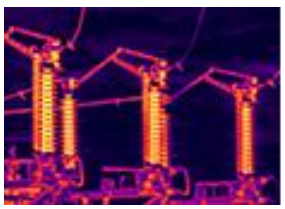
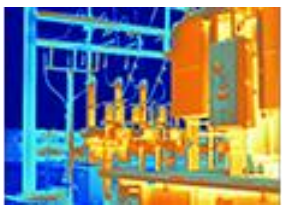
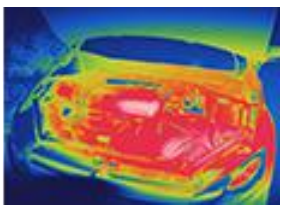
Handheld Thermal Camera

User Manual





Company Statement

Our company is committed to providing customers with high-quality, high-performance infrared thermal imaging products. Our dedicated R&D team and advanced production technology ensure that every product meets stringent quality standards. Our goal is to meet the demands of various industries for infrared thermal imaging technology through continuous innovation and improvement, providing customers with a superior and more convenient user experience. We will also continue to provide comprehensive after-sales service and technical support to ensure that any problems encountered by customers during use are promptly resolved.

Product Declaration

This product is a handheld thermal camera. We ensure that it undergoes rigorous quality testing and calibration before leaving the factory, and all performance parameters meet the product specifications. The software and applications included in the product are carefully designed and developed to ensure its accuracy and stability.

When using this product, please be sure to carefully read and follow the operating instructions and precautions in the user manual. Since our company cannot control the user's specific operating environment and methods, we are not responsible for any damage or data loss caused by improper use or unauthorized modification.

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1 Product introduction

This thermal camera is a new generation of professional temperature measurement thermal imaging product, supporting 640*512 high-definition thermal imaging resolutions. It realizes a variety of applications by combining visible light and thermal imaging.

Currently widely used in

- **Power Industry:** Thermal status inspection of transmission lines and power equipment, and fault defect diagnosis.
- **Electrical and mechanical industries:** Overheating and fault diagnosis of electrical and mechanical equipment.
- **Construction industry:** Detection of moisture, air leakage, and insulation defects.
- **Petrochemical industry:** Oil pipeline status inspection, material interface detection, heat leakage and insulation structure detection, power equipment condition inspection, etc.
- **Firefighting:** Forest fire prevention and potential fire source detection, special material spontaneous combustion prevention detection, electrical fire safety detection.
- **Medicine:** Human body surface temperature detection and temperature field distribution analysis.
- Other research and development industries, automation industry, preventive maintenance, etc.



2 Features

Image

- With a 640*512 resolution infrared detector and 8- megapixel visible light, the image is clearer.
- Adopting unique TisoView image technology, it realizes super-resolution, DDE enhancement, image saturation adjustment, gain adjustment and other algorithms to make the image clearer.
- HDMI and USB interfaces can output handheld instrument images

Structural aspects

- The high-sensitivity capacitive touch screen is superimposed with 1.1mm explosion-proof glass, which can protect the display from being broken while ensuring the sensitivity of touch operation.
- Built-in EMMC 32GB + expandable SD card can make data storage unlimited. For example, when full-frame temperature data recording is required, the SD card can be expanded for large data storage.
- It can be equipped with multiple removable batteries, and the battery capacity reaches 5000mAh, with a battery life of about 5 hours, which can meet the needs of long-term work.
- The standard configuration laser ranging module can support accurate distance detection within 40 meters.

Temperature measurement:

- Unique laser point temperature measurement mode, which can support temperature measurement at the laser point
- The maximum temperature measurement is up to 1200℃ and reaches industrial-grade high-precision standards

Software:

- Supports multiple image recording modes such as taking photos, recording videos, and taking screenshots.

3 Specifications

Parameter		Specification
Thermal camera	IR Resolution	640*512
	Spectral range	8~14um
	Frame rate	50 Hz
	NETD	＜40mK@25℃
	FOV	17.46°×14.01°
	Lens	25mm (Standard),19mm (Optional), 35mm (Optional)
	Temperature measurement range	-20 ° C ~ 1200 ° C
	Measurement accuracy	±2°C or ±2% of reading, whichever is greater
	Temperature measurement	Support temperature measurement of max, min, center point of the entire screen, as well as point, line, and frame temperature measurement
	Color Palette	Iron red, rainbow, rainbow high contrast, white hot, black hot, arctic, lava
Visible light	Resolution	8 Mega pixels
	FOV	D=73° H=66° V=40°
Image Display	Screen size	4.3-inch touch screen
	Image Mode	Thermal imaging, visible light, edge fusion, overlay fusion, picture-in-picture
	Image optimization	TlisoView image enhancement set
General	Language	Supports English, French, German, Spanish, Portuguese, Russian, Arabic, Japanese, Korean, Simplified and Traditional Chinese.
	Digital zoom	Continuous zoom
	Measurement correction	Target distance, ambient temperature, relative humidity, reflected temperature
	Wi -Fi	Supports mobile phone connection via WiFi network and provides APP for real-time image transmission
	Bluetooth	Support
	Interface	USB Type-C, HDMI
	PC analysis software	Support
	Mobile APP	Support
	Laser pointer	Support
	Laser ranging	40m
	Led	Support
	Buzzer	Support
	Battery	Removable 5000mAh lithium battery

	Operation time	A fully charged battery can be used for approximately 5 hours
storage	Capacity	Built-in 32G EMMC storage, expandable to 256G via SD card
Record	Photograph	Support
	Screenshot	Support
	Video	Support
Physical properties	Working temperature	-10 °C ~ +60°C
	Storage temperature	-40°C~+85°C

Note: The lens is installed according to the requirements before leaving the factory. The lens cannot be replaced during use after leaving the factory.

4 Thermal camera component's introduction







NO.	Part Name	Illustrate

①	Menu/ok multiplex button	● Short press on the main interface to enter the first level menu; ● In the first level menu, short press to enter the second level menu; ● Select the corresponding option on the settings interface and press short press to save the settings;
②	Customizable buttons	● In the settings interface, you can select the corresponding function to achieve quick operation
③	Power/return button	● In the off state, long press to turn on the device; ● Long press in power-on state to turn off the device; ● Short press Return on the menu interface;
④	Calibration button	● Short press on the main interface to calibrate
⑤	Arrow button	Up and down arrow button ● On the main interface, short press to switch the image mode; ● In the menu setting interface, short press up and down to move the selection; Left and right arrow button ● Short press on the main interface to switch the color palette; ● In the menu setting interface, short press left or right to move the selection;
⑥	Led	● Open or close through the menu function
⑦	Lens	● Detector original lens
⑧	Laser ranging	● Open or close through the menu function
⑨	Camera	● 8-megapixel visible light camera
⑩	Standard version: LED Professional Edition: Gas Detection	● Standard version: Turn the LED on or off via the menu function ● Professional version: Turn gas detection on or off

		through the menu function
⑪	Manual focus	● When in use, manual focus can be adjusted by rotating the lens.
⑫	Wrist strap interface	● Attach the wrist strap for easy carrying
⑬	Trigger	● On the main interface, short press the trigger button to take a photo. After taking the photo, you need to short press the OK button to save the photo, or short press the Back button to cancel the save. ● On the main screen, press and hold the trigger button for 3 seconds until the recording time appears in the upper left corner of the screen, indicating that the recording has started. Short press the trigger button to stop recording;
⑭	Removable battery	● Battery replacement available ● The battery is rechargeable via USB Type-C
⑮	MICRO SD card	● Insert a MICRO SD card to increase additional storage space.
⑯	Type-C	● Users can connect to a PC through this interface to perform operations, including image export, deletion, and formatting. ● Rechargeable via USB Type-C
⑰	HDMI	● Can transmit images by connecting HDMI cable
⑱	Lens cap	● Protect the lens

5 Quick operation instructions

① When using the thermal camera for the first time, insert the battery into the battery compartment of the thermal camera.

② Press and hold the power/return button for 1 second to turn on the device, and press and hold it for 3 seconds to turn off the device.

③ And temperature on the screen and use it.

④ If the image is not clear, you can adjust the focus manually using the lens knob.

⑤ The camera configuration can also be changed by operating and setting the system menu.

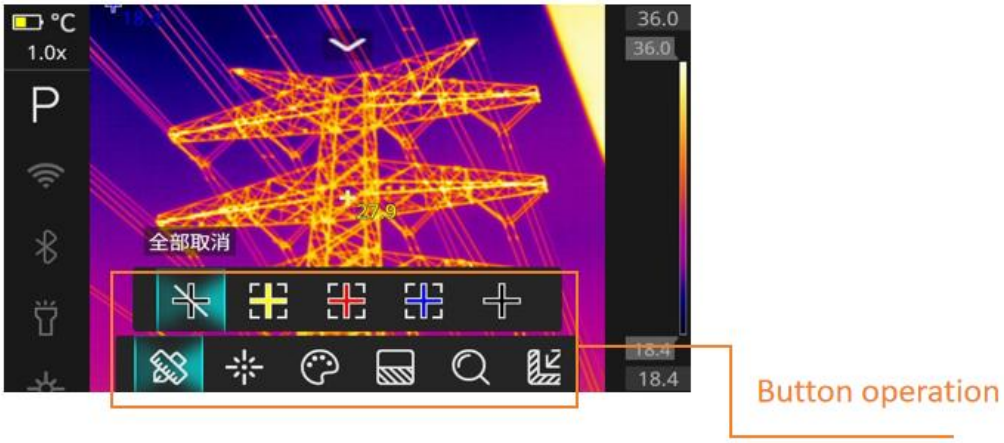
⑥ Short press the trigger button to take a photo, and long press the trigger button for 3 seconds until the recording time appears at the top of the screen to record a video.

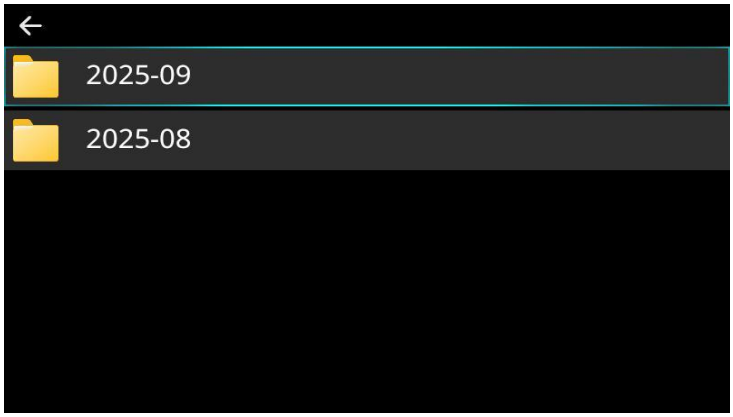
⑦ The photos or videos you have taken can be imported into your computer via USB Type-C .

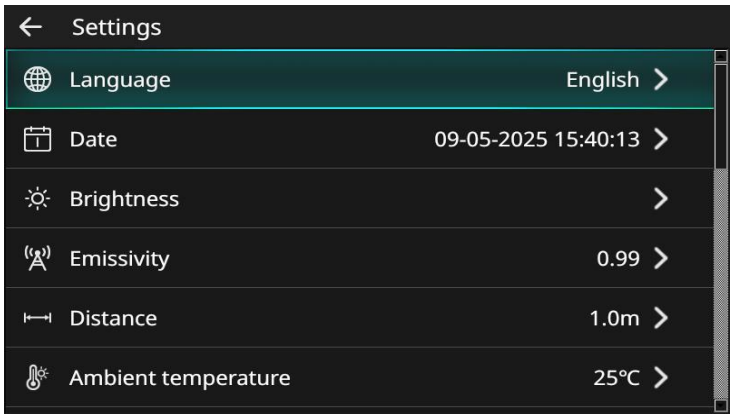
⑧ When the device is low on power, you can charge it directly through the USB Type-C port, or you can remove the battery and charge it using a USB Type-C charger.



6 Button and touch screen operation instructions







The device can be operated by buttons and touch screen. The buttons can be used to operate the first and second level menus, albums and settings. The touch screen can also be used to operate all functions.

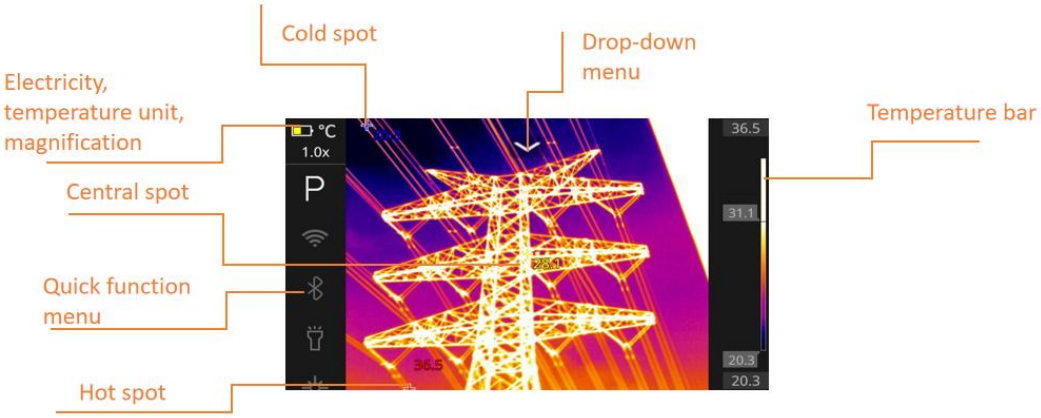
7 Detailed function introduction

7.1 Button description

No.	Button Name	Functional description
1	Power, return multiplex button	● In the off state, press and hold for 1s to turn on the device; ● In the power-on state, press and hold for 3 seconds to turn off the device; ● Short press Return on the menu interface;
2	Confirm, menu multiplexing button	● Short press on the main interface to enter the first level menu; ● In the first level menu, short press to enter the second level menu; ● Select the corresponding option on the settings interface and press short press to save the settings;
3	Calibration button	● Short press on the main interface to calibrate;
4	Up and down arrow button	● On the main interface, short press to switch the measurement mode; ● In the menu setting interface, short press up and down to move the selection;
5	Left and right arrow button	● Short press on the main interface to switch the color palette; ● In the menu setting interface, short press left or right to move the selection;
6	Customizable button	● In the settings interface, you can select the corresponding function to achieve quick operation
7	Trigger	● On the main interface, short press the trigger button to take a photo. After taking the photo, you need to short press the OK button to save the photo, or short press the Back button to cancel the save.

		● On the main screen , press and hold the trigger button for 3 seconds until the recording time appears in the upper left corner of the screen, indicating that the recording has started. Short press the trigger button to stop recording;

7.2 Main interface



7.2.1 Measurement

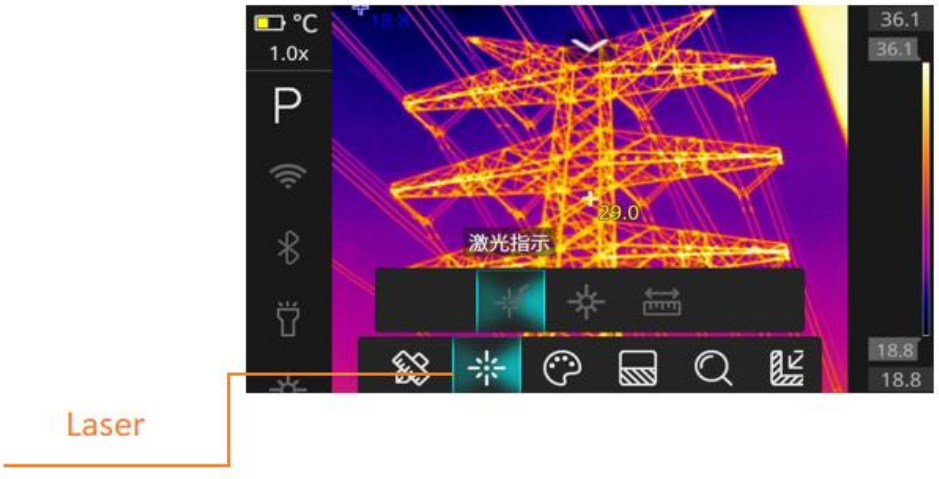
On the main interface, short press the menu button or touch the screen to call up the menu. Select the measurement function in the first-level menu. The measurement function includes the following:



No.	Function	Functional description
1	Cancel All	Cancel the center point, highest temperature, lowest temperature, drawing point, drawing line, and drawing frame of the screen
2	Center Point	Turn on or off the temperature of the center point of the image
3	Max temperature	Turn on or off the maximum temperature
4	Min temperature	Turn on or off the minimum temperature
5	Point	Draw points on the screen by touching the screen
6	Lines	Draw lines on the screen by touching the screen
7	Rectangle	Use the touch screen to draw a rectangle on the screen

7.2.2 Laser

Select Laser in the primary menu. The laser function includes the following:



No	Function	Functional description
1	Laser pointer	Laser pointer function can be turned on
2	Point temperature gun mode	Turn on the point temperature gun mode and display the temperature of the laser pointer point in the lower right corner of the screen
3	Distance measurement	Turn on the laser distance measurement and display the distance of the measured object in the lower right corner of the right screen

7.2.3 Color palette

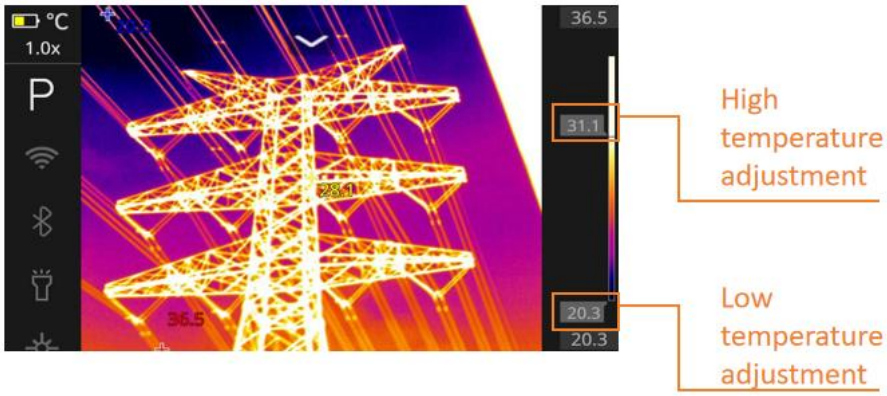
Select the color palette function in the first-level menu, and the color palette contains the following contents:



No.	Function	Functional D escription
1	Iron red	In high temperature areas, red accounts for a larger proportion, which is suitable for detecting scenes where high temperature areas account for a large proportion.

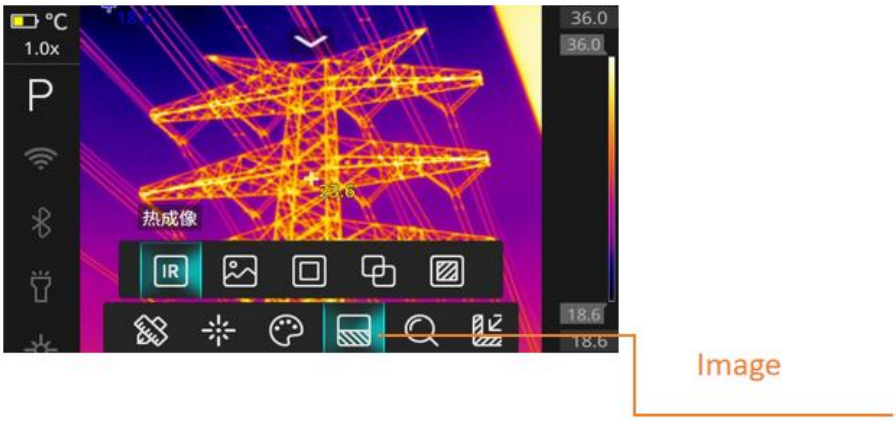
2	Rainbow	The highest temperature is indicated by red, the medium temperature is indicated by yellow, and the low temperature is mainly blue and black, which is suitable for scenes with distinct low temperature colors.
3	Rainbow high contrast	Rich colors increase the contrast of the picture, and small temperature differences can also be accurately identified, making it suitable for use in scenes with small temperature differences
4	White hot	In high temperature areas, the red color accounts for a larger proportion, which is suitable for detecting scenes where high temperature areas account for a larger proportion.
5	Black hot	In the high temperature range, black is used, and the whole screen is mainly a transition between white and black, which is suitable for users of the traditional black and white mode.
6	Arctic	The Arctic palette combines the simple tinting of the Iron Red palette with the low-contrast performance of the Rainbow High Contrast palette, using gold to identify warm objects and blue to identify cooler objects. The different colors quickly detect heat sources, while the darker shades allow for the discrimination of slight temperature changes.
7	Lava	Similar to Iron and Arctic, the Lava palette displays hotter objects in warm tones and cooler objects in blue, making it another good choice for quickly capturing body heat and other details in low-contrast environments.

The color bar on the right side of the screen can be manually pulled to adjust the temperature width and observe the temperature area you want to focus on.



7.2.4 Image

Select the image function in the first-level menu. The image function includes the following:

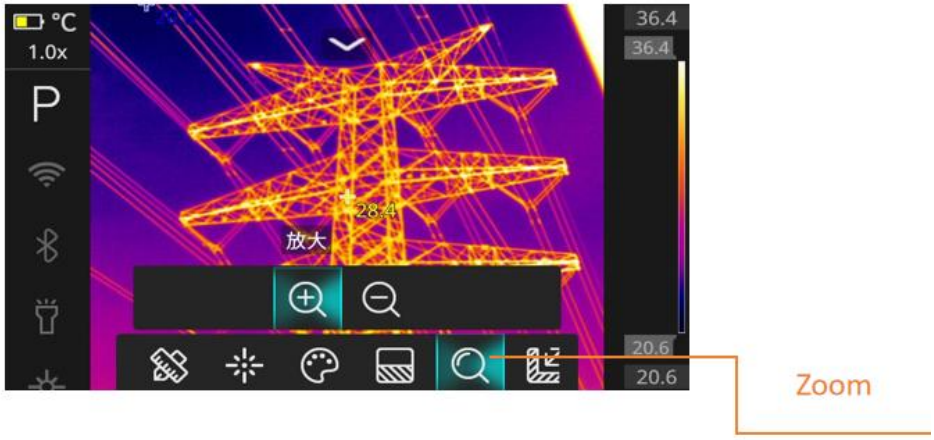


No.	Function	Functional Description
1	Thermal imaging	Single infrared thermal imaging, full-frame temperature measurement, the temperature of every point on the screen can be tested
2	Visible light	High-definition image display, clear at a glance
3	Edge blending	Not only can you see the infrared image distribution and temperature measurement, but you can also display the details of visible light at the same time
4	Overlay fusion	Part of the visible light color can be superimposed on the

		infrared thermal imaging to make the background clearer and facilitate the identification of the environment
5	Picture-in-picture	Especially highlight the temperature measurement of the center part. Suitable for quickly switching between visible light and infrared images to find problem points

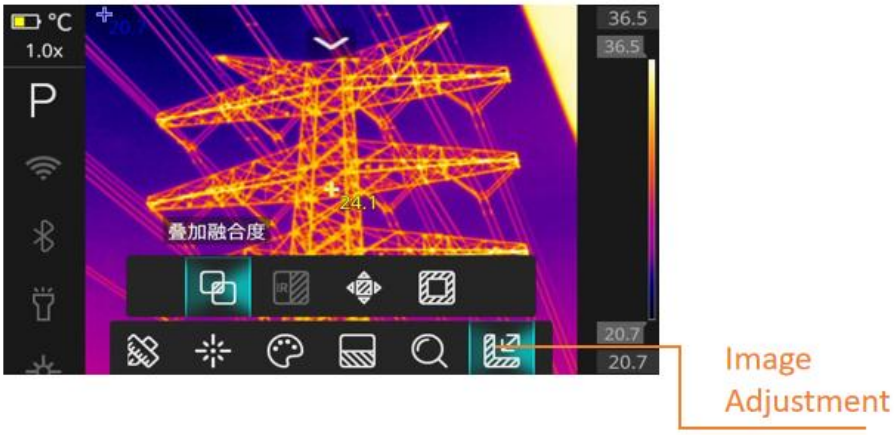
7.2.5 Zoom

Select the zoom function in the first-level menu and zoom in and out by clicking on the zoom function. The zoom function is 1X, 2X, and 4X. You can also use gestures to zoom in and out by touching the screen. The range of gesture zoom is 1 to 4 times, with a step of 0.1X.



7.2.6 Image Adjustment

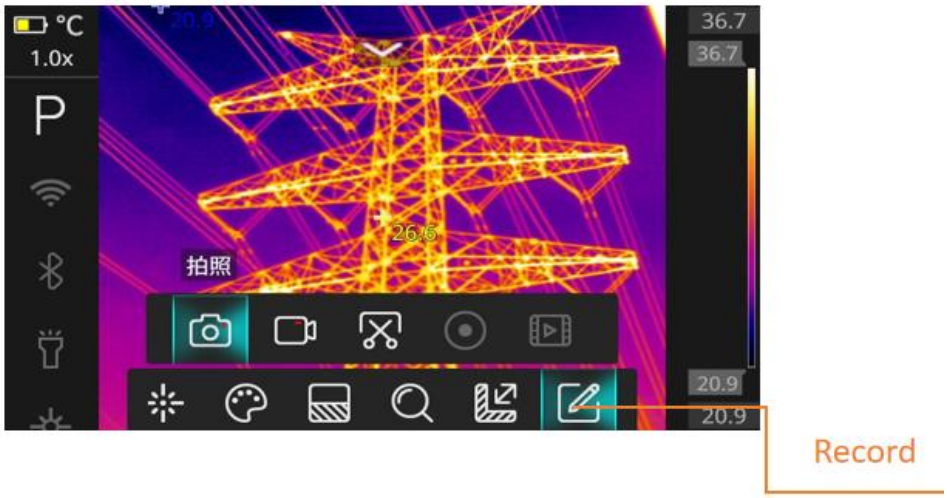
Select the image adjustment function in the first-level menu. The image adjustment function includes the following:



No.	Function	Functional description
1	Superposition fusion	Infrared and visible light images are fused, 0% is a single visible light image, 100% is a single infrared image, which can be adjusted in the fusion degree adjustment
2	Infrared contrast (future upgrade)	Adjust the saturation of infrared images
3	Fusion bias	The infrared and visible light fusion images are not superimposed together, which can be adjusted by fusion deviation
4	Edge blending strength	Infrared and visible light fusion is the intensity adjustment of image edge lines

7.2.7 Record

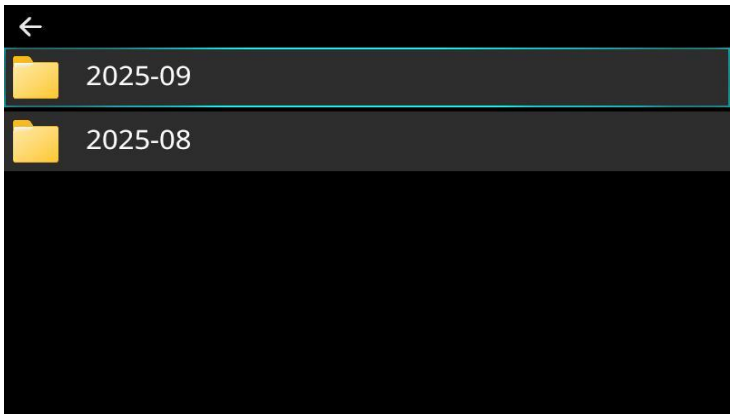
Select the record function in the first-level menu. The record function includes the following:

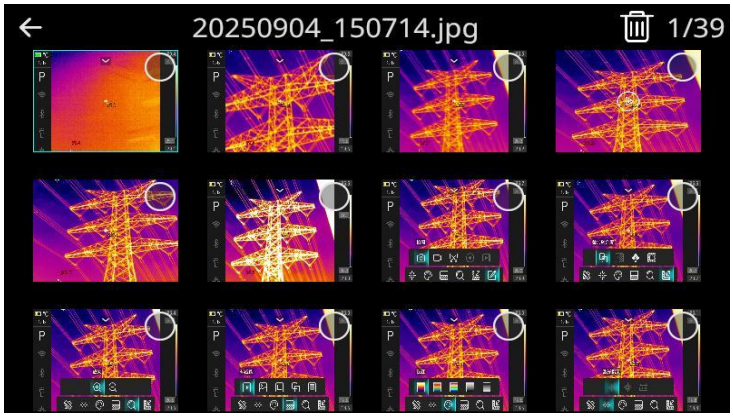


No.	Function	Functional description
1	Photograph	Take photos with temperature data
2	Video	Recording video without temperature data
3	Screenshot	Capture the current screen
4	Screen recording (future upgrade)	Record the current screen
5	Radiation flow files (future upgrade)	Record video files with temperature data in dyv format
6	Photo Interval (Future Upgrade)	You can set the photo interval and timer shooting

7.3 Photo Album

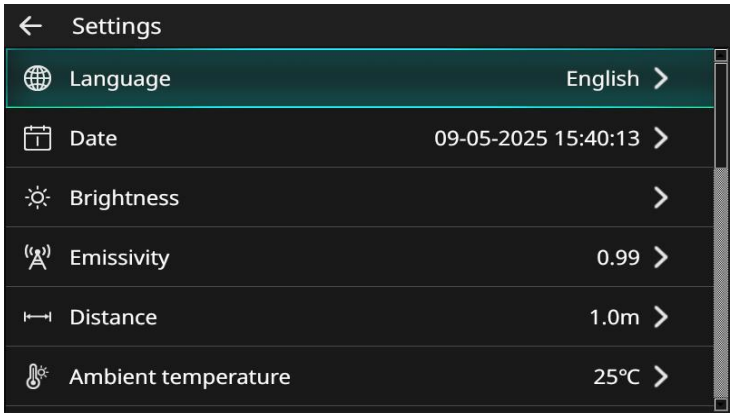
Select the Album function in the first-level menu to enter the gallery. The interface is as follows:





7.4 Setting

Select the settings function in the first-level menu to enter the settings interface:



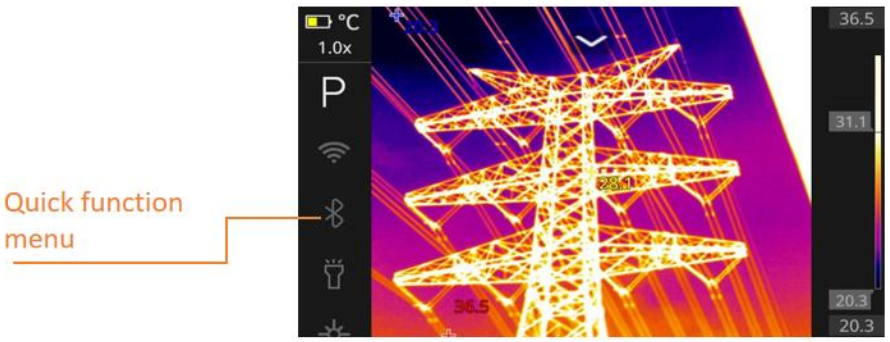
No.	Function	Illustrate

1	Language	Supports English, French, German, Spanish, Portuguese, Russian, Arabic, Japanese, Korean, Simplified and Traditional Chinese.
2	Date and time	Set date and time
3	Brightness	Brightness adjustable
4	Emissivity	Matte: 0.95 Semi-matte: 0.80 Half Specular: 0.60 Specular: 0.30 Custom
5	Target distance	0.5m~20m distance compensation
6	Ambient temperature	Setting the ambient temperature compensation
7	relative humidity	Setting the ambient humidity compensation
8	Reflected temperature	Setting reflected temperature compensation
9	Temperature units	Celsius, Fahrenheit, Kelvin optional
10	Distance units	Meters and feet optional
11	Temperature alarm	Design temperature alarm threshold
12	Temperature range	-20℃~1200℃
13	Customizable buttons	None, enter the gallery, switch display mode in sequence, switch magnification, switch the last two-color palettes used, switch temperature gear, screenshot, screen recording, distance measurement, point temperature gun mode, laser indicator switch, LED switch, Wi-Fi switch, Bluetooth switch, all alarm switches are optional

14	Temperature display	Follow and centralized display optional
15	Automatic shutdown	5 minutes, 10 minutes, 30 minutes, 60 minutes, never
16	Storage	Check storage status and format
17	Reset system parameters	Restore the emissivity, target distance, ambient temperature, relative humidity, reflected temperature, temperature unit, distance unit, temperature alarm, temperature range, temperature display, automatic shutdown, brightness, and measurement to their initial state.
18	Check for upgrades	Upgrade Program
19	About	SN number, device model, software version, firmware version

7.5 Quick function menu

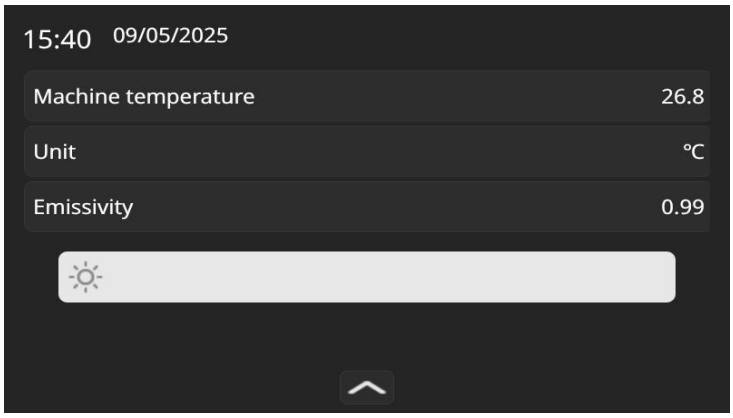
The left side of the screen is the shortcut menu. The icons in the shortcut menu are gray when the function is not enabled, and white when the function is enabled. The shortcut menu includes the following functions:



No.	Function	Illustrate
1	P	P is the custom button function selection; you can choose the function of the custom button
2	Wi- Fi	You can turn Wi-Fi on or off, change the password, and view Wi-Fi parameter status
3	Bluetooth	You can turn Bluetooth on or off, view the Bluetooth name of the device, connectable devices, pair, name of connected devices, cancel pairing, etc.
4	lighting	Turn the light on or off
5	Point temperature gun mode	Turn on or off the temperature gun mode
6	Distance measurement	Turn laser ranging on or off

7.6 Drop-down menu

Click the drop-down menu icon on the main interface to open the drop-down menu, which contains the following contents:



- Date and time
- Body temperature
- Temperature units
- Emissivity
- Adjust brightness

8 Precautions

- Do not expose this device to dust or moisture.
- Do not expose the lens to strong light sources such as sunlight and lasers directly, as this may cause permanent physical damage.
- Do not disassemble the device by yourself, otherwise it may cause damage to the device.
- When the product is not used for a long time, it is recommended to remove the battery and store it in a dry and cool place.
- Do not place the device in a high-temperature environment or near high-temperature objects.
- Never use organic cleaners such as alcohol and detergent to clean the lens. It is recommended to wipe it with a soft object dampened with water.