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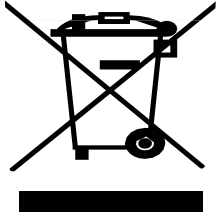
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User manual

**Hybrid Series** | Thermal Imaging Scope  
**HYH50W / HYH35W**



## Information for users on the disposal of electrical and electronic equipment (households)



The WEEE symbol on products and/or accompanying documents means that used electrical and electronic products must not be mixed with normal municipal waste. For proper treatment and recycling, take these products to the appropriate collection points where they will be accepted free of charge.

In some countries, you can also return these products to your local retailer if you buy a matching new product. Proper disposal of this product serves to protect the environment and prevents possible harmful effects to humans and their environment that may result from improper handling of waste.

For more detailed information on the nearest collection point, please contact your local authority. In accordance with national legislation, penalties may be imposed for improper disposal of this type of waste.

### For business customers within the European Union

Please contact your dealer or supplier for disposal of electrical and electronic equipment. They will provide you with further information.

### Information on disposal in other countries outside the European Union

This symbol is valid only in the European Union. If you wish to dispose of this product, please contact your local authority or retailer, then request a disposal option.

## Purpose of use

The device is designed for displaying heat signatures in nature observation, remote hunting observation and for civilian use. This device is not a toy for children. Use the device only as described in this User Guide. The manufacturer and the dealer are not liable for any damages resulting from improper use.

## Functional test

- Please make sure that your device is not visibly damaged before use.
- Test that the device displays a clear, unobstructed picture.
- Check the thermal imaging settings.

## Installing/removing the battery

The Hybrid Series Thermal Imaging is equipped with a removable battery. The battery can be moved and charged (see Chapter 6).

# 1 Specifikace

Model	HYH35W	HYH50W
Rozlišení, pixely	640×480/12µm	
NETD	≤25mK	
Čočky objektivu, mm	f35 /F0.9	f50 /F1.0
Zorné pole, °	12.5°x9.4°	8.8°x6.6°
Dosah detekce (vysoká zvěř)	830 m	1 180 m
Dosah detekce (automobil)	1 490 m	2 130 m
Digitální Zoom, x	1x/2x/3x/4x	
Doporučené přiblížení (ve dne)	1x~9x	
Paleta barev	Teplá bílá; teplá černá; teplá červená; železitá barva; duhová barva; obrys objektů	
Reliéf očí	25~60 mm	
Dioptrická korekce	-4 D~+2 D	
Obrazovka	1.03", 2560×1920 AMOLED	
Typ baterie	Vestavěná baterie 6600 mAh	
Baterie	3.7 V/4400 mAh	
Maximální doba provozu (při teplotě 22 °C)	≥6 h*	
Externí napájení	5 V (USB C)	
Zpětný ráz	1200 g/0.3 ms	
Úroveň krytí, IP	IP67	
Vestavěná paměť	64 GB	
Provozní teplota	-20 °C~+50 °C	
Váha (včetně baterie)	<925 g	<940 g
Rozměry (mm)	267×77×76	280×77×76
Aplikace	Podporováno	
Další přidané funkce	Bluetooth dálkový ovladač; Laserový dálkoměr 1000, s maximálním dosahem detekce 1 000 m (500 m pro vysokou zvěř); Laserový dálkoměr 2000 s maximálním dosahem detekce 2000 m (1 000 m pro vysokou zvěř)	

- ✧ Actual operating time depends on the intensity of Wi-Fi use or video recording.
- The design and software of this product can be improved to enhance its features.
- The technical parameters of the equipment may be improved without prior notice to the customer.

## 2 Contents of the package

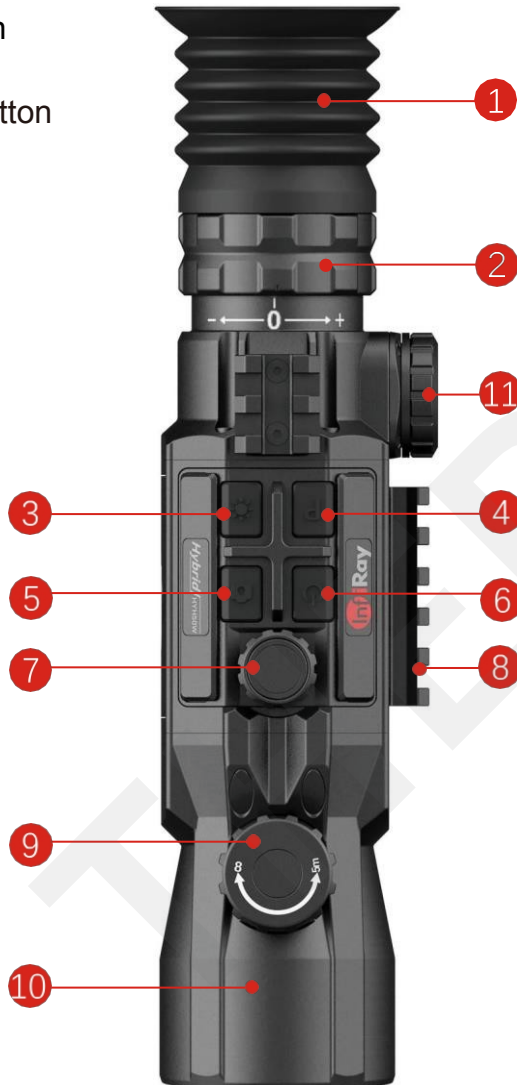
- Hybrid thermal imager
- Shock absorbing weapon recoil bracket
- Bag for carrying equipment
- Charger
- Tool bag
- Lens cleaning cloth
- Infrared sticker
- Infrared card
- Heated target
- User manual

## Product description




The Hybrid Series Thermal Imager is a top of the line product designed for hunting in the outdoors. It supports monocular mode and front sight mode. It combines detection chips with ultra-high sensitivity to restore color and detail to infrared images day and night. It also has a large ultra HD screen, comfortable long eye relief vision system and ballistic calculation. With rich features and long operating time, the device can be widely used for hunting and observation in complex or harsh environmental conditions.

# Components and buttons






1. Eyepiece shade
2. Eyepiece adjustment ring
3. Display brightness button
4. Picture mode button (P)
5. Photo/video recording button
6. Power button
7. Driver
8. Side picatinny rail
9. Lens focus wheel
10. Lens lens
11. USB-C port

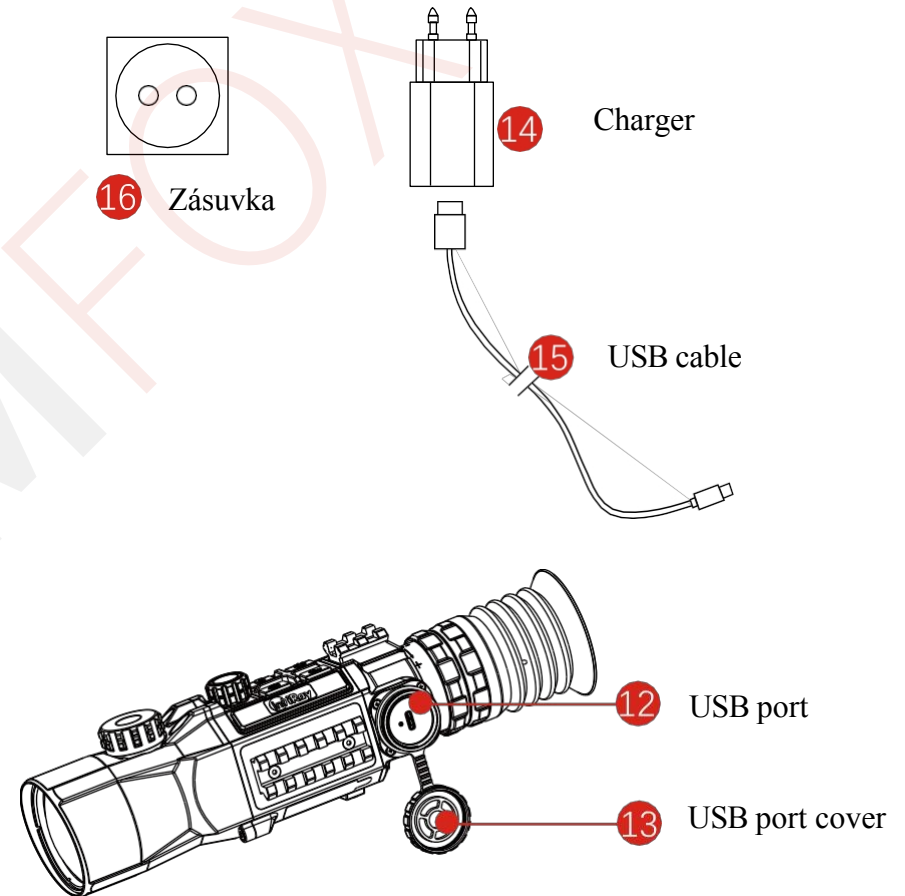


# 5 Description of controls

Button	Default state	Short press	Press and hold
 <b>Button Power</b>	Off	--	
	Home Screen	Calibration image	Shutdown / mode Sleep
	Main offer	Revert to the previous menu, without saving changes	--
	Sleep mode	Waking up the device	
	Connecting a rangefinder	Enable single/continuous distance measurement	--
 <b>Menu button (press the rotary pushbutton)</b>	Home screen	Open a quick quote	Open main offer
	Local offer	Enter the next offer / confirm the selected parameters and return to the previous offer	Save and return to the home screen
	Main offer		
 <b>Menu button (turn left and right)</b>		Digital zoom	
	Menu screen	Scroll up/down/left/right in the menu	--

## 6 Installing the battery

Button	Default state	Short press	Press and hold
 <b>Button of the camera</b>	--	Photography	Video recording
	Camera interface	Photography	Stop recording and saving the video
 <b>Mode button image (P)</b>	Home screen	Select the observation mode	Select the colour of the image
 <b>Display brightness button</b>	Home Screen	Adjust the brightness displays	Turn off / Turn on PIP function
 Home Nastřelení	Off. / On.	--	Freeze image
 Home	Rangefinder mode	Switch between single and continuous measurement	Interface for setting the intent rangefinder crosses
	Home Fig.	--	Enable/disable connection mode



The device is powered by a rechargeable lithium-ion battery that provides power for up to 6 hours of normal operation. The battery should be fully charged before first use.



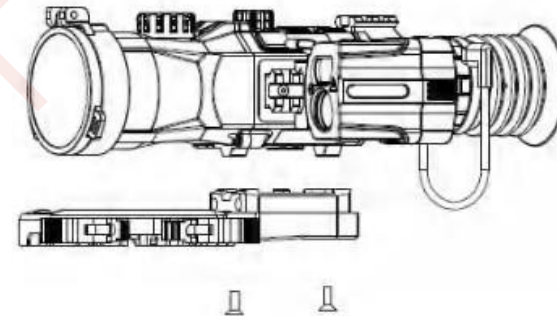
## Charging the battery

- Open the USB C cap (13);
- Insert the end of the USB C data cable on the body of the device (15) into the USB C port (12);
- Connect the other end of the data cable to the power adapter (14) and plug the adapter into the 100-240 V socket (16);
- When charging, a flash icon appears on the battery icon, alternately flashing the current battery level and the LED indicator on the device glows red. When the LED indicator turns green, it indicates that charging is complete.
- During use: if the icon inside is displayed in white, it means that the battery capacity is higher than 20%, which is sufficient. When the icon turns red, it means that the battery capacity is insufficient and should be charged in time to avoid reducing the life of the device due to excessive battery discharge.

## Security measures

- When charging, use a 5V2A power adapter compatible with the device. Using any other type of adapter may cause irreversible damage to the battery or the adapter itself;
- If the device is not used for an extended period of time, the battery should be partially charged, not fully charged or discharged.
- Do not charge the device immediately after moving it from a cold environment to a warm environment. Wait 30 to 40 minutes to do so,  
when the device warms up.
- If the charger is modified or damaged, do not use her;
- The device should be charged at a temperature of 0 °C to +40 °C. Otherwise, the battery life will be significantly reduced.

- Do not leave the battery unattended while charging;
- Do not connect the battery to a power source for more than 24 hours after it is fully charged;
- It is not recommended to connect devices that consume more power than the allowed value.
- The device is equipped with a short circuit protection system, but situations that can lead to a short circuit should be avoided.
- The recommended operating temperature for the device is 20 °C to 50 °C. Do not operate the device outside this temperature range, otherwise the device may  
to shorten battery life.
- When using the device in sub-zero temperatures, the battery capacity decreases. This is normal and does not indicate a fault.



## 7 External power supply

- The Hybrid supports external power sources such as a portable power supply for a mobile phone (5V). Connect the external power supply to the USB C port (12) of the device;
- then the device automatically switches to external power and simultaneously charges the internal battery;
- When the external power is turned off, the device switches to the internal battery.

# 8 Installation and use

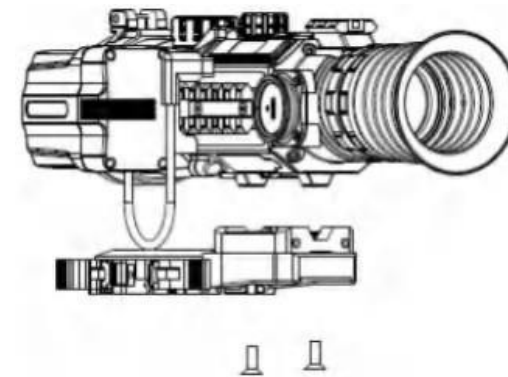
## Fixed installation

**WARNING!** The lens of the device must not be pointed at any sources of intense radiant energy, such as laser or sun emitting devices. This could damage electronic components in the device. Damage caused by failure to follow the instructions in the user manual is not covered by the warranty.

To ensure shooting accuracy, secure the device in the correct position using the picatinny rail on the gun.

- Fixing the device requires the use of the vibration absorbing support included in the package, as follows:
  - Align the chamfered notch of the vibration-absorbing support with the chamfer on the underside of the device;
  - Using the support screw (internal hexagon bolt M3×10) and the fixing wrench (internal hexagon wrench M2.5) included in the package, fix the vibration absorbing support at the bottom of the device.
- The mounting position of the device should be adjusted according to the distance between the eye and the eyepiece (eye relief) as indicated in specifications, and sense of use and comfort. If this recommendation is not followed, the eyepiece may injure the shooter during shooting.
- It is recommended to install the thermal sight as low as possible on the gun, but keep it well away from the barrel or other added facilities;

- It is recommended to use a torque wrench to tighten the bolts to avoid damage to the locking mechanism supports due to over-tightening, the tightening torque must not exceed 2.5 Nm;
- If the thermal imager is used for hunting or shooting at another target, first perform the shooting operation according to the instructions in **"Chapter 9 Shooting"** in this User Guide;
- The steps for installing the laser accessories are as follows:
  - Attach the laser rangefinder to the picatinny rail on the left on the thermal imaging side.
  - Connect the USB C cable of the laser rangefinder to the USB C interface of the thermal imaging device.





## Switching on and setting up the device

- Open the lens cap; **if the light outside is relatively strong, give attention to Lens do not point directly to sunlight to prevent burns to equipment components** ;
- Press and hold the power button (4) for 3 seconds to switch on the device;



- Rotate the eyepiece focus ring (2) until the (InfIRay) icon on the screen is clear;
- Rotate the lens focus ring (9) to adjust the distance;
- Image mode settings: From the home screen, press the P button (4) To set the picture mode, you can select between: clear mode ; birdwatching mode ; fog penetration mode ;, the icon in the status bar will change accordingly
- Setting the colour palette: from the home screen, press and hold the P button (4) to toggle the colour palette to warm white, warm black, warm red, iron, iridescent or the outline of objects. The icon in the top status bar is then updated;
- Adjusting the brightness of the display: From the home screen, press the display brightness button (3) to adjust the screen brightness, you can toggle between level 0 and level 9, while a short prompt appears in the bottom left corner of the display to enter the corresponding brightness level;

- Adjust the sharpness of the image: Press the rotary pushbutton (7) to go to the local menu and adjust the image sharpness (for details, see chapter "Local offer");
- Selecting the rifle viewfinder and front sight connection mode: the default setting is the rifle viewfinder mode. The default setting is the riflescope viewfinder. connection buttons and press the rotary pushbutton to switch to the foreground connection mode from the rifle scope mode (default mode).
- After use, press and hold the power button (6) for 3 seconds, then the shutdown countdown will be displayed. When the the countdown icon changes from 3 to 0, release the button. After that, information about data storage will be displayed. After the data has been saved, the display will turn black and the device will turn off. **Do not disconnect the device from the power source while the device is shutting down and saving data.** Otherwise, the data cannot be saved.
- Press and hold the power button (6) for 3 seconds, then the shutdown countdown will be displayed. When the icon the countdown changes from 3 to 0, release the button and the device enters standby mode. To wake up the device, press the power button (6).



\* In the pre-frame connection mode, the recommended magnification of the image in daytime is 1×~9×.

## 9 Nastřelení

Zařízení využívá metodu nastřelování "zmrazením".

Doporučuje se provádět operaci nastřelení v doporučené provozní teplotě.

- Upevněte zařízení na zbraň pomocí picatiny lišty;
- Vyberte cíl v určité vzdálenosti, např. 100 metrů, 20 m;
- Nastavte nařízení dle uživatelské příručky (Kapitola 7);
- Vyberte nastřelovací profil;
- Stisknutím a podržením ovladače (7) vstoupíte do pokročilého nastavení;
- Vyberte možnost požadovanou variantu nastavení, stiskněte ovladač (7);
- Podle zvolené cílové vzdálenosti vyberte nebo přidejte vzdálenost nastřelení;
- Je-li nastavena vzdálenost nastřelení, otáčejte ovladačem (7) pro výběr funkce nastřelení, kterou následně potvrdíte stisknutím ovladače (7);
- Souřadnice záměrného kříže (osa X a Y) jsou pak zobrazeny v levém horním rohu displeje;
- Střílejte na cíl;
- Sledujte polohu skutečného místa zásahu a předpokládejte, že červený symbol × na obrázku vpravo je poloha místa zásahu (*Tato značka je pouze ilustrační*).

- If the hit point and the aiming point (the centre of the aiming cross)

do not match, hold the aiming position still and in the meantime press the shooting/video recording button (5) + the display brightness button (3) to freeze the image, then the freeze icon will appear;



- Rotate the rotary pushbutton (7) to move the crosshairs, rotate clockwise to move the cursor to the left or down and turn counterclockwise to move the cursor to the right or up;
- Press the rotary pushbutton (7) to switch between X-axis and Y-axis, when the position, where, is icon is highlighted, indicates currently the selected item, and the icon turns blue;
- When the crosshairs are moved, a small white dot appears on the display to indicate the position of the crosshairs prior to movement;
- After moving the position of the aiming cross to the actual hit point, press and hold the rotary pushbutton (7) to save the current the position of the intentional cross and return to the main advanced menu screen;
- Repeat aiming and firing until the position of the hit point is consistent with the position of the aiming point.

### Remark:

After setting the firing positions at different distances, you can switch firing distance options in the local menu.

## 10 Digital Zoom

The Hybrid Series Thermal Imaging can digitally zoom to 1 X, 2 X, 4 X and 8 X.

- At Home screen rotate the rotary pushbutton (7) to zoom in/out;
- Zoom in by turning clockwise and zoom out by turning counterclockwise;
- The magnification is then displayed in the status bar.

## 11 Photography and video recording

The Hybrid has 64 GB of built-in storage to support photo and video recording. Photos and videos will be named by time, so it is recommended to set the system date and time in the advanced menu before using the photo and video recording functions.

### Photography

- From the home screen, press the **camera button** (5) for take photo and a photo icon appears on the left side of the display;
- Images are automatically saved to the built-in storage.



### Video recording

- At Home screen press and hold down the **camera button** (5) to start recording Videos;
- A recording icon appears in the top right corner of the display, including a window with information showing the recording time, with the format time 00:00:00 (hour: minute: second);
- You can also take a photo during recording by pressing **Camera buttons** (5);

- Stop Recording a save the video by pressing a **camera button** (5);
- Videos and photos are stored in the built-in storage.



### Remark:

- You can enter and work with the menu while the video is recording.
- All captured images and recorded videos will be saved to the built-in memory card in IMG\_YYYYMMDDhmmss\_XX.jpg (photos) formats and VID\_YYYYMMDDhmmss\_XX.mp4 (videos); where YYYYMMDDhmm indicates year/month/day/hour/minute/second and XX indicates the serial number of the two-bit multimedia file;
- The serial number of the media file cannot be reset.

### Remark:

- Maximum duration of video recording is 5 minutes. If the duration is longer than 5 minutes, the video is automatically uploaded to a new file;
- The number of files is fixed and limited by the memory space of the device. Each device can store 1,800 photos, 600 videos and 370 automatically recorded videos. When this number is exceeded, the oldest photos or videos are automatically replaced. Periodically transfer videos and photos to other media to free up space on the device's memory card.

### Access to device memory

When the device is turned on and connected to the computer, the computer recognizes it as a flash memory card. You can then access the device's memory and copy pictures and videos.

- Connect the device to your computer using a data cable;
- Switch on the device;
- Double-click "This computer" on the desktop, find the device named "Disk U" and double-click to open the folders called "VIDEO-CIF", "PHOTO-CIF" and (RAV-CIF), you can access photos and videos;
- Open the memory file, there are different folders named by time in the format xx (day) xx (month) xxxx (year);
- Select required files or folders, that you want to copy or delete.

**Remark:**

-When you connect the device to your computer, you will be informed that only part of the memory is available. This is because the storage algorithm mechanism adopted by the device is different from that of the computer and does not represent the actual memory occupancy. Please check the actual memory in the file management of the Hybrid device.

-When connected to a computer, do not use a formatting tool to format the device. Instead, use the corresponding tool in the menu.

## 12 Status bar



The status bar is located at the top, side and bottom of the screen and displays information related to the current operating status of the device. From left to right it is as follows:

1. Video status
2. Current picture mode (for example, birdwatching mode)
3. Current colour palette mode (e.g. warm black)
4. Current Type Shotgun weapon (after activating of the hidden crosshair function)
5. Type of projectile with the current priming (after activating the hidden crosshair function)
6. Calibration mode (manual calibration, automatic calibration, background calibration)
7. Azimuth angle
8. Digital zoom
9. Built-in microphone switch
10. Battery status
11. Current time
12. Wi-Fi switch
13. Bluetooth switch

The pitch angle and bank angle are on the right side of the screen, the target distance is on the left side of the screen. The lower status bar displays the current value of the shooting distance and the resting time status.

## 13 Local offer

You can quickly edit basic configurations in the local menu commonly used functions, including image brightness, image contrast, image sharpness, calibration method, target distance, crosshair type, crosshair colour and quick crosshair position. Press the rotary pushbutton (7) to confirm saving and press the power button to go to the home screen.



- From the home screen, press the rotary pushbutton (7) to go to the local menu screen;
- Turn the rotary pushbutton (7) to switch between the following function options, the icons of the selected functions will then highlight:

-Jas image: Turn the rotary pushbutton (7) to select the selected option and press the rotary pushbutton (7) to adjust the brightness of the picture from level 0 to 9;

-Image contrast: Turn the rotary pushbutton (7) to select the selected option and press the rotary pushbutton (7) to adjust the image contrast from level 0 to 9;

-Image sharpness: Turn the rotary pushbutton (7) to select the selected option and press the rotary pushbutton (7) to adjust the image sharpness from level 0 to 9;

-Calibration method: turn the dial (7) to select the selected option and press the dial (7) to adjust the shutter correction method;

-Shooting distance: turn the rotary pushbutton (7) to select the selected variant and press the rotary pushbutton (7) to set the target shooting distance;

When you open the hidden menu, the following options are available:

-Crosshair type: turn the rotary pushbutton (7) to select the selected option and press the rotary pushbutton (7) to switch between the crosshair types;

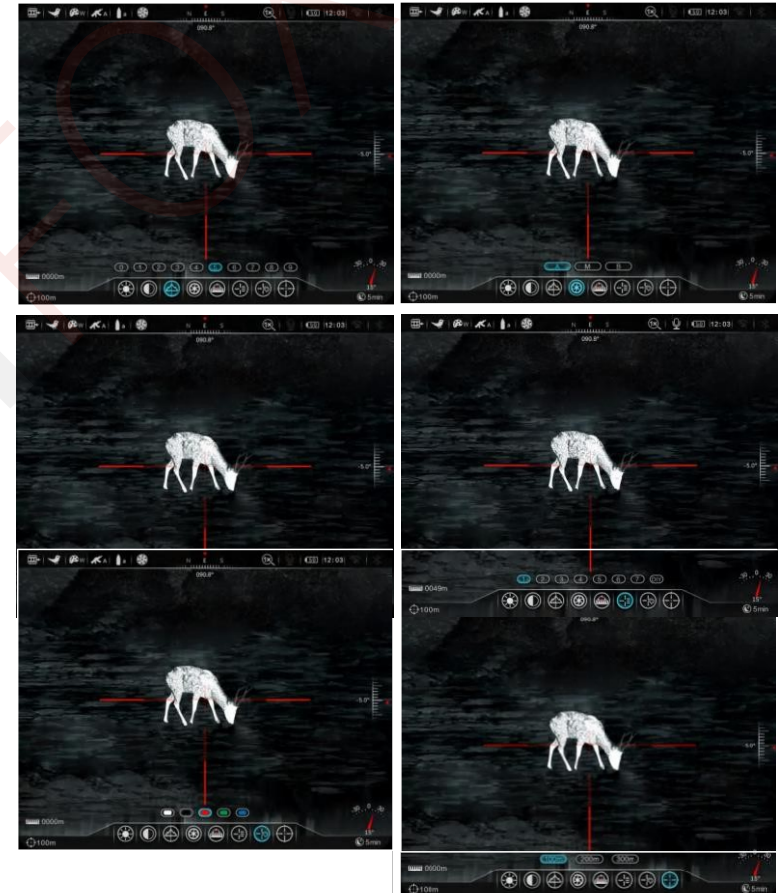
-Colour of the cross: turn the rotary pushbutton (7) to select the selected option and press the rotary pushbutton (7) to switch between the 5 colours of the cross;

-Quickly adjust the crosshair: turn the rotary pushbutton (7) to select the selected option and press the rotary pushbutton (7) to switch between the 3 crosshair positions;

- Press the power button (6) to return to the home screen.

### Remark:

When the status bar is automatically hidden and the local menu is opened, the device will return to the home screen if no operation is performed within 10 seconds.



# 14 Advanced menu

- From the home screen, press and hold the rotary pushbutton (7) for 3 seconds to access the main menu;
- Turn the rotary pushbutton (7) to switch between the function options in the main menu, clockwise you move to the right and counter clockwise you move to the left;
- Press the rotary pushbutton (7) to adjust the parameters of the current option or go to the submenu;
- From any menu interface, press and hold the rotary pushbutton (7) to save your changes and return to the main menu. Press power button (6) to return to the main menu without saving changes;
- In any menu interface, the device will automatically return to the home screen without saving changes if, within 15 seconds you don't perform any surgery.



## Main menu functions and description

- Press and hold the rotary pushbutton (7) to enter the main menu;
- Turn the rotary pushbutton (7) to select the function option "Wi-Fi."
- Press the rotary pushbutton (7) to activate/deactivate Wi-Fi;
- If the function is on or off, the icon in the status bar will change accordingly



Wi-Fi



- Press and hold the rotary pushbutton (7) to enter the main menu;
- Turn the rotary pushbutton (7) to select "Digital compass";
- Press the rotary pushbutton (7) to activate/deactivate the function digital compass;
- When this mode is turned on or off, the information in the





Digital compass








THERMEO



 <p><b>Microphone</b></p>	<ul style="list-style-type: none"> <li>➤ Press and hold the rotary pushbutton (7) to enter the main menu;</li> <li>➤ Turn the rotary pushbutton (7) to select "Microphone";</li> <li>➤ Press the rotary pushbutton (7) to activate/deactivate the microphone;</li> <li>➤ If the function is on or off, the icon in the status bar will change accordingly.</li> </ul> 
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 <p><b>Automatic device sleep</b></p>	<ul style="list-style-type: none"> <li>➤ Press and hold the rotary pushbutton (7) to enter the main menu;</li> <li>➤ Turning of the rotary pushbutton (7) select option for automatic dormancy;</li> <li>➤ Press the rotary pushbutton (7) to select the automatic time idle time or deactivate idle time;</li> <li>➤ When the device is switched on/off, it enters an early sleep or normal sleep state. If for more than 60 minutes minutes after resting, you don't perform any surgery, the device is automatically switched off.</li> </ul> 
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<p><b>Photography settings</b></p>	<ul style="list-style-type: none"> <li>➤ Press and hold the rotary pushbutton (7) to enter the main menu;</li> <li>➤ Turn the rotary pushbutton (7) to select "Shooting";</li> <li>➤ Press the rotary pushbutton (7) to select single shooting; multiple shooting; delayed photography.</li> </ul>
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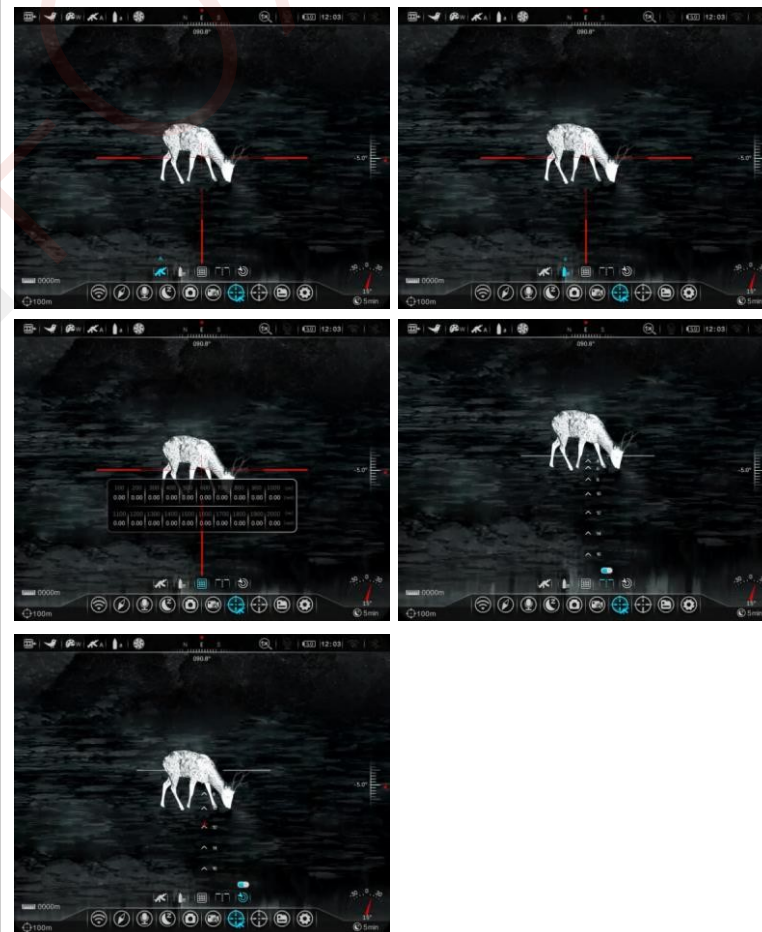
<p><b>Video recoil activated</b></p>	<ul style="list-style-type: none"> <li>➤ Press and hold the rotary pushbutton (7) to enter the main menu;</li> <li>➤ Rotate the rotary pushbutton (7) to select "Video recoil activated";</li> <li>➤ Press the rotary pushbutton (7) to activate/deactivate the video activated by recoil;</li> <li>➤ The icon on the left-hand side of the screen will turn on or turning off this mode will change accordingly.</li> </ul> 
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### Intentional cross firing

- Press and hold the rotary pushbutton (7) to enter the main menu;
- Turn the rotary pushbutton (7) to select the firing profile;
- Press of the rotary pushbutton(7) to open the secondary menu of the "Shooting profile";
- Rotate the rotary pushbutton (7) to select "Weapon type/Shot type/Shot tables/Target crosshairs/Ballistics calculation";
- Press the rotary pushbutton (7) to confirm the selection and go to the submenu.
- If a weapon type is selected, press the menu button to open the weapon type selection interface and turn the rotary pushbutton to adjust the type of weapon. You can choose between "A/B/C". Press the menu button to confirm your selection and return to the top menu, press the power button to return to the main menu, press and hold the menu button to return to the home screen.
- When the Projectile Type is selected, press the menu button to open the projectile type selection interface and rotate the dial to adjust the type missiles. Each type of weapon has a "1/2/3" option. Press the menu button to confirm the selection and return to the top menu, press the power button to return to the main menu, press and hold the menu button to return to the home screen.
- When the shooting tables option is selected, pressing the menu button will open the entered interface where you can see the specified distance and other settings.
- If a deliberate cross is selected, press the menu button, the "open/close" options appear, turn the rotary pushbutton and select opening/closing. After opening, the intentional cross of the shooting tables can be selected. The **center of the aiming cross of the firing tables is the same as the aiming cross of the current firing distance, where the firing distance is taken as the starting point to display the corresponding aiming point positions at different target distances.**

- Je-li zvolen výpočet balistiky, stiskněte tlačítko nabídky, zobrazí se možnosti „otevřít/zavřít“ (pokud je zobrazen také záměrný kříž střeleckých tabulek), otočte ovladačem a zvolte otevřít/zavřít. Když je balistický výpočet zapnutý a systém zná vzdálenost cíle, může automaticky vygenerovat nový zaměřovací bod překrývající se with a deliberate cross of shooting boards. **(See Chapter 18 for detailed procedure)**



Před provedením jakékoli operace nastřelování nastavte typ zbraně, typ střely a vzdálenost nastřelení.  
Zařízení Hybrid podporuje jakoukoli nastřelovací vzdálenost mezi 001 a 999 m.

- Stisknutím a podržením ovladače (7) otevřete pokročilou nabídku;
- Otáčením ovladače (7) vyberte v hlavní nabídce "Zeroing";
- Stisknutím ovladače (7) otevřete sekundární nabídku funkce nastřelení, která zobrazuje celkem 3 vzdálenosti nastřelení;
- Otáčením ovladače (7) vyberte vzdálenost nastřelení (001-999 m) podle vzdálenosti nastavené pro cíl;
- Stisknutím a podržením ovladače (7) potvrďte vzdálenost nastřelení a otevřete podnabídku vzdálenosti nastřelení, včetně dvou možností, tj. "Nastřelení" a "Vzdálenost nastřelení".



Shotgunne  
d





- If the preset distance is the same as the distance displayed on the device, You can be done at shot directly by following these steps:

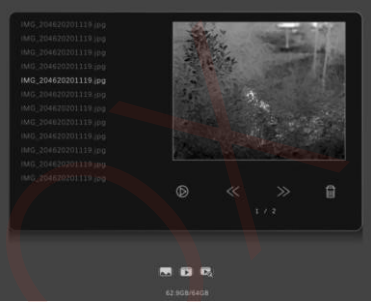



- Turning of the rotary pushbutton (7) select **Zeroing**;
- Press the rotary pushbutton (7) to go to the shooting screen;
- The X-axis and Y-axis coordinates of the intentional cross are shown in the upper left corner of the display;
- Aim the centre of the thermal imaging crosshairs at an object within the target distance and fire, then track the location of the actual hit point;
- Keep the aiming position steady while pressing and holding the display brightness button (3) and the camera button (5) to freeze the image, the freeze icon appears on the display;
- Rotate the rotary pushbutton (7) to move the crosshairs until the centre of the crosshairs points to the location of the hit site. Details can be found in **Chapter 9, the shooting.**






Shot





	<p><b>Setting the firing distance</b></p>	<ul style="list-style-type: none"> <li>➤ Turn the rotary pushbutton (7) to select "Setting the shooting distance";</li> <li>➤ Press the rotary pushbutton (7) to activate the range reset function, then a small triangle symbol appears above the number;</li> <li>➤ Turn the rotary pushbutton (7) to set the numeric value of the current position, which can be switched between 0 and 9;</li> <li>➤ Press the rotary pushbutton (7) to switch between the hundreds, tens and ones positions;</li> <li>➤ After setting, press and hold the rotary pushbutton (7) to save the settings and exit. The cursor will return to the shot option, and in the meantime the shot distance is changed accordingly;</li> <li>➤ In addition, the status bar is synchronously updated to the new firing distance.</li> </ul> 
 <p><b>File management</b></p>	<ul style="list-style-type: none"> <li>➤ In the main menu, rotate the rotary pushbutton (7) to select "File Management";</li> <li>➤ Press the rotary pushbutton (7) to enter the file management interface, which consists of a file list, file information, and file storage information;</li> <li>➤ Use the rotary pushbutton (7) to switch between the image list, video list and between videos activated by the recoil of the weapon;</li> </ul>	

	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to confirm the function selection;</li> <li>➤ Press the rotary pushbutton (7) to return to the top menu.</li> </ul> 
 <p><b>Advanced Settings</b></p>	<p>Analog video settings, Bluetooth, automatic status bar hiding, date and time, compass calibration, defective pixel correction, color palette switching, unit switching, SD card formatting, factory reset and device information.</p> 
 <p><b>Analogue video</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the secondary advanced settings menu.</li> <li>➤ Turn the rotary pushbutton (7) to select "Analog Video";</li> <li>➤ Press the rotary pushbutton (7) to enter the analog video activation page;</li> <li>➤ Rotate the rotary pushbutton (7) to set the selected analogue video status, then press again the rotary pushbutton (7) to exit the status selection;</li> <li>➤ Press the power button (6) to return to top menu;</li> </ul>



	 <p><b>Bluetooth</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the secondary advanced settings menu.</li> <li>➤ Turn the rotary pushbutton (7) to select "<b>Bluetooth status</b>";</li> <li>➤ Press the rotary pushbutton (7) to enter the interface bluetooth status.</li> <li>➤ Turn the rotary pushbutton (7) to set the correct status bluetooth; then press the rotary pushbutton (7) again to leaving the selection state;</li> <li>➤ Press the power button (6) to return to the top menu;</li> <li>➤ Once set up, Bluetooth can be used to pair with the Bluetooth remote. When fixed bluetooth remote on, automatically will connect to the device and support remote control of the device.</li> </ul> 
	 <p><b>Automatic hiding of status line</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the secondary advanced settings menu.</li> <li>➤ Turn the rotary pushbutton (7) to select the automatic status bar hiding function;</li> <li>➤ Press the rotary pushbutton (7) to enter the interface to automatically hide the status bar;</li> </ul>

		<ul style="list-style-type: none"> <li>➤ Turn the rotary pushbutton (7) to set on/off to automatically hide the status bar; enable function, and if the device is not in operation for a period of 15 s, the status bar and some UI information will be automatically hidden so you can use more screen space for observation. Press the rotary pushbutton (7) again to exit the variant selection state;</li> <li>➤ Press the power button (6) to return to the top menu;</li> </ul> 
	 <p><b>Date and time</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the secondary advanced settings menu.</li> <li>➤ Turn the rotary pushbutton (7) to select the date and time settings;</li> <li>➤ Press the rotary pushbutton (7) to activate the setting function dates over time, at format year/month/day/hour/minute.</li> <li>➤ Turn the rotary pushbutton (7) to set the current year, month, day, hour and minute;</li> <li>➤ Press the rotary pushbutton (7) to switch between year, month, day, hour and minute;</li> <li>➤ When the settings are complete, press the rotary pushbutton (7) in position v save and exit.</li> </ul> <p>*Time settings can be automatically synchronized when you connect the InfiRay Outdoor app.</p>





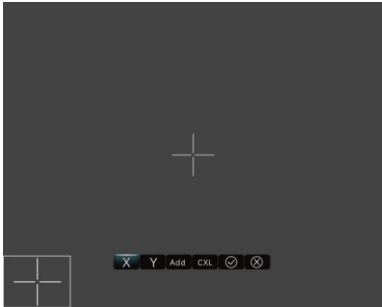



  
**Calibrating the compass**





- Press **of the rotary pushbutton (7)** to open **menu** advanced settings;
- Turn the rotary pushbutton (7) to select the compass calibration;
- Press the rotary pushbutton (7) to enter the calibration interface of the compass;
- Rotate the thermal imager in the three directions shown icon (at least 360° in each axial direction), then set the desired compass calibration status;
- The setup interface will be automatically closed after confirming the settings.







**Defective pixel correction**

- Press the rotary pushbutton (7) to open the advanced settings menu.
- Rotate the rotary pushbutton (7) to select the correction of defective pixels;
- Press the rotary pushbutton (7) to enter the defective pixel correction interface. In the defective pixel correction settings cursor for correcting faulty pixels is displayed, and four position options "X, Y, v, x" are available. Press the menu button to move to the desired position, press the power button to return to the top menu.
- Select X, press the menu button to move to the X setting, turn the rotary pushbutton slowly to move the cursor, move 1 pixel after each action, press and hold the controller to move 10 pixels, press the power button to return to the 4 position selection interface;
- Select Y, press the menu button to move to the Y setting, turn the rotary pushbutton slowly to move the cursor, move 1 pixel each time, press and hold the controller to move 10 pixels, press the power button to return to the 4 position selection interface;
- Select "v" to correct the defective pixels, after correction automatically return to the top menu. Select "x" to stop correcting bad pixels and return to the top menu.
- Press the power button (6) to return to the main menu.

	
 <p><b>Colour temperature switching</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the advanced settings menu.</li> <li>➤ Turn the rotary pushbutton (7) to select the colour temperature switching;</li> <li>➤ Press the rotary pushbutton (7) to enter the colour temperature switching interface, where you can choose between "W" and "C" (warm and cold colour);</li> <li>➤ Turn the dial (7) to set the desired temperature colors, then press the rotary pushbutton (7) again to exit of choice;</li> <li>➤ Press the power button (6) to return to the top menu.</li> </ul>  

	 <p><b>Switching units</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the advanced settings menu.</li> <li>➤ Turn the rotary pushbutton (7) to select the unit switching;</li> <li>➤ Press the rotary pushbutton (7) to enter the unit switching interface, where "m" and "yd" represent a meter a yard; </li> <li>➤ Turn the rotary pushbutton (7) to switch the unit, then press the rotary pushbutton (7) again to exit the selection;</li> <li>➤ Press the power button (6) to return to the top menu.</li> </ul> 
	 <p><b>Formatting an SD card</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the advanced settings menu.</li> <li>➤ Select the memory card formatting function, and for Press the rotary pushbutton (7) to enter the settings;</li> <li>➤ Turn the rotary pushbutton (7) to select Yes or No, then press the rotary pushbutton (7) again to exit of choice;</li> <li>➤ Press the power button (6) to return to the top menu.</li> </ul>

		
	 <p><b>Factory settings</b></p>	<ul style="list-style-type: none"> <li>➤ Press of the rotary pushbutton (7) to open the advanced settings menu.</li> <li>➤ Select the factory settings option and press the rotary pushbutton (7) to open the factory menu Setting;</li> <li>➤ Turn the rotary pushbutton (7) to select Yes or No, "Yes" to restore factory settings or "No" to cancel the operation;</li> <li>➤ Press the rotary pushbutton (7) to confirm the selection;</li> <li>➤ After confirming the factory reset, the resets the following functions to their default settings: <ul style="list-style-type: none"> <li>-Image mode: clear;</li> <li>-Image palette: warm white</li> <li>-Shooting distance: 100 m</li> <li>-Digital zoom: ×1.0;</li> <li>-ROI: Off;</li> <li>-Wi-Fi: Off</li> <li>-PIP: Off</li> <li>-Defective pixel correction: user correction of defective pixels</li> <li>-Automatic hiding of the status bar: Off</li> </ul> </li> </ul>

		
	 <p><b>Information about the device</b></p>	<ul style="list-style-type: none"> <li>➤ Press the rotary pushbutton (7) to open the advanced settings menu;</li> <li>➤ Turn the rotary pushbutton (7) to select the device information option;</li> <li>➤ Press the rotary pushbutton (7) to get the current device information;</li> <li>➤ Press the power button (6) to return to the top menu.</li> </ul>

## 15 PIP function

Picture in Picture (PIP) provides a floating window independent of the entire screen. This window displays the part of the image that is enlarged 2× in a certain area of the position of the main image's intentional cross.

- From the home screen, press and hold the display brightness button (3) to enable or disable PIP;
- Rotate the rotary pushbutton (7) to enlarge the image, the image in the PIP window will then magnify 2x.



## 16 ROI

The device has a ROI function that can highlight and mark the target of the central area. focus

- In the observation interface, **press the camera button (5) at the same time + display brightness button (3) to turn the ROI on or off.**
- In the main menu, select the option shown in the picture above, Press the rotary pushbutton (7) to confirm the selection and turn the rotary pushbutton. After confirming the selection, press the rotary pushbutton to exit the selection interface.
- After confirmation, a circular area with high contrast and high brightness appears in the middle of the image;
- Press the power button (6) to return to the home screen.



## 17 Forehead function

The Hybrid device supports a pre-frame mode that allows you to observe thermal images through a thermal imager attached to a day scope (1×-9×).

Contact your dealer for video instructions on how to install the front panel.

To activate the foreground mode, press and hold the connect button + menu button (press the rotary pushbutton) at the same time, once the home screen appears, the switch to foreground mode has occurred.

In the front sight mode, the menu changes to a simpler interface with an already centered screen, which however removes some of the functionality in the day sight mode.

In order to work properly with different types of weapons and rifle scopes, the image in the foreground mode must be adjusted to the appropriate position. When the foreground mode interface is displayed, press and hold the reload button + the display brightness button simultaneously to enter the adjustment interface.

## 18 Laser surgery rangefinder and crosshair adjustment

The Hybrid device supports an external laser rangefinder just to implement the rangefinder function. Installation of the laser rangefinder

is mentioned in **chapter 7 "Switching on and setting up"**. The following describes the procedure for detailed operation and adjustment of the laser rangefinder aiming cross.

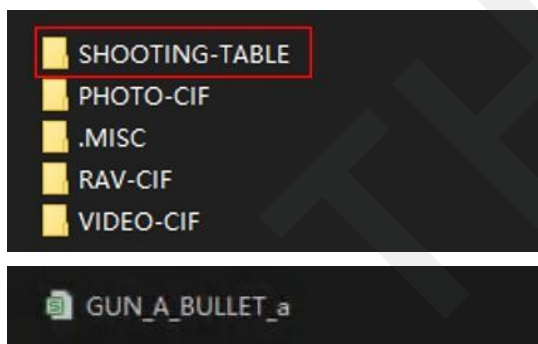
- When the laser rangefinder is connected, the intentional cross is automatically displayed. Press the power button (6) and the image mode (4) to switch between simple distance measurement mode (SGL) and continuous distance measurement mode (CONT).
- In simple distance measurement mode, press the power button (6), the target distance information will appear in the bottom-left corner of the home screen.
- In continuous distance measurement mode, press the power button (6), the target distance information are updated in the bottom left corner of the home screen at 3-second intervals.
- In rangefinder use mode, press and hold the power button (6) + image mode button (4) to call up Set the laser rangefinder aiming cross position, then set the X, Y, center (center of the image) and default (factory laser positioning point) coordinates. The X and Y setting range is not less than  $\pm 100$  pixels (image pixels).

# 19 Shooting tables and ballistic calculation

The Hybrid supports the ability for different users to enter shooting tables for different weapon types. The firing table contains ballistic information corresponding to different weapon types and different projectiles. Users can directly enter the information from the shooting tables into the device. The operating procedures are as follows:

- After switching on, connect the device to the computer with the data cable in the normal working state of the home page and open "Disk U" on your computer;
- On the "U" drive, the name of the sample in the new folder (the folder name must be "SHOOTING-TABLE") is the file name then "GUN\_A\_BULLET\_a," where it indicates the firing table for the type A weapon. Similarly, you can load tables for gun type B and gun type C, just edit the yellow cells of the table

**Note: If the distance unit is m, fill in the table with m; if the selected unit is yd, fill in the table with yd.**



	1	2	3	4	5	6	7	8	9	10	11
m		100	200	300	400	500	600	700	800	900	1000
(mil)		-0.03	0.57	1.42	2.44	3.63	4.98	6.54	8.3	10.76	13.1
m		1100	1200	200	1400	1500	1600	1700	1800	1900	2000
(mil)		16	19.1	23.2	26.7	30	33.5	37.8	42.1	45.8	49.2

- Exit the USB drive interface normally and turn on the device to check if the table has changed.
- After Enter ballistic information can user obtain multiballistic intentional outline designed by ballistic information, as shown in the following figure.
- Location targeting ballistic inverted triangle represents the point of the intentional cross corresponding to the distance of the aiming point. If the target distance is known, aiming can be done using the aiming cross corresponding to the distance of the aiming point.



- If ballistic information is entered but the user is unsure of the target distance, the function can be used to measure the target distance. Automatic ballistic distance calculation using an external laser and automatically display the point of the aiming cross corresponding to the current target (see picture). The position of the red dot is the automatically generated position of the aiming point.



# 20 Wi-Fi

The Hybrid has a built-in Wi-Fi module. The device can connect wirelessly to a mobile device (laptop or smartphone) via Wi-Fi.

- In the advanced menu, enable Wi-Fi.
- Once Wi-Fi is enabled, search for Wi-Fi on the mobile device named "HYBRID\_HYH50W\_XXXX" where XXXX IS 4-bit serial number composed of numbers and letters.




- Select Wi-Fi, enter your password and connect. The initial password is: 12345678;
- Once a Wi-Fi connection is established, you can control the thermal imager via apps on your mobile device.



### Name and password settings

Wi-Fi Device Hybrid allows you to change the Wi-Fi device name and password in the mobile app.

- Once the thermal imaging camera is connected to your mobile device, look for the  settings icon on the **InfiRay Outdoor** app screen, Tap it to open the settings screen;
- Enter and submit a new Wi-Fi name (SSID) and password in the text box;
- After sending the change, reset the device to **a c t i v a t e** the settings.

**Warning!** After refresh factory settings the device is also reset to the factory default Wi-Fi name and password settings.

## 21 Updates and InfiRay Outdoor

You can download the InfiRay Outdoor User Guide on our official website ([www.infirayoutdoor.com](http://www.infirayoutdoor.com)). You can also test and update the product firmware via the InfiRay Outdoor app or download it from our official website.

### About InfiRay Outdoor

- You can download and install the InfiRay Outdoor app on the official website ([www.infirayoutdoor.com](http://www.infirayoutdoor.com)) or in a p p store. Alternatively, you can scan the QR code below to download the app for free.



- After installation, open the application.
- If your device has been connected to a mobile device, turn on mobile data on the mobile device. Once connected, the the app will automatically prompt you to update. Click "Now" to download the latest version immediately or click "Later" to update later.
- InfiRay Outdoor can automatically save the last connected device. So once you have connected to InfiRay before Outdoor, the app automatically detects the update even if the thermal imaging camera is not connected to your phone or laptop. If an update is available and the mobile device has internet access, the update needs to be downloaded first. If the device is connected to the mobile device, the thermovoice will connect to the mobile device and automatically update.
- After the update is installed, the device automatically restarts.



## 22 Technical inspection

Before each use of the equipment, perform a technical check and check the following:

- Outside of the device (no cracks on the cover).
- Lens and eyepiece (free of cracks, oil, stains or other deposits).
- Condition of the rechargeable battery (pre-charged) and electrical contact (no salting or oxidation).

## 23 Maintenance

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

- Wipe the surface of the metal and plastic parts to remove dust and dirt, using a cotton cloth. To clean silicone lubricant can also be used.
- Clean the electrical contact and battery slots on the device with a non-greasy organic solvent.
- Check the glass surface of the eyepiece and lens. If necessary, remove dust and sand from the lens (ideally use  
To clean optical surfaces, use a special wiper tool and solvent.

## 24 Troubleshooting

The following table lists all the problems that may occur during the operation of the device. Check and solve the problems according to this table. Return the equipment to the dealer or supplier if problems occur that are not listed in this table, or if you cannot easily correct them.

Glitch	Probable cause	Solution
The device cannot be Turn on	The battery is dead	Charge the battery
	USB cable is damaged	Replace the USB cable
The device cannot be switched on when using external power	External power supply is insufficient	If necessary, check the status of the external power supply
Images are unclear, vertical lines are present or the background is not even	Calibration is required	Calibrate the image (see Chapter 9)
		Tips display brightness
The picture is too dark	Lens not in focus	or rotate the focus ring of the lens to adjust the focus
The icons are clear, but the image is blurry	The inner or outer optical surface of the lens is dusty or frosted	Wipe the outer surface of the lens with a soft cotton cloth or allow the device to dry in a warm, dry environment for longer than 4 hours

Glitch	Probable cause	Solution
The position of the aiming cross changes after the shot is fired.	Rangefinder or fixing clamp is not fixed Installed by	Check that the device is firmly installed. Make sure the bullet type and calibre, that you're using corresponds to the ballistics for the shot. If you are shooting in the summer and using the device in the winter (or vice versa), the point may shift the shot slightly.
The image cannot be focused	Misconfiguration	Adjust the image according to the instructions in the User Guide. Check the outer surface of the lens and eyepiece, wiping off any dust and frost if necessary. In cold weather, a special anti-fog spray can be applied.
The device cannot connect to a smartphone or computer	The Wi-Fi password is incorrect There are too many Wi-Fi networks within range of the device, which can cause interference with each other	To enable stable network access, we recommend placing the device in an area with to a limited number of Wi-Fi networks or to an area without Wi-Fi coverage.

Glitch	Probable Cause	Solution
Wi-Fi signal not available	The device is out of Wi-Fi coverage. Obstacle (such as a concrete wall) between the device and the receiver	Move your device to a place where you can receive Wi-Fi signals
Observed target disappears	You're looking at the target through the glass	Observe the target directly, away from the glass
Image quality the detection range is poor or shortened	These problems are likely to occur when you use the device in harsh weather (such as snow, rain and fog)	

equipment.

## **25** Legal and regulatory information



Frequency range of the wireless transmitter module:

**WLAN: 2.412-2.472 GHz (for EU)**

Wireless transmitter module power <20 dBm (EU only)

IRay Technology Co., Ltd. hereby declares that the Hybrid Series Thermal Imaging System complies with Directives 2014/53/EU and 2011/65/EU. The full EU Declaration of Conformity and additional information is available at: [www.infirayoutdoor.com](http://www.infirayoutdoor.com). This equipment can be operated in all EU member states.

### **FCC Statement**

FCC ID: 2AY3N-HYBRID

#### **Labelling requirements**

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

#### **Information for users**

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

**Note:** The manufacturer is not responsible for any interference to the radio or television caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the

**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 home installation. This equipment generates and may radiate radio frequency energy and, if not installed and used in accordance with the User's Guide, may cause harmful interference to radio communications. However, there can be no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, which can be detected by turning the equipment off and on, the user is advised to attempt to correct the interference by one or more of the following measures:

- Redirect or relocate the receiving antenna.
- Increase the distance between the device and the receiver.
- Connect the device to an outlet on a different circuit than the one to which the receiver is connected.
- Ask your dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radio frequency exposure limits for uncontrolled environments.

#### **Operation when worn on the body**

This device has been tested for typical human body operations. In order to meet RF exposure requirements, a minimum distance must be maintained between the user's body and the handset, including the antenna 0.5 cm. Belt clips, holsters and similar accessories used with this device should be free of any metal parts. Equipment accessories that do not meet these requirements may not meet RF exposure requirements and should be avoided. Use only the supplied or approved antenna.