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1.Introduction

- The Thermal Imager is handheld imaging camera used for predictive maintenance, equipment troubleshooting and verification.
- Thermal images are displayed on the LCD and can be saved to internal memories.
- With Bluetooth instant share function, thermal images can be transferred to smart phone for analyse, share and report quickly.

Key Features

- 120x120 pixel thermal imaging system
- 14400 points real temperature fast measurements
- Hot, Cold, Center three temperature tracking function
- Large, easy-to-read, bright graphical TFT display
- 50Hz fast Thermal image frame rate
- Bluetooth image instant share & save with iOS and Android smart device
- Scene temperature range Lock function
- With LED flashlight function
- Long running time up to 8 hours with rechargeable battery
- Smart and compact design
- Rugged industrial design

2.Safety

2-1.Safety Infomation

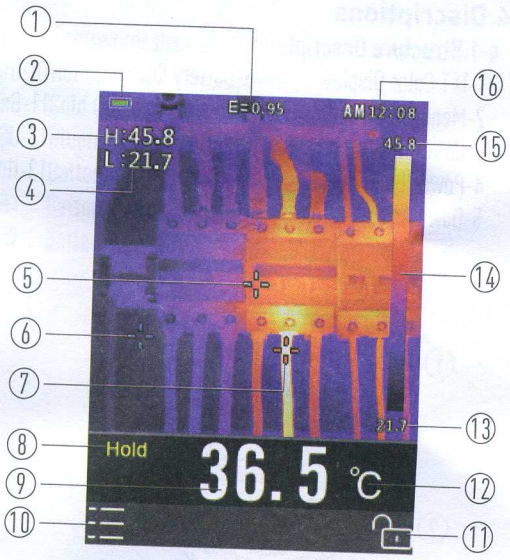
⚠ This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the Operating Instructions to avoid personal injury or damage to the meter.

2-2.CAUTIONS

- Improper use can damage the meter, please read and understand all of the information provided in this User Guide and other included documentation before use.
- Refer to the CAUTION statement label (shown below) for critical safety information.

3-3.The IR Thermal Imaging Display

1-Current Emiisivity Setting
2-Battery Indicator
3-Hot Temperature Point Reading
4-Cold Temperature Point Reading
5-Centre Crosshair
6-Cold Temperature Crosshair
7-Hot Temperature Crosshair
8-Image Freezed Icon
9-Centre Temperature Point Reading
10-"OK" Button
11-"LOCK" Button
12-Current Temperature Unit
13-Scene Low Temperature
14-Palette Scale
15-Scene High Temperature
16-Time Clock



3-4.Control Buttons and Trigger

Became familliar with the operation of the control buttons and trigger as described below:

- **POWER/BACK/LOCK** Button Press and hold >2 seconds to cycle the meter power ON or OFF; Short press to exit a menu screen. Also used to lock the current scene temperature range (a soft "🔒" Button will appear on the display above the button when this option is available).
- **OK/MENU** Button Short press to access the Settings Menu, to confirm an edit, and to save an image when prompted (a soft "SAVE" button will appear on the display above the button when this option is available).
- **UP and DOWN NAVIGATION ARROW** Button Scroll the Settings Menu and select a menu item setting.
- **TRIGGER/LED Flashlight** Short press will take a snapshot of the current image. Short press again to discard image and return to live image mode. Long press will open the LED flashlight,Long press again will close the LED flashlight.

3-5.Measure, Save, Delete and Review IR Images

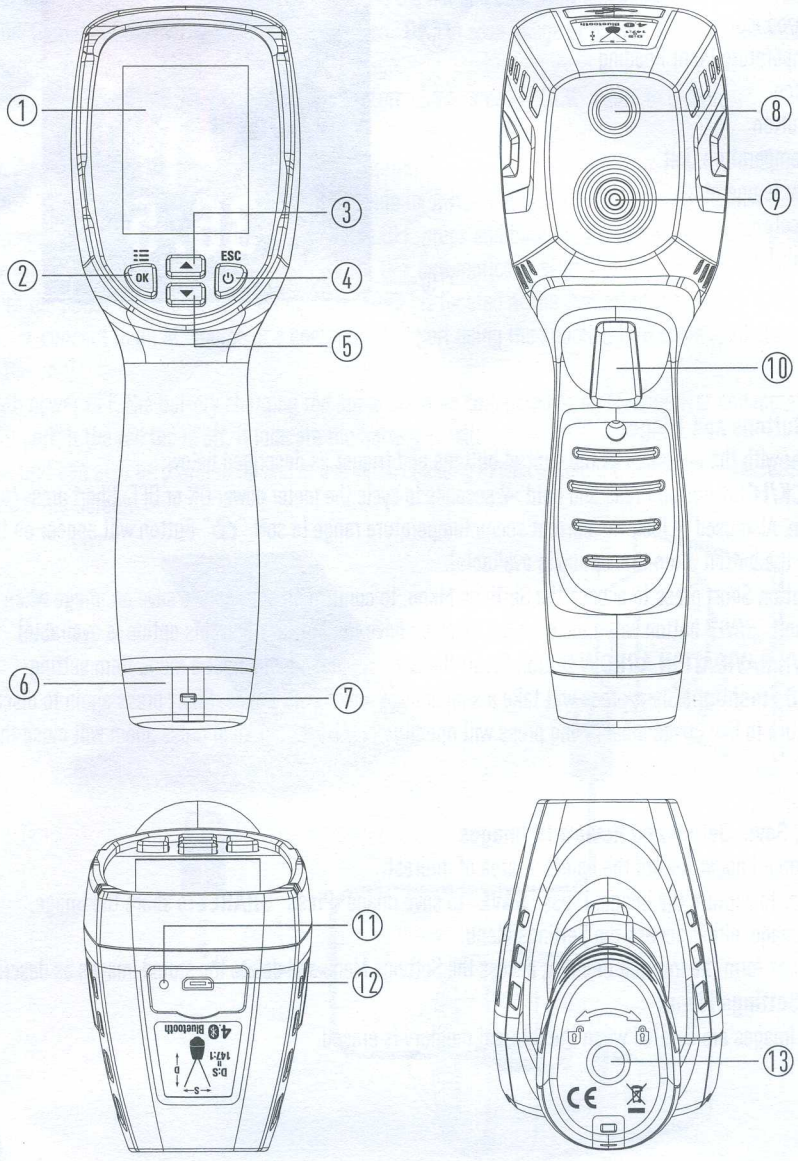
- Point the thermal imager toward the object or area of interest.
- Pull the trigger to capture the image, Press "**SAVE**" to save image; Press "**SHARE**" to share the image.
- To review an image, either access the Settings Menu.
- To delete images form the internal memory, access the Settings Menu and delete the stored images as described in **Section 6 Settings Menu**.

WARNING: All images are deleted when the internal memory is erased.

4.Discriptions

4-1.Structure Description

1-TFT Color Display
2-Menu/OK Button
3-Up Arrow Button
4-Power/Back Button
5-Down Arrow Button
6-Battery Cover
7-Lanyard Access
8-LED Flash Light
9-IR Imaging Len
10-Trigger
11-Battery Charging LED Indicator
12-USB Battery Charging Interface
13-Hole for Tripod Insertion



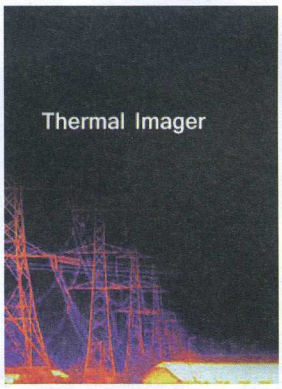
4-2.Display Icon and Indicator Description

°C/°F/k	Temperature Units		Centre Crosshair
H:	Max Temperature Readings		Hot Crosshair
C:	Minimum Temperature Readings		Cold Crosshair
Hold	Freezing Image Icon		Bluetooth Icon
AM	12 Time Format		Battery Empty
	IRON Color Palette		Battery Full
	Unlock Icon		Battery Charging
	Lock Icon		

5.Opertion

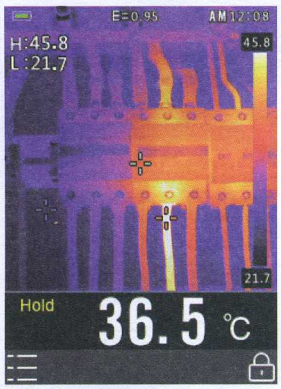
5-1.Switch ON the Thermal Imager

- Press and hold for >2 seconds to switch the unit ON.
- If the unit is sufficiently charged, the meter will display the start-up screen as shown below.
- The initial displayed image will show until the shutter resets the image.
- After the startup period, the unit will show a real time IR thermal image along with an IR Temperature reading.
- If the meter does not switch ON, please refer to Section 3.2 Powering and charging the thermal imager, for information regarding battery charging.

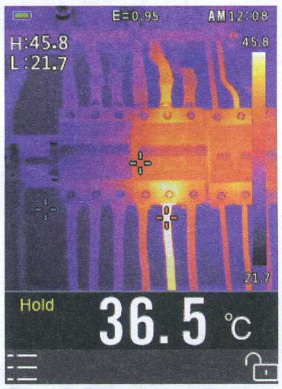


5-2.Lock/Unlock Scene Temperature Level-Span

The unit is real 120x120 pixel s thermal imager, for better get the object temperature problem, It can locks the current scene temperature range, if the temperature higher than lock temperature,the corresponding color is white; if the current scene temperature lower than the lock temperature range,the corresponding color is black.



Lock Mode



Unlock Mode

1.Point the unit at an object or an area of interest.

2.Short press the "🔒" to lock the scene temperature range; the back color of the temperature readings will turn grey.

3.Short press the "🔓" button again ,it will unlock the scene temperature range.

5-3.Capture/Save Images Using The Internal Memory

The unit can store 20 images on internal memory, The saved images can be transferred to iOS, android and PC device through Bluetooth.

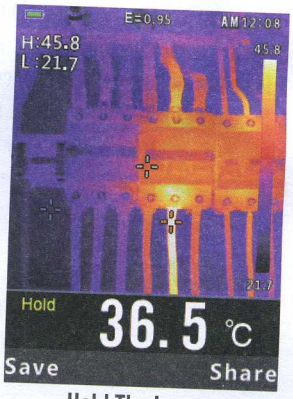
1.Point the unit at an object or an area of interest.
2.Short press the trigger to capture the image; the image will freeze.
3.If don't want to save the current image, Short press the trigger again,the image will unfreeze.
4.Press"**SAVE**" to save the image
5.If the image is stored successfully on the internal memory, the image will unfreeze.
6.To erase/format internal memory please refer to Section 6 Settings Menu.

5-4.Share Images Using Bluetooth

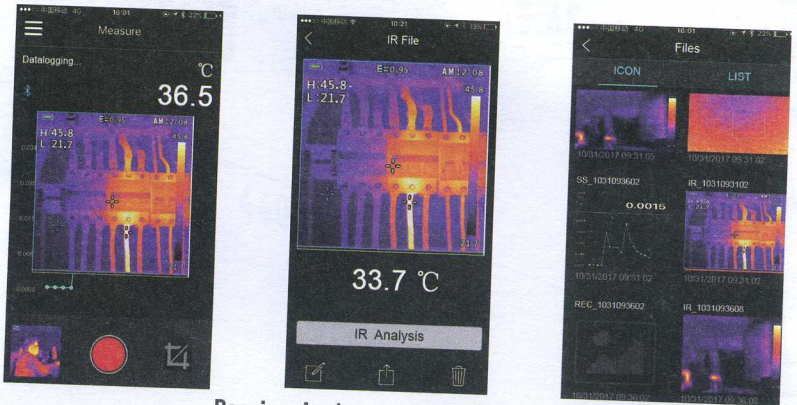
5-4-1.Instant Share

For quick analyse and report the thermal images, the unit has Bluetooth instant share function, corresponding there are softwares for iOS, Androi and PC.

1.Enable the Bluetooth on the thermal imager.
2.Run Apps on smart devices, connect unit with smart device or PC.
3.Point the unit at an object or an area of interest.
4.Short press the trigger to capture the image; the image will freeze and the "hold" icon will display.
5.If don't want the current image, Short press the trigger again, the image will unfreeze.
6.Press "**SHARE**" to transfer the image.
7.If the image is transferred successfully to the smart devices, the image will unfreeze.
8.Save, analyse, share or report the thermal images on smart devices.



Hold The Image



Receive, Analyse and Save The Image

5-4-2.Transfer the Saved Images

1.Enable the Bluetooth on the unit
2.Run Apps on smart devices, connect unit with smart device or PC.
3.To access the Image Review mode, access the Settings Menu to review and delete images.
4.Press Trigger to share the current picture.
5.Press"**SHARE**" to transfer the image
6.Save, analyse, share or report the thermal images on smart devices.

5-5.Review/Delete Images

Use the Review Mode to view or delete stored images.
1.To access the Settings Menu to review and delete images.
2.Press the back button to exit the image review mode
3.To delete all images, please access the Settings Menu as described in Section 6 and reformat the SD card.
4.To delete single picture, please refer Settings Menu.

5-6.Lens and Imager Field of View

This table lists the horizontalFOV, vertical FOV and IFOV for lens.

Focal Length	Horizontal FOV	Vertical FOV	IFOV
7.5mm	15.6°	15.6°	2.27mrad

IFOV (Instantaneous Field of View) is the smallest detail within the FOV that can be detected or seen at a set distance, the unit is rad.

The formula is this:

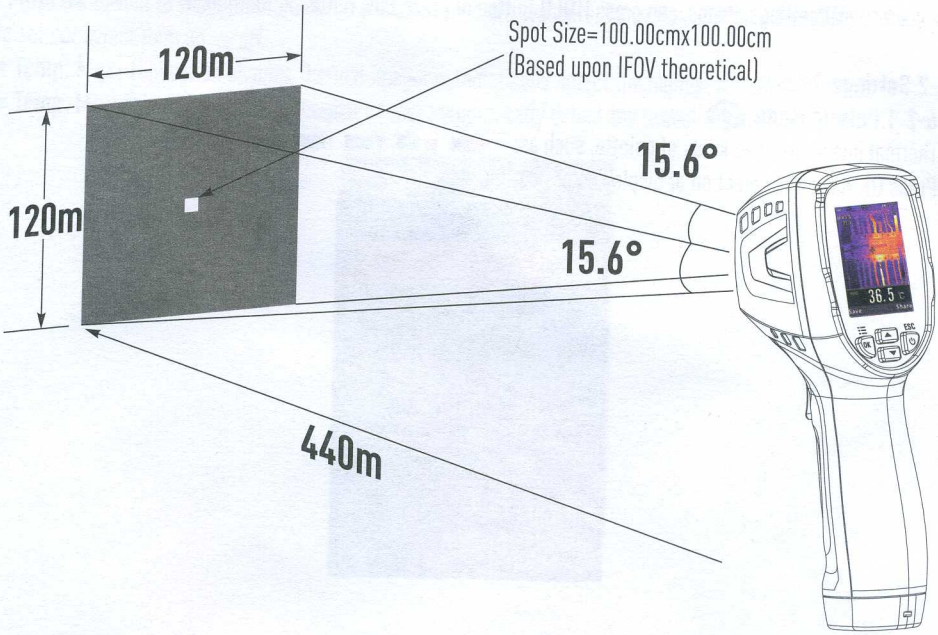
- IFOV=(Pixel Size)/(Lens focal length).
- D:S theoretical (=1/IFOV theoretical) is the calculated spot size based on the pixel size of the Thermal Imager detector array and lens focal length.

Example: If Thermal Imager uses 7.5mm lens, because the Pixel Size of detector is 17um. Horizontal FOV is 15.6°, Vertical FOV is 15.6°, the IFOV is 17um/7.5mm=2.27mrad;

D:S theoretical (=1/IFOV theoretical)=440:1

D:S measure=D:S theoretical/3=147:1

- D:S measure(=1/IFOVmeasure) is the spot size needed to provide an accurate temperature measure.
- Typically D:Smeasure is 2 to 3 times smaller than D:S theoretical, which means the temperature measurement area of the target need to be 2 to 3 times larger than that determined by the calculated theoretical D:S.



6.Settings Menus

6-1.Using Settings Menus

- Press **OK** Button to open the Settings Menus, as show below.

- Press **UP/DOWN** Button to select menu item or change the value of current focus item.
- Press **OK** Button to enter the submenu or set focus on the current sellecteditem, Press **ESC** Button to return to the previous menu.
- If want to exit settings menus, can press **HOLD** Button or press **ESC** Button in root menu.

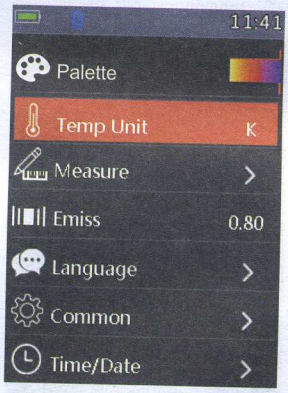
6-2.Settings Details

6-2-1.Palette Mode

- Thermal imager has five kinds of palette, such as: " ".
- Press **OK** Button to select on of display color palettes.

6-2-2.Temp Unit

- Press **OK** Button to set focus on this option and the color of option value will change to black **°C**.
- Infocus state, use the **RIGHT/MENU** Button to toggle **°C**, **°F** and **k**, use **ESC/OK** Button to exit focus state and the color of option value will change to blcak **k**.



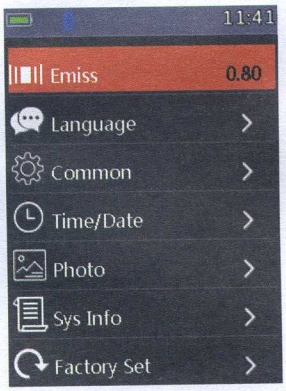
6-2-3.Measure

Press **OK** Button to enter measure menu two selections are available: Temp.Max and Temp.Min, Press **OK** Button to set cur select item on or off.

- **Temp. Max:** This option enables thermal imager automatically detect the highest temperature point.
- **Temp. Min:** This option enables thermal imager automatically detect the lowest temperature point.

6-2-4.Emissivity

- Press **OK** Button to set focus on this option.
- In focus state, use **UP/DOWN** Button to increase or decrease emissivity's value, use **ESC/OK** Button to exit focus state.
- The available range is 0.01 to 0.99 in 0.01 steps.



6-2-5.Language

- Press **OK** Button toto enter language menu.
- Threeoptions are available: Simplified Chinese, Traditional Chinese and English.
- Use **UP/DOWN** Button to select language and use **OK** Button to set selected language to be valid.

6-2-6.Setup

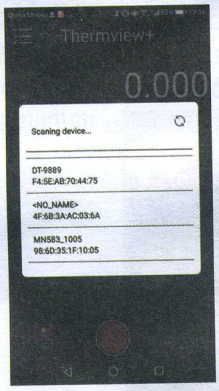
Press **OK** Button to enter setup menu, three options are available: Bluetooth, Brightness and Auto Off.

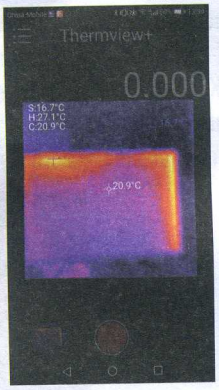
- **Bluetooth:** Use **OK** Button to set bluetooth power on or off.
- **Brightness:** Press **OK** Button to set focus on this option, In focus state, use **UP/DOWN** Button to change LCD's brightness, use **ESC/OK** Button to exit focus state, the available brightness's range is 100% to 10% in 10% steps.
- **Auto Off:** Press **OK** Button to set focus on this option, In focus state, use **UP/DOWN** Button to choose the time period after which the meter enters the sleep mode.

6-2-7.Bluetooth Connect

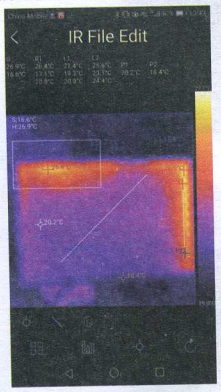
1.Turn on the Bluetooth function on the instrument.

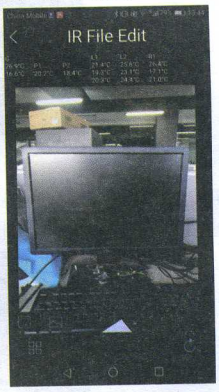
2.Turn on the bluetooth of smartphone, press the icon "**Thermoview+**" and enter into the home interface, Then press Connect Device icon on the Home interface, bluetooth device name will appear.





3.Touch the device name listed in Bluetooth devices list to connect the device.





The detail information about Thermview+,please refer to MeterBox Pro APP help file.

- **Thermview+** for Android : Please search in Google Play with keyword "**Thermview+**", download and run.
- **Thermview+** for iOS: Please search in Apple store with keyword "**Thermview+**", download and run.

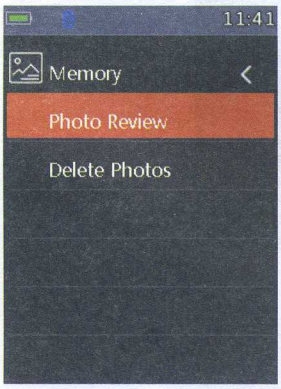
6-2-8.Time/Date

- Press **OK** Button to enter time menu.
- In this menu/yeas/month/day/hour/minute and time formate can be set.
- The changes take effect after exitting settings menus.

6-2-9.Memory

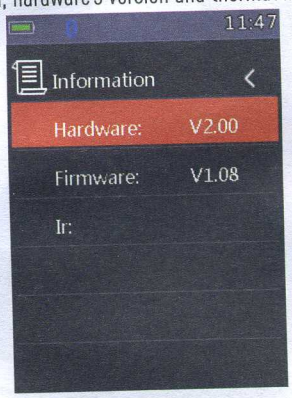
- Press **OK** Button to enter memory menu.
- Two options are available: **Photo Review** and **Delete Photo**.

Photo Review: Press **OK** Button to enter image browser function, and eixt settings menus immediately.
Delete Photo: After Press **OK** Button, dialog box will be displayed as show below.
WARNNING: Select "**YES**", will delete all the photos in "**RECORD**" folder of the memory card.



6-2-10.Infomation

- Press **OK** Button to enter system infomation menu.
- This menu contains software's version, hardware's version and thermal imager's version.



6-2-11.Factory Set

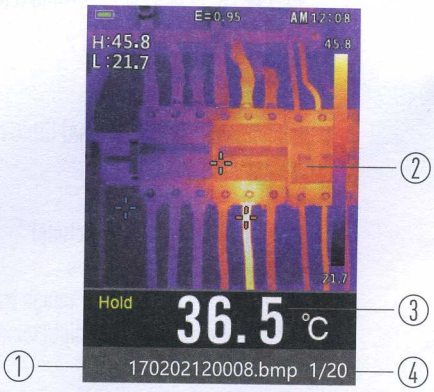
- When select Factory Set option, after press **OK** Button, the dialog box will be displayed as show below.
- Select "**YES**" Button, system parameter will be reset.

7.Image Browser

7-1.Image Browser

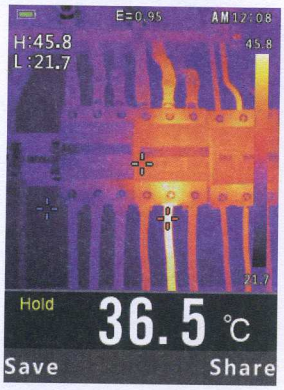
- In Image Browser mode, User can browse the pictures in "**RECORD**" folder of the memory card.
- Press **UP/DOWN** Button to select prev or next picture.
- Press any other keys to exit Image Browser mode.

1-Current displayed picture's file name
2-Picture display area
3-Temperature of center point
4-Current picture's.index and total number of pictures



7-2.How to Capture Screen

- When in Thermal imaging mode, use **HOLD** Button to enter hold mode, as show below.
- Then press **OK** Button to capture screen.
- After saving to memory completly, screen will exit hold mode.



8.Technical Specifications

Field of View (FOV)/Minimum Focus Distance	15.6°x 15.6°/0.5m
Spatial Resolution (IFOV)	2.27mrad
Thermal Sensitivity/NETD	< 0.1°C at 30°C (86°F)/100mK
Image Frequency	50Hz
Focus Mode	Focus free
Focal Length	7.5mm
Focal Plane Array (FPA)/Spectral Range	Uncooled microbolometer/8-14μm
Object Temperature Range	-20 to 380°C (-4 to 716°F)
Accuracy In Normal Mode	±2°C(±3.6°F) or ±2% of reading (Environment temperature 10 to 35°C, object temperature >0°C)
Display	2" color TFT LCD screen
Display Resolution	240x320 pixels resolution
Battery	Rechargeable 3.7V (1300mA) lithium ion battery(Not user serviceable)
Battery Lift	>6 hours, typical
Battery Charger	5V 1A USB charger (Not include)
Drop Proof	Designed for up to 2 meters
Connect	Bluetooth BLE4.0, thermal image transfer and data logger.
Save Image Format	Bitmap (.bmp) with 6400 points temperature analyse and emissivity
Operating Temperature	-10 to 45°C (14 to 113°F)
Storage Temperature	-30 to 55°C (-22 to 131°F)
Allowable Relative Humidity	<80%RH
Storage Humidity	<80%RH