

User's Manual

I N F I R A Y O U T D O O R

HYBRID COMPACT

MULTI-FUNCTION THERMAL IMAGING SCOPE



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.



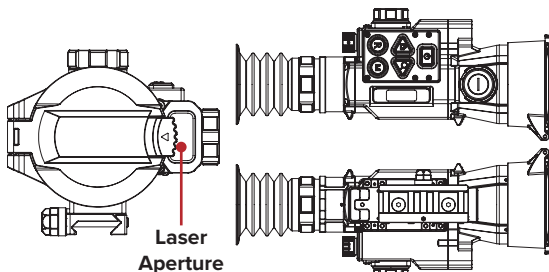
CAUTION

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 1 laser product.

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 1 during all procedures of operation.

Wavelength: 905nm

Laser Power for Classification: 142.7nJ

Emission Type: Pulsed, Invisible

Emission Frequency 25 kHz

Beam Diameter: 11mm*8 mm

Divergence: 1mRad*6 mRad

**INVISIBLE LASER RADIATION
AVOID DIRECT EYE EXPOSURE
CLASS 1 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 of this product. This product is not a toy; keep out of reach of children.

1. OVERVIEW

The HYBRID COMPACT (HCH50R) is the next evolution of the HYBRID series, combining advanced thermal performance with versatile functionality. It features a 50mm F/0.9 lens and the industry's first available 10 μm thermal sensor, extending the detection range, delivering larger and clearer targets, and revealing finer details. The 640×480 self-produced sensor with a ≤ 15 mK NETD rating delivers exceptional thermal sensitivity and clarity. The Hybrid Compact functions as a weapon sight, thermal clip-on, or handheld monocular. Its 3.5× native magnification and 60mm eye relief provide a comfortable, immersive view. The "Fast Engine" low-latency architecture (15ms) and 60Hz refresh rate ensure a smooth, life-like image, improving target tracking and accuracy. A 1440×1080 AMOLED display provides a crisp image, while the integrated laser rangefinder and ballistic calculator adjust for drop based on target distance. Built-in photo and video recording with 64GB of internal storage lets you capture every detail.

2. FEATURES

- 10 μm high-performance thermal detector
- ≤ 15 mK sensitivity
- Magnesium housing
- Maximum detection range 3408 yards
- HD 1440×1080 AMOLED display
- High frame frequency: 60Hz or 30Hz
- Integrated 1,200yd laser rangefinder
- Multiple reticle types and color options
- Onboard ballistic solver
- Recoil activated video
- Standalone, handheld, and clip-on optic modes
- Multiple zero profiles and ranges
- Digital Zoom: $\times 1/\times 2/\times 4/\times 8$
- Built-in 64 GB storage to support image capture and video recording
- Built-in Wi-Fi module
- Mobile device App compatible
- Built-in digital compass and gravity sensor
- Picture in Picture (PIP)
- Pixel calibration functions

3. TECH SPECS

HYBRID COMPACT		HCH50R
SENSOR		
Resolution		640×480
Pixel Size		10 μm
Frame Rate		30hz / 60hz
Sensor Sensitivity		≤15 mK
Image Processing		MATRIX III
Core		Micro II 640
OPTICS		
Objective Lens		50 mm f/0.9
Magnification		3.5×
Digital Zoom		8×
Field of View		7.3° × 5.5°
Detection Range		3408 Yards
Display Type		0.71-inch Large-format AMOLED
Display Resolution		1440×1080
Color Palettes		White Hot, Black Hot, Red Hot, Iron Red, Violet, Crimson, Viridian, Rainbow
Reticle Types		8 (7 Static, 1 DIY)
Reticle Colors		Black, White, Red, Green, Blue
Mounting System		Picatinny MIL-STD 1913 Rail
Working Modes		Standalone, Handheld, Clip-on
P.I.P.		Yes
Rangefinder		Integrated 1,200yd LRF
Eye Relief		60 mm
Dioptr Range		-5 to +2
ELECTRONICS		
Onboard Recording		Video, Recoil-Activated Video, and Image
Onboard Storage		64 GB
Wireless Connectivity		Image and Video via App.
Data/Power Connector		USB-C
Power Supply		USB-C External, 18650 Batteries x2 (7+ Hours Each)
Start Up Time		<10 Seconds, Instant from Standby
PHYSICAL		
Size		9.87" × 4.05" × 3.07"
Weight		25.56 Oz
ENVIRONMENTAL/WARRANTY		
Warranty		5 Years
Housing Color		Cerakote TAN H-235
Housing Material		Magnesium
Ingress Protection		IP67
Operation Temperature		-4°F~122°F
Max. Recoil		1000 g/s ² (300 Win./7mm Mag)

4. ACCESSORIES

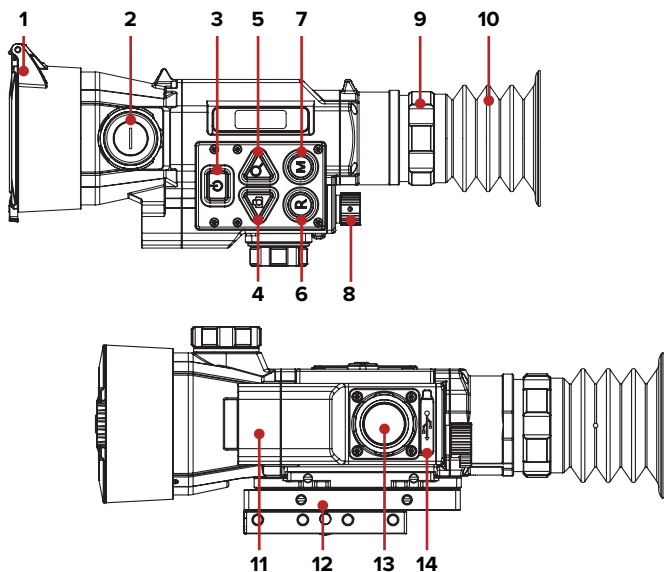
The HYBRID COMPACT rifle scope ships with everything you need to get out and hunt.

- 50mm Objective Lens Cap
- Standard Rubber Eyeguard
- DLOC QD Mount for HYBRID COMPACT
- Adapter Bracket
- Screws for the Mount and Adapter
- Hex Keys and Spanner Tool
- Bluetooth Remote Control
- USB-C Cable
- 18650 Battery ×2
- USB-C Power Adapter
- Hard Case
- Lens Cloth
- User Manual



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

5. COMPONENTS AND CONTROLS



- 1 Objective Lens Cap
- 2 Objective Lens Focus Knob
- 3 Power Button
- 4 Left / Photo Button
- 5 Right / Zoom Button
- 6 Rangefinder Button
- 7 Menu Button
- 8 Multi-Function Switch
- 9 Eyepiece / Diopter Adjustment Ring
- 10 Eyeguard
- 11 Laser Rangefinder
- 12 DLOC QD Mount for HYBRID COMPACT
- 13 Battery Cover
- 14 USB-C Cover / USB-C Port

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	Perform a non-uniformity correction (NUC)	Power off the device / enter standby mode
Main menu	Return to previous	---
In standby mode	Exit standby	---
Reticle zeroing interface	When X or Y is selected, returns to the last saved position. When no axis is selected, exits the interface.	---

Photo / Left Button 		
Current Screen / Menu	Short Press	Long Press
Home screen	Take a photo	Start / stop recording video
Quick menu / main menu	Move the cursor left	---
Reticle zeroing & pixel defect interface	Move the cursor 1 pixel in the negative direction	Move the cursor 10 pixels in the negative direction

Zoom / Right Button 		
Current Screen / Menu	Short Press	Long Press
Home screen	Adjust the digital zoom	Turn the PIP window on / off
Main menu / quick menu	Move the cursor right	---
Reticle zeroing & pixel defect interface	Move the cursor 1 pixel in the positive direction	Move the cursor 10 pixels in the positive direction

Menu Button (M)		
Current Screen / Menu	Short Press	Long Press
Home screen	Enter the quick menu	Enter the main menu
Main menu / quick menu	Enter the submenu; confirm main menu and submenu changes and return to previous	---
Reticle zeroing interface	Select / deselect (and save) the axis of movement (X or Y)	---

Left Button  + Rangefinder Button (R)		
Current Screen / Menu	Short Press	Long Press
Home screen in clip-on mode	---	Enter the clip-on mode screen adjustment interface

Multi-Function Switch*		
Current Screen / Menu	Rotate 30 Degrees	Rotate 60° Clockwise
Home screen	Enable/disable ballistic solver (clockwise to enable; counterclockwise to disable)	Enable/disable clip-on mode (clockwise to enable; counterclockwise to disable)

Left Button  + Right Button 		
Current Screen / Menu	Short Press	Long Press
Reticle zeroing interface	---	Freeze image to keep reticle centered on aiming point; press again to clear

* In Clip-on mode, rotate the multi-function switch 30 degrees counterclockwise to enable the ballistic solver.

7. QUICK START GUIDE

Step 1: Prepare to Use the HYBRID COMPACT

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 18650 battery (15). See **Charging the Battery** on page 10.

Step 2: Turn On the HYBRID COMPACT

1. Open the objective lens cap (1).
2. Long press the **Power**  **Button** for 3 seconds to power on the HYBRID COMPACT. The InfiRay Outdoor logo will appear.
3. Rotate the diopter adjustment ring (9) 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 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 17):

1. Set the polarity (color palette) to white hot, black hot, red hot, iron red, violet, crimson, viridian, rainbow.
2. Set the image brightness level, from 1–10.
3. Set the contrast level, from 1–10.
4. Set sharpness level, from 1–10.
5. Set the non-uniformity correction (NUC) mode to automatic (A), manual (M), or background (B).
6. Select the reticle type, 1–7, or the custom reticle in the App.
7. Set the reticle color to white, black, red, green, or blue.
8. Select a zero distance from the three preset options.
9. Set the frame rate to 60 Hz or 30 Hz.

Step 4: Adjust Device Settings in the Main Menu

1. Long press the **Menu**  **Button** to enter the main menu (see **Main Menu Options and Descriptions** on page 30 for detailed instructions) to:
 - a. Set the screen brightness level, from 1–10.
 - b. Turn on the digital compass.
 - c. Turn on the microphone.
 - d. Set the photo settings to single shot, burst, or self-timer.
 - e. Turn on recoil activated video.
 - f. Turn on the ballistics solver.
2. In the Settings menu to:
 - a. Set the date and time.
 - b. Calibrate the compass.
 - c. Set the color temperature to cool or warm.
 - d. Set the units of measurement to meters or yards.
3. From the home screen:
 - a. Short press the **Zoom**  **Button** to zoom in and out on the observed object.
 - b. Long press the **Zoom**  **Button** to turn on the PIP window.
 - c. Long press the **Power**  **Button** to perform a non-uniformity correction (NUC).

Step 6: Zero the HYBRID COMPACT

1. Zero the rifle scope. See **Zeroing the HYBRID COMPACT** on page 20.
 - a. Select the zeroing profile, A, B, or C.
 - b. Select the bullet type, 1, 2, or 3.
 - c. Select, or customize, a preset zero distance that matches the target distance.
 - d. Zero the reticle.

8. CHARGING THE BATTERY

The HYBRID COMPACT rifle scope comes with two long-lasting rechargeable lithium-ion 18650 batteries, which allow for 7+ hours of operation. Fully charge the battery before using the HYBRID COMPACT for the first time.

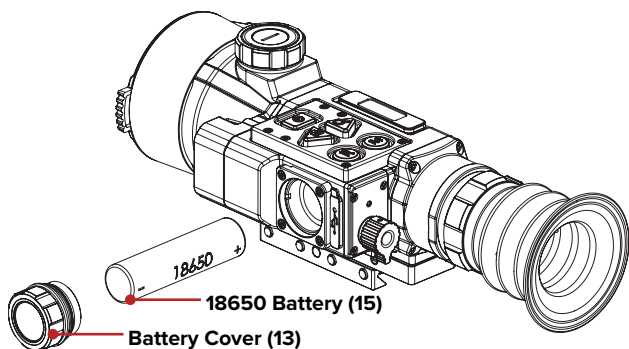
Charging the 18650 Battery

1. Install the 18650 battery **(15)** in the battery charger **(16)** per the polarity markings in the charger.
2. Connect the USB-C cable to 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; **OR**
 - c. An external power supply, such as a USB power bank.
4. When charging, the battery status is shown on the charger's display screen. The screen will show FULL when the battery is fully charged. When fully charged, disconnect the charging cable. Do not overcharge.

NOTES: The battery status  icon turns red when the battery is below 20%; charge right away to avoid over-discharge and a reduction in battery capacity or service life.

9. INSTALLING THE BATTERY

1. Remove the battery cover **(13)** by turning it counterclockwise.
2. Insert a 18650 battery **(15)** into the battery compartment. The positive **[+]** battery terminal faces in and the negative **[-]** terminal faces out.
3. Replace the battery cover.



WARNING: The HYBRID COMPACT can only be powered by a factory-supplied 18650 battery. Using any other battery may cause irreparable damage to the rifle scope or cause a fire. Any damage from using an improper battery will not be covered by warranty.

10. REMOVING THE BATTERY

To remove the battery from the HYBRID COMPACT:

1. Remove the battery cover (13) by turning it counterclockwise.
2. Remove the battery and replace the battery cover.

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 HYBRID COMPACT supports the use of a 5V external power supply, such as a mobile power bank. To connect to an external power supply:

1. Open the USB-C cover on the side of the HYBRID COMPACT.
2. Connect the USB-C cable to the USB-C port (14).
3. Connect the other end of the data cable to the external power supply.
4. The HYBRID COMPACT will switch to operation from the external power supply.
5. If the external power supply is disconnected, the HYBRID COMPACT will automatically switch to the battery, if installed, without powering off.

NOTE: Do not connect the HYBRID COMPACT 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 HYBRID COMPACT is operated via five control buttons. The control buttons can be used to perform shortcut operations from the home screen, as well as in the menu and full-screen interfaces. See **Description of Control Buttons and Shortcuts** on page 6 for shortcut button details.

Powering On

1. Open the objective lens cap **(1)**.
2. Long press the **Power**  **Button** for 3 seconds to turn on the rifle scope. The InfiRay Outdoor logo will appear.
3. To determine the current battery charge, check the battery status  icon in the top status bar.

Powering Off and Entering Standby Mode

To power off the HYBRID COMPACT:

1. Long press the **Power**  **Button**. The shutdown screen will open, showing a 3-second countdown.
2. Continue holding the **Power**  **Button** until the 3-second countdown completes.
3. "Data saving..." appears on the screen and the HYBRID COMPACT will shut down automatically after saving.

NOTE: Releasing the **Power**  **Button** at any time before the countdown reaches zero will stop the shutdown process and the rifle scope will enter standby mode. Short press the **Power**  **Button** to exit standby mode.

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

STANDBY MODE

Standby mode may be activated to conserve battery life.

Manually Enter Standby Mode

The user may enter standby mode manually at any time.

1. To enter standby from the home screen:
 - a. Long press the **Power**  **Button** to bring up the shutdown screen.
 - b. Release the **Power**  **Button** during the 3-second shutdown countdown to manually enter standby mode.
2. Short press the **Power**  **Button** to exit standby.

Set the HYBRID COMPACT to Enter Standby Mode Automatically

The rifle scope may be set to automatically enter standby mode.

1. In the main menu, select the standby  time, 5, 10, 20, 30, or 60 minutes. Once set, the HYBRID COMPACT will automatically enter standby according to the specified length of inactivity.
2. Short press the **Power**  **Button** to exit standby.

NOTES:

- When **off** is selected, standby mode is turned off and the rifle scope will operate until the battery runs out.
- See **Main Menu > Standby** on page 33 for instructions.

Adjusting the Focus

ADJUSTING THE DIOPTER/EYEPIECE

1. Rotate the eyepiece diopter adjustment ring **(9)** at the rear of the rifle scope right or left until the user interface is clear.
2. Look closely to ensure all screen symbols, the status bar, and the reticle appear sharp and in focus. No additional diopter adjustments are required unless the user wishes to make changes.

NOTES:

- After the initial adjustment, there is no need to rotate the eyepiece adjustment ring **(9)** for long distances or other conditions.
- If necessary during standard use, the objective lens focus knob **(2)** may be rotated to adjust fine focus on the target object being observed. See **Focusing the Objective Lens** below.

FOCUSING THE OBJECTIVE LENS

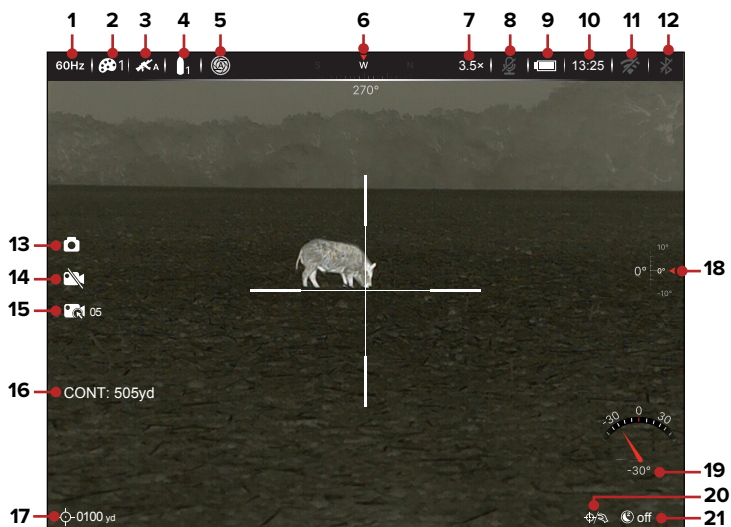
To adjust the focus on the target object:

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

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

Status Bar Overview

The status bars at the top, sides, and bottom of the screen show information on the operating status of the HYBRID COMPACT.



- 1 **Frame Rate:** Shows the set frame rate, 60Hz or 30Hz.
- 2 **Color Palette:** Shows the set color palette, 1: white hot, 2: black hot, 3: red hot, 4: iron red, 5: violet, 6: crimson, 7: viridian, 8: rainbow.
- 3 **Zeroing Profile:** Shows the set zeroing profile, A, B, or C.
- 4 **Bullet Type:** Shows the set bullet type, 1, 2, or 3.

- 5 **Non-Uniformity Correction (NUC) Mode:** Shows the icon for the selected non-uniformity correction (NUC) mode, automatic , manual , or background . Automatic is selected by default. A countdown will appear when 5 seconds remain until an automatic NUC.
- 6 **Compass:** Displays at the top of the screen when turned on.
- 7 **Digital Zoom:** Shows the real-time amplification, 3.5×, 7.5×, 15×, or 30×.
- 8 **Microphone:** Shows the microphone status, on  or off .
- 9 **Battery:** Shows the current battery status. The battery status icon turns red when the battery is below 20%. When connected to an external power source, the battery status  icon will alternate with the battery charging  icon.
- 10 **Time:** Shows the current time in 24-hour format.
- 11 **Wi-Fi:** Shows the Wi-Fi status, on  or off .
- 12 **Bluetooth:** Shows the Bluetooth status, on  or off .
- 13 **Camera Icon:** Briefly appears when taking a photo.
- 14 **Video Recording Status:** Shows the video recording status, on  or unavailable . Video recording is unavailable when recoil activated video is on.
- 15 **Recoil Activated Video Status:** Shows the recoil activated video status, on  or off/unavailable . Recoil activated video is off by default. Recoil activated video is unavailable when a video recording is in progress.
- 16 **Rangefinding Status:** Shows the selected rangefinding mode, CONT or SGL and the target distance when the rangefinder is enabled.
- 17 **Zero Distance:** Shows the selected zero distance.
- 18 **Pitch Angle:** The pitch angle displays when the compass is turned on.
- 19 **Tilt Angle:** The tilt angle displays when the compass is turned on.
- 20 **Mode:** Shows the  icon when in standalone/handheld mode.
- 21 **Standby Status:** Shows the standby  status, off, 5min, 10min, 20min, 30min, or 60min.

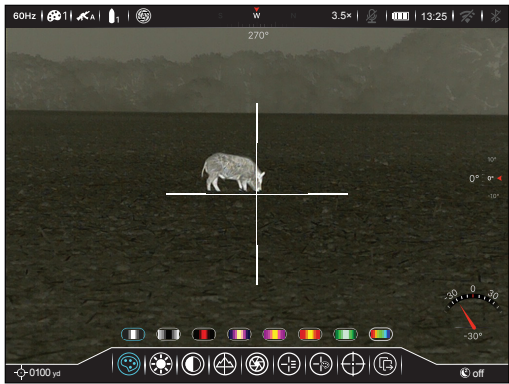
BATTERY STATUS

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

COLOR / ICON	BATTERY STATUS
White Battery 	21% – 100%
Red Battery 	<20%; charge the battery pack right away.
External Power 	An external power supply or computer is connected via the data cable.

Using the Quick Menu

In the quick menu, polarity, image brightness, contrast, and sharpness, NUC mode, reticle type and color, zero distance, and frame rate may be quickly adjusted.

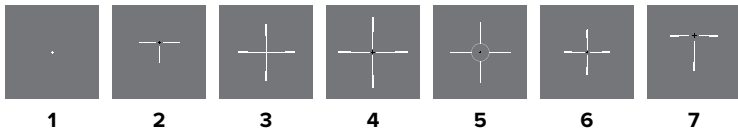


In the quick menu:

- Menu icons turn blue to indicate the current cursor position in the top-level menu and all submenus.
- On the home screen, short press the **Menu**  **Button** to enter the quick menu.
- Press the **Left / Photo**  **Button** or **Right / Zoom**  to move left and right through the menu options.
- Short press the **Menu**  **Button** to confirm any changes and return to previous.

- Upon exiting the main menu, the cursor location is stored for a single working session (until the HYBRID COMPACT is turned off). After restarting the HYBRID COMPACT and entering the menu, the cursor position will be at the first menu item.
- The quick menu options are:
 -  **Polarity:** Choose from white hot, black hot, red hot, iron hot, violet, crimson, viridian, rainbow.
 -  **Image Brightness:** Choose from levels 1–10.
 -  **Image Contrast:** Choose from levels 1–10.
 -  **Image Sharpness:** Choose from levels 1–10.
 -  **Calibration:** Set the non-uniformity correction (NUC) mode to automatic (A), manual (M), or background (B).
 -  **Reticle Type:** Choose from reticle type 1–7 (see **Reticle Types** below), or the custom reticle in the App.
 -  **Reticle Color:** Choose from white, black, red, green, or blue.
 -  **Zeroing Distance:** Select a zero distance within the currently selected zeroing profile. Only the zero distances in the selected profile will be available for selection. The selected zero distance appears in the lower-left corner of the screen.
 -  **Frame Rate:** Set the frame rate to 30Hz or 60Hz. Choose 60Hz for smoother motion with no image lag or 30Hz for longer battery life.

Reticle Types



CLIP-ON MODE QUICK MENU

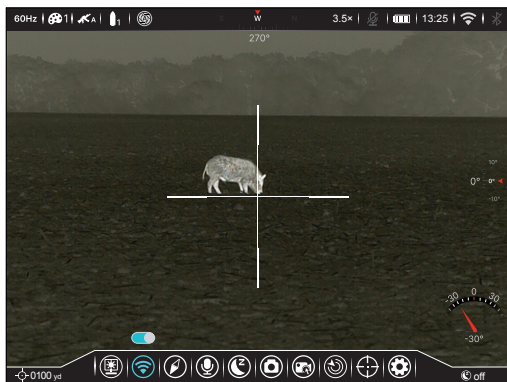
Clip-on mode has abbreviated menu options. The clip-on quick menu combines elements from the standard quick menu and the main menu. Navigation of the clip-on mode quick menu is the same as described in the previous section; only the menu options are different:

-  **Polarity:** Choose from white hot, black hot, red hot, iron hot, violet, crimson, viridian, rainbow.
-  **Screen Brightness:** Choose from levels 1–10.
-  **Image Brightness:** Choose from levels 1–10.
-  **Image Contrast:** Choose from levels 1–10.
-  **Image Sharpness:** Choose from levels 1–10.

- **Calibration:** Set the non-uniformity correction (NUC) mode to automatic (A), manual (M), or background (B).
- **Frame Rate:** Set the frame rate to 30Hz or 60Hz. Choose 60Hz for smoother motion with no image lag or 30Hz for longer battery life and clearer image.
- **Ballistic Solver:** Turn the ballistic solver on and off; and adjust ballistic solver settings.

Navigating the Main Menu

From the home screen, long press the **Menu**  **Button** to enter the main menu.



In all menu interfaces:

- Menu icons turn blue to indicate the current cursor position in the top-level menu and all submenus.
- Short press the **Left / Photo**  **Button** or **Right / Zoom**  **Button** to move up and down through the menu options.
- Short press the **Menu**  **Button** to:
 - Change the parameters for the selected menu option; **OR**
 - Enter the submenu; **OR**
 - Confirm submenu changes and return to the previous menu.
- Short press the **Menu**  **Button** to confirm any changes and return to the home screen.
- Upon exiting the main menu, the cursor location is stored for a single working session (until the HYBRID COMPACT is turned off). After restarting the HYBRID COMPACT and entering the menu, the cursor position will be at the first menu item.

14. ZEROING THE HYBRID COMPACT

HYBRID COMPACT features a “freeze” zeroing method.

To zero the HYBRID COMPACT:

1. Set a suitable target at the desired zero distance.
2. Confirm that the rifle is empty, safe, and pointed in a safe direction, with no ammunition near the weapon.
3. Adjust the image and device settings following the steps in the **Quick Start Guide** on page 8, if you have not done so already.
4. Select the zeroing profile type, A, B, or C. See **Zeroing Menu > Zeroing Profile** on page 38.
5. Select the bullet type, 1, 2, or 3. See **Zeroing Profile > Bullet Type** on page 39.
6. Based on the distance to the target you wish to zero, select a preset zero distance OR customize one of the preset zero distances to match. The HYBRID COMPACT supports custom zeroing distances of 1 to 999 meters or 1 to 999 yards. See **Zeroing Menu > Zero Distance** on page 39.
7. Ensure a stable platform and natural shooting position is achieved behind the rifle.
8. Load ammunition, aim, and take one good shot at the target.
9. Make your rifle safe and observe the location of impact on the target.
10. If the point of impact does not match the point of aim (the center of the reticle), adjust the X/Y position of the reticle. See **Zeroing Menu > Reticle Zeroing** on page 40.
11. In the submenu for the selected zero distance, center the reticle on the aiming point and long press the **Left**  and **Right**  Buttons at the same time to freeze the image. The image freeze ❄ icon will appear below the X/Y coordinates.
12. Short press the **Left**  or **Right**  Button to move between X and Y. Blue text indicates the cursor location.
13. Short press the **Menu**  Button to select the axis (X or Y) along which to move the reticle. A blue arrow appears to the left of the selected axis.
14. Adjust the X/Y position of the reticle until the reticle matches the point of impact.
 - a. Press the **Right**  Button to move in the positive direction: X= Right and Y= Up.
 - b. Press the **Left**  Button to move in the negative direction: X= Left and Y= Down.

- c. Upon moving the reticle, a red dot appears onscreen, indicating the original reticle position for the selected axis.
15. Short press the **Menu**  **Button** to save and deselect the axis.
16. Repeat steps 12–15 above to move the cursor along the second axis.
17. With neither axis selected, short press the **Power**  **Button** to return to the previous menu.
18. Take a confirmation shot—the point of impact should now match the point of aim. If not, adjust the X/Y position of the reticle again.

For detailed Zeroing instructions, please see **Zeroing Menu > Reticle Zeroing** on page 40.

15. NON-UNIFORMITY CORRECTION

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

The HYBRID COMPACT has three NUC modes, automatic , manual , and background . The selected NUC mode appears on the left side of the status bar. For instructions on setting the NUC mode in the quick menu, see **Using the Quick Menu** on page 17.

Automatic Mode

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

A countdown timer will appear in the status bar when 5 seconds remain until an automatic NUC is performed. Pressing the **Power**  **Button** during the 5-second countdown will interrupt a pending NUC for approximately 2 minutes. The timer will appear only after the microbolometer temperature has stabilized—after approximately 10 minutes of continuous operation of the HYBRID COMPACT.

NOTE: A manual NUC (see next page) may be performed at any time while in Automatic (**A**) mode.

Manual Mode

In manual mode (**M**), the user independently determines the need to perform a NUC based on the quality of the observed image. It is not necessary to close the objective lens cap (**1**) during a manual NUC, as the internal shutter covers the sensor.

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

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

Background Mode

In background mode (**B**), the user independently determines the need to perform a background NUC based on the quality of the observed image. A background NUC uses less power than an automatic or manual NUC because it does not use the internal shutter to cover the sensor; instead, the user must close the lens cap.

To perform a background NUC while in background mode:

1. Close the objective lens cap (**1**).
2. From the home screen, short press the **Power**  **Button**.
3. A prompt to close the lens cap appears on the screen and the background NUC will be performed.

NOTES:

- 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.

16. PHOTOGRAPHY AND VIDEO RECORDING

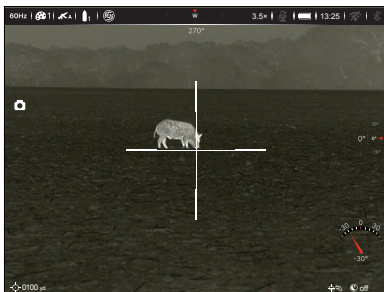
The HYBRID COMPACT is equipped with video recording and image capture. All videos and photos are automatically saved to the built-in 64 GB memory storage.

NOTE: Photo and video files are named with the time and date; therefore, it is recommended to set the date and time before using the photo and video functions. See **Settings Menu > Date and Time** on page 44. Alternatively, the date and time may be synchronized in the InfiRay Outdoor 2 App.

Photography

To take a photo:

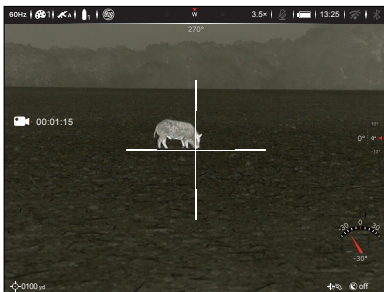
1. From the home screen, short press the **Photo  Button**.
2. The camera  icon will appear on the left side of the screen to indicate a photo was taken.



Video Recording

To record video:

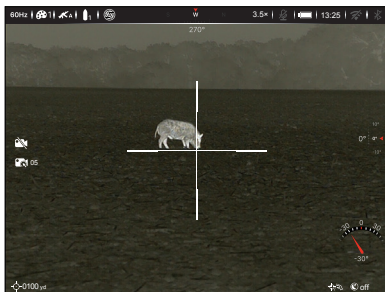
1. Turn on the microphone in the main menu if desired. See **Main Menu > Microphone** on page 32.
2. From the home screen, long press the **Photo  Button** to start a video recording.
3. When the video recording starts, the video  icon and the recording timer, in HH:MM:SS (hour, minute, second) format, appear on the left side of the screen.
4. When recording, short press the **Photo  Button** to take a photo.
5. Long press the **Photo  Button** to stop and save the video recording.



NOTE: When recording video and recoil activated video are unavailable.

Recoil Activated Video Recording

When recoil activated video is turned on in the main menu, a video is automatically recorded when a shot is taken. The HYBRID COMPACT will record 20 seconds before the shot and 20 seconds after the shot. The recoil activated video  icon and a timer will appear on the left side of the screen. See **Main Menu > Recoil Activated Video** on page 34 for instructions.



NOTES:

- When multiple shots are taken within the same 20-second period, only one video will be taken.
- The video off icon will appear on the left side of the screen to indicate that video recording is unavailable when RAV is on.

Video and Photography Notes

- You may enter and navigate the menu as normal during video recording. The user interface (the status bar, icons, and menu) is not captured in recorded video or photo files.
Recorded photos and videos are saved to the memory card.
 - Photos are saved as IMG_YYYYMMDDhhmmss_XX.jpg.
 - Videos are saved as VID_YYYYMMDDhhmmss_XX.mp4.
 - YYYYMMDDhhmmss is year, month, day, hour, minute, second.
 - XX is a 2-digit counter number. The counter number cannot be reset. If a file is deleted from the internal memory, its counter number is not taken by another file.
- The maximum duration of a recorded video file is 20 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. The internal memory can store up to 1,800 photos, 600 videos, and 370 recoil activated videos.
- Regularly check the available memory storage space and transfer video footage and images to other storage media to free up memory space, as needed. The oldest photos or videos are automatically replaced when memory storage reaches capacity.

17. ACCESSING THE INTERNAL MEMORY

When the HYBRID COMPACT 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 HYBRID COMPACT.
2. Connect the USB-C cable to the USB-C port (14).
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 **Hybrid_Compact** to access the built-in memory. Recorded photos and videos are separated into subfolders by date.
6. Select the desired files or folders to copy or delete.

NOTES:

- The number of recorded files is limited only by the capacity of the internal memory.
- Regularly check the available memory storage space and move video footage and images to other storage media to free up space on the memory card.
- The internal memory may be reformatted in the settings menu. See **Settings Menu > Formatting** on page 48. Do not use a formatting application or tool to format the internal storage.

18. USING THE INFIRAY OUTDOOR 2 APP

The HYBRID COMPACT can be operated using the InfiRay Outdoor 2 App when connected to a tablet or smartphone or via Wi-Fi.

1. Download the App for free and install it on your device:
 - a. Scan a QR code to download it from the App Store or Google Play; **OR**
 - b. Download the App from any app store.



2. Turn on Wi-Fi in the main menu; see page 31 for instructions.
3. Open the App and tap the **Connect the Device** button on the home screen. Then, click the **Connect Phone WLAN** button.
4. On the mobile device,
 - a. Go to **Settings > Wi-Fi**.
 - b. Select the HYBRID COMPACT from the list of Wi-Fi networks. It will appear in the list as “Compact_XXXXX.”
 - c. Enter the Wi-Fi password and tap the **Join** button. The default password is 12345678.
5. In the App, tap the View Finder button to operate the HYBRID COMPACT:
 - a. Take real-time photos and videos.
 - b. View, share, download, and delete photos and videos taken via the App, which are saved to the mobile device.
 - c. Adjust device settings such as the color palette and digital zoom level.
 - d. Change the Wi-Fi password and SSID.
 - e. Synchronize the date and time from the mobile device.
 - f. Update the HYBRID COMPACT firmware.

NOTE: When a factory reset is performed, the Wi-Fi SSID and password are reset to the defaults, Compact_XXXXX and 12345678. See **Settings Menu > Factory Reset** on page 49.

19. INTEGRATED LASER RANGEFINDER

The HYBRID COMPACT is equipped with an integrated, precision laser rangefinder which allows the user to measure the distance to objects up to 1,200 yards away, with ± 1 -yard accuracy. The laser rangefinder has two rangefinding 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. The rangefinder interface has the following features:

- 1 **Cursor:** The red rangefinder cursor  appears in the center of the screen.
- 2 **Mode:** The selected rangefinding mode, SGL (single) CONT (continuous) or appears on the left side of the screen.
- 3 **Rangefinding Measurement:** The target distance appears on the left side of the screen.

To use the laser rangefinder in continuous rangefinding mode:

1. Long press the **Rangefinder**  **Button** to turn on the laser rangefinder in continuous ranging mode.
2. Locate the target.
3. The distance to the target indicated by the cursor will be refreshed automatically by the rangefinder every second.
4. Long press the **Rangefinder**  **Button** to turn off the laser rangefinder.

To use the laser rangefinder in single rangefinding mode:

1. Short press the **Rangefinder**  **Button** to turn on the laser rangefinder in single ranging mode.
2. Locate the target, and short press the **Rangefinder**  **Button** to take a rangefinding measurement.
3. Long press the **Rangefinder**  **Button** to switch to continuous ranging mode.
4. Long press the **Rangefinder**  **Button** a second time to turn off 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.

20. BLUETOOTH REMOTE CONTROL

The HYBRID COMPACT comes with a wireless remote control, allowing access to the control buttons from your rifle stock or a tripod. Consult the instruction sheet in the pouch with the remote for setup and use instructions.



21. DIGITAL ZOOM

The HYBRID COMPACT will quickly increase the base magnification by enlarging the image from 1 to 8 times digitally.

To use digital zoom:

1. From the home screen, short press the **Zoom**  **Button** toggle through the digital zoom levels.
2. The real-time amplification 3.5×, 7.5×, 15×, 30×, appears on the right side of the status bar.

22. PICTURE IN PICTURE (PIP)

The Picture in Picture function opens a small floating window with a magnified image view at the top of the screen.

1. From the home screen, long press the **Zoom**  **Button**. A 2× zoomed image, centered on the reticle, will appear at the top of the screen. Please note that the PIP image is 2× that of the real-time magnification level shown in the status bar.
2. To exit PIP mode, long press the **Zoom**  **Button**.

NOTES: When the image in the main body of the screen is enlarged via digital zoom, the PIP image will enlarge accordingly.

23. CLIP-ON MODE

By default, the HYBRID COMPACT is set to standalone mode for use as a dedicated thermal sight. In clip-on mode, the HYBRID COMPACT is compatible with day optics up to 10× as an inline clip-on sight. In clip-on mode, the screen size is reduced to be in unity (1×).

To enable or disable clip-on mode:

1. To enable clip-on mode, turn the multi-function switch **(8)** clockwise 60 degrees.

2. To disable clip-on mode, turn the multi-function switch (8) counterclockwise 60 degrees.

NOTES:

- We recommend going no higher than 10× on any rifle scope used in clip-on mode as image performance will become unsatisfactory.

Using Clip-on Mode

- Short press the **Menu (M) Button** to access the clip-on mode quick menu. The quick menu combines elements from the standard quick menu and the main menu. See **Clip-on Mode Quick Menu** on page 18 and **Main Menu Options and Descriptions** on page 30 for detailed instructions.
- Short press the **Right (D) Button** to change the color palette.
- Long press the **Left (A) and Rangefinder (R) Buttons** at the same time to adjust the X/Y position of the screen so that the center of the screen matches up with the day scope reticle. See detailed instructions on the next page.

24. ADJUSTING CLIP-ON MODE SCREEN POSITION

In clip-on mode, the display size is reduced to be in unity (1×). On your first use, it may be necessary to adjust the X/Y of the screen to collimate the HYBRID COMPACT to your reticle. If your POI and POA differ in clip-on mode, adjust the screen as you would adjust the reticle in the zeroing section.

To adjust the screen position:

1. On the home screen with clip-on mode enabled, long press the **Left (A) and Rangefinder (R) Buttons** at the same time to enter the clip-on mode screen-position adjustment interface.
2. The screen-position adjustment interface has the following features:
 - 1 **X Button:** Move the screen along the X-Axis.
 - 2 **Y Button:** Move the screen along the Y-Axis.

