User manual

Limited Warranty and Scope of Rights and Responsibilities

This product comes with a one-year warranty from the date of purchase.

This warranty does not cover fuse (blown), general accessory damage, or damage caused by accidents, negligence, misuse, modifications, contamination, or abnormal operating conditions.

Note: If you experience lagging or freezing during use, please restart the device.

Menu

Overview

This product is a two-in-one measuring instrument that combines infrared thermal imaging and high-precision multimeter functions. It features an elegant design, compact size, easy portability, and flexible operation. The 2.4-inch TFT high-definition display screen allows for one-button intelligent switching between thermal imaging and oscilloscope modes. The thermal imaging function offers high resolution and automatically captures target temperature values, with multiple scene display effects. The multimeter mode uses a high-precision 25,000-count display, capable of simultaneously showing measurement values and waveform curves. With superior performance and powerful functions, this device can meet a wide range of measurement needs.

Safety Instructions

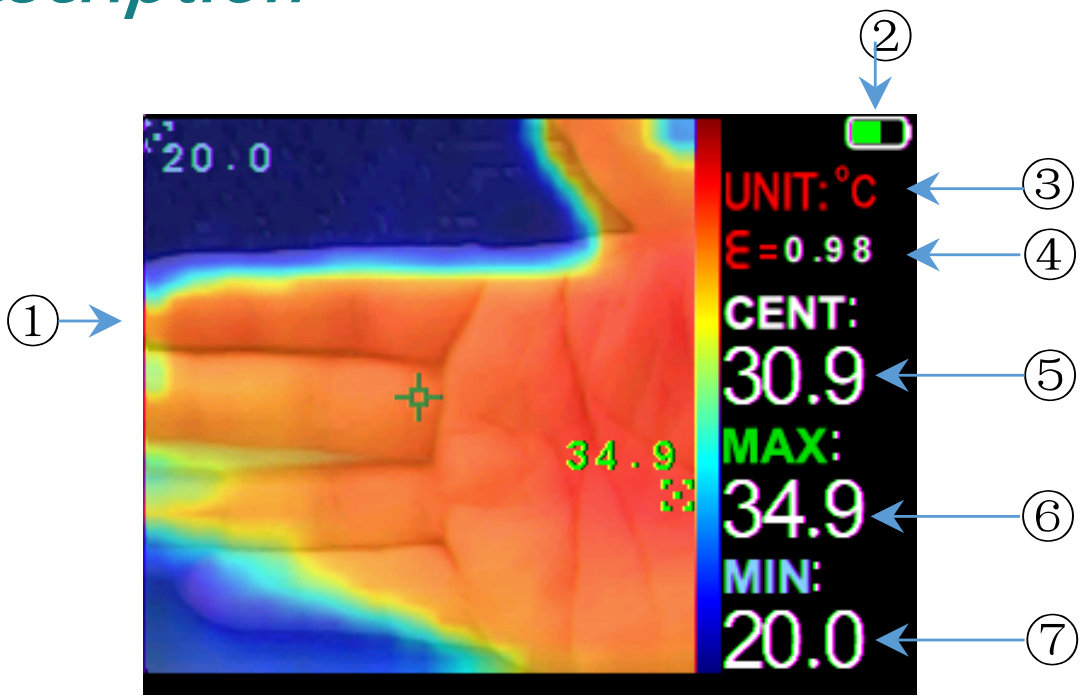
To avoid the risk of electric shock, fire, and personal injury, please read the safety precautions before use. Only use the product for its intended purpose, as improper use may compromise the protection provided by the product.

Before using the product, check for any cracks or damage to the plastic casing. Carefully inspect the insulator near the input ports. Follow the instructions in this manual to use the correct input ports and settings, and perform measurements within the specified range outlined in this manual.

- Do not use this product in explosive gas or vapor environments, or in damp conditions.
- Do not touch unused input ports when the product is connected to a circuit under test.
- Disconnect the test probes from the circuit before changing test settings.
- When measuring DC voltage above 36V or AC voltage above 25V, there is a risk of serious injury. Users should take precautions to avoid electric shock.
- Select the correct test settings and range to prevent damage to the instrument or personal injury.
- Do not use the product with the front or back cover open.
- When the battery voltage is low, it may affect the accuracy of test results. Please recharge in time.
- Keep the device as stable as possible during use to avoid excessive shaking.

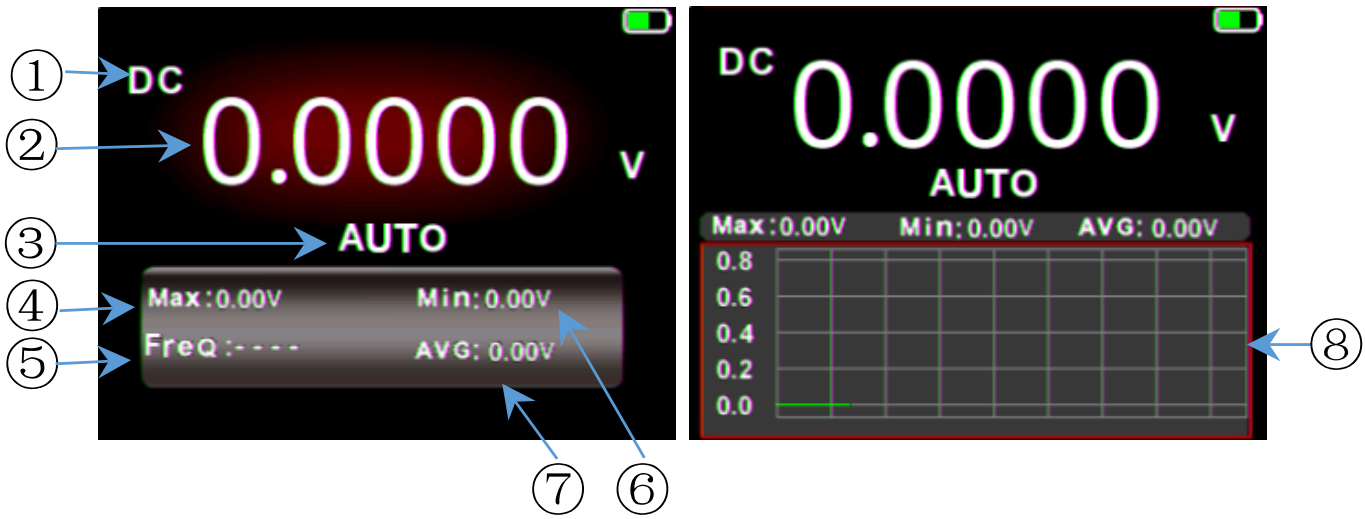
Instrument panel description

Thermal Imaging Display Interface Description



1	Image Display Area	Displays the target as an image, automatically capturing the highest and lowest temperatures.
2	Battery Symbol	Shows battery level and charging status.
3	Temperature Unit	Displays temperature in Celsius (℃) or Fahrenheit (℉).
4	Emissivity	Set emissivity based on the object's material for accurate measurement (refer to the emissivity table).
5	Real-time Temperature	Displays the real-time temperature measured
6	Maximum Temperature	Displays the highest temperature measured.
7	Minimum Temperature	Shows the lowest temperature measured.

Multimeter Display Interface Description



1	Measurement Symbol Display	Show current measurement symbols: AC, DC, resistance, capacitance, diode, buzzer.
2	Main Display	Display measurement values (up to 25,000).
3	AUTO	Indicate auto-ranging mode.
4	Max	Display the maximum measured value.
5	FreQ	Display the measured frequency value.
6	Min	Display the minimum measured value.
7	AVG	Display the average measured value.
8	Waveform Display Area	Automatically generate a waveform curve based on measurement changes, recording the signal variation.

Panel button function description

-  Power button: Press and hold for 2 seconds to power on/off; in multimeter mode, press briefly to switch between current measurement ranges.
-  HOLD/REL button: Press briefly to enter or exit data hold mode; press and hold to enter or exit relative value measurement mode.
-  IR/DMM button: Press and hold to switch between multimeter and thermal imaging modes. In the thermal imaging interface, press briefly to switch image modes. In the settings interface, press briefly to increase or select upwards.
-  Palette button: In the thermal imaging interface, press this button to adjust the image color palette. In the settings interface, press this button to decrease or select downwards. In the multimeter interface, press this button to switch voltage ranges.
-  Return button: In the settings interface, press this button to exit settings. In the multimeter interface, press this button to switch between resistance, capacitance, diode, and continuity modes.
-  MENU/OK button: Press briefly to enter the settings interface. In the settings interface, press briefly to confirm values. During measurements, press and hold this button to turn the flashlight on or off.
-  SAVE button: Press and hold this button to save the measurement data screenshot. In the multimeter interface, press briefly to toggle the waveform display on or off.

Thermal Imaging Function Operation

- Thermal imaging temperature measurement

Determine the material of the target object's surface and set the corresponding emissivity based on the "Common Object Emissivity Reference Table."

1.Switch to the thermal imaging measurement interface and aim the lens at the object to be measured.

2.Maintain a distance of 0.25m to 2m between the lens and the object to be measured.

3.Observe the thermal image on the screen and read the temperature value displayed on the screen.

- Image mode switching

Based on different measurement scene requirements, press the IR button to switch the image mode; you can switch to visible light mode, visible light and infrared fusion mode, or infrared mode.

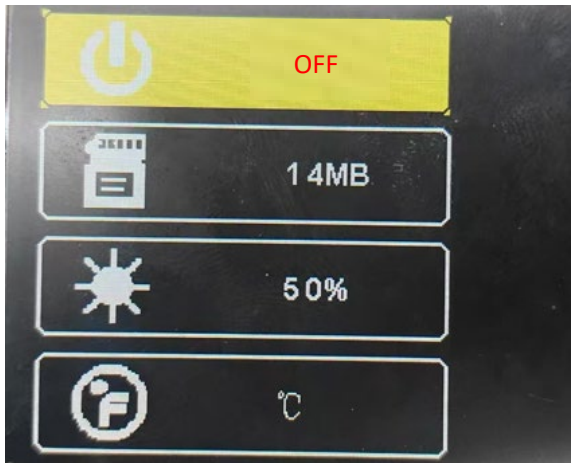
- Image color palette adjustment

Based on different measurement scene requirements, press the [] to adjust the image display color. The color can be adjusted to black and white, iron red, heat, or rainbow, with four color options.

System settings

Press the MENU button to enter the system settings menu. Use the up and down arrow keys to select the menu you need to set, then press the MENU button to confirm the setting.

Thermal Imaging Function Guide



Shutdown time setting: off, 120min, 60min, 30min, 15min.

Press OK to browse images.

Adjust screen brightness.

Switch temperature units

Set emissivity

Palette, adjust image colors

Enable or disable cursor-following temperature value.

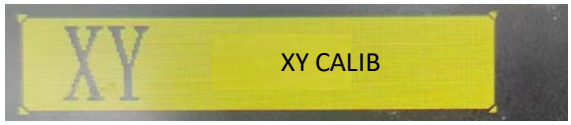
Enable or disable cursor-following temperature.

Enable or disable USB communication.

Format, clear stored data.

Restore factory data

Language selection: Chinese or English



Enter Fusion Auto-Alignment Mode

Thermal Imaging Function Operation

- Fusion Alignment Calibration

When adjusting for close or far-distance measurements, fusion alignment calibration is required to improve the measurement progress and accuracy.

Press the MENU button to enter the settings interface, then press the down arrow key to go to the last page.

Press the OK button to automatically perform fusion alignment calibration.

- Image Data Saving

The instrument supports the screenshot saving function for both thermal imaging and multimeter measurement data. To save the measurement image and data, press and hold the SAVE button. A progress prompt will appear on the screen, and the instrument will save the current measurement interface as an image file with a sequential number in the Flash memory.

- Image Browsing and Transfer

Device Browsing: Enter the settings interface, select the memory menu, press the OK button to enter, then choose the image you wish to preview.

Computer Browsing: Open USB communication in the settings interface, connect the instrument to the computer using the supplied data cable. Once connected, the computer will display a DISK USB drive. Open the PICTURE folder to view the saved images, and you can also copy the images to the computer for browsing and analysis.

Thermal Imaging Function Operation

- Firmware Upgrade

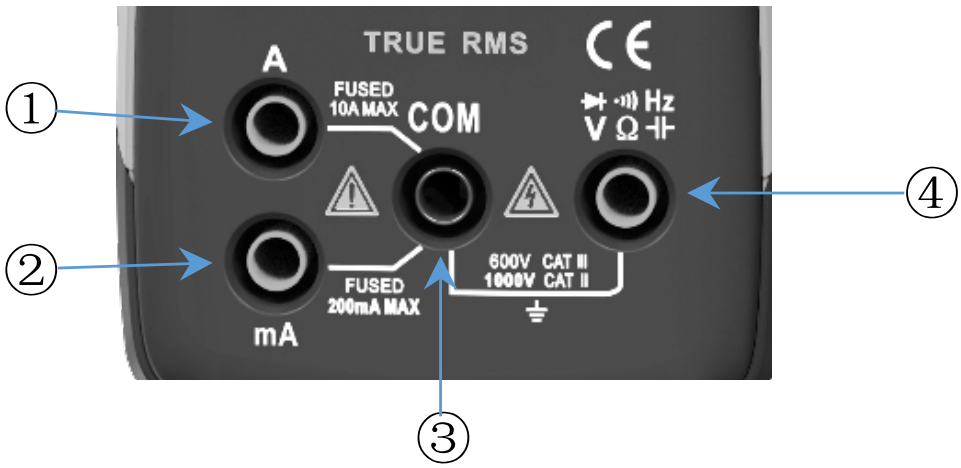
1、Insert the supplied TYPE-C data cable to connect the instrument to the computer. Once connected successfully, the computer will display a DISK 15.7MB drive.

2、Open the drive, find the "firmware" folder, and place the prepared firmware files into this folder.

3、At this point, the program upgrade progress bar will appear on the screen. Please wait patiently until the upgrade is complete and do not perform any other operations during the process.

Multimeter Function Introduction

Measurement Input Ports



1	Input port for current measurement (≤9.999A)
2	Input port for current measurement (≤250mA)
3	Common (return) port for all measurements
4	Input port for the following measurements: 1. AC/DC Voltage 2. Resistance 3. Capacitance 4. Frequency 5. Continuity 6. Diode

Measurement method

Measurement of AC voltage and DC voltage

1. Insert the black probe into the COM terminal and the red probe into the VΩHz terminal.
2. Select the appropriate range based on the nature of the voltage to be measured. Press the voltage measurement button to choose DC voltage, AC voltage, DC millivolt voltage, or AC millivolt voltage.
3. Use the probes to contact the correct test points on the circuit.
4. Read the voltage value displayed on the screen.

- The measured voltage must not exceed the rated maximum test value, otherwise, it could damage the instrument and pose a risk to personal safety.
- When measuring high-voltage circuits, avoid touching the high-voltage circuit.

Measurement of AC current and DC current

1. Insert the black probe into the COM terminal and the red probe into the 10A terminal or the mA terminal (choose the appropriate port based on the maximum test value of the two terminals and the estimated value of the current to be measured).
2. Select the appropriate range based on the nature of the current to be measured. Press and the measurement button to select DC current, AC current, DC milliamps, or AC milliamps.

3. Disconnect the circuit path to be measured, connect the probes in series with the circuit, and power on the circuit. Read the current value displayed on the screen.

- The measured current must not exceed the rated maximum test value, otherwise, it could damage the instrument and pose a risk to personal safety.
- If the size of the current to be measured is unknown, first test and determine it at the A terminal, and then select the appropriate test port and range based on the displayed value.
- It is strictly forbidden to apply voltage in this range.

Measurement of resistance

1. Insert the black probe into the COM terminal and the red probe into the VΩHz terminal.
2. Press to select the resistance mode.
3. Touch the probe tips to the desired circuit test points.
4. Read the resistance value displayed on the screen.

Continuity measurement

1. Insert the black probe into the COM terminal and the red probe into the VΩHz terminal.
2. Press [button] to select the continuity mode.

- Before measuring resistance, ensure that all power sources to the circuit being tested have been turned off and all capacitors have been fully discharged.
- It is strictly forbidden to apply voltage in this range.

3. Connect the probes to the two points of the circuit to be measured. If the built-in buzzer sounds, it indicates a short circuit.

Measurement of diodes

Press to select the diode mode.

Use the red probe to connect to the positive terminal of the diode to be measured, and the black probe to connect to the negative terminal of the diode. Then, read the forward voltage displayed on the screen. If the polarity of the test leads is opposite to the diode's polarity or the diode is damaged, the screen will display "OL".

- It is strictly forbidden to apply voltage in the continuity and diode modes.
- Before testing, the power supply of the circuit should be disconnected, and all high-voltage capacitors should be discharged.

Measurement of capacitance

1. Insert the black probe into the COM terminal and the red probe into the VΩHz terminal.
2. Press to select the capacitance mode.
3. Connect the red probe to the positive terminal of the capacitor to be measured, and the black probe to the negative terminal of the capacitor.
4. After the reading stabilizes, read the capacitance value displayed on the screen.

Maintenance and upkeep

Except for replacing the battery and fuse, do not attempt to repair this product or modify the circuit unless you have the necessary qualifications and corresponding calibration, performance testing, and repair operation instructions.

Clean the product

Please use a damp cloth and mild detergent to clean the casing, and avoid using corrosive agents or solvents. Dust or moisture in the test ports may affect the accuracy of the readings.

*Before cleaning the product, please remove all input signals.

Battery charging

When the battery indicator symbol at the top right corner of the screen shows "  ", it is time to charge the device. The steps are as follows:

1. Connect the TYPE-C data cable to a DC 5V output adapter for charging.
2. Connect the TYPE-C data cable to the computer's USB port for charging.
3. While charging, the screen will display the  symbol.
4. When fully charged, the screen will display the  symbol.

5.During the instrument's charging process, the built-in red LED on the power button "  " will light up. Once the battery is fully charged, the red LED will either blink or turn off.

Replace the fuse

When the fuse blows or malfunctions, please follow these steps to replace the fuse:

1.Before replacing the fuse, remove the test leads and power off the device.

2.Unscrew the four screws on the back cover of the product and remove the back cover.

3.Remove the old fuse and replace it with a new one of the same type.

4.Reattach the back cover and tighten the screws.

Technical Specifications

General Technical Specifications of the Multimeter	
Display (TFT)	25000 counts
Range	Auto/Manual
Material	ABS+TPE
Sampling Rate	3 times/second
True RMS	√
Data Hold	√
Backlight	√
Low Battery Warning	√
Auto Power Off	√

Mechanical Technical Specifications	
Dimensions	149*76*33.5mm
Weight	193g (with built-in battery)
Battery Type	2000mAh lithium battery * 1
Warranty	One year

Environmental Technical Specifications		
Operating Environment	Temperature	0~40℃
	Humidity	＜75%
Storage Environment	Temperature	-20~60℃
	Humidity	＜80%

Multimeter Technical Specifications

Function	Range	Resolution	Accuracy
DC Voltage （V）	2.5000V	0.0001V	±(0.05% +3)
	25.000V	0.001V	
	250.00V	0.01V	
	1000.0V	0.1V	
DC Voltage (mV)	25.000mV	0.001mV	±(0.5%+3)
	250.00mV	0.01mV	
AC Voltage (V)	2.5000V	0.0001V	±(0.5%+3)
	25.000V	0.001V	
	250.00V	0.01V	
	750.0V	0.1V	
AC Voltage (mV)	25.000mV	0.001mV	±(0.8%+3)
	250.00mV	0.01mV	
AC Voltage Frequency Response: 40Hz ~ 1kHz			

Function	Range	Resolution	Accuracy
DC Current (A)	2.5000A	0.0001A	±(0.5%+3)
	10.000A	0.001A	
DC Current (mA)	25.000mA	0.001mA	±(0.5%+3)
	250.00mA	0.01mA	
AC Current (A)	2.5000A	0.0001A	±(0.8%+3)
	10.000A	0.001A	
AC Current (μA/mA)	25.000mA	0.001mA	±(0.8%+3)
	250.00mA	0.01mA	
AC Voltage Frequency Response: 40Hz ~ 1kHz			
Resistance	250.00Ω	0.01Ω	±(0.5%+3)
	2.5000kΩ	0.0001kΩ	±(0.2%+3)
	25.000kΩ	0.001kΩ	
	250.00kΩ	0.01kΩ	
	2.5000MΩ	0.0001MΩ	±(1%+3)
	25.00MΩ	0.01MΩ	
	250.0MΩ	0.1MΩ	±(5.0%+5)

Function	Range	Resolution	Accuracy
Capacitance	9.999nF	0.001nF	±(5.0%+20)
	99.99nF	0.01nF	±(2.0%+5)
	999.9nF	0.1nF	
	9.999μF	0.001μF	
	99.99μF	0.01μF	
	999.9μF	0.1μF	
	9.999mF	0.001mF	±(5.0%+5)
	99.99mF	0.01mF	
Frequency	9.999Hz	0.001Hz	±(2.0%+2)
	99.99Hz	0.01Hz	±(0.1%+2)
	999.9Hz	0.1Hz	
	9.999kHz	0.001kHz	
	99.99kHz	0.01kHz	
	999.9kHz	0.1kHz	
Diode	√		
Continuity	√		

Thermal Imaging Technical Specifications

Functional Features	Explanation
Infrared Resolution	32*32
Infrared Wavelength	8~14um (Wavelength)
Emissivity	0.10~1.00 Adjustable
Frame Rate	7 frames/second
Field of View (FOV)	33°（H）*33°（V）
Focusing Method	Auto Focus
Minimum Focusing Distance	0.25m
Effective Measurement Distance	≤2m
Measurement Range	-20 ~ 550℃
Measurement Accuracy	±2° C or 2%
High and Low Temperature Values	Auto Capture
Measurement Point	Center Point
Measurement Area	3 values (Max temperature, Real-time temperature, Min temperature)
Display	2.4-inch TFT 16bit parallel
Display Resolution	320*240
Image Mode	Infrared, Visible Light
Color Palette	Black & White, Iron Red, Thermal, Rainbow
Image Format	BMP
Screenshot Save and Review	Supported
USB Communication	Type-C, USB 2.0 interface
Firmware Upgrade	Supported
Power Supply	3.6V~4.2V Lithium battery
Battery Capacity	2000mAh
Charging	USB interface 5V
Charging Time	Approx. 3 hours
Battery Life	>6 hours

*Appendix: Comparison Table of Emissivities of Common Objects

Material	Specification	Emissivity	Material	Specification	Emissivity
Aluminum	Oxidized	0.20~0.4	Human skin		0.98
	Polished	0.02~0.04	Graphite	Oxidized	0.20~0.60
Copper	Oxidized	0.40~0.80	Plastic	Transparency >0.5mm	0.95
	Polished	0.02~0.05			0.85~0.95
Gold		0.01~0.10	Rubber		0.95
Iron	Oxidized	0.60~0.90	Textiles		0.90~0.95
Steel	Oxidized	0.70~0.90	Concrete		0.95
Asbestos		0.95	Cement		0.96
Gypsum		0.80~0.90	Soil		0.90~0.98
Asphalt		0.95	Plaster		0.89~0.91
Pottery		0.95	Brick		0.93~0.96
Wood		0.90~0.95	Marble		0.94
Charcoal	Powder	0.96	Glass	Tableware	0.85~0.92
Lacquerware	Polished	0.80~0.95	Paper	All colors	0.94
	Unpolished	0.97	Sand		0.9
Carbon adhesive		0.9	Gravel		0.95
Soap bubble		0.75~0.80	Water		0.93
Snow		0.83~0.90	Ice		0.96~0.98