



T410/412

Professional Thermometer
User Manual

V1.3.5

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Document Description

This section provides important information for using this document.

This document contains information necessary for the safe and effective use of this product. Please read through this document carefully and familiarize yourself with the operation of this product.

Instruction for Buttons

Short Press: Press the button and lift it up, there will be a beep when you press it.

Long Press: Press and hold the button for about 2 seconds, then lift it up when you hear a beep.

An audible tone will sound when the function corresponding to the button is active. No sound means the current function is not available or the key sound is turned off.

Document Identification Instructions

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's a low-temperature cold storage or a high-temperature boiler, the flexible use of multiple types of probes ensures accurate measurement.

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

Highly Scalable: Use standard thermocouple sockets to connect any shape of probe.

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):

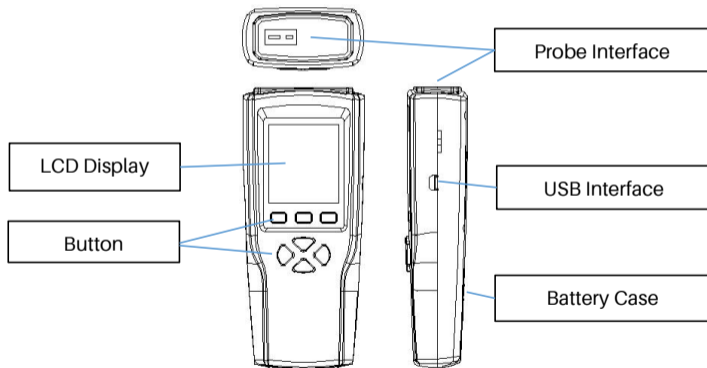
- Use in explosive hazardous areas
- Use in high-voltage areas
- Smelting industry

3. Product Description









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

3.1 Display and Control Elements





Instrument Overview



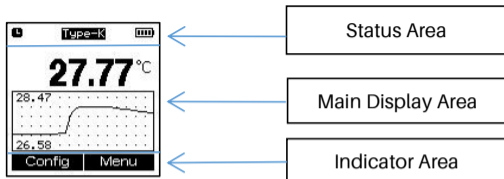
Button

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

Regional Division



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

3.2 Interface

- **Probe Interface**
 - The pluggable probe can be connected to the instrument through the probe interface.
- **USB Interface**
 - The measuring instrument can be connected to a computer 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 AAA rechargeable batteries for power supply.

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 . The instrument enters the power-on state, press and hold the  key in the power-on state, you can see the version number and serial number on the screen.

➤ Turn on the Instrument

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

4.3 Backlight

➤ Turn On/Off the Backlight

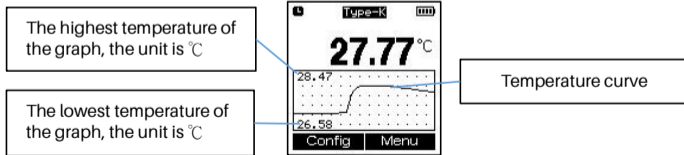
- ✓ Turn on the instrument.
- 1. Short press  key to turn on or off the backlight. The display icon  indicates that the backlight is on. After the backlight is automatically turned off due to power saving, press any key to turn on the backlight.

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 Channel Trend Chart



- !! The maximum temperature of the trend graph is set to 105% of the maximum temperature measured in the chart. 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 chart.

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.



➤ Set the Button Sound

- ✓ Enter the configuration interface, and move the cursor to "Sound".
- 1. Short press button **F1** (Set) to switch settings.

➤ Set 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** (Enter), then press button **▲** / **▼** 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 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 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  (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 has only one channel and supports up to 10 calibration data points. **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 channel" interface.

!! The number of the existing calibration points is displayed after the channel. For example, if the channel has 2 calibration points, "Data: 2 points" will be displayed.

1. Move the cursor to "Data", and then short press button  (Enter) to start calibration.

➤ Delete All Data Points

- ✓ Open the calibration mode and enter the "Select channel" interface.

1. Move the cursor to "Data", and then short press button  to the selection of "Data: delete", then short press button  (Ok) to delete all the calibration data.

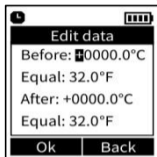
➤ Add a Data Point

- ✓ Open the calibration mode, select the channel to be calibration in the surface of "Select channel" and then enter the "Select Data".

!! After each data 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 data point is -100.00°C. When a

calibration is added each time, it will be automatically sorted according to the temperature value before calibration from small to large.

1. Cursor to "Add new data", then press button **F1** (Ok) to enter the data point edit mode. The interface to edit calibration points is shown in the figure below as "Edit data" Interface.



2. Press button **◀** / **▶** to cursor, press button **▲** / **▼** to increase or decrease the number under the cursor. Enter the temperature value before calibration in the Before column and the temperature value after calibration in the After column.
3. Press button **F1** (Ok) to save the data of calibration point, then press button **F2** (Back) to return to the previous interface.



!! When the data point is in effect, "CAL" will be displayed in white letters on a black background to the left of the temperature display.



Edit a Data Point


- ✓ Open the calibration mode, select the channel to be calibrated in the "Select channel" interface and enter the "Select Data" interface.
1. If a certain data point is entered incorrectly, for example, the second data point is wrong, you can move the cursor to the second data point and press button **F1** (Edit) directly to enter the edit mode to modify the calibration point data.

➤ **Remove a Data Point**





- ✓ Open the calibration mode, select the channel to be calibrated in the “Select channel” interface and then enter the “Select Data” interface.
- 1. If user no longer needs a certain data point, such as the second data point, user can move the cursor to the second data point, then press button  to make the option “Delete data 2”, and press button  (Ok) to confirm to remove the calibration point data.

4.9 Record Data (Models With Recording Function)

➤ **Turn On Recording Mode**

- ✓ Turn on the instrument and then enter the menu interface.
 - !! 20000 data points are supported by this instrument.
- 1. Cursor to “Logging”, and then press button  (Enter).

➤ **Start Recording / Discard Recording**

- ✓ Open the logging mode and enter the Logging interface.
 - !! The internal storage will be cleared first when the instrument starts recordings, so the last recorded data will be cleared. 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 displays  .
- 1. Cursor to “Start Logging”, press button  (Enter) back to the main interface. Then press button  (Start) to start recording, and press button  (Exit) to discard recording.

➤ **Stop Recording/ Save Data**

- ✓ The instrument will start recording once users enter the recording mode.
 - !! The current data will be saved automatically to the internal storage when the recording is stopped. Data can be viewed by connecting to a computer via USB.
 - !! In addition to be stopped by user, the recording will also be stopped when the computer software stops, the battery is low, the battery is loose, the instrument is turned off, and the number of recorded points

reaches 20000 points.

1. Press button **F1** (Stop) to stop recording.

➤ **View Recording Information**

- ✓ Open the logging mode and enter the Logging interface. Before viewing, data recording is required for at least once.

!! Connect the computer via USB to view all the record files.

!! If the user formats the USB flash disk on the computer side, the instrument must be restarted, otherwise the newly recorded data cannot be saved.

1. Move the cursor to "View", press button **F1** (View) to enter the view information interface to view the latest recorded information. Short press button **▲** / **▼** to switch display content.

➤ **View Disk Information**

- ✓ Open the logging mode and enter the Logging interface.

1. Move cursor to "Flash", short press **F1** (View) button to enter the disk usage information interface.

➤ **Regenerate File**

!! It can be used to recover files when the record file is corrupted. If users want to generate a file in another format, please set the file format first and then re-generate it. When generating a new file, the old file will be erased, so please make a backup.

1. Cursor to "Regenerate File", press button **F1** (Ok) to enter the setting interface.

➤ **Enter the Setting Interface**

- ✓ Open the logging mode and enter the Logging interface.

1. Cursor to "Settings", press button **F1** (Set) to enter the setting interface.

➤ **Set Time**

- ✓ Open the logging mode and enter the Log Setting interface.

!! The time cannot be saved or counted when the instrument is shut down. Therefore, the time must be set after the instrument is turned on and before recording.

1. Cursor to "Set Time", press button **F1** (Set) to enter the set time interface.
2. Press button **▲** / **▼** to select the option, press button **◀** / **▶** to modify the value of the option. Press button **F1** (Ok) to save the setting.

➤ **Set Sample Rate**

- ✓ Open the logging mode and enter the Log Setting interface.
 - !! The range of sample interval is from 1 second to 86399 seconds, which is 23 hours 59 minutes and 59 seconds.
- 1. Cursor to "Set Sample Rate", press button **F1** (Set) to enter the set sample rate interface.
- 2. Press button **▲** / **▼** to select the option, press button **◀** / **▶** to modify the value of the option. Press **F1** (Ok) to save the sample rate.

➤ **Set File Format**

- ✓ Open the logging mode and enter the Log Setting interface.
- 1. Cursor to "Set File Format", press button **F1** (Set) to enter the set file format interface.
- 2. Press button **▲** / **▼** to choose the file format. Press button **F1** (Ok) 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 button **MAX/MIN/AVG** to view the temperature chart of each value.
 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.

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 "Error"	<ul style="list-style-type: none">● Probe's interface is loose, poor contact● Measurement temperature is out of range	<ul style="list-style-type: none">● Connect the probe● Please change the probe with larger measuring range
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">● Incorrect probe connection● The probe does not meet the standard● Data point is set in error● The internal circuit of the instrument is damaged	<ul style="list-style-type: none">● Please connect the probe properly● Please use the designated probe● Clear all data points● Please send it back to the original factory for repair

8. Technical Parameter

Probe Type	Type-K	Type-T	Type-J
Channel No.	1		
Measurement Parameters	Temperature (°C/°F)		
Measuring Range	-200~1370°C	-200~400°C	-200~1200°C
Resolution	0.01°C (-200.00~999.99°C); 0.1°C (1000.0~1370.0°C)		
Instrument Accuracy	±(0.3% t +0.40)°C		
Measuring Rate	2 times/second		
Storage Capacity	20000 groups of measuring data (Models with recording function)		
Sample Rate	Adjustable from 1~86399 seconds (Models with recording function)		
Operating Temperature	-10~50°C (Non-condensing)		
Storage Temperature	-20~60°C (No battery)		
Power Supply	3 pcs AAA 1.5V batteries / 1.2V AAA rechargeable battery		
Protection Class	IP52		
Size	174*73*40mm		
Weight	About 198g (Not including probe and battery)		
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".

