Outdoor Thermal Imaging Telescope Operation Instructions

TM75

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Foreword

Dear the user,
Greetings! Thank you for your purchase of our instruments. In order that you can use it better, we remind you of reading the operation instructions carefully before using it, and recommend that you keep it properly so as to reference it in the future application.

For Your Safety

Before using this product, please ensure that you have read and understood the safety cautions mentioned below so that you can use this product properly.
The safety cautions mentioned below guide the user to operate the product safely and properly, and to avoid damage to himself, others and equipment.

⚠ Cautions

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

Please do not refit or dismantle this product

This product is a very precise device. Please do not attempt to dismantle or refit any part of the product. The repair of this product shall be conducted by the technicians designated by this Company.

Clicks out of the product

This product will utter slight clicks every few seconds. It is a normal case that the lens captures images.

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

⚠ Warning

Warning indicates actions that may cause harm to the user. To avoid an electric shock or personal injury, please follow the following operation instructions.

If the casing of the product has been damaged, please do not continue to use it.

In this case, please contact the local dealer or agent of this Company.

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

In this case, please turn off the power of the product. After smoking or odor has completely stopped, please contact the local dealer or agent of this Company.

Please do not refit the adaptor and the data cable.

Otherwise, such refitting may cause a short circuit or a fire.

Please do not weld the battery without authorization.

Such operation may damage the battery, cause the battery to leak or explode.

Please do not allow the battery to suffer from impact (such as collision or fall, etc.).

Such operation may damage the battery's casing causing leak or explosion of the battery.

When it is not being charged, please remove the adaptor off the power socket.

The adapter may overheat, deform, or even catch fire after being powered on for long. **Please ensure that the adaptor's plug has been inserted into the designated power socket.**

The plug of the adapter varies by region. Before application, 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, and other serious consequences.

In the case of any damage to the adaptor's plug or electric wires, please stop using them immediately.

Charge the unit after ensuring that the adaptor's plug has been totally inserted into the socket.

Please do not touch electric wires with wet hands.

Touching electric wires with wet hands may cause an electric shock. When electric wires are pulled out, it is required to hold wire ends before pulling out the wires. Never pull wires directly, for, otherwise, it may cause break, electric shock or fire of wires.

It is prohibited to dip this product in water or spray onto it.

If the casing is dipped with water or other solution, please wipe it dry. In the case of flow of water or other solution into the unit, please turn off power, for continued use of it may cause damage to the product.

Clear dust off the adaptor's plug and data cable regularly.

Long term exposure to a dusty and humid environment may lead to the accumulation of humidity around electrical equipment, which may cause a short circuit or a fire.

Please use this Company's original adaptor to charge this unit.

Use of power accessories other than original ones may cause serious consequences such as equipment overheating, electric shock, fire, chemical leakage inside the battery, and explosion.

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

Such operation may damage the casing of the product.

After it is used for long, the product's temperature will rise.

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

Avoid problems caused by condensation.

Bringing the product from a higher temperature to a lower one, or from a lower temperature to a higher one may cause condensation (water droplets) to form on the 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 operation, and then take out the product for operation.

If there is any condensation in the product, please turn off the device, and take out the battery. Otherwise, it may damage the device. Operation can be resumed after the condensation disappears completely.

Please avoid product impact (such as collision or fall, etc.).

Such operation may result in product damage, so please take care to avoid that.

Long-term storage and regular charging.

If the product lies idle for long, please place it in a dark, cool and dry environment. If you store the product mounted with battery for long, please perform regular charging. Otherwise, the power will be exhausted, and the battery's service life will become shorter.

Preliminary knowledge of the thermal imager

The infrared thermal imaging detection technology has for long become an important approach to ensure the safety of industrial products in developed countries. The infrared thermal imaging detection technology is widely used in industries such as power, metallurgy, petrochemicals, machinery, coal, transportation, fire protection, and national defense in China. Real-time detection under high voltage, high current, and high-speed operation facilitates the detection of potential problems and prevents the occurrence of faults.

Such non-contact modern detection technology is secure, rapid and reliable. The infrared thermal imaging detection technology is widely used in the following fields:

- Inspection of power equipment, transmission, and transformer lines;
- Search for concealed fire sources in firefighting;

Search and rescue of personnel in a fire, as well as command of the fire scene;

Analyze the location of exposure points and heat loss in thermal pipelines and heating equipment; and determine the location of heating faults in operating trains;

Nighttime monitoring at security departments.

Profile

This unit is a monocular handheld infrared telescope that is light, portable, with easy and simple operation and widely used applications. It looks comfortable in appearance providing clear and delicate thermal imaging, so it is an ideal outdoor device.

It supports multiple pseudo color modes. With one-click switching, it can distinguish the location of targets in scenes in a timely manner. It has images taken capable of saving thermal imaging into this device. By the USB, it can read images or save them into your computer used to generate reports or have them printed.

Product cleaning

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

Lens maintenance

To prevent damage to the infrared lens:

Clean the infrared lens carefully. There is a fine anti-reflective coating on the lens.

- Please do not clean by force so as not to damage the anti-reflective coating.
- Use cleaning solutions for lens maintenance, such as commercial lens cleaning solutions containing alcohol, and a piece of lint free cloth or tissue. Loose particles can be removed using a compressed air tank.

Cleaning the lens:

- Compressed air tanks or dry nitrogen ion sprayers (if applicable) can be used to blow particles off lens surfaces.

  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.

To repeat the above steps, please use a new cloth strip dipped in liquid to wipe.

Battery charging and description

Use USB data cords for charging:

- This product has chargeable No. 18650 lithium battery.
- When power is low, “ ” will be displayed in the right upper part of the screen. Please perform timely charging through the Type-C USB interface (Charging can be performed when the product is in the power off state).
- After it is fully charged, remove the USB cord.

In order that the lithium ion battery can give its full play:

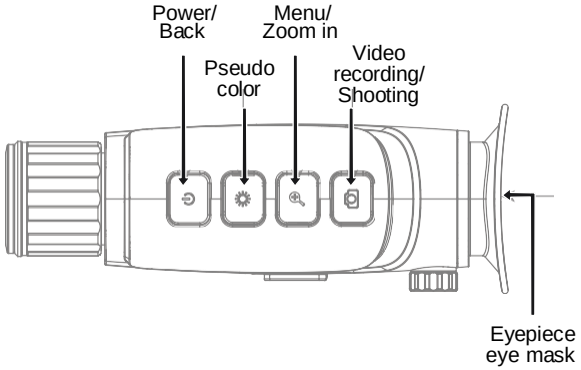
- Do not place the battery onto the charger for more than 24 hours.
- Charge the thermal imager for at least two hours every three months to maximize battery life.
- Please do not attempt to charge the battery in an extremely cold condition.

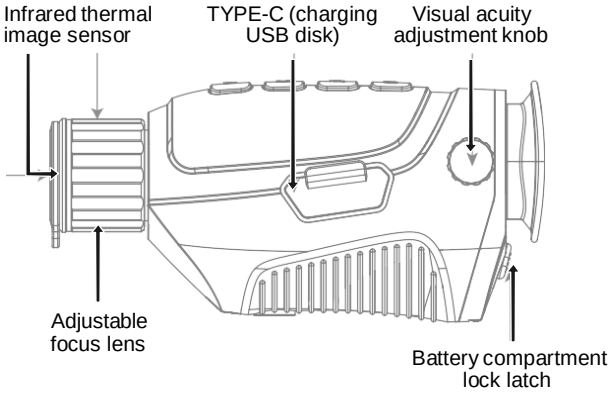
Performance indicators

Product model	TM75
Electronic magnification	2.5X/5X/10X/20X
Detector’s resolution	384x288
Pixel size	12 µm
Frame rate	50 Hz
Focal length of objective lens	25mm
Exit pupil distance	18.5mm
Field of view	55.26ft@100yd
Viewing angle	10.53°*7.90°
Detection distance (6’ substance)	1367yd
Identification distance (6’ substance)	324yd
Hot spot tracking	Supported
Picture inpictures	Supported
Picture in pictures electronic zoom	5X, 10X, 20X and 40X
NETD	≤40mk
Temperature change detection	0.072℉
Screen resolution	800*600 AMOLED
Color palette	White heat, black heat, rainbow and iron red
Power adaptor	1 piece of chargeable 18650 battery
Endurance	5 hours maximum
IP level	IP65
Product dimension	161.7*78.5*61mm
Product weight	422.3g

Memory capacity	16GB (actually 14GB or so)
Bracket	None-can be mounted on the tripod
WiFi function	Supported
Shooting and video recording	Supported
Application programs	Supported
Mobile phone App	X-Vision Optics Infinity Series
Accessories	Dual battery charger, charger cable, lens cloth, lens cover, 1 piece of 18650 battery

Product structure





Description of battery charging

Use USB data cable for charging:

This unit has built-in chargeable batteries.

When power is low, please perform timely charging through Type-C interface. After it is fully charged, remove the USB cable.

Note: When the battery has totally run out, there may be abnormalities. It is recommended that it be used when the battery is fully charged.

Zoom in application

When shooting distant targets, the zoom in function can be used to observe the target clearly, with the rendering as follows:

Normal

2X

4X

8X

An introduction to the pseudo color palette

It is used to change the pseudo color display of infrared images on the display screen. Some pseudo colors are more suitable to specific 8X application, and can be set as required.

Pseudo colors are divided into: white heat, black heat, rainbow, and iron red.

These pseudo colors work best in situations with high thermal contrast, providing additional color contrast between higher and lower temperatures.

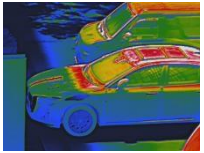
For example, the white heat color palette provides uniform linear colors.

Selecting appropriate pseudo colors can better showcase details of target objects.

The following are the photos of the same object taken by selecting different pseudo colors:

White heat

Black heat



Rainbow

Iron red

Operation instructions

Focal length adjustment: Adjust the focus to make the image clearer.

Type-C interface: used to charge the battery and connect your computer to view photos and videos.

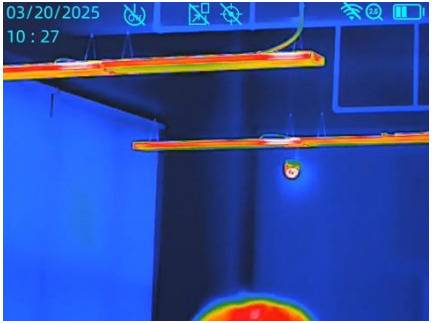
Diopter adjustment: Adjust the appropriate visual acuity for oneself.

After pressing the power button to turn off the screen, press the power button to turn on the screen.

Description of buttons

Buttons/Status		Shortly press	Long press
Power button	Main interface	Screen off standby	Power off operation
	Menu interface	Return button	/
Pseudo color button	Main interface	Pseudo color switching	Shutter refresh
	Menu interface	Select up	Delete button
Zoom in button	Main interface	Magnification (1x/2x/4x/8x)	Enable the menu
	Menu interface	OK button	Return button
Shoot button	Main interface	Shoot	Enable video recording/Stop video recording
	Menu interface	Select down	/

An introduction to main interface icon



The left upper corner of the screen is the current time, and the right upper corner is the battery capacity and zoom in amplification. The icons in the following cases will display on the interface:

- Video recording icon: Long press the button for video recording;
- USB connecting the icon: when data cable connects the computer;
- Memory full icon: when storage space is less than 100M;
- WIFI status icon, when it's enabled or disabled, there is display of
- Auto power off time icon, the set time will become
- Picture in pictures on/off status icon. Enabling it will become
- Hot spot tracking icon: to track the maximum point of temperature

Menu description

Long press the button to go to the menu; and the button or button (Up or Down) to select the option to be set; press the to go to the setting, and then press the button or button (up or down) to select the values to be set or the switch.

After going to the menu, shortly press the button to exit the current menu, and return to the previous menu until it totally exits the menu.

Pseudo colors: white heat, black heat, rainbow, and iron red. Zoom in: electronic zoom in by 1X, 2X, 4X and 8X.

Image brightness: The brightness of infrared images is adjustable by 1-10 levels.

Image contrast: The contrast of infrared images is adjustable by 1-10 levels.

Scene mode: 1-hightlight, 2-enhance, 3-jungle, 3 kinds in all. After setting, shortly press the button to exit.

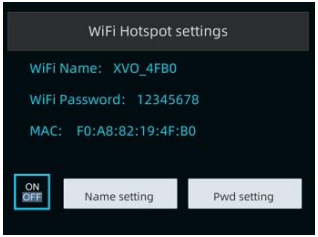
Correction mode: manual correction and automatic correction. Manual correction is done once only at each choice. When the correction animation appears, the correction is OK. (APP can also be manually corrected). To select 2 auto correction will lead to regular correction. Auto correction will lead to regular correction. The starting default is automatic correction.

Hotspot tracking: After opening, the hotspot box is the highest temperature point, and every time it is turned on, it will return to the state before the last power off.

Picture in pictures: In the infrared image mode, the picture in pictures function is set to be on or off, and every time it is powered on, it will restore the state before the last power off.

WIFI setting

When the mobile phone connects the device's WIFI, use APP to be able to display and control the real-time thermal imaging screen. After you go to the WIFI setting window, the name and password will be displayed at the WIFI setting window. The cursor is at the ON/OFF option. You can press the button to confirm the selection. Now, the ON/OFF icon will be lit up. Then press the button or the button (up or down) to be able to enable/disable WIFI. After it is enabled, use your mobile phone to connect WIFI, and then enable the corresponding APP auto connection or search device. Press the button to cancel the selection.



Within the APP, it can control zoom in, pseudo color, scene mode, shooting and video recording saved into your mobile phone. After connecting the APP, the time and device of the mobile phone will be synchronized automatically;

After connecting the APP, you can perform photo taking and video recording within the APP. Meanwhile, the device is unable to take photos and perform video recording;

After connecting the APP, for the scene modes in the APP, you can select 1-highlight, 2-enhance, 3-jungle, 3 kinds in all.

If you need to modify the WIFI name and password, press the name setting and password setting buttons respectively to automatically generate the name or password. It is recommended that the WiFi password be changed regularly.
The mobile phone can set the APP to be permanently installed in the background or have unlimited power saving to avoid disconnection after the APP enters the background.
For the purpose of saving power, the starting default each time is WIFI disabled.

Language setting

Language: Currently, only English is supported. After selecting the language, press the button for confirmation, as shown in the figure below.

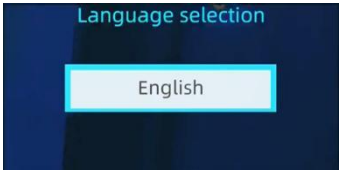
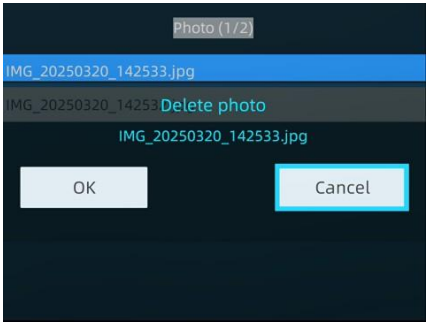
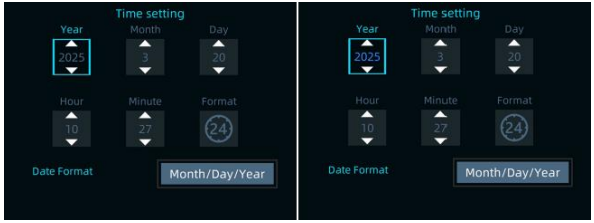


Photo: photo list, to view photos.
Video: video list, to view videos, as shown in the figure below.
After pressing the button to go to the list, press the button or the button, to select the list up and down, then press the button to view photos or videos. Long press the button to be able to delete photos or videos.



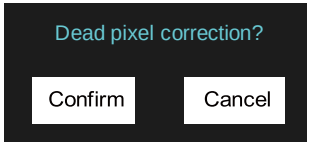
When viewing photos, press the button or the button (up or down) to switch photos up and down.
When viewing videos, press the button or the button (up or down) to be able to play/pause videos.

Time/date: to set date (year, month and date) and time (hour and minute), time format (12 hours, and 24 hours), date format (year/month/date, date/month/year, month/date/year).



Operation method: Press the to go to the time setting interface, press the button or the button to select year, month, date, hour, and minute, then press the button to confirm the selection, and the icon will light up. Then press the button or the button to set values. After selection, press the button to cancel the selection, and the icon will become dimmer.

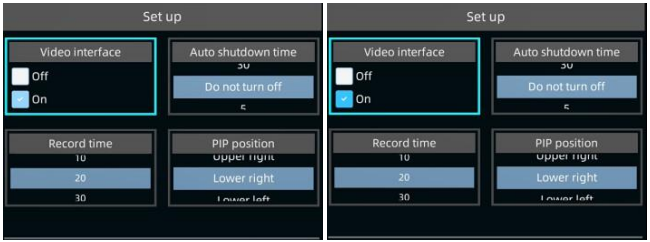
Dead pixel correction: auto dead pixel correction. Press the button to pop up the auto dead pixel correction prompt window. After selecting confirmation, press the button to start dead pixel correction.
(Just operate based on the prompt), as shown in the figure below.



Set: to set video recording interface, auto power off duration, video recording duration, and picture in pictures position.

- Video recording interface: to set whether there is display information with the UI interface when shooting video is set;
- Auto power off time: You can set no power off, 5 minutes, 10 minutes, 20 minutes and 30 minutes;
- Video recording duration: to set the duration of each video recording file. You can set 5 minutes, 10 minutes, 20 minutes or 30 minutes;
- Picture in pictures position: to set the picture in pictures position. You can set right upper, right lower, left lower, and lower upper.

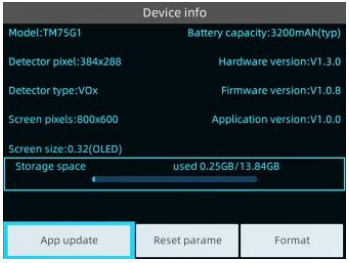
Operation methods: Press the button to go to the setting interface. Press the button or the button to switch the setting option (video recording interface, auto power off duration, video recording duration and picture in pictures position), and then press the button to confirm the selection. Now, the option selected will light up. Then press the button or the button to adjust the set value. Press the button to cancel the selection. The color of the option will become dimmer.



Device information: To view the model, detector's pixel, detector type, screen size, screen pixel, battery capacity, hardware version, firmware version, application version, storage space, etc. of this device. You can also perform application updates, reset parameters, format, and other operations on the device, as shown in the figure below.

- Application updating: to update software.
- Reset parameters: to restore factory settings.
- Formatting: to clear disc memory (mainly storing images and videos. Note: Do not perform formatting while your computer is being connected. The operation is ineffective.)

Operation mode: After pressing the button or the button to switch the setting option, press the to go to the following functions.



When these functions are not run, press to exit. Running these functions will lead to automatic rebooting.

FCC Caution：

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.

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.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.