

Rico II Series User Manual

V1.0

2022/5

Technical Specifications

Product Model	RH50R
Detector Parameters	
Type	Uncooled Vox
Resolution, pixel	640*512
Pixel Size, μm	12
NETD, mk	≤20
Frame Rate, Hz	60
Optical Parameters	
Objective Lens	F50mm /1.0
FOV	8.8*7.0
Visual Magnification, ×	3x~12x
Eye Relief, mm	60
Diopter Adjustment, D	-3~+3
Detection Range, m (Target Size: 1.7m×0.5m, P(n)=99%)	2597
Display	
Type	AMOLED
Resolution, pixel	2560*2560
Size, inch	1.03
Power Supply	
Battery Type/Capacity/Output Voltage	Lithium-ion battery pack IBP-2 / 4400mAh / DC 3.7V
Service Voltage	3V~4.2V
External Power Supply	5V (Type C USB)
Physical Parameters	
Operating Time (t=22°C), h★	5.5h
IP Rate	IP67
Memory Capacity, GB	32
Operating Temperature, °C	-20°C-50°C
Laser Rangefinding Module	√
Weight, g	926g
Laser Rangefinding Specifications	

Wavelength, nm	905
Maximum Measurement Distance, m	1200m
Measurement Accuracy, m	±1

★ The actual operating time depends on the density of Wi-Fi use, photo-taking, recording, laser rangefinding, etc.

★★ The measurement distance depends on the characteristics of the target, and the observation and environmental conditions.

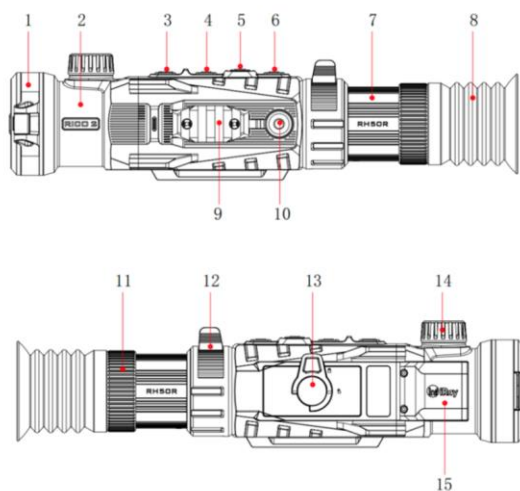
I. In the Box

- Rico II 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

II. Product 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 2,000 meters away. Its applications span across nighttime observation, terrain positioning, as well as search and rescue operations.

III. Product Components and Buttons




- 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 - SR2000 laser rangefinding

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IV. Product Features

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

V. Button Operation

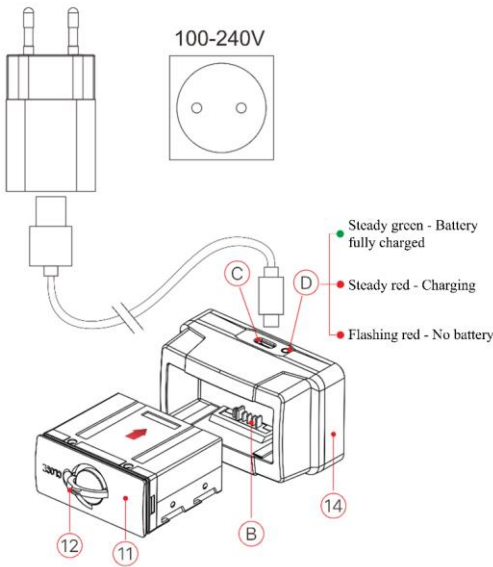
Button	Current Status	Press	Press and Hold
Power button 	Powered off	——	Power on the device
	Powered on	Standby	Shutdown
	Standby	Wake up the device	——
	Single ranging mode	Exit the ranging mode	Standby
	Continuous ranging mode	Exit the ranging mode	Standby
	Main menu interface	Discard changes and return to the previous menu	——
Up button	Home screen	Single ranging	Continuous ranging
	Menu interface	Scroll up the menu	——
Menu button	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	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	Home screen	Digital zoom	
	On the screen brightness adjustment menu	Brightness adjustment	

VI. Battery Pack Instructions

The Rico II 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.

Charging with Battery Holder

- 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;
- Connect the Type-C connector of the data cable to the **port (C)** of the battery holder;
- Connect the other end of the data cable to the USB port of the power adapter;
- Insert the power adapter into a 100V - 240V power socket to charge the battery pack;



Steady green - Battery fully charged
Steady red - Charging
Flashing red - No battery

- After the above steps are finished, the **LED indicator (D)** on the battery holder will light up or blink:
 - The indicator light stays red indicating that the battery pack is charging;
 - The indicator light turns green indicating that the battery pack is fully charged;
 - If the indicator blinks red, the battery charging holder is connected to the power source but there is no installed battery pack.
- After the battery is fully charged, remove the battery pack from the battery holder.

Battery Pack Installation

- Pull out the **ring-pull (12)** on the battery pack and rotate it clockwise to align it horizontally with the battery pack;
- Align the pins on the battery pack with the slots on the device and install the battery pack onto the

Rico II;

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

Safety Precautions



- 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;
- After a long storage time, the battery pack should be partially charged, not fully charged or discharged;
- 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;
- Do not charge the battery unsupervised;
- If the charger is modified or damaged, do not use it;
- Charge the battery in the environment of 0°C to +45°C. Otherwise, the service life of the battery will be reduced;
- Charging time should not exceed 24 hours;
- Do not expose the battery to high temperature or open flame;
- Do not immerse the battery in water;
- Do not connect a third-party device on which the current exceeds the rated current;
- The battery pack is equipped with a short circuit protection function, but situations that may lead to short circuits should be avoided;
- Please do not disassemble or modify the battery pack without professional instructions; do not knock or drop the battery pack;
- 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;
- Do not use the battery in an environment with a temperature greater than 50°C, which may reduce the

service life of the battery;

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

VII. External Power Supply

The Rico II series supports external power supplies, such as a power bank.

- Connect the external power supply to the Type-C port of the Rico series;
- The device will switch to the external power supply and charge the internal battery pack at the same time;
- The battery icon will be changed to the charging icon  on the display;
- 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 ;
- When the external power supply is disconnected, the Rico series device will automatically switch to the battery pack without shutdown.

VIII. Operation

WARNING: The lens of the device must not be pointed at any strong light source, such as laser-emitting devices or the sun. This may damage the electronic components in the device. Damage caused by improper use is not covered under warranty.

Power-on and Settings

- 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.
- Rotate the **eyepiece adjusting ring (7)** until the icon display of the image becomes clear in the eyepiece; After the adjustment is completed, for the same user, there is no need to readjust the diopter when using it again.
- Rotate the **focus ring knob (2) of the objective lens** to focus on the object to be observed.
- To set the display brightness, image sharpness, image mode, digital zoom, and so on, please refer to the shortcut menu functions in this manual.
- 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. **Do not disconnect it from the power source during the shutdown process, otherwise the data cannot be saved.**



IX. Calibration

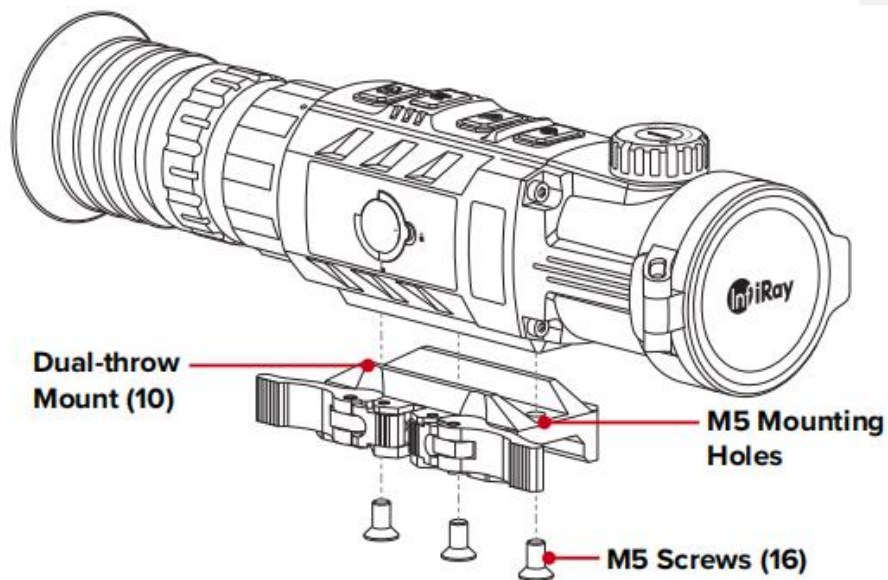
When the image is degraded or uneven, it can be improved by calibration. Calibration can balance the background temperature of the detector and eliminate the defects in the image.

There are three calibration modes: Automatic (A), Manual (M), and Background (B).

Select the required mode from **Calibration** on the main menu.

- **Automatic (A):** The device conducts automatic shutter calibration through software algorithms with the lens cap removed (the sensor automatically closes the internal shutter). Before automatic shutter calibration, the device prompts a 5s countdown next to the shutter icon on the status bar. Press the **Power button (3)** during the countdown to cancel the automatic shutter calibration. In this mode, you can also press the **Power button (3)** to conduct shutter calibration (that is, manual calibration).
- **Manual (M):** On the home screen, press the **Rangefinding button** and **Capture button** for manual calibration with the lens cap removed (the sensor automatically closes the internal shutter).
- **Background (B):** When calibration mode B is selected, press and hold the **Rangefinding button** and **Capture button** for background calibration. Then a text prompt will appear on the home screen - **cover lens during calibration**, and perform background calibration after 2 seconds. Remove the lens cap after calibration.

X. Picatinny Rail Installation



Install the Picatinny Rail

Before using the Rico II series thermal scope, you need to install the provided **quick-release Picatinny rail clamp** () onto

the bottom slot of the scope. There are many options for mounting hole positions, and the appropriate eye relief can be adjusted based on the type of rifle.

- Use M5 countersunk head screws () to secure the **quick-release Picatinny rail clamp** () onto the bottom threaded hole of the scope ();
- Secure the scope on the Picatinny rail of the rifle, and adjust it to a comfortable position;
- When the position adjustment is completed, disassemble the scope, partially unscrew the bottom Picatinny rail clamp screw, apply some thread sealant on the screw threads, then tighten it completely and allow the sealant to dry for a period of time;
- After the sealant has dried, the scope can be installed on the rifle and set up for zeroing;
- If it is the first time installing it on the rifle, please follow **Step 11 Zeroing** below to complete the operation.

Adjust the Picatinny Rail Clamp

The quick-release clamp controls the clamping by adjusting the tightness of the nut () and the position of the locking plate.

Before installing it on the Picatinny rail, open the arms of the quick-release clamp, and use the provided wrench to loosen the nut counterclockwise, allowing the clamp to be smoothly buckled onto the rail. Then, tighten the nut clockwise with the wrench to secure the quick-release clamp in a stable position, allowing the arms of the rail to close. This completes the adjustment of the quick-release clamp.

XI. Zeroing

The RICO II features the freezing-zeroing function.

- Secure the scope on the rifle using the included **quick-release Picatinny rail (14)** provided in the package;
- Set a target at a certain distance, such as 100 m and 200 m;
- Adjust the scope based on the operating instructions as described in Chapter VIII **Power-on and Settings**;
- Press and hold the **M button** to enter the advanced menu, and select the third option to enter the secondary menu of **Zeroing**.
- Select or add the new zeroing distance (refer to **Zeroing - Distance Settings** in the main menu) according to the selected target distance;
- Enter the zeroing interface, and the horizontal and vertical coordinates (X/Y) of the reticle are displayed in the upper left corner.
- Aim and shoot at the target.
- 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** to freeze the screen. At this time, the freezing icon changes from white to blue.
- 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;
- 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.
- After moving the reticle, a little red dot will appear on the screen, indicating the position of the reticle before the movement;
- 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.

- 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.

XII. Rangefinding Function

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

- The Rico II series supports two rangefinding modes: single ranging (SGL) and continuous ranging (CONT).
- 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 rangefinding information is displayed in real time.

The operating characteristics of laser rangefinding

- 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 environmental 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.
- The measurement accuracy is also affected by lighting conditions, fog, haze, rain, snow, and other factors. Light conditions or sunlight will degrade the rangefinding performance.
- Measuring the range of a small-sized target is much more difficult than measuring a large-sized target.

XIII. Digital zoom

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

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

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

XIV. Photo Taking/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.

Photo taking

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

Video Recording

- On the home screen, press and hold the **Capture button (6)** to start the video recording;
- 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);
- During the recording process, press the **Capture button (6)** to take a photo, and the photo icon is displayed in the upper left corner;
- Press and hold the **Capture button (6)** to stop the recording and save the video;
- The videos and images captured are saved in the internal memory space.

Note:


- You can open and operate the menu during video recording;
- The images taken and the videos recorded are stored in the built-in memory card in the format of IMG_HHMMSS_XXX.jpg (image) and VID_HHMMSS_XXX.mp4 (video), with HHMMSS indicating hours/minutes/seconds and XXX indicating the serial number of the three-digit multimedia file;
- Serial numbers of multimedia files cannot be reset.

Note:

- The maximum duration of a video recording file is 5 minutes. When the duration is more than 5 minutes, the video will be automatically recorded onto a new file;
- Due to the limitation of the storage space, it is recommended to clean the memory regularly or move the images and videos to another storage medium to release the memory space of the device;

Memory Access

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.

- Connect the device to a computer through the USB cable;
- Power on the device;
- Double-click **My Computer** on the desktop, double-click to open the device named **Infiray** , and then double-click to open the device named **RH50R** to access the memory;
- There are different folders named after time in the format of DD/MM/YY in the memory;
- The folders store the videos/images captured on the corresponding days. To copy or delete files or folders, select accordingly.

XV. Status Bar






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 image mode (☀️: white-hot; 🌑: black-hot; 🔥: red-hot; 🌈: pseudo-color, **single red, single green, and violet**)
2. Current selected gun type
3. Current visual magnification
4. Ultra-clear mode status: (👁️: the ultra-clear mode is off; 👁️: the ultra-clear mode is on)
5. 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).

6. Wi-Fi status (🚫: Wi-Fi off; 📶: Wi-Fi on; 📶: Wi-Fi on but not connected)

7. Standby setting (off by default)

The top status bar always displays the current time and power status of battery pack. (When the icon is displayed in green , it means that the battery capacity is higher than 20%, which is sufficient; when it is displayed in red , it means that the battery capacity is insufficient and should be charged in time; when a lightning sign appears in the battery icon , it indicates that the battery pack is being charged. There is a power percentage on the right side of the battery icon, which provides a more precise reading of the current battery level.)





XVI. Shortcut Menu



The shortcut menu is designed for quick adjustments to basic settings of commonly used functions, including image mode, screen brightness, and image sharpness.

- On the home screen, press the **M button (5)** to open the shortcut menu;
- Press the **Up button (4)** and **Down button (6)** to switch between the following functions;
 - **Image mode:** After selecting this option, press the **M button (5)** to circularly switch among image modes in a sequence of white-hot, black-hot, red-hot, pseudo-color, single red, single green, and violet;
 - **Image brightness:** After selecting this option, press the **M button (5)** to adjust the image sharpness among 1-10 levels;
 - **Image contrast:** After selecting this option, press the **M button (5)** to adjust the image sharpness among 1-10 levels;
 - **Image sharpness:** After selecting this option, press the **M button (5)** to adjust the image sharpness among 1-10 levels;
- Press and hold the **Menu button (5)** to save the changes and return to the home screen.

Note: In the shortcut menu, if there is no operation within 5s, the device will automatically save the changes and return to the home screen.


XVII. 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.



Main Menu Options and Descriptions




Ultra-clear mode 	Enabling/Disabling Ultra-Clear Mode ↔ Press and hold the M button (5) to open the main menu; ↔ Select the Ultra-Clear Mode (selected by default on the main menu after startup); ↔ Press the M button (5) to enable or disable ultra-clear mode, during which a click of shutter calibration will be heard; ↔ The icon in the status bar changes accordingly after this mode is enabled/disabled.
Reticle	Setting the Zeroing Profile, Reticle Type and Reticle Color





	<p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select the Reticle Setting;</p> <p>↔ Press the M button (5) to enter the secondary menu of the Reticle Setting and make the following settings:</p>
	<p>Zeroing Profile</p> <p>Selecting Zeroing Profile</p> <p>↔ Press the Up button (4) or Down button (6) to select the Zeroing Profile;</p> <p>↔ Press the M button (5) to confirm the selection and enter the secondary menu of the Zeroing Profile;</p> <p>↔ Press the Up button (4) and Down button (6) to select one of the three zeroing profiles (A, B, C, D, E, F);</p> <p>↔ Press the M button (5) to confirm the selection. The icon flashes, and returns to the interface of the previous menu.</p>
	<p>Reticle Type</p> <p>Selecting Reticle Type</p> <p>↔ Press the Up button (4) or Down button (6) to select the Reticle Type;</p> <p>↔ Press the M button (5) to confirm the selection and enter the secondary menu of the Reticle Type;</p> <p>↔ Press the Up button (4) or Down button (6) to select one of the seven reticle types;</p> <p>↔ The type of reticle will also change as the cursor moves;</p> <p>↔ Press the M button (5) to confirm the selection. The icon flashes, and returns to the interface of the previous menu.</p> <p>The last reticle is the custom reticle, which requires connection to the InfrayOutdoor app for configuration.</p>
	<p>Reticle Color</p> <p>Setting Reticle Color</p> <p>↔ Press the Up button (4) or Down button (6) to select the Reticle Color;</p> <p>↔ Press the M button (5) to confirm the selection and enter the secondary menu of the Reticle Color;</p> <p>↔ 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.</p> <p>↔ The color of reticle will also change as the cursor moves;</p> <p>↔ Press the M button (5) to confirm the selection. The icon flashes, and returns to the interface of the previous menu.</p>
<p>Zeroing</p> 	<p>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.</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select the Zeroing;</p> <p>↔ Press the M button (5) to enter the secondary menu of the Zeroing; the default zeroing</p>


	<p>distance is 100 m;</p> <p>↔ 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.</p> <p>↔ Press the Up button (4) and Down button (6) to select the zeroing distance based on the set distance of the target;</p> <p>↔ Press the M button (5) to confirm the zeroing distance and enter the submenu of this zeroing distance.</p> <p>↔ 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).</p>
<p>Zeroing Interface</p>	<p>↔ Select the Zeroing function, and press the M button (5) to enter the zeroing interface;</p> <p>↔ 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;</p> <p>↔ Aim at the target distance through the reticle center of the scope, and shoot.</p> <p>Then observe the actual point of impact after shooting;</p> <p>↔ 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;</p> <p>↔ 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.</p> <p>↔ 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;</p> <p>↔ Press and hold the M button (5) to save the reticle position, and return to the home screen.</p> <p>For more details, refer to Chapter X Zeroing.</p>
<p>Distance Setting</p>	<p>If the zeroing distance is not consistent with the preset target distance, this option can be used for setting;</p> <p>↔ Select an invalid zeroing distance, and press the M button (5) to open its submenu;</p> <p>↔ Press the Up button (4) or Down button (6) to select the Set Zeroing Distance.</p> <p>↔ 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;</p> <p>↔ Press the Up button (4) and Down button (6) to set the value of the current position;</p> <p>↔ Press the M button (5) to switch between the positions of hundreds, tens and ones digits;</p> <p>↔ 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</p>

		status bar and menu will also be updated simultaneously.
	Delete Distance	<p>If the current set distance is no longer needed, you can delete the current distance.</p> <p>↔ Select an invalid zeroing distance, and press the M button (5) to open its submenu;</p> <p>↔ Press the Up button (4) or Down button (6) to select the Delete Distance;</p> <p>↔ 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 distance;</p>
Wi-Fi 		<p>Enabling/Disabling Wi-Fi</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select the Wi-Fi;</p> <p>↔ Press the M button (5) to enable/disable the Wi-Fi function;</p> <p>↔ When the Wi-Fi is enabled/disabled, the icon in the status bar will change accordingly.</p>
PIP		<p>Enabling PIP function (picture-in picture)</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select PIP;</p> <p>↔ Press the M button (5) to enable/disable the Wi-Fi function;</p> <p>↔ 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.</p>
Calibration 		<p>Selecting Calibration Mode</p> <p>The Rico series provides three calibration modes: Automatic (A), Manual (M), and Background (B).</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select Calibration Mode;</p> <p>↔ Press the M button (5) to open the secondary menu of the calibration function;</p> <p>↔ Press the Up button (4) or Down button (6) to select one from the three modes:</p> <ul style="list-style-type: none"> - 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. - Background: The camera must be covered with a lens cap in this mode. <p>↔ Press the M button (5) to confirm the selection. The icon in the status bar changes accordingly.</p>
Motion Sensor 		<p>Enabling/Disabling Motion Sensor</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select Motion Sensor;</p> <p>↔ Press the M button (5) to enable/disable the motion sensor;</p>

	<p>↔ After it is enabled, its functions will be displayed on both sides of the screen;</p> <p>↔ The curved ruler on the left represents the tilt angle and the vertical ruler on the right represents the pitch angle.</p>
Recoil Activated Video (RAV) Recording	<p>Enabling/Disabling RAV Recording</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select RAV;</p> <p>↔ Press the M button (5) to enable/disable the microphone;</p> <p>↔ 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.</p>
Microphone 	<p>Enabling/Disabling Microphone</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select Microphone;</p> <p>↔ Press the M button (5) to enable/disable the microphone;</p> <p>↔ 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.</p>
Standby 	<p>Automatic Standby Setting</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select Automatic Standby;</p> <p>Press the M button (5) to enable/disable the automatic standby;</p> <p>↔ Press the Up button (4) or Down button (6) to make a selection;</p> <p>↔ Press the M button (5) to confirm the selection, and then the selected option is displayed at the bottom status bar;</p> <p>↔ If Off is selected, the standby function is disabled;</p> <p>When the function is enabled,</p> <p>Note:</p> <ul style="list-style-type: none"> - 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°; - When the device is in the shooting status (horizontally positioned), the device is woken.
Brightness Adjustment	<p>Setting Screen Brightness</p> <p>↔ Press and hold the M button (5) to open the main menu;</p> <p>↔ Press the Up button (4) or Down button (6) to select Screen Brightness Adjustment;</p> <p>↔ Press the M button (5) to open the menu of the screen brightness adjustment;</p> <p>↔ In the screen brightness adjustment menu, rotate the magnification knob to finely adjust the screen brightness. The screen brightness is divided into 100 levels, with the default set at level 50.</p> <p>↔ Press and hold the M button (5) to save the changes and return to the previous menu after the adjustment is completed.</p>
	<p>When using the scope, you may see pixel defects, such as visible light spots or dark spots</p>

Pixels Defect Correction 	<p>with stable brightness. To address this problem, the pixel defect correction function can be used to remove the pixel defects.</p> <p>↔ In the main menu, select the Pixel Defect Correction;</p> <p>↔ 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;</p> <p>↔ 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;</p> <p>↔ Press the Up button (4) or Down button (6) to navigate through the options, and press the M button (5) to make the selection;</p> <p>↔ 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;</p> <p>↔ Press the M button (5) to save it in this direction after the movement is completed, and press the Up button (4) or Down button (6) to switch to the other direction;</p> <p>↔ Repeat the preceding steps to change the cursor location until it reaches the position of the pixel defect;</p> <p>↔ 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;</p> <p>↔ 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;</p> <p>↔ When the cursor moves near the PIP, the PIP and the content on the right will move to the upper left corner automatically;</p> <p>↔ Press and hold the M button (5) after the correction is completed, and a prompt box will display, asking whether to save the correction;</p> <p>↔ Press the Up button (4) or Down button (6) to switch selection, and press the M button (5) to confirm the selection;</p> <p>↔ Select Yes to confirm the saving and exit; and select No to cancel the saving and exit;</p> <p>↔ 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.</p>	
Settings 	<p>This function is used to set the date, time, language, measurement unit, status auto hiding, factory reset, and device information query.</p> <p>Date</p> 	<p>Setting System Date</p> <p>↔ Press the M button (5) to open the secondary menu of Settings;</p> <p>↔ Select Date;</p> <p>↔ Press the M button (5) to activate the date reset function, with the date in the format of DD/MM/YY;</p> <p>↔ Press the Up button (4) or Down button (6) or press and hold them to set the correct year, month and day;</p> <p>↔ Press the M button (5) to switch between the year, month, and day;</p> <p>↔ Press and hold the M button (5) to save changes and exit the Date Reset after the setting is completed.</p>

Time 	Setting System Time ↔ Press the M button (5) to open the secondary menu of Settings ; ↔ Select Time ; and the time is displayed in a 24-hour format, with hour/minute shown; ↔ Press the M button (5) to activate the Time Reset ; ↔ Press the Up button (4) or Down button (6) or press and hold them to set the correct hour and minute; ↔ Press the M button (5) to switch between the hour and minute; ↔ Press and hold the M button (5) to save changes and exit Time Reset after the setting is completed; ↔ After the time is reset, the icon in the status bar is changed accordingly.
Units of Measure 	Selecting the Units of Measure ↔ Press the M button (5) to open the secondary menu of Settings ; ↔ Select Units of Measure , and press the M button to open the secondary menu of Units of Measure ; ↔ Press the Up button (4) and Down button (6) to select the required measurement unit of meters or yards; ↔ Press the M button (5) to confirm the selection, then save the setting and exit;
Language 	Selecting Language ↔ Press the M button (5) to open the secondary menu of Settings ; ↔ Select Language , and press the M button (5) to open the secondary menu for language selection; ↔ Press the Up button (4) and Down button (6) to switch the language; ↔ Press the M button (5) to confirm the selection, then save the setting and exit;
Factory Reset 	Restoring Factory Default Settings ↔ Press the M button (5) to open the secondary menu of Settings ; ↔ Select Factory Reset , and press the M button (5) to enter the secondary menu of Factory Reset ; ↔ Press the Up button (4) and Down button (6) to select Yes for restoring factory settings or No for canceling the operation; ↔ Press the M button (5) to confirm the selection; ↔ If Yes is selected, the scope will restart automatically; ↔ If No is selected, the operation is canceled and the screen returns to the previous menu. The functions will be restored to their default settings after the Factory Reset is selected.
Info	Querying Device Information

		↔ Press the M button (5) to open the secondary menu of Settings ; ↔ Select Info ; ↔ Press the M button (5) to display the relevant information of the current scope; ↔ Press and hold the M button (5) to exit and return to the previous menu.
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XVIII. 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.

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

' 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;

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

' 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.

' 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;

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

' 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.

XIX. Product Update and Description of 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

' 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.

' After installing the app, open it;

' 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;

' 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;

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

XX. Technical Inspection

Perform a technical inspection to check the following items each time before you use the device.

- Exterior of the device (no crack on the enclosure).
- Lens and eyepiece (no crack, oil, stain, or other sediments)
- Status of the rechargeable battery (fully charged in advance) and electrical contact (no salinization or oxidation).

XXI. Maintenance

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

- Wipe the surface of metal and plastic parts to clear off dust and dirt by using a cotton cloth. Silicone grease may be used for the cleaning process.
- Clean the electric contact and battery slots on the device using a non-greasy organic solvent.
- Check the glass surface of the eyepiece and lens. If necessary, clear off the dust and sand on the lens (it is perfect to use a non-contact method). Use a specialized wiping tool and solvent to clean the optical surfaces.

XXII. 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.

Fault	Possible Causes	Solution
Failure to start	The battery is out of charge.	Charging
The device cannot be powered by an external power supply	The USB cable is damaged.	Replace the USB cable.
	The external power supply is insufficient.	If necessary, check the external power supply.
Images are unclear, vertical lines are present, or the background is not even.	Calibration is required.	Calibrate the images as instructed in Chapter IX of the User Manual.
The image is too dark.	The screen is not bright enough.	Adjust the display brightness
The icons are clear but the image is blurry.	The lens is not focused.	Rotate the lens focus ring to adjust the focus.
	The inner or outer optical surface of the lens is dusted or iced.	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.
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.	<p>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.</p> <p>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.</p>
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XXIII. Legal and Regulatory Information

Wireless transmitter module frequency range:

WLAN: 2.412-2.472 GHz(For EU)

Wireless transmitter module power < 20 dBm(only for EU)

 We, IRay Technology Co., Ltd., hereby declares that the radio equipment Geni Series is in compliance with the Directives 2014/53/EU and 2011/65/EU.

FCC Statement

FCC ID: 2AYGT-4C-00

Labeling requirements

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.

Information to the user

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

EMC: Class B

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.

Laser Statement

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.

