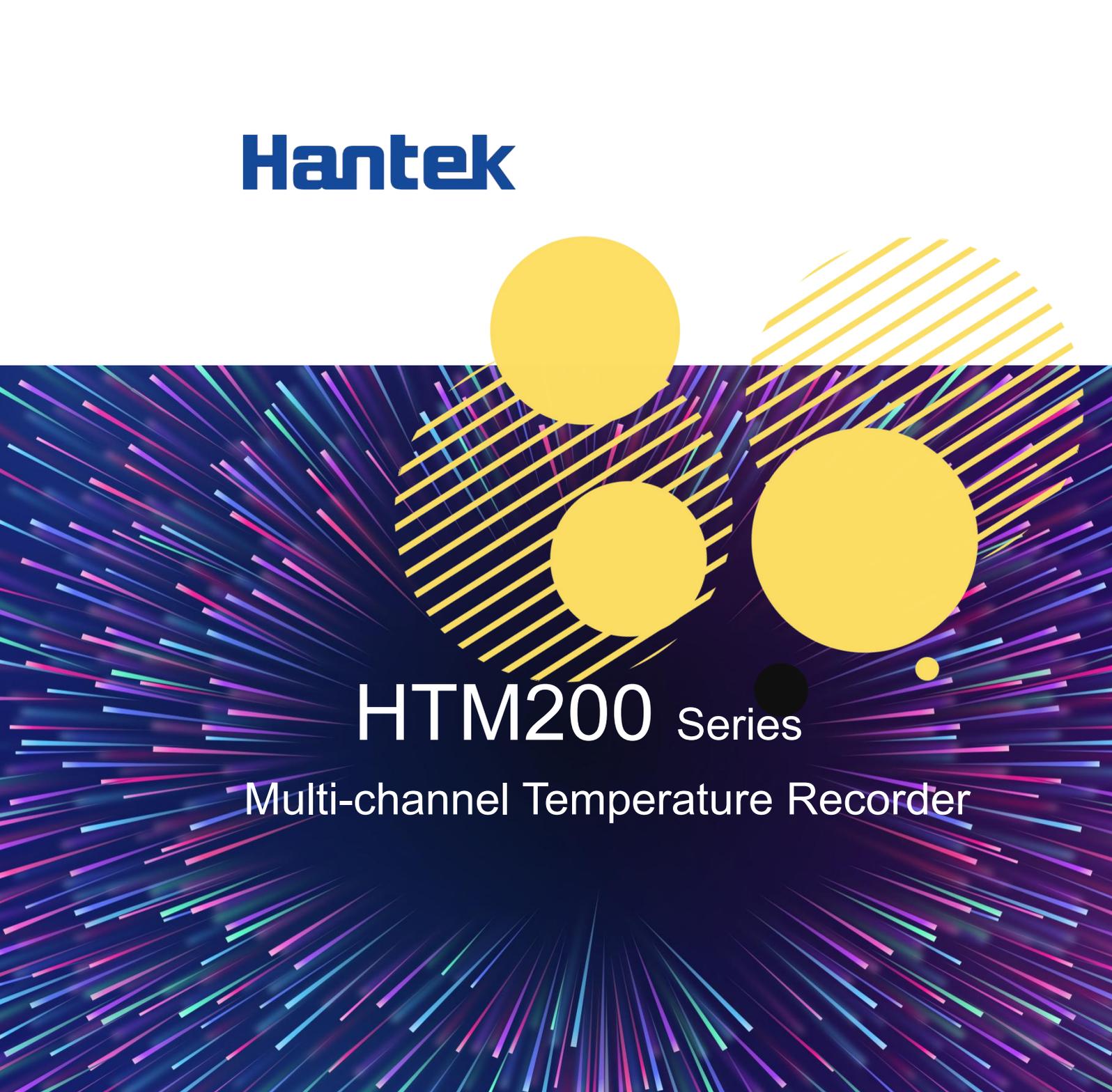




**Hantek**



**HTM200** Series

Multi-channel Temperature Recorder

User Manual

2022.06

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The product complies with China national product standards and industry product standards, as well as ISO9001:2015 and ISO14001:2015 standards, and will further complete the certifications of other members of international standard organizations.

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# Contents

Contents .....	I
Figures .....	V
Tables .....	VIII
1 Safety Requirements .....	1
1.1 Summary of general security issues .....	1
1.2 Safety Notices and Symbols .....	2
1.3 Measurement Category .....	3
1.4 Working Environment .....	3
1.5 Maintenance and Cleaning .....	5
1.6 Environmental Considerations .....	5
2 Product features .....	7
3 Document Overview .....	8
4 Quick Start .....	10
4.1 General Inspection .....	10
4.2 Appearance and Dimensions .....	11
4.3 Preparation before Use .....	11
4.3.1 Adjusting the Stand .....	11

---

4.3.2 Charging .....	12
4.3.3 Turn-on check .....	13
4.3.4 Set the system language .....	13
4.3.5 Test terminal connection .....	13
4.3.6 Product Introduction .....	14
4.3.7 Front Panel Overview .....	14
4.3.8 Side Panel Overview .....	16
4.3.9 Top Panel Overview .....	17
4.3.10 User Interface .....	17
4.4 Storage and replacement of batteries .....	19
4.4.1 Battery storage .....	19
4.4.2 Battery replacement .....	20
4.5 Safety lock hole .....	22
5 Function introduction .....	23
5.1 Measurement list .....	23
5.2 Measurement bar chart .....	23
5.3 Channel configuration .....	24
5.4 System settings .....	25
5.4.1 User .....	25

---

5.4.2 File .....	26
5.4.3 Service .....	28
5.5 Firmware update .....	28
5.6 Error code description .....	29
6 Remote control and data transmission .....	30
6.1 Control via USB .....	30
6.2 Control via Bluetooth .....	31
6.3 Network data transmission .....	31
7 Android application .....	33
7.1 Application download and installation .....	33
7.2 Application introduction .....	34
7.2.1 Main interface .....	34
7.2.2 Setting Interface .....	35
8 Windows Software .....	39
8.1 Software Download and Installation .....	39
8.2 Software Functions .....	40
8.2.1 User Interface .....	40
8.2.2 File Storage .....	40
8.2.3 Connection Method .....	41

8.2.4 Record .....	44
8.2.5 Display .....	44
8.2.6 Shortcuts .....	45
8.2.7 Channel settings .....	46
9 Troubleshooting .....	47
10 Appendix .....	48
10.1 Appendix A: Accessories .....	48

---

# Figures

Figure 4.1 Front view and side view .....	11
Figure 4.2 Adjusting the stand .....	12
Figure 4.3 Test interface .....	13
Figure 4.4 Front panel .....	14
Figure 4.5 Side panel .....	16
Figure 4.6 Top panel .....	17
Figure 4.7 User interface .....	17
Figure 4.8 Open the stand .....	20
Figure 4.9 Install the battery .....	21
Figure 4.10 Safety lock hole .....	22
Figure 5.1 Measurement list .....	23
Figure 5.2 Measurement bar chart .....	24
Figure 5.3 Data preservation instance .....	28
Figure 6.1 USB connection diagram .....	31
Figure 7.1 Application download QR code .....	33
Figure 7.2 Main interface of the Android application .....	34
Figure 7.3 Channel settings .....	35
Figure 7.4 Android application setting interface .....	35
Figure 7.5 Data source selection .....	36
Figure 7.6 Import network data .....	36

---

Figure 7.7 Data file export.....	37
Figure 7.8 Data file import.....	37
Figure 7.9 Delete file.....	37
Figure 7.10 Channel settings.....	38
Figure 7.11 Line chart settings.....	38
Figure 8.1 Windows software user interface.....	40
Figure 8.2 File menu.....	40
Figure 8.3 Connection menu.....	41
Figure 8.4 Communication connection window.....	42
Figure 8.5 Windows software data collection.....	42
Figure 8.6 Bluetooth connection.....	43
Figure 8.7 Viewing historical data.....	43
Figure 8.8 Record menu.....	44
Figure 8.9 Display menu.....	44
Figure 8.10 Track.....	44
Figure 8.11 Zoom.....	45
Figure 8.12 Shortcuts.....	45
Figure 8.13 Channel settings.....	46

---

## Tables

Table 3.1 Model list.....	9
Table 4.1 Status display.....	19
Table 5.1 Channel configuration descriptions.....	25
Table 5.2 Function menu descriptions.....	25
Table 5.3 User menu table.....	26
Table 5.4 File menu table.....	27
Table 5.5 Function menu descriptions.....	27
Table 5.6 Error code descriptions.....	29
Table 6.1 Network connection status symbols.....	32

# 1 Safety Requirements

## 1.1 Summary of general security issues

Carefully read the following safety precautions to avoid injury and to prevent damage to this product or products connected to it. To avoid potential hazards, please follow the instructions specified in this manual to use the instrument properly.

- **Only professionally authorized personnel can perform repairs.**

- **Use Proper power Cord.**

Use only the power cable approved by your country.

- **Ground the product.**

To avoid electric shock, the product is grounded through the grounding conductor of the power cable. The grounding conductor must be connected to the ground before connecting the input or output end of the product. Ensure that the product is properly grounded.

- **Check all terminal ratings.**

To avoid fire or excessive current, check all rated values and marking instructions on the product. Please consult the product manual for details before connecting the product.

- **Do not open the cover.**

Do not run the product when the outer cover or panel is open.

- **Avoid circuit exposure.**

Do not touch exposed wire terminals and electronic components after the power supply is switched on.

- **Do not perform operations when you suspect that the product is faulty.**

If you suspect that the product has been damaged, have it inspected by a qualified maintenance person.

- **Maintain proper ventilation.**

- **Do not operate in a damp environment.**

- **Do not operate in inflammable and explosive environment.**

- **Please keep the product surface clean and dry.**

- **Anti-static protection**

Static electricity may damage the instrument. Therefore, test the instrument in an anti-static zone. Before connecting the cable to the instrument, ground the inner and outer conductors briefly to release static electricity.

- **Use batteries properly. Use the Battery Properly.**

If batteries are provided, do not expose them to high temperature or fire. Keep batteries away from children. Improperly replacing batteries can cause explosions (warning: lithium-ion batteries). Only the battery specified for the product shall be used.



**Warning:**

Equipment that meets class A requirements may not provide adequate protection against broadcast services in the residential environment.

## 1.2 Safety Notices and Symbols

Safety notices in the manual:



**Warning:**

Indicates that this operation may not cause immediate damage to you.

**Note:**



Indicates that you may damage the product or other property if you do so.

Safety terms on the product:

**Warning:**

Indicates that if you do not perform this operation, potential harm may be caused.

Safety symbols on the product:



Warning

## 1.3 Measurement Category

### Measurement Category

The instrument can operate under measurement category I.



### Warning:

**This instrument can only be used for measurements within its specified measurement categories.**

### Definitions of measurement categories

- **Measurement Class I** refers to measurements made on circuits not directly connected to the main power supply. For example, circuits that are not derived from the main power supply, especially from the protected (internal) main power supply. In the latter case, instantaneous stress changes. Therefore, the user should be aware of the instantaneous capacity of the device.
- **Measurement Class II** refers to measurements made on circuits directly connected to low voltage equipment. For example, household appliances, portable tools and similar equipment.
- **Measurement Class III** refers to measurement in construction equipment. For example, switchboards, circuit breakers, circuits (including cables, busbars, junction boxes, switches, sockets) in fixed equipment, equipment for industrial use, and other equipment (for example, fixed motors permanently connected to fixed equipment).
- **Measurement class IV** refers to measurement at the source of low-voltage equipment. For example, electricity meters, measurements on primary overcurrent protection equipment, and measurements on pulse control units.

## 1.4 Working Environment

### Temperature

Operating: 0°C - 50 °C

Non-operating: -20°C - 60 °C

### Humidity

≤+104°F (≤+40°C): ≤90%RH

106°F~122°F (+41°C ~50°C): ≤60%RH

**Warning:**

To avoid short circuit or electric shock, do not operate the device in a damp environment.

**Altitude**

Operating and Non-operating: 3,000m (10,000 feet).

Random vibration: 0.31g RMS from 50Hz to 500Hz, 10 minutes in each axial direction.

When not operating: 2.46g RMS from 5Hz to 500Hz, 10 minutes in each axial direction.

**ESD Category**

ESD + 8 kv

**Installation (overvoltage) Category**

This product is powered by a main power supply conforming to Installation (overvoltage) category II.

**Warning:**

Ensure that no overvoltage (e.g., lightning) reaches the product. Otherwise, the operator may be in danger of suffering from electric shock.

**Definitions of Installation (overvoltage) category**

Installation (overvoltage) category I refers to the signal level, which is applicable to the device measurement terminals connected to the source circuit. Measures have been taken to limit the instantaneous voltage to the corresponding low level.

Installation (overvoltage) Class II refers to the local distribution, which is applicable to equipment connected to the AC line (AC power).

**Degree of pollution**

Class 2

**Definition of pollution level**

- **Pollution level 1:** No pollution, or only dry non-conductive pollution. This pollution level has no impact. For example, clean room or air-conditioned office environment.
- **Pollution level 2:** Generally, only dry non-conductive pollution occurs. Transient

conduction due to condensation may sometimes occur. For example, general indoor environment.

- **Pollution level 3:** Conductive pollution occurs, or dry non-conductive pollution becomes conductive due to condensation. For example, an outdoor environment with a canopy.
- **Pollution level 4:** Permanent conductive pollution through conductive dust, rain, or snow. For example, outdoor places.

**Security level**

Level 1 - Grounded products

## 1.5 Maintenance and Cleaning

**Maintenance**

Do not expose the LCD to direct sunlight for a long time when storing or placing the instrument.

**Cleaning**

Check the instrument frequently as required by the operating conditions. Clean the outer surface of the instrument according to the following steps:

- 1) Use lint-free cloth to remove floating dust outside the instrument. Please be careful to avoid scratching the smooth display.
- 2) Clean the instrument with a soft cloth soaked in water. For a more thorough cleaning, use an aqueous solution of 75% isopropyl alcohol.



**Note:**

To avoid damaging the surface of the instrument, do not use any corrosive reagent or chemical cleaning reagent.



**Warning:**

Before powering on again, ensure that the device is dry enough to avoid electrical short circuit or personal injury caused by moisture.

## 1.6 Environmental Considerations

The following symbol indicates that the product complies with WEEE Directive

2002/96/EC.



### **Equipment recycling**

Producing this product requires the extraction and use of natural resources. Some substances contained in the equipment may be harmful to the environment or human health if the product is not disposed of properly. To avoid the release of harmful substances and reduce the cost of natural resources, it is recommended that appropriate methods be used to recycle this product to ensure most of the materials can be properly reused.

## 2 Product features

### Product features

- 18650 standard lithium battery, support Type-c charging;
- Digital signal and analog signal adopt isolation design, can carry on electric test, safe and reliable;
- 320\*240 TFT HD display, intuitively display multi-channel real-time signal changes, can switch the temperature list and bar chart in real time;
- Support 11 types of thermocouple test, including J/K/T/E/S/N/B/R/A/C/D;
- Save the settings of the last shutdown by default, which is convenient for engineers to measure and record;
- Standard with USB disk storage function, support optional Micro SD card data storage;
- Temperature alarm control: when the set temperature is higher than the upper limit or lower than the lower limit, the buzzer will alarm;
- Standard with type-C communication function, support optional Bluetooth module /4G communication module;
- Equipped with Windows and Android data acquisition terminals, support multi-platform data collection and monitoring;
- Widely used in cold storage, warehouse temperature, electronic components surface measurement and other fields.

HTM200 series handheld multi-channel temperature recorder adopts high-performance 32-bit ARM microprocessor control, can simultaneously collect multi-channel temperature data in real time, support list display and bar chart display, upper and lower limit alarm, 11 kinds of thermocouple types and broken couple detection function. Measurement data are stable and accurate. Standard with USB disk storage and support optional SD card, which is convenient for data storage, export, and print. Support optional Bluetooth and 4G function, which is convenient for remote data collection.

## 3 Document Overview

This document is to guide users to quickly understand the front and rear panels, user interfaces, and basic operations of the HTM200 series products.



### Tip:

The latest version of this manual can be downloaded at <http://www.hantek.com>

### Software version

Software update may change or add product functions. Please visit Hantek website to obtain the latest version.

### Document format conventions:

#### 1 Button

Use icons to represent front panel buttons, for example,  represents "Utility" button.

#### 2 Menu

Use "Menu text (bold) + color (blue)" to represent a menu option. For example, **Serve** represents clicking "Serve" on the current operation interface to enter the function configuration menu of "Serve".

#### 3 Operation step

Use the arrow ">" to indicate the next operation. For example,  > **Edit** represents pressing the button  before clicking **Edit**.

### Document content conventions:

HTM200 series multi-channel temperature recorders include the following models. Unless otherwise specified, this document uses HTM208 as an example to introduce the series and basic operations.

Model	Channel	U disk	Bluetooth	SD card	4G (General)	4G (China)
HTM202B	2	Yes	No	No	No	No
HTM202C	2	Yes	Yes	Yes	No	No
HTM202D	2	Yes	Yes	Yes	Support	No

Model	Channel	U disk	Bluetooth	SD card	4G (General)	4G (China)
HTM202E	2	Yes	Yes	Yes	No	Support
HTM204B	4	Yes	No	No	No	No
HTM204C	4	Yes	Yes	Yes	No	No
HTM204D	4	Yes	Yes	Yes	Support	No
HTM204E	4	Yes	Yes	Yes	No	Support
HTM208B	8	Yes	No	No	No	No
HTM208C	8	Yes	Yes	Yes	No	No
HTM208D	8	Yes	Yes	Yes	Support	No
HTM208E	8	Yes	Yes	Yes	No	Support

Table 3.1 Model list

## 4 **Quick Start**

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### 4.1 **General Inspection**

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#### **Check shipping packing**

After receiving the instrument, check it according to the following steps: Check whether there is any damage caused by transportation. If the carton or foam protective pad is seriously damaged, keep it until the machine and accessories pass the electrical and mechanical tests.

#### **Check the accessories**

The details of the accessories are provided in [Appendix A: Accessories](#) at the back of this manual. If any accessory is found missing or damaged, please contact the dealer responsible for this business.

#### **Check the instrument**

If the appearance of the instrument is damaged, the instrument does not work properly, or fails the performance test, please contact the dealer responsible for the business.

## 4.2 Appearance and Dimensions

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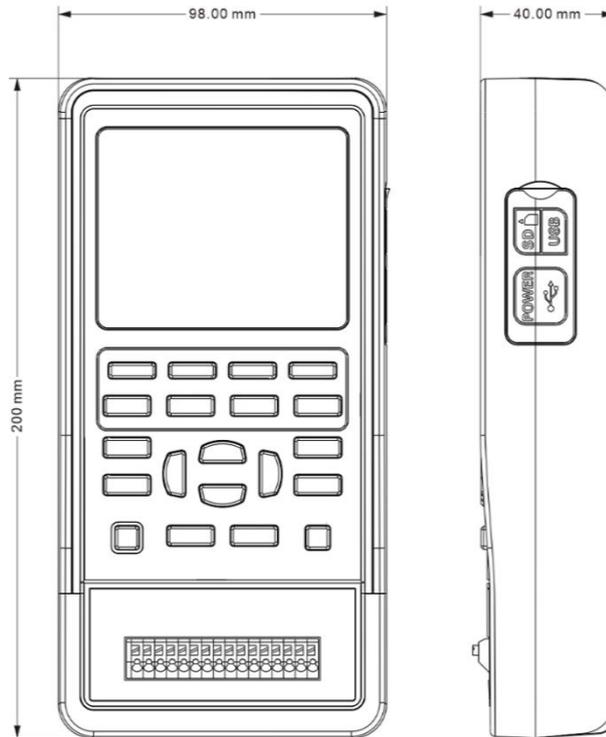


Figure 4.1 Front view and side view

## 4.3 Preparation before Use

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### 4.3.1 Adjusting the Stand

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When using the instrument, the user can open the stand to tilt the instrument upward for easy operation and observation. When the instrument is not in use, the user can close the stand for easy placement or handling.



Figure 4.2 Adjusting the stand

### 4.3.2 Charging

After pressing the power button , if the instrument is not responding, it may indicate that the battery is dead.

You can charge the instrument in the following ways:

#### Method 1: Charge the instrument through a power adapter

Connect the instrument to a power socket through the standard power adapter (5V/2A) and Type-C data cable for charging.

#### Method 2: Charge the instrument through a Type-C interface

Connect the instrument to a computer or other devices (5V/500mA) for charging through a Type-C data cable.

#### Charging status description:

When charging, in the case of battery installation, the power indicator light is red, and the battery box at the upper right corner of the screen shows the change of electric quantity. If no battery is installed, the power indicator light will be red and blinking. The battery box on screen will also blink.

When the battery is full, the instrument will automatically stop charging and the power button indicator light will turn off.

When the battery box in the upper right corner of the screen is blank, the battery is about to be used up.

When the battery is low, the instrument will prompt "power off after 5s". In order to avoid automatic shutdown due to insufficient power, please charge in time.

### 4.3.3 Turn-on check

Press the power button  in the lower left corner of the front panel to start the device and light up the display.

### 4.3.4 Set the system language

This product supports many languages, you can click  > Language > Edit to set the system language.

### 4.3.5 Test terminal connection

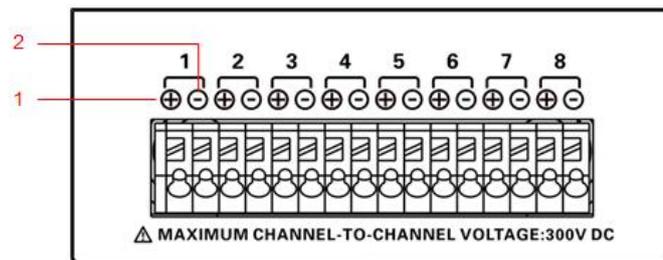


Figure 4.3 Test interface

1 + represents connecting the positive end of the thermocouple

2 - represents connecting the negative end of the thermocouple

**Note:**

**1. The isolation voltage between channels should not exceed 300VDC, otherwise the instrument may be damaged.**

**2. The red connector of the thermocouple line is the positive end.**

## 4.3.6 Product Introduction

This chapter introduces the front and rear panels and the user interface of the device.

## 4.3.7 Front Panel Overview



Figure 4.4 Front panel

### 1 Display screen

2.8-inch TFT LCD screen.

### 2 Menu buttons

Corresponding to the four menus displayed at the bottom of the LCD.

### 3 Button lock

Press the button, the indicator light will be on and the button lock symbol  will be

displayed in the status bar. At this time, all buttons except this button and the power button are disabled. Press this button again and all the buttons will be available again.

#### **4 Bluetooth Switch**

If the instrument supports Bluetooth communication, hold down the button for more than 3 seconds, the backlight of the button will be on, and the Bluetooth symbol  will be displayed in the status bar, which indicates that the Bluetooth is enabled. Hold down this button again for more than 3 seconds to turn off the Bluetooth function.

#### **5 Auxiliary button**

Press the button to enter the system menu, you can set users, save files and view information.

#### **6 Temperature upper limit and lower limit alarm control switch**

The alarm function is turned on by default. When the measured temperature is higher than the upper limit or lower than the lower limit, the buzzer will alarm (ringing). Press the button, the backlight of the button will be on, the alarm closing symbol will be displayed in the status bar, and the alarm function will be off. At this time, if the measured temperature is higher than the upper limit or lower than the lower limit, the buzzer will not alarm.

#### **7 Power button**

Press the button when shutdown, the instrument will start up. Press the button on state, the instrument will turn off.

#### **8 Measurement list shortcut button**

In any interface, press  button to quickly access the < List >page.

#### **9 Direction buttons**

Under the menu page or when entering a value, up, down, left and right arrow buttons are used to change the cursor's position. When changing the date and time, the up and down arrow buttons are used to change the value, and the left and right arrow buttons are used to change the cursor's position.

#### **10 Thermocouple connection end**

#### **11 Shortcuts for saving files**

Quickly access the page for saving files.

#### **12 Screen brightness shortcut button**

Adjust screen brightness in a loop.

#### **13 Delete button**

When entering a value, used to delete a number.

#### 14 Enter button

When entering a value, used to enter the selected number.

#### 15 Pause/Run button

When the backlight is green, the temperature updates in real time. Press the button and the backlight will turn red, the temperature will stop updating.

#### 16 Measuring bar chart shortcut button

In any interface, press  to quickly enter the <Bar chart> page.

### 4.3.8 Side Panel Overview



Figure 4.5 Side panel

#### 1 USB storage interface

Insert a USB flash drive (FAT32 format) to save the file.

#### 2 Type - C interface

Connect type-c wire for charging and remote control.

### 4.3.9 Top Panel Overview

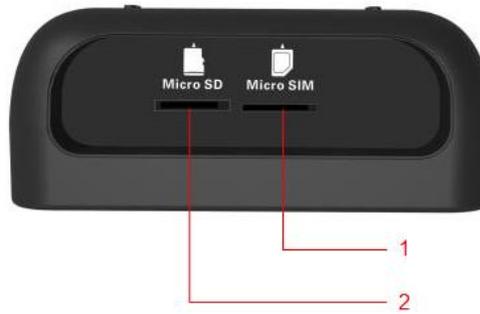


Figure 4.6 Top panel

#### 1 4G card slot

Insert a 4G card (Micro-SIM card, dimension: 15mm \* 12mm). Only for models with 4G module functions.

#### 2 SD card slot

Insert a SD card (FAT32). Only for models with SD card function.

### 4.3.10 User Interface



Figure 4.7 User interface

#### 1 Status display

Status display	Mark	Instructions

Status display	Mark	Instructions
< List >	Page title	The page title
Time	Instrument time	Press  > <b>User</b> , enter the user menu to change the time. When the battery is removed, the time and date will be restored to original values.
Run	Running state	Run and pause. Press  at the lower right corner of the instrument to change the running state.
Unit	Temperature unit	Including °C and °F. Press  > <b>User</b> , enter the user menu to change the unit.
	Temperature alarm closing symbol	Press  , the backlight of the button will be on, and the temperature alarm closing symbol will be displayed in the status bar. At this time, even if the temperature is higher than the upper limit or lower limit, the buzzer will not alarm. Press  again, the backlight of the button will be off and the temperature alarm closing symbol will be hidden. At this time, if the temperature is higher than the upper limit or lower than the lower limit, the buzzer will alarm (ringing). To set upper and lower limits, refer to <a href="#">Channel configuration</a> .
	Button lock symbol	Press  , the backlight of the button will be on, and the button lock symbol will be displayed in the status bar. At this time, only this button and power button are available, other buttons are disabled. Press  again, the backlight of the button will be off, and the button lock symbol will be hidden. All buttons resume available.
	Bluetooth symbol	If the product supports Bluetooth communication, press  , the backlight of the button will be on, and the Bluetooth symbol will be displayed in the status bar. The Bluetooth function is turned on. If the product does not support Bluetooth communication, when pressing  , it will prompt "this model doesn't support this function", the backlight of the button will not be on, and the Bluetooth symbol will not be shown. Press  , the backlight of the button will be off, and the Bluetooth symbol will be hidden. The Bluetooth function will be off.
	4G symbol	If the product supports 4G network transmission, after inserting a 4G SIM card, press  to enter the < File > page, then press the upload soft button and hold down it for 3 seconds to open the network transfer function. The 4G symbol will be displayed in the status bar.
	4G error	When some errors occur, such as SIM card missing, poor signal

Status display	Mark	Instructions
	symbol	quality or no signal, SIM card arrearage, 4G module initialization failure, etc., this symbol will be displayed in the status bar.
	Data transmission	When the 4G module is successfully initialized and the data is being uploaded, the symbol will be displayed in the status bar.
	SD card symbol	If the product supports SD card storage, after the SD card is inserted, the SD card symbol will be displayed in the status bar.
	USB symbol	After a USB flash drive is inserted, the USB symbol will be displayed in the status bar.
	USB-type C connection symbol	When using USB-Type C interface for communication or charging, the USB-Type C connection symbol will be displayed in the status bar.
	Surplus electricity prompt	Indicates the remaining electricity quantity. If the battery box is red, it indicates that the battery is low. Charge the device in time.

Table 4.1 Status display

## 2 Function area

Press the function buttons or menu buttons to enter the corresponding function interface.

## 3 Menu area

Press     to select the corresponding menu.

## 4.4 Storage and replacement of batteries

### 4.4.1 Battery storage

Lithium-ion batteries can be stored in clean, dry and ventilated rooms. Avoid contact with corrosive substances and keep away from fire and heat sources.

If the instrument is not used for a long time (such as more than 6 months), the battery should be charged 50% to 70% and be removed from the instrument to store in a dry and cool environment.

If the lithium battery appears broken, rust, leakage, swelling, etc., it needs to be taken out immediately and scrapped.

## 4.4.2 Battery replacement

Batteries can be recharged, but they are easily consumable. If the standby time is greatly reduced, you need to replace the battery. The specification of the battery is 18650 lithium battery, 3.7V, 2600mA.

Please refer to the following steps to replace:

**1** Open the standing, you can see two screws. Remove the screws and remove the battery cover to see the battery.



Figure 4.8 Open the stand

**2** Take out the battery from the negative pole, and then take out the battery after the negative pole leaves.



**3** When installing the battery, ensure that the positive terminal of the battery has

an insulation tube. Otherwise, install the insulation heat shrink tube by referring to the following steps.

- 1) Prepare an insulation heat shrink tube of the following sizes.  
Heat shrink tube dimension: thickness 0.2~0.3mm, inner diameter 18~19mm, length 21mm.
- 2) Place it on the positive pole of the battery.
- 3) Set the temperature of a heat gun to 270°, then blow on the heat shrink tube for 5 seconds to make the heat shrink tube stick to the battery.



#### 4 Install the battery.



Figure 4.9 Install the battery

**Note:** When replacing the battery, pay attention to the positive and negative

terminals of the battery.

## 4.5 Safety lock hole

The safety lock hole is reserved on the back cover of the instrument, and the user needs to buy the safety lock by himself. Wrap one end of the safety lock around a hard-to-move object. Insert the other end into the safety lock. Turn the key clockwise to lock the instrument and remove the key to meet the most basic anti-theft requirements.



Figure 4.10 Safety lock hole

## 5 Function introduction

### 5.1 Measurement list

The instrument will enter < List > after startup. If you are on any other page, you can enter the < List > page by pressing  .

The < List > page mainly highlights the measurement results. At the same time, change the font color to display the current sorting results. When the measured temperature is above the upper limit or below the lower limit, the color of the temperature value on the < List > page will turn red.

The display page is shown as following:



Figure 5.1 Measurement list

- 1 Number of channels
- 2 Temperature value
- 3 Type of thermocouple

### 5.2 Measurement bar chart

After the instrument is started, enter <List>. Then press the bar chart button to enter < Bar chart >. If you are on any other page, you can just press  to enter the < Bar chart > page.

The < Bar chart > page mainly highlights the proportion of the measurement results to the limit value.

The display page is shown as following:



Figure 5.2 Measurement bar chart

### 5.3 Channel configuration

All settings on the < Configuration > page will be saved automatically at shutdown and loaded automatically at next startup.

Press **List** or **Bar** to enter the < List > or < Bar chart >, and then press the configuration button to enter the < Configuration > page.

use  arrow buttons to select the configurations that you want to modify.

Configurations descriptions:

Configuration item	Descriptions
Type	The thermocouple types include J/K/T/E/S/N/B/R/A/C/D. The initial is type K.
Enable	Open or close channels.
Upper limit	Set the upper temperature limit. The initial value is 1800. When the temperature is higher than the upper limit, the color of the temperature values on the < List > page will turn red, and a buzzer alarm will be sounded.
Lower limit	The upper limit value can be set ranges from -200 ° C to 2480 ° C. Set the temperature lower limit. The initial value is -200. When the

Configuration item	Descriptions
	temperature is below the lower limit, the color of the temperature values on the < List > page will turn red, and a buzzer alarm will be sounded. The lower limit value ranges from -200 ° C to 2480 ° C.
Revised value	Allows the user to modify the temperature of each channel. The available value ranges from -99.9 ° C to 999.9 ° C.

**Table 5.1 Channel configuration descriptions**

**Function menu Description:**

Menu item	Descriptions
Edit	Edit the parameter of the selected configuration item.
Reset	Restore the parameter of the selected configuration item to its initial values.
Flip up/down	Turn the page.
Return	Exit the <Configuration> page and return to the <List> page.

**Table 5.2 Function menu descriptions**

## 5.4 System settings

All settings on the < System > page will be automatically saved at shutdown and loaded automatically at next startup.

Press **Utility** to enter the < System > page.

### 5.4.1 User

Press **Utility** > **User** to enter the < User > page, use the up or down arrow buttons to select the corresponding function, and then press the **Edit** button to change the corresponding settings.

On the user settings page, you can set the system language, backlight brightness, automatic shutdown, button sound, temperature unit and date and time.

**User menu table:**

Function	Settings	Descriptions
Language selection	Chinese English	Set the menu language.
Backlight brightness	30% 50% 70% 100%	Set the screen backlight brightness. You can also use shortcut button  to quickly adjust screen brightness.
Backlight time	30 s 60 s 90 s 120 s OFF	Set the screen backlight time. The screen will dim after the button is not operated for a specified period of time.
Automatic shutdown	5 min 10 min 30 min OFF	Set the automatic shutdown time. The instrument will shut down automatically after the button is not operated for a specified period of time.
Button sound	ON OFF	Turn on or off the button sound.
Temperature unit	°C °F	Choose Celsius as unit. Choose Fahrenheit as unit.
Date and time	--	When the battery is removed, the time and date are restored to their original values.

**Table 5.3 User menu table**

## 5.4.2 File

**Users can save temperature data in real time to USB memory or Micro SD card**

**(optional).**

Press  > **File** to the < File > page. If you are on any other page, you can just press  to quickly enter the < File > page.

## File menu table:

Function	Settings	Descriptions
File name	--	The file name is automatically generated when the USB flash drive or SD card is inserted.
Storage device	U disk SD card	When inserting a USB flash drive or SD card, select the corresponding storage device. The SD card storage function is optional.
Time interval	10 s 30 s 1 min 10 min 30 min 60 min	Set the interval for saving temperature data to a USB flash drive or SD card.
4G interval	10 s 30 s 1 min 10 min 30 min 60 min	Set the interval for uploading temperature data to the network.

Table 5.4 File menu table

## Function menu descriptions:

Menu item	Descriptions
Edit	Edit the parameters of selected items.
Start	Start saving data, and automatically enter the < List > page.
Upload	Hold down the soft button for 3 seconds to enable the 4G network transmission function. After the network transmission function is enabled, all other buttons are disabled except the power button  and the alarm button  . Hold down the Return soft button for 3 seconds to disable the network transmission function.
Return	Exit the < File > page and return to the < System > page.

Table 5.5 Function menu descriptions

## Steps to save data files

- 1 Insert a MicroSD card or USB memory.
- 2 Press  to enter the < File > page.
- 3 Select USB flash drive or SD Card.
- 4 Set the time interval.  
Time interval options: 5 s, 30 s, 1 min, 10 min, 30 min, 60 min.
- 5 Press the **start** button, the instrument will start recording data, and the < List > page

will be automatically displayed. Long press the **stop** button and hold down for 3 seconds to stop.

### Document descriptions

#### 1 File Name example

When inserting the memory, the time is: 2021-11-02 13:50:35. At this time, the file name has already been generated in the format of 021350.CSV.

The file name won't change if the storage is not disconnected. Start button can be triggered multiple times, temperature data will be saved in the same file.

#### 2 Data

The data consists of two parts, recording time and corresponding channel temperature. The data format is float and one digit after the decimal point is reserved. Channels are separated by “,”.

	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	Unit
2021/11/2 13:55:56	K 19.5	K 19.6	K 19.3	K 19.3	K 19.4	K 19.6	K 19.9	K 20.2	C
2021/11/2 13:56:02	19.9	20.2	21.1	21.1	24.4	27.4	26.6	28.7	C

Figure 5.3 Data preservation instance

**Note:** The instrument only saves temperature data under the <List> page.

## 5.4.3 Service

Press **Utility** > Service to enter the <Service> page to view the device model and version information.

**Note:** Calibration is not available to users.

## 5.5 Firmware update

1. Download and install DfuSe Demo V3.0.5. Download the upgrade package (\*\*\*.dfu).
2. In the shutdown state, insert the USB cable into the Type C port of the instrument, and connect the instrument with the computer. Keep holding down **F1**. Press the power button and release it. At this time, the indicator light at the lower right corner starts flashing red and green, indicating that the instrument has entered Dfu mode. Release F1.

## 5.6 Error code description

Error code	Descriptions
ERROR1	The temperature is out of the current thermocouple testable range. Please refer to the Data Manual of this series for details of measuring ranges of different thermocouples.
ERROR2	The cold end temperature is abnormal.

**Table 5.6 Error code descriptions**

## 6 Remote control and data transmission

There are basically three ways to remotely control the instrument as followings:

- **User defined programming**

Users can program to control the instrument using Standard Commands for Programmable Instruments (SCPI). For detailed instructions on commands and programming, refer to the *Programming Manual* of the series.

- **Use PC software or Android apps**

Users can use the PC software or Android applications of this series to remotely control the instrument.

- **Network data transmission**

This product supports network data transmission. Users can realize communication between the instrument and PC terminal or Android mobile terminal through 4G network module.

The instrument supports communication with computer through USB interface, Bluetooth module and 4G network module. Remote control is based on the Standard Commands for Programmable Instruments (SCPI) command set.

This chapter will introduce how to use the corresponding software to control the instrument remotely through various interfaces.



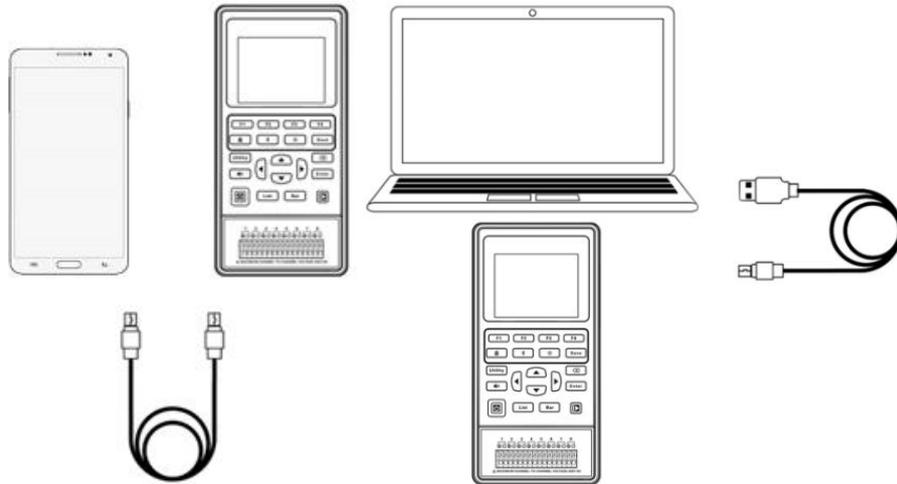
**Note:**

**Before connecting the communication cable, shut down the device to avoid damaging the communication interface of the device.**

### 6.1 Control via USB

**Press the power button to turn on the instrument.**

**Use the USB cable to connect the instrument to an Android phone or a Windows computer to carry out USB communication.**



**Figure 6.1 USB connection diagram**

When Windows software or Android application communicates with the instrument through USB connection, the instrument enters the USB connection mode. At this time, all buttons are disabled except for the power button  and alarm button . After the USB cable is disconnected, the instrument exits the USB connection mode, and all buttons are restored to use.

When the instrument is connected to a Windows computer, the user can use SCPI instructions for remote control. Please refer to the Programming Manual of this series.

## 6.2 Control via Bluetooth

**Only the instrument with Bluetooth function supports Bluetooth data transmission.**

For specific models, see [model list](#).

Press the power button  to turn on the instrument.

Press the Bluetooth button  and hold down for 3 seconds to enable Bluetooth function.

After the Bluetooth function is enabled, the instrument enters Bluetooth remote mode.

At this time, all buttons are disabled except for the power button and alarm button . Press the Bluetooth button  again and hold down for 3 seconds to turn off the Bluetooth function, and all the buttons will be restored to use.

The Bluetooth name corresponding to the instrument is HTM-XXXXXX.

Bluetooth communication protocol: Support BLE4.2 protocol, backward compatibility.

## 6.3 Network data transmission

**The instrument with 4G (universal) module supports universal 4G function**

transmission. The instrument with 4G (domestic) module supports domestic 4G

function transmission. For specific models, see [model list](#).

When communicating with the instrument over a network device, the user needs to know the serial number (SN) and ID of the instrument.

Ways to view the SN and ID:

Press **Utility** on the front panel and the **service** button to view the SN and ID of the instrument. SN is the serial number of the current device. The SN and ID of the instrument can also be seen on the display screen after the 4G module is activated.

Press the power button  to turn on the instrument.

Press **Save** to enter the < File > page.

Press arrow buttons   to select 4G Interval and press the **Edit** button to change the 4G transmission interval. The interval can be 10 seconds, 30 seconds, 1 minute, 10 minutes, 30 minutes, or 60 minutes.

Press the **upload** button and hold down for 3 seconds to enable 4G network transmission. After the network transmission function is enabled, all buttons except the power button  and the alarm button  are disabled. Press the **return** button and hold down for 3 seconds to turn off the network transmission function.

Note: Before enabling 4G network transmission function, ensure that the SIM card has been inserted.

Symbols		Descriptions
	4G symbol	If the product supports 4G transmission, after inserting a 4G SIM card, press <b>Save</b> to enter the < File > page and then press the upload button and hold down for 3 seconds to open the network transmission function. The 4G symbol will be displayed in the status bar.
	4G error symbol	When some errors occur, such as SIM card missing, poor signal quality or no signal, SIM card arrearages, 4G module initialization failure, etc., the 4G error symbol will be displayed in the status bar.
	Data transmission	When the 4G module is successfully initialized and the data is being uploaded, the symbol will be displayed in the status bar.

**Table 6.1 Network connection status symbols**

When the 4G module and the remote communication mode is enabled, the SN and ID will be displayed on the page.

The instrument will upload temperature data to the background server at a set interval and frequency.

Holding down the exit button will disable the 4G network transmission function.

## 7 **Android application**

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### 7.1 **Application download and installation**

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Users can download the instrument's Android mobile application from Hantek's official website:

<http://hantek.com.cn/products/detail/12273>

It can also be downloaded by scanning the QR code on the back of the instrument.



Figure 7.1 Application download QR code

Use an Android phone to install the application of the instrument, and the icon will be displayed on the phone desktop after installation.

## 7.2 Application introduction

### 7.2.1 Main interface

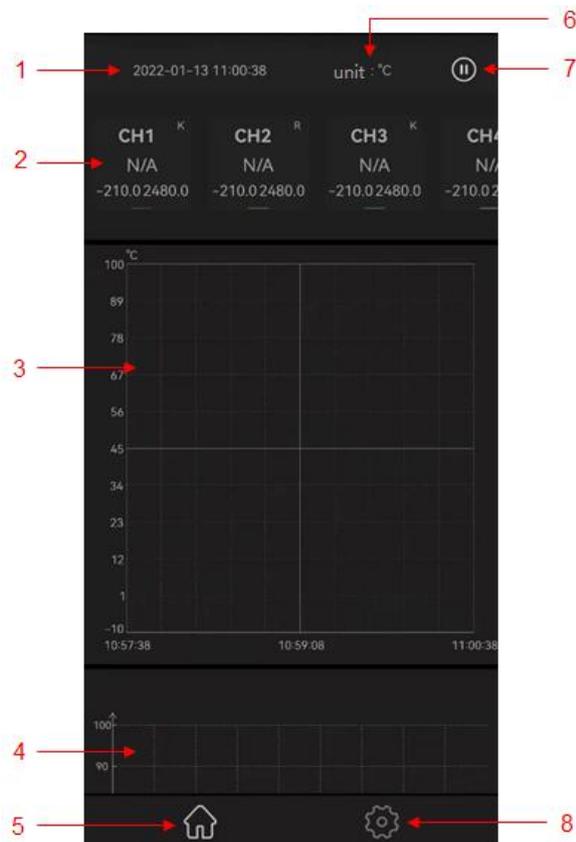


Figure 7.2 Main interface of the Android application

1. Time
2. Channel
3. Line chart
4. Histogram
5. Home button
6. Unit
7. Pause/Run button
8. page setting button

A. Gently point the channel on the screen and slide left and right, and the channel will move with the finger.

B. Gently point any position of the main interface on the screen and slide up and down. The main interface will move with the finger. The user can choose to view the line chart or bar chart.

C. Gently click any channel to open the channel setting window. You can set alarm

upper limit, alarm lower limit, channel name and thermocouple type. Click the save button to download the alarm upper limit, alarm lower limit and thermocouple type to the instrument. The channel names displayed by the application will also change.

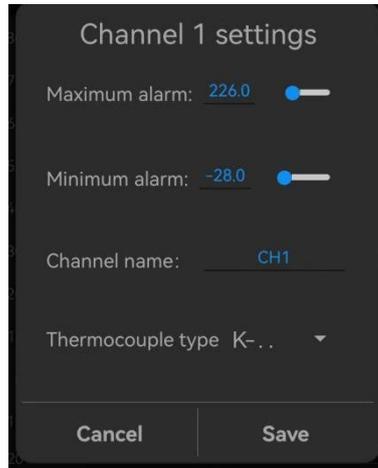


Figure 7.3 Channel settings

## 7.2.2 Setting Interface

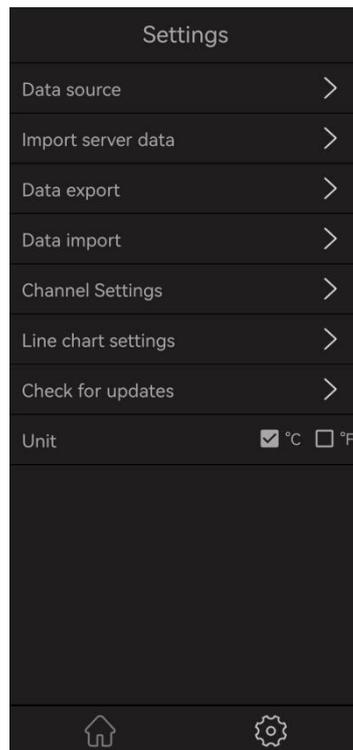
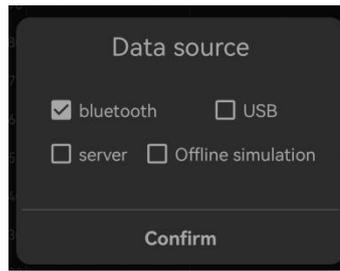


Figure 7.4 Android application setting interface

### Data source

Data source includes Bluetooth, USB, network device and offline simulation. For details

about how to open each data source, see [remote control](#).

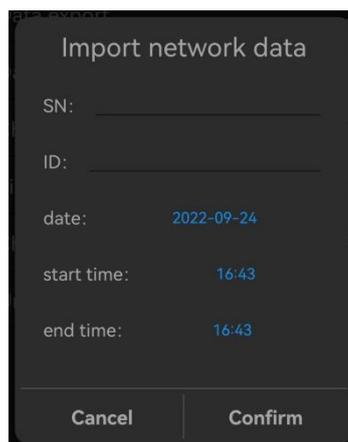


**Figure 7.5 Data source selection**

- A. If Bluetooth is selected as the data source, search for the Bluetooth device and select it (the Bluetooth name of the device is HTM-XXXXXX). You will enter the main interface of the application program after connecting with the instrument successfully.
- B. If USB is selected as data source, allow the temperature recorder to access the USB device. You will enter the main interface of the application program after connecting with the instrument successfully.
- C. If network device is selected as the data source, input the correct SN and ID, and click the **OK** button. The application will obtain all the temperature data uploaded by the instrument on that day and the latest data in time.
- D. If offline simulation is selected as the data source, the temperature displayed is simulated random data. Users can perform “Import Server Data” and “Import Data Files” anytime offline to view historical data.

**Import server data**

Enter the correct SN and ID, set the date, start time, and end time, and click **OK**. The application will prompt "Data import succeeded", and the temperature data will be displayed in the line chart on the home page. The settable time range can be any time range before the current time when temperature data is available. If the temperature data is empty during the specified period, the temperature data cannot be imported.



**Figure 7.6 Import network data**

**Data file export**

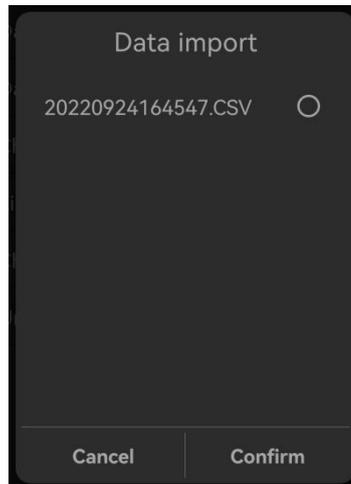
Save the recorded temperature Data to the internal memory of the mobile phone in .csv. The file path is Thermodetector/Data.



**Figure 7.7 Data file export**

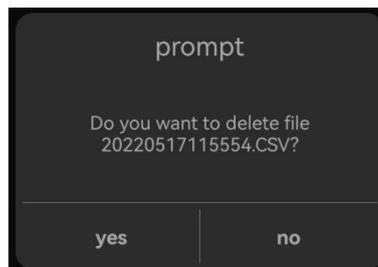
### Data file import

Select the saved file and click "OK" to import the temperature data and display them on the line chart.



**Figure 7.8 Data file import**

To delete the file, tap the file name and hold for 2s.



**Figure 7.9 Delete file**

### Channel settings

You can open or close any channel, click "Save" to close the channel of the instrument, and the channel will not be displayed on the home page.

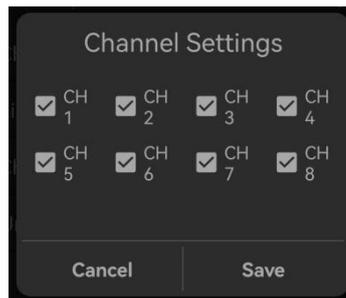


Figure 7.10 Channel settings

### Line chart settings

You can set the range of X and Y axes on a line chart. The X axis is time and the Y axis is temperature.

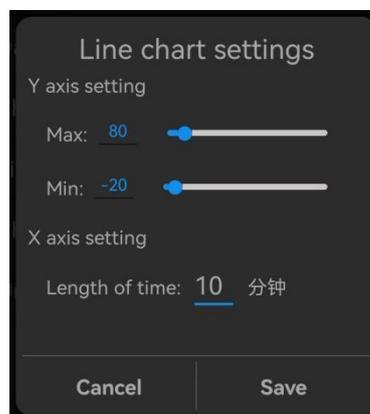


Figure 7.11 Line chart settings

### Check the update

Check whether the application is the latest version.

### Unit

The unit can be set to °C and °F.

## 8 **Windows Software**

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### 8.1 **Software Download and Installation**

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The application software can be downloaded from the Hantek website:

<http://hantek.com.cn/products/detail/12273>

Also you can scanning the QR code on the back of the instrument and download the software.

#### **Application software installation**

Double-click the Setup.exe file and follow the installation wizard to install it. After the installation is complete, the software icon will be displayed on the desktop.

#### **Driver software installation**

Double-click the IOLibSuite\_\*\*\*\*. Exe file and follow the installation wizard to install. After installation is complete, the IO icon  will be displayed in the status bar at the lower right corner of the computer.

## 8.2 Software Functions

### 8.2.1 User Interface



Figure 8.1 Windows software user interface

1. Menu
2. Shortcuts
3. Temperature line chart
4. Switch button between line chart and bar chart
5. Temperature list
6. Channel settings

### 8.2.2 File Storage



Figure 8.2 File menu

**Saved as CSV**

The temperature data can be saved as a .csv file for data analysis.

**Screenshot saved as PDF**

You can save the line chart or bar chart screenshot as a .pdf file.

**Screenshot saved as PNG**

You can save the line chart or bar chart screenshot as a .png file.

## 8.2.3 Connection Method



**Figure 8.3 Connection menu**

Connection modes include USB, Bluetooth, and network devices. For details, see [Remote Control](#).

**USB connection**

Connect the instrument to the computer. For the connection method, refer to [Control via USB](#).

After the instrument is successfully connected, double-click the IO icon in the status bar at the lower right corner of the desktop to open "Keysight Connection Expert 2022", and the device will be displayed in the window list.

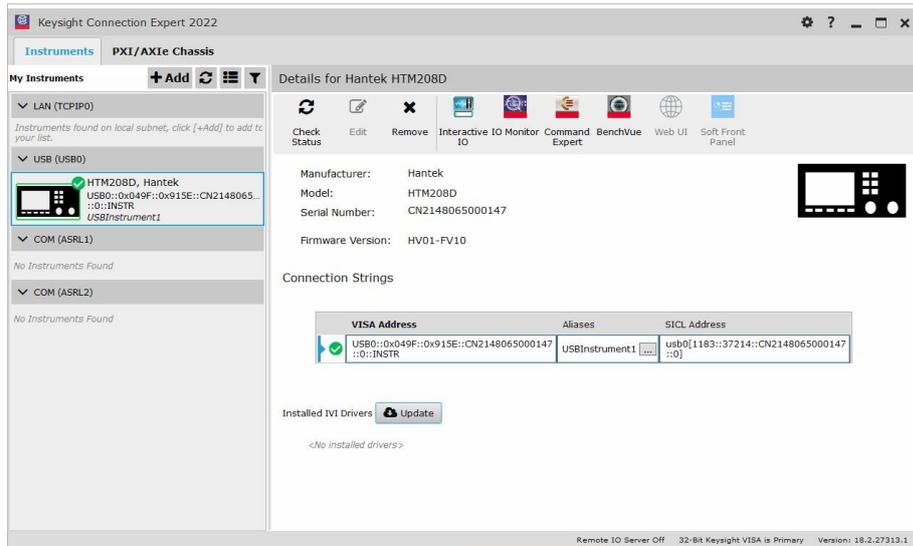


Figure 8.4 Communication connection window

Choose **Connect > USB**, the software will automatically connect the instrument and collect temperature data.



Figure 8.5 Windows software data collection

**Bluetooth connection**

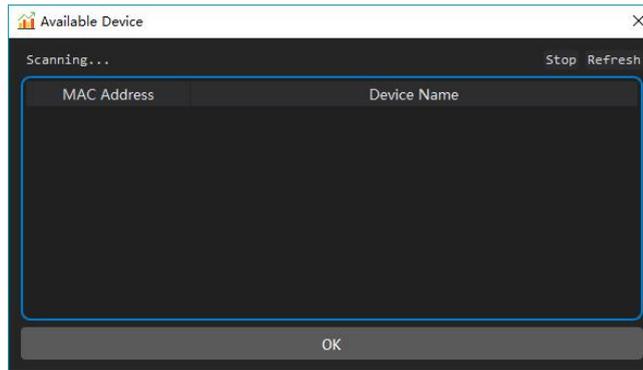
Turn on the Bluetooth function of the temperature recorder and use a computer with Bluetooth function or a computer with Bluetooth adapter.

For the connection method, refer to [Control via Bluetooth](#).

Support BLE4.2 protocol, backward compatibility.

Choose **Connect > Bluetooth**, the software will automatically find Bluetooth devices.

The Bluetooth name corresponding to the instrument is HTM-XXXXXX.



**Figure 8.6 Bluetooth connection**

Select the Bluetooth device to be connected and click **OK**. The software will automatically connect the device and collect temperature data.

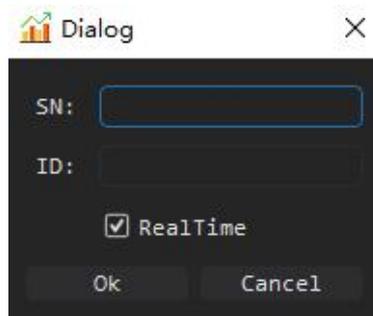
### Network device connection

Enable 4G transmission function of the temperature recorder. For the connection method, see [Network data transmission](#).

When the screen of the temperature recorder shows "Remote communication mode started", the instrument will start uploading data.

Choose **Connect > Network Device**, input the SN and ID of the instrument, and select "Real-time Data". The software will obtain all the temperature data uploaded by the instrument on that day and the latest data in time.

Choose **Connect > Network Device**, input the SN and ID of the instrument, and deselect "Real-time Data". You can view the historical data uploaded by the instrument on a previous day.



**Figure 8.7 Viewing historical data**

### Offline simulation mode

When there is no connection, you can choose the offline simulation mode, and the temperature data is the simulated random value.

## 8.2.4 Record

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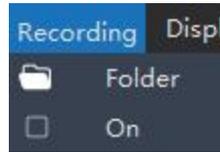


Figure 8.8 Record menu

### Folder

You can specify a path for saving the record file. The default path is the root directory of the software installation.

### ON

Select this menu to start recording and deselect to stop recording. The file format is .csv. Each time you select this menu, a new file will be generated.

## 8.2.5 Display

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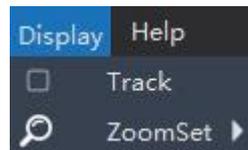


Figure 8.9 Display menu

### Track

Select this menu to turn on the tracking function, as shown below, to track the temperature data at a certain point in time. Deselect to turn off tracking.

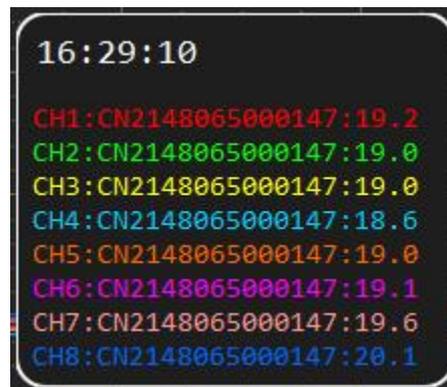


Figure 8.10 Track

## Zoom

You can choose horizontal direction, vertical direction or both.

If you scroll the mouse wheel down to enlarge the line chart and up to shrink the line chart.

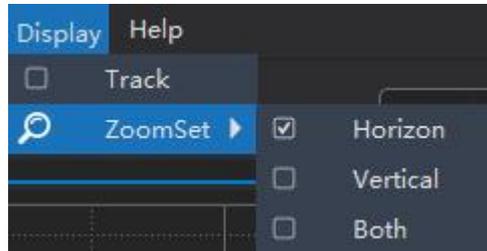


Figure 8.11 Zoom

## 8.2.6 Shortcuts

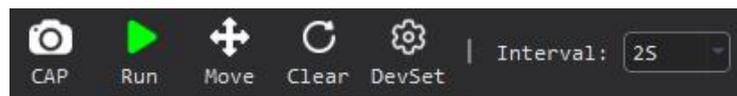


Figure 8.12 Shortcuts

### Screenshot

Take a screenshot of the line graph or bar graph and save it as a .png file to the computer.

### Run/stop

Run or stop button.

### Move

After selecting the button, you can use the mouse up, down, left and right to move the line chart. Click the button again to turn off this function.

### Reset

Click this button to clear all collected temperature data and line charts.

### Settings

You can set the temperature unit of the selected device or remove the selected device.

### Interval

Set the interval for software to obtain the temperature.

## 8.2.7 Channel settings



Figure 8.13 Channel settings

1. Channel name: You can click to edit the channel name
2. Channel switch
3. Temperature lower limit
4. Temperature upper limit
5. Reset the channel name
6. Change the thermocouple type

## 9 Troubleshooting

### 1. If you press the power button and there is still no display on the screen.

- 1) Check whether the battery is installed.
- 2) Check whether the battery voltage is higher than 3.4V.
- 3) After the above examination, restart the instrument.
- 4) If you still cannot start up the product normally, please contact Hantek.

### 2. The screen is too dark to see clearly.

- 1) Check whether the brightness of the LCD screen is too low. Press **Utility** > **User**, then press   to select the backlight brightness. Press **Edit** to change the LCD brightness to the appropriate value.
- 2) Check backlight time settings. Press **Utility** > **User**, then press   to select the backlight time. Press **Edit** to change the screen backlight time.

### 3. The temperature value is incorrect.

- 1) Check whether the thermocouple type set by the instrument is consistent with the thermocouple sensor used.
- 2) Check whether the thermocouple is installed correctly. The red connector of the thermocouple sensor is the positive end.

### 4. The USB storage device cannot be recognized.

- 1) Check whether the USB device can work normally if connected to other instruments or computers.
- 2) Confirm that the USB flash drive is FAT32 format device.
- 3) After restarting the instrument, insert the USB device again for inspection.
- 4) If it still doesn't work, please contact Hantek.

## 10 **Appendix**

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### 10.1 **Appendix A: Accessories**

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This product provides the following accessories. User can obtain all accessories from the local supplier.

**Standard accessories:**

- **Power adapter**
- **USB cable**
- **Two Type K thermocouple test cables**
- **Product certificate**



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Address: Building 35, Lian Dong U Gu, No.780 Baoyuan Road, High-tech Zone, Qingdao, Shandong  
Province

Switchboard: 400-036-7077

E-mail: [service@hantek.com](mailto:service@hantek.com)

Tel: 0532-55678770, 55678772, 55678773

Postcode: 266000

Website: [www.hantek.com](http://www.hantek.com)

Qingdao Hantek Electronics Co., LTD