2MTHPH-1612 PORTABLE THERMAL IMAGER

Installation Guide

2M TECHNOLOGY

Preface

Thank you for purchasing the new 2MTHPH-1612 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

2M Technology 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 damage caused by accident, negligence, misuse, modification, contamination or improper handling. The dealer shall not be entitled to give any other warranty on behalf of 2M Technology. If you need warranty service within the warranty period, please contact your seller directly.

2M Technology will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device.

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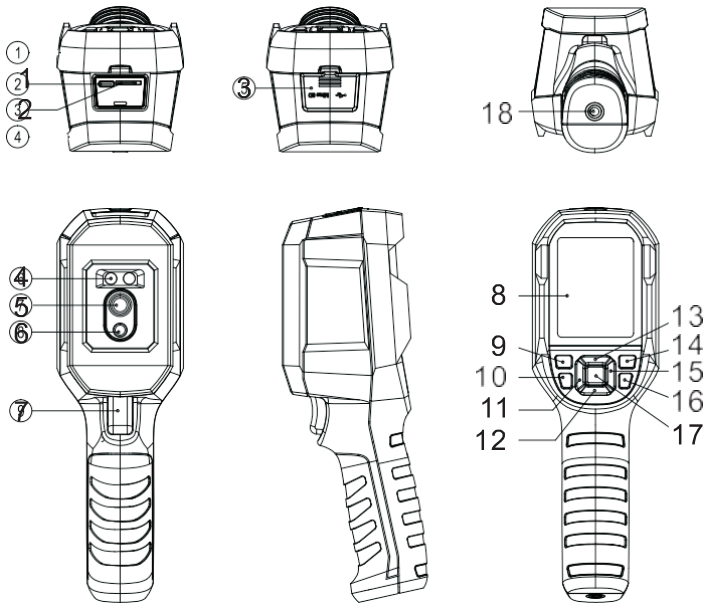
1. Safety Instructions

To ensure proper use of this product, please read the instructions carefully before using.

- The optimal measuring distance for this product is 3.2ft.
- To ensure measurement accuracy, please use the product in an operating environment of 59°F～86°F, <85% RH (non-condensing).
- Please use the product indoors without wind.
- When changing to a new environment, please turn on the product and leave it for 10 to 20 minutes before measuring.
- The ambient temperature for measuring must be stable. Do not measure in places with large airflow such as fans and air outlets.
- When the measured object comes from a place with a large temperature difference from the measurement environment, keep it in the measurement environment for 10 to 30 minutes before measuring.
- The product tests the surface temperature of the object. If temperature compensation is needed, please adjust in the Settings menu.
- The product has a self-calibration function. If the reading jumps quickly, please read the temperature after it gets steady.
- After measuring extremely high or low temperature objects, please leave the product for 10 minutes before next use.
- Do not use the product in places with strong sunlight or electromagnetic interference.
- Please do not use the 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 accuracy of the product, please warm it up for 10 to 20 minutes before measuring if it has not been used for a long time.
- When being charged, the internal temperature of the product rises, which will lead to inaccurate temperature measurement. So, it is not recommended to take measurements during or right after charging the product.

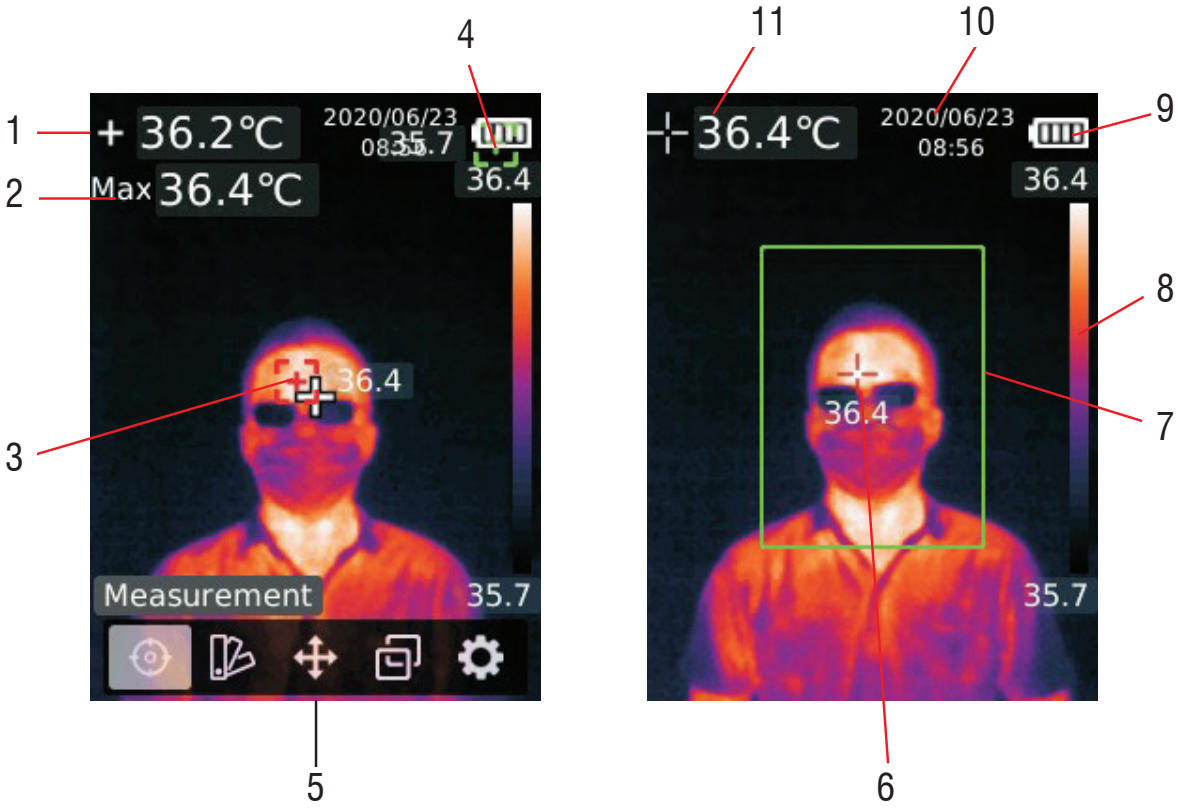
2. Structure



Item	Description	Item	Description
1	USB (Type-C) interface	10	Flashlight button
2	SD card slot	11	Left button
3	Interface cover	12	Down button
4	LED light	13	Up button
5	Infrared camera lens	14	Replay button
6	Visual light camera lens	15	Right button
7	Trigger	16	Back button
8	LCD display	17	SET button
9	Power button	18	Tripod mounting hole

3. Display

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



Item	Description	Item	Description
1	Center point temperature	7	Region of interest (ROI)
2	Maximum temperature	8	Temperature bar
3	Maximum temperature point	9	Battery status
4	Minimum temperature point	10	Date and time
5	Main menu	11	Maximum temperature in ROI
6	Maximum temperature point in ROI		

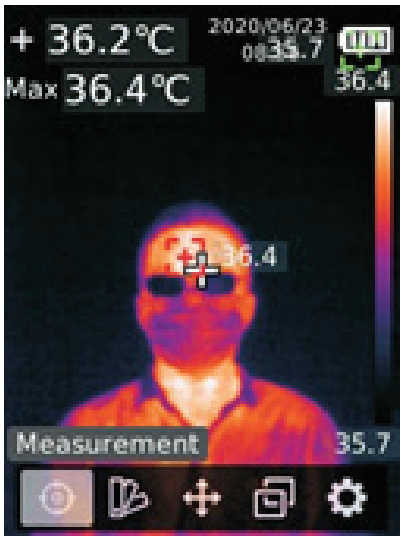
4. Power On/Off

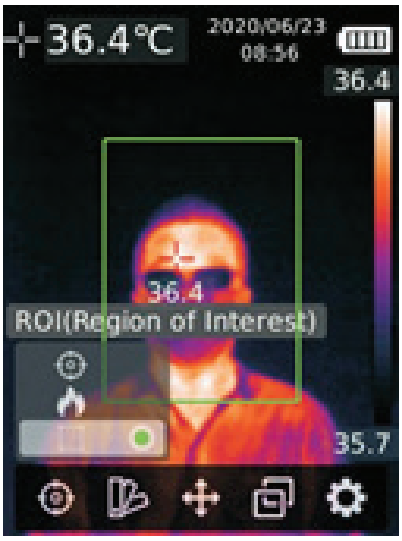
Press and hold the power button for 3 seconds to turn on/off the product.

Note: After the product starts the shutdown procedure, it takes 5 to 6 seconds. Please try to avoid turning on and off the product continuously to avoid damage.

5. Menu Introduction

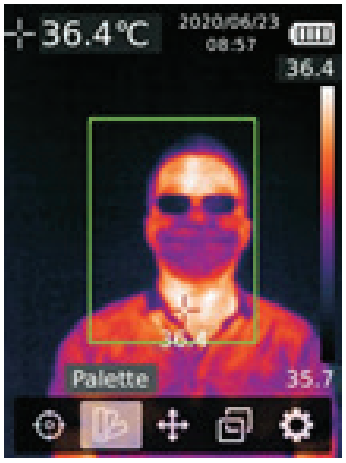
5.1 Measurement

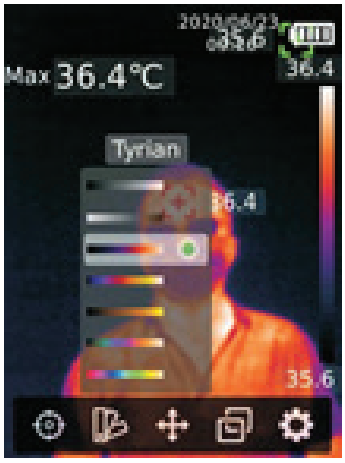


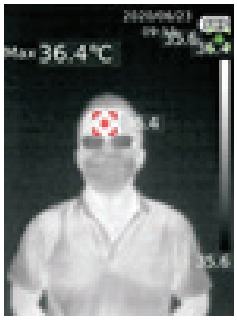


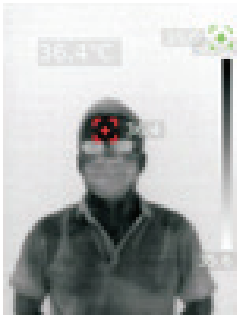
1. Press the SET button to open the main menu.
2. Press the left/right button to select the option.
3. Press the SET button to enter the Measurement menu.
4. Press the up/down button to select Center Spot (center point measurement), HiLo Spot (maximum and minimum temperature measurement) or ROI.
5. Press the SET button to turn on/off Center Spot, HiLo Spot or ROI.
6. Press the back button to exit.

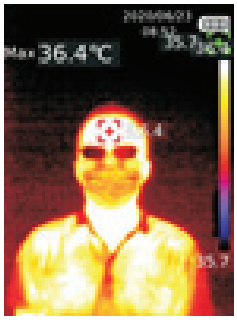
5.2 Palette

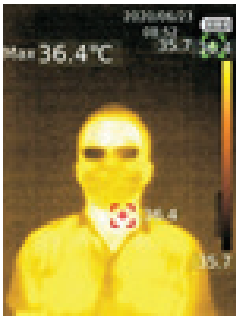


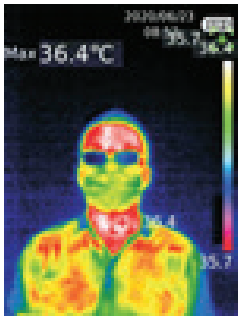






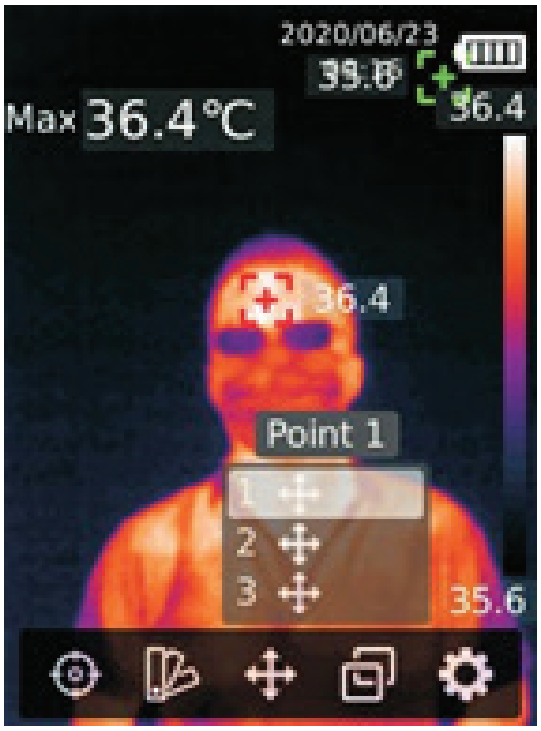


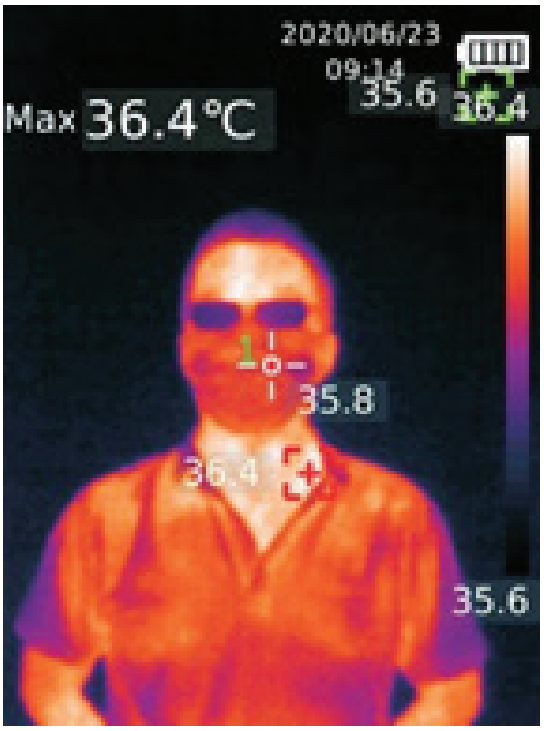




1. Press the SET button to open the main menu.
2. Press the left/right button to select the option.
3. Press the SET button to enter the Palette menu.
4. Press the up/down button to select the desired palette.
5. Press the SET button to apply the palette.
6. Press the back button to exit.

5.3 Point Temperature

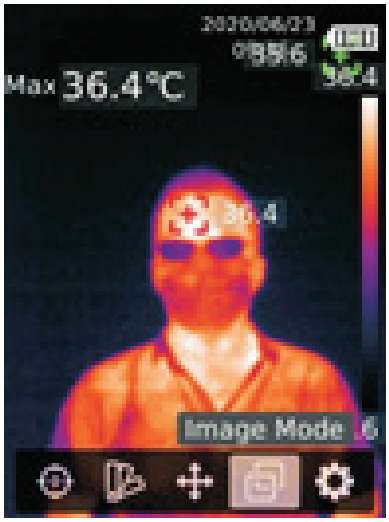


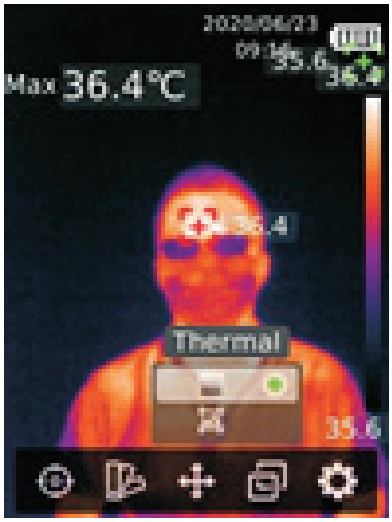


1. Press the SET button to open the main menu.
2. Press the left/right button to select the ✣ option.
3. Press the SET button to enter the Point Temperature menu.
4. Press the up/down button to select the desired point.

   A. Press the SET button to turn on the point and enter the thermal imaging page. Press the left/right/up/down button to move the point. Press the SET button to confirm and read the temperature of the current point.
   B. Press the SET button to turn off the point. Press the back button to exit.

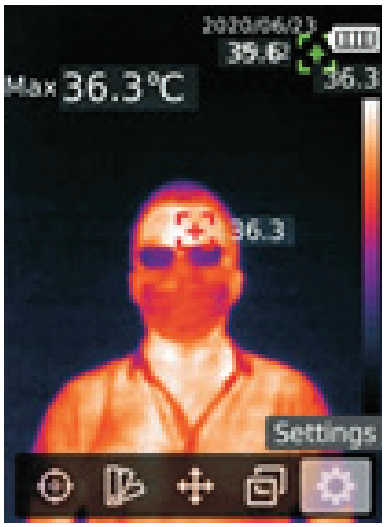
5.4 Image Mode





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 Image Mode menu.
4. Press the up/down button to select the desired mode from Thermal (infrared image), Digital (visual light image).
5. Press the SET button to apply the current mode.
6. Press the back button to exit.

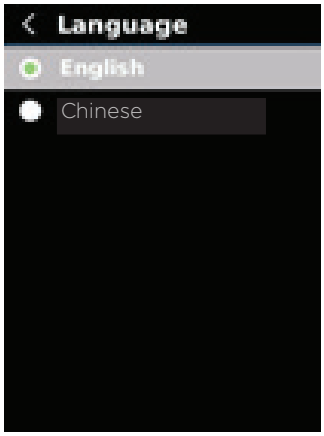
5.5 Settings



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 enter the Settings menu.

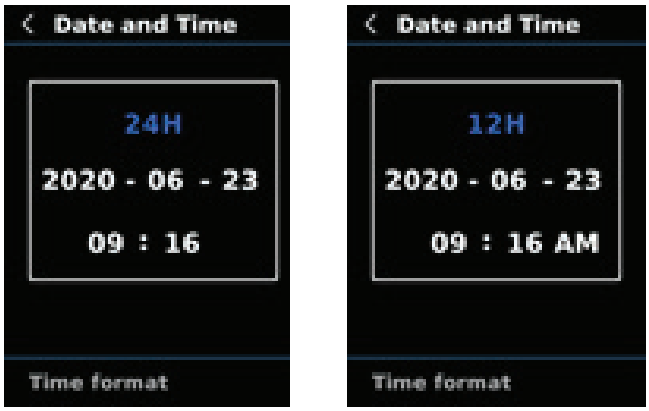
5.5.1 Language



To set language:

1. Press the up/down button to select the Language option in the Settings menu.
2. Press the SET button to enter the Language submenu.
3. Press the up/down button to select Chinese or English.
4. Press the SET button to confirm.
5. Press the back button to exit.

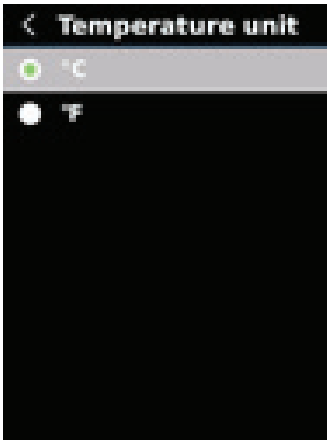
5.5.2 Date and Time



To set date and time:

1. Press the up/down button to select the Date and Time option in the settings menu.
2. Press the SET button to enter the Date and 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.

5.5.3 Temperature Unit



To set temperature unit:

1. Press the up/down button to select the Temperature Unit option in the Settings menu.
2. Press the SET button to enter the Temperature Unit submenu.
3. Press the up/down button to select °C or °F.
4. Press the SET button to confirm.

5.5.4 HI/LO Alert

To set high/low temperature alert:

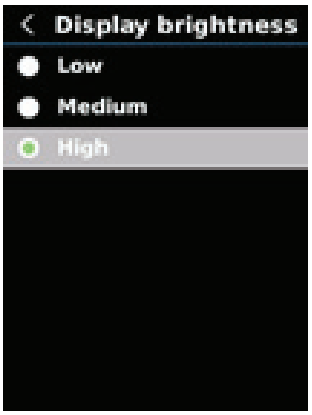
1. Press the up/down button to select the HI/LO Alert option in the Settings menu.
2. Press the SET button to enter the HI/LO Alert submenu.
3. Press the up/down button to select the desired option.
4. Select HI or LO to adjust the temperature parameter.
5. Select other options to turn the alert on or off.
6. Press the back button to exit.

5.5.5 Measurements

To set temperature unit:

1. Press the up/down button to select the Measurements option in the Settings menu.
2. Press the SET button to enter the Measurements submenu.
3. Press the up/down button to select Emissivity or Temperature Comp (temperature compensation).
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 current setting.
7. Press the back button to exit.

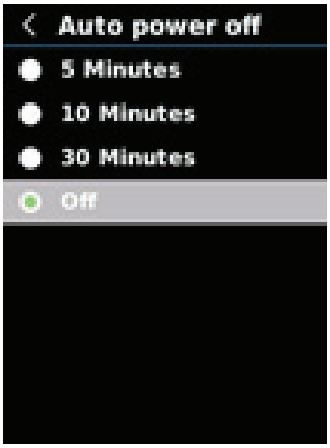
5.5.6 Display Brightness



To set display brightness:

1. Press the up/down button to select the Display Brightness option in the Settings menu.
2. Press the SET button to enter the Display Brightness submenu.
3. Press the up/down button to select the desired brightness level from Low, Medium, and High.
4. Press the SET button to confirm.
5. Press the back button to exit.

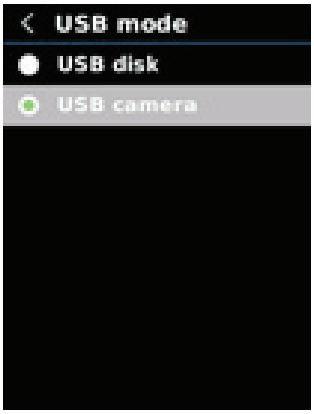
5.5.7 Auto Power Off



To set auto power off:

1. Press the up/down button to select the Auto Power Off option 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 Minutes, 10 Minutes, 30 Minutes, and Off.
4. Press the SET button to confirm.

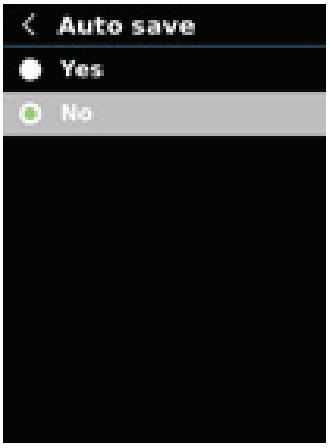
5.5.8 USB Mode



To set USB mode:

1. Press the up/down button to select the USB Mode option in the Settings menu.
2. Press the SET button to enter the USB Mode submenu.
3. Press the up/down button to select USB Disk or USB Camera.
4. Press the SET button to confirm.
5. Press the back button to exit.

5.5.9 Auto Save



To set auto save:

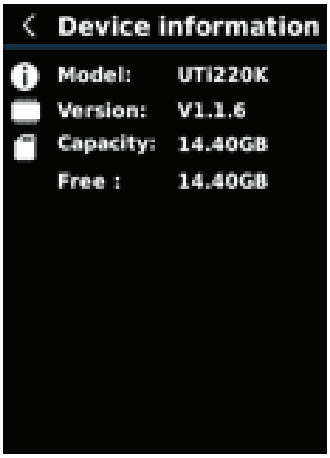
1. Press the up/down button to select the Auto Save option in the Settings menu.
2. Press the SET button to enter the Auto Save submenu.
3. Press the up/down button to select Yes or No.
4. Press the SET button to confirm.
5. Press the back button to exit.

5.5.10 System Settings

To enter System Setting submenu:

1. Press the up/down button to select the System Settings option in the Settings menu.
2. Press the SET button to enter the System Settings submenu.

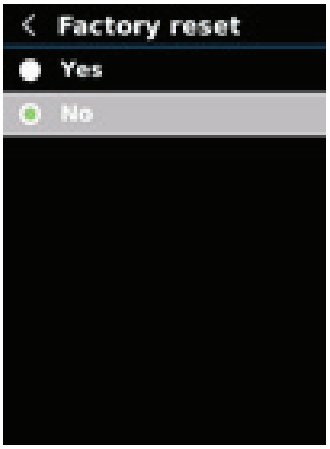
Device Information



To view the device information:

1. Press the up/down button to select the Device Information option in the System Settings submenu.
2. Press the SET button to view the detail information of the device.
3. Press the back button to exit.

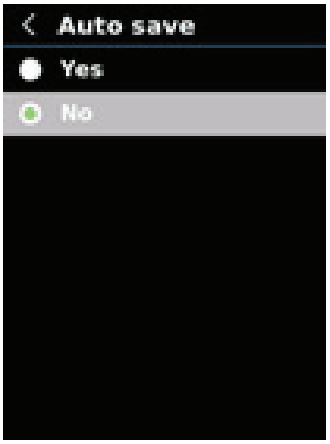
Factory Reset



To restore factory settings:

1. Press the up/down button to select the Factory Reset option in the System Settings submenu.
2. Press the SET button to enter.
3. Press the up/down button to select Yes.
4. Press the SET button to confirm.
5. Press the back button to exit.

Format SD Card

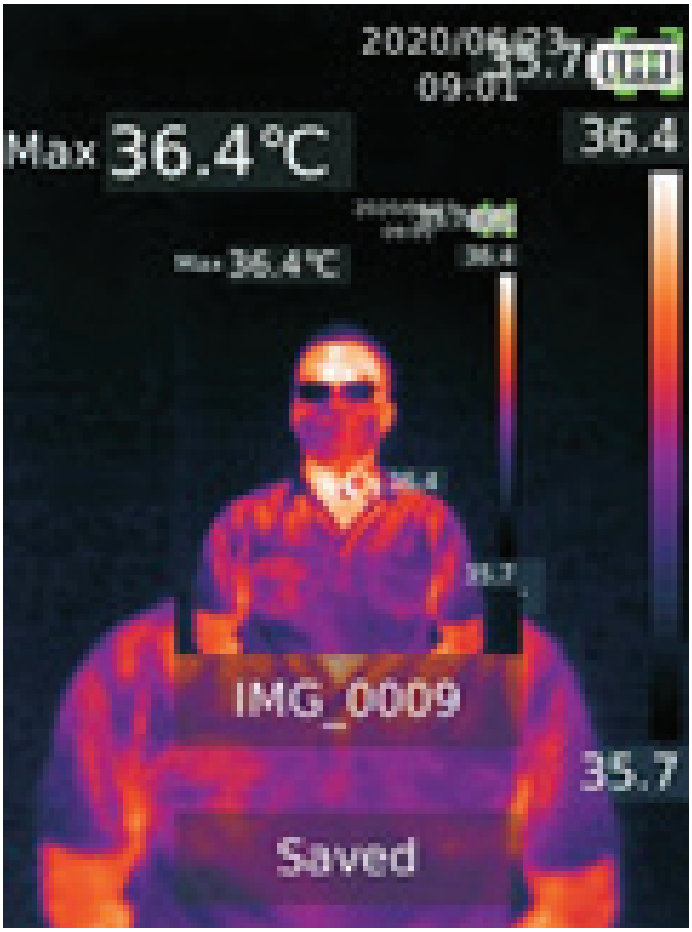


To format SD card:

1. Press the up/down button to select the Format SD Card option in the System Settings submenu.
2. Press the SET button to enter.
3. Press the up/down button to select Yes.
4. Press the SET button to confirm.
5. Press the back button to exit.

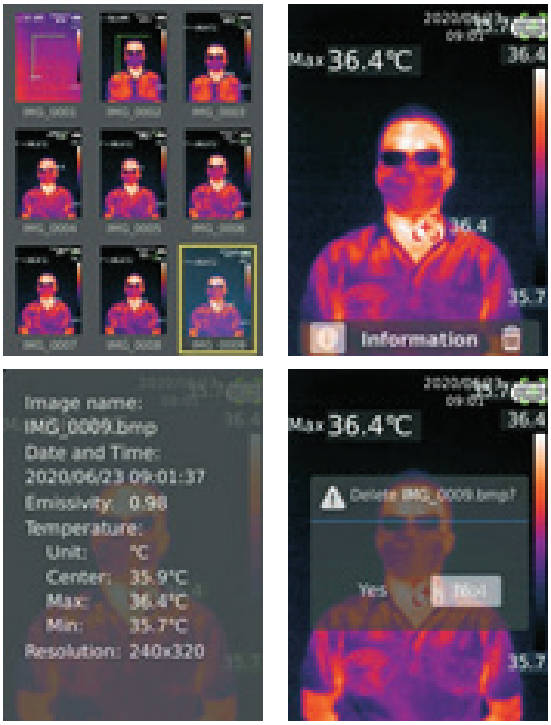
6. Operating Instruccions

6.1 Image Capture



1. Pull and release the trigger to capture an image.
2. In the manual save mode, press the left/right button to discard or save the image, and press the SET button to confirm or the back button to return.
3. In the auto save mode, the image will be saved automatically.

6.2 Image Viewing



1. Press the replay button to enter the gallery interface.
2. Use the up/down/left/right button to select the desired image.
3. Press the SET button to view the image in full screen mode.
4. Press the SET button in full screen mode to delete the image or view its information.

6.3 Temperature Compensation and Calibration

To adapt to different environments and places, manual temperature compensation is available. For the specific setting method, please refer to 5.5.5 Measurements.

To improve the stability of temperature measurement, manual temperature calibration can be performed. Calibration method: Press the back button on the main measurement interface.

6.4 LED Light

Press and hold the flashlight button for 3 seconds to turn on/off the LED light. When the temperature alert is on and the measured temperature exceeds the set temperature range, the LED light will flash.

6.5 USB Communication and Image Projection

1. Download and install the PC software (refer to 2M Technology Documents Download Operation Guide).
2. Connect the USB cable to the PC.
3. Set the USB mode to USB Disk to browse pictures and analyze data through the PC software; set the USB mode to USB Camera to realize real-time image projection through the PC software.

6.6 SD Card

This device supports Micro SD card (TF card) to store images. To avoid affecting the operating speed of the device, please copy the backup data regularly and clean up the SD card in time. To avoid causing abnormal data on the SD card, do not insert or remove the SD card repeatedly. Try to remove and insert the SD card when the device is turned off.

6.7 Charging

Please use a safety-certified 5V/1A or 5V/2A power adapter for charging. Do not turn off the product easily during charging. If shutdown or restart is needed, please unplug the Type-C power cord and disconnect the power supply first.

7. Specifications

Sensor	UFPA
Temperature range	30°C~45°C / 86°F~113°F
Measurement resolution	0.1°C / 32°F
Accuracy	±0.5°C / 32.9°F (at 25°C / 77°F ambient temperature)
Optimal measuring distance	1 meter / 3.28ft
Response time	≤500ms
IR resolution	30000 pixels (200 × 150)
Pixel size	12μm
Color palette	Iron, White Hot, Black Hot, Tyrian, Amber, Cool, Rainbow
Infrared spectral band	8μm~14μm
Field of view (FOV)	35° (H) × 26° (V)
Spatial resolution (IFOV)	3.1mrad
Thermal sensitivity (NETD)	<100mK
Frame rate	< 9Hz
Temperature measurement display	ROI, center point temperature, high temperature tracking (default)
Image format	BMP
Image mode	Thermal, Digital (visual light image)
Point temperature measurement	In addition to the center point, 3 points can be added.
Temperature Alarm	Icon alarm/LED alarm/Audio alarm
Visual light camera	Yes
Visual light resolution	640 x 480 pixels
PC software	Yes
Real-time image transmission	Yes (real-time image projection through PC software)
Data transmission	Type-C USB interface
Product size (L x W x H)	236mm x 75.5mm x 86mm / 9.29in x 2.97in x 3.38in
Display type	2.8" TFT LCD
Display resolution	320 × 240 pixels
Battery	3.6V/5000mAh rechargeable Li-ion battery

7. Specifications

PC software	Yes
Real-time image transmission	Yes (real-time image projection through PC software)
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	≤5 hours
Charging voltage/current	5V/2A
Image storage	Micro SD card
Transportation/Storage environment	-20°C~60°C (-4°F~140°F), <85% RH (non-condensing)
Operating environment	15°C~30°C (59°F~86°F), <85% RH (non-condensing)
Operating altitude	≤2000m
Standard accessories	User manual, USB cable, 16GB micro SD card

8. 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.

9. Common Emissivity

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
Aluminum plate	0.09	Rust	0.8
Copper plate	0.06	Gypsum	0.75
Black aluminum	0.95	Paint	0.9
Human skin	0.98	Rubber	0.95
Asphalt	0.96	Soil	0.93
PVC	0.93		

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