PULSAR
IMAGE.QUALITY

THERMAL
IMAGING

Thermal Imaging Monoculars

AXION KEY

PULSAR
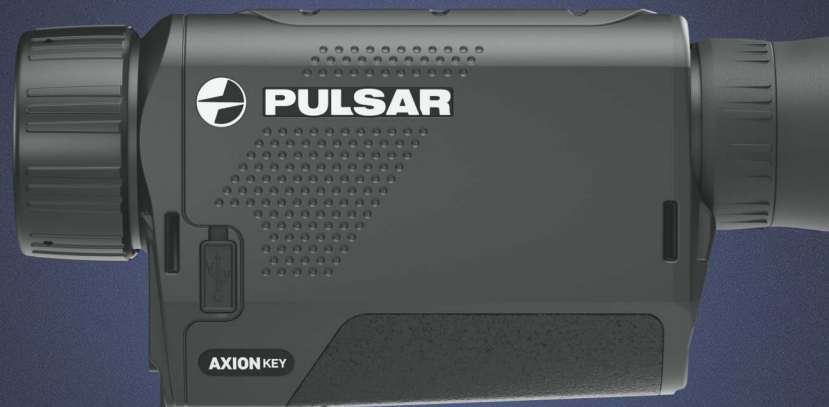
AXION KEY

Operating Instructions

English / Français / Deutsch / Español / Italiano / Русский

⚡ SPECIFICATIONS

SKU#	77424	77425
AXION KEY Model	**KEY XM22**	**KEY XM30**
Microbolometer		
Type	uncooled	uncooled
Resolution (pixels)	320x240	320x240
Frame refresh rate (Hz)	50	50
Pixel size (microns)	12	12
Optical specifications		
Optical magnification (x)	2	2,5
Smooth digital zoom (x)	2-8	2,5-10
Digital zoom (x)	2/4	2/4
Relative aperture (D/f)	1.2	1.2
Minimum focusing Distance (m/y)	3	3
Exit pupil diameter (mm/inch)	3	3
Angle of field of view (HxV), degrees	10	7,3
Angle of field of view, metres at 100m	17,5	12,8
Focusing range of eyepiece (dioptres)	-4/+5	-4/+5
Maximum observation distance (m/y) *	950	1300
Display		
Type	LCOS	LCOS
Resolution (pixels)	960x720	960x720
Operational specifications		
External power voltage	3 – 4.3V	3 – 4.3V
Battery type	Li-Ion Battery Pack APS3	Li-Ion Battery Pack APS3
Capacity	3200 mAh	3200 mAh
Rated Output Voltage	DC 3.7V	DC 3.7V
External power supply	5V (USB)	5V (USB)
Battery charge life in hours ** (at 22°C)	4	4
IP code (IEC60529) degree of protection	IpX7	IpX7
Operating temperature range	-10°C … +40°C/+14F … +104F	-10°C … +40°C/+14F … +104F
Dimensions (mm/inch)	143x41x69/5.63x1.61x2.71	149x49x70/5.87x1.93x2.75
Weight without batteries (kg/oz)	0.25/8.82	0.27/9.52

* For animal object, such as a deer.

Improvements may be made to the design and software of this product to enhance its user features. The current version of the User's Manual may be found on the website www.pulsar-vision.com

⚡ DELIVERY PACKAGE

- AXION KEY Thermal Imager
- APS3 rechargeable battery
- Mains charger
- USB cable
- Case
- Hand strap
- User's Manual
- Cloth for cleaning optics
- Warranty card

⚡ DESCRIPTION

AXION KEY IR-matrix (microbolometer) based thermal imaging monoculars are represented by a number of models that differ in magnification and lens diameter. These devices are designed for use 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 devices that are based on electron-optical converters, thermal vision monoculars do not require an external light source and are resistant to the effects of bright light.

AXION KEY monoculars can be used for night-time hunting, observation and terrain orientation, and carrying out rescue operations.

⚡ DISTINGUISHING FEATURES

- High magnification
- Long detection distance
- High-contrast HD Display.
- Microbolometer pixel size of 12 microns
- Various colour palettes
- Stadiametric rangefinder
- IPX7 Completely watertight
- Convenient user interface
- Strengthened metal body
- Short power-up time (quick start)
- Lightweight and compact
- Functional and ergonomic design
- Three calibration modes (manual, semi-automatic and automatic)
- Three observation modes (forest, city and identification)
- Picture in picture (PiP) function

Battery Pack
- Quick-change APS3 Li-ion battery pack
- USB charging option

⚡ COMPONENTS AND CONTROLS

1. Eyepiece dioptre adjustment ring
2. Down button ▽
3. Menu button ⬚
4. Up/Zoom button △
5. On/Calibration ON button ⏻
6. Lens focus ring
7. Lens cap
8. MicroUSB connector
9. Battery release button
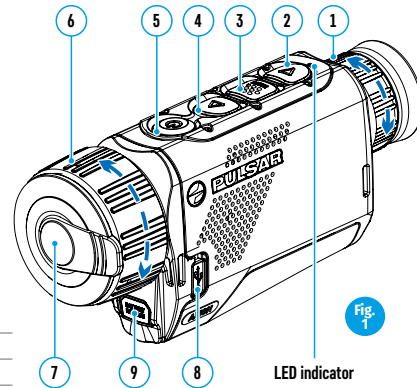
LED indicator displaying current status of the device

LED Indicator	Operating Mode
●	Device is powered on
●	Device on / battery charge <10%

Fig. 1

LED indicator

⚡ BUTTON OPERATION

Control mechanism	Condition / Operating Mode	1 short press	Next short press	Long press
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
Up/Zoom button △	Device is powered on	Change magnification (Zoom)		PiP on/off
	Quick menu	Increase parameter		Increase parameter
	Main menu	Navigation up, right		Navigation up, right
Menu button ⬚ MENU	Device is powered on	Open quick menu		Open main menu
	Quick menu	Navigation up		Exit quick menu
	Main menu	Confirm value, enter menu options		Exit menu options, exit main menu
Down button ▽	Device is powered on	Switching palettes		Enabling the standard palette
	Quick menu	Reduce parameter		Reduce parameter
	Main menu	Navigation down, left		Navigation down, left

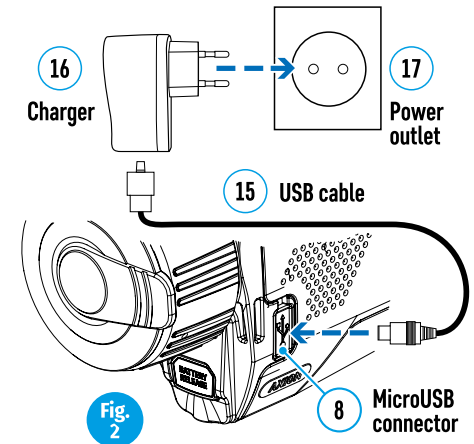## ⚡ USING THE RECHARGEABLE BATTERY

AXION KEY thermal imagers are supplied with a rechargeable APS3 Lithium-ion Battery Pack which enables the thermal imager to be used for up to 3 hours. The battery should be charged before first use.
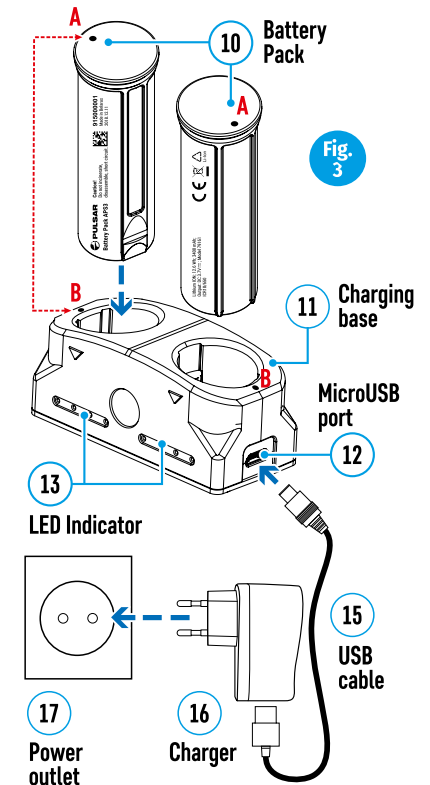
Charging the battery
Option 1 (Fig.2):
• Install the battery (10) into its slot on the instrument case (14) by aligning the icons to form a 'dot' on the device and the battery. (see Fig. 4).
• Attach a USB cable (15) to the microUSB connector (8) on the device.
• Connect the other end of the USB cable (15) to the mains charger (16) or to a USB socket connected to another power source with rated output of 5V or less.
• Connect the mains charger (16) to the mains power supply.
Note: The PB8I* Power Bank may be used as a charger (see Item 7).

16 Charger
17 Power outlet
15 USB cable
Fig. 2
8 MicroUSB connector

Option 2 (Fig.3):
• Insert the rechargeable battery (10) supplied with your device, or purchased separately, fully along the guide rail into the APS charger slot (available separately) (11).
• Point A on the battery and Point B on the charger should be aligned.
• Two batteries can be charged at the same time – a second slot is provided for this.
• Attach the microUSB plug on the USB cable (15) to the microUSB connector on the mains device (16). Plug the device into a 100–240V power outlet (17).
• Attach the second plug of the microUSB cable to the socket (12) of the mains charger (11).
Attention! AXION KEY thermal imagers require a licence when exported outside your country.
• The LED indicator (13) will light up.

A
10 Battery Pack
A
Fig. 3
B
11 Charging base
B
MicroUSB port
13
12
LED Indicator
17 Power outlet
16 Charger
15 USB cable

Battery charge status (see table).

LED Indicator *	Battery charge status
●	Battery charge from 0% to 10%; Charger not connected to the mains power supply.
✳	Battery charge from 0% to 10%; Charger connected to the mains power supply.
● ● ● ●	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. 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:

• Insert the battery (10) into the assigned slot on the device casing (14), aligning the images on the instrument and the battery.

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

• To remove the battery, press the Battery Release button (9).
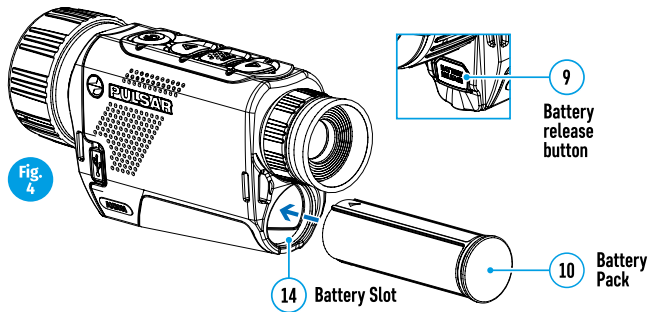
Safety measures:

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

• After being stored for a long time, the battery should be partially charged – it should not be fully charged or completely discharged.

• Do not charge the battery immediately after bringing it from the cold into a warm atmosphere. Wait 30–40 minutes for the battery to warm up.

• 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, otherwise the battery life will be significantly reduced.

• 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.

• Do not subject the battery to shocks or falls.

• Where the battery is used in below-zero temperatures, capacity will decrease. This is normal and does not indicate a defect.

• Do not use the battery in temperatures that exceed those shown in the table – this may shorten battery life.

Store the battery out of the reach of children.

Fig. 4

9 — Battery release button
14 — Battery Slot
10 — Battery Pack

⚡ EXTERNAL POWER SUPPLY

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

• Attach the external power source to the device's USB connector (8) (Fig. 1)

• The device will switch to operation from the external power source, while the APS3 battery will be gradually recharged.

• An icon of a battery ⊏⚡⊐ will appear on the display showing its charge as a percentage.

• If the device is operated from an external power source and the APS3 battery is not connected, an icon is displayed ▬■▬.

• When the external power supply is disconnected, the device switches to the internal power supply without the device powering off.

⚡ OPERATION

ATTENTION! The lens of the device 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 device. Damage caused by failure to comply with the operating guidelines is not covered under warranty.

Switching on and adjusting the image

• Remove the lens cover (7). Secure the cover to the strap using the magnet built into the cover.

• Power up the device by pressing the ON button (5).

• Adjust the resolution of the icons on the display by rotating the dioptre adjustment ring on the eyepiece (1). In future, it will not be necessary to rotate the eyepiece dioptre adjustment ring, regardless of distance and other conditions.

• To focus on the object being observed, rotate the lens focus ring (6).

• Adjustment of brightness and contract in the display, as well as turning on the smooth digital zoom, are described in the FAST ACCESS MENU FUNCTIONS section.

• Turn the device off after use with a long press of the ON button (5).

⚡ 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 of the menu ⊹.

• **M mode** (manual). Secure the lens cap and briefly press the ON button (5). After completing the calibration process, remove the lens cap.

• **SA mode** (semi-automatic). Calibration is engaged by a brief press of the ON button (5). The lens cap need not be secured (the sensor is closed by an internal shutter).

• **A mode** (automatic). The device 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 device may be calibrated by the user using the ON button (5) (in semi-automatic mode).

⚡ DISCRETE DIGITAL ZOOM

The device's functionality offers the possibility of quickly increasing its base multiplicity (see the table of technical properties in the Digital Zoom line) by a factor of 2 or 4. Adjust the digital zoom accordingly by pressing the DOWN button (2).

⚡ THE QUICK ACCESS MENU FUNCTIONS

The basic settings (brightness and contrast adjustment, use of the smooth digital zoom function and the stadiametric rangefinder) are changed via the Quick Access Menu.

• Enter the menu with a short press of the Menu button (3).

• A short press of the Menu button (3) enables you to switch between functions.

Brightness ☀ – by pressing the UP (4) / DOWN (2) buttons and changing the display brightness value from 00 to 20.

Contrast ◐ – by pressing the UP (4) / DOWN (2) buttons and changing the display contrast value from 00 to 20.

Smooth digital zoom ⊕ – by pressing the UP (4) / DOWN (2) buttons and changing the digital zoom value from 1.0 to 4.0. The increment size of the digital zoom is 0.1.

To exit the menu, press and hold down the Menu button (3), or wait 10 seconds for automatic selection.

The initial smooth digital zoom factor displayed is equal to x1.0 if the discrete zoom is inactive, x2.0 if is 2x, and x4.0 if 4x.

Note. Current magnification is calculated as the product of the base magnification and the smooth digital zoom ratio. Example: where the basic device magnification is 3.0x and the smooth digital zoom ratio is x1.7, the actual magnification is 5,1x (3,0*1,7). The next time the device is turned on, the image is projected onto the display with the brightness and contrast settings saved from the previous power off.

Stadiametric rangefinder ⊿ – press the UP (4) / DOWN (2) buttons to change the position of the markings for determining the distance of the object being observed (see Section 16 for further information on the rangefinder).

⚡ MAIN MENU FUNCTIONS

• Enter the menu with a long press of the Menu button (3).
• Press the UP (4) / DOWN (2) buttons to move through the menu functions.
• Menu navigation is be means of scrolling. When the last item on the first tab is reached, navigation moves to the first item of the second tab.
• One short press of the Menu button (3) opens a menu item.
• To exit the menu, press and hold down the Menu button (3).
• Automatic exit from the 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 device is powered off). The next time the device is powered on and the menu is accessed, the cursor will be at the first item on the menu.

General view of the menu

Tab 1

Menu ●•	Mode
▶ ⌄ — 🌲🌲	
🎨 — **Hot White**	
✛ — **Automatic**	
PIP — (Off ○)	
🔅 — **10**	

Tab 2

Menu ●●	General Setting
▶ ⚙ ›	
⊞ ›	
ⓘ ›	

Composition and description of the menu

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 Menu button (3) to enter the menu.
• Select the ⌄ 'Mode' option.
• A short press of the Menu button (3) opens the menu.
• Select one of the settings described below with the UP (4) / DOWN (2) buttons.
• A short press of the Menu button (3) confirms the selection.
Mountains/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 Mode 👁 – A universal mode for application under various observation conditions.

Calibration Mode ✛
Selection of calibration mode There are three calibration modes: manual, semi-automatic and automatic.
• Press and hold the Menu button (3) to enter the menu.
• Select the ✛ 'Calibration Mode' option.
• A short press of the Menu button (3) opens the submenu.
• Select one of the calibration modes described below with the UP (4) / DOWN (2) buttons.
• A short press of the Menu button (3) confirms the selection.
Automatic
Calibration requirements in the automatic mode are determined programmatically, with the calibration process being started automatically.
Semi-automatic
The user independently sets the calibration requirements (according to the image being observed).
Manual
Manual calibration. Close the lens cap before beginning calibration.

Icon brightness 🔅
Adjusting icon brightness.
• Press and hold the Menu button (3) to enter the menu.
• Select the 🔅 'Icon Brightness' option.
• A short press of the Menu button (3) opens the submenu.
• Select the brightness level of the pictograms with the UP (4) / DOWN (2) buttons.
• A short press of the Menu button (3) confirms the selection.

General Settings ⚙
This menu item allows you to program the following settings

Language 🌐
Choose Language
• Enter the 'Language' submenu 🌐 with a short press of the Menu button (3).
• Select one of the available interface languages (English, French, German, Spanish or Russian) with the UP (4) / DOWN (2) buttons.
• Confirm your selection with a short press of the Menu button (3).
• To save your choice and exit the submenu, press and hold down the Menu button (3).

| **Date** 📅	Setting the Date • Enter the 'Date' submenu ▦ with a short press of the Menu button (3). The date appears in dd/mm/yyyy format. • Set the required year, month and day with the UP (4) / DOWN (2) buttons. Press the Menu button (3) to move through the digits. • To save your chosen date and exit the submenu, press and hold down the Menu button (3).
Time 🕐	Setting the Time • Enter the 'Time' submenu ☺ with a short press of the Menu button (3). • Select the time format (24-hour clock or AM/PM) by pressing the UP (4) / DOWN (2) buttons. • Press the Menu button (3) to move to the hour setting. • Set the hour by pressing the UP (4) / DOWN (2) buttons. • Press the Menu button (3) to move to the minute setting. • Set the minute by pressing the UP (4) / DOWN (2) buttons. • To save your chosen time and exit the submenu, press and hold down the Menu button (3).
Units of Measurement ᴹ⁄ᵧ	Selecting a unit of measurement • Enter the 'M/Y' submenu ⚄ with a short press of the Menu button (3). • Set the unit of measurement (metres or yards) by pressing the UP (4) / DOWN (2) buttons; then press the Menu button (3) . • Return to the submenu occurs automatically.
Default Settings ⤺	Restore Factory Settings • Enter the 'Default Settings' submenu ⤺ with a short press of the Menu button (3). • Select the 'YES' option to reset to factory settings or 'NO' to cancel with the UP (4) / DOWN (2) buttons. • Confirm your selection with a short press of the Menu button (3). • 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** – forest **Calibration mode** – automatic **Language** – English **Magnification** – original value **Colour palette** – Hot White **Unit of measurement** – metres **Note:** When resetting to factory settings the date/time settings and the user pixel map are saved.
Removal of Defective Pixels ⊞	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. AXION KEY thermal imagers 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 Menu button (3). • Select the icon ⊞ with a short press of the Menu button (3). • 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.
• Use the UP (4)/DOWN (2) buttons to move the marker to align its centre with the defective pixel.
• A short press of the Menu button (3) switches the marker direction from the horizontal to the vertical and vice versa.
• Using the UP (4) and DOWN (2) buttons, 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/Calibration ON button (5).
• 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 'Delete defective pixels' function, press and hold down the Menu button (3).

| **Return to factory 'pixel map'** ⤺	Return all defective pixels previously disabled by the user to their original state: • Open the submenu by pressing the Menu button (3). • Select the icon ⤺ and press the Menu button (3). • Select 'YES' if you want to return to the factory pixel map and 'NO' if you do not. • Confirm your selection with a short press of the Menu button (3). **Attention!** One or two pixels on the imager display in the form of black, bright white or coloured (blue or red) dots may appear. These are not a defect.

⚡ STATUS BAR

The status bar is located at the bottom of the display and displays information relating to the operational status of the device, including:
• Observation mode
• 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).
• Current full magnification
• USB connection (if the device is connected)
• Colour palette (displayed only when the Hot Black palette is installed)
• Current time
• Battery discharge level (when the device is powered by the rechargeable battery)
• External power supply indicator (when the device is powered from an external supply)

⭕ ⛰	SA	11.0x	08:13PM	🔋
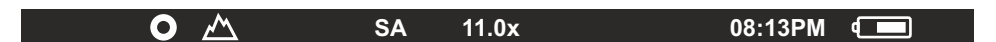
Note: when calibration is in progress, the display image freezes for the duration of the calibration

⚡ STADIAMETRIC RANGEFINDER

Thermal imagers are fitted with a stadiametric rangefinder that enables the distance to an object to be defined where its size is known.
• The stadiametric rangefinder function is accessed by a short press of the Menu button (3) and selecting the icon ᴄᴍ.
• 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, with the UP (4) / DOWN (2) navigation buttons, move the upper horizontal cursor relative to the lower

🦌	160m
🐗	66m
🐇	28m
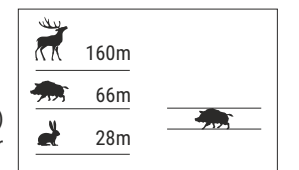
horizontal fixed cursor so that the object is positioned between the cursors. An automatic recalculation of the distance to the target occurs simultaneously with this movement.
• If the distance is not determined within 10 seconds, the information disappears from the display.
• Go to the relevant item on the menu to select a unit of measurement (metres or yards).
• A distance value is rounded up or down before appearing on the display to 5 metres for longer distance readings and 1 metre for shorter distance readings.
• To exit the rangefinder mode, press the Menu button (3) briefly, or wait 10 seconds for automatic exit.

⚡ DISPLAY OFF FUNCTION

This function disables the transfer of images to the display, reducing the intensity of its illumination to a minimum. This helps prevent inadvertent unmasking. The device will continue to function.
• When this function is in use, the device switches to standby mode, which allows it to be quickly turned off, if necessary.
• When the device is switched on, press and hold the ON button (5). The display will disappear and the message 'Display off.' will appear.
• To switch on the display, press the ON button (5) briefly.
• When the ON button (5) is held, the display will show 'Display off.' and a countdown.
Then the device will turn off.

✦✦ ⏱ 00:03

Display off
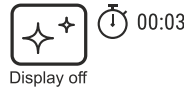
⚡ PiP FUNCTION

PiP (Picture in Picture) enables you to view a magnified digital zoom image in a separate 'window' simultaneously with the main image.
Enabling/disabling the PiP function:
• Press and hold the Menu button (3) to enter the main menu.
• Select the ⊞ 'PiP Mode' option
• A short press of the Menu button (3) switches the mode on/off.
• Press and hold the Menu button (3) to exit the main menu.
• The enlarged image is displayed in a separate window using the full optical zoom value.
• To alter the zoom ratio in the PiP window, briefly press the UP button (4).
• The remaining image is displayed with the optical zoom value which corresponds to the value of the x1.0 coefficient.
• When the PiP is turned on, you can control the discrete and smooth zooms. In this instance, the full optical magnification value will appear only in the separate window.
• When PiP is turned off, the image is displayed with the optical zoom value set for the PiP mode.

6.9x

3.1x
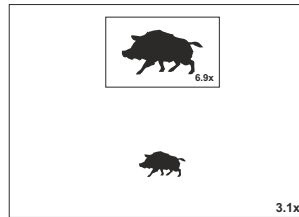
⚡ PiP FUNCTION

 The principal display mode for an observed image is 'Hot White'.
• To enable the alternative palettes described below and to toggle between them, briefly press the DOWN button (2).
• A long press of the DOWN button (2) activates the 'Hot White' mode.
Colour palettes:
Hot White
A black and white palette (cold temperature corresponds to black, and hot temperature to white).
Hot Black
A black and white palette (cold temperature corresponds to white, and hot temperature to black).
Hot Red
Rainbow
**Ultramarine**
Sepia

⚡ USB CONNECTION

USB connection
▶ Use as power

Connecting the device to a computer used as an external power source.
• Connect one end of the USB cable to the device's microUSB connector (8) and the other end to the port on your computer.
• Switch the device on by pressing the ON button (5) (the computer will not detect the device if it is turned off).
• The device is detected automatically by the computer and no installation of drivers is required.
• When this option is selected, the computer is 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 are available.
• The battery installed in the device will not be charged.
• When disconnecting the USB from the device when connected in Power Mode, the device will continue to function on battery power, if present and sufficiently charged.
• If a video was being recorded at the time of connection, the recording will cease and be saved.
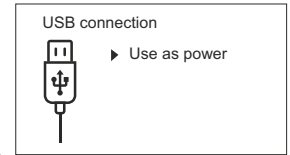
⚡ TECHNICAL INSPECTION

A technical inspection of the device is recommended before each use. Check:
• The external appearance of the device (there should be no cracks in the casing).
• The condition of the lens and eyepiece (there should be no cracks, greasy spots, dirt or other deposits).
• The condition of the rechargeable battery (this should be charged) and the electrical contracts (there should be no presence of salts or oxidation).
• The controls should be in working order.

⚡ MAINTENANCE

• Maintenance should be carried out at least twice a year and consist of the following actions.
• Wipe the external surfaces of metal and plastic parts free of dust and dirt with a cotton cloth Silicone grease may be used for this.
• Clean the electrical contacts of the battery and battery slot on the unit using a non-greasy organic solvent.
• Check the glass surfaces of the eyepiece and the lens. If necessary, remove dust and sand from the lenses (preferably using a non-contact method). Cleaning of the external surfaces of the optics should be done with substances designed specially for this purpose.

⚡ TROUBLESHOOTING

This table lists all the problems that may arise when operating the device. Carry out the recommended checks and repairs in the order shown in the table. If a defect should occur that is not listed in the table, or if it is impossible to repair the defect yourself, the device should be returned for repair.

Malfunction	Possible reason	Correction
Thermal imager does not power up.	Battery completely discharged.	Charge the battery.
Does not operate from external power source.	USB cable damaged.	Replace USB cable.
	External power source discharged.	Charge external power source (if necessary).
Image is unclear, with vertical lines and uneven background.	Calibration required.	Perform image calibration according to Section 8 'Operation' of the Instructions.
Image is too dark.	Low brightness or contrast level set.	Adjust brightness or contrast.
Coloured lines appeared on display or image has disappeared.	The device was exposed to static electricity during operation.	After exposure to static electricity, the device may either reboot automatically, or require turning off and on again.
Poor image quality / reduced detection distances.	These problems may occur during observation in difficult weather conditions (snow, rain, fog etc.).	
When used in low temperature conditions, image quality of the surroundings is worse than in positive temperature conditions.	In positive temperature conditions, objects being observed (surroundings and background) heat up differently because of thermal conductivity, thereby generating a high temperature contrast. Accordingly, image quality produced by the device will be higher.
In low-temperature conditions, objects being observed (background) do, as a rule, cool down to roughly the same temperature, because of which temperature contrast is substantially reduced and image quality (detail) is poorer. This is a feature of thermal imaging devices.	

By following the link below you can find answers to the most frequently asked questions about thermal imaging https://www.pulsar-nv.com/glo/support/faq/79

Environment protection first!
Your appliance contains valuable material which can be recovered or recycled.
Leave it at a local civic waste collection point.

Attention! AXION KEY thermal imagers require a licence when exported outside your country.

Electromagnetic compatibility.
This product complies with the requirements of European standard EN 55032: 2015, Class A.
Caution: Operating this product in a residential area may cause radio interference.