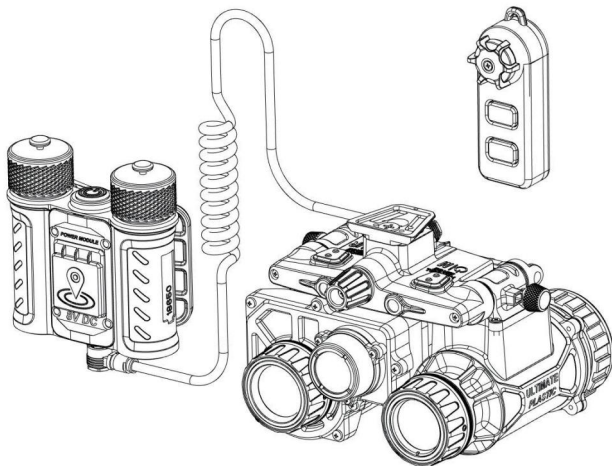


# Enhanced Night Vision Binocular Goggles V2.0

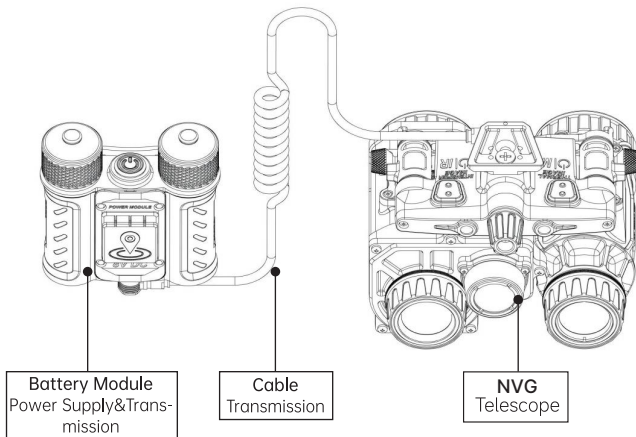
## User Manual



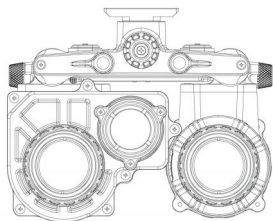
- Please read this manual carefully! Use and maintain the product according to the introduction
- The external optical surfaces should be clean at all times. Touching the optical surfaces with bare hands is not recommended.
- Sand and sea water can damage the optical coatings!
- Do not point the device directly at the sun!
- Image performance is dependent on scenery and atmosphere conditions.
- External sensor performance depends on environmental and atmospheric conditions.
- Please remove the battery when the device is not in use for a long time.
- When carrying or transporting the device, put the protective lens cap!
- Clean the lens surfaces with the Lens Cloth or with the napkin!
- The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.
- 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.
- Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

# SUMMARY

A night telescope used for target recognition and differentiation.



# PACKING LIST



1



2



3



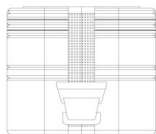
4



5



6



7

1 NVG

2 Battery module

3 Cable

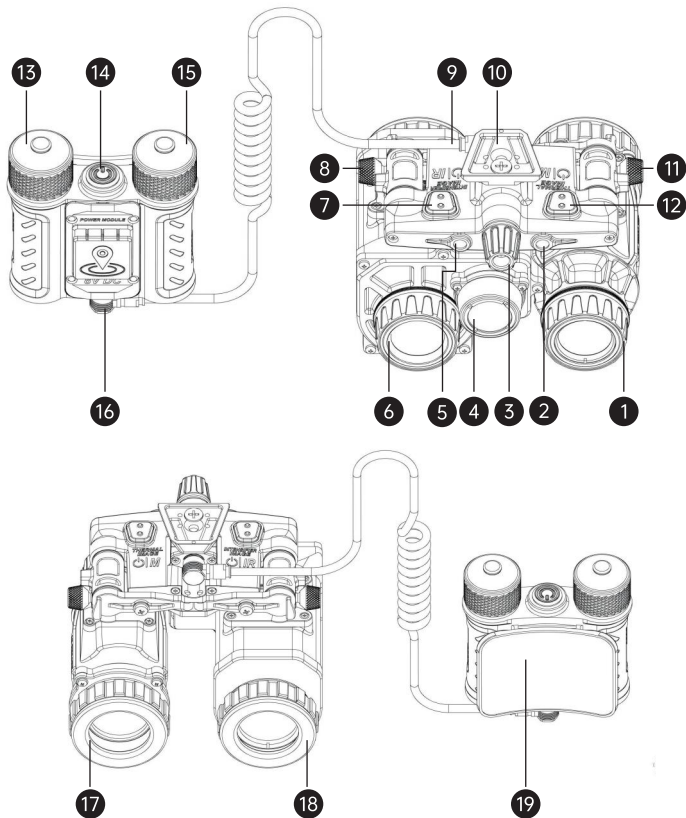
4 Remote control

5 Eye Cups

6 User manual

7 Nylon protective bag

# APPEARANCE

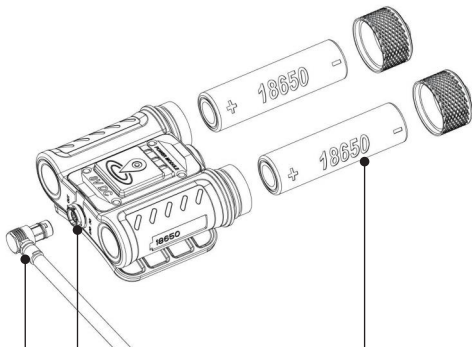


# NOTE

All images used in this instruction manual are for illustrative purpose only. Actual product condition may vary.

- |    |                                      |    |   |
|----|--------------------------------------|----|---|
| 1  | Image Intensifier-Objective Lens (L) | 11 | IPD Knob (L)                            |
| 2  | Brightness Sensing Window            | 12 | Function Control Button (L)             |
| 3  | Function Control Knob                | 13 | Battery Compartment - Battery Cover (R) |
| 4  | Thermal Image Objective Lens         | 14 | Battery Compartment - Switch            |
| 5  | IR Fill Window                       | 15 | Battery Compartment - Battery Cover (L) |
| 6  | Image Intensifier-Objective Lens (R) | 16 | Cable And Cable Access Port             |
| 7  | Function Control Button (R)          | 17 | Eyepiece (L)                            |
| 8  | IPD Knob (R)                         | 18 | Eyepiece (R)                            |
| 9  | Cable And Cable Access Port          | 19 | Battery Module (Hook And Loop)          |
| 10 | L4G24 Bracket Interface              |    |   |

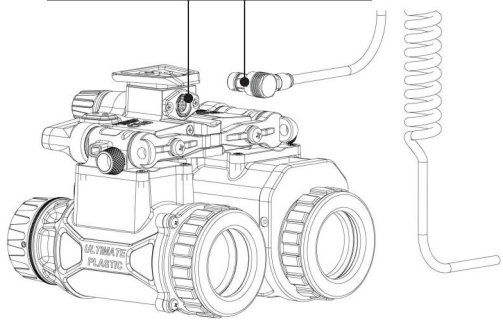
# INSTALLATION AND CONTROLS



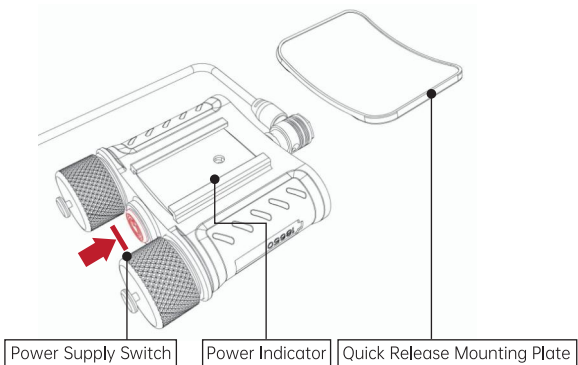
Align The Marked Points For Installation

Battery Installation Diagram

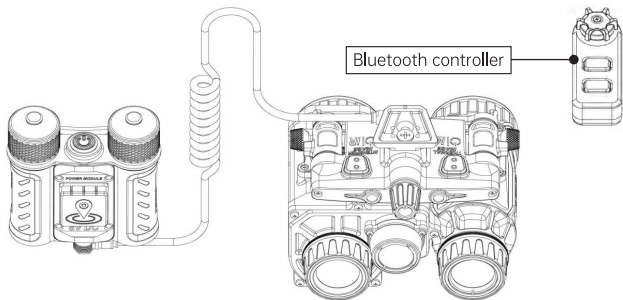
Align The Marked Points For Installation



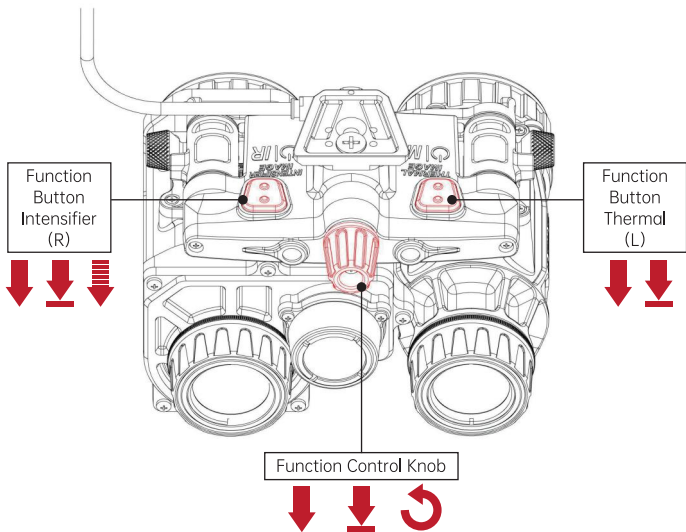
Please complete the installation of battery and cable as shown in the figure. Please use 3.7V standard 18650 battery . Incorrect installation will cause electrical short circuit and equipment damage.



Turn on or off the power of the battery box as shown in the figure (long press). When the battery compartment is powered on, it displays the power (green, blue and red prompts). When it is used, click to display the current power



The external Bluetooth controller can control and adjust the host of the night vision instrument. Please set and adjust the remote controller through the "MENU-SENSOR-BT". The Bluetooth remote controller has a sleep function. When the controller is not operated, it will automatically enter low-power sleep. Please click the middle button to wake up.

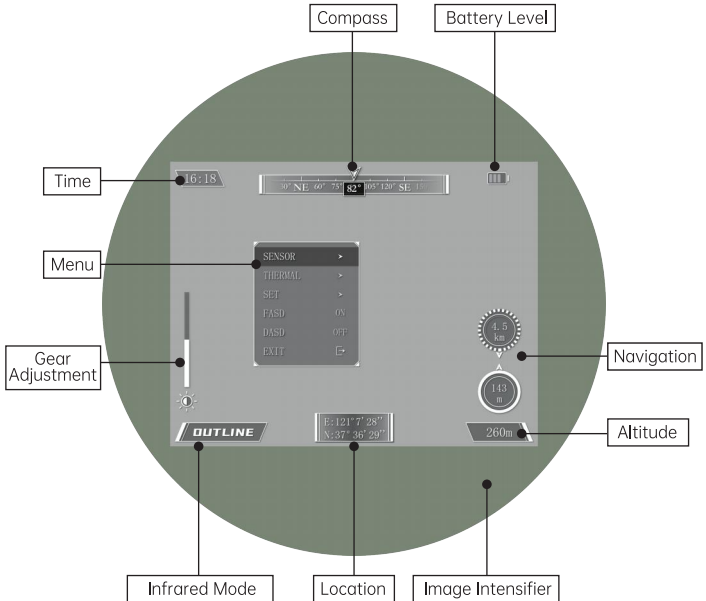


● Please control and adjust the whole machine as shown in the figure

position	Function control button(R)	Function Control Knob	Function control button(L)
Long Press	Image Intensifier Switch	Enter menu	TI Switch
Short Press	TI Refresh	Adjustment Switching	TI Mode Switching
Three-Strikes	Fill light switch	/	/
Rotate	/	Gear Adjustment	/

(TI: Thermal Image)

# STATUS BAR

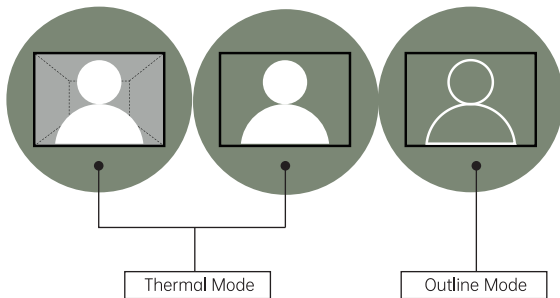


The equipment interface contains the above contents:

- **Image Intensifier**: Provide 40 ° FOV
- **Location**: Display the current positioning position (the positioning information will be automatically output when the machine is turned on. Please use it in an open place)
- **Infrared Mode**: Switch between Thermal mode and outline mode  
Thermal mode: The target is displayed in full infrared, the threshold can






be adjusted by 0%-100%, and the image will be switched from thermal image to highlight.(Please adjust the threshold according to the actual use environment to achieve the best use effect)



Outline mode: The target is displayed in outline, the threshold can be adjusted by 0%-100%, and the image will change the target details.(Please adjust the threshold according to the actual use environment to achieve the best use effect)



- **Gear Adjustment:** Adjust brightness,gain,frequency and threshold (0-100%)  
Brightness:Adjust the thermal image brightness  
Frequency:When the "Twinkle" mode is started, Blinking speed can be adjusted through options  
Threshold:Adjust the threshold function  
Gain:Adjust the gain of NVG image tube

● **Menu:** Adjust menu functions

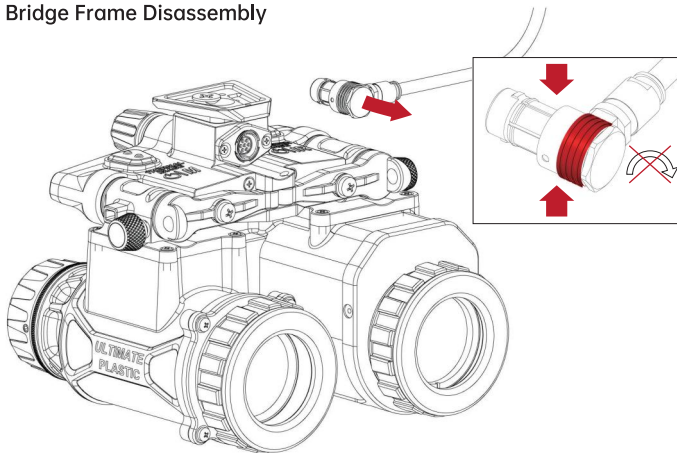
SENSOR	COMP	STD	Full status display of compass information
		NO.	Digital simplified display of compass information
		AC	With DASD and FASD kept off, complete compass calibration according to the operation tips
	NAV	W-X°X'X" N-X°X'X"	Set the first navigation point information and input the location information
		W-X°X'X" N-X°X'X"	Set the second navigation point information and input the location information
		OFF/ON	After the navigation switch is activated, the real-time target status will be displayed in the lower right corner of the main page
		EXIT	When the positioning information is normal, the destination distance and direction will be updated in real time (distance accuracy ± 20m)
	BT	OFF/ON	The Bluetooth remote control switch is in position. After it is turned on, it can be operated by an external remote control
		SET	Bluetooth connection settings, you can set the Bluetooth connection after entering
	EXIT		Digital simplified display of compass information
THERMAL	DORMANCY	OFF/ON	The infrared thermal image sleep function will hide the infrared image and retain the sensor information when it is started
	TWINKLE	OFF/ON	Infrared image twinkle function, supporting frequency adjustment
	BRIGHT	OFF/ON	Infrared bright color display to further enhance the target
	EXIT		
SET	OLED	5	Screen backlight brightness, suitable for different environments
	CAL		It is used for the coincidence calibration function of infrared and low light level, and can be used for translation calibration and saving
	INFO		Display product status and batch number
	UTC	0	Adjust the time according to the local time zone
	RESET		

SET	EXIT		
FASD	OFF/ON		The power-off function switch for up turning and side turning can automatically realize the power-off function of image tube and thermal image after the product is turned up.
DASD	OFF/ON		The external strong light protection switch turns off the power supply function of the image tube when the intensity is higher than a certain value.
			

- **Time:** Display current time(Output current information through positioning function)
- **Compass:** Display current orientation
- **Battery Level:** Display current power
- **Navigation:** Display navigation information  
It supports dual target navigation indication (8 directional navigation and maximum 999km distance display), and can set target points and start functions through navigation.
- **Altitude:** Display current altitude(Output current information through positioning function)

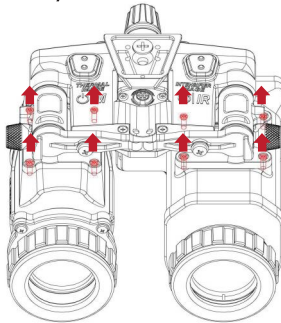
# INSTALLATION AND DEBUGGING OF IMAGE INTENSIFIER

## Bridge Frame Disassembly



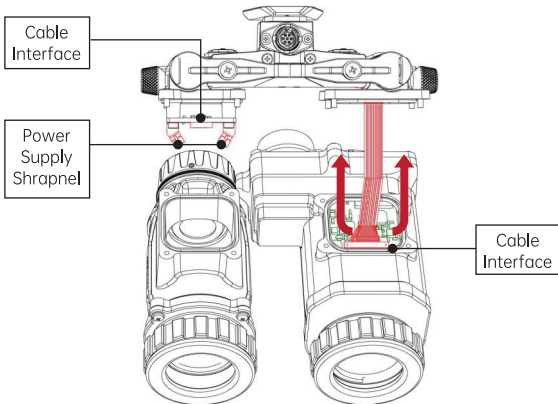
Please press and hold the cable head to remove the connecting cable(The red position is the lock ring). Do not use the knob connector, otherwise the device will be damaged

## Bridge Frame Disassembly



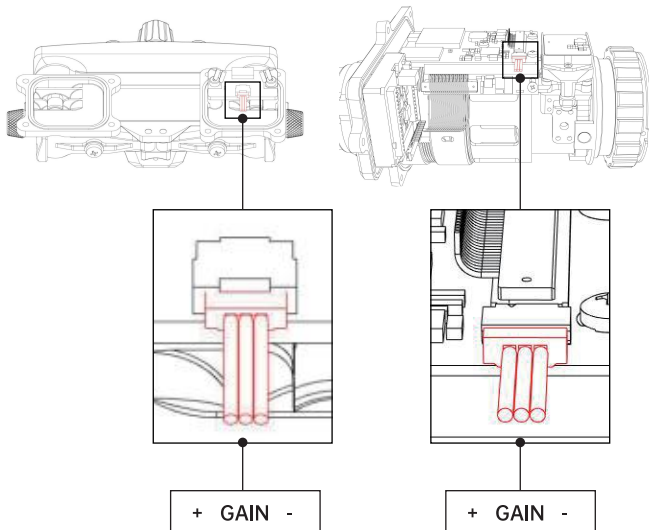
Please remove the left and right assembly screws (PM2-8 pcs.) as shown in the figure

## Bridge Frame Disassembly



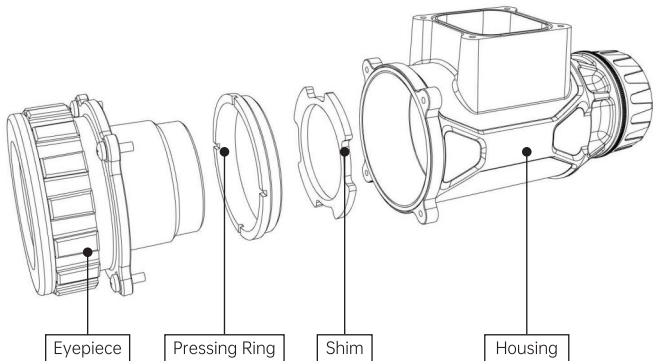
Please remove the PCB cable connector as shown in the figure (please carefully buckle the connector from both ends and do not pull the cable to avoid irreversible device damage)

## Image Intensifier Cable Definition



Support contact type, 2-wire and 3-wire image tubes  
Please use 3-wire Image Intensifier for installation and adaptation.  
White cable (Left) :Power in 3V  
Black cable (Middle) :Gain 0-3V  
Black cable (right) :Power GND

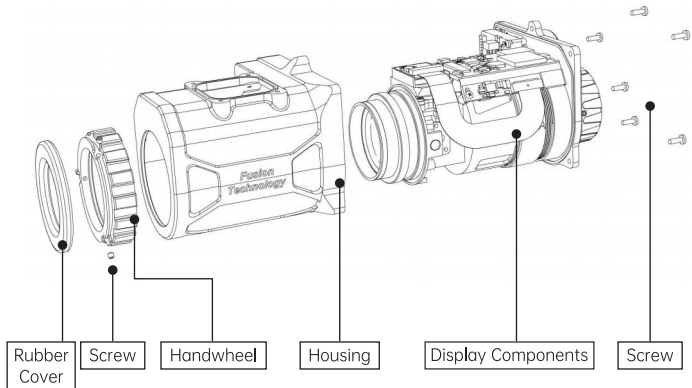
## Bridge Frame Disassembly



Please disassemble the left eye module as shown in the figure, and remove the eyepiece, pressing ring and shim in turn.

- After installing the mx10160 Image Intensifier with the contact upward, restore the installation devices in turn and end the installation of the left component.

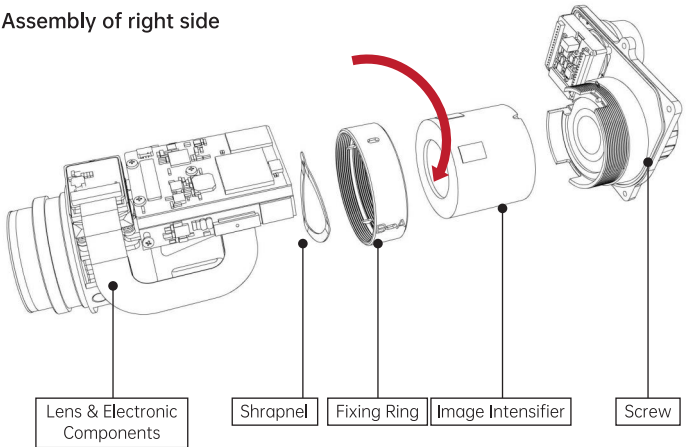
## Bridge Frame Disassembly



Please disassemble the right eye module as shown in the figure:

- Remove the eyepiece rubber cover
- Remove the hand wheel screws (M2-3pcs.) Remove the hand wheel after
- Remove the six screws from the front panel
- Remove the components slowly (please pay attention to the internal cables to avoid damage)

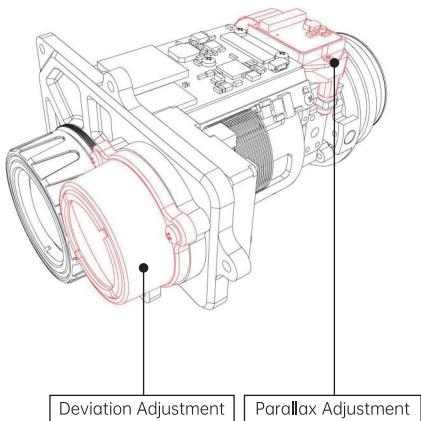
## Assembly of right side



Perform the following operations as shown in the figure:

- Loosen fixing ring counterclockwise
- Install the image intensifier into housing (the contact piece faces the PCB) and install it in place in a directional manner
- Install shrapnel into "lens&electronic components"
- Put fixing ring "A" towards housing, and screw it in for 1/3 turn
- At the same time, pick up the front-end housing and rear-end integrated components, install the positioning structures at both ends, and rotate the fitting ring clockwise until it is installed in place
- Please observe whether the image intensifier is installed in place through the internal gap

## Imaging adjustment

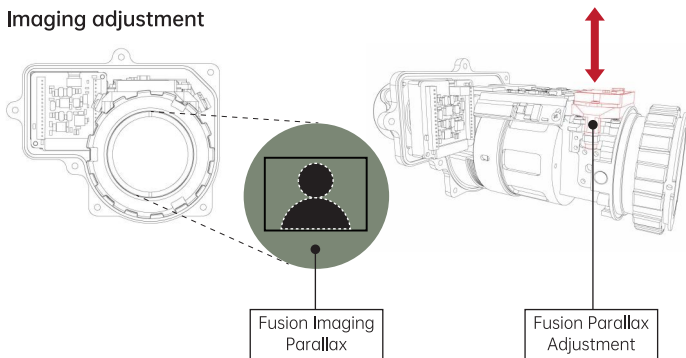


As shown in the figure, the two components are important components for image commissioning. Please select a target 35 meters away to complete the adjustment.

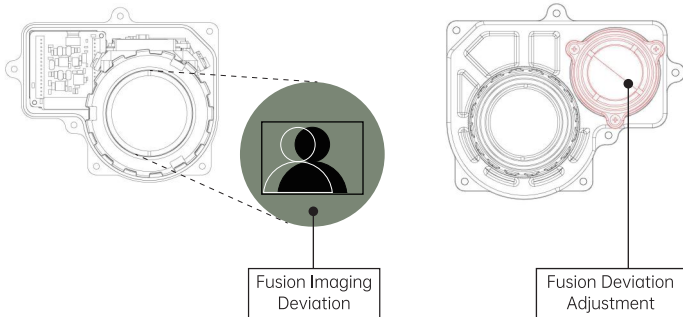
- When there is a coincidence deviation between the thermal imaging image of the right eye and the intensifier image, please loosen the three screws of the infrared lens and pan the infrared lens to complete the coincidence calibration of the thermal imaging image and the intensifier image while the product is turned on for imaging.
- The OLED display assembly realizes image Parallax Adjustment by moving the gasket up and down, so that the OLED imaging Focal plane coincides with the image intensifier imaging Focal plane.

The parallax adjustment effect of the image will affect the viewing effect of both eyes, which is very important!

## Imaging adjustment



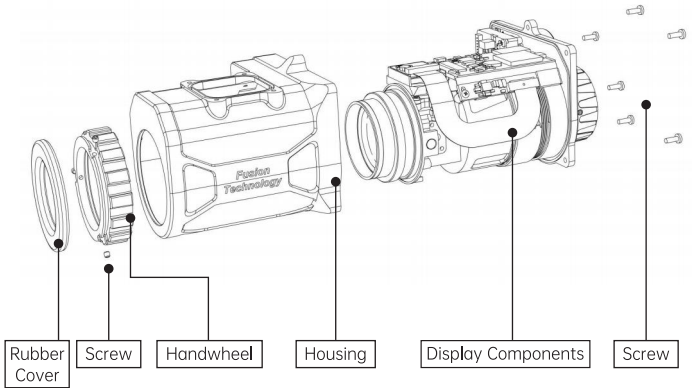
- If there is deviation in the imaging focal plane of the thermal image and image intensifier after installation (Example: 1. When shaking the product left and right, the thermal image and the low light level image have deviation and dislocation of the imaging plane; 2. When the thermal image or low light level image is clear and inconsistent), please manually adjust the two imaging planes to the same clear state by adjusting the height of the OLED bracket gasket.
- When there is no deviation in the left and right observation, the parallax adjustment is completed
- The effect of parallax adjustment will affect the effect of binocular stereo imaging



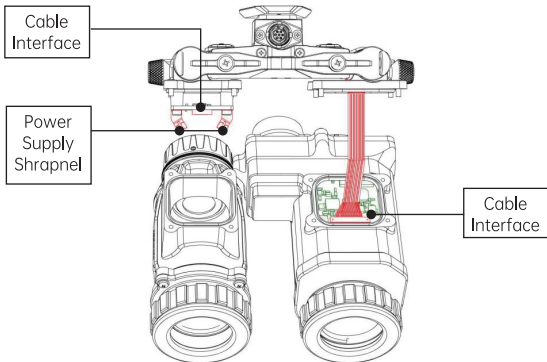
- If there is deviation between Thermal Image and Image Intensifier after installation, Please loosen the flange screw (M1.6-3pcs) and move the infrared lens flange to adjust the deviation, or fine tune the calibration through the MENU -SET-Deviation

Infrared lens adjustment calibration: **rough calibration**

Menu deviation calibration: **trim calibration**

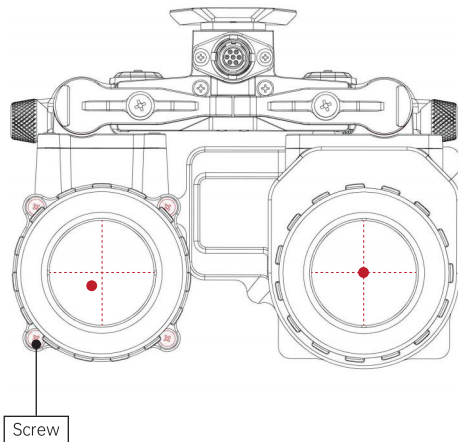


After completing the parallax and aberration adjustment, assemble and restore the components as shown in the figure.(replace the waterproof rubber pad if necessary to achieve sealing effect)



Complete bridge assembly and restoration.

Install the cable, open the battery compartment, check the function of the product, and carry out the next commissioning after confirming that the function is OK.



If the whole machine has difficulty in combining images after completing the adjustment of aberration and parallax, and it still cannot be solved after adjusting the visibility of the left and right eyepieces, please loosen the screws of the left eyepiece, and then translate the left eyepiece to achieve the optical axis calibration.

# STORAGE AND TRANSPORTATION

- Before storing it, clean the device (if on its surface there are moisture, dust or traces of dirt)
- Make sure that there are no traces of moisture, and the battery compartment is empty!
- The location in which the device is stored long term must be dry, enclosed, unheated, and ventilated. Temperature between  $-50^{\circ}\text{C}$  and  $+60^{\circ}\text{C}$ , avoid direct sunlight
- Before each transportation, the product should be neatly packed in its original packaging!
- Night vision device and all other items and accessories should be carefully placed in the bag. The bag should be steadily placed in the transport suitcase!

# TECHNICAL DATA SHEET OF SERIES

<b>Optical Specifications</b>
Magnification: 1×
Infrared Focal Length: 16mm
Focal Length Range: 25cm ~+∞
Image Intensifier FOV: 40°
Infrared FOV: 25.9°×20.9°
Eye Relief: 25mm
Diopter: +2/-3
<b>Performance Specifications</b>
Image Intensifier :Gen 2 (Gen 3 optional)
Infrared Thermal Imaging: 640×512-12μm
Display Mode: thermal, outline
Induction Information Display: Support
Up-turning Shutdown: Support
IPD adjust: Support
Positioning navigation: Support
<b>Binocular Goggles Information</b>
Dimensions:107×115×85mm
Weight: 570g (goggles)/320g (battery+cables)
Battery Life: 8H (infrared fusion), 80H (Image Intensifier only)
Power Supply Type: External battery
Bluetooth Control: Support
Interface Type: L4G24

# EXCEPTIONS AND HANDLING

The following table lists the common faults of L-FB during use, and checks and takes corrective measures in the order indicated.

If there are unlisted faults or corrective actions cannot eliminate abnormal problems, please go to a higher level of maintenance.

SN	Abnormal site	Test or inspection method	Corrective actions
1	Battery compartment battery cover cannot be properly installed or opened	<p>Check whether the installation direction of the battery is correct.</p> <p>Check for debris or debris around the battery cover.</p> <p>Check the battery cover for damage, wear or deformation.</p>	<p>Reinstall the 18650 battery (length <math>65 \pm 0.5</math>).</p> <p>Clean the threads of the battery cover and the battery compartment.</p> <p>Go to high level maintenance.</p>
2	Low light level image cannot be displayed	<p>Check whether the battery is installed, whether the battery direction is correct, and whether the power is sufficient.</p> <p>Check whether the battery compartment power supply switch is on.</p>	<p>Replace the battery with a new one and install the battery correctly according to the instructions.</p> <p>Turn on the main power supply of the battery compartment and confirm that the power supply interface is installed normally.</p>

SN	Abnormal site	Test or inspection method	Corrective actions
3	Low light level image cannot be displayed	<p>Confirm whether the low light level is used under the completely dark condition.</p> <p>Confirm whether the low light level objective lens cover is opened.</p> <p>Confirm whether to turn on the main power switch of the battery compartment.</p> <p>Try adjusting the low light level.</p>	<p>Open or cover the object light when using the micro lens under the condition of no light. Please open the fill light and mirror cover.</p> <p>Turn on the main power supply of the battery compartment.</p> <p>Dim the dim light.</p>
4	Infrared image cannot be displayed	<p>Confirm whether the infrared objective lens cover is open.</p> <p>Confirm whether the battery compartment switch is on.</p> <p>Try adjusting the infrared brightness.</p> <p>Check whether there is any object blocking the infrared lens.</p>	<p>Open or close as required</p> <p>Turn on the main power supply of the battery compartment. Objective lens cover.</p> <p>Adjust the infrared brightness.</p> <p>Remove obstructions.</p>