

Professional Thermometer

User Manual

V1.0.9

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Document Description

This section provides important advise while using this instrument.

This document contains all the information that is required about how to use this instrument safely and effectively. Please read it carefully and be familiar with the operation of this product.

Instruction of Buttons

Short Press: Press the button and then lift it, there will be a prompt sound when pressed.

Long Press: Press and hold the button for about 2 seconds, then lift it up after hearing the prompt.

There will be a prompt sound when the corresponding function of the button is activated. If there is not any sound, which means that the current function is not available or the button sound is turned off.

Identification Introduction

Identification	Signification	Introduction
!!	Note	Provide important advise and information
✓	Condition	Conditions that must be met before performing an operation
➤, 1, 2...	Objective	Indicate what user wants to achieve. The sequence number is the steps required to achieve the objective, and these sequences must be followed all along
BUTTON	Button	Short press/long press the button
-	Supplement	Supplementary instructions for certain operations/items
●	Example	List some related details or examples
◆	Result	Obtained when performing some certain operations

1. Safety Introduction

This section describe the general rules that must be obeyed and followed in order to use this product safely.

Avoid Personal Injury/Equipment Damage

- Do not use this instrument to measure on alive parts or nearby (Especially for high voltage).
- The probe cannot be used to measure corrosive solvents, unless it is a designated anti-corrosion probe.

Valid Safety/Warranty Statement

- Please operate the instrument within the technical parameters specified in this article.
- Always use the instrument in the correct way and its intended purpose.
- Do not place the handle and cable in an environment above 80°C, unless it is clearly specified that it can be used in a high temperature environment. The temperature given on the probe is only related to the measuring range of the sensor.
- The instrument can only be disassembled when it is clearly stated in this article for maintenance and repair purposes. Please follow the prescribed steps to perform the maintenance and repair work described in this article. For safety, please use original accessories.

Correct Disposal Statement

- Please send the used batteries to the battery recycling point.
- At the end of the service life of this product, please return the product to the original factory. We promise to dispose of them in an environmentally friendly manner.

2. Intended Use

This chapter describes the intended using range of this product.

Use this product only for those applications for which it is designed.

This product is a high-precision measuring instrument with calibration for temperature measurement.

Accurate Measurement: Whether it is a low-temperature cold storage or a high-temperature boiler, PT100 and PT1000 sensors can ensure accurate measurement across the entire range.

Safe and Reliable: Provide you with a safe and reliable measurement experience during the measurement process.

High Scalability: The instrument can be compatible with more types of probes through the calibration function, such as PT100(3916), PT100(3926).

Excellent Performance: Large backlight display, temperature over limit alarm, maximum/minimum/average display, large dot matrix screen to display more information.

Practical Accessories: Protective soft cover, waterproof and oil-proof. When it is connected with temperature probe, it can reach IP52 protection level.

This product can be used for the following tasks/applications (including but not limited to):

- Temperature standard instrument
- Scientific experiment
- Medical
- Food
- Chemical industry
- HVAC industry

This product can not be used for the following tasks/applications (including but not limited to):

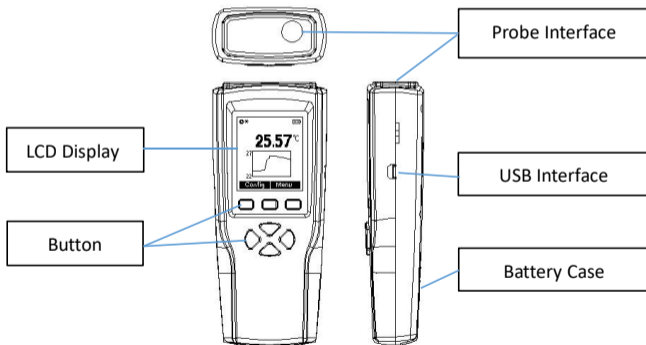
- Use in explosive hazardous areas
- Use in high-voltage areas
- Smelting industry

3. Product Description









This section describes an overview of the product components and their functions.

3.1 Display and Control Elements






Instrument Overview



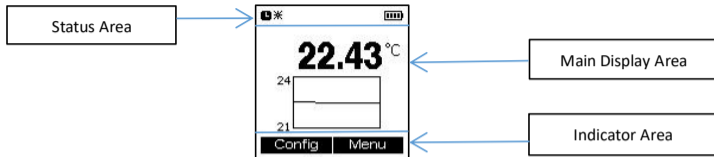
Button

Button	Function
	Multi-functional button 1, its function will be displayed at the bottom left of the screen
	Turn on the instrument, turn off the instrument (long press)
	Turn on/off the backlight
	Multi-functional button 2, its function will be displayed at the bottom right of the screen
	Switch the probe type
	Keep the current reading
	Display the maximum/minimum/average value
	Switch the unit of the reading

Important Display

Display	Signification
	Alarm enable: Displayed when the alarm function is turned on
	High and low limit alarm: Display when the temperature is higher or lower than the limit value
	Auto power off: Display when the auto power off function is turned on
	Battery capacity: Display when the instrument is powered by battery
	Displayed when the instrument is connected to a computer or USB power

Regional Division



The division of the area is to facilitate users to quickly locate the position of the icon or reading that they want to view.

3.2 Interface

- **Probe Interface**
 - The pluggable probe can be connected to the instrument through the probe interface.
- **USB Interface**
 - The instrument can be connected to a computer or other 5V output USB power supply equipment through a Micro USB cable.

3.3 Power Supply

Under normal conditions, the instrument is used three pieces of 1.5V AAA batteries or 1.2V rechargeable batteries for power supply. 5V voltage can be provided through the USB interface. However, unstable USB power supply may cause inaccurate measurement, therefore please use a genuine 5V adapter.

4. Operation



This section describes operations frequently performed when using this product.

4.1 Preparation

- Tear off the protective film on the display.
- Install the battery/rechargeable battery. Please pay attention to the polarity of the battery.
- Connect the plug of the probe to the probe interface of the instrument.

4.2 Turn On/Off

➤ Turn on the Instrument/ View the Version Number and Serial Number

1. Short press button , and the instrument is on. Press and hold the button  then the instrument will display the version number and series number.

➤ Turn off the Instrument

1. Long press button , and lift the button  when the LCD shows “Shut down!”.

4.3 Backlight

➤ Turn on/off the Backlight

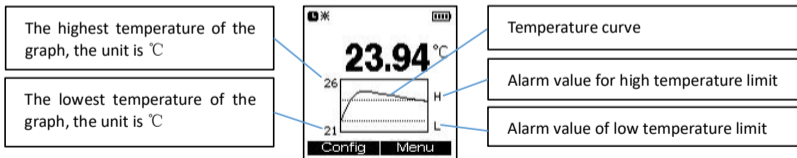
- ✓ Turn on the instrument.
- 1. Short press button . When it shows  on the screen, which means the backlight is on.

4.4 Multi-Functional Button

- There are two multi-functional buttons of this instrument: **F1** and **F2**. Their specific functions will be displayed in the indicator area!

Analysis for Commonly Used Function of F1		Analysis for Commonly Used Function of F2	
Config	Enter the configuration interface	Menu	Enter the menu interface
Enter	Enter the interface for the next option	Exit	Exit the configuration interface or menu interface
Set	Change the setting of the current option	Back	Return to the previous interface or exit the editing interface
Ok	Confirm the change of an option or value	No	Cancel an operation
Yes	Perform an action		
Edit	Edit a value		

4.5 Tendency Chart



- !! The maximum temperature of the trend graph is set to 105% of the maximum temperature measured in the past 70 seconds. Therefore, there will be in the situation of exceeding the range, but it does not mean that the instrument can measure the temperature beyond the range. The same applies to the lowest temperature of the trend graph.

4.6 Instrument Settings

➤ Enter the Configuration Interface

- ✓ Turn on the instrument and the indicator area is displayed **Config** **Menu** .

1. Short press button **F1** (Config) to enter the configuration interface.

!! The configuration interface is shown on the right. You can use the button **▲** / **▼** to move the cursor.

!! The settings related to the properties of the instrument are all in the configuration interface.

!! User can exit the configuration mode at any time when user short press the button **F2** (Exit). The modified settings will be saved when exiting the configuration mode.



➤ Button Sound

- ✓ Enter the configuration interface, and move the cursor to "Sound".

1. Short press button **F1** (Set) to switch settings.

➤ Automatic Shutdown

- ✓ Enter the configuration interface, and move the cursor to "Auto Off".

!! When the automatic shutdown function is turned on, if there is no any operation within 10 minutes, the instrument will be automatically shut down.

1. Short press button **F1** (Set) to switch settings.

➤ System Language

- ✓ Enter the configuration interface, and move the cursor to "Language".

1. Short press button **F1** (Set) to switch settings.

➤ Restore Factory Configuration

- ✓ Enter the configuration interface, and move the cursor to "Recovery", then short press button **F1** (Enter) to enter, and wait for 5 seconds.

1. Short press button **F1** (Yes) to restore factory configuration. Short press button **F2** (No) to return to the configuration interface.

4.7 Data Settings

➤ Enter the Menu Interface

- ✓ The instrument is turned on and the indicator area is displayed **Config | Menu** .
- 1. Short press button **F2** (Menu) to enter the menu surface.
 - !! Short press button **▲** / **▼** to switch menu options. If there is a triangle icon at the right end of the cursor, it means there are sub-options, short press button **◀** / **▶** to switch sub-options.
 - !! The options related to measurement data are all in the menu interface.
 - !! User can exit the menu interface at any time while short press button **F2** (Exit). The changed settings will be saved when exiting the menu mode.

➤ Set the Alarm Value of High Temperature Limit

- ✓ Turn on the instrument then enter the menu interface.
- 1. Move the cursor to “High temperature limit”, short press button **F1** (Edit) to set the alarm value of high temperature limit.

➤ Set the Alarm Value of Low Temperature Limit

- ✓ Turn on the instrument then enter the menu interface.
- 1. Move the cursor to the “low temperature limit”, short press button **F1** (Edit) to set the alarm value of low temperature limit.

➤ Set the Temperature Alarm

- ✓ Turn on the instrument then enter the menu interface.
 - !! The status of the alarm enable will be directly displayed on the option. “Beep” means the buzzer will sound when over limit.
- 1. Move the cursor to “Alarm”, short press button **F1** (Set) key to turn on or off the temperature alarm.

4.8 Calibration

➤ Turn on Calibration Mode

- ✓ Turn on the instrument then enter the menu interface.
 - !! This product supports two types of probes, PT100 and PT1000, so they can be calibrated separately, and the calibration operation of the PT100 probe is the same as that of the PT1000 probe. There are 5 calibration points for each probe. **Calibration will directly affect the measuring result. Please ensure that the calibration value is the result of the correct measurement by the high-precision instrument.**
- 1. Move the cursor to “Calibration”, short press button (Enter).

➤ Start Calibration / View the Total Number of Calibration Points

- ✓ Open the calibration mode and enter the “Select Probe Type” interface.
 - !! The number of the existing calibration points is displayed after the probe type. For example, if PT100 has 2 calibration Points, “PT100: 2 points” will be displayed.
 - !! The operation of the PT1000 probe is the same as that of the PT100 probe, so the following operations will take the calibration of the PT100 probe as an example.
- 1. Move the cursor to “PT100”, and then short press button (Enter) to start calibrating the PT100 probe.

➤ Delete All Calibration Points of PT100/PT1000

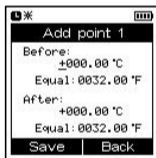
- ✓ Open the calibration mode and enter the “Select Probe Type” interface.
 - !! The operation of the PT1000 probe is the same as that of the PT100 probe, so the following operations will take the calibration of the PT100 probe as an example.
- 1. Move the cursor to “PT100”, and then short press button change the option to “Delete all points” and then short press button (Yes) to delete all PT100 calibration points (the PT1000 calibration points will not be deleted).

➤ Add a Calibration Point

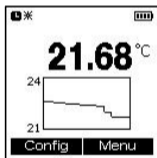
- ✓ Open the calibration mode and select the probe type to be calibrated in the “Select Probe Type” interface.
 - !! After each calibration point, the temperature value before calibration is displayed, such as “ point 1: -100.00°C”,

which means the temperature value before calibration of the first calibration point is -100.00°C . Each time a calibration point is added, it will be automatically sorted according to the temperature value before calibration from small to large.

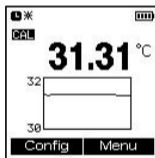
1. Short press button **F1** (Add) to enter the calibration point editing mode. The interface for editing calibration points is shown in the figure below "Add Point Interface".
2. Short press button **◀** / **▶** to move cursor, short press button to **▲** / **▼** to increase or decrease the number. Enter the temperature value before calibration in the Before column, and enter the temperature value after calibration in the After column.
3. Short press button **F1** (Save) to save the data of the calibration point data, short press button **F2** (Back) to return to the previous interface.
!! When the calibration point is in effect, the screen will display "CAL" and displays in reversed colors. As shown in the figure below, "Before Calibration" and "After Calibration".



Add Point Interface



Before Calibration




After Calibration



Remove a Calibration Point

- ✓ Open the calibration mode and select the probe type to be calibrated in the "Select Probe Type" interface.
1. If a certain calibration point is entered incorrectly, for example, the second calibration point is wrong, user can move the cursor to the second calibration point, then short press button **▶** to choose the option to "Remove Point 2", then short press button **F1** (Yes) to confirm to remove the calibration point data.

4.9 Data Logging

- **Enter the Recording Mode**
 - ✓ Turn on the instrument and enter the menu interface. Please make sure that the battery is sufficient.
 - !! 20000 data points are supported for this product.
 - 1. Move the cursor to “Logging”, short press button **F1** (Enter).
- **Start Recording/Abandon Recording**
 - ✓ Open the record mode and enter the record interface.
 - !! The internal storage will be cleared first when recording is started, so the last recorded data will be cleared, but the last recorded file will not be deleted. At the same time, the automatic shutdown function is disabled.
 - !! During recording, the number of recorded data points will be displayed in real time in the middle of the screen, and display the icon .
 - 1. Move the cursor to “Start Logging”, short press button **F1** (Enter) to return to the main interface. At this time, short press button **F1** (Start) to start recording. Short press button **F2** (Exit) to discard the record.
- **Stop Recording/Save Results**
 - ✓ Enter the recording mode and start recording.
 - !! When the recording is stopped, the file generated by the current result will be automatically saved to the internal storage. Files can be viewed by connecting to a computer via USB.
 - !! In addition to manual stop, recording will also stop when connected to a computer, low battery power, loose battery, manual shutdown, and memory full.
 - 1. Short press button **F1** (Stop) to stop recording.
- **View Recorded Information**
 - ✓ Open the record mode and enter the record interface. Before viewing, a data recording is required.
 - 1. Move the cursor to “View”, short press button **F1** (View) to enter the logging summary interface. Short press button **▲** / **▼** to switch the display content.

- **View Storage Space**
- ✓ Open the record mode and enter the record interface.
1. Move the cursor to “Flash”, short press button **F1** (View) to enter the view disk information interface.
- **Regenerate File**
- !! When the record file is damaged, it can be used to restore the file. If you want to generate files in other formats, please set the file format before generating again. Please do not delete a single file on the computer, if you no longer need to record the file, please format it directly.
1. Move the cursor to “Regenerate file”, short press button **F1** (Ok) to regenerate the file.
- **Enter the Settings Interface**
- ✓ Open the record mode and enter the record interface.
1. Move the cursor to “Settings”, short press button **F1** (Set) to enter the setting interface.
- **Set Time**
- ✓ Open the record mode and enter the log setting interface.
1. Move the cursor to “Set Time”, short press button **F1** (Set) to enter the set time interface.
 2. Short press button **▲**/**▼** to select an option, short press button **◀**/**▶** to modify the value of the option. Short press button **F1** (Ok) button to save the time.
- **Set Sample Rate**
- ✓ Open the record mode and enter the log setting interface.
 - !! The range of the sample rate is from 1 second to 86399 seconds, which is 23 hours 59 minutes and 59 seconds. If the total recording time is exceeded 3 days, please use USB as power supply.
1. Move the cursor to “Set Sample Rate”, short press button **F1** (Set) to enter the interface of “Set Sample Rate”.
 2. Short press button **▲**/**▼** to select an option, short press button **◀**/**▶** to modify the value of the option. Short press button **F1** (Ok) to save the sampling rate.



Connect to the Computer

- ✓ Make sure that the instrument is in the main interface and connect the computer with a USB cable.
- 1. If you short press the button **F1** (Ok), it will connect to the computer. Please do not operate the instrument at this time.
- 2. If you short press the button **F2** (Exit), it will only use the computer to supply power without connecting to the computer.



Set File Format

- ✓ Open the record mode and enter the log setting interface.
- 1. Move the cursor to “Set File Format”, short press button **F1** (Set) to enter the file format setting interface.
- 2. Short press button **▲** / **▼** to select the desired file format. Short press button **F1** (Set) to save the file format.

5. Measurement

This section describes the steps required to perform measurements with this product.

- ✓ Turn on the instrument and enter the measurement interface. Insert the probe.
- **Perform Measurement and Read the Current Temperature Reading on the Screen**
 - When the alarm function is turned on, once the temperature is exceeded the high limit or the low limit, the instrument will start to alarm.
 - When the reading is higher than the low limit or lower than the high limit, the alarm will stop.
 - In order to save power, the alarm will automatically stop in 10 minutes after the alarm starts.
- **Hold the Reading**
 1. Short press button **HOLD** to hold the reading in the main screen area. At the same time, the probe reading will continue to be displayed in small letters above the frozen reading.
- **View/Reset Maximum, Minimum and Average Values**
 1. Short press the button **MAX/MIN/AVG** several times, then user can switch the display of various values. The value will be updated in small letters in real time.
 - The following values are displayed alternately: maximum, minimum, average, current reading.
 2. While viewing the maximum, minimum and average values, short press button **F1** (Reset) key to clear the statistics.
- **Switch Unit**
 1. Short press button **°C/°F** to switch the unit between Celsius and Fahrenheit.
- **Switch Probe**
 1. Short press button **PROBE** to switch the probe type, and the current type will be displayed in the status area for 5 seconds.

6. Maintenance

This section describes steps to help maintain the function of this product and extend its life.

➤ **Clean the Shell**


1. If the case gets dirty, please clean the case with a clean damp cloth. Do not use aggressive cleaning agents or solutions!

➤ **Replace Battery/Rechargeable Battery**

- ✓ Turn off the instrument.
1. Remove the battery cover in the direction of the arrow marked on the battery cover.
 2. Take out the used battery/rechargeable battery and replace the new battery/rechargeable battery in the battery compartment. Please pay attention to the battery polarity.
 3. Put back the battery cover, push and fasten it in the opposite direction of the arrow.

7. FAQ

This section gives answers to frequently asked questions.

Question	Possible Reason	Possible Solution
 The icon is bright, even flashing	<ul style="list-style-type: none"> ● Instrument battery is with low battery power 	<ul style="list-style-type: none"> ● Replace new battery
Instrument shuts down automatically	<ul style="list-style-type: none"> ● Turned on the function of automatic shutdown ● Dead battery ● Operation temperature exceeds the specified value 	<ul style="list-style-type: none"> ● Turn off the function of automatic shutdown ● Replace new battery ● Move to a location that meets the requirements for measurement
Display "Probe Abnormal"	<ul style="list-style-type: none"> ● Wrong probe type 	<ul style="list-style-type: none"> ● Switch probe type
Display "Short Circuit"	<ul style="list-style-type: none"> ● Probe tip short circuit 	<ul style="list-style-type: none"> ● Switch new probe
Display "No Probe"	<ul style="list-style-type: none"> ● Probe pull out 	<ul style="list-style-type: none"> ● Connect the probe
The function is working well but there is no sound while pressing buttons	<ul style="list-style-type: none"> ● The buzzer is damaged 	<ul style="list-style-type: none"> ● Please send it back to the original factory for repair
Inaccurate measurement data	<ul style="list-style-type: none"> ● The probe does not meet the standard ● Calibration point is set in error ● The internal circuit of the instrument is damaged 	<ul style="list-style-type: none"> ● Please use the designated probe ● Clear all calibration points ● Please send it back to the original factory for repair
Display "SD Card Error!"	<ul style="list-style-type: none"> ● SD card reading error inside the instrument 	<ul style="list-style-type: none"> ● Please re-install or replace the SD card
Display "FLASH Error!"	<ul style="list-style-type: none"> ● The internal FLASH of the instrument is damaged 	<ul style="list-style-type: none"> ● Please send it back to the original factory for repair
Failed to generate file, FLASH shows OKB	<ul style="list-style-type: none"> ● SD card reading error 	<ul style="list-style-type: none"> ● Please restart the instrument and regenerate the file

8. Specification

Probe Type	PT100	PT1000
Measurement Parameters	Temperature(°C/°F)	
Measuring Range	-200~800°C	
Resolution	0.01°C(-200~800°C)	0.001°C(-99.999~99.999°C), 0.01°C(others)
Accuracy	±(0.05% t +0.10)°C	±(0.05% t +0.05)°C
Storage Capacity	20000 groups of measuring data	
Measuring Rate	1 times/second	
Sample Rate	Adjustable from 1~86399 seconds	
Export File Format	txt, csv, xls, dlg	
Operating Temperature	-10~50°C	
Storage Temperature	-20~60°C (No battery)	
Power Supply	3 pcs AAA 1.5V batteries/3 pcs AAA 1.2V rechargeable battery	
Protection Class	IP52	
Size	174*73*40mm	
Wight	About 205g(Not including probe and battery)	
Standard	CE, EMC, ROHS	
Warranty	12 months	

The accuracy of the system is affected by the quality of the probe! The above list is the accuracy of the machine. More detailed parameters, please check the product data sheet.

Standard basis: JJF1171-2007 National Standard "Calibration Specification for Temperature Circuit Detector",
JJG (Mechanical) 94-1992 Metrological Verification Regulations "Digital Temperature Measuring Instrument".

