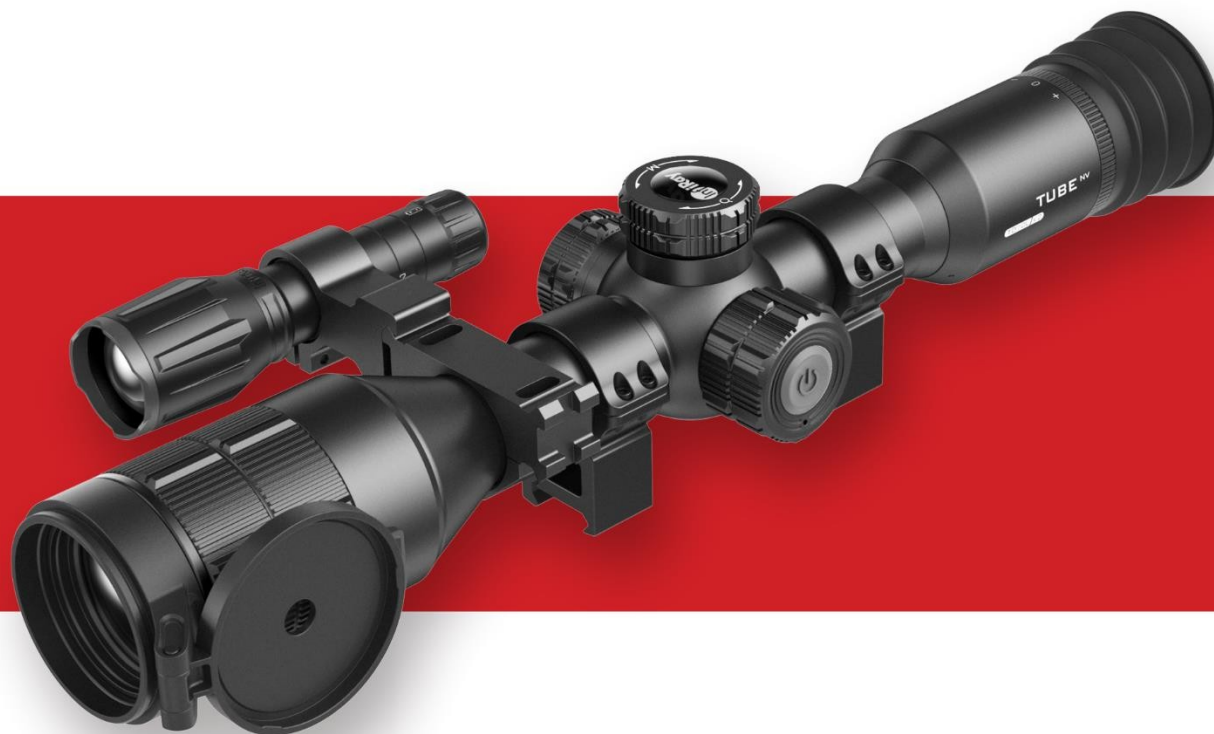


TUBE NV

Digital Night Vision Scope



THERMFOX

User Manual

TD70L V2

V1.0

IMPORTANT SAFETY INFORMATION

Environmental influences

WARNING! Never point the lens of the device directly at intense heat sources such as the sun or laser equipment. The lens and eyepiece may then become so hot that the internal components of the instrument may be damaged. This warranty does not cover damage caused by improper operation.

Danger of ingestion

Please note: Do not place this device in the hands of small children. Improper handling may cause small parts to come loose and be swallowed.

Safety instructions for use

- Handle the device with care: rough handling can damage the internal battery.
- Do not expose the device to fire or high temperatures.
- Do not disassemble the device to access the battery. Battery

is not intended for exchange by the end user.

- Battery capacity decreases when operating at low ambient temperature. This is not a fault, it occurs for technical reasons.
- The recommended temperature for use of this product is -20 °C to +50 °C. Failure to follow the above instructions may affect the life of the product.
- Always store the equipment in a dry, well-ventilated place.
- Do not store the device for long periods of time at temperatures below -20 °C and above +50 °C, otherwise you will permanently reduce the battery capacity.
- The product may only be connected to a USB Type-C interface.
- If the device has been damaged or the battery is faulty, please send the device to our after-sales service for repair.

Safety instructions for the power supply

- Before use, check the power supply, cable and adapter for visible damage.
- Do not use defective parts. Defective parts must be replaced.
- Do not use the power supply in damp or wet environments.
- Only charge the device at temperatures between 0 °C and 40 °C.
- Do not make any technical modifications to the equipment.

Disposal of batteries



Directive 2006/66/EC (Battery Directive): this product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union.

For details about the battery, see the documentation for

to a specific product. The battery is marked with this symbol, which may contain Cd (indicating cadmium), Pb (indicating lead) or Hg (indicating mercury). For proper recycling, return the battery to your supplier or send it to a designated collection point. For more information, visit www.recyclethis.info.

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



2012/19/EU (WEEE Directive): products bearing this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier after purchasing an equivalent new device or dispose of it at a

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.

designated collection points. For more information, please visit: www.recyclethis.info.

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

This symbol is only valid in the European Union. To dispose of this product, contact your local authority or product dealer and ask for 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 responsible for any damages resulting from improper use.

Function check

1. Please make sure that your device is not visibly damaged before use.
2. Test that the device displays a clear, unobstructed picture.
3. Check that the thermal imaging settings are correct.
See notes in the Operation section.

Installing/removing the battery

The Tube NV Series Thermal Imaging System is equipped with a built-in battery that cannot be removed.

Observation with and without glasses

Thanks to the flexible visor, the Tube NV series can be used with or without glasses. In both cases, it offers a full field of view.

1 Specifications

ModelTD	
Sensor Specifications	
Sensor resolution, pixels	1920 × 1080
Pixel size, μm	4
Frequency, Hz	50 / Car
Optics specifications	
Lens lens, mm	70 / F1.8
Field of view, °	4.7 × 3.5
Linear field of view (H×V), m@100m	8.2 × 6.2
Optical magnification, ×	5.5 ~ 22.0
Digital Zoom, × Eye	1 ~ 4
relief, mm	45
Dioptric correction, D	Maximum operating time *, h
Detection range, m	External power supply
Display Specifications	
Type	
Resolution, pixels	
Battery power	
Battery type	

Physical specifications	
Wi-Fi / APP	Supported (InfiRay outdoor)
Photography / Video Recording	Supported 32
Memory capacity, GB	IP67
Degree of IP	
Operating temperature, °C	-20 ~ +50
Weight, g	945
Dimensions, mm	383 × 86 × 75
Instrument body	Aluminium
Compatibility and compatibility	
Maximum weapon recoil force (Eo), Joules	6 000
Aiming point, MOA/CLICK	0.2 (5.6 mm@100 m)
Connection	Standard ring 30 mm

Functions

	-4 ~ +4
	300
	OLED 1440 × 1080
	Built-in 6600mAh battery 9 (t=22°C)
	5 V (Type C)

IR illumination**,

custom
850 / 940 (Optional)

IR power, w

r. 3

* Actual uptime depends on frequency of Wi-Fi use and video features.

** Product package

does not include

IR lighting.

Please select

850nm / 940nm

IR illumination

according to your

needs.

➤ The design and software of this product may be improved to enhance its features without notice to the

2 Contents of the package

- Tube NV thermal imaging for night vision
- Lampshade
- Clamp attachment to gun rail × 2
- USB-C cable
- Lens cleaning cloth
- Certificate of qualification

3 Description

The Tube NV series digital night vision riflescope is a dual-use day and night riflescope designed for outdoor hunting. It features a low-light moonlight chip that can faithfully recreate colors and details day and night. The Tube NV series device has a powerful battery with long operating time and can therefore be widely used for hunting, observation and positioning in low visibility.

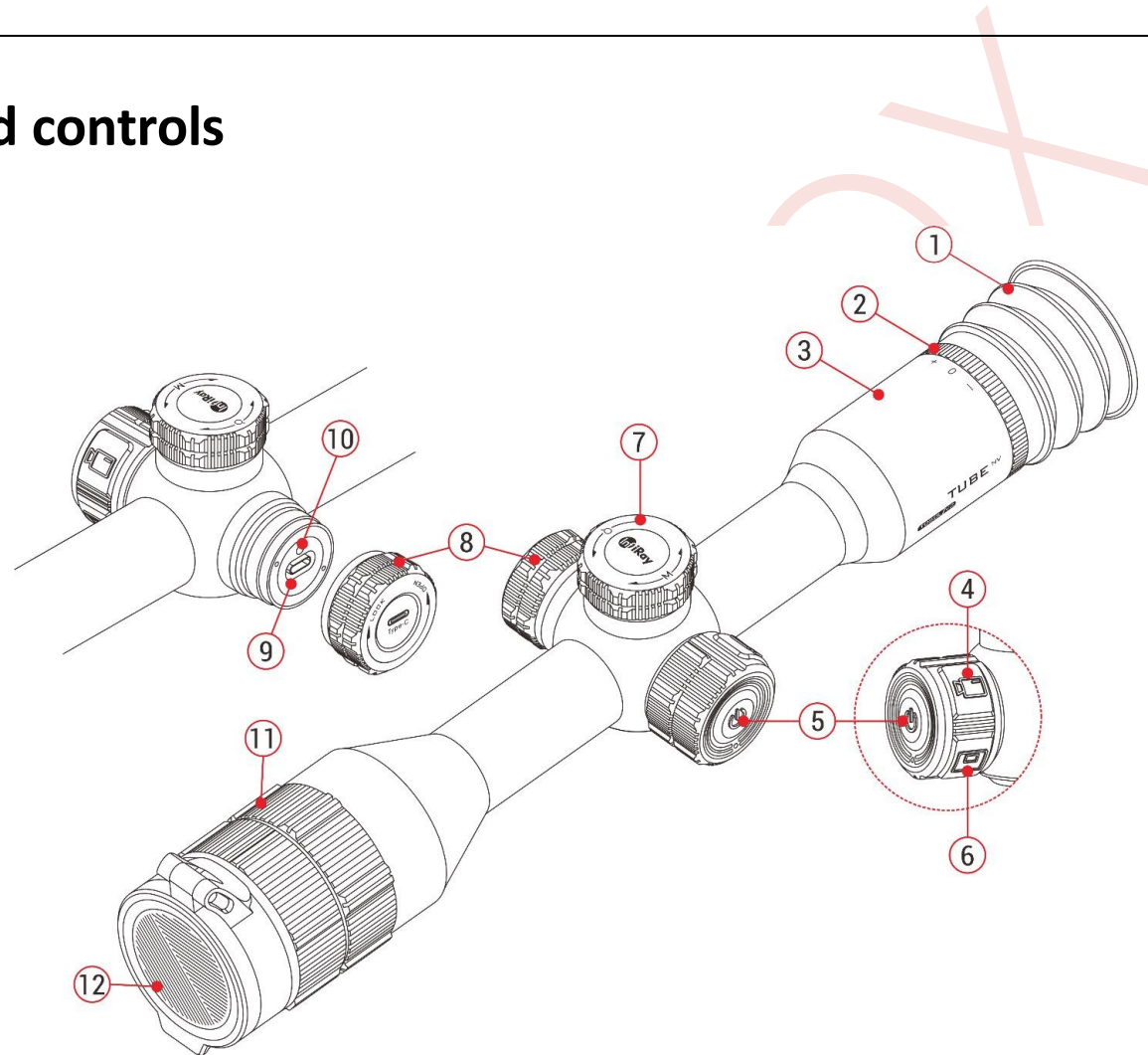
The riflescope is designed with a standard tube diameter of 30 mm to meet the requirements of the general clamp interface.

4 Product Features




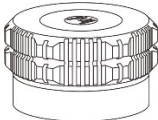
- OLED display with 1440×1080 resolution
- High precision, 1 click = 0.2 MOA with 70 mm lens
- High magnification, 5.5× with 70mm lens
- 4um Starlight low light sensor
- Powerful battery with long operating time
- Standard pipe diameter 30 mm
- Built-in memory card, supporting photo and video recording
- Built-in Wi-Fi module supporting app connectivity
- PIP support
- Convenient control interface

5 Components and controls

1. Lampshade
2. Eyepiece adjustment ring
3. Eyepiece
4. Video button
5. Power button
6. PIP button
7. Driver
8. USB cover
9. USB Type-C port
10. LED indicator
11. Lens focus ring
12. Lens cap



6 Description of buttons


Button	Default state	Short press	Long press	Turning
Power button 	Off	–	Switching on the device	–
	Home screen	Device standby mode	Shutting down the device	–
	Standby mode	Waking up the device		–
	Main menu interface	Return to the top menu without saving	–	–
Video button 	Home screen	Start / Stop video recording	Taking a photo	–
PIP button 	Home screen	Turning PIP on/off	Enable/disable laser rangefinder function when paired with LRF	–
Driver 	Home screen	Enter the local menu interface	Enter the main menu interface	Adjusting the magnification
	Local menu interface	Edit parameters	To save and return to the home screen	Switch menu options
	Main menu interface	Edit parameters / Enter submenu	Save and return to the top menu	Switch menu options
	Shot	Confirmation / Cancellation		Switching the shooting option / Shifting the position of the aiming cross: Clockwise: move left/down; Counterclockwise: move right / up

7 Power source

The Tube NV series uses a powerful battery system (built-in 6600 mAh rechargeable lithium-ion battery). Normal operating time of the dual power system can be up to 9 hours. Thermal imaging Tube NV can support USB power supply.

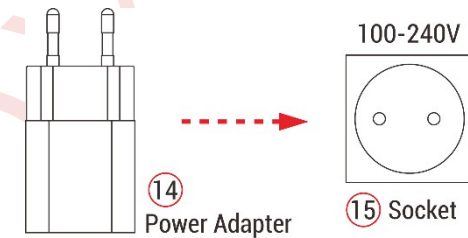
Please note that the battery should be fully charged before first use.

Charging


If the battery icon changes to , during use, it means that the battery charge level is low. Charge the battery in a timely manner to avoid reducing the life of the device due to excessive battery drain.

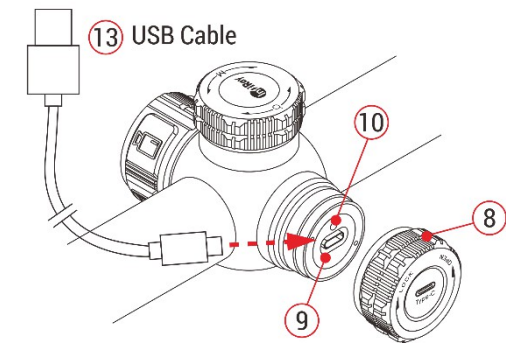
- Turn the USB cover (8) counterclockwise and remove it.
- Connect the end of the attached Type C data cable (13) to the Type C port (9) on the Tube NV Series device.

- Connect the other end of the data cable (13) to the USB port on the power adapter (14).



- Plug adapter (14) to Sockets 100-240 V (15) for charging.

- While charging, the charging icon  will appear on the battery icon



- The LED indicator (10) on the device is red. When the indicator (10) turns green, this means that charging has been completed.

Security measures

- When charging, always 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

warm environment. Wait 30 to 40 minutes for it to preheat.

- If the charger is modified or damaged, do not use it.
- 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.
- The device is equipped with a short circuit protection system, but conditions that can lead to a short circuit should be avoided.

8 Installing the device on the weapon

To ensure full functionality of the device, first mount the Tube NV Thermal Imager in the correct position on the gun.

The Tube NV Series Thermal Imaging uses a 30mm diameter tubular body design that is compatible with standard 30mm diameter holders, such as the included round holders.

When installing the Tube NV thermal imaging system on the rifle, follow

All rights reserved, content may not be copied or distributed in any form without written permission of the author.

the instructions of the mount manufacturer.



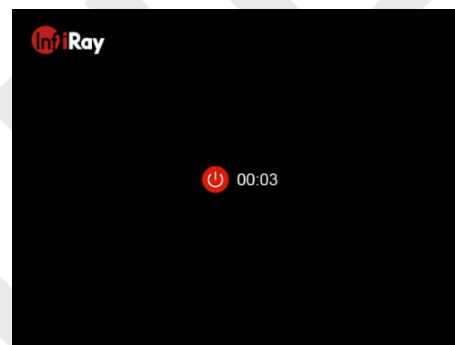
Specific tools such as a torque wrench may be required to control the torque to prevent damage to the thermowell body due to over tightening, and the recommended tightening torque must not exceed 2.5 nm.

- When mounting the Tube NV to the rifle, adjust the position of the Tube NV to achieve the correct eye relief as specified in the **Specifications**. Failure to follow this recommendation may result in injury to the shooter from the eyepiece while shooting.
- It is recommended to install the scope as low as possible on the gun, but keep it well away from the barrel or other hazardous components of the weapon.
- After assembly, however, before hunting with the Tube NV thermal imaging camera, first shoot the device. Refer to the **Shooting** instructions in this manual.
- When using thermal imaging in the dark, it is recommended to use a shade to prevent camouflage detection. The mounting of the shade on the eyepiece is done via a thread.

9 Operations

1. Open the lens cap (12).
2. Press and hold the power button (5) for 3 seconds to switch on the device. The home screen will then appear after 3 seconds.
3. Rotate the eyepiece adjustment ring (2) to adjust the resolution of the icon on the display.
4. Rotate the lens focus ring (11) to focus on the subject.
5. Turn the rotary pushbutton (7) on the home screen to set the digital zoom.
6. Short press the rotary pushbutton (7) on the home screen to enter the local menu and adjust the display brightness, image contrast, image mode, frame rate and shooting distance.
7. **Standby mode:**

From the home screen, briefly press the power button (5) to turn off the device in standby mode.



Press the power button (5) again to wake up the device.

- **Switching off:** after use, switch off the device by long pressing the button power (5) until the countdown icon changes to 0, then the display turns black and the device turns off.

10 Shot

The Tube NV series uses the "freeze" injection method. It is recommended to be shot in an environment within the operating range of the

Thermal imaging temperatures.

- Attach the thermal imaging camera with a clamp on your gun. See the **Installation** section for details.
- Select a target at a certain distance, e.g. 100 m, 200 m, etc.
- Aim the gun at the center of the target and shoot.
- Observe the position of the actual hit point, and if the hit point does not coincide with the aiming point (centre of the aiming cross), keep the aiming position stationary while pressing and holding the rotary pushbutton (7) to enter the main menu interface.

- In the main menu, select the spray profile (see **Main menu** -

Shot ).

- Turn the rotary pushbutton **(7)** to select Shooting and press the rotary pushbutton briefly.



(7) to enter the Shooting submenu (see **Main menu - Shooting**).

- Select the shooting distance a distance.



If there is no corresponding distance, press the Joystick **(7)** briefly to create it (see **Main menu - Shooting -**

Add a new shooting distance ).

- After setting the shooting distance, press the rotary pushbutton **(7)** to enter the submenu. Turn the rotary pushbutton **(7)** to select the Shooting function and press the **rotary pushbutton (7)** to enter the Shooting interface (see

Main menu - Shooting - Dist



The coordinate positions of the aiming cross (X-axis and Y-axis) are shown in the upper left corner of the display.

- Turn the **rotary pushbutton (7)** select the freeze function , then press the rotary pushbutton **(7) to freeze the image.**
- Turn the rotary pushbutton **(7)** to select the direction of movement along the X or Y coordinate, then press the rotary pushbutton **(7)** to confirm the selection, the selected option will then flash.
- Then move the deliberate cross by turning the rotary pushbutton **(7)**. Turn

clockwise to move the crosshairs

left or up, and rotate counterclockwise to move the intentional cross to the right or down.

- Press the rotary pushbutton **(7)** again to stop the flashing and exit the current option. Then repeat the above two steps to select

other directional options and move the aiming cross until the centre of the aiming cross coincides with the hit point.

- When the crosshairs are moved, a small white dot appears on the display to indicate the position of the crosshairs prior to movement.
- When the intentional cross matches the actual hit point, press and hold the rotary pushbutton **(7)** to save and return to the main menu interface.
- Take another shot - the point of impact should now coincide with the point of aim. If not, repeat the above operations until the hit point is consistent with the aim point.

Note

- After setting the firing position, you can toggle the **Firing Distance** options in the local menu.

11 Status bar



The status bar in the top menu of the panel displays information about

All rights reserved, content may not be copied or distributed in any form without written permission of the author.

current device operations. The following are listed from left to right:

1. Current picture mode (: day mode; : night mode)
2. Current shot profile and shot distance (e.g. 100m)
3. Current optical magnification (e.g. 4.0x)
4. Video activated by recoil (RAV is on, RAV is off)
5. Current display brightness (default level 3)
6. Wi-Fi (: Wi-Fi is on, : Wi-Fi is off)
7. Bluetooth (: Bluetooth is on, Bluetooth is off; Bluetooth is not connected)
8. Time (can be set in the main menu or synchronize time in the InfiRay Outdoor app)
9. Built-in battery power status

Note: The icons below show the level of battery life remaining.

Icon	Colour / Condition	Battery status
	Green	More than 40%
	Yellow	20 % - 40 %
	Red	Less than 20%, need to charge immediately
	Charging icon	Charging the battery with external power

12 Digital Zoom

The Tube NV Thermal Imaging allows you to quickly increase the base magnification from 4.0×/5.5× to 16.0×/22.0× and the image can be correspondingly magnified from 1× to 4×.

- From the home screen, turn the rotary pushbutton (7) in the direction of clockwise to zoom in, or counterclockwise to zoom out.
- Magnification options are as follows: 5.5×, 6.0×, 7.0×, 8.0×, 9.5×, 11.0×, 12.5×, 14.5×, 16.5×, 19.0×, 22.0×.
- The magnification is displayed on the top status bar in real time.

13 Photography and video recording

The Tube NV thermal imaging camera is equipped with 32 GB of built-in memory that supports taking photos and recording video of the target being observed. Images and video files will be named according to the time, so it is recommended to set the system date and time in the main menu (**Main Menu - Settings -**

Date/Time),



or synchronise the system date and time in **Settings**

InfiRay Outdoor, before taking photos and recording videos.

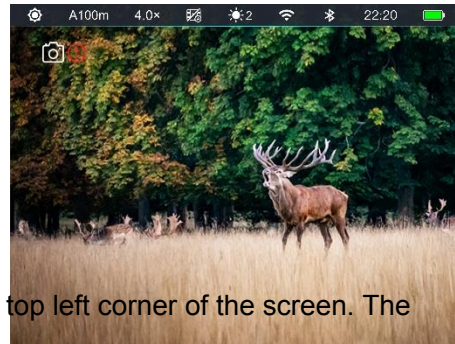
Video recording

- From the home screen, short press the video button **(4)** to start recording the video.
- In the upper right corner
The recording
icon appears
on the display
and a prompt
window
showing the
recording
time with the
time format
00:00:00
(hours:
minutes:
seconds).
- You can also take a photo during recording by long pressing video buttons **(4)**.

- Stop recording and save the video by briefly pressing the video button **(4)**.
- All videos and photos are stored in the built-in memory.

Photography

- On the home screen
Press and hold the video button **(4)** to take a photo.



- When taking a photo will be under the status bar the camera icon flashes in the top left corner of the screen. The photo is successfully taken when the icon disappears.

- Photos are stored in the built-in memory.
- When the exclamation mark icon appears on the right side of the camera icon, you will be prompted that there is insufficient memory space. Check and transfer videos and images to other media to free up space.

- You can still control the menu during video recording.

- Images and videos are saved to the built-in memory card in IMG_YYMMDD.jpg (for images) and VID_HHMMSS.mp4 (for videos). YYMMDD - hours/minutes/seconds.
- If a file is removed from the list, its number is not taken over

the second file.

- The number of files is limited by the capacity of the device's built-in memory space. It is recommended that you regularly check the available space on the memory card and transfer videos and images to other media to free up space on the memory card.

Memory access

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;
- There are different folders named by time in the format xxxx (year), xx (month), xx (day);
- The photos and videos recorded on a given day are saved in folders, e.g.: 2020-03-17_181530;
- Select the files or folders you want to copy or delete.

14 Local offer

The local menu can be used to quickly adjust basic settings for some common functions, including display brightness, image contrast, image mode, image frame rate and shooting distance.

- From the home screen, short press the rotary pushbutton (7) to enter the local menu interface.
- Then briefly turn the rotary pushbutton (7) to toggle the following function options and the background of the selected option icon will be highlighted:

- To adjust the **Display Brightness** (☀️): turn the rotary pushbutton (7)

to select the desired display brightness option, then press the rotary pushbutton (7) to confirm the option from level 1 to level 5.



- **Image contrast** (👁️): Turn the rotary pushbutton (7) to select image contrast option and press the rotary pushbutton (7) to adjust the image contrast from level 1 to level 5.

- **Picture mode** (🌙): Turn the rotary pushbutton (7) to select the picture mode option and press the rotary pushbutton (7) to switch the picture mode between day mode and night mode.

FPS

- (FPS): Rotate the rotary pushbutton (7) to select FPS and press the rotary pushbutton (7) to toggle between Auto FPS and 50 FPS.

In auto mode, the frame per second is 50 Hz, however in low light environments (visible and near infrared), it automatically switches to 25 Hz.



- **Distance of the shot** (🔫): Turn the rotary pushbutton (7) to select an option and press the rotary pushbutton (7) to toggle between the distance values stored for the current shot type (e.g. for a Type A firearm, only the distance values stored for Type A will be available).

- Press and hold the rotary pushbutton (7) to save your changes and return to home screen.


15 Main offer




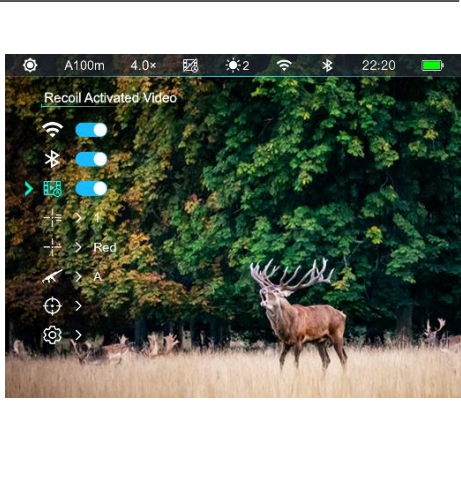
- From the home screen, press and hold the rotary pushbutton for 2 seconds (7) to enter the main menu interface.
- Turn the rotary pushbutton (7) to switch between the function options in the main menu, turn clockwise to you move down and counterclockwise you move up.
- The function options in the main menu are cyclical: when the cursor reaches the last option, continue turning the rotary pushbutton (7) and the cursor will move to the first option.
- Press the rotary pushbutton (7) to adjust the parameters of the current option or enter the sub-menu.




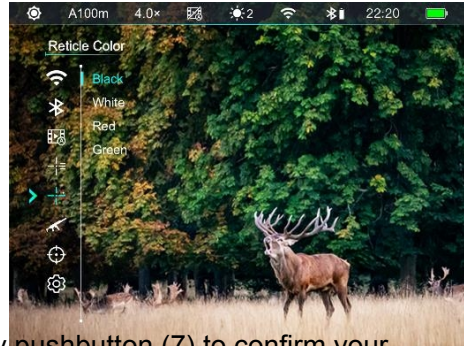
- The cursor position indicates the selected option and the selected icon changes from white to blue.
- The handling of secondary and tertiary offers is the same as above.
- In any menu interface, press and hold the rotary pushbutton (7) to save changes and return to the top menu interface. Press the power button (5) briefly to return to the top menu without saving.
- In the main menu interface, the device automatically returns to the home screen without saving anything, as long as you don't perform any operations within 1 minute.
- During continuous operation of the thermal imaging system when leaving the main the cursor stays at the position before termination. When you reboot the device and enter the main menu for the first time, the selected option remains at the first menu option.






Main menu functions and description





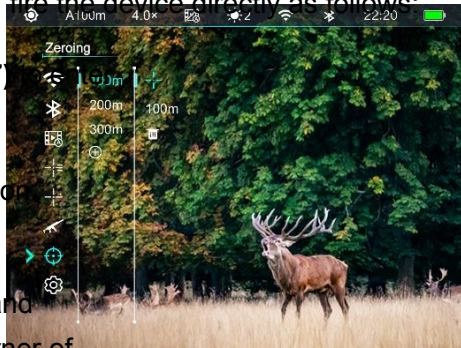
Switching Wi-Fi on/off

<p>Wi-Fi</p> 	<ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Turn the rotary pushbutton (7) to select the Wi-Fi function. ● Press the rotary pushbutton (7) to switch the Wi-Fi function on/off.
--	---

	<ul style="list-style-type: none"> ● When Wi-Fi is on, you will be prompted for 3 seconds to enter the password you s ● The password will only be displayed for the first 3 attempts. If the password is changed, it will no longer be displayed. ● The icon in the status bar changes accordingly when Wi-Fi is on or off. 	
<p>Bluetooth</p> 	<p>Switching Bluetooth on/off</p> <ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Turn the rotary pushbutton (7) to select the Bluetooth function. ● Press the rotary pushbutton (7) to switch the Bluetooth function on/off. ● When Bluetooth is turned on, the device automatically finds and connects to Bluetooth LRF devices. ● The Bluetooth status is displayed in the status bar. 	
<p>Video recoil activated (RAV)</p> 	<p>Turning the RAV function on/off</p> <ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Turn the rotary pushbutton (7) to select the recoil-activated video option. ● Press the rotary pushbutton (7) to switch the RAV function on/off. ● The icon in the status bar changes accordingly when the RAV is on or off. ● When the RAV function is enabled, the device will automatically record videos from 3 seconds before shooting to 2 minutes 57 seconds after shooting. 	





	<ul style="list-style-type: none"> ● A recording icon appears in the upper right corner of the display and a prompt window displays the recording time in 00:00:00 (hour: minute: second) format. ● The video is saved to the built-in storage. If continuous shooting occurs within 3 minutes, only one video is saved.
<p>Type of deliberate cross</p> 	<p>Select the type of intentional cross</p> <ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Turn the rotary pushbutton (7) to select the crosshair type function. ● Press the rotary pushbutton (7) briefly to enter the submenu of the cross type function. ● There are a total of 7 types to choose from. ● Turn the rotary pushbutton (7) to select the desired type and briefly press the rotary pushbutton (7) to confirm your selection and return to the main menu interface. ● The type of intentional cross will change when you switch the type selection. 
<p>The colour of the intentional cross</p> 	<p>Select the colour of the intentional cross</p> <ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Turn the rotary pushbutton (7) to select the crosshair colour function. ● Press the rotary pushbutton (7) briefly to enter the submenu of the crosshair colour function. ● There are 4 colours to choose from - black, white, red and green. ● Turn the rotary pushbutton (7) to select the desired colour and briefly press the rotary pushbutton (7) to confirm your selection and return to the main menu interface. 


	<p>main menu interface.</p> <ul style="list-style-type: none"> ● The colour of the intentional cross will change when you toggle the colour selection.
<p>Spray profile</p> 	<p>Select the spray profile</p> <ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Rotate the rotary pushbutton (7) to select the firing profile. ● Press the rotary pushbutton (7) to enter the spray profile submenu. ● Turn the rotary pushbutton (7) to select one of the five spraying profiles (A, B, C, D, E). ● Press the rotary pushbutton (7) to confirm the selection and return to the main menu. ● The name of the selected profile will change in the status bar. 
<p>Shot</p> 	<p>Before performing any priming operation, set the priming profile and priming distances. The Tube NV Series supports any shot distance between 1 and 999 m.</p> <ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Turn the rotary pushbutton (7) to select the shooting option. ● Press the rotary pushbutton (7) to enter the submenu for selecting or adding the shooting distance. The distance in the factory default setting is 100 m. ● Turn the rotary pushbutton (7) to select a distance or select the add icon:  to add a new distance. ● Press the rotary pushbutton (7) briefly to confirm the selection. 

<p>Add new shooting distance</p> 	<p>If you need to create a new shooting distance, you can do the following.</p> <ol style="list-style-type: none"> 1. Select Add and press the rotary pushbutton (7) briefly to add the new distance. 2. Above and below the number are two small triangle symbols . 3. Turn the rotary pushbutton (7) to set the numerical value of the current position from 0 to 9. 4. Press the rotary pushbutton (7) to switch between the hundreds, tens and units positions. 5. After setting, press and hold the rotary pushbutton (7) to save the settings and exit. <ul style="list-style-type: none"> ● Tube NV supports up to 10 types of shooting distances for each firing profile. 	
<p>Spraying</p> 	<p>If the firing distance is consistent with the preset target distance, fire the device directly as follows:</p> <ul style="list-style-type: none"> ● Select the distance and briefly press the rotary pushbutton (7) to the submenu. ● Select the spray option and briefly press the rotary pushbutton (7) to enter the firing interface. ● The X-axis and Y-axis coordinates of the intentional cross and the image freeze function are displayed in the upper left corner of the screen. ● Keep the aiming position stationary, then rotate the rotary pushbutton (7) to select the freeze icon 	


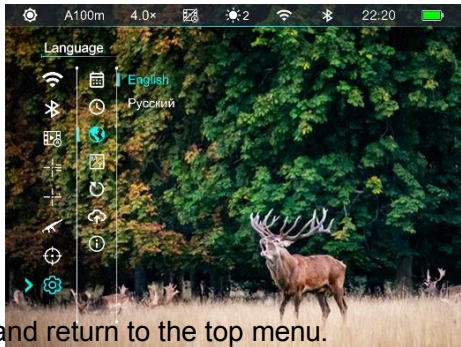


		<p>and then press the rotary pushbutton (7) to freeze the image.</p> <ul style="list-style-type: none"> ● Move the crosshair position by turning or pressing the dial (7) until the centre of the crosshair of the cross is aligned with the point. <p>For details, see the chapter Shooting.</p> <ul style="list-style-type: none"> ● When the intentional cross matches the actual hit point, press and hold the rotary pushbutton (7) to save the current position of the intentional cross and return to the main menu interface.
<p>Reset the shooting distance</p> <p>000</p>		<p>Adjusting the firing distance</p> <ul style="list-style-type: none"> ● Select the distance and enter the submenu by briefly pressing the rotary pushbutton (7). ● Turn the rotary pushbutton (7) to select the range setting. ● Press the rotary pushbutton (7) briefly to activate the function. <p>Reset the firing distance, then two small triangle symbols appear above and below the number.</p> <ul style="list-style-type: none"> ● Turn the rotary pushbutton (7) to set the numeric value current position from 0 to 9. ● Press of the rotary pushbutton (7) you can switch between the hundreds, tens and units positions. ● After setting, press and hold the rotary pushbutton (7) to save the settings and exit. The cursor will




		<p>will return to the shot option and the shot distance will change accordingly.</p> <ul style="list-style-type: none"> ● In addition, the status bar is synchronously updated to the new firing distance.
	<p>Remove the shooting distance</p> 	<p>If you need to clear the shooting distance, you can proceed as follows:</p> <ul style="list-style-type: none"> ● Select the distance and enter the submenu by briefly pressing the rotary pushbutton (7). ● Turn the rotary pushbutton (7) to select the option to remove the distance of the shot. ● Press the rotary pushbutton (7) briefly to clear the current distance, returning to the top menu interface.
<p>Settings</p> 	<p>This function is used to set the date, time, language, unit of measure, factory reset, firmware update and display device information.</p> <ul style="list-style-type: none"> ● Press and hold the rotary pushbutton (7) to enter the main menu. ● Turn the rotary pushbutton (7) to select Settings. ● Press the rotary pushbutton (7) to enter the settings submenu. <p>This menu item allows you to configure the following settings.</p>	
	<p>Date</p> 	<p>Setting the system date</p> <ul style="list-style-type: none"> ● In the settings submenu, turn the rotary pushbutton (7) to select Date.





		<ul style="list-style-type: none"> ● Press the rotary pushbutton (7) briefly to activate the reset function data accompanied by two icons triangles that appear above and below the value. ● The date format is displayed as YY MM.DD. (year, month, day). ● Turn the rotary pushbutton (7) to set the correct year, month and day. ● Press the rotary pushbutton (7) to switch between year, month and day. ● After setting, press and hold the rotary pushbutton (7) to save the changes and exit the date setting function.
<p>Time</p> 		<p>Setting the system time</p> <ul style="list-style-type: none"> ● In the settings submenu, turn the rotary pushbutton (7) to select Date. ● The time format is displayed as HH:MM in 24-hour format (14:48). ● Press the rotary pushbutton (7) briefly to activate the function resetting data accompanied by two triangle icons that appear above and below the value. ● Turn the rotary pushbutton (7) to set the correct hour and a minute. ● Press the rotary pushbutton (7) to switch between the hour



		<p>and a minute.</p> <ul style="list-style-type: none"> ● After setting, press and hold the rotary pushbutton (7) to save the changes and exit the time reset function. ● After setting the time, the time in the status bar will change accordingly.
<p style="text-align: center;">Language</p> 		<p>Language selection</p> <ul style="list-style-type: none"> ● In the settings submenu, turn the rotary pushbutton (7) to select Language. ● Press the rotary pushbutton (7) to enter the language selection submenu. ● Turning of the rotary pushbutton (7) You can switch between English and Russian. ● Press the rotary pushbutton (7) to confirm the selection and return to the top menu. 
<p style="text-align: center;">Units of measurement</p> 		<p>Selection of units of measurement</p> <ul style="list-style-type: none"> ● In the settings submenu, turn the rotary pushbutton (7) to select Units of measure. ● Press the rotary pushbutton (7) to enter the unit setup submenu. ● Turn the rotary pushbutton (7) to switch between meter and yard. 

		<ul style="list-style-type: none"> ● Press the rotary pushbutton (7) to confirm the selection and go to the top menu interface. 												
	<p style="text-align: center;">Factory settings</p> 	<p>Restore factory settings</p> <ul style="list-style-type: none"> ● In the settings submenu, select "Factory Reset" by turning the rotary pushbutton (7). ● Press the rotary pushbutton (7) to enter the submenu. ● Turn the rotary pushbutton (7) to select "Yes" to restore the factory settings or "No" to cancel the operation. ● Press the rotary pushbutton (7) to confirm the selection. ● If Yes is selected, the device automatically restarts. ● If "No" is selected, the operation is cancelled and returns to the top menu. ● Selecting factory settings will restore the following functions to their default settings: <table border="0" style="width: 100%; margin-top: 10px;"> <tr> <td style="width: 50%;">- Picture mode: Day Mode</td> <td style="width: 50%;">- Wi-Fi: Off</td> </tr> <tr> <td>- Display brightness: level 3</td> <td>- Bluetooth: off</td> </tr> <tr> <td>- Image Contrast: Level 3</td> <td>- RAV: off</td> </tr> <tr> <td>- FPS: Automatic</td> <td>- Language.</td> </tr> <tr> <td>- Shooting distance: A100 m</td> <td>- Unit of measurement: m (metre)</td> </tr> <tr> <td>- Optics magnification: 4.0× / 5.5×</td> <td>- Memory: formatted</td> </tr> </table> 	- Picture mode: Day Mode	- Wi-Fi: Off	- Display brightness: level 3	- Bluetooth: off	- Image Contrast: Level 3	- RAV: off	- FPS: Automatic	- Language.	- Shooting distance: A100 m	- Unit of measurement: m (metre)	- Optics magnification: 4.0× / 5.5×	- Memory: formatted
- Picture mode: Day Mode	- Wi-Fi: Off													
- Display brightness: level 3	- Bluetooth: off													
- Image Contrast: Level 3	- RAV: off													
- FPS: Automatic	- Language.													
- Shooting distance: A100 m	- Unit of measurement: m (metre)													
- Optics magnification: 4.0× / 5.5×	- Memory: formatted													



<p style="text-align: center;">Firmware updates</p> 	<p>Firmware updates</p> <ul style="list-style-type: none"> ● In the settings submenu, turn the rotary pushbutton (7) and select "Firmware Update" - Firmware updates. ● Press the rotary pushbutton (3) briefly to enter the firmware update function submenu. ● Turn the rotary pushbutton (7) to select Yes or No and press the rotary pushbutton (7) to confirm the selection. ● If you select Yes, the update file will be automatically searched for, then update. ● For details on how to update, see Updating the firmware. ● Note: Before updating, make sure the power supply to the device is sufficient. 	
<p style="text-align: center;">Information</p> 	<p>View device information</p> <ul style="list-style-type: none"> ● In the submenu set by turning the rotary pushbutton (7), ● The relevant thermal imaging information is displayed by briefly pressing the rotary pushbutton (7). ● This item allows the user to see the following <i>information about the thermocouple: product model, GUI version, SYS Info, Boot version, FPGA, PN and SN number of the thermocouple, version hardware and FCC ID.</i> 	

- Press and hold the rotary pushbutton (7) to return to the top menu interface.

Laser calibration

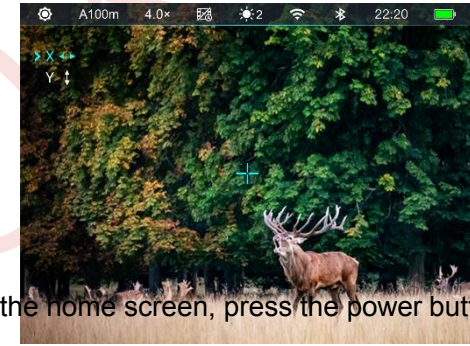


This function is displayed and activated only when the laser rangefinder module (ILR-1200-1) is connected. If the target position pointed by the laser pointer is not aligned with the center of the rangefinder cursor on the screen, the laser pointer cursor position must be calibrated using this function.

- First, make sure that the laser rangefinder is connected to the NV thermal imager.
- Press and hold the rotary pushbutton (7) to enter the main menu interface.
- Turn the rotary pushbutton (7) to select **Laser Calibration**.
- Press the rotary pushbutton (7) to enter the laser calibration interface, the laser indicator and the rangefinder cursor are automatically switched on.
- A deliberate cross will appear on the screen and the information below will be displayed in the top left corner:
 - X is the X axis (horizontal)
 - Y is the Y-axis (vertical)



- Let's assume that the red "x" in the picture represents the target position targeted by the laser sight (it is actually shown as a red dot).
- Press the rotary pushbutton **(7)** briefly to switch between X and Y.
- Turn the rotary pushbutton **(7)** to move the laser cursor until the centre of the the laser cursor aligned with the target position locked by the laser sight. Rotate clockwise to move left/down and counterclockwise to move right/up.
- After calibration, press and hold the rotary pushbutton **(7)** to save and return to the home screen, press the power button **(5)** to exit this calibration and terminate.



16 PIP function

Picture in Picture (PIP) provides a floating window independent of the main image. This window displays an image that is magnified 2x in a specific area centered on an intentional cross of the main image.



- From the home screen, press the PIP button **(6)** to turn on / turn off the PIP function.
- When PIP is on, a separate window appears at the top of the display at the same time as the main image.
- When the main image is enlarged by turning the rotary pushbutton **(7)**, the image displayed in the PIP window is enlarged accordingly.
- For example, if the magnification of the main image is 4x, the corresponding magnification of the image in the picture-in-picture is 8x.

Note

- Due to some factors, this feature is not available in some types of environments.


17 Laser rangefinder

(ILR-1200-1, supplied separately)

The Tube NV thermal imaging camera supports an external laser rangefinder module (ILR-1200-1), which is supplied separately.

For a detailed description of how to install and use the laser rangefinder module, please refer to the laser rangefinder manual in the laser rangefinder package.

- Turn on the Bluetooth function on Tube NV.
- Press and hold the power button **(5)** on the laser module to turn on the laser rangefinder module. The LED on the laser rangefinder module will flash.
- The laser rangefinder module then automatically connects to the device Tube NV.
- After successful connection, the LED on the laser module

of the rangefinder goes out and the Bluetooth icon on 

the right side of the status bar appears

battery icon, indicating that the Tube NV thermal imager is successfully connected to the laser rangefinder module.



- Then press and hold PIP button **(4)** to switch the laser rangefinder function on/off.
- The ILR-1200-1 supports a continuous distance measurement mode in which the distance is displayed in real time without of any operation.
- The distance values are displayed in the top right corner of the screen.
- When the distance value shows MAX, it means that the target the distance exceeded the maximum distance (999 m) of the laser rangefinder.
- Switch the unit of measure as instructed by Main Menu - Settings - Units of measure.
- During the changing distance, other functions are not affected,

such as the menu and other shortcut functions.


18 Wi-Fi

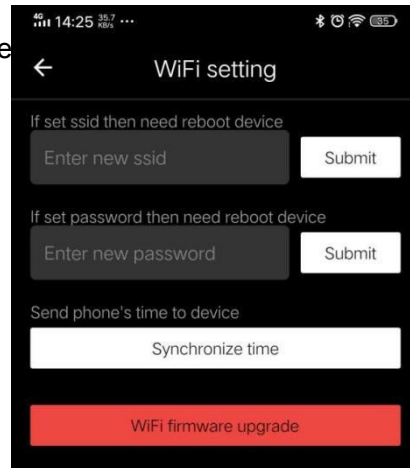
The Tube NV Series Thermal Imaging has a built-in Wi-Fi module. The device can connect wirelessly to a mobile device (laptop or smartphone) just via Wi-Fi.

- To activate the wireless module, enter the main menu long press the rotary pushbutton **(7)**.
- Turn the rotary pushbutton **(7)** to select **Wi-Fi**.
- Press the rotary pushbutton **(7)** briefly to switch the Wi-Fi module on/off.
- Once the Wi-Fi thermal imaging is turned on, look for a Wi-Fi signal on the mobile device called InfiRay_XXXXXX, where XXXXXX is the 6-bit serial a number composed of numbers and letters.
- Select Wi-Fi, enter your password and connect. The initial password is 12345678.
- When Wi-Fi is successfully connected, you can control the thermal imager via the mobile app.

To set a Wi-Fi name and password

The name and password of the Tube NV Series Wi-Fi device can be reset in the InfiRay Outdoor app.

- When connected to a mobile device find and click on the **Settings**  **InfiRay Outdoor** icon to enter the settings interface.
- In the text box, type and send the new Wi-Fi name (SSID) and password.
- To make the new name and password the device needs to be restarted.



Note

- Factory resetting your device will also restore the Wi-Fi name and password to the factory defaults.

19 Updates and InfiRay Outdoor

The Tube NV series thermocouples support **InfiRay Outdoor** technology, which allows the image from the thermocouple to be transmitted to a smartphone or tablet via Wi-Fi in real-time.

Detailed instructions for **InfiRay Outdoor** can be found on the official website www.infirayoutdoor.com.

The design of the thermal imaging system provides the possibility of software updates. Updates are possible via the **InfiRay Outdoor** app. It is also possible to download and update the software from the official website.

About InfiRay Outdoor

- Download the **InfiRay Outdoor** app on the official website or app store, or by scanning the QR code.
- Turn on the Wi-Fi thermal imaging function in the main menu.
- Open the **InfiRay Outdoor app** on your mobile device.
- Find and connect a Wi-Fi signal



with the name InfiRay_XXXXXXXX on a mobile device.

grease spots,

- After a successful connection, you will automatically be prompted to update.
Click "Now" to download the latest version immediately, click "Later" to update it later.
- **InfiRay Outdoor** automatically saves the last connected device.
So if the thermal imaging system has not connected to your mobile device but was previously connected to InfiRay Outdoor, you will be prompted to update, then the update will occur when you open **InfiRay Outdoor**. You can first download the update via mobile Wi-Fi, then complete the update by connecting the thermal imager to your mobile device.
- After the update is complete, the device automatically restarts.

20 Technical inspection

It is recommended to perform a technical check before each use of the thermal imaging system. Check the following:

- Appearance of the device (there should be no cracks on the body of the device).
- Condition of the lens and eyepiece (there should be no cracks,

dirt or other deposits).

- Condition of the rechargeable battery (should be fully charged beforehand) and electrical contact (no salting or oxidation).
- Electrical controls/buttons should be in working order.

Maintenance

21

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

- Wipe the outer surface of metal and plastic parts free of dust with a cotton cloth. Silicone lubricant can also be used for cleaning.
- Clean the electrical contacts and battery slots on the thermal imaging camera with a non-greasy organic solvent.
- Check the optics of the lens and eyepiece. If necessary, remove dirt and sand from the optics (ideally using the non-contact method). Cleaning of the outer part of the optics should be carried out with cleaning agents specifically designed for this purpose.

22 Troubleshooting

The following table lists all the faults that can occur when working with thermal imaging. Perform the recommended checks and steps for

troubleshooting in the order listed in the table. If faults occur that are not listed in the table, or if the fault cannot be repaired by yourself, return the equipment to the dealer or supplier for repair.

Glitch	Possible causes	Solution
Thermal imaging cannot be started	The battery is dead	Charge the battery
The device cannot be powered by external power supply	USB cable is damaged	Charge the battery
	External power supply is insufficient	If necessary, check the external power supply
The picture is too dark	Display brightness level is too low	Adjust the brightness of the display
The GUI icons are clear, but the pictures are blurry	Lens not in focus	Rotate the focus ring of the lens to adjust the focus
	Dust or condensation on the inner or outer optical surface of the lens	Wipe the outer optical surface with a soft cotton cloth. Allow the riflescope to dry by leaving it in a warm environment for 4 hours.
The position of the aiming cross shifts after the shot is fired.	The rifle scope or mount is not firmly attached	Check that the thermal imaging system is securely mounted. Ensure that the type and calibre of bullet you are using is consistent with that used to fire the thermal imager. If your thermal imaging camera was shot in the summer but is being used in winter (vice versa), the zero point may shift slightly.
Thermal imaging can't focus	Configuration error	Set up the thermal imager according to the Operations section.


		<p>Check the outer surface of the lens and eyepiece and wipe off any dust and frost if necessary.</p> <p>In cold weather, a special anti-fog coating can be applied (such as those used on glasses or car rear-view mirrors).</p>
The device cannot connect to a smartphone or tablet.	The Wi-Fi password is incorrect	Enter the correct password
	There are too many Wi-Fi signals around the device, which may cause interference	Move the device to an area with no or less signal Wi-Fi
Wi-Fi signals are lost or interrupted	Your smartphone or tablet is out of range of a strong Wi-Fi signal. Or the devices are and smartphone or tablet obstacles (for example, a concrete wall).	Move your device to a location where you can receive Wi-Fi signals.
Observed target disappears	Observe the target through the glass	Remove the glass from the field of view
The picture quality is poor or is reduced detection range	These problems can occur due to deteriorated outdoor conditions, e.g. snow, rain, fog, etc.	
If the device is used at low temperature, the image quality is worse than at normal temperature.	At temperatures above 0 °C, the temperature rise varies depending on the observed objects (environment and background) due to different thermal conductivity coefficients. As a result, high temperature contrast occurs and image quality is improved. At low temperatures, the observed targets (background) usually cool down to a similar temperature due to reduced temperature contrast. However, this is characteristic of thermal imaging.	

23 Legal and regulatory information

Frequency range of the wireless transmitter module:

WLAN: 2.412-2.472GHz

Wireless transmitter module power supply < 20dBm

 We, IRay Technology Co., Ltd., hereby declare,
that the Tube NV series radio equipment complies with
Directive 2014/53/EU and 2011/65/EU.

FCC Statement

FCC-ID: 2AYGT-2Q-00

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 and (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.

EMC class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection from harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions for use, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

A minimum distance of 0.00 cm must be maintained between the user's body and the handset, including the antenna, to meet RF exposure requirements.



IRay Technology Co., Ltd.