



FL35R/FH35R

# FINDER II

Thermal Imaging Monocular

# Operating Manual



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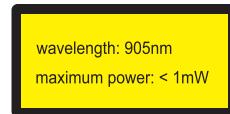
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## WARNING!



## SPECIFICATION

Model	FL35R	FH35R
<b>Microbolometer</b>		
Resolution, pixels	384 x 288	640 x 512
Pixel size, $\mu\text{m}$		12
NETD, mK	$\leq 40$	$\leq 35$
Frame refresh rate, Hz		50
<b>Optical Specifications</b>		
Objective Lens, mm	35 / F1.0	
Field of view, degree	7.5 x 5.7	12.6 x 10.1
Optical magnification, x	3.4 ~ 13.6	2 ~ 8
Digital zoom, x	1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4	
Minimum focusing distance, m	1	
Focusing range of eyepiece, D	$-5 \sim +5$	
Detection range, m (Target size: 1.7mx0.5m, P(n)=99%)	1818	
<b>Display</b>		
Type	OLED	
Resolution, pixels	1024 x 768	
<b>Operational Specifications</b>		
Battery type	Li-ion battery pack	
Max. battery life( $t=25^\circ\text{C}$ )*, h	6	5.5
Laser rangefinder range, m	$800 \pm 1$	
Amount of built-in memory, GB	32	
APP compatibility	Support	
Dimension, mm	160 x 90 x 50	
Weight, g	$\leq 400$	
IP code	IP67	
Operation temperature, $^\circ\text{C}$	$-20 \sim +50$	

\* Actual operation time depends on the intensity of Wi-Fi use and the built-in video recorder.

## PACKAGE CONTENTS

- Finder II Thermal Monocular
- Portable Bag
- Type C USB cable
- HDMI cable
- Power adapter
- IPB-2 battery pack \*2
- IBC-2 battery charger
- Hand strap
- Neck strap
- Cloth for cleaning optics
- Operating manual

\* 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.

## DESCRIPTION

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

## DISTINGUISHING FEATURES

- 12 $\mu\text{m}$  thermal imaging detector
- High image quality
- Integrated laser rangefinder
- Display off function
- OLED display
- Long detection distance
- Ultraclear mode for harsh weather conditions

- Cool hue and warm hue for selection
- 32GB Build-in memory
- Support photo and video recording
- Support APP connection via Wi-Fi
- Built-in digital compass and motion sensor
- Replaceable Battery Pack
- Convenient user interface

## UNITS AND CONTROLS

1. Lens cap
2. Lens focus ring
3. Power button
4. Menu button
5. Up/Ranging button
6. Down/Photo button
7. Laser rangefinder
8. IBP-2 battery pack
9. Eyepiece
10. Infrared sensors switch
11. Eyepiece diopter adjustment
12. LED indicator
13. Type C port
14. HDMI port



LED indicator displaying the current status of the device

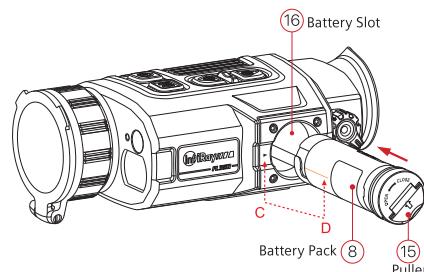
LED Color	LED Status	Operating Mode
●	Normal	Fully charged
	Flashing	Standby
●	Normal	Charging
	Flashing	Less than 10% battery level

## BATTERY AND SAFETY

Finder II series is supplied with a quickly removable 18650 Li-ion battery pack, which enabled the device to be used for up to 5.5h. The battery should be fully charged before first use.

### Battery Pack Installation

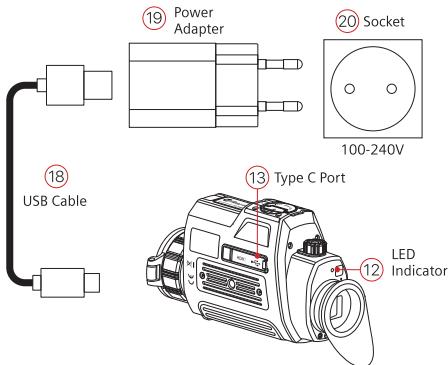
- Turn up the puller (15) on the battery pack (8), and align the orange line (D) on the battery pack (8) with the triangle symbol (C) on the battery slot (16) and push the battery pack (8) into the battery slot (16).
- When the battery pack is completely inserted into the battery slot, turn the puller (15) clockwise to lock the battery pack.
- Close the puller (15), and the battery pack is completely installed.
- Finder II series can only be powered by this battery pack. If other battery packs are used, it may cause irreparable loss, damage to the device, and can even possibly cause fire.



## Method 1: Charging with Type-C Port

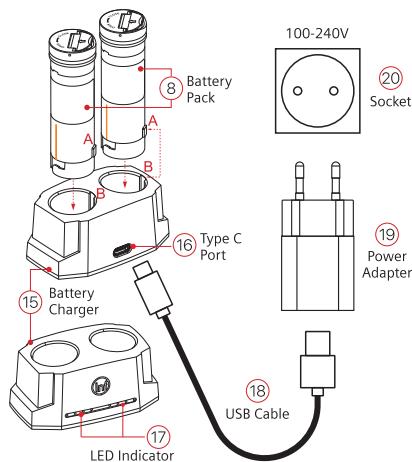
- Align the orange vertical line on the battery pack with the white triangle symbol next to the battery compartment on the Finder II, and install the battery pack into the battery compartment of the product. For details, see **Battery Pack Installation**.
- Connect the Type C end of the data cable (18) to the Type C port (13) of the product.
- Connect the other end of the data cable (18) to the power adapter (19) that comes with the product, or connect to another USB power socket with a rated output voltage not exceeding 5V.
- Plug the adapter (19) into a 100-240V power socket (20) for charging.
- when charging, the LED indicator will change to red.

LED indicator displaying the current status of the device



## Method 2: Charging with Battery Charger

- Align the positioning block (A) of the battery pack (8) with the groove (B) of the battery charger (15), and insert the battery pack (8) into the battery charger (15).
- Connect the plug of the USB Type-C cable (18) to the USB connector of the power adapter (19). Plug the power adapter (19) into a socket 100-240V (20) (110V for US).
- Connect the other end of the USB cable (18) to the Type-C port (16) of the battery charger (15).
- After finishing the above steps, the LED indicator (17) on the battery charger (15) will display the battery charge state.
- After the battery is fully charged, remove the battery pack from the battery charger.



## Battery charge status (see table).

LED Indicator	Battery charge status
	Battery level is from 1% to 25%.
	Battery level is from 25% to 50%.
	Battery level is from 50% to 75%.
	Battery level is from 75% to 99%.
	Battery is fully charged.

**Note:** Two batteries can be charged at the same time: the second slot is designed for it.

## Safety Measures

- Use this battery charger to charge the battery pack only. Otherwise it will cause irreparable damage to the battery pack or charger and even may cause fire.
- Before a long storage time, the battery pack should be partially charged, not fully charged or discharged.
- Do not charge the battery immediately after you bring it from the cold to the warm. Wait 30 to 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 ~ +45°C. Otherwise the battery life will be significantly reduced.
- When charging, please don't leave the battery unattended.
- Do not expose the battery to high temperature or open flame.
- Do not immerse the battery in water.
- The battery pack has short circuit protection. But situations that may lead to short circuits should be avoided.
- Do not charge the battery for more than 24 hours after it is already fully charged.

- It is not recommended to connect third-party devices that consume more power than allowed.
- Do not disassemble or modify the battery pack without professional instructions. Do not knock or drop the battery pack.
- The recommended operating temperature for the device is - 20°C ~ +50°C. Do not use the device beyond this temperature range, which may shorten the battery life.
- When the device is used under sub-zero temperature, the battery capacity drops, which is normal and does not indicate a defect.
- Please keep the battery pack out of the reach of children.

## EXTERNAL POWER SUPPLY

Finder II series supports external power supply, such as the portable power source (5V).

- Connect the external power supply to the **Type-C port (13)** of the device.
- The device will automatically switch to the external power supply and charge the **battery pack (8)** at the same time.
- At this time, the battery icon on the display will become to the charging icon and the power indicator will turn red, and then turn green after the battery is fully charged.
- If an external power supply is connected, but no battery pack is installed, the battery icon will become a USB icon and the power indicator will turn green.
- When the external power supply is disconnected, Finder II series will automatically switch to the battery pack power supply and will not shut down.

## 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	Cancel all calibrations of this operation with shutter correction
	Shortcut menu/ Main menu	Return to the home screen	Standby	--
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	Confirm value, enter menu option	Exit menu option / main menu
	Defective pixels calibration interface	Switch cursor movement direction	Switch cursor movement direction	Save and exit calibration
Up/ Ranging button 	Home screen state	Turn on the laser ranging function	--	--
	Laser ranging mode	Single ranging	--	Switch ranging mode between single and continuous mode
	Shortcut menu 1	Adjust E-zoom	Adjust E-zoom	--
	Shortcut menu 2	Adjust display brightness	Adjust display brightness	--
	Main menu	Navigation up	Navigation up	--
	Defective pixels calibration interface	Move one pixel up/ right	Move one pixel up/ right	Move ten pixels up/ right
Down/ Photo button 	Home screen state	Take a photo	Take a photo	Start video recording
	Video recording	Take a photo	Take a photo	Stop and save video recording
	Shortcut menu 1	Image mode adjustment	Image mode adjustment	--
	Shortcut menu 2	Adjust image sharpness	Adjust image sharpness	--
	Main menu	Navigation down	Navigation down	--
	Defective pixels calibration interface	Move one pixel down/left	Move one pixel down/left	Move ten pixels down/left
Up+ Down	Home screen state	Shutter correction	Shutter correction	Background correction

## MENU/STATUS BAR ICONS

	White Hot
	Black Hot
	Red Hot
	Target Highlight
	Ironbow
	Rainbow
	$\times 1/\times 1.5/\times 2/\times 2.5/\times 3/\times 3.5/\times 4$ Digital zoom
	Display brightness
	Image sharpness
	Automatic calibration
	Manual calibration
	Ultraclear mode
	Wi-Fi
	Video out
	PIP
	Digital compass
	Motion sensor
	Auto display off
	Microphone
	Switch unit
	More
	Calibration mode
	Image Hue
	Defective pixel calibration
	Compass calibration
	Time and Date
	System information

	Factory reset
	Return to the Main Menu
	Single ranging
	Continuous ranging
	Battery indication
	Battery charging

## OPERATION

**WARNING!** The lens of Finder II series 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** (1). Press and hold the **Power** (3) **button** for 2s to power on the device. Then, the home screen appears after 10s.
- Rotate the **eyepiece diopter adjustment** (11) to adjust the resolution of the icons on the display. After the adjustment is completed, for the same user, when using it again there is no need to adjust the diopter again.
- Rotate the **lens focus knob** (2) to focus on the object observed.
- Set the digital zoom, image mode, screen brightness and image sharpness with a short press of the **Menu** (4) **button** (Refer to the **Shortcut Menu** section in this manual for details).

## Shut Down

- After using the device, press and hold the **Power (3)** button for 3 seconds. The shutdown countdown screen will appear.
- When the countdown from 3 to 0 is completed as indicated by the countdown icon, the device is powered off. Then release the button. The display is off, the indicator is off, and the device is shut down.



## Standby

- The standby mode can let the device into a sleep state (turn off the display screen, the main chip is standby).
- During use, press the **Power (3)** button briefly, which allows it to be quickly turned off, if necessary.
- Press the **Power (3)** button 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), Ultraclear mode (on), Microphone (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 calibration (M) and automatic calibration (A).

Select the required mode in the **CALIBRATION** section of the **MAIN MENU**.

- 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).

- **M mode (manual).** The device needs to be calibrated manually.
  - Short press the **Up (5)+Down (6)** button for shutter calibration, and long press for background calibration.
  - The lens cap should be closed for background calibration.

#### Note

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

## PHOTOGRAPHING AND VIDEO RECORDING

Finder II 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 photo 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 (6)** button 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 (6)** button 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 (6)** button to take a photo also.
- Stop the video recording by pressing and holding down the **Down/Photo (6)** button.
- 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.