INFIRAY OUTDOOR

RICO 2 SERIES

Rugged Infrared Compact Optic

Inf iRay Outdoor

TABLE OF CONTENTS

FCC ID:2AYGT-4C-00

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

CAUTION: Changes or modifications not expressly approved by IRayUSA 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.

This device was tested for typical body-supported operations and use. To comply with RF exposure requirements, a minimum separation distance of 0.5cm must be maintained between the user's body and the handset, including the antenna. Third-party belt-clips, holsters, and similar accessories used by this device should not contain any metallic components. Body accessories that do not meet these requirements may not comply with RF exposure requirements and should be avoided. Use only the supplied or an approved antenna.

WARNING: CHOKING HAZARD
Children under 3 years old can choke or suffocate on small parts of this product. This product is not a toy; keep out of reach of children.

1. OVERVIEW

Unlike night vision equipment based on image intensifiers, the Rico series thermal imager, relying on the principles of infrared thermal imaging, does not require an external light source, and is not affected by strong light exposure. No matter in the daytime when weather conditions are severe (such as rain, snow, fog, and haze) or at night, targets hidden behind obstacles (such as tree branches, tall grass, and shrubs) can be observed. The Rico series boasts formidable capabilities and comes standard with a built-in high-precision laser rangefinder, which can measure up to 1,200 meters away. Its applications span across nighttime observation, terrain positioning, as well as search and rescue operations.

2. FEATURES

- 12μm self-developed detector
- Rotary encoder with infinite zoom
- NETD<20mk
- Frame Rate：60Hz
- 1,200 m high-precision integrated rangefinding
- Magnesium alloy shell
- Built-in Wi-Fi module, supporting app connection
- Detection range of 2600m
- 1.03-inch OLED HD display
- 60 mm long eye-relief-distance eyepiece
- Ultra-clear mode
- Rechargeable battery pack, quickly replaceable
- Display brightness with infinite adjustment
- Magnetic charging cable supported
- User-friendly operation interface

3. TECH SPECS

| RICO II	RH50R
DETECTOR SPECIFICATIONS	
Type	Uncooled
Resolution, pixels	640×512
Pixel Size, um	12 μm
NETD, mk	≤20 mK
Frame Rate, Hz	60hz
OPTICAL SPECIFICATIONS	
Objective Lens, mm	50 mm f/1.0
Visual Magnification, ×	3×~12×
Field of View,°	8.8° × 7.0°
Detection Range (Target size: 1.7mx0.5m, P(n)=99%)	2597
Eye Relief, mm	60
Diopter Adjustment, D	-3~+3
DISPLAY SPECIFICATIONS	
Type	AMOLED
Resolution, pixels	2560×2560
Size，inch	1.03
POWER SUPPLY	
Battery Type / Capacity / Output Voltage	Li-Ion Battery Pack IBP-5/ 4400mAh / DC3.7V
Service Voltage	3V~4.2V
External Power Supply	5V (Type C USB)
PHYSICAL SPECIFICATIONS	
Max. Operating Time (at t=22℃), h★	5.5
IP Rating	IP67
Memory Capacity, GB	32
Operating Temperature,°C	-20 ~ +50
Laser Rangefinder	√
Weight, g	926
LASER RANGEFINDING SPECIFICATIONS	
Wavelength, nm	905
Maximum Measurement Distance, m★★	1200
Measurement Accuracy, m	±1

★ The actual operating time depends on theintensity of using Wi-Fi, video recorder, laser rangefinder.

★★ The measuring range depends on the characteristics of the object under observation and environmental conditions.
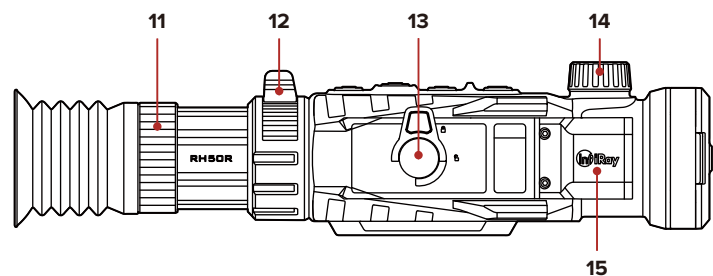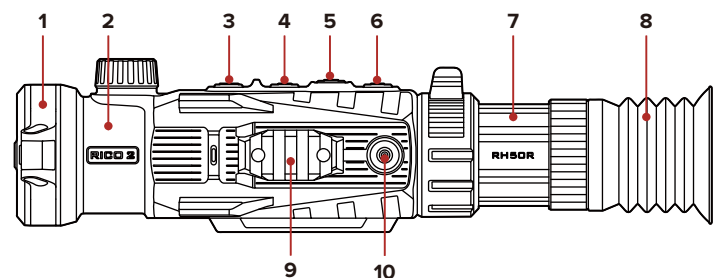
4. ACCESSORIES

The RICO 2 Series rifle scope ships with everything you need to get out and hunt.

- RICO 2 series infrared thermal imager
- Portable bag
- Picatinny rail
- IBP-5 battery pack
- IBC-5 battery charger
- Magnetic data cable
- Power adapter
- USB cable
- Lens cloth
- Manual
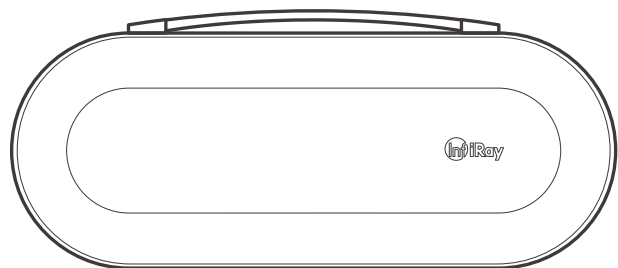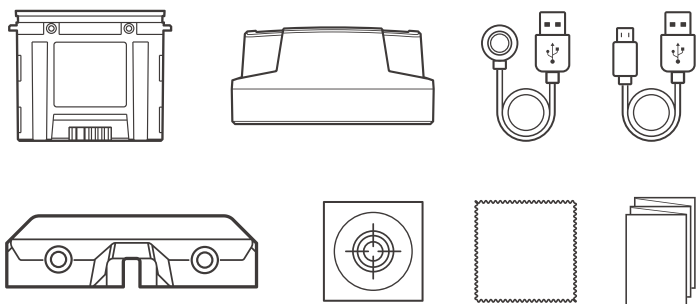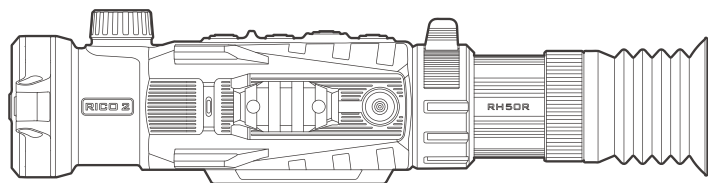
5. COMPONENTS AND CONTROLS

1   Lens cap
2   Objective lens
3   Power button
4   Up button/Rangefinding button
5   Menu button/M button
6   Down button/Capture button
7   Eyepiece
8   Eyeshade
9   Side Picatinny rail
10 Magnetic charge port
11 Diopter adjustment handwheel
12 Digital magnification knob
13 IBP-5 battery pack
14 Focusing knob
15 SR1200 laser rangefinding

6. DESCRIPTION OF CONTROL BUTTONS AND SHORTCUTS

Power Button		
Current Screen, Menu, or Device Status	**Short Press**	**Long Press**
Powered off	——	Power on the device
Powered on	Perform a non-uniformity correction(NUC)	Shutdown
Standby	Wake up the device	——
Single ranging mode	Exit the ranging mode	Shutdown
Continuous ranging mode	Exit the ranging mode	Shutdown
Main menu interface	Discard changes and return to the previous menu	——

Up button		
Current Screen/ Menu	**Short Press**	**Long Press**
Home screen	Single ranging	Continuous ranging
Menu interface	Scroll up the menu	——

Menu button		
Current Screen/ Menu	**Short Press**	**Long Press**
Home screen	Open the shortcut menu	Open the main menu
Shortcut menu interface	Adjust specific parameters of a certain function	Save and back to the home screen
Main menu interface	Open the submenu/ Confirm the option parameter	

Down button		
Current Screen/ Menu	**Short Press**	**Long Press**
Home screen	Photo taking	Start video recording
Menu interface	Scroll down the menu	——
Video recording	Photo taking	End the recording and save the video

Rotary encoder	
Current Screen/ Menu	
Home screen	Digital zoom
On the screen brightness adjustment menu	Brightness adjustment

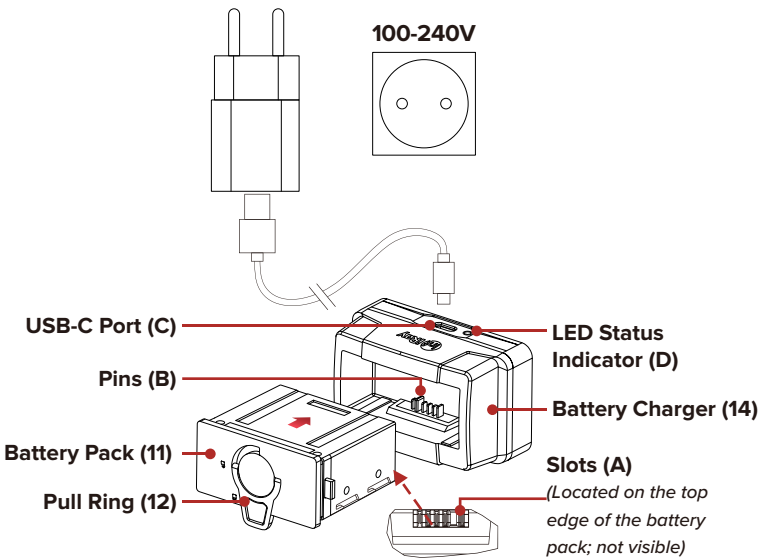| Up button +Down button	
Current Screen/ Menu	**Short Press**
	Background

Power Button+Up button	
Current Screen/ Menu	**Short Press**
	Standby

7. CHARGING THE BATTERY PACK

The RICO 2 series utilizes a rechargeable lithium-ion battery pack, IBP-5, with a runtime of up to 5.5 hours. The battery pack should be fully charged before the first use.

The IBP-5 uses a cam-locking mechanism to ensure quick and secure battery changes in the field. Fully charge the battery packs before using the RICO 2 Series for the first time.

Charging with the Battery Charger

1. Align the pins **(A)** of the battery pack with the groove **(B)** of the battery charging holder **(14)**, and insert the battery pack into the battery holder.

2. Connect the Type-C connector of the data cable to the port **(C)** of the battery holder.

3. Connect the other end of the data cable to the USB port of the power adapter.

4. Insert the power adapter into a 100V - 240V power socket to charge the battery pack.

100-240V

USB-C Port (C)

LED Status Indicator (D)

Pins (B)

Battery Charger (14)

Battery Pack (11)

Slots (A)
(Located on the top edge of the battery pack; not visible)

Pull Ring (12)

5. After the above steps are finished, the LED indicator **(D)** on the battery holder will light up or blink:

   a. The indicator light stays red indicating that the battery pack is charging;

   b. The indicator light turns green indicating that the battery pack is fully charged;

   c. If the indicator blinks red, the battery charging holder is connected to the power source but there is no installed battery pack.

6. After the battery is fully charged, remove the battery pack from the battery holder.

8. INSTALLING THE BATTERY PACK

1. Pull out the ring-pull **(12)** on the battery pack and rotate it clockwise to align it horizontally with the battery pack;

2. Align the pins on the battery pack with the slots on the device and install the battery pack onto the RICO 2;

3. When the battery pack is fully inserted into the RICO 2 housing, rotate the ring-pull **(12)** on the battery pack counterclockwise to lock the battery pack;

4. At this point, the ring-pull **(12)** is in the vertical position. Lower the ring-pull so that the bulge on the ring-pull points to CLOSE on the battery pack, and then the installation of the battery pack is completed;

5. The RICO 2 series can only be powered by this battery pack. If other battery packs are used, it may cause irreparable loss, damage the device, and even may cause fire.

   WARNING: The RICO 2 can only be powered by a factory-supplied IBP-5 battery pack. Using any other battery pack may cause irreparable damage to the device or cause a fire. Any damage from using an improper battery pack will not be covered by warranty.

9. SAFETY PRECAUTIONS

1. The battery pack must only be charged by this battery holder. Otherwise, it will cause irreparable damage to the battery pack or holder and may even cause fire;

2. After a long storage time, the battery pack should be partially charged, not fully charged or discharged;

3. Do not charge the battery immediately after you bring it from the cold to the warm. Wait 30 to 40 minutes for it to warm up;

4. Do not charge the battery unsupervised;

5. If the charger is modified or damaged, do not use it;

6. Charge the battery in the environment of 0°C to +45°C. Otherwise, the service life of the battery will be reduced;

7. Charging time should not exceed 24 hours;

8. Do not expose the battery to high temperature or open flame;

9. Do not immerse the battery in water;

10. Do not connect a third-party device on which the current exceeds the rated current;

11. The battery pack is equipped with a short circuit protection function, but situations that may lead to short circuits should be avoided;

12. Please do not disassemble or modify the battery pack without professional instructions; do not knock or drop the battery pack;

13. When the device is used under sub-zero temperatures, the capacity of the battery pack may drop. This is normal and does not indicate a defect;

14. Do not use the battery in an environment with a temperature greater than 50°C, which may reduce the service life of the battery;

15. Please keep the battery pack out of the reach of children.

10. EXTERNAL POWER SUPPLY

The RICO 2 series supports external power supplies, such as a power bank.

1. Connect the external power supply to the Type-C port of the RICO series;

2. The device will switch to the external power supply and charge the internal battery pack at the same time;

3. The battery icon will be changed to the charging icon ⊞ on the display;

4. If the device is connected to an external power supply and no battery pack is installed, the battery icon will be changed to the USB icon ⊞ ;

5. When the external power supply is disconnected, the Rico series device will automatically switch to the battery pack without shutdown.

11. OPERATING INSTRUCTIONS

<div style="border: 2px solid red; padding: 8px;">

WARNING!

Don't point the objective lens towards any intense energy sources, such as laser radiation or the sun. This may render the electronic components inoperative. The warranty does not cover damage caused

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Power-on and Settings

1. Remove the lens cap, and press and hold the Power button (3) to power on the device. Then, the home screen is displayed after several seconds.

2. Rotate the eyepiece adjusting ring (7) until the icon display of the image becomes clear in the eyepiece; After the adjust ment is completed, for the same user, there is no need to readjust the diopter when using it again.

3. Rotate the focus ring knob (2) of the objective lens to focus on the object to be observed.

4. To set the display brightness, image sharpness, image mode, digital zoom, and so on, please refer to the shortcut menu functions in this manual.

5. After using the device, press and hold the Power button (3) for 3 seconds. Then the shutdown countdown screen will appear.When the icon counts down from 3 to 0, then the display is off, and the device shuts down.

⏻ 00:03   Any key cancels shutdown

WARNING: Do not disconnect it from the power source during the shutdown process, otherwise the data cannot be saved.

12. CALIBRATION

A non-uniformity correction (NUC) allows a thermal imager's sensors to correct its pixels and eliminate any image defects caused by pixel drift.A NUC will be performed automatically each time the RICO 2 Series is powered on.

The RICO 2 has three NUC modes,automatic (A) , manual (M) .The selected NUC mode (A, M) appears in the status bar.

Automatic Mode

In automatic mode (A), the RICO 2 will perform a NUC automatically according to the internal software algorithm. There is no need to close the objective lens cap (1) as the RICO 2's internal shutter covers the sensor.

A countdown timer will appear in the status bar instead of the calibration mode when 5 seconds remain until an automatic NUC is performed. Pressing the   Power Button (3) during the 5-second countdown will cancel the pending NUC. The timer will appear only after the microbolometer temperature has stabilized—after approximately 10 minutes of continuous operation of the RICO 2 .

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 NUC based on the quality of the observed image. It is not necessary to close the objective lens cap (1) during a manual NUC, as the internal shutter covers the sensor.

To perform a manual NUC while in manual mode (or automatic mode):

1. From the home screen, short press the Power Button+ Rangefinding button.
2. A manual NUC is performed instantly.

Background NUC

A background NUC uses less power than an automatic or manual NUC because it does not use the imager shutter to cover the sensor; instead, the user must close the lens cap.

To perform a background NUC :

1. Close the objective lens cap (1).

2. From the home screen, short press the Rangefinding button+ Capture button.

3. A prompt to close the lens cap appears onscreen. The background NUC starts after about 2 seconds.

NOTE: If the lens is 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.

13. MOUNTING THE RICO 2 SERIES

Installing the Dual-Throw Mount

Dual-throw Mount (16)

M5 Mounting Holes
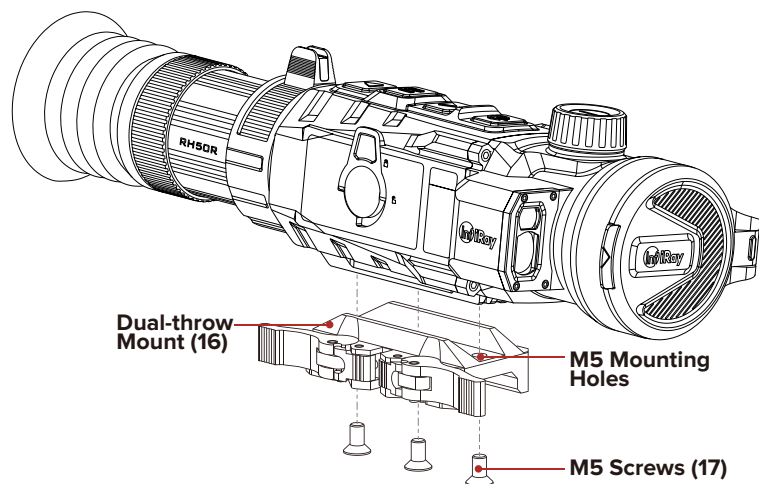
M5 Screws (17)

Before using the RICO 2 ,install the dual-throw mount to the three mounting holes in the base of the rifle scope.

1. Install the dual-throw mount **(16)** to the base of the RICO 2 using a 3mm hex key and the M5 screws **(17)** supplied in the package.

2. Install the RICO 2 to the rifle and adjust its position so that it produces a clear image and is comfortable for the shooter.

3. When the location is suitable, remove the M5 screws one at a time and apply a small amount of blue Locktite 242 to the threads.

4. Reinsert each screw and tighten to 20 in/lbs with a torque wrench.

5. Allow the threadlocker to dry.

   NOTE: Please note, torque is inch pounds, NOT foot pounds. If you do not have a torque wrench, apply until snug. Do not overtighten.

When the threadlocker is dry, install the mount and rifle scope to the Picatinny rail of your rifle.

6. Press the locking button **(18)** and then pull each throw lever **(19)** forward to open it.
7. Install the mount to the Picatinny rail.


Locking Button (18)
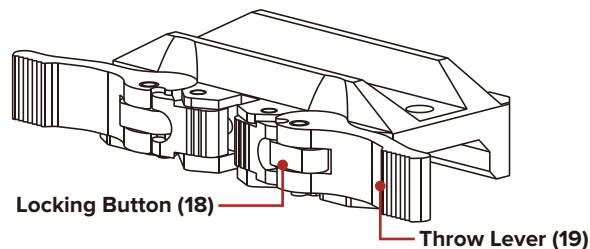
Throw Lever (19)

8. Press the throw levers closed to lock the mount in place. You will hear the levers and locking buttons click into place.

The RICO 2 is now ready to be zeroed. See Zeroing the RICO II Series on page 20 for instructions.

Adjusting the Tension of the Throw Levers

If you cannot slide the mount onto the Picatinny rail because the throw levers are in the open position but the locking plate is not, or if the mount is not tight to the rail after the throw levers are closed, you may loosen or tighten the tension of the throw levers **(19)** by adjusting the nuts **(18)**.

1. Open both throw levers **(19)**. This will cause the adjustment nuts **(18)** to protrude on the opposite side of the mount.

Nut (18)
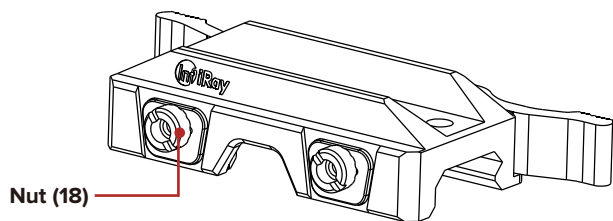
2. Use the included spanner tool to turn both adjustment nuts clockwise to tighten, or counterclockwise to loosen, to achieve the correct amount of tension. You should not feel any tension on the throw lever when closing until it reaches a 45-degree angle. Do not overtighten.

14. ZEROING THE RICO 2 SERIES

The RICO 2 features the freezing-zeroing function.

1. Secure the scope on the rifle using the included quick-release Picatinny rail (16) provided in the package;

2. Set a target at a certain distance, such as 100 m and 200 m;

3. Adjust the scope based on the operating instructions as described in Chapter VIII Power-on and Settings;

4. Press and hold the M button(5) to enter the advanced menu, and select he third option to enter the secondary menu of Zeroing.

5. Select or add the new zeroing distance (refer to Zeroing - Distance Settings in the main menu) according to the selected target distance;

6. Enter the zeroing interface, and the horizontal and vertical coordinates (X/Y) of the reticle are displayed in the upper left corner.

7. Aim and shoot at the target.

8. If the point of impact and the aiming point (the center of the reticle) do not match, keep the aiming

position still, press the Capture button, select the fourth option, Freezing function, and press the M button (5) to freeze the screen. At this time, the freezing icon changes from white to blue.

9. At this point, you can move the reticle position. Press the M button (5) to switch the moving direction of the reticle to the X-axis or Y-axis. The position where the cursor is located indicates the currently selected item, and the icon turns blue;

10. Press the Up button (4) or Down button (6) or press and hold them to move the reticle. The Up button (4) controls the cursor to move right or up, and the Down button (6) controls the cursor to move left or down. When pressed, the cursor moves one pixel, and when pressed and held, the cursor moves continuously by 10 pixels each time.

11. After moving the reticle, a little red dot will appear on the screen, indicating the position of the reticle before the movement;

12. After moving the reticle position to the actual point of impact, press and hold the M button (5) to save the latest reticle position and return to the home screen.

13. Repeat the above operation until the point of impact and the aiming point are consistent.

NOTE: After the zeroing position is set up, you can switch the options of Zeroing Distance in the shortcut menu.
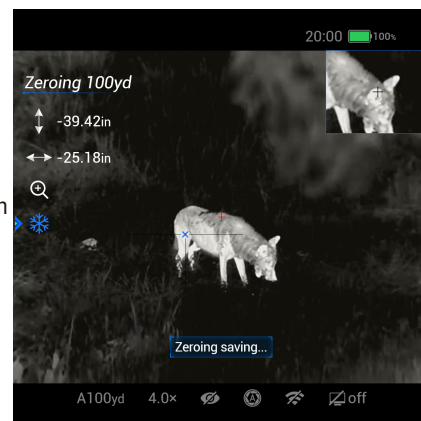
15. RANGEFINDING FUNCTION
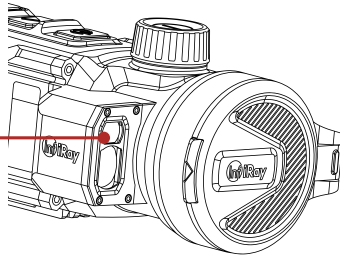
WARNING!

Caution statement
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Information for the user
Telescopes and binoculars may pose an eye hazard and thus the user should not direct the beam into an area where such instruments are likely to be used.

Certification label
And it is a Class 3R laser product that complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

DANGER
LASER RADIATION
AVOID DIRECT EYE EXPOSURE
P<2W,905nm, 40ns
EN 60825-1:2014/A11:2021
CLASS IIIa LASER PRODUCT

LASER APERTURE

The Rico 2 series is an integrated rangefinding model that supports accurate rangefinding of up to 1,200 m.

1. The Rico 2 series supports two rangefinding modes: single ranging (SGL) and continuous ranging (CONT).

2. On the home screen, press the Rangefinding button to enable single ranging. Then a square rangefinding box appears at the center of the screen, and the distance information is displayed on the upper right corner of the screen at this point. Press and hold the Rangefinding button to enable continuous ranging, and the range finding information is displayed in real time.

The operating characteristics of laser rangefinding

1. The measurement accuracy and maximum distance depend on the reflectance of the target surface, the angle at which the emitted beam strikes on the target surface, and the environ mental conditions. Reflectance is affected by the target surface texture, color, size, and shape. A glossy or bright surface usually reflects more energy than a dark surface.

2. The measurement accuracy is also affected by lighting conditions, fog, haze, rain, snow, and other factors. Light conditions or sunlight will degrade the rangefinding perfor mance.

3. Measuring the range of a small-sized target is much more difficult than measuring a large-sized target.

16. DIGITAL ZOOM

The Rico series supports 1x to 4x digital magnification of images to increase visual magnification.

1. On the home screen, rotate the rotary encoder to perform the digital magnification;

2. The corresponding visual magnification is displayed in the status bar at the bottom;

17. PHOTOGRAPHY AND VIDEO RECORDING

The Rico series thermal imager is equipped with built-in 32GB memory, and supports photo taking and video recording. The image and video files will be named after time, so it is recommended to set the system date and time in the main menu (refer to Main Menu - Settings - Date/Time), or synchronize the system date and time on the Settings page of the app before photo taking and video recording. For specific steps, see the operating instructions for the app, which can be downloaded from our official website.

Photography

To take a photo:

1. On the home screen, press the Capture button (6) to take a photo. The screen may experience a brief pause, and a photo icon flashes in the top left corner. After the photo is taken, the icondisappears.

2. The images taken are saved in the built-in memory space.

Video Recording

To record video:

1. On the home screen, press and hold the Capture button (6) to start the video recording;

2. The recording icon and recording time prompt will be displayed on the status bar of the screen, and the time is in the format of HH:MM:SS (Hour, Minute, Second);

3. During the recording process, press the Capture button (6) to take a photo, and the photo icon is displayed in the upper left corner;

4. Press and hold the Capture button (6) to stop the recording and save the video;

5. The videos and images captured are saved in the internal memory space.

Video and Photography Notes

- You can open and operate the menu during video recording; The user interface (status bar and menu) is captured in recorded photos and video.

- Recorded photos and videos are saved to the internal memory card:

  - Photos are saved in PIC_HHMMSS.jpg format.
  - Videos are saved in VID_HHMMSS.mp4 format.
  - HHMMSS is hour/minute/second.
  - The counter used for multimedia file names cannot be reset.
  - If a file is deleted from the internal memory, its counter number is not taken by another file.
  - 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.
  - Check the available space on the internal storage card regularly and move video footage and images to other storage media to free up space on the memory card.

18. ACCESSING THE INTERNAL MEMORY

When the device is powered on and connected to a computer, it will be recognized by the computer as a flash memory card. Then, you can access the memory of the device and copy images and videos.

1. Connect the device to a computer through the USB cable;

2. Power on the device;

3. Double-click My Computer on the desktop, double-click to open the device named Infiray   Infiray   , and then double-click to open the device named RH50R to access the memory;

4. There are different folders named after time in the format of DD/MM/YY in the memory;

5. The folders store the videos/images captured on the corresponding days. To copy or delete files or folders, select accordingly.

19. STATUS BAR OVERVIEW
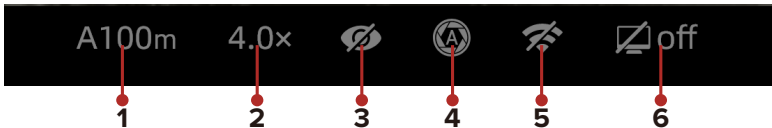
The status bar is located at the top and bottom of the screen to indicate the current operational status of the thermal imager. The display content from the left to the right are as follows:

1 Current selected gun type

2 Current visual magnification

3 Ultra-clear mode status: (⊘ : the ultra-clear mode is off; ◉ : the ultra-clear mode is on)

4 Calibration mode: (In automatic shutter calibration mode (A), 5s before the calibration, a countdown icon appears next to the calibration icon 🔄00:05 , replacing the letter A.) Upon start, the device automatically performs continuous shutter correction but does not prompt the countdown, which only appears when the device is in a stable state (about 10 minutes after the continuous operation).

5 Wi-Fi status (📶 : Wi-Fi off; 📶 : Wi-Fi on; 📶 : Wi-Fi on but not connected)

6 Standby setting (off by default)

Battery Status

The battery icon color and fill level indicate the current battery status. The battery icon is replaced by the charging battery icon when an external power supply is connected.

| COLOR / ICON	BATTERY STATUS
Green Battery	41% – 100%
Yellow Battery	20% – 40%
Red Battery	<20%; charge the battery pack right away.
Charging Battery	The battery pack is charging; an external power supply or computer is connected via the data cable.

20. USING THE QUICK MENU

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

1. On the home screen, short press the M button (5) to enter the quick menu.

2. Press the Up button (4) and Down button (6) to move between the menu options below. The selected menu item is highlighted in the background.

   a. **Color Palette**: Short press the M button (5) to set the color palette to white hot ( ), black hot ( ), red hot ( ), color ( ), violet ( ), crimson ( ) or viridina ( ). The selected color palette appears in the status bar.

   b. **Image Brightness**: Short press the M button (5) to change the image brightness level, from 1–10.

   c. **Image Contrast:** Short press the M button (5) to change the image contrast level, from 1–10.

   d. **Image Sharpness**: Short press the M button (5) to change the image sharpness level, from 1–10.

   e. **Zero Distance**: Short press the M button (5) to select a new 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 status bar.

3. Long press the M button (5) to save any changes and returnto the home screen.

NOTE: In the quick menu, if there is no user input for 5 seconds, the RICO 2 will automatically save any changes and return to the home screen.

21.   MAIN MENU

- On the home screen, press and hold the Menu button (5) to open the main menu;

- Press the Up button (4) or Down button (6) to switch between menu options;

- The function options of the main menu are cyclical: when the cursor reaches the last menu option on the first page,continue to press the Down button (6) so that it will start from the first menu option on the second page; when the cursor stays at the first option on the first page, press the Up button (4) to jump directly to the last menu option on the second page;

- Press the M button (5) to modify the parameter settings of the current menu option, or to open the submenu;
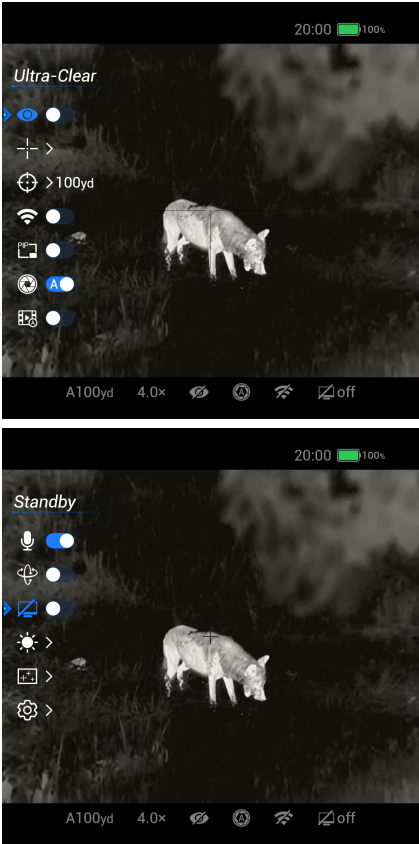
- The position of the cursor   indicates the selected option, the icon of which turns from white into blue;

- On the secondary and tertiary menus, press the M button (5) to confirm the selection, then the icon will flash to save the modifications, and go back to the previous menu;

- In all menu interfaces, press the Power button (3) to return directly to the previous menu or the home screen without saving changes; press and hold the M button (5) to save changes and return directly to the home screen;

- If there is no operation within 15s on any menu interfaces, the device does not save the changes and the home screen is automatically displayed;

- During the continuous operation of the thermal imager, when exiting from the main menu, the cursor remains at the position before exiting. When the product is restarted, the cursor stays at the first menu option upon initial entry into the main menu.

Use the and buttons to navigate through the advanced menu options up and down, press the M button to confirm on/off, confirm entry into a submenu, or confirm the current option parameters. Press and hold the M button to save the changes and return to the home screen; press the Power button to return to the previous menu, and return to the home screen when there is no operation within 15s.

22. MAIN MENU OPTIONS AND DESCRIPTIONS

Ultra-Clear 👁

Turn Ultra-Clear mode on / off

Enabling/Disabling Ultra-Clear Mode

1. Press and hold the M button (5) to open the main menu;

2. Select the Ultra-Clear Mode (selected by default on the main menu after startup);

3. Press the M button (5) to enable or disable ultra-clear mode, during which a click of shutter calibration will be heard;

4. The icon in the status bar changes accordingly after this mode is enabled/disabled.
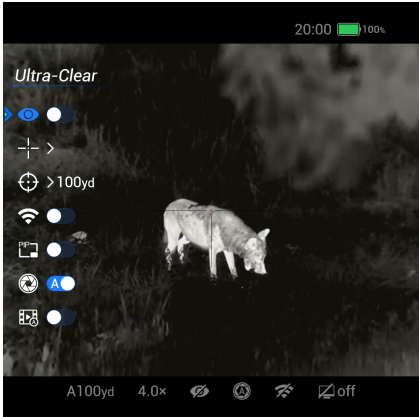
Reticle ⌖

Set the zeroing profile, reticle type, or reticle color

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select the Reticle Setting;

3. Press the M button (5) to enter the secondary menu of the Reticle Setting and make the following settings:

RETICLE MENU > ZEROING PROFILE 🔫

Set the zeroing profile

1. Press the Up button (4) or Down button (6) to select the Zeroing Profile;

2. Press the M button (5) to confirm the selection and enter the secondary menu of the Zeroing Profile;

3. Press the Up button (4) and Down button (6) to select one of the three zeroing profiles (A, B, C, D, E, F);

4. Press the M button (5) to confirm the selection. The icon flashes, and returns to the interface of the previous menu.
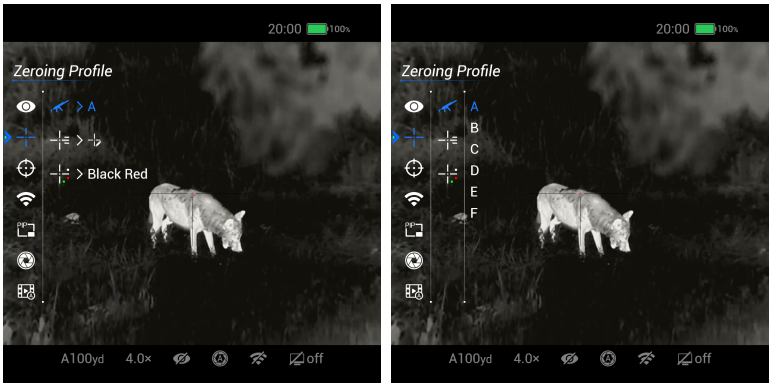
RETICLE MENU > RETICLE TYPE ⌖

Set the reticle type

1. Press the Up button (4) or Down button (6) to select the Reticle Type;

2. Press the M button (5) to confirm the selection and enter the secondary menu of the Reticle Type;

3. Press the Up button (4) or Down button (6) to select one of the seven reticle types;

4. The type of reticle will also change as the cursor moves;

5. Press the M button (5) to confirm the selection. The icon flashes, and returns to the interface of the previous menu.

The last reticle is the custom reticle, which requires connection to the InfirayOutdoor app for configuration.

RETICLE MENU > RETICLE COLOR ⌖

Set the reticle color

1. Press the Up button (4) or Down button (6) to select the Reticle Color;

2. Press the M button (5) to confirm the selection and enter the secondary menu of the Reticle Color;

3. Press the Up button (4) or Down button (6) to select one of the eight reticle colors, and from top to bottom, they are black red, black green, white red, white green, black white, white black, red, and green.

4. The color of reticle will also change as the cursor moves;

5. Press the M button (5) to confirm the selection. The icon flashes, and returns to the interface of the previous menu.

Zeroing ⌖

Select or customize zero distance

In a zeroing file for the Rico II series, up to 9 sets of zeroing distances are supported, allowing users to perform zeroing at any distance between 1 to 999 meters.

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select the Zeroing;

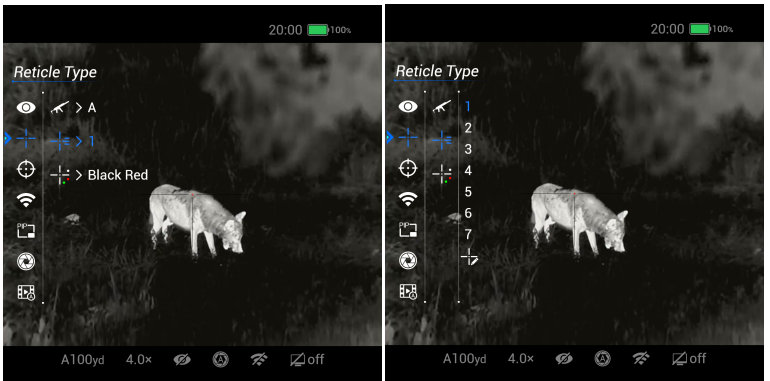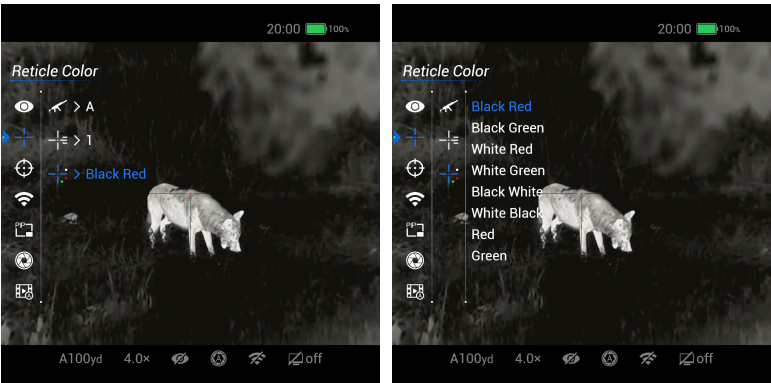3. Press the M button (5) to enter the secondary menu of the Zeroing; the default zeroing distance is 100 m;

4. Press the Down button (6) if there is a need to add more than one zeroing distance, and select the + option to increase the distance. The increased distance is 100 meters higher than the previous distance by default.

5. Press the Up button (4) and Down button (6) to select the zeroing distance based on the set distance of the target;

6. Press the M button (5) to confirm the zeroing distance and enter the submenu of this zeroing distance.

7. In the tertiary menu, there are three options, namely the Zeroing Interface, Distance Settings, and Delete Current Distance. You can select these options by pressing the Up button (4) or Down button (6).

ZEROING MENU >ZEROING INTERFACE

1. Select the Zeroing function, and press the M button (5) to enter the zeroing interface;

2. Display the coordinates of the X-axis and Y-axis where the reticle is located, Freezing option, and Magnification option in the upper left corner of the screen;
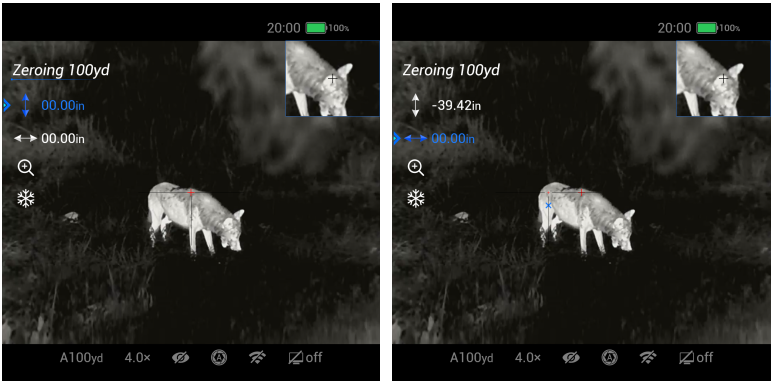
3. Aim at the target distance through the reticle center of the scope, and shoot. Then observe the actual point of impact after shooting;

4. Keep the aiming position still; press the Down button (6) to select the Freezing; press the M button (5) to freeze the screen; the freezing icon on the screen will change from white to blue;
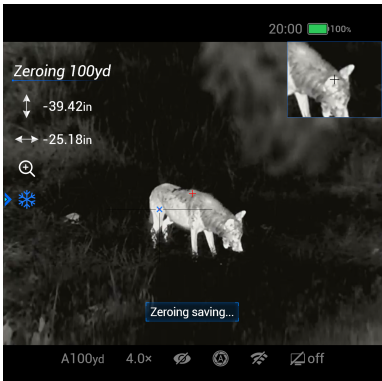
5. Press the Up button (4) or Down button (6) to switch the moving direction of the reticle to the X-axis or Y-axis, and press the M button to select it.

6. After selecting a certain direction, press the Up button (4) or Down button (6) or press and hold them to move the reticle until the center of the reticle is aligned with the actual point of impact;

7. Press and hold the M button (5) to save the reticle position, and return to the home screen.

For more details, refer to Chapter X Zeroing.

ZEROING MENU >DISTANCE SETTING

If the zeroing distance is not consistent with the preset target distance, this option can be used for setting;

1. Select an invalid zeroing distance, and press the M button (5) to open its submenu;

2. Press the Up button (4) or Down button (6) to select the Set Zeroing Distance.

3. Press the M button (5) to activate the zeroing distance reset function, and then two small triangle symbols are displayed above and below the number;

4. Press the Up button (4) and Down button (6) to set the value of the current position;

5. Press the M button (5) to switch between the positions of hundreds, tens and ones digits;

6. Press and hold the M key (5) to save the changes and return to the Zeroing after the setting is completed, and the zeroing distance in the status bar and menu will also be updated simultaneously.

ZEROING MENU >DELETE DISTANCE

If the current set distance is no longer needed, you can delete the current distance.

1. Select an invalid zeroing distance, and press the M button (5) to open its submenu;

2. Press the Up button (4) or Down button (6) to select the Delete Distance;

3. Press the M button (5) to pop up a prompt box for confirming deletion, then press the Up button (4) or Down button (6), and select Yes to delete the current

Wi-Fi 📶

Turn the Wi-Fi on / off
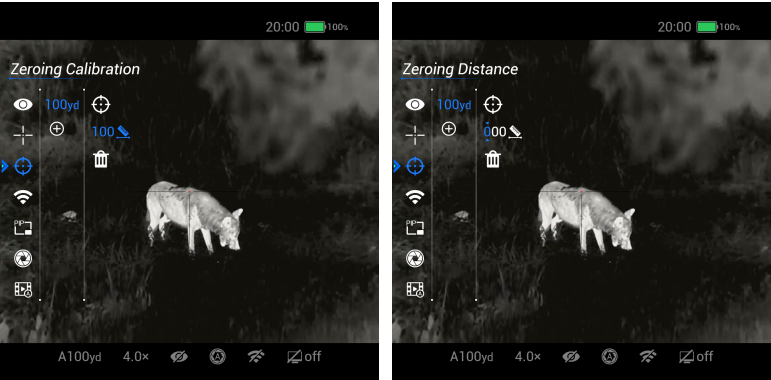
1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select the Wi-Fi;

3. Press the M button (5) to enable/disable the Wi-Fi function;

4. When the Wi-Fi is enabled/disabled, the icon in the status bar will change accordingly.

PIP

Enabling PIP function (picture-in picture)

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select PIP;

3. Press the M button (5) to enable/disable the Wi-Fi function;

4. After the PIP function is enabled, a display box of size 320×256 will appear in the middle of the screen. The image around the cross cursor will be magnified by 2 times, and the magnification of the display box at this time will be displayed in the lower right corner.

Calibration ⚙

Selecting Calibration Mode

The Rico series provides three calibration modes: Automatic (A), Manual (M).

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select Calibration Mode;

3. Press the M button (5) to open/close automatic callbration.

4. Automatic: Parameters are defined by software algorithm and images are calibrated automatically in this mode.
   Manual: Images are calibrated by the user according to the image effect.

5. Press the M button (5) to confirm the selection. The icon in the status bar changes accordingly.

Motion Sensor ⌖

Turn the RAV Recording on / off

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select Motion Sensor;

3. Press the M button (5) to enable/disable the motion sensor;

4. After it is enabled, its functions will be displayed on both sides of the screen;

5. The curved ruler on the left represents the tilt angle and the vertical ruler on the right represents the pitch angle.

Recoil Activated Video (RAV) Recording 🎥
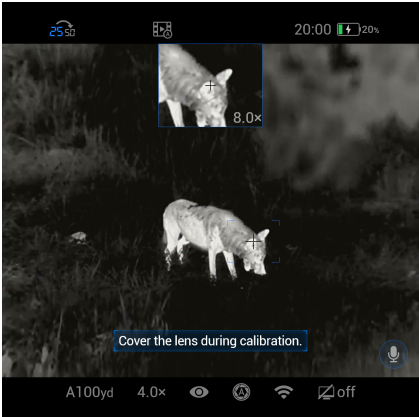
Turn the RAV Recording on / off

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select RAV;

3. Press the M button (5) to enable/disable the micro phone;

4. After the RAV recording is enabled, its icon in the upper status bar will change from dark to bright. At this time, if a shot is detected, a video will be automatically recorded. The recording time will be 3 seconds before the shot and 2 minutes 57 seconds after the shot.
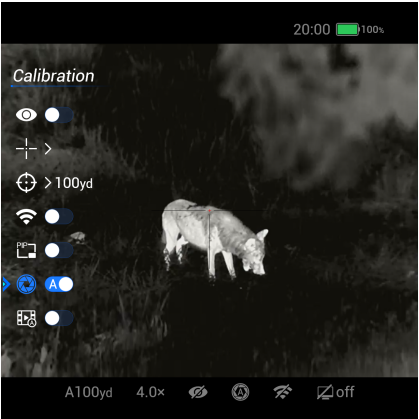
Microphone 🎤

Turn the microphone on / off

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select Microphone;

3. Press the M button (5) to enable/disable the microphone;

4. When the microphone is enabled, a microphone icon will appear in the lower right corner of the screen. At this point, video recording will also capture audio simultaneously.

Standby ⊡

Turn on automatic standby mode

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select Automatic Standby;

   Press the M button (5) to enable/disable the automatic standby;

3. Press the Up button (4) or Down button (6) to make a selection;

4. Press the M button (5) to confirm the selection, and then the selected option is displayed at the bottom status bar;

5. If Off is selected, the standby function is disabled; When the function is enabled,

NOTES:

1. The standby mode is activated automatically when the device is tilted up or down at an angle of more than 70° and left or right at an angle of more than 30°;

2. When the device is in the shooting status (horizontally positioned), the device is woken.

Brightness Adjustment

Setting Screen Brightness

1. Press and hold the M button (5) to open the main menu;

2. Press the Up button (4) or Down button (6) to select Screen Brightness Adjustment;

3. Press the M button (5) to open the menu of the screen brightness adjustment;

4. In the screen brightness adjustment menu, rotate the magnifica tion knob to finely adjust the screen brightness. The screen brightness is divided into 100 levels, with the default set at level 50.
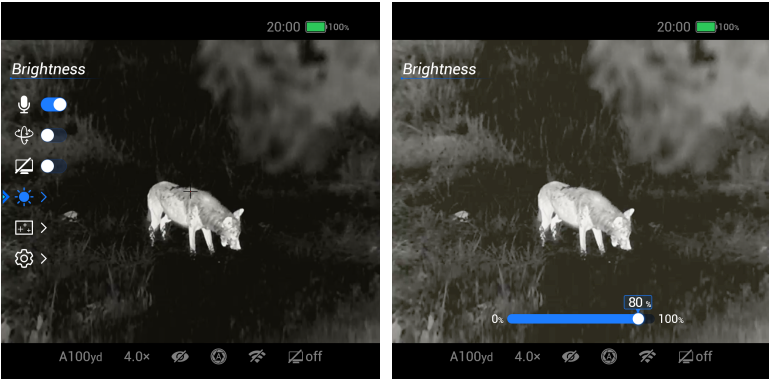
5. Press and hold the M button (5) to save the changes and return to the previous menu after the adjustment is completed.

Pixel Defect Correction ⊞

Correct defective pixels

When using the scope, you may see pixel defects, such as visible light spots or dark spots with stable brightness. To address this problem, the pixel defect correction function can be used to remove the pixel defects.

1. In the main menu, select the Pixel Defect Correction;

2. Press the M button (5) to enter the Pixel Defect Correction interface. A small cross cursor will appear in the center of the screen, and at the same time it will automatically enable the PIP function, with the default position in the lower left corner;

3. The right side of the PIP window shows the cursor moving direction: X-axis, Y-axis, add defective pixel option (the scale of the current defective pixel), and automatic pixel defect correction;

4. Press the Up button (4) or Down button (6) to navigate through the options, and press the M button (5) to make the selection;

5. Press the M button (5) to switch the moving direction, then press the Up button (4) or Down button (6) or press and hold them to move the cursor in the current direction. The Up button controls the cursor to move right or up, and the Down button controls the cursor to move left or down. When pressed, the cursor moves one pixel, and when pressed and held, the cursor moves continuously by 10 pixels each time;

6. Press the M button (5) to save it in this direction after the move ment is completed, and press the Up button (4) or Down button (6) to switch to the other direction;

7. Repeat the preceding steps to change the cursor location until it reaches the position of the pixel defect;

8. Select the Add Defective Pixel, press the M button (5) to add the defective pixel, and the number on the right increases, indicating that the pixel defect has been added;

9. At the same position, press the M button (5) again to cancel the pixel defect correction there, and the number on the right decreases, indicating a successful cancellation;

10. When the cursor moves near the PIP, the PIP and the content on the right will move to the upper left corner automatically;

11. Press and hold the M button (5) after the correction is completed, and a prompt box will display, asking whether to save the correction;

12. Press the Up button (4) or Down button (6) to switch selection, and press the M button (5) to confirm the selection;

13. Select Yes to confirm the saving and exit; and select No to cancel the saving and exit;

14. Selecting the Automatic Pixel Defect Correction menu can automatically add defective pixels of the current screen. In the case of incomplete addition, manual addition is required.

Settings ⚙

This function is used to set the date, time, language, measurement unit, status auto hiding, factory reset, and device information query.

SETTINGS MENU > DATE 📅

Setting System Date

1. Press the M button (5) to open the secondary menu of Settings;

2. Select Date;

3. Press the M button (5) to activate the date reset function, with the date in the format of DD/MM/YY;

4. Press the Up button (4) or Down button (6) or press and hold them to set the correct year, month and day;

5. Press the M button (5) to switch between the year, month, and day;

6. Press and hold the M button (5) to save changes and exit the Date Reset after the setting is completed.

SETTINGS MENU > TIME 🕐

Setting System Time

1. Press the M button (5) to open the secondary menu of Settings;

2. Select Time; and the time is displayed in a 24-hour format, with hour/minute shown;

3. Press the M button (5) to activate the Time Reset;

4. Press the Up button (4) or Down button (6) or press and hold them to set the correct hour and minute;

5. Press the M button (5) to switch between the hour and minute;

6. Press and hold the M button (5) to save changes and exit Time Reset after the setting is completed;

7. After the time is reset, the icon in the status bar is changed accordingly.

SETTINGS MENU > UNIT 🔲

Selecting the Units of Measure

1. Press the M button (5) to open the secondary menu of Settings;

1. Select Units of Measure, and press the M button to open the secondary menu of Units of Measure;

1. Press the Up button (4) and Down button (6) to select the required measurement unit of meters or yards;

1. Press the M button (5) to confirm the selection, then save the setting and exit;
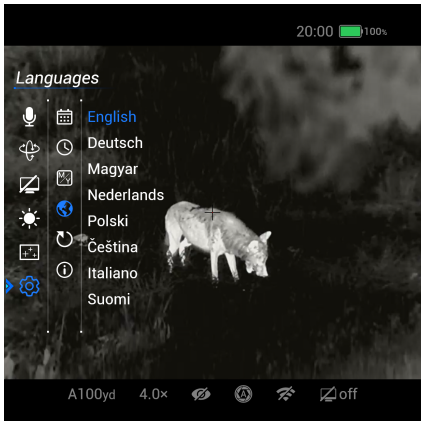

SETTINGS MENU > LANGUAGES 🌐

Selecting Language

1. Press the M button (5) to open the secondary menu of Settings;

2. Select Language, and press the M button (5) to open the secondary menu for language selection;

3. Press the Up button (4) and Down button (6) to switch the language;

4.   Press the M button (5) to confirm the selection, then save the setting and exit;

SETTINGS MENU > FACTORY RESET ↻

Restoring Factory Default Settings

1.   Press the M button (5) to open the secondary menu of Settings;

2.   Select Factory Reset, and press the M button (5) to enter the secondary menu of Factory Reset;

3.   Press the Up button (4) and Down button (6) to select Yes for restoring factory settings or No for canceling the operation;

4.   Press the M button (5) to confirm the selection;

5.   If Yes is selected, the scope will restart automatically;

6.   If No is selected, the operation is canceled and the screen r eturns to the previous menu.

The functions will be restored to their default settings after the Factory Reset is selected.

SETTINGS MENU > INFO ⓘ

Querying Device Information

1.   Press the M button (5) to open the secondary menu of Settings;

2.   Select Info;

3.   Press the M button (5) to display the relevant information of the current scope;

4.   Press and hold the M button (5) to exit and return to the previous menu.


23. Wi-Fi

The Rico II series comes with a built-in Wi-Fi module, allowing the device to wirelessly connect to external apparatus such as computers and smartphones via Wi-Fi.

1.   In the main menu, enable the Wi-Fi on the device (for details of the operation, refer to the operations of main menu functions).

2.   After the Wi-Fi of the scope is enabled, search for the Wi-Fi named Rico2_XXXXXX on the mobile device, where XXXXXX is the serial number composed of digits and letters;

3.   Select the Wi-Fi and enter the password to connect. The initial password is 12345678;

4.   The scope can be controlled via the app on the mobile device after the Wi-Fi connection is established.

Setting Wi-Fi Name and Password

The Rico II series allows you to change the name and password of the device's Wi-Fi via the app.

1.   After the scope is connected to the mobile device, locate the Settings icon on the InfiRay Outdoor image screen and tap it to open the Settings interface;

2.   In the text box, enter and submit the new Wi-Fi name (SSID) and password;

3.   Reset the device to activate them after submitting the changes.
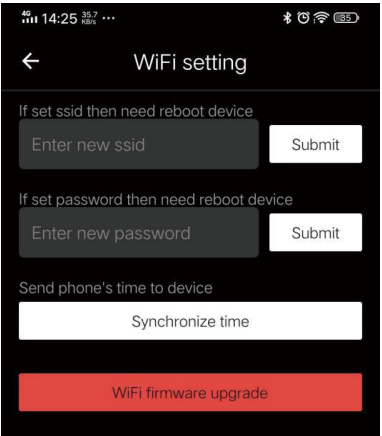
NOTE: If the device is reset to the factory settings, the name and password of the Wi-Fi will also be restored to the default settings.

24. USING THE INFIRAY OUTDOOR APP

The Rico II series thermal imager is equipped with an app. By connecting the device to the app in a mobile phone or laptop via Wi-Fi, it supports real-time image transmission, device operations, and program updates.

You can download the user manual of InfiRay Outdoor at our official website (www.xinfrared.com).

You can also test and update the software of the product via the InfiRay Outdoor app or download it on our official website.

About InfiRay Outdoor

1. You can download and install the InfiRay Outdoor app on the official website (www.xinfrared.com) or in an app store. Alternatively, you can scan the QR code below to download it for free.

2. After installing the app, open it;

3. If your device has been connected to a mobile device, please switch on the mobile data of the mobile device. After the device accesses the Internet, an update prompt will be displayed automatically on the app. Tap Now to download the latest version immediately or Later to update later;

4. InfiRay Outdoor automatically registers the last connected device. Therefore, once you have connected the scope with InfiRay Outdoor before, it will automatically detect the update even when the device is not connected to a mobile phone or laptop. If an update is available and the mobile device accesses the internet, you can download the update first. After the download is completed, connect the scope to the mobile device and the update process automatically starts;

5. After the update is installed, the device will restart and enter operation mode.

25. WARRANTY

At iRayUSA we're first and foremost hunters and users of our products and we understand that failure isn't an option. We also understand that having to wait extended periods for repair isn't something that a customer should have to put up with when something does go wrong. During your published warranty period, iRayUSA will repair or replace, at its discretion, any optic that becomes defective during normal use. Additionally, if we cannot fix your optic in less than one week, we will offer to replace it with a replacement product in like or better condition. If you would rather wait for your specific optic to be repaired, we can handle that too.

We know you've never seen this from a thermal manufacturer, and neither have we, and that's why we started iRayUSA.

Our warranty follows the product and is not tied to the original owner. The warranty period is tied to the date of sale to the dealer. This warranty only covers normal use and does not cover cosmetic damage, normal wear, intentional damage, theft, loss, any act of God, or a condition caused by use other than intended. Any product that is modified, opened, or tampered with will void any warranty coverage. Any serial number damage or alteration on the product will be considered a modification.Be sure to register your RICO2 Series rifle scope at irayusa.com/register .

To return a product for repair:

1. Go to irayusa.com/warranty and click the **Request an RMA button** to request an RMA number. Returns will not be accepted without an RMA.

2. The customer is responsible for shipping the product to iRayUSA, per the instructions included in the RMA. iRayUSA will return the product at no cost.

WARRANTY NOTES

- The one-week timeline starts from the time of receipt of the product at iRayUSA.

- iRayUSA is not liable for any damages or loss incurred when shipping to iRayUSA.

- This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Please give us a call at **800-769-7125**, visit irayusa.com/warranty , or email info@irayusa.com with any questions.

26. 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 body or 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.

27. 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 with a clean, dry cotton cloth. Do not use 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.

28. GENERAL TROUBLESHOOTING

The troubleshooting table on the page lists issues that may occur when operating the RICO 2 Series.Carry out the recommended troubleshooting steps in the order shown in the table. Please contact iRayUSA at 800-769-7125 or irayusa.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.

29. TROUBLESHOOTING

The following table lists all problems that are likely to occur during device operation. Check and address problems by referring to this table. If faults not included in this table occur or you cannot fix the fault, return the device to its vendor or supplier for troubleshooting.

ISSUE	POSSIBLE CAUSES
Failure to start	The battery is out of charge
The device cannot be powered by an external power supply	The USB cable is damaged
	The external power supply is insufficient
Images are unclear, vertical lines are present, or the background is not even	Calibration is required
The image is too dark	The screen is not bright enough
The icons are clear but the image is blurry	The lens is not focused
	The inner or outer optical surface of the lens is dusted or iced

TROUBLESHOOTING STEPS
Charging
Replace the USB cable
If necessary, check the external power supply
Calibrate the images as instructed in Chapter IX of the User Manual
Adjust the display brightnessAdjust the display brightness
Rotate the lens focus ring to adjust the focus
Wipe the outer optical surface with a soft cotton cloth, or leave the thermal imager to dry in a warm and dry environment for more than 4 hours

ISSUE	POSSIBLE CAUSES	TROUBLESHOOTING STEPS
The device cannot connect to a mobile phone or computer.	The Wi-Fi password is incorrect.	Enter the correct password.
	There are too many Wi-Fi networks in the range of the device, which may cause interference.	To enable stable network access, you are advised to move the device to an area with a limited number of Wi-Fi networks, or an area without Wi-Fi coverage.
Wi-Fi signals are lost or interrupted.	The device is beyond Wi-Fi coverage. There is blocking (such as concrete walls) between the device and the receiver.	Move the device to a place where you can receive Wi-Fi signals.
The observed target disappears.	You are observing the target through the glass.	Observe the target directly without the presence of glass.
The image quality is poor or the detection range shortens.		These problems are likely to occur when you use the device in harsh weather (such as snow, rain, and fog).
When the device is used at a low temperature, the imaging quality is poorer than that at a normal temperature.		At temperatures above 0°C, the temperature rise varies with the observed objects (environment and background) due to different heat conductivity coefficients. As a result, high-temperature contrast occurs and the image quality is better. At low temperatures, the observed targets (background) usually cool down to a similar temperature because of reduced temperature contrast. Therefore, the image quality (details in particular) is poor, which is a characteristic of thermal imaging devices.

30. NOTES