

Thermal Scope



M7L

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Foreword

Dear our user,
Hello! Thank you for purchasing our thermal imaging telescope. To ensure you can make the most of it, we remind you to read the instruction manual carefully before use and recommend keeping it in a safe place for future reference.

For Your Safety

Before using this product, please ensure that you have read and understood the safety precautions described below, so that you can use this product correctly. The safety precautions below guide users to operate the product safely and correctly, thus avoiding damage to themselves, others, and the devices.



Cautions

In order that the product is ensured not be damaged, please follow the following instructions:

Please do not modify or disassemble this product without authorization;

This product is a very precise device, please do not attempt to disassemble or modify any part of the product;

The maintenance of this product shall be performed by the technical personnel designated by this Company.

The product makes a clicking sound.

This product produces a slight clicking sound every few seconds during operation, but it is a normal case for the camera to capture images.

Note: Do not directly face the sun or other strong light sources, otherwise it may damage the detector of the product.



Warning

Warning indicates actions that may cause harm to users. To avoid electric shock or personal injury, please follow the following steps.

If the product casing is already damaged, do not continue to use it.

In this case, please contact our local dealer or agent.

If smoke, sparks, or burnt odors are found during operation, please stop using immediately.

In this case, please turn off the power of the product. After smoke or odor has completely stopped, please contact our local distributor or agent.

Please do not weld batteries without authorization.

This type of operation may damage the battery, which may cause it to leak and explode.

Do not allow the battery to be impacted (such as hitting, dropping, etc.).

This type of operation may damage the battery casing, which may lead to battery leakage and explosion.

Please unplug the adapter from the power outlet when not charged.

The adapter may overheat, deform, or even catch fire after being powered on for a long time.

Please ensure that the adapter plug is inserted into the designated power outlet.

The plug of the adapter varies by regions. Before using it, please confirm whether the specifications of the adapter are consistent with the electrical specifications in your region. Otherwise, it may cause equipment overheating, electric shock, fire, chemical leakage inside the battery, explosion, or other serious consequences.

When the plug or wire of the adapter is damaged, please stop using it immediately.

Charge the unit only after ensuring that the adapter plug is fully inserted into the socket.

Do not touch the wires with wet hands.

Touching wires with wet hands may cause electric shock. When pulling out the wire, grip the wire head tightly before pulling out the wire. Do not directly pull or tug on the wires, as it may cause wire breakage, electric shock, or fire.

Do not immerse this product in water for testing or rinsing.

If the shell comes into contact with water or other liquids, please wipe it dry immediately. If water or other liquids flow into the instrument, please immediately turn off the power. Continuing to use may cause product damage.

Regularly remove dust from the adapter plug and data cable.

Long term exposure to dusty and humid environments may lead to the accumulation of moisture around electrical equipment, which may cause short circuits and fires.

Do not use abrasives, isopropanol, or gaseous organic solvents to clean the product casing.

This type of operation may damage the outer shell of the product.

After used for long, the temperature of the product may be higher.

When touching the adapter with your hands, you may feel a burning sensation.

Avoid problems caused by condensation.

Bringing the product from a high temperature to a low one, or from a low temperature to a high one, may cause condensation (water droplets) to form on the outer casing and inside of the product. In this case, you can put the product in the randomly included instrument package, gradually adjust the product to the ambient temperature before using it, and then take out the product for operation. If condensation has already formed inside the product, please turn off the device immediately and remove the battery, otherwise it may damage the device. Operate only after the condensation has completely disappeared.

Please avoid the product from being impacted (such as hitting, falling, etc.).

This type of operation may cause product damage, please be careful to avoid it.

Long term storage and regular charging.

If the product is not used for a long time, please place it in a cool and dry environment. If storing products with batteries for a long time, please charge them regularly, otherwise the battery will be depleted and the lifespan of the battery will be shortened.

Operation Instructions

Please read carefully to ensure that you understand the following instructions and use this product correctly based on the instructions.

To achieve optimal performance:

- Please ensure that the equipment is in a good condition. Please note that not all devices can achieve optimal performance under any environmental conditions.
- Do not avoid extreme conditions as they may affect the accuracy of the equipment.
- Please ensure that the device is not obstructed by objects, as this may affect the accuracy of the device.

Instructions for operation: To achieve optimal performance, please follow the following instructions such as:

- For all users, it is recommended to use a compressed air tank or a dry nitrogen gun (if applicable) to remove dust from the lens surface.
- Soak the lint free cloth in alcohol.
- Twist off excess liquid from the cloth or gently apply a lint free cloth onto a dry cloth.
- Perform circular motion on the surface of the lens for wiping, and then discard the cloth strip.
- If you need to repeat the above steps, please use a new cloth strip dipped in liquid to wipe.

Warning

The adapter used with the device may vary depending on the voltage and current intensity. Therefore, it is recommended to use only the specified adapter for optimal performance.


Product Cleaning

The casing of this product shall be cleaned with damp cloth or diluted soapy water. Do not use abrasives, isopropanol, or solvents for cleaning. Use professional optical lens cleaning agents for lenses and screens.

Battery Charging Instructions

Charging Using USB Data Cords:

This product is built-in with chargeable batteries.

- When battery power is low, “” will be shown in the right upper part of the screen. Please perform timely charging through Type-C USB interface.
- When it is fully charged, unplug the USB cords.

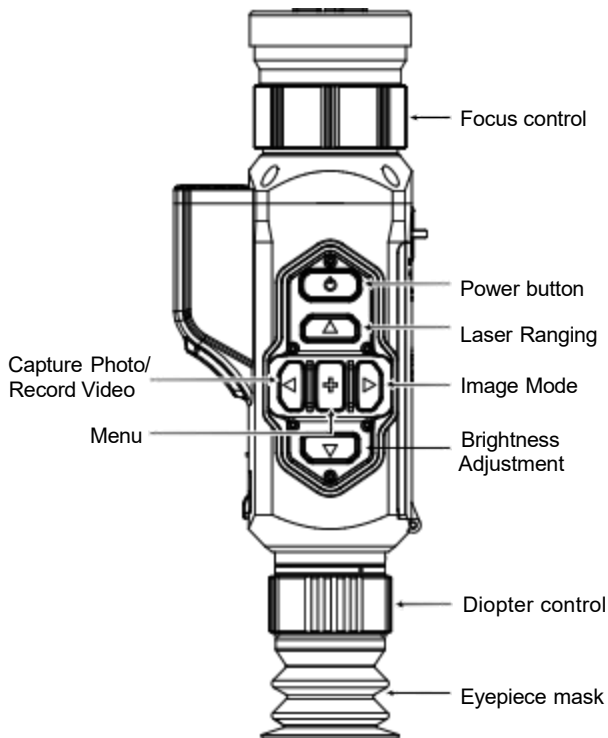
Battery installation

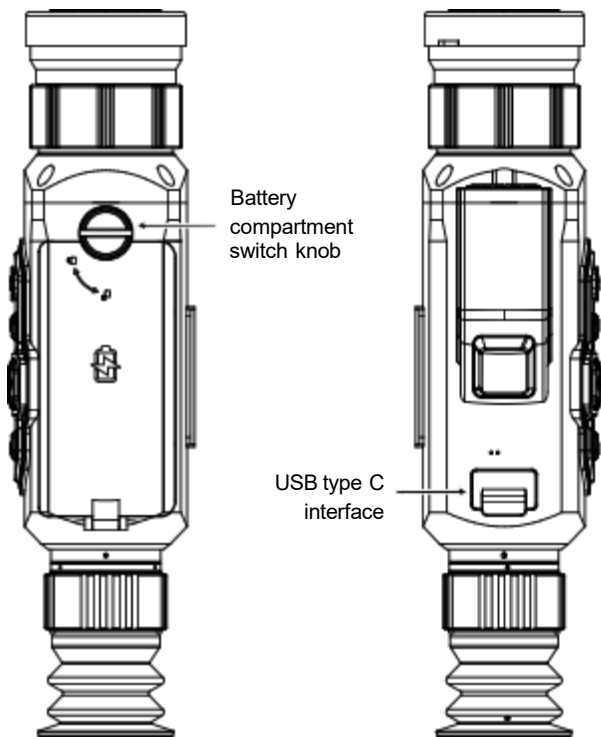
- (1) Rotate the battery compartment switch knob counterclockwise and manually open the battery compartment cover;
- (2) Follow the positive and negative directions of the battery in the battery compartment when installing the battery;
- (3) Close the battery compartment cover and turn the battery compartment switch knob clockwise until it locks.

Note:1. Do not use batteries with damaged insulation layers;
2.If the positive and negative terminals of the battery are reversed, the device will not work.

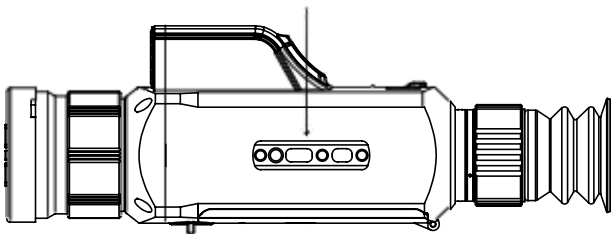


Product Structure Introduction





Installation hole position of guide rail



Focus control: Adjust the focus to make the image clearer.

Type C interface: used for battery charging and connecting to a computer to view device images and video files.

Battery compartment: Two detachable 18650 lithium batteries;

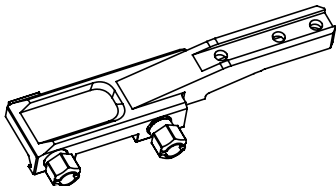
Refractive control: Adjust the appropriate visual acuity;

Installation hole position of guide rail: It can be connected to other objects by installing the guide rail base.







Guide Rail Base

As shown in the figure below, align the screw holes of the guide rail base with the screw holes at the bottom of the device, screw in the screws, and securely connect them to the equipment as a whole.

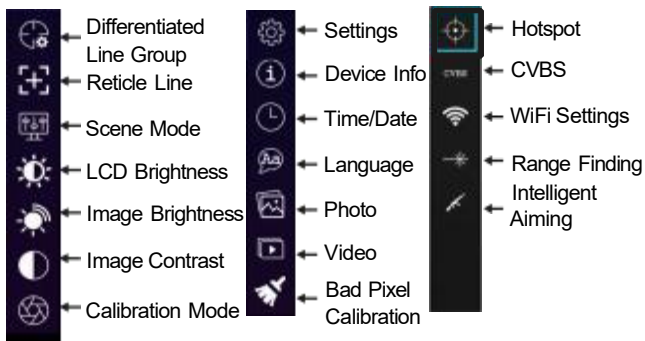
Install them on other objects through the guide rail.



Button Description

Button/Status		Shortly press	Long press
 Power button	Main interface	Disable the screen or freeze the image	Power on/off
	Menu interface	Return to an upper level menu	\
 Cross button	Main interface	\	Go to the menu interface
	Menu interface	Confirm or control parameters	\
 Up button	Main interface	Turn On/Off Laser Ranging	\
	Menu interface	Upward direction	\
 Down button	Main interface	Brightness Adjustment	\
	Menu interface	Downward direction	\
 Left button	Main interface	Shooting	Enable/Disable video recording
	Menu interface	Leftward direction	\
 Right button	Main interface	Switch Image Mode	Manually refresh the shutter speed
	Menu interface	Rightward direction	\

Menu Description



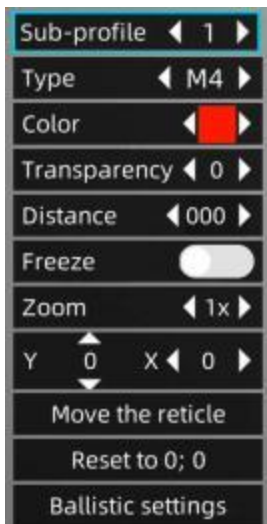
Differentiated Line Group: To set reticle/zeroing group, capable of setting A, B, C, D, E and F groups .

Reticle Line: Sub-profile, Type, Color, Transparency, Distance, Freeze, Zoom, and to set the reticle/zeroing position by X/Y axis, as shown in the figure below.

Operation method: Press the Cross button or Up/Down button to select functions and press the Power button to exit and save the mark settings.

- Sub-profile: Select this option and press the Cross button to switch settings. Four fixed dividing lines can be set. For example, select line 1, and set the type, color, and line position. After setting, pressing the Power button will pop up whether to “save parameters?” and select “OK”. At this point, the dividing line 1 parameters have been set, as shown in the following figure.
- Type: to select type, press the cross button to set. You can set 3 reticle/zeroing types.

- Transparency: Adjustable transparency level for the differentiation line (0–9). Higher values result in greater transparency.
- Distance: No practical functional significance.
- Freeze: Select the freeze function and short-press the Right button to turn it on/off. When freeze is activated, the infrared image will be displayed in a static state.
- Zoom: Select the magnification level and press the Left/Right button to set it.
- XY Coordinates: XY coordinates of the reticle center or bullet impact point (adjustment defaults to the impact point indicator icon). Press the Cross button to enter, press the Up button (decrease) or Down button (increase) to set the Y value, press the Left button (decrease) or Right button (increase) to set the X value.
- Move the reticle: Move the reticle to the specified XY coordinates.
- Reset to 0;0: Reset the XY coordinates of the reticle center or bullet impact point to 0.



Scene Mode: Standard Mode, City Mode, Jungle Mode, and Custom Mode are selectable. Custom Mode supports adjusting the intensity of image details and noise reduction strength via numerical values.

Operation method:

- Long press the Cross button to go to the menu;
- Press the Up button or Down button to select the desired setting item, and press the cross key to enter the settings;
- When setting a value, press the Up button (increase) or Down button (decrease) to complete the setting, and then press the Power button to return.

- When entering the scene mode and selecting the custom mode, press the Cross button again to pop up the detail mode settings. Press the left/right button to select the detail mode and detail intensity (denoising intensity). After selecting, press the Up or Down button to set the value. Once the settings are complete, press the Power button to exit (when the detail mode is turned off, it is the edge mode setting).

LCD Brightness: The display screen brightness can be adjusted by 1-10 levels.

Image Brightness: The brightness of the image can be adjusted by 1-10 levels.

Image Contrast: The contrast of the image can be adjusted by 1-10 levels.

Calibration Mode: The image correction method can be set to manual calibration, automatic calibration, or scene calibration.

Scene Mode



LCD Brightness



Image Brightness



Image Contrast



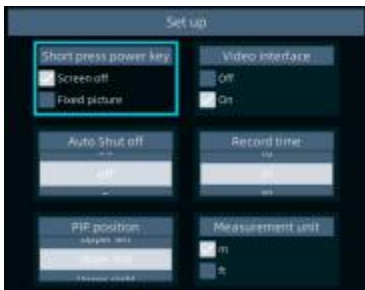
Calibration Mode



Setting: Set the power button short press function, recording interface, automatic power off, video recording duration, picture in pictures position, and distance measurement unit.

- Shortly press the Power button: You can set the power short press function, which can be set to turn off the screen or freeze the screen;
- Video recording interface: Set whether there is a UI interface for displaying information when recording;
- Auto Shut Off: Can be set to not turn off, 5 minutes, 10 minutes, 20 minutes, 30 minutes;
- Video recording duration: Set the duration of each recording file, which can be set to 5 minutes, 10 minutes, 20 minutes, or 30 minutes;
- Unit for displaying ranging measurement results: The unit for displaying distance measurement results can be set to meters and feet.

Operation method: Press the Left or Right button to select the video recording interface, automatic power off time, video recording duration, picture in pictures position, press the Up or Down button to set it, press the power button to exit the settings, as shown below.



Device Info: To view the model, hardware version, firmware version, application version, serial number, storage space of this device. You can also perform application updates, reset parameters, format, and other operations on the device, as shown in the following figure.

- Application update: To update software.
- Reset parameters: Restore factory settings.
- Formatting: Clear disk memory (mainly storing images and videos).



Time/Date: Set the hour, and the date format (year/month/day, day/month/year, month/day/year).

Operation method: Press the left or right button to select the year, month, day, hour, and minute. After selection, press the up button (increase) or down button (decrease) to set them. Press the up/down button to switch the time format and date format. After setting, press the power button to exit the time setting, as shown in the figure below.



Language: The device's language currently supports English(Supports language customization)

Bad Pixel Calibration: To perform automatic bad pixel correction.

Hotspot: To set hotspot tracking on or off.

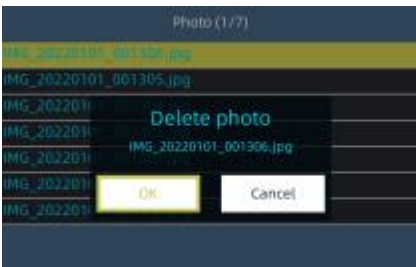
CVBS: To set CVBS function on or off.

Range Finding: The ranging can be set as single or continuous. Press the Down on the main interface to turn on/off the ranging (The effective range of ranging is 10-1200m). The display of the measured distance depends on the size of the object and the reflection ability of the object surface.

Intelligent Aiming: To set the trajectory calculation function on or off.

Photo And Video

- View photos: Select photos from the menu, enable the photo list, and press the cross button to view photos. When viewing photos, press the Up button to view the previous photo, press the Down button to view the next photo, and press the Power button to return.
- Delete photos: In the photo list, pressing the left arrow key will pop up a prompt to delete the photo. Select the "OK" button by pressing the left/right arrow key, and press the cross key to delete the image, as shown below.
- View videos: Select videos from the menu, open the video list, and press the cross key to view the videos.
- Delete videos: In the video list, pressing the left arrow key will pop up a prompt to delete the video. Select the "OK" button by pressing the Left/Right arrow button, and press the Cross button to delete the video.



WiFi Settings

Go to the "Wi-Fi Settings" option in the menu and press the cross.



Operation method: After entering Wi-Fi settings, press the Left or Right button, select to connect/disconnect Wi Fi, and set the WiFi name and password.

Enable/Disable WiFi: Press the Cross button to select whether to turn on or off the WiFi module.

Set WiFi parameters: Press the Cross button to select the desired operation (set WiFi name or password), use the Up/Down/Left/Right buttons to select values, confirm the values with the cross button, and these values will be saved in the device, as shown in the following figure.



After changing the settings, select the button (✓) and press the Cross button to confirm the settings.

Image Mode

Used to change the color palette display of infrared images on the screen. Some color palettes are more suitable for specific applications and can be set as needed. Color palettes are divided into 5 types: Black hot, Black hot (PIP), White hot, Rainbow, Iron red.

These color palettes work best with high thermal contrast providing additional color contrast between high and low temperatures.

Choosing appropriate color palettes can better showcase the details of the target object. The following are images taken of the same object using different color palettes:



Black hot



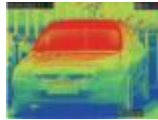
Black hot(PIP)



White hot



Fire hot



Rainbow

Intelligent Aiming

- Trajectory calibration

We have added a smart targeting option in the main menu, we have prepared 2 options, and I will explain each one:

1. Turn on/off IMU prompts (which will display the pitch and roll angles respectively).
2. Turn on/off assisted targeting (which will display assisted targeting points when ranging).

- Regarding the calibration of assisted targeting

1. Zero calibration is the same as the previous method. Before calibration, we need to properly align the position of the x-axis. The current assisted targeting only predicts bullet drop.

2. Calibration: You need to go to the last option (ballistic settings) , select and click on it, which will take you to the calibration interface. On this interface, you can freeze the frame, zoom in, adjust the calibration distance, and adjust the calibration impact point.

3. You need to fire shots at 30m, 60m, 80m, 100m, 150m, and 200m respectively, and enter this interface to adjust the corresponding impact points. The 250m and 300m marks can be omitted...

4. After setting up, you need to save it. At this point, you can turn on the assisted targeting switch and perform ranging. The predicted point will be displayed on the screen based on the ranged distance.