

Thermal Camera

Quick Start Guide

本手册可能因为产品功能增强或者版本变更出现与产品不一致的地方, 请以实际产品为准。

This manual may be inconsistent with the product due to product enhancements or version changes, please refer to the actual product.

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01 重要说明

本手册为通用手册，涵盖一个产品线中的多款热像仪，这意味着某些功能和说明并不适用于您特定型号的热像仪。

02 注意事项

在任何时候都请严格遵守下列注意事项：

1. 在使用设备时请尽量保持稳定，避免剧烈晃动。
2. 不要在超出设备许可的工作温度或储存温度环境中使用或存放仪器。
3. 不要将设备直接对准很高强度的热辐射源，例如太阳，激光器，点焊机等。
4. 不要将设备暴露在灰尘或潮湿的环境中。在有水的环境中使用时，应避免水溅到仪器上。在不使用仪器时应盖上镜头盖。
5. 当不使用本设备时，请将仪器和所有配件放置在专用包装箱内。
6. 不要堵塞设备上的孔。
7. 不要敲打，扔掷或震动仪器和配件，以免造成损坏。
8. 请勿自行拆卸本机，这有可能造成设备损坏，并丧失保修权利。
9. 避免将TF卡挪作他用。
10. 请不要在超过设备使用工作温度的环境下使用该设备，这可能会造成设备的损坏。
11. 不要将有溶解性或类似的液体用于设备，线缆，这可能会导致设备的损坏。
12. 擦拭本设备时请遵照以下措施：
 - 非光学表面：在必要时可以使用干净柔软的布擦拭热像仪的非光学表面。
 - 光学表面：使用热像仪时请避免弄脏镜头的光学表面，特别要避免用手触碰镜头，因手上的汗迹会在镜头玻璃上留下痕

迹且可能会腐蚀玻璃表面的光学镀膜层。当光学镜头表面受到污染时,使用专业镜头纸小心的擦拭。

03 锂电池存储及使用说明

【锂电池存储说明】

1. 锂离子电池应被储存于比较阴凉、干燥、通风的环境中,应远离水源、火源及高温的地方。电池储存温度必须在 $-10^{\circ}\text{C}\sim 45^{\circ}\text{C}$ 的范围内,湿度为 $65\pm 20\%\text{RH}$ 。
2. 存储电压及电量:电压为 $3.7\text{V}\sim 3.9\text{V}$ (4.2V 锂电池标准电压体系,多串组合*相应倍数);电量为:30%-70%之间。
3. 长期存储电池(超过3个月)须置于温度为 $23\pm 5^{\circ}\text{C}$ 、湿度为 $65\pm 20\%\text{RH}$ 的环境中。
4. 电池应按储存要求存放,3个月进行1次完整充放电并补电至70%电量。
5. 不要在环境温度高于 65°C 时运输电池。

【锂电池使用说明】

1. 需使用专用充电器或在整机内进行充电,不要使用被改装过的或者损坏的充电器。使用大电流或高电压充电将可能引起电芯的充放电性能、机械性能和安全性能的问题,并可能会导致发热、泄漏或起鼓。
2. 电池必须在 $0^{\circ}\text{C}\sim 45^{\circ}\text{C}$ 的环境温度范围内进行充电。超过此温度范围,将会引起电池性能及寿命降低,存在泄漏或起鼓等问题。
3. 电池必须在 $-20^{\circ}\text{C}\sim 60^{\circ}\text{C}$ 的环境温度范围内进行放电。
4. 电池长期未使用期间(超过3个月),可能会因为其自放电特性而处于某种过放电状态。为防止过放电的发生,电池应定期充电,将其电压维持在 $3.7\text{V}\sim 3.9\text{V}$ 之间。过放电会导致电芯性能、电池功能的丧失,长期低于保护板电压会造成电芯深度放电至电芯损坏。

- 未装入设备的电池或电池组, 建议用户每1个月对电池进行一次充电, 每3个月对电池进行一次完整充放电过程。
- 已装入设备的电池或电池组, 考虑到设备可能的静态放电, 应根据设备的使用说明书要求, 对电池定期及时进行充电补充, 防止电池因亏电而损坏。

【锂电池特殊注意事项】

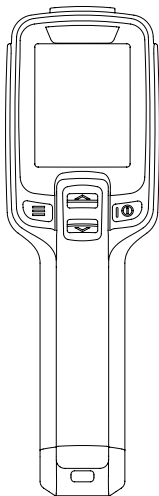
1. 禁止在火源或极热条件下给电池充电! 勿在热源 (如火或加热器) 附近使用或贮存电池! 如果电池泄漏或发出异味, 应立即将其从接近明火处移开。
2. 电池出现起鼓、漏液等问题时, 应立即停止使用!
3. 勿将电池投入水中或将其弄湿!
4. 勿将电池投入火中或给电池加热!
5. 勿将电池直接连接到墙上插座或车载点烟式插座上!
6. 禁止用导线或其它金属物体将电池正负极短路, 禁止将电池与项链、发夹或其它金属物体一起运输或贮存!
7. 禁止用钉子或尖锐物体刺穿电池壳体, 禁止锤击或脚踏电池!
8. 禁止撞击、投掷或者使电池受到机械震动!
9. 禁止以任何方式分解电池!
10. 禁止将电池置入微波炉或压力容器中!
11. 禁止与一次性电池 (如干电池) 或不同容量、型号、品种电池组合使用!
12. 如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用。
13. 如果电池正在使用或充电, 应立即从用电器中或充电器上取出并停止使用!
14. 请按照本手册中说明的方法为电池充电, 并请遵照充电步骤和注意事项。错误的充电会导致电池变热, 损坏甚至造成人体受伤。

04 产品简介

本产品是工具型手持测温红外热像仪，它具有49,152个有效红外像素点，配置激光，照明灯和可见光，可外接PC机，TF卡，满足不同场合下的使用需求。

05 物品清单

☑ 热像仪(含电池)	1台	☑ 腕带	1根
☑ 快速操作指南	1份	☑ 充电器	1个
☑ 资料下载卡	1份	☑ TF卡	1张
☑ USB数据线	1根		



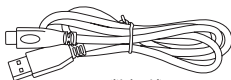
热像仪(含电池)



快速操作指南



资料下载卡



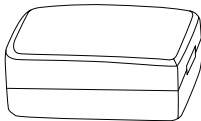
USB数据线



腕带

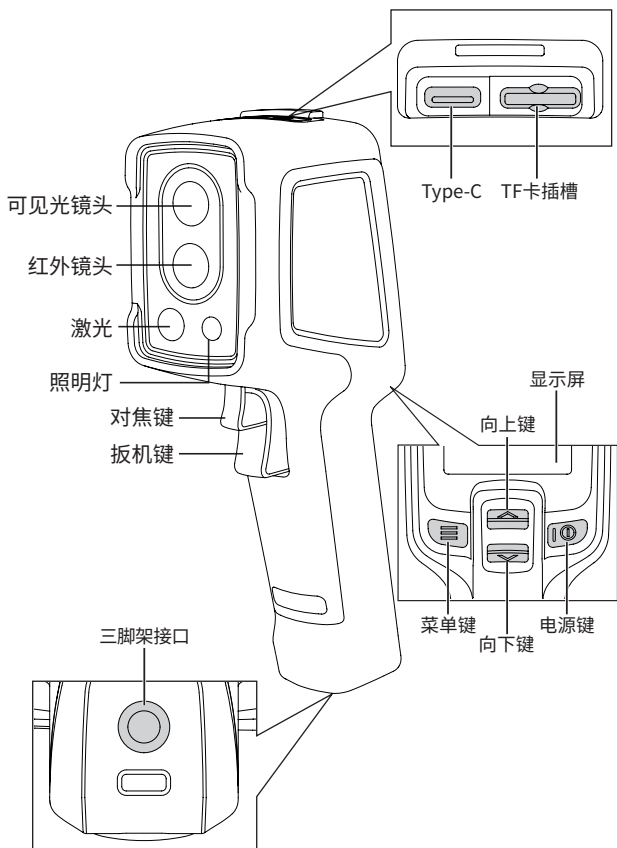


TF卡



充电器

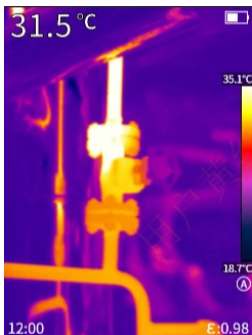
06 产品部件











07 基本操作

【拍照与查看】

在实时观测界面，短按“扳机键”获取图片，根据当前界面提示按下“”键以保存图像或按下“”键以放弃图像。

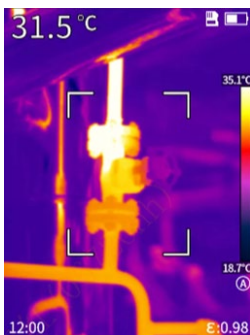


查看及删除图片


1. 短按“”键，进入菜单界面。
2. 通过按“ ”选择图片栏。
3. 短按“”键进入图片文件界面。
4. 短按“”键查看图片，若需切换图片，可通过上下键切换。
5. 在图片预览界面，短按“”可调出“可见光/删除”，选中“可见光”短按“”可查看可见光图片，选中“删除”短按“”可删除图片。

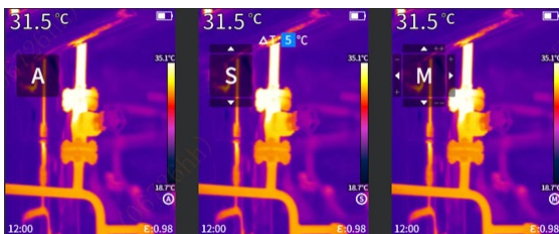
【自动对焦】









在实时观测模式下(IR, MIF, PIP)，短按“扳机上键”对焦功能启动，画面显示对焦框，直至图像最清晰状态，对焦框消失，对焦结束。



【调光模式】

在实时观测模式下，长按“”进入调光模式设置，本机支持三种调光模式，分别是自动调光(A)、半自动调光(S)、手动调光(M)。



1. 进入调光模式设置后，通过短按“”依次切换A-S-M。
2. S模式下，按“ ”选中“上/下箭头”，按“”加减 ΔT 值。
3. M模式下，按“ ”选中“上/下/左/右箭头”，按“”加减Tmax/Tmin值。
4. 按“”保存退出。

【图像模式】





在实时观测模式下,通过遥控器的“上/下键”选择图像模式,本机支持四种图像模式,分别是红外模式、可见光模式、MIF模式、PIP模式。

【测温参数】

测温参数会影响测温结果的准确性,测温前需要提前设置好测温参数。

1. 测温范围:根据被测量目标的温度选择合适的测温范围。
2. 发射率:根据被测目标的发射率调节,本机中有常用物体的发射率,也可以自定义。
3. 反射温度:当前观测的目标环境温度对目标的温度影响。
4. 目标距离:根据被测目标的距离,调节设备的对应距离参数,测温更精准。

【高低温报警】

1. 短按“”,进入菜单界面。
2. 选择“报警”选项短按“”进入设置界面。
3. 短按“”将OFF设置为ON。
4. 通过按“”选择高温或者低温,再通过调节报警阈值实现报警功能。

【USB模式】

USB模式包含两种:U盘模式和投屏模式,进入设置菜单—USB模式,按“菜单键”切换模式。

U盘模式:用于文件导出。

1. 打开设备顶部的USB盖。
2. 使用USB-TypeC数据线与电脑连接,USB模式选择U盘模式。
3. 进入电脑的磁盘文件夹,选择需要导出的图片,拷贝到电脑上,通过分析软件查看图片文件。
4. 拷贝完成后,断开usb数据线和电脑的连接。

投屏模式：用于PC上第三程序进行投屏显示。

1. PC上安装第三程序，例如：“Potplayer”。
2. 使用USB-TypeC数据线与电脑连接，USB模式选择投屏模式。
3. 点击“Potplayer”下拉框。选择打开“摄像头设备”，即可投屏显示。

【重置设置及格式化SD卡】

1. 进入设置菜单-重置设置，按“上/下键”切换到√，按“菜单键”确认重置。
2. 此功能会将机器恢复为出厂状态，请谨慎操作。
3. 进入设置菜单-格式化SD卡，按“上/下键”切换到√，按“菜单键”确认格式化SD卡。
4. 此功能会将SD卡内容清空，请谨慎操作。

【常见物体发射率】

材质	发射率
木	0.85
水	0.96
砖	0.75
不锈钢	0.14
胶带	0.96
铝板	0.09
铜板	0.06
黑铝	0.95
人体皮肤	0.98
沥青	0.96
PVC塑料	0.93

材质	发射率
黑纸	0.86
聚碳酸	0.8
混凝土	0.97
氧化铜	0.78
铸铁	0.81
锈	0.8
石膏	0.75
油漆	0.9
橡胶	0.95
土壤	0.93

08 常见问题汇总

症状	原因	措施
无法开机	电池电量不足	充电10分钟后开机
	外接电源的插头没插到位	拔出电源插头，重新插入并推到位
	电池寿命已到	更换新电池
红外图像不清晰	镜头蒙上水气或被污染	使用专业设备清洁镜头
可见光图像不清晰	环境太暗	采取适当照明措施
	可见光前端有水汽或被污染	使用专业设备清洁可见光前端
测温不准	与测温相关的参数设置不对	更改参数设置，或直接恢复默认参数值
	开机立刻测温	为保证测温精度，我们建议您打开热像仪之后，等待5~10分钟再开始测温
	长时间没有校准	为获取精确的测温结果，我们建议您每年将热像仪送回校准一次

01 IMPORTANT!

This manual is a general manual covering multiple thermographic cameras in a product line, which means that some functions and instructions are not applicable to certain model of thermographic camera.

02 NOTES

Please strictly observe the following rules at all times:

1. Keep the device as stable as possible during use and avoid violent shaking.
2. Do not use or store the device in an environment with the temperature beyond the permitted range.
3. Do not expose the device directly to high-intensity heat radiation source, such as sun, laser, and spot welding machine.
4. Do not expose the device to dust or moisture. When used in an environment with water, avoid splashing water on the device. The lens shall be covered when the device is not in use.
5. When the device is not used, please place the device and all accessories in the special packing box.
6. Do not block the holes on the device.
7. Do not knock, throw or vibrate the device and accessories to avoid damage.
8. Do not disassemble the device, which may cause damage to the device and lose the warranty right.
9. Avoid using TF card for other purposes.
10. Do not use the device in an environment exceeding the

operating temperature of the device, which may damage the device.

11. Do not use soluble or similar liquids on device and cables, which may cause damage to the device.
12. Please observe the following rules when wiping the device:
 - Non-optical surface: if necessary, wipe the non-optical surface of the thermographic camera with a clean and soft cloth.
 - Optical surface: when using the thermographic camera, please avoid soiling the optical surface of the lens, especially avoid touching the lens with your hands, because the optical coating on the glass surface may be corroded due to sweat on the hands. When the optical lens surface is contaminated, use special lens cloth to carefully clean it.

03 LITHIUM BATTERY STORAGE AND OPERATING INSTRUCTIONS

Instructions on lithium battery storage

1. Lithium ion batteries shall be stored in a cool, dry and ventilated environment, away from water source, fire source and high temperature. The storage temperature of the battery must be within the range of $-10^{\circ}\text{C} \sim 45^{\circ}\text{C}$, and the humidity must be $65 \pm 20\%$ RH.
2. Storage voltage and power: the voltage is $3.7\text{V} \sim 3.9\text{V}$ (4.2V lithium battery standard voltage system, multi-series combination * corresponding multiple); Power: 30% - 70%.
3. For long-term storage (more than 3 months), the battery must be placed in an environment with temperature of $23 \pm 5^{\circ}\text{C}$ and humidity of $65 \pm 20\%$ RH.

4. The battery shall be stored according to the storage requirements, and shall be fully charged and discharged once every three months and charged to 70% of the capacity.
5. Do not transport the battery when the ambient temperature is higher than 65°C.

Instructions for use of lithium battery

1. Use dedicated charger or charge in the whole device. Do not use modified or damaged charger. The use of high current or high voltage charging may cause problems in the charge and discharge performance, mechanical performance and safety performance of the cell, and may cause heating, leakage or bulging.
2. The battery must be charged within the ambient temperature range of 0 °C ~ 45 °C. Exceeding this temperature range will reduce the performance and service life of the battery, and there will be problems such as leakage or bulging.
3. The battery must be discharged within the ambient temperature range of - 20 °C ~ 60 °C.
4. If the battery is not used for long term (more than 3 months), it may be in over discharge state due to self-discharge characteristics. In order to prevent over-discharge, the battery shall be charged regularly and its voltage shall be maintained between 3.7V and 3.9v. Over-discharge will lead to the loss of cell performance and battery function. If the voltage is lower than the protection plate for a long time, the cell will be deeply discharged to the cell damage. For batteries or battery packs not loaded into the device, it is recommended to charge the battery every 1 month and

complete full charging and discharging process of the battery every 3 months; For the battery or battery pack loaded into the device, considering the possible static discharge of the device, the battery shall be charged regularly according to the requirements of the operation manual to prevent battery damage due to power loss.

Warning

1. Do not charge the battery near fire sources or under extremely hot conditions! Do not use or store batteries near heat sources such as fires or heaters! If the battery leaks or emits an odor, it shall be removed from the place close to the open fire immediately.
2. When the battery has problems such as bulging and liquid leakage, stop using the battery immediately!
3. Do not put the battery in water or get it wet!
4. Do not put the battery into the fire or heat the battery!
5. Do not connect the battery directly to the wall socket or vehicle cigarette lighter socket!
6. Do not short circuit the positive and negative terminals of the cell with wires or other metal objects, and do not transport or store the battery with necklaces, hairpins or other metal objects!
7. Do not pierce the battery case with nails or other sharp objects, and do not hit or step on the battery!
8. Do not knock, throw or vibrate the battery mechanically!
9. Do not disassemble the battery in any way!
10. Do not place the battery in the microwave oven or pressure vessel!

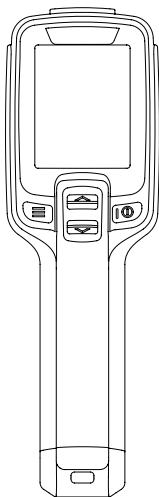
11. Do not mix the cell with primary batteries (such as dry batteries) or batteries of different capacities, models and varieties!
12. Do not use smelly, hot, deformed, discolored battery and battery with any other abnormal phenomenon.
13. If the battery is in use or charging, it shall be taken out of the electrical appliance or charger immediately and stop using!
14. Charge the battery according to the methods described in this manual, and follow the charging steps and warnings. Incorrect charging can lead to battery heating, damage and even personal injury.

04 PRODUCT INTRODUCTION

This product is a hand-held temperature measurement infrared thermographic camera. It has 49,152 effective infrared pixels, and is equipped with laser, lighting and visible light. It can be connected to external PC and TF card to meet the needs of different occasions.

05 LIST OF ITEMS

☑ Thermal camera (including battery)	1	☑ USB cable	1
☑ Quick Start Guide	1	☑ Wristband	1
☑ Data download card	1	☑ Adapter Adapter	1
		☑ TF card	1



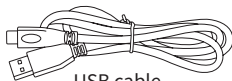
Thermal camera
(including battery)



Quick Start Guide



Data download card



USB cable



Wristband

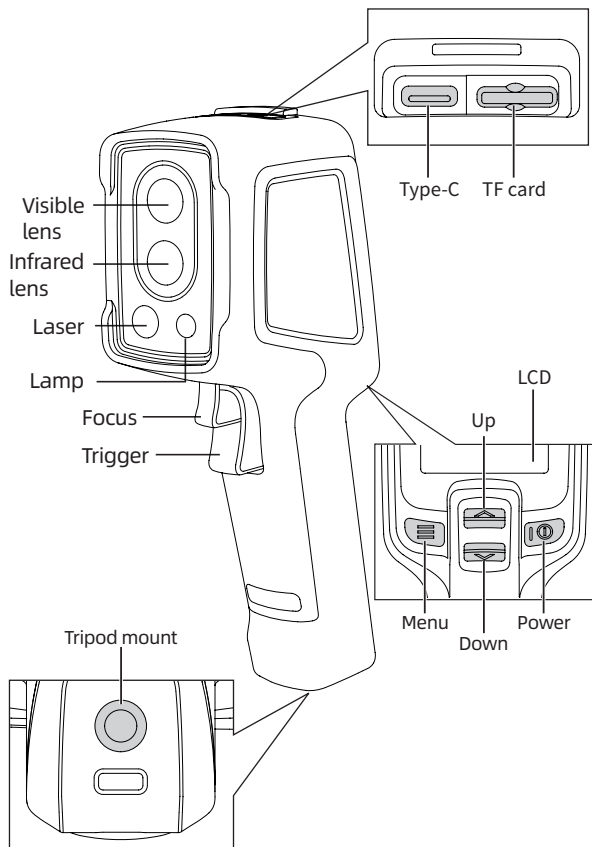


TF card





Adapter

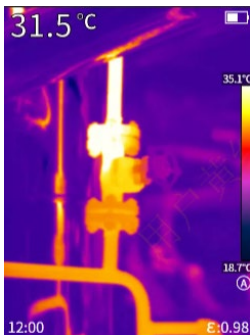
06 PRODUCT COMPONENTS









07 OPERATION INSTRUCTIONS

【Take photos and view】

In the real-time observation interface, short press the "trigger button" to obtain the picture, press  to save the image or press  to abandon the image according to the prompt of the current interface.

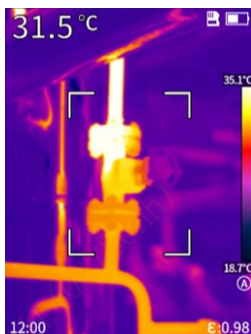


View and delete images

1. Short press  to enter the menu interface.
2. Select the image bar by pressing  .
3. Short press  to enter the image file interface.
4. Short press  to view the image. Press up and down buttons to switch the image.
5. In the image preview interface, short press  to delete images.

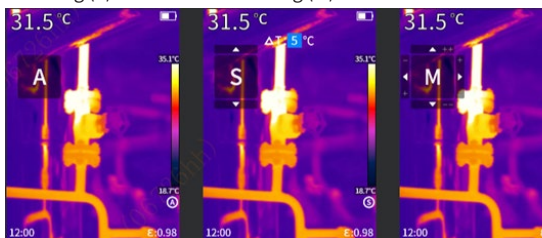
【Auto focusing】

In the real-time measuring mode (IR, MIF or PIP), short-press the "Trigger Up" button to start the focusing function to display the AF frame on the screen until the image is at its sharpest, and then the AF frame disappears and the focusing is completed.





【Dimming mode】

In the real-time measuring mode, long-press the "Menu" button to enter the dimming mode setting. The device supports three dimming modes: automatic dimming (A), semi-automatic dimming (S) and manual dimming (M).



1. After entering the dimming mode setting, switch between A-S-M successively by long-pressing the "Menu" button.
2. In the S mode, press the "Up/Down" arrow button to select "Up/Down Arrow", and press the "Menu" to increase or decrease Δt value.
3. In the M mode, press the "Up/Down" arrow button to select "Up/Down/Left /Right Arrow," and press the "Menu" to increase or decrease Tmax/Tmin value.
4. Press the "Power" button to save and exit.

【Image mode】

In the observation mode, select the image mode through   of the remote control. The device supports four image modes, namely infrared mode, visible light mode, MIF mode and PIP mode.

【Temperature measurement parameters】

As the temperature measuring parameters may affect the accuracy of measuring results, the parameters need to be set in advance before measuring.

1. Temperature measuring range: select the appropriate temperature measuring range according to the temperature of the measured object.
2. Emissivity: it can be adjusted according to the emissivity of the measured object. The emissivity of common objects in this device can also be customized.
3. Reflected temperature: the impact of the ambient temperature of

the currently measured object on the object temperature.

4. Distance to the object: adjust the distance parameter of the device according to the distance to the measured object to make the temperature measuring more accurate.

【High and low temperature alarm】

1. Long-press the "Menu" button to enter the menu interface.
2. Select the "Alarm" option and long-press the "Menu" button to enter the setting interface.
3. Short-press the "Menu" button to turn OFF to ON.
4. Press the "Up/Down" button to select high temperature or low temperature, and then adjust the alarm threshold to realize the alarm function.

【USB mode】

There are two USB modes: USB flash drive mode and projection mode. Enter the Setting menu-USB mode, and press the "Menu" button to switch the mode.

USB flash drive mode: used for file export.



1. Open the USB cover on the top of the device.
2. Use USB-TypeC data cable to connect with the computer, and select USB flash drive mode.
3. Enter the disk folder of the computer, select the images to be exported, copy them to the computer, and view the image files through the analysis software.
4. After copying, disconnect the USB cable from the computer.

Projection mode: projection of third-party program on PC.

1. Install a third-party program on the PC, such as "Potplayer".
2. Use USB-TypeC data cable to connect with the computer, and select the projection mode.

Click the "Potplayer" drop-down box. Select "Camera" for projection.

【Reset and format the SD card】

1. Enter the Setting menu - Reset, and press  to confirm the reset.
2. This function will restore the device to the factory settings. Please be careful.
3. Enter the Setting menu - Format SD card, and press  to confirm the formatting.
4. This function will clear the SD card. Please be careful.

【Emissivity of common objects】

Materials	Emissivity
Wood	0.85
Water	0.96
Brick	0.75
Stainless steel	0.14
Adhesive tape	0.96
Aluminum plate	0.09
Copper plate	0.06
Black aluminum	0.95
Human skin	0.98
Asphalt	0.96
PVC plastic	0.93

Materials	Emissivity
Black paper	0.86
Polycarbonate	0.8
Concrete	0.97
Copper oxide	0.78
Cast iron	0.81
Rust	0.8
Gypsum	0.75
Paint	0.9
Rubber	0.95
Soil	0.93

08 FAQs

Fault	Cause	Measures
Start failure	Low battery	Start the device after charging for 10 minutes
	The plug of the external power supply is not plugged in place	Unplug, reconnect and push it into place
	Battery life has expired	Replace the battery with a new one
Infrared image is not clear	The lens is covered with water vapor or contaminated	Clean the lens with dedicated device
Visible light image is not clear	The environment is too dark	Take proper lighting measures
	Water vapor or contamination in the front end of visible light	Clean the visible light front end with dedicated device
Inaccurate temperature measurement	The parameters related to temperature measurement are not set correctly	Change the parameter settings or restore the default parameter values directly
	Measure temperature immediately after startup	To ensure the accuracy of temperature measurement, we recommend to start temperature measurement after 5 ~ 10 minutes when the device is turned on
	No calibration for a long time	For accurate temperature measurement results, we recommend to calibrate the thermographic camera once a year

特别声明:说明书版本将会在产品技术改进后更新。

Notice:or any technical improvement, we will specify in the latest user manual.