

Thermal Monocular

User Manual

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FCC Information

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
FCC compliance: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help
This equipment should be installed and operated with a minimum distance 20cm between the radiator and your body.
FCC Conditions
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

EU Conformity Statement

This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the EMC Directive 2014/30/EU, the RoHS Directive 2011/65/EU

2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info



2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info

Industry Canada ICES-003 Compliance

This device meets the CAN ICES-3 (B)/NMB-3(B) standards requirements.

1. This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

1. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes : l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This equipment should be installed and operated with a minimum distance 20cm between the radiator and your body.

Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
Danger	Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.
Caution	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
Note	Provides additional information to emphasize or supplement important points of the main text.

Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss.

Laws and Regulations

- Use of the product must be in strict compliance with the local electrical safety regulations.

Transportation

- Keep the device in original or similar packaging while transporting it.
- Keep all wrappers after unpacking them for future use. In case of any failure occurred, you need to return the device to the factory with the original wrapper. Transportation without the original wrapper may result in damage on the device and the company shall not take any responsibilities.
- DO NOT drop the product or subject it to physical shock. Keep the device away from magnetic interference.

Power Supply

- Please purchase the charger by yourself. Input voltage should meet the Limited Power Source (5 VDC, 2A) according to the IEC61010-1 standard. Please refer to technical specifications for detailed information.
- Make sure the plug is properly connected to the power socket.
- DO NOT connect multiple devices to one power adapter, to avoid over-heating or fire hazards caused by overload.

Battery

- Improper use or replacement of the battery may result in explosion hazard. Replace with the same or equivalent type only. The battery type is CR123A*2/RCR123A*2. Dispose of used batteries in conformance with the instructions provided by the battery manufacturer.
- For long-term storage of the battery, make sure it is fully charged every half year to ensure the battery quality. Otherwise, damage may occur.
- Do not charge other battery types with the supplied charger. Confirm there is no flammable material within 2 m of the charger during charging.

Maintenance

- If the product does not work properly, please contact your dealer or the nearest service center. We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.
- A few device components (e.g., electrolytic capacitor) require regular replacement. The average lifespan varies, so periodic checking is recommended. Contact your dealer for details.
- Wipe the device gently with a clean cloth and a small quantity of ethanol, if necessary.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.

- It is recommended to reboot the device every 2 hours when using it to ensure the device performance.

Using Environment

- Make sure the running environment meets the requirement of the device. The operating temperature shall be -20°C to 55°C (-4°F to 131°F), and the operating humidity shall be 95% or less.
- DO NOT expose the device to high electromagnetic radiation or dusty environments.
- DO NOT aim the lens at the sun or any other bright light.

Emergency

- If smoke, odor, or noise arises from the device, immediately turn off the power, unplug the power cable, and contact the service center.

Manufacture Address

Room 313, Unit B, Building 2, 399 Danfeng Road, Xixing Subdistrict,Binjiang District, Hangzhou, Zhejiang 310052, China
Hangzhou Microimage Software Co., Ltd.

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Chapter 1 Overview

1.1 Device Description

The thermal monocular is equipped with high-sensitivity IR detector, and adopts advanced thermal imaging technology, to get clear view in poor visibility or dark environment.
It helps to view the target and measure the distance in outdoor condition. The device can be widely used for patrolling, searching and rescuing, hiking, and travel, etc.

1.2 Main Function

- Distance Measurement: The device can detect the distance between the target and the device.
- Highest Temperature Tracking: The device can detect the highest temperature in the scene and mark the spot.
- Client Software Connection: The device can capture snapshots, record videos, and set parameters by T-Vision App after being connected to your phone via hotspot.
- Image Correction: The device supports DPC (Defective Pixel Correction) and FFC (Flat Field Correction) which can optimize the image quality.
- Image Calibration: The device adjusts the thermal view to make it consistent with the optical view.

1.3 Appearance

There are two types of thermal monocular cameras. Please take the actual product for reference.

1.3.1 Button

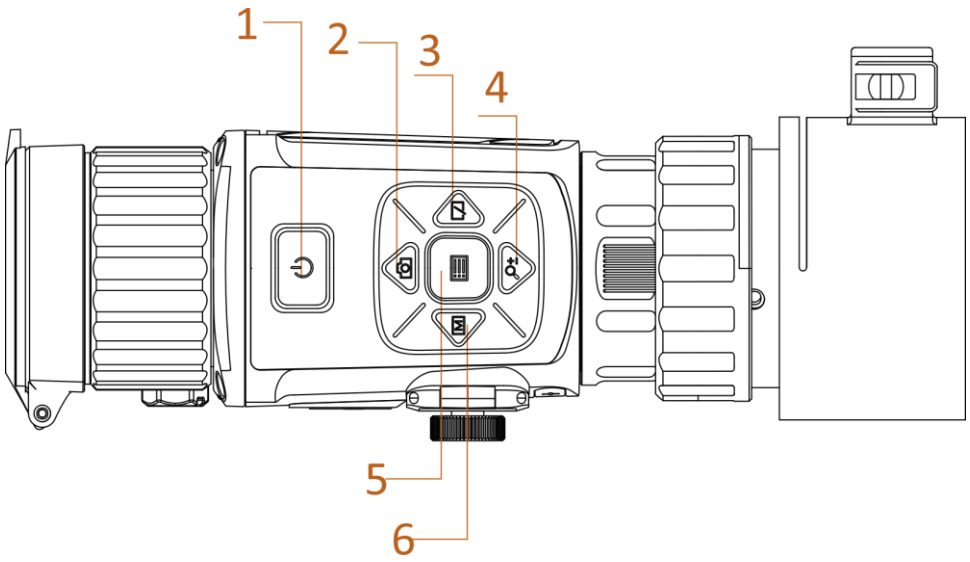


Figure 1-1 Buttons on Device

Table 1-1 Function of Buttons

No	Icon	Button	Description
1		Power	● Press: Standby Mode/Wake up Device ● Hold: Power On/Off
2		Capture	● Press: Capture ● Hold: Start/Stop Video Recording
3		Shutter	● Press: Correct Non-uniformity of Display
4		Zoom	● Press: Switch Digital Zoom ● Hold: Enable/Disable Reticle
5		Menu	● Press: Enable/Disable OSD ● Hold: Menu Operation
6		Mode	● Press: Switch Palettes
2 + 4	+	Capture + Zoom	● Press: Enter Image Calibration Mode

1.3.2 Interface

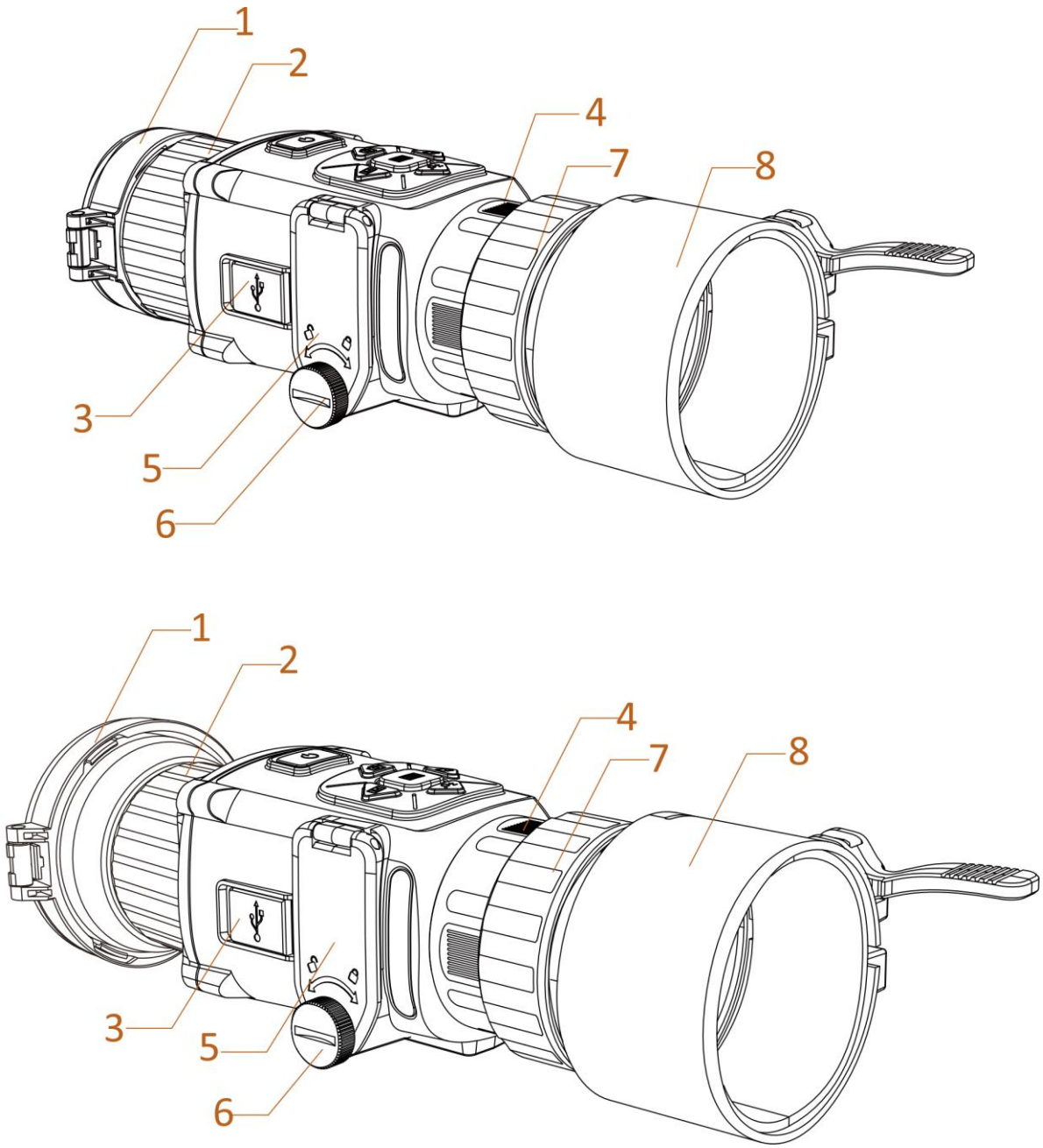


Figure 1-2 Interfaces of Device

Table 1-2 Interface Description

No	Component	Function
1	Lens Cover	Protect the lens.
2	Objective Lens	Adjust the distance between the lens and the sensor to

No	Component	Function
		view the target much clearer.
3	Data Exchange Interface	Connect with the output cable.
4	Fixing Ring	Fix the adapter.
5	Battery Compartment	Install the battery in it.
6	Bolt	Loosen the bolt to install the batteries.
7	Locking Ring	Lock the adapter with the device.
8	Adapter	Connect with a daylight scope.

Chapter 2 Preparation

2.1 Connect Device

Before You Start

- Remove batteries from the device before connecting to your PC, or it may cause device damage.
- Turn on the device after connecting it to your PC, and keep the device on for 10 to 15 seconds before other operations.

Steps

1. Turn on the device and make sure the hotspot function is disabled.
2. Lift the cable interface cover.
3. Connect the device and power adapter with a type-C cable to power on the device. Alternatively, connect the device and PC to export files.

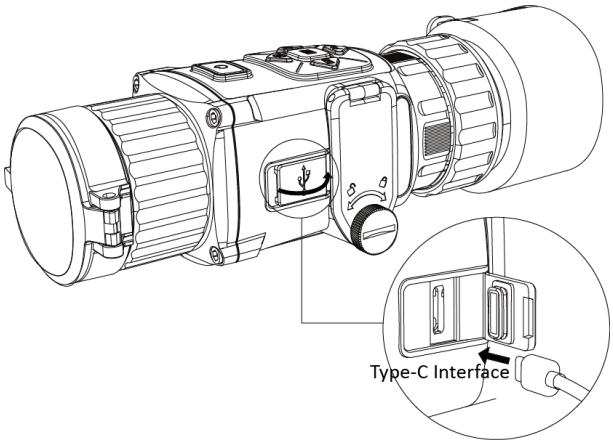


Figure 2-1 Cable Interface

2.2 Install Battery

Insert the batteries into the battery compartment.

Before You Start

- The device supports 3.0 V or 3.7 V rechargeable lithium battery or 3.0 V non-rechargeable dry battery.
- Select the correct battery voltage in the device menu, or it may cause abnormal shutdown.

Steps

1. Rotate the bolt anticlockwise to loosen it.

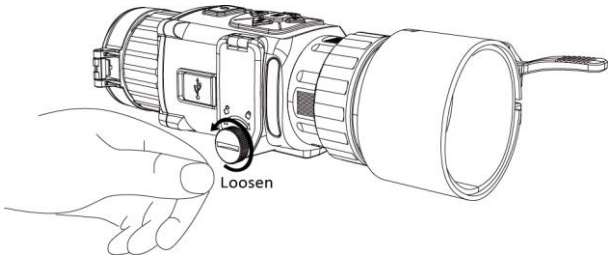


Figure 2-2 Loosen Hand Screw

2. Make sure the battery's positive terminal and negative terminal are installed correctly.

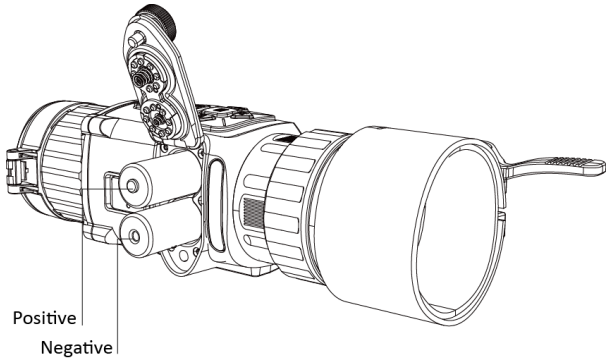


Figure 2-3 Install Batteries

3. Rotate the hand screw clockwise to tighten it.

   Take the battery away if the device is not used for a long time.

2.2.1 Select Battery Type

The device supports multiple types of batteries and you can change the battery type according to your need. Select the battery voltage according to the actual situation, so that the device can display the remaining power correctly.

Steps

1. In the view mode, hold to show the menu.
2. Select , and press to switch the voltage.

2.3 Install Adapter

Steps

1. Make sure the red dot of the adapter align with the red dot of the eyepiece, and insert the adapter as arrow 1.
2. Rotate the locking ring anticlockwise (as arrow 2 shows).

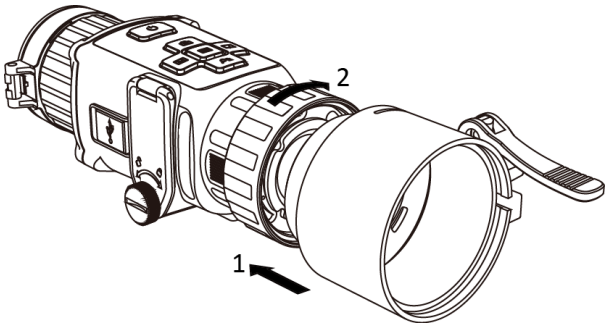


Figure 2-4 Install Adapter

Note

The selectable types of the adapter are 38, 40, 50, and 62.

2.4 Remove Adapter

Steps

1. Rotate only the locking ring clockwise, and make sure the device or other parts of the adapter are not rotated or moved.
2. Plug out the adapter after it is loosen.

2.5 Install Daylight Scope

You can use the device together with a daylight scope to view the target clear in daytime.

Steps

1. Install the daylight scope into the transfer ring as arrow 1.
2. Lock the buckle to fix the daylight scope as arrow 2.

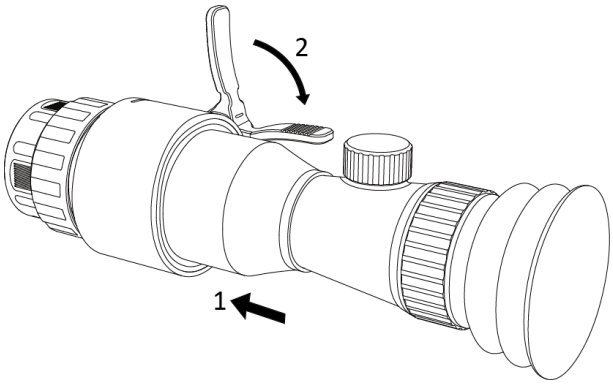


Figure 2-5 Install Daylight Scope

2.6 Power On/Off

Power On

When the battery is enough, press to power on the device.

Power Off

When the device is turned on, hold for 2 seconds to power off the device.

2.7 Menu Description

When the device is turned on, press to display the OSD menu.

- Press to move the cursor up.
- Press to move the cursor down.
- Press to move the cursor left.
- Press to move the cursor right.
- Press to confirm.

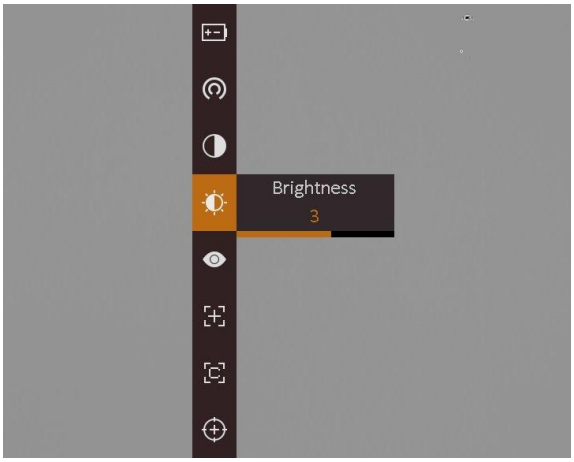


Figure 2-6 Menu Interface

Chapter 3 Image Settings

3.1 Adjust Diopter

Steps

1. Power on the device.
2. Open the lens cover.
3. Hold the device and make sure the eyepiece covers your eye.
4. Rotate the adjust ring until the OSD text or image is clear.

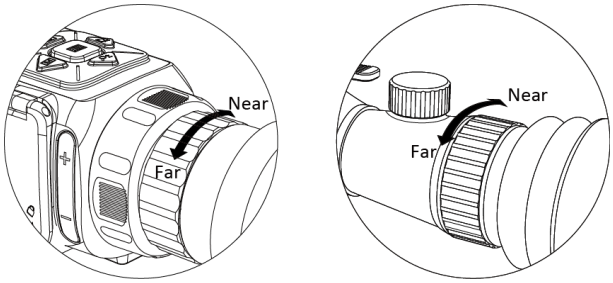


Figure 3-1 Adjust Diopter

Note

When adjusting diopter, DO NOT touch the surface of lens to avoid smearing the lens.

3.2 Adjust Brightness

In the menu mode, select and press to adjust brightness. In white hot mode, the higher the value of brightness is, the brighter the image is. The image effect in white hot mode is showed as picture below and effect in black hot mode is opposite.



Figure 3-2 Adjust Brightness in White Hot Mode

3.3 Adjust Contrast

In the menu mode, select and press to adjust image contrast.

3.4 Select Scene

You can select proper scene according to actual using scene to improve the display effect.

Steps

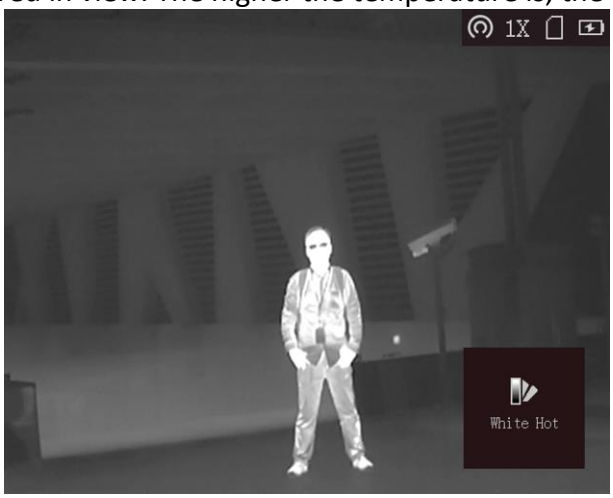
1. Hold to go to the menu.
2. Select and press to switch scene.
   – refers to recognition mode and is recommended in normal scene.
   – refers to jungle mode and is recommended in hunting environment.
3. Hold to save settings and exit.

3.5 Set Palettes

You can select different palettes to display the same scene in different effects. Press M to switch palettes.

White Hot

The hot part is light-colored in view. The higher the temperature is, the lighter the color is.



Black Hot

The hot part is black-colored in view. The higher the temperature is, the more black the color is.



Red Hot

The hot part is red-colored in view. The higher the temperature is, the redder the color is.



Fusion

From high temperature to low temperature, the image is colored in from white, yellow, red, pink to purple.



3.6 Correct Defective Pixel

The device can correct the defective pixels on the screen which are not performed as expected.

Steps

1. Hold to show the menu.
2. Select .
3. Press , , , and to move the cursor to the position of dead pixel.
4. Press to correct the dead pixel.

Note

The selected defective pixel can be magnified and displayed at the bottom right of the interface.

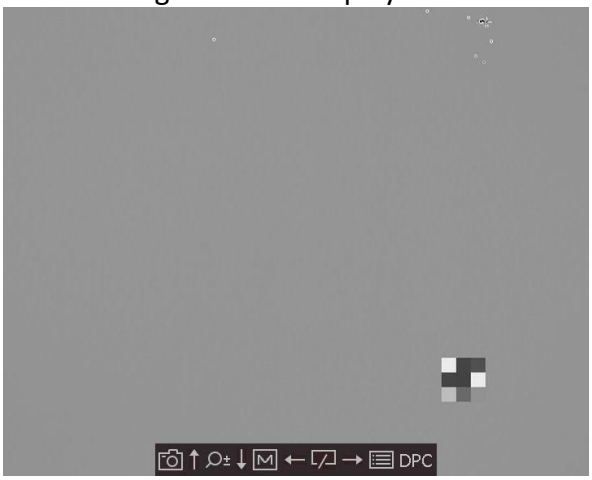


Figure 3-3 Correct Defective Pixel

3.7 Flat Field Correction

This function can correct non-uniformity of display.

Steps

1. Hold to go to the menu.
2. Select and press to switch FFC mode.
   - Manual: Hold in live view to correct the non-uniformity of display.
   - Auto: The device performs FFC automatically according to the set schedule when switching on the camera.
   - External: Cover the lens cover, then hold in live view to correct the non-uniformity of display.
3. Hold to save the settings and exit.

3.8 Set Picture in Picture Mode

Steps

1. In the view mode, hold to show the menu.
2. Select and enter PIP mode. The details show in the upper left corner.
   - When the reticle is enabled, the PIP view is the detail of reticle.
   - When the reticle is not enabled, the PIP view is the detail of central part.
3. Press to switch the PIP type. **Up-Left**, **Center**, **Up-Right**, and **Close** are selectable.

Note

When you select **Up-Right** as PIP type, the OSD will be blocked.



Figure 3-4 Set Picture in Picture Mode

4. Hold to exit.

   If digital zoom is enabled, the PIP view also zooms. If the digital zoom ratio exceeds 4, the PIP does not zoom.

Note

This function varies according to different camera models.

3.9 Adjust Digital Zoom

You can zoom the image by using this function.
Press in the view mode, the live view switches between 1 ×, 2 ×, 4 ×, and 8 ×.

Note

This function varies according to different camera models.

3.10 Set OSD

In the live view interface, press to display or hide the OSD information.

3.10.1 Synchronize Time

Steps

1. Hold to show the menu.
2. Select , and press to enter the time setting interface.
3. Press to switch the time system, and press and to select the time and date to be synchronized.
4. Press to select the hour, minute, second, year, month, or day to be synchronized, and press and to change the number.
5. Hold to save settings and exit.

3.11 Calibrate Image

The device can adjust the thermal view to make it consistent with the optical view.

Steps

1. Hold and to go to image calibration interface.
2. Press , , , and to adjust the position of the live preview window. The image region could be adjusted in 4 directions in the whole screen area.

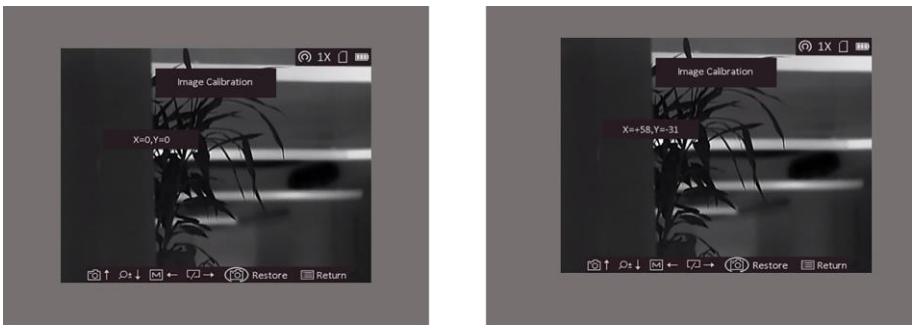


Figure 3-4 Actual Image Calibration Effect

3. Optional: Hold , and press **OK** to restore the view to default position.

Note

The default position of image window may not be exactly at zero (X = 0, Y = 0). This is caused by slight individual differences of optical components, and it is a normal phenomenon.

4. Hold to exit image calibration.

Chapter 4 Burning Prevention

This function can prevent the detector of the thermal channel from being burned. When enabling this function, the shield will close if the grey scale of the detector reaches a certain value.

Steps

1. Hold  to show the menu.
2. Select  and press  to enable or disable the burn-prevention function.
3. Hold  to save settings and exit.

Note

When the burn-prevention function is disabled, the shield should be opened if it closes.

Chapter 5 Highest Temperature Tracking

The device can detect the highest temperature spot in the scene and mark it on display.

Steps

1. Hold to show the menu.
2. Select and press to mark the spot of highest temperature.
3. Hold to save settings and exit.

Result

When the function is enabled, displays in the spot of highest temperature. When the scene changes, the moves.



Figure 5-1 Highest Temperature Tracking Effect

Chapter 6 Measure Distance

The device can detect the distance between the target and the observation position.

Before You Start

When measuring the distance, keep the hand and the position steady. Otherwise, the accuracy may be affected.

Steps

1. Hold to show the menu.
2. Select and press to go to the setting interface.
   1) Press or to select the target from **Deer**, **Wolf**, **Bear**, and **Custom**.
   2) Set the target height.

   Note

   The available height ranges from 0.1 m to 9.9 m.

   3) Press to confirm.
3. Align the center of top mark with the edge of target top. Press .



Figure 6-1 Set the Edge of Target Top

   The cursor blinks on the top edge of the target.
4. Align the center of bottom mark with the edge of target bottom. Press .



Figure 6-2 Set the Edge of Target Bottom

Result

The left top of the image displays the distance measurement result and the height of the target.



Figure 6-3 Measurement Result

Note

Go to distance measurement interface, and press to view the result of the previous measuring target.

Chapter 7 Picture and Video

You can manually record video or capture picture when displaying live view.

7.1 Capture Picture

On the main live view page, press to capture picture.

Note

When capturing succeeds, the image freezes for 1 second and a prompt shows on the display. For exporting captured pictures, refer to ***Export Files***.

7.2 Record Video

Steps

1. In the main live view, hold and start recording.



Figure 7-1 Start Recording

The left top of image displays the information of recording time.

2. Hold again to stop recording.

What to do next

For exporting recording files, refer to ***Export Files***.

7.3 Export Files

This function is used to export recorded videos and captured pictures.

Before You Start

- Turn off hotspot function.
- Turn on the device after connecting it to your PC, and keep the device on for 10 to 15 seconds before other operations.
- Remove batteries from the device before connecting to your PC, or it may cause device damage.

Steps

1. Connect the device and PC with cable.

Note

Make sure the device is turned on when connecting the cable.

2. Open computer disk and select the disk of device. Go to the **DCIM** folder and find the folder named after the capture year and month. For example, if you capture a picture or record a video on June 2021, go to **DCIM → 202106** to find the picture or video.
3. Select and copy the files to PC.
4. Disconnect the device from your PC.

Note

- The device displays images when you connect it to PC. But functions such as recording, capturing and hotspot are disabled.
- When you connect the device to PC for the first time, it installs the drive program automatically.

Chapter 8 Client Software Connection

Connect the device to the T-Vision App via hotspot, then you can capture picture, record video, or configure parameters on your phone.

Steps

1. Hold to show the menu of device.
2. Press to enable hotspot function.
3. Turn on the WLAN of your phone and connect to the hotspot.
   - Hotspot Name: HIK-IPTS Serial No.
   - Hotspot Password: the last 9 digits of serial No.
4. Scan the QR code to download and install the App.

Android System

iOS System

5. Open the App and connect your phone with the device. You can view the interface of device on your phone.

Note

- The hotspot function will be turned off automatically when power is less than 15%.
- The device can not connect to the App if entering wrong password several times. Refer to ***Restore Device*** to reset the device, and connect the App again.
- The device should be activated for the first use. The default password must be changed after the activation.

Chapter 9 CVBS Output

View the device image on the display unit for details.

Before You Start

Connect the device to the display unit via CVBS interface of the aviation plug. Refer to Section ***Cable Connection***.

Steps

1. Hold to show the menu.
2. Select CVBS, and press to switch on CVBS.

Note

The CVBS cable is not included in the package. Please purchase it by yourself.

9.1 Cable Connection

Connect the device with the aviation cable, and you can connect the device to your PC via USB interface or the monitor via the BNC interface.

Caution

- DO NOT drag the cables when you do the connecting, or when it is connected to the device.
- To plug in/out the cable, hold the cable end and then plug in/out it. DO NOT twist the cables, or the pins inside may be damaged.

Make sure the red dot of the cable aligns with the red dot of the aviation plug connector, and then connect the cable.

Chapter 10 Language Settings

Go to the device menu, select , and press  to switch the device language.

Chapter 11 Maintenance

This part introduces the operation of checking device information, upgrading device, and restoring to defaults, etc.

11.1 View Device Information

Steps

1. Hold to show the menu of device.
2. Select , and press . You can view the device information such as version, and serial No.

11.2 Upgrade Device

Before You Start

- Please get the upgrade package (including Main Firmware and FPGA Firmware) first.
- Make sure the hotspot function is disabled.
- Remove batteries from the device before connecting to your PC.
- Turn on the device after connecting it to your PC, and keep the device on for 10 to 15 seconds before other operations.

Steps

1. Connect the device to your PC with cable, and then turn on the device.
2. Open the detected disk, copy the upgrade file and paste it to the root directory of the device.
3. Hold to reboot the device, and the device upgrades automatically. The upgrading process will be displayed in the main interface.

Note

During the upgrade, make sure the device is connected to your PC. Otherwise, it may cause unnecessary upgrade failure, firmware damage, etc.

4. Repeat the above steps to upgrade all firmwares one by one.

11.3 Restore Device

Steps

1. Hold to show the menu of device.
2. Select , and press to restore the device to defaults according to the prompt.

Chapter 12 Frequently Asked Questions

12.1 Why is the monitor off?

Check whether the device is off-battery. Check the monitor after charging the device for 5 minutes.

12.2 The image is not clear, how to adjust it?

Adjust the diopter adjustment knob until the image is clear. Refer to section .

12.3 Capturing or recording fails. What's the problem?

Check the following items.
- Whether the device is connected to your PC. Capturing or recording is disabled in this status.
- Whether the storage space is full.
- Whether the device is low-battery.

12.4 Why the PC cannot identify the device?

Check the following items.
- Whether the device is connected to your PC with supplied USB cable.
- If you use other USB cables, make sure the cable length is no longer than 1 m.
- Whether the hotspot function is turned on. If so, go to device menu and turn off hotspot.

Chapter 13 Appendix

13.1 Reticle Correction

Scan the following QR code to get the correction method of the reticle function.
This function is only supported by certain models. Please take the actual device for reference.

13.1 Device Command

Scan the following QR code to get device common serial port commands.
Note that the command list contains the commonly used serial port commands for HIKMICRO thermal cameras.

13.2 Device Communication Matrix

Scan the following QR code to get device communication matrix.
Note that the matrix contains all communication ports of HIKMICRO thermal cameras.

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