PULSAR

ACCOLADE 2 LRF XP50 PRO
Thermal Imaging Binoculars

USER MANUAL

Attention! Accolade thermal imaging binoculars require a license if exported 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.

The product design improvements are possible to make it more appealing for the consumer.

Repair of the device is possible within 5 years.

Detailed product description and complete user manual are available for download on our official web-page:
https://www.pulsar-nv.com/glo/products/33/thermal-imaging-binoculars/accolade-version-2-lrf/

ACCOLADE 2 LRF XP50 PRO Thermal Imaging Binoculars

USER MANUAL

v.0421

⚡ Specifications

MODEL	XP50 PRO
SKU	**77461**
MICROBOLOMETER	
Type	uncooled
Resolution, pixels	640x480
Pixel Pitch, µm	17
NETD, mK	< 25
Frame rate, Hz	50
Optical Characteristics	
Magnification, x	2.5
Continuous digital zoom, x	2.5-20
Digital zoom	2x/4x/8x
Objective lens	1:1.2
Close-up range, m / y	3 / 3.28
Exit pupil diameter, mm	5
Field of view (HxV), degrees / m@100m	12.4 / 21.8
Diopter adjustment, D	±5
Interpupillary distance adjustment, mm	56-71
Range of detection (deer type object), m (y)	1800 / 1970
DISPLAY	
Type	AMOLED
Resolution, pixels	640x480
OPERATIONAL CHARACTERISTICS	
Power supply, V	3.7
Battery type / Capacity / Output voltage	Li-Ion Battery Pack IPS7 / 6400 mAh / DC 3.7V (3.0-4.2)
External power supply	5V
Operating time on Battery Pack (at t=22°C), h*	9
Degree of protection, IP code (IEC60529)	IPX7
Operating temperature range, °C /° F	-25 ... +50 / -13 ... 122
Dimensions, mm / inch	164 x 130 x 64 / 6.46 x 5.12 x 2.52
Weight (without battery), kg / oz	0.6 / 21.2
VIDEO RECORDER	
Video / photo resolution, pixel	640x480
Video / photo format	.avi / .jpg
Built-in memory	16 Gb
Built-in memory capacity	650 minutes of video or more than 100 000 photos
WI-FI CHANNEL	
Frequency	2.4 GHz
Standard	802.11 b/g
Line-of-sight reception range**, m/y	up to 15/16.4
CHARACTERISTICS OF THE RANGEFINDER	
Safety class for laser equipment according to BS / EN 60825-1: 2014	1
Wavelength, nm	905
Max. measuring range***, m/y	1000 / 1094
Measurement accuracy, m	+/-1

*Actual operating time depends on the extent of using Wi-Fi, integrated video recorder and integrated laser rangefinder.

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

***Depends on the characteristics of the object under observation and environmental conditions.

⚡ Package Contents

- Accolade 2 LRF Pro Thermal Imaging Binoculars
- Carrying case
- IPS7 Battery Pack
- Battery charger with mains charger
- Micro USB cable
- Neck strap
- Quick start guide
- Lens cloth
- Warranty card

⚡ Description

Accolade 2 LRF Pro thermal imaging binoculars are based on an IR sensor (uncooled microbolometer).

The binoculars feature comfortable observation with both eyes.

The binoculars are designed for the use both in the night-time and during the day in adverse weather conditions (fog, smog, rain) to see through obstacles hindering detection of targets (branches, tall grass, thick bushes etc.).

The binoculars do not require an external source of light and are not affected by bright light exposure.

The binoculars are equipped with a precise built-in laser rangefinder designed to measure distance up to 1000 m.

Accolade 2 LRF Pro thermal imaging binoculars are designed for various areas of application including night hunting, observation, trail orienteering, rescue operations etc.

⚡ Features

Major features:

- NETD less than 25 mK
- Built-in precise laser rangefinder (up to 1000 m)
- Comfortable for long observation
- Variable interpupillary distance
- High refresh rate 50 Hz
- Built-in video recorder
- Built-in Wi-Fi module
- Wi-Fi video transmission
- Live internet video sharing
- Frost resistant AMOLED display
- Quick-change long-life rechargeable Battery Packs
- Fully waterproof IPX7

Extra features:

- Picture-in-Picture mode
- Color palettes
- 4 observation modes
- 3 calibration modes
- Manual contrast and brightness adjustment

# ⚡ Components and Controls

1. Power **ON/OFF/Calibration** button
2. Navigation button **UP**
3. Button **MENU**
4. Recording button **REC**
5. Navigation button **DOWN**
6. Interpupillary distance adjustment rings
7. Diopter adjustment rings
8. Lens focusing ring
9. Battery Pack
10. Battery Pack latch
11. Tripod mount
12. Radiator cooling system
13. Lens cover
14. Objective lens
15. MicroUSB port
16. MicroUSB cable
17. Integrated laser rangefinder
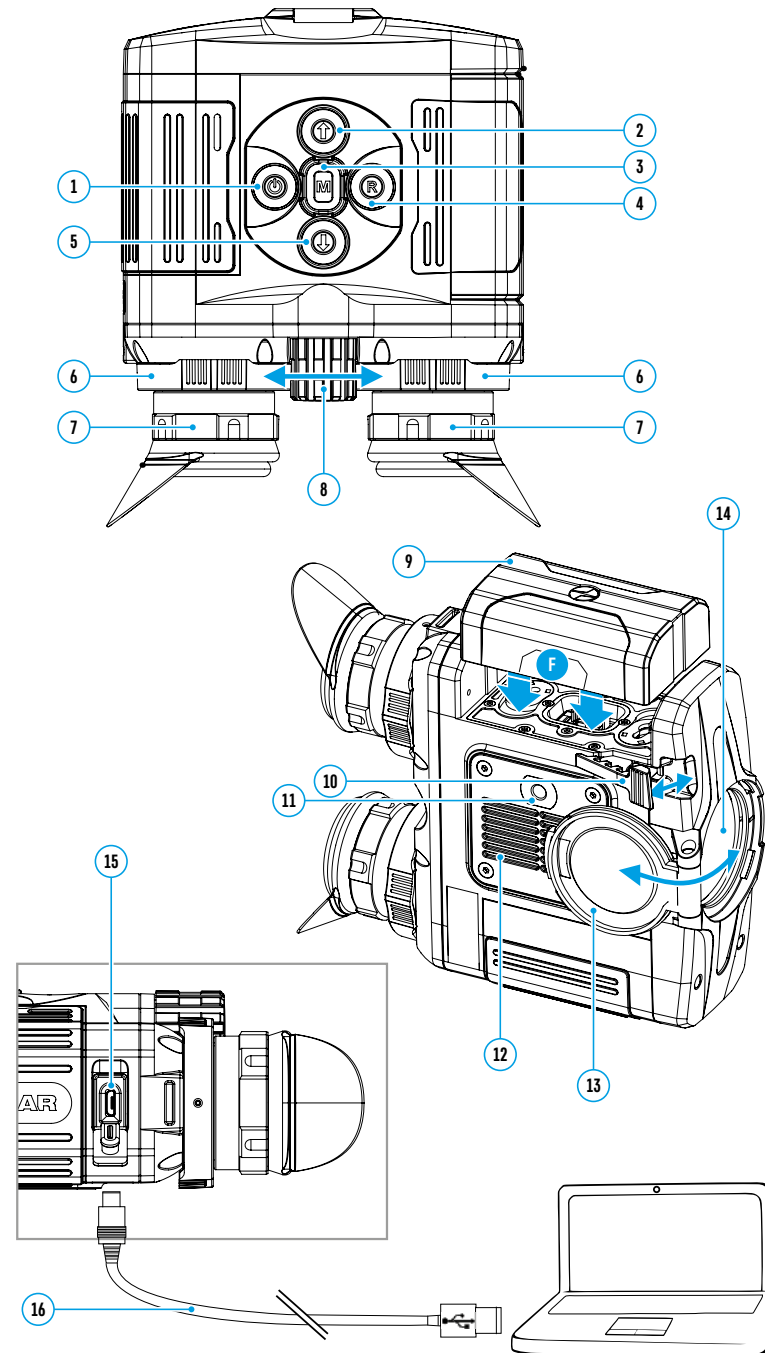
⚡ Button Operation

OPERATION		BUTTON
Power device on	⏻	short press
Power device off	⏻	long press for 3 secs
Turn display off	⏻	long press for less than 3 secs
Turn display on	⏻	short press
Calibrate the microbolometer	⏻	short press
Control discrete digital zoom	⬇	short press
Change observation modes	⬇	long press
VIDEO RECORDER		**BUTTON**
Start/pause/resume video recording	R	short press
Stop video recording	R	long press
Switch to video / photo	R	long press
Capture Photo	R	short press
MAIN MENU		**BUTTON**
Enter main menu	M	long press
Navigation upwards/rightwards	⬆	short press
Navigation downwards/leftwards	⬇	short press
Confirm selection	M	short press
Exit submenu without confirming selection	M	long press
Exit menu (switch to viewing mode)	M	long press
QUICK MENU		**BUTTON**
Enter quick menu	M	short press
Switch between quick menu options	M	short press
Increase value	⬆	short press
Decrease value	⬇	short press
Exit quick menu	M	long press
RANGEFINDER		**BUTTON**
Activate rangefinder	⬆	short press
Measure distance	⬆	short press
Start/stop SCAN mode	⬆	long press

UP

ON/OFF · REC

DOWN
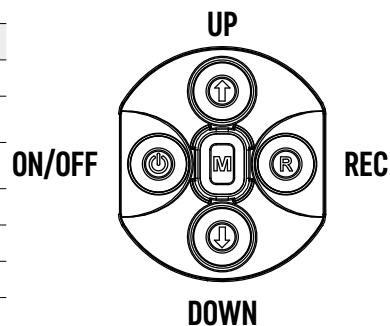
⚡ Using the Battery Pack

Accolade 2 LRF Pro thermal imaging binoculars are supplied with a rechargeable Li-Ion Battery Pack IPS7 which allows operation for up to 9 hours. Please remember to charge the Battery Pack before first use.

Battery Charging

Step 1. Install the battery into the charger

- Lift the lever **(C)** of the charger.
- Remove the protective cover from the Battery Pack.
- Install the Battery Pack into the charger.
- Click the lever **(C)**.

**Step 2. Check the current battery level**

- Upon installation, a green LED indicator **(D)** on the charger will start to glow and begin flashing:
  - once if the battery charge ranges from 0% to 50%;
  - twice if the battery charge ranges from 51% to 75%;
  - three times if the battery charge ranges from 76% to 100%;
- If the indicator lights green continuously, the battery is fully charged.
- You can remove the battery from the charger by lifting the lever **(C)**.
- If the indicator of the charger lights red continuously upon battery installation, probably the battery's charge level is lower than acceptable (the battery has been long in deep discharge). Keep the battery in the charger for a long time (up to several hours), remove and re-insert it.
- If the indicator starts blinking green, the battery is good.
- If the indicator keeps lighting red, the battery defective. **Do not use the battery!**

Step 3. Connect the charger to the mains supply

- Connect the Micro-USB plug of the USB cable to the port **(E)** of the charger.
- Connect the Micro-USB plug to the mains adapter.
- Insert the plug of the mains adapter to the 100-240 V socket.

Battery Installation

- Lift the lever **(10)**.
- Install the battery **(9)** all the way into the dedicated slot on the device housing so that element **F** appears from below.
- Fix the battery by clicking the lever **(10)**.
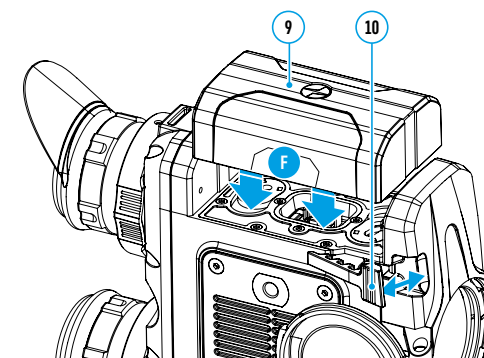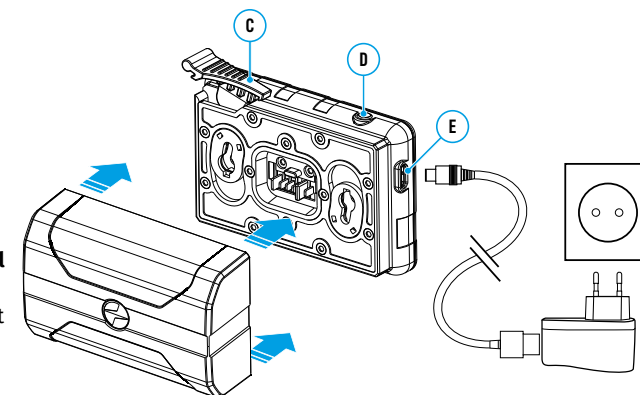
Safety Measures

- Only use the charger supplied with your device.
- The battery should be partially charged for long-term storage – 50 to 80 %.
- Do not charge the battery immediately after bringing the battery from cold environment to a warm one. Wait for 30 - 40 minutes for the battery to get warm.
- Charge the Battery Pack at a temperature from 0 °C to +35 °C. Otherwise, batter's life will decrease significantly.
- Do not leave a battery unattended while charging.
- Never use a modified or damaged charger.
- Do not leave the battery in a charger connected to the mains after charging is complete.
- Do not expose the battery pack to high temperature or to a naked flame.
- Do not submerge the battery in water.
- Do not connect external device with a current consumption that exceeds permitted levels.
- The Battery Pack is short circuit protected. However, avoid any situation that may cause short-circuiting.
- Do not dismantle or deform the Battery Pack.
- Do not drop or hit the battery.
- When using the battery at negative temperatures, battery's capacity decreases, this is normal and is not a defect.
- Do not use the battery at the temperatures above those shown in the table – this may decrease battery's life.
- Keep the battery out of the reach of children.

⚡ External Power Supply

The device can be powered with an external power supply such as Power Bank (5 V).

- Connect the external power supply to the USB port **(15)** of the device.
- The device switches to operation from external power supply, and the IPS7 Battery Pack will begin slowly charging.
- The display will show the battery icon ⊏▭⚡▭ with charge level as a percentage.
- If the device operates on external power supply but the IPS7 battery is not connected, icon ▬◼▬ is shown.
- When the external power supply is disconnected, the device switches to the internal battery pack without powering off.

Attention! Charging IPS7/IPS14 batteries at air temperatures below 0 °C can result in reduced battery life. When using external power, connect Power Bank to the switched-on device, which have worked for several minutes.

⚡ Powering On and Image Setting

- Open the lens cover **(13)**.
- Turn the device on with a short press of the **ON/OFF (1)** button.
- Adjust the interpupillary distance with the rings **(6)** by moving the eyepieces farther or closer to each other.
- To obtain a crisp image of the icons on the display, rotate the diopter adjustment ring **(7)**. Once adjusted, there is no need to rotate the diopter adjustment ring for distance or any other conditions.
- To focus on the object being observed rotate the lens focusing ring **(8)**.
- Select the calibration mode: **manual (M), semi-automatic (SA)** or **automatic (A)** in the main menu (enter the menu by long pressing the **MENU (3)** button).
- Calibrate the image with a short press of the **ON/OFF (1)** button (when calibration mode **(SA)** or **(M)** has been selected). Close the lens cap before manual calibration.

- Select the desired observation mode (**Forest, Rocks, Identification** or **User**) by a long press of the **DOWN (5)** button or in the main menu. User mode allows you to configure and save custom
- To set up display brightness and contrast and continuous zoom, please refer to the **Quick Menu Functions** section.
- After use, press and hold down the **ON/OFF (1)** button to turn the device off.

Warning! Do not point the objective lens of the device at intensive sources of light such device emitting laser radiation or the sun. This may render the electronic components inoperative. The warranty does not cover damage caused by improper operation.

Warning! The radiator cooling system **(12)** becomes warm during operation: this is normal and allows an increase in the sensitivity of the device.

⚡ Microbolometer Calibration

Calibration allows levelling of the background temperature of the microbolometer and eliminates image flaws (such as frozen image, vertical stripes etc.).

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

Select the desired mode in the menu option **Calibration Mode** ◂˙▸.

Mode M (manual)

- Close the lens cover.
- Press briefly the **ON/OFF (1)** button.
- Open the lens cover.

Mode SA (semi-automatic)

- Press briefly the **ON/OFF (1)** button to calibrate.
- You do not need to close the lens cover (the microbolometer is closed with the internal shutter automatically).

Mode A (automatic)

- The device calibrates by itself according to the firmware algorithm.
- You do not need to close the lens cover (the microbolometer is closed with the internal shutter automatically).
- In the automatic mode, the user can calibrate the microbolometer with the **ON/OFF (1)** (in the **SA** mode) button.

⚡ Discrete Digital Zoom

The device allows you to quickly increase the base magnification of 2.5x by 2, 4 or 8 times.

- To operate the discrete digital zoom, press successively the **DOWN (5)** button.
- The digital zoom will not be saved after the device is re-started.

⚡ Image Detail Boost

The **Image Detail Boost** ▽ function increases the sharpness of the contours of heated objects, which increases their detail. The result of the function depends on the selected mode and observation conditions: the higher the contrast of objects, the more noticeable the effect. This option is enabled by default, but can be disabled in the main menu.

⚡ Status Bar

●	👁	☼A	2.5x	📵	22:30	🔋
1	2	3	4	5	6	7

The status bar is located in the lower part of the display and shows information on the actual operating status of the device, including:

1. Color palette (shown only if the **"Black Hot"** palette is selected)
2. Observation mode
3. Calibration mode (in the automatic calibration mode, three seconds before automatic calibration a countdown timer ⏱ 00:03 is shown in place of the calibration mode icon).
4. Current full magnification (for example, 2.5x)
5. Wi-Fi connection status
6. Time
7. Power indication:
   - Battery charge level ▭ (if the device is powered by the Battery Pack).
   - External battery power indicator ▬■▬ (if the device is powered by an external power supply).

⚡ Quick Menu Functions

The quick menu allows change of basic settings such as display brightness and contrast, smooth digital zoom.

- Enter the menu with a short press of the **MENU (3)** button.
- To toggle between the functions below, press successively the **MENU (3)** button.
  - **Brightness** ☼ – press briefly the **UP (2)/DOWN (5)** buttons to change display brightness from 0 to 20.
  - **Contrast** ◑ – press briefly the **UP (2)/DOWN (5)** buttons to change display contrast from 0 to 20.
  - **Smooth digital zoom** ⊕ – press the **UP (2)/DOWN (5)** buttons to change digital zoom from 2.5 to 20. Smooth digital zoom is in 0.1x increments.
  - **Base mode** 🌲 ⛰ 👁 – it allows you to select one of the three observation modes as a base for the User mode.
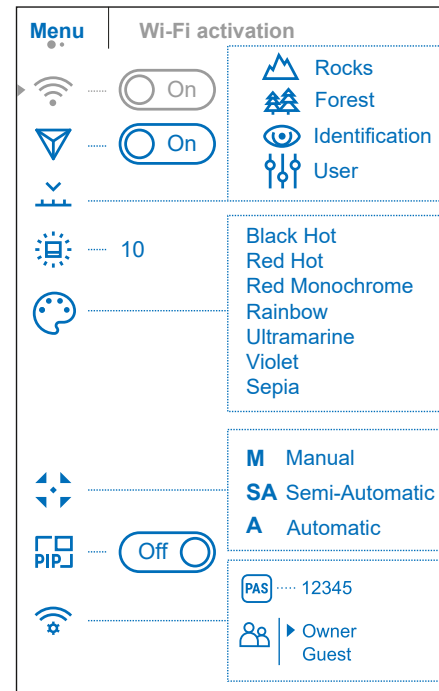- To exit quick menu, press and hold down the **MENU (3)** button or wait 5 sec for automatic exit.

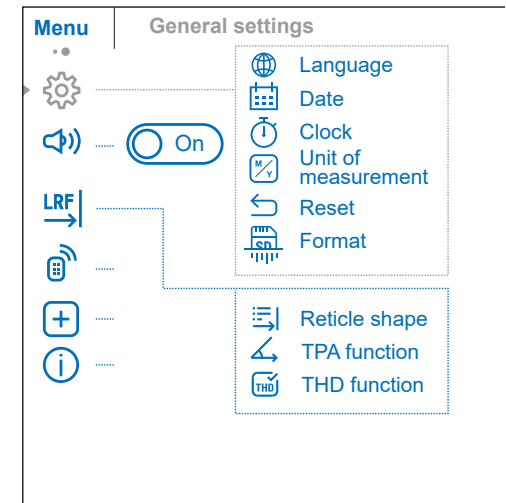## ⚡ Main Menu Functions

Enter the Main Menu

- Enter the main menu with a long press of the **MENU (3)** button.
- Press the **UP (2)/DOWN (5)** buttons to switch between the menu options.
- Enter a menu option with a brief press of the **MENU (3)** button.
- Exit the menu with a long press of the **MENU (3)** button.
- Automatic exit takes place in 10 sec of inactivity (buttons are not pressed).

General View of the Menu

Tab 1

Menu	Wi-Fi activation
🛜	On
▽	On
⌄	
☀	10
🎨	Rocks / Forest / Identification / User
	Black Hot / Red Hot / Red Monochrome / Rainbow / Ultramarine / Violet / Sepia
✛	M Manual / SA Semi-Automatic / A Automatic
PIP	Off
📶	PAS ⋯ 12345
	👥 ▸ Owner / Guest

Tab 2

Menu	General settings
⚙	
🔊	On
LRF→	
📲	Language / Date / Clock / Unit of measurement / Reset / Format
⊕	
ⓘ	Reticle shape / TPA function / THD function

|	
Wi-Fi Activation 📶	• Press and hold down the **MENU (3)** button to enter the main menu. • Select the **Wi-Fi Activation** 📶 menu option with the **UP (2)/DOWN (5)** buttons. • Turn Wi-Fi on/off with a short press of the **MENU (3)** button.
Image Detail Boost ▽	**Turn on/off Image Detail Boost:** • Press and hold down the **MENU (3)** button to enter the main menu. • Select the **Image Detail Boost** ▽ menu option with the **UP (2)/DOWN (5)** buttons. • Turn **Image Detail Boost** on/off with a short press of the **MENU (3)** button.
Mode ⌄	The devices have four observation modes of the thermal imager: **Forest** (observation mode of objects within low thermal contrast conditions), **Rocks** (observation mode of objects within high thermal contrast conditions), **Identification** (high detalization mode), **User** (individual brightness and contrast settings). • Press and hold the **MENU (3)** button to enter the menu. • Select the Mode option with the **UP (2)/DOWN (5)** buttons. • A short press of the **MENU (3)** button opens the menu. • Select one of the settings described below with the **UP (2)/DOWN (5)** buttons. • A short press of the **MENU (3)** button confirms the selection.
Forest 🌲	This is the best mode when searching and observing within field conditions, against the background of leaves, bushes and grass. The mode is highly informative about an object being observed as well as landscape details.
Rocks ⛰	This is the best mode when observing objects after a sunny day or within urban conditions.
Identification 👁	This is the best mode when observing objects within adverse weather conditions (fog, mist, rain and snow). It allows you to recognize the characteristics of an object being observed more clearly. Zoom increase may be accompanied by insignificant image graininess.
User	It allows you to configure and save custom brightness and contrast settings, as well as one of the three modes as basic.
	Note: to quickly change observation modes press and hold the **DOWN (5)** button.
Icon Brightness	• Press and hold the **MENU (3)** button to enter the main menu. • Use the **UP (2)/DOWN (5)** buttons to select the **Icon Brightness** icon. • Press the **MENU (3)** button briefly to enter the submenu. • Use the **UP (2)/DOWN (5)** buttons to select the desired brightness level from 0 to 10. • Press the **MENU (3)** button briefly to confirm the selection.

Color Modes 🎨	Default color mode is **White Hot**.
	To select another palette:
	• Press and hold down the **MENU (3)** button to enter the main menu.
	• Select the **Color Modes** 🎨 icon with the **UP (2)/DOWN (5)** buttons.
	• Press briefly the **MENU (3)** button to enter submenu.
	• Select the desired palette with the **UP (2)/DOWN (5)** buttons.
	• Confirm your selection with a brief press of the **MENU (3)** button.
	  - **Black Hot** (white color corresponds to low temperature, black color – to high temperature)
	  - **Red Hot**
	  - **Red Monochrome**
	  - **Rainbow**
	  - **Ultramarine**
	  - **Violet**
	  - **Sepia**
	Note: to quickly change color modes press and hold the **UP (2)** button.

Calibration Mode	There are three calibration modes: manual **(M)**, semi-automatic **(SA)** and automatic **(A)**. • Press and hold down the **MENU (3)** button to enter the main menu. • Select the **Calibration Mode** option with the **UP (2)/DOWN (5)** buttons. • Press briefly the **MENU (3)** button to enter submenu. • Select the desired calibration mode with the **UP (2)/DOWN (5)** buttons. • Confirm your selection with a brief press of the **MENU (3)** button. More details in the section **Microbolometer Calibration**.
PiP Mode	**Selection of the Picture in Picture Mode:** • Press and hold the **MENU (3)** button to enter the menu. • Select the **PiP Mode** option with the **UP (2)/DOWN (5)** buttons. • A short press of the **MENU (3)** button switches the mode on/off.

Wi-Fi Settings

This menu option allows you to set up your device for operation in a Wi-Fi network.
- Press and hold down the **MENU (3)** button to enter the main menu.
- Select the **Wi-Fi Settings** 📶 menu option with the **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to enter submenu.
- Select the desired menu item with the **UP (2)/DOWN (5)** buttons.

Password Setup

PAS

This menu option allows you to set a password to access your binoculars from an external device.

The password is used to connect an external device (i.e. smartphone) to your thermal imager.
- Press briefly the **MENU (3)** button to enter the **Password Setup** **PAS** submenu.
- The default password (12345678) will appear on the screen.
- Set the desired password with the **UP (2)/DOWN (5)** buttons.
- Switch between digits with a short press of the **MENU (3)** button.
- Save the password and exit the submenu with a long press of the **MENU (3)** button.

Access Level Setup

This menu option allows you to set required access level of the Stream Vision application to your device.

Access level **Owner**. The Stream Vision user has the complete access to all device's functions.

Access level **Guest**. The Stream Vision user has the access only to the real time video stream from the device.
- Press briefly the **MENU (3)** button to enter the **Access Level Setup** submenu.
- Select the access level with the **UP (2)/DOWN (5)** buttons.
- Press and hold the **MENU (3)** to confirm your selection and exit from the submenu.

General Settings

- Press and hold down the **MENU (3)** button to enter the main menu.
- Select option **General Settings** with the **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to confirm.

The following settings are available:

Language

Selecting interface language
- Select option **Language** 🌐 with the **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to confirm.
- Select one of the available interface languages with a short press of the **UP (2)/DOWN (5)** buttons: English, French, German, Spanish, Russian.
- Press briefly the **MENU (3)** button to confirm.

Date

Date setup
- Select option **Date** with **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to confirm. Date format is displayed as: YYYY/MM/DD (year/month/day)
- Select the correct values for the year, month and date with a short press of the **UP (2)/DOWN (5)** buttons.
- Switch between digits with a short press of the **MENU (3)** button.
- Save selected date and exit the submenu with a long press of the **MENU (3)** button.

General Settings

Time

Time setup
- Select option **Time** with **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to confirm.
- Select the desired time format with a short press of the **UP (2)/DOWN (5)** buttons: 24 or PM/AM.
- Switch to hour setup with a brief press of the **MENU (3)** button.
- Select hour value with a brief press of the **UP (2)/DOWN (5)** buttons.
- Switch to minute setup with a brief press of the **MENU (3)** button.
- Select minute value with a brief press of the **UP (2)/DOWN (5)** buttons.
- Save selected time and exit the submenu with a long press of the **MENU (3)** button.

Units of Measure

Selection of units of measurement
- Select option **Units of Measure** with **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to confirm.
- Select the desired unit of measurement - meters or yards - with **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to confirm.
- Exit to general settings submenu takes place automatically.

Default Settings

Restore default settings
- Select option Default Settings with **UP (2)/DOWN (5)** buttons.
- Press briefly the **MENU (3)** button to confirm.
- With a short press of the **UP (2)/DOWN (5)** buttons select "Yes" to restore default settings or "No" to abort.
- Confirm selection with a brief press of the **MENU (3)** button.
  - If "Yes" is selected, display will show "Do you want to restore default settings?" and "Yes" and "No" options. Select "Yes" to restore default settings.
  - If "No" is selected, action is aborted and you return to the submenu.

The following settings will be restored to their original values before changes made by the user:
  - **Video recorder mode** – video
  - **Observation mode** – forest
  - **Calibration mode** – automatic
  - **Language** – English
  - **Wi-Fi** – off (default password)
  - **Magnification** – off (no digital zoom)
  - **PiP** – off
  - **Color mode** – White Hot
  - **Unit of measurement** – metric

Warning: date and time settings, default pixel map and remote control activation are not restored.

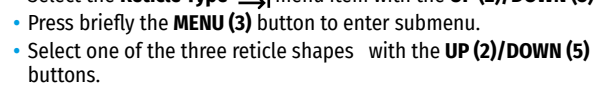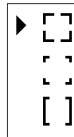|		

General Settings ⚙️	**Format** 📝	This item allows you to format the Flash-card (memory card) of the device (this will delete all files from the memory card).
		• Select option **Format** 📝 with **UP (2)/DOWN (5)** buttons.
		• Press briefly the **MENU (3)** button to confirm.
		• With a short press of the **UP (2)/DOWN (5)** buttons select "Yes" to format the memory card or "No" to return to the submenu.
		• Confirm selection with a short press of the **MENU (3)** button.
		  - If "Yes" is selected, display will show "Do you want to format memory card?" and "Yes" and "No" options. Select "Yes" to format the memory card.
		  - If "No" is selected, formatting is aborted and you return to the submenu.

Microphone 🔊		This item allows you to enable (or disable) the microphone for recording sound during video recording. **Turning on/off Microphone:** • Press and hold the **MENU (3)** to enter the main menu. • Select the **Microphone** 🔊 menu item with the **UP (2)/DOWN (5)** buttons. • To turn on the microphone, briefly press the **MENU (3)** button. • To turn off the microphone, briefly press the **MENU (3)** button.
Rangefinder LRF		Menu item **Rangefinder** allows you to set up built-in rangefinder's parameters as follows: • Enter the main menu with a long press of the **MENU (3)** button. • Select the submenu **Rangefinder** LRF with the **UP (2)/DOWN (5)** buttons. • Enter the submenu with a short press of the **MENU (3)** button. • Select the desired menu item with the **UP (2)/DOWN (5)** buttons.
	Reticle Type	• Select the **Reticle Type** menu item with the **UP (2)/DOWN (5)** buttons. • Press briefly the **MENU (3)** button to enter submenu. • Select one of the three reticle shapes with the **UP (2)/DOWN (5)** buttons. • Confirm selection with a brief press of the **MENU (3)** button. • Selected reticle will appear on the display. • The reticle will disappear from the display if the rangefinder is not used longer than 4 seconds.
	TPA	Function "TPA" (Target Position Angle) allows you to measure the angle of target location (angle of elevation). When the function is activated, the angle is shown continuously in LRF stand-by mode in the top right corner of the display. • Select **TPA** with the **UP (2)/DOWN (5)** buttons. • Turn **TPA** on/off with a short press of the **MENU (3)** button.
	THD	"THD" (True Horizontal Distance) function allows you to measure true horizontal distance to a target based on the angle of elevation value. • Select **THD** with the **UP (2)/DOWN (5)** buttons. • Turn **THD** on/off with a short press of the **MENU (3)** button • Hereinafter the message THD will appear above the distance readings.

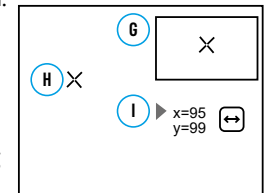|	
Remote Control 📶	**Remote control activation (bought separately)** Before operating the remote control (RC), remember to activate it as follows: • Press and hold down the **MENU (3)** button to enter the main menu. • Select option **Remote Control** 📶 with the **UP (2)/DOWN (5)** buttons. • Press briefly the **MENU (3)** button to confirm. • Display shows message "Wait" and countdown starts (30 sec), within which hold down for two seconds any RC button. • If activation is successful, the message "Connection complete" appears 📶. • If error occurs the message "Connection failed" appears 📶. Repeat the procedure. • The RC is activated and ready for use. • To unlink the **RC**, press the **MENU (3)** button, wait for the countdown to expire without pressing any **RC** button for 30 sec. • All remote controls previously linked to your device are now unlinked. • Now you can activate your **RC** again or activate another **RC**.
Defective Pixel Repair ➕	When operating a thermal imager, defective (dead) pixels (bright or dark dots with constant brightness) may become visible on the microbolometer. Defective pixels on the microbolometer may proportionally increase in size when digital zoom is activated. **Accolade 2 LRF Pro** thermal imaging binoculars allow the user to repair defective pixels on the detector using a firmware-based method or to abort deletion. • Press and hold down the **MENU (3)** button to enter the main menu. • Select the **Defective Pixel Repair** ➕ menu item with the **UP (2)/DOWN (5)** buttons. • Press briefly the **MENU (3)** to open the submenu. • Select the **Defective Pixel Repair** ➕ option by briefly pressing the **MENU (3)** button. • A marker **(H)** ✕ appears on the left side of the display. • On the right side of the display appears "magnifying glass" **(G)** – a magnified image in a frame with a fixed cross ✕, designed for easier detection of a defective pixel and to match the pixel with the marker, horizontal and vertical arrows for X and Y axes **(I)** showing marker's movement. • With a short press of the **UP (2)/DOWN (5)** buttons move the marker to align it with a defective pixel. • Switch the direction of the marker from horizontal to vertical and vice versa with a short press of the **MENU (3)** button. • Align the defective pixel with the fixed cross in the frame – the pixel should disappear. • Delete the defective pixel with a brief press of the REC **(4)** button. A brief message "OK" appears in the frame in case of success. • Then you can delete another defective pixel by moving the marker along the display. • Exit **Defective Pixel Repair** with a long press of the **MENU (3)** button. **Attention!** The display of a thermal imager may have 1-2 pixels represented as bright white or color (blue, red) dots which cannot be deleted and are not a defect.

x=95
y=99

Defective Pixel Repair ⊞	**Restore Default Pixel Map** ↻ This option allows you to cancel deletion of the defective pixels and return them to the original state. • Press and hold down the **MENU (3)** button to enter the main menu. • Select the **Defective Pixel Repair** ⊞ menu item with the **UP (2)/DOWN (5)** buttons. • Press briefly the **MENU (3)** button to open the submenu. • Select **Restore Default Pixel Map** ↻ menu item with the **UP (2)/DOWN (5)** buttons. • Press briefly the **MENU (3)** button. • Using the **UP (2)/DOWN (5)** buttons, select "Yes" if you wish to return to default defective pixel pattern, or "No" if you do not. • Confirm selection with a short press of the **MENU (3)** button.

Device Information
 ⓘ
	This option allows the user to view the following information about the device:
	   - Full name
	   - SKU number
	   - Serial number
	   - Firmware version
	   - Hardware version
	   - Service information
	 To display the information, do the following:
	 • Press and hold down the **MENU (3)** button to enter the main menu.
	 • Select option **Device Information** ⓘ with the **UP (2)/DOWN (5)** buttons.
	 • Press briefly the **MENU (3)** button to confirm.

⚡ Video Recording and Photography

Accolade 2 LRF Pro thermal imaging binoculars feature video recording and photography of the image being ranged to the internal memory card.

Before using this feature, please read the **Date** and **Time** subsections of the section **General Settings**.

The built-in recorder operates in two modes - **Video** and **Photo**.

Video mode. Video recording 🎥

• Switch to **Video** mode by pressing and holding the **REC (4)** button.

• In the top left corner you will see icon 🎥 and remaining recording time in the format HH:MM (hours: minutes).

• Start video recording with a short press of the **REC (4)** button.

• Upon start of video recording icon 🎥 disappears, and icon REC and recording timer in the format MM:SS (minutes : seconds) appear instead: ● REC | 00:25 .

• Pause and resume recording video with a short press of the **REC (4)** button.

• Stop recording video with a long press of the **REC (4)** button.

• Video files are saved to the memory card after stopping video.

• Switch between modes (**Video**-> **Photo**-> **Video**) with a long press of the **REC (4)** button.

Photo mode. Capturing an image 📷

• Switch to the **Photo** mode with a long press of the **REC (4)** button.

• Take a picture with a brief press of the **REC (4)** button. The image freezes for 0.5 sec and a photo is saved to the internal memory.

• In the top left corner of the display you can see: photography icon 📷, ">100" means that you can take more than 100 pictures. If the number of available pictures is less than 100, actual amount of available pictures (for example 98) is shown next to the icon 📷.

Notes:

• You can enter and operate the menu during video recording;

• Recorded videos and photos are saved to the built-in memory card in the format img_xxx.jpg (photos); video_xxx.avi (videos). xxx – three digit counter for videos and photos;

• Counter for multimedia files cannot be reset.

Attention!

• Maximum duration of a recorded file is five minutes. After this time expires a video is recorded into a new file. The number of recorded files is limited by the capacity of unit's internal memory;

• Check regularly the free capacity of the internal memory, move recorded footage to other storage media to free up space on the internal memory card.

Important! To playback video files recorded by thermal imaging devices on macOS based computers, we recommend that you use VLC video player or Elmedia player. Download links are shown below:

VLC VIDEO PLAYER	**ELMEDIA VIDEO PLAYER**
http://www.videolan.org/vlc/download-macosx.html	https://itunes.apple.com/us/app/elmedia-multiformat-video/id937759555?mt=12

⚡ 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:

CONNECTION STATUS	STATUS BAR INDICATION
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 "Accolade 2 LRF_XXXX", where XXXX – is the last four digits of device's serial number.

• After entering the password (default: 12345678) on an external appliance (see **Password Setup** subsection for more information on setting a password) and connection is established, the icon 📶 in the status bar changes to ◀📱.

⚡ Built-In Laser Rangefinder

The binoculars are equipped with a built-in rangefinder **(17)**, allowing you to measure distance to objects up to 1000m away.

How the rangefinder works:

- Turn on the device, set up image according to section **Powering On and Image Setting**.

- Press the **UP (2)** or **LRF (21)** button on remote control - rangefinding reticle appears; in the top right corner of the display dashes of distance values with unit of measurement appear ⎸ ---- m ⎹ , i.e. the rangefinder enters the stand-by mode.

- If PiP mode is activated, the aiming reticle disappears upon activation of the rangefinder and in the PiP window remains active.

- Point the rangefinding reticle at an object and press the **UP (2)** button.

- In the top right corner of the display you will see distance in meters (or yards - depending on settings).

Note: if the rangefinder is idle longer than for 4 seconds, it turns off automatically.

Operation in SCAN mode:

- To measure distance in scanning mode, hold down the **UP (2)** or **LRF (21)** button on remote control for longer than two seconds. Measurement readings will be changing in real time as you point the binoculars at different objects. Message **SCAN** appears in the top right corner.

- To exit **SCAN** mode, press **UP (2)** or **LRF (21)** button again.

- If measurement fails, dashes will appear on the display.

- In 4 seconds of inactivity (no measurement is taken) the rangefinder turns off, the rangefinding reticle with readings disappears from the display.

Notes:

- To select a rangefinding reticle, please see the **Reticle Type** subsection.

- To select a unit of measurement (meters or yards) go to the **Units of Measure** subsection.

Peculiarities of operation:

- Accuracy of measurement and maximum range depend on the reflection ratio of the target surface, the angle at which the emitting beam falls on the target surface and environmental conditions. Reflectivity is also affected by surface texture, color, size and shape of the target. A shiny or brightly colored surface is normally more reflective than a dark surface.

- Measuring range to a small sized target is more difficult than to a large sized target.

- Accuracy of measurement can also be affected by light conditions, fog, haze, rain, snow etc. Ranging performance can degrade in bright conditions or when ranging towards the sun.
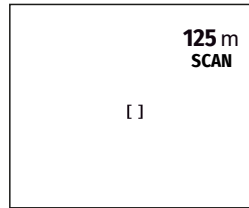
⚡ Display Off Function

The Display Off function deactivates transmission of image to the display by minimizing its brightness. This prevents accidental disclosure. The device keeps running.

- When the device is on, hold down the **ON/OFF (1)** button. Display goes out, message **"Display Off"** appears.

- To activate the display, press briefly the **ON/OFF (1)** button.

- When you press and hold the **ON/OFF (1)** button, the display shows the message "Display Off" with a countdown. Pressing & holding the button down for the duration of the countdown will power the device off completely.

125 m
SCAN

[ ]

⧖ 00:03

Display off
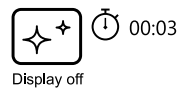
⚡ PiP Function

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

- Enabling/disabling the PiP function is carried out in the main menu (see section **PiP Mode**).

- Change zoom ratio in the PiP window with a short press of the **DOWN (5)** button.

- The zoomed image is displayed in a dedicated window, while the image in the rest of the screen is displayed at base magnification (2.5x).

- When PiP is turned on, you can operate the discrete and continuous digital zoom. Magnification will take place only in the dedicated window.

- When PiP is turned off, the image magnification in the main window changes to the value that was set for the PiP window.

5.0x

2.5x
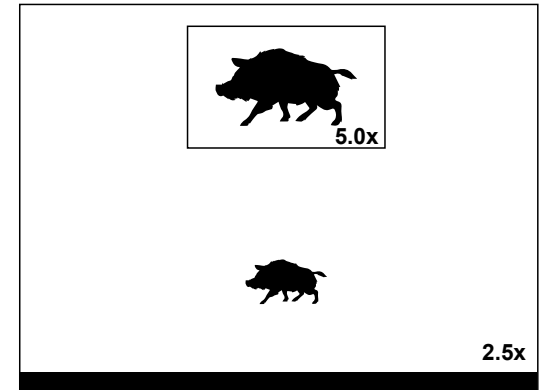
⚡ Stream Vision

Accolade 2 LRF Pro thermal imaging binoculars support Stream Vision technology which allows you to stream an image from the display of your thermal imager to a smartphone or tablet PC via Wi-Fi in real time mode.

Firmware Update

- Download free of charge Stream Vision App"

STREAM VISION

ANDROID APP ON
Google play

Available on the
App Store

https://play.google.com/store/apps/details?id=com.yukon.app

https://apps.apple.com/us/app/stream-vision/id1069593770

- Connect your Pulsar device to your mobile device (smartphone or tablet).

- Launch Stream Vision and go to section "My Devices".

- Select your Pulsar device and press "Check Updates".

- 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 phone, please turn on mobile data transfer (GPRS/3G/4G) to download update;

- if your Pulsar device is not connected to your phone but it's already in the "My Devices" section, you may use Wi-Fi to download update.

Is your firmware up to date?

Click **here** to check the latest firmware for your device.

⚡ USB Connection

- Connect one end of the USB cable **(16)** to the Micro-USB **(15)** port of your device, and the other end to the USB port of your PC/laptop.
- Turn the device on with a short press of the **ON/OFF (1)** button (device that has been turned off cannot be detected by your computer).
- Your device will be detected by the computer automatically; no drivers need to be installed.
- Two connection modes will appear on the display: **Power** and **Memory Card** (external memory).
- Select connection mode with **UP (2)/DOWN (5)** buttons.
- Confirm selection with a short press of the **MENU (3)** button.

USB connection

▶ Use as power

Use as memory card
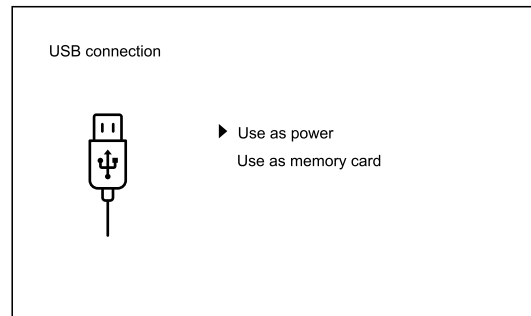
Connection modes:

Power

- In this mode PC/laptop is used as an external power supply. The status bar shows icon ▬◼▬. The device continues operating and all functions are available.
- The Battery pack installed in the device is not being charged!
- When USB is disconnected from the device when in the **Power** mode, the device keeps operating with Battery Pack, if available, and it has sufficient charge.

**Memory Card (external memory)**

- 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.
- When USB is disconnected from the device where connection is in the **Memory Card** mode, the device remains on the OFF state. Turn the device on for further operation.

⚡ Wireless Remote Control

(Bought separately)

Wireless remote control **(RC)** duplicates the power on function, digital zoom, rangefinder control, and menu navigation.

	Controller (18)	Button ON (19)	Button ZOOM (20)	Button LRF (21)
Brief press	Enter the quick menu	Turn on the device / Calibrate the microbolometer	Activate incremental zoom	Activate rangefinder / Measure distance
Long press	Enter the main menu	Display Off / Turn off the device	Activate function PiP	Activate SCAN mode
Clockwise rotation	Increase parameter, move upwards			
Counterclockwise rotation	Decrease parameter, move downwards			
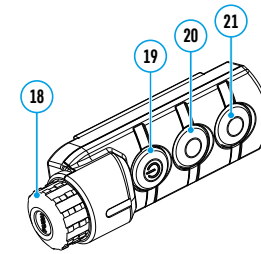
⚡ Technical Inspection

It is recommended to carry out a technical inspection before each use of the device. Check the following:

- External view (there should be no cracks on the housing).
- The state of the objective, eyepiece and rangefinder lenses (there should be no cracks, spot, dust, deposits etc.).
- The state of the Battery Pack (should be charged) and electric terminals (there should be no oxidation).
- Correct functioning of the controls.

⚡ Technical Maintenance and Storage

Maintenance should be carried out no less frequently than twice a year, and should consist of the following measures:

- Wipe external plastic and metal surfaces clean of dust and dirt with a soft cloth moistened with a synthetic cleaning agent.
- Clean the electric terminals of the Battery Pack and device's battery slot using a grease-free organic solvent.
- Check the objective and eyepieces lenses; rangefinder's emitter and receiver lenses. If required, remove dust and sand (preferably by a noncontact method). Clean the external surfaces of the lenses with products expressly designed for this purpose.
- Store the device in a carrying case. Remove the Battery Pack for long-term storage.

⚡ Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
The device does not turn on	The Battery Pack is empty.	Charge the battery pack.
The device does not operate on external power supply	USB cable is damaged.	Replace USB cable.
	The external power supply is discharged.	Charge the external power supply.
The image is blurry, with vertical stripes and uneven background	Calibration is required.	Carry out calibration according to **Microbolometer Calibration** section.
Colored 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.
The image is too dark	Brightness or contrast level is too low.	Adjust the brightness or contrast level in the **Quick Menu Functions.**
Poor image quality / Detection range reduced	Problems described may arise in adverse weather conditions (snow, rain, fog etc.).	
Smartphone or tablet cannot be connected to the device	Password in the device was changed.	Delete network and connect again inserting the password saved in the device.
	There are too many Wi-Fi networks in the area where the device is located which may cause signal interference.	To ensure stable Wi-Fi performance, move the device to an area with few or no Wi-Fi networks.
Wi-Fi signal is missing or interrupted	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).	Relocate smartphone or tablet into the Wi-Fi signal line of sight.
The image of the object being observed is missing	Observation through glass.	Remove the glass from the field of vision.
There are several light or black dots (pixels) on device's display or microbolometer	Presence of dots is caused by peculiarities of microbolometer or display production technology and is not a defect.	
The device cannot be powered on with wireless remote control	Remote control is not activated.	Activate the remote control according to instructions.
	Wireless remote control low battery.	Install a new CR2032 battery.
When using the device at below zero temperatures the image quality is worse than at positive temperatures	Because of variations in thermal conductivity, objects (surrounding environment, background) under observation become warm more quickly at above-zero temperatures, which allows higher temperature contrast and, thus, the quality of the image produced by a thermal imager will be better.	
	At low operating temperatures, objects under observation (background) normally cool down to roughly identical temperatures, which leads to lower temperature contrast, and to image quality (precision) degradation. This is normal for thermal imaging device.	
Rangefinder will not measure distance	There is an object in front of the receiver or emitter lens preventing signal transmission.	Make sure that: the lenses are not blocked by your hand or fingers; the lenses are clean.
	The device is not being held steadily when measuring.	Do not stress the device when measuring.
	Distance to the object exceeds 1000 m.	Pick an object at a distance not longer than 1000m.
	Low reflection ratio (for example, tree leaves).	Pick an object with higher reflection ratio (see **Peculiarities of Operation** in section **Built-In Laser Rangefinder**.
Large measurement error	Inclement weather conditions (rain, mist, snow).	

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IMAGE.QUALITY