

ULIRVISION

# FORESIGHT LRF SERIES

Thermal Monocular

User Manual

# About this manual

Dear users,

Thank you for choosing the FL-Series Thermal Imaging Monocular!

Please take a few minutes to read this manual before first use;

Please be sure to follow the operating rules in this book!

Due to version upgrades or other reasons, this manual is subject to change without notice!

# Disclaimer

- To the fullest extent permitted by law, this manual and the products described (including its hardware, software, firmware, etc.) are provided "as is" and may be subject to defects or errors. ULIRVISION does not provide any form of express or implied warranties, including but not limited to warranties of merchantability, satisfactory quality, fitness for a particular purpose, etc., and shall not compensate for any special, incidental, incidental or consequential damages arising out of the use of this manual or the use of ULIRVISION products, including, but not limited to, lost business profits, system failures, loss of data or documentation.
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- In the event of a conflict between the contents of this manual and applicable law, the provisions of the law shall prevail.

## Precautions

- Safety precautions for use: During the installation and use of the equipment, it is necessary to strictly comply with the electrical safety regulations of the country and the use area.
- Please use the power adapter provided by the regular manufacturer, please refer to the product parameter table for the specific requirements of the power adapter. Do not connect multiple devices to the same power adapter (exceeding the adapter load may generate excessive heat or cause a fire).
- Do not swallow the battery to avoid chemical burns. Do not place the battery within the reach of children.
- Do not place the battery near heat or fire sources, avoid direct

sunlight. Do not use batteries that have been discharged, and remember to charge batteries with a charger in time after discharge.

- The device has a built-in removable battery, please use the correct specification battery, improper use may create an explosion hazard. After the battery has been installed or removed, the battery compartment is required to be closed safely.
- When wiring, disassembling and other operations, please disconnect the power supply of the device, and do not operate with electricity.
- To avoid heat build-up, keep the perimeter of the device well ventilated.
- Do not directly touch the heat dissipation parts of the device to avoid burns.
- If the device smokes, produces peculiar smells, or emits noise, please disconnect the power of the device immediately and contact the dealer or service center in time.
- Do not shoot the laser of the laser device directly into the human eye to avoid possible damage to the human eye. The laser of the laser equipment irradiates flammable objects at close range, which may pose a fire hazard, so please keep a safe distance when using it.

- After the laser projector is turned on, it is strictly forbidden to aim the laser at glass, mirrors and other objects with strong reflection to avoid damage to the thermal imaging detector by laser reflection.
- If the device is not working properly, contact the store where the device was purchased or the nearest service center and do not disassemble or modify the device in any way. (The company is not responsible for problems caused by unauthorized modifications or repairs).
- Check the lens for foreign objects or scratches, and wipe it carefully with a lens cloth.
- Check whether the products and accessories are complete, the host should be handled with care, the infrared lens is fragile, and do not directly contact other objects.
- It is forbidden to face high-temperature objects, and the equipment should be stored in a dry and non-corrosive gas environment, and avoid storing the equipment in direct sunlight, poor ventilation or near heat sources (such as heaters, heaters), etc., ignoring this may lead to fire hazards.
- After opening the battery compartment cover, remove the battery. Place it in the accompanying charger with the negative pole of the battery aligned with the compression spring and the positive pole

facing the direction of the light. Plug it into a 220V AC power source to charge. The positive and negative poles of the battery should be placed according to the "+" and "-" markings on the battery compartment.

- You must use the battery provided by our company, or the model battery with protection specified by our company.

## Waring

### FCC Statement

#### 15.19

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. (2) This device must accept any interference received, including interference that may cause undesired operation.

#### 15.21

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

### **15.105(b)**

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.

### **ISED Compliance**

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two

conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## For FCC

FCC RF Exposure requirements: The highest SAR value reported under this standard during product certification for use next to the Body with the minimum separation distance of 0mm. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

This product is compliance to FCC RF Exposure requirements and refers to FCC website

<https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm> search for

FCC ID: 2BE6SHW0003

## For IC

This EUT is compliance with SAR for general population/uncontrolled exposure limits in IC RSS-102 and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528 and IEC 62209. This equipment should be installed and operated with minimum distance 0 mm between the radiator and your Body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet appareil est conforme aux limites d'exposition DAS incontrôlée pour la population générale de la norme CNR-102 d'Industrie Canada et a été testé en conformité avec les méthodes de mesure et procédures spécifiées dans IEEE 1528 et IEC 62209. Cet appareil doit être installé et utilisé avec une distance minimale de 0 mm entre l'émetteur et votre corps. Cet appareil et sa ou ses antennes ne doivent pas être co-localisés ou fonctionner en conjonction avec tout autre antenne ou transmetteur.

Hereby, [Zhejiang ULIRVISION Technology Co., Ltd.] declares that the radio equipment type [designation of type of radio equipment] is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet

address:

<https://www.ulirvisionnv.com>

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# 1. Product overview

Foresight-LRF (FL Series) is a portable infrared monocular telescope suitable for outdoor adventures, emergency search and rescue, environmental biological monitoring and other occasions. It features convenient operations such as hotspot tracking, digital zoom, laser ranging, PIP, which can adjust the imaging effect according to different scenes. It supports external HD screen components, exhibiting strong expandability, long battery life, and compact structure.

## **Key features:**

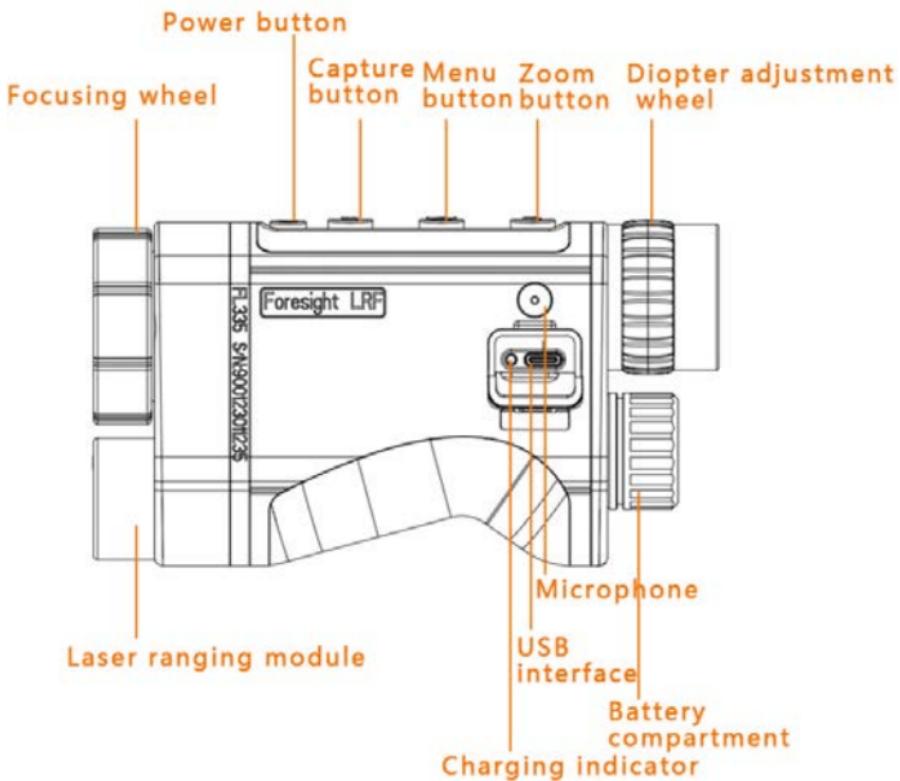
- Optimize algorithms based on different scenarios and allow for custom parameter maintenance;
- Equipped with hotspot tagging and auto tracking functions;
- Powerful image adjustment function with enhanced details, adjustable brightness, contrast, and sharpness;
- Equipped with internal storage, supporting picture and video recording;
- Equipped with WIFI and hotspot functions, supporting quick control and sharing through the APP;
- Equipped with a PIP function, capable of 2x magnification of the target area;
- Accurate distance estimation algorithm;

- Equipped with 1200m laser ranging
- The focusing feel is comfortable, with a short focusing range for quick and clear focusing.

# 1.1 Packing List

Name	Quantity	Note
F series thermal monocular telescope	1	Standard
18650 battery	2	Standard
18650 battery charging stand	1	Standard
Adapter plug	1	Standard
USB cable	1	Standard
Lanyard	1	Standard
Flannel bag	1	Standard
Manual	1	Standard

## 1.2 Appearance introduction



### Product appearance

## 1.3 Buttons and operating instructions

Buttons	Short press	Long press
 Power button	Sleep/wake-up	Power on/off (long press for 3 seconds). Long press for 6 seconds to force shutdown
 Zoom button	Digital zoom 1, 2, 4, (8) times cycle	Custom buttons (long press for 2 seconds)
 Menu button	Switch color palette (White Hot, Black Hot, Red Hot, Fusion, Green Hot, bluish red) cycle/menu confirmation	Call menu/menu to return to previous level (long press for 2 seconds)
 Photo button	Take photo/video	Laser ranging (long press for 2 seconds)

Combination button (  ) Menu button + Zoom button)	None	Calibration (long press for 2 seconds, there will be a calibration prompt)
---	------	---

Note: Both power on and power off require long pressing the power button for 3 seconds.

The function of the buttons varies under different working conditions. Please refer to the prompt information in the table for operation and use of the product.

#### CLASS 1 CONSUMER LASER PRODUCT

PAvG ≤1mW

Pulse duration:50ns

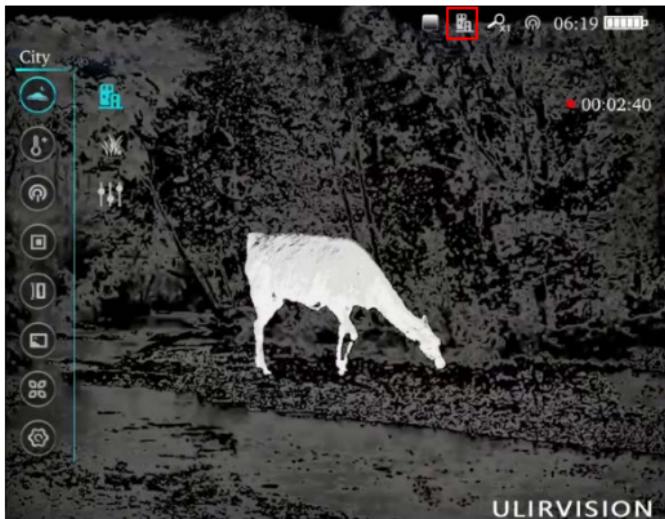
Emitted wavelength(s): 905nm

Comply with IEC60825-1:2014,EN 60825-1:2014+A11:2021,EN 50689:2021

## 2. Description of the main operation interface

### 2.1 Scenes

Select the scene "  " to enter the secondary menu, there are city, jungle, custom three modes.



	It increases contrast, accentuates high-heat subjects, and loses some low-heat details, making it suitable for urban use
	Wide dynamic algorithm, dark part lifting, simultaneous display of target and background details, suitable for use in the jungle
	Manually adjust and maintain brightness, contrast, sharpness

Scene

## 2.2 Hot spot tracking

Hot spot tracking can be turned on or off when "  " is selected, and green crosshairs will appear on the screen to automatically point to the position with the highest temperature value. The cursor defaults to green, and the it is red when the color palette is green hot.



Hot spot tracking

## 2.3 Network



When the network " " is selected, it can be turned on or off, and the device will turn on the WIFI hotspot after it is turned on, and the hotspot icon and the current number of connections will appear on the navigation bar.



	The current number of connections is 0
	The current number of connections is 1
	The current number of connections is 2
	The current number of connections is 3

## 2.4 PIP



Select PIP " " to turn on or off, after turning on, the device will open PIP, and PIP enlarges the image in the center frame. The framing area is shown in the picture



PIP

## 2.5 Ranging mode

Select “” to select single or continuous ranging mode;



## 2.6 Image settings

Select the image settings  to set brightness, contrast, and sharpness;



	Press the Menu button to open it, and the navigation bar displays the DDE
	Press the up and down arrows, adjustable from 0 to 8 gears
	Press the up and down arrows, adjustable from 0 to 8 gears
	Press the up and down arrows, adjustable from 0 to 8 gears

## 2.7 Function settings



Select  to set the cursor shape, cursor color, OLED brightness, OSD, custom button, auto shutdown, and bad pixel correction.



Select the cursor shape  , press the up and down arrows to adjust. There are a total of 0 to 5 cursor shapes, with a total of 6 adjustable cursor shapes, the default is 0 with no cursor:

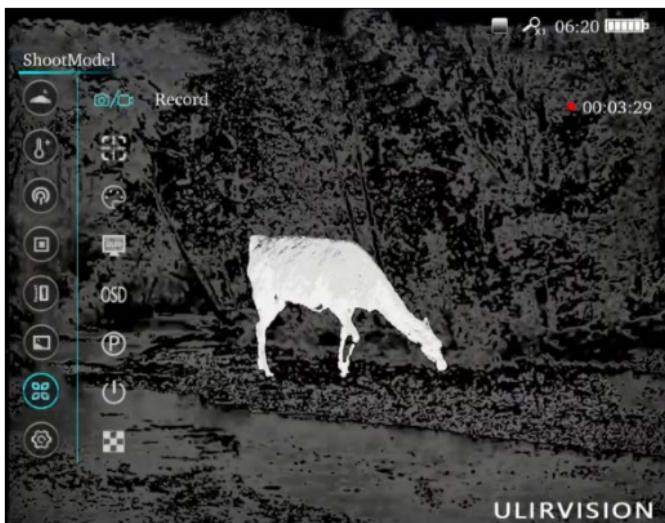
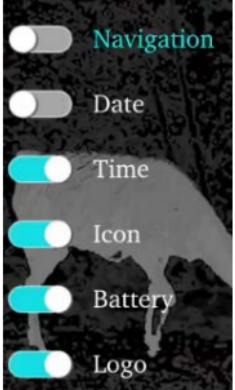


Photo and video

Set the camera button to take photos or record

settings	videos.
 Cursor shape	Adjust by pressing the up and down arrows, there are a total of 0-5, 6 sets of forms, 0 is no cursor
 Color	There are 5 colors: green, white, black, red, and blue
 OLED screen adjustment	Up and down arrow selection, 1-5 gears to adjust OLED brightness
OSD	 <p>the navigation bar information display as needed</p>

 Custom buttons	Press the up and down arrows to adjust, including 5 functions: scene, PIP, hotspot tracking, cursor shape, image enhancement. The default PIP, and after setting, press the menu button to save.
 Auto shutdown	Auto shutdown time setting

Select Bad pixel Correction  and enter the operation interface. Short press the menu button to confirm, long press the menu button to return. Adjust the coordinate positions of the X and Y axes of the crosshairs through the up and down arrows, so that the center point of the cursor overlaps with the bad pixel to be replaced, simultaneously observe whether the bad pixel is located at the center of the auxiliary observation area nine-grid, then choose the bad pixel and click confirm for replacement operation. If an accidental operation leads to abnormal image, you

can choose to clear the bad pixel, and a second confirmation will be prompted after the operation. Select confirm to clear the user's saved bad pixel configuration parameters, otherwise cancel. After the above operations are completed, they need to be saved to take effect, otherwise the previous operation will be retained. The auxiliary observation area on the right side facilitates finding and locating bad pixels. When the crosshair moves to the auxiliary observation area, the position of the auxiliary observation area will change. As shown in the figure:



Bad pixel correction interface

## 2.8 System settings



Select the system settings " ", you can set the language, time, standby indicator, anti-burn, restore factory settings, formatting, system information.

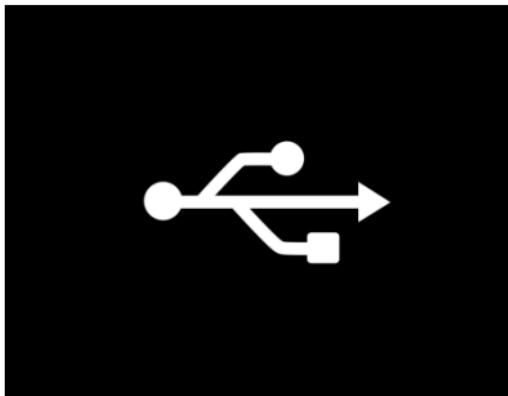
	Available in Chinese and English
	, press up and down arrows to adjust, short press the menu button to confirm, follow the same steps in sequence, and long press the menu to return
	After turning on, the standby indicator light will light up
	Tip : The burn defense mechanism has been triggered, long press the laser

Anti-burn	to return to normal, and when turned on, the lens will be automatically turned off to protect the detector when encountering ultra-high temperature scenes
	Restore factory settings
	Format the memory
	Display the factory information of the instrument, long press the menu button to return

## 2.9 Others

### (1) USB file storage mode

When you enter file storage mode by connecting your PC via USB, the interface displays the USB connection status. When the USB is connected, all operations on the device are temporarily invalid.



USB connection status

## (2) Technical parameters

384 Model	FL325	FL335
Resolution	384x288	
Pixel pitch	12μm	
Operating wavelength	8-14μm	
Laser type	Class 1 Laser	
Thermal sensitivity NETD	≤25mk @25°C F=1.0	
Frame rate	50Hz	
Lens		
Lens focal length (F-number)	25mm (F1.0)	35mm (F1.0)
FOV	10.5°x7.9°	7.5°x5.6°
Minimum imaging distance	>2.5m	>3.5m
Detection range	1280m	1800m
Diopter adjustment	±5	
Eye relief	19mm	
Internal storage EMMC	32G (actual 27G, system operation occupies a portion).	

Frequency range	2.400GHz~2.4835GHz(2.4GHz ISM Band)	
Transmit power	$\leq 18\text{dBm}$	
Power supply	5V DC 2A	
Battery	18650 3350mAh	
Battery operating hours	$\geq 5$ hours (when WIFI and hotspot turned off)	
USB	USB Type-C supports charging, powering, transferring files, and transferring videos	
Operating temperature	-20~55°C	
Storage temperature	-30~65°C	
Humidity	$\leq 90\%$	
IP rating	IP67	
Size	52x185 mm	52x185 mm
Weight	$\leq 400\text{g}$	$\leq 400\text{g}$
Shock, vibration	Packaging and transportation level	

640 Model	FL625	FL635
Resolution	640x512	
Pixel pitch	12μm	
Operating wavelength		8-14μm
Laser type	Class 1 Laser	
Thermal sensitivity NETD		≤25mk @25°C F=1.0
Frame rate	50Hz	
Lens		
Lens focal length (F-number)	25mm (F1.0)	35mm (F1.0)
FOV	17.5°x13.1°	12.5°x9.4°
Minimum imaging distance	>2.5m	>3.5m
Detection range	1280m	1800m
Diopter adjustment	±5	
Eye relief	19mm	
Internal storage EMMC	32G (actual 27G, system operation occupies a portion).	

Frequency range	2.400GHz~2.4835GHz(2.4GHz ISM Band)	
Transmit power	$\leq 18\text{dBm}$	
Power supply	5V DC 2A	
Battery	18650 3350mAh	
Battery operating hours	$\geq 4$ hours (when WIFI and hotspot turned off)	
USB	USB Type-C supports charging, powering, transferring files, and transferring videos	
Operating temperature	$-20\text{--}55^\circ\text{C}$	
Storage temperature	$-30\text{--}65^\circ\text{C}$	
Humidity	$\leq 90\%$	
IP rating	IP67	
Size	52×185 mm	52×185 mm
Weight	$\leq 400\text{g}$	$\leq 400\text{g}$
Shock, vibration	Packaging and transportation level	

### 3. Simple Fault Diagnosis and Elimination

For common problems arising during operation, please refer to the following table. If the problem cannot be settled, please cut off the power of the device and contact our technical department.

Failures	Causes and Solutions
The device can't start	<p>The battery is uninstalled or improperly installed. →Insert the battery or re-install the battery.</p> <p>The battery power runs out. →Replace or charge the battery.</p> <p>Device shutdown for protection. → Wait 5 seconds and then restart.</p>
The device shuts down automatically	The battery power runs out →Replace the battery.

Battery power runs out fast	<p>Ambient temp is too low or too high.</p> <p>The rechargeable battery is not fully charged.</p> <p>→Recharge the rechargeable battery.</p> <p>The life of battery is almost over, about 300 cycles of charge and discharge for the type of battery.</p> <p>→Replace rechargeable battery.</p>
No thermal image displayed	The lens cap is not open→Open the lens cap.

## 4. Product Warranty Card

### Product Warranty Card

<b>Customer</b>	Name			
	Address			
	Telephone			
<b>Product</b>	Type			
	S/N			
<b>ULIRvision Authorized Reseller</b>	Name			
	Address			
	Telephone			
	Resell Date		Test Date	
	Sales Bill			
	Reseller Seal			

Filled by ULIRvision authorized reseller only!

#### Limited Warranty Notice:

1. Each ULIRvision product is warranted to be free from defects in material and workmanship under normal use and service.

ULIRvision's warranty obligation is limited, at ULIRvision's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to an ULIRvision authorized service center within the warranty period.

2. The warranty period is 2 years for device and 1 year for accessories, and begins on the date of shipment. Parts, product repairs, and services are warranted for 150 days.
3. To obtain warranty service, contact your nearest ULIRvision authorized service center to obtain return authorization information, or call ULIRvision directly.
4. This warranty extends only to the original buyer or end-user customer of an ULIRvision authorized reseller, and does not apply to fuses, disposable batteries, or to any product which, in ULIRvision's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation or handling.
5. ULIRvision reserves the right to invoice buyer for costs of repair/replacement parts when product warranty expires or under any condition, in ULIRvision's opinion, not included in this warranty.

## Records of Repair and Service

<b>First Time</b>	Service Center		Telephone	
	Address		Zip Code	
	Bill Number		Technician Signature	
<b>Second Time</b>	Service Center		Telephone	
	Address		Zip Code	
	Bill Number		Technician Signature	
<b>Third Time</b>	Service Center		Telephone	
	Address		Zip Code	
	Bill Number		Technician Signature	
<b>Forth Time</b>	Service Center		Telephone	

	Address		Zip Code	
	Bill Number		Technician Signature	

Filled by ULIRvision authorized service center only!

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