



# **Merger Duo**

## **Manual**

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# Specifications

You can learn more about the main parameters [here](#).

## NXP50

Model	NXP50
SKU	77455
Microbolometer	
Type	uncooled
Resolution, pixels	640x480
Pixel Pitch, µm	17
Sensor NETD, mK	< 25
System NETD, mK	< 18
Frame rate, Hz	50
Digital Sensor	
Type	CMOS
Resolution, pixels	1920x1200
Optical Characteristics	
Lens, mm:	
- Thermal imaging channel	F50 F/1.0
- Digital channel	F50 F/1.4
Magnification, x:	
- Thermal imaging channel	3-24
- Digital channel	2-16
Digital zoom	x1, x2, x4, x8
Minimum Focus Distance, m/y	5 / 5.47



Eye relief, mm/inch	12 / 0.47
Exit pupil diameter, mm/inch	5 / 0.2
Field of view (HxV), degrees / m@100m:	
- Thermal imaging channel	12.4/21.8
- Digital channel	17.5/30.7
Diopter adjustment, D	-4/+3
Interpupillary distance adjustment, mm	63-74
Range of detection (deer type object), m/y:	
- Thermal imaging channel	1800 / 1970
- Digital channel	-
<b>Display</b>	
Type	AMOLED
Resolution, pixels	1280x960
<b>Operational Characteristics</b>	
Power supply, V	3.7
Battery type / Capacity / Output voltage	Li-Ion Battery Pack APS3 / 3200 mAh / DC 3.7 V (removable) Li-Ion Battery Pack / 4000 mAh / DC 3.7 V (built-in)
External power supply	5V
Operating time on Battery Pack (at t=22°C), h*	7
Degree of protection, IP code (IEC60529)	IPX7
Operating temperature range, °C / ° F	-25 ... +50 / -13 ... 122
Dimensions (without IR-Illuminator), mm / inch	207x140x73 / 8.15x5.5x2.87

Weight (with battery, without IR-Illuminator), kg / oz	1.2 / 35.3
<b>Video Recorder</b>	
Video / photo resolution, pixel	1280x960
Video / photo format	.mp4 / .jpg
Built-in memory	64 Gb
<b>Wi-Fi Channel**</b>	
Frequency	2.4/5 GHz
Standard	IEEE 802.11 b/g/n/ac
<b>Detachable IR-Illuminator</b>	
Type/Wavelength, nm	LED/940

\* Actual operating time depends on the extent of using Wi-Fi, integrated video recorder, IR illuminator and operating observation channels.

\*\* The reception range may vary depending on various factors: obstacles, other Wi-Fi networks.



# Description

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**Merger Duo** multispectral binoculars are made with the external design of classic daytime binoculars and provide comfortable viewing with both eyes.

The device allows you to quickly switch between thermal imaging and monochrome night digital channels, as well as supports PiP (Picture in Picture) multispectral mode, when the image of one channel is displayed in the main window, and the second – in the PiP “window”.

**Merger Duo** devices do not require an external light source and are not affected by bright light exposure in thermal imaging mode.

A thermal imaging channel can be used both at night-time and during the day in adverse weather conditions (fog, smog, rain), as well as having the obstacles (branches, tall grass, dense bushes etc.) hindering the target detection.

In black and white digital channel, the device allows observation both day and night. In night conditions (absence of starlight, moonlight), it is recommended to use an infrared illuminator.

**Merger Duo** binoculars are perfectly suited for night hunting, observation, trail orientation, identifying hazards, rescue operations, etc

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To get started, see the sections:

**Battery Charging**

**Battery Installation**

**IR Illuminator Mount**

**Powering on and Image Setting**

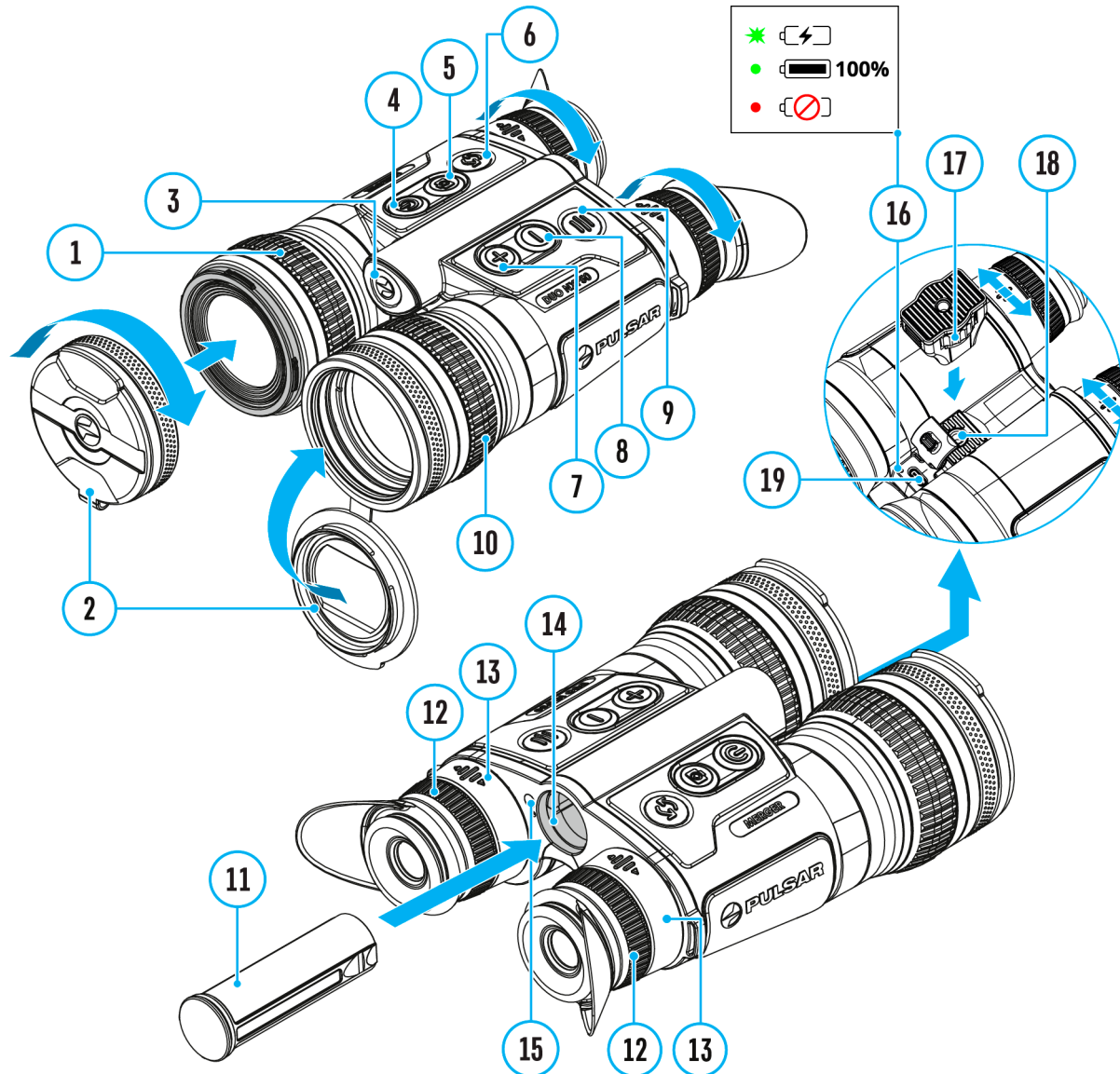
**Image Modes (Thermal Imaging/Digital/Multispectral PiP)**

**Stream Vision 2**

# Package Contents

- Multispectral binoculars
- IR-Illuminator
- APS3 Battery Pack
- APS battery charger
- Power adapter
- USB Type-C cable with USB Type-A adapter
- Carrying case with straps
- Neck strap
- Quick-Start guide
- Lens cloth
- Warranty card
- Tripod adapter

# Components and Controls



1. Digital channel lens focus ring
2. Removable lens covers
3. Battery release button
4. Power ON/OFF/Calibration button
5. REC button
6. MODE button
7. UP/ZOOM navigation button
8. DOWN navigation button
9. MENU button

10. Thermal imaging channel lens focus ring
11. Battery APS 3
12. Eyepiece dioptre rings
13. Eyepieces
14. Battery compartment
15. Proximity sensor
16. LED indication of battery charge in the device
17. Tripod adapter
18. Socket for mounting a tripod adapter and IR illuminator
19. USB Type-C port



# Features

- 3 modes of operation: thermal imaging, black-and-white digital and multispectral PiP
- Microbolometer with a resolution of 640x480 pixels
- Digital sensor with a resolution of 1920x1200 pixels
- AMOLED displays with a resolution of 1280x960 pixels
- Classic daytime binocular design
- 8-color display palette
- 3 calibration modes: manual, semi-automatic and automatic
- Long detection distance (up to 1800 m) in thermal imaging mode
- Smooth digital zoom x1 - x8
- 3 levels of sensitivity enhancement (in thermal imaging and multispectral PiP **Td** modes): Normal, High, Ultra
- "Picture-in-Picture" mode (in thermal and digital modes)
- Display functions turn off with the proximity sensor
- Defective Pixel Repair function
- Device firmware update using the free Stream Vision 2 App
- Wide operating temperature range -25 °C - +50°C (-13 °F - +122 °F)
- Completely waterproof IPX7
- Tripod mount
- Invisible IR illuminator for enhanced image detail in the digital channel

## Video/Audio Recording

- Built-in video and sound recorder
- Integration with iOS and Android devices
- Wi-Fi remote control and viewing using a smartphone
- Storing photos and videos in Cloud when using the Stream Vision 2 App

## Battery Pack

- Quick Change Li-Ion Battery Pack APS 3
- Charging from USB Power Bank
- Quick-Charge power delivery

# Precautions


- Only use the charger supplied with the Battery Pack. The use of any other charger may irreparably damage the Battery Pack or the charger and may cause fire.
- Do not charge the built-in and removable batteries immediately after moving the device and batteries from a cold place to a warm place. Wait at least 30 minutes for the device and batteries to warm up.
- It is not recommended to charge the batteries with a charger connected to the USB port of a computer or laptop. It can damage the computer.
- Do not leave the Battery Pack unattended while charging.
- Never use a modified or damaged charger.
- Do not leave the Battery Pack with a charger connected to the power adapter after charging is complete.
- Do not expose batteries to high temperatures or to a naked flame.
- Do not use batteries as a power source for devices that do not support APS batteries.
- Do not disassemble or bend batteries or charger.
- Do not drop or strike batteries or charger.
- Batteries and charger are not designed to be immersed in water.
- Keep the Battery Pack out of the reach of children.

# Recommendations for Battery Use

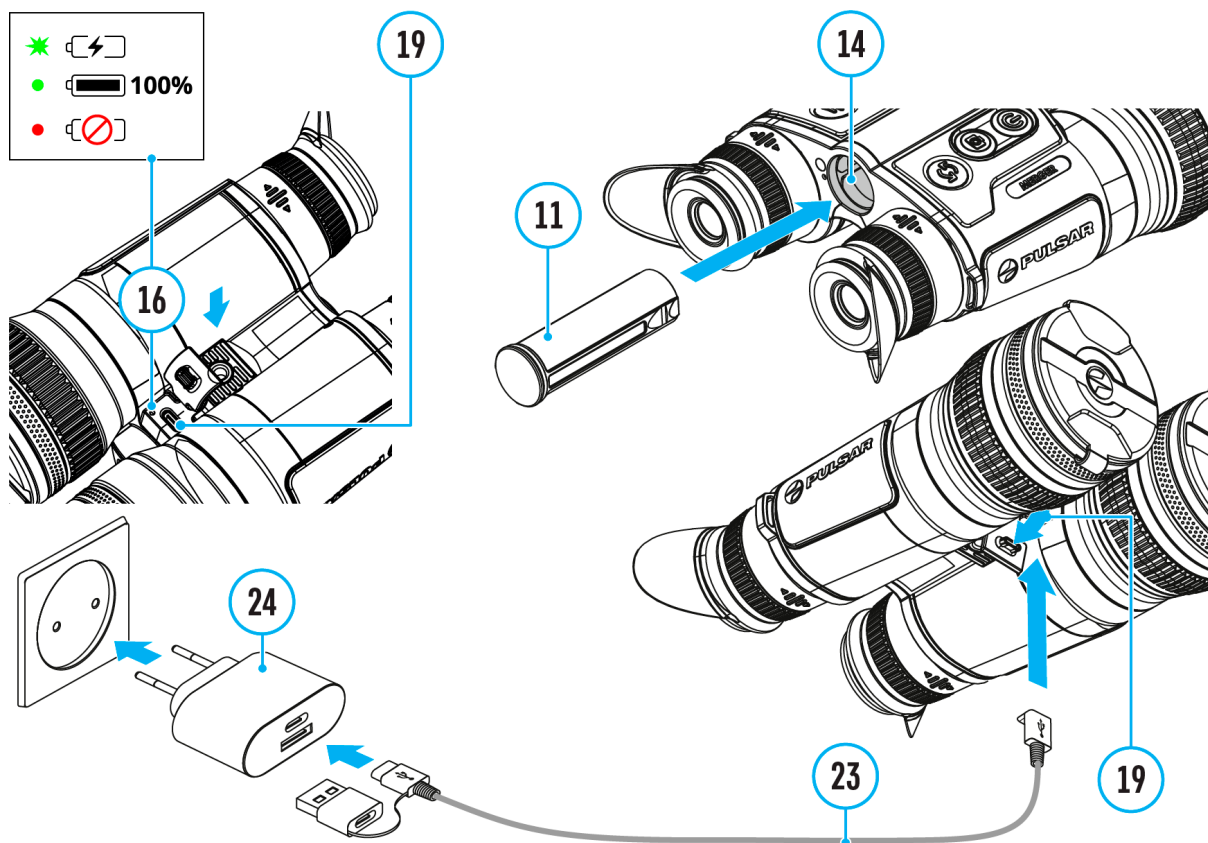
- For long-term storage, the built-in and removable batteries should be partially charged – from 50 to 80%.
- Batteries should be charged at an ambient temperature of 0 °C ... +35 °C. Otherwise, battery life will be significantly reduced.
- When using batteries at sub-zero ambient temperatures, the battery capacity decreases, this is normal and not a defect.
- Do not use batteries at temperatures outside the range of -25 °C ... +50 °C – it may reduce the battery life.
- The battery has a short-circuit protection. Any situation that may cause short-circuiting, however, should be avoided.

# Battery Charging



**Merger Duo** binoculars are supplied with a removable and rechargeable APS3 lithium-ion battery pack and a built-in rechargeable lithium-ion battery. The batteries should be charged before first use.

The icons  in the status bar will flash when the battery is low. The batteries need to be charged.




## Option 1



1. **Install** the APS 3 battery (**11**) in the battery compartment (**14**) of the device.
2. Connect the USB Type-C cable (**23**) to the USB Type-C connector (**19**) of the device.

3. Connect the other end of the USB cable **(23)** to the Power Adapter **(24)** by removing the USB Type-A adapter.
4. Plug the Power Adapter **(24)** into a 100-240 V socket.
5. Wait until the batteries are fully charged (indication in the status bar: 1  2 ; 1 - built-in battery, 2 - removable battery).

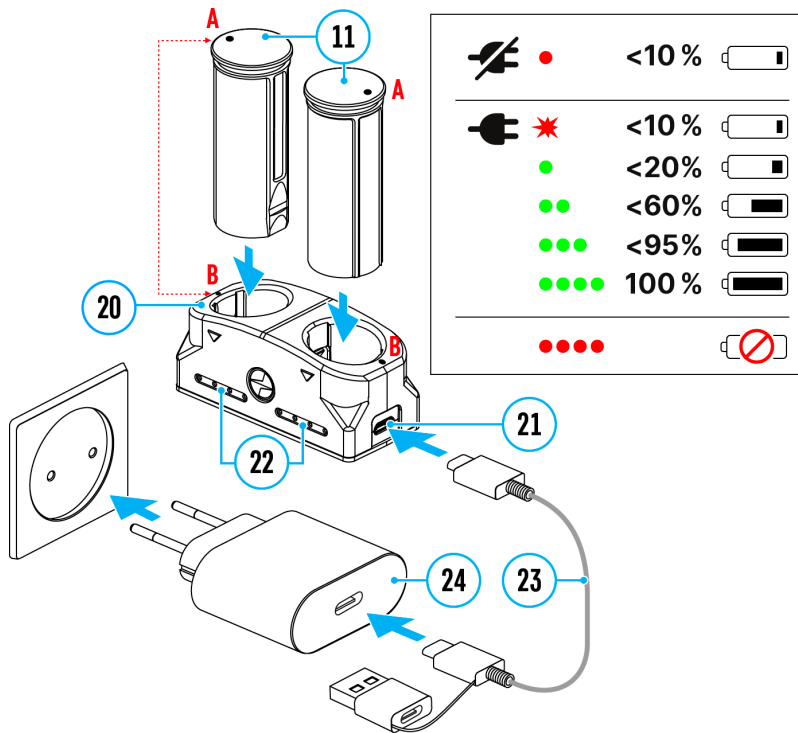
**Note:** next to the USB Type-C connector **(19)** on the device body there is a light-emitting diode **(16)** to indicate the battery charge level when the device is switched off.


<b>(16) LED indication</b>	<b>Battery status</b>
	Batteries are charging
	Batteries are charged
	One of the batteries is defective. The device must not be used. The defective battery should be replaced. Contact Pulsar service to replace the internal battery.
-	There is no external battery in the device, or the device is switched on



**Attention!** When charging rechargeable batteries via a USB Type-C connector **(19)** in the device body section:






- Charging priority is given to the built-in battery.
- When the device is off, both batteries are charged at the same time. When using the device, the external battery is discharged first.
- Built-in and removable batteries support USB Power Delivery fast charging technology when using the USB Type-C cable and power adapter supplied with the device.

## Option 2



1. Insert the Battery Pack **(11)** along the rail into the APS charger **(20)** slot as far as it will go. The APS charger is supplied with your device or purchased separately.
2. Point **A** on the battery and point **B** on the charger should match.
3. Connect the USB Type-C plug of the USB cable **(23)** to the port **(21)** of the charger **(20)**.
4. Connect the second plug of the USB cable **(23)** to the USB port on the power adapter **(24)**.
5. Plug the device into a 100-240 V socket.
6. The LED indicator **(22)** will display battery charge status.
7. Wait until the battery is fully charged (LED indication **(22)**: ).
8. Two batteries\* can be charged at the same time: the second slot is designed for it.

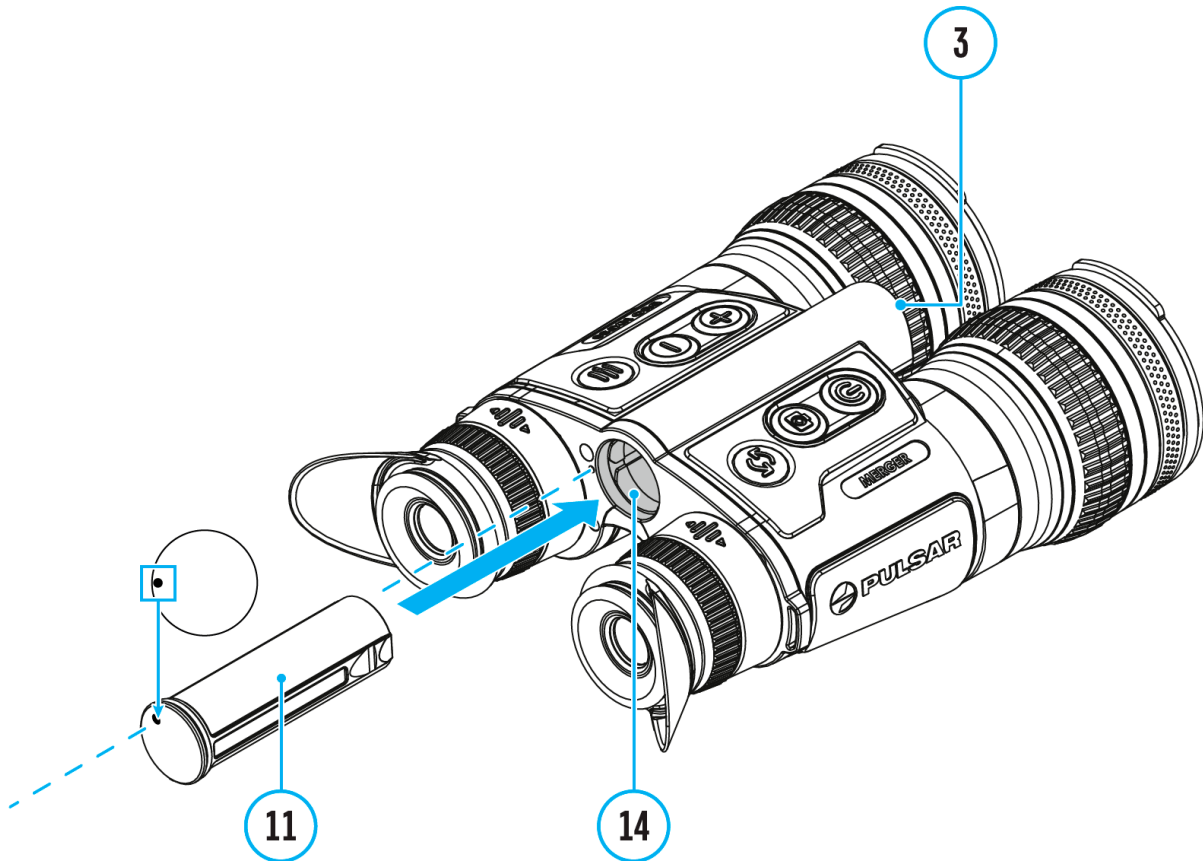
(22) LED Indicator**	Battery Charge Status
	Battery level is from 0% to 10%. Charger is connected to a power supply.
	Battery level is from 0% to 10%. Charger is not connected to a power supply.

	Battery level is from 10% to 20%.
	Battery level is from 20% to 60%.
	Battery level is from 60% to 95%.
	Battery completely charged. Charging will automatically stop. The battery can be disconnected from the charger.
	Defective battery. Do not use the battery.

\* Purchased separately.

\*\* LED indicator displays the current battery charge status for 30 seconds when the APS charger is not plugged in. When the power is being supplied, the indicator is constantly displaying the current battery charge status, the LEDs are additionally flickering to display the battery charging process.

# Battery Installation



**Attention!** Before installing the battery, make sure that there is an undamaged rubber insulating ring on the battery. The ring is designed to protect your device from moisture getting inside. Damage to the device due to a missing ring is not covered by the warranty. To replace or purchase a ring, contact your **local distributor**.

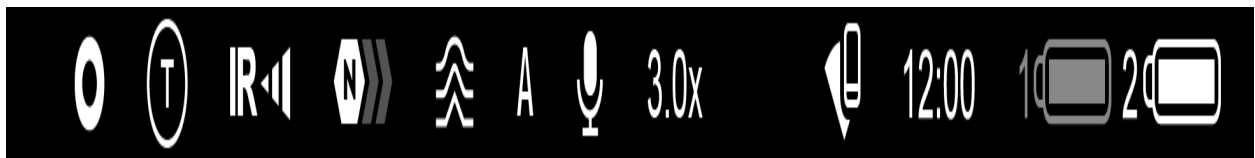
1. Install the battery **(11)** into the battery compartment **(14)**. A pictogram in the form of a “dot” on the battery should be on the left.
2. You will hear a click when the battery is placed correctly.
3. To remove the battery from the device, press the Battery Release button **(3)**.



# Switching and Changing the Batteries

**Merger Duodevices** are powered by 2 batteries: built-in Battery Pack and removable Battery Pack APS3.

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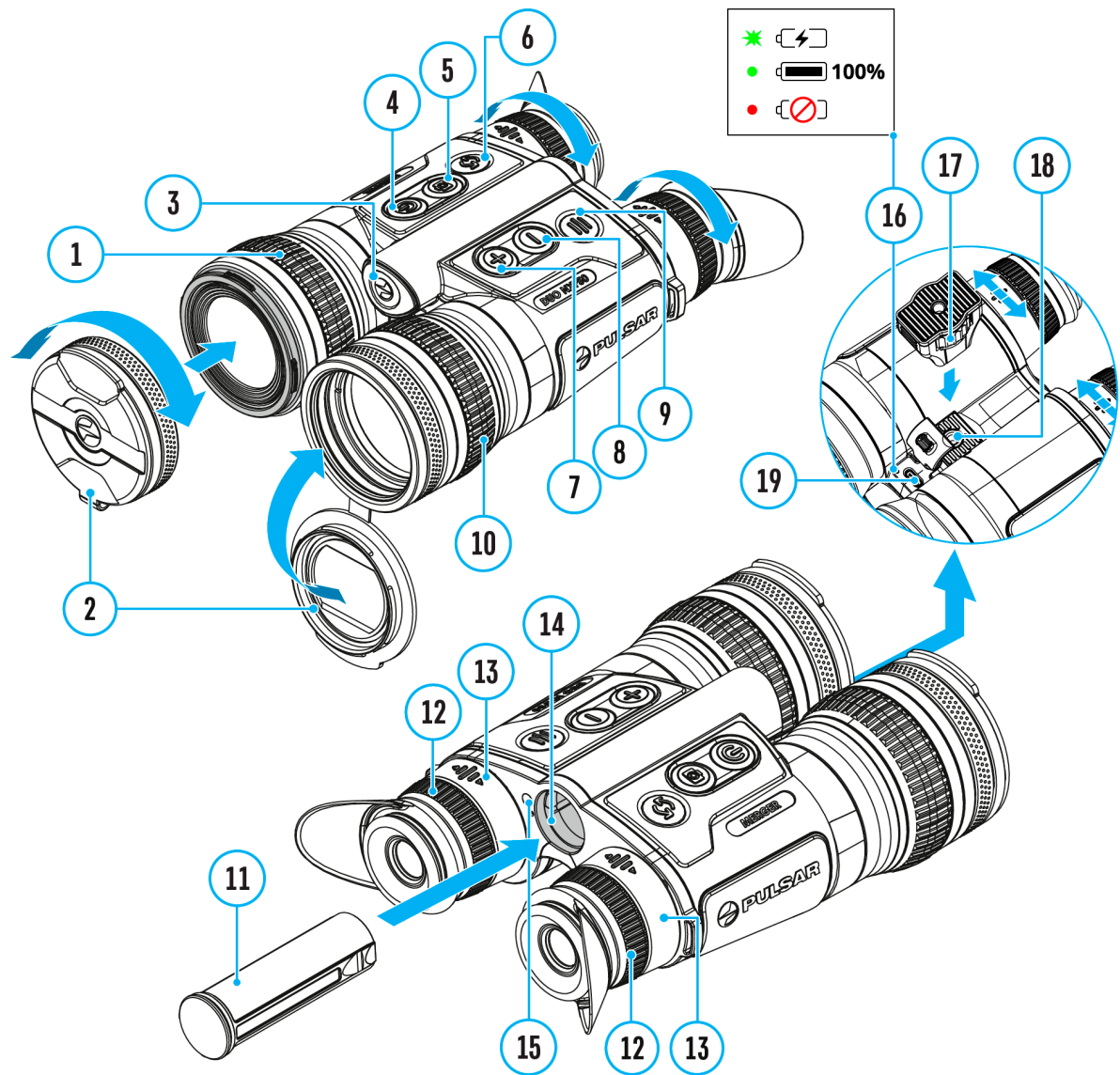


1. If there are two batteries in the device at the same time, two battery icons are displayed in the status bar (1 - built-in battery, 2 - removable battery). The device battery is displayed in white, inactive – in grey.
  2. When there is no removable battery in the device, only one icon for the built-in battery displays in white in the status bar.
  3. When both batteries are fully charged, the device is powered by the removable battery. If there is low removable battery level, the device will switch to the built-in battery.
  4. Battery charge level is displayed in % above the icon in the status bar while charging.
  5. It is possible to replace the removable battery even while the device is on.
- 


**Attention!** When installing a removable battery with a sufficient charge level, the device will automatically switch to it.

# External Power Supply

## Show device diagram



Power can be supplied from an external source such as a 5 V power bank.

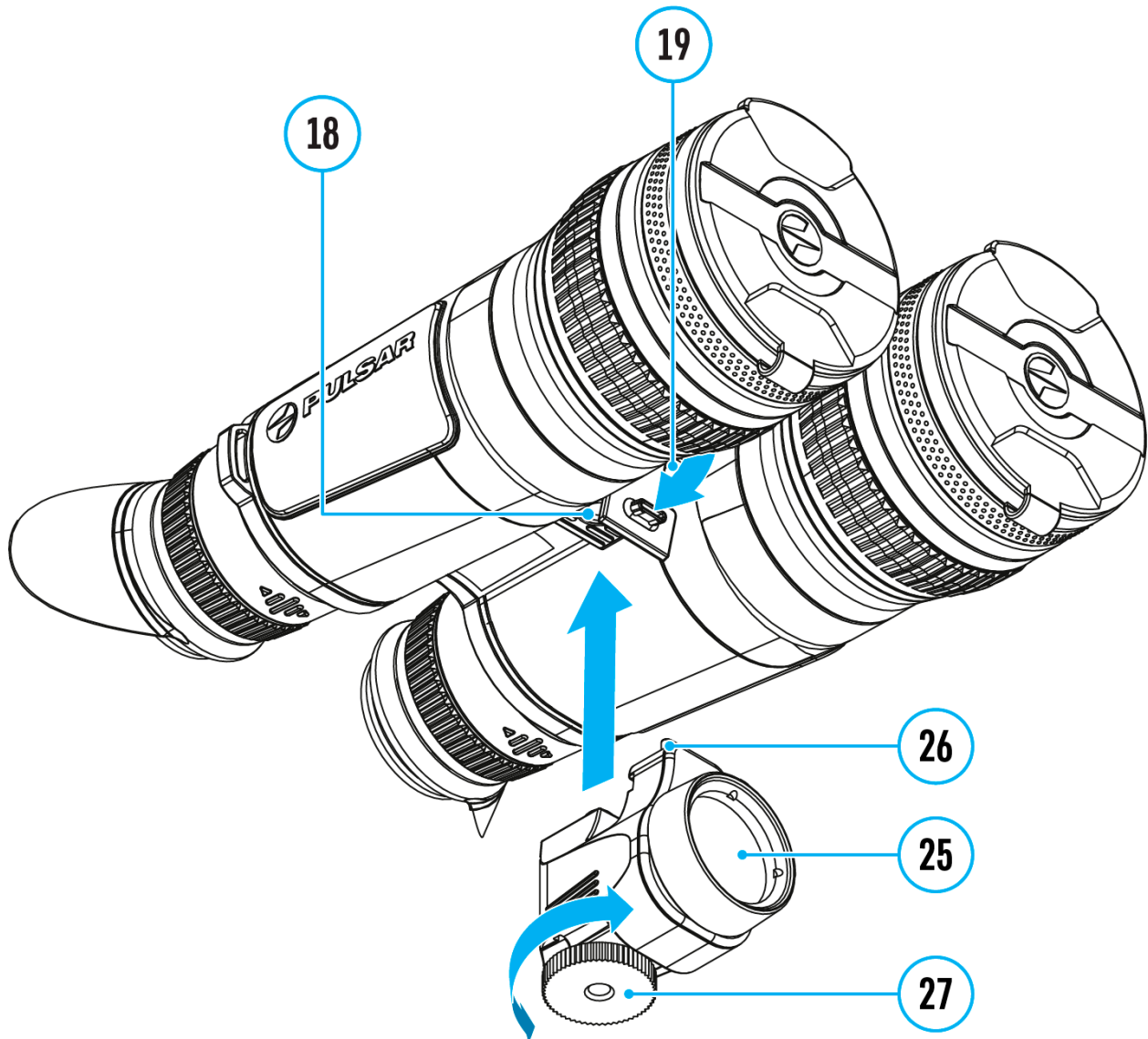
1. Connect the external power supply to the USB Type-C port **(19)** of the device.
2. The device switches to external power source, while built-in Battery Pack and removable Battery Pack APS3 will gradually recharge.
3. The display will show the battery icon  with charge level as a

percentage.

4. If the device is powered by an external power supply, but the APS3 battery is not connected, only the built-in battery will be charged.
  5. When the external power supply is disconnected, the device switches to the internal battery pack without powering off.
- 

**Warning!** Charging the built-in battery and the APS3 battery from the power bank at an external temperature below 0 °C (32 °F) can reduce the battery life. When using external power, connect the Power Bank to the device after it has been turned on and working for several minutes.

# IR Illuminator Mount



1. Open the rubber plug of the USB type-C connector **(19)** of the device.
2. Insert the type-C plug of the IR illuminator **(26)** into the type-C connector **(19)**. The tripod screw **(27)** should fit into the tripod socket **(18)**.
3. Tighten the tripod screw **(27)** as far as it will go.
4. Adjust the light spot position in the field of vision of the digital channel by tilting the IR illuminator lens forcefully **(25)**.

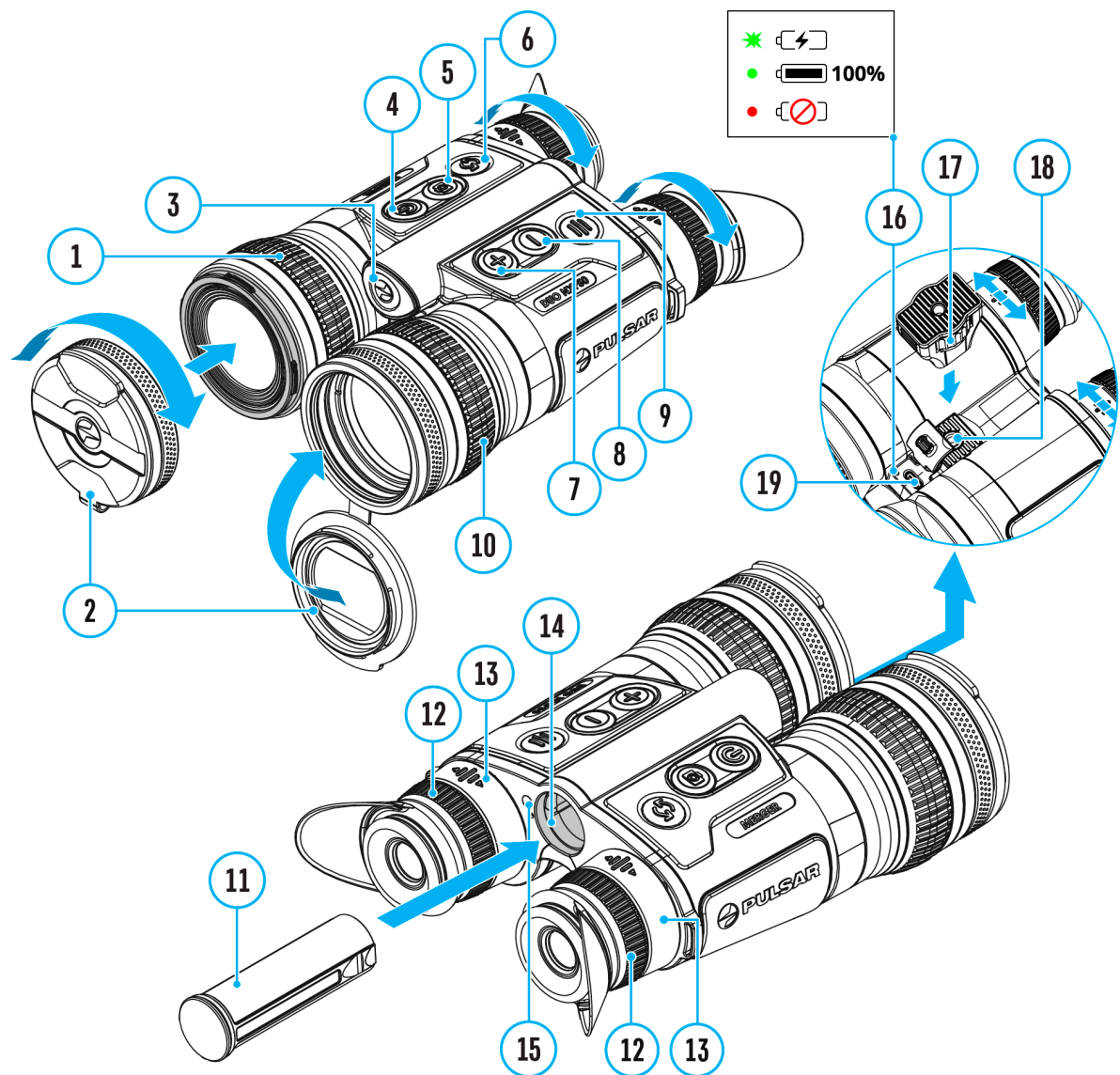
5. To remove the IR illuminator, unscrew the tripod screw **(27)** and disconnect the IR illuminator from the type-C connector **(19)** of the device.

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*Note:* the hole in the tripod screw **(27)** can be used to **mount the device on a tripod.**

# Powering on and Image Settings

Show device diagram



1. Open the lens covers (2).
2. Press the **ON/OFF (4)** button briefly to power the device on.
3. Adjust the interpupillary distance by moving the eyepieces (13) farther

or closer to each other. It takes some effort to move the eyepieces.





**4.** Adjust the symbol sharpness on the displays by rotating the eyepiece dioptre rings **(12)**. In future, it will not be necessary to rotate the eyepiece dioptre rings, regardless of the distance and other conditions.

**5.** Briefly press the **MODE** button **(6)** to select the desired **image mode**: thermal or digital.

**6.** To focus on the observation object, rotate the lens focusing rings of the thermal imaging **(10)** and digital **(1)**

**7.** Long press the **MODE** button **(6)** to activate the PiP multispectral mode. Briefly press the **MODE** button **(6)** to select the image mode of the PiP window: thermal or digital.

## **8. In thermal imaging and multispectral PiP modes:**

- Select the **calibration mode**: **manual (M)**, **semi-automatic (SA)** or **automatic (A)** in the main menu (enter the menu by long pressing the **MENU** button **(9)**).
- Calibrate the thermal image by briefly pressing the **ON/OFF** button **(4)** (when calibration mode **SA** or **M** has been selected). Close the thermal channel lens cover before manual calibration.
- Select the required **amplification level** for the thermal image ("Normal" , "High" , "Ultra" ) by short pressing the **DOWN** **(8)**
- Activate the **smoothing filter**  in the main menu to improve the thermal image as the amplification level increases.
- Fast switch between the "White hot" **palette** of the thermal image and the palette selected in the main menu by long pressing the **DOWN** **(8)** button.

## **9. In digital and multispectral PiP modes with a connected IR illuminator:**

- Shortly press the **DOWN** **(8)** button to turn on the IR illuminator.
- Shortly press the **DOWN** **(8)** button to select one of three power levels of the IR illuminator. An increase in power level is required with the increasing distance to the observation object. This increases the discharge rate.

- To turn off the IR illuminator, press and hold the **DOWN (8)**

**10.** Adjust the brightness, display contrast, smooth digital zoom in the **quick menu** (activate by briefly pressing the **MENU** button **(9)**).

**11.** Power the device off with a long press of the **ON/OFF** button **(4)**.

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*Notes:*

- To prevent accidental decamouflage of the user, the displays automatically turn off when the observer moves the device away from the face.
- When the device approaches the face, the displays will automatically turn on.
- The proximity sensor can be disabled/enabled in the **“General settings”** section of the main menu.

Observation conditions: time of day, weather, different observation objects affect the image quality. Custom settings for brightness, display contrast as well as the function of adjusting the microbolometer sensitivity level will help to achieve the desired quality in a particular situation.

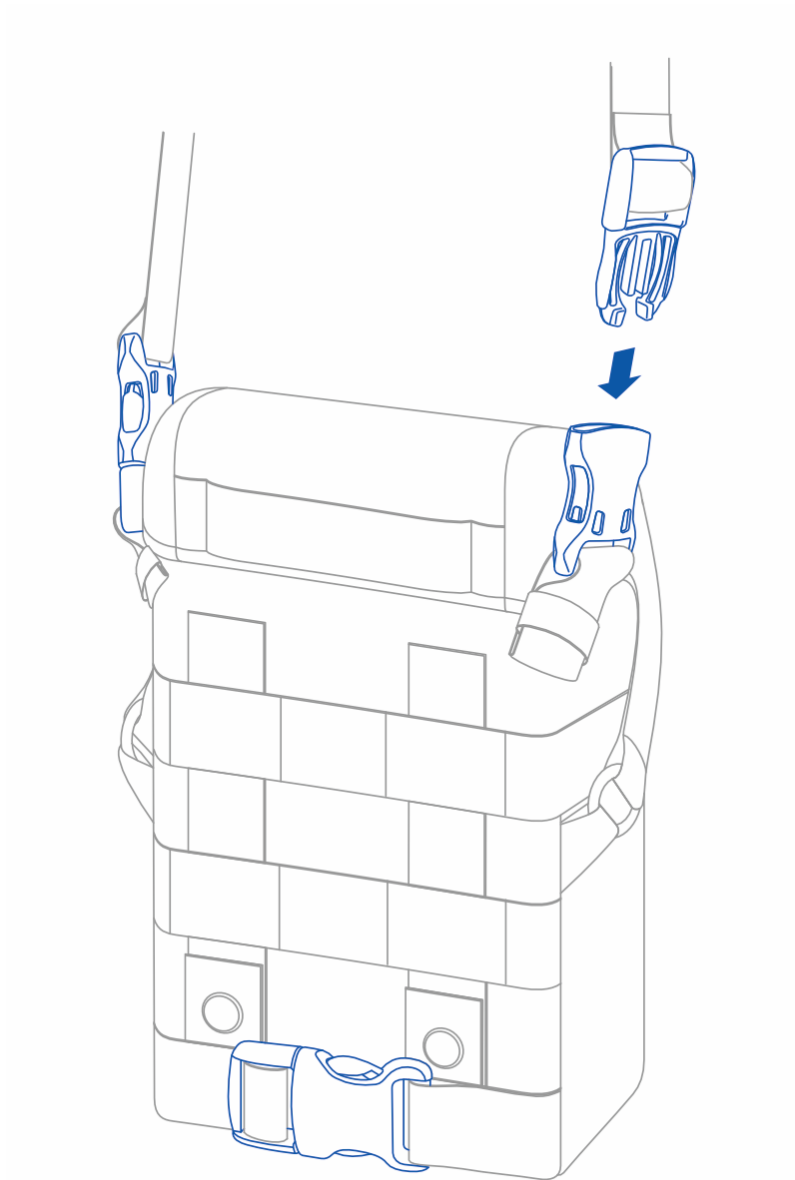
**Warning!** Never point the lens at intensive energy sources such as laser radiation emitting devices or the sun. It can damage electronic components in the device. The warranty does not cover damage arising from failure to comply with operating instructions.



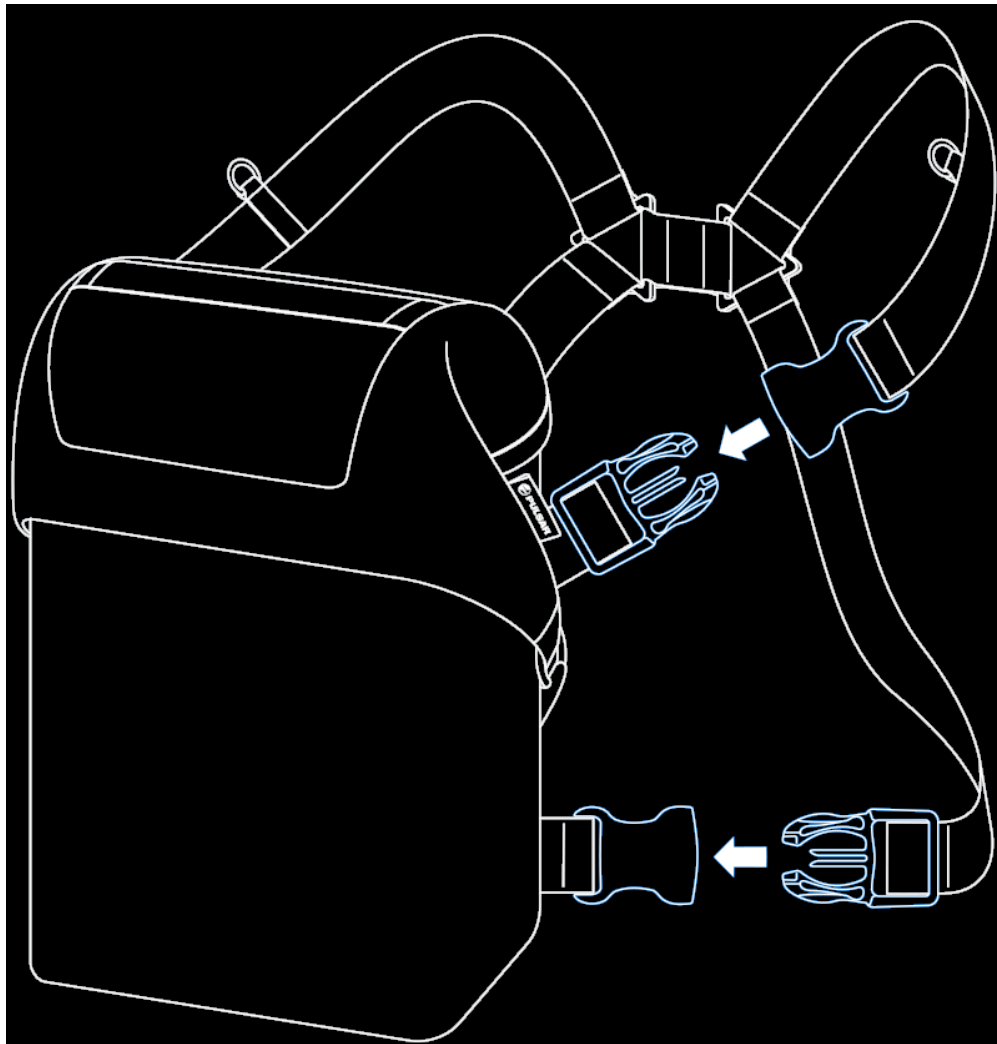
# Installation of straps on the carrying case and device

The carrying case comes with 2 straps:

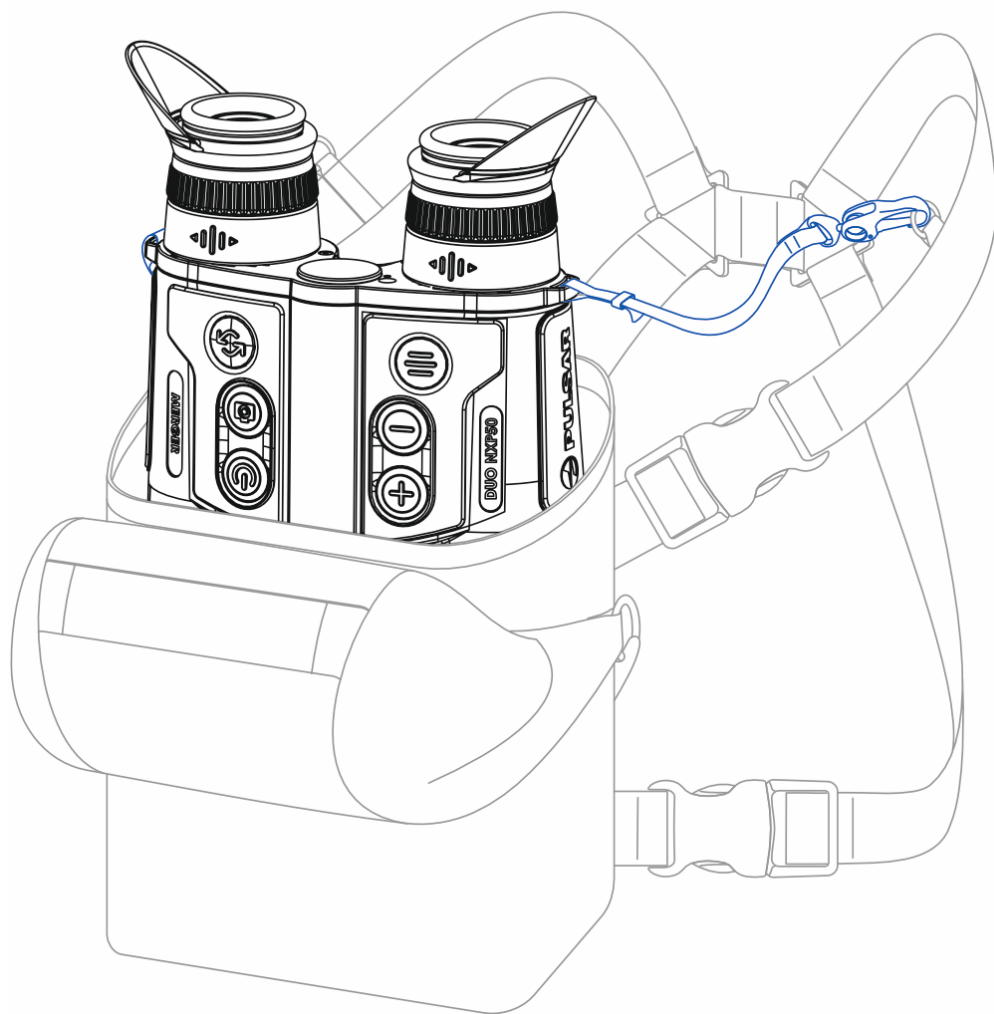
- 1.** 2-point strap for carrying the case on your shoulder.



**2.** 4-point strap for comfortable carrying of the case on the chest during intensive movement and uniform weight distribution.


































The binoculars are equipped with safety straps with carabiners that can be hooked onto the rings on the 4-point strap or on the neck strap. The length of the safety belts can be adjusted.



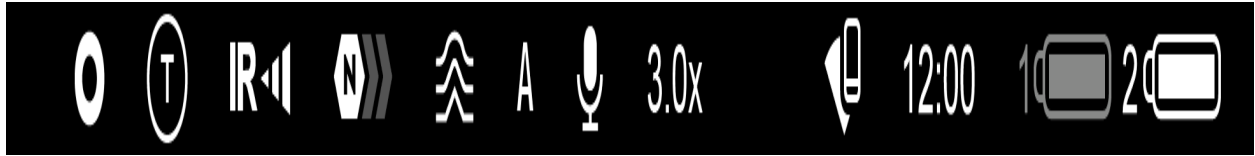


# Button Operation

Operation	Button
Power device on	 short press
Power device off	 long press for 3 secs
Turn display off (if the <b>proximity sensor</b> is off)	 long press for less than 3 secs
Turn display on (if the <b>proximity sensor</b> is off)	 short press
Calibrate the microbolometer (in thermal imaging and multispectral PiP <sup>Td</sup> modes)	 short press
Image modes switching (thermal/digital)	 short press
PiP multispectral mode activation	 long press
PiP window image mode switching (thermal/digital)	 short press
Control discrete digital zoom	 short press
PiP on/off (in thermal and digital modes)	 long press
Switching amplification levels (in thermal imaging and multispectral PiP <sup>Td</sup> modes)	 short press
Turn on/off the White Hot palette (in thermal imaging and multispectral PiP <sup>Td</sup> modes)	 long press
Video Recorder	Button

Start/pause/resume video recording	 short press
Stop video recording	 long press
Switch to video / photo	 long press
Capture Photo	 short press
<b>Main Menu</b>	
Enter main menu	 long press
Navigation upwards/rightwards	 short press
Navigation downwards/leftwards	 short press
Confirm selection	 short press
Exit submenu without confirming selection	 long press
Exit menu (switch to viewing mode)	 long press
<b>Quick Menu</b>	
Enter quick menu	 short press
Switch between quick menu options	 short press
Increase value	 short press
Decrease value	 short press
Exit quick menu	 long press
<b>IR-Illuminator (In digital and multispectral PiP  modes)</b>	
Activate the IR Illuminator	 short press
Changing the power level	 short press
Turn off the IR illuminator	 long press

# Status Bar



The status bar is at the bottom of the image and shows information on the actual operating status of the device, including:

**1.** Colour Mode (displayed only in thermal imaging and Multispectral PiP modes):



- White hot



- Black hot

**2.** Image mode:



Digital mode



Thermal imaging mode



Multispectral PiP Digital



Multispectral PiP Thermal



Multispectral PiP Digital disabled



Multispectral PiP Thermal disabled


The image channel can be disabled in the “Viewing Channel Activation” sub-item of the **General Settings** section.

**3.** IR illuminator power level (e.g. Level 3)



**4.** Amplification level (e.g., Normal; displayed only in thermal imaging and Multispectral PiP modes)

**5.** Smoothing Filter (displayed when the function is on; displayed only in thermal imaging and Multispectral PiP modes)

**6.** Calibration mode (a countdown timer :05 will appear instead of the calibration icon when in automatic calibration mode with 5 seconds remaining until automatic calibration; displayed only in thermal imaging and Multispectral PiP modes)




**7.** Microphone

**8.** Current magnification

**9.** Wi-Fi connection

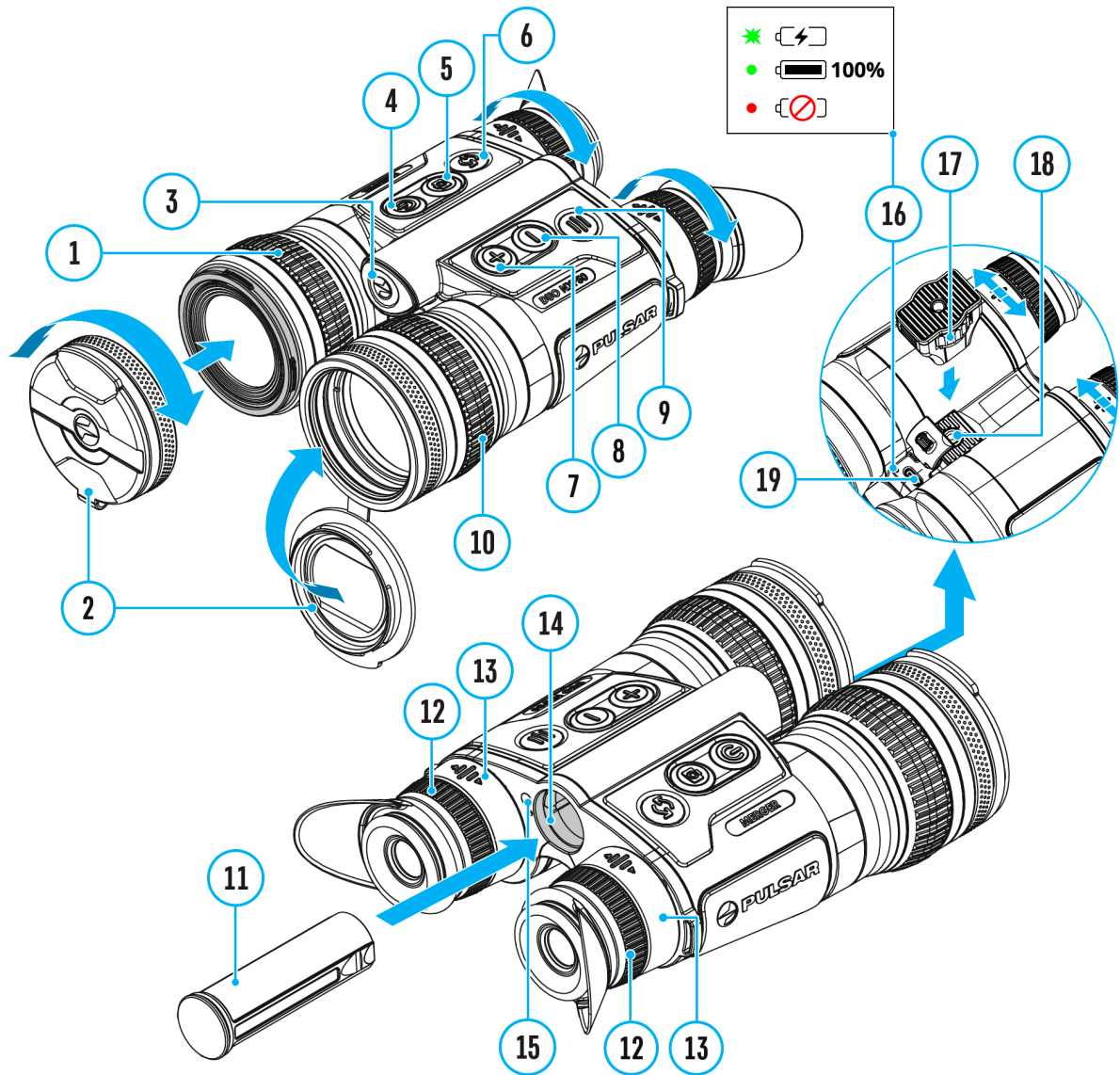
**10.** Clock

**11.** Power supply:

- Battery discharge level  (when the device is powered by a built-in or removable battery).
- External battery power indicator  (when the device is powered by an external power supply).
- Battery indicator  with current percentage of charge (when charging from an external power source).

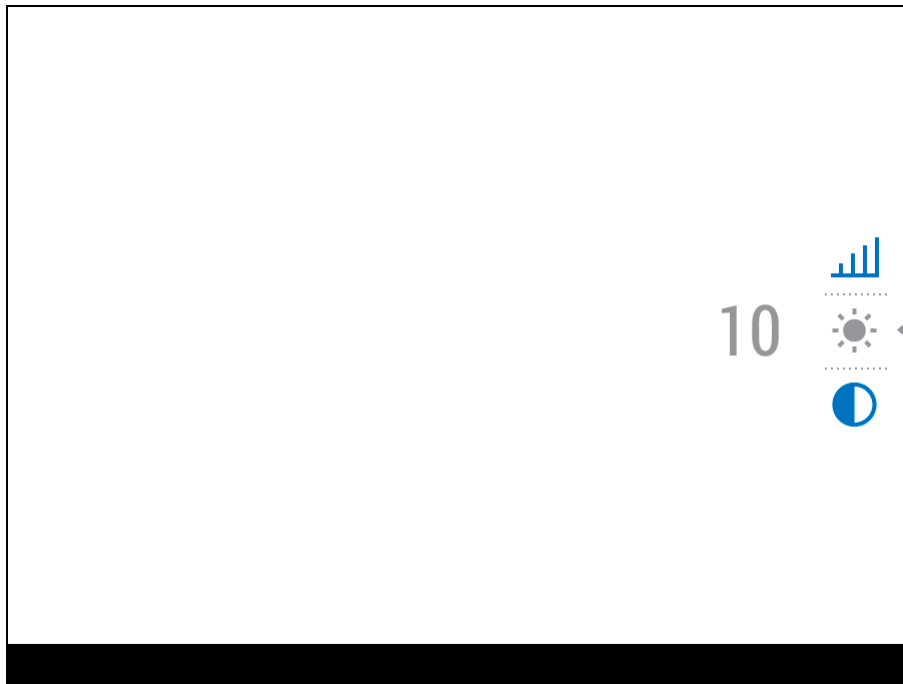
# Quick Menu

## Show device diagram




The quick menu is used to quickly access the settings for brightness, contrast, smooth digital zoom and use the stadiametric rangefinder.

- Enter the menu with a short press of the **MENU (9)** button.
- To toggle between the functions below, press successively the **MENU (9)** button.




**Brightness**  – press briefly the **UP (7)/DOWN (8)** buttons to change display brightness from 0 to 20.

**Contrast**  – press briefly the **UP (7)/DOWN (8)** buttons to change display contrast from 0 to 20.

**Smooth digital zoom**  – press the **UP (7)/DOWN (8)** buttons to change digital zoom.

Smooth digital zoom is in 0.1x increments.

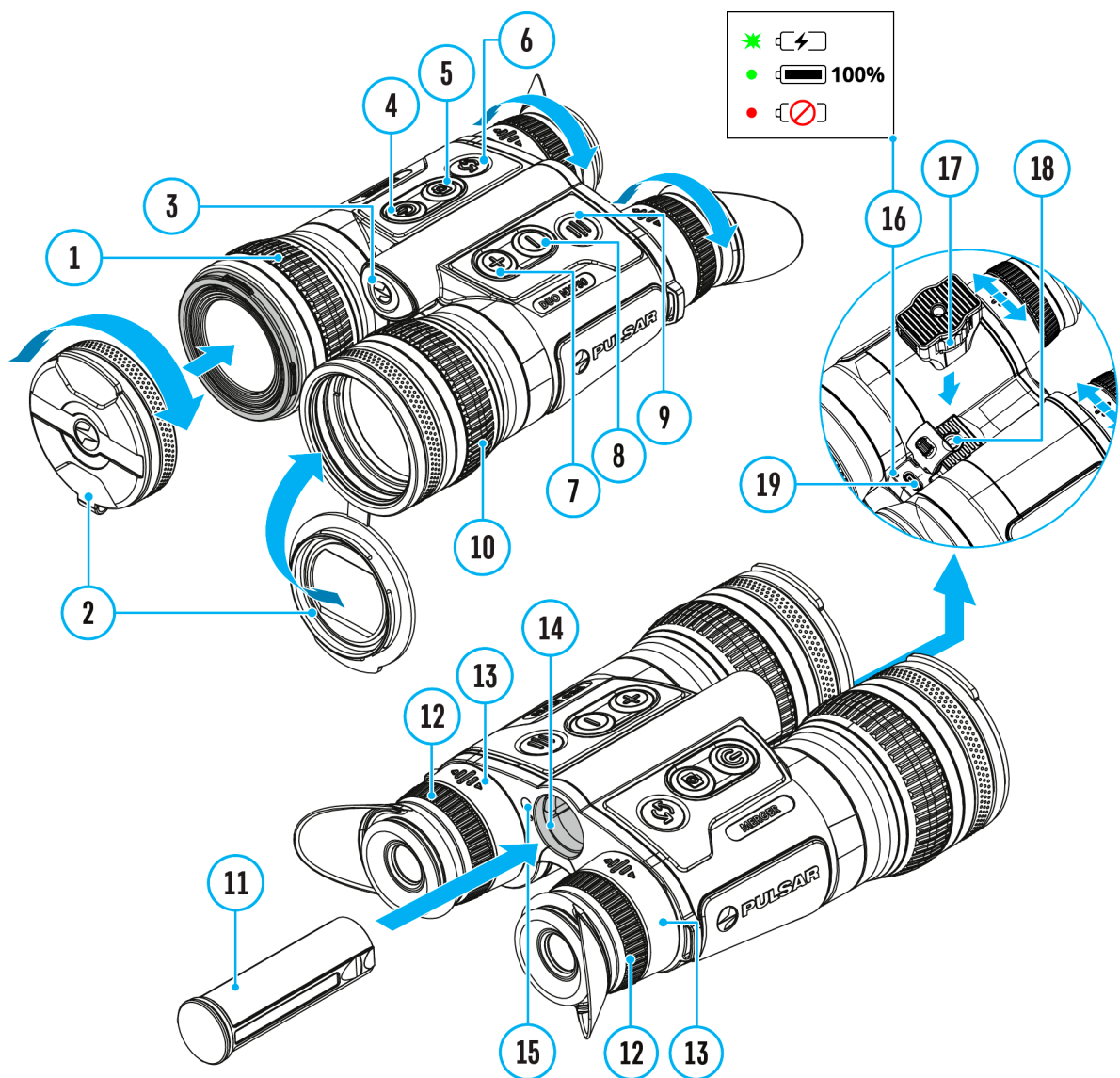
*Note:* the magnification value is reset to the base value when the device is switched off.

**Stadiometric Rangefinder**  - change the position of special marker lines to determine the distance to the object being observed by pressing the **UP (7)/DOWN (8)** buttons (for more details see the [Stadiometric Rangefinder](#) section).

- To exit quick menu, press and hold down the **MENU (9)** button or wait 5 sec for automatic exit.

# Image Modes (Thermal Imaging/Digital/Multispectral PiP)

Show device diagram

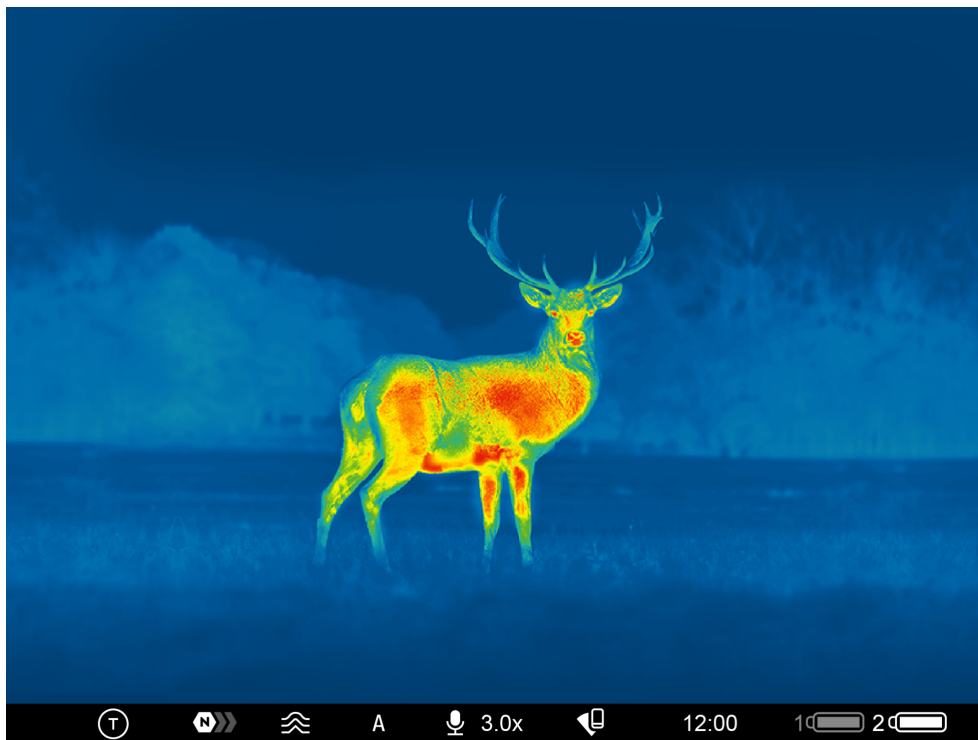


The device has 3 image modes: thermal imaging, digital and multispectral

PiP mode.

- Quickly switch between thermal and digital modes by briefly pressing the **MODE (6)** button.
  - Activate the multispectral PiP mode by a long press of the **MODE (6)** button.
  - In the multispectral PiP mode, the image channels in the PiP window are switched by briefly pressing the **MODE (6)** button.
- 

## Thermal Imaging Mode



The device displays an image from a thermal imaging microbolometer when using the thermal imaging mode.

This mode allows you to use the device both at night-time and during the day in adverse weather conditions (fog, snow, haze) when there are obstacles (branches, tall grass, dense bushes etc.) that make it difficult to detect the target.

In thermal imaging mode, the riflescope does not need an external light source and is resistant to high light levels.

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## Digital Mode

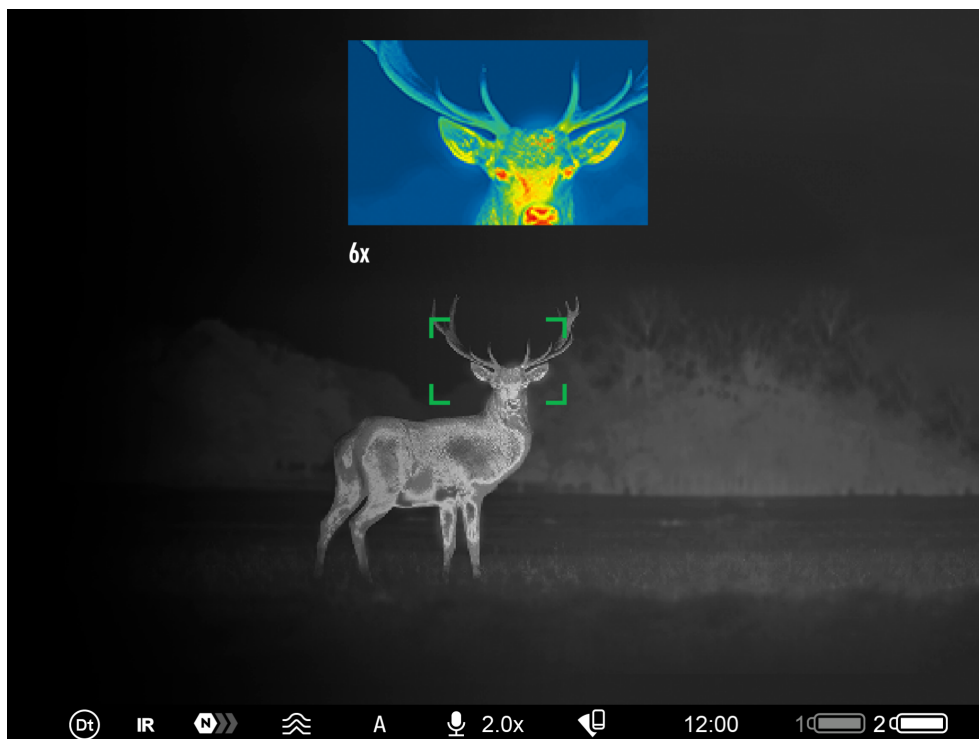
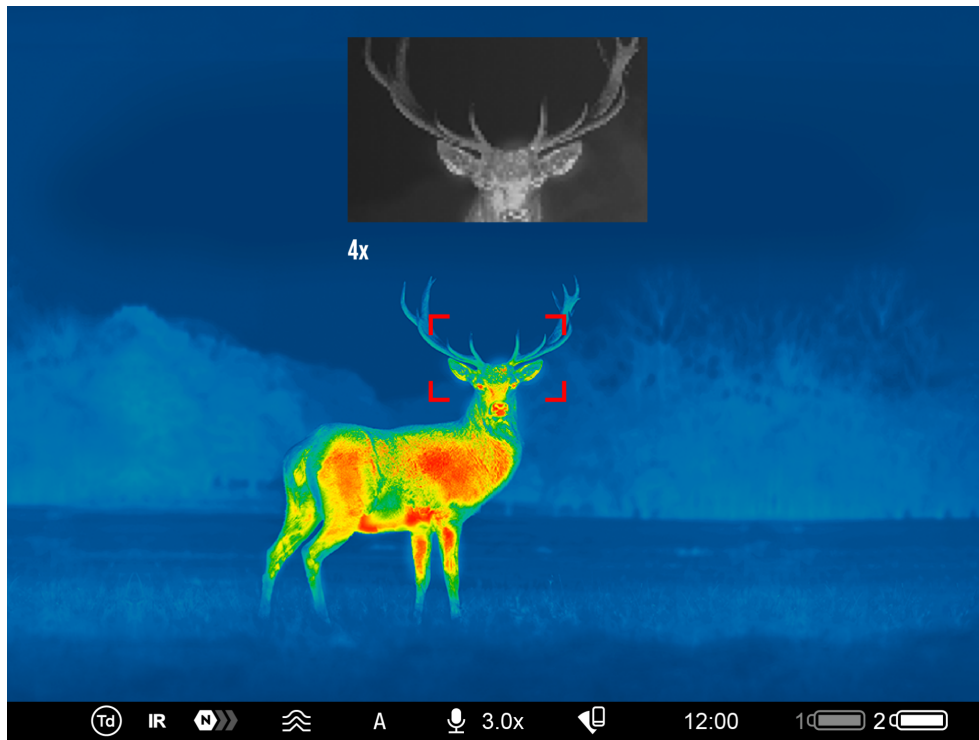


In digital mode, the device generates a black and white image from a digital sensor.

In this mode, the device allows observation both day and night. In night conditions (absence of starlight, moonlight), it is recommended to use an infrared illuminator with a wavelength of 940 nm.

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## Multispectral PiP



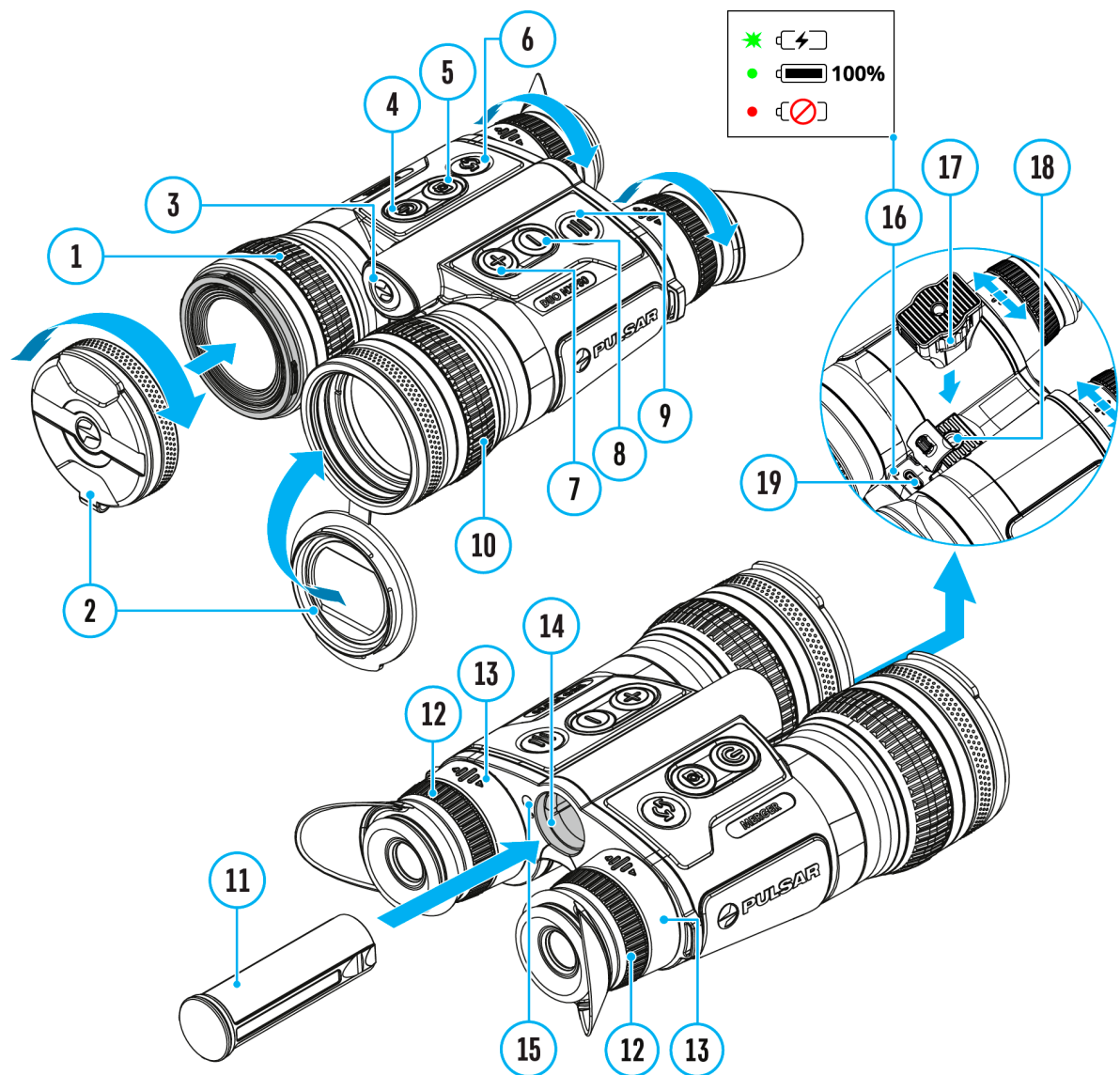
In the multispectral PiP mode, the image of one channel is displayed in the main window, and the image of the second channel is displayed in the PiP window.

In this mode, digital zoom is applied only to the PiP window. The magnification in the main window is set to base.



# Video Recording and Photography

Show device diagram



**Merger Duo** binoculars feature video recording and photography of the image being ranged to the internal memory card.

Before using the photo and video functions, read the **Date and Time**





subsections of the **General Settings** section.

For information on how to watch recorded photos and videos, see the Stream Vision 2 user manual: **Android**, **iOS**.

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Built-in recorder operates in two modes:


- **Photo** (photography; the icon  is displayed in the upper left corner of the image).
- **Video** (video recording; the icon  is displayed in the upper left corner of the image, the total remaining recording time is given taking into account the current resolution in the HH:MM format (hours:minutes).

Switching between the operating modes of the video recorder is done by long pressing the **REC (5)** button. Switching between the modes is cyclical (**Video**-> **Photo**-> **Video...**).

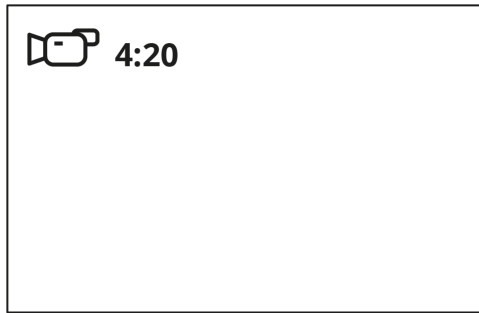
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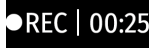
### Photo mode. Capturing an image

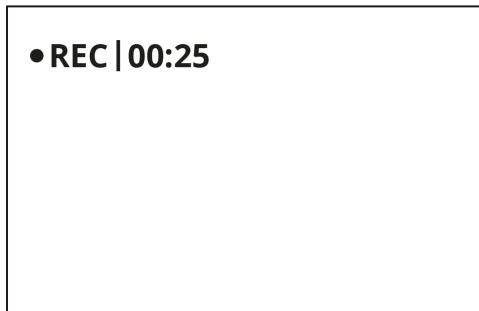


1. Switch to the **Photomode** with a long press of the **REC (5)** button.
  2. Press the **REC (5)** button briefly to capture a photo. The icon  flashes – the photo file is being saved to the built-in SD card.
- 

### Video mode. Recording a video



1. Switch to the **Video** mode with a long press of the **REC (5)** button.
2. Press the **REC (5)** button briefly to start video recording.
3. When the video recording starts, the icon  will disappear, instead of it the **REC** icon as well as the video recording timer displayed in the MM:SS (minutes:seconds) format will appear .



4. Pause/continue recording by briefly pressing the **REC (5)** button.
5. Press and hold the **REC (5)** button to stop video recording.

Video files are stored in the built-in memory card:

- After turning off the video recording;
- Upon powering the device off if recording was on;
- When the memory card is overfilled during recording (Memory Full message appears).

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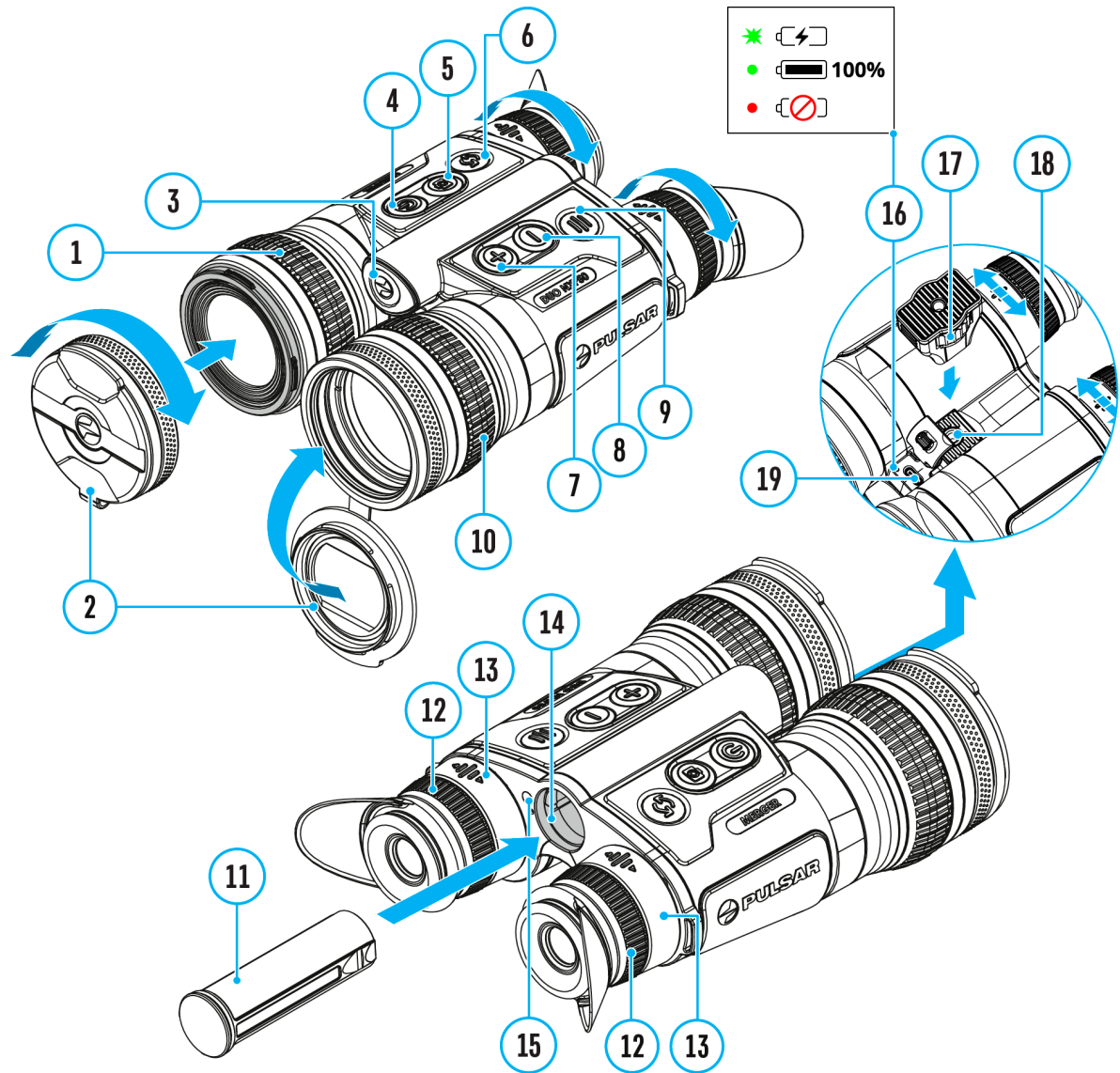
#### Notes:

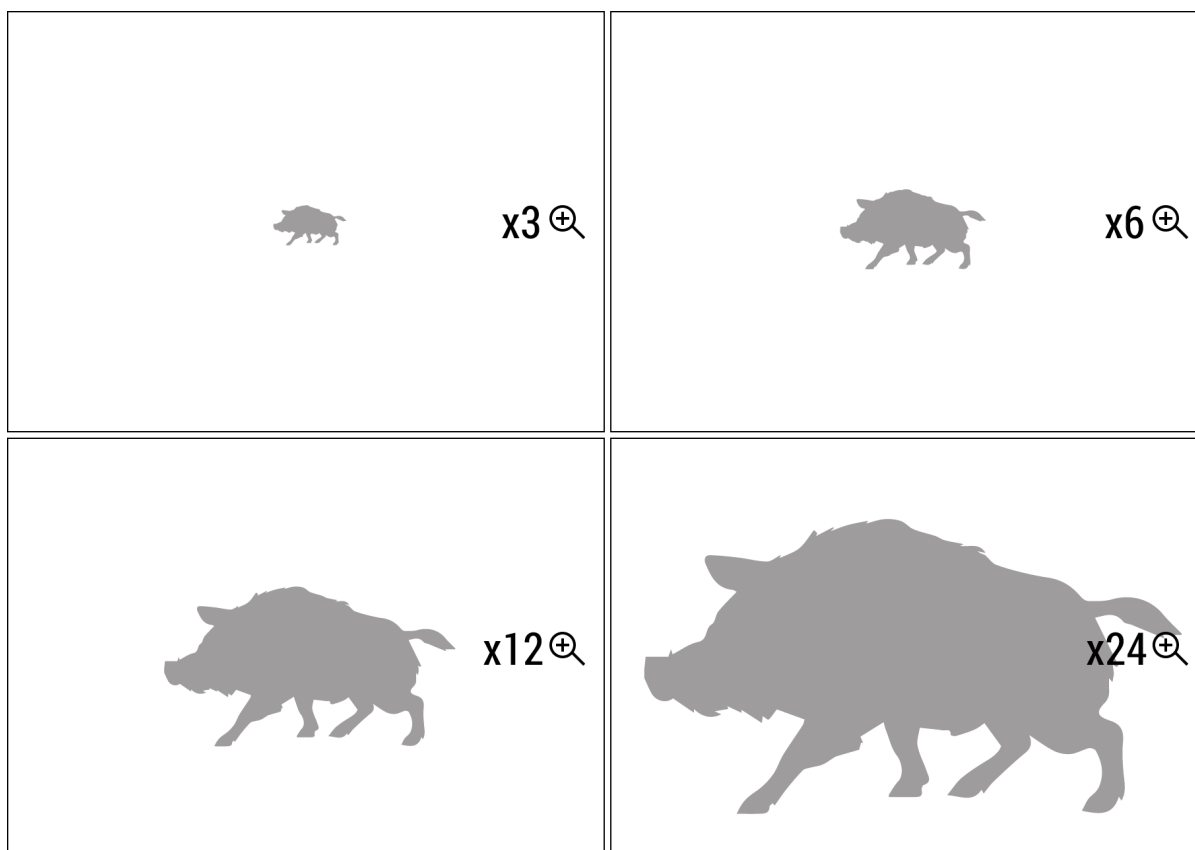
- You can enter and navigate the menu during video recording.
- Recorded videos and photos are saved to the built-in memory card of the device in the format img\_xxx. jpg (for photos); video\_xxx. mp4 (for video).
- Videos are recorded in clips with a maximum duration of 5 minutes. The number of recorded files is limited by the capacity of unit's internal

memory and video compression ratio.

- Regularly check free memory within the built-in memory card and move the footage to other storage media to free up the memory card space.
- In case of a memory card error, you can use the format function in the **General Settings** section of the main menu.
- When the **Display Off** function is activated, video recording continues to run in the background.

## Show device diagram





The device allows you to quickly increase the basic magnification (please refer to the **Magnification** line in the [Specifications](#) table) by 2, 4 or 8 times.

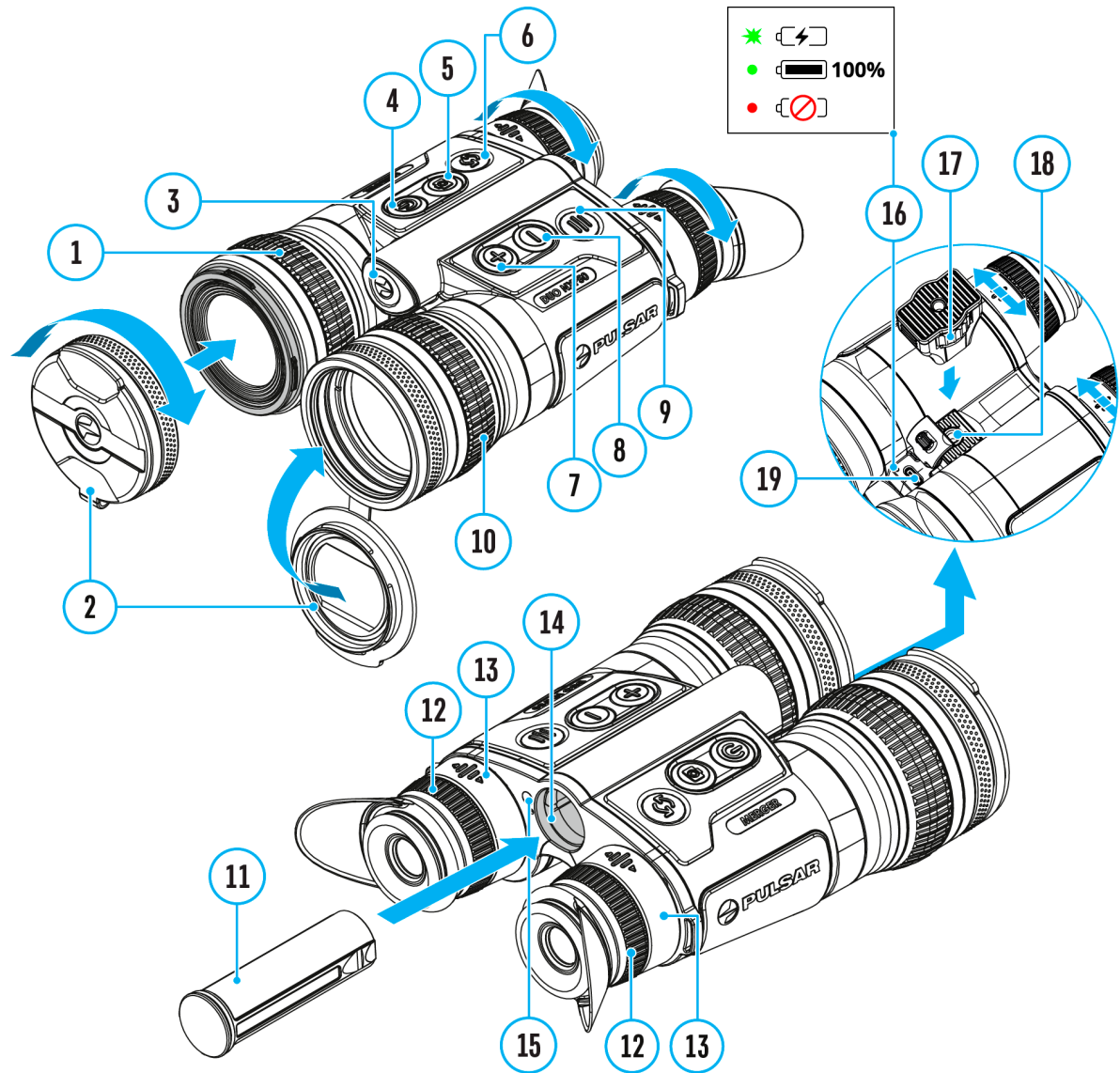
- To operate the discrete digital zoom, press successively the **UP/ZOOM (7)** button.
- The digital zoom will not be saved after the device is re-started.

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*Note:* the magnification value is reset to the base value when the device is switched off.

# PiP Function

## Show device diagram

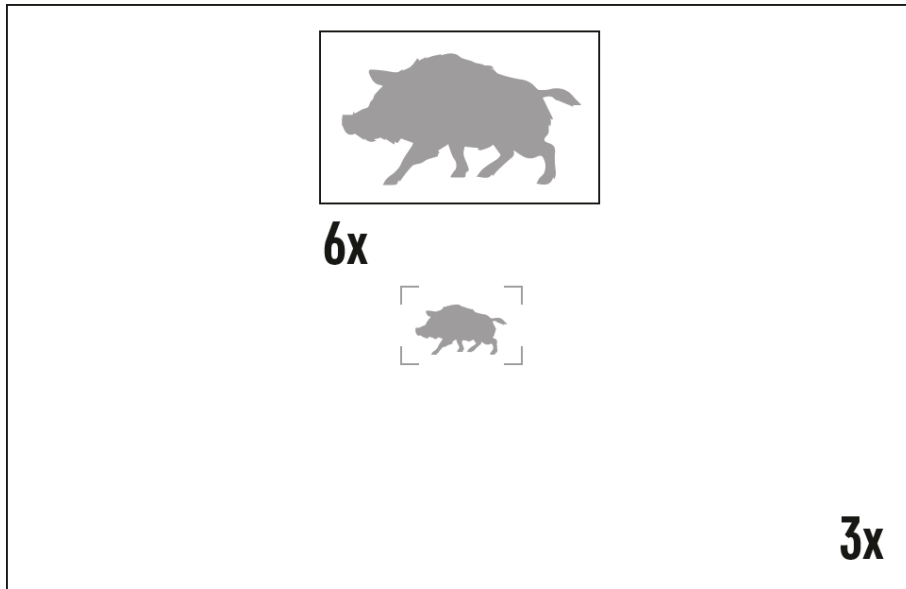


### Available in thermal imaging and digital mode

PiP ("Picture in Picture") allows you to see a zoomed image simultaneously with the main image in a dedicated window.

In this mode, the same image channel is displayed in the main window and the PiP window.

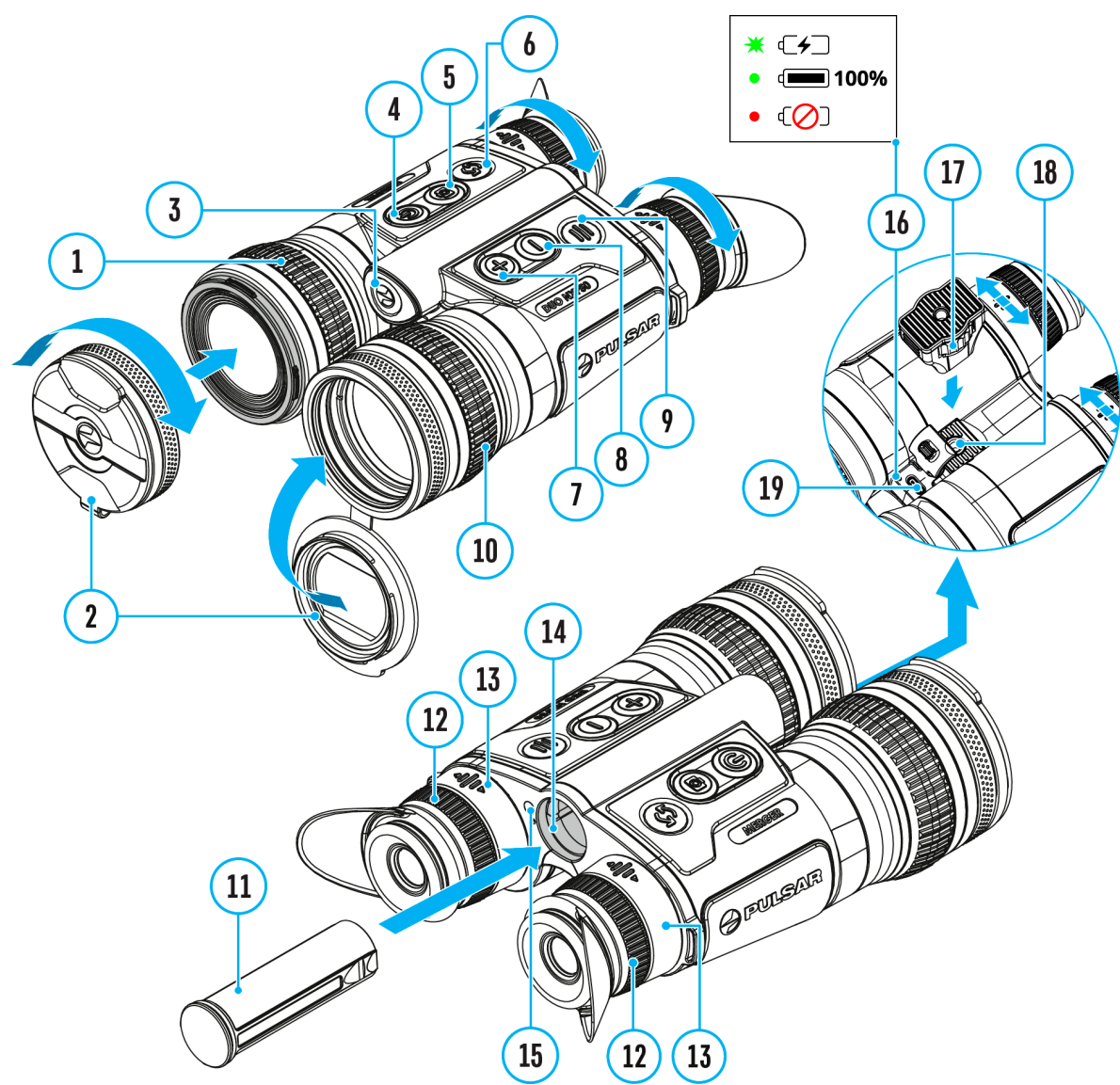
To use the multispectral PiP mode, see [Image Modes \(Thermal Imaging/Digital/Multispectral PiP\)](#).




- Turn on/off the PiP function with a long press of **UP/ZOOM (7)** button.
- Change zoom ratio in the PiP window with a short press of **UP/ZOOM (7)** button.
- The zoomed image is displayed in a dedicated window, while the image in the rest of the screen is displayed at base magnification.
- When PiP is turned on, you can operate the discrete and continuous digital zoom. The magnification will take place only in the dedicated window.
- When PiP is turned off, the image is shown with the optical magnification set for the PiP function.


# Display-Off Function

Show device diagram



This function darkens the screen, which aids the user’s concealment. However, the device stays on.




 00:03



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The displays can be turned off automatically if the **proximity sensor** is turned on or by pressing the **ON/OFF (4)** button if the proximity sensor is turned off.

### **The proximity sensor is turned on:**

1. When the device moves away from the user's face, the displays will turn off.
2. When the device approaches the user's face, the displays will turn on again.
3. While holding the **ON/OFF (4)** button, a countdown icon  will appear on the displays and the device will turn off.

### **The proximity sensor is turned off:**





1. When the device is on, press and hold the **ON/OFF (4)** button. The displays will turn off, the current time and the "**Display off**" icon will appear.
2. Turn the displays back on with a short press of the **ON/OFF (4)** button.
3. When you press and hold the **ON/OFF (4)** button, the displays show the "**Display off**" icon with a countdown. Pressing & holding the button down for the duration of the countdown will power the device off completely.





# Wi-Fi Function

The device has a function enabling wireless communication with external devices (smartphone or tablet) via Wi-Fi.

- Turn on the wireless module in the **Wi-Fi Activation**  menu option.

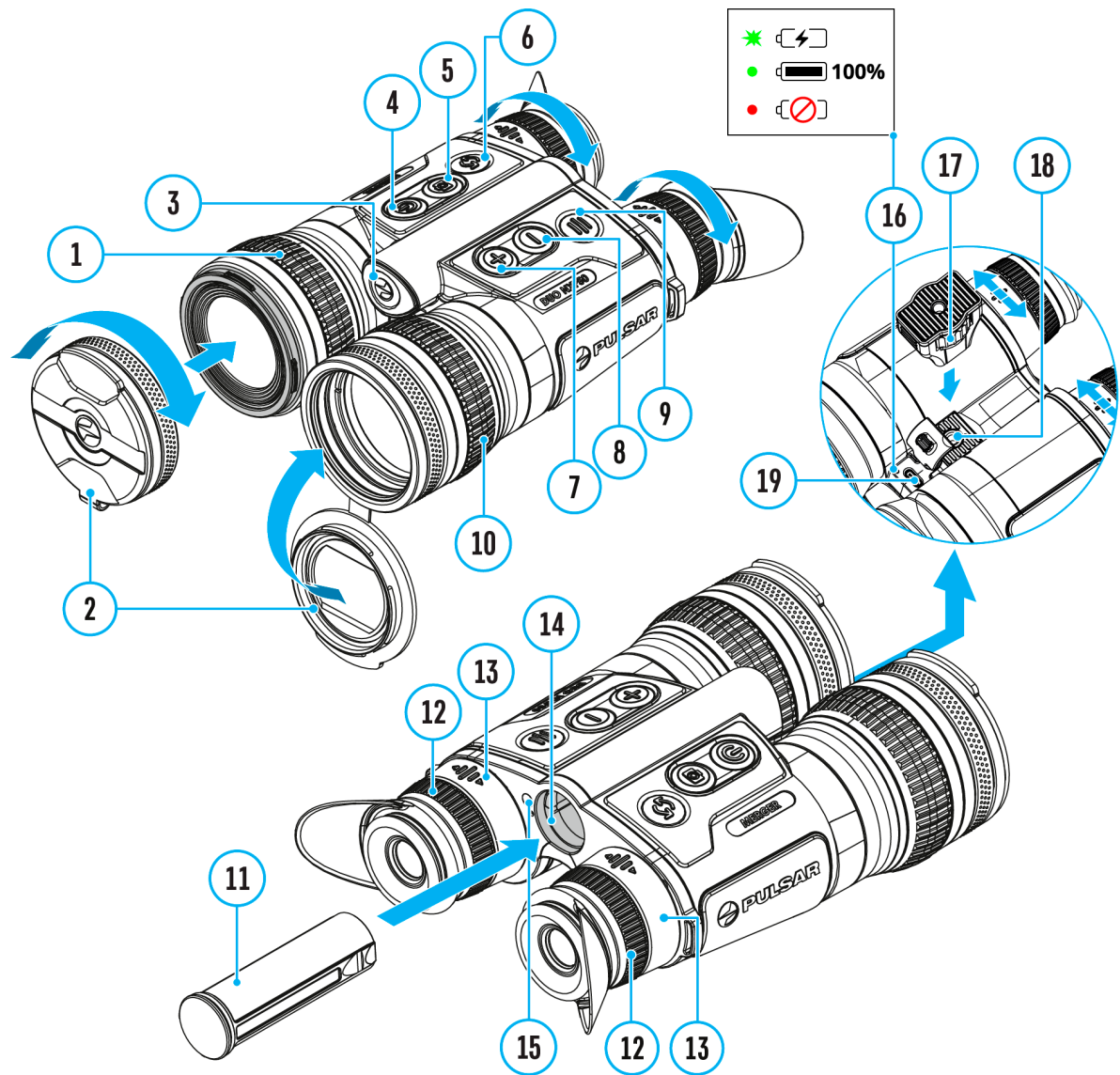
Wi-Fi operation is shown in the status bar as follows:

Status bar indication	Connection status
	Wi-Fi is off
	Wi-Fi activated by the user, Wi-Fi in the device is being activated
	Wi-Fi is on, no connection with device
	Wi-Fi is on, device connected

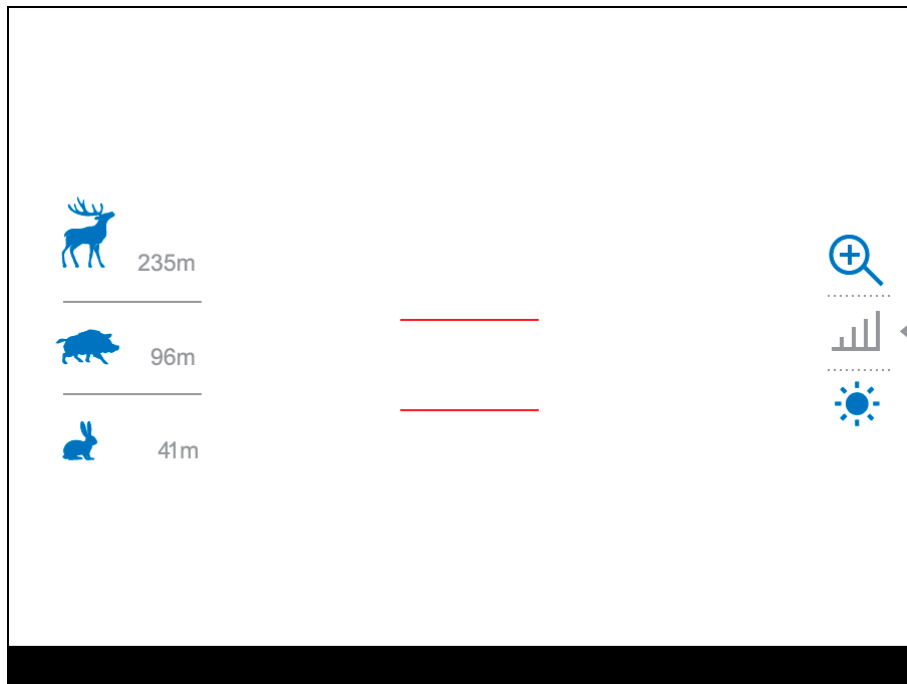
- Your device is detected by an external device as "MERGER\_XXXX", where XXXX – is the last four digits of device's serial number.
- After entering the password (default: **12345678**) on a mobile device (see **Password Setup** subsection of the **Wi-Fi Settings** section for more information on setting a password) and connection is established, the icon  in the status bar will change to . Image found or type unknown
- The Wi-Fi function will turn off automatically if there is not enough battery power for Wi-Fi. The battery icons will turn red   and flash. To use the Wi-Fi function again, you need to charge the batteries.


# Stadiametric Rangefinder

Show device diagram





**Merger Duo** binoculars are equipped with a stadiametric rangefinder which allows the user to determine the approximate distance to an object of a known size with reasonable accuracy.



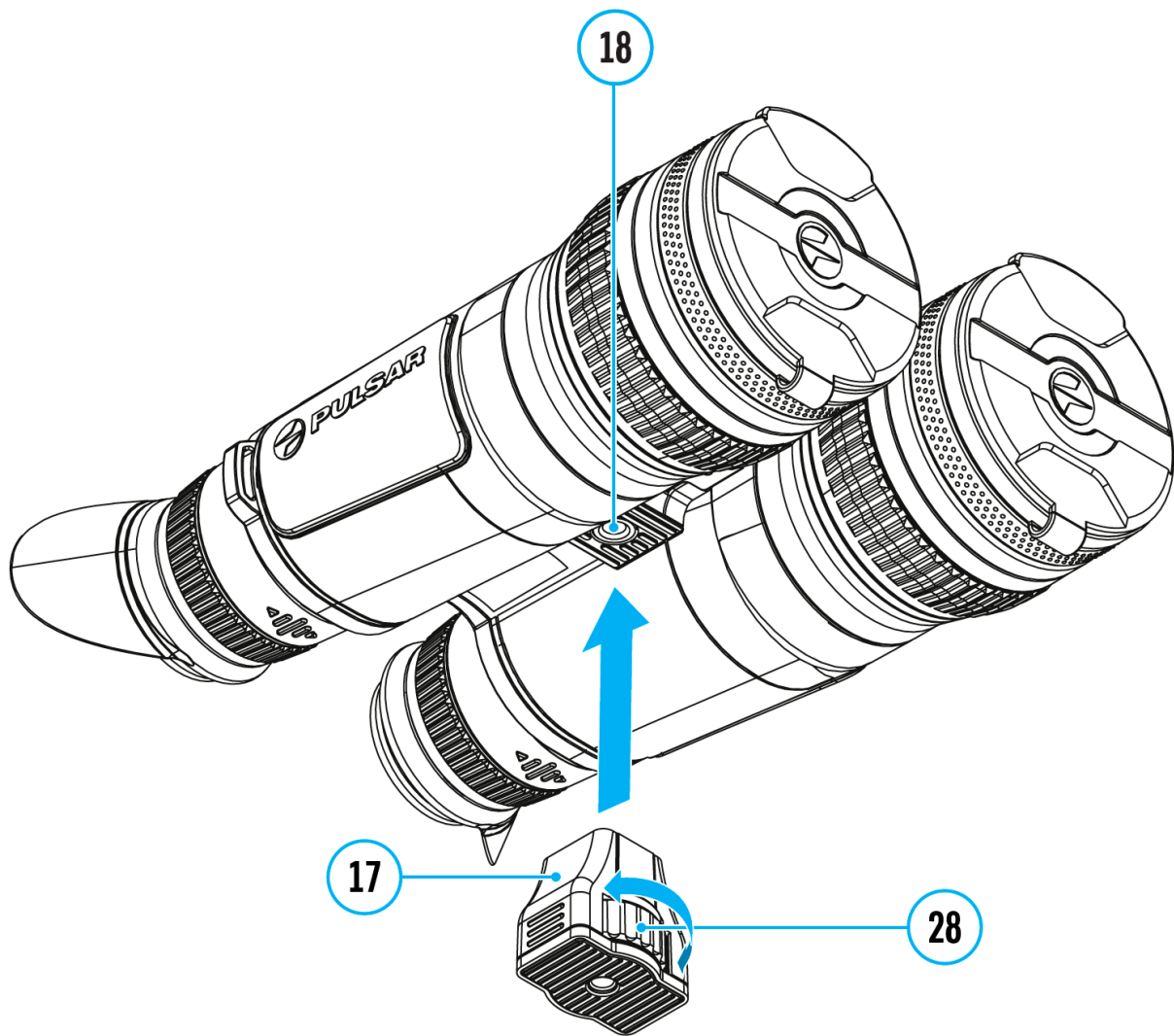
1. Select the **Stadiametric Rangefinder** function with short presses of the **MENU (9)** button until the icon  is selected.
2. You will see on the display: measurement bars, icons of three reference objects and respective distances for the three objects.
3. Position the lower fixed bar under the object being ranged.
4. By pressing the **UP (7)/DOWN (8)** buttons, move the upper horizontal bar relative to the lower fixed bar until the object fits entirely between the two bars. The distance to the object is automatically recalculated as you move the upper line.
5. Exit the rangefinder mode with a long press of the **MENU (9)** button or wait 10 seconds to exit automatically.

#### Notes:

- There are three predefined values for the reference objects: Hare - 0.3 m height, Boar - 0.7 m height, Deer - 1.7 m height.
- Before it appears on the display, a measured distance value is rounded up to 5m for larger values and rounded down to 1m for smaller values.
- To select the unit of measurement (Meters or Yards), go to the **General Settings**  menu item => **Units of Measure**  submenu.

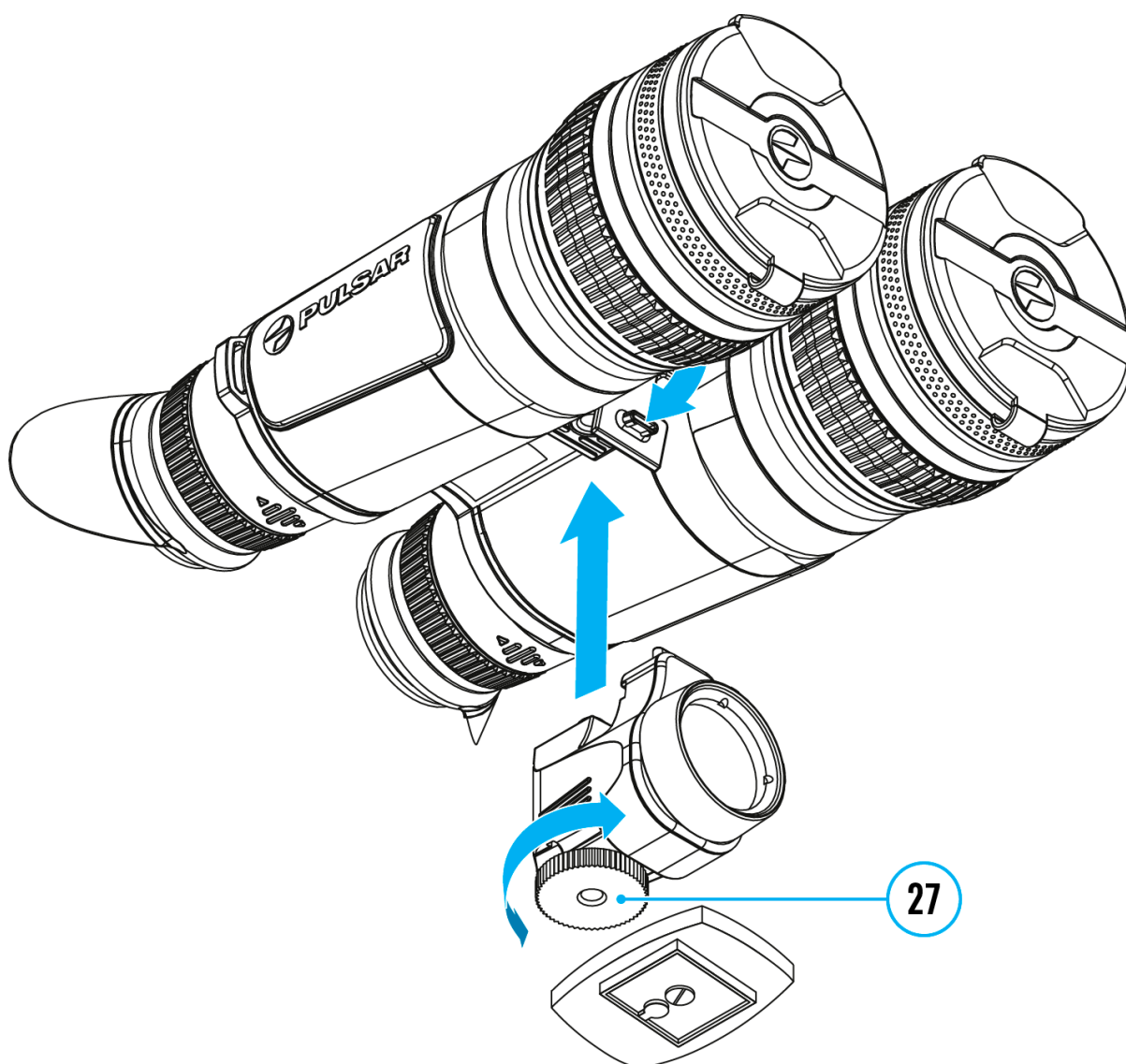
# Installing the Device on a Tripod

## Using a tripod adapter



1. Attach the tripod adaptor (**17**) to the socket (**18**).
  2. Screw the adapter wheel (**28**) clockwise until it stops.
  3. Secure the adaptor with the device on a tripod.
-

## Using an IR illuminator

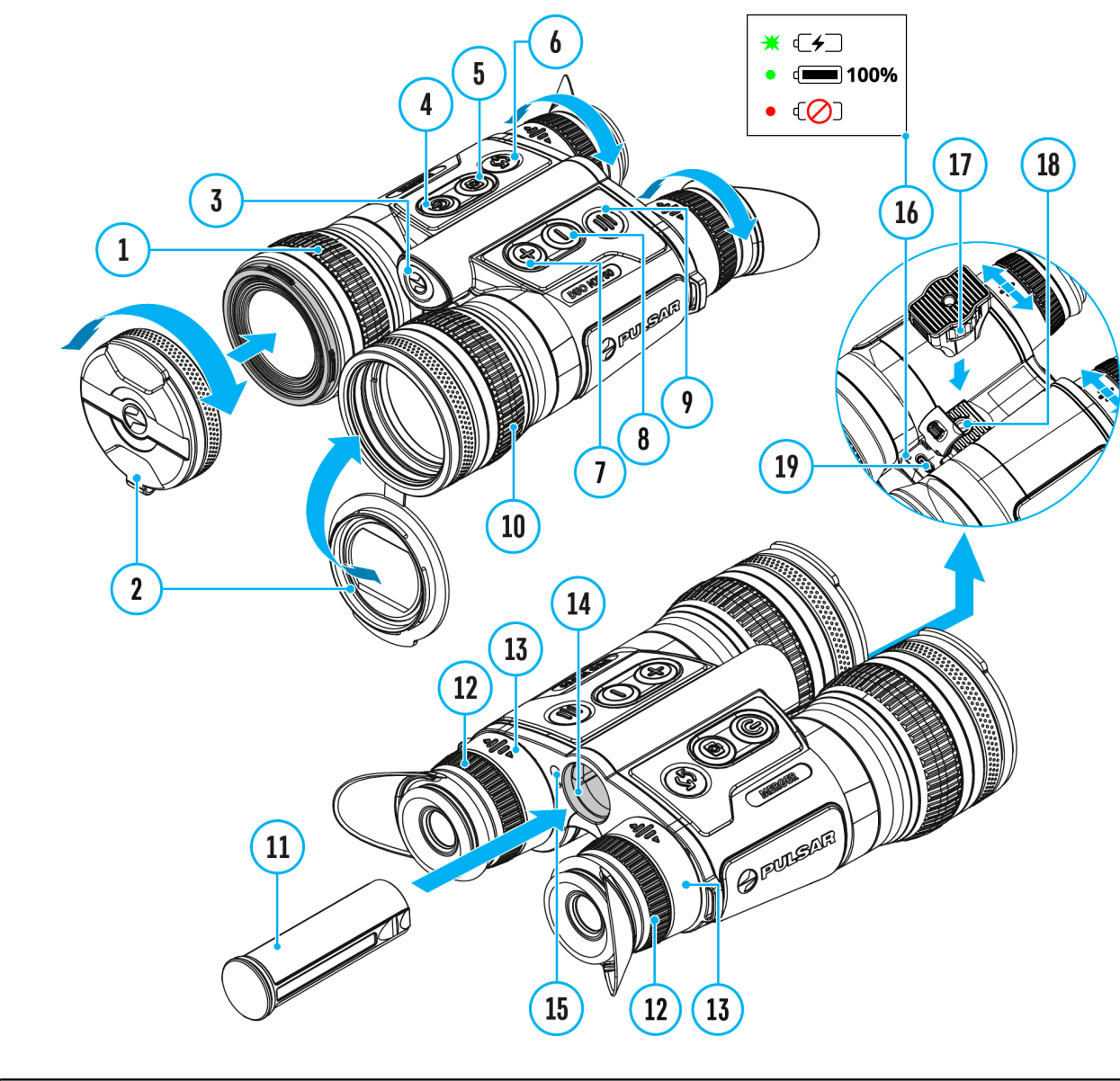


1. Install the IR illuminator on the device.
2. Screw the tripod adapter platform to the hole in the tripod screw **(27)**.
3. Install the device with the platform on a tripod.



# USB Connection

Show device diagram






1. Connect one end of the USB cable to the USB Type-C **(17)** connector of the device, the other one to the port on your computer using a USB Type-A adapter.
2. Turn the device on with a short press of the **ON/OFF (4)** button (device that has been turned off cannot be detected by your computer).
3. Your device will be detected by the computer automatically; no drivers need to be installed.
4. Two connection modes will appear on the image: **Power** and **Memory Card** (external memory).
5. Select connection mode with **UP (7)/DOWN (8)** buttons.
6. Confirm selection with a short press of the **MENU (9)** button.

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## Power

- In this mode, when a computer is used as an external power supply, the icon  appears in the status bar. The device will continue operating and all functions are available.
- The Battery pack installed in the device is not being charged!
- A battery recharge feasibility depends on your computer's USB port.

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## Memory Card

- In this mode the device is detected by the computer as a flash card.
- This mode is designed for work with the files saved in device's memory. The device's functions are not available in this mode; the device turns



off automatically.

- If video recording was in progress when connection was made, recording stops and video is saved.
- 

## **USB Disconnection**

- When the USB is disconnected from the device connected as the **Power** mode, the device continues operating from the rechargeable batteries if they are sufficiently charged.
- If the device is in **Memory Card** mode and is disconnected from USB, the device will remain on.

# Stream Vision 2



Install the Stream Vision 2 application to download files, update firmware, control the device by remote control and broadcast images from your device to a smartphone or a tablet via WiFi.

We recommend using the latest version – Stream Vision 2.

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You can find further guidelines on Stream Vision 2 [here](#).

**Download** from Google Play

**Download** from App Store

Find answers to frequently asked questions about using Stream Vision 2 [here](#).

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**Stream Vision 2 Manual**

**Android**

**iOS**

# Firmware Update

1. Download the free Stream Vision 2 App in [Google Play](#) or [App Store](#).
2. Connect your Pulsar device to your mobile device (smartphone or tablet).
3. Launch Stream Vision 2 and go to section “Settings”.
4. Select your Pulsar device and press “Check firmware update”.
5. Wait for the update to download and install. Pulsar device will reboot and will be ready to operate.

## **Important:**

- if your Pulsar device is connected to a phone or mobile device, please turn on mobile data transfer (GPRS/3G/4G) to download update;
- if your Pulsar device is not connected to your phone or mobile device but is already listed in “Settings” > “My devices” section, you may use Wi-Fi to download update.

Find answers to frequently asked questions about using Stream Vision 2 [here](#).

## **Is your firmware up to date?**

Click [here](#) to check the latest firmware for your device.

# Technical Inspection

It is recommended to inspect your device before each use. Check the following:

- The device should be free of any cracks or deformations.
- The lenses should be free of cracks, grease, dirt or debris.
- The battery level of the device should be full. Electrical sockets should be free of salts, oxidation, or other debris.
- All controls should be responsive.

# Technical Maintenance

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

- Wipe the exterior surfaces of metal and plastic parts with a cotton cloth. Do not use chemically active substances, solvents, etc. as these will damage the paint.
- Clean the electric terminals of the Battery Pack and device's battery slot using a grease-free organic solvent.
- Check the lenses of the eyepieces and objectives. If necessary, remove dust and sand from the optics (it is preferable to use a non-contact method). Cleaning of the exterior surfaces of the optics should be done with cleaners designed especially for this purpose.

# Storage

- Always store the device in its carrying case in a dry, well-ventilated space.
- Remove the Battery Pack for long-term storage.

# Troubleshooting

For technical support please contact [support@pulsar-vision.com](mailto:support@pulsar-vision.com).

Answers to frequently asked questions about the devices can also be found in the [FAQ](#) section.

## The device does not turn on

### Possible cause

The batteries are completely discharged.

### Solution

Charge the batteries.

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## Device malfunction

### Solution

In case of any malfunctions during operation, try resetting the device by long pressing the ON/OFF button for 10 seconds.

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## The device does not operate on external power supply

### Possible cause

USB cable is damaged.

### Solution

Replace USB cable.



### **Possible cause**

The external power supply is discharged.

### **Solution**

Charge the external power supply.

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## **The thermal image is blurry, with vertical stripes and uneven background**

### **Possible cause**

Calibration is required.

### **Solution**

Carry out calibration according to [Calibration Mode](#) section.

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## **Black screen after calibration**

### **Solution**

If the image does not clear after calibration, you need to recalibrate.

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## **When the device is turned on, the calibration frequency is at first higher, then decreases (if the automatic calibration mode is enabled)**

### **Possible cause**

After turning on the device, it takes some time for the sensor temperature to stabilize. This is normal and is not a defect.

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## **Colored lines appeared on display or image has disappeared**

### **Possible cause**

The device was exposed to static electricity during operation.

### **Solution**

After exposure to static electricity, the device may either reboot automatically, or require turning off and on again.

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## **The image is too dark**

### **Possible cause**

Brightness or contrast level is too low.

### **Solution**

Adjust the brightness or contrast level in the [Quick Menu](#).

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## **Poor image quality / Detection range reduced**

### **Possible cause**

Problems described may arise in adverse weather conditions (snow, rain, fog etc.).

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## **The device is not focused**

### **Possible cause**

Wrong settings.

### **Solution**

Adjust the device according to the [Powering on and Image Setting](#) section.

Check the outer surfaces of the lenses and the eyepieces and, where necessary, wipe away dust, condensation, frost, etc. In cold weather, you can use special anti-fogging coatings (e.g., the same as for

corrective glasses).

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## Smartphone or tablet cannot be connected to the device

### Possible cause

Password in the device was changed.

### Solution

Delete network and connect again inserting the password saved in the device.

### Possible cause

There are too many Wi-Fi networks in the area where the device is located which may cause signal interference.

### Solution

To ensure stable Wi-Fi performance, move the device to an area with few or no Wi-Fi networks.

### Solution

**Switch** the device's Wi-Fi band.

### Possible cause

The device has a 5 GHz network enabled, but the smartphone only supports 2.4 GHz.

### Solution

**Switch** the device's Wi-Fi band to 2.4 GHz.

More information on solving problems with connection to Stream Vision 2 by following the [link](#).

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## **Wi-Fi signal is missing or interrupted**

### **Possible cause**

Smartphone or tablet is out of range of a strong Wi-Fi signal. There are obstacles between the device and the smartphone or tablet (e.g., concrete walls).

### **Solution**

Relocate smartphone or tablet into the Wi-Fi signal line of sight.

More information on solving problems with connection to Stream Vision 2 by following the [link](#).

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## **The image of the object being observed is missing in the thermal imaging mode**

### **Possible cause**

The object is behind glass, which obstructs thermal vision.

### **Solution**

Remove the glass.

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## **There are several light or black dots (pixels) on device's displays, microbolometer or digital sensor**

### **Solution**

The presence of such pixels is associated with the manufacturing

technology of displays and microbolometers or digital sensors. It is not a defect.

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## **When using the device at below zero temperatures the thermal image quality is worse than at positive temperatures**

### **Possible cause**

In warm climates, objects in the background of a thermal image heat up differently because of thermal conductivity, generating a high temperature contrast and a sharper thermal image.

In cold climates, objects in the background of a thermal image will cool down to roughly the same temperature, which leads to a greatly reduced temperature contrast and a degraded image quality. This is normal for all thermal imaging devices.

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## **There is no thermal imaging or digital image**

### **Possible cause**

Lens cover closed.


### **Solution**

Open the covers of the thermal imaging and digital channels.

### **Possible cause**

Channel is turned off.

### **Solution**

Turn on the desired channel in the “**Viewing Channel Activation**”  item of the **General Settings** section in the main menu.

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## **The image of the digital channel is overexposed when direct sunlight hits the binocular lens**

**Possible cause**

If direct sunlight hits the binocular digital channel lens during daytime observation, the image may be overexposed. The device has a highly sensitive digital sensor and is intended primarily for night observation.

**Solution**

Do not use the device in both modes (digital and thermal imaging) opposite the sun, as well as in digital mode at night in front of bright oncoming light sources (car headlights, street lamps, etc.). Deterioration in image quality when using the device in this way is not a defect.

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# Legal Compliances and Disclaimers

**Attention!** A license is required for the Merger Duo multispectral binoculars when exporting outside your country.

## **Electromagnetic Compliance**

This product complies with EU Standard EN 55032:2015, Class A.

**Warning!** Operation of this equipment in a residential environment could cause radio interference.

**Updates of the Product.** The manufacturer reserves the right at any time, without mandatory prior notice to the Customer, to make changes to the package contents (subject to the applicable laws, if any), design and characteristics that do not impair the quality of the Product.

**Repair.** Repair of the product is available within 5 years after purchase of the product.

**Limitation of Liability.** Subject to mandatory applicable laws and regulations: manufacturer will not be liable for any claims, actions, suits, proceedings, costs, expenses, damages or liabilities (if any), arising out of the use of this product. Operation and use of the product are the sole responsibility of the Customer. Manufacturer's sole undertaking is limited to providing the product(s) and related services in accordance with the terms and conditions of concluded transactions, including provisions established in warranty. The provision of products sold and services performed by Manufacturer to the Customer shall not be interpreted, construed, or regarded, either expressly or implied, as being for the benefit of or creating any obligation toward any third party (other than Distributor, Dealer, Buyer). Manufacturer's liability hereunder for damages, regardless of the form or action, shall not exceed the fees or other charges paid to Manufacturer for the product(s) and/or service(s).

MANUFACTURER WILL NOT BE LIABLE FOR LOST REVENUES OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES, EVEN IF THE MANUFACTURER KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY.

