

Thermal Monocular

User Manual

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Thermal Monocular User Manual

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- —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.

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. 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, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

Note: Due to the device size limit, the above statement may not be disclaimed on the device.

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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 Directive 2014/53/EU(RED), Directive 2014/30/EU(EMCD), Directive 2014/35/EU(LVD), Directive 2011/65/EU(ROHS).



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Directive 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

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

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment.

ce matériel est conforme aux limites de dose d'exposition aux rayonnements, CNR-102 énoncée dans un autre environnement.

KC

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Symbol	Description	
<u>^</u> i Danger	Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.	
<u>^</u> Caution	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.	
i 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 IEC62368 standard. Please refer to technical specifications for detailed information.
- Use the power adapter provided by qualified manufacturer. Refer to the product specification for detailed power requirements.
- 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 device supports 3.0 V or 3.7 V rechargeable lithium battery or 3.0 V non-rechargeable dry battery.
- The battery size shall meet the requirements on CR17345 battery according to the IEC60086-2 standard.
- Batteries of improper size cannot be installed, and may cause abnormal shutdown.
- Confirm there is no flammable material within 2 m of the charger during charging.
- DO NOT place the battery near heating or fire source. Avoid direct sunlight.
- DO NOT place the battery in the reach of children.

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.

- 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.
- Place the device in a dry and well-ventilated environment.
- When any laser equipment is in use, make sure that the device lens is not exposed to the laser beam, or it may burn out.

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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Table of Contents

Chapter 1 Overview	
1.1 Device Description	
1.2 Main Function	
1.3 Appearance	
1.3.1 Button	2
1.3.2 Interface	3
Chapter 2 Preparation	5
2.1 Connect Device	5
2.2 Install Battery	5
2.2.1 Select Battery Type	6
2.3 Install Adapter	6
2.4 Remove Adapter	7
2.5 Install Daylight Scope	7
2.6 Power On/Off	8
2.7 Menu Description	8
Chapter 3 Image Settings	10
3.1 Adjust Focus	10
3.2 Adjust Brightness	10
3.3 Adjust Contrast	10
3.4 Select Scene	10
3.5 Set Palettes	11
3.6 Correct Defective Pixel	12
3.7 Flat Field Correction	13
3.8 Set Picture in Picture Mode	13
3.9 Adjust Digital Zoom	14
3.10 Set OSD	14
3.10.1 Synchronize Time	15
3.11 Calibrate Image	15
3.12 Set Brand Logo	16

Thermal Monocular User Manual

Chapter 4 Burning Prevention	17
Chapter 5 Hot Tracking	18
Chapter 6 Measure Distance	19
Chapter 7 Picture and Video	20
7.1 Capture Picture	20
7.2 Record Video	20
7.3 Export Files	21
Chapter 8 Client Software Connection	22
Chapter 9 CVBS Output	23
9.1 Cable Connection	23
Chapter 10 Language Settings	24
Chapter 11 Unit Settings	25
Chapter 12 Maintenance	26
12.1 View Device Information	26
12.2 Upgrade Device	26
12.3 Restore Device	26
Chapter 13 Frequently Asked Questions	27
13.1 Why is the monitor off?	27
13.2 The image is not clear, how to adjust it?	27
13.3 Capturing or recording fails. What's the problem?	27
13.4 Why the PC cannot identify the device?	27
Chapter 14 Appendix	28
14.1 Reticle Correction	28
14.2 Device Command	28
14.3 Device Communication Matrix	28

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 searching and rescuing, hunting, 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 HIKMICRO Sight 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

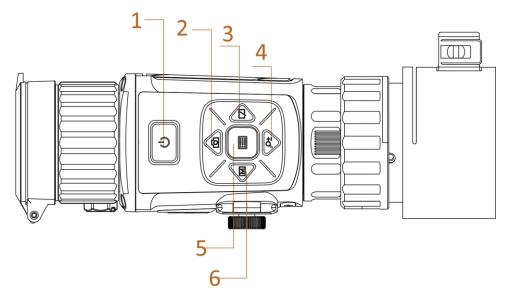


Figure 1-1 Buttons on Device

Table 1-1 Function of Buttons

No	Icon	Button	Description
1	U	Power	Press: Standby mode/wake up deviceHold: Power on/off
2		Capture	Press: CaptureHold: Start/stop record video
3		Shutter	Press: Correct non-uniformity of display
4	₽ ±	Zoom	Press: Switch digital zoomHold: Enable/disable reticle
5	©	Menu	Press: Enable/disable OSDHold: Menu operation
6	M	Mode	Press: Switch palettes
2 + 4	+ 9±	Capture + Zoom	Press: Enter image calibration mode

1.3.2 Interface

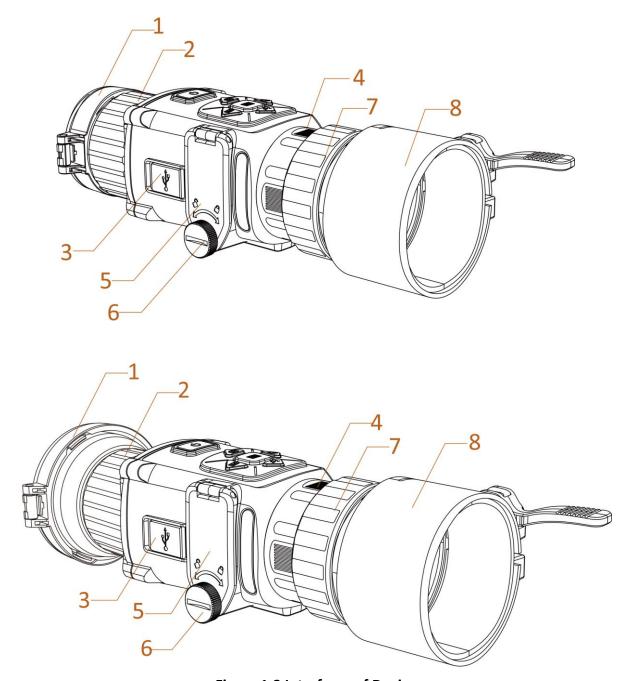


Figure 1-2 Interfaces of Device

Table 1-2 Interface Description

No	Component	Function
1	Lens Cover	Protect the lens.
2	Focus Ring	Adjust the focal length.

Thermal Monocular User Manual

No	Component	Function
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.

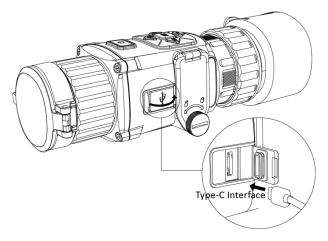


Figure 2-1 Cable Interface

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 after you install the battery, or it may cause abnormal shutdown.

Steps

1. Rotate the bolt anticlockwise to loosen it.

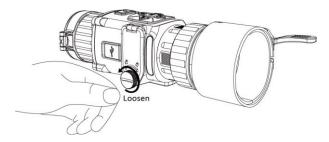


Figure 2-2 Loosen Hand Screw

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

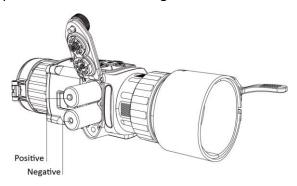


Figure 2-3 Install Batteries

3. Rotate the bolt 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 is to show the menu.
- 2. Select , and press to switch the voltage.

2.3 Install Adapter

- 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).

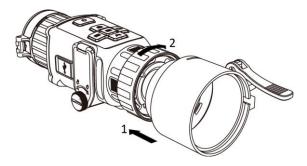


Figure 2-4 Install Adapter

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.

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

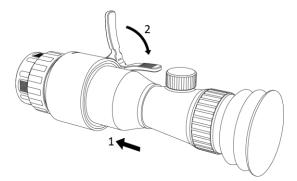


Figure 2-5 Install Daylight Scope

2.6 Power On/Off

Power On

When the battery is sufficiently charged, hold of for about 2 seconds to power on the device.

Power Off

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

Auto Power Off

Set the auto power off time for your device, and then the device will automatically shut down as the set time.

Steps

- 1. Hold to go to the menu.
- 2. Press \bigcirc or \bigcirc to select \bigcirc , and press \bigcirc to select the auto power off time as required.
- 3. Hold to save and exit.



- See the battery icon for the battery status. means the battery is fully charged, and means that the battery is low.
- When the low power note shows, charge the battery.
- The auto power off countdown will start again when the device exits standby mode, or the device is restarted.

2.7 Menu Description

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

- Press to move the cursor up.
- Press 𝔎[⊕] 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 Focus

Steps

- 1. Power on the device.
- 2. Open the lens cover.
- 3. Hold the device and make sure the eyepiece covers your eye.
- 4. Adjust the focus ring until the image is clear.

Note

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

3.2 Adjust Brightness

In the menu mode, select 2 and press is 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.

- 1. Hold is to go to the menu.
- 2. Select and press to switch scene.
 - − or refers to recognition mode and is recommended in normal scene.

- − I 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 to switch palettes.

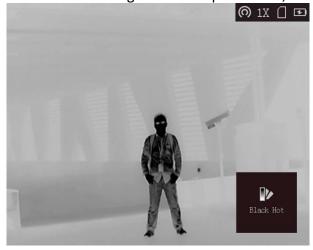
White Hot

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



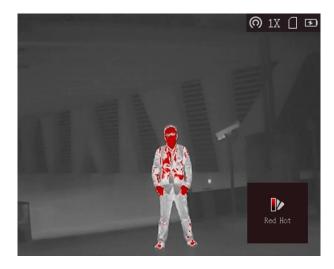
Black Hot

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

- 1. Hold to show the menu.
- 2. Select 🕮.
- 3. Press \bigcirc , \mathcal{P}^{+} , $\boxed{\mathbb{M}}$, and $\boxed{\mathbb{Z}}$ to move the cursor to the position of dead pixel.
- 4. Press is to correct the dead pixel.

Note

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

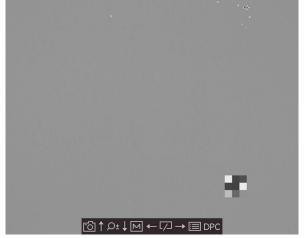


Figure 3-3 Correct Defective Pixel

3.7 Flat Field Correction

This function can correct non-uniformity of display.

Steps

- 1. Hold is to go to the menu.
- 2. Select and press to switch FFC mode.
 - Manual: Hold in live view to trigger calibration.
 - Auto: The device performs FFC automatically according to the set schedule when switching on the camera.
- 3. Hold to save the settings and exit.

3.8 Set Picture in Picture Mode

- 1. In the view mode, hold is to show the menu.
- 2. Select and enter PIP mode. The details show in the upper center.
 - 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.



Figure 3-4 Set Picture in Picture Mode

3. Hold 🛅 to exit.

Note

- If digital zoom is enabled, the PIP view also zooms. If the digital zoom ratio exceeds 4, the PIP does not zoom.
- This function varies according to different camera models.

3.9 Adjust Digital Zoom

You can zoom the image by using this function.

Press \mathcal{P}_{\pm} 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 is to show the menu.
- 2. Select **(L)**, and press **(E)** to enter the time setting interface.
- 3. Press \blacksquare to switch the time system, and press \bigcirc and \bigcirc 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 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.

- 1. Hold \bigcirc and \bigcirc simultaneously to enter the image calibration interface.
- 2. Press or \mathbb{P}^{\pm} to select the coordinates, and press \equiv to confirm.
- 3. Press or to adjust the **X** axis, and or or to adjust the **Y** axis until the image is calibrated.
- 4. (Optional) Press or \mathbb{A} to select **Reference Line**, and press to enable or disable it. A horizontal reference line appears in the middle of the view when it is enabled.



Figure 3-4 Actual Image Calibration Effect



Figure 3-5 Actual Image Calibration Effect with the Reference Line

5. (Optional) Press or \mathscr{D} to select **Restore**, and press to confirm. Press **OK** to restore the view to default position, and **CANCEL** to return to the setting interface according to the prompt.

iNote

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.

3.12 Set Brand Logo

You can add brand logo on the live view interface.

Steps

- 1. Hold to show the menu.
- 2. Press or \mathcal{P} to select \square .
- 3. Press to enable **Brand Logo**.
- 4. Hold to save the settings and exit.

Result

The brand logo is displayed at the bottom right of the image.



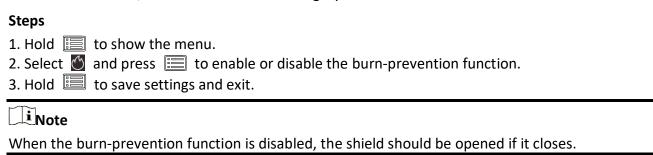
Figure 3-6 Brand Logo Display

Note

After enabling this function, the brand logo only displays on the live view interface, captures and videos.

Chapter 4 Burning Prevention

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



Chapter 5 Hot 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, \div displays in the spot of highest temperature. When the scene changes, the \div moves.



Figure 5-1 Hot 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 is to show the menu.
- 2. Select I and press \mathcal{P}^{\bullet} to go to the setting interface.
 - 1) Press or \mathbb{Z} to select the target from **Deer**, **Grey Wolf**, **Brown 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.
- 4. Align the center of bottom mark with the edge of target bottom. Press 📃.

Result

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



Figure 6-1 Measurement Result

iNote

Go to distance measurement interface, and press \equiv 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.



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.



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.

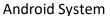
Chapter 8 Client Software Connection

Connect the device to the HIKMICRO Sight 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 o 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.







iOS System

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

iNote

- The device cannot 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

The CVBS output is used to debug the device. You can also 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 Mand press to switch on CVBS.



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.



- 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

You can select the device language in this function.

- 1. Hold to show the menu.
- 2. Select , and press is to enter the language configuration interface.
- 3. Press or select the language as required, and press to confirm.

Chapter 11 Unit Settings

You can switch the unit for fusion level and laser ranging functions.

- 1. Hold is to show the menu.
- 2. Press or \mathbb{Q} to select \mathbb{Q} , and press to switch the unit. **Yard** and **m** (meter) are selectable.
- 3. Hold to save settings and exit.

Chapter 12 Maintenance

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

12.1 View Device Information

Steps

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

12.2 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.



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.

12.3 Restore Device

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

Chapter 13 Frequently Asked Questions

13.1 Why is the monitor off?

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

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

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

13.3 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.

13.4 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 14 Appendix

14.1 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.



14.2 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.



14.3 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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