Smartphone Thermal Camera

Quick Start Guide

1、Precautions

To protect your device from damage, please read all the following information before using this device.

1. Do not expose the device to high-intensity sources such as the sun and bonfires.

2. Do not touch the detector window or lens or collide with them by using any objects.

3. Do not touch the device or USB interface with wet hands.

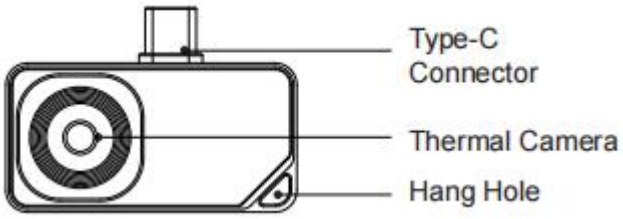
4. Do not scrub your device with diluent.

5. Take measures to prevent static electricity.

6. Do not dismantle the device. If there is any fault, please contact us to have it repaired by professionals.

7. Store the product in a dry environment and keep it away from heat sources (stoves, heaters, sun exposure, etc.).

2、Product Components



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3、Using Thermal Camera with Mobile Device

3.1 APP Download and Connection

- Search for "Camera+" in the Google Play or App Store to download and install the app.
- Connect the Thermal camera to a smartphone, the device will automatically power on.
- Open the mobile app and select the product model to access the device operation interface. If prompted with "Allow the app to access the thermal device?" during the process, tap "OK".
- If no window pops up and asks for access permission, try reconnecting the data cable to the phone.
- For phones like OPPO, VIVO, and OnePlus, manually enable the OTG option in the phone's settings.

3.2 **APP Function Introduction**

	Back Homepage	Go back to the main interface of the APP
	Settings	Tap the settings button to open the settings page, which includes temperature measurement alarming, temperature unit,temperature range,temperature measurement parameters, automatic shutter, logo watermark, time watermark, about.
	Shutter*	Manually turn on the shutter for non-uniformity calibration.
	PIP	to open the camera of your phone and enable Image in Image mode.
	R+	Select the HD mode for HD images.
	Temperature Measurement	Open the temperature measurement toolbar at the bottom to respectively operate the center temperature, highest temperature, lowest temperature, point temperature measurement, line temperature measurement, frame temperature measurement, and delete all.
	Isotherm Scale	Tap the isotherm scale tool button to open the isotherm scale toolbar, which includes the isotherm scale and lock
	Image Setting	Tap the image setting button to open the image adjustment toolbar, which includes 4 tools, namely brightness adjustment, contrast adjustment, image flip, mirroring.
	Palette	Tap to switch the palette style, including IRON, WHITE HOT, BLACK HOT, RAINBOW, CONTRAST, LAVA, FOREST, HOTTEST and COLDEST.
	Image Capture	Tap and save the current image.

	Video Recording	Tap it once to start video recording, and tap it again to stop and save the video.
	Library	View the infrared images and videos stored in the library. You can share or delete them.

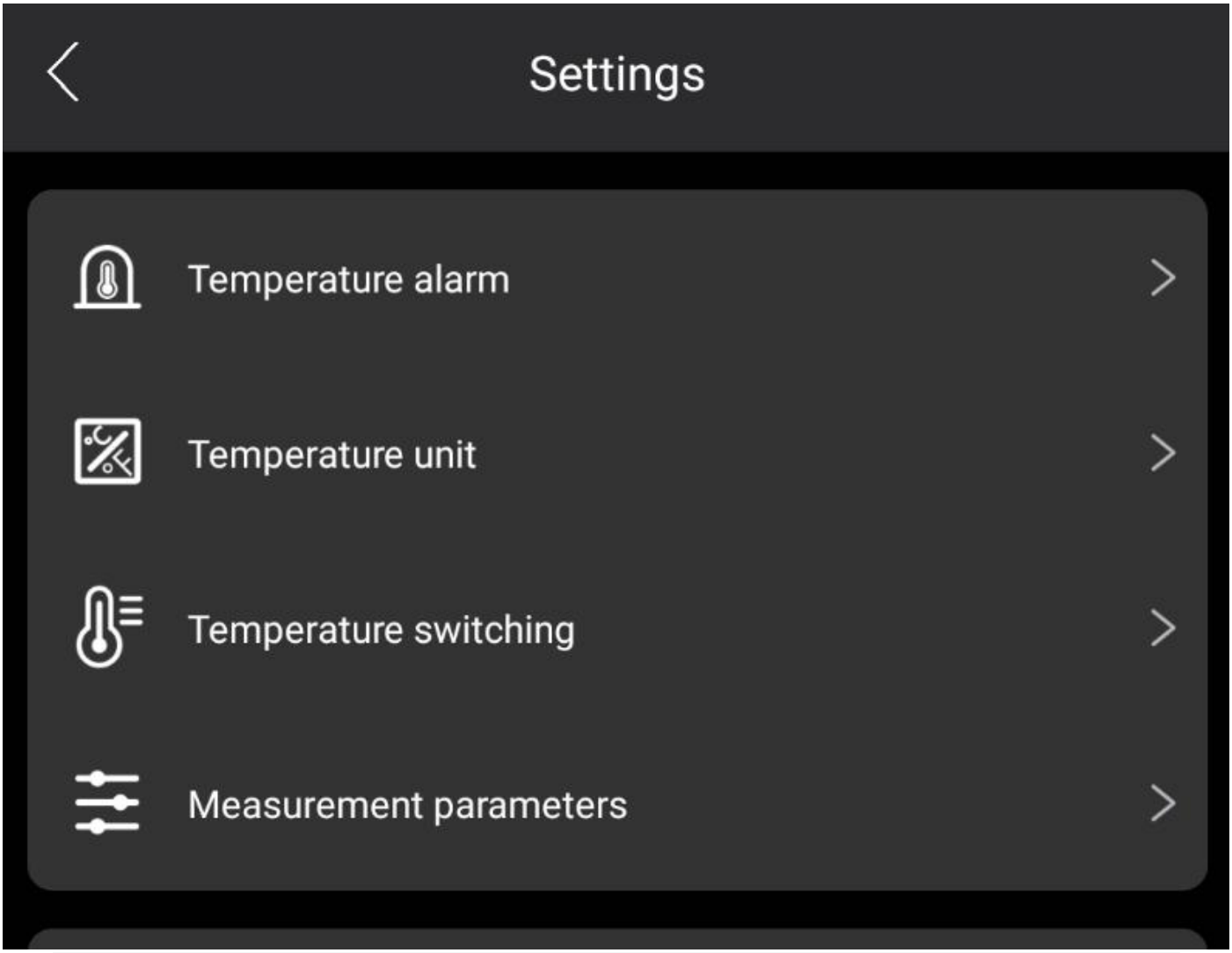
*Shutter calibration: It is used to calibrate the thermal stability status of the thermal device. During the process, the image will be frozen with a clicking sound.

3.3 Instructions on Temperature Measurement Operation

Measurement Tool

	Center Temperature	Display the temperature value of the middle position of the thermal image.
	Highest Temperature	Display the position and temperature value of the highest temperature in the global thermal image.
	Lowest Temperature	Display the position and temperature value of the lowest temperature in the global thermal image.
	Point Temperature Measurement	After tapping the point temperature measurement button, you can tap on the infrared image. Then, the temperature measurement point and temperature value will be displayed. You can tap the point again to delete it. Up to three temperature measurement points can be displayed.
	Line Temperature Measurement	After tapping the line temperature measurement button, you can draw a line on the infrared image. The highest temperature, lowest temperature, and average temperature will be displayed on the line. Tap the line again to turn off line temperature measurement. Up to three lines for temperature measurement can be displayed.
	Rectangle Temperature Measurement	After tapping the rectangle temperature measurement button, you can draw a rectangle on the infrared image. The highest temperature, lowest temperature, and average temperature in the rectangle will be displayed. Tap the rectangle again to turn off rectangle temperature measurement. Up to three rectangles can be displayed.
	Delete	Delete all point, line and frame temperature measurements.

3.4 Measurement Settings:



Temperature alarm	High temp alarm: Set the high temp alarm value, turn on the high temp alarm switch. When the measured temp exceeds the set high temp value, the APP will emit an alarm sound. Low temp alarm: Set the low temp alarm value, turn on the low temp alarm switch. When the measured temp is lower than the set low temp value, the APP will emit an alarm sound.	
Temperature Unit	℃/℉ /K	
Measurement Parameter	Calibration Temp	Calibrate measured temperature errors
	Ambient Temperature	The ambient temperature of the environment in which the target object is located
	Observing Distance	The distance from the thermal camera to the target object
	Emissivity	The emissivity of the target object
Temperature Switching	Switch between the normal mode (-20~120° C) and wide temperature range mode (120-450° C). When the temperature is greater than 120° C, you need to switch to wide temperature range mode.	

4.Using Thermal Camera with PC

4.1 Download and install the “ThermPal” software

Go to http://icamera.online to enter the download page. Then download and install the

ThermPal.

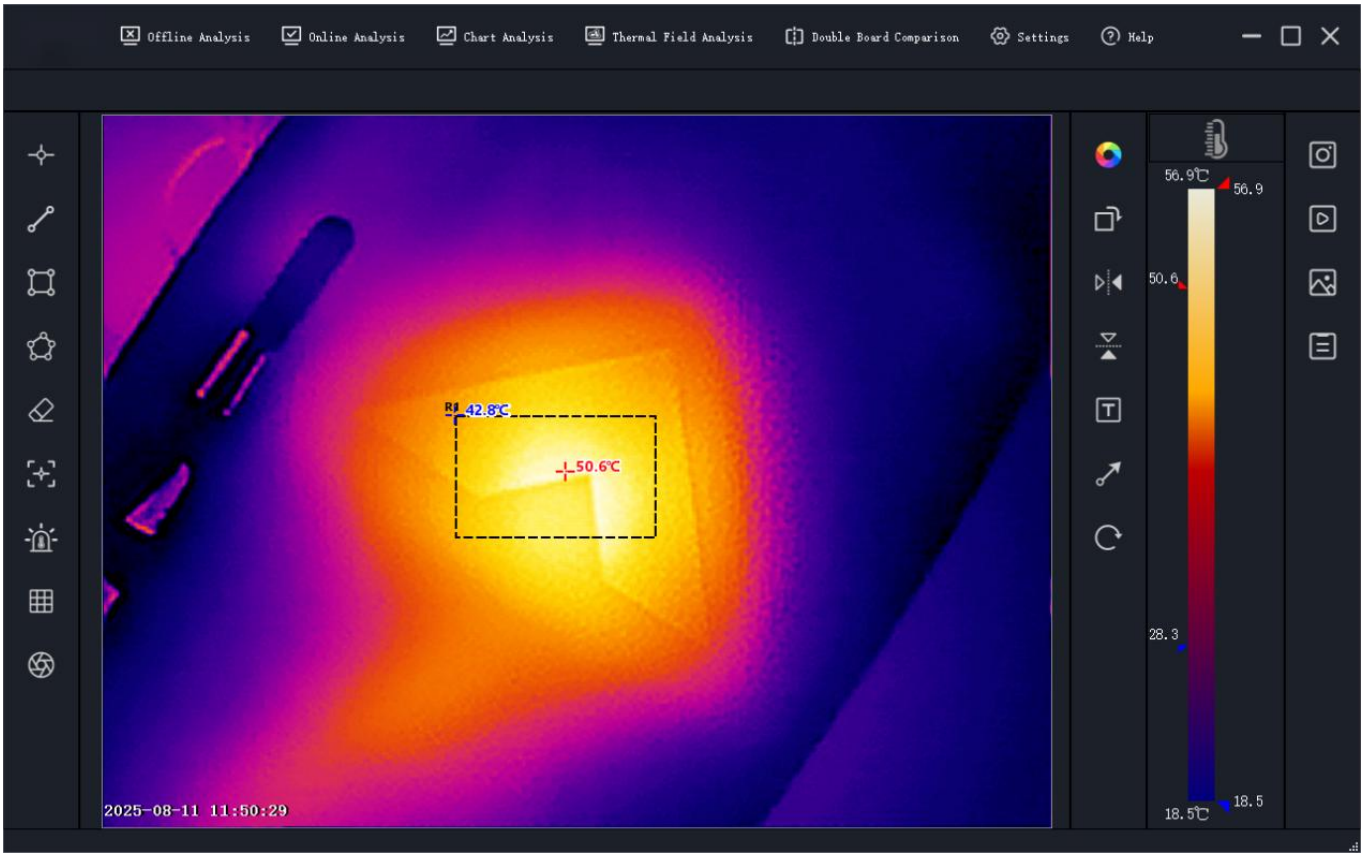
For the installation environment, Microsoft's Windows operating system is preferred, specifically Windows 10 or later version.

4.2 Connect the Thermal Camera to a PC using adapter cable

Connect the Type-C female end of the adapter cable to the Thermal Camera, and connect the Type-C male end to your computer.

(For PC with a USB-A port： plug the Type-C male end of the cable into the USB-A adapter and connect the USB-A end to your computer)

4.3 APP Function Introduction



Online Analysis	Real-time display of infrared images, with functions such as point temperature measurement, line temperature measurement, area temperature measurement, image settings, photo taking, video recording, and report generation.
Offline Analysis	By opening the historical infrared photos in the PC software, one can measure the temperature of the photos, make annotations, change the temperature measurement parameters and color plates, adjust the temperature bar, and generate reports, etc.
Chart Analysis	Display real-time temperatures in charts, including point temperature, line temperature, rectangle temperature, and polygon temperature. Data storage: Synchronize and store the temperature data of the chart and the over-temperature photo images to the computer hard drive.

Thermal Field Analysis	Generate 2D infrared images into 3D images and display the distribution of high and low temperatures through stereoscopic images.
Double Board Comparison	The image area is divided into two halves horizontally: the left side is the standard sample area and the right side is the sample to be tested area. In the left sample area, draw a rectangular or polygonal region, and the corresponding rectangular or polygonal region will be automatically added to the right detection area. At the same time, the system will pop up a temperature trend graph of these two areas for comparison and viewing.
Settings	Click the settings button to open the settings page, which includes Temperature Settings、Camera settings、Storage settings、Alarm settings、Language Settings、About.
Help	Electronic User Manual

5.Product Specifications

Model	**R-T160/N-T160**	**FR-T256/N-T256**
Thermal Resolution	160×120	256×192
Pixel Size	12μm	12μm
Spectral Range	8~14μm	8~14μm
Frame Rate	25Hz	25Hz
NETD	≤50mK@25℃,F#1.0	≤50mK@25℃,F#1.0
FOV	40.5°(H)×31°(V)	46.2°(H)×35.5°(V)
Operating Temperature	-10℃~+50℃（14℉~122℉）	-10℃~+50℃（14℉~122℉）
Measurement Range	-20℃~120℃（-4℉~248℉） 120℃~+450℃（248℉~842℉）	-20℃~120℃（-4℉~248℉） 120℃~+450℃（248℉~842℉）
Accuracy	±2℃ or ±2% of reading, the larger value shall prevail（@25℃ ambient temperature）	±2℃ or ±2% of reading, the larger value shall prevail (@25℃ ambient temperature)
Mobile Phone Connection Interface	Type-C	Type-C
Supported Mobile Phone System	Android 6.0 and above；iPhone15 and above；	Android 6.0 and above； iPhone15 and above；

6.FAQ

Q: Why there is no response after connecting the thermal imaging camera to a phone?

A: Follow the below steps to identify the problem:

a) Check the device may not be properly connected to your phone, or your phone does not support an OTG functionality.

b) Check if OTG is available in your phone Settings and if it is ON. For most phones, OTG functions are enabled by default and can be used directly. If not, please search “OTG” in Settings and turn it on manually. Please note that the thermal

imaging camera is not compatible with phones without OTG function.
c) Check if the version of Android is 6.0 or above.
d) Check if you have downloaded the thermal camera app and give necessary authorization.
e) Unplug the thermal imaging camera and reconnect it. If there is still no response, please contact after-sales personnel.

Q: Can the thermal imaging camera detect objects underwater, through glass, or a wall?

A: No. Infrared detectors mainly detects the long-wave infrared region of 8~14μm, and can only be used to measure surface temperature.

Q: Why does the temperature reading increase when the device gets closer to the object?

A: Infrared radiation attenuates when passing through the atmosphere. The longer the distance, the greater the attenuation. Thus, the accuracy of temperature measurement at a distance will decrease. To ensure accuracy of measurement, please go to Thermography Settings - Distance, and input the actual distance (max: 20m) to get the corrected temperature.

Q: Why is there a clicking sound? What does "shutter moving" mean?

A: The temperature of the infrared imaging will change slightly during use. Therefore, a periodic internal temperature calibration is needed. The micro motor controlled activation or deactivation of such internal calibration makes such a sound, which is known in the industry as "shutter moving".

Q: Why is the measured temperature not precise?

A: The temperature resolution of the thermal imaging camera is ±2°C . And the thermal imaging camera provides a operating temperature range of -10~+50°C, and a Temperature range of -20-450°C . Please select the corresponding range in the app before measuring.

Q: What external factors will affect the infrared temperature measurement?

A: The factors are as follows:
a) Emissivity of the target object surface.
b) Ambient temperature: the object will reflect the infrared rays emitted by surrounding objects, which affects the temperature measurement of the object itself.
c) Atmospheric temperature: the atmosphere also emits infrared rays.
d) Atmospheric transmittance: the infrared rays emitted by the object are attenuated in the atmosphere.
e) Distance: the longer the distance, the greater the attenuation of the infrared rays emitted by the object in the atmosphere.

7.Disclaimer

- Thank you for using the thermal device provided by the company. The content mentioned herein is related to your safety, legal rights, and responsibilities. Please read it carefully and follow the instructions to set up and use this product correctly. Disregarding the provided instructions and warnings may cause injury to you and those around, and may also result in damage to this product or surrounding products.
- Any illegal use by any user is prohibited. Users will be responsible for all actions of purchasing and using products. For this product, the company bears no liability for all risks and responsibilities, including direct, indirect, or third-party losses in connection with debugging and usage of this product by end customers.
- The company will refrain from offering services for any products procured through unauthorized channels or used for unascertained purposes.