

# Handheld Thermal Binoculars

## User Manual

## **User Manual**

### **About this Manual**

This Manual is applicable to **Dual-lens Handheld Thermal Binoculars**.

The Manual includes instructions for using and managing the product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version in the company website.

Please use this user manual under the guidance of professionals.

### **Legal Disclaimer**

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IN THE EVENT OF ANY CONFLICTS BETWEEN THIS MANUAL AND THE APPLICABLE LAW, THE LATER PREVAILS.

## **Regulatory Information**

### **FCC Information**

FCC compliance: This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### **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 are marked with “CE” and comply therefore with the applicable harmonized European standards listed under the Radio Equipment Directive 2014/53/EU, 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](http://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](http://www.recyclethis.info).

## Industry Canada ICES-003 Compliance

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

## Warnings and Cautions

- All the electronic operation should be strictly compliance with the electrical safety regulations, fire prevention regulations and other related regulations in your local region.
- Please use the power adapter, which is provided by normal company. The power consumption cannot be less than the required value.
- Do not connect several devices to one power adapter as adapter overload may cause over-heat or fire hazard.
- Do not drop the device or subject it to physical shock, and do not expose it to high electromagnetism radiation. Avoid the equipment installation on vibrations surface or places subject to shock (ignorance can cause equipment damage).
- Do not place the device in extremely hot (refer to the specification of the device for the detailed operating temperature), cold, dusty or damp locations, and do not expose it to high electromagnetic radiation.
- The device cover for indoor use shall be kept from rain and moisture.
- Exposing the equipment to direct sun light, low ventilation or heat source such as heater or radiator is forbidden (ignorance can cause fire danger).
- Do not aim the device at the sun or extra bright places. A blooming or smear may occur otherwise (which is not a malfunction however), and affecting the endurance of sensor at the same time.

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# About This Manual

This document introduces the **Handheld Thermal Binoculars**.

It covers what is handheld thermal binoculars, device powering on/off, picture management, how to set thermal view/visible light view. Besides, it shows concrete functions and descriptions of the binoculars.

## Overview of Contents

This document contains the following chapters, and appendixes:

**Chapter 1 Overview** introduces the Handheld Thermal Binoculars, including the main description, major functions, appearance, and interface/menu description.

**Chapter 2 Device Management** shows how to charge, power on/off the binocular, and how to connect the cables.

**Chapter 3 Binoculars Setup** describes the binocular focus, digital zoom, brightness and contrast configuration of the image and the screen.

**Chapter 4 Capture and Video** shows you the way to view thermal view and visible light view, and fusion views. Besides, it shows you how to capture snapshots and record videos.

**Chapter 5 Appendix** lists the dimensions of the device, and the emissivity value of common materials for reference.

# 1 Overview

## 1.1 Description

The handheld thermal binoculars (*binoculars* for short) is a pair of binoculars with both thermal observation function and target searching function. In harsh conditions, such as in total dark or under extreme low illumination, you can observe the long-distance targets with the binoculars.

The binoculars are well-designed, and easily adopted for patrol and outdoor activities in the night.

## 1.2 Functions

### **Thermal View**

Device detects the real-time temperature, and display it on the screen.

### **Fusion**

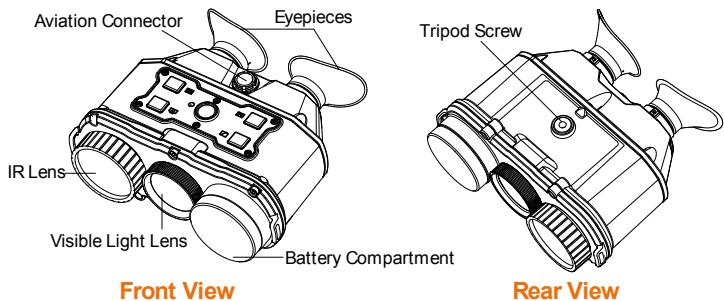
Device can display fusion of thermal view and optical view.

### **Palette**

Device supports multiple palettes, and you can set the palette mode according to the scene.

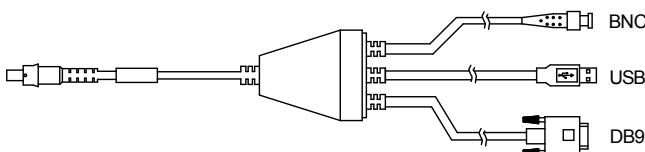
## 1.3 Appearance

### 1.3.1 Components



1	<b>Eyepieces</b>	Cover the eyes.
2	<b>Visible Light Lens</b>	Let the visible light in.
3	<b>IR Lens</b>	Let the infrared light in.
4	<b>Battery Compartment</b>	The battery is here.
5	<b>Tripod Screw</b>	Install the binocular on tripod.
6	<b>Aviation Connector</b>	Connect with the cables. See 1.3.2.

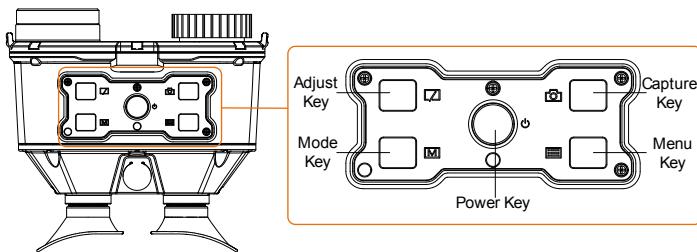
### 1.3.2 Cables Description



1	<b>BNC</b>	Connect it to the display screen.
2	<b>USB</b>	Connect it to your PC to backup videos/images.
3	<b>DB9</b>	Reserved.

### 1.3.3 Key Description

The main keys of the binocular are shown below.



For the descriptions of the menu buttons, see the table below.

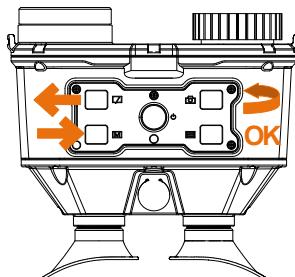
	Adjust Key	Press the  key to adjust the view parameters.
	Mode Key	Press the  key to switch the pallet, four pallets are optional.
	Power Key	Press the  key to emphasize the high-temperature target in the view. For multiple targets, it frames targets and identifies them. Hold the  key to power on / power off the device.
	Capture Key	Press the  key to capture the snapshot. Hold the  key to start/stop the video recording.
	Menu Key	Hold the  key to enter the menu.

## 1.4 Menu Description

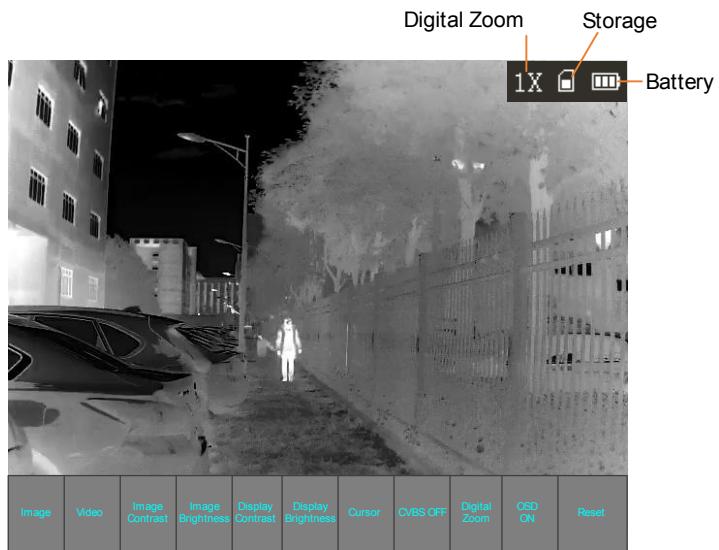
**Step:**

Hold the  button to show the menu.

In the menu, the direction keys, OK key, and the Exit key are shown below.



See the figure below for the menu interface.



## 2 Device Management

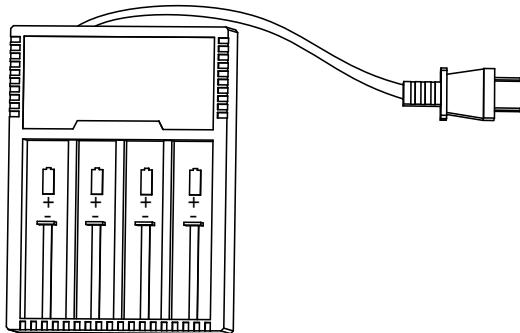
### 2.1 Device Charging

**Purpose:**

For the first use, and when the device is running low, charge the batteries with your charger.

**Steps:**

1. Connect the battery charger to the power outlet with the power cable.



2. Place the battery into the charger with positive/negative marks match with that of the charger.

**Note:**

When the charger is powered on, the LCD display automatically lights up, and all the battery. The charger will detect the battery and charge it.



No.	Signal	Description
1	Empty Bar	Charger completed self-test and is in standby mode.
2	Err	The positive end and negative end of the battery are upside down. Charging stopped.
3	Flashing Bar	Battery is being charged.
4	Chg. Finish	Battery is fully charged.

- When the charger shows **Chg. Finish**, take the battery away from the charger.

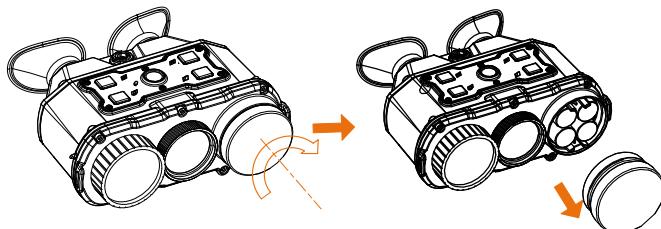
## 2.2 Battery Installation

**Purpose:**

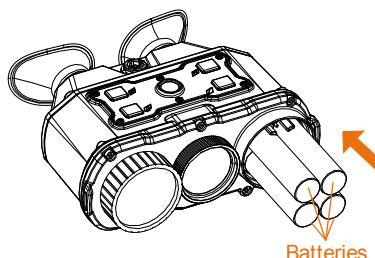
Insert the batteries into the battery compartment.

**Steps:**

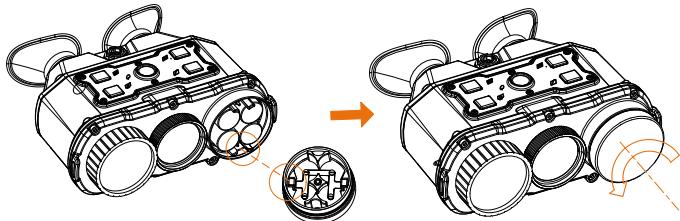
- Rotate the battery cover clockwise to disassemble it.



- Insert four batteries with positive/negative marks match with that of the battery compartment



3. Align the shape of battery cover with that of the batteries and cover the batteries.
4. Rotate the battery cover anticlockwise to fix it.



## 2.3 Power On/Off

### 2.3.1 Power On

**Step:**

When the binocular is sufficiently charged, press the  key to power on the binocular.

**Notes:**

- See the battery icon for the electricity quantity.  means battery is fully charged, and  means that the battery runs low.
- When the Low power note shows, charge the battery.

### 2.3.2 Power Off

**Step:**

When the binocular is running, hold the  key for four seconds to power off the binocular.

## 2.4 Cable Connection



**Attentions:**

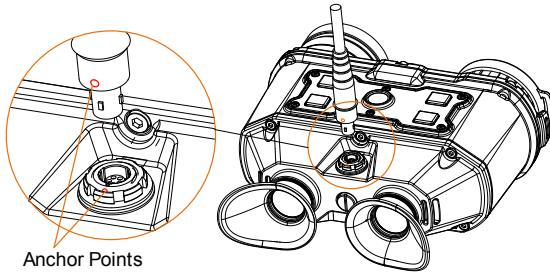
- Do NOT drag the cables when you connect the cables, or when it is connected to the binoculars.
- To plug in/out the cable, hold the cable end and then plug in/out it.

**Purpose:**

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

**Step:**

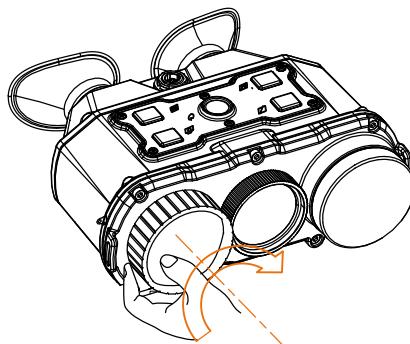
Connect the aviation cable with the aviation Interface. Make sure the anchor points match with each other and insert the cable.



## 3 Binoculars Setup

### 3.1 Focus

Slightly rotate the focus wheel to focus the image.



## 3.2 Local Output

### **Before you start:**

Connect the binocular to the display unit via CVBS interface of the aviation plug. Refer to Section 2.4.

### **Purpose:**

View the binocular image on the display unit for details.

### **Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor and open **Local Output** submenu.
3. Press the  key to confirm.

### **Note:**

To disable the local output, go to **Local Output** submenu and press the  key.

## 3.3 File Export

### **Before you start:**

Connect the binocular to your PC via USB interface of the aviation plug. Refer to Section 2.4.

### **Purpose:**

Export the videos and snapshots with your PC.

### **Steps:**

1. In your PC, go to the **Removable Disk**.
2. Double-click to open the disk. View or copy the videos or snapshots.
3. Disconnect the binocular with the PC.

## 3.4 Reset Default Settings

### **Purpose:**

Restore the device to default settings.

### **Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Reset** submenu.
3. Press the  key to confirm.

## 3.5 Display Settings

### 3.5.1 Cursor Display

**Purpose:**

Display the cursor on the live view, and the target can be indicated better.

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Cursor** submenu.
3. Press the  key to confirm.
4. To move the cursor position, adjust the cursor moving offset first.
  - a) Hold the  key to go to offset setting interface.
  - b) Press the  key and  key to enlarge / shorten the offset value.
5. Adjust the cursor position.
  - a) Press the  key to move the cursor upward.
  - b) Press the  key to move the cursor downward.
  - c) Press the  key to move the cursor leftward.
  - d) Press the  key to move the cursor rightward.
6. Hold the  key to exit.

**Note:**

To disable the cursor, go to **Cursor** submenu and press the  key.

### 3.5.2 Digital Zoom

**Purpose:**

Enable the digital zoom function to enlarge the image display.

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Digital Zoom** submenu.
3. Press the  key to confirm.
4. Press the  key and  key to set the digital zoom ratio. Up to four times zoom ratio are supported.

### 3.5.3 Display Brightness & Contrast

Adjust the brightness and contrast of the screen display.

**Note:**

This adjustment also affects the brightness and contrast of menu, icons, etc.

- **Screen Brightness**

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Display Brightness** submenu.
3. Press the  key to confirm.
4. Press the  key and  key to set the brightness value. The higher, the brighter.

- **Screen Contrast**

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Display Contrast** submenu.
3. Press the  key to confirm.
4. Press the  key and  key to set the contrast value. The higher, the more contrasting.

### 3.5.4 Image Brightness & Contrast

Adjust the brightness and contrast of the image.

**Note:**

This adjustment only affects the brightness and contrast of image.

- **Image Brightness**

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Image Brightness** submenu.
3. Press the  key to confirm.

4. Press the key and key to set the brightness value. The higher, the brighter.

- **Image Contrast**

**Steps:**

1. Hold the key to show the menu of binocular.
2. Press the key and key to move the cursor to **Image Contrast** submenu.
3. Press the key to confirm.
4. Press the key and key to set the contrast value. The higher, the more contrasting.

## 4 Capture and Video

### 4.1 Thermal/Optical Configuration

**Purpose:**

The binocular has dual-lens: thermal and visible light lens. You can set the thermal/optical view to show thermal channel, visible light channel, or both them combined.

**Step:**

In the live view interface, press the key to switch the view mode.

Thermal	In thermal mode, the device displays the thermal view. Press the  key to switch between white hot and black hot mode.
Visible	In visible mode, the device displays the view of visible light channel.
Fusion B/W	It displays the combined view of thermal channel and optical channel in black and white.
Fusion Color	It displays the combined view of thermal channel and optical channel in colors.

## 4.2 Capture Settings

### 4.2.1 Capture Snapshots

**Step:**

In the live view mode, press the  key to capture a snapshot.

When capturing succeeded, it shows **Snapshot captured.**

When capturing failed, it shows **Capturing failed.**

### 4.2.2 View Snapshots

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Image** submenu.
3. Press the  key to confirm.
4. Press the  key and  key to select snapshot.
5. Press the  key to view the selected snapshot.

### 4.2.3 Delete Snapshots



**Attention:**

Once a snapshot is deleted, it can NOT be recovered. Do this operation with attention.

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Image** submenu.
3. Press the  key to confirm.
4. Press the  key and  key to select snapshot.
5. Hold the  key to delete the selected snapshot.

## 4.3 Video Settings

### 4.3.1 Video Recording

**Steps:**

1. In the live view mode, hold the  key to record videos.  
When the recording time shows on the top, it starts to record.
2. When the desired video is recorded, hold the  key to stop recording.

### 4.3.2 Video Playback

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Video** submenu.
3. Press the  key to confirm.
4. Press the  key and  key to select video.
5. Press the  key to play the selected video.

### 4.3.3 Delete Snapshots



**Attention:**

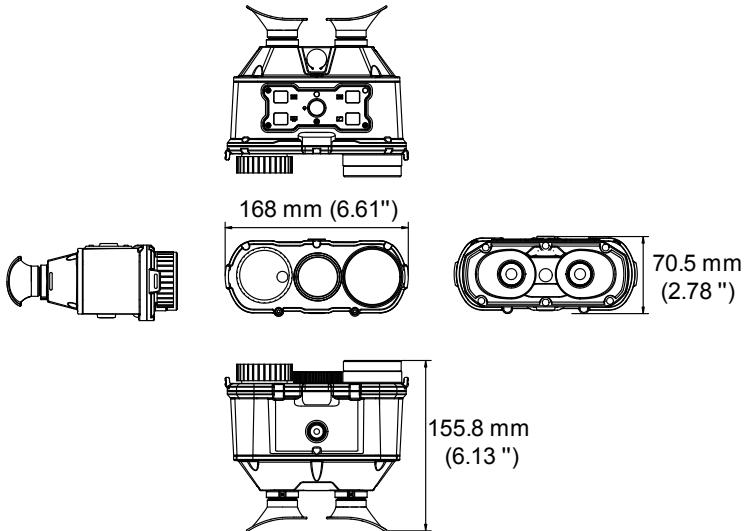
Once a snapshot is deleted, it can NOT be recovered. Do this operation with attention.

**Steps:**

1. Hold the  key to show the menu of binocular.
2. Press the  key and  key to move the cursor to **Video** submenu.
3. Press the  key to confirm.
4. Press the  key and  key to select video.
5. Hold the  key to delete the selected video.

## 5 Appendix

### 5.1 Dimensions



## 5.2 Common Material Emissivity Reference

Material	Temperature (°C/°F)	Emissivity
Water	0 to 100/32 to 212	0.95~0.98
Soil (Dry)	20/68	0.92
Soil (Moist)	20/68	0.95
Wood	17/62.6	0.962
Sand	20/68	0.9
Sandstone	19/66.2	0.909~0.935
PVC (Polyvinyl Chloride)	70/158	0.93
Pitch	20/68	0.967
Paint	70/158	0.92~0.94
Wallpaper	20/68	0.85~0.90
Cloth	20/68	0.98
Concrete	20/68	0.92
Pavement	5/41	0.974
Smooth Porcelain	20/68	0.92
Ceramic	17/62.6	0.94
Plaster	17/62.6	0.86
Brick	35/95	0.94
Ebonite	0 to 100/32 to 212	0.89
Carbon	20 to 400/68 to 752	0.95~0.97
Granite (Rough)	20/68	0.879
CRS (Cold Rolled Steel)	70/158	0.09
Cupric Oxide	50/122	0.88
Copper	20/68	0.07
Copper Oxide	50/122	0.6~0.7



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