FALCON

Medusa Series

USER MANUAL

Thermal Imaging Riflescope

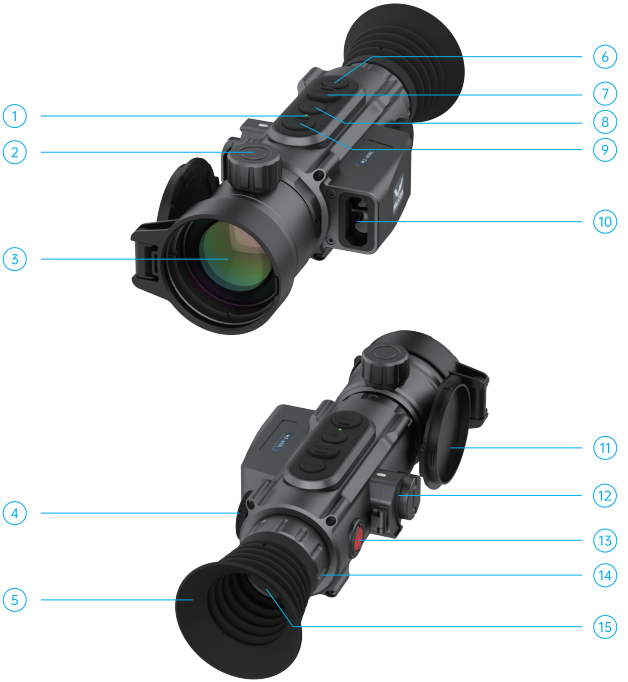
M2-650L

CONTENTS

1.Product Overview

1. The M2 - 650L is an infrared thermal imaging riflescope designed for observation and ranging under nighttime and harsh weather conditions.
2. The infrared optical system receives infrared radiation from the target. After spectral filtering , the energy distribution is projected onto the photosensitive elements of the infrared detector array on the focal plane. The detector converts infrared radiation into electrical signals , which are amplified by the bias and pre-amplification circuit, then fed into the readout circuit.
3. The core assembly digitizes the detector's output signals and performs initial processing of the infrared image, including correction, dead-pixel removal, brightness/contrast control, pseudo-color mapping, overlay generation, and reticle segmentation. The processed signals are then transmitted to the OLED display, where the operator views the target's thermal image through a 12X eyepiece.

2.Product Components



1. Status Indicator	2. Objective Focus Ring	3. Objective Lens	4. Data Port Cover
5. Eyepiece Cup	6. Navigation Button (Down)	7. Menu Button	8. Navigation Button (Up)
9. Photo/Video Button (REC)	10. Rangefinder Module	11. Lens Cover	12. Battery Compartment Cover
13. Power Button	14. Eyepiece Focus Ring	15. Eyepiece	

3.Package Contents

- M2-650L Thermal Imaging Riflescope
- 18650 Battery
- Carrying Case
- Type-C Data Cable
- 5V/2A Power Adapter
- User Manual
- Dual-Pin Mount (with screws, hex nuts, and wrench)

4.Operation Guide

4.1.Warnings

(1) Do not point the device at intense radiation sources (e.g., sun, CO_2 lasers, welding equipment).
(2) The time interval between two power on/off cycles should be greater than 20 seconds.
(3) This device contains precision optics and ESD-sensitive electronics. Avoid impact , vibration , or rough handling.
(4) Do not disassemble. contact the manufacturer for repairs to maintain warranty.
(5) Remove batteries during storage transport; use protective packaging.
(6) Replace low batteries promptly to prevent damage from over-discharge.
(7) Using outside specified environmental conditions may cause damage.

4.2.Precautions

(1) Clean non-optical surfaces with a dry, soft cloth. Avoid solvents.
(2) Lens coating is delicate. clean only when visibly soiled using a dedicated lens cloth. Avoid touching - skin acids damage coatings.
(3) Power off when not observing to extend device lifespan.

5.Key Functions

Power Button

(1) Press and hold the power button for 3 seconds to turn the device on or off.
(2) Press and hold the power button for 1–3 seconds to enter sleep mode (sleep icon appears). In sleep mode, press the power button briefly to wake up.
(3) Short-press to toggle shutter.

Photo/Video Button

(1) Short-press: capture photo.
(2) Long-press(≥1.5s): start/stop recording.

Navigation Button (Up)

(1) Short-press: Select previous item.
(2) Press the Navigation Button(up) to switch the display mode(When no menu is displayed).
(3) Long-press: Enable/disable picture-in-picture (PiP) mode.

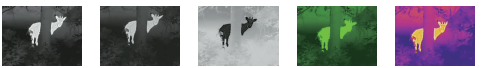
Menu Button

(1) Short-press: Open menu. Navigate with▲/▼; short press to enter submenu. Hold to exit.
(2) Short-press to lock/unlock rangefinder values.

Navigation Button (Down)

(1) Short-presss to select downwards. When there is no menu, it switches between magnification levels: 1x, 2x, 4x, and 8x.
(2) Long-press: Toggle Rangefinder.

6.Menu Functions

Icon	Main Menu	Function Description
	Mode Select	Options: White Hot, Highlight, Black Hot, Low Light, Pseudo Color (Default: White Hot).  White Hot Highlight Black Hot Low Light Pseudo Color
	WIFI	1. Enable WiFi in the device menu. Open the mobile APP testing software and locate the WiFi MAC address "APPshow-XX-XXXXX". Connect using password "12345678". 2. After connection, real-time images captured by the device can be viewed on the mobile phone.
	Picture-in-Picture	Short-press the rotary encoder to enter submenu. Rotate encoder to select ON/OFF. Short-press to confirm and return to main menu.
	Reticle Type	Options: OFF, and 10 reticle types available.
	Reticle Color	Options: Black, white, Gray, Red, Green.
	Zero Storage	Saves user-configured ballistic zeroing parameters.
	Zero Adjustment	After the crosshair is selected for zero calibration, short-press the rotary encoder to enter the sub-menu and select the crosshair zero calibration mode you want to set. Press the rotary encoder again to freeze the image. Short press the shutter button to move to the X and Y axis values. Use the rotary encoder to adjust the crosshair position until it aligns with the impact point. Short press the shutter button to move to other options. After setting is complete, move to the save option. Short press the rotary encoder to save and exit, or long press the rotary encoder to exit without saving. The set distance will be saved as a zero reference point in the zero storage menu.
	Gyroscope	Short-press the rotary encoder to enter the sub-page. Turn the rotary encoder to select either On or Off for the gyroscope.
	Rangefinder Unit	Options: Meters/Yards.
	Screen Brightness	Short-press the rotary encoder to enter submenu. options: Ultra Dim, Dim , Normal , Bright, Ultra Bright.
	Brightness	Short-press the rotary encoder to enter the menu. In the contrast menu, there are 5 options. Selecting any option will result in a corresponding change in image brightness.

	Contrast	Short press rotary encoder to access menu. 5 contrast options available; each selection adjusts imaging contrast accordingly. Higher values intensify contrast.
	Image Detail Enhancement	Short-press the menu button to enter the image detail enhancement option. The higher the number, the more details are enhanced.
	Auto Trajectory	Selecting On enables automatic trajectory. Selecting Off disables automatic trajectory. Selecting Settings allows you to adjust the trajectory parameters.
	Advanced Settings	▶ Video Output Enable/Disable the CVBS Video output function. ▶ Date & Time Select the Date/Time menu and short- press the Menu button to enter sub-options. Short- press the Menu button to move between options. short- press the Up/Down buttons to adjust values. Long- press the Menu button to save and exit after adjustment. ▶ Auto Power Off After selecting "Auto Power Off" in the cursor menu, short press the Menu button to bring up the sub-menu. In the sub-menu, select 5 minutes, 10 minutes, 20 minutes, or Off. By default, the auto power off is set to Off. After powering on, you can choose 5 minutes, 10 minutes, or 20 minutes for automatic power off. ▶ Recording Audio Short- press the Menu button when the cursor selects " Recording Audio" to access the submenu. on the submenu , select "on " or "off" to enable or disable audio recording with video. ▶ Format Short-press the Menu button when the cursor selects the " Format storage card" menu to enter the submenu. Toggle selections using the Left/Right navigation keys. Short-press the Menu button again to confirm the selection. use caution when confirming , as data cannot be recovered after deletion. ▶ Restore Factory Settings In the advanced menu, use the left and right navigation keys to select "Restore Factory Settings". Short- press the menu button to proceed. Use the left and right navigation keys to switch and select the option. Short-press the menu button again to confirm the selection. Once confirmed, the device will restore to its factory default settings. Please proceed with caution.

	Advanced Settings	▶ Dead Pixel Correction Short- press the Menu button when the cursor selects the "Dead pixel correction" menu to enter the submenu. Toggle between "Auto correction" and " Manual correction" modes using the Up/Down navigation keys. To perform correction , cover the lens cap and follow the prompts. (1) select "Auto correction " and short- press the Menu button to complete the correction. (2) select "Manual correction" . Move the cursor using the Up/Down Navigation keys. Toggle pixel states using the Power button. short-press the Menu button to save. ▶ Image Calibration (Flat-Field Correction) Enter the Image calibration menu. To perform calibration, select "confirm" , then cover the lens cap. Short- press the Menu button to calibrate background image uniformity. settings are automatically saved upon completion before exiting. ▶ Multi-language Short-press the Menu button to enter the " Language setting " submenu. Make selections using the Left/Right navigation keys. After operation, short- press the Menu button to save and return to the previous menu level. Long- press the Menu button to save and exit. Factory default language is English. ▶ Version Info Press the Menu button when the cursor selects "version " to view the device software version information.

7.Device Connection

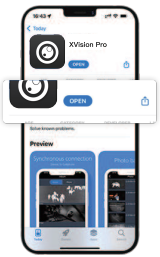
Download the dedicated app to connect the device to your mobile device via WiFi.

Android/iOS: Scan to download

Google Play

XVision

Search "XVision" on Google Play to Download.



Download and install the app

Turn on the device and enable WiFi.

Open the App

Select WiFi "xx." and connect

(Default WiFi password:12345678)

8.Specifications

90.8mm

241.1mm

M2-650L

Sensor	
Type	Uncooled Vanadium Oxide
Resolution	640x512
Frame Rate	50 Hz
Pixel Size	12μm
Sensitivity	⩽18mk
Optics	
Objective Lens	50mm/F1.0
Base Magnification	2.8X
Digital Zoom	1x / 2 x/ 4 x/ 8x
Eye Relief	50 mm
Diopter Adjustment	+5/-5 D
Focus Range	5m - ∞
FOV	8.8°X6.6°
Detection Range (Target size:1.7mX0.5m)	2500m

Display	
Color Modes	White Hot, Sky, Black Hot, Red Hot, Pseudo Color
Type/Res	0.39 inch / OLED / 1024X768
Features	
3D Gyroscope	Yes
Power Input	3-4.2 V
Battery	18650 Li-ion, 3,500 mAh
External Power	5V (USB)
Runtime	5 hours
Shock Resistance	10000 J
Waterproof Rating	IP67
Operating Temp.	-20°C~+50°C
Dimensions	241.1x90.8x71.95mm
Weight	709g
Recorder	
Video/Photo Res	1024x768
Formats	.mp4 / .jpg
Storage	32 GB built-in
Wireless	
Frequency	2.4GHz
Standard	802.11 b/g
WiFi Range	15m
Rangefinder	
Wavelength	905nm

Maximum Range	1000m
Accuracy	+ /-1m

9.Maintenance

(1) Power off the thermal imaging telescope promptly after observation or when targets are not viewed for extended periods after startup to prolong its operational lifespan.
(2) The thermal imaging telescope lens is an important optical component. During installation and use, avoid contamination and damage to the lens surface from oil stains and various chemicals. After use, please cover the lens with the lens cap.
(3) Remove batteries and store the device in its carrying case during non-use or transportation.
(4) For long-term storage or inactivity, keep the thermal imaging telescope in a cool and dry environment.
(5) Do not clean the housing with chemical solvents or thinners. use only a clean, soft, dry microfiber cloth.
(6) Clean the lens only when visibly soiled. Avoid touching the lens surface-acidic residues from fingerprints may damage coatings. clean exclusively with a dedicated lens cloth.
(7) During prolonged storage , power on the device for inspection and calibration every six months.

FCC Caution:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received, including interference that may cause undesired operation.

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

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.
The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Thermal Imaging & Night Vision
www.falconoptic.com