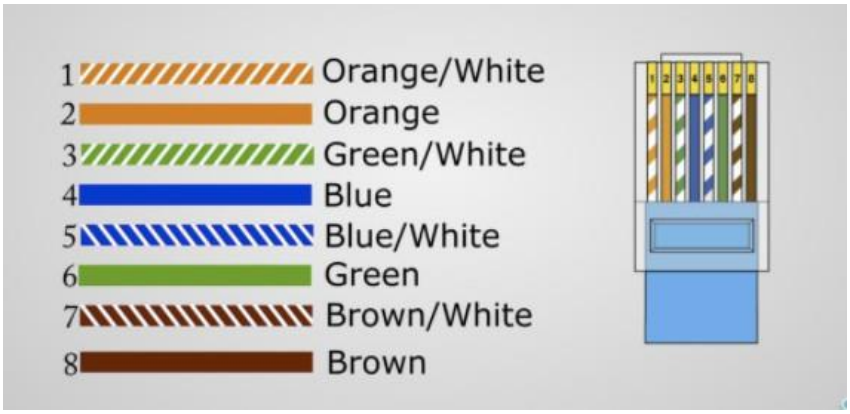
8 Brown	DC12V	**4 Blue**	Relay
2 Orange	Switching value 2	**6 Green**	RS485-B
3 White/ Green	Switching value 1	**7 White/Brown**	RS485-A
5 White/Blue	Relay	**1 White/Orange**	GND

The interface is connected by 568B network cable, and the color definition is shown in the figure below



2.2 Definition Of Eth Wiring

The interface is network transmission interface and Poe power supply interface, using 568B network cable connection.
The wiring definition is shown in the following figure:



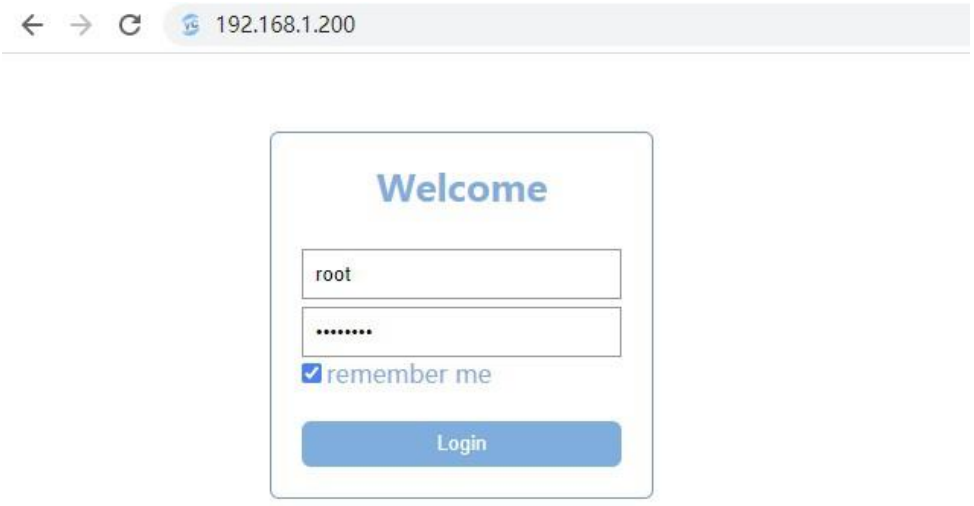
2.3 DC12V-48V

The interface specification is round 5.5 * 2.5mm plug, and the power adapter supports dc12-48v.

3 Web Settings

Before using the Web Settings, please connect the device to the network, or connect the device to the PC with a network cable. View the device's IP and gateway information. Make sure the device and PC are on the same network segment.

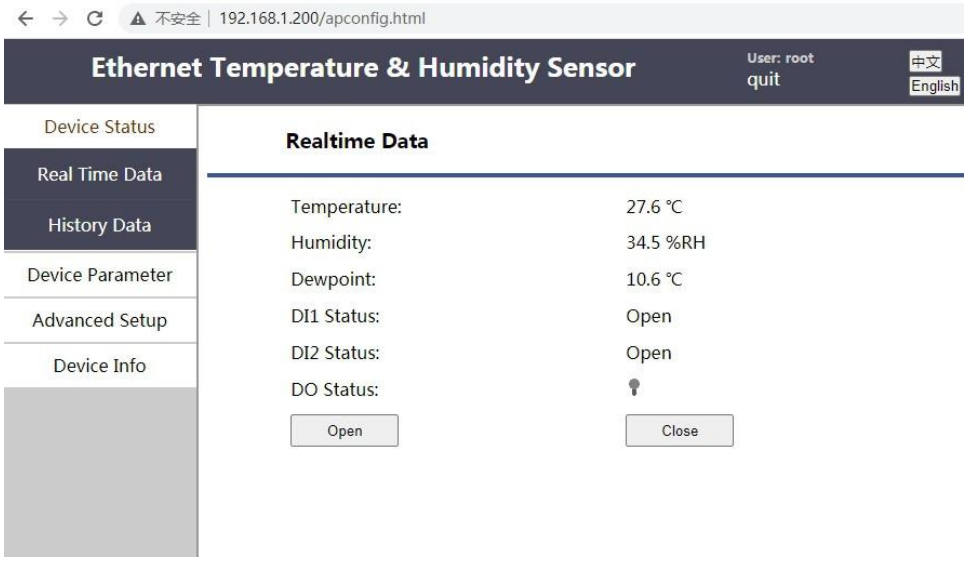
3.1 Login Web Page



Open the browser (Chrome browser is recommended), enter the device IP in the address bar, enter the login page after confirmation, enter the login account and password, and enter the web page.
Username: root password: 12345678

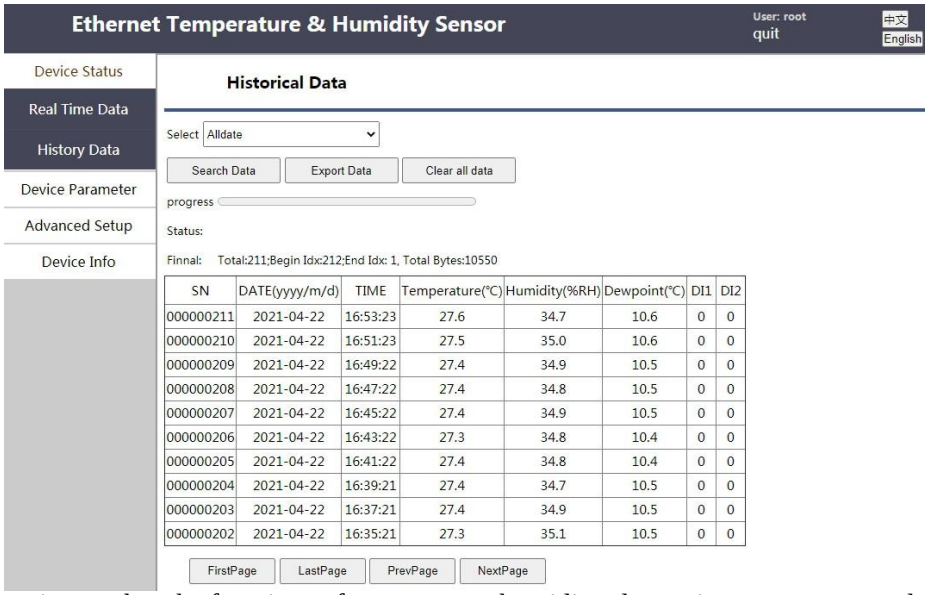
3.2 Equipment Status

3.2.1 Real Time Data



The real-time data page can display the temperature and humidity, dew point, switching value, relay status, and control the relay to open or close.

3.2.2 Historical Data

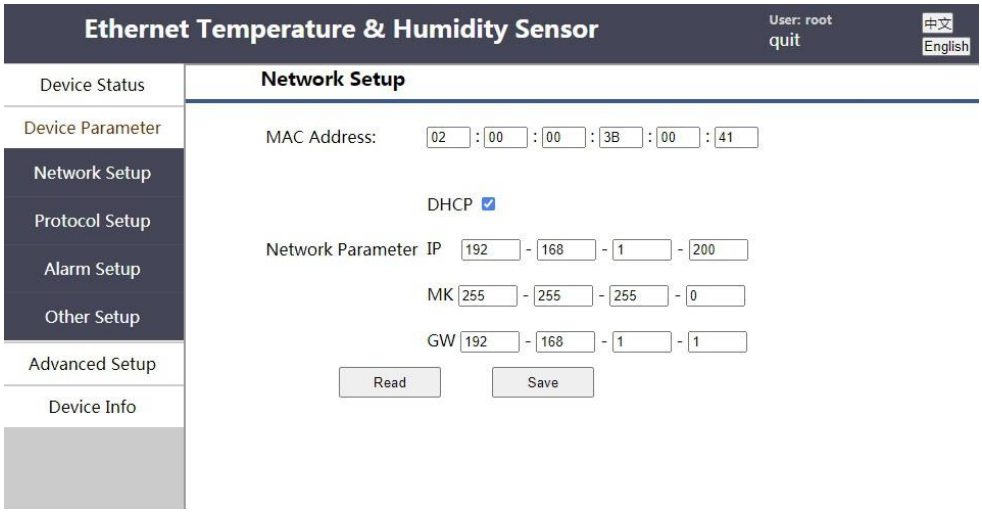


The equipment has the functions of temperature, humidity, dew point temperature and di status

data recording, and supports query data and export record data in user-defined time period.The default data recording time is 2 minutes, and users can customize modify the recording time ("other settings").

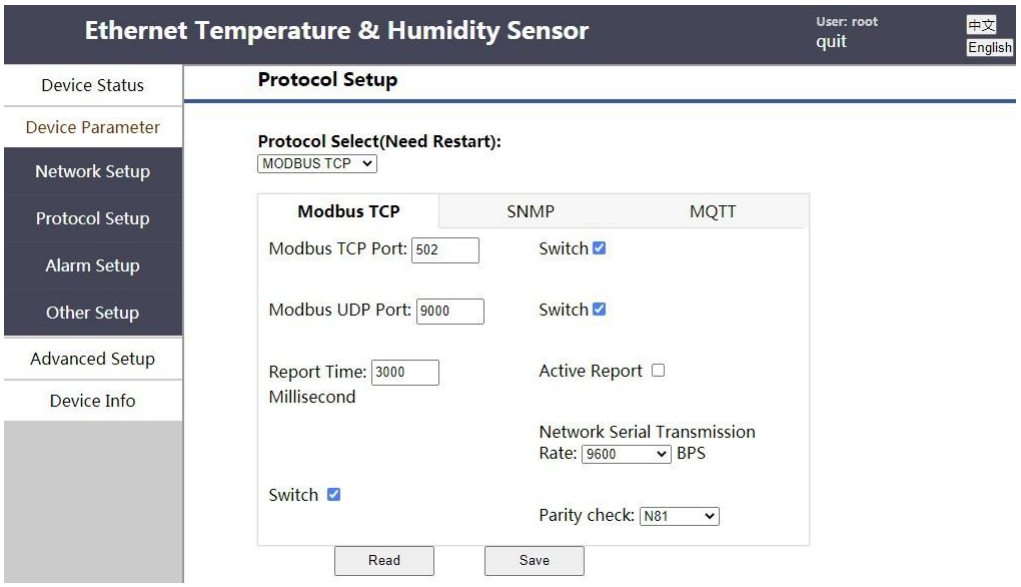
3.3 Equipment Parameters

3.3.1 Network Settings



This page can view the IP, gateway, mask and MAC address information of the device.Note: do not modify MAC information at will

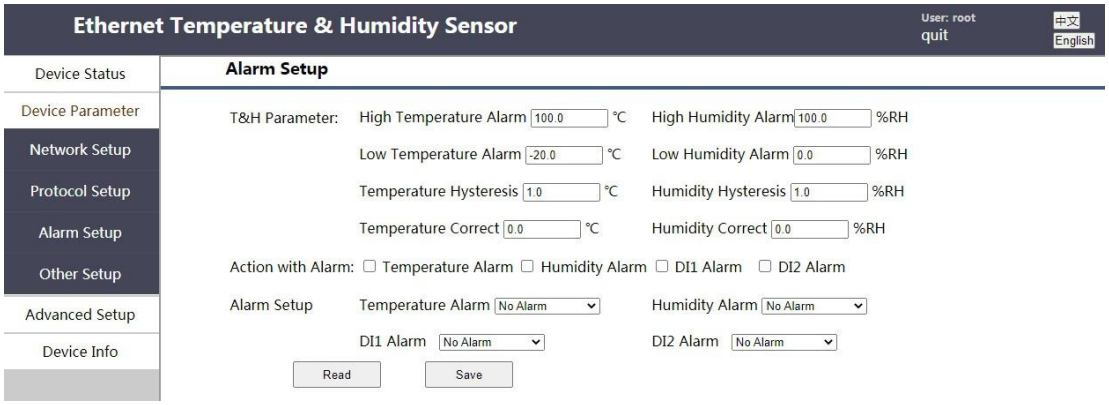
3.3.2 Protocol Settings



On this page, users can choose to open the required protocol and set protocol related configuration parameters.

Note: Please select the protocol to be used, save and restart before it takes effect.

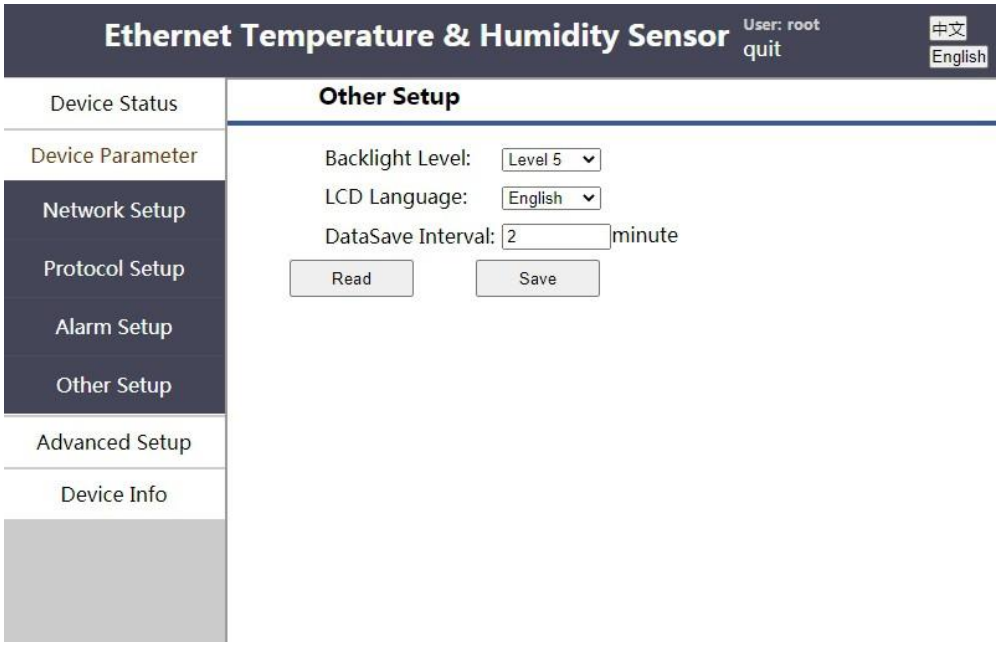
3.3.3 Alarm Setting



The user can set the upper and lower limits of temperature and humidity alarm threshold and alarm return difference value in this page, and users can freely choose whether to turn on the alarm and alarm trigger conditions.

At the same time, the user can select whether the alarm needs linkage relay. If the linkage is selected, the relay will work when the alarm is triggered.

3.3.4 Other Settings



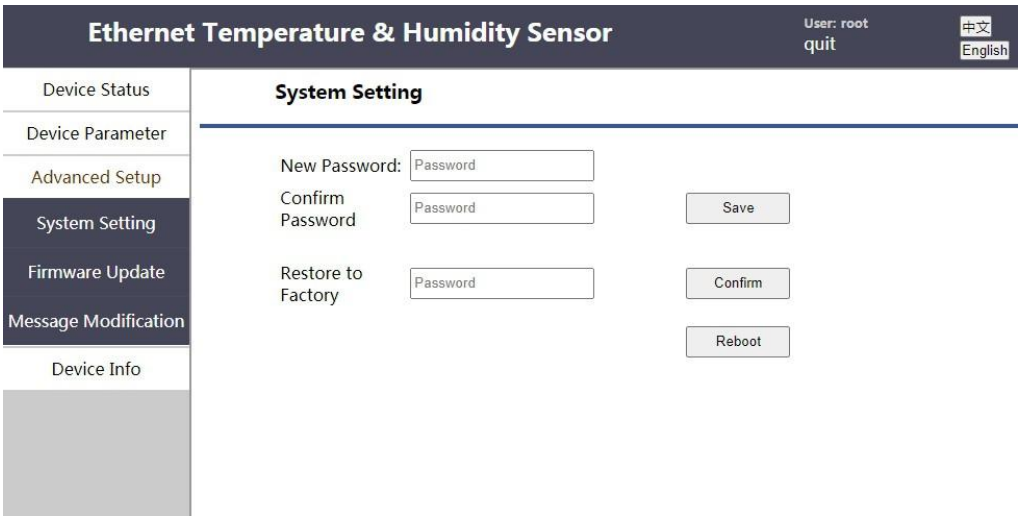
The user can set the backlight level: screen brightness and darkness;

Display language: support Chinese and English at present;

Data storage interval: the minimum storage interval is 2 minutes.The maximum data storage capacity of the device is 100000, so the recording time is related to the set interval time.

3.4 Advanced Settings

3.4.1 System Settings

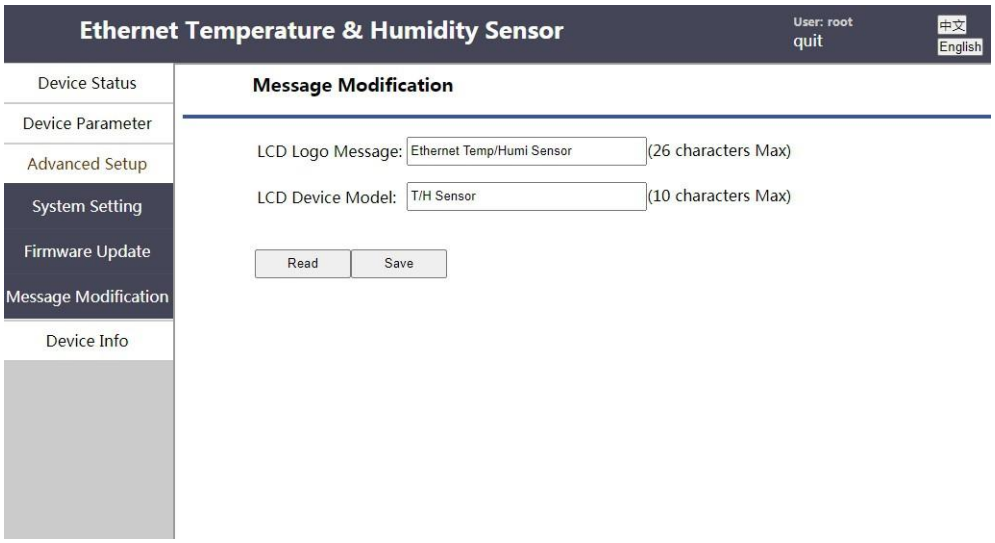


The user can modify the password of the Web login account and restore the factory Settings in the system setting interface.
The password set by factory recovery is the same as the password for Web login

3.4.2 Firmware Upgrade

We will update the firmware of the equipment from time to time. Users can contact the business personnel to ask for the latest firmware update program, and complete the equipment upgrade work in this interface.The specific steps are as follows:
Click "select file" to add the updated firmware package AG-5930.bin (Note: Do not modify the firmware name). Click the firmware upload and prompt "verification is successful, please restart". After that, click restart. The firmware update of the device is completed after restart.
Note: do not disconnect the power supply of the equipment during restart.Some versions of firmware update more content, after the upgrade, you need to restore the factory settings, the device can work normally, otherwise all the data on the screen will be 0..

3.4.3 Information Modification



The device supports user-defined modification of the text content of the boot interface and the device model in the upper right corner of the device screen.At present, only English letters are supported, not Chinese.

3.5 Equipment Information

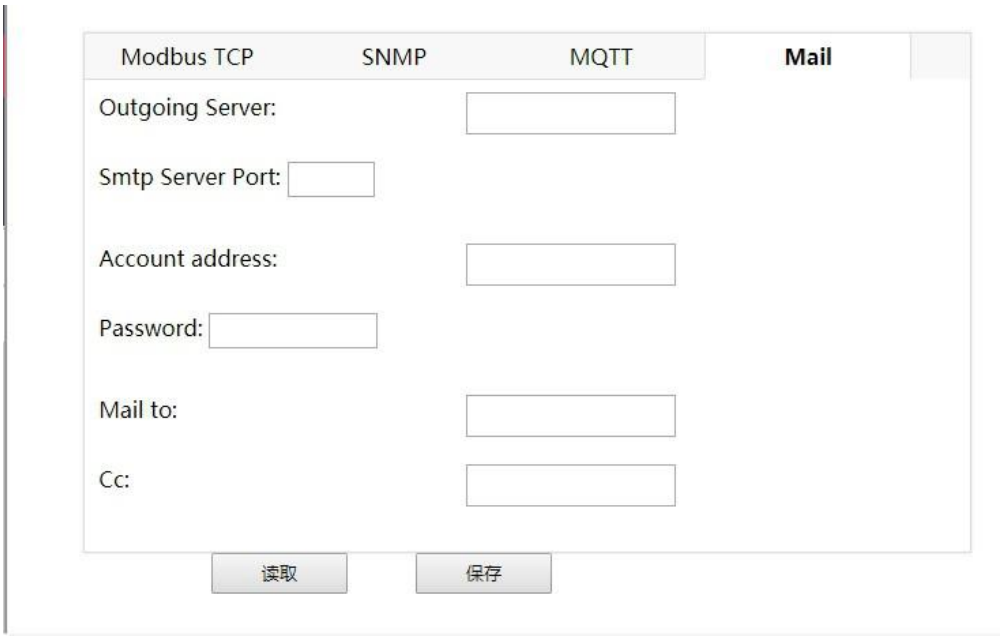
The device information includes: device ID/ device time/local time and firmware version. The user can calibrate the device time on this page.

3.6 Mail Alarm

The setting supports the email alarm function, and the user can set the alarm sending and receiving

mailbox information by himself. When the equipment generates an alarm, the alarm email can be sent.

Note: the email alarm firmware is a separate firmware version. If you need to use this function, please explain when ordering.



Setting method: enter the web interface, select device parameters protocol settings mail save. Email alerts need to use the SMTP protocol, the user needs to fill in the SMTP address, SMTP port number, sending email password, receiving email address and cc email address. please contact your email service provider for SMTP information.

4 Buttons Setting

4.1 Buttons Function

The device has buttons. Users can use the buttons to set the device when they cannot use the web page settings.

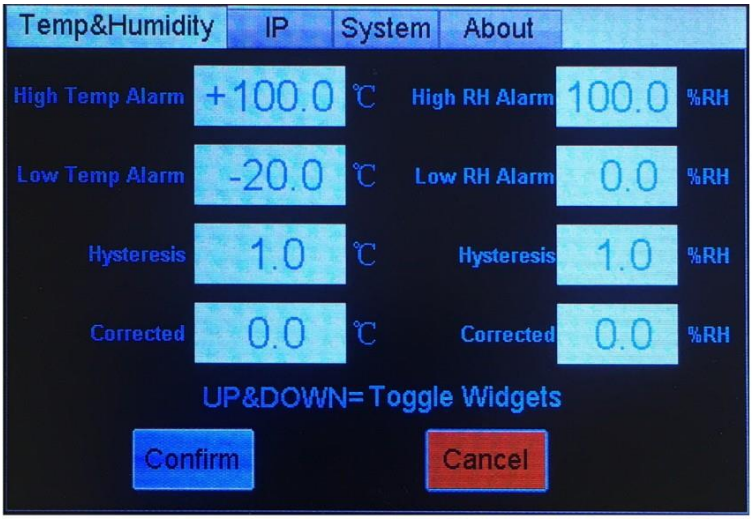
1. Menu function buttons: "M". Press this buttons briefly, the device will enter the parameter setting interface and turn the page of parameter page.

2. Turn down buttons: ▼". After entering the parameter setting page, short press this button, the user can select the parameters to be set down, and adjust the IP, threshold and other digital parameters.

3. Turn up buttons: "▲".After entering the parameter setting page, short press this button, the user can select the parameters to be set up, and adjust the IP, threshold and other digital parameters.

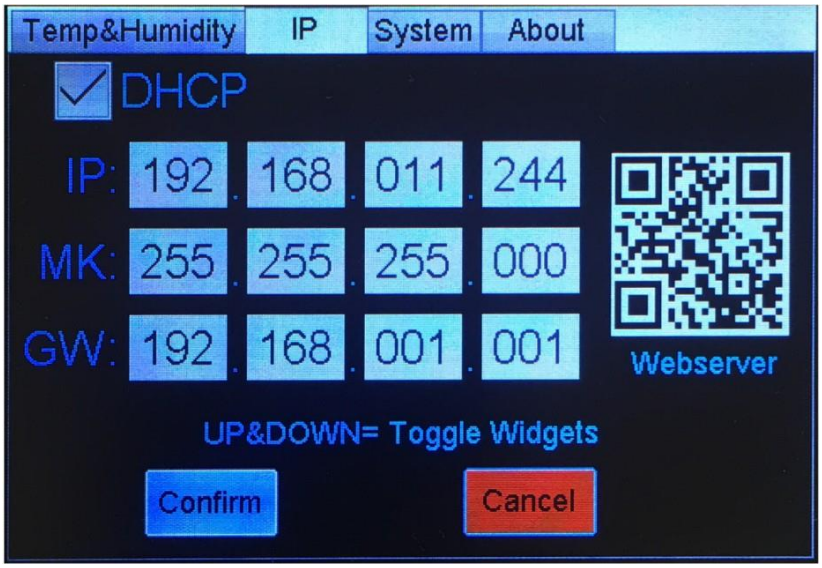
4. Confirm button: "E". After entering the parameter setting page, after reaching the option of setting parameters, press this button to enter the corresponding parameter setting.

4.2 Temperature & Humidity Setting



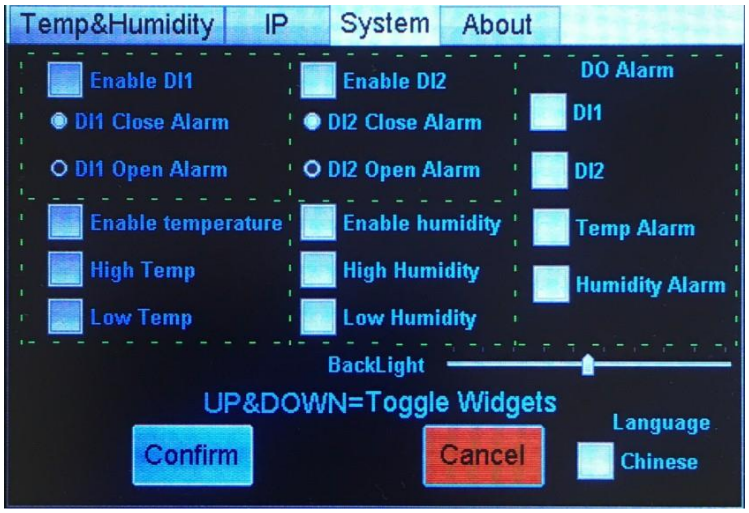
On this page, users can set the upper and lower limits of temperature and humidity threshold, alarm return difference value and temperature and humidity calibration value (temperature and humidity calibration can only be set by pressing the buttons).

4.3 IP Settings



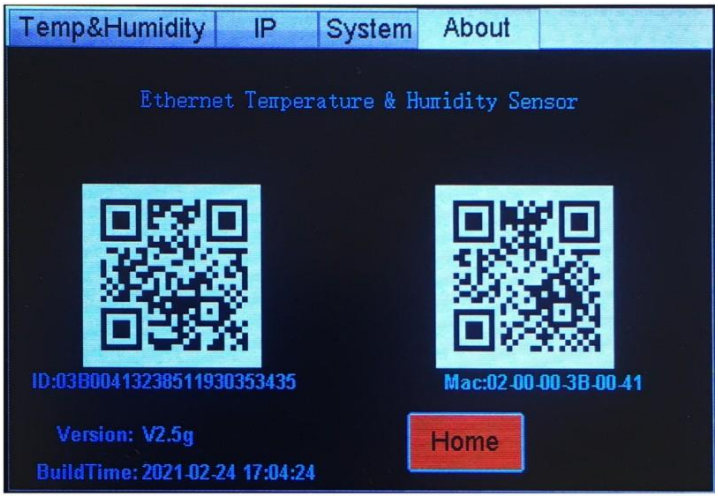
In this page, users can manually set the information of DHCP, IP, gateway and mask.The user can directly enter the web settings interface by scanning the QR code on the right side (The QR code feature only works when the device is connected to the Internet).

4.4 System Settings



In this interface, the user can set the equipment alarm related parameters and set the equipment screen display language type. Note: this page is not available in the email alarm version.

4.5 About



On this page, users can query the device ID , MAC address information, and firmware version information.ID and MAC address can be obtained directly by scanning QR code.

5、Data communication protocol

Protocol or interface	port	explain
MODBUS-TCP	502 (default)	Device data transmission
MODBUS-RTU(UDP) (1)	9000 (default)	Data transmission through
SNMP	161 / 162 (TRAP) (Default, support modification)	Support for SNMP V1 / V2
MQTT	1883	

*Description:

(1) It supports standard MODBUS-RTU, transmits data with RS485 through UDP protocol;

(2) When reading multi-point temperature and multi-point temperature and humidity data, it is necessary to ensure that the sensor corresponding to the read register is connected in the system and works normally.

Choose one of the three protocols (restart after webserver is set).

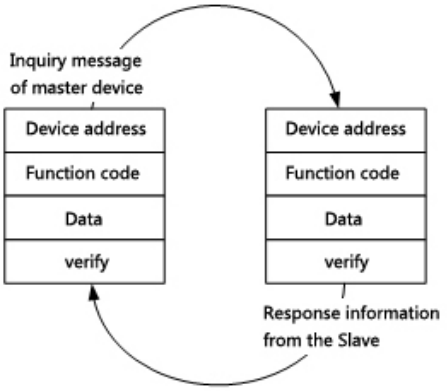
5.1 Modbus Protocol

The MODBUS protocol defines address codes, command codes, and data, which are necessary for a particular data exchange. Modbus protocol uses the master-slave response mode to achieve half duplex communication. The host address through the address code, and the terminal device sends out the response signal after the address matching.

MODBUS protocol only allows communication between host and terminal devices, but does not allow data exchange between independent terminal devices. Therefore, all kinds of devices will not occupy communication lines during work, but only respond to query signals arriving at the device.

5.1.1. Query response cycle of Modbus Protocol

Modbus protocol adopts query response communication mode, as shown in the following figure:



Host query:

The function code of the query message determines what function the selected slave device will perform. The data segment contains any additional information about the functions performed by the slave device. The error detection part provides a method to verify whether the message content is correct for the slave device.

Response from device:

If the slave device generates a normal response, the function code in the response message is the response of the function code in the query message. The data segment contains the messages collected from the device. If an error occurs, the function code is modified to indicate that the response message is wrong, and the data section contains the code that describes the error message. The error detection section allows the host device to confirm whether the message content is available.

5.1.2. Modbus protocol content

When the data frame arrives at the terminal device, the addressed device reads the valid data carried in the data frame. If there is no error, it executes the task requested by the data. Then, it adds the data produced by itself into the returned data frame and sends it to the host.

If any error occurs, there will be no successful response, or an error prompt frame will be returned.

5.1.3. Modbus information format

Inquiry information and response information are composed of address, function code, data and error check code, which are sent in this order in communication.

MODBUS-RTU format
Address code (1 byte)
Function code (1 byte)
Data field (2 ~ 233 bytes)
Error (CR2) (byte check)

Modbus-TCP format
Mbap header (6 bytes)
Address code (1 byte)
Function code (1 byte)
Data field (2 ~ 233 bytes)

Mbap header:

	Byte sequence number	**explain**
MABP header message	1	Transaction ID high byte
	2	Transaction ID low byte
	3	Protocol ID high byte
	4	Protocol ID low byte
	5	Frame length high byte
	6	Frame length low byte

*Description:

(1) Transaction ID

The number of this communication frame is represented by 2 bytes, which is numbered by the master to distinguish each communication, and the slave will return the original value to the host.

(2) Protocol identification

Communication protocol identification code, expressed in 2 bytes, Modbus-TCP protocol identification is zero.

(3) Frame length

The length of Modbus is always less than 256 bytes.

(4) Address code

The address code is composed of one byte at the beginning of the frame. The decimal system is 0 ~ 255. In the system, 1 ~ 247 can be used, 0 is reserved as broadcast

address, and other addresses are reserved. The address field indicates the user specified address of the terminal device, which will receive data from the host connected to it. The address of each terminal device must be unique. Only the addressed terminal will respond to the query containing the address. In the Ethernet system, the slave can be identified by IP address, and the address code is not recognized in this device.

(5) Function code

In Modbus communication protocol, register number is assigned according to function code, and each function code only works on specific register number. The function code determines what function the addressable terminal performs. The following table lists the function codes used in this device:

code	*function*	*target*	*Register number*
01H	Read (continuous)	Relay status	0xxxx
05H	write in	Relay drive	0xxxx
02H	Read (continuous)	Input discrete quantity	1xxxx
03H	Read (continuous)	Holding register	4xxxx
04H	Read (continuous)	Input register	3xxxx
06H	Write (single register)	Holding register	4xxxx

Note: for a detailed description of the register of this device, see the appendix.

(6) Data field

The data field contains the data required by the terminal to perform a specific function or the data collected by the terminal device in response to a query. It is necessary to execute the function code.The composition of data varies with different function codes.The data field may be a value, a reference address, or a set value.For example, the function code requires the terminal to read a register, and the data field needs to indicate which register to read from and the amount of data to be read.

The data in the device is allocated according to the register number, which needs to be specified during communication.Moreover, the relative address of the register number is transmitted in the information.

The relative address is calculated as follows:

Relative address = [lower 4 bits of register number] – 1

For example, when the register number specified by a function code is 40002,

Relative address = (lower 4 bits of 40002) - 1 = 0002 – 1 = 0001

The relative address 0001 will be used in the communication process.

(7) Error check code (MODBUS-RTU only)

The CRC (redundant cyclic code) of MODBUS-RTU communication protocol contains 2 bytes, that is, 16 bit binary number.The transmitting device calculates the CRC code and places it at the end of the transmitted information frame.The receiving device recalculates CRC code for all received information (including CRC code) and judges whether the CRC code is 0. If it is 0, it means that the received information frame is correct; otherwise, it indicates that the received information frame is wrong. Only 8 data bits are used in CRC calculation, and the start bit and stop bit do not participate in CRC calculation.

The calculation method of CRC code is as follows:

- One 16 bit register is preset as hexadecimal ffff (i.e. all are 1); this register is called CRC register;
- The first 8-bit binary data (i.e. the first byte of communication information frame) is different or different from the lower 8 bits of 16 bit CRC register, and the result is put into CRC register;
- Move the content of CRC register to the right by one bit (towards the low bit), fill the highest bit with 0, and check the shift out bit after right shift;
- If the shift out bit is 0: repeat step 3 (shift right again); if the shift out bit is 1: the CRC register XOR polynomial A001 (1010 million 0000 0001);
- Repeat steps 3 and 4 until moving right 8 times, so that all 8-bit data are processed;
- Repeat steps 2 to 5 to process the next byte of communication information frame;
- After calculating all the bytes of the communication information frame according to the above steps, the high and low bytes of the 16 bit CRC register are exchanged;
- Finally, the content of CRC register is CRC code.

In addition, we can also use the look-up table method to calculate CRC16. Its characteristic is that the calculation speed is fast, but the disadvantage is that the table takes up a large storage space.See Appendix B for the source program of look-up table method.

When the CRC16 is attached after the information frame, the low byte is first appended, and then the high byte is the last byte of the information frame.

5.1.4. Modbus slave response

1) Normal response

The slavedevice generates the response information corresponding to each information and replies.At this time, the information composition is as follows:

MODBUS-TCP
Mbap header (6 bytes)
Address code (1 byte)
Function code (1 byte)
Data field (2 ~ 133 bytes)

2) Response when abnormal

If there is an error other than transmission error in the content of instruction information (such as specifying a function code or register that does not exist), the slave does not execute the command and generates an error response message reply. The composition of error response information is shown in the figure below. The function code is the function code of instruction information plus the value of 80h.

MODBUS-TCP
Mbap header (6 bytes)
Address code (1 byte)
Function code + 80h (1 byte)
Error code (1 byte)

The error code is as follows:

Error code	content	explain
01H	Function code error	A function code that does not exist was specified
02H	Register address error	Specifies the relative address of a register number that cannot be used by the current

		function code
03H	Error in the number of registers	There are too many registers specified The specified register number is out of the range of its existence
04H	The device cannot perform the current function	Due to device failure, check the instrument

3) No response

The slave does not respond to command information in the following cases.

- When the address code specified in the instruction information is inconsistent with the address code set in the slave computer.
- Error check code inconsistency.

5.1.5. Reading of switch data (input discrete quantity) (function code: 02h)

Host sending data: 00 00 00 00 06 00 02 00 00 02 00 00 02

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x06
Address code	0 x00

Function code	0 x02
Start address high byte	0 x00
Start address low byte	0 x00
Discrete number high byte	0 x00
Number of discrete bytes low	0 x02

Slave response data:

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x04
Address code	0 x00
Function code	0 x02

Number of bytes	0 x01
Discrete data 1 (discrete 7-discrete 0)	0 x02

Note: each byte in the data part of the response data contains 8 bits, and each bit represents the switching state of a discrete point,

For example: discrete quantity data 2 in response data is 0x02 (0000 0010), which means discrete quantity 2 (switch 2) is short circuit state, discrete quantity 1 (switch 1) is open circuit state.

5.1.6. Reading of temperature and humidity data (input register) (function code: 04H)

Host sending data: 00 00 00 00 06 00 04 00 00 02

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x06
Address code	0 x00
Function code	0

	x04
Start address high byte	0 x00
Start address low byte	0 x00
Number of registers high byte	0 x00
Register number low byte	0 x02

Slave response data:

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x06
Address code	0 x00
Function code	0 x04
Number of bytes	0

	x04
Register 0 high byte	0 x00
Register 0 low byte	0 xD5
Register 1 high byte	0 x01
Register 1 low byte	0 x59

The temperature value (unit: 0.1 ℃) is stored in register 0, and the highest bit is sign bit. The decimal system converted from 0x00d5 is 213, that is, the current temperature is 21.3 ℃; 0x8005 represents - 0.5 ℃.

The humidity value (unit: 0.1% RH) stored in register 1 is converted into decimal system 345, that is, the current humidity is 34.5% RH.

5.1.7. Reading of alarm status (holding register) (function code: 03h)

Take temperature and humidity alarm status reading as an example.

Host sending data: 00 00 00 00 06 00 03 00 00 02

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0

	x06
Address code	0 x00
Function code	0 x03
Start address high byte	0 x00
Start address low byte	0 x00
Number of registers high byte	0 x00
Register number low byte	0 x02

Slave response data:

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x06
Address code	0

	x00
Function code	0 x03
Number of bytes	0 x04
Register 0 high byte	0 x00
Register 0 low byte	0 x00
Register 1 high byte	0 x00
Register 1 low byte	0 x00

The temperature and humidity alarm data is 2 bytes in length

The low byte is the temperature alarm status word: 0 indicates no alarm, 1 indicates alarm, such as 0x10, upper limit alarm, 0x01, lower limit alarm

The high byte is the humidity alarm status word: 0 indicates no alarm, 1 indicates alarm, such as 0x10, upper limit alarm, 0x01, lower limit alarm

The switch value alarm data is 2 bytes in length, the high byte is the switch value 1 status word, and the low byte is the switch value 0 status word; 0x00 indicates no alarm, and 0x01 indicates that there is an alarm.

5.1.8. Relay status reading (function code: 01h)

Data sending host:

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00

MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x06
Address code	0 x00
Function code	0 x01
Start address high byte	0 x00
Start address low byte	0 x00
Number of relays high byte	0 x00
Number of relays low byte	0 x01

Slave response data:

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0

	x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x04
Address code	0 x00
Function code	0 x01
Number of bytes	0 x01
Relay data 1 (relay 7 - relay 0)	0 x00

Note: each byte in the data part of the response data contains 8 bits, and each bit represents the switching state of a relay. For example, the data 1 in the response data is 0x01 (0000 0001), indicating that the relay 1 is in the closed state.

5.1.9 Relay control (function code: 05H)

Host sending data: 00 00 00 00 06 00 05 00 FF 00

00 00 00 00 00 06 00 05 00 00 00 00

MODBUS-TCP	
MBAP Byte-0	0 x00
MBAP Byte-1	0

	x00
MBAP Byte-2	0 x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x06
Address code	0 x00
Function code	0 x05
Start address high byte	0 x00
Start address low byte	0 x00
Control word high byte	0 xFF
Control word low byte	0 x00

Slave response data:

MBAP Byte-0	0 x00
MBAP Byte-1	0 x00
MBAP Byte-2	0

	x00
MBAP Byte-3	0 x00
MBAP Byte-4	0 x00
MBAP Byte-5	0 x06
Address code	0 x00
Function code	0 x05
Start address high byte	0 x00
Start address low byte	0 x00
Control word high byte	0 xFF
Control word low byte	0 x00

Note: when the relay is closed and disconnected, it is necessary to send control word, and 0xff00 means to open, and 0x0000 to open the relay.The starting address is the relay number (the cheap address corresponding to 0xxxx in Appendix A).After successful operation, the data returned by the device is the same as that sent by the host.

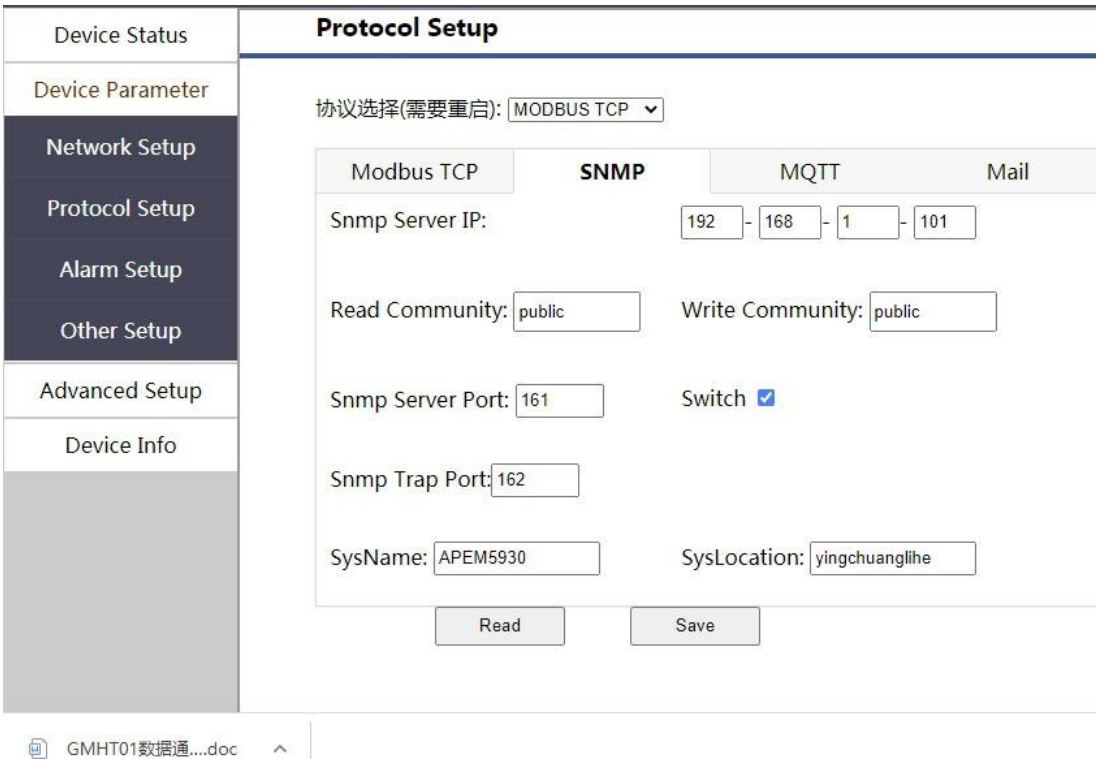
5.2 SNMP protocol

SNMP It is a standard protocol specially designed for managing network nodes in IP network. It is an application layer protocol.At present, there are three versions of

SNMP: SNMPv1, SNMPv2 and SNMPv3. Apem6900 supports SNMP protocols V1 and V2 (supports V2 snmpget / snmpgetnext / snmpset instructions).

SNMP adopts the special form of client / server model: Agent / management station model.The management and maintenance of the network is accomplished through the interaction between the management workstation and SNMP agent.Each SNMP slave agent is responsible for answering various queries about MIB definition information from SNMP management workstation (master agent).

MIB, management information base: management information base, the management object database accessed by network management protocol. It includes the variables that can be set by SNMP management agent of network devices.SMIStructure of management information: the structure of management information, used to define the rules of objects that can be accessed through network management protocol.SMI defines the data type used in MIB and the name or representation of network resources in MIB.MIB is a collection of objects, which represents the resources and devices that can be managed in the network.Each object is basically a data variable that represents one aspect of the managed object.MIB is an important component in network management system. It consists of many managed objects and their attributes in a system.The concept of MIB is actually a virtual database.This database provides information about the managed network elements, which are shared by the management process and the agent processes.



The part of webserver protocol settings supports the modification of SNMP information.

5.3.1. Read only

Serial number	Variable name	describe	OID	attribute	data type
1.1	Temperature Value	emperature value ASCII	1.3.6.1.4.1.34672.20.1.3.1.1.1	read-only	STRING
1.2	Humidity Value	Humidity value ASCII	1.3.6.1.4.1.34672.20.1.3.1.1.2	read-only	STRING
1.3	DI1 Status	Di 1 Status 0-open circuit 1 - short circuit	1.3.6.1.4.1.34672.20.1.3.1.1.3	read-only	STRING
1.4	DI2 Status	Di 2 status 0-open circuit 1 - short circuit	1.3.6.1.4.1.34672.20.1.3.1.1.4	read-only	STRING
1.5	DO Status	Do status 0-open circuit 1 - short circuit	1.3.6.1.4.1.34672.20.1.3.1.1.5	read-only	STRING

5.3.2. Reading and writing

2.1	Temperature1LowThreshold	The upper limit of temperature alarm is ASCII, for example, 80.0 means 80.0 ℃	1.3.6.1.4.1.34672.20.1.3.1.2.1	Reading and writing	STRING
2.2	temperature1HighThreshold	The lower limit of temperature alarm is ASCII, for example, 20.0 means 20.0 ℃; and - 10.0 means -10.0 ℃	1.3.6.1.4.1.34672.20.1.3.1.2.2	Reading and writing	STRING
2.3	humidity1LowThreshold	The upper limit of humidity alarm is ASCII, for example, 800 means 80.0% RH	1.3.6.1.4.1.34672.20.1.3.1.2.3	Reading and writing	STRING
2.4	humidityHighThreshold	The lower limit of humidity alarm is ASCII, for example, 200 means 20.0% RH	1.3.6.1.4.1.34672.20.1.3.1.2.4	Reading and writing	STRING
2.5	DI1 Alert	Di 1 alarm enable 0-low level 1 - high level 2-off	1.3.6.1.4.1.34672.20.1.3.1.2.5	Reading and writing	STRING
2.6	DI2 Alert	Di 2 alarm enable 0-low level 1 - high level 2-off	1.3.6.1.4.1.34672.20.1.3.1.2.6	Reading and writing	STRING
2.7	DO Alert	Do alarm linkage	1.3.6.1.4.1.34672.20.1.3.1.2.7	Reading and writing	STRING
2.8	TemperatureAlert	Temperature alarm enable 0 - Forbidden 1 - high temperature alarm 2 - low temperature alarm 3 - overrun alarm	1.3.6.1.4.1.34672.20.1.3.1.2.8	Reading and writing	STRING
2.9	HumidityAlert	Humidity alarm enable 0-prohibit 1-High humidity	1.3.6.1.4.1.34672.20.1.3.1.2.9	Reading and writing	STRING

		alarm 2-Low humidity alarm 3-Over limit alarm			

5.3.3. System information

3.1	sysName	System name	1.3.6.1.4.1.34672.20.1.3.1.3.1	read-only	STRING
3.2	sysLocation	System location	1.3.6.1.4.1.34672.20.1.3.1.3.2	read-only	STRING
3.3	sysIP	System IP address	1.3.6.1.4.1.34672.20.1.3.1.3.3	read-only	STRING
3.4	sysMask	System subnet mask	1.3.6.1.4.1.34672.20.1.3.1.3.4	read-only	STRING
3.5	sysGateway	System gateway	1.3.6.1.4.1.34672.20.1.3.1.3.5	read-only	STRING
	systemName	System name (support web modification, restart to take effect)	1.3.6.1.2.1.1.5	read-only	STRING
	systemLocation	System address (support web modification, restart effective)	1.3.6.1.2.1.1.6	read-only	STRING

The trap of AG-5930 is sent to the management host by ODI

1.3.6.1.4.1.34672.20.1.3.100

The trap is shown in the following table:

Trap name	describe	specific_trap	Include variable name
High Temperature Trap	High temperature alarm	1	Temperature CurentValue
Low Temperature Trap	Low temperature alarm	2	Temperature CurentValue
Temperature RetTrap	Exit temperature alarm	3	Temperature CurentValue
High Humidity Trap	High humidity alarm	4	Humidity Currentvalue

Low Humidity Trap	Low humidity alarm	5	Humidity Currentvalue
Humidity RetTrap	Exit humidity alarm	6	Humidity Currentvalue
DI_1 Alert Trap	DI_1 alarm	7	DI1 Status
DI_1 Alert RetTrap	Exit di_1 alarm	8	DI1 Status
DI_2 Alert Trap	DI_Alarm 2	9	DI2 Status
DI_2 Alert RetTrap	Exit di_2 alarm	10	DI2 Status
Linkup	Network recovery	.1.3.6.1.2.1.1 1	
coldStart	The device is turned on	.1.3.6.1.2.1.1 1	

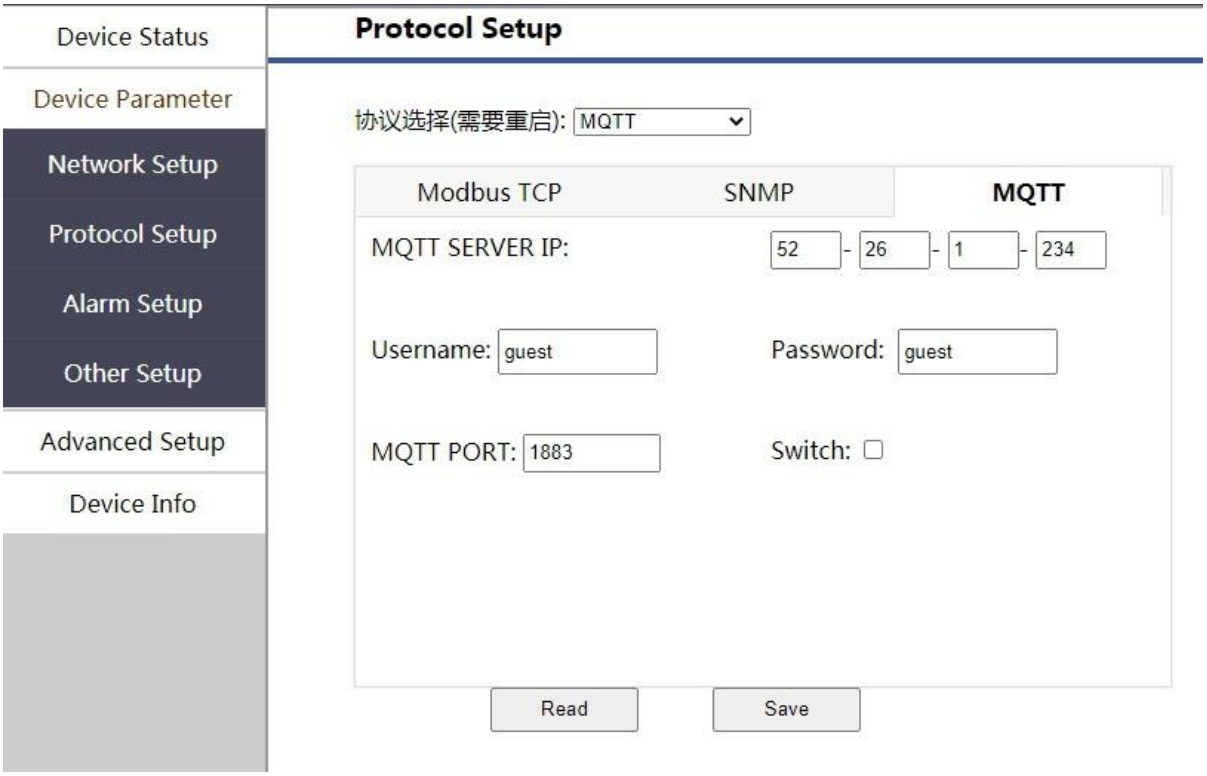
Note: each type of alarm exit trap is sent only once.

5.3 Mqtt protocol

Mqtt is a publish / subscribe message transfer protocol based on client server architecture.Its design idea is light, open, simple, standard and easy to realize.M2om is very good for many environments such as Internet of things.
Key parameters:

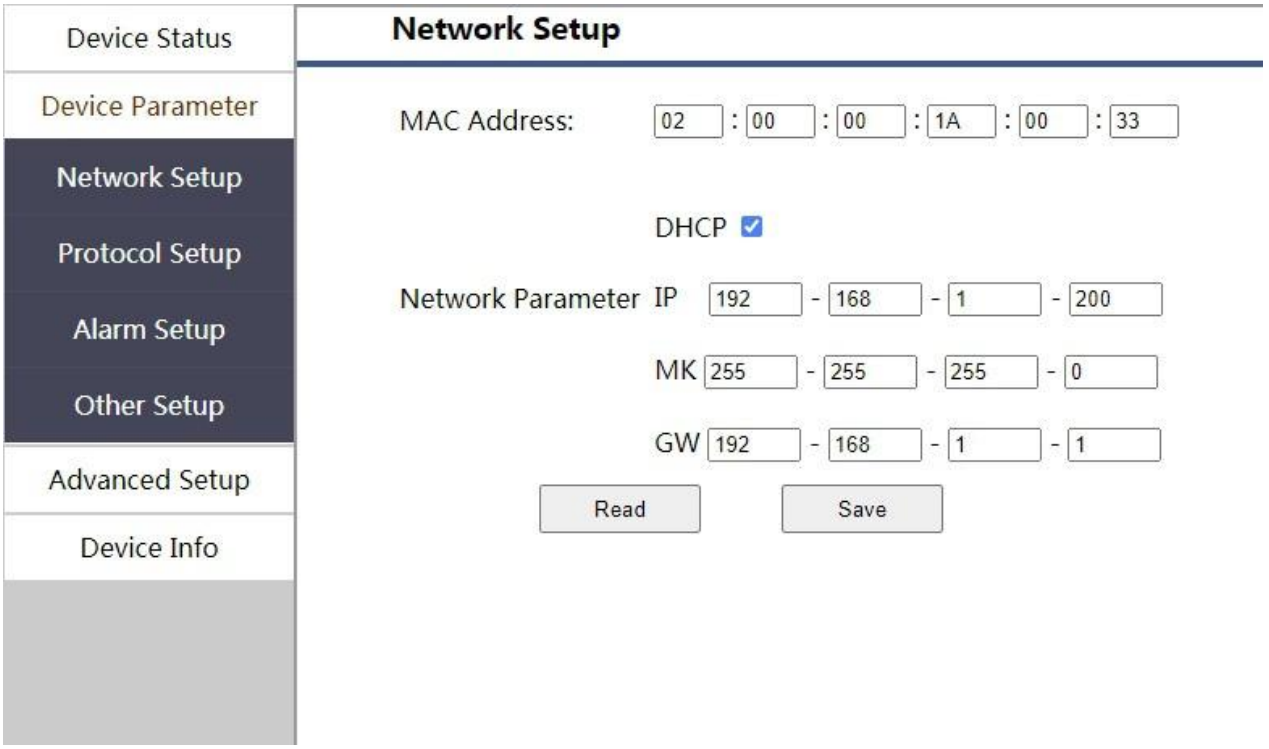
Mqtt server: open the webserver client of the network temperature and humidity meter and find the device parameter protocol setting page.

Activate the mqtt protocol as shown in the figure, and fill in the IP address and port of the server.Tick the mqtt switch.



Restart the temperature and humidity meter after saving.(the above example shows the IP address of the server connecting broker.emqx.io is 52.26.1.234)

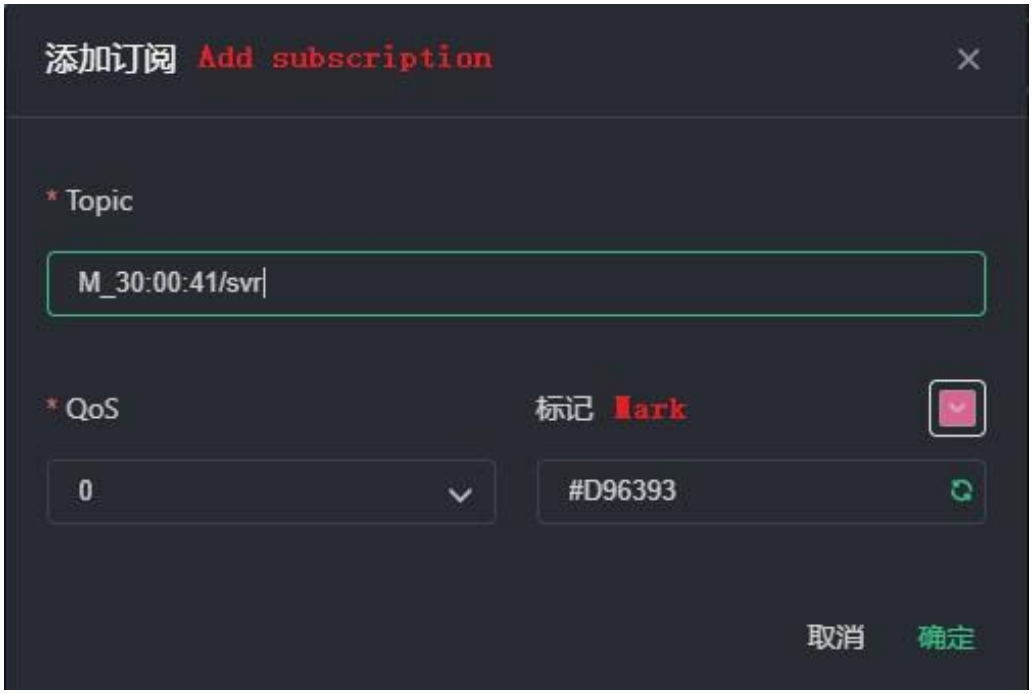
Client: the default name is gmht01: + ID id = 300041.For example, the default name of the example is: gmht01:300041



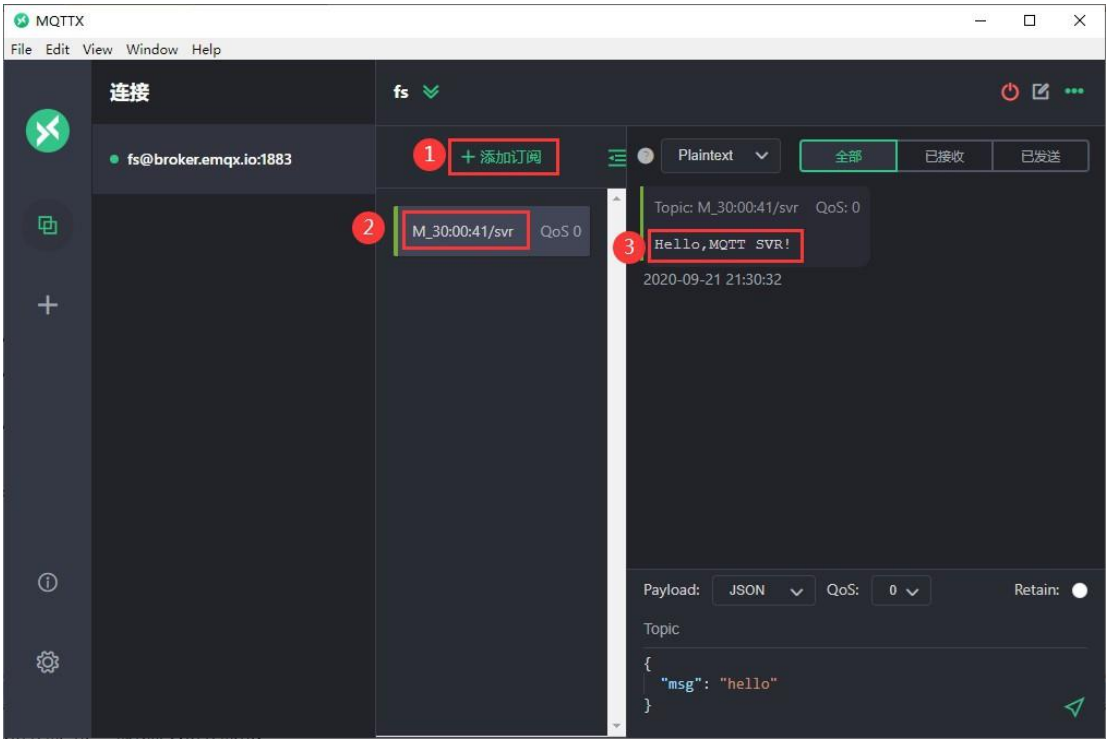
The default connection user name is: guest, password: guest (support webserver change).

Publishtopic: M_+ID (with:) / SVR example: M_30:00:41/svr

Add a subscription on the test side as follows:



Will receive: Hello, MQTT, SVR!



Subscribe topic: M_+ID (with:) / cli for example: M_30:00:41/cli

As shown in the figure below, send M_30:00:41 / cli will receive the temperature and humidity in Jason format.Other contents are being added.