



VILIR-LH



Thermal imaging device
INSTRUCTIONS
USER MANUAL

INTRODUCTION

PACKAGE CONTENT

- VILIR-LH thermal imaging device
- Carrying case
- Rubber lens cover
- Rubber light suppressor for eyepiece
- Lens cleaning cloth
- Video cable (analog PAL)
- External power supply cable (USB power-bank)
- Standard CR123 batteries—2 pcs.
- User manual

DESCRIPTION

This user manual and instructions cover the most basic operations.

Digital thermal imaging device VILIR-LH is designed for detecting and surveillance of any objects in different light and weather conditions. VILIR-LH is based on IR sensor (uncooled microbolometer) shutterless LWIR thermal imaging core ASTIR2. The device is intended to be used in day and night time, harsh weather conditions, rain, fog, smog etc. VILIR-LH comes in two different resolutions (640 x 480 25Hz/9Hz; 384 x 288 50Hz/9Hz), number of different lenses (30mm F/1.0; 35mm F/1.0; 40mm F/1.0; 54mm F/1.0). VILIR-LH is fully thermal imaging device, the image is formed as the result of the differences of the temperature of the observed area or objects. The device does not require an external source of light and is not affected by bright light exposure.

FEATURES

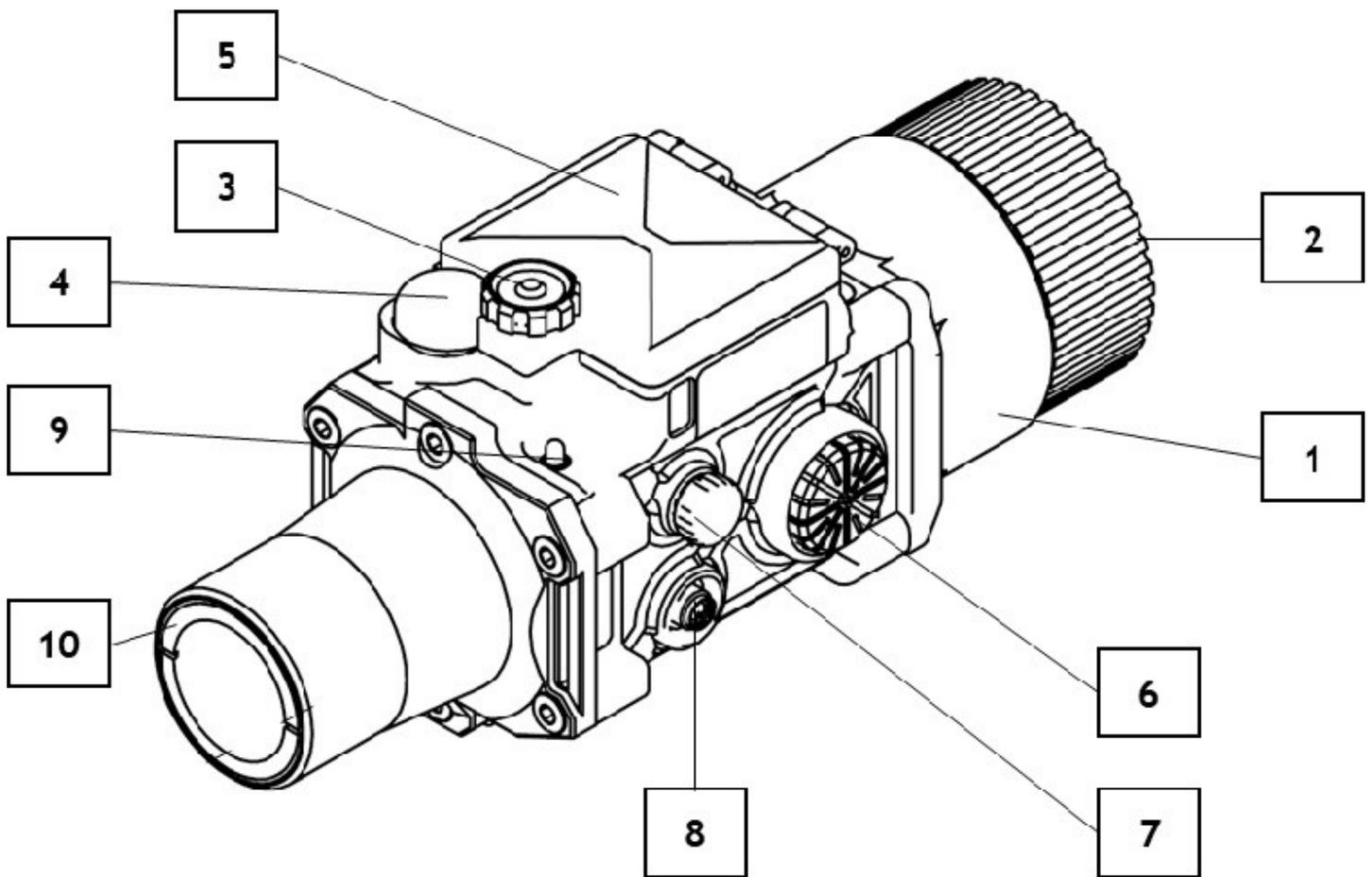
- Thermal imaging core 640 x 480 or 384 x 288
- OLED microdisplay—1024 x768
- Advanced discrete digital zoom—from 1x to 25.5x
- User friendly menu and controls
- Presets modes—forests, city, indoors, identify
- Image quality and palette customization
- External power supply
- External video—analog PAL output

TECHNICAL SPECIFICATIONS

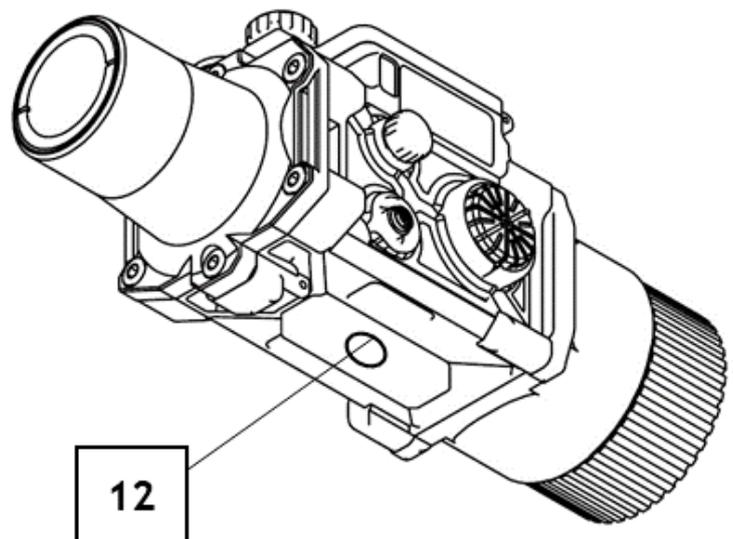
VILIR-LH

RESOLUTIONS	384 x 288	640 x 480	
REFRESH RATE Hz	50 Hz	25 Hz	
DETECTOR TYPE	Uncooled shutterless	Uncooled shutterless	
SPECTRAL RANGE	8 - 14 μ m		
PIXEL PITCH	17 μ m		
SENSITIVITY	< 55 mK		
LENS	35 mm	40 mm	54 mm
F / NUMBER	1.0	1.0	1.0
MODEL	VILIR-LH/35-384	VILIR-LH/40-384 VILIR-LH/40-640	VILIR-LH/54-384 VILIR-LH/54-640
FOV (384 x 288)	10.7° x 8°	9.3° x 7.0°	6.9° x 5.2°
FOV (640 x 480)	-	15.5° x 11.6°	11.5° x 8.6°
VIDEO OUTPUT	PAL (Analog signal)		
DISPLAY	OLED color 1024 x 768		
INTERFACE	USB		
POWER	2 x CR123		
EXTERNAL POWER	USB power bank (5 V-12 V)		
MAXIMAL OPERATING TIME	4 hours		
OPERATIONAL TEMP.	-40°C to +60°C		
COLD START TIME	< 3 s		
PROTECTION DEGREE	IP67		

COMPONENTS AND CONTROL



1. Lens
2. Lens focus ring
3. Battery tray open lock
4. ON / OFF button
5. Battery tray
6. Menu encoder button
7. Video (PAL) cable jack
8. External power supply jack
9. LED indicator
10. Eyepiece
11. Universal mounting port



INSTALLATION OF BATTERIES

- Unscrew the Battery open lock (3).
- Install two standard CR123 batteries (or rechargeable batteries) to the battery tray (5) following polarity shown on the battery container.
- Close battery tray and screw the locker.
- Battery level is displayed on the LED indicator (9) when the device is ON: green—fully charged batteries; yellow—medium level of batteries; red—batteries are discharged.

EXTERNAL POWER SUPPLY

- Use external power supply cable, connect it to power supply jack (8) and external USB power-bank.
- Use only standard power bank with voltages 5 V–12 V.
- Do not connect the device to any uncertified cables or others external electrical power devices.
- External power supply does not charge the rechargeable batteries in the device.

OPERATION

- Press **ON/OFF** (4) button. Unit is ready for the operation in approximate 3 seconds.
- Focus the image to the object to get the best quality by using lens focus ring (2).
- Adjust needed brightness, contrast, polarity, palettes settings etc. by operating the **MENU** by encoder button. Press and hold encoder button for 2 s.(6). Operate **MENU** by turning encoder button in both directions.
- To select required **MENU** setting—press encoder button once.
- To **SAVE** selected options or adjustment—press **SAVE** icon in **MENU** once and select **YES** by clicking once.
- To check the battery status- see battery bar status on the microdisplay or LED indicator (9). Green—fully charged batteries; yellow—medium level of batteries; red—batteries are discharged
- To attach device to standard mounting system (tripod, photo-camera stand etc.) - use universal mounting port (12)
- To connect analog PAL video cable—connect it with the video cable jack (7) to the external video transferring or recording devices.

MENU

PRESETS	Custom
ZOOM	1.0X
BRIGHT.	0
CONTRAST	-20
SHARPNESS	0
ADJUST	BRIGHT
POLARITY	Pos
PALETTES	Pink
SAVE	
DEFAULT	
BAD PIXEL	
ABOUT	
EXIT	

MENU

VILIR-LH is equipped with the user-friendly **MENU** which allows to apply modifications and adjustments of the thermal image. Following settings could be modified:

- Zoom
- Brightness
- Contrast
- Sharpness
- Polarity

ZOOM

User may adjust digital image zoom by fixed factors in 34 steps—from 1x to 25.5x

BRIGHT.

Brightness of the image may be adjusted in ranges: -120 :120 with the steps of 8. The darkest image is represented by -120, and the brightest image by 120 value.

CONTRAST

Contrast of the image may be adjusted from -20 to 12 with steps of 1. The highest available contrast obtained when selected value 12 .

SHARPNESS

Image sharpness may be increased to a maximum by selecting value 15. Value 0 - implies no sharpness correction. Incrementation step is 1.

ADJUST

ZOOM, **BRIGHT.**, **CONTRAST** and **SHARPNESS** may be adjusted directly by **MENU** encoder button, when **MENU** is inactive. **ADJUST** selects which setting will be adjusted by turning encoder button, when **MENU** not shown.

POLARITY

Image colors may be inverted in negative or positive. If **Neg** is selected in **POLARITY** setting the image colors are inverted. Non inverting image is shown when **Pos** is selected.

PALETTES

Temperature may be represented by different color schemes by selecting one of 10 palettes. B/W means grayscale image

- B/W - black/white
- Sepia
- Thermal
- Hi-Lit
- Bone
- Copper
- Earth
- HSV
- Pink
- Temp

PRESETS	Custom	B/W
ZOOM	1.0X	Sepia
BRIGHT.	0	Thermal
CONTRAST	-20	Hi-Lit
SHARPNESS	0	Bone
ADJUST	BRIGHT	Copper
POLARITY	Pos	Earth
PALETTES	Pink	Pink
SAVE		Temp
DEFAULT		
BAD PIXEL		
ABOUT		
EXIT		

SAVE

All adjustments in settings may be saved to the device memory. Click **SAVE** and confirm operation by selecting **YES**. Choose **NO** if you don't want save any changes.

Do not turn power off while it's saving settings (Saving settings message is shown). When settings saving is done, warning closes and VILIR-LH may be turned off.

DEFAULT

Factory default settings may be restored by selecting **DEFAULT**. Confirmations is needed—press **YES** to restore factory default settings.

PRESETS

You can chose one from 6 factory presets.

Default, Forest, City, Indoors, Identif, Custom

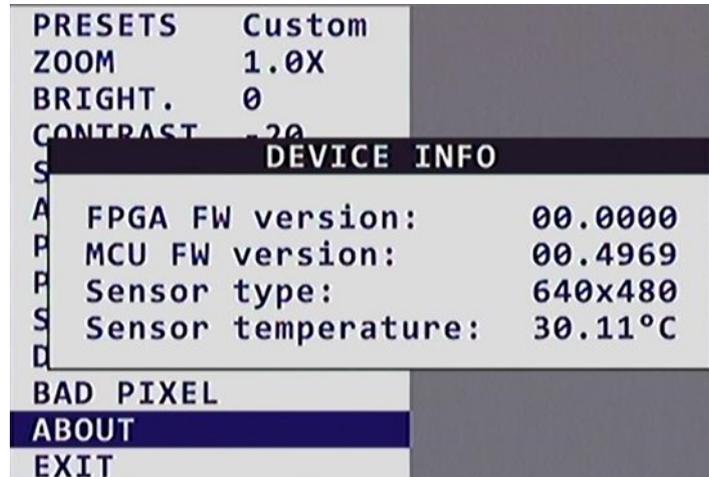
When preset is selected, you can still modify its brightness, contrast and sharpness and zoom. If Brightness, Contrast or Sharpness settings are adjusted after factory preset was selected, modified settings values are written to **Custom** preset. After selecting one of factory presets, user may restore his own last settings by selecting **Custom** preset.

MENU

ABOUT

By selecting **ABOUT** menu setting, following device information is displayed:

- **FPGA FW**—firmware version
- **MCU FW**— firmware version
- **SENSOR type**—(resolution)
- **Sensor temperature**



The screenshot shows a menu with the following items: PRESETS (Custom), ZOOM (1.0X), BRIGHT. (0), CONTRAST (20), and a highlighted 'ABOUT' option. Below 'ABOUT' is a 'DEVICE INFO' screen displaying: FPGA FW version: 00.0000, MCU FW version: 00.4969, Sensor type: 640x480, and Sensor temperature: 30.11°C. At the bottom of the menu are 'BAD PIXEL', 'ABOUT', and 'EXIT' options.

PRESETS	Custom
ZOOM	1.0X
BRIGHT.	0
CONTRAST	20
DEVICE INFO	
FPGA FW version:	00.0000
MCU FW version:	00.4969
Sensor type:	640x480
Sensor temperature:	30.11°C
BAD PIXEL	
ABOUT	
EXIT	

EXIT

To exit **MENU** navigate to **EXIT** and select it, or press and hold encoder button longer than 2 seconds.

BAD PIXEL (Defective pixel)

Noticeable dots, visible through the eyepiece, when objective lens is covered, are considered as bad/defective pixels. Bad pixels on thermal imaging sensor may appear due to aging or strong impact. To improve image, bad pixels may be masked away.

VILIR-LH itself can find and disable all visible defective pixels. If you have noticed bad pixels, proceed with the following steps:

- Cover VILIR-LH objective lens
- Select **BAD PIXEL**
- Select **DETECT** to let the device automatically detect and mask bad pixel

In case something went wrong while performing bad pixel correction (i.e. objective lens was covered incorrectly and possibly good pixels were detected as bad), remove them from the list by performing following:

- Select **RESET** to delete all pixels from bad pixel list
- Cover VILIR-LH objective lens
- Select **DETECT** to perform new bad pixel detection

Warning Message will be shown while deleting or detecting bad pixels. Warning will close automatically when operation ends.

If you don't need any action with bad pixels, select < **Back** or hold encoder button pressed longer than 2 seconds.



MAINTENANCE

MAINTENANCE INSTRUCTIONS

In order to sustain the device in its best condition, perform external inspection of the components for serviceability and cleaning, check the installation of standard and optional accessories. Do this when the device is used or every time it is taken out of its storage case for any purpose. The things that need to be inspected first:

- The lenses and other parts for any dirt, scratches and cracks, loose fitting etc.
- The battery tray for contact damage and signs of the corrosion.

Always store the VILIR-LH in carrying case in a dry, well-ventilated place. For prolonged storage, always remove the batteries.

Batteries shall not be exposed to excessive heat such as sunshine, fire etc.

NEVER expose the device lens to direct sun light, it may cause damage to thermal imaging detector.

Attempts to disassemble or repair the device will void the warranty!

CLEANING

Use only a soft cloth for brushing off any dirt from the device. Use wet cloth to gently wipe the external surfaces (but not the lenses). The lenses can only be wiped with or lens cleaning cloth soft cotton swab dampened in ethanol; this must be performed in a gentle and slow manner. Dry carefully before returning to the storage case.

TROUBLESHOOTING

Troubleshooting	Event	Solution
<i>The image is absent</i>	<i>Battery instalment failure</i>	<i>Try to reinstall batteries in correct position</i>
	<i>The batteries are fully exhausted</i>	<i>Install fresh batteries</i>
	<i>Oxidized contact point of batteries / leaky batteries / contact points becoming exposed to a chemically reactive solution</i>	<i>Clean the battery compartment, focusing on the points of contacts.</i>
<i>It is impossible to reach the proper image sharpness</i>	<i>Objective and eyepiece lenses dirty</i>	<i>Clean the lenses surfaces</i>
	<i>Damaged optical components</i>	<i>Send the device to the service center</i>
<i>The image brightness is very low</i>	<i>The lowest brightness level is set</i>	<i>Adjust brightness in MENU</i>
	<i>Factory alignment is broken</i>	<i>Send the device to the service center</i>

WARRANTY CARD

WARRANTY

The manufacturer guarantees the performance of the thermal vision device VILIR-LH, if the consumer complies with the device storage, transportation and operation requirements.

The warranty period for the device VILIR-LH is 24 months from the date of sale. During the warranty period, the manufacturer takes responsibility for the defect rectification, repairing or replacing the unit on its own expense. The cost of the delivery to the manufacturer is covered by the customer.

The core warranty is 12-months.

The manufacturer reserves the right to change the design without prior notice.

PRODUCT TYPE

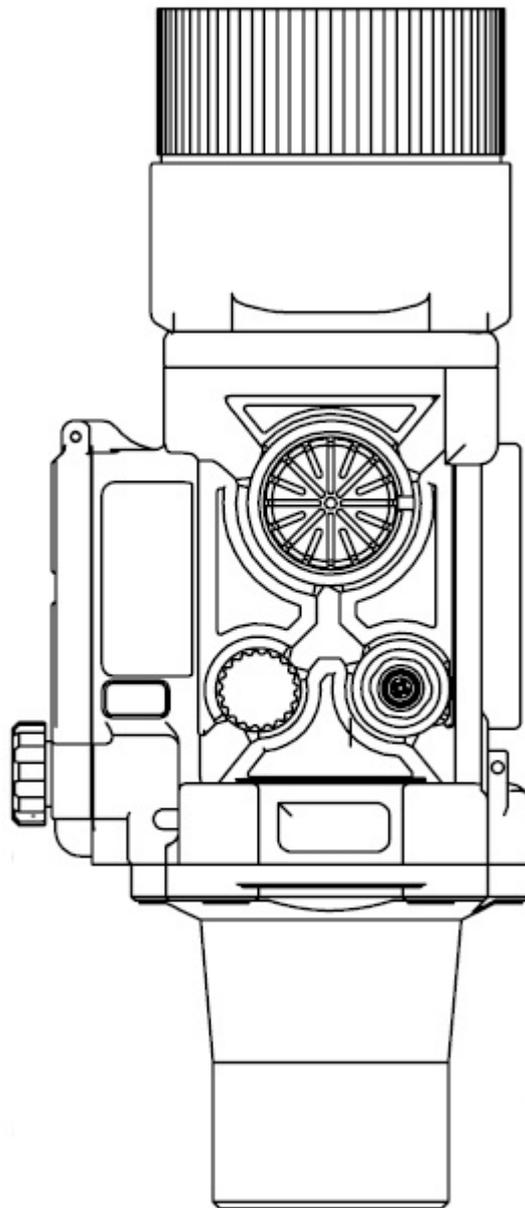
SERIAL NUMBER

DATE OF SALE

SIGNATURE

Attention!

Thermal imaging devices and products could be dual use and are subject to regulation under the legislation EEC. It may have export limitations depending on the laws in your region.



ASTROHN Technology UAB
Naugarduko str. 102-206, 03160, Vilnius, Lithuania
tel: +370 5 205 3456
web: www.astrohn.eu
email: info@astrohn.eu

