

# twilight

INSTRUMENTOS DE MEDICIÓN INDUSTRIAL

## Cámara termografica IR tipo herramienta

### GS-B256V

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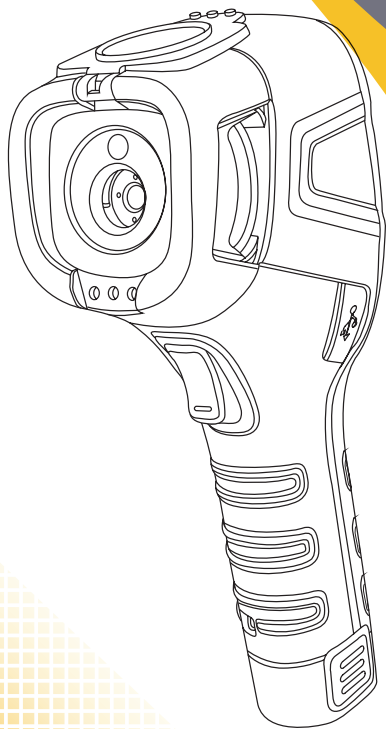
 / [twilightsadecv](#)

# 操作说明书

UESR'S MANUAL

## 手持式测温红外热像仪

Handheld temperature infrared thermometer



感谢您购买本产品，请在使用前阅读此说明书，阅读后请小心收藏，以备日后查阅。图片仅供参考，产品以实物为准。

Thank you for choosing our product. Please thoroughly go through user manual before operation and keep it well for future reference. All photos here are for reference only, and specifications are subject to the physical product.

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## 产品简介

本产品是工具型手持测温红外热像仪，它具有19200/49152/76800个有效红外像素点，配置640×480分辨率可见光摄像头，可外接PC机，SD卡，移动设备（IPHONE或Android设备），可满足不同场合下的使用需求。

## 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。

## 注意事项

### 在任何时候都请严格遵守下列注意事项：

- 在使用设备时请尽量保持稳定，避免剧烈晃动。
- 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。
- 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。
- 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。
- 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。
- 不要堵塞设备上的孔。
- 不要敲打，扔掷或震动仪器和配件，以免造成损坏。
- 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。
- 避免将 SD 卡挪作他用。
- 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。
- 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。
- 本设备使用锂离子电池，为了安全使用电池，必须严格遵守下列事项：
  - 1) 在任何时候都不要尝试打开或拆解电池。
  - 2) 不要将电池置于高温环境或靠近高温物体。
  - 3) 不要使电池的正负极短路。
  - 4) 不要将电池置于潮湿环境或水中。
  - 5) 一旦电池发生泄露导致液体进入人眼，应该立刻用清水冲洗眼睛，且进行医学护理。
  - 6) 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。长时间不使用机器时，请拔出电池。

## 注意事项

### 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。当光学镜表面受到污染时，使用专业镜头纸小心的擦拭。

### 电池使用说明注意事项：

- 电池可以反复充电，但电池属于易损耗品，如发现设备的待机时间大幅度降低，请使用本公司提供的原装电池进行更换。
- 设备长时间工作，尤其在高温环境下，可能出现表面发热的情况，这属于正常现象。感觉发烫时，请停止充电同时将设备移至阴凉处。请避免长时间接触发烫的设备表面。
- 为设备充电时，建议您仅使用本公司提供的原装电池、充电线。
- 电池充电时间会随温度条件和电池使用状况而变化。
- 当电池电量较低时，系统会弹出低电提示。
- 当电池电量过低时，系统会自动关机。
- 若按下电源键，设备没有任何反应，表明电池电量已耗尽，需要使用原装充电器充电 10 分钟以上，才可以启动设备。
- 当电池正在充电时，设备侧方的指示灯会一直显示红色。
- 不支持开机充电。
- 当电池充满后，设备侧方的指示灯会由红变绿，不需要继续充电。

## 物品清单

标配件：

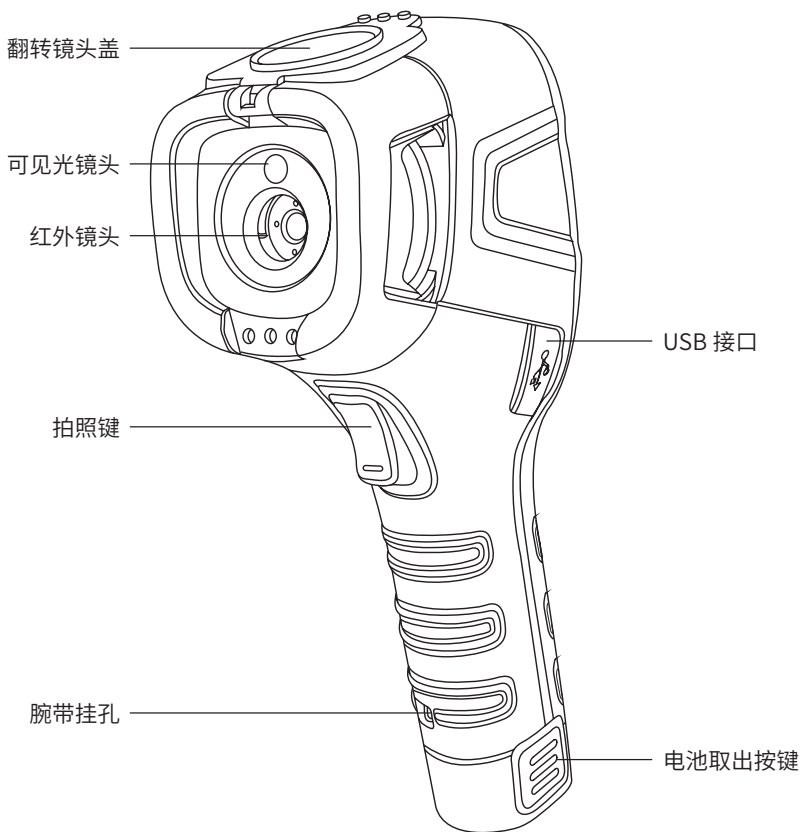


选配件：

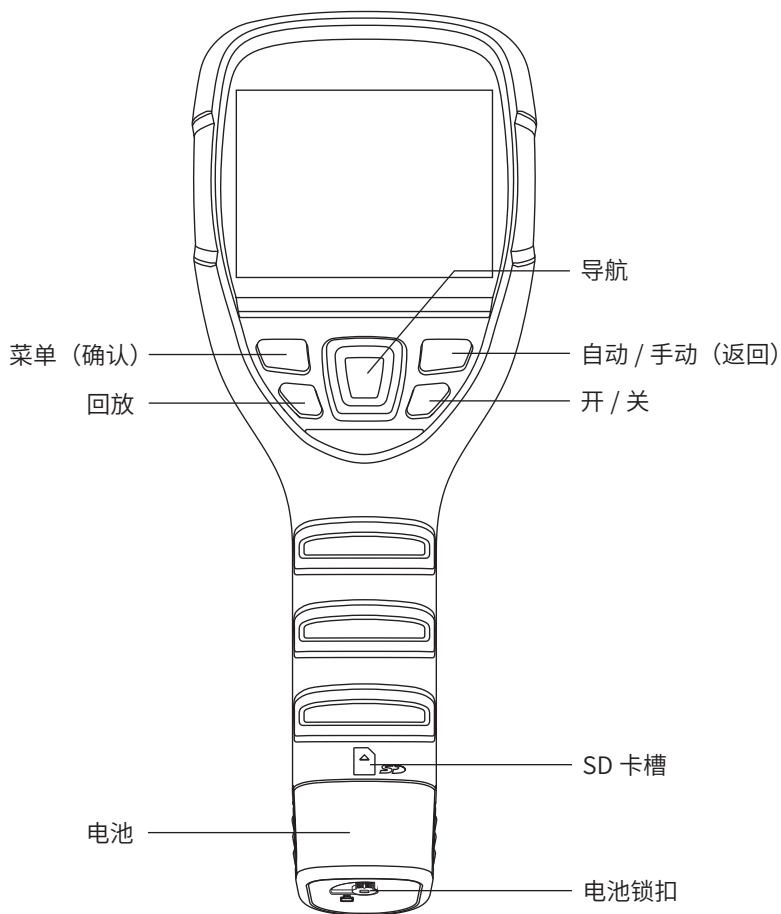




## 产品部件



## 产品部件



## 按键操作介绍

B160V/B256V/B320V 共有 9 个按键 (如上图所示), 包括 4 个方向键: “+”、“-”、“<”、“>”。

“+”、“-”: 菜单上下选择或数值的加减调节。

“◀”、“▶”: 打开和关闭菜单窗口。

**菜单 (确认)**: 按钮用于主菜单的打开或选择确认。

**自 / 手 (返回)**: 自动、手动切换亮度对比度按钮或者菜单返回按钮。

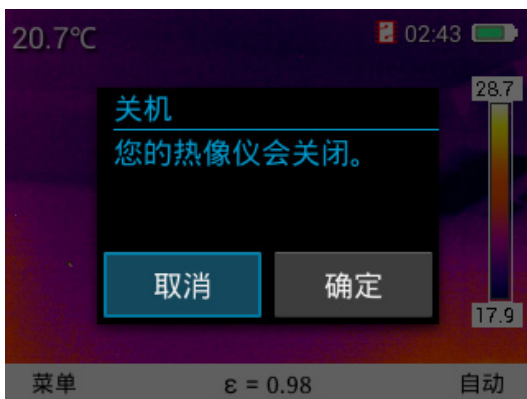
**回放 / 补偿**: 短按此按键回放图片, 长按此按键为补偿。

**开 / 关**: 长按此键为打开或关闭机器, 短按为休眠或唤醒机器。

**扳机键**: 用于拍摄图片。

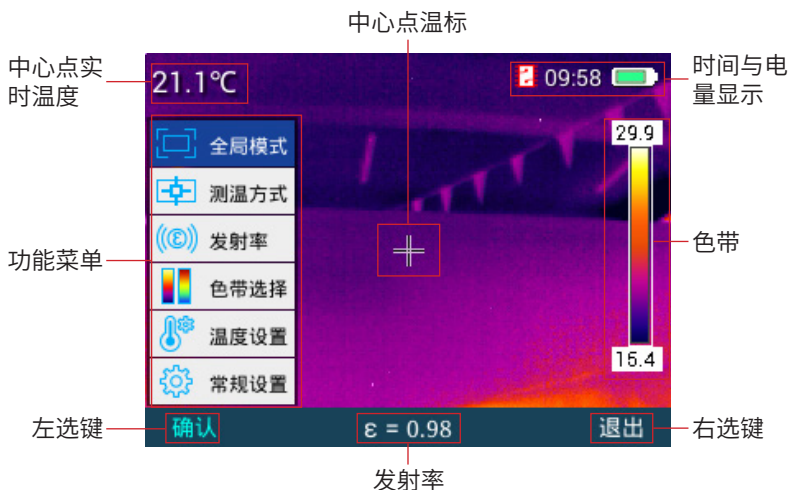
### 启动 / 关闭热像仪

整机在关机状态下, 长按 4s~5s 电源键 (开 / 关键), 屏亮起, 进入开机画面; 整机在开机状态下, 4s~5s 电源键 (开 / 关键), 弹出关机提示, 若选择“确定”即可关闭测温机。



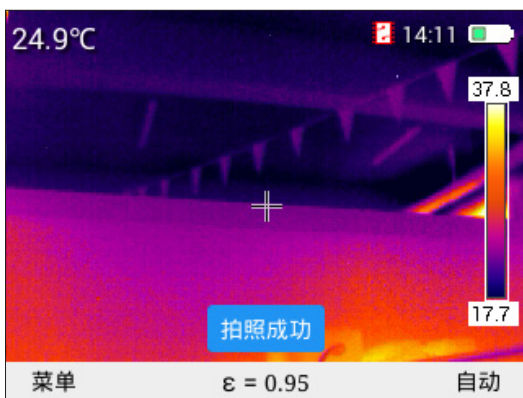
## 主菜单操作

机器开机后进入主菜单如下图所示，此界面为测温机主界面。



## 拍照

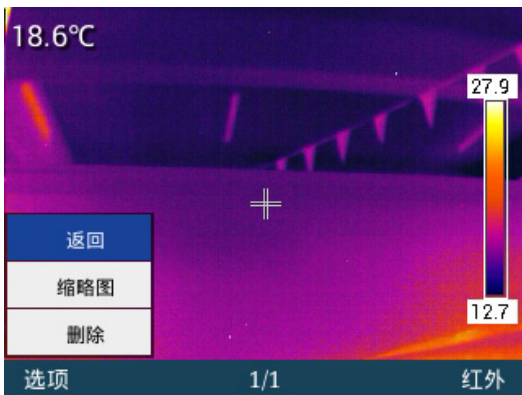
短按扳机键，即可完成当前界面拍照，如下图所示。



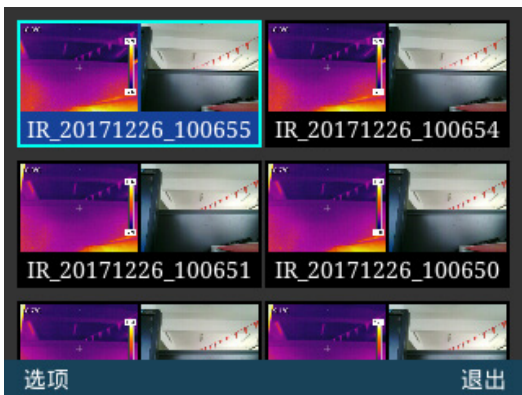
## 文件浏览

主菜单模式下，按下“回放”键即回放最近保存的红外图片，按“返回”

键可切换红外和可见光两种图片模式，按下“◀”或者“▶”键切换图片，在此菜单下按“选项”键可以进入“返回”“缩略图”“删除”菜单。如下图所示。

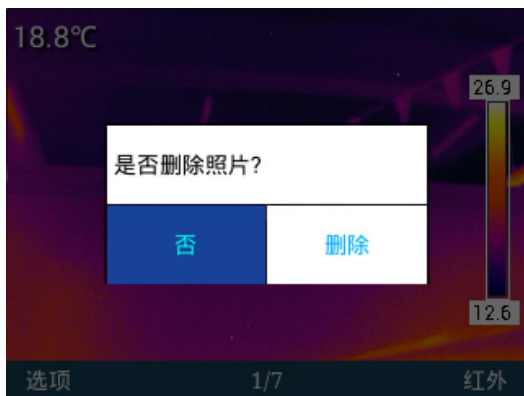


按“+”或者“-”选择“返回”“缩略图”和“删除”菜单，按“返回”键返回主界面，若选中“缩略图”按“确认”键进入“缩略图”菜单，在此菜单下，按“+”“-”“◀”“▶”键可通过上下左右键选择预览相应的图片，并可对其进行删除或全屏预览等操作。如下图所示



在文件浏览菜单中，按“选项”键出现“全屏”、“删除”、“全屏删除”

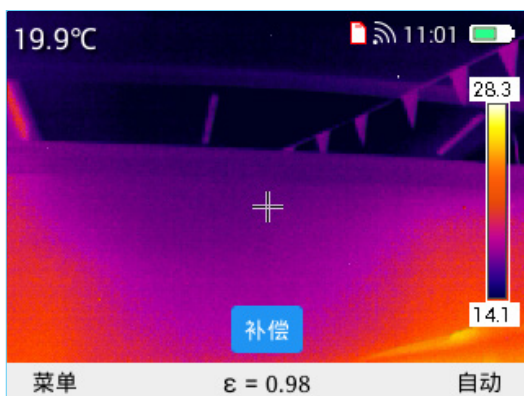
菜单，按“+”、“-”键进行上下选择。如下图所示。



按“全屏”键，在按“确认”键全屏显示选择的图片，按“删除”键单个删除选择的图片，按“全部删除”键删除所有存储图片。如下图所示。

### 手动补偿

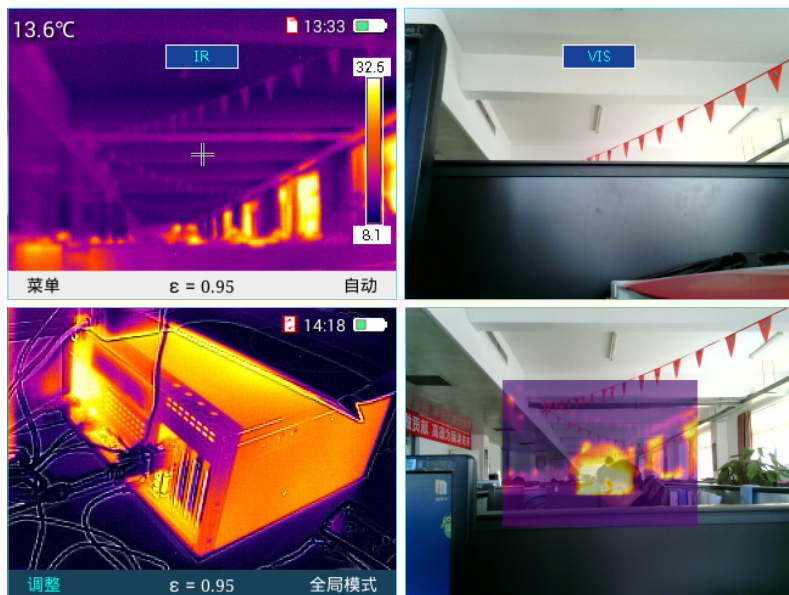
长按“回放”键，为手动补偿如下图所示。



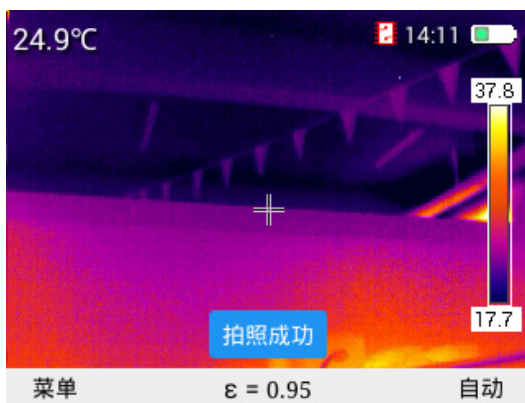
### 图像模式切换

在测温机主界面，按“+”键，可以循环切换四种图像模式，顺序为

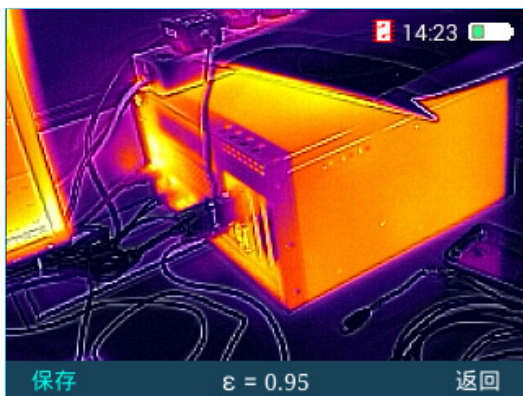
红外模式、可见光模式、融合模式、画中画模式，按“-”键，可以循环切换四种图像模式，顺序为红外模式、画中画模式、融合模式、可见光模式。



四种图像模式下都可以通过按扳机键拍照。

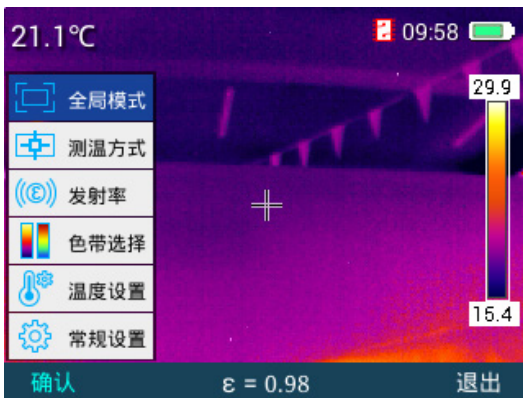


在融合模式下，可以调整红外与可见光的融合位置，按“确认”键，进入融合图像调整模式，按四个方向键可以位移可见光图像，使可见光图像与红外图像重合，按“确认”键可以保存位移调整设置。



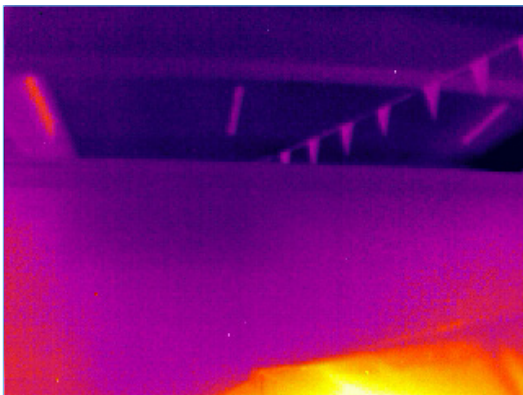
## 全屏模式

按“菜单”键进入主菜单模式，通过“+”“-”键选择“全屏模式”。如下图所示。

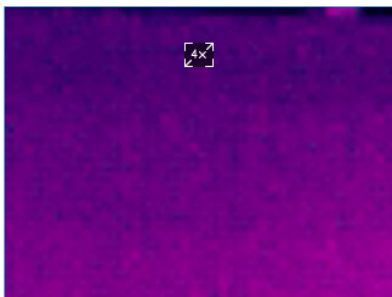
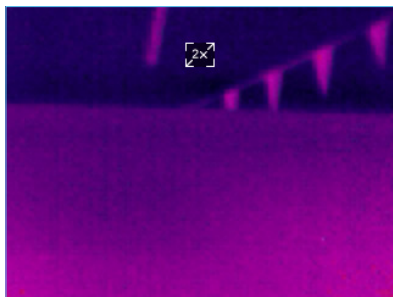


选择“确认”键或者“▶”键进入全屏模式如下图所示。



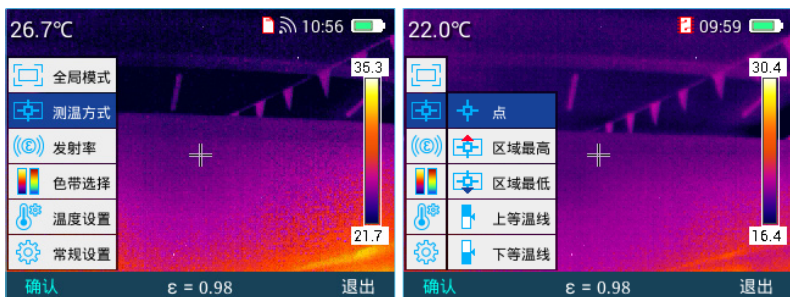


全屏模式菜单下按“+”键可放大图像，出现放大图标提示如下图所示(3S后消失)，在2倍放大状态下，若再按“+”键可4倍放大图像，若按“-”恢复原始图片状态，按“扳机键”，保存图片，按“返回”键回到实时模式。

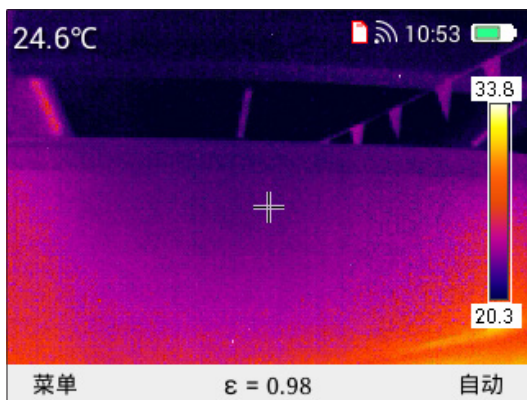


## 测温方式的选择

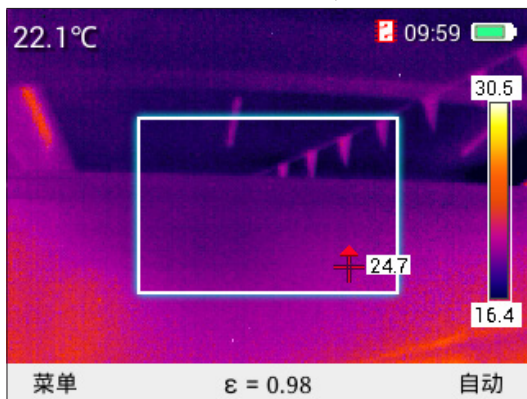
主菜单模式下，按下“确认”键或“右方向”键进入菜单，按“+”、“-”键进入“测温方式”菜单如下图所示，选择“点”、“区域最高”、“区域最低”、“上等温线”、“下等温线”四种测温方式。



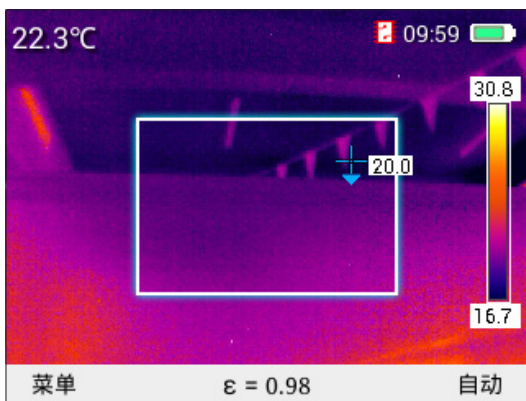
“点”分析模式下测试中心点的温度，如下图所示。



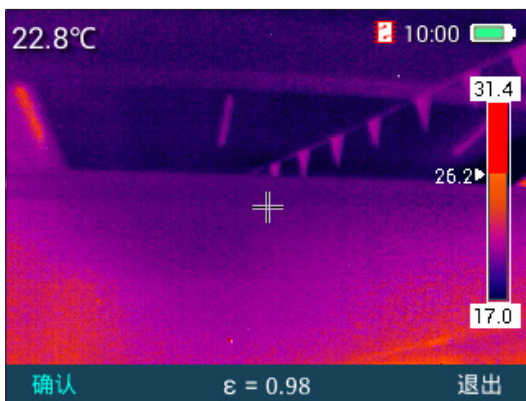
“区域最高”显示区域中最高温度值，如下图所示。



“区域最低”显示区域中最低温度值，如下图所示。



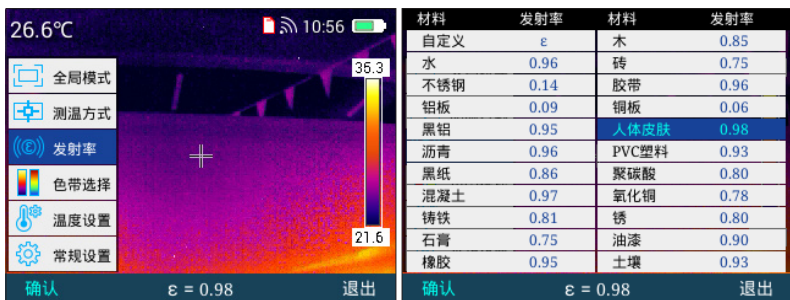
“上等温线”通过“+”“-”键选择高温色带，显示为红色，实时图像中同时显示对应高温区域，如下图所示。



“下等温线”通过“+”“-”键选择低温色带，显示为蓝色，实时图像中同时显示对应低温区域，如下图所示。

## 发射率的选择

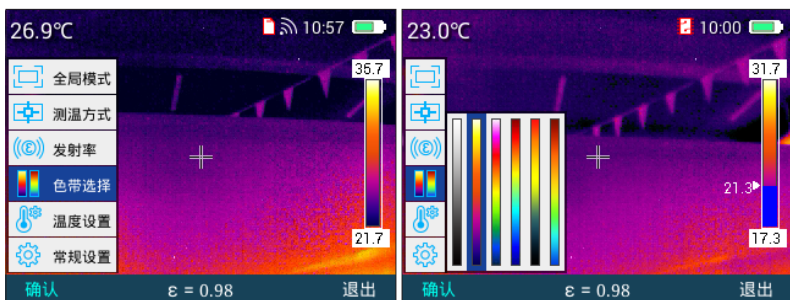
主菜单模式下，按下“菜单”键和“右方向”键进入“发射率”菜单，通过“+”“-”键查表选择所需发射率值。如下图所示。



也可以自定义发射率的值，在发射率模式下进入自定义模式，选择“确认”键，再按“+”“-”键自定义发射率值，发射率范围为0.01~1.00。按“退出”键退回主菜单目录。

## 色带的选择

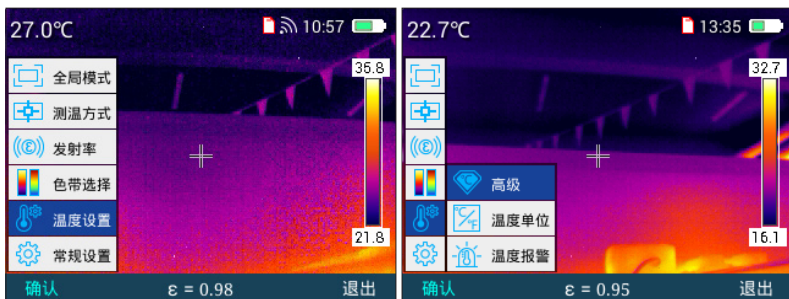
主菜单模式下，按“+”或“-”键选择“色带选择”菜单，再按“确认”键或者“▶”键进入“色带选择”菜单，通过“◀”、“▶”键选择所需色带，有六条可供选择的色带。如下图所示。



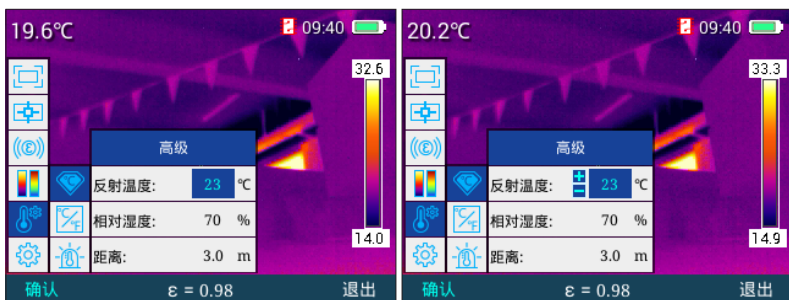
## 温度设置

主菜单模式下，按“+”或“-”键选择“温度设置”菜单，再按“确认”

键或者右方向键进入“温度设置”菜单，可进入“高级”、“温度单位”、“温度报警”子菜单，查看或选择相应功能。如下图所示。

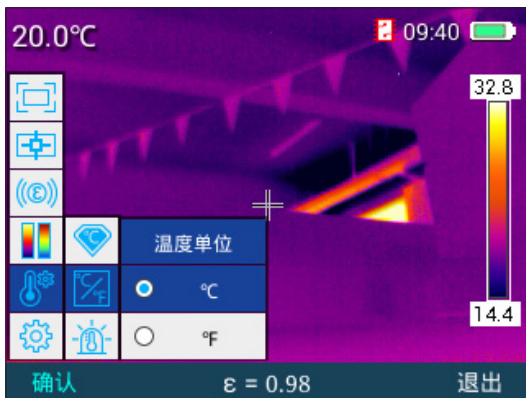


再按“确认”键或者“▶”键进入“高级”菜单，在“高级”菜单下可以对反射温度、相对湿度、和测温距离进行数值的调节。如下图所示。

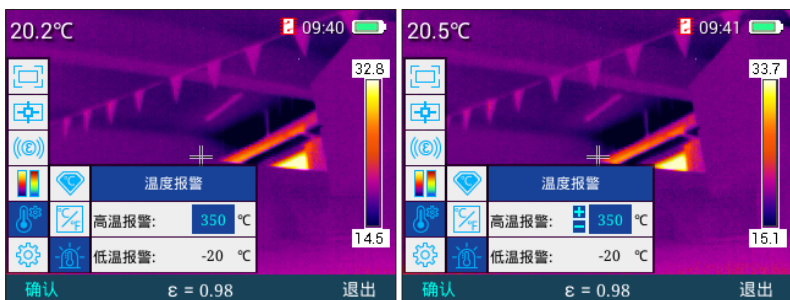


在“高级”菜单模式下按“+”、“-”选择对应的选项进行调节，按“▶”键，出现加减号，进入“反射温度”调节菜单，此菜单下再按“+”、“-”可以进行数值调节，按“确认”键保存调节后的数值，按“◀”键退到上一级菜单。相对湿度和距离跟环境温度菜单的操作方式相同，不再赘述。按“退出”键返回到主菜单模式下。

在“温度单位”菜单中按“▶”键进入温度单位选择菜单，进入菜单后按“+”、“-”键可以选择华氏度和摄氏度相互切换，按“确认”键保存选择状态。按“◀”键退回上一层菜单。如下图所示。



在“报警温度”菜单中按“▶”键进入高温报警、低温报警菜单，此菜单中按“+”“-”号选择高温报警或者低温报警，此时选择的区域会蓝色高亮，再按“▶”键出现加减号，按“+”或者“-”键对报警温度值进行温度数值调节，高温报警温度时在区域分析中对于大于此设置的温度值蓝黑色十字光标会不停闪烁进行光标报警，低温报警温度时在区域分析中对于小于此设置温度值蓝黑色十字光标不停闪烁进行光标报警。按“确认”键保存当前设置的值，按“◀”键退回上一级菜单。按“退出”键退出此菜单回到主菜单目录。如下图所示。



## 常规设置菜单

主菜单模式下，按“+”或“-”键选择“常规设置”菜单，再按“确认”

键或者“▶”键进入“常规设置”菜单常规设置包括“自动关机”、“时间日期”、“语言选择”、“屏幕亮度”、“存储位置”、“升级”、“WIFI热点”、“USB视频”、“恢复出厂”、“帮助”、“版本号”菜单如下图所示。



## 自动关机

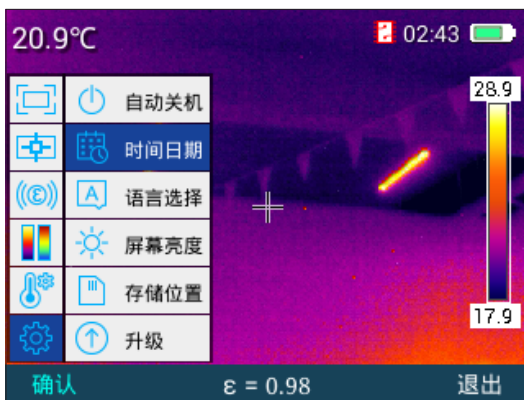
主菜单下，按“+”或“-”键选择“自动关机”菜单，再按“确认”键或者“▶”键进入“自动关机”即可配置自动关机的相应功能。如下图所示。



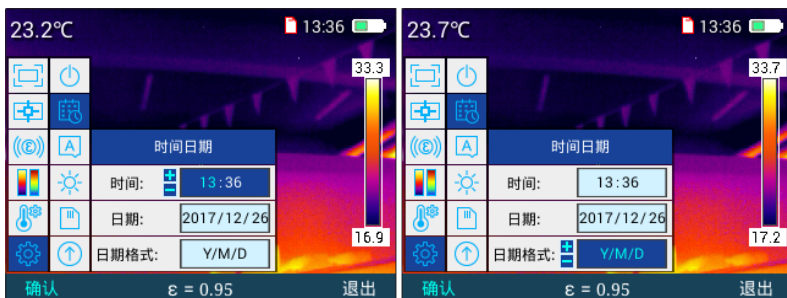
选择“否”表示不自动关机，选择“5分钟”表示5分钟后弹出自动关机提示，若取消则保持开机状态，若无动作则自动关机；同理选择“20分钟”表示20分钟后自动关机。

## 设置时间日期

常规设置菜单下，按“+”或“-”键选择“时间日期”菜单，再按“确认”键或者“▶”键进入“时间日期”菜单，即可配置系统时间及日期。如下图所示。



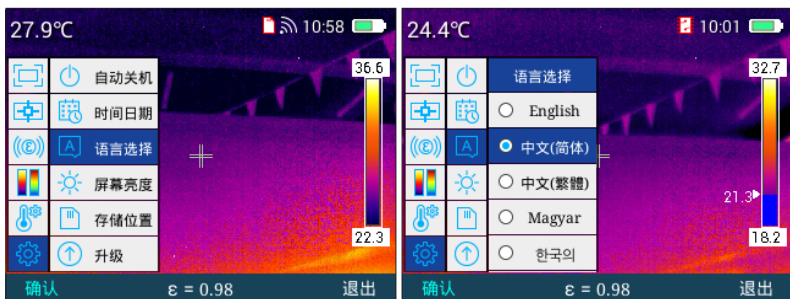
在“时间日期”菜单下按“▶”依次选择要调节的数值，选中的数值蓝色字体高亮显示，选择后按“+”“-”键调节选择的数值。按“◀”键退到上一个选择的数值上，按“确认”键保存当前调节的数值。如下图所示。





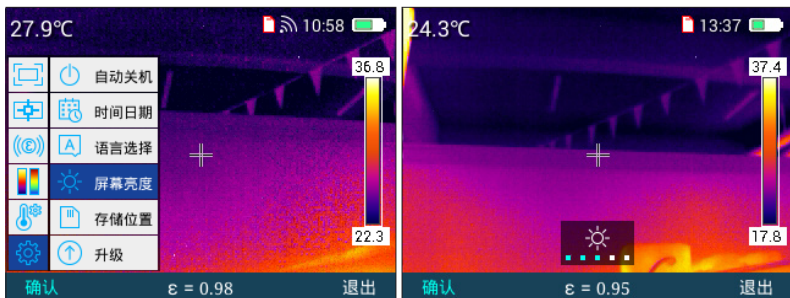
## 语言选择

常规设置菜单下，按“+”或“-”键选择“语言选择”菜单，再按“确认”键或者“▶”键进入“语言选择”菜单，在“语言选择”菜单中按“+”“-”键选择相应语言，如下图所示。



## 屏幕亮度设置

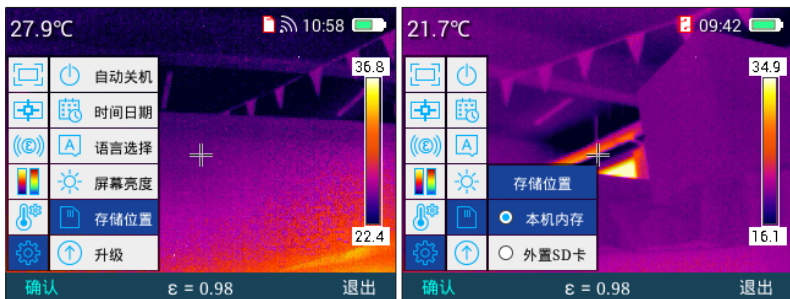
常规设置菜单下，按“+”或“-”键选择“屏幕亮度”菜单，再按“确认”键或者“▶”键进入“屏幕亮度”菜单，在屏幕亮度菜单下按右方向键和“◀”键即可增减屏幕亮度，分五个档位。按“确认”键保存当前设置的亮度等级。按“退出”键退回到主界面。如下图所示。



## 存储位置

常规设置菜单下，按“+”或“-”键选择“存储位置”菜单，再按“确认”键或者“▶”键进入“存储位置菜单”，在存储位置菜单下按“+”键和“-”

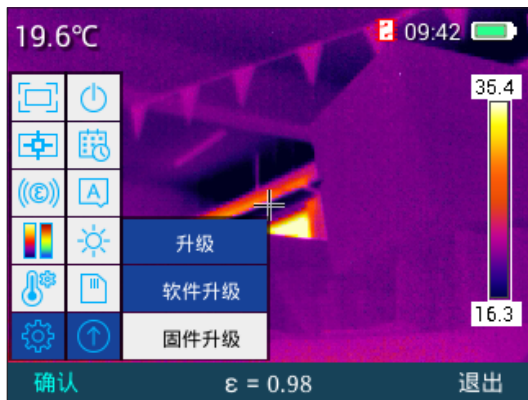
键切换存储位置。本机器支持容量达 16G 的 SD 卡存储功能。在主菜单状态下，按下“扳机键”拍照，可将图片存储至 SD 卡上。如果没有插入 SD 卡，则将图片存储至本机内存，选中外置 SD 卡时会弹出“未检测到外置 SD 卡”。如下图所示。



如果在保存图片中保存失败和保存的图片容量已满，出现如下图所示图片。

## 升级

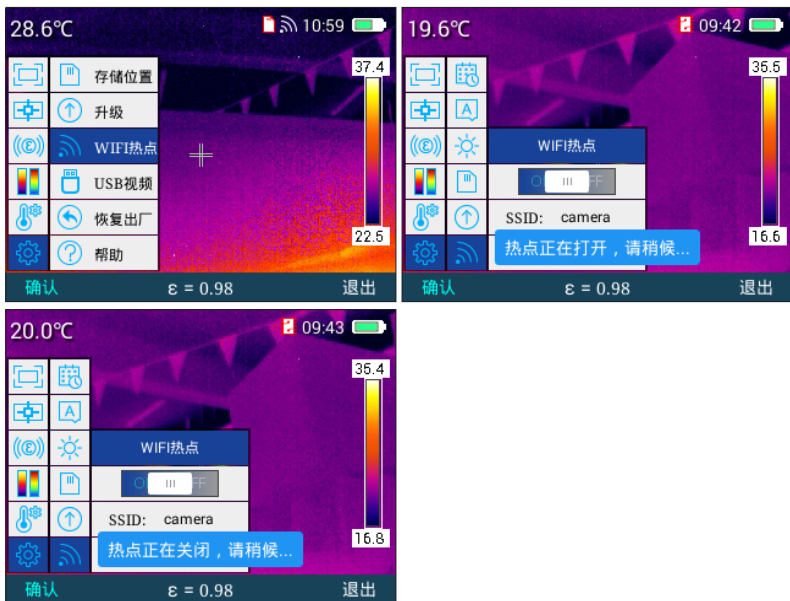
请查阅维护说明书进行升级操作。



## WIFI 热点

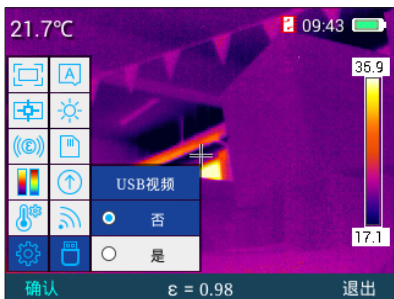
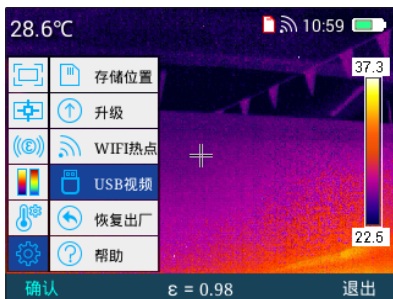
常规设置菜单下，按“+”键选择“WIFI 热点”菜单，按“确认”键或者“

►”键进入“WIFI”热点菜单，再按“确认”键或者“◀”键即可打开或者关闭 WIFI 开关，打开 WIFI 后，右上角有一个 WIFI 的图标，测温手机 APP 和红外分析软件可以通过 WIFI 与设备连接，进行红外实时视频和图片的传输和分析。如下图所示。



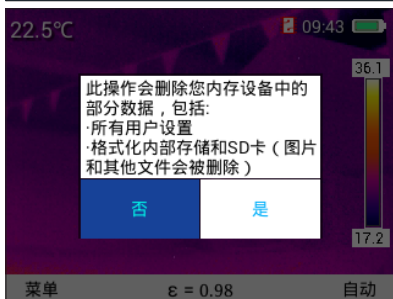
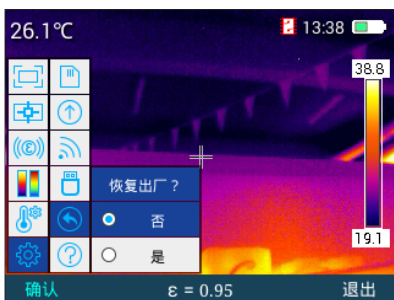
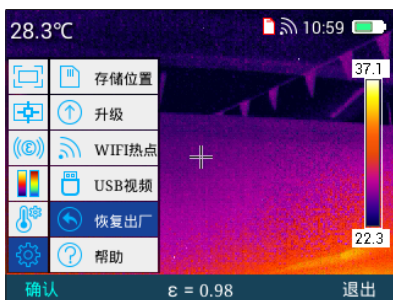
## USB 视频

常规设置菜单下，按“+”或“-”键选择“USB 视频”菜单，按“确认”键或者“►”键进入“WIFI”热点菜单，再按“+”“-”切换 USB 视频的开关状态，按“确认”键保存 USB 视频的开关状态，若开启 USB 视频，则 PC 红外分析软件可以通过 USB 数据线与设备连接，打开 PC 红外分析软件进行红外实时视频和图片的传输和分析。如下图所示。



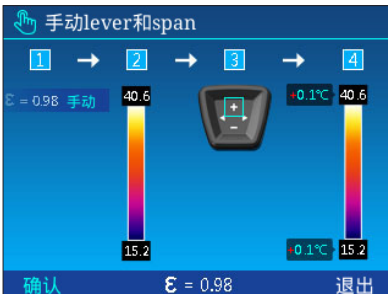
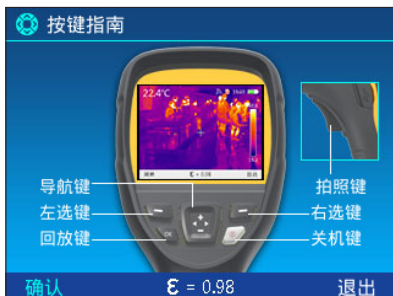
## 恢复出厂设置

常规设置菜单下，按“+”或“-”键选择“恢复设置菜单，再按“确认”键或者“▶”键弹出对话框选择是否恢复系统设置。选择“是”进行恢复出厂设置，选择“否”不进行恢复出厂设置。如下图所示。



## 查看帮助

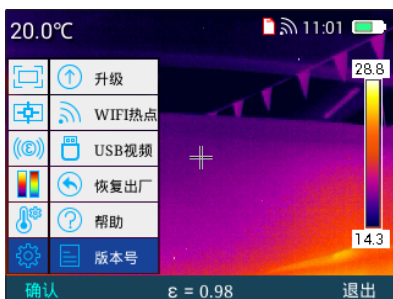
常规设置菜单下，按“+”或“-”键选择“帮助”菜单，再按“确认”键或者右方向键进入“帮助菜单”，进入帮助菜单后，按“◀”或者“▶”键可以循环查看帮助图片，按“退出”键回到主菜单。如下图所示。





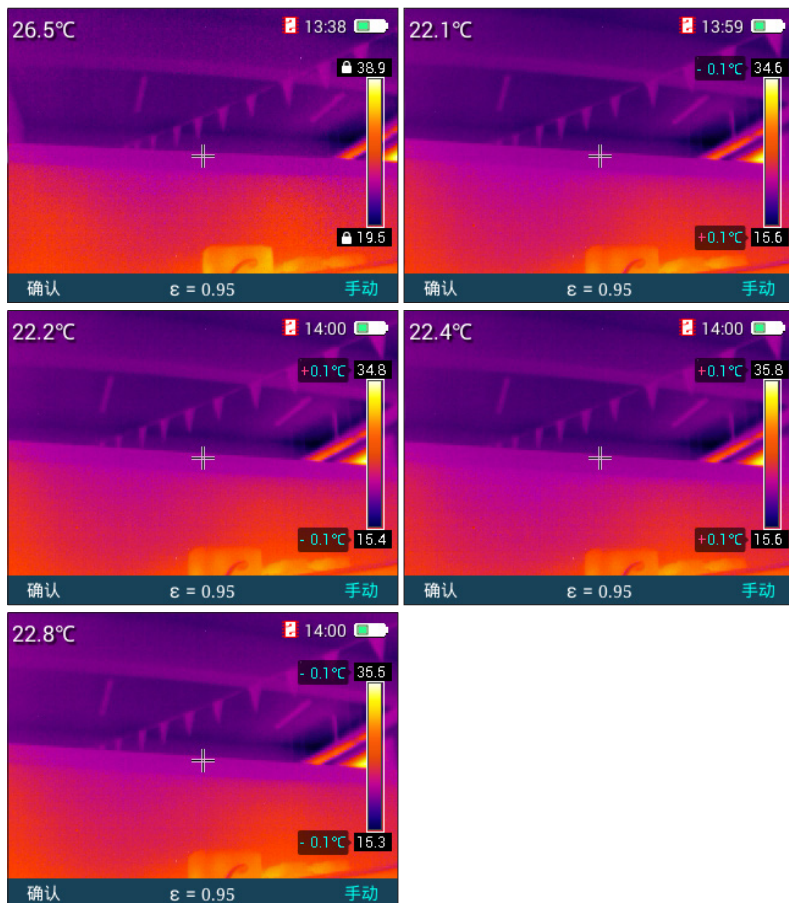
## 版本号

常规设置菜单下，按“+”或“-”键选择“版本号”菜单，再按“确认”键或者“▶”键进入“版本号菜单”，可查看设备的软件版本、内核版本、固件版本，按“退出”键回到主菜单。



## 亮度对比度调整

主菜单模式下，按下“自/手”键，会进入手动调节亮度、对比度模式，按“◀”键同时减小 Tmax 增加 Tmin，按“▶”键同时增加 Tmax 减小 Tmin，按“+”键同时增加 Tmax 和 Tmin、按“-”键可同时减小 Tmax 和 Tmin 的数值。如下图所示。



## 待机

在任意菜单下，短按电源键可进入待机状态，在待机过程中，只能按下电源键才能唤醒。

## 故障排除指南

故障检测	故障定位	解决措施
无法开机	电池电量不足	重新充电后再使用电池
	电池接触不良	取出电池，重新放入电池仓内并安装到位
	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
电池电量指示与实际使用情况偏差较大	电池电量耗尽	更换充满电的电池
	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



故障检测	故障定位	解决措施
测温不准	长时间没有进行非均匀性校正	在菜单中将自定义按键设置为补偿，按下自定义实体按键，听到快门响声，进行一次非均匀性校正
	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

## **INTRODUCTION**

This product is tool-like thermographic camera, effective IR pixels are 19200/49152/76900, visible light camera resolution is 640×480, available to mobile devices (Iphone or Android), SD card and PC to fulfill different requirement in different applications.

## NOTICE

This manual is for general purposes. It covers multiple thermal imagers in a product line. This means that some functions and descriptions herein do not apply to the specific model of your thermal imager.

## FCC CAUTION

**This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:** (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

## PRECAUTIONS

**Always observe the following precautions:**

**When operating the device, keep it stable if possible to avoid violent shaking.**

- Do not use or store the instrument at a place with the operating or storage temperature beyond the allowable range.
- Do not align the device directly with high-intensity thermal radiation sources, such as the sun, a laser and a spot-welder.
- Do not expose the device to the dusty or humid environment. When using the device in an environment with water, do not splash water on it. When the device is not in service, cover the lens cap.
- When the device is not in service, put it and its accessories in the dedicated packing box.
- Do not block the holes on the device.
- Do not beat, throw or shake the instrument and its accessories to ensure intactness.
- Do not disassemble the device by yourself. Otherwise, you may damage the device and void your warranty.
- Do not use the accompanying SD card for other purposes.
- Do not use the device at a place with the operating temperature beyond the specified value. Otherwise, the device may be damaged.
- Do not use deliquescent or equivalent liquid for the device and cables. Otherwise, the device may be damaged.
- After the eyepiece is used for long time, its contrast will be lowered, and the scene will be whitened. You can switch to the LCD display, and switch back to the eyepiece some time later.

## PRECAUTIONS

**This device is powered by a rechargeable lithium battery. To use the battery safely, observe the following items:**

- Do not attempt to open or disassemble the battery in any event.
- Do not put the battery in a high-temperature environment or close to a high-temperature object.
- Do not short-circuit the battery.
- Do not put the battery in a humid environment or in water.
- If the battery leaks and some leaked liquid gets into eyes, flush the eyes with clean water immediately, and go for medical care.
- Charge the battery as specified in this manual, and follow the charging steps and precautions. Otherwise, the battery may be heated or damaged, or cause personal injuries.

**When wiping the device, take the following measures:**

- Non-optical surfaces: Wipe the non-optical surfaces of the thermal imager with a piece of clean and soft cloth when necessary.
- Optical surfaces: When using the thermal imager, do not dirty the optical surfaces of a lens. Especially, do not touch the lens with your hands. Otherwise, the sweat on hands will generate marks on the lens, and may even corrode the optical coating on the glass surface. When the surfaces of the optical lens are contaminated, wipe them carefully with dedicated lens paper.

# LIST OF ITEMS

## STANDARD ACCESSORIES

---

USB power supply  
with multi plugs



User's manual



Product CD



USB cable



Thermal camera



SD card



Adapter



Wrist strap



## OPTIONAL ACCESSORIES

---



Camera carrying pouch

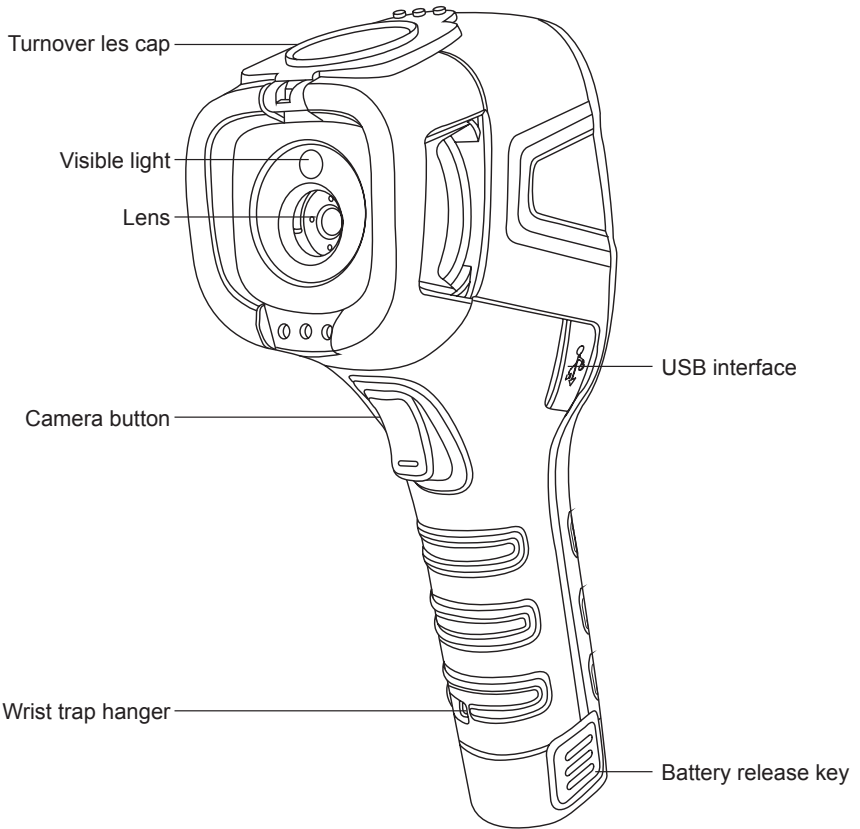


Li-ion Battery

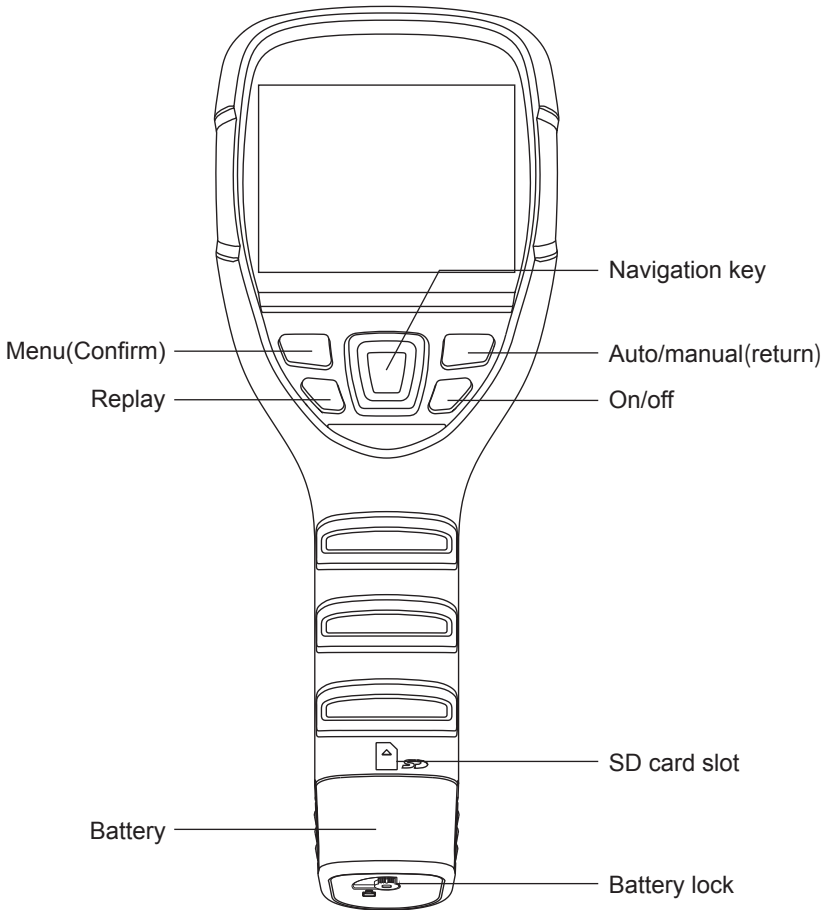


Battery charger

# LIST OF COMPONENTS



# LIST OF COMPONENTS





## DESCRIPTION OF KEYS OPERATION

B160V/B256V/B320V has a total of nine keys (as shown in the above figure), including four direction keys: +, -, <, >

“+” and “-”: select menu up and down or increase/decrease numerical value.

“◀” and “▶” : open and close menu window.

Menu (confirm): used to open main menu or confirm selection.

Auto/manual (back): switch luminance/contrast key automatically or manually or back to menu.

Replay/compensate: replay pictures through short press and compensate through long press.

On/off: turn machine on or off through long press and make machine dormant or awaken it through short press.

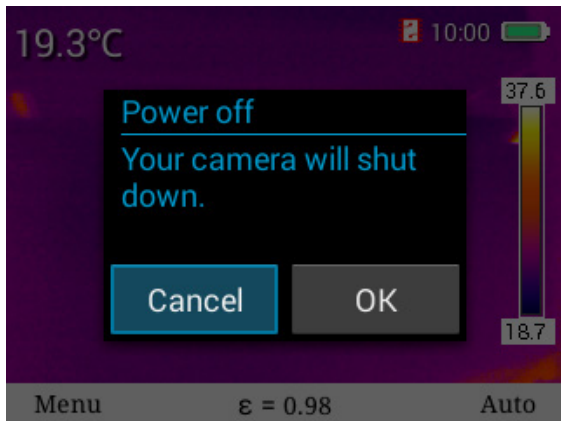
Trigger key: used to take photos.

### Start/close thermal imager

In power off mode, long press power key (on/off key) for 4-5s to light up the screen and the go to the startup picture; in power on mode, long press power key (on/off key) for 4-5s to pop a power off prompt up and then select “Confirm” to close temperature gauge.

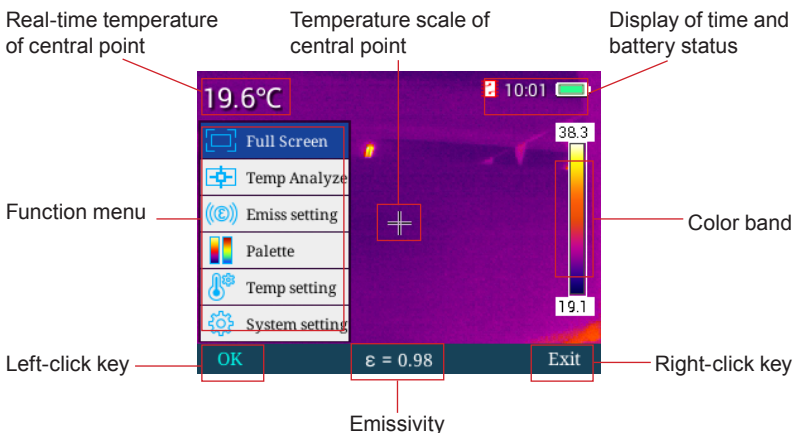
Main menu operation

Once the machine is turned on, it will go to main menu (as shown in following figure) and this interface is exactly the main interface of temperature gauge.



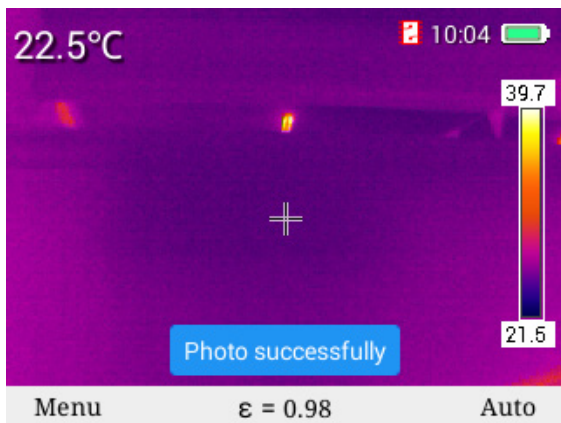
## Main menu operation

Once the machine is turned on, it will go to main menu (as shown in following figure) and this interface is exactly the main interface of temperature gauge.



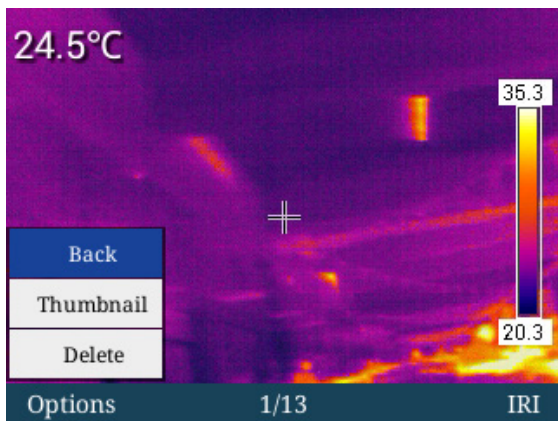
## Photographing

Short press trigger key to complete photographing of current interface, as shown in following figure.

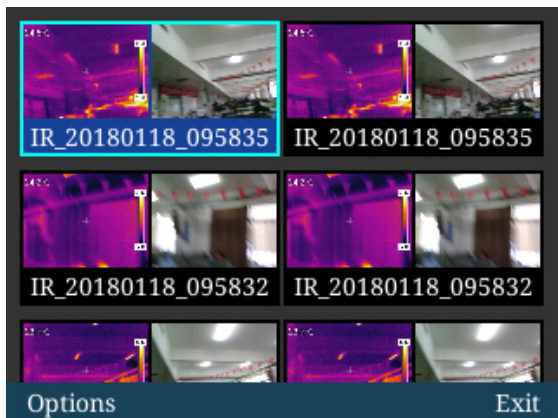


## File browsing

In main menu mode, press “replay” key to replay infrared images stored recently, press “back” key to switch between IR mode and visible light mode, press “◀” or “▶” to switch images, and press “select” key under this menu to go to “back”, “thumbnail” and “delete” menu, as shown below.

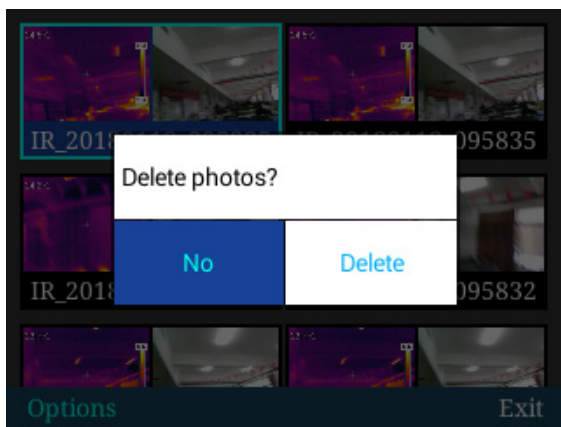


Press “+” or “-” to select “back”, “thumbnail” and “delete” menu, and press “back” key to back to the main interface. If you select “thumbnail” and press “confirm” key to access “thumbnail” menu, under this menu, press “+”, “-”, “◀” and “▶” to select corresponding images with such keys and conduct deletion, full-screen preview and other operations of such images, as shown below.



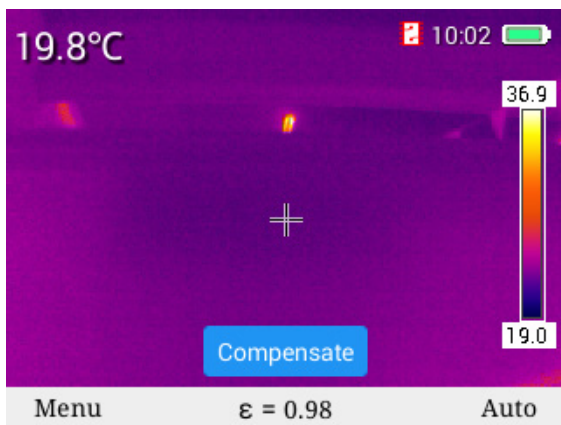
In file browsing menu, “full screen”, “delete” and “full-screen deletion” menu will appear once you press “select” key, and then you can press “+” and “-” keys to select up and down, as shown below.

Press “full screen” key, then press “confirm” key for full-screen display of images selected, press “delete” key to delete single image, and press “delete all” key to delete all images stored, as shown below.



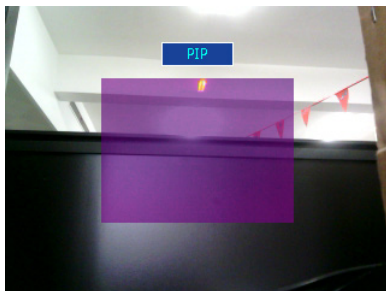
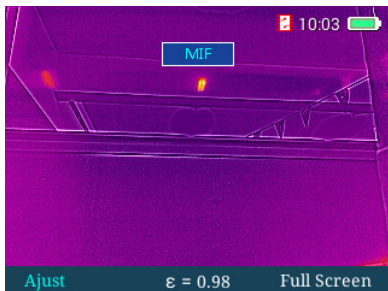
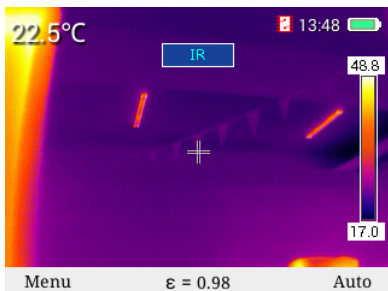
### Manual compensation

Long press “replay” key to go into manual compensation, as shown below.

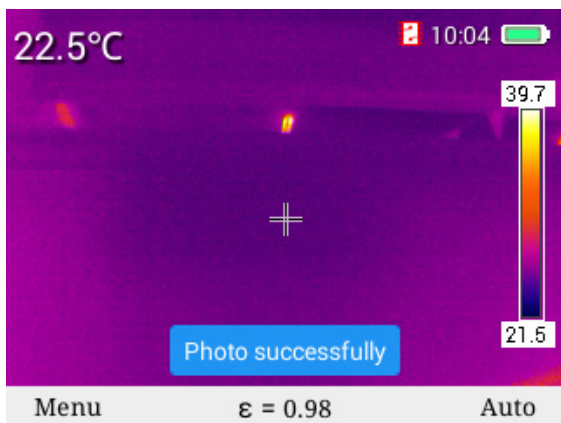


## Image model switch

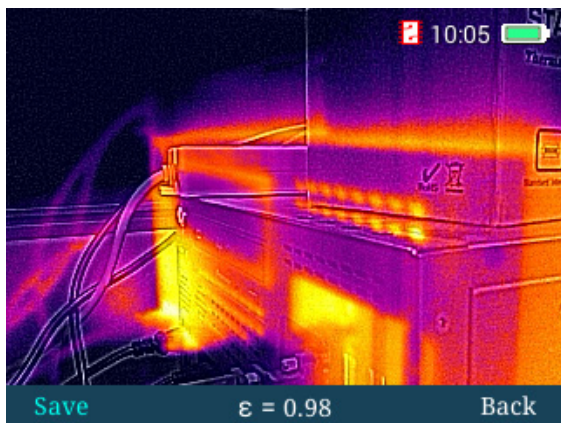
In main interface of temperature gauge, press “+” key to cycle among four image modes in the following order: IR mode, visible light mode, fusion mode and PIP mode, and press “-” key to cycle among four image modes in the following order: IR mode, PIP mode, fusion mode and visible light mode.



You can take photos by pressing the trigger in these four image modes.

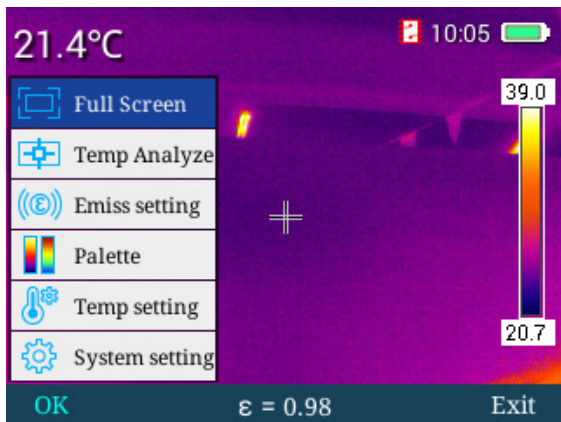


In fusion mode, you can adjust fusion position of infrared light and visible light. Press “confirm” key to go into fusion image adjustment mode, press four direction keys to displace visible light images and fuse visible light images with IR images, and press “confirm” key to store displacement adjustment setting.

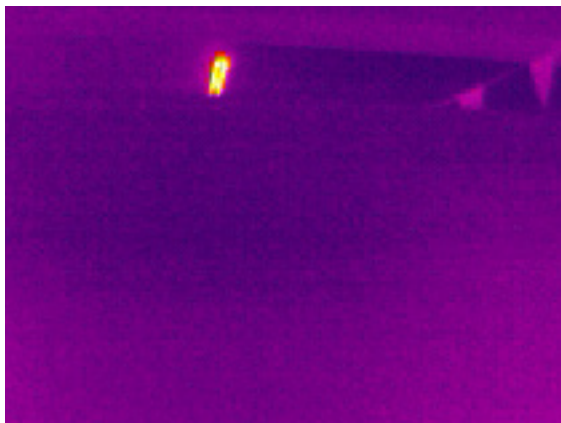


### Full screen mode

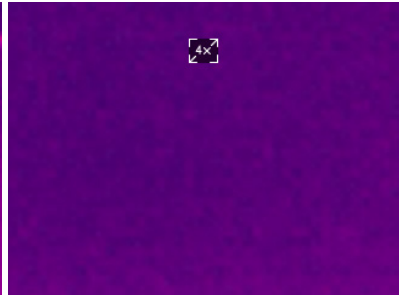
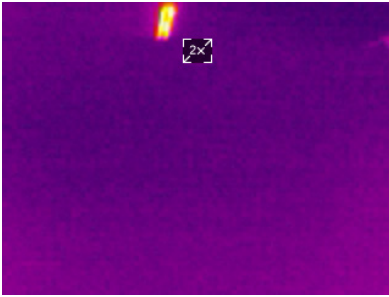
Press “menu” key to go into main menu mode, and select “full screen mode” with “+” and “-” keys, as shown below.



Select “confirm” key or “▶” key to go into full screen mode, as shown below:

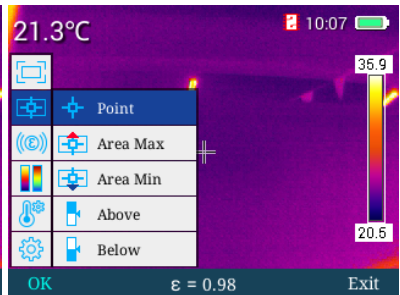
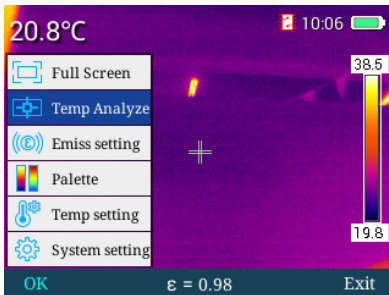


Under full screen mode menu, you can press “+” key to zoom in images and image zoom-in reminder will appear as shown in following figure (disappear after 3s). In 2X zoom-in status, if you press “+” key, you can zoom in images by four times; if you press “-” key, images will return to their original status. Press “trigger” key to store images and press “back” key to back to real-time mode.



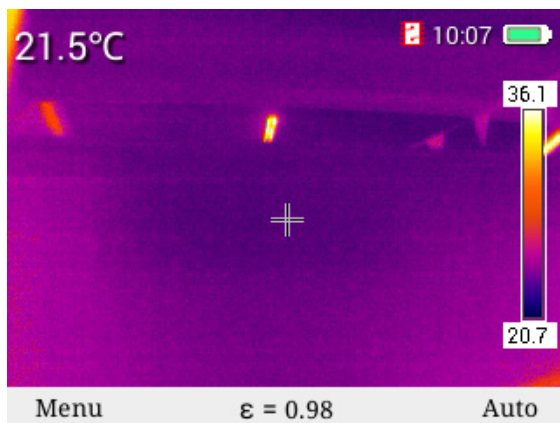
## Selection of temperature measurement pattern

In main menu mode, press “confirm” key or “right” key to go to the menu, press “+” and “-” to go to “temperature measurement pattern” menu as shown below, and select such four temperature measurement patterns as “point”, “area-wide highest”, “area-wide lowest”, “upper isotherm” and “lower isotherm”.

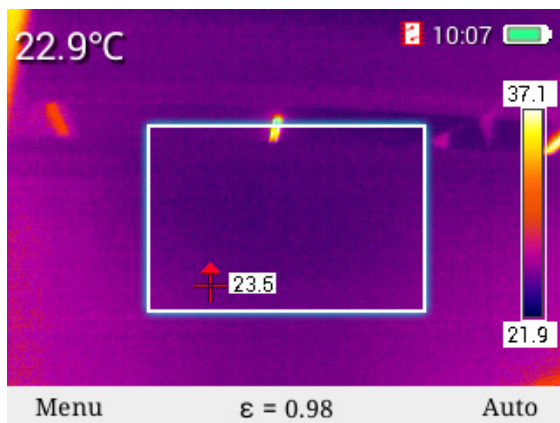




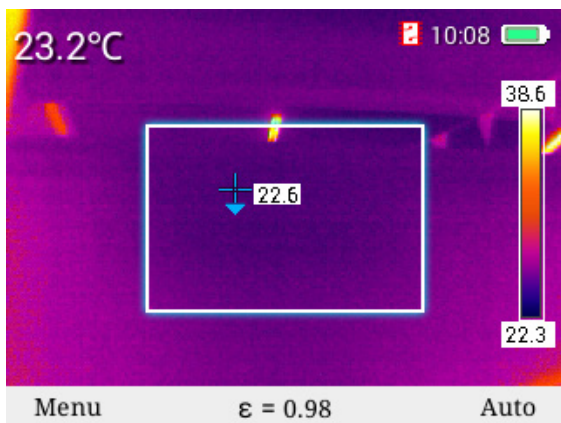
Test temperature of central point in “point” analysis mode, as shown below.



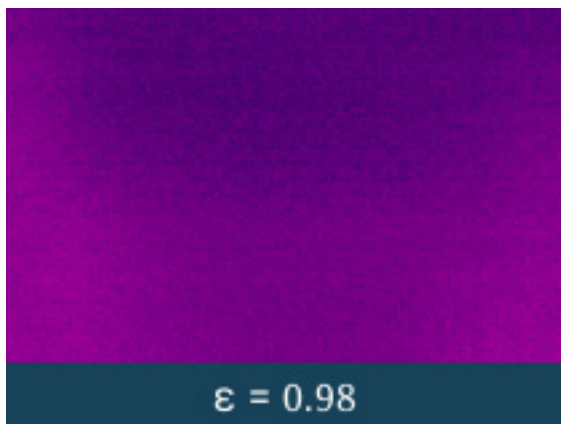
Display the highest temperature value in the area in “area-wide highest” mode, as shown below.



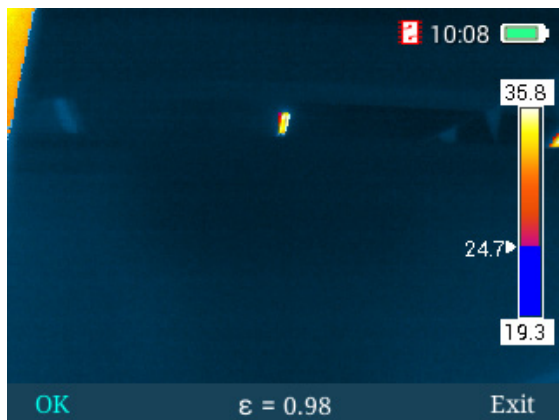
Display the lowest temperature value in the area in “area-wide highest” mode, as shown below.



In “upper isotherm” mode, select high-temperature color band with “+” and “-” keys and display it in red. Meanwhile, display corresponding high temperature area in real-time image, as shown below.

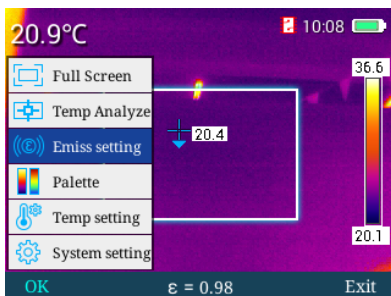


In “lower isotherm” mode, select low-temperature color band with “+” and “-” keys and display it in blue. Meanwhile, display corresponding low temperature area in real-time image, as shown below.



## Selection of emissivity

In main menu mode, press “menu” key and “right” key to go to “emissivity” menu, and select emissivity value required through table look-up and with “+” and “-” keys, as shown below:



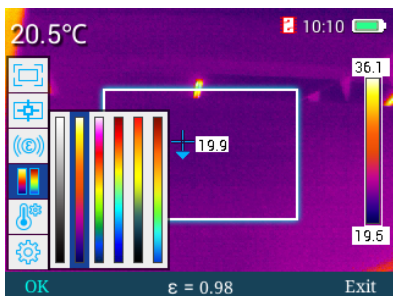
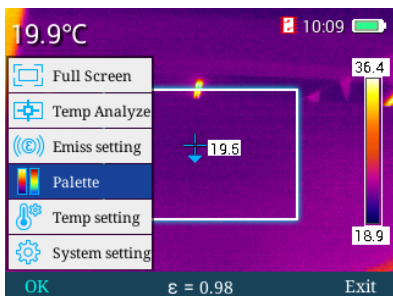
Materials	Emiss setting	Materials
Custom	$\epsilon$	Wood 0.85
Water	0.96	Brick 0.75
Stainless Steel	0.14	Tape 0.96
Aluminum Plate	0.09	Copper Plate 0.06
Black Aluminum	0.95	Human Skin 0.98
Asphalt	0.96	PVC 0.93
Black Paper	0.86	Polycarbonate 0.80
Concrete	0.97	Copper Oxide 0.78
Cast Iron	0.81	Rust 0.80
Plaster	0.75	Paint 0.90
Rubber	0.95	Soil 0.93

OK  $\epsilon = 0.98$  Exit

It is also allowed for user-defined emissivity value. In emissivity mode, go to custom mode, select “confirm” key, and then press “+” and “-” keys to customize emissivity value ranging from 0.01 to 1.00. Press “exit” key to back to main menu.

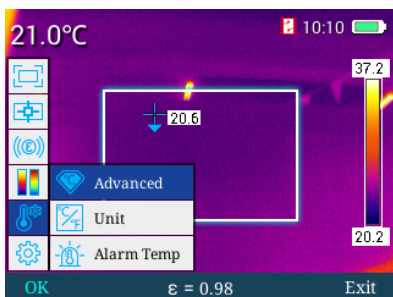
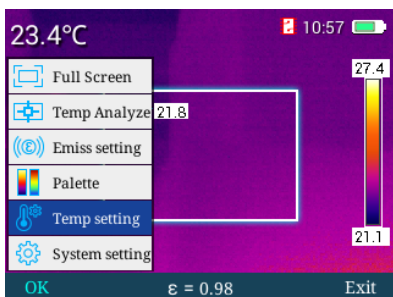
## Selection of color band

In main menu mode, press “+” or “-” keys to select “color band selection” menu, then press “confirm” key or “▶” key to go to “color band selection” menu, and select color bands required with “◀” and “▶” keys. There are six color bands available for selection. It is shown as below.

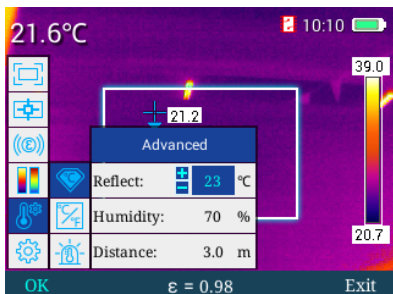
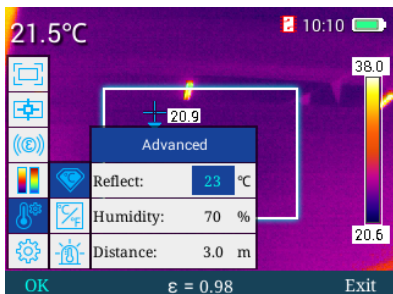


## Temperature setting

In main menu mode, press “+” or “-” keys to select “temperature setting” menu, then press “confirm” key or “right” key to go to “temperature setting” menu. You can enter into such submenus as “advanced”, “temperature unit” and “temperature alarm” to check or select corresponding functions. It is shown as below.

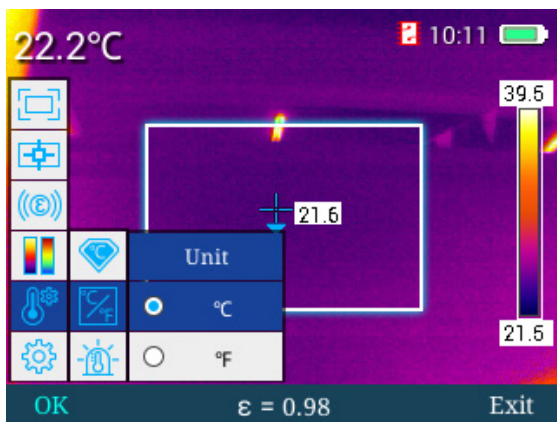


Then press “confirm” key or “▶” key to go to “advanced” menu where you can adjust numerical values of reflected temperature, relative humidity and temperature measurement distance, as shown below.

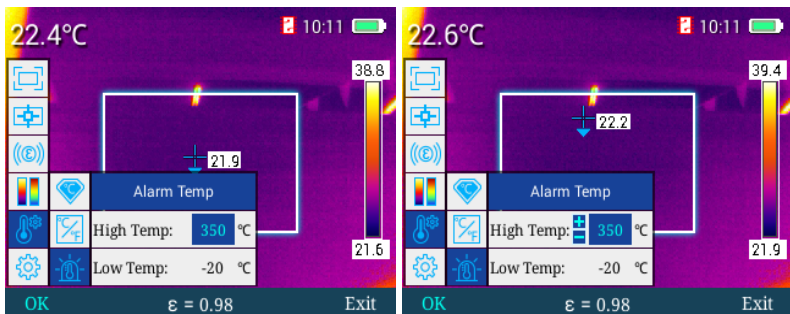


In “advanced” menu mode, press “+” key or “-” key to select corresponding options for adjustment, press “▶” key to call out plus and minus, enter into “reflected temperature” adjustment menu where you can press “+” key or “-” key to adjust numerical values, press “confirm” key to save adjusted values and press “◀” key to back to previous menu. As operating modes for relative humidity and temperature measurement distance are identical with that of environment temperature menu, no more detail will be provided. Press “exit” key to back to main menu mode.

In “temperature unit” menu, press “▶” key to go to temperature unit selection menu, then press “+” key or “-” key to select switch between Fahrenheit and Celsius, and press “confirm” key to save selection status. Press “◀” key to back to previous menu, as shown below.

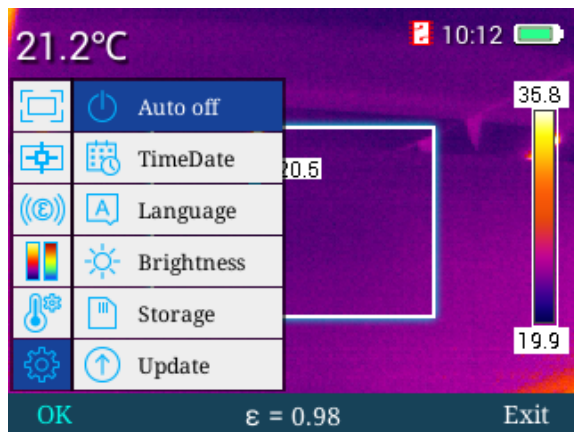


In “temperature alarm” menu, select “▶” key to access high temperature alarm/low temperature alarm menu. In this menu, press “+” and “-” keys to select high temperature alarm or low temperature alarm which will be highlighted in blue, then press “▶” key to call out plus and minus, and press “+” key or “-” key to adjust values of alarm temperature. At high alarm temperature, as for temperature more than value set, the black blue cross cursor will flash continuously for alarming in the course of area-wide analysis; at low alarm temperature, as for temperature less than value set, the black blue cross cursor will flash continuously for alarming in the course of area-wide analysis. Press “confirm” key to save values set, press “◀” key to back to previous menu, and press “exit” key to exit current menu and back to main menu, as shown below.



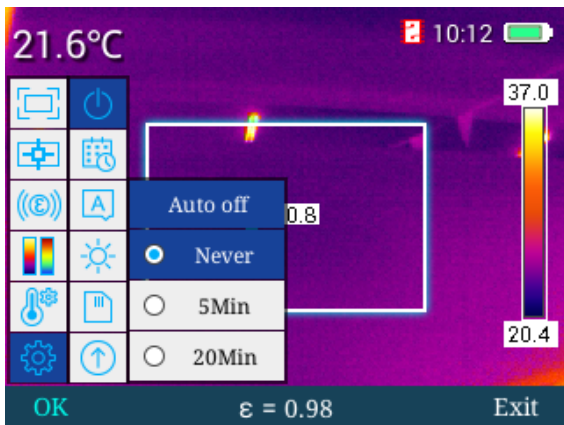
## General setup menu

In main menu mode, press “+” or “-” keys to select “general setup” menu, then press “confirm” key or “▶” key to go to “general setup” menu which includes “auto power-off”, “time and date”, “language selection”, “screen luminance”, “storage location”, “upgrade”, “WIFI hot spot”, “USB video”, “reset”, “help”, and “version No.”, as shown below:



## Auto power-off

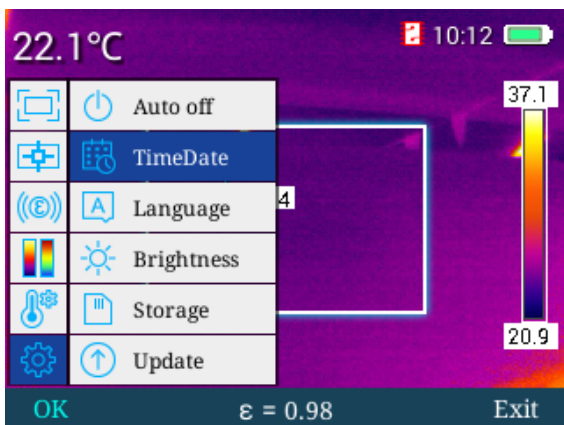
In main menu, press “+” or “-” keys to select “auto power-off” menu, then press “confirm” key or “▶” key to access “auto power-off” to set up corresponding auto power-off functions, as shown below.



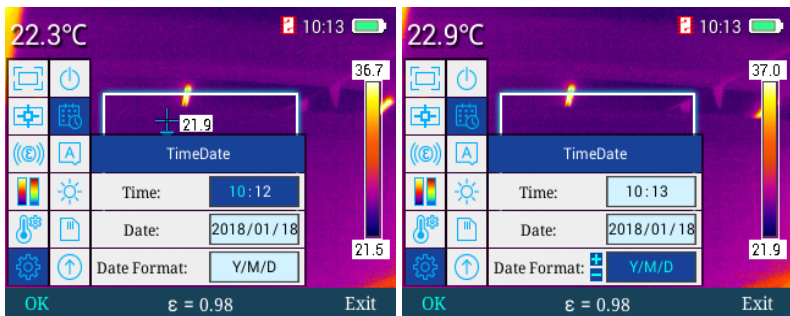
“No” means no auto power-off and “5 minutes” indicate auto power-off reminder will be popped up 5 minutes later. If you select to cancel, it will stay powered on; if you choose nothing, it will power off automatically; in a similar way, “20 minutes” indicate auto power off 20 minutes later.

## Time and date setting

In general setup menu, press “+” or “-” keys to select “time and date” menu, then press “confirm” key or “▶” key to access “time and date” menu to set up system time and date, as shown below.

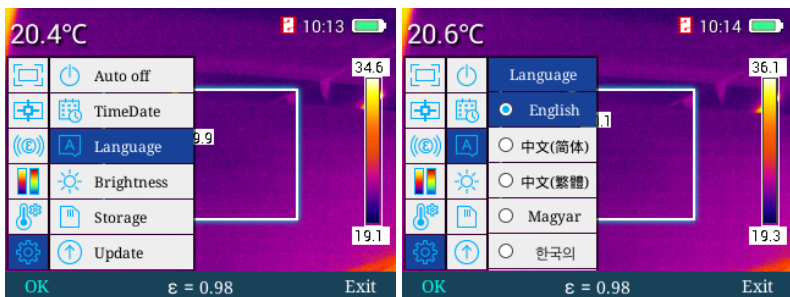


In “time and date” menu, press “▶” to successively select values to be adjusted which will be highlighted in blue, and then select “+” or “-” keys to adjust values selected. Press “◀” key to back to previous value selected and press “confirm” key to save current value adjusted, as shown below.



## Language selection

In general setup menu, press “+” or “-” keys to select “language selection” menu, and then press “confirm” key or “▶” key to access “language selection” menu where you can press “+” or “-” keys to select corresponding languages, as shown in flowing figure.

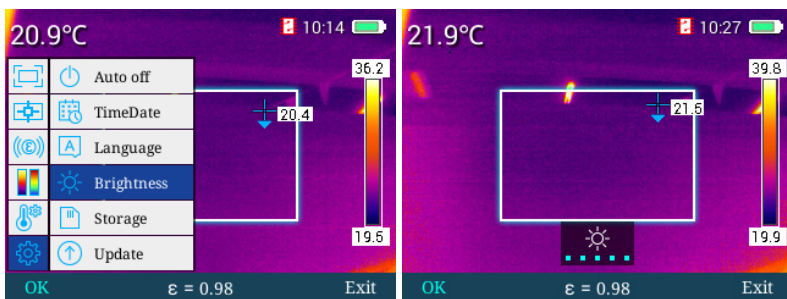


## Screen luminance setting

In general setup menu, press “+” or “-” keys to select “screen luminance” menu, and then press “confirm” key or “▶” key to access “screen luminance” menu where you can press “right” key and “◀” key to increase or decrease screen luminance in five grades. Press “confirm” key to save luminance

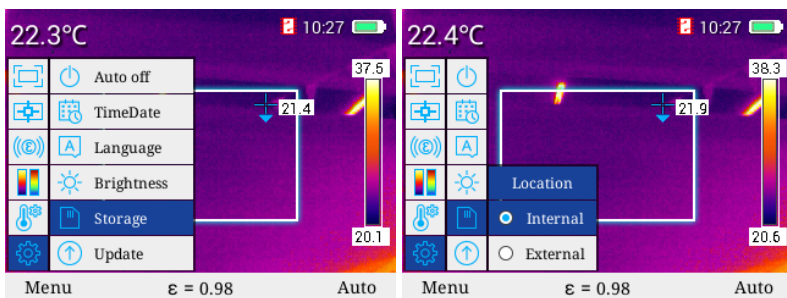


grade set. Press “exit” key to back to the main interface, as shown below.



## Storage location

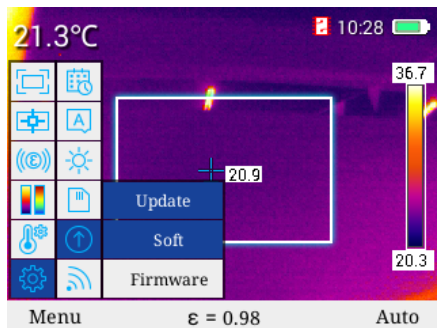
In general setup menu, press “+” or “-” keys to select “storage location” menu, and then press “confirm” key or “▶” key to access “storage location” menu where you can press “+” key and “-” key to switch storage location. This machine supports 16G SD card memory function. In main menu, press “trigger” key to take photos which can be stored in SD card. Without SD card, images will be stored in the memory of the machine; when external SD card is selected, “no external SD detected” pop-up will appear, as shown below.



If you fail to save images and image storage capacity has been met, a picture shown in following figure will appear.

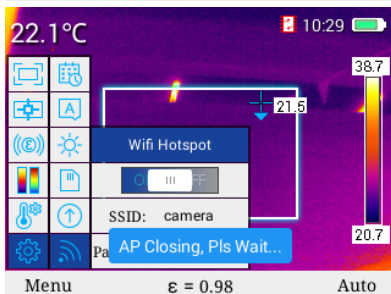
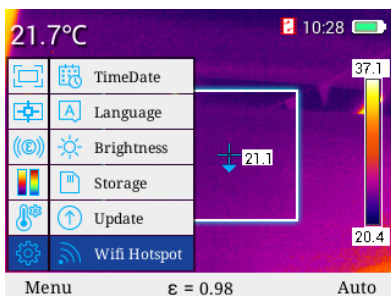
## Upgrading

For upgrading, please refer to maintenance instrument.



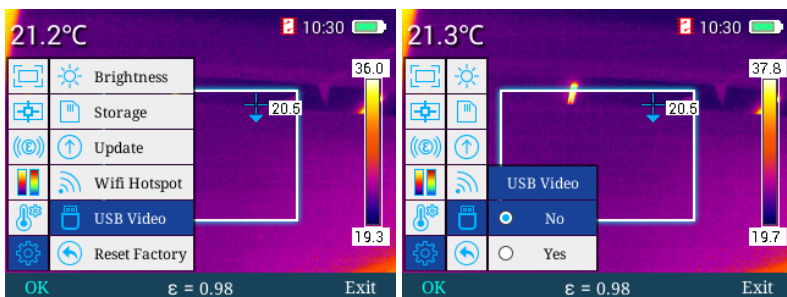
## WIFI hot spot

In general setup menu, press “+” key to select “WIFI hot spot” menu, and press “confirm” key or “▶” key to access “WIFI hot spot” menu, and then press “confirm” key or “▶” key to turn WIFI on or off. Once it is turned on, there will be a WIFI icon at the top right corner. Temperature measurement APP and infrared analysis software can be connected to equipment via WIFI to transmit and analyze IR real-time videos and images, as shown below.



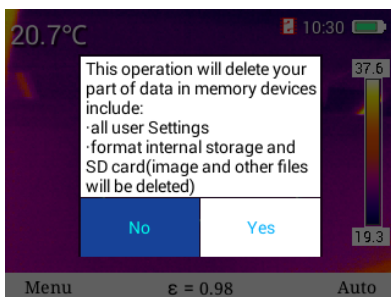
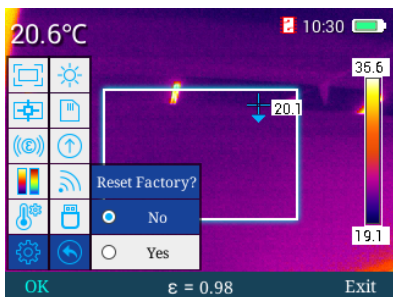
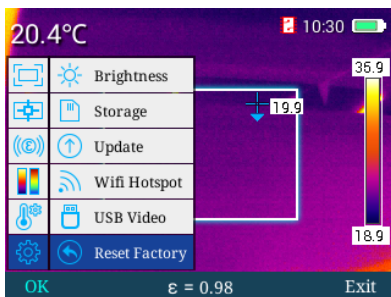
## USB video

In general setup menu, press “+” key or “-” key to select “USB video” menu, and press “confirm” key or “▶” key to access “USB video” menu, then press “+” key or “-” key to switch USB video on or off, and press “confirm” key to save on-off state of USB video. Once USB video is switched on, PC infrared analysis software can be connected to equipment with USB connecting wire and opened to transit and analyze IR real-time videos and images, as shown below.



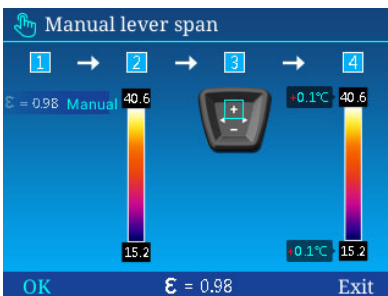
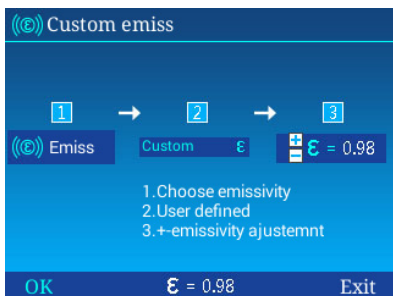
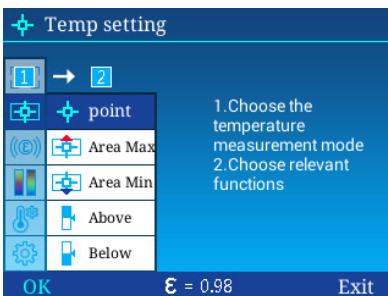
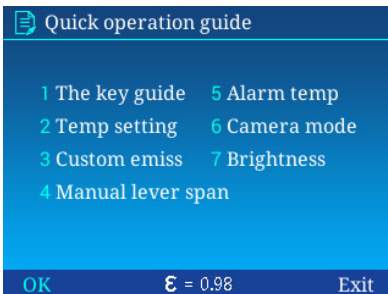
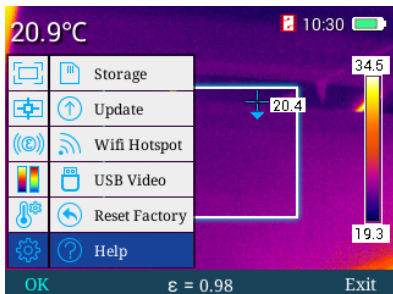
## Factory reset

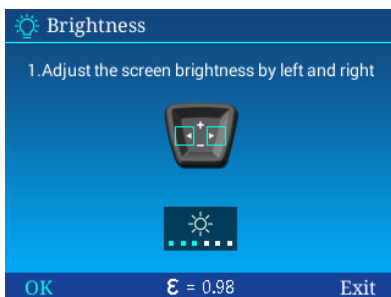
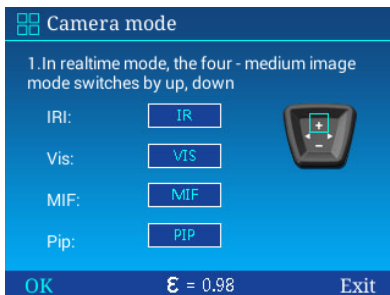
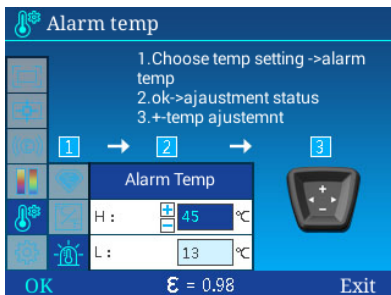
In general setup menu, press “+” key or “-” key to select “factory reset” menu, and then press “confirm” key or “▶” key to pop up dialog box to select whether to restore system settings or not. Select “yes” to restore factory settings and select “no” to not restore factory settings, as shown below.



## Help check

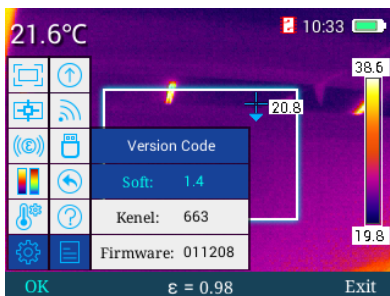
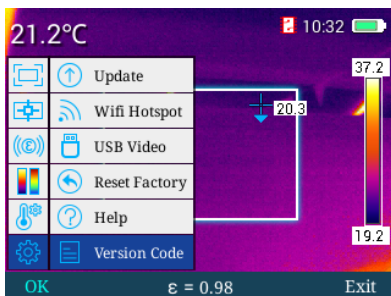
In general setup menu, press “+” key or “-” key to select “help” menu, then press “confirm” key or “right” key to access “help” menu where you can press “◀” key or “▶” key to conduct loop check of help images, and press “exit” to back to main menu, as shown below.





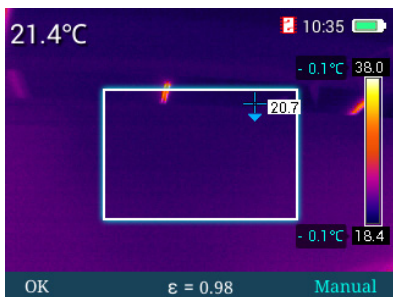
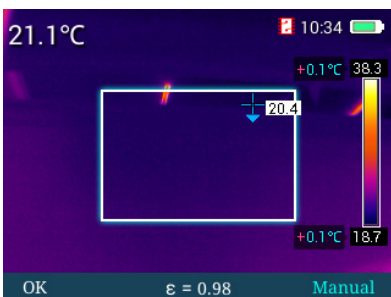
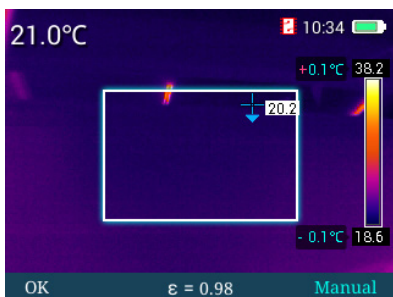
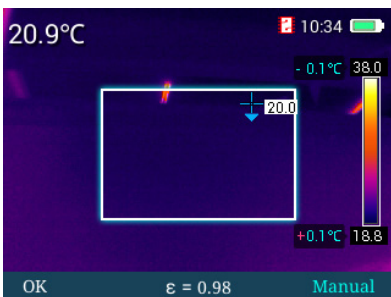
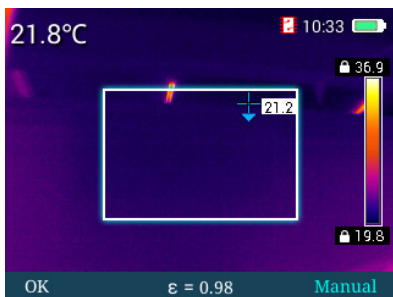
## Version No.

In general setup menu, press “+” key or “-” key to select “version No.” menu, then press “confirm” key or “▶” key to access “version No.” menu where you can check out versions of software, kernel and firmware of equipment, and press “exit” to back to main menu.



## Luminance/contrast adjustment

In general setup menu, press “auto/manual” key to go to manual luminance/contrast adjustment mode, press “▶” key to decrease Tmax and increase Tmin simultaneously, press “◀” key to increase Tmax and decrease Tmin simultaneously, and press “+” key to increase Tmax and Tmin and “-” key to decrease Tmax and Tmin simultaneously, as shown below.



## Standby

In any menu, you can short press power key to go into standby state. In standby state, machine can be awakened merely by pressing power key.

## TROUBLESHOOTING GUIDE

Start-up failure	Low battery	Use battery after charging
	Poor contact of battery	Remove battery, put it in battery compartment again and properly install the battery
	Plug of external battery is not put in proper place	Pull the plug and reinsert the battery in proper place
Obvious deviation between battery power indication and actual power usage	Battery runs out	Replace it with a fully charged battery
	Battery life is expired	Replace it with new battery
Unclear IR image	Lens have misted up or been polluted	Clean lens with specialized equipment
Unclear visible light image	Excessively dark surrounding environment	Take appropriate lighting measures
	There is vapor in front of visible light or the visible light is polluted	Clean the front-end of visible light with specialized equipment
Inaccurate temperature measurement	Relevant temperature measurement parameters are set incorrectly	Change parameter setting or restore the default parameters directly
	Non-uniformity correction has not been implemented for a long time	Set custom key as compensation key in the menu, press custom key, and conduct non-uniformity correction after shutter sounds.
	Temperature measurement starts immediately after start-up	To ensure temperature measurement accuracy, we recommend you to turn on the thermal imager and then wait for 5-10 minutes before temperature measurement.
	No calibration for a long time	To ensure accurate temperature measurement result, we recommend you to send back the thermal imager for calibration once a year.



# twilight

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