ThermTec

User Manual

Thermal Imaging Monocular

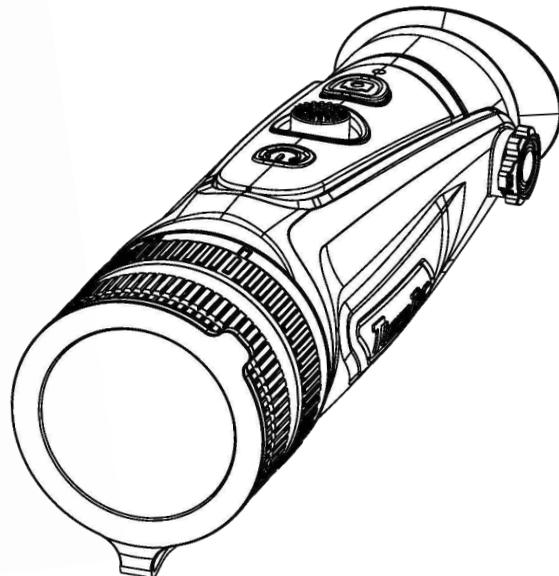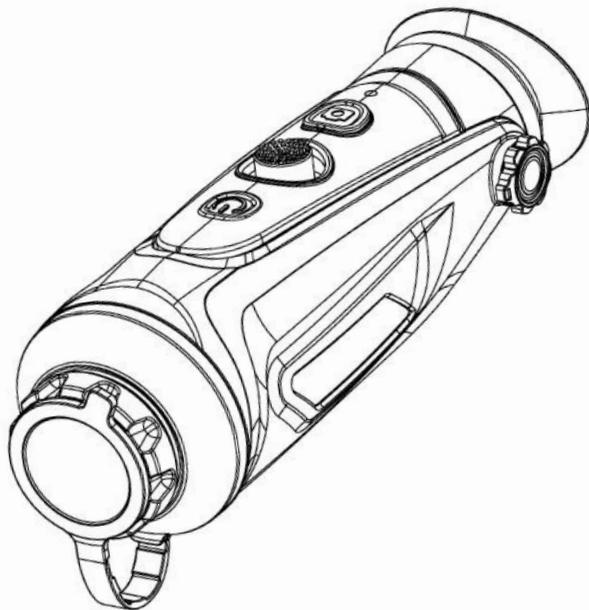# CYCLOPS SERIES

IOS

Andriod

CE RoHS EAC

Table of Contents

About This Manual

This Manual is applicable to Thermal Imaging Monocular.

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.

Regulatory Information

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.

1 Introduction

1.1 Device Description

ThermTec Cyclops Series Thermal Imaging Monocular, the new generation intelligent thermal imaging monocular, is designed with a 12μm uncooled infrared detector and can be equipped with various types of objective lens and 1024x768 OLED high-definition display. With AI image recognition algorithm, it enables users to get clear views under various lighting conditions, even in complete darkness, providing reliable and high-quality visual images for night activities. In particular, the function of easy connection to mobile phones enables users to share views in real time.

1.2 Features

1. Mechanical Joystick Design
It balances the central of gravity, providing an easier and outstanding handheld experience.

2. 12μm VOx Detector
The 12μm VOx detector provides images with better quality, and ensures perfect detail recognition.

3. OLED Display
Designed with 1024x768 OLED display, it brings outstanding HD image quality as well as great durability, making it operable in a broader temperature range as low as minus 20°C.

4. AI Intelligent Ranging
Based on the deep learning algorithm, the monocular can automatically measure the object distance.

5. Two-way Wi-Fi Design
It supports both WIFI and hotspot connection, which allows users to share images and videos with friends in real time.

6. Photo and Video Playback
Integrated pictures and video recording makes sharing the thermal action quick and easy, with the functions of playback and APP sharing.

7. Long Battery Life
Built-in battery with up to 12H super long standby, recording every and instant moment of your hunting and outdoor experience.

8. GPS Function
Enable user to know his own coordinates in real time, which makes field activities safer.
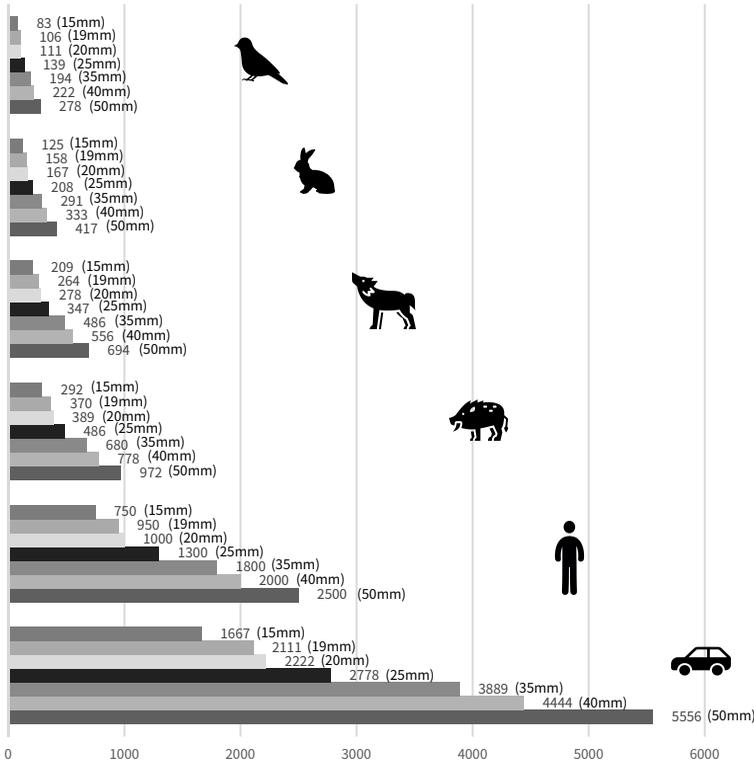
9. Continuous Zooming
Continuous 1.0-6.0 HD zooming ensures excellent sharpness and the highest resolution of details from minimum to maximum magnification.

10. IP67 Protection Design
Provided with IP67-rated weatherproof performance, it is capable of capturing images/videos through rain, snow, smoke, smog, or dust.

1.3 Detection Range

The illustration below shows the comparative range performance of the monocular with different lens configurations. The data is based on detecting a car of 4m, a man of 1.8m tall, a wild boar of 0.7m tall, a wolf of 0.5m tall, a rabbit of 0.3m tall and a bird of 0.2m tall.

83 (15mm)	
106 (19mm)	
111 (20mm)	
139 (25mm)	
194 (35mm)	
222 (40mm)	
278 (50mm)	

125 (15mm)	
158 (19mm)	
167 (20mm)	
208 (25mm)	
291 (35mm)	
333 (40mm)	
417 (50mm)	

209 (15mm)	
264 (19mm)	
278 (20mm)	
347 (25mm)	
486 (35mm)	
556 (40mm)	
694 (50mm)	

292 (15mm)	
370 (19mm)	
389 (20mm)	
486 (25mm)	
680 (35mm)	
778 (40mm)	
972 (50mm)	

750 (15mm)	
950 (19mm)	
1000 (20mm)	
1300 (25mm)	
1800 (35mm)	
2000 (40mm)	
2500 (50mm)	

1667 (15mm)	
2111 (19mm)	
2222 (20mm)	
2778 (25mm)	
3889 (35mm)	
4444 (40mm)	
5556 (50mm)	

0   1000   2000   3000   4000   5000   6000

1.4 Application Scenarios

- Animal Observation
- Outdoor Adventure
- Security Law Enforcement
- Emergency Search and Rescue

1.5 Cautions

⚠ **CAUTION**

🚫	Avoid hard objects.
🚫	Do not aim the lens directly at the sun or high-temperature light sources.
🚫	Do not use the device in extremely cold or hot environment.
🚫	Charge the battery once every three months when it is not used for a long period of time.
🚫 CLOSED	Make sure the USB cover is tightly closed when used in water environment.
🚫	Do not irradiate the laser indicator of the device to human eyes.
🚫	Do not disassemble or modify the device by yourself in any way.

2 Packing List

Monocular	1
Lanyard	1
USB cable	1
Video output cable	1
Carry bag	1
User manual	1

Monocular
(x1)

Lanyard
(x1)

USB cable
(x1)

Video output cable
(x1)

Carry bag
(x1)
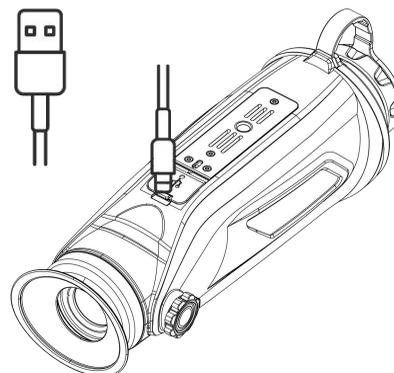
User manual
(x1)

3 Operation Guide

3.1 Battery Charging

The battery should be fully charged prior to use.

Note: The battery is not user replaceable.

Follow the below steps to charge the battery:

1. Lift the cover from the USB port.
2. Plug the cable provided into the USB port.
3. Plug the opposite end of the cable into a USB power source.

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Notes: When the charging indicator on the device becomes red, it means you need to charge the device immediately. The indicator turns to red when it is charging and turns to green when it finishes charging. After it turns to green, stop charging.

3.2 Power on/off

	Power on	Power off
⏻	Hold the POWER button for four seconds and the boost screen will be shown.	When the device is turned on, hold the POWER button for four seconds to power off the device.

Note: Refer to Figure 1 for the main view of the monocular.

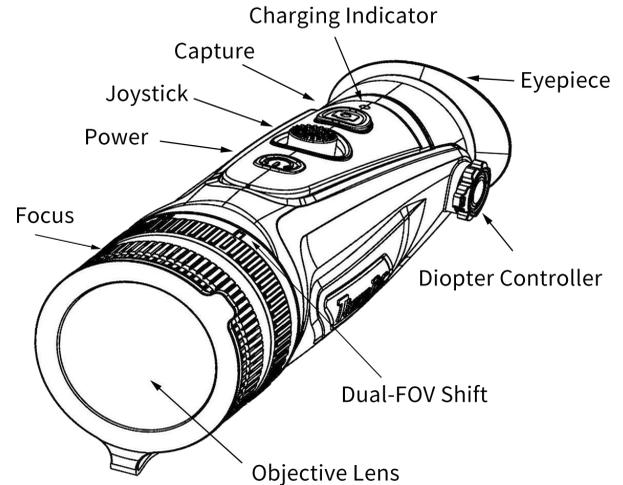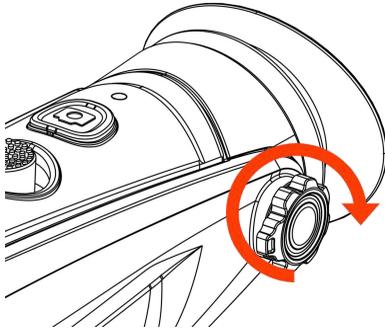## 3.3 Buttons and Controls

3.3.1 Button Features and Introduction

Charging Indicator
Capture
Joystick
Power
Eyepiece
Focus
Diopter Controller
Dual-FOV Shift
Objective Lens

Figure 1

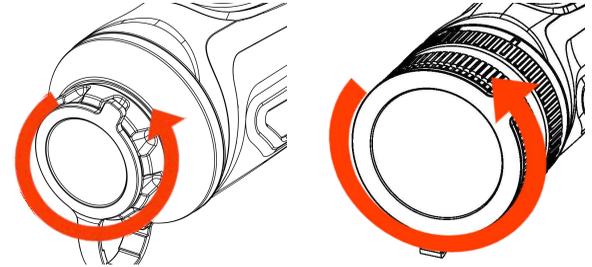|	Press and Hold	Press	Double-Click
⏻	Power on/off	Standby mode on/off	Laser indicator on/off
📷	Take videos	Take photos	
🔴	⊕Zoom in ⊖Zoom out	Peseudo color switch Target outline mode on/off ▦ AI ranging	Main menu

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3.3.2 Lens Adjustment

Diopter Adjustment

Looking through the eyepiece, adjust the position of diopter level to optimize the image sharpness on the OLED display.

Cyclops   Cyclops-D

3.3.3 Joystick Operation

3.3.3.1 Zoom

Zoom out

Zoom in

Objective Lens Focusing

Manually adjust the objective lens focus when necessary.
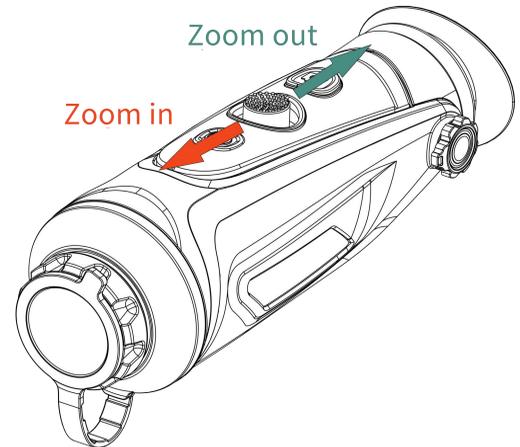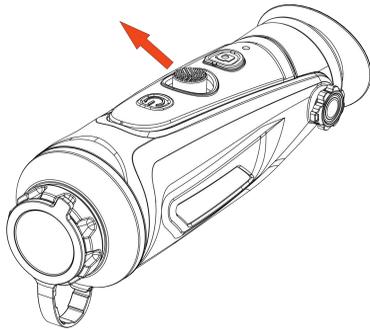
3.3.3.2 Pseudo Color Switch

Use joystick towards right to switch pseudo color.

There are six color palettes by default. You can choose the pseudo color you want by customizing. Unwanted colors can be turned off in the system setting.

Color Palettes

White   Black

Red   Green

Golden   Violet

3.3.3.3 Target Outline Function

Long press the joystick towards right to activate the Target Outline Mode. You can clearly observe the outline of your targets in darkness, and it will help to reduce the strong light contrast to your eyes.

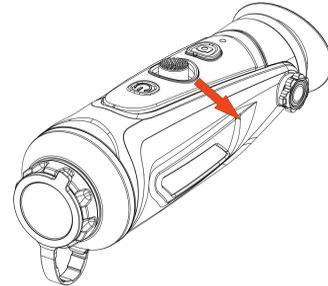Long press the joystick towards right for one more time to exit the Outline Mode.

Notes: This function is applicable to Cyclops D & Cyclops Pro Series.

3.3.3.4 AI Ranging

Use the joystick towards left to enable or disable AI ranging function (before this function is enabled, please make sure the device is in AI ranging mode. Otherwise, refer to Section 3.4 for setting).

AI Ranging Function

3.3.3.4.1 Turning on AI Ranging Function

Double click the joystick to enter the main menu, and check whether the AI ranging function is enabled (this function is enabled by default). If not, press ⚙ to enter the System Setting menu, and press Ranging and AI to turn on this function.

Short press the joystick to left to turn on AI Ranging function, and the corresponding icon will turn to blue at the upper right corner.

Notes: There are six types of objects to be selected for AI measurement in total. If the AI ranging function is not enabled by user before using this device, this funtion will not be working properly.

3.3.3.4.2 Unselecting the Type of Objects

Move the cursor and short press the joystick one time to unselect the type of object that is not your target object in the submenu.

The icon of the unselected type of object will turn to white, as shown in the below figure. The distance of unselected type of object will not be shown on your device.

Press the joystick to the left to exit the current menu.

3.3.3.4.3 Accurate Distance Measurement

Move the cursor to select the type of object that is your target object in the submenu.

Short press the joystick one time to save your selection. The height of the selected type of object can also be set by the user.

Press the joystick to the left to exit the current menu.

Notes: The actual height of the types of objects should be consistent with the set parameters for accurate distance measurement.

3.3.4 Capture/Record

Press 📷 to take photos. Then the photo icon in the upper left corner will flash once.

Press and hold 📷 to take videos. Then the recording icon in the upper left corner starts flashing, and the recording starts timing. Press and hold again to stop recording.

3.3.5 FOV Selection and Shifting (for Cyclops-D)

Cyclops-D is set with dual-field of view. Rotate the lens to shift the field of view from 20°to 40°or from 40°to 20° (or from 25°to 50°or from 50°to 25°).
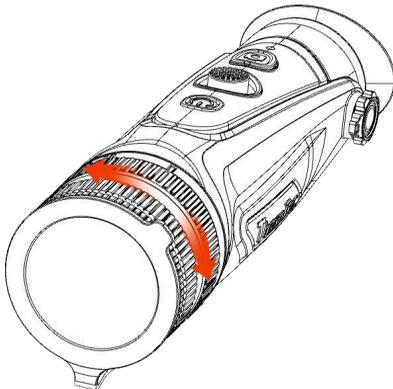
3.4 Settings

Double-click the joystick to enter Setting menu.

Note: Select by moving the joystick, and short-press the joystick to confirm the selection.

3.4.1 Image Setting

Press 🖼 to enter the Imaging Setting menu. There are five sub-menus for image setting, which are "Image Mode", "Sharpness", "Denoise", "Brightness" and "Contrast".
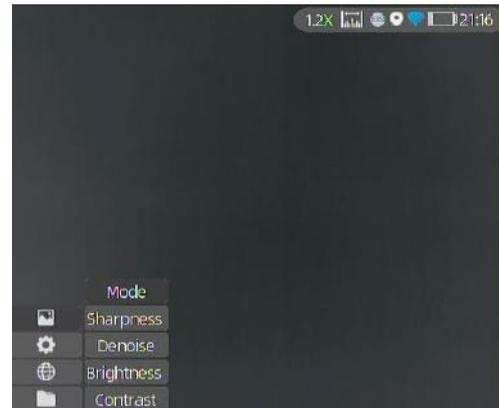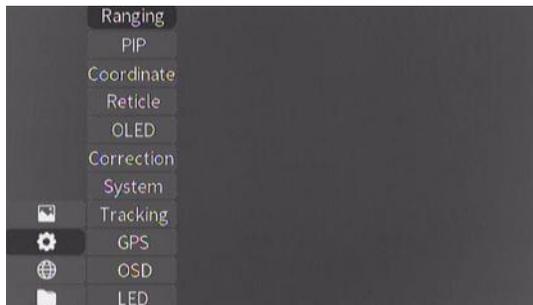
Image Setting

| Mode	Object mode	Especially enhance target's detail. It's recommended to be used in bad weather conditions.
	WDR mode	Gain both background and target's detail with wide dynamic algorithm.
Sharpness	0-10	Adjust image sharpness to make the image edge sharper. The recommended value is 5.
Denoise	0-10	Adjust image noise to make the image cleaner. The recommended value is 5.
Brightness	1-10	Adjust image brightness to make the image brighter. The recommended value is 5.
Contrast	1-10	Adjust image contrast to make the target more prominent in the image. The recommended value is 5.

3.4.2 System Setting

Press ⚙ to enter the System Setting menu. Select by moving the joystick, and short-press the joystick to confirm the selection.

System Setting

EIS		Electronic Image Stabilization. Can be turned on/off in the system setting.
Ranging	AI	AI distance measurement
	MIL	MIL distance measurement
PIP	Picture-in-picture	In the picture, the image is 2x enlarged from the center of the cross.
Coordinate		The position of the crosshair in the picture can be adjusted and separately saved.
Reticle	0-7	Choose the style of the crosshair. "0" represents none, and "1-7" represents seven different styles.
OLED	Hue	Blue, purple and gray are optional for OLED hue.
	Brightness	
Correction	Manual/ Auto	The mask works to calibrate the uniformity of images.
System	Reset	All configuration parameters are restored to the factory default values after resetting.
	Update	You can adjust and upgrade the device system.
	Language	Support multiple languages.
	Time zone	Select local time zone and adjust the date and time.
	Blind pixel	The blind pixel in the picture can be replaced.
	Heat Tracking	Turn on heat tracking to mark the target with the highest temperature in real time in the screen.
GPS		Turn on GPS function to obtain real-time satellite positioning, longitude and latitude coordinates and time information.
OSD		Turn off OSD.
LED		Turn off LED. The work indicator is turned off and the hidden work mode is started.

EIS function: Turn on the EIS function to reduce the impact of body shaking on the image and keep the image stable when observing distant targets.

Notes: EIS function is applicable to Cyclops 6 series, Cyclops Pro series and Cyclops D series.
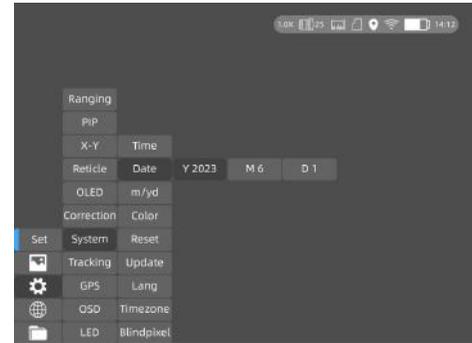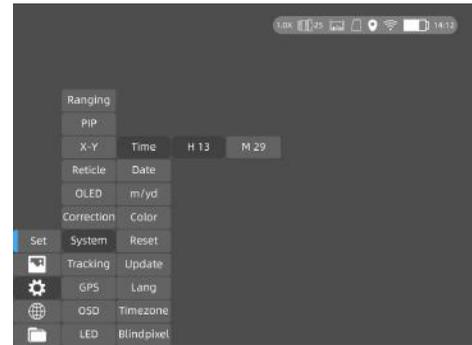
3.4.3 Date & Time Setting

Double press the joystick and press ⚙ to enter the System submenu, and press Time and Date to set the time (hour and minute) and date (year, month and day) respectively, as shown in the below figures.
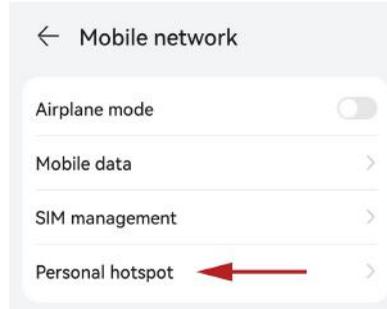

Notes: The date will be displayed on the screen only when entering the Stand-by Mode.

3.4.4 Network Connection

Press 🌐 to enter the Network Connection menu.

3.4.4.1 APP Download

Search "Smart Thermal" in APP store, or scan the below QR code to download the APP.

 IOS

 Andriod

3.4.4.2 Connect via Wi-Fi

① Open smart device's personal hotspot.

② Short-press the joystick to enter the sub-menus of Network Connection, and select WIFI for configuration.

③ Access the Wi-Fi sub-menu on monocular and select the Wi-Fi released by smart devices, and then enter the password through the joystick to connect the Wi-Fi.

④ After the monocular is connected via Wi-Fi, open the mobile APP to connect the monocular.
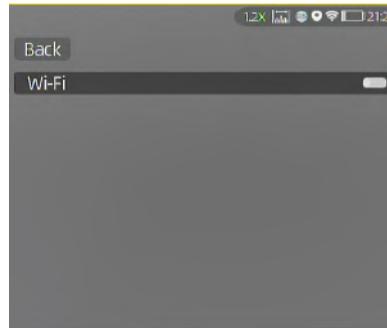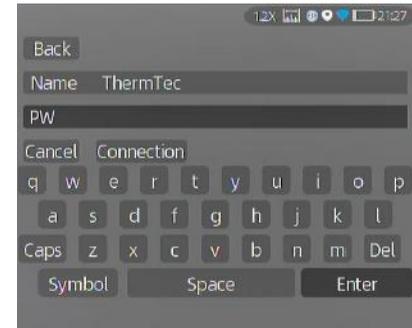
3.4.4.2 ①

3.4.4.2 ②

3.4.4.2 ③

3.4.4.2 ④

3.4.4.3 Connect via Hotspot

① Short-press the joystick to enter the sub-menus of Network Connection, and select WIFI for configuration.

② Access the Hotspot sub-menu, and the monocular will release a hotspot network. Set the hotspot name and password and confirm them through the joystick.

③ Enable mobile device to connect with monocular Hotspot by setting the WLAN on mobile device.

④ After mobile device is connected with monocular Hotspot, open the mobile APP to connect the monocular.
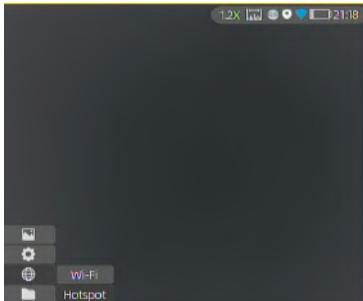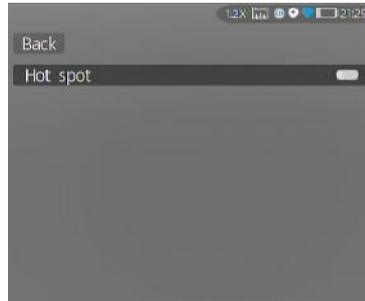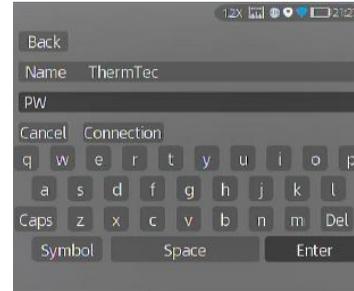
3.4.3.3 ③   3.4.3.3 ④

3.4.5 APP Push Notification

The APP push notification function can detect and identify the target type (human or animal) in real time, measure the distance, and pop up a push notification on the APP.

The specific operation steps are as follows:

Note: Android phones can get push notification always on display by launching the APP in the background.

3.4.3.3 ①   3.4.3.3 ②

(1) Turn on AI and ranging function on the device.
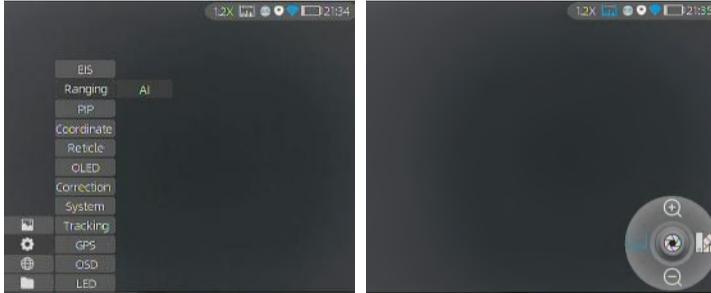
(2) Connect the APP with the device (follow Section 3.4.3). Select "Alarm" and "Open" to turn on the push notification.

3.4.6 File Management

Short-press to enter the File Management menu. Select the image and video sub-menus to view the images and videos and play the videos.

File Setting	
Image	Access the Image sub-menu, and select photo files through the joystick for management.
Video	Access the Video sub-menu, and select video files through the joystick for management.

3.5 External Video & Data Reading
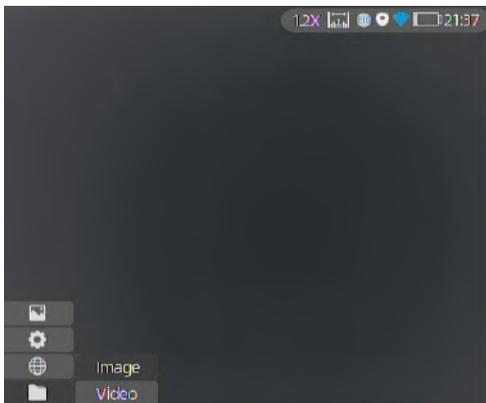
Power on the device before using a type-C to AV video cable to output analog video. When external display is connected, the OLED of the device automatically turns off the display.

Power on the device, use a type-C to USB cable to connect with the computer to read the video and image data in the memory.

Note: video and image taken in analog format (usually taken by external display with analog output) will be saved in folder named "720", video and image directly taken by monocular will be saved in folder named "1024".

3.6 System Software Upgrade

① Connect the device to your computer and drag the upgrade file to the folder.
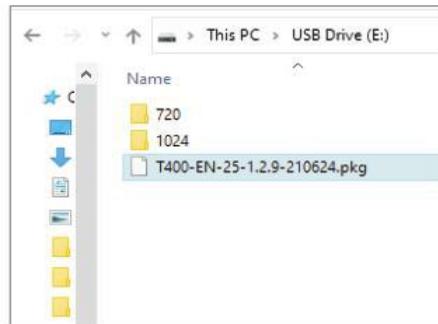
3.6 ①

② Access the Setup menu and select Upgrade.

③ The system will prompt that upgrading is in progress. When the upgrade succeeds, the device will restart automatically.

3.6 ②

3.6 ③

Notes: You can also update the firmware via "Smart Thermal" APP when the device is connected with our APP.

4 Technical Data

4.1 Dimensions

192±2mm

64mm

68±2mm

Cyclops

210±2mm

65mm

73±2mm
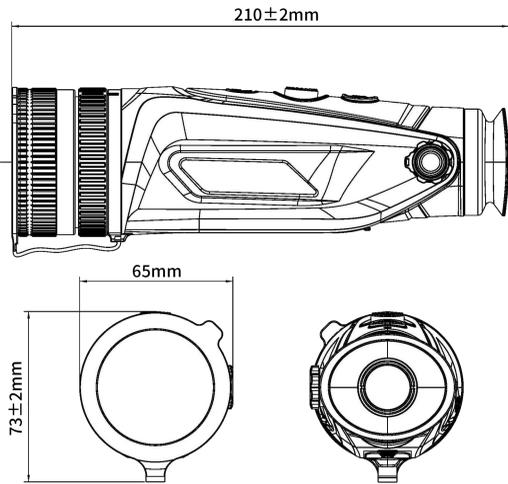
Cyclops-D

4.2 Specifications - Cyclops

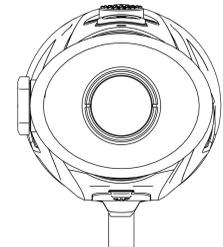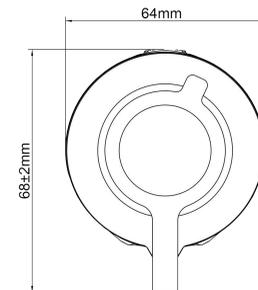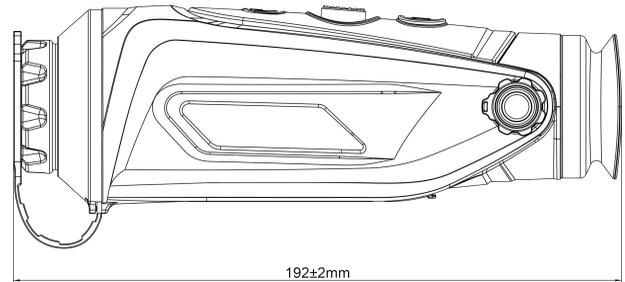| Model	CP315	CP319	CP325	CP335	CP350	CP635	CP650
Microbolometer							
Resolution	384x288					640x512	
Pixel pitch	12μm					12μm	
NETD	≤40mk@300k					≤35mk@300k	
Spectral range	8-14μm						
Frame rate	50Hz						
Optics							
Objective lens	15mm (F/0.9)	19mm (F/1.0)	25mm (F/1.0)	35mm (F/1.0)	50mm (F/1.0)	35mm (F/1.0)	50mm (F/1.0)
FOV	17.5° x 13.1°	13.8° x 10.4°	10.5° x 7.9°	7.5° x 5.6°	5.3° x 4.0°	12.5° x 10°	8.8° x 7.0°
Magnification	1.4X	1.8X	2.4X	3.3X	4.8X	2.0X	2.8X
Digital zoom	1 - 6X continuous zoom						
Eye relief	40mm						
Eye pupil	6mm						
Diopter	±5D						
Display							
Type	AMOLED						
OLED color	3						
Display size	0.39 inch						
Color palette	6						
Image mode	WDR (Wide Dynamic Range) Mode; Object Mode (Object Enhanced)						

Function	
Photo/video playback	Yes
Language	Multiple-languages
Reticle	7, adjustment coordinates
Built-in memory	16GB
PIP	Yes
AI/MIL distance measurement	Yes
Heat track	Yes
GPS	Yes
Laser indicator	Yes (CP315-CP335)
Real-time notification	Yes
Battery	
Battery type	Internal high capacity lithium ion (18650 x 2)
Battery life	Continuous working time ≥12h
Interface	
Type-C	Supports battery charging, data transfer and analog video output
Wi-Fi	Two-way Wi-Fi connection; App remote control
Environment	
Working temperature	-20°C~+55°C
Protection level	IP67, 1 meter drop resistance
Weight, g	550 (with battery)
Size, mm	190x63x67
Accessories	
External cable	Analog video cable; USB data cable
Other accessories	Wrist strap; plush bag; user manual

Specifications - Cyclops Pro

Model	CP315 Pro	CP319 Pro	CP325 Pro	CP335 Pro	CP350 Pro	CP635 Pro	CP650 Pro
Microbolometer							
Resolution	384x288					640x512	
Pixel pitch	12µm					12µm	
NETD	≤25mk@300k						
Spectral range	8-14µm						
Frame rate	50Hz						
Optics							
Objective lens	15mm (F/0.9)	19mm (F/1.0)	25mm (F/1.0)	35mm (F/1.0)	50mm (F/1.0)	35mm (F/1.0)	50mm (F/1.0)
FOV	17.5° x 13.1°	13.8° x 10.4°	10.5° x 7.9°	7.5° x 5.6°	5.3° x 4.0°	12.5° x 10°	8.8° x 7.0°
Magnification	1.4X	1.8X	2.4X	3.3X	4.8X	2.0X	2.8X
Digital zoom	1 - 6X continuous zoom						
Eye relief	40mm						
Eye pupil	6mm						
Diopter	±5D						
Display							
Type	AMOLED						
OLED color	3						
Display size	0.39 inch						
Color palette	6						
Image mode	WDR (Wide Dynamic Range) Mode; Object Mode (Object Enhanced)						

Function	
Photo/video playback	Yes
Language	Multiple-languages
Reticle	7, adjustment coordinates
Built-in memory	16GB
PIP	Yes
AI/MIL distance measurement	Yes
Heat track	Yes
GPS	Yes
Laser indicator	Yes (CP315-CP335)
Real-time notification	Yes
Battery	
Battery type	Internal high capacity lithium ion (18650 x 2)
Battery life	Continuous working time ≥12h
Interface	
Type-C	Supports battery charging, data transfer and analog video output
Wi-Fi	Two-way Wi-Fi connection; App remote control
Environment	
Working temperature	-20℃~+55℃
Protection level	IP67, 1 meter drop resistance
Weight, g	550 (with battery)
Size, mm	190x63x67
Accessories	
External cable	Analog video cable; USB data cable
Other accessories	Wrist strap; plush bag; user manual

Specifications - Cyclops-D

Model	CP340D	CP350D	CP640D	CP650D
Microbolometer				
Resolution	384x288		640x512	
Pixel pitch	12µm			
NETD	25mk@300k			
Spectral range	8-14µm			
Frame rate	50HZ			
Optics				
Objective lens	20/40 F1.0 Dual FOV	25/50 F1.0 Dual FOV	20/40 F1.0 Dual FOV	25/50 F1.0 Dual FOV
Field of view	13.1°x9.9° 6.6°x4.9°	10.5°x7.9° 5.3°x4.0°	21.7°x17.5° 11.0°x8.8°	17.5°x14.0° 8.8°x7.0°
Magnification	1.9X-3.8X	2.4X-4.8X	1.1X-2.2X	1.4X-2.8X
Digital zoom	1-6X continuous zoom			
Eye relief	40mm			
Exit pupil	6mm			
Diopter	±5D			
Display				
Type	AMOLED			
Resolution	1024x768			
Display size	0.39 inch			
Color palette	6			
Image model	WDR (Wide Dynamic Range) Mode; Object Mode (Object enhanced)			

Function				
Photo/video playback	Yes			
Language	Multiple-languages			
Reticle	7, adjustment coordinates			
Built-in memory	32GB			
PIP	Yes			
AI/MIL distance measurement	Yes			
Heat track	Yes			
GPS	Yes			
Real-time notification	Yes			
Battery				
Internal battery	Internal high capacity lithium ion (18650x2)			
Battery life	Continuous working time ≥12h			
Interface				
Type-C	Supports battery charging, data transfer and analog video output			
WI-FI	Two-way Wi-Fi connection; App remote control			
Environment				
Working temperature	-20℃—+50℃			
Protection level	IP67			
Weight, g	550	600	550	600
Size, mm	200x66x62	200x66x62	200x66x62	200x66x62
Accessories				
External cable	Analog video cable; USB data cable			
Other accessories	Wrist strap; plush bag; user manual			