

Titan Series

USER MANUAL

Tri-Sensor Fusion Thermal Scope



T1-650L

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1. Product Overview

1.1. The T1-650L is a multispectral imaging telescope designed for both day and night use. It uses a visible light system for long-range observation and ranging during the day and switches to a thermal imaging system for clear viewing and distance measurement in low light or harsh environments.

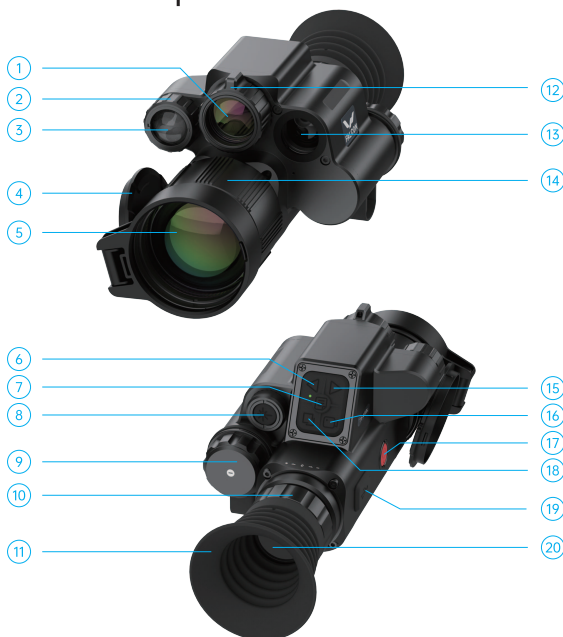
1.2. You can switch between the visible light and thermal imaging modules. Images captured by each module are processed and displayed on the OLED screen, allowing you to view them clearly through the eyepiece. You can also connect the device to a mobile app to view live images, monitor surroundings, and adjust settings directly from your phone.

1.3. With advanced image processing technology, the T1-650L delivers high-resolution images, supports full-color daytime viewing, black-and-white visible light, and thermal imaging giving you reliable observation capabilities around the clock.

1.4. The visible light imaging system employs a high-resolution image sensor, capable of outputting high-resolution color images under favorable daytime lighting conditions, as well as delivering black-and-white night vision images in low-light environments through near-infrared illumination. Additionally, the eyepiece lens can be focused to adjust the clarity of observed objects from 5 meters to infinity.

1.5. The thermal imaging system combines a high-resolution sensor with a large-aperture thermal lens, delivering high-quality thermal images. You can adjust the eyepiece to focus on objects from 5 meters to infinity for sharp, clear viewing.

2. Product Components



1. Visible light objective	2. Fill light focus ring	3. Infrared fill light
4. Lens protection cover	5. Thermal imaging objective	6. Left navigation key
7. Menu key	8. Distance measurement key	9. Battery compartment cover
10. Eyepiece focus ring	11. Eye mask	12. Visible light objective focus ring
13. Laser distance measurement module	14. Thermal imaging lens focus ring	15. Right navigation key
16. Record key	17. Power key	18. Lens switch key
19. Data transmission interface	20. Eyepiece	

3. Package Contents

- ▶ T1-650L Thermal Imager Telescope
- ▶ Equipment Handbag
- ▶ User Manual
- ▶ Double Nail Clamp(With Screws, Hexagonal Nuts, Several Wrenches)
- ▶ 26650 Battery
- ▶ Type-C Data Cable
- ▶ 5V2A Adapter

4. Operating Instructions

4.1. Warnings

- (1) Do not aim the thermal imaging telescope directly at high-intensity radiation sources such as the sun, carbon dioxide lasers, and electric welding machines;
- (2) The time interval between two power-on operations should be more than 20 seconds;
- (3) During use, be careful and gentle, do not drop, knock, or vibrate, so as not to cause damage to optical and electronic components or deformation of structural parts;
- (4) Do not disassemble the thermal imaging telescope without permission. If a fault occurs, please contact the factory in time, otherwise, no warranty will be provided;
- (5) When the thermal imaging telescope is not in use and during transportation, please take out the battery and place the thermal imaging telescope in a packaging box with better protection;
- (6) If the power is too low during use, please replace the battery in time to avoid damage to the battery caused by over-discharge;
- (7) Exceeding the use environment specified in this manual may damage the thermal imaging telescope.

4.2. Usage Method

- (1) Open the package, take out the thermal imager, install the battery, and press and hold the power button for 3 seconds to power on;
- (2) Observe the internal display screen through the eyepiece, and at the same time manually adjust the eyepiece adjustment ring until the symbols and numbers on the eyepiece display screen are clearly visible;
- (3) Short press the menu button to switch to the thermal imaging screen, aim the thermal imaging lens at the target to observe the object, and adjust the thermal imaging module eyepiece adjustment ring until the observed object is clearly visible;
- (4) Then short press the menu button to switch to the visible light screen, aim the night vision objective lens at the target to observe the object, and adjust the visible light eyepiece adjustment ring until the observed object is clearly visible;
- (5) Press and hold the left navigation key for 3 seconds to switch to visible light night vision mode, black-and-white mode, and turn on the infrared supplementary light. Under low-light conditions at night, pull out the infrared illumination lens group, adjust the visible light eyepiece adjustment ring, and adjust until the observed object is clearly visible.

4.3. Notes

- (1) Product optical components (thermal imaging eyepiece, visible light eyepiece, infrared supplementary light lens, laser distance measurement lens) can only be cleaned when the dirt affects the picture quality. A lens cloth should be used to dip a small amount of alcohol to gently wipe the dirty part of the lens surface to prevent the anti-reflection film on the lens surface from falling off;
- (2) During use, long-term direct viewing of infrared lights and laser illumination is prohibited to avoid damage to the biological tissue of the eyes;
- (3) If the product observation is completed or the target is not observed for a long time after power-on, please power off in time to extend the effective utilization time of the thermal imaging telescope.

5. Button Functions



Power Button

- (1) Long-press the power button for 3s to turn the device on or off.
- (2) With the device on, press and hold the power button until the hibernation icon appears, then release to enter hibernation. Press briefly to wake the device.
- (3) If the device is not in hibernation, press the power button briefly to initiate thermal imaging calibration.



Ranging Button

- (1) Long-press the distance measurement button to start distance measurement.
- (2) After starting distance measurement, short-press the distance measurement button to lock distance measurement.
- (3) In the menu function, short-press the distance measurement button to exit the menu.



Lens Switch Button

- (1) Long-press the lens switch button to switch between single and dual light modes.
- (2) Short-press the lens switch button to cycle through modes (current default dual light mode: thermal imaging screen, visible light painting screen, visible light screen, thermal imaging painting screen).
- (3) In the menu function, short-press the lens switch button to return to the previous level.



Menu Button

- (1) Long-press the menu button to open the menu, and then long press the menu button to close the menu.
- (2) Short-press the menu button to switch among 5 kinds of pseudo-color cycles in thermal imaging screen.



Photo/Video Button

- (1) Long-press to start recording, and then long press to end recording.
- (2) Short-press to take a photo.



Left Navigation Button


















- (1) Short-press the left navigation button to reduce the magnification.
- (2) Long-press the left navigation button to switch among fill light mode, natural mode and night vision mode.















Right Navigation Button


- (1) Short-press the right navigation button to increase the magnification.
- (2) In fill light mode, long-press the right navigation button to adjust the brightness of the fill light.

6. Menu Functions

Icons	Main Menu	Function Descriptions
	WIFI	<p>(1) Turn on WiFi in the device menu, then open WiFi and the app on your phone. Find the device name "APPshow-AR-xxx" and connect using the password "12345678".</p> <p>(2) Once connected, you can view the live image on your phone.</p>
	Picture-in-Picture (PiP)	In the menu interface, use the left/right navigation button to enter the PiP setting. Use the same buttons to turn it on or off. Short-press the menu button to confirm and return to the main menu.
	PiP Mode	<p>(1) In the main menu, use the Left/Right navigation buttons to access the sub-menu. Select either Single-Spectrum or Dual-Spectrum mode using the navigation buttons. Press the Menu button to confirm and return to the main menu.</p> <p>(2) In Single-Spectrum mode, the PiP window displays a 2x magnified image. In Dual-Spectrum mode, the PiP window displays a 1x magnified image.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> Single spectrum Dual-Spectrum </div>
	Reticle Type	<p>In the menu, use the Left/Right navigation buttons to enter the sub-menu and select a reticle type. There are 10 reticle styles available. Short-press the menu button to confirm and return to the main menu.</p> <div style="display: grid; grid-template-columns: repeat(5, 1fr); gap: 10px;"> <div style="text-align: center;"> 1</div> <div style="text-align: center;"> 2</div> <div style="text-align: center;"> 3</div> <div style="text-align: center;"> 4</div> <div style="text-align: center;"> 5</div> <div style="text-align: center;"> 6</div> <div style="text-align: center;"> 7</div> <div style="text-align: center;"> 8</div> <div style="text-align: center;"> 9</div> <div style="text-align: center;"> 10</div> </div>
	Reticle Color	In the menu interface, use the left and right navigation keys to enter a sub-menu. Use the left and right navigation keys again to select the crosshair color (5 color options available). Press the menu key briefly to confirm the selection and return to the main menu.

	Reticle Profiles (Zeroing Profiles)	Stores user-defined ballistic zero point parameters. Press the menu key briefly to enter a sub-menu. Use the left/right navigation keys to select the stored user ballistic zero point setting. Press the record key briefly to delete the selected user-stored zero point setting. Deletion is irreversible. Proceed with caution.
	Reticle Adjustment (Reticle Zeroing)	Navigate to Crosshair Zero Calibration using the cursor, then press the menu key briefly to enter the sub-menu. Press the left/right navigation keys briefly to freeze the image. Press the record key briefly to move the cursor to the X/Y-axis values. Adjust the crosshair position to align with the impact point using the left/right navigation keys. Press the record key briefly again to move to other options. After completing settings, navigate to the Save option. Press the menu key briefly to save and exit. Press and hold the menu key to discard changes (no save). The configured distance will be saved as the zero point name in the Zero Storage menu.
	BC	<p>(1) Press the menu button briefly to enter the submenu interface, then use the left and right navigation keys to select and enable or disable the function.</p> <p>(2) After selecting "Settings," press the menu button briefly to enter the ballistic setting interface. Press the photo button briefly to move to other options, and use the left and right navigation keys to adjust settings. Once all settings are complete, press the photo button briefly to move to the "Save" option, then press the menu button briefly to save the settings.</p> <p>(3) Note that the "Sight Height" settings for infrared and night vision modes are different. Be sure to confirm the device's current operating mode before making any adjustments.</p>
	Gyroscope	Press the menu button briefly to enter the submenu, use the left and right navigation keys to select "On" or "Off," then press the menu button briefly to confirm your selection.
	OLED Brightness	Display brightness adjustment allows users to increase or decrease screen brightness. The system offers 10 adjustable brightness levels, ranging from the dimmest (Level 1) to the brightest (Level 10). By default, the brightness is set to "5" upon initial startup. Users may customize the brightness level based on personal viewing preferences and ambient lighting conditions.
	EV Compensation (Exposure Compensation)	<p>(1) Press the menu button briefly to enter the submenu. Exposure compensation offers 10 adjustable levels (Level 1–10), ranging from the darkest (Level 1) to the brightest (Level 10). Use the left/right navigation keys to select the appropriate level, then press the menu button briefly to confirm your selection.</p> <p>(2) This function is only applicable to visible light mode. Before adjustment, ensure the device is set to the correct operational mode (e.g., visible light mode).</p>

	Default IR Luminance	<p>(1) Press the menu button briefly to enter the submenu. The fill light offers 5 adjustable intensity levels (Level 1-5), ranging from the dimmest (Level 1) to the brightest (Level 5). Use the left/right navigation keys to select the appropriate level, then press the menu button briefly to confirm your choice. By default, the fill light is set to Level 3 upon initial startup.</p> <p>(2) This function is only applicable to night vision black-and-white mode. Before adjustment, ensure the device is currently set to the correct operational mode</p>
	Image Brightness	<p>Displaying the brightness adjustment can increase or decrease the brightness of the screen. The brightness has 1 - 10 levels, which can be selected from dark to bright in turn. The initial brightness in the default state when the device is powered on is "5". Users can select a suitable brightness according to their personal viewing habits and the current environmental conditions.</p>
	Image Contrast	<p>(1) Press the menu button briefly to enter the submenu. The image contrast adjustment interface offers 10 adjustable levels (Level 1-10), ranging from the lowest (subtle contrast) to the highest (sharp distinction). Use the left/right navigation keys to select the desired level, then press the menu button briefly to confirm your choice. By default, the image contrast is set to Level 5 upon initial startup..</p> <p>(2) This function is only applicable to thermal imaging mode. Before adjustment, ensure the device is currently set to the correct operational mode .</p>
	Image Detail Boost	<p>(1) Press the menu button to access the submenu. Adjust detail enhancement (Level 1-5) using left/right keys. Short-press the menu button to confirm. Default: Level 3.</p> <p>(2) This function is thermal imaging mode only. Confirm the mode before adjusting.</p>
	Image Adjust (Infrared Image Calibration)	<p>(1) Press the menu button to access the submenu. Select "Image Correction", cover the lens cap, then press the menu button again to start uniformity correction. Settings are auto-saved upon completion.</p> <p>(2) This function is thermal imaging mode only. Ensure the device is in this mode before proceeding.</p>
	Advanced Settings	<p>► Dead Pixel Correction</p> <p>Select the "II Defect Repair" menu with the cursor, press the menu key briefly to enter the sub-menu, and switch between "II Automatic Repair" and "II Manual Repair II modes" through the camera key. If repair is needed, cover the lens cap and perform the defect repair operation as prompted.</p> <p>(1) Select "II Automatic Repair II i", and press the menu key briefly to complete the repair.</p> <p>(2) Select "II Manual Repair", move the cursor with the left and right navigation keys, switch options with the power key, and press the menu key briefly to save.</p>

	<p>Advanced Settings</p>	<p>▶ Format Storage Card</p> <p>Use the cursor to select the "II Format Storage Card" menu. Press briefly the menu key to enter the sub - menu. Switch selections through the left and right navigation keys. Press briefly press the menu key again to confirm the option. Please choose carefully to confirm. Data cannot be recovered after deletion</p> <p>▶ Factory Reset Instructions</p> <p>Steps to restore factory settings: Under the advanced menu, use the left and right navigation keys to select the "Restore factory settings" option. Press the menu key briefly to proceed to the next step. Use the left and right navigation keys to switch selections. Press the menu key briefly again to confirm the option. After confirmation, the factory default settings state will be restored. Please operate with caution</p> <p>▶ Version</p> <p>Select the "Version Information" menu with the cursor, and briefly press the menu key to view the software version of the device.</p> <p>▶ Distance Unit</p> <p>After the cursor selects "Distance Unit Selection", press briefly the menu key to enter the sub-menu, and in the sub-menu, you can switch to select meters and yards.</p> <p>▶ Auto Power-Off</p> <p>After selecting "Automatic Shutdown Settings" with the cursor, press the menu key briefly to call out the sub - menu. On the sub - menu, select "15 minutes, 10 minutes, 20 minutes, Off". The default is Off. After power - on, you can choose to shut down automatically in 5 minutes, 10 minutes or 20 minutes for use.</p> <p>▶ Language (Multilingual Support)</p> <p>Short- press the menu key to enter the "Language Settings" sub-menu, and select by using the left and right navigation keys. After the operation is completed, short- press the menu key to save and return to the settings of the previous level menu option. Long- press the menu key to exit without saving. The factory default language setting is English.</p> <p>▶ Date/Time</p> <p>Use the cursor to select the "Date/Time" menu. Press the menu button briefly to enter the sub - menu. Press the camera button briefly again to move to the option. Adjust the value through the left and right navigation keys. After adjustment, press and hold the menu button to save and exit.</p>
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7.Device Connection

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

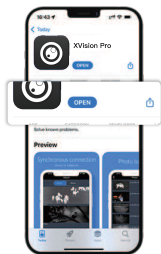


Android/iOS: Scan to download



Search "XVision"

Search "XVision" on Google Play to Download.



Download and install the app



Turn on the device and enable WiFi.



Select WiFi "xx," and connect
(Default WiFi password: **12345678**)



Open the App

8. Specifications



101.3mm

91.65mm



251.4mm

T1-650L

Function Type	Thermal Infrared	Visible & Near Infrared
Sensor Type	Uncooled Vanadium Oxide	RGB sensor
Wavelength Range	8 μ m~14 μ m	400~1000nm
Resolution	640x512, 12 μ m	2048x1520, 2.9 μ m
NETD	\leq 18mK	/
Frame Rate	50Hz	50Hz
Infrared wavelength	/	850
Objective Lens Focal Length	50mm/F1.0	50mm/F2.0
Field of View	8.8°x7°	6.8°x5.1°
Detection Distance (1.7m Target)	\geq 2500m	\geq 2500m
Magnification	2.8X	3X
Focus Method	Manual Focus	Manual Focus
Focus Range	5m ~ + ∞	5m ~ + ∞
Exit Pupil Diameter	\geq 7mm	\geq 7mm
Eye Relief	\geq 50mm	\geq 50mm
Diopter Range	-5 ~ +5SD	-5 ~ +5SD
Rangefinder Range	1000m	1000m
Rangefinder wavelength band	905nm	905nm
Rangefinder Accuracy	\leq ±1m	\leq ±1m
Accuracy	\geq 98%	\geq 98%

Repetition Rate	≥3Hz	≥3Hz
Display	1024x768, AMOLED	1024x768, AMOLED
Display Adjustment	Brightness Adjustment	Brightness Adjustment
Digital Zoom	1X/2X/4X/8X	3X/6X/9X/18X
Image Adjustment	Brightness & Contrast Adjustment	/
Image Enhancement	5 Levels	/
Image Correction	Auto/Manual	/
Display Mode	White hot / High light / Black Hot / Low light / Pseudocolor	Color/Black & White
Operating Mode	Single Infrared/Single Night Vision/Fusion	Single Infrared/Single Night Vision/Fusion
Reticle Type	OFF, 10 Reticle Styles Available	OFF, 10 Reticle Styles Available
Reticle Color	White/ Gray/ Black/ Red/ Green	White/ Gray/ Black/ Red/ Green
Auto Ballistics	Automatic	Automatic
Ballistic Calibration	10 Storage Groups	10 Storage Groups
Mechanical Interface	Picatinny Rail Interface	Picatinny Rail Interface
Electrical Interface	Charging, storage, and software updates via Type-C port	Charging, storage, and software updates via Type-C port
WIFI	2.4GHz, 802.11b/g, 15m Real-Time Image Transmission	2.4GHz, 802.11b/g, 15m Real-Time Image Transmission
Storage Card	Built-in 32GB Storage	Built-in 32GB Storage
Video/Image Resolution	1024x768	1024x768
Video/Image Format	.mp4/.jpg	.mp4/.jpg
Battery	1 x 26650 Lithium Battery / 5000mAh (Supports 18650)	1 x 26650 Lithium Battery / 5000mAh (Supports 18650)
Battery Life	≥5h (At Room Temperature)	≥5h (At Room Temperature)
External Power Supply	DC 5V (USB)	DC 5V (USB)
Dimensions	251.4x101.3x91.65mm	251.4x101.3x91.65mm
Weight	930g	930g
Operating Temperature	-20°C ~ +50°C	-20°C ~ +50°C
Storage Temperature	-30°C ~ +60°C	-30°C ~ +60°C
Recoil Resistance	1000G, 6ms	1000G, 6ms
Protection Rating	IP67	IP67

9. Maintenance and Care

(1) The objective lens, laser rangefinder lens, and illumination lens are critical optical components. Avoid oil stains and chemicals during use to prevent lens damage. After use, please replace the lens cover and return the IR infrared light to its original position.

(2) when the thermal telescope is not in use during transportation, please remove the batteries and place the thermal telescope in its packaging case.

(3) when the thermal telescope is not in use or stored for a long period, it should be kept in a cool and dry environment whenever possible.

(4) Do not clean the housing of the thermal telescope with chemical solvents or thinners. Instead, use a clean, soft, and dry cloth for wiping.

(5) when not in use for an extended period, the device should be powered on and calibrated once 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