# InfiRay

FL25R/FH25R

# FINDER
### Thermal Imaging Monocular

# Operating Manual

## InfiRay

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# 警告！
# WARNING!





wavelength: 635nm

maximum power: < 5mW

# ENGLISH

## SPECIFICATION

| Model | FL25R | FH25R |
|---|---|---|
| **Microbolometer** | | |
| Resolution, pixels | 384 x 288 | 640 x 512 |
| Pixel size, µm | 12 | |
| NETD, mk | ≤40 | |
| 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 | N/A | |
| Max. battery life(t=25°C)*, h | 6 | |
| Laser rangefinder range, m | 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.

✴ **The laser and cursor function may be disabled due to the legal restrictions in your countries and regions.**

❖ 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
- Portable Bag
- 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

- 12μm thermal imaging detector
- High image quality
- Integrated laser rangefinder
- Infrared sensors switch
- Display off function
- Lightweight and compact
- HD micro display
- Long detection distance
- Ultraclear mode for harsh weather conditions
- Cool hue and warm hue for selection
- Build-in memory
- Support photo and video recording
- Support APP connection via Wi-Fi
- Built-in digital compass and motion sensor
- Convenient user interface

## 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. Laser indicator
11. Laser rangefinder
12. Type C connector
13. Eyepiece diopter adjustment



LED indicator displaying the current status of the device

| LED Color | LED Status | Operating Mode |
|---|---|---|
| ● (green) | Normal | Power on/ fully charged |
| | Flashing | Standby |
| ● (red) | 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 | | — |
| | Laser ranging mode | Exit laser ranging mode | | Power off the device |
| | Laser cursor calibration | Return the cursor to the image center | | — |
| **Menu button** | 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 | — |
| | Shortcut menu 2 | Exit the shortcut menu | Open shortcut menu 1 | — |
| | Main menu | Confirm value, enter menu option | | Exit menu option/ main menu |
| | Laser cursor calibration/ Defective pixels calibration interface | Switch cursor movement direction | | Save and 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 | | — |
| | Laser 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 | | — |
| | Laser 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: **White Hot** |
| ☾ | Image mode: **Black Hot** |
| 🔥 | Image mode: **Red Hot** |
| 🕊 | Image mode: **Hot Target Highlight** |
| ▬ | Image mode: **Ironbow** |
| ▬ | Image mode: **Rainbow** |
| ×1/×1.5/×2/×2.5/×3/×3.5/×4 | Digital zoom |
| ☼ ☼ ☼ ☼ | Display brightness |
| ⛰ ⛰ ⛰ ⛰ | Image sharpness |
| ⊛A | Automatic calibration |
| ⊛M | Manual calibration |
| 👁 | Ultraclear mode |
| 📶 | Wi-Fi |
| 🎞▶  🎞▶Out | Video out |
| ▣ | PIP |
| ⊙ | Digital compass |
| ⚖ | Motion sensor |
| ▭🔒 | Auto display off |
| ⊛ | Calibration mode |
| ❈ | Image Hue |
| ▪◇ | More |
| ✛ | Laser cursor calibration |
| ⊞ | Defective pixel calibration |
| ⊛ | Compass calibration |
| ◷ | Time and Date |
| ⓘ | System information |
| ↺ | Factory reset |
| ← | Return to the Main Menu |

| | |
|---|---|
|  | Single ranging |
|  | Continuous ranging |
|  | Battery indication (FL25R/FH25R) |
|  | Battery charging |

## 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 (11) 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 (7) shows red when changing 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 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 (8)**.
- Press and hold the **Power(6)** button to power on the device when the boot screen appears. Enter the home screen after 3s.
- Adjust the resolution of the icons on the display by rotating the **eyepiece diopter adjustment (12)**.
- To focus on the object observed, rotate the **lens focus ring (9)**.
- 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), Ultraclear mode (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.
  - ➢ 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 reset the system time in the **Main Menu** or 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 build-in memory card.

### Video Recording
- In the home screen, press and hold the **Down/Photo** button (3) to start video recording.
- A tooltip ⏺ 00:01 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 photo 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.
➢ The recording time is accumulated in minutes until the recording stops, that is, the time shows 60:00 after 59:59.
➢ The maximum duration of a video recording file is 10 minutes. When it's more than 10 minutes, 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 photos 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" 📱 Infiray – then click and open the device named "Internal Storage" to access memory.
- There are different folders named by time in memory 📁 20200327 .
- 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 videos) which is NOT reset.

## | LASER AND LASER RANGEFINDER FUNCTION

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

### Laser Indication Function

- Turn the laser indicator (13) 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 Rangefinder Function

- Short press the **Up/Ranging** button (4) to switch on the laser rangefinder 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 the 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.
- The measurement range and accuracy is 600m±1m, and it will be affected by fog and heavy rain and other weather.
- After the measurement is completed, short press the **Power** button (6) to exit the laser rangefinder 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.
- An automatic exit from the menu occurs after 10 seconds of inactivity. Also, it will return to the home screen quickly with a short press the **Power** button (6).
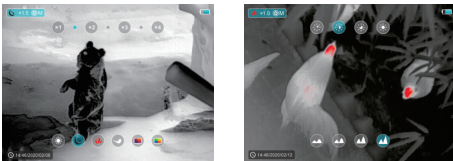


## MAIN MENU FUNCTIONS

- 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. Also, it will return to the home screen quickly with a short press the **Power** button (6).
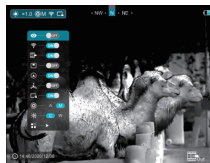


**Composition and Description of the Main Menu**

- 👁 **Ultraclear** – Selection of the Ultraclear mode
  - Press and hold the Menu button (5) to enter the menu.
  - Select the 'Ultraclear' option.
  - Short press Menu button (5) to turn the Ultra-clear on/off.
  - When the Ultraclear mode is on, the image contrast is enhanced, which is suitable for rainy, foggy and other harsh weather conditions.

- 📶 **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.

**Video Out**–Selection of the video out function
- Press and hold the Menu button (5) to enter the menu.
- Select the 'Video out ' option.
- A short press of the Menu button (5) switches the video out on/off.
- The Video out icon is displayed in the lower-right corner 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.
- Switch the Motion sensor function on/off with a short press of the Menu button(5) .
- When enabled, relevant functions  will appear on the right side of the image, that the horizontal scale plate represents the dip angle, while the vertical represents the pitch angle.



**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.

**Image Hue** – Selection of image hue. There are two hues for selection: cool hue(C) and warm hue(W).
- Press and hold the Menu button (5) to enter the menu.
- Select the 'Image Hue' option.
- A short press of the Menu button (5) to select C or W.
- The switch between the warm and cool hues is not applicable to the Pseudo Color mode.

**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.

**Laser Cursor Calibration**
When the target position pointed by the laser is not consistent with the laser cursor position, this function can be used to correct the cursor position.
- Open the submenu by pressing the Menu button (5).

- Select the 'Laser Cursor Calibration' option
- Enter the Laser Cursor Calibration interface with a short press of the Menu button (5)- the laser cursor appears on the screen, and a tooltip appears at the bottom of the screen.
- The tooltip displays the moving direction (horizontal ↔ and vertical ↕ directional arrows) and distance (the position of the cursor).
- The laser indicator will automatically turn on.
- The horizontal and vertical arrows indicate to move the laser 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.
- The laser cursor can be restored to the center of the screen with a short press of the Power button (6).
- To exit and save the Laser Calibration function, press and hold down the Menu button (5).



⊞ 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 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 10s will exit the interface without saving data.

(✪) **Compass Calibration** – 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 at least one 360° in three axial directions in 15 seconds according to the direction shown as the icon to complete the compass calibration.
- Press the Power button (6) briefly to terminate and exit the calibration without saving within 30 seconds.

(🕐) **Time Settings** – Reset the system date and time
- Open the sub menu by pressing the Menu button (5).
- Select the 'Time Settings' option
- Enter the time settings interface with a short press of the Menu button (5), that is displayed as Year. Month. Day | Hour: Minute format.
- Short press the Menu (5) button to switch between digits.
- Select the correct value with a short press of the Up (4)/ Down (6) button.
- Long press the Menu button (5) to exit to the upper interface.

(ℹ) **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).
- Long press the Menu button (5) to exit to the upper interface.

(↻) **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 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
**Image hue** – warm
**System time** – 00:00 2020/01/01
**Ultraclear mode / Wi-Fi** – off
**Video out / PIP / Compass /** – off
**Motion sensor / Automatic Display** – off

⚠ **Note**
➢ Restore factory settings will format memory, so please save the date in advance.

(↩) **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_xxxxx–xxxxxx', xxxxx–xxxxxx is the SN code of the device.
- 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
➢ When factory Settings are restored, the Wi-Fi name and password are also restored to factory default 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
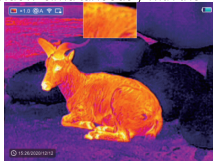
- The image in the separate window is captured from the center area of the main image and then 2x magnified.

## 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.infirayoutdoor.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.infirayoutdoor.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 contracts (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). |

| Malfunction | Possible reason | Correction |
|---|---|---|
| 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. |
| 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 wit 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. | |

# FCC STATEMENT

● **Labeling requirements**

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.

**Information to user**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Information to the user**

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.

**Body Operation**

This device was tested for typical body-support operations. To comply with RF exposure requirements, a minimum separation distance of 0.5cm must be maintained between the user's body and the handset, including the antenna. Third-party belt-clips, holsters, and similar accessories used by this device should not contain any metallic components. Body accessories that do not meet these requirements may not comply with RF exposure requirements and should be avoided. Use only the supplied or an approved antenna.

简体中文

## 规格参数

| 产品型号 | FL25R | FH25R |
|---|---|---|
| **探测器参数** | | |
| 分辨率 | 384×288 | 640×512 |
| 像元尺寸, um | 12 | |
| NETD, mk | ≤40 | |
| 帧频, Hz | 50 | |
| **光学参数** | | |
| 镜头焦距, mm | 25 | |
| 视场角 | 10.5°×7.9° | 17.5°×14.0° |
| 光学变倍, × | 2.5~10.0 | 1.5~6.0 |
| 电子变倍, × | 1 /1.5/2/2.5/3/3.5/4 | |
| 最小聚焦距离, m | 1 | |
| 出瞳距离, mm | 20 | |
| 视度调节, D | -4D~+5D | |
| 探测距离, m<br>（目标：1.7m×0.5m, P(n)=99%） | 1298 | |
| **显示屏** | | |
| 类型 | LCOS | |
| 分辨率 | 1280×960 | |
| **物理参数** | | |
| 内置电池类型 | Li-ion | |
| 可替换电池类型 | N/A | |
| 工作时间 (t=25℃)*, h | 6 | |
| 激光测距*, m | 600±1 | |
| 内存容量, GB | 16 | |
| APP | 支持 | |
| 尺寸, mm | 70×52×130 | |
| 重量（不含可替换电池）, g | <320 | |

★ 实际使用时间取决于Wi-Fi以及视频录制等功能的使用强度。

★ **因您所在地区的法律限制, 激光和光标功能会被禁用。**

❖ 为了完善产品的使用特性, 其设计及软件程序可能会持续更新。

❖ 产品的技术参数如果改动, 将不另行通知。

## 包装清单

- Finder 系列红外热像仪
- 便携包
- Type C 数据线
- 电源适配器
- 手腕带
- 颈带
- 镜片擦拭布
- 合格证
- 操作手册

## 产品概述

Finder系列产品轻便易携带, 可单手操作, 体积小巧, 可随时随地放入口袋, 内置激光测距, 可快速定位目标距离, 其舒适的抓握性和强大的功能使Finder成为户外侦查的最佳选择。

## 产品特点

- 12μm自主研发探测器
- 图像质量高
- 激光测距功能
- 红外感应开关
- 高清显示大屏
- 结构紧凑, 小巧轻便
- 探测距离远
- 高帧频
- 内置存储空间, 支持拍照、录像
- 内置Wifi模块, 可连接APP
- 内置电子罗盘和运动传感器
- 支持盲元校正
- 支持自动关屏
- 操作简单友好

## 部件组成

1.目镜
2.红外感应开关
3.下键/拍照键
4.上键/测距键
5.菜单键
6.电源键
7.LED 指示灯
8.镜头盖
9.物镜调焦环
10.激光指示灯
11.激光测距仪
12.Type C 接口
13.视度调节旋钮



LED指示灯可以显示设备的当前状态

| LED灯颜色 | LED灯状态 | 设备状态 |
|---|---|---|
| ● | 常亮 | 设备开机/充电完成 |
| | 闪烁 | 待机 |
| ● | 常亮 | 正在充电 |
| | 闪烁 | 电池电量低于10% |

## 按键操作

| 按键 | 设备状态/当前操作模式 | 首次短按 | 再次短按 | 长按 |
|---|---|---|---|---|
| 电源键 | 关机状态 | —— | —— | 开机 |
| | 开机状态 | 待机 | 唤醒设备 | 关机 |
| | 盲元校正界面 | 添加盲元 | 撤销此处的盲元校正 | 撤销此次的所有盲元校正 |
| | 快捷菜单/主菜单界面 | 返回至主菜单界面 | 待机 | —— |
| | 激光测距界面 | 退出激光测距功能 | | 关机 |
| | 激光光标校准界面 | 光标一键回到中心位置 | | —— |
| 菜单键 | 开机状态 | 打开快捷菜单1 | 打开快捷菜单2 | 打开主菜单 |
| | 快捷菜单1 | 打开快捷菜单2 | 退出快捷菜单 | 退出快捷菜单 |
| | 快捷菜单2 | 退出快捷菜单 | 打开快捷菜单1 | 退出快捷菜单 |
| | 主菜单界面 | 确定参数,进入菜单选项 | | 退出主菜单 |
| | 激光光标校准/盲元校正界面 | 切换光标的移动方向 | | 保存并退出校准 |
| 上键/测距键 | 开机状态 | 开启激光测距功能 | | 开启/关闭激光 |
| | 激光测距 | 单次测距 | | 切换测距模式 |
| | 快捷菜单1 | 切换电子变倍 | | —— |
| | 快捷菜单2 | 屏幕亮度调节 | | —— |
| | 主菜单界面 | 向上滚动菜单选项 | | —— |
| | 激光光标校准/盲元校正界面 | 向上/右移动1个像素 | | 向上/右移动10个像素 |
| 下键/拍照键 | 开机状态 | 拍照 | | 开启视频录制 |
| | 录像 | 拍照 | | 停止/保存录像 |
| | 快捷菜单1 | 切换图像模式 | | —— |
| | 快捷菜单2 | 图像锐度调节 | | —— |
| | 主菜单界面 | 向下滚动菜单选项 | | —— |
| | 激光光标校准/盲元校正界面 | 向下/左移动1个像素 | | 向下/左移动10个像素 |
| 上键+下键 | 开机状态 | 快门校正 | | 背景校正 |

## 菜单/状态栏图标说明

| 图标 | 说明 |
| --- | --- |
| ☀ | 白热 |
| ☾ | 黑热 |
| 🔥 | 红热 |
| 🐦 | 目标凸显 |
| ▦ | 铁红 |
| ▦ | 彩虹 |
| ×1/×1.5/×2/×2.5/×3/×3.5/×4 | 电子变倍 |
| ☼ ☼ ☼ ☼ | 屏幕亮度 |
| ▲▲ ▲▲ ▲▲ ▲▲ | 图像锐度 |
| ⊛A | 自动校正模式 |
| ⊛M | 手动校正模式 |
| ◉ | 超清模式 |
| 📶 | WiFi |
| ▦▶ ▦Out | 视频输出 |
| ◐ | 画中画 |
| ◬ | 电子罗盘 |
| ⊥ | 运动传感器 |
| ▭🔒 | 自动关屏 |
| ⊛ | 校正模式 |
| ✳ | 色调选择 |
| ▦ | 更多 |
| ⊕ | 测距光标校准 |
| ⊞ | 盲元校正 |
| ◷ | 时间设置 |
| ◉ | 罗盘校准 |
| ⓘ | 系统信息 |
| ↺ | 恢复出厂设置 |
| ↰ | 返回主菜单 |

| 图标 | 说明 |
| --- | --- |
| ▦• | 单次测距 |
| ▦••• | 连续测距 |
| 🔋 | 电池电量指示(FL25R/FH25R) |
| 🔋⚡ | 电池充电 |

## 电池充电

　　Finder系列内置可充电的锂离子电池,正常工作时间可长达6小时。首次使用前,请先充满电。

● 将自带的数据线的Type C端插入Finder上的Type C接口(11);

● 将数据线另一端连接适配器,将适配器插入电源插座进行充电,或者直接连接输出电压为5V的移动电源充电;

● 充电时,电池图标上会出现一个类似闪电的充电图标⚡,设备上的LED指示灯(7)会显示为红色;当LED指示灯变成绿色时,表示充电完成。

● 使用过程中,电池图标变成 ▭ 时,表示电量不足,请及时充电,以避免电池过放导致设备寿命降低。

**安全措施**

● 设备较长时间未用,应进行部分充电,不应完全充电或完全放电。

● 不要在把设备从寒冷的环境带到温暖的环境后立即给它充电,需等待预热30-40分钟。

● 如果充电器被修改或损坏,请不要使用。

● 设备应在0℃～+40℃的温度下充电,否则电池寿命会显著降低。

● 不建议将能量消耗大于允许值的第三方设备连接在一起。

● 设备配有短路保护系统,但是应该避免可能导致短路的情况。

● 设备建议使用温度为-10℃～+50℃,不要在温度超过此的温度范围内使用产品,这可能会缩短电池寿命。

● 当设备在零下温度下使用时,电池容量会下降。这是正常的,并不表示有缺陷。

## 开机运行

**警告！请勿将红外热像仪的镜头对准任何高强度的辐射源，如激光发射装置或太阳等。这可能会损坏设备中的电子元件。因不遵守操作指南而造成的损坏不在保修范围内。**

**运行**

- 打开**镜头盖**(8)，长按**电源键**(6)2秒，设备启动，等待3秒进入主界面，完成启动；
- 转动目镜的**视度调节旋钮**(12)，调节显示屏上图标的分辨率；
- 转动**物镜调焦环**(9)调节焦距；
- 另外，还可以在快捷菜单中调节图像模式、屏幕亮度、图像锐度以及放大倍数；
- 使用完成后，长按**电源键**(6)，当倒计时图标从3数到0时设备关机，松开按键，关机后当前状态将会被自动保存；
- 使用过程中，短按**电源键**(6)，开启待机功能（关闭显示屏，主芯片待机），让设备进入休眠状态，再次短按**电源键**(6)唤醒设备。

## 主界面状态

开机后进入主界面，在主界面上显示着设备的当前操作状态相关的信息。

**左上角：**当前图像模式、放大倍数、校正模式、Wi-Fi（开启状态）、自动关屏（开启状态）、超清模式（开启状态）；

**右上角：**电池电量信息；

**左下角：**时间日期；

**右下角：**视频输出图标（开启状态）。

---

电池图标的颜色代表着当前电池电量情况，当电池图标显示为红色时，表示电量不足，请及时充电。

| 电池图标 | 颜色 | 电量 |
|---|---|---|
|  | 蓝色 | 30%-100% |
|  | 橙色 | 10%-30% |
|  | 红色 | 电量低于10%，请及时充电 |
|  | -- | 正在充电 |

## 校正功能

当图像发生劣化或者不均匀时，可以通过校正进行改善。校正可以使探测器的背景温度得以平衡，可以消除图像中的缺陷。

校正的方式有手动校正(M)和自动校正(A)，在主菜单的校正部分选择所需要的模式。

- **手动模式(M)：**设备需要手动进行快门校正或者背景校正。在主界面下，短按**上键+下键**实现快门校正，长按**上键+下键**进行背景校正。背景校正时需要盖上镜头盖，校正完成后，取下镜头盖。
- **自动模式(A)：**设备会根据软件算法自动快门校正。

⚠️ **注意**

➢ 即使是在自动校正模式下，依然可以进行手动快门校正和手动背景校正。

## 拍照录像

Finder 系列内置存储空间，支持拍照录像。图像和视频的文件将会以时间命名，所以建议在使用拍照录像功能前，先在主菜单中完成时间设置（详见**主菜单-more-时间设置**），或者在APP的设置选项中完成时间的同步，具体操作可以通过公司网站下载APP的操作说明。

**拍照**

- 主界面下，短按**拍照键**(3)，进行拍照，画面卡顿0.5S，屏幕右上角出

现拍照图标 📷 ;
- 所拍摄的照片被保存在内置存储空间中。

**录像**

- 主界面下, 长按**拍照键(3)**, 进行录像;
- 显示屏左上角出现录制时间的提示框 ⬛ 00:01 ;时间格式为 MM:SS(分钟:秒);
- 录像过程中, 提示框左侧的红点闪烁出现;
- 在录像过程中, 短按**拍照键(3)**可以进行拍照操作;
- 长按**拍照键(3)**, 停止并保存录像;
- 所拍摄的视频和照片会被保存在内置的存储空间里。

> ⚠️ **注意**
> ➢ 视频录制过程中依然可以对菜单进行操作;
> ➢ 视频录制的时间以分钟的形式累加直至停止录制;
> ➢ 视频录制文件的最大持续时间为10分钟, 超过10分钟, 视频将被记录到一个新文件中;
> ➢ 文件的数量受到设备内置内存容量的限制。定期查看存储空间的余量, 将素材和照片传输到其他媒体以释放内存卡上的空间。

**内存访问**

当设备开机且连接到电脑时, 设备会被计算机识别为闪存卡, 用于访问设备内存, 进行图片和视频拷贝。
- 通过数据线将设备连接到电脑上;
- 设备开机运行;
- 双击电脑桌面上"我的电脑"-找到名称为"Infiray"的设备, 并双击打开 📁 Infiray -双击打开名称为"Internal Storage"的设备 💾 Internal Storage 14.6 GB 可用, 共 14.6 GB , 访问内存;
- 打开内存后出现以时间命名的不同文件夹 📁 20200327 , 命名方式是xxxx(年)xx(月)xx(日);
- 文件夹里存储的是当天拍摄的照片和录制的视频, 照片是以IMG_HHMMSS_XXX.jpg的格式, 视频VID_HHMMSS_XXX.mp4

(视频)保存到内置的存储卡上;HHMMSS-小时分钟秒;XXX -三位通用文件的流水码。
- 选择需要的文件或者文件夹进行拷贝或删除。

## 激光指示和测距

Finder系列内置激光功能, 可以进行激光指示以及激光测距。

**激光指示\***

- 在主界面下, 长按**测距键(4)**, 开启激光指示功能;
- 激光开启时屏幕同步出现一个红色的激光光标 ╋ ,指示激光的位置;
- 再次长按**测距键(4)**, 关闭激光。

**激光测距功能**

- 在主界面下, 短按**测距键(4)**, 开启测距模式, 激光光标自动开;
- 测距模式下, 屏幕下方出现测距提示框 ▥ 239m , 提示提示当前测距模式以及光标所指示的目标的距离;
- Finder系列有单次测距 ▥ 和连续测距 ▥ 两种测距模式可选, 长按**测距键(4)**进行两种模式的切换;
- 单次测距模式下, 需要短按**测距键(4)**进行测距;
- 连续测距模式下, 每间隔1s 会自动刷新光标所指的目标的距离无需按键操作;
- 测距范围是600m±1m, 测距范围和精度会受大雾大雨等天气影响下降;
- 测距完成后, 短按**电源键(6)**, 退出测距功能;

> ⚠️ **注意**
> ★ 激光功能取决于不同国家和地区的法律限制。
> ➢ 禁止直接观察激光源。
> ➢ 设备待机后, 激光会自动关闭;再次唤醒设备, 需重新开启激光。
> ➢ 开启激光测距模式时, 将不会自动开启激光功能。

## 快捷菜单

通过快捷菜单可以电子变倍、显示屏亮度、图像模式以及图像锐度等基本设置进行调节。

- 主界面下，通过短按**菜单键(5)**，依次进入快捷菜单1-快捷菜单2-退出快捷菜单；
- 进入快捷菜单后，短按**上键(4)**对上方图标参数进行循环调节，短按**下键(3)**对下方图标参数进行调节。



> ▸ **电子变倍：**在快捷菜单1下，短按**上键(4)**进行1-4倍循环放大；
> ▸ **图像模式：**在快捷菜单1下，短按**下键(3)**进行图像模式的循环切换，图标从左到右依次表示白热-黑热-红热-目标凸显-铁红-彩虹；
> ▸ **屏幕亮度：**在快捷菜单2下，短按**上键(4)**进行屏幕亮度1-4档的循环切换；
> ▸ **图像锐度：**在快捷菜单2下，短按**下键(3)**进行图像锐度1-4档的循环切换。

- 在快捷菜单下，10s内无按键操作或短按**电源键(6)**退至主界面。

## 主菜单

- 主界面下，长按**菜单键(5)**2秒，进入主菜单，选项包括：超清模式、Wi-Fi、模拟视频、PIP、罗盘、运动传感器、自动关屏、手动/自动快门、冷暖色调选择、更多(高级)。
- 短按**上键(4)**、**下键(3)**进行选项切换，切换到哪一选项，该选项的背景将变成蓝色；
- 短按**菜单键(5)**对当前选项的参数进行设置，或打开菜单选项；
- 在"更多"选项上，短按**菜单键(5)**，进入二级菜单，进行更多功能

的操作；
- 二级菜单的按键操作同一级菜单；
- 长按**菜单键(5)**或短按**电源键(6)**，退出高级菜单；
- 10秒内无按键操作自动退出。
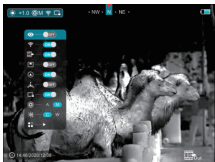


**主菜单功能及描述**

👁 **超清模式**——开启/关闭超清模式
- 长按菜单键(5)进入主菜单界面；
- 选择"超清模式"功能选项；
- 短按菜单键(5)开启/关闭超清模式；
- 超清模式可以使热像仪在大雾、雨雪等恶劣天气环境下，图像细节更丰富，开启时，状态栏图标提示。

📶 **Wi-Fi**——开启/关闭Wi-Fi
- 长按菜单键(5)进入主菜单界面；
- 选择"Wi-Fi"功能选项；
- 短按菜单键(5)开启/关闭Wi-Fi功能；
- Wi-Fi开启时左上角状态栏有Wi-Fi图标显示。

📲 **视频输出**——开启/关闭视频输出功能
- 长按菜单键(5)进入主菜单界面；
- 通过短按上键(4)或下键(3)，选择"视频输出"功能选项；
- 短按菜单键(5)开启/关闭模拟视频输出功能；
- 开启时右下角会出现视频输出的图标。

🖼 **画中画(PIP)**——开启/关闭画中画功能
- 长按菜单键(5)进入主菜单界面；
- 通过短按上键(4)或下键(3)，选择"画中画"功能选项；

- 短按菜单键(5)开启/关闭画中画功能；
- 开启时，一个独立的窗口现于顶部，显示被2倍放大的图像。

Ⓐ **电子罗盘**——开启/关闭电子罗盘功能
- 长按菜单键(5)进入主菜单界面；
- 通过短按上键(4)或下键(3)，选择"电子罗盘"功能选项；
- 短按菜单键(5)开启/关闭电子罗盘功能；
- 罗盘开启后，会在图像顶部中央位置显示罗盘方位。

⚘ **运动传感器**——开启/关闭运动传感器功能
- 长按菜单键(5)进入主菜单界面；
- 选择"运动传感器"功能选项；
- 短按菜单键(5)开启/关闭运动传感器；
- 开启后，相关功能显示于图像右侧，其中水平表示代表倾角，垂直标尺表示俯仰角。



▭ **自动息屏**——开启/关闭自动息屏功能
- 长按菜单键(5)进入主菜单界面；
- 选择"自动息屏"功能选项；
- 短按菜单键(5)开启/关闭自动息屏功能；
- 开启后，图像左上角状态栏会有图标提示。

✿ **校正方式**——选择校正模式
Finder系列有手动校正(M)和自动校正(A)两种校正模式。
- 长按菜单键(5)进入主菜单界面；
- 选择"校正模式"功能选项；
- 短按菜单键(5)在A和M之间进行起换；
- 图像左上角状态栏的图标也会随之变化。

✿A **自动校正**——此模式下的校正是由软件算法决定的，使用过程中会自动进行校正。

✿M **手动校正**——此模式下的校正是由用户根据观察到的图像效果来进行校正。

✴ **图像色调**——选择冷暖色调
Finder系列可以对图像进行冷色调(C)和暖色调(W)的切换。
- 长按菜单键(5)进入主菜单界面；
- 选择"图像色调"功能选项；
- 短按菜单键(5)在C和W之间进行起换；
- 冷暖色调的切换不适用于铁红和彩虹两种伪彩模式。

▦ **更多**——进行更高级功能的操作
- 长按菜单键(5)进入主菜单界面；
- 选择"更多"功能选项；
- 短按菜单键(5)进入更多的二级选项。

✛ **激光光标校准**
当激光指示灯(13)所指向的目标位置与屏幕中光标位置不一致时，可以通过此功能对光标位置进行校正。
- 通过菜单键(5)进入"更多"的二级菜单；
- 选择"激光光标校准"选项后，短按菜单键(5)进入激光光标校准界面；
- 当进入激光光标校准界面时，激光指示灯和激光光标会自动开启，并在图像下方出现提示框，显示光标的移动方向(水平方向↔和垂直方向↕)以及位置；
- 水平和垂直方向的箭头表示可以沿着X轴和Y轴移动光标；

- 短按菜单键(5)，进行光标移动方向的切换，切换到哪个方向，该方向的图标以及文字将会由白色变成蓝色；
- 通过上键(4)、下键(3)移动光标，使其中心与测距所指的位置对齐，短按按键每次移动1个像素，长按则每次移动10个像素；
- 短按电源键(6)，可以将光标一键恢复到中心位置
- 操作完成后，长按菜单键(5)，保存数据并退出。

⊞ **盲元校正**——对坏点进行校正

当使用该设备时，探测器上可能会出现有缺陷的像素，如图像上可见的不变亮度的亮点或暗点。此时，借助盲元校正功能可以删除探测器上这些有缺陷的像素，同时也可以取消这些坏点的校正。

- 通过菜单键(5)进入二级菜单
- 选择"盲元校正"功能选项；
- 短按菜单键(5)进入盲元校正界面；
- 此时，屏幕中央会出现一个白色的十字光标；
- 同时PIP自动开启，显示在屏幕左下角，并在图像下方出现提示框；
- 提示框中会显示当前盲元校正的数量，提示光标移动的方向（水平方向↔和垂直方向↕）以及该方向下移动的距离；
- 水平和垂直方向的箭头表示可以沿着X轴和Y轴移动光标



- 短按菜单键(5)，进行光标移动方向的切换，切换到哪个方向，该方向的图标以及文字将会由白色变成蓝色；
- 通过上键(4)、下键(3)移动光标，使其中心与有缺陷的像素对齐，短按则每次移动1个像素，长按则每次移动10个像素；
- 当光标移动至盲元位置后，短按电源键(6)，添加盲元，并完

成校正；
- 重复上述步骤，继续进行下一个盲元的校正；
- 在同一位置再次短按电源键(6)可取消该处盲元校正；
- 每次添加或者减少盲元，屏幕中信息框数量也会随之变化；
- 长按电源键(6)，撤销此次所有的操作；
- 当分划移动到PIP以及提示框附近时，PIP以及提示框会自动移动到顶部显示。
- 操作完成后，长按菜单键(5)，保存数据并退出。
- 10s内无按键操作会在不保存数据的前提下退出此界面。

⊛ **罗盘校准**——对电子罗盘进行校准
- 通过菜单键(5)进入二级菜单；
- 选择罗盘校准选项；
- 短按菜单键(5)进入罗盘校准界面；
- 在屏幕中央会出现一个类似三轴坐标系的图标；
- 按照图标所示的方向，在30秒内将设备分别进行三个轴向的旋转，完成罗盘校准，每个轴向至少旋转一周；
- 在30秒内，短按电源键可随时终止并退出校准。

🕐 **时间设置**——设置系统时间
- 通过菜单键(5)进入二级菜单；
- 选择"时间设置"功能选项；
- 短按菜单键(5)进入时间设置的二级界面；
- 在时间设置界面里，时间和日期是按照年.月.日|时:分的格式显示的；
- 短按菜单键(5)进行位置切换；
- 短按上键(4)、下键(3)进行数值的变化；
- 设置完成后，长按菜单键(5)保存并退出至上一级菜单。

① **系统信息**——查看系统信息
  - 通过菜单键(5)进入二级菜单;
  - 选择"系统信息"功能选项;
  - 短按菜单键(5)查看系统的相关信息。



↻ **恢复出厂设置**——恢复出厂的默认设置
  - 通过菜单键(5)进入二级菜单;
  - 选择"恢复出厂设置"功能选项;
  - 短按菜单键(5)出现恢复出厂设置选项;
  - 通过上键(4)/下键(3),选择"✓"或者"✕";
  - 选择"✓"恢复出厂设置,选择"✕"取消恢复;
  - 短按菜单键(5),执行选项并退出。
  恢复出厂设置后,以下设置将会被恢复到最初设置:

**图像模式**-白热
**电子变倍**-×1
**屏幕亮度**-3级
**图像锐度**-1级
**校正模式**-自动
**图像色调**-暖色调



**系统时间**-00:00 2020/01/01
**超清模式、Wi-Fi、视频输出**-关
**画中画、电子罗盘、运动传感器、自动息屏**-关

⚠ **注意**
➢ 恢复出厂设置会格式化内存,请提前保存资料。

↰ **返回至主菜单**——返回到主菜单
  - 通过菜单键(5)进入二级菜单;
  - 选择"返回至主菜单"功能选项;
  - 短按菜单键(5)返回到主菜单界面。

## Wi-Fi功能

Finder系列内置Wi-Fi模组,设备可以通过Wi-Fi与外部设备(电脑、智能手机)进行无线连接。

通过主菜单操作,开启设备上的Wi-Fi(具体操作详尽主菜单功能操作)。
  - 在外部设备上查找名称为"Finder_xxxxx-xxxxxx"的Wi-Fi,其中xxxxx-xxxxxx代表此设备的SN码;
  - 选择该Wi-Fi,输入密码并连接,初始密码为12345678;
  - Wi-Fi连接成功后,可以通过APP对设备进行操控。

**设置Wi-Fi名称和密码**
Finder系列支持用户在APP里修改设备Wifi的名称和密码。



  - 在APP里,找到"设置 ✿"图标,点击并进入设置界面;
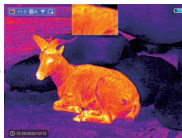  - 在文本框中,输入并提交新的Wifi的名称(ssid)和密码;
  - 提交完成后,需要重启设备才能生效。

⚠ **注意**
➢ 恢复出厂设置后,Wi-Fi的名称、密码以及系统时间也会被恢复到出厂默认的设置。

## 画中画(PIP)功能

画中画功能,就是在主图像的上方同时显示一个的单独"小窗口",可以查看主图中被2倍放大的部分图像。
  - 长按菜单键(5)进入主菜单界面;
  - 选择"画中画"功能选项;
  - 短按**菜单键(5)**开启画中画功能;
  - 长按**菜单键(5)**退出主菜单;
  - 此时,主图像顶部中央出现一个

小窗口；

- 小窗口中的图像是由主图像的中心截取部分区域的图像并进行2倍放大。

## 自动息屏功能

Finder系列在目镜旁边有一个红外感应开关，当开启自动息屏功能后，红外感应开关通过感应红外热量实现自动控制显示屏的开启和闭合。此功能既可节约电量延长设备运行时间，也有助于防止因疏忽而暴露。

- 长按**菜单键(5)**进入主菜单界面；
- 选择"自动息屏"功能选项；
- 短按**菜单键(5)**开启自动息屏功能；
- 开启后，当产品远离眼睛，红外感应开关接收不到热量感应，会自动关闭显示屏；
- 此时设备依然处于正常工作状态，且如果需要，可以直接关闭设备；
- 当将产品靠近脸部时，红外感应开关自动感应到红外热量，可以迅速点亮显示屏。

## 产品更新及APP说明

为了完善产品使用性能，设备的软件程序、性能参数、使用说明等会持续更新，用户可自行去官网进行下载与更新（www.**infirayoutdoor.com**）。

Finder系列热成像仪支持APP技术，可以通过Wi-Fi连接到智能手机或平板电脑，进行图像的实时传输、控制操作以及程序更新。

用户可以去官网（www.**infirayoutdoor.com**）或者在应用商店里搜索**InfiRay Outdoor** 进行APP的下载与安装。

关于**InfiRay Outdoor** 的操作手册也可以去官网进行下载。

## 技术检查

建议在每次使用前对设备进行一次技术检查。

- 检查设备的外观(外壳无裂纹)。
- 检查镜片及目镜状况(无裂纹、油污、污垢或其他沉淀物)
- 检查电池的状态(应提前完成充电)和电气接触(不应存在盐或氧化)。

## 产品维护

产品维护应至少每年进行两次，并包括以下内容。

- 用一块棉布擦拭金属和塑料部件的外部表面，清除灰尘和污垢，擦拭过程中可能会用到硅脂。
- 使用不油腻的有机溶剂清洁电池的电接点和电池槽。
- 检查目镜和镜头的玻璃表面。如有必要，清除镜片上的灰尘和沙子(最好使用非接触式方法)。光学表面的清洁应该使用专业的擦拭工具和溶剂来完成。

## 故障排除

下面这张表列出了操作设备时可能出现的所有问题。按照列表中的建议进行检查和修理。如果出现了表中没有列出的故障，或者无法自己修复缺陷，应该将设备返厂或者供货商进行检修。

| 故障 | 可能的原因 | 解决办法 |
|---|---|---|
| 热像仪无法启动 | 电池没电 | 充电 |
| 不能进行外部电源供电 | USB线损坏 | 更换USB线 |
| | 外部电源电量不足 | 如有必要，检查外部电源 |
| 图像不清晰、出现异常或背景不均匀 | 需要校正 | 根据此手册中的第9节进行图像校正 |
| 图像太黑 | 屏幕亮度低 | 调节屏幕亮度低 |
| 图像质量差或者探测距离缩短 | 这些问题可能由于在恶劣天气条件下(雪、雨、雾等)使用造成的。 | |
| 无法与智能手机或者电脑连接 | Wi-Fi密码不正确 | 输入正确的密码 |
| | 设备所在的范围内，Wi-Fi网络太多，可能会造成干扰 | 为了确保稳定的Wi-Fi运行，可以将设备转移到Wi-Fi网络较少的区域，或者转移到没有Wi-Fi网络的区域。 |
| Wi-Fi 信号消失或者被中断. | 设备不在Wi-Fi覆盖范围内；或者设备和接收器之间有障碍物(如混凝土墙)。 | 将设备重新安置到能直接看到Wi-Fi信号的地方。 |
| 当在低温条件下使用时，环境的成像质量比在正温度条件下差 | 在零上的温度条件下，被观察的物体(环境和背景)由于导热系数不同而升温不同，从而产生高温反差，因此图像质量将会更高。在低温条件下，被观察到的物体(背景)通常会冷却到大致相同的温度，这是因为温度对比度大大降低，图像质量(细节)较差，这是热成像设备的一个特点。 | |