ULIRVISION

EAGLE SERIES

Thermal Imaging Camera

Model: E325, HVIN: E3250001
Model: E335, HVIN: E3350001
Model: E350, HVIN: E3500001
Model: E625, HVIN: E6250001
Model: E635, HVIN: E6350001
Model: E650, HVIN: E6500001
Model: E950, HVIN: E9500001
Model: E350D, HVIN: E350D0001
Model: E650D, HVIN: E650D0001
Model: E950D, HVIN: E950D0001

User Manual

About this manual

Dear users,

Thank you for choosing the E-Series Thermal Imaging Scope!

Please take a few minutes to read this manual before first use;

Please be sure to follow the operating rules in this book!

Due to version upgrades or other reasons, this manual is subject to

change without notice!

Disclaimer

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- When using this product, please strictly follow applicable laws and regulations and avoid infringing on the rights of third parties,

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- In the event of a conflict between the contents of this manual and applicable law, the provisions of the law shall prevail.

Precautions

- During the installation and use of the equipment, it is necessary to strictly comply with the electrical safety regulations of the country and the use area.

- Please use the power adapter provided by the regular manufacturer, please refer to the product parameter table for the specific requirements of the power adapter. Do not connect multiple devices to the same power adapter (exceeding the adapter load may generate excessive heat or cause a fire).

- Do not swallow the battery to avoid chemical burns. Do not place the battery within the reach of children.

- Do not place the battery near heat or fire sources and avoid direct

sunlight. Do not use batteries that have been discharged, and remember to charge batteries in time after discharge.

- The device has a built-in removable battery, please use the correct specification battery, improper use may create an explosion hazard. After the battery has been installed or removed, the battery compartment is required to be closed safely.

- When wiring, disassembling and other operations, please disconnect the power supply of the device, and do not operate with electricity.

- To avoid heat build-up, keep the perimeter of the device well ventilated.

- Do not directly touch the heat dissipation parts of the device to avoid burns.

- If the device smokes, produces peculiar smells, or emits noise, please disconnect the power of the device immediately and contact the dealer or service center in time.

- Do not shoot the laser of the laser device directly into the human eye to avoid possible damage to the human eye. The laser of the laser equipment irradiates flammable objects at close range, which may pose a fire hazard, so please keep a safe distance when using it.

- After the laser projector is turned on, it is strictly forbidden to aim

the laser at glass, mirrors and other objects with strong reflection to avoid damage to the thermal imaging detector by laser reflection.

- If the device is not working properly, contact the store where the device was purchased or the nearest service center and do not disassemble or modify the device in any way. (The company is not responsible for problems caused by unauthorized modifications or repairs).

- Check the lens for foreign objects or scratches, and wipe it carefully with a lens cloth.

- Check whether the products and accessories are complete, the host should be handled with care, the infrared lens is fragile, and do not directly contact other objects.

- It is forbidden to face high-temperature objects, and the equipment should be stored in a dry and non-corrosive gas environment, and avoid storing the equipment in direct sunlight, poor ventilation or near heat sources (such as heaters, heaters), etc., ignoring this may lead to fire hazards.

- You must use the battery provided by our company, or the model battery with protection specified by our company.

Waring

FCC Statement

15.19

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.

15.21

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

15.105(b)

NOTE: 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.

ISED Compliance

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.

2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1.L'appareil ne doit pas produire de brouillage;

2.L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

For FCC

FCC RF Exposure requirements: The highest SAR value reported under this standard during product certification for use next to the Body with the minimum separation distance of 0mm. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

This product is compliance to FCC RF Exposure requirements and refers to FCC website

https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm   search for

FCC ID: 2BE6SHW0001

For IC

This EUT is compliance with SAR for general population/uncontrolled exposure limits in IC RSS-102 and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528 and IEC 62209. This equipment should be installed and operated with minimum distance 0 mm between the radiator and your Body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet appareil est conforme aux limites d'exposition DAS incontrôlée pour

la population générale de la norme CNR-102 d'Industrie Canada et a été testé en conformité avec les méthodes de mesure et procédures spécifiées dans IEEE 1528 et IEC 62209. Cet appareil doit être installé et utilisé avec une distance minimale de 0 mm entre i'émetteur et votre corps. Cet appareil et sa ou ses antennes ne doivent pas être co-localisés ou fonctionner en conjonction avec tout autre antenne ou transmetteur.

Menu

1. Product overview

Eagle (referred to as E series) is an infrared thermal imaging scope, suitable for outdoor exploration, emergency search and rescue, mountain guarding, hunting and other occasions. The combination of infrared detector with high-performance SoC chip and full-color gamut HD OLED display makes it have excellent imaging effect. The 1200-meter ultra-long-distance ranging and intelligent ballistic correction function make aiming easier, and it has a variety of convenient operation functions such as user shooting meter, hot spot tracking, digital zoom, PIP, etc., which can be personalized according to different operating habits. In addition, it has the characteristics of strong environmental adaptability, long battery life and durability.

Key features:

- It has the function of laser ranging, and can automatically calculate the trajectory landing point according to the ranging value;

- Support internal storage, can take photos, video, recoil automatic recording;

- Hotspot marking and tracking function;

- With WIFI, hotspot function, support APP, can quickly transfer and share pictures; connect to the supporting client through Wi-Fi or hotspot, and realize functions such as multi-person synchronous

thermal camera preview, video recording, and parameter configuration on mobile terminals such as mobile phones/tablets

- Support custom scenes and custom function buttons, faster operation;

1.1 Appearance introduction
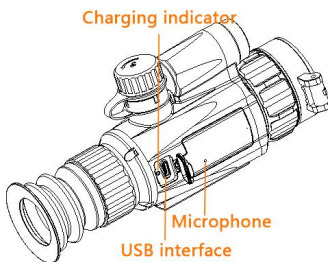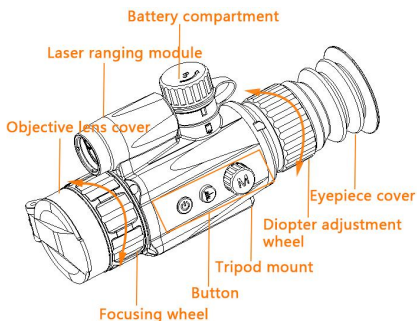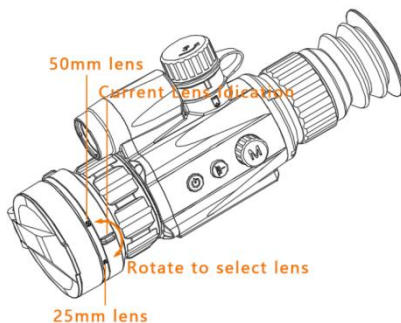
Product appearance

1.2 Buttons and operating instructions

Note: Short press the laser button in the main preview interface to trigger the laser ranging function. The distance value returned by the ranging is displayed on the screen as well as an indication of the laser drop point. The ranging supports one-time, on/stop continuous ranging, which can be selected in the settings. In continuous ranging mode, the ranging is measured every 2 seconds. Long press the power button for 6 seconds to force it to shut down.

CLASS 1 CONSUMER LASER PRODUCT

PAvG ≤1mW

Pulse duration:50ns

Emitted wavelength(s): 905nm

Comply with IEC60825-1:2014,EN 60825-1:2014+A11:2021,EN 50689:2021

Buttons	Short press (counter-clockwise)	Long press (clockwise, not long-press)
⏻ Power button	Sleep/wake-up	Power on/off (long press for 3 seconds).
Laser buttons	Ranging	Image correction (long press for 2 seconds).
M Menu button	Color palette (white hot, black hot, red hot, fusion, green hot、bluish red) / Confirm in the menu	Invoke menu/return to the upper level in the menu (long press for 2 seconds).
M Menu button (spin code)	Digital zoom in/up button in menu	Digital zoom out/down button in menu
M + 　 (Menu button +Laser button).		Photo/video (long press for 2 seconds).

M Menu button long press + (Spin code rotation)	Switch the current shooting table forward	Switch the current shooting table backward

2. Description of the main operation interface

2.1 Cursor calibration

Select the cursor calibration " " to set the following options:

👤 User	A to E, 5 gears, associated with the shot table, distance, shape, color, calibration
🗓 Shot table	1-5 groups can be set, associated with subsequent distance, shape, color, calibration
✐ Distance	0-999, press the up and down arrows to adjust, and long press the menu to exit
┼ Cursor	Press the up and down arrows to adjust, there are a total of 0-5 groups of patterns.
⊘	The cursor supports 5 colors: green, white, black, red,

Color	and blue
⊕ Calibration	It will enter the operation interface, short press the menu button to confirm, long press the menu button to return, adjust the position of the X and Y axes of the crosshair, make the crosshairs move to the specified position, and realize the digital zoom through the counterclockwise or clockwise spin code, the counterclockwise is the digital zoom in, and the clockwise is the digital zoom out.
⊹⊦ Landing point compensation	Enter the operation interface, the red dot in the center of the cross reticle is the landing point prompt, short press the menu button to confirm, long press the menu button to return, press the up and down adjustment arrow to set the distance, after the distance is selected, record the actual landing point by shooting the corresponding distance target, and then move the

|	
	cursor to the specified position by adjusting the coordinate position of the Y axis of the cross cursor; The default landing point for an unset distance is at the center, and if the current table does not have cross reticle, the landing point is not displayed. This function will be linked to intelligent trajectory (Dual field lenses are only for the current field of view)
⊙ Zero	After confirmation, the current user remains the same, the device remains the same, the distance is changed to 100, the cursor shape and color remain the same, and the cursor position is adjusted to the center position.

2.2 Intelligent trajectory

Select the intelligent trajectory " ", you can choose to turn it on or off,

this function is related to ranging, user shooting table, and landing point

compensation. When turning on, on the interface the landing point appears at the center of the reticle (if there is no reticle, it will not be displayed). If the user triggers ranging, the reference distance return value adjusts the position of the landing point display, the landing point is updated once each time a single ranging is triggered, without considering returning to the center of the reticle; during continuous ranging, the landing point position is updated according to the continuous ranging refresh, after the ranging is turned off, the landing point returns to the center of the reticle. (Landing point compensation needs to form a compensation value curve, which automatically matches the landing point on the curve when the intermediate value is returned) as shown in the figure:

Intelligent trajectory

2.3 Scenes

Select the scene " " to enter the secondary menu, there are city, jungle, custom three modes.
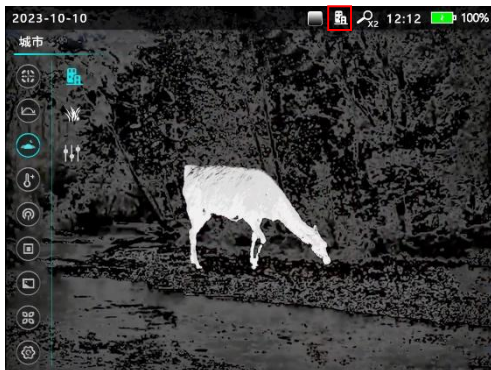
 City	It increases contrast, accentuates high-heat subjects, and loses some low-heat details, making it suitable for urban use
 Jungle	Wide dynamic algorithm, dark part lifting, simultaneous display of target and background details, suitable for use in the jungle
 Custom	Manually adjust and maintain brightness, contrast, sharpness

scene

2.4 Hot spot tracking

Hot spot tracking can be turned on or off when " " is selected, and green crosshairs will appear on the screen to automatically point to the hottest location. The cursor defaults to green, and the it automatically switches to red when the color palette is green hot.

Hot spot tracking

2.5 Network

When the network " " is selected, it can be turned on or off, and the device will turn on the WIFI hotspot after it is turned on, and the hotspot icon and the current number of connections will appear on the navigation
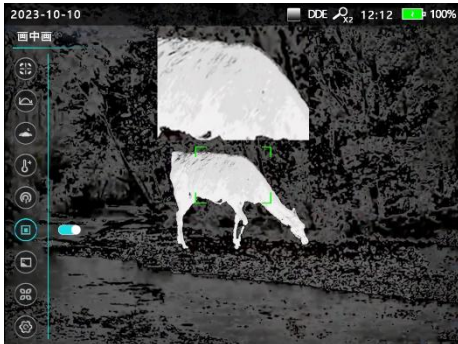
bar.

⍢	The current number of connections is 0
⍢₁	The current number of connections is 1
⍢₂	The current number of connections is 2
⍢₃	The current number of connections is 3

2.6 PIP

Select PIP " " to turn on or off, after turning on, the device will open

PIP, and PIP enlarges the image in the center frame. The framing area is

shown in the picture

Picture-in-picture

2.7 Image settings

Select the image settings to set image enhancement,

brightness, contrast, and sharpness;

🖼️ Image enhancement	Press the Menu button to open it, and the navigation bar displays the DDE
💡 Brightness	Selected spin code adjustment, adjustable from 0 to 8 gears
◐ Contrast	Selected spin code adjustment, adjustable from 0 to 8 gears
◢ Sharpness	Selected spin code adjustment, adjustable from 0 to 8 gears

2.8 Function settings

Function settings include shooting mode, RAV, OLED brightness, OSD, microphone, ranging mode, auto power off, dead pixel correction.

Select the shooting mode " 📷/📹 ", you can adjust through spin code,

there are two modes of recording and shooting, as shown in the figure:

📷/📹 Photo and video settings	Spin code adjustment, set the camera button to take photos or record videos
📹 Impact recording	Turn on recoil for 10 seconds before and after recording, and the RAV logo appears on the navigation bar
🖥 OLED screen adjustment	Spin code adjustment, 1-5 gears to adjust OLED brightness

OSD	☑ 导航栏 ☑ 日期 ☑ 时间 ☑ 图标 ☑ 电池信息 ☑ LOGO ☑ 用户信息 Set navigation bar information display as needed
🎤	Turn the microphone on or off while recording
📏	Choose single or continuous ranging
⏻	Automatic shutdown time setting

2.9 System settings

Select the system settings " ⚙ ", you can set the language, time, standby indicator, anti-burn, restore factory settings, formatting, system information.

[A文] icon Language setting	Two language options are available
clock icon Time setting	⏰ 2023 - 10 - 18 20 : 12 , spin code adjustment, short press the menu button to confirm, follow the same steps in sequence, and long press the menu to return
aperture icon Auto correction	When turned on, the image quality is automatically corrected
ruler icon Distance units	You can choose between yards and meters
shield icon Anti-burn	Tip ⚠: The burn defense mechanism has been triggered, long press to zoom back to normal, and when turned on, the lens will be automatically turned off to protect the detector when encountering ultra-high temperature scenes

⬡ⓔ	Restore factory settings
▣	Format the memory
ⓘ	Display the factory information of the instrument, long press the menu button to return

2.10 Others

(1) USB file storage mode

When you enter file storage mode by connecting your PC via USB, the interface displays the USB connection status. When the USB is connected, all operations on the device are temporarily invalid.
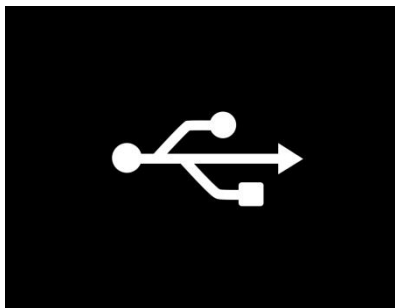
USB connection status

(2) Technical parameters

384 Model	E325	E335	E350	E350D
Resolution	384×288			
Pixel pitch	12μm			
Operating wavelength	8-14μm			
Laser type	class1 laser product			
Thermal sensitivity NETD	≤25mk @25℃ F=1.0			
Frame rate	50Hz			
lens				
Lens focal length (F-number)	25mm (F1.0)	35mm (F1.0)	50mm (F1.0)	25mm (F1.0) /50mm (F1.1)
FOV	10.5°×7.9°	7.5°×5.6°	5.3°×4.0°	10.5°×7.9°/ 5.3°×4.0°
Minimum imaging distance	>2.5m	>3.5m	>5m	>2.5m/ >5m
Detection range	1280m	1800m	2600m	1280m/2600m

Diopter adjustment	±5
Eye relief	45mm
Internal storage EMMC	32G (actual 27G, system operation occupies a portion).
Frequency range	2.400GHz~2.4835GHz(2.4GHz ISM Band)
Transmit power	≤18dBm
Power supply	5V DC 2A
Battery	18650 3350mAh
Battery operating hours	>5.5 hours (when WIFI and hotspot turned off)
USB	USB Type-C supports charging, powering, transferring files, and transferring videos
Operating temperature	-30~55℃
Storage temperature	-40~65℃
Humidity	≤90%

IP rating	IP67			
Size	196×62×90	196×62×90	203×66×90	212×66×90
Weight	≤585g (with battery).	≤595g (with battery).	≤620g (with battery).	≤750g (with battery).
Shock	1000g/0.4ms			

640 Model	E625	E635	E650	E650D
Resolution	640×512			
Pixel pitch	12μm			
Operating wavelength	8-14μm			
Laser type	class1 laser product			
Thermal sensitivity NETD	≤25mk @25℃ F=1.0			
Frame rate	50Hz			

Lens				
Lens focal length (F-number)	25mm (F1.0)	35mm (F1.0)	50mm (F1.0)	25mm (F1.0) /50mm (F1.1)
FOV	17.7°×14.1°	12.5°×10°	8.8°×7°	17.7°×14.1°/ 8.8°×7°
Minimum imaging distance	>2.5m	>3.5m	>5m	>2.5m/ >5m
Detection range	1280m	1800m	2600m	1280m/2600m
Diopter adjustment	±5			
Eye relief	45mm			
Internal storage EMMC	32G (actual 27G, system operation occupies a portion).			
Frequency range	2.400GHz~2.4835GHz(2.4GHz ISM Band)			
Transmit power	≤18dBm			

Power supply	5V DC 2A			
Battery	18650 3350mAh			
Battery operating hours	>4 hours (when WIFI and hotspot turned off)			
USB	USB Type-C supports charging, powering, transferring files, and transferring videos			
Operating temperature	-30~55℃			
Storage temperature	-40~65℃			
Humidity	≤90%			
IP rating	IP67			
Size	196×62×90	196×62×90	203×66×90	212×66×90
Weight	≤585g (with battery).	≤595g (with battery).	≤620g (with battery).	≤750g (with battery).
Shock	1000g/0.4ms			

1280 Model	E950	E950D
Resolution	1280×1024	
Pixel pitch	12μm	
Operating wavelength	8-14μm	
Laser type	class1 laser product	
Thermal sensitivity NETD	≤25mk @25℃ F=1.0	
Frame rate	50Hz	
Lens		
Lens focal length (F-number)	50mm（F1.0）	25mm（F1.0）/50mm（F1.1）
FOV	17.1°×14.1°	34.2°×28.2°/ 17.1°×14.1°
Minimum imaging distance	>5m	>2.5m/ >5m

Detection range	2600m	1280m/2600m
Diopter adjustment	±5	
Eye relief	45mm	
Internal storage EMMC	32G (actual 27G, system operation occupies a portion).	
Frequency range	2.400GHz~2.4835GHz(2.4GHz ISM Band)	
Transmit power	≤18dBm	
Power supply	5V DC 2A	
Battery	18650 3350mAh	
Battery operating hours	>4 hours (when WIFI and hotspot turned off)	
USB	USB Type-C supports charging, powering, transferring files, and transferring videos	
Operating temperature	-30~55℃	

Storage temperature	-40~65℃	
Humidity	≤90%	
IP rating	IP67	
Size	203×66×90	212×66×90
Weight	≤620g (with battery).	≤750g (with battery).
Shock	1000g/0.4ms	

3. Simple Fault Diagnosis and Elimination

For common problems arising during operation, please refer to the following table. If the problem cannot be settled, please cut off the power of the device and contact our technical department.

Failures	Causes and Solutions
The device can't start	The battery is uninstalled or improperly installed. →Insert the battery or re-install the battery. The battery power runs out. →Replace or charge the battery. Device shutdown for protection. → Wait 5 seconds and then restart.
The device shuts down automatically	The battery power runs out →Replace the battery.

Battery power runs out fast	Ambient temp is too low or too high. The rechargeable battery is not fully charged. →Recharge the rechargeable battery. The life of battery is almost over, about 300 cycles of charge and discharge for the type of battery. →Replace rechargeable battery.
No thermal image displayed	The lens cap is not open→Open the lens cap.