



专业级热成像仪
Professional Thermal Imager

03082



使用说明书 \ User's Manual





序言

尊敬的用户：

您好！感谢您选购全新的 03082 热成像仪，为了正确使用本产品，请您在使用之前仔细阅读本说明书全文，特别是有关“安全注意事项”的部分。

如果您已经阅读完本说明书全文，建议您将此说明书妥善保管，与热成像仪一同放置或者放在您随时可以查阅的地方，以便在将来的使用过程中查阅。

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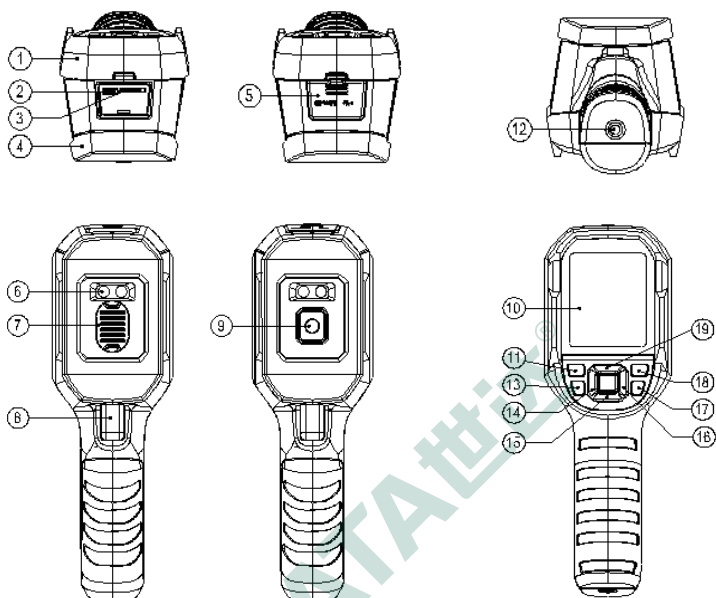
1. 性能指标

传感器	非制冷焦平面
温度范围	-10° C~400° c
分辨率	0.1°C
模式	自动增益
精度	±2°C或 2%
测量距离	25cm
测温响应时间	≤500ms(读数的 95%)
发射率	0.95(默认) (0.01~0.99 可调) 系统有预设值
热成像像素	19200 (160*120)
像素大小	12µm
色板	黑白、红白、蓝白、彩虹、铁红
红外光谱带宽	8~14µm
视场角 (FOV)	56° (H)*42° (V)
瞬时视场角 (IFOV)	6mrad
热成像灵敏度	<50mK
帧速率	<9Hz
测温显示	中心点测温和高低温追踪
图像格式	BMP
按键	10 个按键 (开机键、拍照键、返回键、左右上下导航键、SET 键、图片浏览键、LED 照明开关键)

General

PC 分析软件	有
数据通讯	Type-c uSB
产品尺寸 (LxWxH)	236mm*75.5mm*86mm
显示屏类型	2.8" TFT LCD
显示分辨率	320*240
电池	Li-ion 3.6V / 5000mAh 26650 单节
自动关机	可选 (5min 10min 30min) 默认 30min
使用时间	不低于 6 个小时
充电时间	4 小时
充电电压 / 电流	5V/2A
图像存储	Micro SD 卡
跌落要求	2 米
IP 等级	IP65
认证	CE
存储温度	-20~60c (-4~140° F)
工作温度	0~50c (32~140° F)
工作湿度	<90%RH(非冷凝)
海拔	不超过 2000 米
配件	说明书, Type-c USB 线, 16GB TF 卡

2. 构造



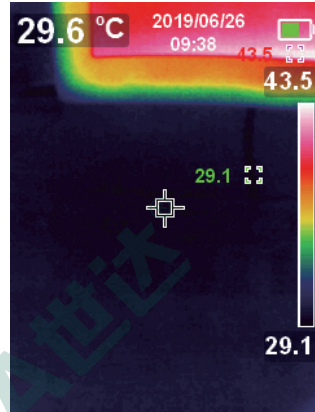
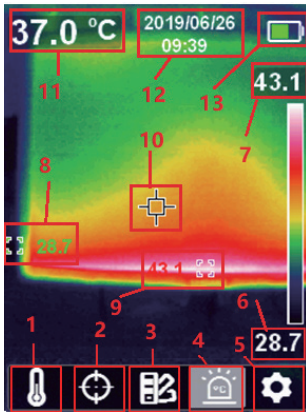
- 1 上壳
- 2 SD 卡槽
- 3 USB 接口
- 4 下壳
- 5 接口防护盖
- 6 照明灯
- 7 红外热像窗口防护盖
- 8 拍照扳机键
- 9 红外热像窗口
- 10 液晶显示屏

- 11 按键开机键
- 12 支架固定螺孔
- 13 按钮照明灯键
- 14 按钮左键
- 15 按钮下键
- 16 按钮右键
- 17 按钮返回键
- 18 按钮照片浏览键
- 19 按钮上键
- 20 按钮 SET 键

3. 显示说明

- 屏幕尺寸 :2.8"

- 显示器分辨率 :320(垂直)×240(水平)



1. 温度单位选项
2. 光标选项
3. 调色板选项
4. 高低温警报选项
5. “设置”选项
6. 当前自动追踪温度最小点温度
7. 当前自动追踪温度最大点温度

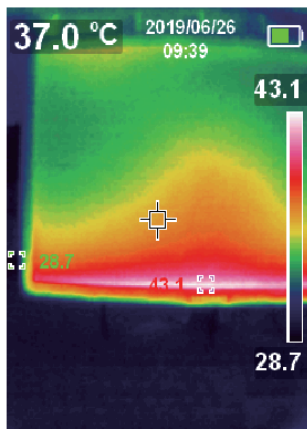
8. 当前自动追踪温度最小点
9. 当前自动追踪温度最大点
10. 温度测量中心点
11. 当前温度测量中心点温度
12. 当前日期时间
13. 当前电池电量指示

4. 开关机

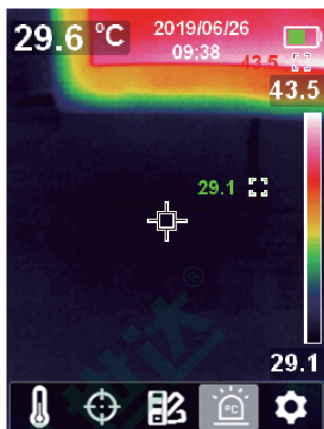
开机时长按开机键 3 秒，热像仪开机，关机时短按开机键 1 秒，热像仪关机。

5. 配置菜单说明

主菜单配置选项



热成像测试页面



1. 在测试页面按 SET 键弹出主菜单
2. 按左右键选择子菜单
3. 按 SET 键确定进入相应子菜单
4. 按上下键选择子菜单设置项
5. 按 SET 键选择设置
6. 按返回键返回上级并保存设置
7. 再次按返回键返回热成像测试页面

主菜单



子菜单



温度单位选项



光标选项



调色板选项

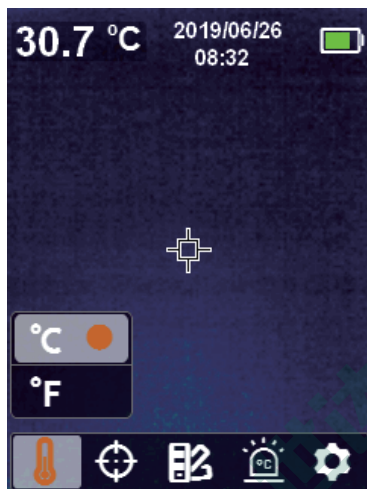



温度警报选项



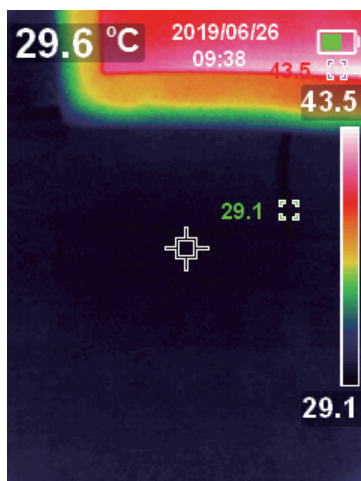
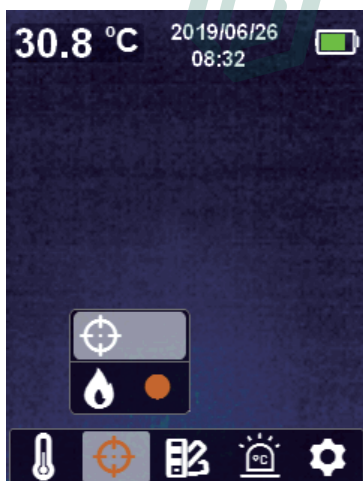
设置选项

6. 摄氏度和华氏度切换



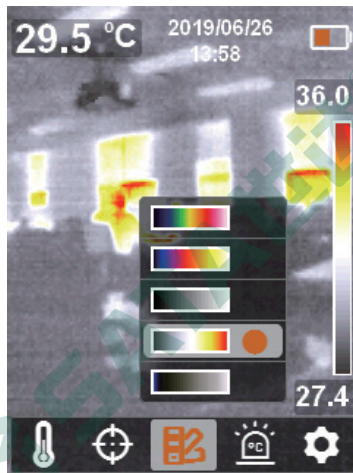
在热成像主测试页面，按 SET 键进入配置主菜单，按左 / 右键选择温度单位选项 ；按 SET 键进入子菜单配置，按上 / 下键选择摄氏度°C或华氏度°F单位切换，按返回键保存配置；

7. 中心点与高低温追踪



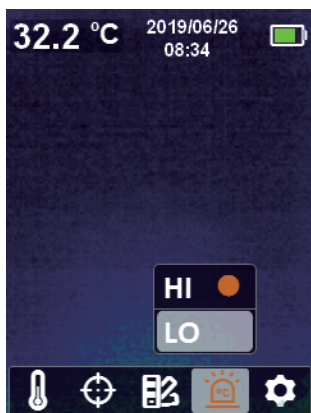
若需要使用中心点 / 高低温追踪功能，按 SET 键弹出主菜单选项，通过左键 / 右键选中光标选项 \oplus ，再按 SET 键进入光标子菜单选项，通过上键 / 下键进行选择；按 SET 键选中 \oplus 选项，当出现十字准心时表示打开了中心点光标，当十字准心消失表示关闭了中心点光标功能；按 SET 键选中 \ominus 选项，打开高低温追踪功能，热成像画面中出现高低温自动追踪框，并在追踪框旁边同步显示对应温度，当自动追踪框消失表示关闭高低温追踪功能，最后点击返回键退出光标子菜单返回到一级主菜单，再次点击返回键退出一级主菜单回到图像显示模式，在显示模式下在屏幕的右边彩条的上下区域，显示最高点和最低点的温度。


8. 调色板样式选择



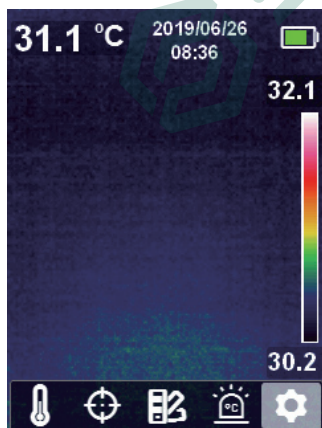
调色板菜单提供了铁红、彩虹和黑白、红白、蓝白五种色彩，用于调节捕获的红外图像伪色。若需使用调色板功能，按 SET 键弹出主菜单选项，通过左键 / 右键选中色板选项，再按 SET 键进入色板子菜单选项，通过上键 / 下键在铁红、彩虹和黑白、红白、蓝白五种中进行选择，按返回键保存配置，再次点击返回键退出一级主菜单回到图像显示模式，此时热成像会根据不同的伪色显示。

9. 高低温警报



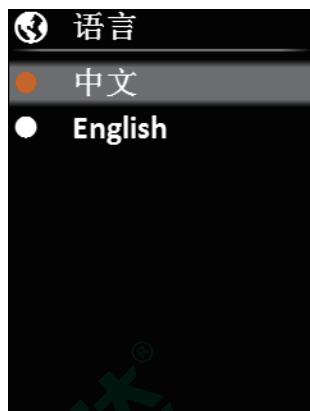
若需要使用高低温警报功能，按 SET 键弹出主菜单选项，通过左键 / 右键选中警报选项 ，再按 SET 键进入子菜单选项，通过上键 / 下键进行选择；按 SET 键选中 HI (High) 或 LO (Low) 选项，然后按 SET 键设定，可以同时或分别打开关闭高温警报和低温警报，再次点击返回键退出一级主菜单回到图像显示模式。

10. 设定页面



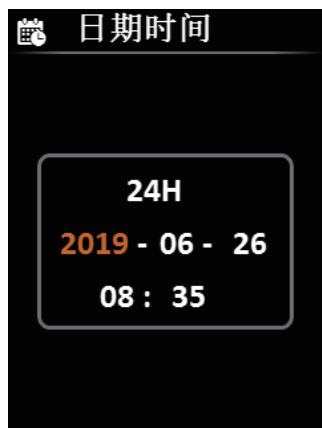
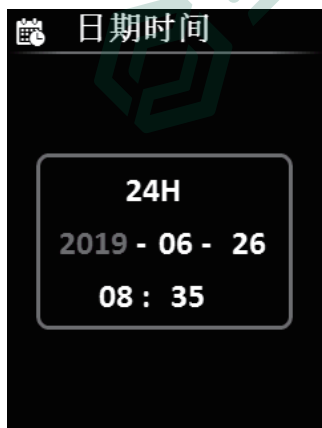
按 SET 键进入子菜单，按左键或右键选择设定选项，按 SET 键进入设定页面二级菜单，可分别选不同设定项进行设定，点击返回键返回到设定页面一级菜单，再次点击返回键则返回到主菜单。

11. 语言



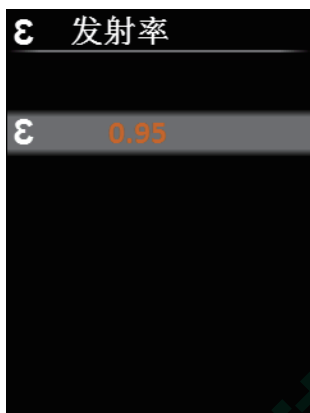
进入设定页面一级菜单后，选中语言选项，点击 SET 键，进入“语言”子菜单，如上图所示，通过上 / 下键选择语言种类，系统默认语言有中文、英文，点击 SET 键选中所需语言选项，然后点击返回键退出“语言”子菜单，返回到设定页面一级菜单。

12. 日期及时间



进入设定页面一级菜单后，选中日期时间选项，点击 SET 键，进入“日期时间”子菜单，如上图所示，点击左键 / 右键选择日期年 / 月 / 日或时间 / 时间制式进行设置，按 SET 键进入设定状态 [文字显示为橙色]，按上键 / 下键进行加 / 减数字设置相应时间日期，设定后，按 SET 键保存并返回，返回可继续选择其他时间日期项进行设置，最后按返回键退回到设定页面一级菜单。

13. 发射率



选择正确的发射率数值对您进行精确温度测量很重要，发射率对产品测得的表面温度有重大影响。进入设定页面一级菜单后，选中发射率选项，点击 SET 键，进入“发射率”子菜单，如上图所示，再次点击 SET 键进入设置状态（数字变为橙色），用户通过上/下键可自定义发射率，可以以 0.01 步长调节 0 到 0.99 内的发射率，默认值设为 0.95，点击 SET 键保存参数，最后点击返回键退出“发射率”子菜单回到设定页面一级菜单。

备注：常用物体发射率请参照附录的常用发射率表

14. 自动关机



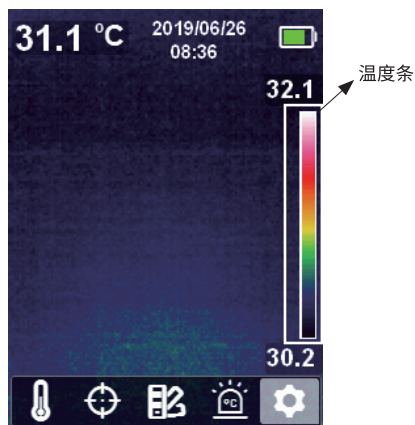
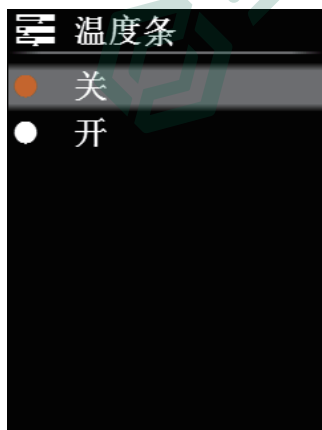
进入设定页面一级菜单后，选中自动关机选项，点击 SET 键，进入“自动关机”子菜单，如上图所示，通过上/下键选择时间参数，系统预设 5 分钟、10 分钟、30 分钟、关四项，选中后点击 SET 键选中所需时间参数选项，然后点击返回键退出“自动关机”子菜单，返回到设定页面一级菜单。

15. 显示屏亮度



进入设定页面一级菜单后，选中显示屏亮度选项，点击 SET 键，进入“显示屏亮度”子菜单，如上图所示，通过上 / 下键选择亮度参数，系统预设为 1. 低 2. 中 3. 高，选中后，点击 SET 键选中所需选项，然后点击返回键退出“显示屏亮度”子菜单，返回到设定页面一级菜单。

16. 温度条



进入设定页面一级菜单后，选中温度条选项，点击 SET 键，进入“温度条”子菜单，如上图所示，通过上 / 下键选择温度条打开关闭，可以打开关闭热像测试页面的温度条显示，选中后点击 SET 键选中所需选项，然后点击返回键退出。

17. 高低温度设定



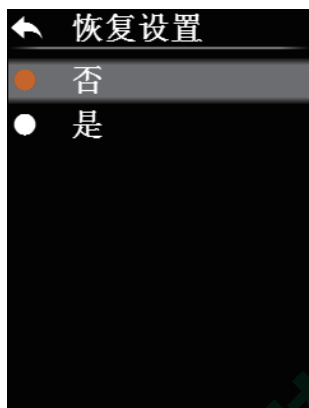
进入设定页面一级菜单后，选中高低温报警设定选项，点击 SET 键，进入“高低温设定”子菜单，用户可以自定义高低温警告阈值，如上图所示，通过上/下键选择选项，当选中“高温设定”或“低温设定”选项时，点击 SET 键，进入设定状态，通过上/下键调节温度参数，设置完之后按 SET 键退出设定并保存，然后点击返回键退出“高低温设定”子菜单，返回到设定页面一级菜单。

18. 本机信息



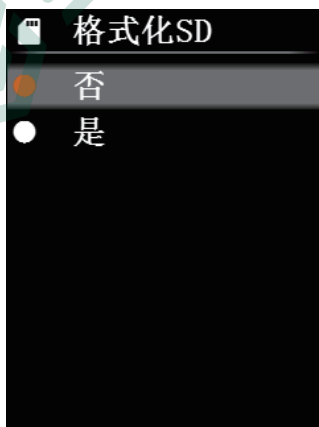
进入设定页面一级菜单后，选中本机信息选项，点击 SET 键，进入“本机信息”子菜单，如上图所示，可以查看本机固件版本、存储容量、型号等信息，然后点击返回键退出“本机信息”子菜单，返回到设定页面一级菜单。

19. 恢复设置



进入设定页面一级菜单后，选中恢复设置选项，点击 SET 键，进入“恢复设置”子菜单，如上图所示，通过上/下键选择否或是选项，点击 SET 键选中所需选项，然后点击返回键退出“恢复设置”子菜单，返回到设定页面一级菜单。

20. 格式化 SD



进入设定页面一级菜单后，选中“格式化 SD”选项，点击 SET 键，进入“格式化 SD”子菜单，如上图所示，通过上/下键选择选项，点击 SET 键选中所需选项，等待格式化完毕，然后点击返回键退出“格式化 SD”子菜单，返回到设定页面一级菜单。

21. 图片保存自动和手动选项



进入设定页面一级菜单后，选中自动保存选项，点击 SET 键，进入“自动保存”子菜单，如上图所示，通过上/下键选择选项，点击 SET 键选中所需选项，然后点击返回键退出“自动保存”子菜单，返回到设定页面一级菜单。

1. 备注：在保存、浏览图片的过程中，请勿拔插 SD 卡；
2. 在使用过程中如果更换 SD 卡，需要在换卡后重启机器才能使用拍照及图片保存功能。

22.USB 通信

- 请参照下载指南下载 Thermal Analyzer 上位机软件并完成安装。
- 将 USB 数据线与电脑连接
- 通过上位机软件可以浏览图片和分析数据。关于上位机软件的使用方法，你可以从操作界面的帮助选项中调取《软件用户手册》做参考

备注：

在软件读取图片过程中，请勿拔掉 USB 数据线。

23. 保养

用湿布或弱肥皂液清洗结构外壳，不要使用研磨剂、异丙醇或溶剂清洁仪表外壳、镜头和窗口。

24. 安全须知

为了保证测量结果准确，请仔细阅读使用说明。请务必按照说明书使用本产品，否则造成产品损坏后将不进行免费保修。请不要在易燃易爆、蒸汽周围、潮湿或腐蚀性环境下使用本仪器。请不要在仪器损坏、摔落或修正后的情况下继续使用，以免造成错误的测试结果。请参考辐射系数信息获取实际温度，否则会导致测得的温度不准确。由于充电会引起机体内部温度升高，从而影响温度测量精度。因此，建议在对本产品充电时不要进行温度测量。

25. 使用须知

请参考辐射系数信息获取实际温度，否则会导致测得的温度不准确。由于产品功耗发热比较大，会引起机体内部温度升高，为了保证产品精度，长时间关机状态再开机使用时，建议开机预热十分钟后再进行测量。由于充电会引起机体内部温度升高，从而影响温度测量精度，因此，建议在对本产品充电时不要进行温度测量。

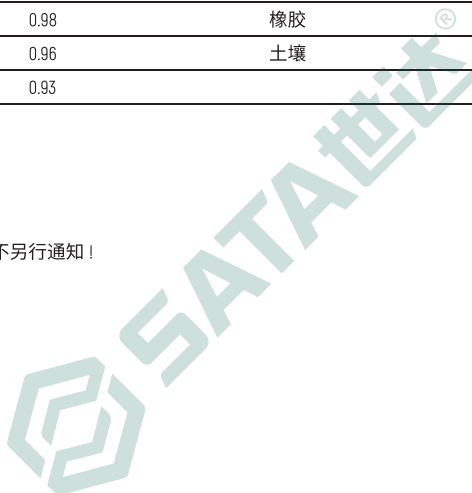
因传感器固有的温度漂移特性，偶尔会测温不准，在测温界面按一下下导航键显示“Calibrating”会自动进行温度校正。

备注：本说明书可以在世达官网下载电子档，下载方法请参照指南。

26. 附录常用发射率

材质	发射率	材质	发射率
木	0.85	黑纸	0.86
水	0.96	聚碳酸	0.80
砖	0.75	混凝土	0.97
不锈钢	0.14	氧化铜	0.78
胶带	0.96	铸铁	0.81
铝板	0.09	锈	0.80
铜板	0.06	石膏	0.75
黑铝	0.95	油漆	0.90
人体皮肤	0.98	橡胶	0.95
沥青	0.96	土壤	0.93
PVC 塑料	0.93		

本说明书内容如有变更，恕不另行通知！



Preface

Thank you for purchasing the new 03082 thermal imager. In order to use this product safely and correctly, please read this manual thoroughly, especially the Safety Instructions part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Limited Warranty and Liability

SATA guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. The dealer shall not be entitled to give any other warranty on behalf of SATA. If you need warranty service within the warranty period, please contact your seller directly.

SATA will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device.



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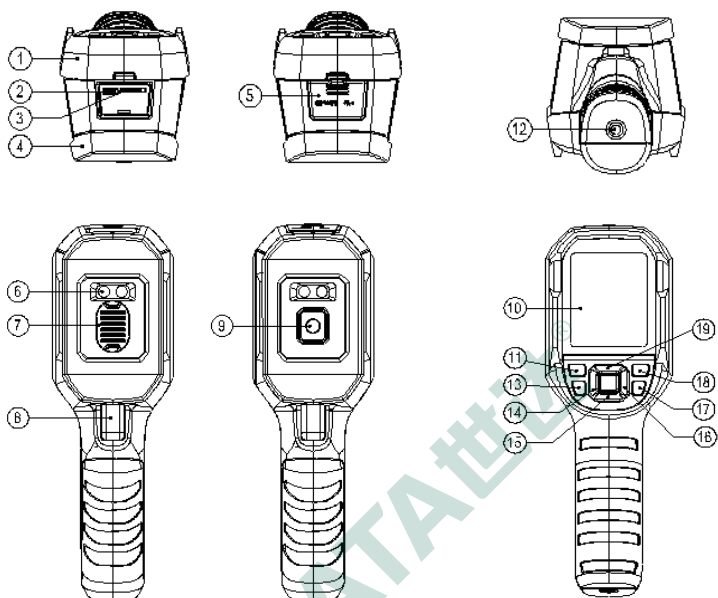
1. Safety Instructions

To ensure accurate measurement results, please read the instructions carefully.

- Please use this product in accordance with the user manual, otherwise the free warranty will be voided if the product is damaged.
- Please do not use this product in flammable, explosive, steamy, wet or corrosive environments.
- Please stop using the product if it is damaged or modified to avoid inaccurate measurement results.
- Please use the correct emissivity to obtain accurate temperature readouts.
- To ensure the accuracy of the product, please warm it up for 10 minutes before measuring if it has not been used for a long time.
- When being charged, the internal temperature of the product will rise, which will lead to inaccurate temperature measurement. So, it is not recommended to take measurements during or right after charging the product.
- The inherent temperature drift of the sensor will occasionally cause inaccurate measurement. In this case, press the down button under the temperature measurement interface to bring out "Calibrating" and automatically calibrate temperature.



2. Structure

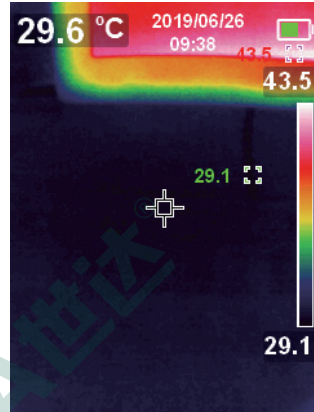
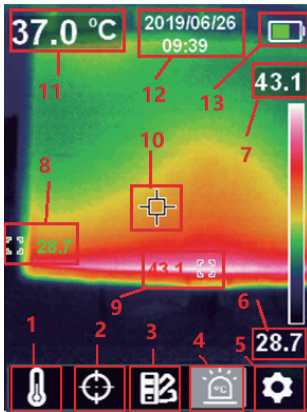


- 1 Upper shell
- 2 Micro SD card slot
- 3 USB interface
- 4 Lower shell
- 5 Interface cover
- 6 LED light
- 7 Infrared thermal image window cover
- 8 Picture taking trigger
- 9 Infrared thermal image window
- 10 LCD

- 11 Power button
- 12 Tripod mounting hole
- 13 Light button
- 14 Left button
- 15 Down button
- 16 Right button
- 17 Back button
- 18 Picture browsing button
- 19 up button
- 20 SET button

3. Display

- Display size: 2.8"
- Display resolution: 320 (vertical) x 240(horizontal) pixels

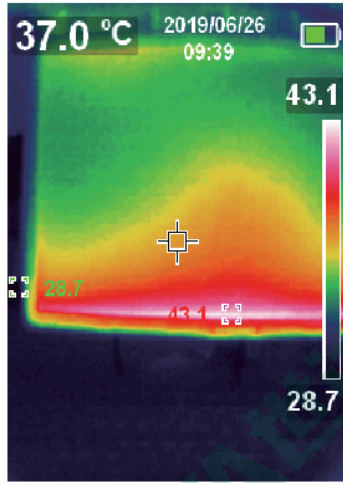


- | | |
|-------------------------------------|-----------------------------|
| 1 Temperature unit option | 8 Minimum temperature point |
| 2 cursor option | 9 Maximum temperature point |
| 3 color palette option | 10 Center point |
| 4 High/Low temperature alarm option | 11 Center point temperature |
| 5 Settings option | 12 Date & time |
| 6 Minimum temperature | 13 Battery status |
| 7 Maximum temperature | |

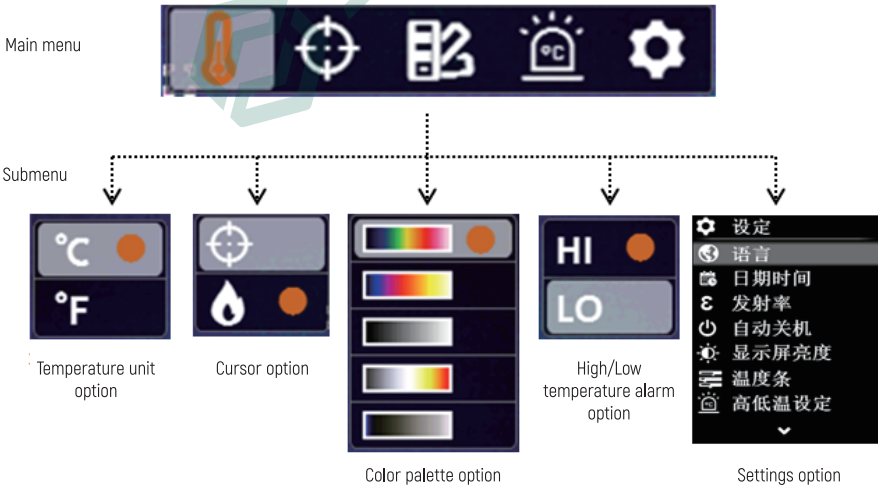
4.Power On/Off

Press the power button for 3s to power on, and press the power button for 1sto power off.

5. Menu Introduction

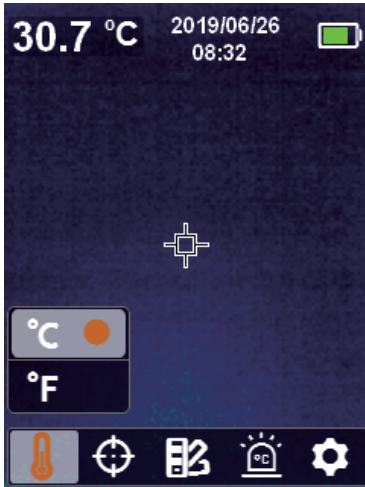



Thermal imaging page



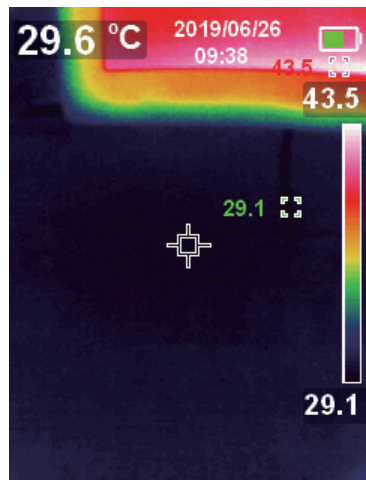
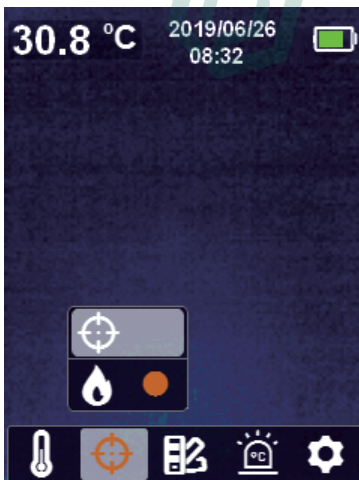
6. Operating Instructions

6.1 Temperature Unit Selection





1. Press the SET button to open the main menu.
2. Press the left/right button to select the  option.
3. Press the SET button to enter the temperature unit submenu.
4. Press the up/down button to select °C or °F.
5. Press the back button to exit the current menu.



6.2 Center Point and High/Low Temperature Tracking



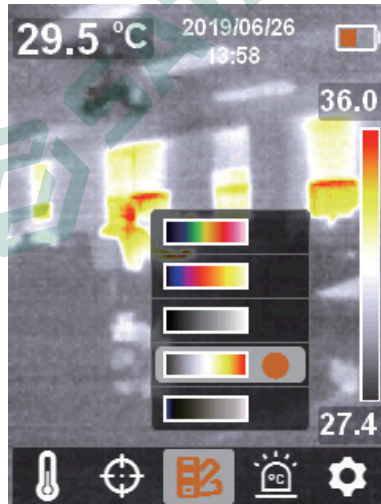
To track center point:


1. Press the SET button to open the main menu.
2. Press the left/right button to select the  option.
3. Press the SET button to enter the cursor submenu
4. Press the up/down button to select the  option.
5. Press the SET button to confirm.
6. The center point marker is turned on.
7. Press the back button to exit the current menu.

To track high/low temperatures:

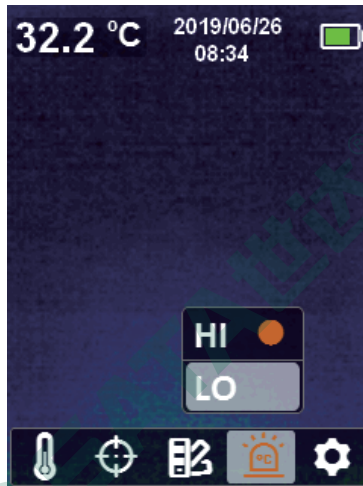
1. Press the SET button to open the main menu.
2. Press the left/right button to select the  option.
3. Press the SET button to enter the cursor submenu.
4. Press the up/down button to select the  option.
5. Press the SET button to confirm.
6. The high/low temperature indicators are turned on and the corresponding temperatures are displayed beside them.
7. Press the back button to exit the current menu.

6.3 Color Palette Selection




1. Press the SET button to open the main menu.
2. Press the left/right button to select the  option.
3. Press the SET button to enter the color palette submenu.
4. Press the up/down button to select the desired color from Iron Red, Rainbow, Grayscale, Red-White, and Blue-White.
5. Press the back button to exit the current menu.

6.4 High/Low Temperature Alarm

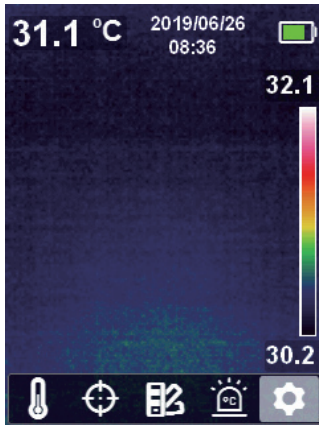


To enable high/low temperature alarm:


1. Press the SET button to open the main menu.
2. Press the left/right button to select the  option.
3. Press the SET button to enter the high/low temperature alarm submenu.
4. Press the up/down button to select HI (High) or LO (Low).
5. Press the SET button to confirm.
6. Press the back button to exit the current menu.

Note: High temperature alarm and low temperature alarm can be enabled simultaneously or separately.

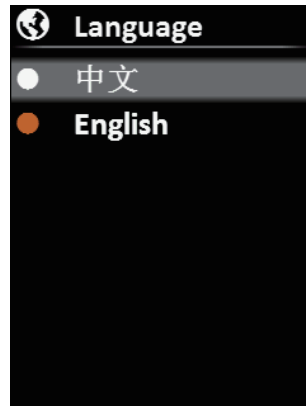
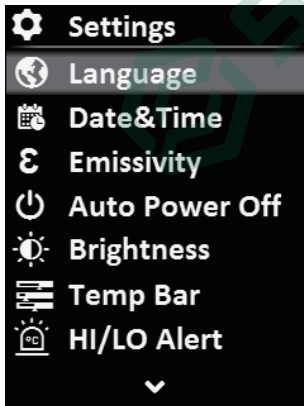
6.5 Settings



To enter Settings menu:

1. Press the SET button to open the main menu.
2. Press the left/right button to select the  option.
3. Press the SET button to confirm.

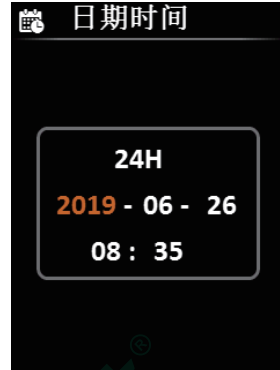
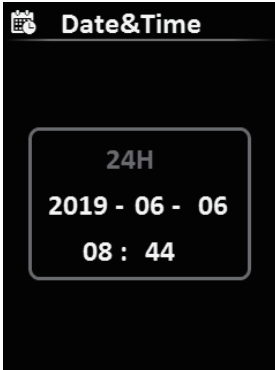
6.5.1 Language



To set language:

1. Select the Language option (up/down button) in the Settings menu.
2. Press the SET button to enter the Language submenu.
3. Press the up/down button to select the desired language from Chinese and English.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

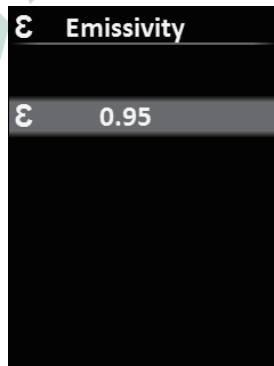
6.5.2 Date & Time



To set date & time:

1. Select the Date & Time option (up/down button) in the settings menu.
2. Press the SET button to enter the Date & Time submenu.
3. Press the left/right button to select the parameter to be adjusted.
4. Press the SET button to enter the parameter adjustment state.
5. Press the up/down button to increase or decrease the value.
6. Press the SET button to save the settings and return to set other parameters.
7. Press the back button to exit the current menu.

6.5.3 Emissivity



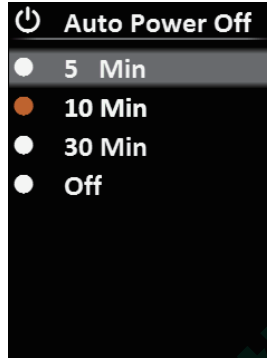
To set emissivity:

1. Select the Emissivity option (up/down button) in the Settings menu.
2. Press the SET button to enter the Emissivity submenu.
3. Press the SET button again.
4. Press the up/down button to adjust the emissivity (step: 0.01; range: 0.01-0.99; default: 0.95)
5. Press the SET button to save the settings.
6. Press the back button to exit the current menu.

Note: Selecting correct emissivity is very important for accuracy of temperature measurement, as emissivity has a significant impact on the measured surface temperature.

For emissivity values of common materials, please refer to the common emissivity table in the appendix.

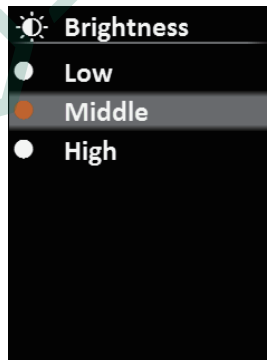
6.5.4 Auto Power Off



To set auto power off:

1. Select the Auto Power Off option (up/down button) in the settings menu.
2. Press the SET button to enter the Auto Power Off 'submenu.
3. Press the up/down button to select the desired option from 5 Min, 10 Min, 30 Min, and off.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu

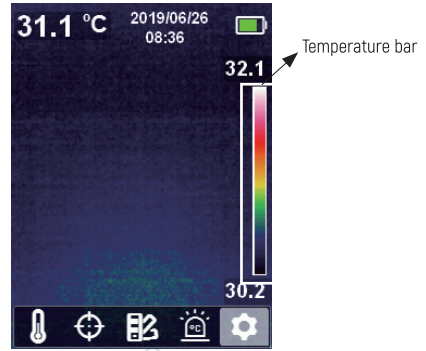
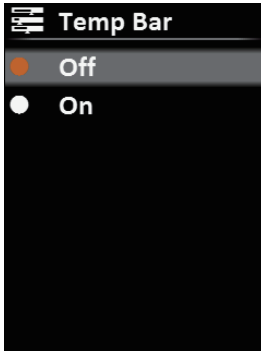
6.5.5 Display Brightness



To set display brightness:

1. Select the Brightness option (up/down button) in the settings menu.
2. Press the SET button to enter the Brightness submenu.
3. Press the up/down button to select the desired option from Low, Middle, and High.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

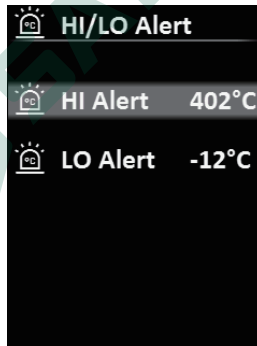
6.5.6 Temperature Bar



To turn on/off temperature bar:

1. Select the Temp Bar option (up/down button) in the settings menu
2. Press the SET button to enter the Temp Bar submenu.
3. Press the up/down button to select On or Off.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

6.5.7 Alarm Temperatures



To set alarm temperatures:

1. Select the HI/LO Alert option (up/down button) in the settings menu.
2. Press the SET button to enter the HI/LO Alert submenu.
3. Press the up/down button to select the desired option from HI Alert and LO Alert.
4. Press the SET button to enter the temperature adjustment state.
5. Press the up/down button to adjust the temperature.
6. Press the SET button to save the settings and return to set another temperature
7. Press the back button to exit the current menu.

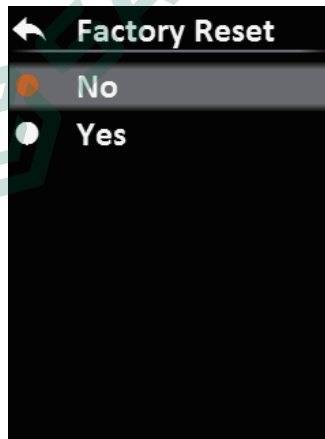
6.5.8 Device Information



To view the device information:

1. Select the Device Info option (up/down button) in the settings menu.
2. Press the SET button to view the detail information of the device.
3. Press the back button to exit the current menu.

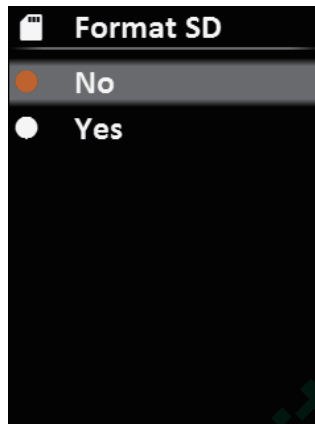
6.5.9 Factory Reset



To restore settings:

1. Select the Factory Reset option (up/down button) in the settings menu.
2. Press the SET button to enter the Factory Reset submenu.
3. Press the up/down button to select Yes.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

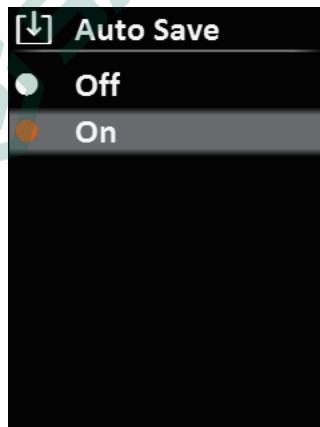
6.5.10 Format SD Card



To format SD card:

1. Select the Format SD option (up/down button) in the settings menu.
2. Press the SET button to enter the Format SD submenu.
3. Press the up/down button to select Yes.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

6.5.11 Auto Save



To turn on/off auto save:

1. Select the Auto Save option (up/down button) in the settings menu.
2. Press the SET button to enter the Auto Save submenu.
3. Press the up/down button to select On or Off.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

7. USB Communication

- Download and install the PC software (refer to SATA Documents Download Operation Guide).
- Connect the USB cable to the PC.
- Users can browse pictures and analyze data through the PC software. Regarding its usage, retrieve the Software User Manual from the Help option of the operation interface.

8. Specifications

Sensor	UFPA
Temperature range	-10° C~400° C
Measurement resolution	0.1° C
Mode	Auto gain
Accuracy	±2.0° C or ± 2%
Measuring distance	25cm
Response time	500ms (95% of reading)
Emissivity	0.01~0.99 adjustable (default: 0.95)
IR resolution	19,200 pixels (160×120)
Pixel size	12µm
Color palette	Iron red, rainbow, grayscale, red-white, blue-white
Wavelength range	8µm~14µm
Field of view (FOV)	56° (H) × 42° (V)
Spatial resolution (IFOV)	6mrad
Thermal sensitivity (NETD)	<50mK
Frame rate	<9Hz
Image format	BMP

General parameters

PC software	Yes
Data transmission	Type-C USB interface
Product size (L x W x H)	236mm x 75.5mm x 86mm
Display type	2.8" TFT LCD
Display resolution	320 × 240 pixels
Battery	3.6V/5000mAh rechargeable Li-ion battery
Auto power off	5 minutes,10 minutes, 30 minutes,off (default: 30 minutes)
Battery life	≥6 hours
Charging time	4 hours
Charging voltage/current	5V/2A
Image storage	Micro SD card
Drop test	2m
IP rating	IP65
Certification	CE
Storage temperature	-20° C~60° C (-4° F~140° F)
Operating temperature	0° C~50° C (32° F~122° F)
Operating humidity	<90%RH(non-condensing)
Altitude	2000m
Standard accessories	User manual, USB cable,16GB Micro SD card

9.Maintenance

Use a wet cloth or weak soap solution to clean the outer shell of the device.Do not use abrasives, isopropyl alcohol or solvents to clean the outer shell,lens or window.

10.Appendix

Emissivity of common objects

Material	Emissivity	Material	Emissivity
Wood	0.85	Black paper	0.86
Water	0.96	Polycarbonate	0.8
Brick	0.75	Concrete	0.97
Stainless steel	0.14	Copper oxide	0.78
Tape	0.96	Cast iron	0.81
Adhesive tape	0.09	Rust	0.8
Copper plate	0.06	Gypsum	0.75
Dark aluminum	0.95	Paint	0.9
Human skin	0.98	Rubber	0.95
Asphalt	0.96	Soil	0.93
PvC material	0.93		

Note: This manual can be downloaded from the official website of SATA (refer to SATA Documents Download Operation Guide).



适用型号 / Model:

03082

版本号 / Version No:

V_SC_03082_1102



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