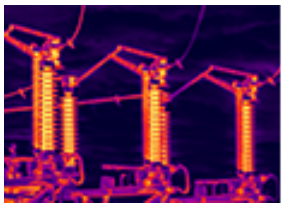
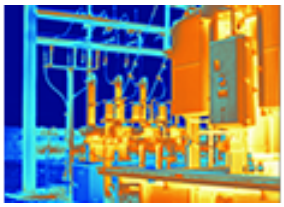
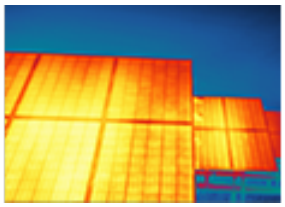
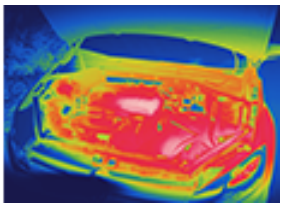
T80 Handheld Thermal Imaging Camera

User Manual



V1.01 03.06.2026

Statement

Company Statement

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

Product Statement

This product is a handheld thermal imaging camera. We ensure that this product undergoes rigorous quality testing and calibration before leaving the factory, and all performance parameters conform to the description in the product specification sheet. The software and applications included with the product have been carefully designed and developed to ensure the accuracy and stability of its functions.
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 liable for any damage or data loss caused by improper use or unauthorized modifications.

Usage Declaration

This manual serves as a product usage guide. The photographs, graphics, charts, and illustrations included in this manual are for illustrative purposes only and may differ from the actual product. The actual product shall prevail. In the event of updates to

operating procedures and functional settings due to product upgrades, and if any discrepancies are found with this manual, please contact the company for the latest version of the product manual.

Safety Precautions

⚠ **Caution: Ignoring these precautions may result in injury or property damage.**
◆ Do not point the lens at strong light sources, such as the sun, incandescent lamps, or other high-temperature targets, otherwise it may damage the lens or thermal imaging detector.
◆ Do not attempt to open or disassemble the battery, and do not place the device in a high-temperature environment or near a hot object.
◆ Because fill lights may cause blue light damage to the retina, please do not look directly at the product or for extended periods of time when the fill light is on. Keep an eye on the fill light.
◆ If the device emits smoke, unusual odors, or makes abnormal sounds during use, please disconnect the charging device. Try shutting down and restarting the device, and contact the product supplier promptly.
◆ To avoid heat buildup that could cause accidents, please ensure good ventilation around the equipment.
◆ For product repair issues, please consult a professional. Do not attempt to open the outer cover for repairs yourself.
◆ Do not use alcohol, detergent, or other organic cleaning agents to clean the lens. It is recommended to use a soft, damp item to wipe it .
◆ Lasers are dangerous light sources. It is strictly forbidden to point lasers at objects with strong reflections, such as glass or mirrors, to avoid laser reflection damaging equipment. Never point lasers at the human body, especially the eyes, to avoid serious injury.

User Guidelines

◆ **Regarding correction**

We recommend that you have your thermal imaging camera calibrated annually. You can contact us or your distributor for more information.

◆ **Regarding accuracy**

To obtain more accurate measurement results, it is recommended that you wait 5 minutes after turning on the thermal imaging camera before taking temperature measurements.

◆ **Update Notes**

We are committed to providing our customers with high-quality products and reliable services. We will update and release new versions of our handheld infrared thermal imaging camera product manual from time to time. Please contact us if needed.

◆ **Scope of application**

This manual applies to all products within a series, which means that the descriptions in this manual are not valid for all products.

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1 Product Introduction

This infrared thermal imaging camera is a new generation of professional temperature measurement thermal imaging product, supporting a high-definition thermal imaging resolution of 640 x 512 . It combines visible light and thermal imaging to achieve a variety of applications.

Currently widely used

- **Electric power industry:** Thermal condition inspection of power transmission lines and power equipment, and diagnosis of faults and defects.
- **Electrical and mechanical industry:** Overheating electrical and mechanical equipment: troubleshooting.
- **Construction industry:** Detection of moisture, air leakage, and insulation defects.
- **Petrochemical industry:** Inspection of oil pipeline conditions, detection of material interfaces, detection of heat leaks and insulation structures, and inspection of power equipment conditions, etc.
- **Firefighting:** Forest fire prevention and locating potential fire sources, detection of spontaneous combustion prevention of special materials, and electrical fire safety inspection.
- **Medical:** Human body surface temperature detection and temperature field distribution analysis.
- Other research and development industries, automation industries, preventive maintenance, etc.

2 Specifications

Parameter		Specification
Thermal camera	IR Resolution	640*512
	Spectral range	8~14um
	Frame rate	25 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=90°
Image Display	Screen size	4.3-inch touch screen
	Image Mode	Thermal imaging, visible light, edge fusion, overlay fusion, picture-in-picture
	Image optimization	TIisoView 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.

3 Thermal imaging camera Components Introduction




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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	Customization 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	● Standard version: Turn the LED on or off via the menu function

	Professional Edition: Gas Detection	● 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

4 Basic Operations

4.1 Equipment Description

4.1.1 Charge

- Connect the battery to the USB port using a USB cable, or insert the battery into the thermal imaging camera's battery compartment and connect the USB cable to the USB port on top of the handheld thermal imaging camera.
- Simply connect a 5V 2A power adapter or computer to start charging.

4.1.2 Power on/off

- With the device powered off, press and hold the power/return switch for 1 second to power it on. After the system has finished loading, you can start observation.
- With the device powered off, press and hold the power/return switch for 3 seconds to power off the device.

4.1.3 Video recording

- Taking photos: In the observation interface, if you encounter a scene you want to record, you can adjust the screen to the desired state, briefly press the trigger button to take a photo, and then press the "OK" button to save the current photo.
- Video recording: In the observation interface, if you encounter a scene you want to record, you can adjust the screen to the desired state, press and hold the trigger button to record until the recording time appears in the upper left corner of the screen, indicating that recording has started. Press the button briefly to stop recording. After stopping recording, the video will be automatically saved.

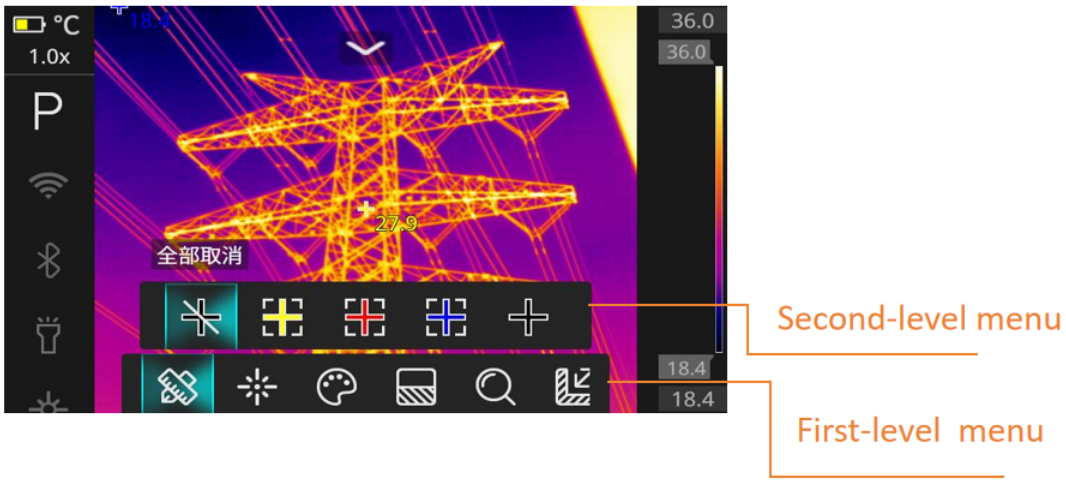
4.1.4 File transfer

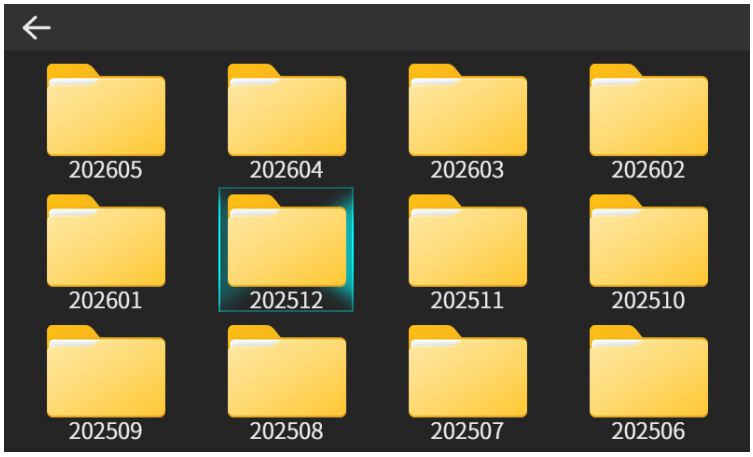
- Open the interface cover on the top of the device and connect the device to the computer using a USB Type-C data cable.
- The computer recognizes the connected disk, navigates to the corresponding folder (the folder is named with the date and time), and can view or copy photos and video files.
- Once the operation is complete, disconnect the USB Type-C data cable from the computer.

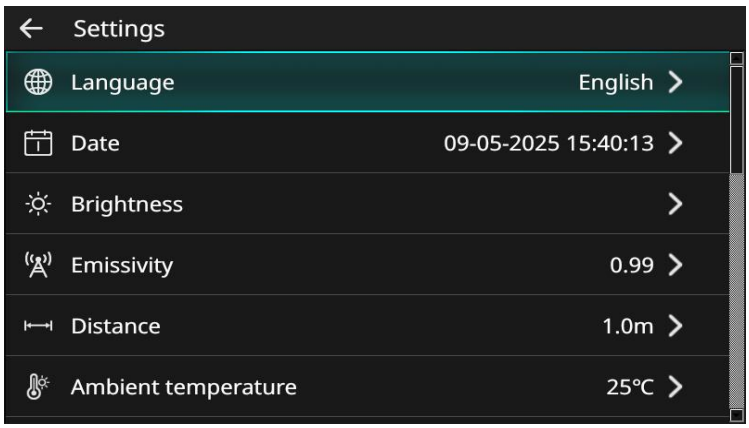
4.1.5 Image Analysis

- First, install and open the PC analysis software.
- Simply import the photos copied from the device into the PC analysis software for analysis.

4.2 Button and Touchscreen Operation Instructions







The device can be operated via buttons and a touchscreen. The buttons control the first and

second level menus at the bottom of the main interface, the photo album, and settings. The touchscreen provides full functionality.

4.3 Features

4.3.1 Image

- Resolution: 640*512 high resolution, combined with the unique TisoView image algorithm , brings a more extreme image effect .
- Color rendering: Nine unique color algorithms, each suitable for high temperature, low temperature and temperature distribution patterns, enabling users to better analyze image problems.
- Image modes: Five image modes can be flexibly switched, combined with visible light to supplement on-site details, making fault location faster and more accurate.
- NETD: 40mK thermal sensitivity, capable of keenly capturing subtle temperature differences, resulting in richer thermal image details and clearer images.

4.3.2 Temperature measurement

- Temperature measurement range: 1200℃ high temperature measurement range covers more than 99% of customer needs.
- Temperature measurement accuracy: It maintains ±2% accurate temperature measurement even at a high temperature of 1200℃, which can significantly improve the yield rate and data reliability in high-temperature application scenarios.
- Spot temperature gun mode: The screen now displays the temperature at the laser point, showing the temperature at the location indicated by the laser, enabling "point-and-measure" and easily controlling the temperature of the target point.

4.3.3 Hardware

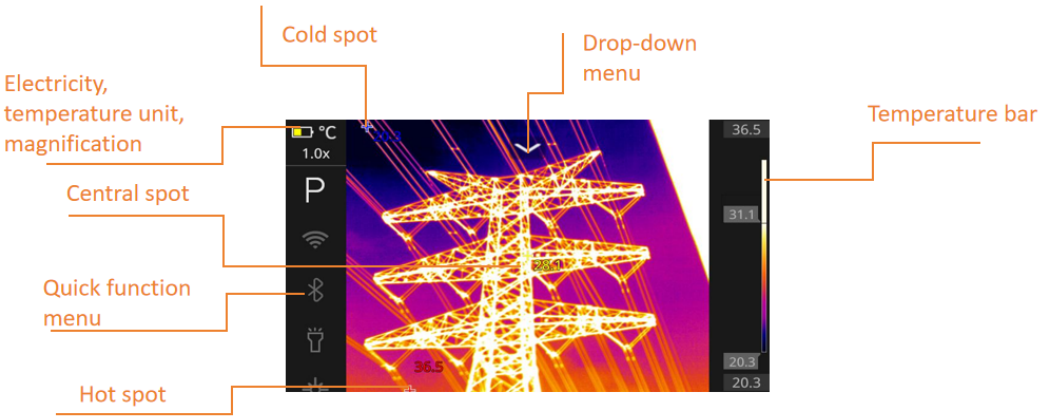
- Visible light: 8-megapixel high-definition visible light assists to accurately restore on-site details, making fault location clearer and detection records more accurate.
- WiFi: Direct WiFi connection to the app allows for real-time screen mirroring between mobile phones and tablets, enabling you to monitor test data anytime, anywhere.
- Storage: Built-in 32G + up to 256G expansion, ultra-large storage space, can save more than 200 million photos, record more than 200 hours of video, and record more than 30 hours of full-radio stream video.

4.3.4 Software

- Measurement functions: Multi-area graphic temperature measurement and independent emissivity adjustment significantly improve detection efficiency and data accuracy in complex scenarios.
- Image analysis: Supports secondary analysis of images in the image library, allowing for the timely addition of any overlooked points of interest, ensuring comprehensive detection data.
- Recording Modes: Supports multiple image recording methods and video recording with temperature data. Combined with custom timers and automatic over-temperature capture, it can easily achieve efficient archiving and unattended remote monitoring.
- PC Analysis: Through professional PC software, secondary analysis of image depth and flexible parameter adjustment are achieved, and standardized reports can be exported, greatly improving the efficiency of detection and recording.
- APP: The Wi-Fi synchronized app enables real-time collaboration and remote control among multiple users, easily solving the challenges of observation and guidance in complex scenarios.

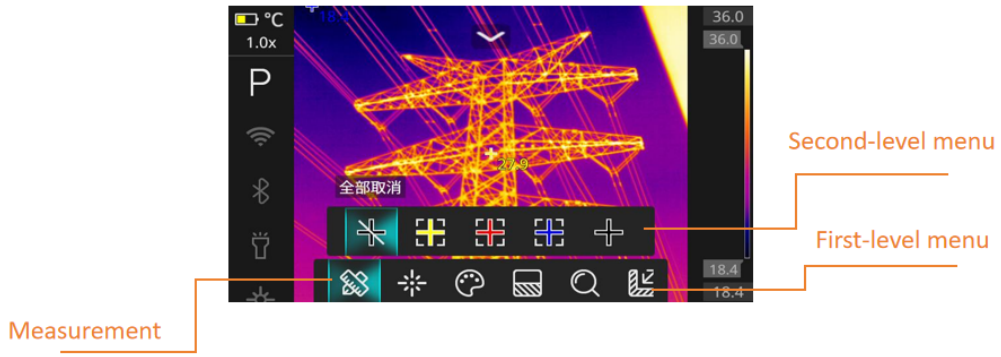
4.4 Operating Instructions

4.4.1 Main interface



4.4.1.1 Measurement

A short press of the menu button or a tap on the screen on the main interface will bring up the menu. Select the measurement function from the first-level menu. The measurement function includes the following:



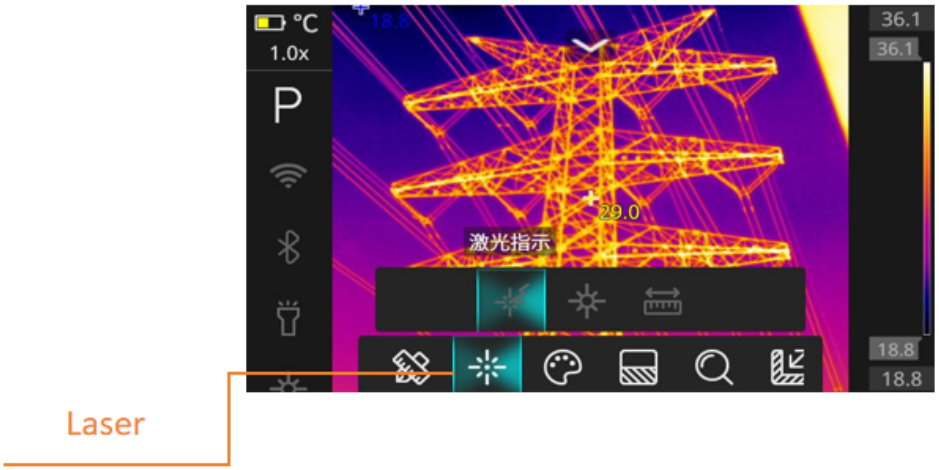
No.	Function	Function Description
1	Cancel all	When the image displays information such as the center point, maximum temperature, minimum temperature, plotted points, lines, or boxes, clicking "Clear All" removes all measurement data from the image. If users find during operation that the plotted points, lines, or boxes on the image have become too numerous and are obscuring the view, they can use the "Clear All" function to quickly remove them.
2	Center spot	When the scene requires monitoring the temperature at the center point of the image, you can select to enable center point temperature monitoring. A yellow cursor will appear in the center of the screen, displaying the corresponding temperature.
3	Hot spot	When the scene is focused on high temperatures, you can choose to enable the highest temperature setting. A red cross-hair cursor will appear on the screen, tracking the highest temperature point on the image and displaying the temperature.
4	Cold spot	When the scene requires low temperature as a concern, you can choose to turn on the lowest temperature setting. A blue cross hair cursor will appear on the screen, tracking the lowest temperature point on the image and displaying the temperature.
5	Draw: Points	When users need to focus on the temperature of certain points, they can draw points on the screen using the touchscreen , and then tap the drawn points to move their positions, focusing on the temperature of the drawn points. When you click on the drawn point, a function menu will appear in the upper left or upper right corner. You can quickly copy the point, adjust its emissivity, distance compensation, and ambient temperature, and adjust them to better match the actual situation for more accurate temperature measurement.

6	Draw: Line	When a user needs to focus on the temperature along a specific straight line, they can draw the line on the screen using the touchscreen , and then tap the drawn line to move its position, focusing on the temperature of the drawn line. When you click on the drawn straight line, a function menu will appear in the upper left or upper right corner. You can quickly copy the line, adjust its emissivity, distance compensation, and ambient temperature functions to better match the actual situation and make the temperature measurement more accurate.
7	Draw: Rectangle	When users need to focus on the temperature within certain rectangular areas, they can draw a rectangle on the screen using the touchscreen , and then tap the drawn rectangle to move its position, focusing on the temperature within the drawn rectangle. When you click on the drawn rectangle, a function menu will appear in the upper left or upper right corner. You can quickly copy the rectangle, adjust the emissivity, distance compensation, and ambient temperature functions within the rectangle to better reflect the actual situation and make the temperature measurement more accurate.
8	Draw: Polygons	When users need to focus on the temperature of certain irregular objects being measured, they can draw polygons on the screen using the touchscreen , and then tap the drawn polygon frame to move its position, focusing on the temperature within the drawn polygon frame. When you click on the drawn polygon frame, a function menu will appear in the upper left or upper right corner. You can adjust the number of borders of the polygon, as well as the emissivity within the frame, distance compensation, and ambient temperature functions to better reflect reality and make temperature measurement more accurate. Note: Only one polygon can be drawn. The initial polygon has 5 sides. You can add or remove sides through the function menu to create up to 10 sides and at least triangles. You can also adjust the length and position of each side by dragging

		the small green squares connected to each side using the touch screen.
9	Draw: Poly-line	When users need to focus on the temperature on certain irregular lines, they can draw a polyline on the screen using the touchscreen , and then tap the drawn polyline to move its position and focus on the temperature on the drawn poly-line. When you click on the drawn poly-line, a function menu will appear in the upper left or upper right corner. You can adjust the number of poly-lines, the emissivity of the poly-lines, distance compensation, and ambient temperature functions to better reflect the actual situation and make the temperature measurement more accurate. Note: Only one poly-line can be drawn. The initial poly-line is a 3-polyline. You can add or remove poly-lines through the function menu. You can draw up to 9 poly-lines and at least 2 poly-lines. You can also adjust the length and position of each poly-line by dragging the small green squares that connect the poly-lines using the touch screen.
10	Draw: Ellipse	When users need to focus on the temperature of certain elliptical or circular objects being measured, they can draw an ellipse on the screen using the touchscreen. They can then select and move the drawn ellipse, or drag a small green square that appears on the ellipse to adjust its shape. The user should then focus on the temperature within the drawn ellipse. When you click on the drawn ellipse, a function menu will appear in the upper left or upper right corner. You can adjust the emissivity, distance compensation, and ambient temperature functions within the ellipse to better reflect reality and make temperature measurement more accurate. Note: Only one ellipse can be drawn.

4.4.1.2 Laser

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



No	Function	Function Description
1	Laser pointer	Users can enable the laser pointer function, and the location of the laser pointer can be observed with the naked eye.
2	Laser temperature measurement	Upon activating the spot thermometer mode, a red laser dot is emitted. Users can aim this laser dot at the specific location they wish to measure; a laser indicator icon will appear on the screen, and the temperature of the targeted spot will be displayed in the bottom-right corner, allowing for precise temperature readings at every specific point. For instance, when inspecting minute components—such as small connectors, screws, or bus bar joints—that are difficult to discern with the naked eye, a simple aim of the laser allows for the precise identification of hot spots, ensuring highly accurate temperature measurements without any deviation.
3	Distance measurement	Users can enable laser rangefinder to determine the distance to the object being measured and adjust the target distance accordingly for more accurate temperature measurement . It can also accurately measure the straight-

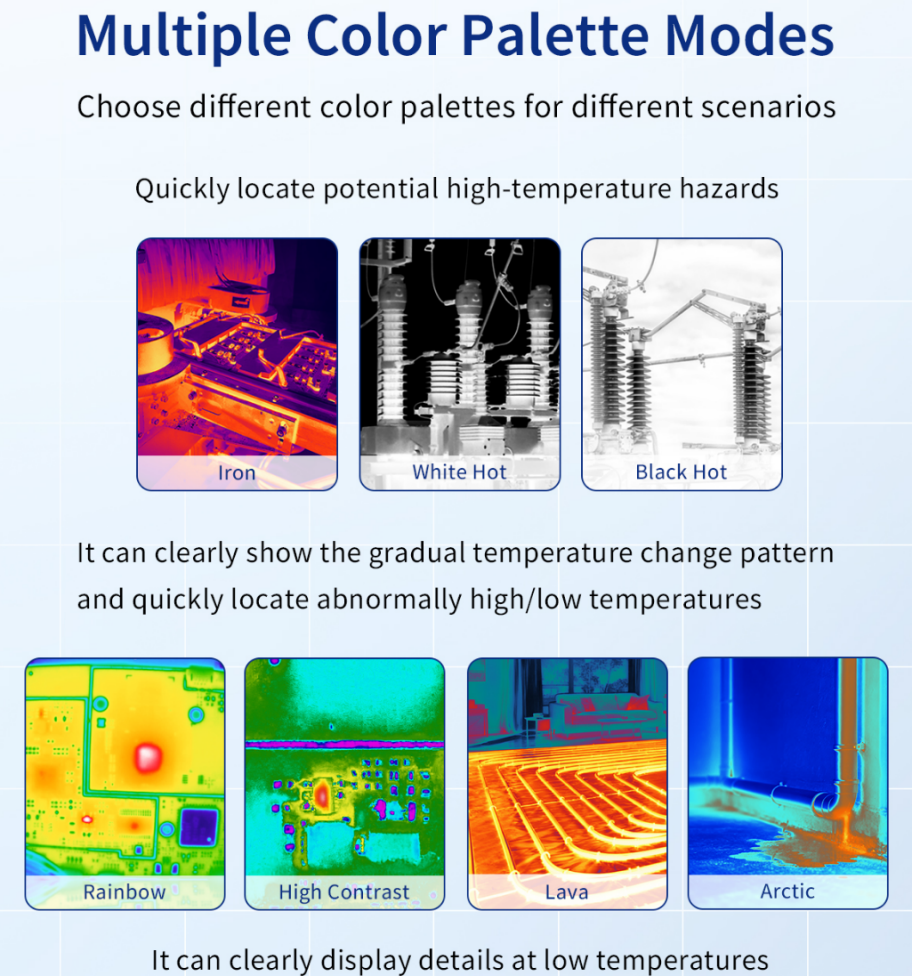
		line distance between objects, quickly obtaining size and distance data.

4.4.1.3 Color palette

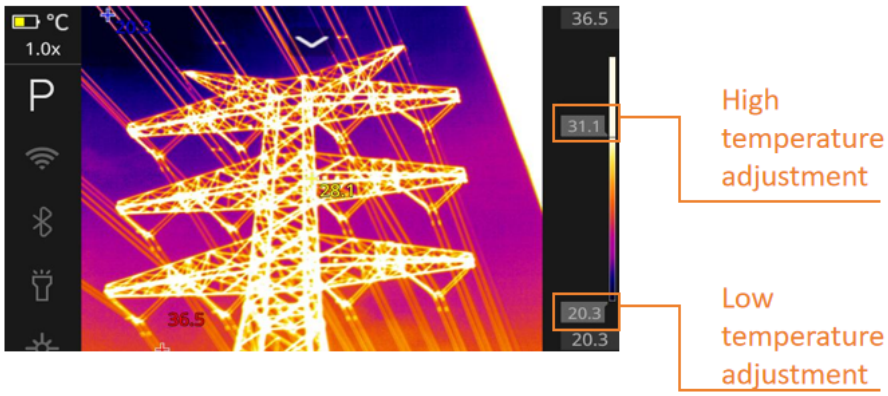
Select the color palette function from the primary menu. The color palette contains the following information about iron.

No.	Function	Function Description
1	Iron	In high-temperature areas, the red color has a higher density, allowing users to quickly identify potential high-temperature hazards. This technology is suitable for industries such as power line inspection, industrial equipment monitoring, and automotive repair.
2	Rainbow	The highest temperature is indicated by red, medium temperature by yellow, and low temperature by blue-black. This color-coded approach is suitable for scenarios where high temperature differences are required , such as inspecting circuit boards and testing material uniformity.
3	Rainbow High Contrast	The rich colors enhance image contrast, and the device can accurately identify even small temperature differences, making it suitable for low-temperature , color-distinct scenarios such as circuit board inspection and material uniformity testing.
4	White Hot	In the high-temperature section, white is used, and the entire screen primarily features black and white transitions, enabling users to quickly identify potential high-temperature hazards. This is suitable for industries such as power line inspection, industrial equipment monitoring, R&D analysis, and automotive repair .
5	Black Heat	In the high-temperature section, black is used, and the entire screen primarily features a black-and-white transition, allowing users to quickly identify potential high-temperature hazards. This is suitable for industries such as power line

		inspection, industrial equipment monitoring, and automotive repair.
6	Arctic	The Arctic Palette combines the simple coloring of iron oxide red with the low-contrast performance of a high-contrast rainbow palette. It uses gold to identify warm objects and blue to identify cooler objects. It is suitable for detecting "cold sources," such as water leaks or air conditioning malfunctions.
7	Lava	Similar to Iron Red and Arctic Blue, the Lava Palette uses warm colors to display hotter objects and blue to display colder objects, making it suitable for detecting "cold sources," such as water leaks or air conditioner leaks.

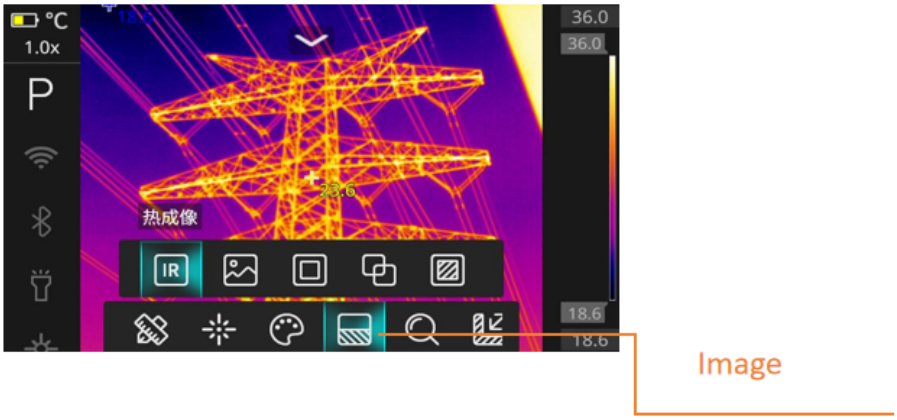


The color bar on the right side of the screen can be adjusted by dragging the icon shown in the image below to observe the temperature area you want to focus on.



4.4.1.4 Image mode

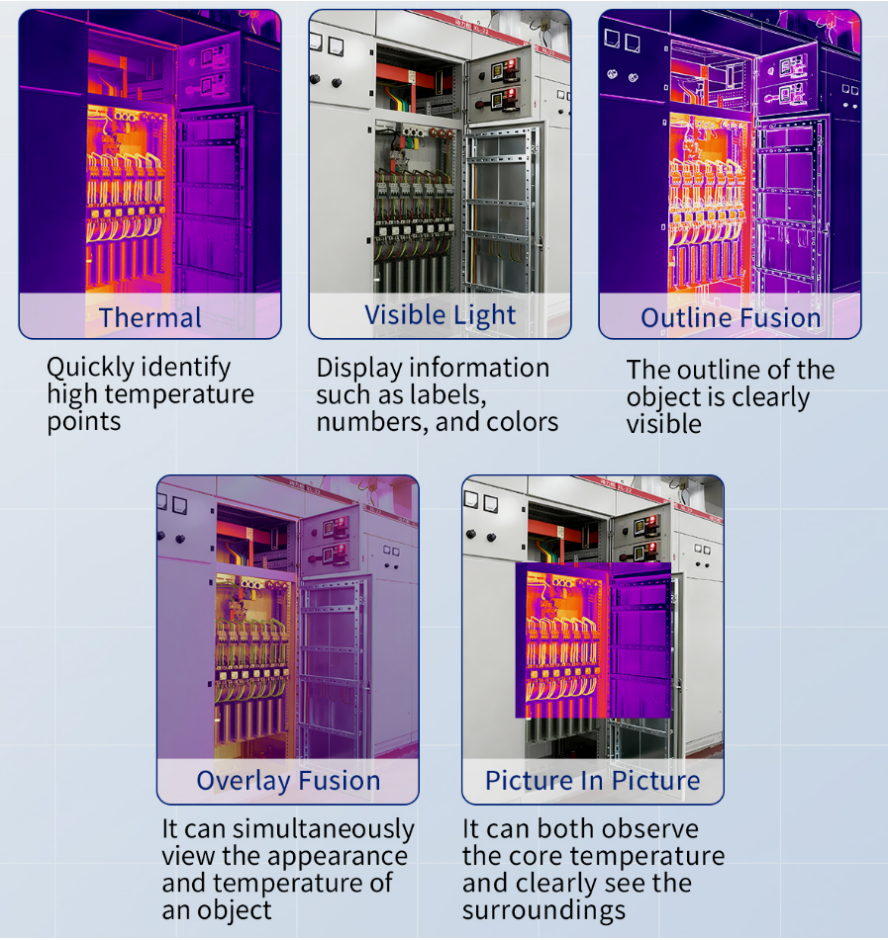
Select the Image function from the primary menu. The Image function includes the following:



No.	Function	Function Description
1	Infrared	Advantages: Infrared imaging cameray displays only thermal data, free from visible light interference; Strong penetration capabilities and smooth video feed ensure clear detection over long distances; Intuitive temperature measurement facilitates the rapid identification of potential thermal hazards; Disadvantages:

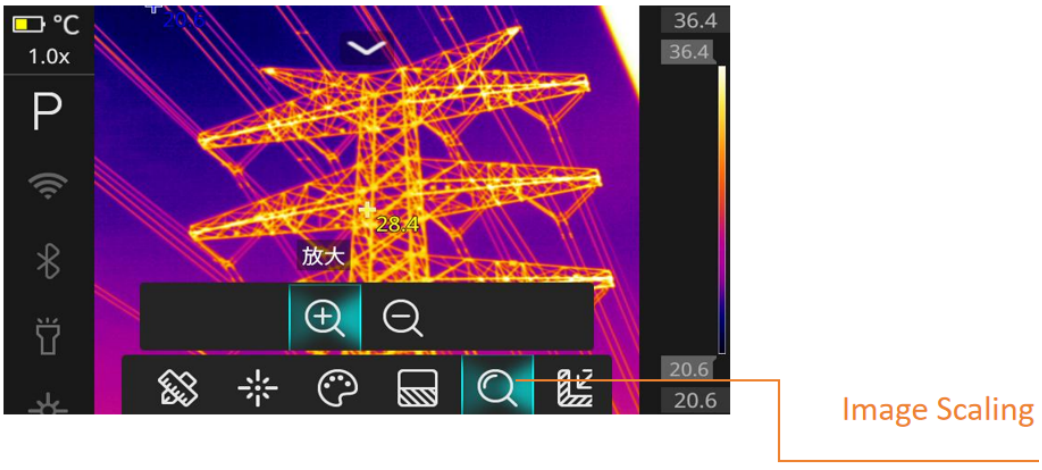
		Lacks distinct outlines of physical objects, making it difficult to distinguish specific components and prone to misidentifying locations; Suitable Scenarios: Rapid screening for thermal anomalies, nighttime search and rescue operations, long-range temperature measurement, and similar applications;
2	Visible light	Advantages: High-definition visible-light imaging provides realistic, crystal-clear visuals—identical to what is perceived by the naked eye; Device models, text labels, and intricate details such as screws are rendered with maximum clarity; In well-lit conditions, it offers the most intuitive method for identifying external damage, cracks, or loose components; Disadvantages: Direct visibility is compromised in darkness or low-light environments; Temperature distribution patterns are not intuitively displayed; Suitable Scenarios: Inspecting the external condition of equipment in well-lit environments, and documenting on-site conditions;
3	Edge Blending	Advantages: Preserves the full infrared thermal color spectrum, superimposing only the outlines of physical objects; Clearly distinguishes the precise locations of terminals, switches, and busbars, offering highly accurate positioning; Does not obscure thermal color blocks, ensuring zero error in temperature measurement and assessment; Disadvantages: Lacks real-world color imaging cameray, providing only outline-based visual assistance; Due to the physical separation between the thermal imaging lens and the visible-light lens, parallax exists, preventing complete

		image fusion at very close distances; Applicable Scenarios: Precise temperature measurement for power distribution cabinets, electrical circuits, and electrical equipment.
4	Overlay Fusion	Advantages: Seamless integration of infrared temperature data and real-world imaging came ray; the visual output is realistic and natural, with thermal hot spots corresponding perfectly to the actual scene. Easy for beginners to pick up; intuitive and user-friendly. Disadvantages: The real-world colors introduce slight interference with the thermal color gradients, resulting in a minor impact on the precision of fine temperature measurements. Applicable Scenarios: Routine inspections, on-site demonstrations, and general equipment troubleshooting.
5	Picture- in-Picture	Advantages: Supports opening multiple Picture-in-Picture (PiP) windows simultaneously, with adjustable size and position, allowing for the simultaneous monitoring of multiple thermal hot spots; Enables simultaneous viewing of both the live visual feed and thermal data, making comparisons instantly clear; Eliminates the need to constantly switch between modes, resulting in high operational efficiency; Disadvantages: Extended use may lead to visual fatigue; when focusing on a single specific fault point, the display is not as clean or streamlined as a dedicated single-screen view; Applicable Scenarios: Routine inspections, power distribution cabinet maintenance, circuit troubleshooting, on-site demonstrations, and use by beginners.



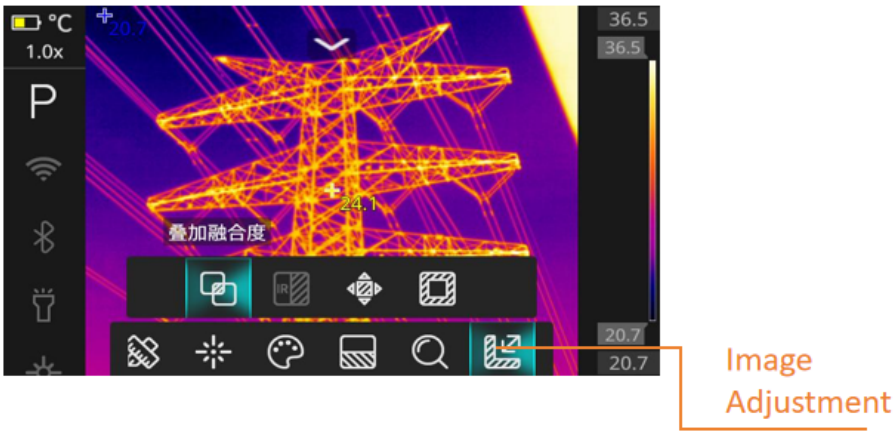
4.4.1.5 Image Scaling

Select the zoom function in the primary menu to zoom in and out. The zoom options are 1X, 2X, and 4X. You can also zoom using touch gestures, which range from 1 to 4 times in 0.1X increments.



4.4.1.6 Image Adjustment

Select the image adjustment function from the primary menu. The image adjustment function includes the following:

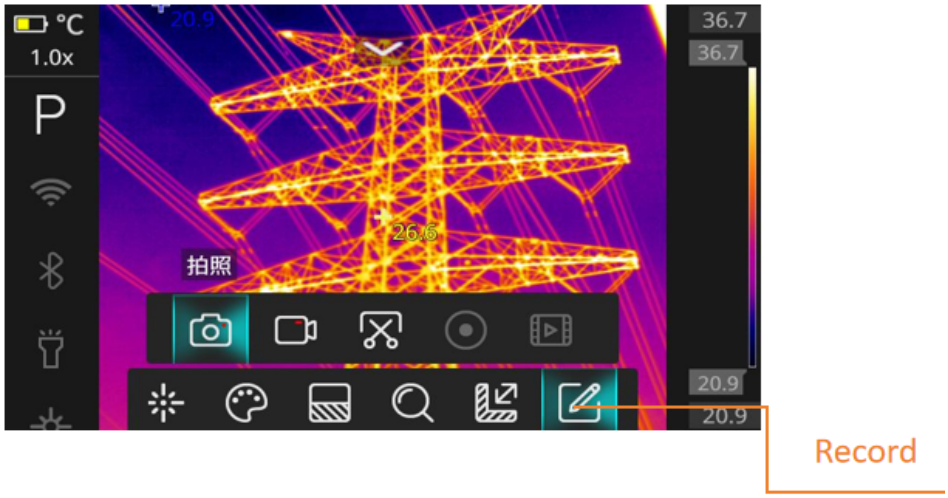


No.	Function	Function Description
1	Fusion adjustment	Infrared and visible light images are superimposed , with the default initial state being 50%. Both visible light and infrared images are in a semi-transparent state when superimposed and blended. Adjusting the blending degree up or down can adjust the transparency of the image. 0% is a single visible light image, and 100% is a single infrared image. Users can adjust the superimposition and blending degree according to different scene preferences.
2	Thermal effect adjustment	Reserved for Future Upgrades
3	Fusion bias adjustment	During use, the observation distance may vary. Furthermore, prolonged carrying, vibration, or accidental bumps may cause a slight misalignment of the lenses, resulting in images that do not fully fuse; this issue can be resolved by performing fine-tuning via the fusion deviation adjustment.
4	EBS ADJ.	Regarding the adjustment of edge line thickness in fused infrared and visible-light images—some users prefer fainter outlines, while others prefer them sharper—users can customize this setting

		according to their personal preferences.

4.4.1.7 Record

Select the Record function from the top-level menu. The Record function includes the following:



No.	Function	Function Description
1	Photograph	You can capture an image by briefly pressing the trigger button or by tapping the touchscreen. Once captured, the image freezes; you must then briefly press the confirmation button to save it, or briefly press the back button to cancel. Upon completion of the capture process, two image files are saved to the album: one is a "What You See Is What You Get" (WYSIWYG) thermal image embedded with temperature data (suitable for subsequent analysis), and the other is an 8-megapixel visible-light photograph. This facilitates user record-keeping, issue reporting, and other related tasks. For example: Documenting Fault Evidence: Capture a thermal image of a hot spot to visually record its temperature, location, and fault status; Generating Inspection Reports: Perform secondary analysis on the captured images to compile comprehensive inspection reports;

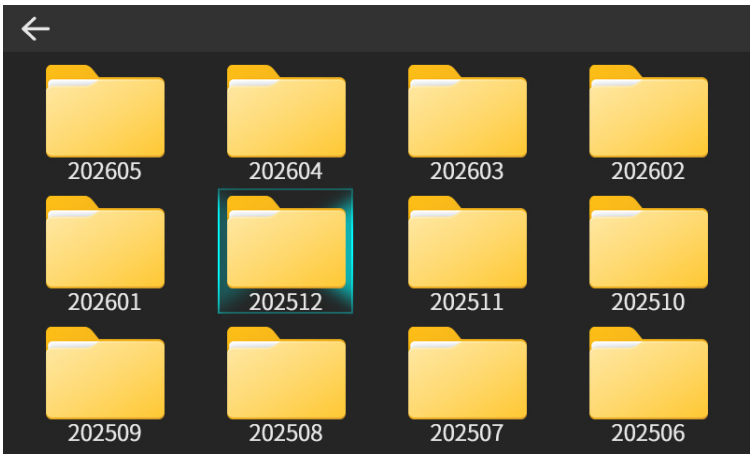
		Archiving for Fault Comparison: Archive current temperature readings to serve as a baseline for future re-inspections, allowing you to track whether overheating has worsened or if potential hazards have been resolved; Remote Reporting and Communication: Capture on-site images and share them with supervisors, clients, or maintenance personnel, enabling them to clearly visualize the issue without needing to be physically present.
2	Video	High-definition video recording captures the entire inspection process, facilitating the creation of inspection reports and remote briefings. For example: Continuous Dynamic Recording: Captures the entire process of walk-through inspections and full-cabinet diagnostics, ensuring no hidden heat sources are overlooked; Replay and Refine Analysis: Allows for the review of video footage to meticulously analyze and pinpoint subtle hotspots that may have been unclear during the on-site inspection; On-site Demonstration and Evidence: Provides clients with video footage of the actual inspection, verifying the authenticity and validity of the assessment while fostering trust; Continuous Temperature Monitoring for Complex Equipment: Enables uninterrupted recording of long electrical lines or entire rows of distribution cabinets, creating a comprehensive record of the temperature status across the entire circuit.
3	Screenshot	Capture the current screen view to facilitate user screenshots and operations, and create instructional materials.
4	Screen recording	Reserved for Future Upgrades
5	Radiometric video	Recorded radiometric videos are saved in the .dyv file format and require specialized analysis software to be opened. A radiometric video (or "full-radiometric video") is a recording in which every single frame retains the original infrared radiation and temperature data; this allows for retrospective, point-by-point

		temperature measurement, playback, and analysis—making it an invaluable tool for precise temperature monitoring, documenting dynamic processes, and tracing the root causes of faults. For example: Power System Operations Review: Conducting inspections of power distribution cabinets, transformers, and high-voltage transmission lines; saving radiometric videos enables retrospective analysis of thermal evolution processes to identify and troubleshoot latent faults. Industrial Equipment Temperature Rise Testing: Performing load tests on motors, bearings, and heating equipment; recording temperature fluctuations throughout the entire process to generate professional data reports on test results. Energy Storage / Battery Safety Monitoring: Conducting dynamic temperature monitoring of individual battery cells and battery packs; reviewing thermal data streams to predict and preempt the risk of thermal runaway.
6	Photograph interval	The photo capture interval feature encompasses both time-lapse photography and thermal imaging. Users can customize scheduled continuous shooting and configure the device to automatically capture images whenever a temperature threshold is exceeded. This allows users to continuously monitor the status of target objects over extended periods, even when they are not physically present on-site. Examples: Unattended Inspection of Power Distribution Rooms: Automatically captures time-lapse images during nighttime hours or after business hours, creating a comprehensive visual record without the need for on-site personnel. Monitoring of Equipment Rooms and Base Stations: Periodically captures snapshots within equipment rooms and base stations to monitor the temperatures of cabinets, power supplies, and battery banks. Identification of High-Risk Electrical Hazards: Automatically saves images the moment components—such as distribution cabinet

		terminals, cable heads, or bus bars—exceed safe temperature limits, enabling the early detection of overheating faults. Inspection of EV Charging Stations and Energy Storage Facilities: Automatically captures images whenever battery packs or charging modules overheat, serving as a preventive measure against thermal runaway.

4.4.1.8 Gallery

Selecting the album function from the primary menu will take you to the photo library, as shown below:

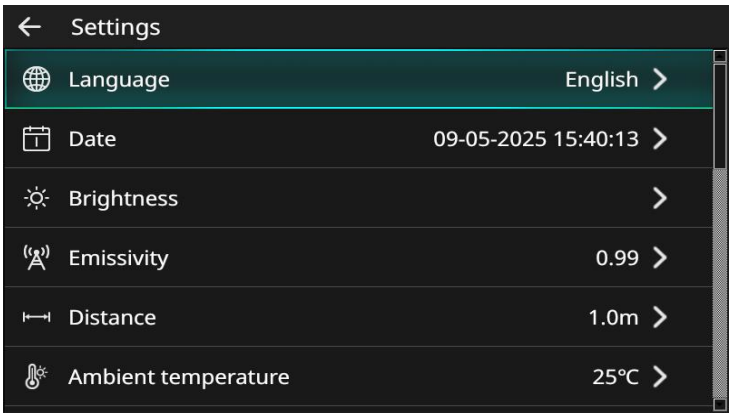




When the device captures an image, it saves two separate files: one is a "What You See Is What You Get" (WYSIWYG) infrared image—named with the suffix "IR.jag"—and the other is an 8-megapixel visible-light image—named with the suffix "VI.jpg." The WYSIWYG infrared image is suitable for subsequent analysis; by selecting the corresponding infrared image and either briefly pressing the Confirm button or tapping the touchscreen to enlarge it, a menu bar will appear on the left side of the screen. This menu bar includes the following functions:

No.	Function	Function Description
1	Image mode switching	It allows users to switch between three image modes: WYSIWYG image, visible light image of the same size as WYSIWYG, and 8-megapixel visible light image. Users can operate in different modes according to their needs.
2	Voice annotation (not yet available)	Not open yet
3	Text annotations (not yet available)	Not open yet
4	Point, line, and frame analysis	Users can perform secondary analysis by drawing points, lines, and boxes on photos, and supplement any overlooked points of interest at any time to ensure comprehensive detection data.

4.4.1.9 Setting



No.	Function	illustrate
1	Language	Supporting 11 languages—English, French, Spanish, Portuguese, German, Russian, Arabic, Japanese, Korean, Simplified Chinese, and Traditional Chinese—the system allows operators from diverse regions to switch to their native tongue, ensuring a seamless and barrier-free user experience.
2	Date and Time	Users can set the date and time themselves.
3	Brightness	Users can adjust the brightness according to their usage.
4	Emissivity	Emissivity refers to an object's ability to radiate infrared thermal energy outward. The rougher and darker an object is, the more easily it radiates heat, resulting in a higher emissivity value. The smoother an object is—particularly polished metals—the more difficult it is for it to radiate heat, resulting in a lower emissivity value. An object's material, surface finish, and texture all influence its emissivity; even for objects made of the same material, differences in surface finish and texture can lead to significant variations in emissivity. Thermal imaging cameras measure temperature by detecting infrared radiation; setting the emissivity correctly ensures that

		the true temperature is accurately measured. Matte: 0.95 Semi-matte: 0.80 Semi-gloss: 0.60 Glossy: 0.30 Custom: Default 0.99 (user-adjustable)
5	Target distance	0.5m–20m Distance Compensation: As the measurement distance increases, infrared signal attenuation can affect the accuracy of temperature readings. To address this, users can specify the exact distance between the sensor and the object being measured; the device then applies a proprietary temperature algorithm to compensate for and correct these effects, resulting in more accurate temperature measurements.
6	Ambient temperature	The object being measured not only emits its own infrared radiation but also reflects the temperatures of the surrounding air, walls, and sunlight; consequently, the instrument may inadvertently factor the ambient temperature into its readings. During the measurement process, ambient temperatures that are either excessively high or low can lead to inaccurate readings. To ensure greater accuracy, it is recommended to configure the instrument's ambient temperature setting to match the actual current environmental temperature. However, when the object being measured possesses a high emissivity—and, conversely, a very low reflectivity—the ambient temperature will have virtually no impact on the measurement results; in such cases, the ambient temperature setting may simply be maintained at a standard room temperature of 25°C.
7	Relative humidity	Relative humidity refers to the ratio of the actual water vapor content in the air to the saturation water vapor content at the same temperature, expressed as a percentage.

		The higher the humidity value, the more humid the air; conversely, the lower the value, the drier the air. Water vapor can attenuate infrared radiation, leading to deviations in temperature measurement data. To ensure greater accuracy when taking temperature measurements, users should set the environmental relative humidity parameter to match the actual relative humidity of the surrounding environment.
8	Reflection temperature	Object surfaces reflect infrared thermal energy from surrounding heat sources (such as sunlight, high-temperature equipment, walls, or other heat-emitting bodies); this component of external thermal energy is referred to as the reflected temperature. How to set the reflected temperature: When the emissivity of the object under measurement is high, the impact of reflection is negligible; in such cases, the reflected temperature can simply be set to the ambient room temperature of 25°C. However, when the object's emissivity is low, setting the reflected temperature to match the temperature of any intense heat sources surrounding the object will yield more accurate temperature measurements.
9	temperature unit	Celsius, Fahrenheit, and Kelvin are all available , allowing users to choose different temperature units according to their usage habits.
10	Distance unit	Meters and feet are both available , allowing users to choose different distance units according to their usage habits.
11	Temperature alarm	temperature alarms as needed , and set temperature alarm thresholds to facilitate timely detection of temperature anomalies during the testing process.
12	Temperature range	Select able temperature ranges include Auto, -20°C to 150°C, 150°C to 600°C, and 600°C to 1200°C; the default setting is Auto Range. When the user is unsure of the approximate temperature of the object under measurement, the Auto Range mode can be

		selected to scan across the entire temperature spectrum. When the user has a general idea of the object's temperature range, the corresponding temperature tier can be selected to focus on observing the specific thermal conditions within that particular interval.
13	Custom buttons	The customization button functions include a wide range of options: None, Enter Gallery, Cycle Display Modes, Toggle Magnification, Switch Between Last Two Color Palettes, Toggle Temperature Ranges, Screenshot, Screen Recording, Range finding, Spot Thermometer Mode, Laser Pointer Toggle, LED Light Toggle, Wi-Fi Toggle, Bluetooth Toggle, and All Alarms Toggle. Users can assign frequently performed operations to a specific button, thereby minimizing the need to navigate menus, reducing the total number of button presses, and minimizing the risk of accidental operations.
14	Temperature display	Follow Mode vs. Centralized Display (Selectable) **Follow Mode:** When enabled, the maximum, minimum, and center-point temperatures are displayed directly adjacent to their corresponding crosshairs on the screen. **Advantages:** * Each temperature reading corresponds directly to a specific point, making it intuitive and unambiguous. * When performing multi-point temperature measurements, the temperature at each specific location is immediately visible at a glance. * Facilitates maintenance and troubleshooting by allowing for precise identification and targeting of fault locations. **Disadvantages:** * With numerous measurement points, the screen can become cluttered, potentially obscuring fine details within the thermal image. * On small screens, the scattered text can make rapid

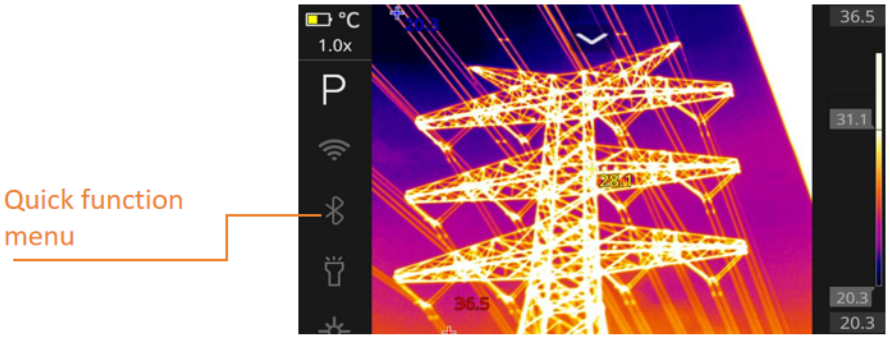
		reading visually fatiguing. The visual layout may appear disorderly when performing temperature measurements across a large, full-screen area. Centralized Display: When enabled, the maximum, minimum, and center-point temperatures are grouped together and displayed in the upper-left corner of the screen. Advantages: Readings are arranged neatly and centrally, offering a clear overview that allows for faster data acquisition. Does not obstruct the thermal image itself, allowing for an unimpeded view of the complete temperature distribution. The interface remains clean and uncluttered, making it more comfortable for prolonged observation sessions. Disadvantages: It is not immediately intuitive to determine which specific temperature value corresponds to which specific point on the screen. When performing simultaneous multi-point measurements, it can be difficult to distinguish which data belongs to which specific location. Precise, point-by-point comparison lacks the visual immediacy of the Follow Mode.
15	Automatic shutdown	5 minutes, 10 minutes, 30 minutes, 60 minutes, Never Users can configure the automatic shutdown time based on their usage patterns. If the device remains inactive for the specified duration, it will automatically power off, thereby conserving energy.
16	Storage	Check storage status and format.
17	Reset system parameters	Includes emissivity, target distance, ambient temperature, relative humidity, reflectance temperature, temperature unit, distance unit, temperature alarm, temperature range, temperature display, automatic shutdown, brightness , and

		measurement reset to initial state.
18	Check for upgrade	Upgrade program
19	About	Displays the serial number, software version number, firmware version number, and lens focal length.

Note: Adjusting emissivity, target distance, ambient temperature, relative humidity, and reflected temperature will affect the accuracy of temperature measurement. Please do not set these parameters arbitrarily.

4.4.2 Quick Function Menu

The left side of the screen displays the quick access menu. Functions in the quick access menu have gray icons when disabled and white icons when enabled. The quick access menu includes the following functions:

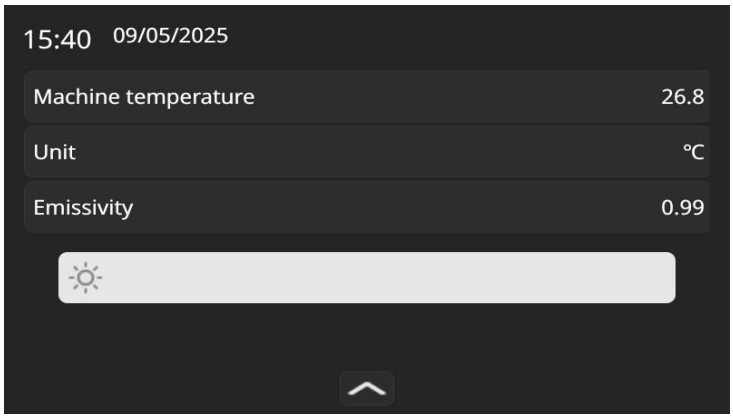


No.	Function	illustrate
1	P	P is for custom button function selection. You can choose the functions of custom buttons without entering the settings, making operation more convenient .
2	WiFi	It allows you to turn WiFi on or off, change the password, and view Wi-Fi parameter status , making it easy to connect your device to the app.
3	Bluetooth	It allows you to turn Bluetooth on or off, view the device's Bluetooth name, connectable devices, pair, view connected device names, and unpair . When the device is connected to the app, it can directly transmit Wi-Fi passwords via Bluetooth for seamless connection.
4	Lighting	turning the lights on or off , users can use LED supplemental lights in low-light environments to assist with positioning and capture visible light details.
5	Temperature gun mode	the spot temperature gun mode on or off . When the spot temperature gun mode is on, it will emit a red laser dot. The user can point the red laser dot at the location to be

		measured, and a laser pointer icon will appear on the screen. The temperature at the location pointed to by the laser dot will also be displayed in the lower right corner of the screen , allowing for precise temperature readings at each point.
6	Distance measurement	enabling or disabling laser ranging , users can determine the distance to the object being measured and adjust the target distance accordingly for more accurate temperature measurement.

4.4.3 Drop-down menu

Tap the drop-down menu icon on the main interface to view the device's operational status. The drop-down menu includes the following items:



- Date and Time
- Machine temperature
- Unit
- Emissivity
- Adjust brightness

5 Frequently Asked Questions

Frequently Asked Questions (FAQs) for handheld devices are shown in the table below.

If you encounter any problems that cannot be resolved, please contact the supplier.

Q1	**Why does the temperature fluctuate so much after the computer has been running for a while ?**
A1	and temperature measurements may be inaccurate during the warm-up process . Generally, the more advanced the thermal imaging camera, the shorter the stabilization time.
Q2	**Is the image lagging?**
A2	To ensure a uniform display of thermal images and more accurate temperatures, an internal calibration baffle is used for calibration . During calibration, the baffle will make a clicking sound, and the image will freeze for about 1 second . Almost all infrared thermal imaging products on the market do this, which is normal, so please use them with confidence .
Q3	**How can I determine if the temperature is accurate?**
A3	In the absence of a standard temperature source, you can aim the device at your mouth from a distance of 1 meter and measure the temperature, which will be approximately 35~38℃ (the temperature measured when the machine clicks to indicate a temperature setting is more accurate). Since the human body is not a standard temperature source, the temperature may have some deviation.
Q4	**How can infrared and visible light be combined?**
A4	This product supports the fusion of visible and infrared light. Visible light can supplement image details that infrared cannot observe. Due to differences in installation location and field of view between visible light and infrared sensors, it is recommended to observe from a distance of more than 1 meter when enabling contour or overlay fusion functions to achieve better fusion results. If the fusion effect is still not good at a distance greater than 1 meter, fine-tuning can be performed through the fusion deviation adjustment in the image mode.
Q5	**How do I set up temperature compensation?**
A5	Since the thermal imaging camera performs temperature calibration at a distance of 1m, the default temperature compensation distance of the device is 1m. Therefore, the measured temperature is most accurate when the target object is 1m away from the device. If the distance between the object being

	measured and the device is not 1m, the corresponding distance can be adjusted through the distance compensation settings. Different devices have different compensation distances, and the more advanced the device, the farther the compensation distance.
Q6	**Is the image blurry ?**
A6	Since this infrared thermal imaging camera uses an adjustable focus lens, if the image is blurry during use, you can rotate the lens by hand while observing the screen. Once the image is clear, you can adjust the focus. Different observation distances require readjusting the focus.

6 Emissivity table of common objects

Infrared thermal imaging temperature measurement technology is a technique that uses an infrared detector to receive the infrared radiation of the object being measured, and then a signal processing system converts it into a video thermal image of the target. It transforms the thermal distribution of the object into a visual image, which is then displayed on a monitor in grayscale or pseudo-color, thereby obtaining information about the temperature distribution field of the object being measured.

Because the surface temperature of an object measured by an infrared thermal imaging camera is not obtained directly but calculated from the measured radiant energy, the measurement accuracy is affected by factors such as the emissivity and reflectivity of the measured surface, background radiation, atmospheric attenuation, measurement distance, and ambient temperature. A table of emissivity for common objects is shown below:

Material	Emission rate	Material	Emission rate
Wood	0.85	Aluminum plate	0.09
Black paper	0.86	Rust	0.8
PVC plastic	0.93	Copper coin	0.06
Bricks	0.75	Plaster	0.75
Concrete	0.97	Black aluminum	0.95
Stainless steel	0.14	Paint	0.9
Copper oxide	0.78	Human skin	0.98
Polycarbonate	0.8	Rubber	0.95
Adhesive tape	0.96	Asphalt	0.96
Cast iron	0.81	Soil	0.93

Note: The emissivity in the table is for reference only. Factors such as the object's appearance, manufacturing process, and degree of oxidation will affect the object's emissivity.

7 APP for Android systems

Download the UNIKS THERMAL PRO APP compatible only for Android systems.



8 Analysis software

8.1 Overview

Thermal Tools is a professional computer-based data analysis software capable of performing secondary analysis and processing on images acquired by specific infrared equipment. Download the Software from the [www.uniks.it website]

8 . 2 Feature

- The software interface is easy to understand and use;
- The temperature can be displayed anywhere on the entire screen;
- Multiple image modes can be switched;
- Processed images can generate corresponding reports;
- Available to integrate other related software or hardware cameras;

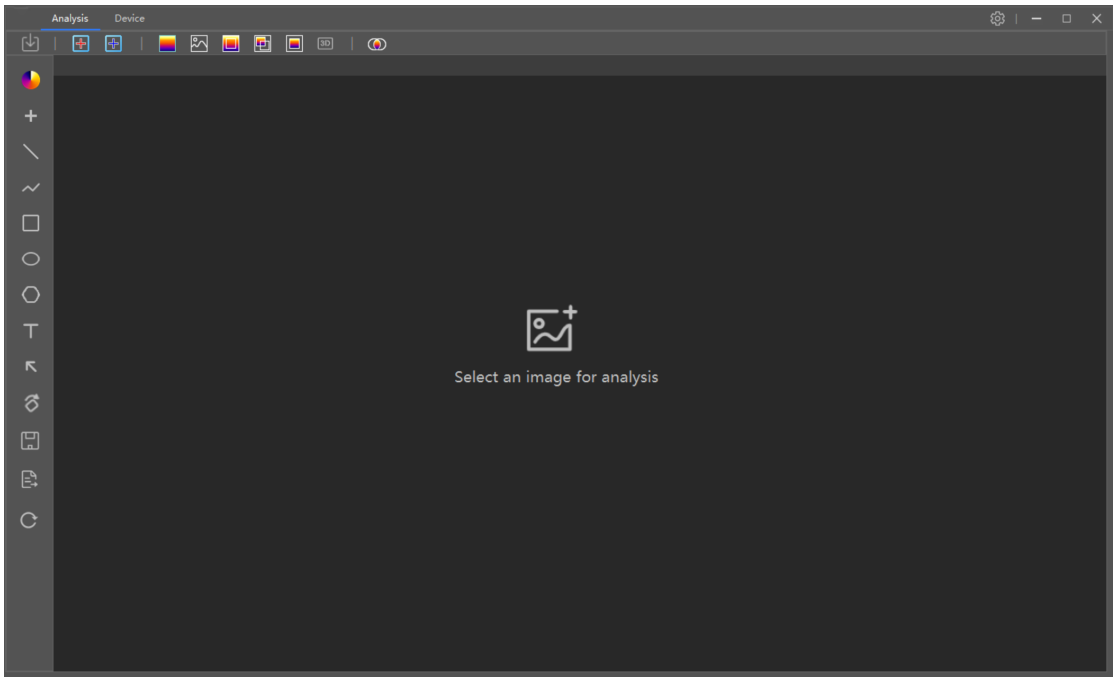
8 . 3 Details

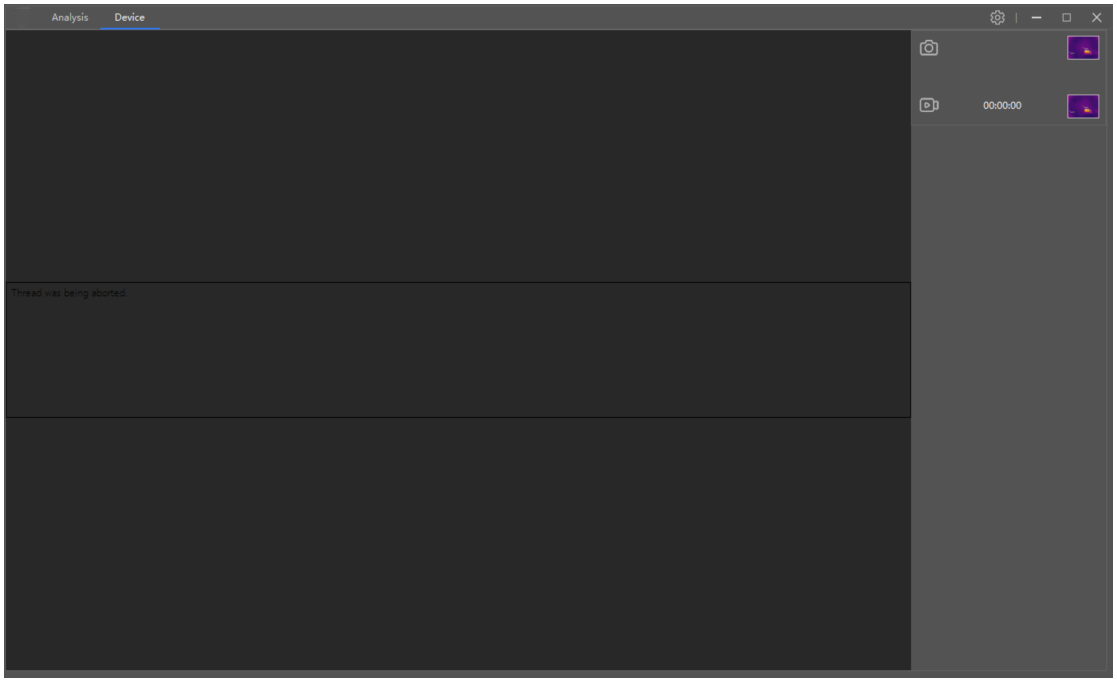
8 . 3 .1 Operating Environment

It is recommended to install this software on Windows 10 and later operating systems to ensure normal and stable operation of the software.

8 . 3 . 2 Main Interface

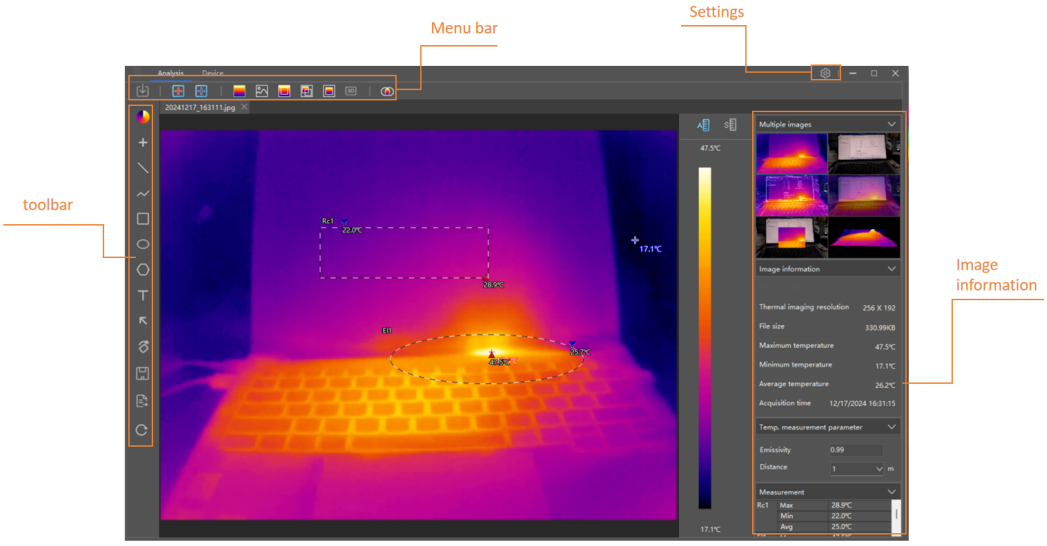
Open the software, which includes the thermal image analysis section and camera import section. The interface is shown in the figure below.





8 .3.3 Radiometric analysis

Import the image into the radiometric analysis sector for analysis. The interface is shown in the figure below.



The toolbar contains the following functions:

NO.	Function	Functional description
1	Color palette	Different color palettes can be replaced as needed
2	Points	Select to display the temperature information of the corresponding point on the image
3	Line	Draw a line on the image and observe the highest and lowest temperature on the line.
4	Polyline	Draw a polyline on the image and observe the highest and lowest temperatures on the line.
5	Rectangle	Draw a broken line on the image and observe the highest and lowest temperatures on the line
6	Ellipse	Draw an ellipse on the image and observe the highest and lowest temperatures on the line

7	Polygons	Draw a polygon on the image and observe the highest and lowest temperatures present on the polygon.
8	Text	Annotate images with text
9	Arrow	Markup arrows on images
10	Rotate	Rotate the image 90° clockwise
	Horizontal mirror	Mirror image horizontally
	Vertical mirror	Mirror image vertically
11	Save	Save the image
12	Export Report	Export graphical analysis reports
13	Reset Screen	Restores the graphics, rotation angle, and color temperature area drawn on the screen to its initial state

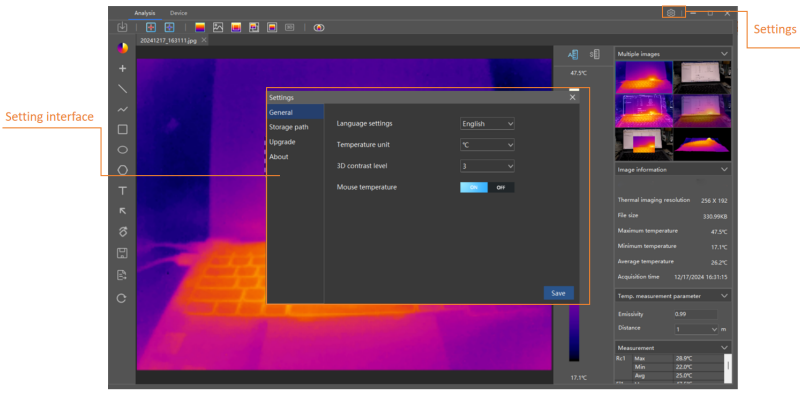
The menu bar contains the following functions:

NO.	**Function**	**Functional description**
1	Files	Open, close, save, export file reports
2	High temperature	Cancel or enable high temperature display in image
3	Low temperature	Cancel or enable low temperature display in image
4	Thermal imaging	Switch to thermal imaging
5	Visible light	Switch to visible light image
6	Feathering edges	Switch to edge blending image
7	Overlapping Blending	Switch to the Overlay Blending Image

8	Picture in picture	Switch to picture-in-picture
9	3D	Change 3D Image
10	Fusion alignment	Thermal and visible light images are not completely fused, so they can be universally fused, aligned, and adjusted.

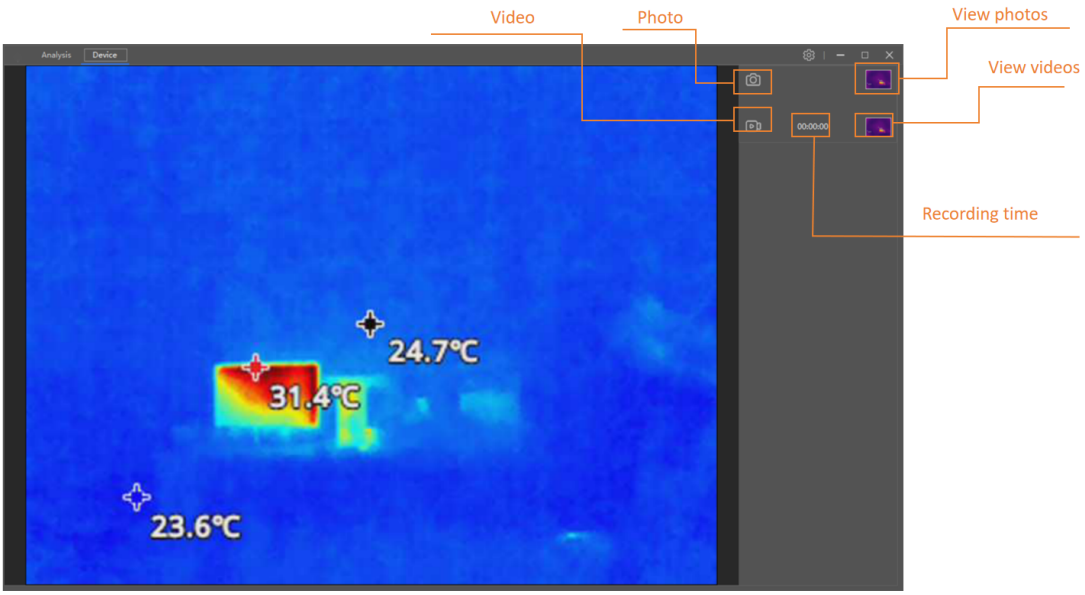
"In the top right corner of the software you will find the setting options, which include the following:

NO.	Options	Description
1	Language settings	It supports English, French, German, Spanish, Russian, Japanese, Korean, and Chinese.
2	Temperature unit	Celsius, Fahrenheit, Kelvin
3	3D contrast level	Adjust image contrast in 3D mode
4	Mouse temperature	Enable or disable the temperature display feature on the image when the mouse is turned on
5	Storage location	Storage location for images, reports, and videos
6	Update	To upgrade the version
7	About	Software name, version number.



8 .3.4 Importing the Camera

The camera import section requires the portable camera to be connected to the computer via USB. Once connected, the camera screen can be synchronized with the camera's import section, and photo/video operations can be completed in the upper left corner.



The camera import interface feature contains the following contents:

NO.	Function	Functional description
1	Photos	After successfully connecting the camera, click the camera to take photos.
2	Video	After successfully connecting the camera, click the record button with the mouse: the recording icon turns red, and the recording time on the right starts to change, indicating that the recording was successful. Click Register again to complete the registration.

3	View photos	By clicking with the mouse on the photo you can enter and see more details
4	Watch videos	By clicking with the mouse on the video you can enter and see more details

9 Precautions and Warranty

WARRANTY CONDITIONS

This instrument is guaranteed against defects in materials and workmanship, in accordance with the general conditions. During the warranty period, defective parts may be replaced, but the manufacturer reserves the right to repair or replace the product. If the instrument is to be returned to the after-sales service or to a dealer, the transport is at the expense of the customer. The shipping wort, however, be agreed. In a report to send an explanatory note about the reasons for the tool must always be included. Only for transport use the original packaging. Any damage caused by the use of non-original packaging is the responsibility of the customer. The manufacturer accepts no liability for damage caused to persons or property.

The warranty does not apply in the following cases:

- Repair and/or replacement of accessories and battery (not covered by warranty).
- Repairs required due to incorrect use of the tool or its use with incompatible equipment.
- Repairs made due to improper packaging.
- Repairs required due to work carried out by unauthorized personnel.
- Modification of the instrument without the explicit permission of the manufacturer.
- Use not covered by the instrument specifications or instruction manual.

- The contents of this manual may not be reproduced in any form without the permission of the manufacturer.
- Our products are patented and of their own brands. The manufacturer reserves the right to change specifications and prices if this is due to technological improvements.

ASSISTANCE

If the tool is not working properly, check the condition of the battery and the wear of the cables before contacting Customer Service and replace them if necessary. If the instrument continues to malfunction, check whether the procedure for using it complies with the instructions in this manual. If the instrument is to be returned to the after-sales service or to a dealer, the transport is at the expense of the customer. The shipping wort, however, be agreed. In a report to send an explanatory note about the reasons for the tool must always be included. Use only the original packaging for shipping; Any damage caused by the use of non-original packaging is the responsibility of the customer.

- Do not expose this device to dust or moisture.
- Do not directly expose the lens to bright light sources, such as sunlight and lasers, as this may cause permanent physical damage.
- Do not disassemble the device yourself, otherwise you risk damaging it.
- 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 detergents to clean the lenses. It is recommended to clean them with a soft object moistened with water.

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