LONGOT 朗高特

TR650L

Thermal Imaging Sights

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用户指南/User Guide V1.0

TR650L Infrared | 热成像观察镜 Thermal Sights

DISCLAIMER

This product is prohibited for illegal use, including illegal hunting,military,chemical, biological or nuclear weapons,illegal privacy photographing,and other violations of laws and regulations.It is prohibited to transport goods prohibited by the United Nations,the European Union or the OSCE.The products are only sold in the place where the company is registered and cannot be exported.

Purchase of this machine is equivalent to accepting the constraints of this statement, equivalent to agreeing to sign the relevant liability statement.In case of any violation,the company shall not be held responsible.

LONGOT TECHNIC

FEATURES

·12 um high-performance thermal detector

·≤20 MK sensitivity

·1200-yard integrated, high-precision laser rangefinder

·Stepped digital zoom from 1.0x-4.0x

·High image quality

·Magnesium alloy housing

·Quick-change rechargeable battery pack

·Maximum detection range 2400 yards

·HD 2560x2560 AMOLED display

·High frame frequency: 60Hz

·Multiple reticule types and color options

·Supports multiple charging options, including a durable magnetic charging cable

·Recoil activated video

·Multiple zero pro files and ranges

·Built-in 32 GB storage to support image capture and video recording

·Built-in Wi-Fi module

·Mobile device App compatible

· Built-in gravity sensor

· Picture in Picture (PIP)

· User-friendly interface

· Pixel calibration functions

Model	TR650L
Detector Specifications	
Detector Type	Uncooled vanadium oxide
Resolution	640×512
Pixel Size	12 μ m
OPTICS	
Objective Lens	50 mm f/1.0
Magnification	3x
Digital zoom, x	3x-24x stepless multiplier, step by 0.1x-0.3x
Min Focus Distance, M	5m
Exit pupil distance, mm	60 mm
Exit pupil Diameter, mm	23mm
Field of View (H × V),	8.8°×6.6°
Diopter, D	± 3D
Identify distances, m (Target size: 1.7m×0.5m)	1229 m
Rangefinder Characteristics	
Wavelength, nm	905mm
Measuring Range, M/Y	1200m
Measurement accuracy,	⊥ 1m
Electrical Characteristics	
Display Type	1.03inch AMOLED
Display Resolution	2560×2560

Model	TR650L
WiFi Frequency,GHz	2.4GHz
Video/Photo fomat	MP4/JPG
Built-in memory，GB	32CB
Power Supply，V	3~4.2V
Batterytype*QTY/Capacity , mA	Replaceable battery,4400mAh
External power supply，V	5V2A
Others Characteristics	
Operating time (at t=22℃) , hours	≥5.5h
Storage temperature, ℃	-30℃～+60℃
Housing Material	Magnesium Alloy
Degree of protection, IP code (IEC60529)	IP67
Dimension（L*W*H), mm	296mm×78mm×76mm
Weight(without battery), g	926g

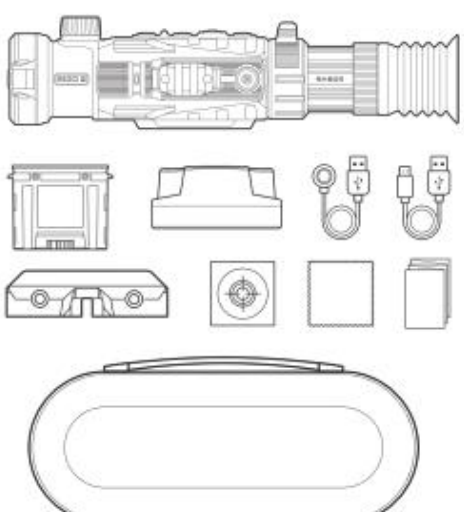
★ Actual operation time depends on the use of Wi-Fi, video intensity.

The design and software of this product can be improved to enhance practical functions.

The technical parameters of this equipment can be improved without prior notice to the user.

ACCESSORIES

- 50mm Objective Lens Cap
- Standard Rubber Eye-guard
- Dual Throw Mount for TR650
- M5 Screws
- 3mm Hex Key and Spanner Tool
- Magnetic Charging Cable
- US B-C Cable
- IBP-5 Battery 4400 MAH
- IBC-5 Battery Charger
- USB Power Adapter
- Soft Case
- Lens Cloth
- User Manual



COMPONENTS AND CONTROLS

1.Objective Lens Cap

2.Objective Lens Focus Knob

3.Power Button

4.Up Button

5.Menu Button

6.Down Button

7.Zoom Lever

8.Eyepiece / Dioptre Adjustment Ring

9.Eye-guard

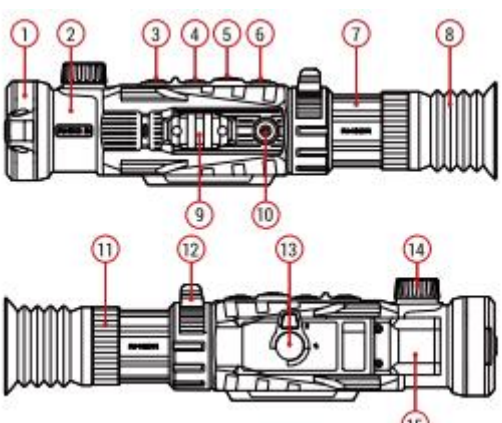
10Accessony Rail

11.Magnetic Charging Port / USB-C Port

12.IBP-5 Battery Pack

13.Battery Pack Pull-Ring

14.Laser Rangefinder



DESCRIPTION OFCONTROLBUTTONS AND SHORTCUTS

Power Button		
current screen, Menu,or Device Status	Short Press	Long Press
Device off	—	Power on the device
Home screen	Perform a shuttered non-uniformity correction （NUC）	Power off the device
Main menu	Return to the previous menu without saving changes	-
Single or continuous range-finding mode	Exit the interface mode	Power off the devolve
Defect pixel correction & reticule zeroing interfaces	Exit the interface without saving	-
Menu Button		
Current Screen / Menu	Short Press	Long Press
Home screen	Enter the quick menu	Enter the main menu
Main menu	Change menu options;enter sub menu changes and return	Save and return to home screen
Quick menu	Toggle through the menu options	Exit the quick menu
Defective pixel correction interface	Select/deselect axis of movement (x or Y)）	Correct pixel's| and return to previous
Reticule zeroing interface	Select /deselect the axis of movement (x or Y)	Save the new reticule position
Up Button		
Current Screen /Menu	Short Press	Long Press
Home screen	Enter single range-finding mode	Enter continuous ranging mode
Single range-finding mode	Take a range-finding measurement	Switch from single to continuous rangefinder
Continuous range finding mode	-	Exit the range-finding mode
Main menu /quick menu	Move the cursor up	-
Defect pixel correction & reticule zeroing interfaces	Move the cursor 1poteel in the positive direction	Move the cursor 10 pixels in the positive direction
Down Button		
Current Screen / Menu	Short Press	Long Press
Home screen	Take a photo	Start/ stop recording video
Main menu / quick menu	Move the cursor down	-

Defect pixel correction & reticule zeroing interfaces	Move the cursor t pixel in the negative direction	Move the cursor 10 pixels in the negative direction
Zoom Lever		
Current Screen / Menu	Rotate	
Home screen	Adjust the digital zoom	
In the screen brightness menu	Adjust the screen brightness	

Power Button+ Up Button		
Current Screen / Menu	Short Press	Long Press
Home screen	Enter the standby screen	-
Up Button+ Down Button		
Current Screen / Menu	Short Press	Long Press
Home screen	Perform a shuttered non-uniformity correction(NJC)	-
Menu Button+ Down Button		
Current Screen / Menu	Short Press	Long Press
Home screen	-	Activate /deactivate reticule (Long press for 15 seconds))

OPERATING INSTRUCTIONS

Using the Control Buttons

The TR650 is operated via four control buttons, The control buttons can be used to perform shortcut operations from the home screen, as well as in the menu and full-screen interfaces.

POWERING ON

1. open the objective lens cap (1).

2. Long press the Power |Button for 3 seconds to tum on the rifle scope. The Lon-got Outdoor logo will appear.

3. To determine the current battery charge, check the battery status icon and battery charge percentage in the top status bar.

TURN OFF THE POWER

1.Long press the Power Button, The shutdown screen will open,showing a 3-second countdown.

2.The TR650 will shut down automatically when the 3.second count down completes.

SHURDOWN CAUTION AND WARNING

NOTE: Press any button before the countdown completes to cancel the shutdown and return to the home screen.

WARNING: if using an external power supply, do not remove the power supply when saving data, as the data may not be saved.

STANDBY MODE

Manually Enter Standby Mode

1.To enter standby at any time from the home screen, long press the Power and Up Buttons at the same time.

2. Short press any button to exit standby.Set the TR650 to Enter Standby Mode Automatically The rifle scope may be set to automatically enter standby mode.

1.In the main menu, turn automatic standby on. When turned on.the TR650 will automatically enter standby after 5 seconds of inactivity, See Main Menu > Standby on page 39.

2.Press any button or move the rifle scope to exit standby.

STANDBY NOTES:

- When automatic standby is turned on:
- The TR650 will enter standby mode automatically when it is tilted up or down at an angle of more than 7O° or left or right at an angle of more than 30°
- The TR650 will not enter standby mode while it is in a level (horizontal) firing position.

When off is selected, standby mode is turned off and the rifle scope will operate until the battery runs out.

ADJUSTING THE FOCUS

ADJUSTING THE DIOPTER/EYEPIECE

1. Rotate the eyepiece dioptre adjustment ring (8) at the rear of the rifle scope right or left until the user interface is clear.

2.Look closely to ensure all icons, the status bar, and the reticent appear sharp and in focus. No additional dioptre adjustments are required unless the user wishes to make changes.

NOTES:

After the initial adjustment, there is no need to rotate the eyepiece adjustment ring (8 for long distances or other conditions.

If necessary during standard use, the objective lens focus knob (2) may be rotated to adjust fine focus on the target object being observed,See Focusing the Objective Lens below.

FOCUSING THE OBJECTIVE LENS

To adjust the focus on the target object:

1. Rotate the objective lens focus knob (2) left or right to adjust fine focus.

NOTE: Re-adjusting the focus will be necessary if the distance to the target changes.

Activating/Deactivating the Reticule

1. The reticule may be inactive when the TR650 is powered on for the first time.

To activate the reticule, press and hold the Menu and Down Buttons at the same time for 15seconds from the home screen.

STATUS BAR OVERIEW

1-Photo: The camera icon appears briefly when a photo ls taken.A warning icon appears when insufficient memory storage is available.

2-Recoil Activated Video: The recoil activated video (RAV) icon will appear when RAV is turned on.

3-VideoTimer: The video timer will appear during video3recording.

4-Time: Shows the current time in 24-hour format.

5-Battery Status: Shows the battery status.

6-Battery Charge: Shows the current battery charge level.

7-Zeroing Profile and Distance: Shows the selected zero profile,A,B,C, D, E.or F, and the zero distance.

8-Magnification:Shows the total magnification.

9-Ultra-Clear： Shows the Ultra-Clear status, on or off .

10-Non-Uniformity Correction (NUC) Mode: Shows the icon for the selected non-uniformity correction (NUC) mode. automatic or manual.When automatic mode is selected.a countdown timer icon will appear when 5 seconds remain until a NUC.

11-Wi-Fi ： Shows the Wi-Fi status,on ,on but not connected or off .

12-Standby Status: Shows the standby icon and the status, on or off.

13-Microphone:When on, the microphone icon appears.

USING THE QUICK MENU

In the quick menu, the color palette, image brightness, image contrast image sharpness, and zero distance can be quickly adjusted.

On the home screen, short press the Menu [M] Button to enter the quick menu.

- Short press the Up [▲] or Down [▼] Button to move between the menu options below, The selected menu item Is highlighted in the background.

  ■ (Color Palette)) : Short press the Menu Button to set the color palette to white hot , black hot , red hot , rainbow , violet , crimson , or viridian .

  ■ (image Brightness}) : Short press the Menu [M] Button to set the image brightness level, from 1-10.

  ■ (image Contrast) : Short press the Menu [M] Button to set the image contrast level. from 1-10.

  ■ (image Sharpness)) : Short press the Menu [M] Button to set the image sharpness level, from 1-10.

  ■ (Zero Distance)) : Short press the Menu [M] Button to select a zero distance within the selected zeroing profile.Only the

- zero distances in the selected profile will be available for selection, The selected zeroing profile and distance appear in the bottom status bar.

●Long press the Menu [M] Button to save any changes and return to the home screen.

NOTE: In the quick menu, after 5 seconds of inactivity, the system will automatically save any changes and return to the home screen.

NAVING THE MAIN MENU

●From the home screen, long press the Menu [M], Button to enter the main menu.

●Short press the Up [▲] or Down [▼] Button to move up and down through the menu options.

●A blue arrow icon indicates the cursor position in the menu.

●Short press the Menu [M] Button to:

●Change the parameters for the selected menu option; OR

●Enter the sub menu; OR

●confirm sub menu changes and return to the previous menu.

●Long press the Menu [M]]Button to confirm any changes and return to the home screen.

●Short press the Power [⏻] Button to return to the previous menu without saving.

●After 15 seconds of inactivity, the menu will automatically close and the interface will return to the home screen. Changes (except changes to toggle on/off menu items, such as Ultra-clear and WiFi)are not saved automatically.

- Upon exiting from the main menu the cursor location is stored for a single working session (until the TR650 is turned off).After restarting the TR650 and entering the menu, the cursor position will be at the first menu item.

ZEROING THETR650

TR650 features a "freeze" zeroing method, To zero the TR650:

1.Set a suitable target at the desired zero distance.

2.Confirm that the rifle is empty, safe, and pointed in a safe direction,with no ammunition near the weapon.

3.Adjust the image and device settings following the steps in the Quick Start Guide on page 8, if you have not done so already.

4.Set the zeroing profile to A, B, C, D, E, or F, See Reticule Menu >Zeroing Profile on page 29.

5.Based on the distance to the target you wish to zero, selector customize a zero distance to match. See Zeroing Menu >Customize Zero Distance on page 35.

6.Ensure a stable platform and natural shooting position is achieved behind the rifle.

7.Load ammunition, aim, and take one good shot at the target.

8.Make your rifle safe and observe the location of impact on the target.

9.if the point of impact does not match the point of aim (the center of the reticule), adjust the x/y position of the reticule. See Zeroing Menu > Reticule Zeroing on page 32.

10.In the sub menu for the selected zero distance, center the reticent on the aiming point and freeze the image view.

a.Short press the Down ▼ Button to move to the image freeze icon The cursor position is indicated by a blue arrow › icon.

b.Short press the Menu M Button to freeze the image. The icon will tum from white to blue.

11. Select the axis (X or Y) along which to move the reticule.

a.Short press the Up ▲ or Down ▼ Button to move between X and Y, The cursor position is indicated by a blue arrow › icon.

b.Short press the Menu M Button to select X or Y. The selected axis will turn from 'white to blue.

12.Adjust the X/Y position of the reticule until the reticule matches the point of impact.

a.Use the Up ▲ Button to move in the positive direction X= Right and Y= Up.

b.Use the Down ▼ Button to move in the negative direction:X= Left and Y= Down.

c.Upon moving the reticule, a red cursor appears on the screen representing the original position of the reticule.

13.Long press the Menu M Button to save the reticule position.

14.Take a confirmation shot-the point of impact should now match the point of aim. if not, adjust the x/y position of the reticule again.

For detailed Zeroing instructions, please see Zeroing Menu > Reticule Zeroing on page 32.

NON-UNIFORMITY CORRECTION

A non-uniformity correction (NUC) allows a thermal image's sensors to correct its pixels and eliminate any image defects caused by pixel drift. A NUC will be performed automatically each time the TR650is powered on.

The TR650 has two non-uniformity correction (NUC) modes,automatic (A) and manual (M). in either mode, the user may choose to manually perform a NUC (shuttered or shutter less)at any time. See Main Menu > Calibration Mode on page 37 for instructions on setting the NUC mode.

Automatic Mode

In automatic mode (A}, the TR650 will perform ash-uttered NUC automatically according to the internal software algorithm. There is no need to close the objective lens cap (1) as the TR650L's internal shutter covers the sensor.

When automatic mode is selected, a countdown timer icon will appear when 5 seconds remain until a NUC, The timer will appear only after the micrometer temperature has stabilized-after approximately 10 minutes of continuous operation of the TR650.

NOTE: A manual NUC (see below' may be performed at any time while in Automatic (A) mode.

Manual Mode

in manual mode (M), the user independently determines the need to perform a shuttered or shutter less NUC based on the quality of the observed image.

Performing a Shuttered NUC

A shuttered NUC may be performed at any time while in manual or automatic mode, it is not necessary to close the objective lens cap (1)during a shuttered NUC, as the internal shutter covers the sensor.

1. From the home screen, short press the Power and Button.
2. .The internal shutter will cover the sensor and a shuttered non-uniformity correction (NUC), will be performed instantly.

Performing a Shutter less NUC

2. The user may perform a shutter less NUC based on the

quality of the observed image. A shutter less NUC uses less power than a shuttered NUC because it does not use the imaged shutter to cover the sensor.instead,the user must close the lens cap (1).A shutter less NUC may be performed in manual or automatic mode:

1. Close the objective lens cap (1)

2. From the home screen, short press the Up and Down Buttons at the same time.

3. A prompt to close the lens cap (1) appears onscreen, The shutter less NUC stars after about 2 seconds.

NOTE:if the lens ls not properly covered, a temporary "image burn' will remain in the image until the next non-uniformity correction. This image burn" is temporary and is not a defect or sign of permanent damage.

PHOTOGRAPHY AND VIDEORECORDING

The TR650 is equipped with video recording and image capture All videos and photos are automatically saved to the built-in 32 GB memory storage.

NOTE: Photo and video files are named with the time and date;therefore, it is recommended to set the date and time before using the photo and video functions. See Settings Menu > Date and Time on page 43. Alternatively, the date and time may be synchronized in the Longot Outdoor APP.

Photography

To take a photo:

1. From the home screen.short press the Down Button.

2. The camera icon will appear briefly in the upper-left corner of the screen to indicate a photo was taken.

NOTE: A red warning icon appears next to the camera icon in the upper-left comer of the screen when insufficient memory storage is available, Transfer video and image files to other storage media to free up space on the memory card.

Video Recording

To record video:

1. Turn on the microphone in the main menu if desired. See Main Menu > Microphone on page 38.

2.From the home screen,long press the Down ▼ , Button to start &video recording.

3. When the video recording starts. The recording timer, in HH;MM;SS (hour, minute, second) format. appears in the top status bar.

4. When recording, short press the Down ▼ Button to take a photo.

5.Long press the Down ▼]Button to stop and save the video recording.

Recoil Activated Video Recording

When recoil activated

video is turned on in tho main menu, a video is automatically recorded when a shot is taken. The TR650 will record 3 seconds before the shot and 2 minutes and 57 seconds after the shot. . The recoil activated vide icon appears in the top status bar when RAV is turned on. The video recording timer, in HH:MM:SS (hour, minute. second, format, will appear next to the RAV icon when video is recording, See Main Menu > Recoil Activated Video on page 38 for instructions.

NOTES:

- When multiple shots are taken within the same 30-secondperiad, only one video will be taken.
- When recoil activated video recording is turned on, standard video recording is unavailable.

Video and Photography Notes:

- You may enter and navigate the menu during video recording.The user interface the status bar, icons, and menu is captured in recorded video or photo files.

- Recorded photos and videos are saved to the memory card.
  - Photos are saved as PIC_HHMMSS.jpg.
  - Videos are saved as VD_HHMMSS.mp4 or RAV_HHMMSS.mp4.
  - HHMMSS is hour, minute, second.
- The maximum duration of a recorded video file is 5 minutes After this time, video recording will begin a new file automatically.
- The number of recorded files is limited only by the capacity of the internal memory.
- Regularly check the available memory storage space and move video footage and images to other storage media to free up space on the memory card.

ACCESSING THE INTERNALMEMORY

When the TR650 is turned on and connected to a computer via the included data cable, it is recognized by the computer as a flash memory [USB} drive, This allows the user to access the saved multimedia files and copy or delete any desired files.

To access the internal memory:

1.Turn on the TR650.

2.Connect the TR650 to your computer via the included magnetic charging cable (17) or the USB - C cable (16).

3.Double-click My computer on your computer desktop.

4.Double-click to open the device named infirmary.

5.Double-click to open the device named RH5OR to access the built-in memory.

6.Recorded photos and videos are separated into folders by date,YYYYDDMM.

7.Select the desired files or folders to copy or delete.

USING THE Lon-got Outdoor APP

The TR650 can be operated using the App when connected to a tablet or smartphone or via WiFi.

1. Download the App for free and install it on your device:

b.Download the App from any app store.

2. Connect:

a.Tum on the WiFi, See Main Menu >WiFi.

b.Open the App and press the Viewfinder icon on the home screen. Then, click the Connect Device WiFi button.

c.On the mobile device, go to Settings > WI-Fl.

d.Select the TR650 from the list of Wi-Fi networks.it will appear in the list as"TL650R_YYYYY_XXXXXXXX"where XXXXXXXX is the eight-digit device serial number.

e.Enter the Wi-Fi password and tap the Join button, The default password is 12345678.

3. Operate the via the App; :

A.Take real-time photos and videos, with or without audio.

b.View, share, download, and delete photos and videos taken via the App, which are saved to the mobile device.

c.Synchronize the date and time from the mobile device.

INTEGRATED LASERRANGEFINDER

The TR650 is equipped with an integrated,precision laser rangefinder. which allows the user to measure the distance to objects up to 1200 yards away, with ti yard accuracy.

The laser rangefinder has two range-finding.

modes:continuous and single-measurement capture. Continuous range-finding allows the user to adjust quickly to changing distances for better shot placement.

CAUTION:Do not stare directly into the laser.

The rangefinder interface has the following features:

1. Cursor: The blue rangefinder cursor appears in the center of the screen.

2.Mode: Shows the selected range-finding mode.CONT2(continuous} or SGL (single).

3. Range finding Measurement: Shows the target distance.

To use continuous rangefinder mode:

1.Short press the Up Button to turn on the laser rangefinder and enter single range-finding mode.

2.Locate the target

3.The distance to the target indicated by the cursor will be refreshed automatically by the rangefinder every second.

4.Short press the Power Button to exit the laser rangefinder.

To use single rangefinder mode:

1.Long press the Up Button to turn on the laser rangefinder and enter single rangefinder mode.

2.Locate the target.

3.Short press the Up Button to take a rangefinder measurement..

4.Long press the Up Button to switch from single to continuous rangefinder.

5.Short press the Power Button to exit the laser rangefinder.

NOTE: The rangefinder interface times out after 15 seconds in single-measurement mode.

ACCURACY NOTES:

●The measurement accuracy and maximum range depend on there flection ratio on the target surface, the angle at which the laser beam falls on the target surface, and

environmental conditions.Reflectivity depends on the surface texture, color, size, and shape of the object. Typically, a glossy, bright surface will have higher reflectivity than a darker surface.

- Ranging performance can degrade in bright conditions or when ranging towards the sun.
- The measurement accuracy can be affected by fog, smog, heavy rain, snow, and other weather conditions. It can also be affected by a low battery or a dirty or smudged objective lens.
- Measuring the range to a small target is more difficult than measuring the range to a large target.

0DIGITAL ZOOM

The TR650 will quickly increase the base magnification by enlarging the image from 1 to 4 times digitally.

To use digital zoom:

1.From the home screen,rotate the zoom lever(7)clockwise to zoom in or counterclockwise to zoom out on the observed object.

2.The real-time amplification,3x_12x in increments of 0.1x,appears in the bottom status bar.

ULTRA-CLEAR MODE

Ultra-Clear mode improves the image quality in inclement weather conditions, such as rain, fog, high humidity, or high temperatures as these conditions all result in lower thermal contrast, Ultra-clear mode enhances the NETD value of the thermal sensor and improves the sensor's response rate to these challenging environment conditions.See Main Menu > Ultra-Clear on the next page.

Ultra-clear mode provides:

- Improved image quality and clarity, images are crisper and sharper.
- Increased image detail.
- Improved recognition of observed targets.

MAIN MENU OPTIONS ANDDESCRIPTIONS

Menu and sub menu options, from left to right are:

- Main Menu: Ultra-Clear, Reticent, Zeroing, WiFi, PIP, Calibration.Recoil Activated Video, Microphone, Motion Sensor, Standby.Brightness, Pixel Defect Correction, Settings.

■Reticent Menu: Zeroing Profile, Reticent Type, Reticle Color.

■Zeroing Menu: Reticent Zeroing, Customize Zero Distance,Delete Distance.

■Settings Menu: Date, Time, Unit, Languages, Factory Reset,Info.

Menu option details,descriptions, and navigation instructions are listed in order on the following pages.

ULTRA-CLEAR

Turn Ultra-Clear mode on / off

When Ultra-Clear mode is turned on, the image contrast is enhanced, which is suitable for rainy, foggy,or low-contrast conditions.

1.Long press the Menu [M] Button to enter the main menu.

2.Short press the Up [▲] or Down [▼] Button to select the Ultra-clear menu item.

3.Short press the Menu [M] Button to turn Ultra-Clear on / off.

4.The Ultra-Clear status, on or off appears in the bottom status bar

5.Long press the Menu Button to return to the home screen.

NOTE: When Ultra-Clear mode is turned on and off, the TR650will automatically perform a shuttered non-uniformity correction.

Reticent

Select the zeroing profile reticent type, and reticlecolor1.

1. Long press the Menu [M] Button to enter the main menu,

2.Short press the Up [▲] or Down [▼] Button to select the reticent menu item.

3.Short press the Menu [M] Button to enter the reticent sub menu.

4.There are three sub menu items: zeroing profile, reticent type, and reticent color.

RETICLE MENU >ZEROING PROFILE

Select the zeroing profile

1. in the reticent sub menu the zeroing profile .menu item is selected by default.

2.Short press the Menu [M] Button to enter the zeroing profile sub menu.

3.Short press the Up [▲] or Down [▼] Button to move through zeroing profile options,A,B,CD. E.Or F.

4.The selected zeroing profile appears in the bottom status bar.

5.Long press the Menu [M] Button to confirm the selection and return to the home screen.

RETICLE MENU > RETICLE TYPE

select the reticent type

1.in the reticent sub menu short press the Up or Down ▼ Button to select the reticent type menu item.

2.Short press the Menu M Button to enter the reticent type sub menu.

3.Short press the Up ▲ or Down ▼ Button to move through

Reticent type options, 1-7 (see below). The reticent changes as the cursor moves through the reticent types, A custom reticent ls also available for purchase in the Lon got Outdoor App.

4.Long press the Menu M Button to confirm the selection and return to the home screen.

Reticent Types

RETICLE MENU > RETICLE COLOR

Select the reticent color

1.In the reticent sub menu short press the Up ▲ or Down ▼ Button to select the reticent color. menu item.

2.Short press the Menu M Button to enter the reticent color sub menu.

3.Short press the Up ▲ or Down ▼ Button to move through reticent color options. Black red, black green, white red,white green, black white, white black, crimson, or viridian. The reticent color changes as the cursor moves through the color options.

4.Long press the Menu M Button to confirm the selection and return to the home screen.

Zeroing

Select or customize a zero distance

in the zeroing menu.you can add a new zero distance or select a zero distance in the list to edit it, delete it, or adjust the reticent position. The TR650 supports up to 10 zero distances.

NOTE: Before selecting or adding a new zero distance, you must select a zeroing profile, A, B, C, D, E, or F See Reticent Menu >Zeroing Profile on page 29.

1.Long press the Menu [M] Button to enter the main menu.

2.Short press the Up [▲] or Down [▼] Button to select the zeroing menu item.

3.Short press the Menu [M] Button to enter the zeroing sub menu.

ZEROING MENU >ZERO DISTANCESUBMENU

Add or select a zero distance

To add a new zero distance.

1.in the zeroing menu,short press the Up ▲ or Down ▼ Button to move to the add ⊕ icon.

2.Short press the Menu M Button to add a new zero distance. A blue arrow will appear above and below the far-left digit to mark the cursor location.

3.Short press the Up ▲ or Down ▼ Button to increase or decrease the value of the selected digit from 0-9.

4. Short press the Menu M Button to switch between the three digits, The two blue arrows move to indicate the selected digit.

5.Short press the Power ⏻ Button to return to the previous menu without saving changes; OR

6. Long press the Menu M Button to save the new zero distance and return to the home screen.

To select a zero distance:

1.In the zeroing menu,short press the Up ▲ or Down ▼ Button to select a zero distance.

2.Short press the Menu M Button to enter the sub menu for the selected zero distance.

3. In the sub menu for the selected zero distance you may:

a.Select the reticent zeroing ⌖ menu item to adjust the X/Y position of the reticent. See Reticent Zeroing below.

b. Select the zero distance to edit it. See Zeroing Menu >Customize Zero Distance on page 35.

C.Select the delete 🗑 menu item to delete it. See Zeroing Menu >Delete Distance on page 36.

ZEROING MENU>ZERO DISTANCE SUBMENU>RETICLE ZEROING

Adjust the reticent position of the selected zero distance

In the reticent zeroing interface,the X/Y position Of the reticent may be adjusted to match the point of impact.

1.In the sub menu for the selected zero distance,the reticent zero distance item is selected by default.Short press the Menu [M] Button to select and enter the reticent zeroing interface.

2.The reticent zeroing interface has the following features:

1 Y-Axis t icon:

Vertical point of impact change(in cm or inches).

2 X-Axis Icon:

Horizontal point of impact change (in cm or inches).

3.Zoom Icon: Select to change the zoom level.

4.Freeze Icon:Select to freeze the image.When frozen,the icon turns from white to blue.Select a second time to unfreeze the image.

5 .Reticule:Shows the new reticent position.

6.Red Cursor:Indicates the center of the original reticule position.

7.In the sub menu for the selected zero distance,center the reticent on the aiming point and freeze the image view.

a.Short press the Down [▼] Button to move to the image freeze ❄ icon.The cursor position is indicated by a blue arrow icon.

b.Short press the Menu [M] Button to freeze the image.The freeze icon will turn from white to blue.

8.Adjust the zoom level,as needed:

a.Short press the Up [▲] Down [▼] Button to move to the zoom icon.

b.Short press the Menu M Button to select it.

c.Short press the Up [▲] or Down [▼] Button to zoom in or out.The selected real-time amplification appears in the bottom status bar,3.0×,6.0×,9.0×,or 12.0×.

9.Select the axis(Xor Y)along which to move the reticent:

a.Short press the Up [▲] or Down [▼] Button to move between X and Y.

b.Short press the Menu [M] Button to select the desired axis.The selected axis will change from white to blue.

10.Adjust the X/Y position of the reticent until there reticent matches the point of impact.

a.X(horizontal)is the windbag and Y(vertical)is the elevation.

b.Upon moving the reticent,a red curse appears onscreen,representing the original position of the reticent.

c.Use the Up [▲] Button to move in the positive direction:X=Right and Y=Up.

d.Use the Down [▼] Button to move in the negative direction:X=Left and Y=Down.

e.Short press the Up ▲ or Down ▼ Button to move the reticent in the corresponding direction by 1 pixel;long press to move 10 pixels.

f.When adjusting your zero at a distance of 50yards,a short press will change the impact point by 0.22,and a long press moves 2.16"as shown in the X and Y coordinate displays.At 100 yards that same short press moves 0.43"and a long press moves 4.32".At 200 yards a short press moves 0.86"and a long press moves 8.64.

g.The distance of your X/Y adjustments will update automatically if you change your zero distance,for example from 100 to 200 yards.

11.Short press the Menu M Button to save the position for the selected axis and deselect it.When deselected,the axis will change from blue to white.

12.Repeat steps 5-7 to adjust the reticent position along the second axis if needed.

13.Short press the Power ⏻ Button to exit the interface without saving the reticent position;OR.

14.Long press the Menu M Button to save the reticent position for both axes and return to the home screen.

15."Data saving"will appear at the bottom of the screen and the system will exit to the homepage.

16.Take a confirmation shot-the point of impact should now match the point of aim.If not,adjust the XY position of the reticent again.

ZEROING MENU >ZERO DISTANCE SUBMENU >CUSTOMIZE ZERO DISTANCE

Edit a selected zero distance

1.In the sub menu for the selected zero distance,short press the Up ▲ Down ▼ Button to move to the zero distance.

2.Short press the Menu M Button to edit the selected zero distance.A blue arrow will appear above and below the far-left digit to mark the cursor location.

3.Short press the Up ▲ Down ▼ Button to increase or decrease the value of the selected digit from 0-9.

4.Short press the Menu [M] Button to switch between the three digits.The two blue arrows move to indicate the selected digit.

5.Short press the Power [⏻] Button to return to the previous menu without saving changes;OR.

6.Long press the Menu [M] Button to save the edited zero distance and return to the previous menu.

ZEROING MENU>ZERO DISTANCE SUBMENU>DELETEDISTANCE

Delete the selected zero distance

1.In the submerse for the selected zero distance,short press the Up [▲] Down [▼] Button to move to the delete [🗑] icon.

2.Short press the Menu [M] Button to delete the selected distance.

3.A popup window shows the message "Delete this distance?"and two options,No and Yes.No is selected by default.

4.Short press the Menu [M] Button to select No to return to the previous menu without deleting the zero distance;OR

5.Short press the Up [▲] Down [▼] Button to select Yes and short press the Menu [M] Button to delete the zero distance and return to the previous menu.

WIFI

Turn Wi-Fi on/ off

Turn on Wi-Fi to manipulate the TR650 via the Lon got Outdoor App.

1. Long press the Menu [M] Button to enter the main menu.

2. Short press the Up [▲] or Down [▼] Button to select the Wi-Fi menu item.

3.Short press the Menu [M] Button to toggle Wi-Fi on/off.The Wi-Fi status,on or off,appears in the status bar.

4.Long press the Menu [M] Button to return to the home screen.

PICTURE INPICTURE

Turn the picture-in-picture window on/off

1.Long press the Menu [M] Button to enter the main menu.

2.Short press the Up [▲] or Down [▼] Button to select the picture-in-picture menu item.

3.Short press the Menu [M] Button to toggle the PIP window on/off.When turned on,the PIP window appears at the top of the screen and displays a 2×zoomed image.

4.Long press the Menu [M] Button to return to the home screen.

CALIBRATION MODE

Set the non-uniformity correction mode to automatic or manual

1.Long press the Menu Button to enter the main menu.

2.Short press the Up [▲] or Down [▼] Button to select the calibration mode menu item.

3.Short press the Menu [M] Button to toggle the two Options:A(automatic) and M(manual).

4.The selected NUC mode,or,appears in the status bar.

5.Long press the Menu M Button to return to the home screen.

RECOIL ACTIVATED VIDEO

When recoil activated

Video is turned on,the rifle scope will record 3 seconds before the shot and 2 minutes and 57 seconds after the shot.

1.Long press the Menu [M] Button to enter the main menu.

2.Short press the Up [▲] Down [▼] Button to select the recoil activated video menu item.

3.Short press the Menu [M] Button to toggle recoil activated video on/off.The recoil activated video icon appears in the top status bar when RAV is turned on.The video recording timer,in HH:MM:SS(hour,minute,second)

format,will appear next to the RAV icon when video is recording.

4.Long press the Menu [M] Button to confirm the selection and return to the home screen.

NOTES:

·When multiple shots are taken within the same 30-secondperiod,only one video will be taken.

·When recoil activated video recording is turned on,standard video recording is unavailable.

MICROPHONE

Turn the microphone on/off

1.Long press the Menu [M] Button to enter the main menu.

2.Short press the Up [▲] or Down [▼] Button to select the microphone menu item.

3.Short press the Menu [M] Button to turn the microphone on/off.

4.When on,the microphone icon appears in the lower-right corner of the screen.

5.Long press the Menu [M] Button to return to the home screen.

STANDBY

Turn on automatic standby mode

The TR650 may be set to automatically enter standby mode.

1.Long press the Menu Button to enter the main menu.

2.Short press the Up ▲ or Down ▼ Button to select the standby menu item.

3.Short press the Menu M Button to toggle auto standby on/off When turned on,the TR650 will automatically enter standby after about 5 seconds.

4.Long press the Menu M Button to confirm the selection and return to the home screen.

NOTES:

·When auto standby mode is turned on:

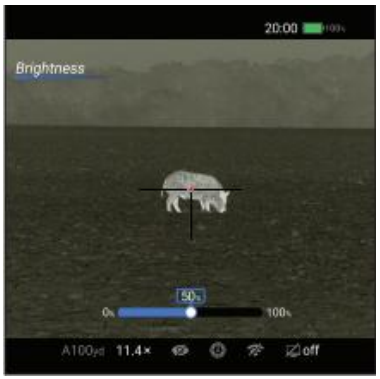
·The TR650 will enter standby automatically when it is tilted up or down at an angle of more than 70°or left or right at an angle of more than 30°.

·The TR650 will not enter standby mode while it is in a level firing position.

·Press any button to exit auto standby.

·When auto standby is turned off,the rifle scope will operate until the batteries run out.

BRIGHTNESS



Adjust the screen brightness

1.Long press the Menu M Button to enter the main menu.

2.Short press the Up ▲ or Down ▼ Button to select the brightness ☀ menu item.

3.Rotate the zoom lever(7)right or left to adjust the screen brightness level,from0-100%.

4.Long press the Menu Button to confirm the selection and return to the home screen.

PIXEL DEFECT CORRECTION

Turn the microphone on/off

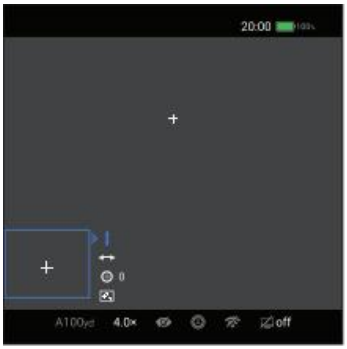
Correct defective pixels

Defective pixels are pixels that do not change correctly compared to the other image pixels-they are either brighter or darker than surrounding pixels.The TR650 has a tool that corrects defective pixels on the sensor using its internal software.

1.Long press the Menu Button to enter the main menu.

2.Short press the Up or Down Button to select the pixel correction menu item.

3.Short press the Menu Button to enter the pixel correction interface.



The interface has the following features:

1.Pixel Cursor : Appears in the center of the screen in place of the reticule. Move the cursor to the position of the defective pixel.

2.PIP Window:Appears in the lower-left corner.

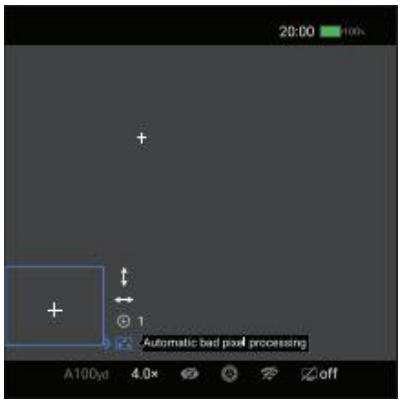
3.Navigation Cursor Icon:Shows the cursor position in the interface.

4.X-Axis Icon:Select to move the pixel cursor horizontally.

5.Y-Axis Icon:Select to move the pixel cursor vertically.

6.Add Icon:Select to add a defective pixel to the "to be corrected"list.

7.Automatic Pixel Correction Icon:Select to automatically correct all defective pixels.



To auto-correct defective pixels:

1.Short press the Up or Down Button to move to the automatic pixel correction icon.

2.Short press the Menu Button to correct all defective pixels automatically.

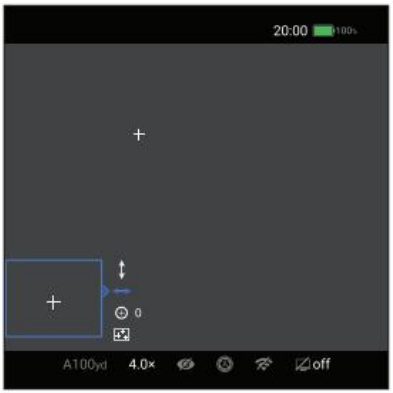
NOTE: If the algorithm fails to locate all defective pixels,it may be necessary to manually correct additional pixels.

To manually select and correct defective pixels:

1.Select the axis(X or Y)along which to move the cursor:

a.Short press the Up or Down Button to move between X and Y.The cursor position is indicated by a blue arrow icon.

b.Short press the Menu Button to select Xor Y.The selected axis will change from white to blue.



2.Move the cursor along the selected axis to the location of the defective pixel:

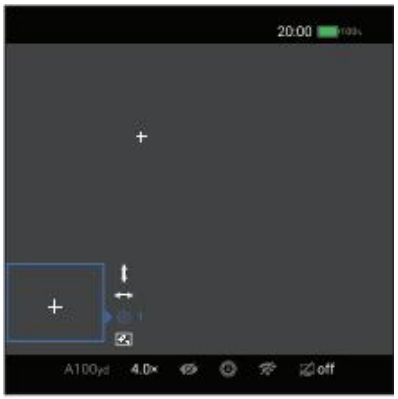
a.Use the Up Button to move in the positive direction:X=Right and Y=Up.

b.Use the Down ▼ Button to move in the negative direction:X=Left and Y=Down.

c.Short press the Up ▲ or Down ▼ Button to move the cursor in the corresponding direction by 1 pixel;long press to move 10pixels.

3.Short press the Menu M Button to save the position for the selected axis and deselect it.When deselected,the axis will change from blue to white.

4.Move to and select the second axis and adjust the cursor position,as needed.



5.Add the pixel to the "to be corrected"list:

a.With the cursor in position,short press the Menu M Button to deselect the axis of movement.

b.Press the Up ▲ or Down ▼ Button to move to the add ⊕ icon.

c.Short press the Menu M Button to add the pixel.The number of pixels to the right of the add icon will increase to indicate that one pixel has been added to the list.

d.If the defective pixel has been added in error,short press the Menu M Button a second time from the same X/Y coordinates(do not move the cursor)to remove the pixel from the "to be corrected"list.The number of pixels shown to the right of the add icon will decrease to indicate the pixel has been removed.

6.Repeat steps 1-5 to add additional defective pixels as needed.

7.Short press the Power Button to exit the interface without saving;OR

8.When all defective pixels have been added to the list,long press the Menu M Button to confirm changes.

9."Data saving"will appear at the bottom of the screen and the system will exit to the home screen.

NOTES:The PIP window and interface controls move to the upper-left corner when the cursor moves into the lower-left corner.

SETTINGS MENUV DATE

Set the date

1.In the settings sub menu,short press the Up ▲ or Down ▼ Button to select the date menu item.

2.Short press the Menu M Button to edit the date.A blue arrow will appear above and below the year digit..The date is displayed in YYYY.MM.DD format.

3.Short press the Up ▲ or Down ▼ Button to select the correct value for each digit (year,month,and day).

4.Short press the Menu M Button to switch between digits.The two arrows move to indicate the selected digit.

5.Long press the Menu M Button to save the date and return to the home screen.

SETTINGS MENU>TIME

Set the time

1.In the settings sub menu,short press the Up ▲ or Down ▼ Button to select the time menu item.

2.Short press the Menu M Button to edit the time.A blue arrow will appear above and below the hour digit.The time is displayed in HH.MM,in 24-hourformat.

3.Short press the Up ▲ or Down ▼ Button to select the correct value for each digit(hour and minute).

4.Short press the Menu M Button to switch between digits.The two arrows move to indicate the selected digit.

5.Long press the Menu M Button to save the time and return to the home screen.

6.The time appears in the status bar.

SETTINGS MENU>UNIT

Set the units of measurement

1.In the settings sub menu,short press the Up or Down Button to select the unit menu item.

2.Short press the Menu M Button to enter the sub menu.

3.Short press the Up or Down Button to move through unit options meters and yards.

the selected units,m(meters)or y(yards),display along with the selected zero profile and distance in the bottom status bar.

4.Long press the Menu M Button to confirm the selection and return to the home screen.

SETTINGS MENU>LANGUAGES

Select the languages

1.In the settings sub menu,short press the Up or Down Button to select the languages menu item.

2.Short press the Menu Button to enter the sub-menu.

3.Short press the Up or Down Button to move through the language options.

4.Long press the Menu M Button to confirm the selection and return to the home screen.

SETTINGS MENU>FACTORY RESET

Restore factory default settings

1.In the settings sub menu,short press the Up ▲ or Down ▼ Button to select the factory reset ↻ menu item.

2.Short press the Menu M Button to enter the factory reset sub menu.

3.Two options,Yes and No,appear;Yes will restore factory settings and No will cancel the operation.No is selected by default.

4.Short press the Menu M Button to select Yes to confirm the factory reset.Factory settings will be restored and the TR650will reboot automatically;OR

5.Short press the Up ▲ or Down ▼ Button to select No and short press the Menu M Button to confirm cancellation of the factory reset and return to the submenu.

FACTORY RESET NOTES:

· The screen will go dark and the factory restart will begin after a pause of about 20 seconds.

· A factory reset cannot be undone.

· The settings listed below will be reset to the factory defaults:

· Color Palette:White Hot

· Reticule Type:1

· Image Sharpness:5

· Reticule Color:Black Red

· Microphone:Off

· Image Brightness:5

· Standby:Off

· Image Contrast:5

· Screen Brightness:50%

· Magnification:3×

· Ultra-Clear mode:Off

· Language:English

· Wi-Fi:Off

· Unit:Meters

· Calibration:Automatic

· Wi-Fi Password:12345678

· Motion Sensor:Off

· Zeroing Profile:A

· Wi-Fi SSID:

TR650_YYYYY_XXXXXXXX

SETTINGS MENU>INFO

Show device information

1.In the settings sub menu, short press the Up ▲ or Down ▼ Button to select the info ⓘ menu item..

2.Short press the Menu M Button to enter the sub menu.

3.The info sub menu will display the following information about the TR650:the model number,the GUI FPGA,boot,kernel,root,and hardware versions,the part and serial numbers,and the FCC ID.

4.Long press the Menu M Button to save and return to the home screen.

BASIC INSPECTION

It is recommended to carry out a technical inspection before each use.Please check the following:

· The rifle scope appearance:there should be no cracks in the bod yore visible damage.

· The condition of the objective lens and eyepiece:there should be no cracks,greasy spots,dirt,or other deposits on the lens.

· The internal rechargeable battery pack should be fully charged.

· The control buttons should be in working order.

BASIC MAINTENANCE

Always replace the objective lens cap(1)after use to avoid damaging or scratching the lens.Never touch the lens directly;oil from your skin can damage the lens coating and surface.

·Basic maintenance should be carried out at least twice a year and includes the following steps:

·Wipe the surface of the external metal and plastic

Components chemical,corrosive,or abrasive cleaners.Canned air may also be used to clean the external components.

·Clean the electric contacts and battery slots on the rifle scope using a non-greasy organic solvent. Check the lens and eyepiece.If necessary,remove any dirt or sand from the optics;a non-contact cleaning method is preferred.

·Cleaning the exterior of the lens should only be done with the included microfiber lens cloth or a similar product.Only clean the lens when it is visibly soiled.Frequent wiping or cleaning can degrade the anti-reflective lens coating.

GENERAL TROUBLESHOOTING

The troubleshooting table on the next page lists issues that may occur when operating the TR650.Carry out the recommended troubleshooting steps in the order shown in the table.Please contact iRayUSA at 800-769-7125 or hairspray.com/support or an authorized vendor for assistance before attempting to perform any modifications or repairs beyond the scope of the troubleshooting procedures in this manual.Unauthorized repairs or modifications will void your warranty.

ISSUE	POSSIBLE CAUSES	TROUBLESHOOTINGSTEPS
The TR650 will not turn on.	The IBP-5 battery pack is very low or has completely discharged.	Charge the battery pack.
The TR650 can not connect to a computer or external power supply.	External power supply has completely discharged.	Check the external power supply and charge it if necessary.
	Computer is turned off.	Power on the computer.
	USB-C or magnetic charging cable is damaged.	Replace the cable.
The TR650 can not connect to the mobile device(smart phone or tablet).	WIFI is not turned on.	Turn on the Wi-Fi in the main menu.See Main Menu>Wi-Fi on page 36.
	Wrong WIFI password entered.	On the mobile device,go to Settings>WIFI and enter the correct password.The default password is 12345678.See Main Menu>Wi-Fi on page 36.
	Too many WIFI signals nearby.which may cause interference.	Move the TR650 and mobile device to an area with no or fewer Wi-Fi signals.

Wi-Fi signal is lost or interrupted.	The device is out of range of a strong Wi-Fi signal,or there are obstacles(such as concrete walls)between the device and the signal.	·Try again when the Wi-Fi signal is stable. · Move the TR650Lcloser to the Wi-Fi signal.
The image is blurry,the background is uneven,or vertical lines or artifacts are present.	Non-uniformity correction Is required.	Perform a non-uniformity correction.See Non-uniformity Correction on page 21 and See Using the Quick Menu on page 18.
The image is too dark.	Screen brightness level s too low.	Adjust the screen brightness in the menu.See Main Menu>Brightness on page 40.
The GUI is clear,but the image Is blurry	The lens is not focused.	· Adjust the focus on the target by rotating the objective focus knob(2) · Adjust the image sharpness in the quick menu.See Using the Quick Menu on page 18.
	There is dust or ice on the interior or exterior optical Surfaces of the lens.	· Wipe the external optical surface with the included microfiber lens cloth.
	There is condensation on the interior or exterior optical surfaces of the lens.	· Wipe the external optical surface with the included microfiber lens cloth. · Allow the TR650 to dry by leaving it in a warm,dry environment for at least 4 hours.
The aiming reticent shifts after firing rounds.	The TR650L is not mounted securely or the mount is not secured on the TR650.	· Check that the TR650 has been securely mounted. · Make sure you are using the same brand,type,and weight of the bullets as when the TR650 and weapon were initially zeroed. · If the TR650L was zeroed in different environmental conditions,a slight shift of the zero is possible.

Observed target disappears.	Observing the target through glass.	Remove any glass windows from the field of view.
The TR650L will not focus.	Image settings are not optimal for the current environmental conditions or the object being observed.	· Check the external surface of the objective lens and eyepiece and,where necessary,wipe away any dust,condensation,frost,etc. · In cold weather,you can use special anti-fogging coatings,such as those made for corrective glasses. · Adjust the focus on the target by rotating the objective focus knob(2). · Adjust the image sharpness in the quick menu.See Using the Quick Menu on page 18. · Adjust the image and device settings.See Quick Start Guide on page 8.
The TR650L will not focus.	Image settings are not optimal for the current environmental conditions or the object being observed.	· Turn on Ultra-Clear mode.See Main Menu>Ultra-Clear on page 28.
Image quality is low or the detection range is reduced.	Environmental conditions,such as snow,rain,humidity,and fog.	Turn on Ultra-Clear mode.See Main Menu>Ultra-Clear on page 28.
When the TR650 is used in low-temperature conditions,the image quality of the surroundings is worse than in warm-temperature conditions.	Environmental conditions.	In warm-temperature conditions,objects being observed(surroundings and background)heat up differently because of thermal conductivity,thereby generating a high-temperature contrast.Accordingly,image quality produced by the rifle scope will be higher.

		In low-temperature conditions,the background will cool down to roughly the same temperature,and thus the temperature contrast is substantially reduced and image detail can go down as there is less contrast in the scene.This is a normal function of a thermal image and is no indicator of actual detector performance.