



Entry-Level Handheld Thermal Camera

User Manual

About This Manual

This manual is intended for guidance only. The photos, graphics, icons, and illustrations provided in this manual are for explanation and reference purposes only and may differ from the actual product. The actual product shall prevail. FOTRIC may update this manual due to product upgrades or other requirements without prior notice.

The trademarks, images, and other materials used in this manual are for illustrative purposes only. All copyrights belong to their respective owners.

Disclaimer

The products described in this manual, including hardware and software, may contain defects, errors, or faults. FOTRIC makes no express or implied warranties of any kind, including but not limited to warranties of merchantability, satisfactory quality, fitness for a particular purpose, or non-infringement of third-party rights. FOTRIC shall not be liable for any special, incidental, accidental, or indirect damages arising from the use of this manual or FOTRIC products, including but not limited to loss of business profits or loss of data or documents.

To the maximum extent permitted by law, the company's liability shall not exceed the amount paid for this product.

Once the product is connected to the Internet, it may be exposed to risks including, but not limited to, network attacks, hacking, and virus infection. The company shall not be liable for product malfunction, information leakage, or other issues caused by such risks, but will provide timely technical support.

When properly installed and configured, the product can detect motion and fire events; however, it cannot prevent accidents or any resulting personal injury or property loss.

Thermal imaging products are classified by the U.S. Department of Commerce as export-controlled products under Export Control Classification Number (ECCN) 6A003.b.4.b. This product contains a focal plane array with export control classification number 61002.a.3.f. This product must not be used in controlled countries or regions, including North Korea, Iran, Syria, Cuba, and Sudan. Do not bring or use this product in controlled countries. You shall bear any loss or liability arising from such actions.

When using this product, you must strictly comply with all applicable laws. You agree that this product is for civilian use only and must not be used to infringe third-party rights, in medical or safety equipment, in applications where product failure could result in danger to life or personal injury, in weapons of mass destruction, biological or chemical weapons, nuclear explosions, unsafe uses of nuclear energy, or any dangerous or inhumane purpose. You shall bear any loss or liability arising from such uses.

If the above conflicts with applicable law, the provisions of applicable law shall prevail.

Preface

User Manual



Analysis Software



AnalyzIR Venus

Symbols

 Warning	 Caution	 Note
potential death or serious injury inducing hazards.	potential danger of injury or property damage.	provides additional information to emphasize the main text.

Safety information

The purpose of this section is to ensure that the user uses the product properly to avoid danger or property damage.

Before using this product, please read this instruction manual carefully and keep it in a safe place for future reference.



Warning:

- Never disassemble or modify the thermal camera battery. The battery is equipped with safety and protective devices which, if tampered with, may cause the battery to overheat and may also cause an explosion or burn. If the battery is leaking and the leak gets into your eyes, do not rub it, wash it with water and get immediate medical attention.
- Thermal cameras that use a laser pointer. Do not view the laser beam directly with the human eye. The laser beam can cause eye irritation.
- If the unit is not working properly, contact your dealer or our company and do not disassemble or modify the unit in any way (unauthorized modifications or repairs cause problems at your own risk).



Caution:

- Avoid using the product in humid, dusty, extremely hot or cold environments, please refer to the product's parameter table for specific temperature and humidity requirements.
- Do not touch the sensor or lens directly to avoid staining and damage from oil and various chemicals. If cleaning is necessary, moisten a clean cloth and gently wipe off any dust. Close the lens cap when the thermal camera is not in use.
- When the thermal camera is turned on, it may take approximately 5-10 minutes for the camera to warm up before taking accurate readings.

- Avoid aiming at the sun, strong radiation sources (laser emissions devices) or objects with extremely high temperatures, otherwise it may cause burning black mark or other permanent damage to the sensor.
- Avoid over-range use of the device (aiming at objects of higher temperature than the current temperature range), otherwise it may cause burning black mark or other permanent damage to the sensor.
- For long-term storage of the battery, make sure it is fully charged every 3 months to ensure the battery quality. Otherwise, damage may occur.
- To prevent the potential danger of data loss, always make a copy (backup) of your data on a computer.
- When storing the thermal camera, it is strongly recommended to use the original box and to keep it in a cool, dry, ventilated environment free from strong electromagnetic fields.
- When shipping the thermal camera, it is strongly recommended that it be shipped protected in its factory packaging.

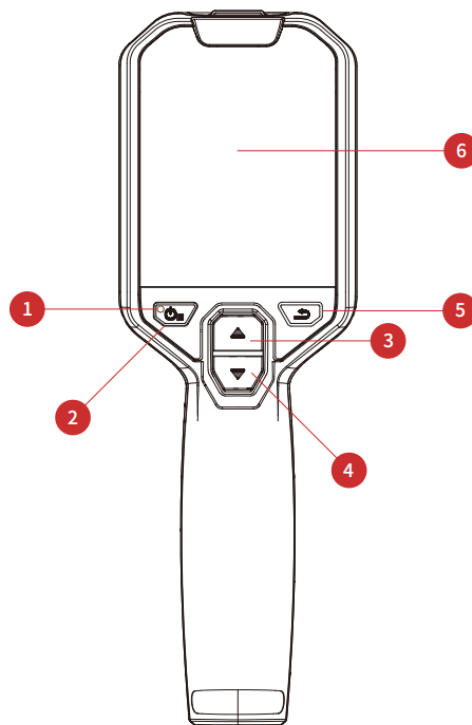
Contents

PREFACE.....	1
CONTENTS.....	3
PRODUCT OVERVIEW	5
1. FRONT VIEW	5
2. REAR VIEW	5
3. TOP VIEW.....	6
4. BOTTOM VIEW	6
1. PREPARATION.....	7
2. CHARGING	7
3. POWERING ON AND OFF	8
4. WAKE.....	8
5. STORAGE MEDIA.....	8
2 IMAGE DISPLAY.....	8
1. IMAGE MODE.....	9
1.1. INFRARED IMAGE.....	9
1.2. VISIBLE-LIGHT TEMPERATURE MEASUREMENT (T-DEF®).....	9
1.3. PICTURE-IN-PICTURE.....	10
1.4. VISIBLE LIGHT	10
2. PALETTE	10
3. COLOR ALARM.....	11
4. TEMPERATURE SPAN MODE	11
5. IMAGE OVERLAY INFORMATION.....	12
6. HIGH/LOW TEMPERATURE TRACKING.....	12
6.1. GLOBAL HIGH/LOW TEMPERATURE TRACKING	12
6.2. REGIONAL HIGH/LOW TEMPERATURE TRACKING	13
7. HIGH TEMPERATURE DIFFERENCE EQUALIZATION IMAGING (T-TWB®).....	13
3 MEASUREMENT AND ANALYSIS	13
1. TEMPERATURE MEASUREMENT RANGE.....	13
2. GLOBAL TEMPERATURE MEASUREMENT CORRECTION	13
3. MEASUREMENT MARKERS	14
3.1. TEMPERATURE MEASUREMENT POINT.....	14
3.2. TEMPERATURE MEASUREMENT BOX.....	14
4. ANALYSIS SOFTWARE.....	14
4 BASIC PARAMETERS.....	14
1. FOCUS MODE.....	14
5 CAPTURE FUNCTIONS	14
1. SINGLE-FRAME CAPTURE	14

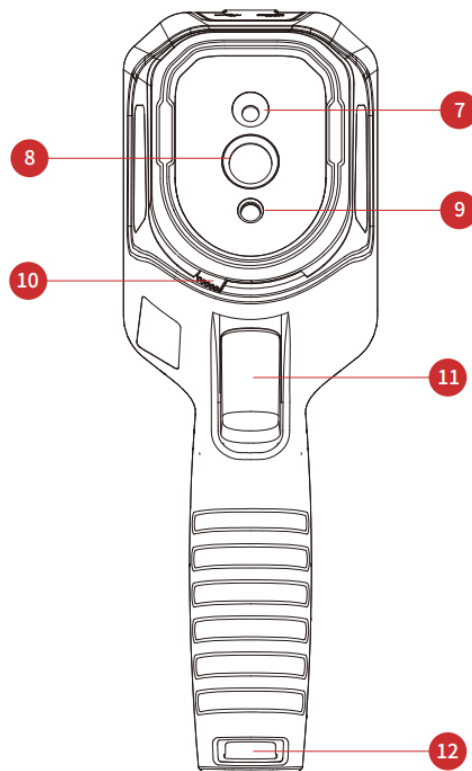
1.1.	IMAGE FORMAT	14
	GALLERY	15
6	DATA CONNECTION	16
1.	USB PORT	16
7	AUXILIARY FUNCTIONS	17
1.	LED ILLUMINATION	17
2.	SUPPORTED LANGUAGES.....	17
3.	SOFTWARE AND FIRMWARE UPGRADE.....	17
4.	DEVICE SETTINGS	17
	EMISSIONS TABLE	23

Product Overview

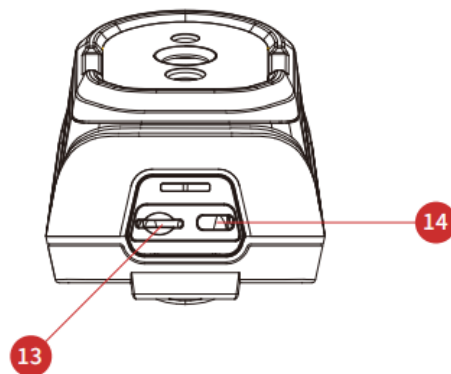
1. Front View



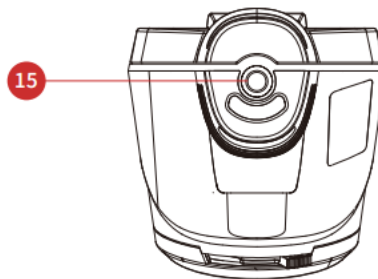
2. Rear View



3. Top View



4. Bottom View



Note

The appearance of different models of the product may vary. Please refer to the actual product.

Parts and interfaces

	Name	Function
1	Indicator LED	● Green, blinking: charging ● Green, glowing: fully charge
2	Power Button	● Short press: summon menu when menu is not present; Confirm selection when menu is present ● Long press: sleep/wake screen
3&4	Navigation Buttons	On menu interface, short press ▲ or ▼ to select or adjust parameters
5	Back Button	Exit menu or back to the previous menu

6	Display Screen	Display screen
7	Digital Camera	Digital visible-light camera
8	Infrared Lens	For infrared imaging
9	LED Flash Light	● Flash light : serve as a flash light when taking photos ● For illumination in dark environment
10	Lens Cover	Flip to turn on/off the lens cover
11	Capture Button	For capturing images
12	Wrist Strap Hole	For fixing the wrist strap
13	SD Storage Card Interface	For inserting the SD card
14	USB Type-C Interface	● For connecting to a USB Type-C cable for power supply and data transmission
15	Tripod Connection Interface	For mounting on a tripod

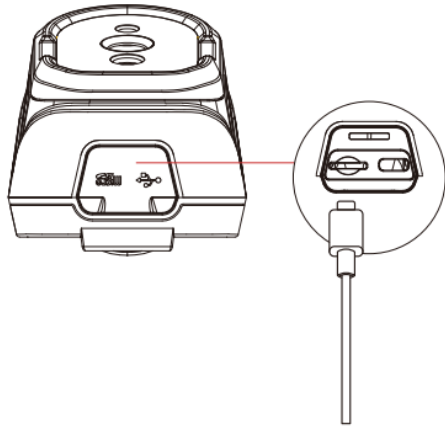
1. Preparation

2. Charging

Charge the thermal camera before first use or when the battery is low.
The thermal camera can be charged directly using a DC 5 V power adapter.

Procedure

1. Open the port cover.
2. Connect the power adapter to start charging.



3. Powering On and Off

3.1. Power On

When the device has sufficient battery power, press and hold the Power button to turn it on.



Note

When the battery is low, charge the device promptly to avoid interrupting use.

3.2. Power Off

The device can be powered off manually or by setting an automatic power-off time.

Manual Power-Off

Press and hold the Power button to turn off the device.

Automatic Power-Off

Set the automatic power-off time. If there is no operation, and no USB cable connected for the configured period, the device will power off automatically.

4. Wake

Short press the Power button to wake the device.

5. Storage Media

The device is equipped with a memory card for storing captured images.



Note

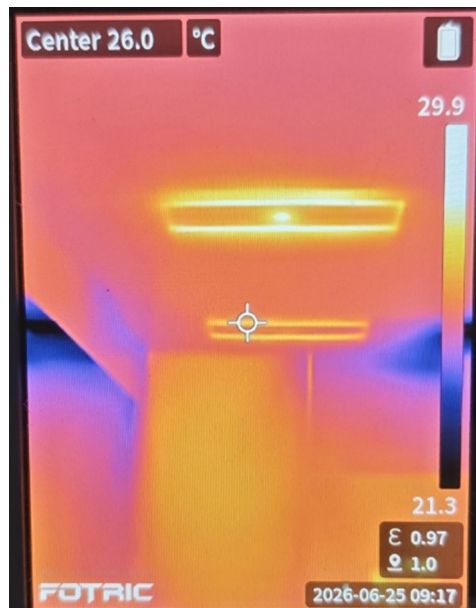
The supplied memory card may vary. The actual product shall prevail.

2 Image Display

1. Image Mode

The device captures both infrared and visible-light images. Select the appropriate image mode to meet different display requirements. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons and the Power button: Device Menu > Image Mode.
3. Press the direction buttons to select the desired image mode.

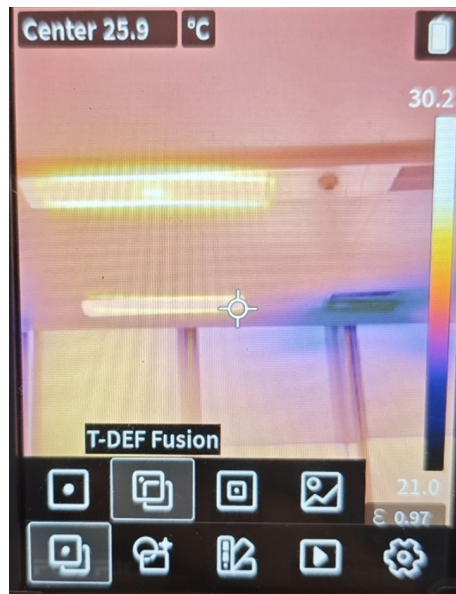


1.1. Infrared Image

This mode displays the infrared image.

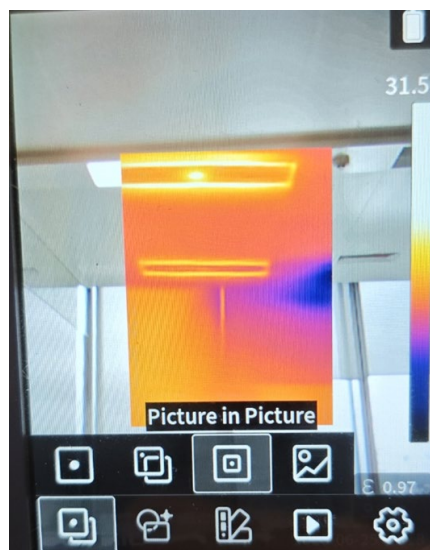
1.2. Visible-Light Temperature Measurement (T-DEF®)

This mode displays the live thermal image and visible-light image at the same time. Press the Power button and direction buttons to select visible-light mode, then press the Power button to activate the transparency control. After activation, press the Up/Down buttons to adjust infrared image transparency from 0% to 100% in 10% increments.



1.3. Picture-in-Picture

This mode overlays the infrared image on the visible-light image.



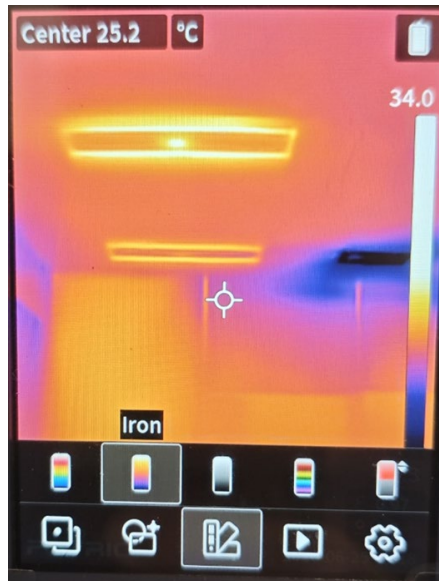
1.4. Visible Light

This mode displays the visible-light image captured by the digital camera.

2. Palette

The device can change palettes to display images in different color schemes, making scenes easier to interpret. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu> Palette.
3. Press the Power button and direction buttons to select the desired palette.



3. Color Alarm

The device supports color alarms for temperatures above a threshold. After an alarm threshold is set, targets or objects that meet the alarm condition are displayed in the alarm color, helping users identify abnormalities in the monitored scene. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu> Palette.
3. Press the Power button and direction buttons to select Above-Temperature Alarm.
4. After selecting Above-Temperature Alarm, press the Power button to set the alarm threshold. All pixels above the alarm threshold will be displayed in the alarm color.

4. Temperature Span Mode

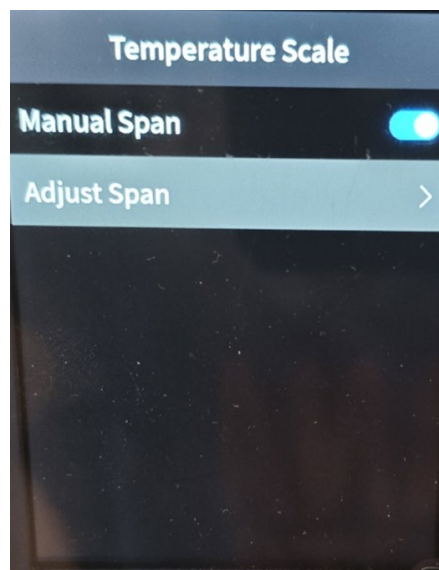
The device supports both automatic and manual temperature span adjustment.

Automatic span: adjusts the upper and lower limits based on the global maximum and minimum temperatures in the image.

The procedure for manual span adjustment is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons and the Power button: Device Menu > Settings.
3. Press the Power button and direction buttons: Settings > Temperature Span Mode.
4. Press the Power button to enable manual temperature span.
5. Press the direction buttons and the Power button to enter the span adjustment screen. Adjust the upper and lower limits close to the temperature of a specific target in the image. The upper and lower limits can be adjusted individually or together to optimize the image display. Press the Up/Down buttons to change the limit values, and press the Power button to switch between individual and

simultaneous adjustment.



5. Image Overlay Information

This setting specifies which information is overlaid on the image, including center temperature, maximum temperature, minimum temperature, center-box maximum and minimum temperatures, temperature measurement parameters, and date/time information. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons and the Power button: Device Menu > Temperature measurement Area > Add Center Measurement to overlay the center temperature on the image.
3. Press the direction buttons and the Power button: Device Menu > Temperature Measurement Area > Show Maximum Temperature to overlay the global maximum temperature on the image.
4. Press the direction buttons and the Power button: Device Menu > Temperature Measurement Area > Show Minimum Temperature to overlay the global minimum temperature on the image.
5. Press the direction buttons and the Power button: Device Menu > Temperature measurement Area > Add Measurement Rectangle to overlay the center-box maximum and minimum temperatures on the image.

6. High/Low Temperature Tracking

The device can automatically track the positions of global or regional maximum and minimum temperature points using special markers.

6.1. Global High/Low Temperature Tracking

When no measurement rectangle has been added and maximum/minimum temperature overlays are enabled, the global maximum temperature point is marked in red and the global minimum temperature point is marked in blue.

6.2. Regional High/Low Temperature Tracking

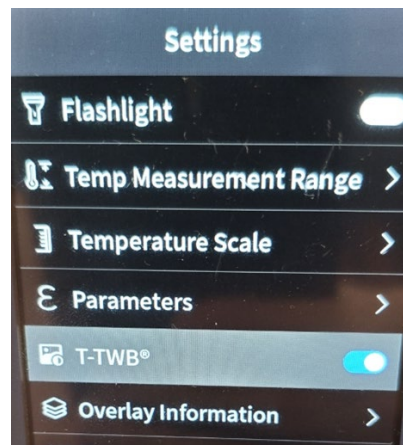
When a measurement rectangle has been added and maximum/minimum temperature overlays are enabled, the regional maximum temperature point is marked in red and the regional minimum temperature point is marked in blue.

7. High Temperature Difference Equalization Imaging

(T-TWB®)

This function optimizes image display over a wide dynamic range and reveals more detail. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the direction buttons and the Power button to enable High Temperature Difference Equalization Imaging (T-TWB®).



3 Measurement and Analysis

1. Temperature Measurement Range

The device supports multiple temperature ranges. To obtain accurate temperature measurements, select the appropriate range based on the expected temperature of the target. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button and direction buttons: Temperature Measurement Range > select the appropriate range.

2. Global Temperature Measurement Correction

To ensure accurate measurements for different targets, set the correct temperature measurement parameters. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button and direction buttons: Temperature Parameters >

Emissivity. Adjust the parameter according to the target. Refer to Appendix A: Emissivity Table.

4. Press the Power button and direction buttons: Temperature Parameters > Target Distance. Adjust the parameter according to the distance between the target and the device.

3. Measurement Markers

The device can measure temperature using a center point or center box.

3.1. Temperature Measurement Point

The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons and the Power button: Device Menu > Temperature Measurement Area > Add Center Measurement.
3. Press the Power button again to remove the center point.

3.2. Temperature Measurement Box

The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Temperature Measurement Area.
3. Press the Power button, direction buttons, and Power button again to add a measurement rectangle.
4. Press the Power button again to remove the measurement rectangle.

4. Analysis Software

AnalyzIR professional thermal analysis software is available. For detailed operation, refer to the software user manual.

4 Basic Parameters

1. Focus Mode

Focus-free.

5 Capture Functions

1. Single-Frame Capture

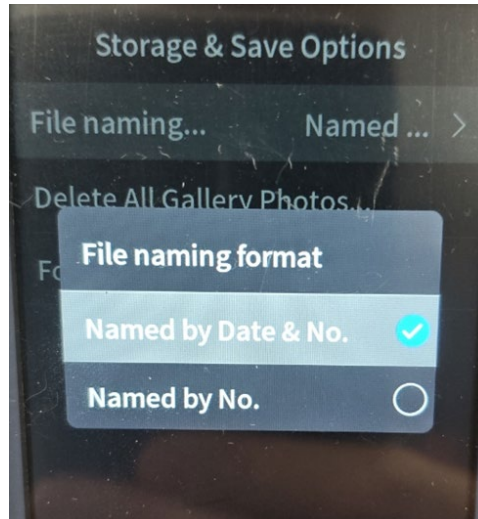
Capture images from the live view and save them to the device memory card. On the live view, press the Capture button to take a single image.

1.1. Image Format

Date + Sequence Number Naming

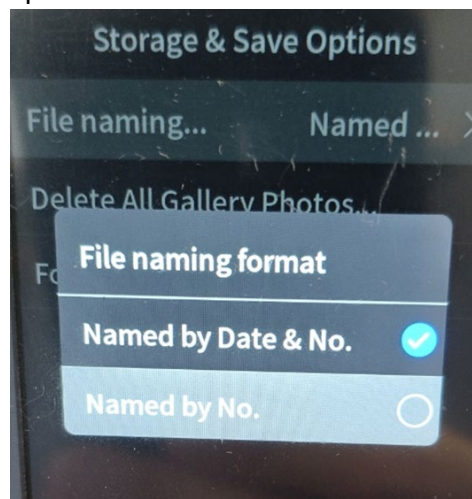
1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.

-
3. Press the Power button, direction buttons, and Power button again. In Storage and Save Options, set File Naming Format to Date + Sequence Number.
 4. After single-frame capture (file name: date + sequence number), go to Gallery > Image Preview > File Properties.
View the file name: Date + Sequence Number.



Sequence Number Naming

5. On the live view, press the Power button to open the device menu.
6. Press the direction buttons: Device Menu > Settings.
7. Press the Power button, direction buttons, and Power button again. In Storage and Save Options, set File Naming Format to Sequence Number.
8. After single-frame capture (file name: sequence number), go to Gallery > Image Preview > File Properties.
View the file name: Sequence Number.

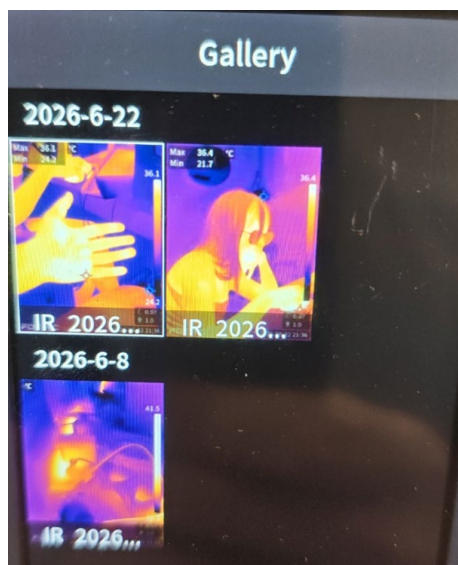


Gallery

Files are saved on the SD card. Use the Gallery to view all saved files. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Gallery.

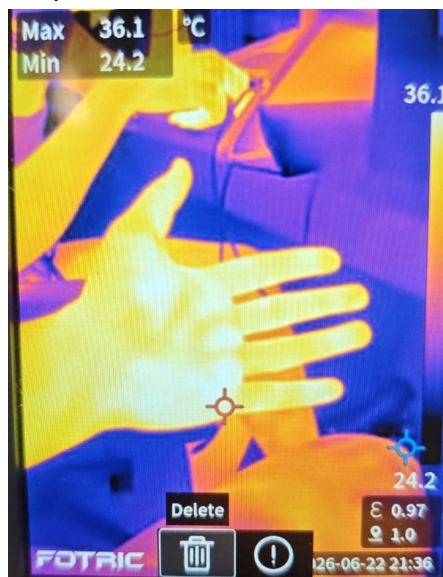
3. Press the Power button to enter the Gallery.



Press the Back button on the device to return to the live view.

Gallery Preview

In the Gallery, press the direction buttons to select a thermal image, then press the Power button to enter Gallery Preview.



Delete Function:

1. Press the Power button and direction buttons to display the Delete button.
2. Press the Power button. After secondary confirmation, the image is deleted.

6 Data Connection

1. USB Port

Use a USB cable to connect the device to a computer. After the connection is established, images can be moved from the memory card to the computer.

7 Auxiliary Functions

1. LED Illumination

Supports flashlight illumination and flash mode.

Flashlight Illumination:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button to turn on the light and use it as a flashlight.

Flash Mode:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Enable LED as Flash.

2. Supported Languages

Supported languages include Simplified Chinese, English, German, French, Spanish, Portuguese, Italian, Polish, Japanese, Korean, Traditional Chinese, and Thai. The procedure is as follows:

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Language.
4. Press the direction buttons and the Power button to select a language and switch to it.

3. Software and Firmware Upgrade

Offline firmware upgrade is supported.

Offline Firmware Upgrade

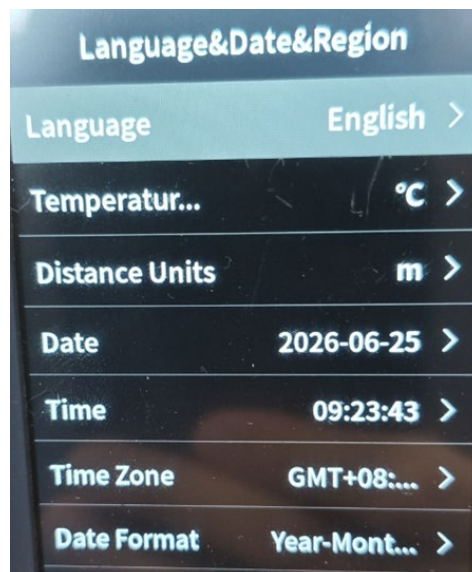
1. The upgrade package file has been placed on the device memory card.
2. On the live view, press the Power button to open the device menu.
3. Press the direction buttons: Device Menu > Settings.
4. Press the Power button and direction buttons: Device Settings > System Upgrade.
5. Select System Upgrade. The device detects the available upgrade version.
6. Select the Update button to start the system upgrade. After the upgrade is complete, the device restarts and the system version is updated to the upgraded version.

4. Device Settings

Use Device Settings to configure language, time and region, LED as flash, screen brightness, screen-off time, automatic power-off time, reset, and device information.

Language, Time, and Region

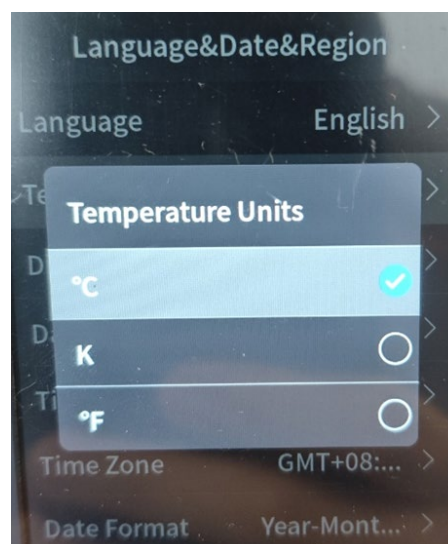
Set language, temperature unit, distance unit, date, time, time zone, and date format.



Set Language: Refer to Section VII Auxiliary Functions > 2. Supported Languages.

Set Temperature Unit

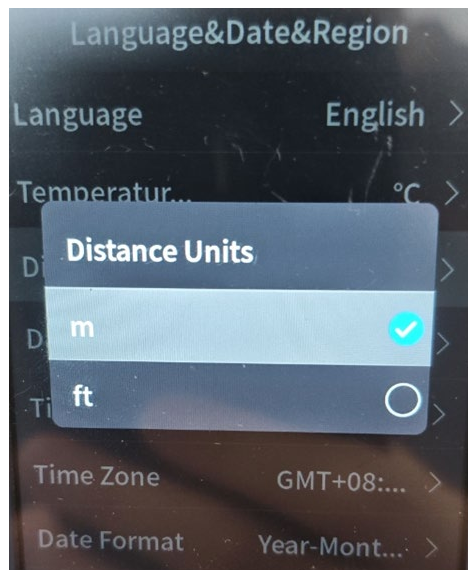
1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Temperature Unit.
4. Press the direction buttons and the Power button to set the temperature unit parameter.



Set Distance Unit

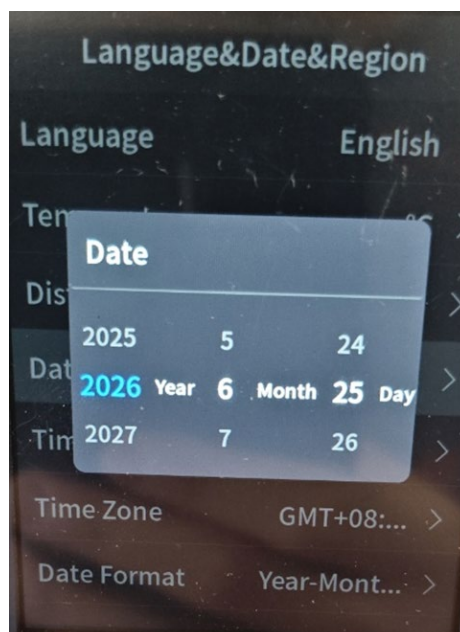
1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Distance Unit.

4. Press the direction buttons and the Power button to set the distance unit parameter.



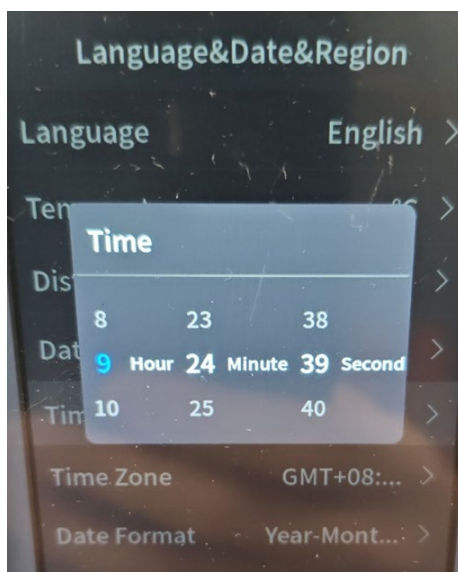
Set Date

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Date.
4. Press the direction buttons and the Power button to set the date parameter.



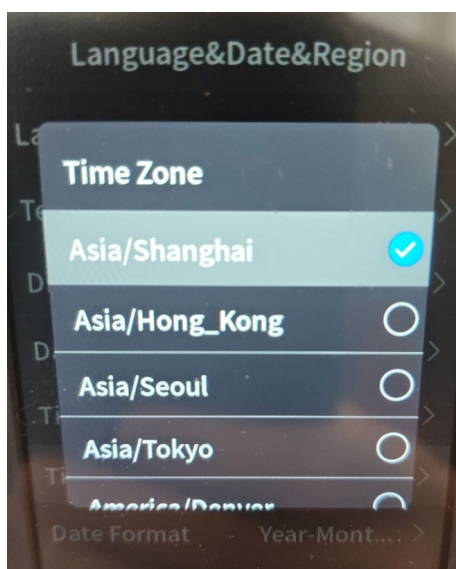
Set Time

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Time.
4. Press the direction buttons and the Power button to set the time parameter.



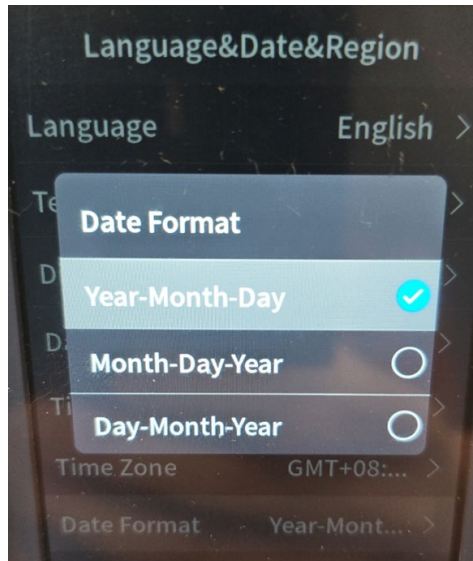
Set Time Zone

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Time Zone.
4. Press the direction buttons and the Power button to set the time zone parameter.



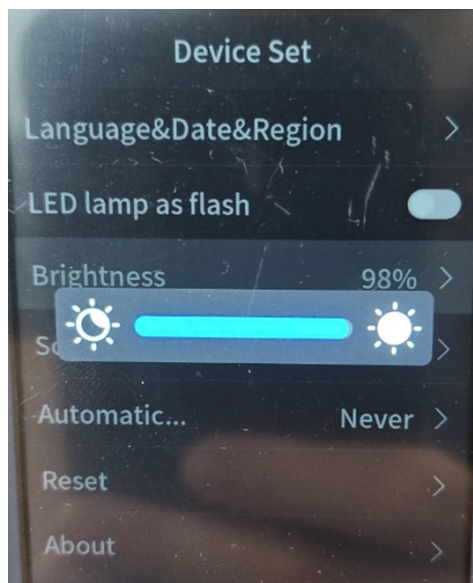
Set Date Format

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Date Format.
4. Press the direction buttons and the Power button to set the date format parameter.



Screen Brightness

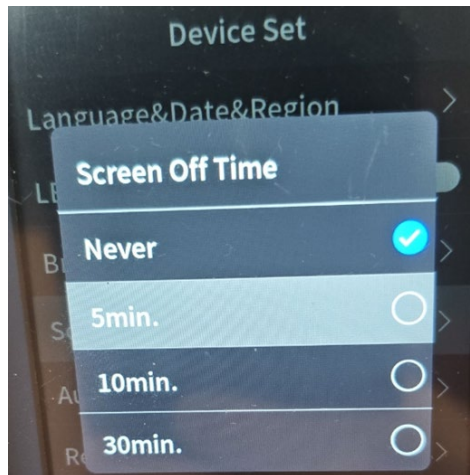
1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the Power button, direction buttons, and Power button again: Device Settings > Language, Time, and Region > Screen Brightness.
4. Press the direction buttons and the Power button to set the screen brightness parameter.



LED as Flash: Refer to Section VII Auxiliary Functions > 1. LED Illumination.

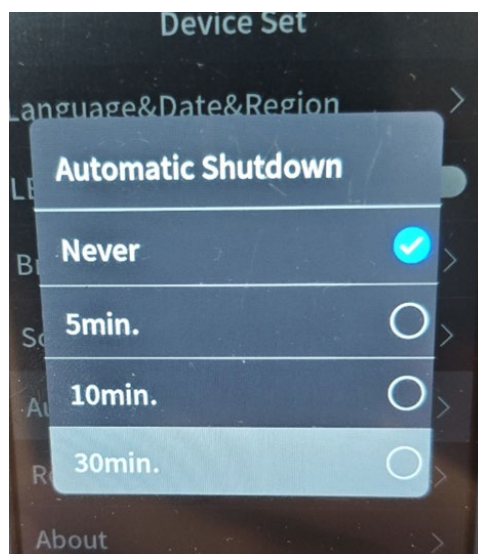
Screen-Off Time

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the power button + arrow keys, device settings → screen time
4. Press the direction buttons and the Power button to set the screen-off time. If the device is not operated for the configured period, the screen turns off automatically.



Automatic Power-Off Time

1. On the live view, press the Power button to open the device menu.
2. Press the direction buttons: Device Menu > Settings.
3. Press the power button + arrow keys, device settings → screen time
4. Press the direction buttons and the Power button to set the automatic power-off time. If the device is not operated for the configured period, it powers off automatically.



Reset

Resets parameters to factory defaults.

Device Information

View the model, serial number, firmware version, lens, battery level, remaining memory card capacity, and system upgrade information.

Emissivity Table

(For reference only)

Material	Surface Condition	Temperature (°C)	Emissivity (ϵ)
Aluminum	Non-oxidized	100	0.20
	Oxidized	100	0.55
Brass	Polished, brown	20	0.40
	Matte	38	0.22
	Oxidized	100	0.61
Copper	Heavily oxidized	20	0.78
Iron	Oxidized	100	0.74
	Rusty	25	0.65
Cast Iron	Oxidized	200	0.64
	Non-oxidized	100	0.21
Wrought Iron	Rough surface	25	0.94
	Polished	38	0.28
Nickel	Oxidized	200	0.37
Stainless Steel	Oxidized	60	0.85
Steel	Oxidized at 800°C	200	0.79
Common Brick	Surface	20	0.93
Concrete	Surface	20	0.92
Glass	Polished plate	20	0.94
Paint	White	100	0.92
	Natural black	100	0.97
Carbon	Soot	25	0.95
	Candle Soot	20	0.95
	Rough graphite surface	20	0.98
Paint	Average of 16 Colors	100	0.94
Paper	White	20	0.93
Sand	Surface	20	0.90
Wood	Planed	20	0.90
Water	Distilled water	20	0.96
Skin	Human	32	0.98
Ceramic	Fine	21	0.90
	Coarse	21	0.93
Material	Surface Condition	Temperature (°C)	Emissivity (ϵ)
Aluminum	Non-oxidized	100	0.20
	Oxidized	100	0.55

Brass	Polished, brown	20	0.40
	Matte	38	0.22
	Oxidized	100	0.61
Copper	Heavily oxidized	20	0.78
Iron	Oxidized	100	0.74
	Rusty	25	0.65
Cast Iron	Oxidized	200	0.64
	Non-oxidized	100	0.21
Wrought Iron	Rough surface	25	0.94
	Polished	38	0.28
Nickel	Oxidized	200	0.37
Stainless Steel	Oxidized	60	0.85
Steel	Oxidized at 800°C	200	0.79
Common Brick	Surface	20	0.93
Concrete	Surface	20	0.92
Glass	Polished plate	20	0.94
Paint	White	100	0.92
	Natural black	100	0.97
Carbon	Soot	25	0.95
	Candle Soot	20	0.95
	Rough graphite surface	20	0.98
Paint	Average of 16 Colors	100	0.94
Paper	White	20	0.93
Sand	Surface	20	0.90
Wood	Planed	20	0.90
Water	Distilled water	20	0.96
Skin	Human	32	0.98
Ceramic	Fine	21	0.90
	Coarse	21	0.93