Portable Infrared Thermal Imager

IR thermometry · 3.5" touch screen · Visible fusion

USER MANUAL

Model **TT-96 · TT-160 · TT-256**



■ **3.5” touch screen · Visible fusion · Point / line / area analysis**

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1. Safety Instruction

To protect yourself and others from injury or to protect your device from damage, please read all the information below before using your device.

1) Notes

① Do not direct the equipment at very high intensity thermal radiation sources, such as the sun, lasers, spot welders, etc., which may cause damage to the equipment.

② Do not use or store the instrument in an environment that exceeds the permitted operating temperature or storage temperature of the equipment, which may cause damage to the equipment.

③ Do not knock, throw or vibrate instruments and accessories to avoid damage.

④ Do not touch the device or USB port with your wet hand to avoid damage.

⑤ Do not use dissolved or similar liquids on equipment and cables, as this may cause damage to the equipment.

Please follow the below instructions when you wipe the ⑥ device:

a. Non-optical surface: the user could user the clean and soft cloth to wipe it;

b. Optical surface: When using the thermal camera, please avoid staining the optical surface of the lens, especially touching the lens with your hands, because the sweat on your hands will leave traces on the lens glass and may corrode the optical coating layer on the glass surface.

When the surface of the optical lens is contaminated, carefully wipe it with professional lens paper.

⑦ When using the equipment, please try to keep it stable and avoid violent shaking.

⑧ This product will emit a slight "click" sound when working, which is the "shutter refresh" sound of the lens, which is a normal phenomenon in the operation of the equipment.

2) Warnings

① If you find that the product has smoke, sparks, burnt odor during use, please stop using immediately; To ensure personal safety, power off the device.

② Do not charge the device with wet hands; Charging with wet hands poses a risk of electric shock.

③ When not charging, please unplug the adapter from the power socket; After the adapter is powered on for a long time, it is possible to overheat, deformation, and even fire.

④ If the adapter or USB cable is damaged, stop using it immediately. A damaged adapter or USB cable may cause a fire due to overheating or short circuit.

⑤ If the device is not used for a long time, please store it in a cool and dry environment and charge the device regularly, otherwise the power will be exhausted and the battery life will be shortened.

3)Do not disassemble the equipment, which may cause damage to the equipment and forfeit the warranty rights; If there is a fault, please contact the company, by professional maintenance.

2. Product Specifications

Model	TT-96	TT-160	TT-256
Detector type	Vanadium oxide (VOx) microbolometer		
IR resolution	96×96	160×120	256×192
IR wavelength	8~14μm		
Pixel spacing	12μm	17μm	12μm
Focal length	1.35mm	3.2mm	3.5mm
IFOV	8.89mrad	5.31mrad	3.43mrad
Image frame rate	25Hz		
NETD (@25℃, F#1.0)	≤60 mK	≤40 mK	≤40 mK
Focal adjustment mode	Fixed focal		
Field angle	50°×50°	50°×37.2°	50°×37.2°
Emissivity	0.01~1.00		
Temp. measured range	-20℃~550℃ (-4℉~1022℉)(253.2K~823.2K)		
Temp. accuracy	±2℃ or ±2% of reading, whichever is greater		
Minimum scale	0.1℃		
Temp. measurement mode	Industrial temperature measurement		
Temp. unit	℃/℉/K		
Temp. measurement display	Center point, highest point and lowest point temperature		
Temp. analysis	Point, line, surface (area)		
Isotherm	Support		
Center point temperature	Support		
High/low temperature tracking	Support		

Model	TT-96	TT-160	TT-256
High/low temperature alarm	Icon alarm		
Palette	White hot / Black hot / Rainbow / Iron red / Red hot / Lava		
Image mode	Infrared mode, visible light mode, fusion mode, PIP mode		
Visible light resolution	2 million; 1600×1200		
Lighting lamp	Support		
Display screen	3.5 inch		
Display screen resolution	640×480		
Touch TP	Support, capacitive screen		
Temperature alarm	Support		
Image/video format	JPEG/MP4		
Photo/video	Support		
Language	Supports 10 languages		
Storage	Built-in SD card (8GB)		
PC analysis software	Support		
External interface	Type-C		
Battery	Built-in polymer lithium battery 2500mAh		
Charging duration	≤4h		
Total machine power	≤1.4W		
Operating temperature	-10~50℃		
Operating humidity	10%~90% RH non-condensing		
Storage temperature	-20~60℃		
Protection level	IP54		
Certification	CE、FCC、ROHS		

Other parameters

Device weight	200g
Device size	106×86×26.5mm
Optional accessories	Macro lens

Note: This product does not include a power adapter. Please use a compliant power adapter purchased separately.

3. Product Structure

Item	Instructions	Item	Instructions	Item	Instructions
1	Power button	4	Tripod fixing screw hole	7	Thermal imaging
2	Shutter button	5	Type-C USB port	8	Fill light
3	Display screen	6	Lanyard hole	9	Visible light

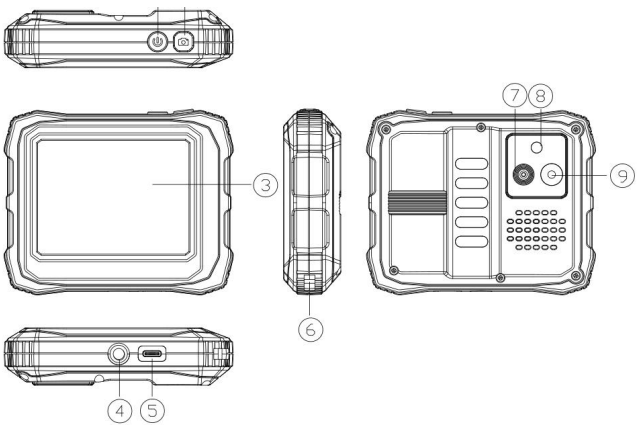


Fig. 1 Product structure

4. Display Instructions

Item	Instructions	Item	Instructions
1	Center / highest / lowest temperature value	6	Temperature measurement distance
2	Tracking the highest temperature point	7	Emissivity
3	Tracking the lowest temperature point	8	Quantity of electricity
4	Observing the center point of the image	9	Pseudo color bar
5	Date and time	10	Menu



Fig. 2 Display interface

5. Button Illustration

Button	Current status of device	Short press	Long press
Power button	Power off	/	Power on
	Main interface	Sleep screen / wake up	Power off / 10S forced shutdown
	Menu interface	Go back	Power off / 10S forced shutdown
Shutter button	Main interface	Take a photo	Record a video
	Menu interface	/	/

6. Menu

Menu Operation Guide Tap the "Menu" icon to enter the menu interface. Use the option box to switch between Image Mode, Image Parameters, Magnification, Temperature Analysis, File, Settings and other options, then tap to enter the corresponding function interface.



Fig. 3 Bottom menu icon bar

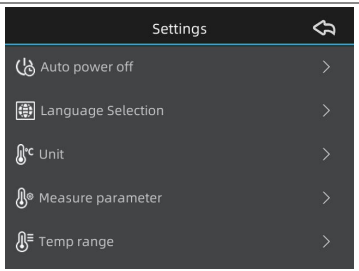


Fig. 4 Settings menu (1)

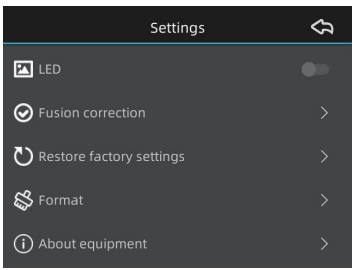


Fig. 5 Settings menu (2)

Tap a blank area or short-press the power key to return to the previous interface.

6.1 Image Mode

Function Description: It can be freely switched according to different observation scenarios to meet diverse observation and temperature measurement requirements.

①Thermal Imaging Mode: Presents the temperature distribution of the measured object via infrared thermal imaging.

②Fusion Mode: Fuses infrared thermal imaging and visible light images, providing both temperature information and object details.

③PIP: Dual-window display (infrared thermal image + visible light), balancing detection accuracy and scene recognition.

④Visible Light Mode: Displays only the visible light image to observe the object appearance and surrounding environment, assisting in the judgment of abnormal temperatures.

Operation Method: After selecting the "Image Mode" option, you can tap to switch between Thermal Imaging / Fusion / PIP / Visible Light modes as required.

6.2 Image Parameters

Function Description: Used to adjust the screen display effect, including Image Brightness / Image Contrast / LCD Brightness. Can be freely adjusted according to the usage environment and observation needs to improve screen clarity and viewing comfort.

Operation Method: After selecting the Image Parameters option, you can tap to switch among Image Brightness, Image Contrast, and LCD Brightness according to environmental requirements. Each can be set within the range of Level 1–10.

6.3 Magnification

Function Description: Magnification is used to zoom in on part of the image for detailed viewing. It supports switching between ×1 / ×2 / ×4 magnification, allowing you to enlarge details according to observation needs, so as to clearly view the details and temperature characteristics of the target area.

Operation Method: After After selecting the Magnification option, you can tap to switch between ×1 / ×2 / ×4 magnification as needed.

6.4 Temperature Analysis

Function Description: Temperature Analysis is used to measure and analyze the temperature of the target area. It supports 3 points / 1 line / 1 area temperature measurement functions and can display real-time temperature data of the corresponding area. Select Delete to clear the current temperature measurement markers for re-adding targets.

Operation Method: After selecting the Temperature Analysis option, the function selection interface with Delete / Point / Line / Area will pop up.

①Delete: Tap this button to delete all added point, line and area measurement data at once.

②Point: Touch the " " symbol on the touchscreen; a point temperature measurement icon will be added at the center of the imaging screen.When the icon is red, you can long-press and drag the point icon freely to the target position within the imaging area.Touch any other area of the screen or short-press the power key to save the position; the icon will turn green, and the temperature data of this point will be displayed on the left.Up to 3 sets of point temperature analysis data can be added.Existing point data supports secondary editing, hide & show, and delete operations.

③Line: Touch the " " symbol on the touchscreen; a line temperature measurement icon will be added at the center of the imaging screen.When the icon is red, you can tap both ends of the line icon and drag them freely to the target position within the imaging area; the line can be lengthened or shortened.Touch other areas of the line icon or short-press the power key to save the position; the icon will turn green, and the maximum and minimum temperatures of the line will be displayed on the left.Only 1 set of line temperature analysis data can be added.Existing line data supports secondary editing, hide & show, and delete operations.

④ Area: Touch the " " symbol on the touchscreen; an area temperature measurement icon will be added at the center of the imaging screen.When the icon is red, you can long-press and drag the area icon freely to the target position within the imaging area, and you can expand or shrink the area.Touch other areas of the area icon or short-press the power key to save the position; the icon will turn green, and the maximum and minimum temperatures of the area will be displayed on the right.Only 1 set of area temperature analysis data can be added.Existing area data supports secondary editing, hide & show, and delete operations.

6.5 File

Function Description: Used to store and manage photos and videos captured by the device, supporting browsing, viewing and deletion operations.

Operation Method:

①Select the Photo option. Slide up and down the photo list to switch and view; double-tap the screen to open a photo.Long-press a photo in the list or preview interface to bring up the delete confirmation dialog.Tap Yes to delete or No to cancel. The system will automatically return to the previous interface after the operation.

② Video: Select the Video option. Slide up and down the video list to switch between videos, and double-tap the screen to open a video.During playback, single-tap the screen to pause or resume, and drag the progress bar left or right to fast-forward or rewind.Long-press a video in the list or playback interface to bring up the delete confirmation dialog.Tap Yes to delete or No to cancel. The system will automatically return to the previous interface after the operation.

6.6 Settings

After entering the Settings interface, tap to select the corresponding option:Auto Power Off / Language Settings / Unit / Measurement Parameters / Temperature Range / Temperature Alarm / Time Settings / Display Settings / USB Flash Drive / TISR / Fill Light / Fusion Calibration / Restore Factory Settings / Format / About Device.Tap the option again to enter its function settings interface.

6.6.1 Auto Power Off

Function Description:With this setting enabled, the device will automatically power off after a set period of inactivity.

Operation Method: After entering the Auto Power Off option, tap the corresponding setting to switch among five modes: Off / 5 min / 10 min / 20 min / 30 min.

6.6.2 Language Settings

Function Description: Used to switch the device interface display language. You can select the corresponding language according to usage needs for easier operation and viewing.

Operation Method: After entering the Language Settings option, tap the corresponding language to switch among:Simplified Chinese / Traditional Chinese / English / Русский язык / 日本語 / Deutsch / Français / Italiano 한국어 Język/ / polski.The system interface will update automatically once the target language is selected.

6.6.3 Unit

Function Description: Used to switch the temperature display unit. You can select the corresponding unit according to usage habits to meet temperature reading requirements in different scenarios.

Operation Method: After entering the Unit option, tap the corresponding unit to switch among °C (Celsius) / °F (Fahrenheit) / K (Kelvin).

6.6.4 Measurement Parameters

Function Description: Used to calibrate temperature measurement accuracy, including ambient temperature, measurement distance and emissivity.Can be set according to actual detection scenarios to improve the accuracy of temperature measurement.

Operation Method: After entering the Measurement Parameters option, the interface with function options including Ambient Temperature / Measurement Distance / Emissivity will pop up.

① Ambient Temperature: After selecting Ambient Temperature, set it according to the current actual ambient temperature. The adjustable range is -10℃ ~ 50℃. Once finished, click the ✓ to confirm and save.

② Measurement Distance: After selecting Measurement Distance, set it according to the actual distance between the device and the measured target. The adjustable range is 0.3 ~ 3m. Once finished, click the ✓ to confirm and save.

③ Emissivity: After selecting Emissivity, adjust the corresponding emissivity value according to the material of the measured object. The adjustable range is 0.01 ~ 1.

Once finished, click the ✓ to confirm and save.

6.6.5 Temperature Range

Function Description: Used to switch the temperature measurement range of the device. You can select the corresponding range according to the temperature interval of the measured target.

Operation method: After entering the Temperature Range option, select and switch between Low Range (-20~150℃) and High Range (100~550℃) according to the temperature of the measured target. Click OK to confirm after selection.

6.6.6 Temperature Alarm

Function Description: Used for over-limit monitoring and automatic recording of the measured target temperature.

Operation method:

① After entering Temperature Alarm, click to set the high temperature threshold and low temperature threshold.

②Turn on/off the high temperature alarm switch and low temperature alarm switch.

③If automatic recording is required, enable the alarm auto-capture switch.

④Set the capture interval (adjustable range: 5s~30s) and capture quantity (adjustable range: 1~50 pieces).Click Back after completing all settings.

6.6.7 Time Settings

Function Description: The year, month, day, hour, minute and second can be adjusted to cope with time differences of the device in different time zones.

Operation Method:① After entering Time Settings, turn on/off the 24-hour format and select the time display format.

② Enter Date Settings to adjust the year, month and day.

③ Enter Time Settings to adjust the hour and minute. Click Back after completing all settings.

6.6.8 Display Settings

Function Description: Used to hide or display on-screen information for a cleaner and more intuitive display.

Operation Method: After entering the Display Settings option, click to turn on or off Minimum Temperature / Center Point / Emissivity / Measurement Distance / Date / False Color Bar as needed. The settings will take effect after clicking Back.

6.6.9 USB Flash Drive

Function Description: Used for data transmission and file copying between the device and a computer.

Operation Method:

① After entering the USB Flash Drive option, connect the device to the computer via a data cable.

② After the computer recognizes the external storage device, open the corresponding disk to view files such as images and videos stored in the device.

③ You can copy the images and videos stored in the device to the computer.

6.6.10 TISR

Function Description: TISR is an infrared image enhancement technology. When enabled, it can improve the clarity and detail performance of thermal imaging images.

Operation method: After entering the TISR option, turn TISR on or off as needed. The setting will take effect immediately after clicking Back.

6.6.11 Fill Light

Function Description: Used to provide auxiliary lighting when ambient light is insufficient, supplement light for the visible light camera, and facilitate clear imaging in dim, night and other low-light environments.

Operation Method: After entering the Fill Light option, you can choose to turn on/off the fill light for use as needed.

6.6.12 Fusion Calibration

Function Description: Used to calibrate the alignment of infrared and visible light fused images, resolve image misalignment and offset issues, and correct deviations or mismatches between thermal imaging and visible light images.

Operation Method: After entering the Fusion Calibration option, follow the operation prompts in the upper left corner, aim at the target object, and adjust to align the visible light image and infrared thermal image by moving.

6.6.13 Restore Factory Settings

Function Description: Used to restore the parameters of the settings function to the factory default status.

Operation Method: After clicking the Restore Factory Settings option, the system will pop up a dialog box saying "Restore factory settings?". Select Yes, and the device will immediately perform the restoration and clear all data.Warning: This operation is irreversible. Please choose carefully.

6.6.14 Format

Function Description: Used to format the internal storage of the device. All data and files on the device will be cleared after formatting.

Operation Method: After clicking the Format option, the system will pop up a dialog box saying "Format?". Select Yes, and the device will

immediately perform the formatting operation and clear all files in the storage.Note: This operation will permanently delete all data.

6.6.15 About Device

Function Description: This item is used to display basic device information, such as model, firmware version, application version, SN number, storage space, etc.

Operation Method: After clicking the About Device option, you can view the relevant information.

7. Common material emissivity

Emissivity differs between materials. Before measuring, select the emissivity matching the target material in the app.

Material	Emissivity
Wet soil	0.95
Glass	0.94
Red brick	0.95
Skin	0.98
Water surface	0.95
White paper	0.93
Black cloth	0.98
Wood	0.87

8. Warranty Service

Thank you for choosing this product, in order for you to fully enjoy the perfect after-sales service support, please keep the purchase receipt properly as warranty proof.

(1)The warranty period of this product is 1 year:The warranty period starts from the date of the first purchase of the product, and the purchase date is based on the invoice date of the purchase of the product. If there is no valid invoice, the warranty period will be calculated from the date the product leaves the factory. The invoice date of the product is later than the actual delivery date of the product, and the warranty period starts from the actual delivery date of the product.

(2)Non-warranty:

①Out-of-date； not produce the product valid warranty certificate and valid original purchase invoice or ②Can receipt, the original serial number label of the product has been altered, replaced, torn phenomenon, the product has no serial number or the product model or number on the warranty certificate is not consistent with the physical product;

or damage caused by misuse, accident, modification, inappropriate physical or ③Failure operating environment, natural disaster, power surge and improper maintenance or storage； or damage caused by third-party software, services or ④Failure actions； decolorization, aging, bruising and scratches of the surface shell during the use of ⑤Normal the product； product can operate without interruption or

⑥The error； parts, except for failures caused by defects in materials or ⑦Consume workmanship；

⑧Failure to use the product in accordance with the attached instructions, or failure to use the product for the intended function or environment, any other circumstances in which the company in determines, upon verification, that you have violated the instructions.

(3)The Company is not responsible for any additional commitments made to you by the Seller or any third party, and you shall demand fulfillment from such third parties.

Notes

For calibration dates, test results and service history. Version V1.0