![InfiRay logo]

![THERMFOX logo]

Technical specifications

Model	RL42	RH50
Microbolometer		
Type	Unrefrigerated	
Resolution, pixels	384×288	640×512
Pixel size, um	12	
NETD, mk	≤50	
Frame rate, Hz	50	
Optical properties		
Lens lenses	F42mm / 1.0	F50mm / 1.2
Field of view, degrees	6.3 × 4.7	5.3 × 4.0
Magnification, ×	4~16	3~12
E-zoom, ×	1 / 2 / 3 / 4	
Output pupil distance, mm	55	
Output pupil diameter, mm	6	
Dioptric correction, D	-4~+4	
Detection range, m (Target size: 1.7mx0.5m, P(n)=99%)	2197	2594
Display		
Type	AMOLED	
Resolution, pixels	1024×768	
Size, inches	0.39	
Power		
Battery Type / Capacity / Output Voltage	Li-Ion battery IBP-1 / 3600mAh / DC3.7V	
Power	3V~4.2V	
External power supply	5V (Type C USB)	
Operating characteristics		
Max. operating time (at t=22°C), ★	6	
Max. recoil on rifle, g/s^2	1000	
Degree of protection, IP code	IP67	
Internal memory size, Gb	32	
Operating temperature range, °C	-20~+50	
Laser rangefinder	Optional	
Weight, g	820	830
Dimensions, mm	250×65×58	250×61×58
Rangefinder features		
Wavelength, nm	905	
Max. measuring range, ★★	1000/1094	
Measurement accuracy, m	±1	

★ Actual operating time depends on the use of Wi-Fi, v i d e o recording, laser rangefinder.

★★ measurement range depends on the type of object being observed and the weather conditions.

1. Contents of the package

- Thermal imaging rifle scope
- IRM-030-205-Q1 Picatinny rail
- IBP-1 battery pack
- IBC-1 battery pack chargers
- Power adapter
- Data cable
- Portable bag IPB-3
- Lens cloth

2. Description

The Rico Series thermal imaging riflescope is designed for use on hunting scopes at night and in daylight under adverse weather conditions (rain, snow, fog or smog) to see through obstacles that prevent target detection (tree branches, tall grass and brush, etc.). Unlike night vision devices, the Rico series does not require an external light source and is not affected by strong lights. A high-precision laser rangefinder is optional with the Rico series, which allows distance measurements up to 1000 meters. The Rico series finds wide use in night hunting, field observation and navigation, search and rescue operations, etc.

3. Features

- High resolution 12μm thermal detector
- High image quality
- Body with aluminium alloy
- Maximum detection range 2600m
- Optional laser rangefinder
- Quickly replaceable battery charging pack
- HD AMOLED display:1024*768
- High frame rate: 50Hz
- Quick storage function for 3 types of weapons
- Digital Zoom: ×1/×2/×3/×4
- Built-in 32GB storage, supports photo and video recording
- Built-in Wi-Fi module
- **InfiRay Outdoor** app support
- Built-in digital compass and motion detector
- Optional sight cross types and colours
- Ultraclear mode
- PIP and pixel calibration support
- User-friendly interface

4. Components and controls

1. Lens cover
2. Lens focus controller
3. On/Off button
4. Up/Zoom button
5. Menu/M button
6. Down/Photo button
7. Eyepiece adjustment wheel
8. Eyelets
9. Laser rangefinder (Optional)
   9a. Output port
   9b. Input port
   9c. Marking port
10. USB-C port
11. Accumulator
12. Battery wheel
13. IRM-030-205-Q1 Picatinny rail
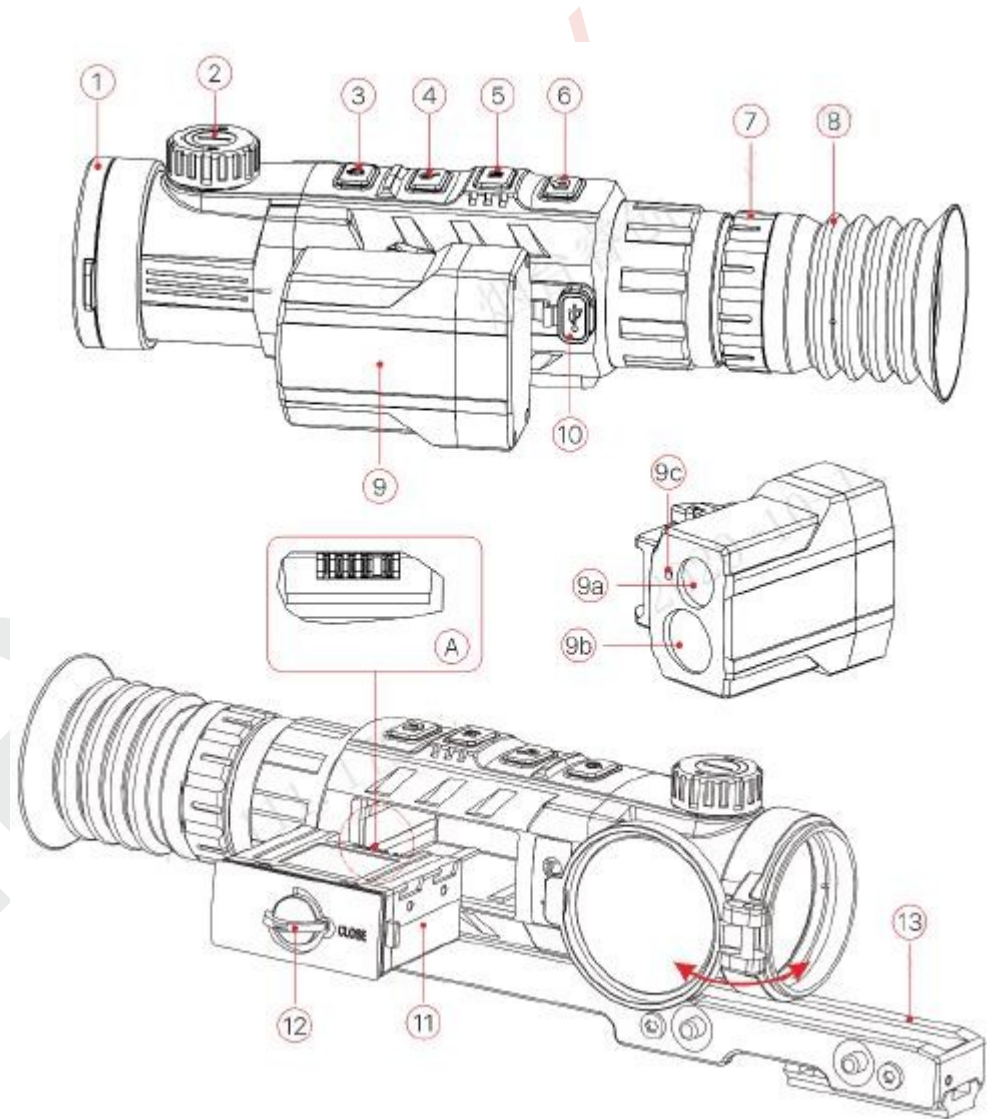
5. Controls

| Button	Status / Current operating mode	Short press	Long press
On/Off button ⏻	The device is switched off	----	Turns on the device
	The device is switched on	Calibrates the detector	Shuts down the device/standby mode
	Standby mode	Turns on the device	---
	Single rangefinder mode	Distance measurement	---
	Main menu	Leave without saving	---
	Defective pixel calibration	Add/delete defective pixel	---
Up/E-zoom button 🔍	Home screen	Digital Zoom	PIP on/off
	Main menu / Quick menu	Moving up	---
Menu button M	Home screen	Enter the quick menu	Enter the quick menu
	Quick menu	Switch and confirm parameters	Save and go to your home screen
	Main menu	Enter submenu/Confirm selection	
	Defective pixel calibration	Add/delete defective pixel	
Down button/Camera 📷	Home screen	Retrieved from	Start recording video
	Main menu / Quick menu	Shift down	---
	Video recording	Retrieved from	Stop and save video
Up + Down button	Main menu	----	Activate rangefinder mode
	Rangefinder mode	Switch between single and continuous mode	Turn off rangefinder mode
Menu + Down button	Rangefinder mode	----	Switching laser marking on/off

6. Accumulator

The Rico series is equipped with a rechargeable Li-ion battery IBP-1 allowing up to 6 hours of operation. Charge the battery before first use.

Charging the battery

➢ Insert the battery into the charger **(14)** so that the pins **(A)** fit into the groove **(B) of** the charger **(14)**.

➢ Insert the type C connector of the data cable to the (C) port of the charger **(14)**.

➢ Connect the opposite end of the data cable to the power adapter.

➢ Insert the plug of the adapter into the socket;

➢ Once fitted, the LED indicator **(D)** on the charger **(14)** will light up or flash:
  - During charging, the LED indicator will be permanently red;

  - When the LED indicator is permanently green, the battery is fully charged;

  - If the charger is connected to the power supply but the battery is not

    inserted, the LED indicator will flash red.

➢ When the charger is fully charged, disconnect it from the mains and remove the battery.

Unbroken green
- The battery is charged.

Unbroken red
- The battery is charging.

Flashing red
- Without battery.
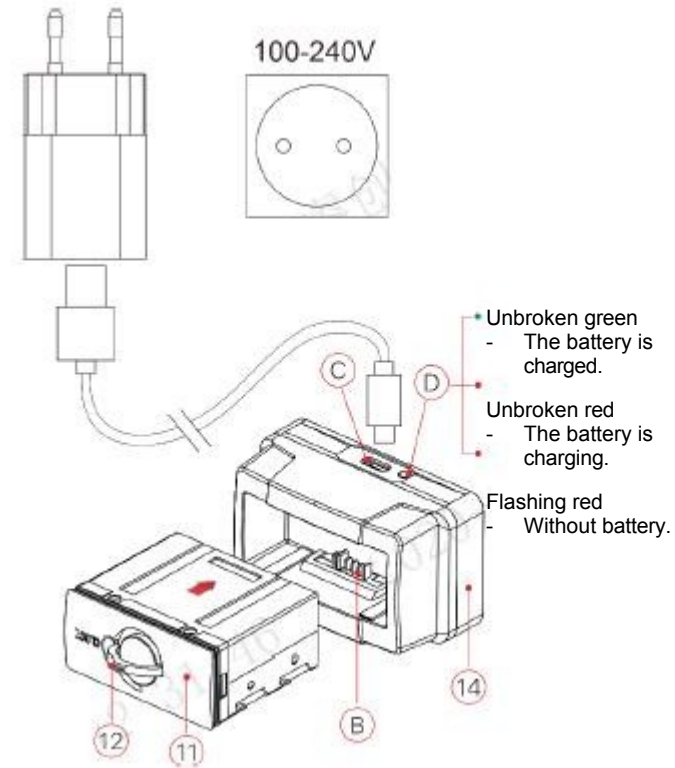
Fitting the battery

➢ Pull out and turn the wheel on the battery **(12)** 90° clockwise.

➢ Insert the battery pack by pushing the pins on the battery pack into the groove in the Rico case.

➢ After inserting the battery pack into the Rico case, turn the wheel **(12)** 90° counterclockwise to lock the battery pack **(11)**

➢ Then slide the wheel **(12) back** in and the convex part of the wheel **(12)** will face the "CLOSED/CLOSE" sign on the battery pack **(11)**.

Security measures

- Use only the charger **(14)** supplied with the battery. Using another charger may irreparably damage the battery or charger and may cause a fire.
- If you plan to leave the battery pack unused for a longer period of time, it must be partially charged. Avoid fully charging or discharging the cell.
- Do not charge the battery immediately after bringing it in from a cold or hot environment. Wait 30-40 minutes before charging;
- Do not leave the battery unattended when charging;
- Never use a damaged or modified charger;
- Charge the battery at a temperature between 0°C and +45°C, otherwise the battery life will be significantly reduced.
- After a full charge, do not leave the battery in the charger for more than 24 hours.
- Do not expose the battery to high temperatures or open flames.
- Do not immerse the battery in water.
- Do not connect external devices with a higher than permitted current consumption.
- The battery is short-circuit protected. However, you should avoid any situation that could potentially cause a short circuit;

- Do not disassemble or deform the battery.
- Do not subject the battery to shock or drop it on the ground.
- The battery capacity may decrease during use i n negative temperatures. This is normal and is not a fault.
- Accumulator do not use in temperatures exceeding temperatures listed in the table. This will reduce the life of the battery.
- Keep the battery out of the reach of children.

7. External power supply

The Rico series supports the use of an external power s u p p l y , e.g. a power bank (5V).

➢ Plug the external power supply into the USB port **(10)** on the Rico.
➢ The riflescope will switch to operation using an external power supply and the IBP-1 battery will slowly start charging.
➢ The battery icon ⟳ will appear on the display indicating the percentage of charge.
➢ If the device is connected to an external power source without a battery present, the battery icon will change to a USB icon .
➢ When the external power supply is disconnected, the riflescope switches to the battery,
without shutting down.

8. Operation

Picatinny rail installation

➢ Before using the Rico series, mount the Picatinny rail on the underside of the riflescope
(13).

➢ Mounting holes **(15)** in the base of the riflescope allow the rail **(13)** to be mounted **in** one of several positions.

➢ Selecting the mounting position allows the user to choose the correct distance from the muzzle according to the type of rifle.

➢ Fit the Picatinny rail **(13) to** the base of the rifle scope using the Phillips screwdriver and M5 screws **(16) included**.

➢ Mount the rifle scope on the scope and check that the position is comfortable for you.

➢ If it suits you, remove the scope, loosen the screws halfway, apply thread sealant and tighten them fully (do not over tighten).

Allow the product to dry for a while.

➢ After drying, the rifle scope is ready to be mounted on the rifle and shot.

➢ After the first fitting of the rifle scope to your rifle, follow the instructions in Chapter **9 "Shooting"**.

WARNING!

Do not turn the lens lens towards strong light sources such as laser light or sunlight.

Electronic components may become inoperable. The warranty does not cover damage caused by improper handling.

Position 1: 3 screws

Position 2: 3 screws

Position 2: 2 screws
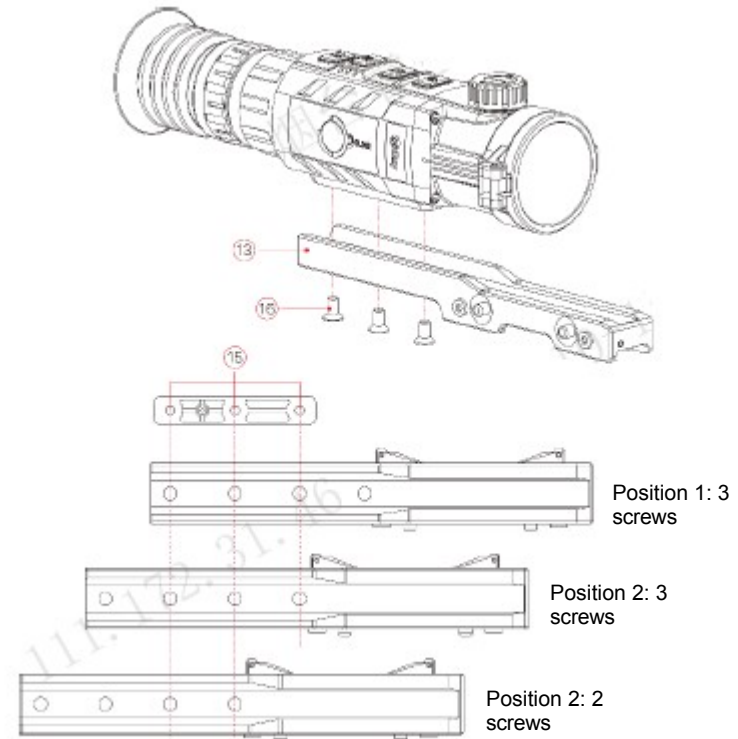
Switching on and setting the picture

➢ Open the lens cap **(1)**.
➢ Press and hold the **On** button **(3)** to turn on the rifle scope.
➢ Turn the eyepiece adjustment wheel **(7)** until the image in the eyepiece is sharp.
Then the eyepiece adjustment wheel **(7)** no longer needs to be turned when adjusting the distance or under other conditions.

- Turn the lens focus control **(2)** to focus on the subject.
- For adjusting brightness, image contrast, display modes, and digital zoom, see the **Quick Menu Functions** chapter.
- After use, press and hold the **On** button **(3)** for about 3 seconds. The power off information and the countdown to power off will appear. Release the button and the data saving information appears with a countdown from 3 to 0 and the device switches off when the data has been saved. **Do not disconnect the power supply while data is being saved, otherwise the data loss may occur.**
- If you release the button before the countdown is over, the device goes into standby mode. Press the **Power** button **(3)** briefly to reactivate it.

9. Spraying

The Rico series allows for the so-called "Fixing" method of shooting. Spraying should be carried out at operating temperature and according to the following steps:

- Set the rifle with the Rico scope on the shooting bench.

- Set a target at a certain distance.
- Set up your riflescope according to the instructions in Chapter **8 Turning on and setting up the image.**
- Call up theprofile (see"Sighting Cross - Sighting P r o f i l e " in the Main Menu).
- Press and hold the **M** button **(5)** to enter the Main Menu.
- Briefly press the **Up (4)** or **Down (6)** button to select an item **Spraying**. Then press the **M** button **(5)** to return to the submenu.
- Use the existing distance to the target to select a shooting distance in the submenu or add a new distance (see Main menu option

  Spraying - submenu **Spraying distance** - **Reset spraying distance**).
- After setting the distance to be shot, choose the option Shooting and press the **M** button **(5)** briefly to enter the Spraying interface (see the option of the Main menu **Spraying** - submenu **Spraying distance**

  - Spraying). The X and Y coordinates of the aiming cross are s h o w n   i n

  t h e   upper left corner of the screen.

- Aim and fire at the target.
- Look at the point of impact. Suppose the red hair cross on the right picture represents the point of impact, but the cross is there only as a marker and

  it doesn't actually appear that way on the interface.

- If the point of impact does not coincide with the aiming point (centre of the aiming
  crosshairs), keep the centre of the aiming crosshairs on the aiming point and

  simultaneously press and hold the **Up (4)** and **Down (6)** buttons until the

  ❄ the fixing symbol on the left side of the screen and the image is fixed.
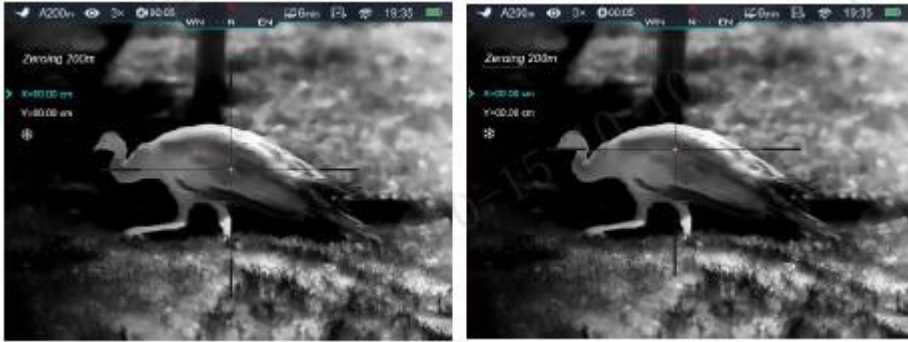
- ➢ Move the aiming cross **Up (4)** or **Down (6)** until the aiming cross aligns with the point of impact.

- ➢ Briefly press the **M** button **(5)** to change the direction of movement between the X (default direction) and Y axes. The cursor location ➤ represents the current selected option and the icon will turn blue.

- ➢ Press the **Up** button **(4)** to move the crosshairs right or up and the **Down** button **(6)** to move them left or down.

- ➢ When the crosshairs are moved, a white dot appears on the screen to indicate the original crosshair position.

  - ➢ When the aiming cross moves to the point of impact, press and hold the **M (5)** to save the crosshair position and return to the home screen.

- ➢ Fire again - the point of impact should now coincide with the point of aim.

10. Calibration

Calibration allows to equalize the detector temperature and eliminate image defects (e.g. vertical streaks, noise, etc.).

Three calibration modes are available: Automatic **(A)**, Manual **(M)** and Background **(B)**.

Select the desired calibration mode from the Main Menu.

- ➢ **Mode A (Automatic)**. The device will calibrate automatically according to the software algorithm. There is no need to fit a lens cover (the sensor is covered

  internal closing). Before automatic calibration, a five-second countdown appears behind the shutter icon on the status bar, during which the calibration can be cancelled by briefly pressing the **On** button **(3)**. In this mode, the riflescope can be calibrated using the **On** button **(3)**.

- ➢ **M (Manual) mode**. Briefly press the **On** button **(3)** to activate shutter calibration without covering the lens (the sensor is covered by the internal shutter.

- ➢ **Mode B (Background)**. Cover the lens with the lens cap and briefly press the **On** button.
  (3). The instruction "cover the lens during calibration" will appear on the home screen, calibration will start after two seconds.

11. Digital Zoom

The Rico series supports a quick increase of the base magnification by 2x, 3x or 4x and also a return to the base magnification.

➢ On the home screen, briefly press the **Up** button **(4)** to control the additional digital zoom, each press moves the zoom to

next and its status is displayed in the status bar at the top.

➢ For the Rico RL42, the apparent ×1 to ×4 magnification of the digital zoom is 4×, 8×, 12×, 16×; and for the RH50, it is 3×, 6×, 9×, 12×.

12. Photography and video recording

The Rico series is equipped with a function for recording videos and taking pictures of the observed image, which is stored in the built-in 32GB memory. Photo and video files are time-stamped, so we recommend resetting the time and date in the Main Menu (see **Main Menu - Settings - Date/Time Settings** in this manual) or synchronizing the date and time in the InfiRay Outdoor app before you start shooting or recording.

Photography

➢ Press the **Camera** button **(6)** on the home screen to take a photo.
The screen freezes for 0.5 seconds, and the top left corner of the screen appears

icon 📷 .

➢ The photos are stored in the internal memory.

Video recording

➢ From the home screen, press and hold the **Camera** button **(6)** to start recording video.

➢ When the recording starts, the 📹 icon and the HH:MM:SS (hour:minute:second) format will appear in the upper right corner of the screen.

➢ Short Press button **Camera** **(6)** At recording to take a still picture.

➢ Press a press and hold button **Camera (6)** to stop and save the recording.

➢ All videos and photos will be stored in internal memory.

Tips:

- You can enter and navigate the menu while recording.

- Photos and videos are saved to the internal memory card in the IMG_HHMMSS_XXX.jpg (for photos) and VID_HHMMSS_XXX.mp4 (for videos) format. HHMMSS - Hour/Minute/Second; XXX - three-digit counter (for videos and photos).

- The counter used for media file names cannot be reset.

- If a file is deleted from the list, another file will not take its place.

Warning:

- The maximum length of the recorded video is 5 minutes. After this time, the video is automatically uploaded to a new file.
  The number of uploaded files is limited by the size of the internal memory.
- Check the free space on the internal memory card regularly and move recordings to other storage devices to free up space.
- Graphical data (status bar, icons and menus) will not be displayed on the recorded video or photo.

Memory access

A powered-on device that is connected to a computer is identified by the computer as a memory card that is used to access the device's memory and make copies of pictures and videos.

➢ Turn on the binoculars and connect them to your computer using a USB Type-C cable.

➢ Double click on "my computer" on the desktop - double click to open the device named "Infiray" - double click to open the device named "Internal Storage" to access and internal memory.

➢ In the repository there are different folders named according to the time of acquisition

20191218 .

➢ Photos and videos uploaded on a given day are stored in folders.
➢ Choose the files or folders you want to copy or delete.

13. Status bar
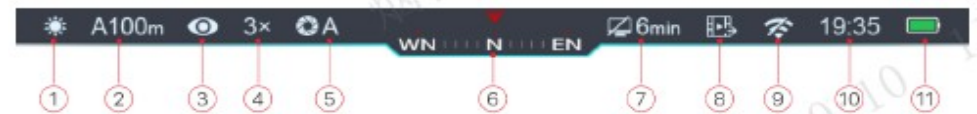
The status bar at the top of the screen displays information about the current operating status of the riflescope. From left to right, these are:

1. Existing image mode (White Hot; : Black Hot; : Red Hot; : Target Highlight; : Pseudo color)

2. Existing shot type and distance (e.g. A100m)

3. Ultraclear mode (: Ultraclear off; : Ultraclear on)

4. Existing magnification (e.g. 3.0×)

5. Calibration mode(the timer 00:05 appears instead of the calibration mode with5 seconds remaining until automatic calibration). The timer appears only after the microbolometer has stabilized (after 10 minutes of continuous operation of the riflescope). Immediately after the riflescope is switched on, the shutter calibration is activated automatically without displaying the timer.

6. Compass (if enabled).

7. Standby status and time

8. Video output status (if enabled)

9. Wi-Fi status 🛜: Wi-Fi off; 📶 : Wi-Fi on)

10. Clock (set the clock in the "InfiRay Outdoor" app or in the Main Menu)

11. Battery status

Icon	Colour/Stv	Battery status
🔋	Green	More than 40%
🔋	Yellow	20% - 40%
🔋	Red	Less than 20%, charge immediately
🔌	Lightning icon	External power supply and battery charging
🖥	USB icon	External Power Source without battery inserted in the rifle scope

14. Quick menu function

Basic settings (incl. Image Mode, screen brightness, image sharpness and shooting distance) can be changed in the Quick Menu.

➢ From the home screen, briefly press the **M** button **(5)** to enter Quick menu.

➢ Toggle between the function items described below by briefly pressing the **Up (4) or Down (6)** button. The selected item will be highlighted

Background:

- **Image mode:** press the **M** button **(5)** briefly to switch the image mode between White Hot, Black Hot, Red Hot, Pseudo Color and Target Highlight.

- **Display brightness:** press the **M** button **(5)** briefly to change the brightness level from 1 to 5.

- **Image sharpness:** briefly press the **M** button **(5)** to toggle between image sharpness from 1 to 5.

- **Shooting distance:** briefly press the **M** button **(5)** to change the base shooting distance in the current shooting profile (if you choose profile A, you can only switch the distance stored in profile A).

➢ Press and hold the **M** button **(5)** to save your edits and exit the menu or Wait 5 seconds and you'll leave automatically.

15. Main menu

➤ To access the Main Menu, long press the **M** button **(5)** on the home screen.

➤ Briefly press the **Up (4)** or **Down (6)** button to toggle between the Main Menu options.

➤ Navigation in the Main Menu is cyclical: once you reach the last option of the first tab, you go to the first item of the second tab.

➤ Modifying existing parameters or going to a submenu is done using the **M** button **(5)**.

➤ In all menu interfaces, long press the **M** button **(5)** to save your edits and go to the home screen. Short press the **Power** button **(3)** to go to the previous menu without saving.

➤ You will exit the Main Menu to the Home screen after 15 seconds of inactivity.

➤ After leaving the Main Menu, the location of the ▶ cursor is saved only once (i.e. until you turn off the rifle scope). After switching the rifle scope back on The cursor will be on the first menu item again.

Options and descriptions in the Main Menu

Ultraclear ◉	**Ultraclear mode on/off** • Press and hold the **M** button **(5)** to enter the Main Menu. • In the menu, select the **Ultraclear** option using the **Up (4)/Down (6)** button. • Turn Ultraclear mode off/on by briefly pressing the **M** button **(5),** accompanied by the shutter calibration sound.
Wi-Fi 📶	**Turning Wi-Fi on/off** • Press and hold the **M** button **(5)** to enter the Main Menu. • Select the **Wi-Fi** option in the menu using the **Up (4)/Down (6)** button. • Press the **M** button **(5)** briefly to switch Wi-Fi on/off.

Video output ⊞▸⊟→	**Turning the video output on/off** • Press and hold the **M** button **(5)** to enter the Main Menu. • Select the **Video Output** option in the menu using the **Up (4)/Down (6)** button. • Press the **M** button **(5)** briefly to switch the video on/off. • The video output function allows connection to an external display or recording device.
Calibration ⊘	**Calibration mode selection** There are three calibration modes: automatic (A), manual (M) and background (B). The selected calibration mode is displayed in the status bar (see **Status Bar** section). • Press and hold the **M** button **(5)** to enter the Main Menu. • Select the **Calibration** option in the menu using the **Up (4)/Down (6)** button**.** • Press the **M** button **(5)** briefly to enter the submenu. • Press the **Up (4)/Down (6)** button to select one of the following modes: - **Automatic.** In automatic mode, determines the need for software calibration. The calibration starts automatically. - **Manual.** The user independently determines the need for calibration based on the quality of the observed image. - **Background.** Cover the lens before starting the calibration. • Press the **M** button briefly to confirm your selection.
Compass Ⓐ	**Switching the digital compass function on/off** • Press and hold the **M** button **(5)** to enter the Main Menu. • Select the **Compass** option in the menu using the **Up (4)/Down (6)** button**.** • Press the **M** button **(5)** briefly to switch the compass on/off. • If the compass function is enabled, it will be displayed in the middle of the top status bar.

Gravity sensor ⟲	**Switching the gravity sensor on/off** • Press and hold the **M** button **(5)** to enter the Main Menu. • Select the **Gravity sensor** option in the menu using the **Up (4)/Down (6)** button. • Briefly press the **M** button **(5)** to switch the **Gravity Sensor** on/off. • If the gravity sensor is on, two scales will appear on either side of the screen. • The left scale shows the tilt angle and the right scale shows the angle.	

Aiming cross ⊹		**Setting the firing profile, type of sight cross and its colour.** • Press and hold the **M** button **(5)** to enter the Main Menu. • Select the **Aiming cross** option in the menu using the **Up (4)/Down (6)** button. • Press the **M** button **(5)** briefly to enter the crosshair submenu below.	
	Spray profile 🔫	**Choose your shooting profile** • Use the **Up (4)/Down (6)** buttons to select the firing profile. • Briefly Press button **M (5)** for enter to submenu of the shooting profile. • Select one of the three Profiles (marked A, B, C) by briefly pressing the **Up (4)/Down (6)** button. • Press the **M** button **(5)** briefly to confirm the selection. • The name of the selected profile is displayed in the status bar at the top of the display.	
	Type of sighting cross ⊹	**Choose the type of sighting cross** • Use the **Up (4)/Down (6)** button in the submenu to select the **Crosshair Type**.	

		• Briefly press the **M** button **(5)** to enter the submenu **Type of crosshair**. • Select the desired type of sighting cross from the seven types by briefly pressing the **Up (4)/Down (6)** button. • The crosshair type will change as the cursor moves between the crosshair types. • Confirm the selection by briefly pressing the **M** button **(5)**.
	Colour of the sighting cross	**Choosing the colour of the sighting cross** • Use the **Up (4)/Down (6)** button in the submenu to select the **Crosshair Colour**. • Press the **M** button **(5)** briefly to enter the **Aiming Cross Color** submenu. • Select the desired Crosshair colour from white, black, red and green by briefly pressing the **Up (4)/Down (6)** button. • The color of the crosshair will change a s t h e cursor moves between the crosshair colors. • Confirm the selection by briefly pressing the **M** button **(5)**.
Spraying	To shoot your rifle scope, you first need to set the shooting profile and the shooting distance. The Rico series supports shooting distances from 1 to 999 m. • Press and hold the **M** button **(5)** to enter the main menu.	

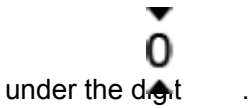|		
	• Use the **Up (4)/Down (6)** button to select the **Shooting** menu. • Press the **M** button **(5)** briefly to enter the range submenu (r a n g e selection). • Use the **Up (4)/Down (6)** button to select one of the preset values **Shooting distances**. The basic values are 100m, 200m, 300m. • Press the **M** button **(5)** briefly to enter the **Shooting Distances** submenu.	
Spraying ‐¦‐	If the shooting distance is the same as the current distance, you can shoot your rifle scope directly as follows. • Use the **Up (4)/Down (6)** button in the submenu to select the option **The distance of shooting**. • Press the **M** button **(5)** briefly to enter the function interface **Spraying**. • The X and Y coordinates of the sighting cross are displayed in the upper left corner of the screen. • Aim and fire at the target. • Keep the centre of the aiming cross fixed on the aiming point, then press and hold the **Up (4)** and **Down (6)** buttons simultaneously until ❄ symbol appears on the left side of the screenimage is fixed.	
	• Adjust the position of the aiming cross using the **Up (4)/Down (6)** button until the aiming cross is aligned with the point of impact. Briefly press the **M** button **(5)** to enter to change the direction of movement. • For a detailed description of the sight crosshairs setting, see Chapter 9 **Shooting.**	

		• Press and hold the **Menu** button **(5)** to save the crosshair position and return to the home screen.
	Resetting the shooting distance ▼ 000 ▲	If the shooting distance is not the same as the set object, you can set a different distance here. • Select a **non-primary distance** and briefly press the **M** button **(5)** to enter the submenu. • In the menu, select the **Resetting the shooting distance** using the **Up (4)/Down (6)** button. • Press the **M** button **(5)** briefly to allow the range to be reset. Two triangles appear above and ▼ 0 under the digit . • Use the **Up (4)/Down (6)** button to reset the value from 0 to 9. • Press the **M** button **(5)** briefly to switch between numbers. • After resetting, press and hold the **M** button **(5)** to save and exit. • The new range is now shown in the status bar at the top of the display.
Setting the standby mode	**Set the standby mode and time** • Press and hold the **M** button **(5)** to enter the Main Menu. • Use the **Up** **(4)/Down (6)** button to select **Standby Settings** from the menu. • Press the **M** button **(5)** briefly to enter the **Standby Settings** submenu. • Briefly press the **Up (4)/Down (6)** button to select one of the four options (2 min., 4 min., 6 min., off). • Briefly press the **M** button **(5)** to confirm the selection and display the status bar at the top of the display.	

	• If you choose off, then standby mode is disabled.
	Warning:
	- Standby mode is activated when the riflescope is tilted up or down at an angle greater than 70° and to the right or left at an angle greater than 30°.
	- The riflescope will not be put into standby mode if it is in the shooting position.
Calibrating the rangefinder	If the position of the target marked by the laser is not aligned with the centre of the rangefinder cursor on the screen, the laser rangefinder cursor position needs to be calibrated using this function (rangefinder module required).
	• Press and hold the **M** button **(5)** to enter the Main Menu.
	• Use the **Up (4)/Down (6)** button to select the **Rangefinder** option in the menu.
	• Briefly press the **M** button **(5)** to enter the **Rangefinder Calibration** interface and the starter light will automatically illuminate.
	• A small crosshair will appear on the screen with the instructions below shown in the top left corner:
	- X is the X axis (horizontal)
	- Y is the Y axis (vertical)
	- Center means the cursor returns to the center of the screen.
	- Default means return to factory settings.
	• **Use the Up (4)/Down (6)** button to select your options and confirm by briefly pressing the **M (5**) button.
	• If you choose **X** or **Y, the** icon will turn blue and flash.
	Then move the cursor by pressing the **Up (4)/Down (6)** button for short or long presses. Press the **Up (4)** button to move the cursor to the right or up and the **Down (6)** button to move it to the left or down. A short press moves one pixel at a time, and a long press pressing ten pixels at a time.

	• After moving the cursor to the correct position, press the **M** button **(5)** briefly to save the position. Then the icon will stop flashing.
	• Switch to the other axis and continue until the cursor is aligned with the position on the target marked by the laser.
	• After selecting **Center/Default,** briefly press the **M** button **(5)** to return the cursor to the center/default position.
	• Press and hold the **M** button **(5)** to save and go to the home page.
Correction defectiv e pixels $\boxplus$	Defective pixels are pixels that do not change brightness compared to other pixels in the image. They are either brighter or darker than the surrounding pixels. The Rico series offers the ability to remove any defective pixels on the sensor using software and also allows you to cancel any removal. • Press and hold the **M** button **(5)** to enter the Main Menu. • Use the **Up (4)/Down (6)** button to select the **Defective Pixel Correction** option from the menu. • Briefly press the **M** button **(5)** to enter the **Defective Pixel Correction** interface. • Instead of the aiming cross, a small crosshair appears in the middle of the screen. • The Picture in Picture (PIP) window appears at the bottom left of the screen. • The cursor coordinates and the number of corrected pixels are displayed on the right side of the PIP window. • On the right side of the PIP window is information showing the direction of cursor movement in the X-axis (horizontal), Y-axis (vertical) and the number of corrected pixels.

	• Short or long press the **Up (4)/Down (6)** button to move and align the cursor with the defective pixel. Press the **Up (4)** to move the cross to the right or up and the **Down (6)** buttons to move the cross to the left and down. A short press moves one pixel at a time and a long press moves ten pixels at a time. • Press the **M** button **(5)** briefly to change direction between the X and Y axes. • Remove the faulty pixel by briefly pressing the **On** button **(3)**. After the pixel has been successfully removed, the **Add** message is briefly displayed in the PIP window. • Then remove the next defective pixel by moving the cursor across the display. • Briefly press the **On** button **(3)** in the same position as the defective pixel was calibrated to cancel the correction and the Del message will briefly appear in the PIP window. This is limited to existing corrections only. • The number of defective pixels changes each time a pixel correction is added or removed. • The PIP and information will move to the top left year of the screen when the cursor approaches the bottom left year. • Press and hold the **M** button **(5)** until "Do you want to save the settings?" appears on the display. and the "Yes" and "No" options. • Briefly press the **Up (4)/Down (6)** buttons to select "Yes" to save and exit or "No" to cancel and exit. • Press the **M** button **(5)** briefly to confirm the selection. • If you select **Yes, a five-second** countdown will appear on the screen for saving. After the **Save successful** message, you will automatically exit to the home screen.
Calibrating the compass 	**Digital compass calibration** • Press and hold the **M** button **(5)** to enter the Main Menu.
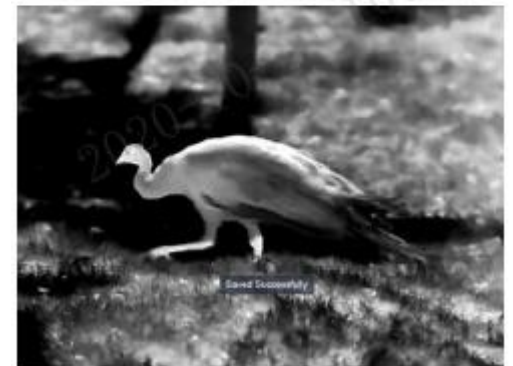
	• Use the **Up (4)/Down (6)** button to select the **Compass Calibration** option from the menu. • Briefly press the **M** button **(5)** to enter the **Compass Calibration** submenu. • An icon similar to the tri-axial coordinate system will appear on the screen. • When the appropriate icon is displayed, rotate the scope around the three axes at least 360 degrees for 15 seconds. • After 15 seconds, the calibration is complete and you are taken to the home screen.	
Settings ⚙	**Choose general settings** • Press and hold the **M** button **(5)** to enter the Main Menu. • Use the **Up (4)/Down (6)** button to select **Settings** from the menu. • Press the **M** button **(5)** briefly to enter the submenu. • This item allows you to configure the following settings.	
	Date 📅	**Setting the date** • In the **Settings** submenu, briefly press the **M** button **(5)** to activate the **Date** submenu. Two triangular icons will appear above and below the value. • The date format is **YY.MM.DD** (2020.01.01). • Select the correct value for the year, month and date by briefly pressing the **Up (4)/Down (6)** button. • Switch between digits by briefly pressing the **M** button **(5)**. • Save the selected date and exit the submenu by long pressing the **M** button **(5)**.

Time ![clock icon]	**Time settings** In the **Settings** submenu**,** briefly press the **M** button **(5)** to activate the **Time** submenu. Two triangular icons will appear above and below the value • The time format is displayed as **HH:MM** in 24-hour format (14:48). • Select the correct value for the year, month and date by briefly pressing the **Up (4)/Down (6)** button. • Switch between digits by briefly pressing the **M** button **(5)**. • Save the selected date and exit the submenu by long pressing the **M** button **(5)**.	
Language ![globe icon]	**Choice of language** • In the **Settings** submenu, use the **Up (4)/Down (6)** button to select **Language**. • Press the **M** button **(5)** briefly to enter the **Language** submenu. • Press the **Up (4)/Down (6)** button briefly to select the desired language. The Rico series supports English and Russian. • Briefly press the **M** button **(5)** to enter to confirm the selection. • You will automatically exit the submenu.	
Units of measurement ![M/Y icon]	**Choice of units of measure** • Use the **Up (4)/Down (6)** button in the **Settings** submenu to select the **Units of measure** option. • Press the **M** button **(5)** briefly to enter the **Units of Measurement** submenu.	

	- Choose between metres and yards by briefly pressing the **Up** button **(4)/Down (6)**. - Briefly press the **M** button **(5)** to enter to confirm the selection. - You will automatically exit the submenu.	
Auto-hide mode	**Turning automatic hiding on/off** - Use the **Up (4)/Down (6)** button in the **Settings** submenu select **Auto-hide mode**. - Press the **M** button **(5)** briefly to enter the **Auto Hide Mode** submenu. - Briefly press the **Up (4)/Down (6)** button to select **On** or **Shutdown.** - Briefly press the **M** button **(5)** to enter to confirm the selection. - You will automatically exit the submenu...	
Reset to factory settings	**Reset to factory settings** - Use the **Up (4)/Down (6)** button in the **Settings** submenu select **Reset to factory settings**. - Press the **M** button **(5)** briefly to enter the **Reset to Factory Settings** submenu. - Briefly press the **Up (4)/Down (6)** button to select **Yes** or **No.** - Briefly press the **M** button **(5)** to enter to confirm the selection.	

		• If you select **Yes, the** rifle scope will restart.
		• If you choose **No**, the action is cancelled and you return to the submenu. After returning to factory settings, the settings will be as follows:

- **Picture mode:** white hot;		- **Video output:** off
- **Loading:** A100		- **Wi-Fi:** Off
- **Ultraclear mode:** off;		- **Gravity sensor:** Off
- **Magnification:** 3.0 x;		- **Language:** English
- **Calibration mode:** automatic;		- **Unit of measure:** Metre
- **Digital compass:** off		- **Auto-hide mode:** off
- **Standby mode:** Off;		

Information (i)	**View device information**	
	• Use the **Up (4)/Down (6)** button in the **Settings** submenu to select the **Information** option.	
	• Briefly press the **M** button **(5)** to display relevant information about the rifle scope.	
	• This item allows the user to view the following information about the riflescope: product model, GUI version, SYS Info, Boot version, FPGA, PN and SN numbers of the riflescope, hardware version.	
	• Press and hold the **M** button **(5)** to return to the submenu.	

16. Laser marker and rangefinder (rangefinder module required)

The Rico series supports a laser rangefinder module (optional accessory) for laser marking and distance measurement, which allows distance measurement to objects up to 1000 m away.

Installing the laser rangefinder module

➢ Press the button **(17)** on the frame **(22) of** the module **(9)** to push in the tightening wrench.

➢ Open the key **(20)** vertically.

➢ Fit **(22) the** module frame to the Picatinny rail **(23)** on the side

and close the key.

(20).

➢ Adjust the hex nut **(18)** she frame **(22)** and the module

(9) tighten using a hexagon wrench.

➢ Then tighten locking screw **(21)** on the back side frame with a hexagonal wrench.
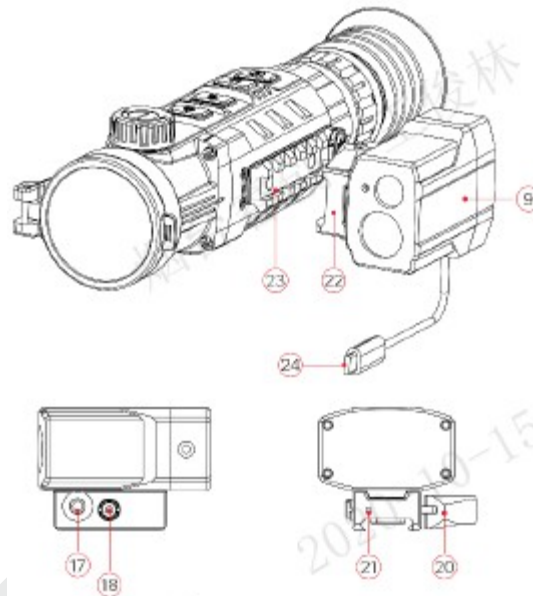
➢ Plug the USB Type-C plug **(24) of** the module into the USB Type-C port (**10)** on the
rifle scope to complete the installation.

Laser rangefinder functions

➢ Simultaneously press and hold the **Up (4)** and **Down (6)** buttons on the home screen to turn the laser rangefinder function on/off.

➢ rangefinder cursor ⌐¬⌐¬ appears on the screenDashes with the unit of measure appear in theright corner of the display. The rangefinder mode is to the left of the values.

➢ The Rico series has two rangefinder modes: the **SGL** (single-use) and the

CONT (Continuous Measurement). Briefly press the **Up (4) and Down (6)** buttons simultaneously to switch between SGL (basic set mode) and CONT modes.

➢ In **SGL** mode, press the Mode **On** button **(3)** to measure the distance to the target. The manual calibration function is not available in SGL mode.

- In **CONT** mode, the measured distance will be refreshed in real time as soon as you aim the rifle scope at an object and there is no movement within one second.

  to press any buttons. A manual calibration function is available in this mode.

- If the target is more than **1000 m** away, instead of **MAX** will appear.

- To exit the laser rangefinder function, press and hold the **Up (4) and Down** buttons simultaneously.

Laser marker

- In rangefinder mode, simultaneously press and hold the **M (5) and Down (6)** buttons to switch the laser marker on/off.

Calibrating the rangefinder

- After the initial installation or if the target position marked by the laser is not aligned with the center of the cursor on the screen, the rangefinder cursor needs to be calibrated.

- Set your destination and press and hold the **M** button **(5)** to enter the Main Menu.

- Use the **Up (4)/Down (6)** button to select the **Rangefinder** option in the menu.

- Briefly press the **M** button **(5)** to enter the **Rangefinder Calibration** interface and the laser marker will automatically light up.

- The rangefinder cursor changes to a crosshair on the screen.

- Move the cursor to the position indicated by the laser (see **Main menu - Calibrating the rangefinder**).

- Press and hold the **M** button **(5)** to save and go to the home screen.

Warning:

- **The use of lasers is subject to legal restrictions in different countries and regions.**

- As with other laser devices, long-term observation of the beam through a magnifying lens is not recommended.

- The laser marker does not activate automatically when the laser rangefinder function is activated.

- To set the units of measure (meters or yards), go to **Settings** in the Main Menu.

Special features when using the laser

- The accuracy of the measurement and the maximum range depend on the reflectivity of the target surface, the angle at which the transmitted beam strikes the target and the weather conditions. The reflectivity depends on the surface texture, colour, size and shape of the object. Glossy and bright surfaces generally have higher reflectivity than dark surfaces.

- The accuracy of the measurement can also be affected by light conditions, fog, smog, rain, snow, etc. The range may decrease in brightly lit conditions or when measuring towards the sun.

➤ Measuring the distance to a small target is more difficult than to a large target.

- **Alert** -

⚠ Attention LASER 3R	🚫

	Wavelength: 635nm Maximum power: < 5mW
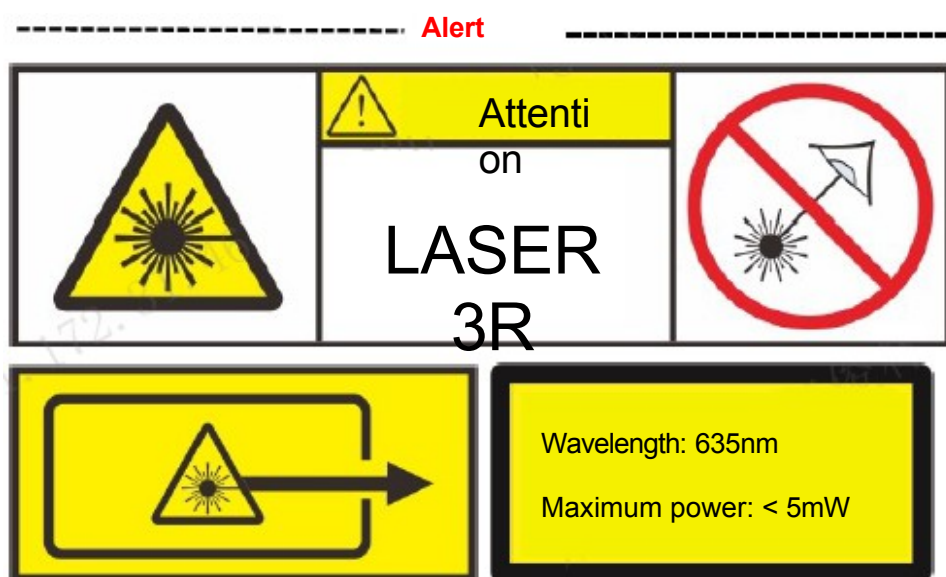
17. PIP function

The PIP (Picture in Picture) function allows you to see both the magnified image and the main image in a specific window.

➤ Press and hold the **Zoom** button **(4)** on the home screen to turn PIP on/

➤ If there is an increase in the main image by briefly pressing the **Zoom** button **(4)**, the PIP image will be synchronously zoomed 2×.

➤ For example, if the magnification of the main image is 4×, 8×, 12×, 16×, the corresponding
PIP image magnification will be 8×, 16×, 24×, 32×.

18. Automatic state hiding

This feature allows you to automatically hide GUI information in the interface except for the aiming cross so that the image is not disturbed.

➤ Press and hold the **M** button **(5)** to enter the Main Menu.
➤ Use the **Up (4)/Down (6)** button to select **Settings** from the menu.
➤ Press the **M** button **(5)** briefly to enter the submenu.
➤ Use the **Up (4)/Down (6)** button in the menu to select the **Automatic status hiding** option.
➤ Press the **M** button **(5)** briefly to enter the **Auto Hide Status** submenu**.**
➤ Briefly press the **Up (4)/Down (6)** button and select **On** or **Off.**
➤ Press the **M** button **(5)** briefly to confirm the selection.
➤ If you choose the **On** option**, the** GUI icons in the interface, including the status bar, are automatically hidden after 8 seconds of inactivity. Only the image and a sighting cross.
➤ The GUI information is displayed again when any button is pressed.
➤ Only after the GUI is displayed will the buttons and menus be active again.

19. Wi-Fi features

The Rico series has a built-in Wi-Fi module for wireless communication with mobile devices (smartphone or tablet).

➢ Press and hold the **M** button **(5)** to enter the Main Menu.
➢ Use the **Up (4)/Down (6)** button to select the **Wi-Fi** option from the menu.
➢ Press the **M** button **(5)** briefly to switch the Wi-Fi function on/off.
➢ The rifle scope is recognized by an external device under the name "Rico_XXXXXX",
  XXXXXX represents the last six digits of the serial number, which consists of numbers and letters.

➢ Choose this Wi-Fi signal and enter the password (factory password is 12345678) to
  mobile device to establish a connection.
➢ After a successful Wi-Fi connection, you can control the device via the app.
➢ Launch the **InfiRay Outdoor** app on your mobile device (see chapter **Updates and applications**).

To set a Wi-Fi name and password

The Wi-Fi name and password on the Rico line can be changed in the **InfiRay Outdoor** app.

➢ Once connected to your mobile device, locate and click on the "settings"

  ⚙ icon in the **InfiRay Outdoor** app to navigate to the setup interface.

➢ Enter the new Wi-Fi name (SSID) and password in the text box.
➢ To activate the new name and password, the device must be restarted.

Note! After resetting to factory settings, the Wi-Fi name and password are also reset to factory settings.

20. Updates and InfiRay Outdoor

Rico thermal imaging riflescopes support **InfiRay Outdoor** technology, which allows real-time transmission of thermal camera images to a smartphone or tablet via Wi-Fi.

For detailed information about **InfiRay Outdoor**, please refer to the manual available at **www.xinfrared.com.**

The riflescopes are equipped with a software update option. Updates are possible via the **InfiRay Outdoor** app. It is also possible to download and update the software from the official website: www.xinfrared.com.

About InfiRay Outdoor

- You can download the **InfiRay Outdoor** app on the official website: www.xinfrared.com; or search for **InfiRay Outdoor** in the AppStore for download the app; or download the app by scanning the QR code.

- Once installation is complete, open the InfiRay Outdoor app.
- If your rifle scope is already connected to a mobile device, turn on mobile data on your mobile device. Once connected, it will check for updates automatically with a query in the app. Click "Now" to download updates or click "Later" to update later.
- **The InfiRay Outdoor** app automatically saves the last connected device. So if your riflescope has not connected to your mobile device, but has previously connected to the **InfiRay Outdoor** app**, the** update query will appear when you turn on the **InfiRay Outdoor** app**.** You can first download the update via mobile Wi-Fi and then connect the riflescope to your mobile device to complete the update.

- After the update is complete, the device restarts.

21. Technical inspection

A technical check is recommended before each use of the riflescope. Check the following:

- Appearance of the rifle scope (the body should be free of cracks).
- Condition of the lens and eyepiece (should be free of cracks, grease spots, dirt or other deposits).
- Battery charging status (should be).
- Controls/buttons should be in working order.

22. Maintenance

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

- Wipe dust from surfaces and plastic parts with a cotton cloth. Silicone lubricant can be used for cleaning.
- Clean the electrical contacts and battery slots on the rifle scope with an organic, non-greasy solvent.
- Check the optics of the lenses and eyepiece. If necessary, remove dirt and sand from the optics (preferably using a non-contact method). Cleaning of the outer surfaces of the optics should be done using cleaners specifically designed for this purpose.

23. Troubleshooting

The table lists the difficulties that can occur when using the riflescope. Perform the recommended inspection and troubleshooting steps in the order listed in this table. If you encounter a malfunction that is not listed in this table, or if you are unable to correct the malfunction yourself, have the riflescope serviced.

Glitch	Probable cause	Solution
The rifle scope doesn't turn on.	The battery's completely dead.	Charge the battery.
Riflescope not working with an external power supply.	The USB cable is damaged.	Replace the USB cable.
	The external power supply is discharged.	Check the external power supply.
Image is blurry, blurry, unbalanced, streaky.	Calibration is required.	Calibrate the image according to the **Calibration** section of this manual.
The picture is too dark.	The brightness level is too low.	Adjust the screen brightness.
The GUI is clear, but the image is blurry.	The lens is out of focus.	Adjust the sharpness of the image by turning the lens adjuster.
	There is dust or condensation on the inner or outer surface of the lenses.	Wipe the outer surface of the optics with a cotton cloth. Allow the riflescope to dry by leaving it in a warm environment for 4 hours.
Targeting cross with after ...after the shot is fired.	The riflescope is not firmly mounted or the mount is not firmly attached to the riflescope.	Check that the riflescope is securely fixed. Make sure you use the same type and caliber of ammunition that you used when you shot the rifle scope and gun. If you shot the rifle scope in summer and use it in winter (or vice versa), a slight shift is possible.
The image of the observed object is missing.	Observation is through glass.	Remove the glass from the field of view.
The scope doesn't focus.	Wrong settings	Adjust the riflescope according to the chapter **"Switching on and adjusting the image"**.

		Check the outer surfaces of the lens and eyepiece and clean it if necessary to remove dust, condensation, frost, etc.
		In cold weather, you can use an anti-fog product (e.g. the same as for dioptric glasses).
The binoculars cannot be connected to smartphones and tablets.	Wrong Wi-Fi password	Enter the correct password
	There are too many Wi-Fi signals near the device.	Move your device to an area with no or fewer Wi-Fi signals
Wi-Fi is missing or has been interrupted	The smartphone or tablet is out of range of a strong Wi-Fi signal, or there are obstacles (e.g. concrete walls) between the device and the smartphone or tablet.	Move your device around until you find a stable Wi-Fi signal.
The image quality is too poor or the detection distance has been reduced.	These problems can be caused by weather conditions such as snow, rain, fog, etc.	
If the riflescope is used at too low temperatures, the quality of the view of the surroundings is worse than at temperatures above zero.	At temperatures above freezing, the observed objects (surroundings and background) heat up differently due to thermal conductivity and thus create a large temperature contrast. Therefore, the resulting thermal image quality is higher. At low temperatures, the observed objects (background) cool down to approximately the same temperature and therefore the thermal contrast is usually greatly reduced and the image quality (zoom) is reduced. This is a unique feature of thermal imaging.	