

User's Manual

INFIRAY OUTDOOR
FINDER FH35R V2

Thermal Imaging Rangefinder



WARNING! ITAR REQUIREMENTS

These products may be subject to export and foreign trade control laws of the United States and may not be exported without prior approval of the U.S. Department of State. Learn more at irayusa.com/ITAR.

CAUTION

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

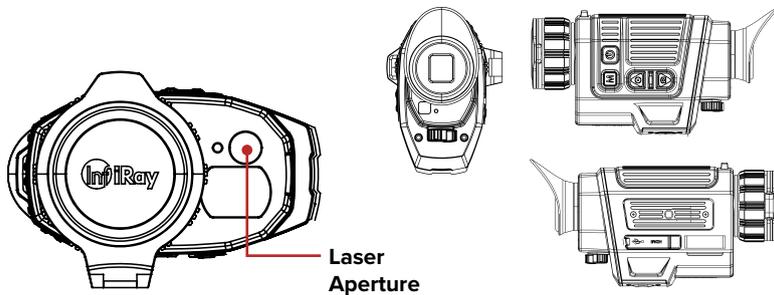
2601 State Hwy 121, Building 3, Suite 306, Lewisville, TX 75056
800.769.7125 info@irayusa.com

NOTICE: This product is a Class 3R laser product.

Explanatory Label



Mfr ID and Certification Label



NOTE: There is no scheduled maintenance or service necessary to keep this product in compliance and no user service or maintenance is required.

This Laser Product is designated as Class 3R during all procedures of operation.

Wavelength: 905 nm
Laser Power for Classification: <800nJ
Emission Type: Pulsed, Invisible
Emission Frequency 5 kHz
Beam Diameter: 20mm*5mm
Divergence: 2 mRad*0.5Rad

**INVISIBLE LASER RADIATION
AVOID DIRECT EYE EXPOSURE
CLASS 3R LASER PRODUCT**

NOTES:

- There is no service required or allowed of this product by the end user.
- This product is to be serviced or repaired only by factory authorized technicians.
- This product is not to be opened or modified by the user.
- The user is not to modify the unit or remove protective covers or housing. Service is only to be handled by authorized factory trained technicians. This product has no user-serviceable parts.
- Do not point laser or allow laser light to be directed or reflected toward other people or reflective objects.
- Operators should be trained to not target the eyes of people, animals, and pets or aim at reflective objects, etc.
- There is a potential hazard of eye or skin exposure to laser radiation if the included instructions are not followed.
- This laser is never to be operated if the unit is defective or the cover or seal is damaged.
- Always operate the product with the aperture pointed downrange.

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WARNING: CHOKING HAZARD

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

1. OVERVIEW

FINDER V2 combines a powerful thermal viewer with a handheld laser rangefinder, giving hunters the ability to identify targets at night and accurately determine their range. A 640×512 thermal sensor paired with a 3× (35mm) f/0.9 lens provides a crisp image with ample room for digital zoom, ideal for viewing wildlife or recording photos and videos. FINDER V2 pairs 800-yard infrared laser rangefinding capability (continuous or single capture) with a 1,750-yard thermal detection range in a compact unit that fits in the palm of your hand. FINDER V2 ships with two IBP-2 batteries, each providing approximately 3 hours of run time. A proximity sensor automatically powers off the display when moved away from the viewer's eye to reduce power consumption and visible light signature.

2. FEATURES

- 12 μm high-performance thermal detector
- High image quality
- ≤35 mK NETD sensor sensitivity
- Maximum detection range of 1750 yards
- Two quick-change rechargeable IBP-2 battery packs
- High-resolution 1024×768 AMOLED display
- Integrated 800yd laser rangefinder
- High frame frequency: 50hz
- Digital Zoom: ×1/×2/×3/×4
- Built-in 32 GB storage to support image capture and video recording
- Built-in Wi-Fi module
- Mobile device App compatible
- Ultra-clear mode for advanced image detail
- User-friendly interface
- Pixel calibration functions

3. TECH SPECS

FINDER	FH35R V2
SENSOR	
Resolution	640×512
Pixel Size	12 μm
Frame Rate	50hz
Sensor Sensitivity	≤35 mK
Image Processing	MATRIX III
Core	InfiRay Micro II 640
OPTICS	
Objective Lens	35 mm f/0.9
Magnification	2×
Digital Zoom	4×
Field of View	12.6° × 9.4°
Detection Range	1750 Yards
Display Type	AMOLED
Display Resolution	1024×768
Color Palettes	White Hot, Black Hot, Red Hot, Highlight, Ironbow, Rainbow
P.I.P.	Yes
Rangefinder	Integrated 800yd LRF
Eye Relief	20 mm
Diopter Range	-5 to +5
ELECTRONICS	
Onboard Recording	Video and Image
Onboard Storage	32 GB
Wireless Connectivity	Video and Image via App.
Data/Power Connector	USB-C
Power Supply	USB-C External, IBP-2 Li-ion Battery Pack ×2 (3+ Hours Each)
Start Up Time	<10 Seconds, Instant from Standby
PHYSICAL	
Size	6.30" × 3.54" × 1.97"
Weight	14.11 Oz
ENVIRONMENTAL/WARRANTY	
Warranty	5 Years
Housing Material	Aluminum
Ingress Protection	IP67
Operation Temperature	-4°F~122°F

4. ACCESSORIES

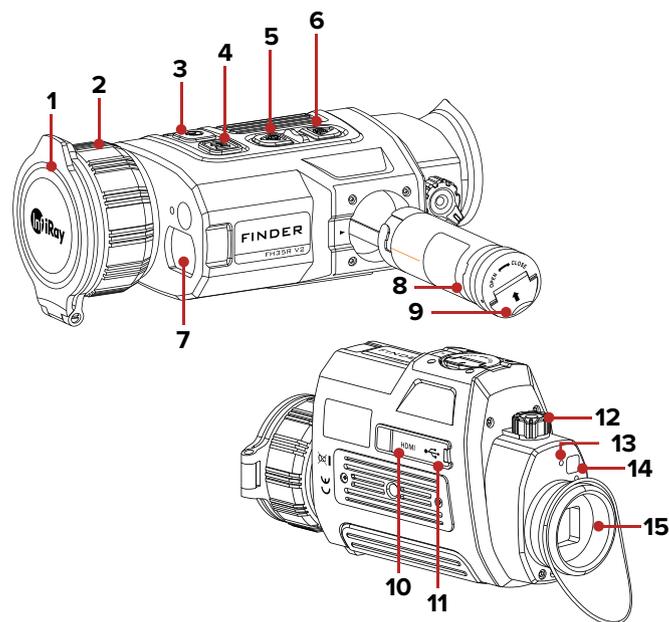
The FINDER FH35R V2 thermal imaging rangefinder ships with everything you need to get out and hunt.

- Objective Lens Cap for FINDER V2
- USB-C to USB Cable
- HDMI to Mini HDMI Cable
- IBP-2 Battery Pack
- IBC-2 Battery Charger
- USB Power Adapter
- Storage Bag
- Neck Strap
- Hand Strap
- Lens Cloth
- User Manual



Replacement accessories are available for purchase. Contact 800-769-7125 or irayusa.com/support.

5. COMPONENTS AND CONTROLS



- 1 Objective Lens Cap
- 2 Objective Lens Focus Ring
- 3 Power Button
- 4 Menu Button
- 5 Up Button
- 6 Down Button
- 7 Laser Rangefinder
- 8 IBP-2 Battery Pack
- 9 Battery Pull Tab
- 10 Mini HDMI Port
- 11 USB-C Port
- 12 Eyepiece/Diopter Adjustment Ring
- 13 Indicator LED
- 14 Infrared Sensor Switch
- 15 Eyeguard

6. DESCRIPTION OF CONTROL BUTTONS AND SHORTCUTS

Power Button 		
Current Screen / Menu or Device Status	Short Press	Long Press
Device off	---	Power on the device
Home screen	Enter standby mode	Power off the device
Standby mode	Exit standby mode	---
Main menu	Return to previous	---
Laser rangefinder interface	Turn off the laser rangefinder and exit the rangefinder interface	---

Up Button 		
Current Screen / Menu	Short Press	Long Press
Home screen	Turn on the laser rangefinder and enter the rangefinder interface	---
Menu interfaces	Move the cursor up	---
Quick menu page 1	Adjust the digital zoom level	---
Quick menu page 2	Adjust the display brightness	---
Laser rangefinder interface	Take a rangefinding measurement when in single rangefinding mode	Toggle between the rangefinding modes: continuous and single

Menu Button 		
Current Screen / Menu	Short Press	Long Press
Home screen	Enter the quick menu	Enter the main menu
Main menu	Change menu options; select a menu item	Save and return to the home screen
Quick menu	Press to enter page 2 of the quick menu; press again to exit the quick menu	---

Down Button 		
Current Screen / Menu	Short Press	Long Press
Home screen	Take a photo	Start / stop recording video
Menu interfaces	Move the cursor down	---
Quick menu page 1	Adjust the color palette	---
Quick menu page 2	Adjust the image contrast	---

Up + Down Button  + 		
Current Screen / Menu	Short Press	Long Press
Home screen	Perform a shuttered non-uniformity correction (NUC)	Perform a shutterless non-uniformity correction (NUC)

7. QUICK START GUIDE

Step 1: Prepare to Use the FINDER V2

1. Compare the box contents to the accessories list and examine each for any shipping damage. See **Accessories** on page 4.
2. Check the lens to ensure there are no smudges or dirt present. Clean with the included lens cloth, if necessary.
3. Charge the battery packs (12) using the included battery charger (16) before using the FINDER V2 for the first time. See **Charging the Battery Pack** on the next page.
4. Insert a battery pack into the battery compartment. See **Installing a Battery Pack** on page 10.

Step 2: Turn On the FINDER V2

1. Open the objective lens cap (1).
2. Long press the **Power**  **Button** for 3 seconds to power on the FINDER V2. The InfiRay Outdoor logo will appear.
3. Rotate the diopter adjustment ring (12) of the eyepiece until the interface icons are clear.

WARNING: Do not point the objective lens toward intense energy sources, such as the sun. This may render the electronic components inoperative. The warranty does not cover damage caused by improper operation.

Step 3: Adjust Image Settings in the Quick Menu

Short press the **Menu**  **Button** to enter the quick menu to adjust the following settings (see **Using the Quick Menu** on page 16):

1. Set the digital zoom level, from 1–4 \times , in increments of 0.5 \times .
2. Set the color palette to white hot, black hot, red hot, highlight, ironbow, or rainbow.
3. Set the image brightness level from 1–5.
4. Set the image contrast level from 1–5.

Step 4: Adjust Device Settings in the Main Menu

Long press the **Menu**  **Button** to enter the main menu to adjust the following settings (see **Main Menu Options and Descriptions** on page 24 for detailed instructions):

1. Turn on Ultra-clear mode.
2. Turn on the digital compass and gravity sensor.
3. Turn on the microphone.
4. Set the units of measurement to meters or yards.
5. Set the non-uniformity correction (NUC) mode to automatic or manual. See **Non-Uniformity Correction** on page 17.

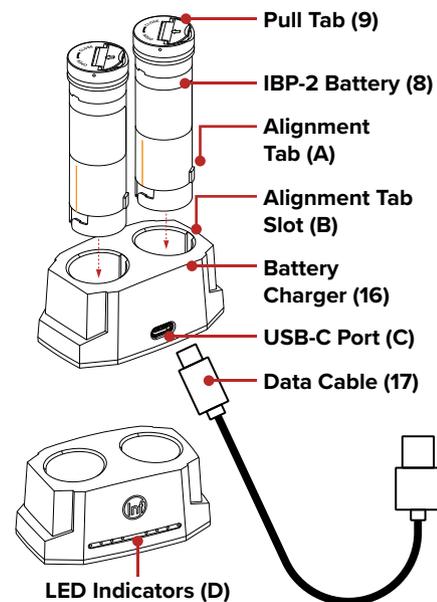
6. Set the image hue to warm or cool.
7. Set the date and time.

8. CHARGING THE BATTERY PACKS

The FINDER V2 rangefinder comes with two IBP-2 long-lasting rechargeable lithium-ion 3300mAh batteries, which allow for 3+ hours of operation each. Fully charge the battery packs before using the FINDER V2 for the first time.

Charging with the Battery Charger

1. Insert one or both of the IBP-2 batteries (8) into the battery charger (16).
 - a. Align the small alignment tab (A) near the bottom of the battery with the long shallow slot (B) on the inside of the charger.
2. Connect the USB-C end of the data cable (17) to the USB-C port (C) on the battery charger.
3. Connect the standard USB end of the data cable to:
 - a. The included 5V–2A USB power adapter; **OR**
 - b. Any standard USB 3.0 port on a laptop or computer.
4. During charging, the LED indicators (D) on the battery charger will indicate the current charge level. See **Battery Charger Status LEDs** on the next page.
5. When fully charged, remove the batteries from the charger. Do not overcharge.



BATTERY CHARGER STATUS LEDS

LED INDICATOR	BATTERY CHARGING STATUS
●●●●	Fully charged
●●●●◐	75% – 99% charged
●●●◐	50% – 75% charged
●●◐	25% – 50% charged
◐	<25% charged

NOTE: The half-circle icons indicate flashing LEDs.

Charging via the USB-C Port

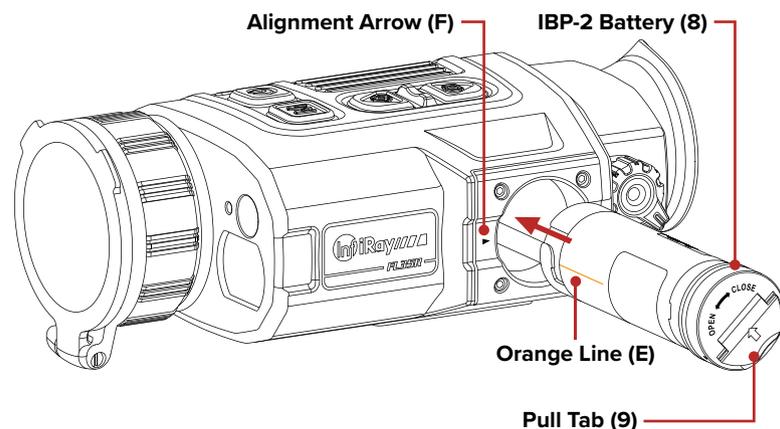
1. Connect the USB-C end of the data cable to the USB-C port (11) on the FINDER V2.
2. Connect the standard USB end of the data cable to:
 - a. The included 5V–2A USB power adapter; **OR**
 - b. Any standard USB 3.0 port on a laptop or computer; **OR**
 - c. An external power supply, such as a USB power bank.
3. When fully charged, disconnect the data cable. The indicator LED (13) at the rear of the FINDER V2 will turn green when full charge is reached. Do not overcharge.

NOTES:

- You may charge and operate the FINDER V2 at the same time.
- When less than 20% battery charge remains, the battery status icon in the status bar becomes the low battery  icon. When less than 10% battery charge remains, a prompt to charge the battery will appear on the screen. Charge the battery right away to avoid over-discharge and a reduction in battery capacity or service life
- During charging, the battery status icon will change to the charging  icon and the indicator LED (13) at the rear of the FINDER V2 will be solid red.

9. INSTALLING A BATTERY PACK

1. Flip the battery pull tab (9) up.
2. Align the orange line (E) on the side of the IBP-2 battery (8) with the alignment arrow (F) to the left of the battery slot and insert the battery into the slot.
3. Grasp the pull tab (9) and press the battery firmly while twisting clockwise a quarter turn to lock the battery in place.
4. Flip the pull tab down so that it is flush with the battery.



WARNING: The FINDER V2 can only be powered by a factory-supplied IBP-2 battery pack. Using any other battery pack may cause irreparable damage to the device or cause a fire. Any damage from using an improper battery pack will not be covered by warranty.

10. REMOVING THE BATTERY PACK

To remove the battery pack from the FINDER V2:

1. Lift the pull tab (9) on the battery (8).
2. Press the IBP-2 battery in firmly while rotating the battery counterclockwise a quarter turn until it pops out.
3. Pull firmly on the pull tab to remove the battery.

11. BATTERY SAFETY WARNINGS

WARNING: Only use the battery charger supplied with the battery pack. The use of any other charger may irreparably damage the battery pack or the charger and may cause a fire. Any damage from using an improper battery charger will not be covered by warranty.

WARNINGS:

- Do not use a battery charger, power adapter, or USB cable that has been modified or damaged.
- Do not expose the battery to high temperatures or flames, and do not immerse in water.
- Do not leave the battery unattended while charging.
- Do not leave the battery in the charger for long periods after full charge is reached. Charging time should not exceed 24 hours.
- Keep the battery pack out of the reach of children and pets.
- The battery is equipped with short-circuit protection. However, any situation that may cause short-circuiting should be avoided.

- Do not disassemble, modify, hit, or drop the battery pack.
- Do not connect the battery to any external device with an electrical current that exceeds permitted levels.
- Do not connect an external device with a current supply that exceeds a 3.0 USB port.

To maintain optimal battery capacity and service life:

- Avoid storing a fully charged or discharged battery for long periods. Partial charging of the battery is necessary if the battery will be stored for an extended period.
- Do not charge an extremely cold battery without bringing it into a warm environment. Let the battery warm up for 45 minutes before charging.
- Charge the battery at a temperature range from 32°F to 113°F, otherwise, the service life of the battery may be reduced.
- The recommended operating temperature range is -4°F to 122°F. Avoid using the battery above the maximum or below the minimum recommended temperature range as this may decrease the battery capacity or service life.

12. EXTERNAL POWER SUPPLY

The FINDER V2 supports the use of a 5V external power supply, such as a mobile power bank.

1. Connect the external power supply to the USB-C port (11).
2. The FINDER V2 will switch to operation from the external power supply, and the battery pack will begin slowly charging.
3. The battery status icon in the status bar will change to a charging battery  icon, with the battery color and fill level indicating the current charge level. See **Battery Status** on page 15 for additional information.
4. If an external power supply is connected, but no battery pack is installed, the battery icon will become the USB  icon and the indicator LED (13) will flash.
5. If the external power supply is disconnected, the FINDER V2 will automatically switch to the battery pack, if installed, without powering off.

NOTE: Do not connect the FINDER V2 to an external device with a power supply that exceeds the 3.0 USB cable.

13. OPERATING INSTRUCTIONS

WARNING!

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

Using the Control Buttons

The FINDER V2 is operated via four control buttons. The control buttons can be used to perform shortcut operations from the home screen, as well as in the menu and popup windows. See **Description of Control Buttons and Shortcuts** on page 6 for control button details.

Power On

1. Open the objective lens cap (1).
2. Long press the **Power**  **Button** for 2 seconds to turn on the FINDER V2. The InfiRay Outdoor logo will appear.

To determine the current battery charge, check the battery icon on the right side of the status bar at the top of the screen. See **Battery Status** on page 15.

Powering Off

To power off the FINDER V2:

1. Long press the **Power**  **Button**. A 3-second shutdown timer will appear on the screen.
2. Continue holding the **Power**  **Button** until the 3-second countdown completes and the FINDER V2 shuts down.



NOTE: Releasing the **Power**  **Button** before the 3-second shutdown timer concludes will stop the shutdown process and the FINDER V2 will resume its normal operation.

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

Entering Standby Mode

Standby mode may be activated at any time to conserve battery life.

1. From the home screen, short press the **Power**  **Button** to enter / exit standby mode.

NOTE: When in standby mode, the indicator LED (13) will flash red.

Adjusting the Focus

ADJUSTING THE DIOPTRER/EYEPIECE

1. Rotate the eyepiece diopter adjustment ring (12) at the rear of the FINDER V2 right or left until the user interface is clear.
2. Look closely to ensure all screen icons and the status bar appear sharp and in focus.

NOTES:

- After the initial adjustment, there is no need to rotate the diopter adjustment ring (12) for long distances or other conditions.
- If necessary during standard use, you may rotate the objective lens focus ring (2) to adjust fine focus on the target object being observed. See **Focusing the Objective Lens** below.

FOCUSING THE OBJECTIVE LENS

To adjust the focus on the target object:

1. Rotate the objective lens focus ring (2) left or right to adjust fine focus on the target object being observed.

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

Status Bar Overview



The status bar at the top of the screen shows information on the operating status of the FINDER V2. Additional status information is displayed along the screen edges.

- 1 **Color Palette:** Shows the selected color palette: white hot , black hot , red hot , highlight , ironbow , or rainbow .
- 2 **Digital Zoom Level:** Shows the selected digital zoom level: 1x, 1.5x, 2x, 2.5x, 3x, 3.5x, or 4x.
- 3 **Non-Uniformity Correction (NUC) Mode:** Shows the non-uniformity correction (NUC)  icon and selected mode: automatic (A) or manual (M).
- 4 **Wi-Fi:** The Wi-Fi  icon displays when Wi-Fi is turned on.
- 5 **Ultra-clear Mode:** The Ultra-clear  icon displays when Ultra-clear mode is turned on.
- 6 **Microphone:** The microphone  icon displays when the microphone is turned on.
- 7 **Automatic Display-off:** The automatic display-off  icon displays when the automatic display-off feature is turned on.
- 8 **Digital Compass:** The digital compass appears at the top of the screen when turned on.
- 9 **Battery:** Shows the current battery status.
- 10 **Gravity Sensor:** The gravity sensor appears on the right side of the screen when turned on.
- 11 **Video Output:** The video output  icon displays when video output is turned on.
- 12 **Time and Date:** Shows the current time, in 24-hour format, and the date.

BATTERY STATUS

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

COLOR / ICON	BATTERY STATUS
Blue Battery 	30% – 100%
Orange Battery 	20% – 30%
Red Battery 	<20%; charge the battery pack right away.
Charging Icon 	The battery pack is charging; an external power supply or computer is connected via the data cable.
USB Icon 	An external power supply or computer is connected via the data cable, but no battery is installed.

Using the Quick Menu Screens

In the quick menu, the digital zoom level, color palette, display brightness, and image contrast may quickly be adjusted.



- On the home screen, short press the **Menu [M] Button** to enter page 1 of the quick menu.
 - Short press the **Up [▲] Button** to toggle through the digital zoom levels, from 1–4 \times , in increments of 0.5 \times .
 - Short press the **Down [▼] Button** to toggle through the color palettes, white hot ☀, black hot ☾, red hot 🔥, highlight 🐦, ironbow 🌈, or rainbow 🌈.
- Short press the **Menu [M] Button** to move to page 2 of the quick menu.
 - Short press the **Up [▲] Button** to toggle through the display brightness levels, 1–5.
 - Short press the **Down [▼] Button** to toggle through the image contrast levels, 1–5.
- Short press the **Power [⏻] Button** to return to the home screen.

NOTES:

- A blue back highlight indicates the current position in the quick menu.
- Changes to quick menu items are made in real time.
- After 10 seconds of inactivity, the FINDER V2 will automatically return to the home screen.

Navigating the Main Menu



- From the home screen, long press the **Menu [M] Button** to enter the main menu.
- Short press the **Up [▲] Button** or **Down [▼] Button** to move up and down through the menu.
- A blue back highlight indicates the current position in the menu.
- Changes to toggle on/off menu items are made in real time.
- Short press the **Menu [M] Button** to:
 - Select a menu item; **OR**
 - Change the current parameters for the selected menu option.
- Long press the **Menu [M] Button** to confirm any changes and exit to the home screen.

NOTE: After 10 seconds of inactivity, the FINDER V2 will automatically return to the home screen.

14. NON-UNIFORMITY CORRECTION

A non-uniformity correction (NUC) allows a thermal imager's sensors to correct its pixels and eliminate any image defects caused by pixel drift. A NUC will be performed automatically each time the FINDER V2 is powered on.

The FINDER V2 can perform two types of non-uniformity corrections, shuttered and shutterless. Non-uniformity corrections may be set to automatic or may be performed manually. For instructions on setting the NUC mode to automatic (**A**) or manual (**M**), see **Main Menu > Calibration Mode** on page 28.

Automatic Mode

In automatic mode (**A**), the FINDER V2 will perform a shuttered NUC automatically according to the internal software algorithm. There is no need to close the objective lens cap (**1**) as the FINDER V2's internal shutter covers the sensor.

NOTE: A manual shuttered or shutterless NUC may be performed at any time while in Automatic (**A**) mode.

Manual Mode

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

Performing a Shuttered NUC

A shuttered NUC may be performed while in manual or automatic mode:

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

Performing a Shutterless NUC

A shutterless NUC uses less power than an automatic or manual NUC because it does not use the FINDER V2's shutter to cover the sensor; instead, the user must close the lens cap (**1**).

A shutterless NUC may be performed while in manual or automatic mode:

1. Close the objective lens cap (**1**).
2. From the home screen, long press the **Up**  and **Down**  **Button** at the same time.
3. A prompt to close the lens cap (**1**) appears on the screen. The shutterless NUC starts after about 2 seconds.

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

15. PHOTOGRAPHY AND VIDEO RECORDING

The FINDER V2 is equipped with video recording and image capture. All videos and photos are automatically saved to the FINDER V2's built-in 32 GB memory storage.

NOTE: Photo and video files are named with the time and date; therefore, it is recommended to set the date and time before using the photo and video functions. See **Main Menu > Date and Time** on page 30. Alternatively, the date and time may be synchronized in the InfiRay Outdoor App.

Photography

To take a photo:

1. From the home screen, short press the **Down**  **Button**.
2. The image freezes for 0.5 seconds and the camera  icon appears briefly in the upper-right corner of the screen.



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

Video Recording

To record video:

1. From the home screen, long press the **Down**  **Button** to start a video recording.
2. When the video recording starts, the video recording  timer appears, in MM:SS (minute: second) format, in the upper-right corner of the screen.
3. When recording, short press the **Down**  **Button** to take a photo.
4. Long press the **Down**  **Button** to stop and save the video recording.



Video and Photography Notes

- You may enter and navigate the menu during video recording.
- Recorded photos are saved to the internal memory card.
- The maximum duration of a recorded video file is 10 minutes. After this time, video recording will begin a new file automatically.
- The number of recorded files is limited only by the capacity of the internal memory.
- Check the available space on the internal storage card regularly and move video footage and images to other storage media to free up space on the memory card.

16. ACCESSING THE INTERNAL MEMORY

When the FINDER V2 is turned on and connected to a computer via the included data cable, it is recognized by the computer as a flash memory (USB) drive. This allows the user to access the saved multimedia files and copy or delete any desired files.

To access the internal memory:

1. Turn on the FINDER V2.
2. Connect the USB-C end of the data cable to the USB-C port (11).
3. Connect the standard USB end of the data cable to your computer.
4. Double-click **My Computer** on your computer desktop.
5. Double-click to open the device named **InfiRay**.
6. Double-click to open the device named **Internal Storage** to access the built-in memory.
 - a. The device shows the available space (in GB) remaining of the 32 GB of total memory storage.
 - b. Recorded photos and videos are separated by date into folders, which are named in YYYYMMDD format (year/month/day).
 - c. Photos are saved in IMG_HHMMSS_XXX.jpg format. Videos are saved in VID_HHMMSS.mp4 format. HHMMSS is hour/minute/second and XXX is a 3-digit file counter number, which does not reset.
7. Select the desired files or folders to copy or delete.

17. VIDEO OUTPUT

The video output function enables connectivity with an external display or recording device via analog video.

To output video:

1. Turn on the FINDER V2.
2. Connect the HDMI cable to the HDMI mini port (10) on the FINDER V2.
3. In the main menu, turn on video output. See **Main Menu > Video Output** on page 25 for instructions.
4. When video output is on, its  icon appears in the lower-right corner of the screen.
5. Connect the other end of the HDMI cable to an HDMI port on the external display or recording device.

18. USING THE INFIRAY OUTDOOR APP

The FINDER V2 can be operated using the InfiRay Outdoor App when it is connected to a smartphone or tablet via Wi-Fi.

1. Download the App for free and install it on your smartphone or tablet:
 - a. Scan one of the QR codes above to download the InfiRay Outdoor App from the App Store or Google Play; **OR**
 - b. Download the App from any app store.
2. Connect the FINDER V2 to Wi-Fi:
 - a. In the main menu, turn on Wi-Fi. See **Main Menu > Wi-Fi** on page 25 for detailed instructions.
 - b. Open the App and press the **ViewFinder**  icon on the home screen.
 - c. Click the **Connect Device WiFi** button.
 - d. On the mobile device, go to **Settings > Wi-Fi**.
 - e. Select the FINDER V2 from the list of Wi-Fi networks. It will appear in the list as “FINDER_XXXXX-XXXXXXXX”, where XXXXX-XXXXXXXX is the device serial number.
 - f. Enter the Wi-Fi password and tap the **Join** button. The default password is 12345678.



3. Operate the FINDER V2 via the App:
 - a. Take real-time photos and videos, with or without audio.
 - b. View, share, download, and delete photos and videos taken via the App, which are saved to the mobile device.
 - c. Change the Wi-Fi password and SSID.
 - d. Synchronize the date and time from the mobile device.
 - e. Update the firmware of the FINDER V2.

NOTE: When a factory reset is performed, the Wi-Fi SSID and password are reset to the defaults, FINDER_XXXXX-XXXXXXXX and 12345678. See **Main Menu > Factory Reset** on page 32.

19. DIGITAL ZOOM

The FINDER V2 will quickly increase the base magnification by enlarging the image from 1 to 4 times digitally.

To adjust the digital zoom:

1. From the home screen, short press the **Menu**  **Button** to enter the quick menu.
2. Short press the **Up**  **Button** to adjust the digital zoom, from 1x–4x, in increments of 0.5x. The selected zoom level is displayed in the status bar.
3. Short press the **Power**  **Button** to exit the laser rangefinder.



20. ULTRA-CLEAR MODE

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

Ultra-clear mode provides:

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

See **Main Menu > Ultra-clear** on page 24.

21. INTEGRATED LASER RANGEFINDER

The FINDER V2 is equipped with an integrated, precision laser rangefinder which allows the user to measure the distance to objects up to 800yd away, with ± 1 yd accuracy. The laser rangefinder has two ranging modes: continuous and single-measurement capture. Continuous rangefinding allows the user to adjust quickly to changing distances for better shot placement.



CAUTION: Do not stare directly into the laser.

To use the laser rangefinder:

1. Short press the **Up**  **Button** to turn on the laser rangefinder and enter the rangefinder interface.
2. The rangefinder interface has the following features:
 - 1 **Cursor:** The square blue rangefinder cursor  appears in the center of the screen.
 - 2 **Tooltip:** The tooltip at the bottom of the screen shows the selected rangefinding mode, continuous  or single  ranging, and the distance to the target.
3. Long press the **Up**  **Button** to toggle between the two rangefinding modes.
4. Locate the target. The distance to the target will be updated in the rangefinder according to the rangefinding mode selected:
 - a. In continuous ranging  mode, the distance to the target indicated by the cursor will be refreshed automatically by the rangefinder every second.
 - b. In single ranging  mode, the user must short press the **Up**  **Button** to take a rangefinding measurement.
5. Short press the **Power**  **Button** to exit the laser rangefinder.

ACCURACY NOTES:

- The measurement accuracy and maximum range depend on the reflection ratio on the target surface, the angle at which the laser beam falls on the target surface, and environmental conditions. Reflectivity depends on the surface texture, color, size, and shape of the object. Typically, a glossy, bright surface will have higher reflectivity than a darker surface.

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

22. MAIN MENU OPTIONS AND DESCRIPTIONS

Menu options, from top to bottom are:

- **Main Menu Page 1:** Ultra-clear, Wi-Fi, Video Output, PIP, Digital Compass, Gravity Sensor, Automatic Display-off, Microphone, Units of Measure, and Next Page.
- **Main Menu Page 2:** Calibration Mode, Image Hue, Pixel Defect Correction, Compass Calibration, Date and Time, Info, Factory Reset, and Previous Page.

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

Ultra-clear

Turn Ultra-clear mode on / off

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

1. Long press the **Menu**  **Button** to enter the main menu.
2. Short press the **Up**  or **Down**  **Button** to select the Ultra-clear  menu item.
3. Short press the **Menu**  **Button** to toggle Ultra-clear on / off. When turned on, the Ultra-clear icon  appears in the status bar.
4. Long press the **Menu**  **Button** to return to the home screen.

NOTE: When Ultra-clear mode is turned on and off, the FINDER V2 will automatically perform a shuttered non-uniformity correction.

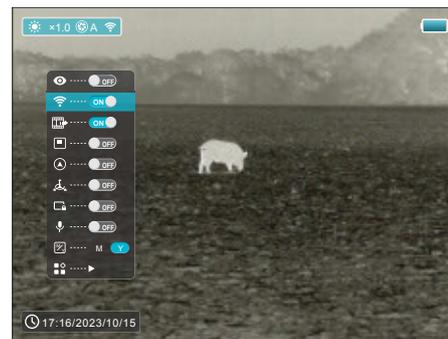


Wi-Fi

Turn Wi-Fi on / off

Turn on Wi-Fi to manipulate the FINDER V2 via the InfiRay Outdoor App.

1. Long press the **Menu**  **Button** to enter the main menu.
2. Short press the **Up**  or **Down**  **Button** to select the Wi-Fi  menu item.
3. Short press the **Menu**  **Button** to toggle Wi-Fi on / off. When turned on, the Wi-Fi icon  appears in the status bar.
4. Long press the **Menu**  **Button** to return to the home screen.

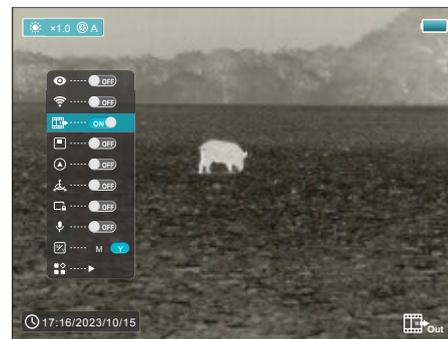


Video Output

Turn video output on / off

The video output function enables connectivity with an external display or recording device via the included HDMI cable

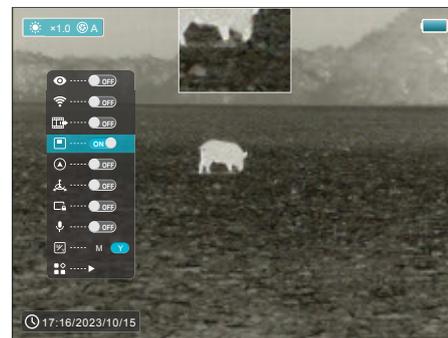
1. Long press the **Menu**  **Button** to enter the main menu.
2. Short press the **Up**  or **Down**  **Button** to select the video output  menu item.
3. Short press the **Menu**  **Button** to toggle video output on / off. When turned on, the video output  icon appears in the lower-right corner of the screen.
4. Long press the **Menu**  **Button** to return to the home screen.



PIP

Turn the picture in picture window on / off

1. Long press the **Menu**  **Button** to enter the main menu.
2. Short press the **Up**  or **Down**  **Button** to select the PIP  menu item.

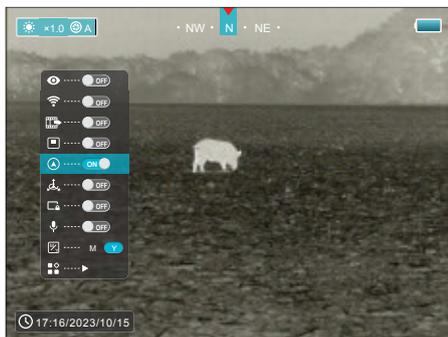


- Short press the **Menu** **M** Button to toggle the PIP window on / off. When turned on, the PIP window appears at the top of the screen and displays a 2x zoomed image.
- Long press the **Menu** **M** Button to return to the home screen.

Digital Compass

Turn the digital compass on / off

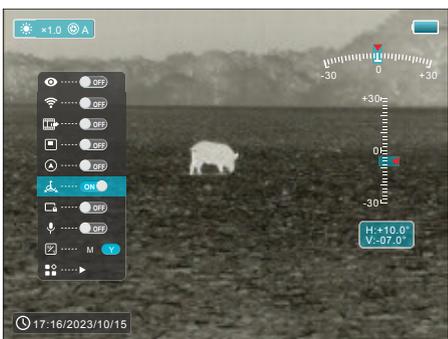
- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the compass  menu item.
- Short press the **Menu** **M** Button to toggle the digital compass on / off. When turned on, the compass appears at the top of the screen.
- Long press the **Menu** **M** Button to return to the home screen.



Gravity Sensor

Turn the gravity sensor on / off

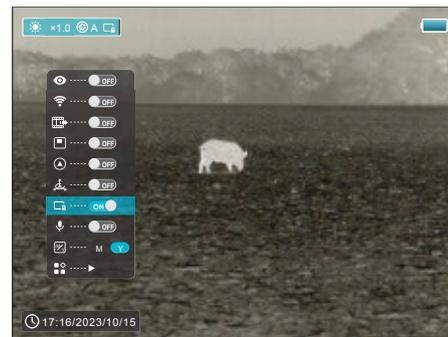
- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the gravity sensor  menu item.
- Short press the **Menu** **M** Button to toggle the gravity sensor on / off. When the gravity sensor is on, the tilt angle (horizontal scale) and the pitch angle (vertical scale) appear on the right side of the screen.
- Long press the **Menu** **M** Button to return to the home screen.



Automatic Display-off

Turn the automatic display-off feature on / off

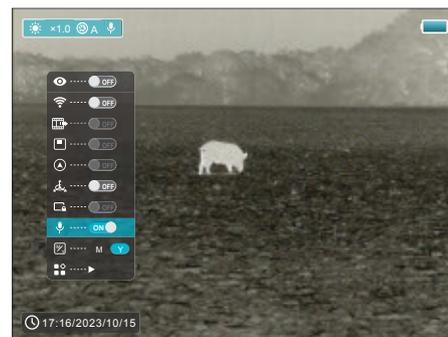
- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the automatic display-off  menu item.
- Short press the **Menu** **M** Button to toggle the automatic display-off feature on / off. When turned on, the automatic display-off  icon appears in the status bar and the display will turn off automatically when the FINDER V2 stops moving and turn back on when it begins moving again.
- Long press the **Menu** **M** Button to return to the home screen.



Microphone

Turn the microphone on / off

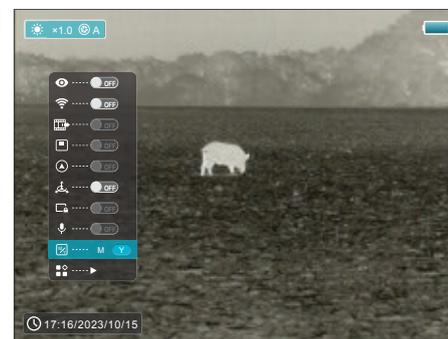
- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the microphone  menu item.
- Short press the **Menu** **M** Button to toggle the microphone on / off. When turned on, the microphone  icon appears in the status bar.
- Long press the **Menu** **M** Button to return to the home screen.



Units of Measure

Set the units to meters or yards

- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the units  menu item.

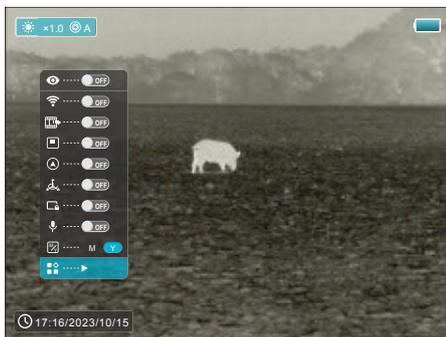


- Short press the **Menu** **M** Button to toggle between the two options: M (meters), and Y (yards).
- Long press the **Menu** **M** Button to return to the home screen.

Next Page

Go to the next page of the main menu

- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the next page  menu item.
- Short press the **Menu** **M** Button to go to the next page of the main menu.



Calibration Mode

Select the non-uniformity correction mode to automatic or manual

- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the calibration mode  menu item.
- Short press the **Menu** **M** Button to toggle between the two options: A (automatic) and M (manual).
- The selected NUC mode, A or M, appears in the status bar.
- Long press the **Menu** **M** Button to return to the home screen.



Image Hue

Set the image hue mode to warm or cool

- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the image hue  menu item.



- Short press the **Menu** **M** Button to toggle between the two options: W (warm) and C (cool).
- Long press the **Menu** **M** Button to return to the home screen.

NOTES:

- Cool mode provides a brighter, higher-contrast image and warm mode provides a softer image and reduces eye strain.
- The red hot, rainbow, and ironbow color palettes do not support image hue.

Pixel Defect Correction

Automatically correct defective pixels

Defective pixels are pixels that do not change correctly compared to the other image pixels—they are either brighter or darker than surrounding pixels. The FINDER V2 has a tool that automatically corrects defective pixels on the sensor using its internal software.

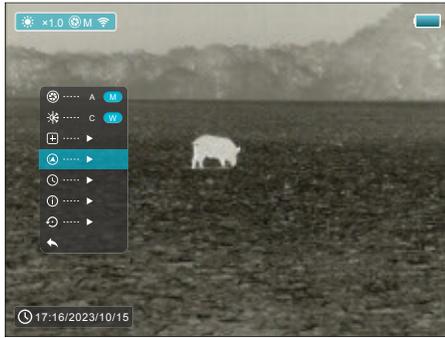
- Long press the **Menu** **M** Button to enter the main menu.
- Short press the **Up**  or **Down**  Button to select the pixel defect correction  menu item.
- Short press the **Menu** **M** Button to open the pixel defect popup window.
- The popup has two options,  and . Select  to automatically correct any defective pixels on the sensor or select  to cancel.  is selected by default.
- Short press the **Menu** **M** Button to select  to confirm the defective pixel correction. The screen will display “Correcting the blind pixels” while the correction is in progress and will display “Correction finished” when complete; **OR**
- Short press the **Down**  Button to select  and short press the **Menu** **M** Button to confirm cancellation of the pixel correction and return to the main menu.



Compass Calibration

Calibrate the digital compass

1. Long press the **Menu**  **Button** to enter the main menu.
2. Short press the **Up**  or **Down**  **Button** to select the compass calibration  menu item.
3. Short press the **Menu**  **Button** to begin the compass calibration.
4. A triaxial coordinate icon prompt will appear on the screen.
5. Follow the prompt to rotate the FINDER V2 at least 360 degrees along each axis, X, Y, and Z. Rotations must be completed within the 20-second calibration time.
6. After 20 seconds, the calibration is finished and the FINDER V2 will automatically exit to the home screen.



Date and Time

Set the date and time

1. Long press the **Menu**  **Button** to enter the main menu.
2. Short press the **Up**  or **Down**  **Button** to select the date and time  menu item.
3. Short press the **Menu**  **Button** to open the date and time popup window.



4. The date and time are displayed in YYYY.MM.DD | HH:MM format (year, month, day, hour, minute). Blue arrows will appear above and below the year digit.
5. Short press the **Up**  or **Down**  **Button** to select the correct value for each digit of the date and time.
6. Short press the **Menu**  **Button** to switch between digits. The two blue arrows move to indicate the selected digit.
7. Long press the **Menu**  **Button** to save and return to the home screen.



Info

Show device information

1. Long press the **Menu**  **Button** to enter the main menu.
2. Short press the **Up**  or **Down**  **Button** to select the info  menu item.
3. Short press the **Menu**  **Button** to open the device info popup window.
4. The window will display the following information about the FINDER V2: the model, the GUI, SYS, BOOT, FPGA, and HW versions, and the part and serial numbers.
5. Long press the **Menu**  **Button** to return to the home screen.



Factory Reset

Restore factory default settings

1. Long press the **Menu  Button** to enter the main menu.
2. Short press the **Up  or Down  Button** to select the factory reset  menu item.
3. Short press the **Menu  Button** to open the factory reset popup window.
4. The popup has two options,  and . Select  to restore factory settings or  to cancel.  is selected by default.
5. Short press the **Menu  Button** to select  to confirm cancellation and return to the menu; **OR**
6. Short press the **Up  Button** to move to  and short press the **Menu  Button** to confirm the factory reset. The factory settings will be restored and the FINDER V2 will reboot automatically.



NOTES:

- There is a pause of about 20 seconds before the factory restart begins. Do not press any buttons during this time.
- A factory reset cannot be undone.
- Restoring factory settings will reformat the internal memory, so please save any files to alternate media.
- Corrected defective pixels may be cleared and need to be re-corrected.
- The settings listed below will be reset to the factory defaults:
 - Color Palette: White Hot
 - Image Brightness: 2
 - Image Contrast: 2
 - Digital Zoom: x1
 - Ultra-clear mode: Off
 - Wi-Fi: On
 - Video Output: Off
 - PIP: Off
 - Digital Compass: Off
 - Gravity Sensor: Off
 - Automatic Display-Off: Off
 - Microphone: Off
 - Units of Measure: Meters
 - Calibration Mode: Auto
 - Image Hue: W
 - Wi-Fi SSID: FINDER_XXXXX-XXXXXXXXX
 - Wi-Fi Password: 12345678

Previous Page

Return to the previous page of the menu

1. Long press the **Menu  Button** to enter the main menu.
2. Short press the **Up  or Down  Button** to select the previous page  menu item.
3. Short press the **Menu  Button** to return to the previous page main menu.



23. BASIC INSPECTION

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

- The appearance of the FINDER V2: there should be no cracks in the body or visible damage.
- The condition of the objective lens and eyepiece: there should be no cracks, greasy spots, dirt, or other deposits on the lens.
- The rechargeable battery pack should be fully charged.
- The control buttons should be in working order.

24. BASIC MAINTENANCE

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

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

- Wipe the surface of the external metal and plastic components with a clean, dry cotton cloth. Do not use chemical, corrosive, or abrasive cleaners. Canned air may also be used to clean the external components.
- Clean the electric contacts and battery slots on the FINDER V2 using a non-greasy organic solvent.
- Check the lens and eyepiece. If necessary, remove any dirt or sand from the optics; a non-contact cleaning method is preferred.
- Cleaning the exterior of the lens should only be done with the included microfiber lens cloth or a similar product. Only clean the lens when it is visibly soiled. Frequent wiping or cleaning can degrade the anti-reflective lens coating.

25. WARRANTY

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

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

Our warranty follows the product and is not tied to the original owner. The warranty period is tied to the date of sale to the dealer. This warranty only covers normal use and does not cover cosmetic damage, normal wear, intentional damage, theft, loss, any act of God, or a condition caused by use other than intended. Any product that is modified, opened, or tampered with will void any warranty coverage. Any serial number damage or alteration on the product will be considered a modification. Be sure to register your FINDER V2 at irayusa.com/register.

To return a product for repair:

1. Go to irayusa.com/warranty and click the **Request an RMA button** to request an RMA number. Returns will not be accepted without an RMA.
2. The customer is responsible for shipping the product to iRayUSA, per the instructions included in the RMA. iRayUSA will return the product at no cost.

WARRANTY NOTES:

- The one-week timeline starts from the time of receipt of the product at iRayUSA.
- iRayUSA is not liable for any damages or loss incurred when shipping to iRayUSA.
- This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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

26. FCC STATEMENT

FCC ID: 2AYGT-26-00

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by iRayUSA could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

27. GENERAL TROUBLESHOOTING

The troubleshooting table on the next page lists issues that may occur when operating the FINDER V2. Carry out the recommended troubleshooting steps in the order shown in the table. Please contact iRayUSA at 800-769-7125 or irayusa.com/support or an authorized vendor for assistance before attempting to perform any modifications or repairs beyond the scope of the troubleshooting procedures in this manual. Unauthorized repairs or modifications will void your warranty.

ISSUE	POSSIBLE CAUSES
The FINDER V2 will not turn on.	The battery pack is very low or has completely discharged.
The FINDER V2 can not connect to a computer or external power supply.	External power supply has completely discharged.
	Computer is turned off.
	Data cable is damaged.
Video output is not working.	Video output is not turned on
The FINDER V2 can not connect to the mobile device (smartphone or tablet).	Wi-Fi is not turned on.
	Wrong Wi-Fi password entered.
	Too many Wi-Fi signals near the FINDER V2.
Wi-Fi signal is lost or interrupted.	Smartphone or tablet is out of range of a strong Wi-Fi signal, or there are obstacles between the FINDER V2 and the mobile device.
The image is fuzzy, not clear, not balanced, with artifacts.	Non-uniformity correction is required.
The image is too dark.	Display brightness level is too low.
The GUI is clear, but the image is fuzzy.	The lens is not focused.
	There is dust on the interior or exterior optical surfaces of the lens.
	There is condensation on the interior or exterior optical surface of the lens.
The image of the object being observed is missing.	Looking through glass.
The FINDER V2 will not focus.	Image settings are not optimal for the current environmental conditions or the object being observed.
Image quality is too low or the detection range is reduced.	These issues may occur due to the weather conditions, such as snow, rain, humidity, and fog.
When the FINDER V2 is used in low-temperature conditions, the image quality of the surroundings is worse than in warm-temperature conditions.	Environmental conditions.

TROUBLESHOOTING STEPS
Charge the battery pack.
Check the external power supply and charge it if necessary.
Power on the computer.
Replace the USB-C data cable.
Turn on video output in the main menu. See Main Menu > Video Output on page 25.
Turn on the Wi-Fi in the main menu. See Main Menu > Wi-Fi on page 25.
On the mobile device, go to Settings > Wi-Fi and enter the correct password. The default password is 12345678. See Main Menu > Wi-Fi on page 25.
Move the FINDER V2 and mobile device to an area with no or fewer Wi-Fi signals.
<ul style="list-style-type: none"> Try again when Wi-Fi signal is stable. Relocate the FINDER V2 closer to the Wi-Fi signal.
Perform a non-uniformity correction. See Non-uniformity Correction on page 17 and Main Menu > Calibration Mode on page 28.
Adjust the display brightness in the quick menu. See Using the Quick Menu on page 16.
<ul style="list-style-type: none"> Adjust the focus on the target by rotating the Objective Focus Ring (2). Adjust the image contrast in the quick menu. See Using the Quick Menu on page 16.
<ul style="list-style-type: none"> Wipe the outside optical surfaces with the included microfiber lens cloth.
<ul style="list-style-type: none"> Wipe the external optical surface with the included microfiber lens cloth. Allow the FINDER V2 to dry by leaving it in a warm, dry environment for at least 4 hours.
Remove any glass windows from the field of view.
<ul style="list-style-type: none"> Check the external surface of the objective lens and eyepiece and, where necessary, wipe away any dust, condensation, frost, etc. In cold weather, you can use special anti-fogging coatings, such as those made for corrective glasses. Adjust the focus on the target by rotating the Objective Focus Ring (2). Adjust the image contrast in the quick menu. See Using the Quick Menu on page 16. Adjust the image and device settings. See Quick Start Guide on page 8. Turn on Ultra-clear mode. See Main Menu > Ultra-clear on page 24.
Turn on Ultra-clear mode. See Main Menu > Ultra-clear on page 24.
In warm-temperature conditions, objects being observed (surroundings and background) heat up differently because of thermal conductivity, thereby generating a high-temperature contrast. Accordingly, image quality produced by the imager will be higher. In low-temperature conditions, the background will cool down to roughly the same temperature, and thus the temperature contrast is substantially reduced and image detail can go down as there is less contrast in the scene. This is a normal function of a thermal imager and is no indicator of actual detector performance.



2601 State Hwy 121,
Building 3, Suite 306
Lewisville, TX 75056
800-769-7125
682-499-0047
info@irayusa.com