PULSAR

THERMION Thermal Imaging Riflescopes | OPERATING INSTRUCTIONS

ENGLISH / РУССКИЙ

1 Specifications

SKU#	76524	76525	76526	76542	76543
MODEL	XM30	XM38	XM50	XP38	XP50
MICROBOLOMETER					
Type			Uncooled		
Resolution (pixels)		320x240		640x480	
Pixel size (microns)		12		17	
Frame refresh rate (Hz)			50		
OPTICAL SPECIFICATIONS					
Lens (mm)	F30 F/1.25	F38 F/1.2	F50 F/1.2	F38 F/1.2	F50 F/1.2
Magnification (x)	3.5-14	4-16	5.5-22	1.5-12	2-16
Exit pupil distance (mm)	50	50	50	50	50
Angle of field of vision (horizontal), degrees	7.3	5.8	4.4	16.3	12.4
Eyepiece focusing range (dioptres)			-3/+5		
Lens focus ring type	unfocused		focused		
Maximum detection distance *, (m/y)	1300/1420	1700/1860	2300/2515	1350/1476	1800/1968
RETICLE					
Price per click (horizontal/vertical) (mm at 100m)	12/12	10/10	7/7	28/28	21/21
Aiming reticule range (horizontal/vertical) (mm at 100m)	2400/2400	2000/2000	1400/1400	5600/5600	4200/4200
DISPLAY					
Type			AMOLED		
Resolution (pixels)			1024x768		
OPERATING FEATURES					
Diameter of the riflescope body for the attaching of mounting rings (mm)			30		
Battery life (built-in APS3 and removable APS2) at temp. = 22 ° C, hours (Wi-Fi off)			7		
External power voltage			3–4.2V		
Battery type / Capacity / Rated Output Voltage		Li-Ion Battery Pack APS2 / 2000 mAh / DC 3.7V (removable)** APS3 / 3200 mAh / DC 3.7V (integral)			
External power supply			5V (USB)		
Maximum shock resistance on a rifle (Joules)			6000		
Maximum shock resistance on a smooth-bore weapon (Joules)			12		
Degree of protection: IP code (IEC60529)			IPX7		
Operating temperature (°C/°F)			-25 – +50 / -13 – +122		
Dimensions (LxWxH) (mm/inch)	385x78x74 / 15.16x3.07x2.91	395x78x72 / 15.55x3.07x2.83	407x78x80 / 16.02x3.07x3.15	407x78x80 / 16.02x3.07x3.15	407x78x80 / 16.02x3.07x3.15
Weight without removable battery (kg/oz)	0.75 / 26.45	0.75 / 26.45	0.9 / 31.75	0.9 / 31.75	0.9 / 31.75
VIDEO RECORDER					
Photo / video resolution (pixels)			1024x768		
Video / photo format			.mp4 / .jpg		
Amount of built-in memory			16 GB		
WI-FI CHANNEL					
Frequency			2.4 GHz		
Standard			802.11 b/g/n		

* Object of 'deer' type

** An APS3 battery may be used (available separately)

2 Description

THERMION thermal imaging riflescopes are designed for use on hunting firearms both at night-time and during the day in difficult weather conditions (fog, smog, rain), as well as where obstacles are present that impede the detection of a target (branches, tall grass, dense shrubs etc.). Unlike night-vision riflescopes that are based on electron-optical converters, thermal vision riflescopes do not require an external light source and are resistant to the high levels of light.

Areas of application: hunting, observation and orientation in conditions of limited visibility.

3 Key Features

- Extreme detection range
- High Definition image
- Variable Digital Zoom
- 12 μm Thermal Imaging Sensor (XM models)
- Recoil Rated up to .375 H&H, 12-Gauge and 9.3x64
- Mounts on Standard 30mm Scope Rings
- Instant Start-up
- Rugged, Reliable All-Metal Housing
- IPX7 Waterproof Rated
- Customizable Reticle Options
- Full-Color, HD AMOLED Display
- Video and Still-Photo Recording
- Picture-in-Picture
- Colour Palettes
- Stream Vision App Supported
- Upgradable Functional (ability to update riflescope software with the aid of the free Stream Vision app)
- User Friendly Controls
- B-Pack Mini Combined Power System
- Functional and ergonomic design
- Wide range of operating temperatures (-25 °C – +50°C / -13 – +122°F)

4 Other Functions and Modes

- Convenient user interface
- Stadiometer distance meter (for estimating the distance of an object)
- Built-in 3-axis accelerometer gyroscope (drift angle indicator)
- Three observation modes: forest, city and identification
- Three calibration modes: manual, semi-automatic and automatic
- Smooth digital ZOOM
- Large number of electronic markers
- Scalable markers (marker divisions vary in proportion to ZOOM)
- 5 zeroing profiles (10 distances in the profile)
- One shot zeroing function
- ZOOM-Zeroing fine zeroing function (reduction in cost per click when ZOOM is increased)
- Freeze-Zeroing function

- 8 Colour Palettes
- Defective sensor pixel removal function
- Display off function
- Wi-Fi Smartphone remote control and surveillance

Video recording
- Built-in video recorder
- 16 GB of internal memory
- Integration with iOS and Android devices
- YouTube Live video broadcasting and recording to the Internet via a smartphone and the Stream Vision app.

Battery Pack:
- Built-in APS3 3200 mAh battery
- Quick Change Li-Ion APS2 / APS3 batteries
- Ability to charge the built-in and external APS2 and APS3 batteries from the microUSB port

5 Units and Controls

Fig. 1
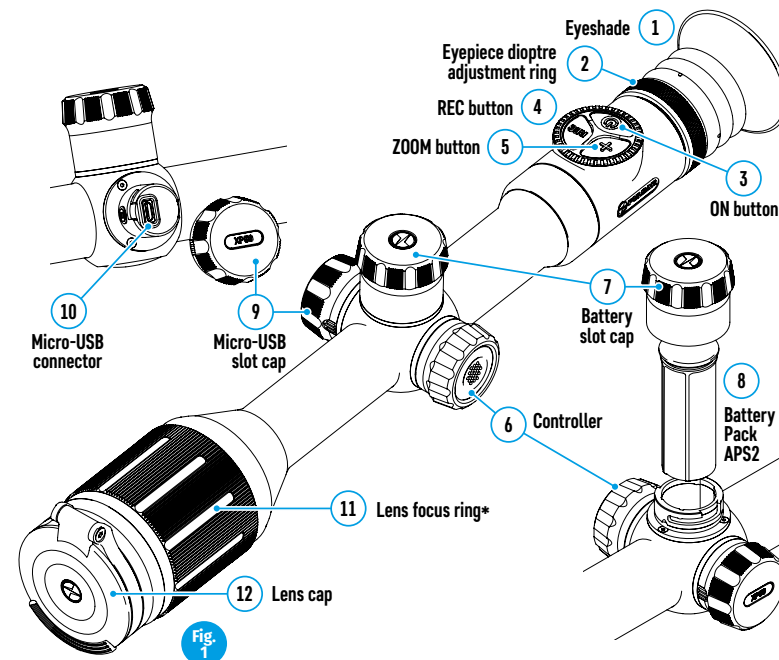
* except for Model XM30 (non-focusing lens)

6 Button Operation

Control mechanism	Condition / Operating Mode	First short press	Next short press	Long press	Rotation
ON button	Device is powered off	Power on the device	Device calibration	Power on the device	-
	Display off	Turn on display	Device calibration	Power off the device	-
	Device turned on, quick menu, main menu	Device calibration		Display off / device powered off	-
ZOOM button	Device turned on, quick menu, main menu	Change magnification (Zoom)		PiP on/off	-
REC button	Device turned on, quick menu, main menu, video mode	Begin video recording		Toggle video / photo mode	-
	Device turned on, quick menu, main menu, video recording on			Stop video recording	
	Device turned on, quick menu, main menu, photo mode	Photographing		Toggle video / photo mode	-
Controller	Device is powered on	Open quick menu	-	Open main menu	-
	Quick menu	Navigation		Exit quick menu	Change parameter
	Main menu	Confirm value, enter menu options		Exit menu options, exit main menu	Navigation through menu
	ZOOM	-		-	Smooth zoom change

7 Using the Rechargeable Battery

THERMION thermal imaging riflescopes are supplied with a built-in rechargeable lithium-ion rechargeable APS3 Battery Pack with a capacity of 3200 mAh and a removable rechargeable lithium-ion rechargeable APS2 Battery Pack with a capacity of 2000 mAh. The battery should be charged before first use.

Charging: .

• Open the microUSB cover **(9)** by turning it anticlockwise (Fig. 2).

• Attach the microUSB plug of the USB cable **(16)** to the microUSB connector **(10)** in the body of the riflescope.

• Attach the second microUSB plug on the USB cable **(16)** to the microUSB connector on the mains device **(17)**. Plug the device into a 100–240V power outlet **(18)**.

WARNING. When charging batteries via the microUSB connector **(10)**, the integral APS3 Battery Pack is the first to be charged. Once it is fully charged, the removeable APS2 Battery Pack begins charging. When the device is in use, power consumption occurs in reverse order.

The rechargeable APS2 lithium-ion Battery Pack may be recharged using the APS* charger.

• Insert the APS2 * battery **(8)** all the way along the guide into the APS charger slot (see Fig. 3) supplied with your device.

• Point A on the battery and Point B on the charger should be aligned.

18 Power outlet
17 Charger
16 USB cable
Fig. 2
10 Micro-USB connector
9 Micro-USB slot cap
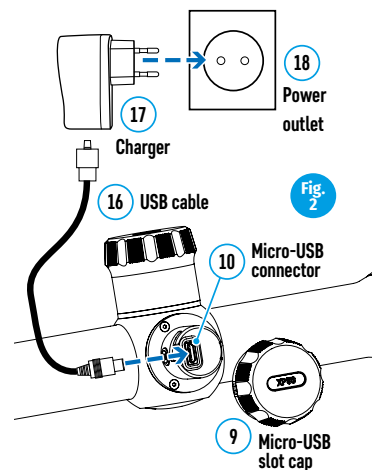
• Two batteries** can be charged at the same time – a second slot is provided for this.

• Attach the microUSB plug on the USB cable **(16)** to the microUSB connector on the mains device **(17)**. Plug the device into a 100–240V power outlet **(18)**.

• Attach the second plug of the microUSB cable to the socket **(14)** of the APS charger.

• The LED indicator **(15)** will display the battery charge status (see table).

* Included in the delivery package. An APS3 rechargeable battery may be used (available separately).

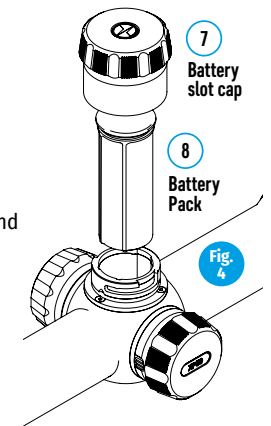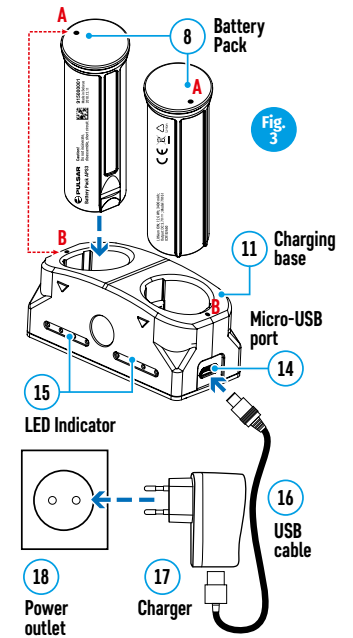| LED Indicator**	Battery charge status
●	Battery charge in the range of 0% to 10%. The charger is not connected to the mains.
☀	Battery charge in the range of 0% to 10%. The charger is connected to the mains.
●●●●	Battery defective. Battery should not be used.
●	Battery charge from 10% to 20%;
●●	Battery charge from 20% to 60%
●●●	Battery charge from 60% to 95%
●●●●	Battery completely charged. Can be disconnected from the charger.

** The LED indicator displays the current level of charge of the battery for 30 seconds when the APS charger is not plugged in to the mains. When the power is connected, the display shows the current status of the battery constantly, the LEDs additionally flickering to indicate the battery charging process.

Installation:

• Turn the battery slot cap **(7)** anticlockwise and remove.

• Install the battery **(8)** into the battery compartment along the special guides in the device casing.

• When properly installed, the battery is locked into the slot with a special clip.

• Replace the battery slot cap **(7)**, turning it clockwise.

Safety measures:

• When charging, always use the charger supplied with the package. The use of a different charger may cause irreparable damage to the battery or the charger, and may cause the battery to ignite.

• Do not leave the battery unattended during charging.

• Do not use the charger if it has been modified or damaged.

• The battery should be charged at a temperature of between 0 °C and +45 °C.

• Do not leave a charger with a battery connected to the mains for more than 24 hours after full charge.

• Do not expose the battery to high temperatures or naked flame.

• The battery is not intended to be immersed in water.

• The connecting of third-party devices with an energy consumption greater than permissible is not recommended.

• The battery is equipped with a short circuit protection system. However, situations that may lead to short circuiting should be avoided.

• Do not dismantle or deform the battery.

• Store the battery out of the reach of children.

A
8 Battery Pack
A
Fig. 3
11 Charging base
B
B
Micro-USB port
14
15
LED Indicator
16 USB cable
18 Power outlet
17 Charger

7 Battery slot cap
8 Battery Pack
Fig. 4

Switching and changing batteries:

Thermion devices are powered by 2 batteries: an integral APS3 battery pack and a removable APS2/APS3 battery pack.

- Where there are two batteries in the device, two battery icons are displayed in the status bar (1 – the built-in battery and 2 – the removable battery. The battery powering the device is displayed in blue, and the inactive battery in grey.

A		👁	A	5.5x	📱	12:00	1▢▬▬ 2▢▬▬

- If there is no removable battery in the device, the icon of the integral battery alone is displayed in blue.
- When both batteries are fully charged, the device is powered by the removable battery. When the level of the removable battery is low, the device will switch to operate from the internal battery.
- When charging batteries via the microUSB connector **(10)** (see Fig. 2), the internal battery is charged first. When the charge of the internal battery reaches 100%, the device switches to charging the removable battery. The battery level is displayed as a percentage above the icons in the status bar.
- The removable battery can be changed either when the device is turned off or when turned on and operating from the internal battery (the device will continue to function).

Attention! When a removable battery is taken from the device, and the device has been powered by it, the device will restart and switch to operating from the internal battery. When a removable battery with sufficient charge is installed, the device will automatically switch to operating from it.

8 External Power Supply

External power is supplied from an external source, such as a 5V Power Bank.

- Attach the external power source to the microUSB connector **(10)** on the device (Fig. 1).
- The riflescope will switch to functioning from an external power source, while the internal APS3 battery pack and the removable battery APS2 (or APS3 *) will be gradually recharged.
- An icon of a battery being charged ▢⚡▢ will appear in the status bar showing its charge as a percentage.
- When the external power supply is disconnected, the riflescope switches to the internal power supply without being powered off. Where there is no removable battery present, or where its charge is low, the device switches to the internal battery.

* Not included in the delivery package.

9 Operation

ATTENTION! The lens of the riflescope must not be pointed at any sources of intense energy, such as laser-emitting devices or the sun. This may damage the electronic components in the riflescope. Damage caused by failure to comply with the operating guidelines is not covered under warranty.

MOUNTING ON THE WEAPON:

The **THERMION** riflescope must be properly mounted on the rifle to ensure accurate shooting.

- The riflescope is fixed using a mount which is purchased separately. Use only high-quality mounts and rings that are designed specifically for your weapon. When fitting, follow the recommendations of the manufacturer on the procedure for mounting and use the appropriate tool.
- When fitting a riflescope, select its position on the weapon, which, with the correct (comfortable) positioning of the shooter over the weapon, ensures adherence to the distance specified in the technical characteristics (see the table of technical characteristics) between the riflescope and the eye (removal of the exit pupil). Failure to adhere to this recommendation may lead to the shooter being injured by parts of the eyepiece when firing.
- It is recommended that the scope be set as low as possible, and it should not come into contact with the barrel or receiver.
- In order to avoid clamping of the housing of the riflescope, the fastening ring screws must be tightened with a tightening torque of not more than 2.5 Nm. A torque wrench is recommended for adjusting the torque.
- Before using the riflescope on a hunt, follow the recommendations in the section titled **"Zeroing"**.

- In order to avoid the user's cover being blown when the riflescope is being used during the hours of darkness, the use of the eyeshade is recommended. The eyeshade is mounted on the eyepiece of the riflescope with the aid of built-in magnets.

10 Switching On and Adjusting an Image

- Remove the lens cover **(12)**.
- Turn the unit on with a short press of the **ON** button **(3)**.
- Adjust the resolution of the icons on the display by rotating the dioptre adjustment ring on the eyepiece **(2)**.
- To focus on the object under observation, rotate the lens focus ring **(11)**. *
- Select the desired calibration mode in the main menu: Manual **(M)**, Semi-automatic **(SA)** or Automatic **(A)**.
- Calibrate the image with a short press of the **ON** button **(3)** (where calibration mode **SA** or **M** has been selected). Close the lens cap **(12)** during manual calibration.
- Adjust the brightness and contrast of the display using the controller **(6)** (see the **"Quick Access Menu Functions"** section for details).
- Turn the unit off with a long press of the **ON** button **(3)**.

* except for Model XM30 (non-focusing lens).

11 Zeroing the Weapon

The riflescope is designed with the ability to shoot using the "one-shot" method or using the **"Freeze"** functions. Zeroing is recommended at a temperature close to the operating temperature of the riflescope.

- Set the weapon with the riflescope mounted on the aiming rest.
- Set the target at the target range.
- Adjust the riflescope according to the recommendations given in the **"Switching on and adjusting an image"** section
- Set the zeroing profile (see the **"Zeroing Profile"** item in the main menu 🗄)
- Point the gun at the centre of the target and shoot.
- If the entry point does not coincide with the aiming point (with the centre of the reticle on the riflescope), press and hold the controller button **(6)** to enter the main menu.
- Rotate the controller ring **(6)** and select the **"Zeroing"** submenu ⊕ . Confirm the selection with a short press of the controller button **(6)**.
- Set the value of the shooting distance (see the menu item **"Zeroing"** => submenu **"Add new distance"** ⊕).
- A short press of the controller button **(6)** accesses the additional menu.
- Select the icon by turning the controller ring **(6)** ⊣⊢ . Follow with a short press of the controller button **(6)**.
- An additional menu will appear on the screen for setting up the zeroing parameters .
- Reference cross hairs will appear in the centre of the display ✕ , with the X and Y coordinates in the upper right corner (see Fig.).
- Select the icon by turning the controller ring **(6)** ↰↱ . Follow with a short press of the controller button **(6)**.
- Holding the reticle at the aiming point, rotate the controller ring **(6)** to move the reference cross hairs until they are aligned with the target.

Attention! So as not to have to hold the reticle at the aiming point, you can use the **"Freeze"** function to freeze the shooting screen (see menu item **"Zeroing"** => submenu **"Distance"** => submenu **"Zeroing parameters"** => submenu **"Freeze"** ❄).
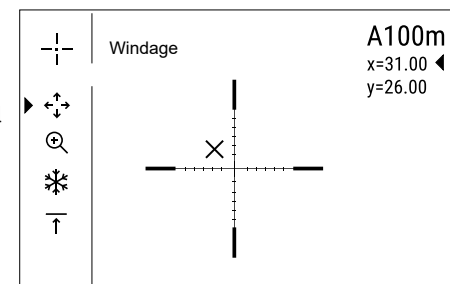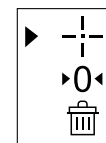
- A short press of the controller button **(6)** switches reference cross hairs direction from the horizontal to the vertical and vice versa.
- Press and hold the controller button **(6)** to save the new position. The message, "Aiming coordinates saved" will appear, confirming the successful completion of the operation.
- The submenu will then be exited. The reticle will be aligned with the point of impact.
- Exit the menu and fire another shot. The reticle and point of impact should now coincide.

12 "Smart Reticle" Function

When the digital zoom is changed, the reticle that is displayed on the display is scaled, i.e. its view will change (increase or decrease) in proportion to the variable magnification. This allows the use of distance reticles with any digital zoom.

13 Calibrating the Sensor

Calibration enables the microbolometer temperature background to be equalised and defects in the image (such as vertical lines, phantom images etc.) to be eliminated.

There are three calibration modes: manual **(M)**, semi-automatic **(SA)** and automatic **(A)**.

Select the required mode in the **"Calibration"** section .

- M mode (manual). Secure the lens cap and briefly press the **ON** button **(3)**. After completing the calibration process, remove the lens cap.
- SA mode (semi-automatic). Calibration is engaged by a brief press of the **ON** button **(3)**. The lens cap need not be secured (the sensor is closed by an internal shutter).
- A Mode (automatic) The riflescope is calibrated autonomously in accordance with the software algorithm. The lens cap need not be secured (the sensor is closed by an internal shutter). In this mode, the riflescope may be calibrated by the user with the **ON** button **(3)** (in semi-automatic mode).

14 Discrete Digital Zoom

The riflescope's functionality offers the possibility of quickly increasing its base multiplicity (see the table of technical properties in the Enlargement bar) by a factor of 2 or 4 (x8 for XP models), as well as return to base magnification.

- Adjust the basic riflescope magnification accordingly by pressing the **ZOOM** button **(5)**.
- A smooth digital zoom from a given basic riflescope magnification is achieved by rotating the controller ring **(6)**.

15 Quick Access Menu Functions

The basic settings (brightness and contrast adjustment, use of the smooth digital zoom function, stadiametric rangefinder and information on the current profile and distance) are changed via the Quick Access Menu.
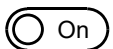
- Entry to the Quick Access Menu is through a short press of the controller button **(6)**.
- A short press of the controller button **(6)** enables you to switch between functions.
- **Brightness** – rotate the controller ring to alter the display brightness value from 00 to 20.
- **Contrast** – rotate the controller ring to alter the display contrast value from 00 to 20.
- **A100** – information on the current profile and the distance at which the aim was calculated out in this profile (for example, in profile A the distance of adjustment is 100m). This information is always displayed in the status bar. Rotate the controller ring **(6)** to switch between the shooting distances in the set profile. This function is available when there are two or more distances in the profile.
- Stadiametric Rangefinder – change the distance between special marks to determine the distance to the observed object by rotating the controller ring **(6)** (see the Stadiametric Rangefinder section for more information on the rangefinder).
- To exit the menu, press and hold down the controller button **(6)**, or wait 10 seconds for automatic exit.

16 Main Menu Functions

- Enter the main menu with a long press of the controller button **(6)**.
- Rotate the controller ring **(6)** to navigate through the main menu items.
- Scroll to navigate the main menu. When the last item on the first tab is reached, navigation moves to the first item of the second tab.
- Sub-items in the main menu are opened with one short press of the controller button **(6)**.
- To exit a sub-item in the main menu, press and hold down the controller button **(6)**.
- Automatic exit from the main menu occurs after 10 seconds of inactivity.
- When exiting the menu, the cursor ▶ location is remembered only for the duration of the one working session (i.e. until the riflescope is powered off). The next time the device is powered on and the main menu is accessed, the cursor will be at the first item on the menu.

General view of the menu:

Tab 1
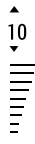
Menu ●●●	Zeroing profile
▶ 🔲 ····· A	
┼ >	
⌄ ·····	
☀ ····· 10	
🛜 ····· ◯ On	
◆ ····· Automatic	
⊕ >	

Tab 2

Menu ●●●	Color modes
▶ 🎨 ····· White hot	
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5
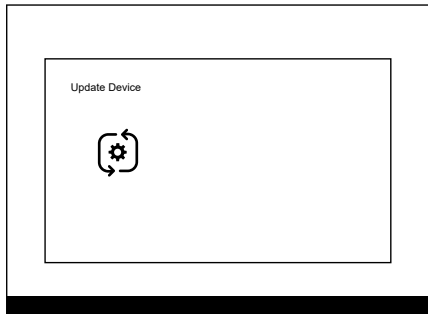
17 Menu Structure and Description

MENU ITEM	SUBMENU
Zeroing Profile	This item in the main menu allows you to select and use one of five profiles (A, B, C, D or E). Each profile includes the following parameters:
	1. A set of distances with zeroing coordinates for each.
	2. Reticle colour
	3. Reticle type
	Different profiles can be used when using the riflescope on different firearms or when shooting with different cartridges.
	• Press and hold the controller button **(6)** to enter the main menu.
	• A short press of the controller button **(6)** opens the **Zeroing Profile** item in the main menu.
	• Open the **Zeroing Profile** submenu with a short press of the controller button **(6)**.
	• Select one of the zeroing profiles (A, B, C, D or E) by rotating the controller ring **(6).**
	• Confirm your selection with a short press of the controller button **(6)**.
	• The name of the selected profile appears in the status bar in the bottom half of the display.

Reticle Setup	This item in the main menu allows you to select the configuration, colour and brightness of the reticle.
	• Press and hold the controller button **(6)** to enter the main menu.
	• Rotate the controller ring **(6)** to select the **Reticle Setup** item in the main menu.
	• With a short press of the controller button **(6)**, opens the **Reticle Setup** submenu.

	Reticle Type	• Rotate the controller ring **(6)** to select the **Reticle Type** item in the submenu.
		• With a short press of the controller button **(6)** open the **Reticle Type** submenu.
		• Rotate the controller ring **(6)** to select the desired Reticle configuration from the list that appears. Moving the cursor through the list will preview the Reticles on the display.
		• Confirm your selection with a short press of the controller button **(6)**.

	Reticle Colour	• Rotate the controller ring **(6)** to select the **Reticle Colour** item in the submenu.
		• With a short press of the controller button **(6)** open the **Reticle Colour** submenu.
		• Turn the controller ring **(6)** to select one of the colour options for the Reticle:
		– **Black/Red**
		– **White/Red**
		– **Black/Green**
		– **White/Green**
		– **Red**
		– **Green**
		– **Yellow**
		– **Blue**
		– **Orange**
		• Confirm your selection with a short press of the controller button **(6)**.

	Reticle Brightness	• Rotate the controller ring **(6)** to select the **Reticle Brightness** item in the submenu.
		• With a short press of the controller button **(6)** open the **Reticle Brightness** submenu.
		• Rotate the controller ring **(6)** to set the desired brightness level (from 1 to 10).
		• Confirm your selection with a short press of the controller button **(6)**.

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MENU ITEM	SUBMENU
Mode ⌣	**Selection of observation mode** The thermal imager has three automatic operating modes. Each of these modes includes an optimum combination of parameters (brightness, contrast, intensity etc.) for ensuring the best image quality under any given observation conditions. • Press and hold the controller button **(6)** to enter the main menu. • Rotate the controller ring **(6)** to select the **Mode** item in the main menu. • With a short press of the controller button **(6)** open the **Mode** submenu. • Rotate the controller ring **(6)** to select one of the modes: Rocks, Forest, Identification. • Confirm your selection with a short press of the controller button **(6)**.
	Rocks ⛰ **High Contrast Mode** This is the optimum mode for observing wildlife against a background of rocks and soil in an upland situation.
	Forest 🌲 **Low Contrast Mode** This is the optimum mode for observing wildlife against a background of vegetation.
	Identification 👁 A universal mode for application under various observation conditions.
Icon Brightness 🔆	**Adjusting the brightness level of icons on the display.** • Press and hold the controller button **(6)** to enter the main menu. • Rotate the controller ring **(6)** to select the **Icon Brightness** item in the submenu. • A short press of the controller button **(6)** opens the **Icon Brightness** submenu. • Rotate the controller ring **(6)** to set the desired brightness level (from 1 to 10). • Confirm your selection with a short press of the controller button **(6)**. 10
Wi-Fi activation 📶	**Switching Wi-Fi on/off** • Press and hold the controller button **(6)** to enter the main menu. • Rotate the controller ring **(6)** to select the **Wi-Fi on** item in the main menu. • **Switch on Wi-Fi** with a short press of the controller button **(6)**. 📶 --- ◯ On • **Switch off Wi-Fi** with a short press of the controller button **(6)**. 📶 --- Off ◯
Calibration Mode	**Selection of calibration mode** There are three calibration modes: manual, semi-automatic and automatic. The selected calibration mode is displayed in the status bar (See Section 18 **"Status Bar"**). • Press and hold the controller button **(6)** to enter the main menu. • Rotate the controller ring **(6)** to select the **Calibration Mode** item in the main menu. • With a short press of the controller button **(6)** open the **Calibration Mode** submenu. • Rotate the controller ring **(6)** to select one of the calibration modes described below. • A short press of the controller button **(6)** confirms the selection.
	Automatic (A) Calibration requirements in the automatic mode are determined programmatically, with the calibration process being started automatically.
	Semi-automatic (SA) (PA) The user independently sets the calibration requirements (according to the image being observed).
	Manual (M) (P) Manual calibration. Close the lens cap before beginning calibration.

MENU ITEM	SUBMENU	
Zeroing ⊕	**Adding a new distance** ⊕	In order to zero the riflescope, you must initially add a target distance ranging from 1 to 910 metres (955 yards). • Press and hold the controller button **(6)** to enter the main menu. • Rotate the controller ring to select a menu item ⊕ and enter it with a short press of the controller button. • Briefly press the controller button to enter the **"Add a new distance"** ⊕ submenu. • Turn the controller ring to select a value for each digit of the distance. A short press the controller button toggles the digits. ⊕ │ 15**0** m ▲ • After setting the desired distance, press and hold the controller button to save it. • The first distance set becomes the primary distance. This is indicated by the symbol ▸()◂ to the right of the distance value. **Note:** the maximum number of zeroing distances is ten for each profile.
	Working with distances 100m ┅ ▸()◂ 200m ┅ +7.0 ⊕	• Press and hold the controller button **(6)** to enter the main menu. • Rotate the controller ring **(6)** to select an item in the **"Zeroing"** menu ⊕ and enter it with a short press of the controller button **(6)**. The distances for which the zeroing was made will be displayed. • Values indicated to the right of the distance values (for example, +7.0), refer to the number of clicks on the Y axis, by which the position of the reticle at the other distances differs from the position of the reticle at the primary distance.
	Changing zeroing parameters ╌┆╌	• To edit zeroing parameters of any distance, rotate the controller ring **(6)** to select the required distance, followed with a short press • Follow with a short press on **"Zeroing parameters"** icon ╌┆╌ • The zeroing screen will appear for changing the parameters.
		Horizontal/ vertical correction ↔↕ — The **Horizontal/vertical correction** additional menu option enables you to adjust the reticle position. See the section **"Zeroing the weapon"** for a detailed description of the reticle correction.
		Magnification ⊕ — Additional Menu Item **"Magnification"** enables the digital zoom of the riflescope to be increased during zeroing, which reduces the click cost. This improves the accuracy of zeroing. • Rotate the controller ring **(6)** to select the **"Magnification"** ⊕ icon and briefly press on it • Rotate the controller ring **(6)** to select the digital zoom value (for example, x4). • A short press of the control button **(6)** confirms the selection.
		"Freeze" function zeroing ❄ — **A feature of the function is that, unlike zeroing with one shot, it is not necessary to hold the riflescope at the aiming point!** • Rotate the controller ring **(6)** to select the **"Freeze"** ❄ icon and briefly press on it • A photograph of the display will be taken (a "freezing" of the image), and an icon will appear on the display ❄. • Make any reticle position adjustments and press and hold the controller button **(6)** to save the new reticle position. • The zeroing screen will be exited and the reticle will be aligned with the point of impact. See more at the section **"Zeroing the weapon"**.
		Changing distance name ↑ — This submenu enables you to change the name of the current distance. • Rotate the controller ring **(6)** to select the "**Changing distance name**" icon ↑ and briefly press on it • Turn the controller ring **(6)** to select a value for each digit. Press the controller button **(6)** to toggle through the digits. • Press and hold the controller button **(6)** to confirm the selection.
	Changing primary distance ▸()◂	• To change any non-primary distance into primary, rotate the controller ring **(6)** to select the required distance, followed with a short press • Rotate the controller ring **(6)** to select the **"Change primary distance"** icon ▸()◂ • Follow with a short press of the controller button **(6)**. • The result of confirming this change of the primary distance is shown as an icon ▸()◂ opposite the selected distance. • There will also be a recalculation in clicks of the differences of other distances from the new primary distance.
	Deleting created distance 🗑	• To delete any distance, rotate the controller ring **(6)** to select the required distance, followed with a short press • Rotate the controller ring **(6)** to select the the **"Delete distance"** icon 🗑. • Follow with a short press of the controller button **(6)**. • Select "yes" in the window that appears to delete this distance. Select "no" to cancel the deletion. **Attention!** When a primary distance is deleted, the new default primary distance will be the one that is first in the list.

MENU ITEM	SUBMENU

Colour Palettes

The default display mode for an observed image is 'Hot White'. The 'Colour Palettes' menu item allows you to select an alternative palette:
- Press and hold the controller button **(6)** to enter the menu.
- Select the **"Colour Palettes"** option.
- With a short press of the controller button **(6)** open the **Colour Palettes** submenu.
- Rotate the controller ring **(6)** to select one of the palettes described below:
  - **White Hot** – A black and white palette (cold temperature corresponds to black, and hot temperature to white).
  - **Black Hot -** A black and white palette (cold temperature corresponds to white, and hot temperature to black).
  - **Red Hot**
  - **Red Monochrome**
  - **Rainbow**
  - **Ultramarine**
  - **Violet**
  - **Sepia**
- A short press of the control button **(6)** confirms the selection.

Attention! The device does not measure the temperature of objects being observed. The image is formed on the basis of the difference in temperature of the objects.

General Settings

This menu item allows you to program the following settings:

Language
- Enter the **"Language"** submenu with a short press of the controller button **(6)**.
- Rotate the controller ring **(6)** to select one of the available interface languages: English, French, German, Spanish or Russian.
- Confirm your selection with a short press of the controller button **(6)**.
- To save your choice and exit the submenu, press and hold down the controller button **(6)**.

Date
- Enter the **"Date"** submenu with a short press of the controller button **(6)**. The date appears in dd/mm/yyyy format.
- Rotate the controller ring **(6)** to select the desired year, month, and date. Short presses of the controller button **(6)** will toggle through the digits.
- To save your chosen date and exit the submenu, press and hold down the controller button **(6)**.

Time
- Enter the **"Time"** submenu with a short press of the controller button **(6)**.
- Select the time format (24-hour clock or AM/PM) by rotating the controller ring **(6).**
- Press the controller button **(6)** to move to the hour setting.
- Select the hour value by rotating the controller ring **(6)**.
- Press the controller button **(6)** to move to the minute setting.
- Select the minute value by rotating the controller ring **(6)**.
- To save your chosen time and exit the submenu, press and hold down the controller button **(6)**.

Units of Measurement
- Enter the **"M/Y"** submenu with a short press of the controller button **(6)**.
- Rotate the controller ring **(6)** to select the desired unit of measurement – metres or yards, and press the controller button **(6)**.
- Return to the submenu takes place automatically.

Default Settings
- Enter the 'Default Settings' submenu with a short press of the controller button **(6)**.
- Select the 'YES' option to reset to factory settings or 'NO' to cancel by rotating the controller ring **(6).**
- Confirm your selection with a short press of the controller button **(6)**.
- If the 'YES' option has been selected, the message 'Do you want to return to default settings?' will appear together with options 'YES' and 'NO'. Select 'YES' to format the memory card.
- If the 'NO' option has been selected, formatting will be cancelled and the submenu will reappear.

The following settings will be restored to their factory state before being set by the user:
- Operating mode – video
- Mode – Rocks
- Calibration mode – automatic
- Language – English
- Wi-Fi – off (default password)
- Magnification – original value
- PiP – off
- Colour palette – Hot White
- Unit of measurement – metres
- Weapon block – on
- Weapon profile – A
- Reticle selection from riflescope memory – 1

Attention! When restoring default settings, the date, time, custom pixel map, as well as the profile data entered by the user are saved.

MENU ITEM	SUBMENU	
General Settings ⚙	**Factory Settings** 🔄	**Attention!** Implemented in **THERMION** riflescopes is a function to restore software to factory settings. To restore software to factory settings: • Turn off the riflescope. • With the riflescope switched off, press and hold together the **ZOOM (5)** and **REC (4)** buttons and, without releasing these buttons, switch the riflescope on with the **ON (3)** button and wait until the "Update Device" message appears. • Release the buttons on the riflescope. • The riflescope will automatically revert to factory software settings within 3 minutes and will then reboot.

Update Device

	Formatting the Memory Card 🗑	This function enables the device's Flash Card (memory card) to be formatted (all files to be deleted from its memory). • Enter the **"Memory Card Formatting"** submenu 🗑 with a short press of the controller button **(6)**. • By rotating the controller ring **(6)** select the 'YES' option to reset to format the memory card or 'NO' to return to the submenu. • Confirm your choice by pressing the controller button **(6)**. If the 'YES' option has been selected, the message 'Format the Memory Card?' will appear together with options 'YES' and 'NO'. Select 'YES' to format the memory card. • The message 'Formatting memory card' means that formatting is in progress. • The message 'Formatting completed' means that formatting is completed. • If the 'NO' option has been selected, formatting will be cancelled and the submenu will reappear.
Wi-Fi Settings 📶		This option enables you to configure the device to operate on a Wi-Fi network.
	Setting a password PAS	This function enables you to set a password to access the device from an external device. This password is used when linking an external device (e.g. a smartphone) to the device. • Press the controller button **(6)** to enter the **"Wi-Fi"** submenu. • The default password – 12345678 – will appear on the screen. • Set the chosen password by rotating the controller ring **(6)**. Rotate the controller ring **(6)** to move through the digits. • Press and hold down the controller button **(6)** to save the password and exit the submenu.
	Setting Access Levels 👥	This sub-function enables you to configure the appropriate level of access to your device made available via **Stream Vision** app. • **Owner level.** A **Stream Vision** user has full access to all the device's functions. • **Guest level.** A **Stream Vision** user is only able to view video footage from the device in real time. • Press and hold the controller button **(6)** to enter the main menu. • A short press of the controller button **(6)** opens the submenu. • Select the access level by rotating the controller ring **(6)**. • To save your choice and exit the submenu, press and hold down the controller button **(6)**.
Accelerometer (•)		This menu item includes two options: **Autoshutdown** and **Side Incline**.
	Autoshutdown ⏻	This option enables activation the automatic shutdown of the riflescope when in a non-working position (tilted up or down at an angle of more than 70°, or right or left at an angle of more than 30°). In this event, the controls (buttons, controller) become inactive. • Press and hold the controller button **(6)** to enter the main menu. • By rotating the controller ring **(6)** select the **"Accelerometer"** submenu and confirm the selection with a short press of the controller **(6)**. • Using the controller ring **(6)** select **"Autoshutdown"**. • A short press of the controller button **(6)** opens the submenu. • Rotate the controller ring **(6)** to select the time period during which the riflescope in the idle position will automatically turn off (1 min, 3 mins, 5 mins), or select "Off" if you want to deactivate the automatic shutdown function. • Confirm your selection with a short press of the controller button **(6)**. **Note:** an icon ⏻ and the selected shutdown time in the 1 min format are displayed in the status bar when the automatic riflescope deactivation function is active.

MENU ITEM	SUBMENU	

Accelerometer ((•))	**Side Incline** → ←	This option allows you to enable or disable the horizontal (side) incline display function of the weapon. The incline indication is displayed by "sector" arrows to the right and left of the reticle. The arrows indicate the direction in which the weapon should be tilted to eliminate the incline.
		There are three incline display modes:
		  – 5°-10° – one sector arrow;
		  – 10°-20° – two sector arrow;
		  – >20° – three sector arrow; (see Fig.).
		An incline of less than 5° is not displayed.
		• Press and hold the controller button **(6)** to enter the main menu.
		• Rotate the controller ring **(6)** to select the **"Accelerometer"** option in the menu.
		• With a short press of the controller button **(6)** open the **"Accelerometer"** submenu.
		• Rotate the controller ring to select the **"Side Incline"** option
		• With a short press of the controller button **(6)** open the **"Side Incline"** submenu.
		• Rotate the controller ring to select the "On" option to activate the incline indicator or "Off" to switch it off.
		• Confirm your selection with a short press of the controller button **(6)**.

Defective pixels ⊞	**Defective pixel repair** ⊞	When using the device, defective (broken) pixels may appear on the sensor: i.e. bright or dark points of constant brightness that are visible on the image. **THERMION** riflescopes offer the possibility of removing any defective pixels on the sensor programmatically, as well as to cancel any deletion. • Open the submenu by pressing the controller button **(6)**. • Select the icon with a short press of the controller button **(6)** ⊞ . • A marker ✕ will appear on the left side of the display. • A magnifying glass will appear on the right side of the display – an enlarged image with a fixed cross– that is required to facilitate a search for the defective pixel and to align the marker with it. There are horizontal and vertical directional arrows to move the marker with the coordinates along the X and Y axes. • Rotate the controller ring **(6)** to move the marker to align its centre with the defective pixel. • A short press of the controller button **(6)** switches the marker direction from the horizontal to the vertical and vice versa**.** • Rotate the controller ring **(6)** to align the defective pixel with the fixed cross in the frame – the pixel should disappear. • Delete the defective pixel with a short press of the **ON** button **(3)**. • Where a pixel has been successfully deleted, the word 'OK' will appear briefly on the screen. • Then, by moving the marker across the display, you can delete the next defective tile. • To exit the '**Defective pixel repair**' function, press and hold down the controller button **(6)**.
	Restore default pixel map ⤺	Return all defective pixels previously disabled by the user to their original state: • Open the submenu by pressing the controller button **(6)**. • Select the icon ⤺ and press the controller button **(6)**. • Select 'YES' if you want to return to the factory pixel map and 'NO' if you do not. • Confirm your selection by pressing the controller button **(6)**. **Attention!** One or two pixels on the imager display in the form of black, bright white or coloured (blue, red or green) dots may appear. These are not a defect.

Device Information ⓘ		• Press and hold the controller button **(6)** to enter the main menu.
		• Rotate the controller ring **(6)** to select the **"Device Information"** item in the main menu.
		• With a short press of the controller button **(6)** open the **"Device Information"** submenu.
		The user has access to the following information:
		  – full name of the riflescope,
		  – the SKU number of the riflescope,
		  – the serial number of the riflescope,
		  – the software version of the riflescope,
		  – the assembly version of the riflescope,
		  – service information,
		  – battery information.

X=100
Y=100

18 The Status Bar

The status bar is located in the lower half of the display and displays information relating to the operational status of the device, including:

- Image inversion mode (Hot Black only)
- Current zeroing profile (e.g. A)
- Aiming distance (e.g. 900 metres)
- Observation mode (e.g. Forest)
- Calibration mode (when in automatic calibration mode with 3 seconds remaining until automatic calibration, a countdown timer will appear in place of the calibration icon). The timer ⏱ 00:03 will appear only after the microbolomoter temperature has stabilised (after 5–7 minutes of continuous operation of the riflescope). Immediately after turning on the riflescope the shutter activates automatically without displaying the timer.
- Current full magnification
- Wi-Fi connection
- "Auto Power Off" function (e.g. 1 minute)
- Clock
- Battery discharge level (if the riflescope is powered by an internal or removable rechargeable battery) or
  - External power supply indicator (when the device is powered from an external supply) or
  - Battery charge indicator with current charge percentage (where charging is by an external power source).

Note: when calibration is in progress, the display image freezes for the duration of the calibration

19 Video Recording and Photography

THERMION riflescopes are equipped with a function for video recording (photographing) an observed image onto the built-in memory card.

Before using the photo and video functions, read the subsections on **"Date setting"**, **"Time setting"** in the "Main menu functions" section of these instructions.

The built-in recording device operates in two modes:

- **Photo** (photography; an icon 📷 appears in the upper left corner of the display). If the estimated number of still pictures that can still be saved to the flash memory exceeds 100, > 100 is displayed.
- **Video** (video recording; an icon 📹 is displayed in the upper left of the display, the approximate total remaining recording time given the current resolution in HH: MM format (hours: minutes).
The device is in VIDEO mode as soon as it is turned on. Switching between the riflescope's operating modes is by a long press of the **REC (4)** button. Switching between the modes toggles Video–> Photo–> Video…

Photo Mode. Photographing an image

- Go to photo mode.
- To take a photograph, press the **REC** button **(4)** briefly. The image freezes for 0.5 seconds and the image file is saved to the internal memory card.

Video Mode. Recording video clips

- A long press of the **REC** button **(4)** engages Video mode
- Begin video recording with a short press of the **REC** button **(4)**.
- Once video recording has begun, the icon 📹 will disappear, with an icon **REC** appearing in its place and the recording timer displaying in MM:SS (minutes : seconds) format;
- Stop the video recording by pressing and holding down the **REC** button **(4)**.
- Video files are stored in the built-in memory card after video recording has been turned off;
  - after video recording has been turned off / after photographing;

- when the device is switched off where a recording had been made;
- when the memory card has been filled up during video recording (the display will show "Memory Full").

Notes:

- you can enter and work on the riflescope menu during video recording;
- recorded videoclips and photographs are saved to the device's internal memory card in the format: **img_xxx.jpg** (for photos); **video_xxx.mp4** (for videos). **xxx** - three-digit general file counter (for photos and video);
- the counter used in the names of multimedia files is NOT reset.
- when a file is deleted from the middle of a list, its number is never taken up by another file.
- when the counter can take no more files, a new folder is created – img_xxxx, Where xxxx is the file counter.
- The maximum duration of a video recording file is five minutes. After this time, the video will be recorded onto a new file. The number of files is limited by the capacity of the device's internal memory;
- monitor regularly the amount of free memory in the internal memory card, transferring footage and photographs to other media to free up space.
- graphical information (status bar, icons etc.) is not displayed in video files and photographs

20 Wi-Fi Function

The riflescope is equipped with wireless communication with external devices (smartphone or tablet) via Wi-Fi.

- To activate the wireless module, open the main menu with a long press of the controller button **(6).**
- Rotate the controller ring **(6)** to select the **"Wi-Fi on"** item in the main menu.
- A short press of the controller button **(6)** turns the Wi-Fi module on/off.
- Wireless operation is displayed in the status bar in the following way:

Connection status	Status bar indication
Wi-Fi disconnected	📶✕
Wi-Fi enabled by the user	
Wi-Fi connection process in progress	📶
Wi-Fi turned on, no connection to the riflescope	📶?
Wi-Fi turned on, the device is connected	📱

- The device is recognised by an external device under the label 'THERMION_XXXX', where XXXX are the four last digits of the serial number.
- After entering the password (default: 12345678) on an external device (for more detailed information of setting passwords, see the subsection entitled 'Setting up Wi-Fi' in the section, 'Main Menu Functions' of the Instructions) and establishing a connection, the icon 📶 in the status bar changes to 📱 .
- Launch Stream Vision on the mobile device (see Section 21 of the Instructions).
- Video broadcasting on the screen of the mobile device begins after the "viewfinder" button on the screen of the mobile device has been activated. The icon in the status bar changes to 📶⇆

21 Stadiametric Rangefinder

Thermal imaging riflescopes are fitted with a stadiametric rangefinder that enables the distance to an object to be defined where its size is known.

- The **"Stadiametric Rangefinder"** is opened by a short press of the controller button **(6)**.
- Select the icon 📏 with a short press of the controller button **(6)**.
- Bars will appear on the display to determine the distance, icons of three objects and digits of the estimated distance of these three objects.

- There are three pre-set values for objects:
- **Hare** – height 0.3 m
- **Boar** – height 0.7 m
- **Deer** – height 1.7 m
- Place the lower fixed cursor beneath the object and, and rotating the controller ring **(6)**, move the upper cursor relative to the lower horizontal fixed cursor so that the object is positioned directly between the cursors. An automatic recalculation of the distance to the target occurs simultaneously with this movement.
- If the object is not measured within 10 seconds, the information disappears from the display.
- Go to the **"Units of Measurement"** submenu to select a unit of measurement (metres or yards).
- A defined distance is rounded up or down before appearing on the display to 5 metres for larger distance readings and 1 metre for smaller distance readings.
- To exit the rangefinder mode, press the controller button **(6)** briefly, or wait 10 seconds for automatic exit.
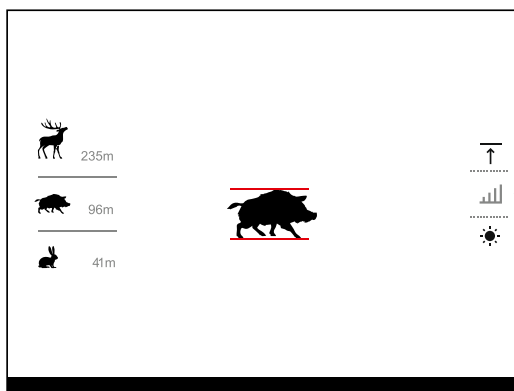
22 Display Off Function

When this function is in use, the riflescope switches to standby mode, which allows it to be turned off quickly if necessary.

Options for working with the "Display Off" function

Option 1. The riflescope is turned off. Turning the riflescope and **"Display Off"** function on:

- Turn the riflescope on with a short press of the **ON** button **(3)**.
- Turn on the **"Display Off"** function: press and hold the **ON** button **(3)**. A "Display off" message will appear on the screen together with a countdown.
- Release the **ON** button **(3)**.
- Briefly press **ON (3)** to turn off the **"Display Off"** function.
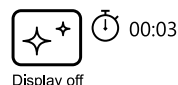
Option 2. The **"Display Off"** function is on. Turning the riflescope off:

- Press and hold the **ON** button **(3)**. A "Display off" message will appear on the screen together with a 3-2-1 countdown (disablement will occur after 1 on the countdown).
- Hold down the **ON** button **(3)** until the riflescope turns off (turning off will occur after 1 on the countdown).

23 PiP Function

PiP (Picture in Picture) enables you to view a magnified digital zoom image in a separate 'window' simultaneously with the main image.

- Press and hold the **ZOOM** button **(5)** to enable the PiP function.
- Rotate the controller ring **(6)** to alter the digital zoom in the PiP window.
- The enlarged image is displayed in a separate window using the full optical zoom value.
- The rest of the image is displayed only with the optical zoom value (digital zoom is disabled).
- When PiP is turned off, the image is displayed with the optical zoom value set for the PiP mode.

24 Stream Vision

THERMION thermal imagers support Stream Vision technology, which enables the transmission of an image in real time from the thermal imager to your smartphone or tablet via Wi-Fi.

Detailed instructions on the operation of Stream Vision technology can be found in a separate booklet or on the www.pulsar-vision.com website.

Note: the design of the riflescope includes the possibility of updating software. Updating is possible via the Stream Vision app.

Scan the QR codes to download the Stream Vision app:

Google Play (Android OS)
https://play.google.com/store/apps/details?id=com.yukon.app

iTunes (iOS)
https://itunes.apple.com/us/app/stream-vision/id1069593770?mt=8

25 USB Connection

- Switch the device on by pressing the **ON** button **(3)** (the computer will not detect the riflescope if it is turned off).
- Connect one end of the USB cable to the device's microUSB connector **(10)** and the other end to the port on your computer.
- The device is detected automatically by the computer and no installation of drivers is required.
- Two connection options will appear on the display: **Memory card** and **Power.**
- Select the connection method by rotating the controller ring **(6)**.
- A short press of the control button **(6)** confirms the selection.

Connection options:

- **Memory card**. When this option is selected, the device will be recognised by the computer as a flash card. This option is designed for working with files that are stored in the riflescope's memory; its functions are not accessible and it does not turn itself off. The device continues to function after disconnection from the computer.

    – If a video was being recorded at the time of connection, the recording will cease and will be saved.

- **Power**. When this option is selected, the computer will be used by the device as an external power source. An icon will appear in the status bar . The device will continue to function and all functions will be available.

    – The battery installed in the device will not be charged.

USB connection

Use as power

Use as memory card