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Small color screen wireless temperature measurement master KL-MT86MP Manual

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Safety and precautions

◆ Danger and Warning

This device can only be installed and maintained by professionals.

The manufacturer assumes no responsibility for any malfunctions caused by failure to comply with the instructions in this manual.

◆ Dangers of electric shock, fire and explosion

The equipment can only be installed and maintained by qualified personnel.

Before performing any operation on the equipment, the voltage input should be isolated and the operating power supply to the equipment should be disconnected.

A reliable voltage detection device is needed to confirm whether the voltage has been cut off.

Before powering on the equipment, all mechanical parts should be returned to their original positions.

The equipment should be supplied with the correct rated voltage during use.

Before powering on, carefully check that all wiring is correct.

Failure to take these precautions could lead to serious harm!

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I. Product overview

Temperature monitoring points for high-voltage electrical equipment are typically located in environments with high voltage, high current, and strong magnetic fields. Due to the stringent conditions such as strong electromagnetic noise, high-voltage insulation, and space constraints, real-time temperature monitoring of high-voltage electrical equipment becomes extremely difficult.

Our company's independently developed wireless temperature monitoring system is a real-time temperature measurement system that uses radio waves for signal transmission. This system mounts a sensor on the device being measured, and the sensor is connected to the receiving host via a wireless network. This system fundamentally overcomes the challenge of real-time online monitoring of the operating temperature of high-voltage equipment contacts.

The KL-MT86MP small color screen wireless temperature measurement host is a host with a standard 86*86 color screen display, equipped with a standard communication interface, supporting network operation, and capable of receiving data from wireless temperature sensors. Simultaneously, with the help of host computer software, the host can record real-time operating temperature data of high-voltage equipment, enabling proactive maintenance of high-voltage equipment for thermal faults and providing historical data for high-voltage equipment repair.

The wireless temperature monitoring system boasts extremely high reliability and security . The temperature sensor employs ultra-low power wireless communication, transmitting the collected temperature data to the wireless temperature monitoring host via a wireless network. The wireless temperature sensor is directly installed at the temperature monitoring point of each high-voltage electrical device, such as industrial production equipment, high-power motors, high-voltage switches, busbar joints, outdoor disconnectors, transformers, and other electrical contacts prone to high temperatures.

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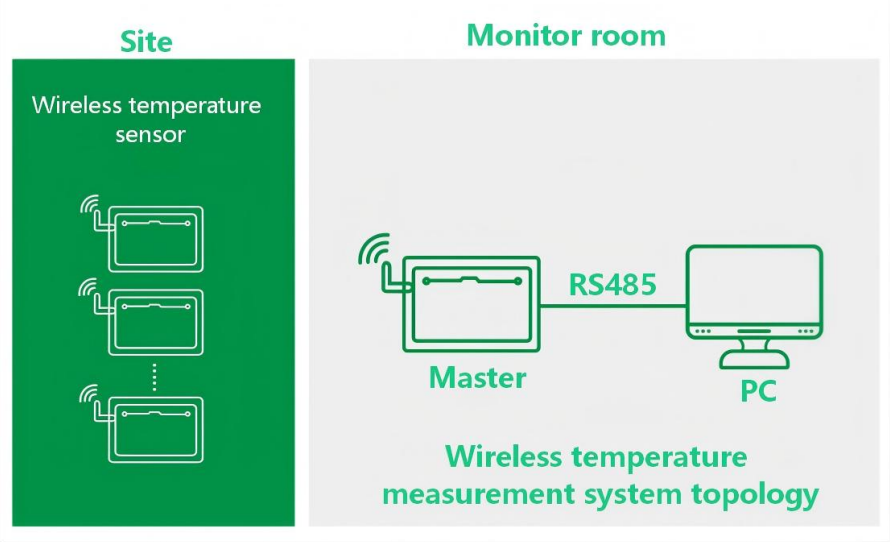
II. Structure of wireless temperature measurement system

2.1 Wireless temperature measurement system structure diagram

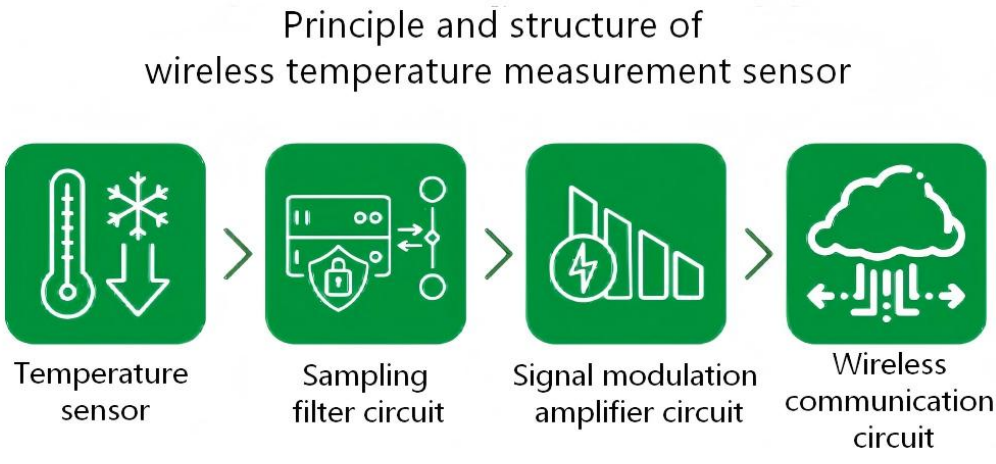


2.2 Wireless temperature sensor

The wireless temperature sensor consists of a temperature sensor, signal modulation and amplification, logic control circuit, wireless communication circuit, antenna, and other components. It collects temperature data and sends it to the wireless temperature measurement host via a wireless network.

Temperature sensors can be used to measure the temperature of the surface or contact points of high-voltage energized objects, such as the operating temperature of industrial production equipment, high-power motors, exposed contacts in high-voltage switchgear, busbar connections, outdoor disconnectors, and transformers.

The schematic diagram of the wireless temperature sensor is shown below.



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III、Main technical parameters

3.1 Introduction to main functions

Main functions		Function introduction
Basic function	Receive data	It receives the temperature and sensor operating voltage uploaded by the wireless temperature sensor.
	Display data	The received data is displayed in color, providing a more intuitive display effect. The backlight switch is controllable, making it suitable for a variety of applications.
	Clock display	A real-time clock is displayed and serves as the time reference for event logging.
	Parameter settings	All parameters are flexibly adjustable, the operation is convenient, and data is not lost when power is off.
	Alarm output	When an alarm event occurs, the relay dry contact outputs a signal and emits a buzzer alarm sound.
Advanced Function	Extreme temperature records	Records the highest and lowest temperatures at each temperature measurement point monthly, along with the corresponding power supply voltage and the time of occurrence. When used across years, it automatically overwrites the data for that month from the previous year.
	Temperature alarm record	Records the temperature, start time, and end time of each phase at the temperature measurement location where an alarm has occurred. Up to 100 records can be saved. When there are more than 100 records, the oldest record will be automatically overwritten.
	Temperature imbalance record	When the three phase temperatures at the same temperature measurement location are not equal, the temperature and occurrence time of each phase in the current group are recorded monthly, and the imbalance degree is calculated. When used across years, the data of the previous year for that month are automatically overwritten.
	Password Management	Password management is used, and a password must be entered when setting parameters. There are two types of passwords: user password and system password. Entering the system password allows access to more advanced settings.

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3.2 Technical specifications

Technical parameters		Technical indicators
Wireless parameters	wireless frequency	2.4GHz and 433MHz are optional.
	Managing the number of wireless sensors	≤240
Communication parameters	Communication methods	RS485 communication interface, communication distance ≤1200m (without repeater)
	Number of hosts in a network	≤128
	Communication Protocol	Modbus Protocol: Communication Protocol for Wireless Temperature Measurement Systems
	baud rate	1200, 2400, 4800, 9600, 19200 bps available
Alarm Default Parameters	Temperature alarm value	Upper limit: +90℃, lower limit: -20℃
	Temperature alarm value	Upper limit: +60℃, lower limit: -10℃
	alarm voltage value	2700mV
Relay dry contact parameters		AC220V/5A (1 set of passive normally open/normally closed contacts)
Operating voltage		AC 85～265V / DC 110～370V
Overall power consumption		≤5VA
Operating temperature		-10℃ to +70℃
Operating humidity		≤90%RH, non-condensing, non-corrosive
altitude		≤2500 meters
Protection level		IP20
Insulation resistance		≥100MΩ (temperature between 10~30℃, relative humidity less than 80%)
Installation method		Embedded installation

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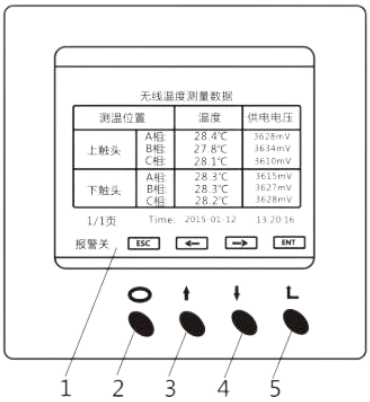
IV. Display and parameter settings

4.1 Display panel



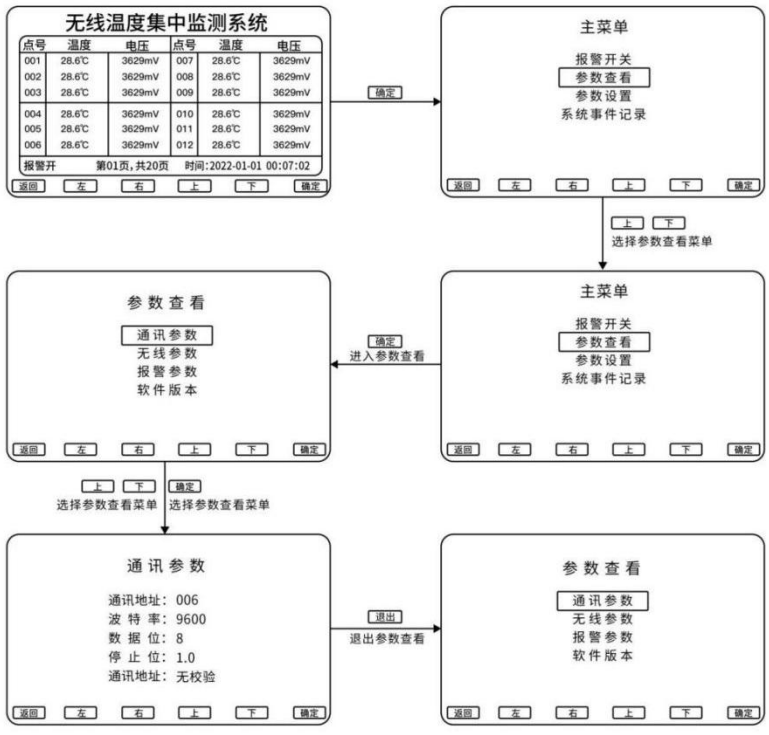
Legend:

1. LCD display area
2. Exit button
3. Up arrow key
4. Down arrow key
5. Confirm button

4.2 Parameter settings

4.2.1 Alarm switch settings

The alarm switch is used to set whether an alarm sound is emitted when an alarm event occurs. When an alarm event occurs, an alarm sound will be emitted if the alarm switch is turned on, and no alarm sound will be emitted if the alarm switch is turned off. Regardless of whether the alarm switch is turned on or off, the system will record the alarm eve



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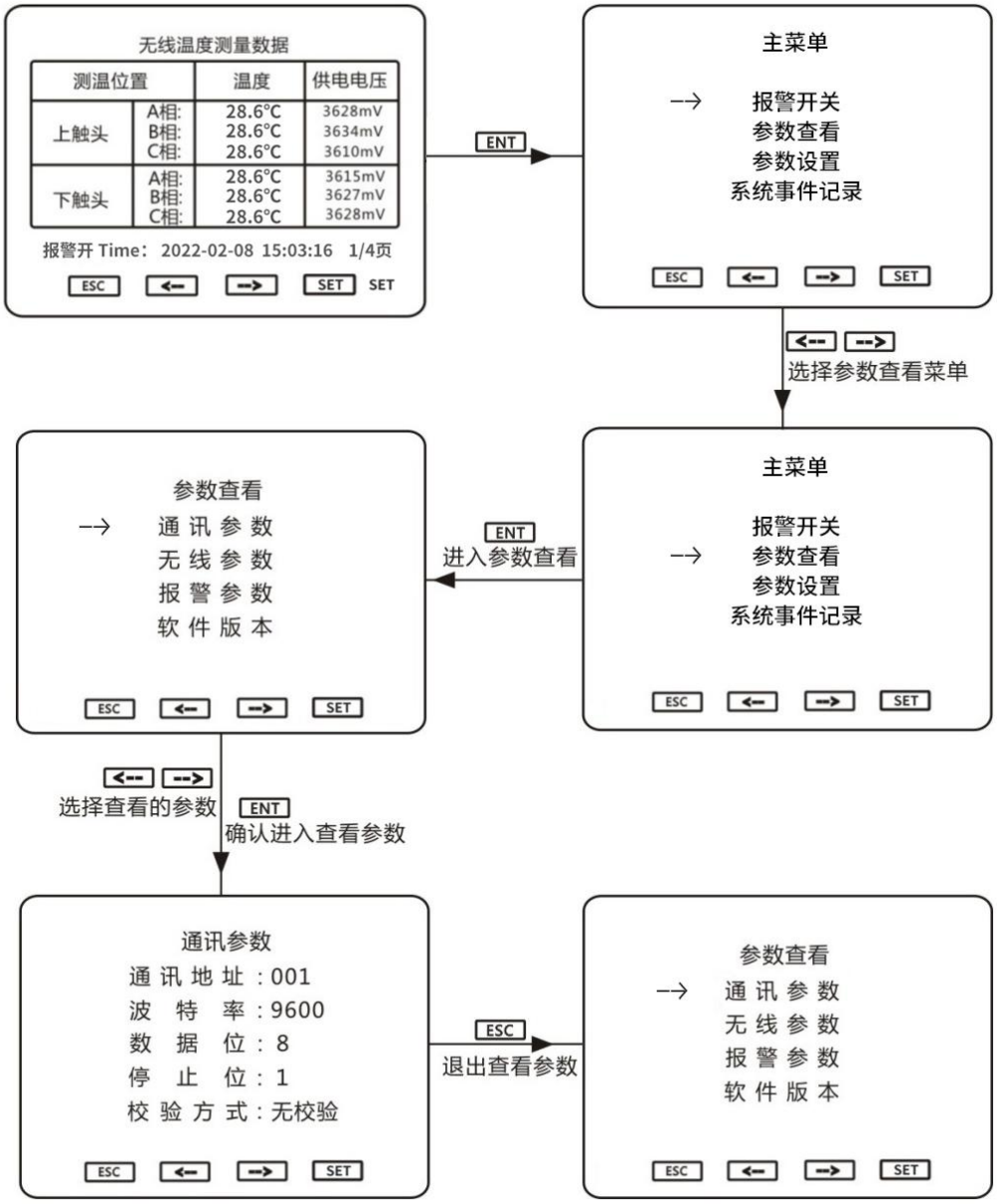
4.2.2 Parameter Viewing

The parameter viewer is used to view the current parameter settings of the device, including communication parameters, wireless parameters, and alarm parameters. No password is required. The viewing method is shown in the figure below. The viewing method for other parameters is the same.



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4.2.3 Parameter Settings

The parameter settings are used to set system parameters. You can set commonly used parameters by entering the user password. Generally, incorrect settings will not have serious consequences for the device (such as not being able to receive wireless data). If you accidentally set the wrong settings, you can simply restore the factory settings to make the device work normally.

Entering the system password allows for more advanced settings, such as setting the local wireless address, display group name, etc., and modifying the address, operating mode, temperature compensation, etc. of the wireless temperature sensor. This setting requires a certain amount of patience and professional knowledge from the user, and it is generally not recommended to modify it. This manual does not provide the setting method. If the user needs to set it, please contact the manufacturer.

User password factory default value: 2000

System password factory default value: 5102

All passwords can be changed. You can change both the user password and the the user password by logging in with the user password. If you have changed all your passwords and forgotten them, please contact the manufacturer.

Note: When setting the time, after entering the time setting interface, press the ESC key and the ENT key simultaneously to enter the setting menu. Press the ENT key to select the setting item, press the ESC key to modify the setting value, and press the ESC key to exit and save the setting time.

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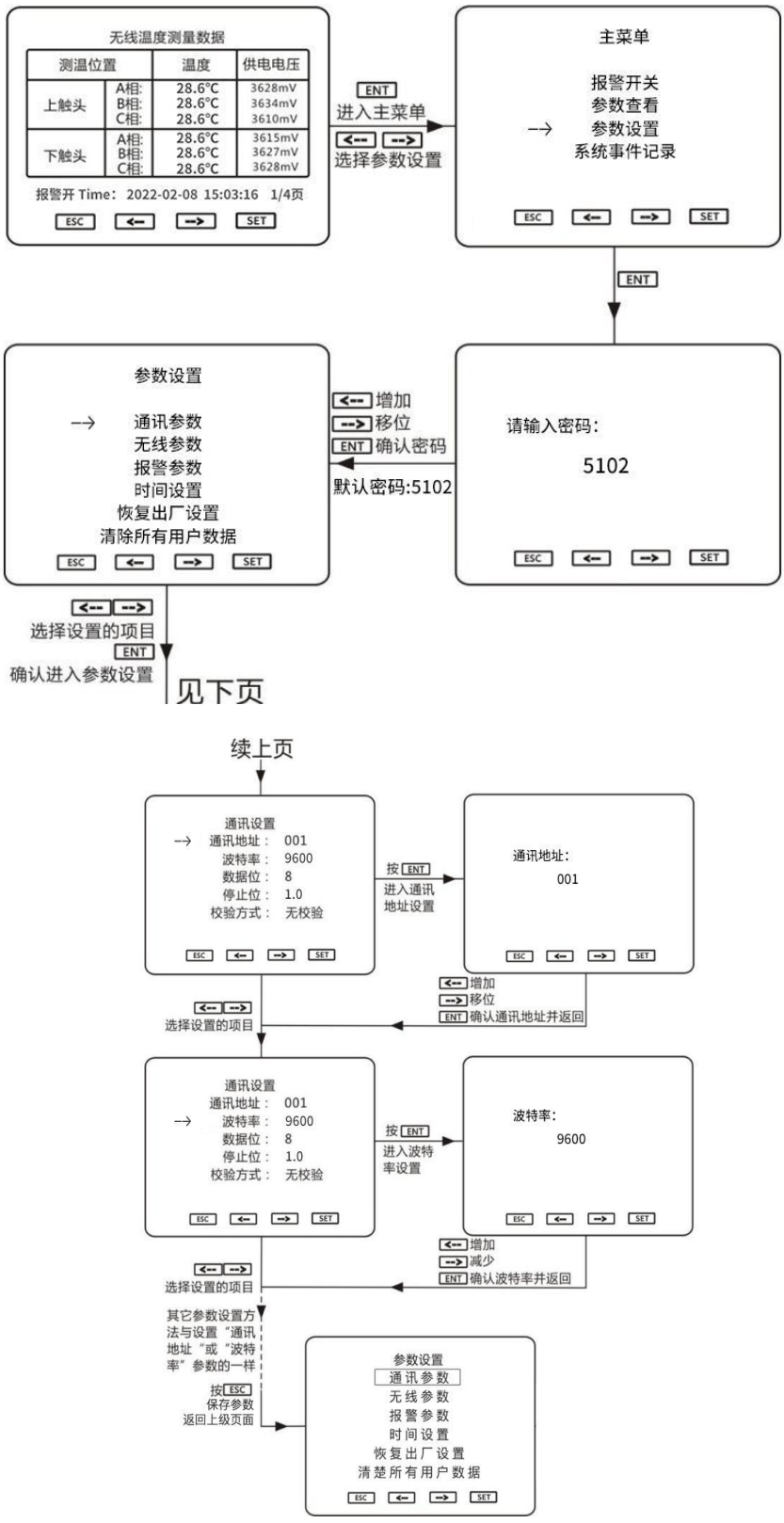
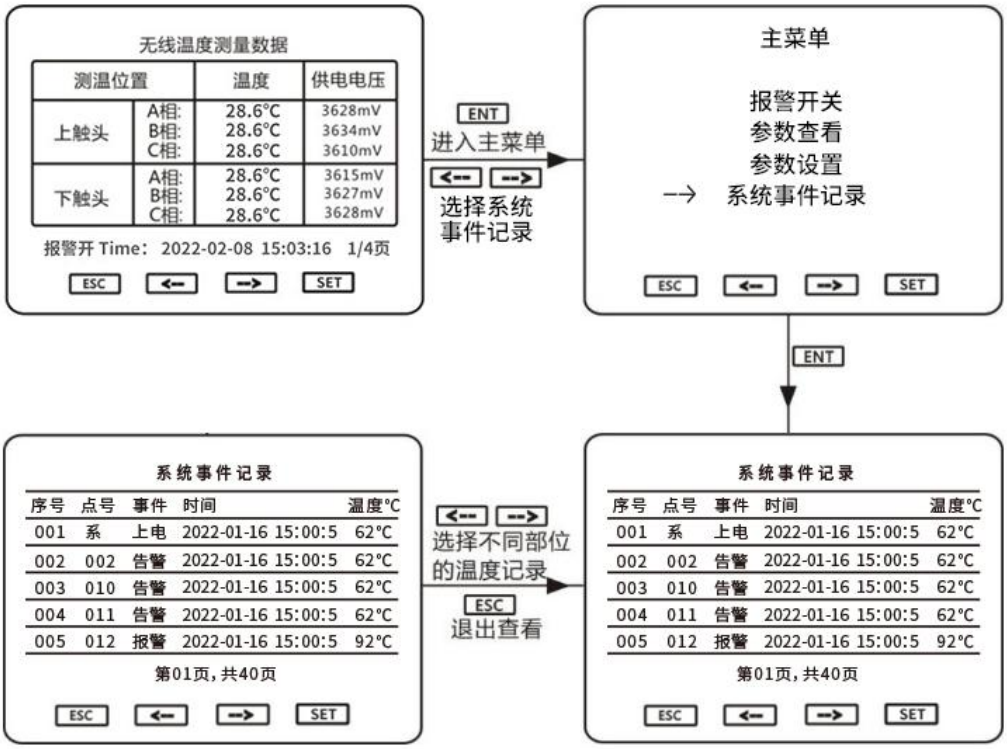


4.2.4 Extreme temperature records

Extreme temperature recording: Records the highest and lowest temperatures at each measurement point monthly, along with the corresponding power supply voltage and the time of occurrence. When used across years, it automatically overwrites the data for that month from the previous year. The viewing method is shown in the image below:



4.2.5 Temperature alarm record

Temperature alarms are divided into two types: high temperature alarms and low temperature alarms.

High temperature alarm: When the temperature of one or more temperature measuring points exceeds the upper limit of the alarm temperature, a high temperature alarm event occurs. The alarm event will not be cleared until the

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temperature falls below the upper limit of the alarm temperature.

Low temperature alarm: When the temperature of one or more temperature measuring points is lower than the lower limit of the alarm temperature, a low temperature alarm event occurs. The alarm event will not be cleared until the temperature is higher than the lower limit of the alarm temperature.

After an alarm event occurs, if the alarm switch is turned on, the device will immediately sound an alarm. After 10 minutes, regardless of whether the alarm event has been cleared, the system will automatically turn off the alarm. If the alarm event is cleared and another alarm event occurs, the alarm will turn on again, and so on.

After an alarm event occurs, the temperature value displayed at the corresponding temperature measuring point will flash until the alarm is cleared.

Alarm event recording: If an alarm event persists for 10 minutes after it occurs, the system will begin recording alarm event data. The recorded data will be based on the current temperature value and time. If the temperature data in the alarm record is lower than the upper limit of the temperature alarm, the user can view the highest temperature value and occurrence time in the monthly record of the extreme temperature. Once the alarm event is cleared, the system will immediately record the end time based on the current time. If the device experiences a power outage before the alarm event is cleared, the end time will not be recorded. If the duration of the alarm event is less than 10 minutes, this alarm event will not be recorded.

Temperature alarm log: Records the temperature, start time, and end time of each phase at the temperature measurement location where an alarm has occurred. A maximum of 100 records can be saved; when more than 100 records are saved, the oldest record is automatically overwritten. White temperature indicates that the alarm value has not been exceeded, while red temperature indicates that the alarm value has been exceeded.

The method for viewing it is the same as that for viewing the "Extreme

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Temperature Records". Please refer to the method for viewing the "Extreme Temperature Records".

4.2.6 Temperature imbalance record

Temperature imbalance record: When the three-phase temperatures at the same temperature measurement location are unequal, the temperature and occurrence time of each phase in that group are recorded monthly, and the imbalance degree is calculated. This record shows the temperature data and occurrence time when the imbalance rate is the highest this month. When used across years, it automatically overwrites the data for that month of the previous year. Note: The imbalance rate is only calculated when all three-phase temperature values are positive or all three-phase temperature values are negative. The imbalance rate is not calculated if the three-phase temperature values are incomplete (temperature missing phase).

Formula for calculating the imbalance rate:

Imbalance rate = (maximum temperature − minimum temperature) / average of three-phase temperatures. The method for viewing this value is the same as that for viewing the "limit temperature record". Please refer to the method for viewing the "limit temperature record".

4.2.7 Restore factory settings

If a user accidentally modifies the settings and causes the host to malfunction, they can try restoring the factory settings. If the problem persists after restoring the factory settings, please contact the manufacturer.

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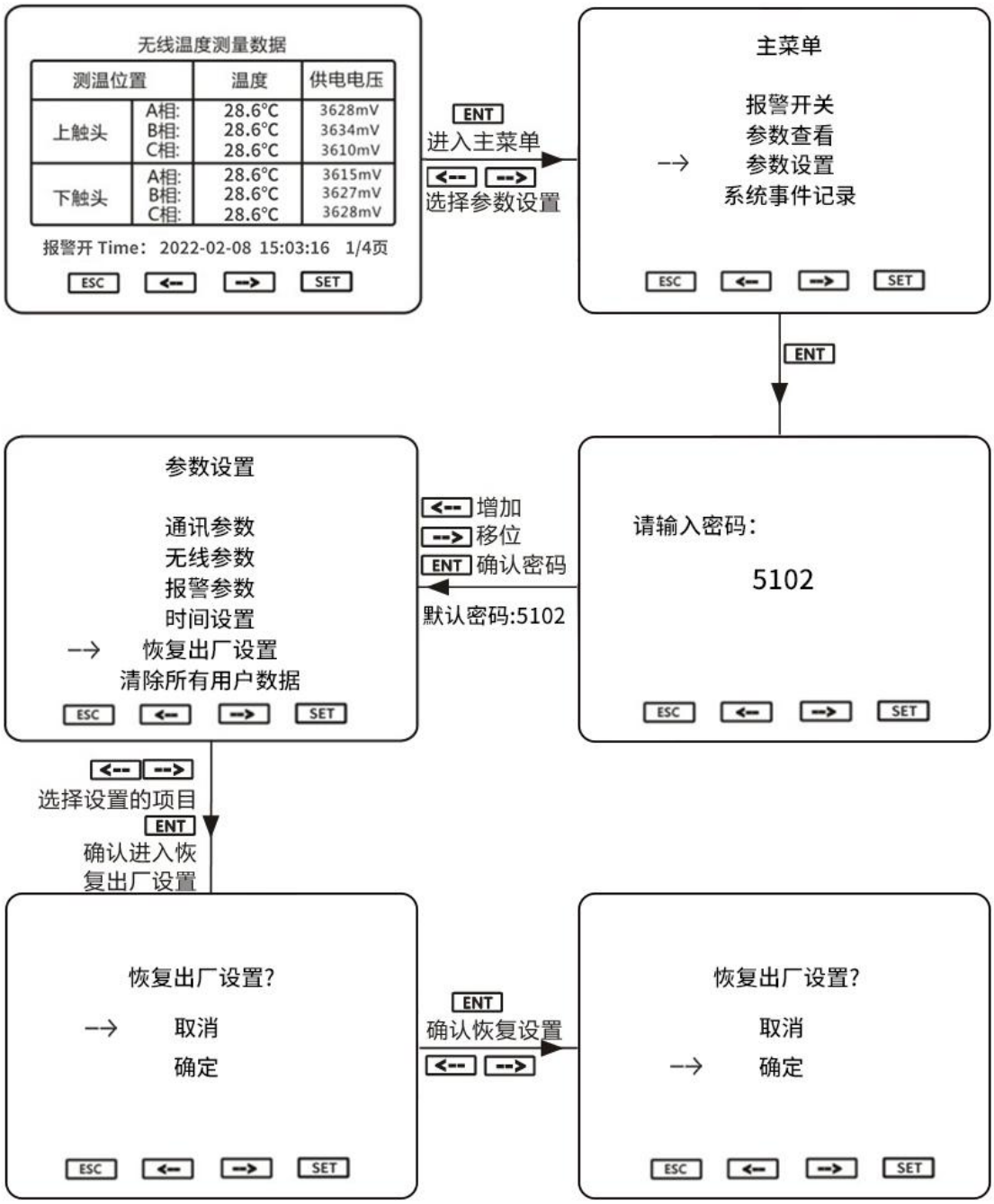
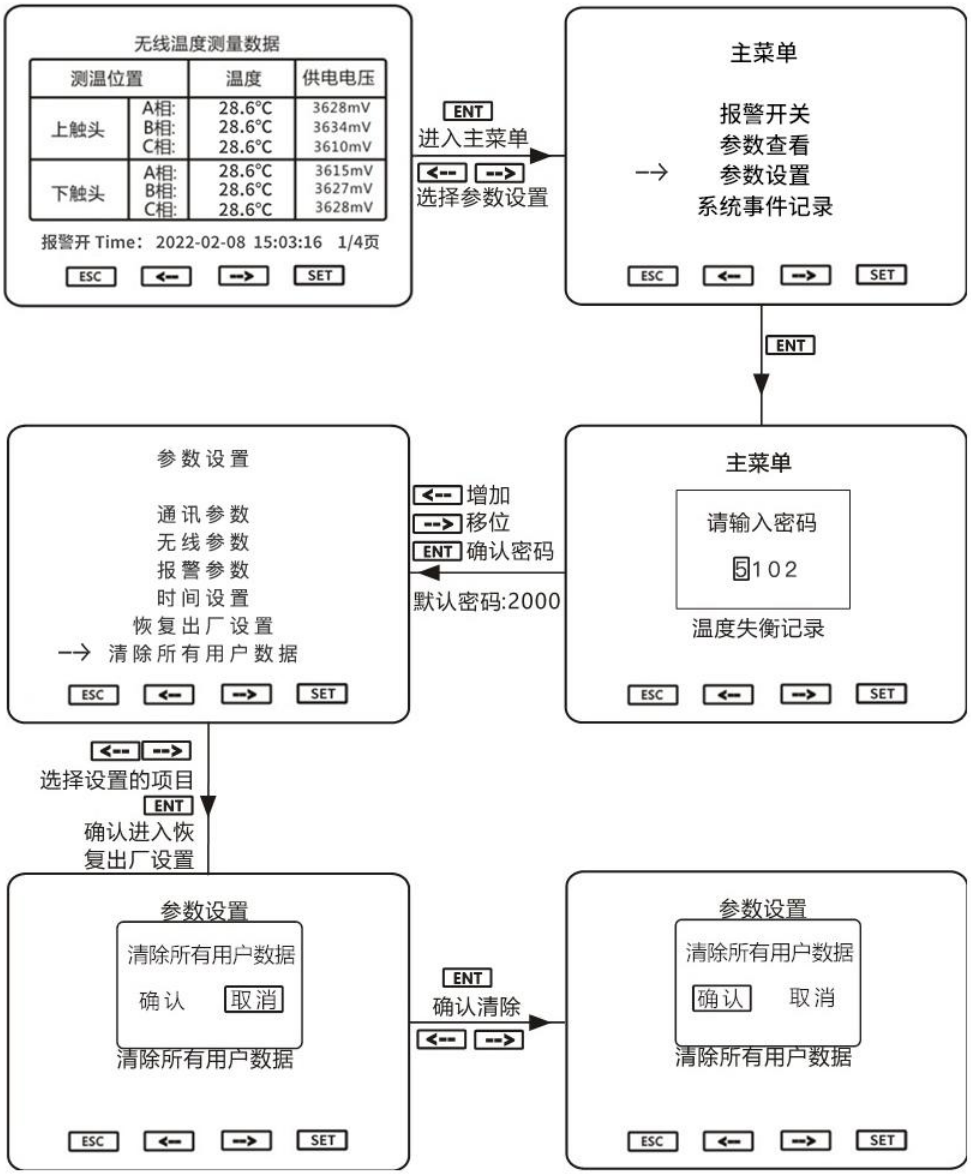


4.2.8 Clear all user data

This operation will erase all extreme temperature records, temperature event records, and temperature imbalance records. Therefore, users should operate with caution. If the deletion operation is performed, the lost data cannot be recovered.

Extreme temperature records and temperature imbalance records can also be cleared monthly. This method will not clear other data. Temperature event records can also be cleared independently, but extreme temperature records and temperature imbalance records will not be cleared.



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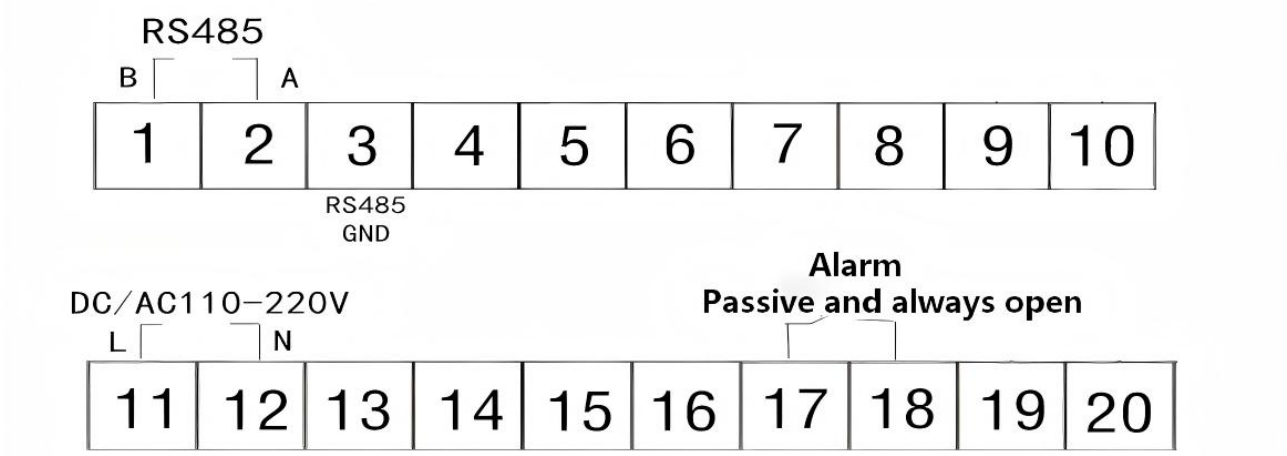
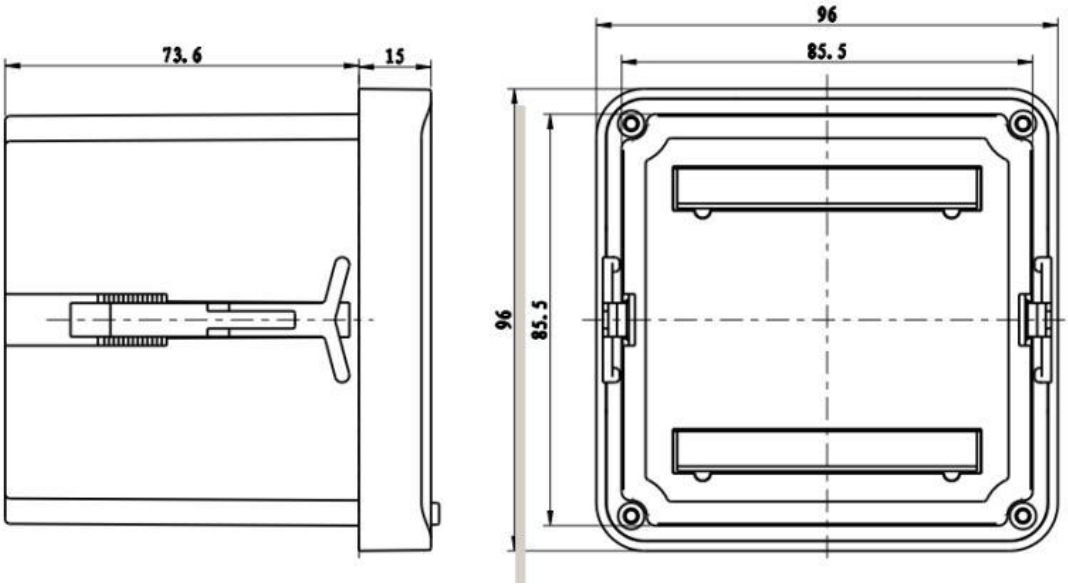
V. Wiring method



VI. External dimensions and installation method

Temperature measurement unit dimensions (unit: mm)



Opening size: 86mm*86mm

Temperature measurement unit installation method: Embedded installation

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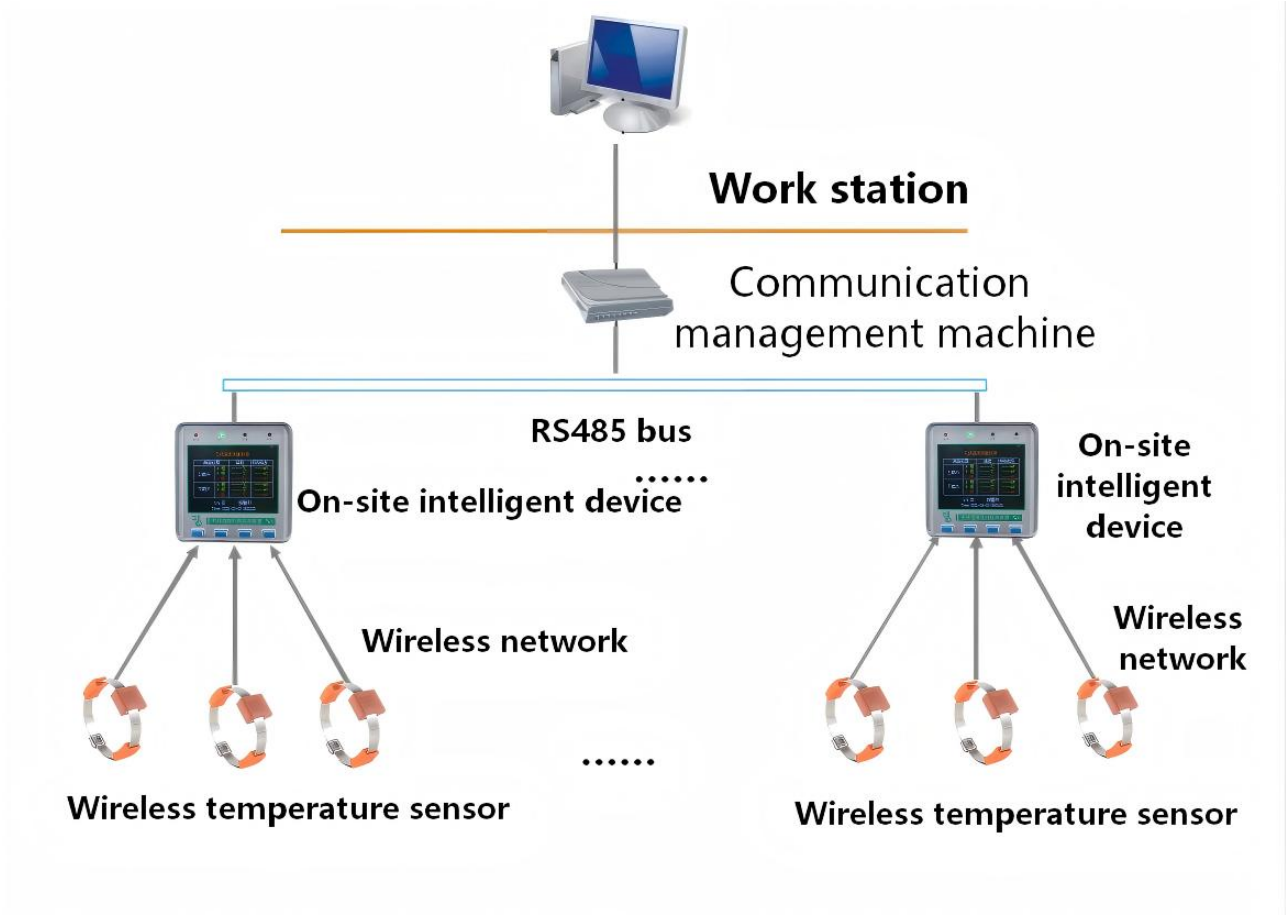
VII . Typical networking methods for wireless temperature measurement systems



Note: This diagram shows a typical network topology, which may vary depending on the specific project requirements.

VIII. Contact Us

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