PULSAR
IMAGE.QUALITY

LEXION

Thermal Imaging Scopes

Operating Instructions

English / Français / Deutsch / Español / Italiano / Русский

EN **Attention!** Lexion thermal imaging monoculars 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.
For detailed information about the device, please download the complete user manual: www.pulsar-vision.com/products/thermal-imaging-scopes

FR **Attention!** Les caméras thermiques Lexion nécessitent une licence s'ils sont exportés hors de votre pays.
Compatibilité électromagnétique
Ce produit est conforme à la norme européenne EN 55032:2015, Classe A.
Attention! L'utilisation de ce matériel dans un environnement résidentiel peut produire des interférences radio.
Pour des informations détaillées sur la lunette, prière de télécharger le manuel complet d'utilisation: www.pulsar-vision.com/products/thermal-imaging-scopes

DE **Achtung!** Wärmebildgeräte Lexion benötigen eine Lizenz, wenn sie außerhalb Ihres Landes exportiert werden.
Elektromagnetische Verträglichkeit
Das Produkt entspricht der Europäischen Norm EN 55032:2015, Klasse A.
Warnung! Der Betrieb dieses Gerätes im Wohngebiet kann Funkstörungen verursachen.
Für detaillierte Informationen über das Gerät, bitte das vollständige Handbuch herunterladen: www.pulsar-vision.com/products/thermal-imaging-scopes

ES **¡Atención!** Los monoculares de visión térmica Lexion requieren una licencia si se exportan fuera de su país.
Compatibilidad electromagnética
Este producto cumple con la reglamentación de la UE EN 55032:2015, Clase A.
Advertencia: el funcionamiento de este equipo en áreas residenciales podría causar radio interferencias.
Para obtener información detallada acerca del dispositivo, descargue el manual de usuario al completo: www.pulsar-vision.com/products/thermal-imaging-scopes

IT **Attenzione!** I monocoli termici Lexion richiedono una licenza se esportati al di fuori del proprio paese.
Compatibilità elettromagnetica
Questo prodotto è conforme alla norma europea EN 55032:2015, Classe A.
Avvertenza: l'uso di questa apparecchiatura in un'area residenziale può causare perturbazioni radioelettriche.
Per informazioni dettagliate sul dispositivo, scaricare il manuale d'uso completo: www.pulsar-vision.com/products/thermal-imaging-scopes

RU **Внимание!** Тепловизионные монокуляры Lexion требуют лицензии, если они экспортируются за пределы Вашей страны.
Электромагнитная совместимость.
Данный продукт соответствует требованиям европейского стандарта EN 55032:2015, Класс А.
Внимание: эксплуатация данного продукта в жилой зоне может создавать радиопомехи.
Для получения подробной информации о приборе скачайте полное руководство по эксплуатации:
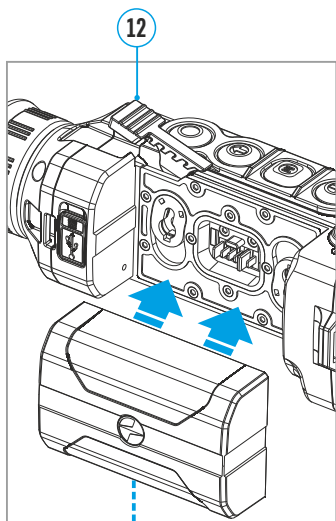http://www.pulsar-vision.com/ru/products/thermal-imaging-scopes

CE — RoHS COMPLIANT PRODUCT — EAC

v.1219
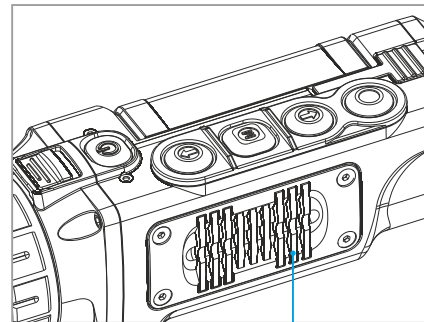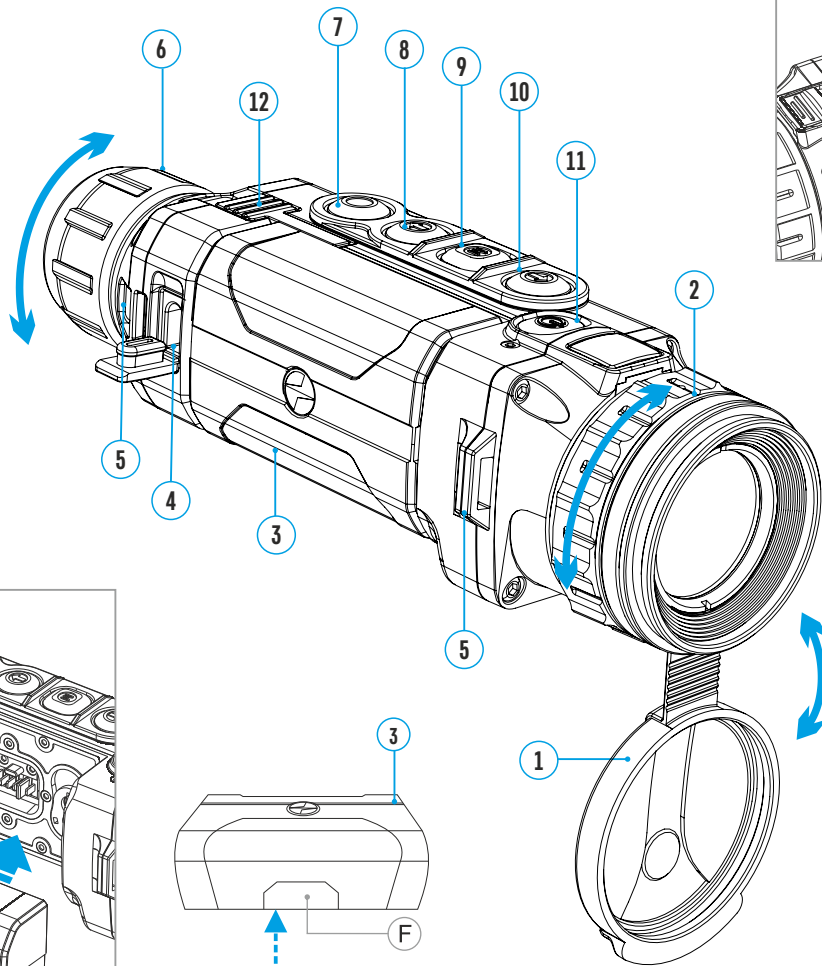
Pic. 1

Pic. 2
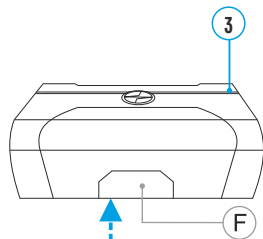
SPECIFICATIONS

MODEL Lexion SKU#	XP28 77443	XP38 77444	XP50 77445
Microbolometer:			
Type	uncooled	uncooled	uncooled
Resolution, pixels	640x480	640x480	640x480
Frame rate, Hz	50	50	50
Pixel size, µm	17	17	17
Optical characteristics:			
Magnification, x	1.4	1.9	2.5
Continuous digital zoom, x	1.4-11.2	1.9-15.2	2.5-20
Digital zoom	2x/4x/8x	2x/4x/8x	2x/4x/8x
Objective lens	F28 mm, F/1.2	F38 mm, F/1.2	F50 mm, F/1.2
Field of view (horizont.), degrees / m@100m	22 / 39	16.3 / 28.6	12.4 / 21.8
Dioptre adjustment, D	±5	±5	±5
Detection distance (1,7 m object), m / y	1000 / 1094	1350 / 1476	1800 / 1969
Display:			
Type	AMOLED	AMOLED	AMOLED
Resolution, pixels	640x480	640x480	640x480
Operational characteristics:			
Power supply	3 – 4.2 V	3 – 4.2 V	3 – 4.2 V
Battery type / Capacity / Output voltage	Li-Ion Battery Pack IPS7 / 6400 mAh / DC 3.7 V		
External power supply	5 V (USB)	5 V (USB)	5 V (USB)
Operating time on battery pack (at t=22°C), h*	10	10	10
Degree of protection, IP code (IEC60529), with installed battery	IPX7	IPX7	IPX7
Operating temperature range	-25 °C ... +50 °C / -13 °F ... 122 °F		
Dimensions, mm	207x58x58	207x58x58	217x58x58
inch	8.1x2.3x2.3	8.1x2.3x2.3	8.5x2.3x2.3
Weight (without battery), kg	0.4	0.45	0.5
oz	14.1	15.9	17.6
Video recorder			
Video / photo resolution, pixel	640x480	640x480	640x480
Video / photo format	.avi / .jpg	.avi / .jpg	.avi / .jpg
Built-in memory	16 Gb	16 Gb	16 Gb
Built-in memory capacity	300 min video or >20 000 pictures		
Wi-Fi channel			
Frequency	2.4 GHz	2.4 GHz	2.4 GHz
Line-of-sight reception range, m	15	15	15
Standard	802.11 b/g	802.11 b/g	802.11 b/g

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

MODEL Lexion SKU#	XQ38 77441	XQ50 77442
Microbolometer:		
Type	uncooled	uncooled
Resolution, pixels	384x288	384x288
Frame rate, Hz	50	50
Pixel size, µm	17	17
Optical characteristics:		
Magnification, x	3,1	4,1
Continuous digital zoom, x	3,1 – 12,4	4,1 – 16,4
Digital zoom	2x/4x	2x/4x
Objective lens	F38 mm, F/1.2	F50 mm, F/1.2
Field of view (horizont.), degrees / m@100m	9,8 / 17,2	7,5 / 13
Dioptre adjustment, D	±5	±5
Detection distance (1,7 m object), m / y	1350 / 1476	1800 / 1969
Display:		
Type	AMOLED	AMOLED
Resolution, pixels	640x480	640x480
Operational characteristics:		
Power supply	3 – 4.2 V	3 – 4.2 V
Battery type / Capacity / Output voltage	Li-Ion Battery Pack IPS7 / 6400 mAh / DC 3.7 V	
External power supply	5 V (USB)	5 V (USB)
Operating time on battery pack (at t=22°C), h*	10	10
Degree of protection, IP code (IEC60529),with installed battery	IPX7	IPX7
Operating temperature range	-25 °C ... +50 °C / -13 °F ... 122 °F	
Dimensions, mm	207x58x58	217x58x58
inch	8.1x2.3x2.3	8.5x2.3x2.3
Weight (without battery), kg	0.45	0.5
oz	15.9	17.6
Video recorder		
Video / photo resolution, pixel	640x480	640x480
Video / photo format	.avi / .jpg	.avi / .jpg
Built-in memory	16 Gb	16 Gb
Built-in memory capacity	300 min video or >20 000 pictures	
Wi-Fi channel		
Frequency	2.4 GHz	2.4 GHz
Line-of-sight reception range, m	15	15
Standard	802.11 b/g	802.11 b/g

This product is subject to change in line with improvements to its design. The latest edition of this user manual is available online at www.pulsar-vision.com

1 PACKAGE CONTENTS

- Lexion Thermal Imaging Scope
- IPS7 Battery Pack
- Battery charger with mains charger
- USB cable
- BPS 3xAA Battery Holder
- Carrying case
- Wrist strap
- Quick start guide
- Lens cloth
- Warranty card

2 DESCRIPTION

Lexion thermal imaging scopes are based on an IR sensor (uncooled microbolometer) are represented by a number of models featuring various magnification and lens diameter. The scopes 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, tallgrass, thick bushes etc.).

Lexion thermal imaging scopes do not require an external source of light and are not affected by bright light exposure.

Lexion thermal imaging scopes are designed for various areas of application including surveillance, trail orienteering, search and rescue operations, law enforcement, security, etc.

3 FEATURES

- User-friendly interface
- Three operating modes - Rocks, Forest, Identification
- Three calibration modes – Manual, Semi-automatic, Automatic
- Eight colour palettes for observation
- Built-in 3-axis accelerometer, gyroscope, magnetometer
- Defective pixel repair function
- Stadiametric rangefinder
- Display off option
- Functional and ergonomic design
- Updatable features
- Wide range of operating temperatures (-25 °C …+50 °C)

VIDEO RECORDING

- Built-in video and sound recorder
- Integration with iOS and Android based mobile devices
- Wi-Fi. Remote control and viewing using smartphone
- YouTube. Direct video streaming and recording to the Internet via smartphone using the Stream Vision application

BATTERY PACK:

- Quick-release Li-Ion battery packs IPS7/IPS14
- Operating time in Wi-Fi mode up to 20 hours*
- Operation on AA or CR123 batteries
- Charging IPS7/IPS14 batteries via USB

* on Battery Pack IPS14 (sold separately).

4 EXTERNAL VIEW AND CONTROLS

1. Lens cover
2. Lens focusing ring
3. Battery Pack
4. Micro-USB port
5. Wrist strap lugs
6. Dioptre adjustment ring
7. Recording button **REC**
8. Navigation button **DOWN**
9. Button **MENU**
10. Navigation button **UP**
11. Power on/off button **ON**
12. Lever for battery pack
13. Radiator cooling system

DESCRIPTION OF CONTROLS

BUTTON	OPERATING MODE	FIRST SHORT PRESS	OTHER SHORT PRESSES	LONG PRESS
ON (11) ⏻	Device is off	Power device on	Calibrate the sensor	Turn display off/ Power device off
	Display OFF mode	Turn display on	Calibrate the sensor	
	Device is on	Calibrate the sensor		
UP (10) ⬆	Regular (viewing)	Operating modes		Color palettes
	Main menu	Navigation upwards/rightwards		----
	Quick menu	Changes parameters		----
MENU (9) M	Regular (viewing)	Enter quick menu	----	Enter main menu
	Main menu	Confirm selection		Exit submenu without confirming selection / Exit menu (switch to viewing mode)
	Quick menu	Switch between quick menu options		
DOWN (8) ⬇	Regular (viewing)	Control step-up digital zoom		PiP on/off
	Main menu	Navigation downwards/leftwards		----
	Quick menu	Changes parameters		----
REC (7) ◯	Video mode	Start video recording	Pause / resume video recording	Stop video recording / Switch to photo mode
	Photo mode	Take a photograph		Switch to video mode

6 USING THE BATTERY PACK

Lexion thermal imaging scopes are supplied with a rechargeable Li-Ion Battery Pack IPS7 which allows operation for up to 10 hours. Please remember to charge the Battery Pack before first use.

Charging:

- Lift the lever **(C)** of the charging base.
- Remove the protective cover from the Battery Pack.
- Install the Battery Pack into the charging base as shown in Pic.3; click the lever **(C).**
- Upon installation, a green **LED** indicator **(D)** on the charging base 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 it keeps lighting red it's defective. **Do not use the battery!**
- Connect the Micro-USB plug of the USB cable to the port **(E)** of the charger.
- Connect the Micro-USB plug to the charger.
- Insert the plug of the charger to the 220 V socket.

Charging base — **Battery Pack** — **Charger** — **220V socket**
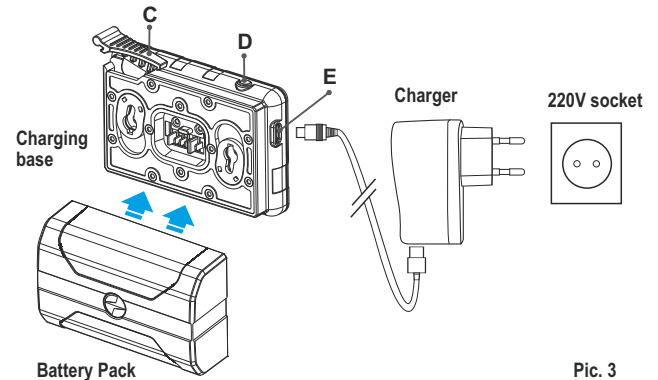
Pic. 3

INSTALLATION:

- Remove the protective cover from the Battery Pack.
- Lift the lever **(12)**.
- Install the battery into the dedicated slot on the device housing so that element **F** (Pic.2**)** appears from below.
- Fix the battery by clicking the lever.

SAFETY MEASURES:

- 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.
- **When keeping the battery for a long period, the battery should not be fully charged or fully discharged.**
- **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.**
- Do not leave a battery unattended while charging.
  Never use a modified or damaged charger.
- Charge the Battery Pack at a temperature from 0 °C to +45 °C. Otherwise batter's life will decrease significantly.
- Do not leave the Battery Pack with a charger connected to the mains longer than 24 hours after full charge.
- 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, any situation that may cause short-circuiting should be avoided.
- 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.

7

● **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 **(4)** of the device (Pic. 1).
- 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, the icon ▬■▬ is shown.
- When the external power supply is disconnected, the device switches to the internal battery pack without powering off.

8

● **OPERATION**

WARNING! Do not point the objective lens of the unit 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 (13) becomes warm during operation: this is normal and allows an increase in the sensitivity of the device.

Powering on and image setup
- Open the lens cover **(1)**.
- Turn the unit on with a short press of the **ON (11)** button .
- To obtain a crisp image of the icons on the display, rotate the dioptre adjustment ring **(6)**. After this there is no need to rotate the dioptre adjustment ring for distance or any other conditions.
- To focus on the object being observed rotate the lens focusing ring **(2)**.
- To set up display brightness and contrast and continuous zoom, please refer to the QUICK MENU FUNCTIONS section.
- After use, hold down the **ON** button to turn the unit off.

9

● **SENSOR 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 M (manual)**. Close the lens cover, turn the device on with a short press of the **ON** button **(11)**. Having finished calibration, open the lens cover.
- **Mode SA (semi-automatic)**. Calibration is activated with a short press of the **ON** button. You do not have to close the lens cover (the sensor is closed with the internal shutter automatically).
- **Mode A (automatic)**. The device calibrates by itself according to the software algorithm. You do not have to close the lens cover (the sensor is closed with the internal shutter automatically). User assisted calibration with the **ON** button is allowed in this mode (in semi-automatic mode).

10 STEP-UP DIGITAL ZOOM

The device allows you to quickly increase the basic magnification (please refer to the **"Digital zoom"** line in the specifications table) by two times or four times (8 times in XP models), as well as to return to the basic magnification. To operate the step-up digital zoom, press successively the **DOWN (8)** button.

11 QUICK MENU FUNCTIONS

The Quick menu allows change of basic settings (display brightness and contrast, continuous digital zoom and stadiametric rangefinder).

- Enter the menu with a short press of the **M (9)** button.
- To toggle between the functions below, press successively the **M** button.
- **Brightness** ☀ – press the **UP (10)/ DOWN (8)** buttons to change display brightness from 00 to 20.
- **Contrast** ◖ – press the **UP/ DOWN** buttons to change display contrast from 00 to 20.
- **Digital zoom** ⊕ press the **UP/ DOWN** buttons to change digital zoom from 1.0x to 4.0x (or 8.0x in XP models). Continuous digital zoom is in 0.1x increments.
  The initial value of the continuous digital zoom is x1.0 if the step-up digital zoom is not active.

Notes.
 - actual magnification is the product of the basic magnification value and continuous digital zoom value. For example: the device's basic magnification is 3.0x, continuous digital zoom value x1.7. Actual magnification is 5.1x (3.0*1.7).
 - display brightness and contrast settings are saved in the memory when the unit is turned off.

The stadiametric rangefinder ᴵᴵᴵ — press the **UP/ DOWN** buttons to change distance to an object being ranged (please refer to section 16 for more details).

12 MAIN MENU FUNCTIONS

- Enter the main menu with a long press of the **M (9)** button.
- Press the **UP (10)/ DOWN (8)** buttons to switch between the menu options.
- Menu navigation is cyclical: as soon as the last menu option of the first tab is reached, first menu option of the second tab starts.
- Enter a menu option with a short press of the **M** button.
- Exit the menu with a long press of the **M** button.
- Automatic exit takes place in 10 sec of inactivity.
- Upon exit from the menu the cursor location ▶ is memorized only for the duration of the working session (i.e. until the unit is turned off). Upon restarting the device and entering the menu the cursor will be located on the first menu option.

MENU CONTENTS:

TAB 1

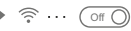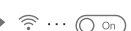| Menu	Wi-Fi activation
📶	···· Off ◯
⌄	···· 🌲
⬜	···· 10
🎨	···· Black Hot
✦	···· Automatic
📶⚙ ❯	

TAB 2

Menu	General settings
⚙ ❯	
🔊))	···· Off ◯
📡 ❯	
⊞ ❯	
ⓘ	

Menu contents and description

🛜	**Wi-Fi**	**Wi-Fi ON/OFF**

▸ 🛜 ⋯ (Off ⚪)   ▸ 🛜 ⋯ (⚪ On)

- Enter the main menu with a long press of the **M (9)** button.
- Select option "Wi-Fi" with **UP (10)/ DOWN (8)** buttons.
- Turn Wi-Fi on-off with a short press of the **M** button.

Mode

The devices have three operating modes: **FOREST** (observation mode of objects within low thermal contrast conditions), **IDENTIFICATION** (high zoom mode), **ROCKS** (observation mode of objects within high thermal contrast conditions). Each mode has been created to provide the best image quality of an object being observed within various observation conditions.

- Press and hold the **Menu** button to enter the menu.
- Select the 'Mode' option.
- A short press of the **Menu** button opens the menu.
- Select one of the settings described below with the **UP / DOWN** buttons.
- A short press of the **Menu** button confirms the selection.

Rocks

ROCKS MODE – This is the best mode when observing objects after a sunny day or within urban conditions.

Forest

FOREST MODE – 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.

Identification

IDENTIFICATION MODE – 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.

Note: Quick activation of the operating modes is possible by using the **UP** button. Short press of the **UP** button activates the switching of the operating modes.

Graphics brightness

Graphics brightness

- Hold down the **M (9**) button to enter the main menu.
- Select submenu with **UP (8) and DOWN (10)** buttons.
- Press briefly the **M** button the enter the submenu.

- Set the desired graphics brightness (menu and status bar icons) from 0 to 10 with **UP/DOWN** buttons.
- Confirm your selection with a short press of the **M** button.

🎨 **Color palettes**

Selection of colour palettes

Basic image mode is **"White Hot"**. Menu option **"Colour palettes"** allows you to select an alternative palette.

- Enter the main menu with a long press of the **M (9)** button.
- Enter the submenu with a short press of the **M** button.
- Select one of the palettes below with a short press of the **UP (10)/ DOWN (8)** buttons.
- Confirm selection with a short press of the **M** button.

Black Hot palette

(white colour corresponds to low temperature, black colour – to high temperature)
Hot Red
Red Monochrome
Rainbow
Ultramarine
Violet
Sepia

Note: A long press of the **UP** button **(10)** also activates the change of a color palette.

Calibration

Selection of calibration mode.

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

- Enter the main menu with a long press of the **M** button.
- Enter the submenu with a short press of the **M** button.
- Select one of the below calibration modes with **UP (10)/ DOWN (8)** buttons.
- Confirm selection with a short press of the **M** button.

A   In automatic mode the need for calibration is based on software algorithm. Calibration starts automatically.

SA   The user determines for himself the need for calibration based on the actual image status.

M   Manual (silent) calibration.

Close the lens cover before calibration.

WiFi settings

Wi-Fi setup

This menu option allows you to set up your device for operation in a Wi-Fi network.

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

The password is used to connect an external device (i.e. smartphone) to your thermal imager.

Password setup

▶ [PAS] ··· 12345

- Enter the submenu **"Wi-Fi"** with a short press of the **M (9)** button.
- The default password (12345 or 12345678 depends on product firmware) will appear on the screen.
- Set the desired password with the **UP (10)** and **DOWN (8)** buttons (button **UP** to increase value; button **DOWN** to reduce). Switch between digits with a short press of the **M** button.
- Save the password and exit the submenu with a long press of the **M** button.

Access level setup

[PAS] ▶ Owner
[👥] Guest

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.

Settings Language

▶ 🌐 ··· English

The following settings are available:

Language selection

- Enter the submenu **"Language"** with a short press of the **M** button.
- Select one of the available interface languages with a short press of the **UP/ DOWN** buttons: English, French, German, Spanish.
- Switch between languages with a short press of the **M** button.
- Save selection and exit the submenu with a long press of the **M** button.

Date

Date setup

- Enter the submenu **"Date"** with a short press of the M button. 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/ DOWN** buttons.
- Switch between digits with a short press of the **M** button.
- Save selected date and exit the submenu with a long press of the **M** button.

Time

Time setup

- Enter the submenu **"Time"** with a short press of the **M (9)** button.
- Select the desired time format with a short press of the **UP/ DOWN** buttons: 24 or PM/AM.
- Switch to hour setup with a short press of the M button.
- Select hour value with a short press of the **UP/ DOWN** buttons.
- Switch to minute setup with a short press of the **M** button.
- Select minute value with a short press of the **UP/ DOWN** buttons.
- Save selected time and exit the submenu with a long press of the **M** button.

Units of measure

▶ [M/Y] ···
Meters

Selection of units of measurement

- Enter the submenu **"M/Y"** with a short press of the **M** button.
- Select the desired time format with a short press of the **UP/ DOWN** buttons, press **M** again.
- Menu exit will take place automatically.

Format

Formatting.

This menu option allows you to format your device's Flash card or memory card (erase all files from its memory).

- Enter the Format submenu with a short press of the **M (9)** button.
- With a short press of the **UP/ DOWN** buttons select **"Yes"** to format the memory card or **"No"** to return to the submenu.
- Confirm selection with a short press of the **M** 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.
- Message **«Memory card formatting»** means that formatting is in progress.
- Upon completion of formatting the message **«Formatting completed»** is shown.
- If **"No"** is selected, formatting is aborted and you return to the submenu.

↰

Reset

Restore default settings

- Enter the Reset submenu with a short press of the **M (9)** button.
- With a short press of the **UP/ DOWN** buttons select **"Yes"** to restore default settings or **"No"** to abort.
- Confirm selection with a short press of the **M** button.
- If **"Yes"** is selected, display will show **"Return 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:

- **Operating mode of video recorder** – video
- **Operating mode** – Forest
- **Calibration mode** – automatic
- **Language** – English
- **Wi-Fi** – off (default password)
- **Digital zoom** – off
- **PiP** – off
- **Colour palette** – White Hot
- **Unit of measurement** - metric

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

Remote Control

Remote control (bought separately)

Before operating the remote control (RC), remember to activate it as follows:

- Press the **M** button, 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 **M** 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.
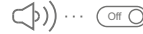
Microphone

- Hold down the **M (9)** button to enter the main menu.
- Select submenu with **UP (8) and DOWN (10)** buttons.
- Press briefly the **M** button the enter the submenu.
- Turn the microphone on/off with a short press of the **M** button.
- With the microphone on, you will have audio track in your video. Microphone is off by default.

⊞

Defective pixel repair

Defective pixel repair

When operating a thermal imager, defective (dead) pixels (bright or dark dots with constant brightness) may become visible on the sensor.

The defective pixels on the sensor may proportionally increase in size when digital zoom is activated. **Lexion** thermal imagers allow the user to repair defective pixels on the detector using a software-based method or to abort deletion.

- Enter the submenu with a short press of the **M** button.
- Select icon ⊞ with a short press of the **M** 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/ DOWN** 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 **M** button.
- 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 **REC (7)** 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"** option with a long press of the **M** button.
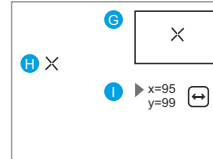
Return to default defective pixel pattern

This option allows you to cancel deletion of the defective pixels and return them to the original state.

- Enter the submenu with a short press of the **M** button.
- Select icon ↻ and press **M**.
- 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 **M** 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.

ⓘ

Device information

This option allows the user to view the following information about the device:

- Full name
- SKU number
- serial number
- software version
- hardware version
- service information

Select menu option **Device information** with a short press of the **M** button to review information.

13
● **STATUS BAR**

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

⚫ 🎋 ✥A   16x 🚫   12:30AM ▱
1   2   3   4   5   6   7

(1) Colour palette
*(shown only if the **"Black Hot"** palette is selected)*
(2) Operating mode
(3) Calibration mode
(in the automatic calibration mode, three seconds before automatic calibration a countdown timer 00:01 is shown in place of the calibration mode icon).
(4) Current full magnification (for example, 16x)
(5) Wi-Fi connection status
(6) Running time
(7) Battery charge level
(if the device is powered by the Battery Pack) or
External battery power indicator ━■
(if the device is powered by an external power supply)

14
● **VIDEO RECORDING AND PHOTOGRAPHY**

Lexion thermal imagers feature video recording and photography of the image being ranged to the internal memory card.
Before using this feature please read the menu options **"Date setup"**, **"Time setup"** of the section **"Main menu functions"**.

The built-in recorder operates in two modes - VIDEO and PHOTO

VIDEO mode. Video recording 🎥

- The device in the VIDEO mode upon turning on.
- In the top left corner you will see icon 🎥 and remaining recording time in the format HH:MM (hours: minutes)   5:12.
- Start video recording with a short press of the **REC (7)** 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** button.
- Stop recording video with a long press of the **REC** 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** button.

Photo mode. Photography 📷

- Switch to the Photo mode with a long press of the **REC** button.
- Take a picture with a short press of the **REC** 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 i**mg_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 seven 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;
- regularly check 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 iOS-based computers, we recommend that you use **VLC** video player or **Elmedia player.**
Download links and QR codes are shown below:

VLC VIDEO PLAYER
http://www.videolan.org/
vlc/download-macosx.html

ELMEDIA VIDEO PLAYER
https://itunes.apple.com/us/
app/elmedia-multiformat-video/
id937759555?mt=12

15 WI-FI FUNCTION

Your thermal imager features wireless connection option (Wi-Fi) which links it with external appliances (smartphone, tablet PC).

- Turn on the wireless module with a long press of the **M** button. 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 **Lexion_XXXX**», where **XXXX** – is the last four digits of device's serial number».
- After a password is generated on an external appliance (please refer to the menu option **"Wi-Fi setup"** of the section "**Main menu functions"** of this user manual) and connection is established, the icon in the status bar changes to .

16 STADIAMETRIC RANGEFINDER

Thermal imagers are equipped with a stadiametric rangefinder which allows the user to estimate approximate distance to an object of known size.

- Select the **"Stadiametric rangefinder"** function with a short press of the **M (9)** button and select icon . Press **M** to confirm selection.
- You will see on the display:
  - horizontal measurement bars **(J)**;
  - three reference objects with approximate height (0.3m; 0.7m; 1.7m) **(K)**;
  - respective distance values for the three objects **(L)**.
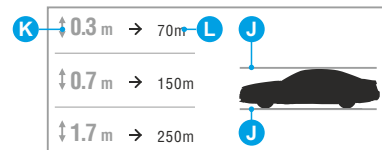
- Move the lower fixed bar under the object being ranged and, while pressing the **UP/ DOWN** buttons, move the upper horizontal bar relative to the lower fixed bar until the object fits entirely between the two cursors. The distance to the object is automatically recalculated as you move the upper line.
If ranging does not take place within 10 seconds, the information disappears from the display.
- To select the unit of measurement (metres or yards), go to the respective menu option. When switching to "yards" unit of measurement pre-set values are shown as: 0.3y; 0.7y; 1.7y.

- Before it appears on the display, a measured distance value is rounded up to 5 m for larger values, and rounded down to 1 m for smaller values.
- Exit rangefinder mode with a short press of the **M** button or wait 10 seconds to exit automatically.

17 FUNCTION DISPLAY OFF

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 (11)** button. Display goes out, message **"Display off"**.
- To activate the display, press briefly the **ON** button.
- When holding down the **ON** button, the display shows **"Display off"** message with countdown, the device will turn off.
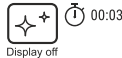
18 FUNCTION PiP

PiP ("Picture in Picture") allows you to see a zoomed image simultaneously with the main image in a dedicated window.
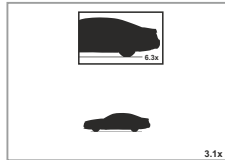
- Turn on/off the **PiP** function with a long press of the **DOWN (8)** button.
- Change zoom ratio in the **PiP** window with a short press of the **DOWN** button.
- The zoomed image is displayed in a dedicated window, with the full optical magnification being shown.
- The main image is shown with optical magnification ratio which corresponds to ratio x1.0.
- When **PiP** is turned on, you can operate the step-up and continuous digital zoom. The full optical 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.

19 STREAM VISION

Lexion thermal imagers support Stream Vision technology which allows you to stream image from the display of your thermal imager to a smartphone or tablet PC via Wi-Fi in real time mode. You can find further guidelines on Stream Vision online at www.pulsar-vision.com

Note: The Stream Vision application allows you to update the firmware features of your thermal imager.
Scan the QR codes to download Stream Vision free of charge:

Google Play (Android OS):   **iTunes (iOS):**

20 USB CONNECTION

- Connect one end of the **USB** cable to the **Micro-USB (4)** 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 (11)** 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:
- **Memory card (external memory)** and **Power**.
- Select connection mode with **UP** and **DOWN** buttons.
- Confirm selection with a short press of the **M** button.

USB connection

Use as power
Use as memory card
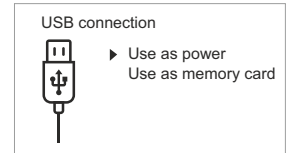
Connection modes:

- **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 **USB** Mass storage device mode, the device remains on the **OFF** state. Turn the device **ON** for further operation.

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.
  Note: 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.

21 WIRELESS REMOTE CONTROL (bought separately)

Wireless remote control (RC) duplicates the **POWER ON** function, digital zoom, video start/stop and menu navigation.

RC controls are as follows:

- **ON Button (14)**: duplicates the functions of the **ON (11)** button.
- **Button (15)**: digital zoom activation. Function **PiP**.
- **Button (16)**: duplicates the functions of the **REC (7)** button.

- Controller **(17)**: duplicates the functions of the **M (9)** button when pressed; duplicates the functions of the **UP (10)/ DOWN (8)** upon rotation (in quick menu/main menu).
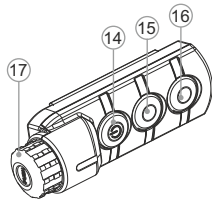
22 TECHNICAL INSPECTION

Check:
- External view (there should be no cracks on the housing).
- The state of the objective and eyepiece 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.

23 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 eyepiece 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.

24 TROUBLESHOOTING

The table presented below lists some potential problems that may occur when using the device. If a problem encountered with the device is not listed, or if the recommended action does not resolve the problem, the unit should be returned for repair.

Problem	Check	Corrective action
The thermal imager will not turn on.	Battery Pack is discharged.	Charge the battery.
The unit does not operate on external power supply.	USB cable is damaged.	Replace USB cable.
	External power supply is discharged.	Charge the external power supply (if necessary).

Problem	Check	Corrective action
The image is blurry, with vertical stripes and uneven background.	Calibration is required.	Carry out calibration according to Section "SENSOR CALIBRATION".
The image is too dark.	Brightness or contrast level is too low.	Adjust brightness/contrast with the UP/DOWN buttons.
Poor image quality / Detection range reduced.	Problems described may arise in adverse weather conditions (snow, rain, fog etc.).	
Smartphone or tablet PC cannot be connected to the device.	Password in the unit was changed.	Delete network and connect again inserting the password saved in the device.
No Wi-Fi signal or erratic signal.	The unit is beyond reliable Wi-Fi range.	Place the device in line-of-sight of the Wi-Fi signal.
	There are obstacles between the device and the signal receiver (i.e. concrete walls).	
	There are too many Wi-Fi networks in the area where the scope 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.
Smartphone or tablet PC cannot be connected to the device.	Password in the unit was changed.	Delete network and connect again inserting the password saved in the device.
The device cannot be powered on with wireless remote control.	Remote control is not activated. Low battery.	Activate the remote control according to instructions. Install a new CR2032 battery.
Color stripes appear on the display or images disappears.	The device has accumulated static charge during operation.	As soon as the impact of the static charge is over, the device may reboot automatically; alternatively please turn off and restart the device.
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.	

Follow the link to read FAQs on thermal vision
http://www.pulsar-vision.com/support/faq/

The term of possible repair of the device is five years.