



FL25/FL25R/FH25/FH25R

# FINDER

Thermal Imaging Monocular

## Operating Manual



**IRay Technology Co., Ltd.**

Add: 11th Guiyang Street, YEDA, Yantai 264006, P.R. China

Tel: 0086-400-998-3088 Email: sales@iraytek.com

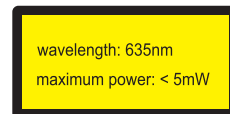
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English/Chinese

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警告!  
**WARNING!**



**ENGLISH**  
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## SPECIFICATION

Model	FL25	FL25R	FH25	FH25R
Microbolometer				
Resolution, pixels	384 x 288		640 x 512	
Pixel size, μm	12			
Frame refresh rate, Hz	50			
Optical Specifications				
Objective Lens, mm	25			
Field of view, degree	10.5 x 7.9		17.5 x 14.0	
Optical magnification, x	2.5 ~ 10.0		1.5 ~ 6.0	
Digital zoom, x	1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4			
Minimum focusing distance, m	1			
Exit pupil diameter, mm	20			
Focusing range of eyepiece, D	-4~+5			
Detection range, m (Target size: 1.7mx0.5m, P(n)=99%)	1298			
Display				
Type	LCOS			
Resolution, pixels	1280 x 960			
Operational Specifications				
Battery type	Li-ion			
Replaceable battery type	18500 x 1	N/A	18500 x 1	N/A
Max. battery life(t=25°C)*, h	8	6	8	6
Laser rangefinder range, m	N/A	600 ±1	N/A	600 ±1
Amount of built-in memory, GB	16			
APP compatibility	Support			
Dimension, mm	70 x 52 x 130			
Weight(without replaceable battery), g	≤ 320			

- \* Actual operation time depends on the intensity of Wi-Fi use and the built-in video recorder.
- ❖ Improvements may be made to the design and software of this product to enhance its useful features.
- ❖ Technical parameters of the device may be improved without prior notice of the customer.

## PACKAGE CONTENTS

- Finder Thermal Imager
- USB cable
- Power adapter
- Hand strap
- Neck strap
- Cloth for cleaning optics
- Warranty card
- Operating manual

## DESCRIPTION

The Finder series is light and easy to carry and can be operated with one hand. With its compact size and lightweight, it can be placed in the pocket at any time. The built-in laser ranging can quickly locate the target distance. The ergonomic construction and powerful function make the Finder the best choice for outdoor exploration.

## DISTINGUISHING FEATURES

- 12 $\mu\text{m}$  thermal imaging detector
- High image quality
- Integrated laser rangefinder
- Infrared sensors switch
- Display off function
- Lightweight and compact
- HD micro display
- High image frequency
- Long detection distance
- Build-in memory
- Support photo and video recording
- Support APP connection via Wi-Fi
- Built-in digital compass and motion sensor
- Convenient user interface
- Pixel correction function

## UNITS AND CONTROLS

1. Eyepiece
2. Infrared sensors switch
3. Down/Photo button
4. Up/Ranging button
5. Menu button
6. Power button
7. LED indicator
8. Lens cap
9. Lens focus ring
10. External battery cover (FL25/FH25)
11. Type C connector
12. Eyepiece diopter adjustment
13. Laser indicator (FL25R/FH25R)
14. Laser rangefinder (FL25R/FH25R)



LED indicator displaying the current status of the device

LED Color	LED Status	Operating Mode
●	Normal	Power on/ fully charged
	Flashing	Standby
●	Normal	Charging
	Flashing	Less than 10% battery level

## BUTTON OPERATIONS

Button	Device status/ operation mode	First short press	Next short press	Long press
Power button	The device is off.			Power on device
	Home screen state	Standby	Wake up the device	Power off device
	Defective pixels calibration interface	calibrate a defective pixel	Undo the pixel calibration	Undo calibrations of this operation
	Shortcut menu/ Main menu	Return to the home screen		Power off the device
Menu button	Laser ranging mode	Exit laser ranging mode		
	Home screen state	Open shortcut menu 1	Open shortcut menu 2	Open main menu
	Shortcut menu 1	Open shortcut menu 2	Exit the shortcut menu	Exit the shortcut menu
	Shortcut menu 2	Exit the shortcut menu		Exit the shortcut menu
	Main menu	Confirm value, enter menu option		Exit menu option/ main menu
	Ranging cursor calibration/ Defective pixels calibration interface	Switch cursor movement direction		Exit calibration
Up/ Ranging button	Home screen state	Turn on the laser ranging function		Turn laser on/off
	Laser ranging mode	Single ranging		Single/continuous ranging switch
	Shortcut menu 1	E-zoom adjustment		
	Shortcut menu 2	Display brightness adjustment		
	Main menu	Navigation up		
	Ranging cursor calibration/ Defective pixels calibration interface	Move one pixel up/ right		Move ten pixels up/ right
Down/ Photo button	Home screen state	Photographing		Begin video recording
	Video recording	Photographing		Stop and save video recording
	Shortcut menu 1	Image mode adjustment		
	Shortcut menu 2	Image sharpness adjustment		
	Main menu	Navigation down		
	Ranging cursor calibration/ Defective pixels calibration interface	Move one pixel down/ left		Move ten pixels down/ left
Up+ Down	Home screen state	Shutter correction		Background correction

## MENU/STATUS BAR ICONS

	Image mode: <b>White Hot</b>
	Image mode: <b>Black Hot</b>
	Image mode: <b>Red Hot</b>
	Image mode: <b>Hot Target Highlight</b>
	Image mode: <b>Ironbow</b>
	Image mode: <b>Rainbow</b>
	Digital zoom
	Display brightness
	Image sharpness
	Automatic calibration
	Manual calibration
	Time and Date
	Wi-Fi
	PIP
	Digital compass
	Motion sensor
	Auto display off
	Calibration mode
	More
	Ranging cursor calibration
	Defective pixel calibration
	Compass calibration
	System information
	Factory reset
	Return to the Main Menu

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	Single ranging
	Continuous ranging
	Battery indication (FL25R/FH25R)
	Battery charging
	Battery indication (FL25/FH25) 1: Built-in battery indication 2: External battery indication

## BATTERY AND SAFETY

Finder series is supplied with a rechargeable Li-ion Battery Pack, which enabled the thermal imager to be used for up to 6 hours. The battery should be charged before first use.

- Attach the USB cable to the Type C connector on the device;
- Connect the other end of the USB cable to the power adapter or a USB socket connected to another power source with a rated output of 5V or less.
- Connect the power adapter to the mains power supply.
- The LED indicator shows red when charging and turns green when charging is finished.
- When the battery icon becomes during use, it means the battery is low in power. Please charge in time to avoid the loss of the life caused by over-discharged of the battery.

### Safety Measures

- After a long storage time, the device should be partially charged, not fully charged or fully discharged.
- Don't charge your device immediately after you bring it from the cold to the warm. Wait 30-40 minutes for it to warm up.
- Do not use the charger if it is modified or damaged.
- The device should be charged at a temperature of 0°C to +40°C. Otherwise, the battery life will be significantly reduced.
- It is not recommended to connect third-party devices that consume more energy than allowed.
- The equipment is equipped with a short circuit protection system. But situations that may lead to short circuits should be avoided.
- The recommended operating temperature for the device is

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between -10°C and +50°C. Do not use the product beyond this temperature range -- this may shorten battery life.

- When the device is used in sub-zero temperatures, the battery capacity drops., this is normal and does not indicate a defect.

### OPERATION

**ATTENTION!** The lens of the device must not be pointed at any sources of intense energy, such as laser-emitting devices or the sun. This may damage the electronic components in the device. Damage caused by failure to comply with the operating guidelines is not covered under warranty.

#### Power on and image adjustment

- Remove the lens cap.
- Long pressing the **Power(6)** button for 2 seconds to power on. Waiting for 3 seconds to enter the main interface.
- Adjust the resolution of the icons on the display by rotating the diopter adjustment ring on the eyepiece.
- To focus on the object being observed, rotate the lens focus ring.
- Adjustment of display brightness, image mode and sharpness, as well as turning on the smooth digital zoom, are described in the SHORTCUT MENU FUNCTIONS section.
- Turn the device off after use with a long press of the **Power(6)** button.



- During use, the standby mode can let the device into a sleep state (turn off the display screen, the main chip is standby) by pressing the **POWER** button (6) briefly, which allows it to be quickly turned off, if necessary. And press the **POWER** button (6) again to wake up the device.

### HOME SCREEN

When the device booted up, the home screen shows upon. There is some general information shown on the interface. Detail as follows:

**Upper left corner**--Color palette, magnification, calibration mode, Wi-Fi (on), Automatic screen off (on);

**Upper right corner**--Battery level;

**Lower left corner**--Time and date;

**Lower right corner**--Video output icon (on).



The color of the battery icon represents the current battery level. When the battery icon is shown in red, it indicates that the battery is low. Please charge it in time.

Icon	Color	Battery level
	Blue	30%-100%
	Yellow	20%-30%
	Red	Less than 10%
	---	Charging

### CALIBRATING THE SENSOR

When the image is degraded or uneven, it can be improved by calibration. Calibration enables the detector temperature background to be equalized and defects in the image to be eliminated.

There are two calibration modes: manual (M) and automatic (A). Select the required mode in the CALIBRATION section of the MAIN MENU .

- **M mode (manual).** The device needs to be calibrated manually.
  - For FL25R/FH25R- short press the **Up (4)+Down (3)** button for shutter calibration, and long press for background calibration.
  - For FL25/FH25- short press the **Up (4)** button for shutter calibration, and long press for background calibration
  - The lens cap should be closed for background calibration.
- **A mode (automatic).** The device is calibrated autonomously by the software algorithm. The lens cap need not be secured (the sensor is closed by an internal shutter).

#### **Note**

- Manual shutter calibration and manual background calibration are still possible even in mode A.


## **PHOTOGRAPHING AND VIDEO RECORDING**

Finder Series thermal imager is equipped with a function for video recording and photographing an observed image onto the built-in memory card. The files of images and videos will be named after the time, so it is recommended to synchronize the system time and date in the Settings of the APP before using the camera and video function. For specific operations, you can download the operating instructions of the APP from the company's website.

### **Photographing**

- Take a photograph with a short press of the **Down/Photo** button (3) in the home screen. The image freezes for 0.5 seconds with a photo icon (📷) displayed on the upper-right corner of the display.
- The picture file is saved to the built-in memory card.

### **Video Recording**

- In the home screen, press and hold the **Down/Photo** button (3) to start video recording.
- A tooltip  showing the recording time (showing in MM:SS (minutes: seconds) format) will appear in the upper right corner of the display.
- The red dot in the tooltip flashes during recording.
- During recording, short press the **Down/Photo** button (3) to take a

photographing also.




- Stop the video recording by pressing and holding down the **Down/Photo** button (3).
- Video and picture files are stored in the built-in memory card after video recording has been turned off.

#### **Note**

- You can enter and work on the menu during video recording.
- When the video recording time exceeds 1 hour, that is, the tooltip shows 59:59, and the next second will automatically jump to 00:01 to start the counting of the next hour.
- The maximum duration of a video recording file is five minutes. After this time, the video will be recorded onto a new file.
- The number of files is limited by the capacity of the device's built-in memory. Regularly monitor the amount of free memory in the built-in memory card, transferring footage and photographs to other media to free up space on the memory card.

### **Memory Access**


When the device is turned on and connected to a computer, it is recognized by the computer as a flash memory card, which is used to access the device's memory and make copies of pictures and videos.

- Turn on the device and connect it to the computer through the USB cable.
- Double-click "my computer" on the desktop - double-click to open the device named "Infiray"  - then click and open the device named "Internal Storage"  to access memory.
- There are different folders named by time in memory .
- Recorded videos and photographs are saved in these folders in the format: IMG\_HHMMSS\_XXX.jpg (for photos) and VID\_HHMMSS\_XXX.mp4 (for video). HHMMSS- hour minute second; XXX - three-digit common file counter (for photos and video). The counter used in the naming of multimedia files is NOT reset.




## LASER AND LASER RANGING FUNCTION (Only for FL25R/FH25R)

FL25R/FH25R is built-in laser function for laser indication and laser ranging.

### Laser Indication Function

- Turn the laser on with a long press of the **Up/Ranging** button (4) in the home screen.
- And a red laser cursor  appears synchronously on the screen to indicate the position indicated by the laser.
- Long press the **Up/Ranging** button (4) again or short press the **Power** button (6) to turn off the laser indication function.

### Laser Ranging Function

- Short press the **Up/Ranging** button (4) to switch on the laser ranging function in the home screen.
- The laser cursor opens automatically, and the tooltip  239m at the bottom of the screen displays the current ranging mode and the distance of the target indicated by the cursor.
- There are two kinds of ranging modes: single ranging  and continuous ranging . Press and hold the **Up/Ranging** button (4) to switch between the two modes.
- In single ranging mode, short press the **Up/Ranging** button (4) is required for ranging.
- In the continuous ranging mode, the distance of the target indicated by the cursor will be refreshed automatically every 1 second, without any keystroke operation.
- Ranging range and accuracy is 600m±1m, and it will be affected by fog and heavy rain and other weather.
- After the distance measurement is completed, short press the **Power** button (6) to exit the laser ranging function.

### Note

- ★ The laser function depends on the legal restrictions of different countries and regions.
- As with any laser device, it is not recommended to directly view the emissions for long periods of time with magnified lenses.
- The laser will be off automatically while in the standby mode.

## SHORTCUT MENU FUNCTION

The basic settings (use of the smooth digital zoom function, display brightness adjustment, image mode and sharpness adjustment) are changed via the Shortcut Menu.

- In the home screen, by pressing the **Menu** button (5) to enter shortcut menu 1-shortcut menu 2-exit the menu accordingly.
- After entering the menu, press the **Up** button (4) to set the parameters at the top of the screen and press the **Down** button (3) to set the parameters at the bottom of the screen.

**Smooth Digital Zoom**- by pressing the **Up** button (4) to change the digital zoom value from 1.0 to 4.0 in the shortcut menu 1.

**Image Mode**- by pressing the **Down** button (3) to change the image mode in the shortcut menu 1. The icons from left to right are white hot, black hot, red hot, hot target highlight, ironbow and rainbow.

**Display Brightness**- by pressing the **Up** button (4) to change the display brightness level from 1 to 4 in the shortcut menu 2.


**Image Sharpness**- by pressing the **Down** button (3) to change the image sharpness level from 1 to 4 in the shortcut menu 2.

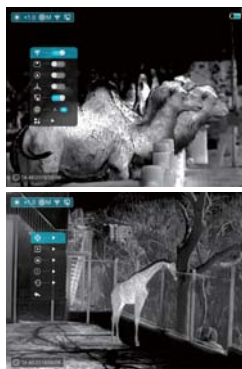


## MAIN MENU FUNCTIONS



- Enter the menu with a long press of the **Menu** button (5) in the home screen.
- Press the **Up** (4) / **Down** (3) buttons to move through the menu functions, and the background of the option will become blue simultaneously.
- Press the **Menu** button (5) to set the parameters of the current option, or open the menu item.




- On the "More " option, short press the **Menu** button (5) to enter the sub menu for more settings.
- The button operation of the sub menu is the same as that of the Main Menu.
- To exit the menu, press and hold down the **Menu** button (5).
- An automatic exit from the menu occurs after 10 seconds of inactivity.




#### Composition and Description of the Main Menu


-  **Wi-Fi** - Selection of the Wi-Fi function
  - Press and hold the Menu button (5) to enter the menu.
  - Select the 'Wi-Fi' option.
  - A short press of the Menu button (5) switches the Wi-Fi on/off.
  - The Wi-Fi icon is displayed in the upper-left status bar when it is on.
-  **PIP Mode** - Selection of the Picture in Picture Mode
  - Press and hold the Menu button (5) to enter the menu.
  - Select the 'PIP Mode' option.
  - Switch the mode on/off with a short press of the Menu button (5).
  - A 2x magnified image in a separate 'window' appears at


the top of the display simultaneously with the main image.

-  **Digital Compass** - Selection of the Digital Compass
  - Press and hold the Menu button (5) to enter the menu.
  - Select the 'Digital Compass' option.
  - A short press of the Menu button (5) switches the compass on/off.
  - The compass bearing is displayed in the top center of the image.

-  **Motion Sensor** - Selection of the Motion Sensor
  - Press and hold the Menu button (5) to enter the menu.
  - Select the 'Motion Sensor' option.
  - A short press of the Menu button (5) switches the Motion sensor on/off.
  - When enabled, relevant functions will appear on the right side of the image.



-  **Automatic Display-off** - Selection of the Automatic Display-off
  - Press and hold the Menu button (5) to enter the menu.
  - Select the 'Automatic Display-off' option.
  - A short press of the Menu button (5) switches on/off.
  - The icon is displayed in the upper-left status bar when it is on.

-  **Calibration Mode** - Selection of calibration mode. There are two calibration modes: automatic(A) and manual(M).
  - Press and hold the Menu button (5) to enter the menu.
  - Select the 'Calibration Mode' option.
  - A short press of the Menu button (5) to select A or M.

#### Automatic(A) A

Calibration requirements in the automatic mode are determined by the software algorithm, with the calibration process being started automatically.

#### Manual(M) M



The user independently sets the calibration requirements according to the image being observed.

#### More - Get more settings

- Press and hold the Menu button (5) to enter the menu.
- Select the 'More' option.
- A short press of the Menu button (5) to enter the sub menu for more settings.

#### Ranging Cursor Calibration(Only for FL25R/FH25R)

When the target position pointed by the rangefinder is not consistent with the cross-cursor position on the display, this function can be used to correct the cross-cursor position.

- Open the sub menu by pressing the Menu button (5).
- Select the 'Ranging Cursor Calibration' option
- Enter the Ranging Cursor Calibration interface with a short press of the Menu button (5).
- A white cross cursor will appear on the display.
- A tooltip will appear at the bottom of the display, which displays the moving direction (horizontal  and vertical  directional arrows) and the position of the cursor.
- The horizontal and vertical directional arrows indicate to move the cursor with the coordinates along the X and Y axes.
- A short press of the Menu button (5) switches the cursor direction from the horizontal to the vertical and vice versa. The icon and text will be changed from white to blue when this direction is activated.
- Use the Up (4)/Down (3) buttons to move the cursor to align its center with the position indicated by the rangefinder. And with a short press to move 1 pixel and long press to move 10 pixels each time.
- To exit and save the Ranging Cursor Calibration function,



press and hold down the Menu button (5).

- No operation within the 30s will exit the interface without saving data.



#### Defective Pixels Calibration

When using the device, defective (broken) pixels may appear on the sensor: i.e., bright or dark points of constant brightness that are visible on the image. Finder Series offers the possibility of removing any defective pixels on the sensor, as well as to cancel any deletion.

- Open the sub menu by pressing the Menu button (5).
- Select the 'Defective Pixels Calibration' option
- Enter the Defective Pixels Calibration interface with a short press of the Menu button (5).
- A white cross cursor will appear on the display.
- A 2x magnified image of the cross cursor area (PIP) will appear on the lower-left corner of the display that is required to facilitate a search for the defective pixel and to align the marker with it.
- A tooltip will appear at the bottom of the display, which displays the current number of defective pixels calibrated, the moving direction (horizontal  and vertical  directional arrows) and the position of the cursor.
- The horizontal and vertical directional arrows indicate to move the cursor with the coordinates along the X and Y axes.
- A short press of the Menu button (5) switches the cursor direction from the horizontal to the vertical and vice versa. The icon and text will be changed from white to blue when this direction is activated.

- Use the Up (4)/Down (3) buttons to move the cursor to align its center with the defective pixel. With a short press to move 1 pixel and long press to move 10 pixels each time.
- After the cursor aligns with the defective pixel, delete the defective pixel with a short press of the Power button (6).
- Then, by moving the cursor across the display, you can delete the next defective pixel.
- Short press the Power button (6) again in the same position to undo the calibration.
- Each time you add or reduce a blind pixel, the number of defective pixels calibrated in the tooltip will change accordingly.
- Long press the Power button (6) to cancel all calibrations done this operation.
- When the cursor is moved near the PIP and prompt box, the PIP and prompt box are automatically moved to the top of the display.
- To exit and save the Defective Pixels Calibration function, press and hold down the Menu button(5).
- No operation within the 30s will exit the interface without saving data.



#### Ⓐ Calibrate the digital compass

- Open the sub menu by pressing the Menu button (5).
- Select the 'Compass Calibration' option with the Up (4) / Down (3) buttons.
- Enter the compass calibration interface with a short press of the Menu button (5).
- An icon like a triaxial coordinate system appears on the screen.
- Rotate the device in three axial directions in 30 seconds

according to the direction shown as the icon to complete the compass calibration.

- Each axis completes at least one rotation of 360°.

#### ① System Information - View system information of this device

- Open the sub menu by pressing the Menu button (5).
- Select the 'System Information' option
- Open the system information box with a short press of the Menu button (5).

#### ⌚ Factory Reset - Restore Factory Settings

- Open the sub menu by pressing the Menu button (5).
- Select the 'Factory Reset' option
- Enter the 'Factory Reset' sub menu with a short press of the Menu button (5).
- Select the option '✓' to reset to factory settings or '✗' to cancel with the Up (4) / Down (3) buttons.
- Confirm your selection with a short press of the Menu button (5).

The following settings will be restored to their factory state before being set by the user:

**Image Mode** -white hot

**Digital Zoom** -x1

**Display Brightness** - level 3

**Image Sharpness** - level 1

**Calibration mode** -automatic

**Wi-Fi** - off

**PIP** - off

**Compass** - off

**Motion sensor** - off

**Automatic Display** - off



#### ⬅ Return To The Main Menu

- Open the sub menu by pressing the Menu button (5).
- Select the 'Return to Main Menu' option
- Return to the main menu with a short press of the Menu button (5).


## Wi-Fi FUNCTION

The device is equipped with wireless communication with external devices (computer, smartphone) via Wi-Fi.

- Press and hold the **Menu** button (5) to enter the menu.
- Select the 'Wi-Fi' option.
- A short press of the **Menu** button (5) switches the Wi-Fi on.
- The device is recognized by an external device under the label 'Finder\_XXXXXX', where XXXXXX are six digits.
- Enter the password on an external device, and establish a connection. The initial password is 12345678.
- And then, the device can be controlled through the APP.

### Set Wi-Fi name and password

The Wi-Fi name and password of your device can be set in the APP.

- Click the "setting" icon  in the APP to enter the setting interface.
- In the text box, enter and submit the name (SSID) and password of the new Wi-Fi.
- It needs to restart the device to take the new name and password effect.

### Note

- Once factory settings are restored, the date and time as well as Wi-Fi name and password are also restored to factory settings.

## PIP FUNCTION

PIP (Picture in Picture) function enables you to view a magnified digital zoom image in a separate 'window' simultaneously with the main image.

- Press and hold the **Menu** button (5) to enter the menu.
- Select the 'PIP Mode' option.
- A short press of the **Menu** button (5) switches the mode on/off.
- A separate window appears at the top of the display simultaneously with the main image.
- The image in the separate window is captured from the center area of the main image and then 2x magnified.

## EXTERNAL BATTERY

In addition to a rechargeable li-ion battery pack, the FL25/FH25 can also use an 18500 rechargeable battery to extend working time.

The actual battery life is related to battery performance and brand. A dual battery icon will appear on the display interface, where 1 represents the power of the built-in battery and 2 represents the power of the 18500 battery.

- In the case of dual batteries, 18500 batteries are preferred;
- When USB for power supply, only the built-in battery will be charged. Meanwhile, the battery icon 1 turns blue and the charging icon is displayed.
- The blue battery icon indicates the battery is working.



## UPDATE AND APP TECHNOLOGY

In order to continuously improve the product performance and provide better user experience, the software program, as well as parameters and operating instruction of the device will be constantly updated. Users can go to the official website ([www.xinfrared.com](http://www.xinfrared.com)) to download and update.

The Finder series support APP technology, and can be connected to a smartphone or tablet PC via Wi-Fi for real-time image transmission, control operations, and program updates.

Users can go to the official website ([www.xinfrared.com](http://www.xinfrared.com)) or search **Infiray Outdoor** in the App store to download and install the APP. Instructions for using **Infiray Outdoor** can also be downloaded from the official website.

## TECHNICAL INSPECTION

A technical inspection of the device is recommended before use.

- Check the external appearance of the device (there should be no cracks in the casing).
- Check the condition of the lens and eyepiece (there should be no cracks, greasy spots, dirt or other deposits)

- Check the condition of the rechargeable battery (this should be charged) and the electrical contacts (there should be no presence of salts or oxidation).

## MAINTENANCE

Maintenance should be carried out at least twice a year and consist of the following actions.

- Wipe the external surfaces of metal and plastic parts free of dust and dirt with a cotton cloth. Silicone grease maybe used for this.
- Clean the electrical contacts of the battery and battery slot on the unit using a non-greasy organic solvent.
- Check the glass surfaces of the eyepiece and the lens. If necessary, remove dust and sand from the lenses (preferably using a non-contact method). Cleaning of the external surfaces of the optics should be done with substances designed specially for this purpose.

## TROUBLESHOOTING

This table lists all the problems that may arise when operating the device. Carry out the recommended checks and repairs in the order shown in the table. If a defect should occur that is not listed in the table, or if it is impossible to repair the defect yourself, the device should be returned for repair.

Malfunction	Possible reason	Correction
Thermal imager does not power up.	Battery completely discharged	Charge the battery
Does not operate from external power source.	USB cable damaged	Replace USB cable
	External power source discharged	Charge external power source (if necessary).
Image is unclear, with vertical lines and uneven background	Calibration required	Perform image calibration according to Section 9 'Calibration' of the Manual
The image is too dark.	Low brightness level set.	Adjust display brightness.

Malfunction	Possible reason	Correction
Colored lines appeared on display or the image has disappeared.	The device was exposed to static electricity during operation.	After exposure to static electricity, the device may either reboot automatically or require turning off and on again.
Poor image quality/ reduced detection distance	These problems may occur during observation in difficult weather conditions(snow, rain, fog, etc. ).	
Smartphone or tablet cannot be connected to the device	The device password has been changed.	Delete the network and reconnect using the device password
	The device is in an area with a large number of Wi-Fi networks that may cause interference.	To ensure stable Wi-Fi operation, relocate the device to an area with fewer Wi-Fi networks, or into an area with none.
Wi-Fi signal non-existent or interrupted	The device is outside the area of Wi-Fi coverage. There are obstacles between the device and the receiver (e.g. concrete walls.)	Relocate the device into direct line of sight of the Wi-Fi signal.
When used in low-temperature conditions, the image quality of the surroundings is worse than in positive temperature conditions.	In positive temperature conditions, objects being observed (surroundings and background) heat up differently because of thermal conductivity, thereby generating a high-temperature contrast. Accordingly, the image quality produced by the device will be higher.	
	In low-temperature conditions, objects being observed (background) do, as a rule, cool down to roughly the same temperature because of which temperature contrast is substantially reduced and the image quality (detail) is poorer. This is a feature of thermal imaging devices.	