

# Medusa Series

# USER MANUAL

Thermal Imaging Telescope



M4V2.0-219/225L

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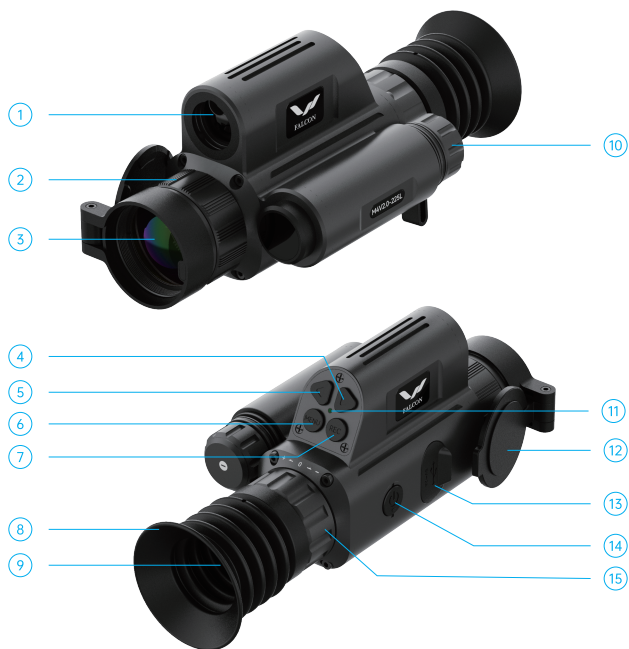




## 1. Product Overview

1. The M4V2.0-219/225L is an infrared thermal imaging telescope designed for observation and ranging under nighttime and adverse weather conditions.
2. The device detects thermal radiation from target objects. The thermal imaging module captures the image signal, processes it, and transmits it to an OLED display. Users can view a magnified, clear image through the eyepiece. Additionally, real-time image observation, monitoring, and related settings / operations are available via a dedicated smartphone app.
3. A high-resolution thermal imaging module paired with a large-aperture infrared lens to deliver high-quality thermal images. Adjustable eyepiece focus, enabling sharpness optimization for observed objects at distances ranging from 5 meters to infinity.

## 2.Product Components



|                                         |                                    |                                              |
|-----------------------------------------|------------------------------------|----------------------------------------------|
| 1. Rangefinding Module                  | 2. Objective Lens Focus Ring       | 3. Objective Lens                            |
| 4. Right Navigation Button              | 5. Left Navigation Button          | 6. Menu Button                               |
| 7. Photo/Record Button (REC)            | 8. Eyepiece Eye Cup(or Eye Shield) | 9. Eyepiece                                  |
| 10. Battery Compartment Cover           | 11. Device Status Indicator        | 12. Lens Cap                                 |
| 13. Data Compartment Cover (Port Cover) | 14. Power Switch                   | 15. Eyepiece Focus Ring (Diopter Adjustment) |

## 3. Package Contents

- ▶ M4V2.0-219/225L Thermal Imaging Telescope
- ▶ 18650 Battery
- ▶ Carrying Case
- ▶ Type-C Data Cable
- ▶ User Manual
- ▶ 5V/2A Adapter
- ▶ Mount (with screws, hex nuts, and wrench)

## 4. Operation Instructions

### 4.1. Warnings

- (1) Do not point the thermal imaging Device directly at high-intensity radiation sources such as the sun, CO<sup>2</sup> lasers, or welding machines.
- (2) The interval between power cycles should be at least 20 seconds.
- (3) The thermal imaging Device combines precision optical instruments and electrostatic-sensitive electronic components. Avoid dropping, striking, or vibrating the device to prevent structural deformation or misalignment.
- (4) Do not disassemble the thermal imaging Device. Contact the manufacturer for any malfunctions to avoid voiding the warranty.
- (5) Remove the battery when not in use or during transportation, and store the device in a protective case.
- (6) Replace the battery promptly when it is low to avoid damage from over-discharge.
- (7) Using the device outside the specified environmental conditions may cause damage.

**Note:** Only charge with a 5V 2A charger.

### 4.2. Notes

- (1) Clean non-optical surfaces with a clean, soft, dry cloth. Avoid chemical solvents or thinners.
- (2) The infrared lens is coated with an anti-reflective film. Clean only when visibly dirty, using a dedicated lens cloth. Avoid touching the lens surface, as fingerprints can damage the coating.
- (3) Power off the device when not in use to extend its operational life.

## 5. Button Functions



### Power Button:

- (1) Press and hold for 3 seconds to power on/off.
- (2) When on, press and hold the Power button for 1-3 sec. The standby icon appears. Click to wake.
- (3) Click to refresh in observation mode (NUC).



### Photo/Video Button:

- (1) Click to take a photo.
- (2) Press and hold for more than 1.5 seconds to start/stop recording.



### Navigation Button(Left):

- (1) Click to navigate up or switch display modes.
- (2) Press and hold to enable/disable picture-in-picture.



### Menu Button:

- (1) Click to bring up the menu, use the navigation key to move the menu options, and click the menu key to enter the secondary menu.
- (2) Long-press the menu key in the menu mode to return to the primary menu.
- (3) When starting the distance measurement, use the menu key to lock or unlock the distance measurement value.



### Navigation Button(Right):

- (1) Click to navigate down or switch magnification (1x, 2x, 4x, 8x).
- (2) Press and hold to enable/disable rangefinder.

## 6. Menu Functions

| Icon                                                                                | Main Menu               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Mode Selection          | <p>The device offers 5 color palettes: White Hot, Low Light, Black Hot, Red Hot, and Pseudocolor. The default is "White Hot". When in the menu interface, press the Left/Right Navigation Button briefly to switch palettes, then press the Menu Button briefly to confirm and exit.</p> <div>      </div> <p>White Hot      Low Light      Black Hot      Red Hot      Pseudocolor</p>                                                       |
|    | WiFi                    | <p>To connect via WiFi, first enable the WiFi function in the device's Menu Button, then turn on your mobile phone's WiFi and open the required software app. Locate the WiFi network with the MAC address V3XXXXXXX and enter the password 12345678 to connect to the device. Once connected, real-time video will be displayed on your mobile phone screen.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|    | Picture-in-Picture      | <p>Press the Menu Button to enter the subpage, then, press Left/Right to select on or off and press the Menu Button briefly to confirm</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|    | Reticle Type            | <p>The scope offers 10 different reticle styles, including an option to turn them off. By default, it displays Number 1 reticle.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | Reticle Color           | <p>The reticle color options include five choices: "Black, White, Gray, Red, and Green," with the default color set to "Gray." To select the reticle color, press the navigation buttons briefly to navigate to the "Reticle Color" option. Press the Menu Button to display the color list "Black, White, Gray, Red, Green" on the right. Use the Left/Right navigation buttons to cycle through the options, then press the Menu Button briefly to confirm your selection and return to the previous menu.</p>                                                                                                                                                                                                                                                                                                                                                   |
|    | Reticle Profiles        | <p>Used to save the ballistic zero point parameters set by the user. Press the Menu Button enter the sub-page, and press Left/Right to select the stored user ballistic zero point setting.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|  | Reticle Zero Adjustment | <ul style="list-style-type: none"> <li>▶ After entering the crosshair zeroing calibration interface, click the record button to cycle through different function options. Use the Left/Right navigation buttons to adjust the function values.</li> <li>▶ Image Freeze: Briefly press the menu button to toggle image freeze.</li> <li>▶ Click the record button to move to the X and Y axis values. Use the Left and Right navigation buttons to adjust the crosshair position until it aligns with the point of impact. Briefly press the record button to move to other options. After completing settings, move to the save option. Click the menu button to save and exit; press and hold the menu button to cancel saving.</li> <li>▶ The set distance is used as the zeroing point distance in Smart Ballistics and saved to the zeroing memory.</li> </ul> |

|                                                                                     |                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Gyroscope              | Press the Menu Button to enter the sub menu. Use the Left/Right buttons to select either "On" or "Off," and press the Menu Button briefly to confirm.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|    | Laser Rangefinder Unit | Click the Menu Button, and a secondary menu appears on the right. Use the Left/Right navigation buttons to select the unit. Two options are available: Meters / Yards.                                                                                                                                                                                                                                                                                                                                                                                                                                |
|    | OLED Brightness        | Click the Left/Right navigation buttons to select the "Screen Brightness" option. Click the Menu Button, and a secondary menu appears on the right. Use the Left/Right navigation buttons to select the brightness level. The higher the value, the brighter the screen (from dark to bright). Confirm and return to the previous menu.                                                                                                                                                                                                                                                               |
|    | Image Brightness       | Brightness adjustment increases or decreases the image brightness. There are 10 brightness levels (1-10), ranging from dark to bright. The default brightness when first powered on is "5". Users can select the appropriate brightness level based on their viewing preference and current ambient conditions.<br>Click the Left/Right navigation buttons to select the "Image Brightness" option. Click the Menu Button, and a secondary menu appears on the right. Use the Left/Right navigation buttons to select the desired level, then confirm and return to the previous menu.                |
|    | Contrast Ratio         | Contrast adjustment increases or decreases the contrast of the image to make the target stand out. Contrast levels range from 1 to 10, from weakest to strongest. The default contrast when first powered on is "5". Users can select the appropriate contrast level based on their viewing preference and current ambient conditions.<br>Click the Left/Right navigation buttons to select the "Contrast" option. Click the Menu button, and a secondary menu appears on the right. Use the Left/Right navigation buttons to select the desired level, then confirm and return to the previous menu. |
|  | Image Detail Boost     | Press the Menu Button to access the "Image Detail Boost" option. The higher the numerical value, the more details are enhanced.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|  | Date/Time              | To adjust the Date/Time settings, select 'Date/Time' from the main menu, then click the Menu Button to enter sub-options. Use brief presses of the Menu Button to navigate between options, and use the Left/Right buttons to adjust values. Once adjustments are complete, click the Menu Button again to save your changes and return to the main menu. This process allows you to customize date and time settings based on your preferences.                                                                                                                                                      |

|                                                                                     |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Language         | The device has English and other languages set up, and users can make settings according to their needs. The default multi-language setting when leaving the factory is English. Press the Left and Right buttons briefly to select the "Multi-language" option, then press the Menu Button briefly. A secondary Menu will appear on the right side. Press the navigation Left and Right buttons briefly to select the appropriate language, confirm and return to the previous Menu level. Press and hold the Menu button to exit without saving.                                                                                                    |
|    | Audio Recording  | Select "Record Audio" with the cursor and press the Menu to bring up a sub menu. Select 'Open' or 'Close' on the sub menu to enable recording with or without voice and audio input.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|    | Format           | To format the device, enter the formatting submenu by clicking the Menu Button, then select "Confirm" or "Cancel" using the same button. Please proceed with caution when selecting "Confirm"! Once confirmed, all data will be permanently deleted and cannot be recovered. Ensure you have backed up important files before proceeding.                                                                                                                                                                                                                                                                                                             |
|    | Auto Power Off   | After selecting "Auto Power Off," press the Menu Button to access the sub menu. In the sub menu, choose from "3 minutes," "5 minutes," or "Off." The default setting is "Off." After powering on, you can select automatic Power Off after 3 or 5 minutes.                                                                                                                                                                                                                                                                                                                                                                                            |
|    | Default Settings | After selecting 'Default Settings' with the cursor, press the Menu Button to open the sub menu. On the sub menu, choose 'Confirm' or 'Cancel' to restore default settings. If confirmed, the system will revert to factory default settings—please proceed with caution.                                                                                                                                                                                                                                                                                                                                                                              |
|    | Pixel Fix        | To repair dead pixels, click the Menu Button to enter menu mode, then use the navigation buttons to move the cursor to "Dead Pixel Repair" and follow the on-screen prompts. First, click the Menu Button to activate the repair function, which will display the message: "Please close the lens cap to ensure a uniform thermal surface, then click the Menu key." After clicking the Menu Button again, the system will show "Repair in Progress" and automatically complete the calibration. Once the repair is successful, the message "Calibration Complete!" will appear, and the device will automatically return to the previous menu level. |
|  | Image Adjustment | To perform Image Calibration, select "Image Calibration" from the Menu, then follow the on-screen prompts: First, a message will appear instructing you to "Place the lens cap and press Menu" — click the Menu Button to confirm. The system will then display "Calibration Started" and automatically complete the calibration process without further input. Once successful, a confirmation message "Calibration Complete!" will appear, and the device will automatically return to the main menu.                                                                                                                                               |

|                                                                                   |                           |                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Auto Ballistic Calculator | Click the navigation button to select the "Auto Trajectory" option, press the menu button to confirm, turn on, off, and set. Selecting 'on' indicates the activation of automatic ballistics. Selecting 'off' means turning off automatic ballistics. Select settings to adjust trajectory parameters. |
|  | Version                   | Press the navigation buttons briefly to select the "Version Information" option, then press the Menu Button to confirm. This will display the software version information of the device.                                                                                                              |

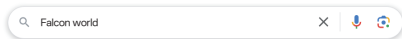


## 7. Device Connection

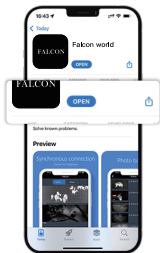
Download the dedicated app to connect to mobile devices via Wi-Fi.



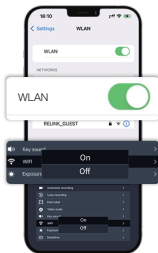
Scan for Android/iOS download



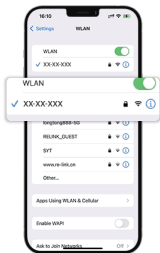
Google Play Store search "Falcon world" to download



Download and install the APP



Turn on WiFi on both the phone and the device



Select wifi "XX..." and connect  
(WIFI default password: **12345678**)



Open the APP

## 8. Technical Specifications



83.37mm

80.22mm



183.33mm

### M4V2.0-219/225L

| Sensor:             |                                       |
|---------------------|---------------------------------------|
| Type                | Uncooled Vanadium Oxide (VOx)         |
| Resolution          | 256x192                               |
| Frame Rate          | 50 Hz                                 |
| Pixel Size          | 12μm                                  |
| NETD                | ≤30mK                                 |
| Optics:             |                                       |
| Objective Lens      | 19/25mm/F1.0                          |
| Base Magnification  | 2.7X/3.5X                             |
| Digital Zoom        | 1x / 2 x/ 4 x/ 8x                     |
| Exit Pupil Distance | 50 mm                                 |
| Diopter Adjustment  | +5/-5 D                               |
| Focus Distance      | 2m - ∞                                |
| Field of View       | 9.2°×7°/7°×5.3°                       |
| Detection Range     | 900m/1300m (Target Size: 1.7m x 0.5m) |

| Display:               |                                                       |
|------------------------|-------------------------------------------------------|
| Color Modes            | White Hot, Low Light, Black Hot, Red Hot, Pseudocolor |
| Type/Resolution        | 0.39-inch / OLED / 1024X768                           |
| Power:                 |                                                       |
| 3D Gyroscope           | Yes                                                   |
| Power Supply           | 3-4.2 V                                               |
| Battery                | 18650 Li-ion, 3500mAh                                 |
| External Power         | 5V (USB)                                              |
| Runtime                | 5 hours                                               |
| Shock Resistance       | 10000 J                                               |
| Waterproof Rating      | IP67                                                  |
| Operating Temperature  | -20°C~+50°C                                           |
| Size                   | 183.33x80.22x83.37mm                                  |
| Weight                 | 450g ±5g                                              |
| Recorder:              |                                                       |
| Video/Photo Resolution | 1024x768                                              |
| Video/Photo Format     | .mp4 / .jpg                                           |
| Storage Card           | Built-in 32GB Memory Card                             |
| Wireless Channel:      |                                                       |
| Frequency              | 2.4GHz                                                |
| Standard               | 802.11 b/g                                            |
| WiFi Range             | 15m                                                   |
| Rangefinder:           |                                                       |
| Wavelength             | 905nm                                                 |

|               |        |
|---------------|--------|
| Maximum Range | 1000m  |
| Accuracy      | + /-1m |

## 9. Maintenance and Care

- (1) Power off the device when not in use to extend its operational life.
- (2) The thermal imaging lens is a critical optical component. During installation and use, avoid contamination or damage to the lens surface from oil stains or chemicals. Please replace the lens cap after use.
- (3) Remove the battery during storage or transportation.
- (4) Store the device in a cool, dry environment.
- (5) Clean the exterior with a soft, dry cloth. Avoid chemical solvents.
- (6) The thermal imaging Device lens should only be cleaned when visibly dirty. Avoid touching the lens surface, as the acidic substances left by fingerprints can damage the coating and lens surface. Use only a dedicated lens cloth for cleaning.
- (7) Perform a power-on check and calibration every six months if the device is unused for an extended period.

## 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.



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