DEFENDER

NVECTECH

Manual for the thermal imaging device

CONTENT

INTRODUCTION

DEVICE DESCRIPTION

NVECTECH Defender: the highest quality
in the world of thermal imaging technologies.

Especially for the defenders of Ukraine,
the company NVECTECH Ukraine has created
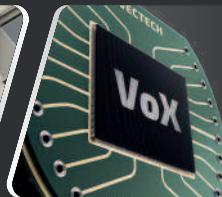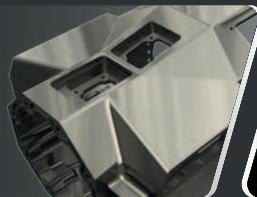a thermal imaging device Defender.
It is fully optimized to work in difficult conditions
and is equipped with with advanced technologies.
It is a benchmark in the world of
thermal imaging technology.
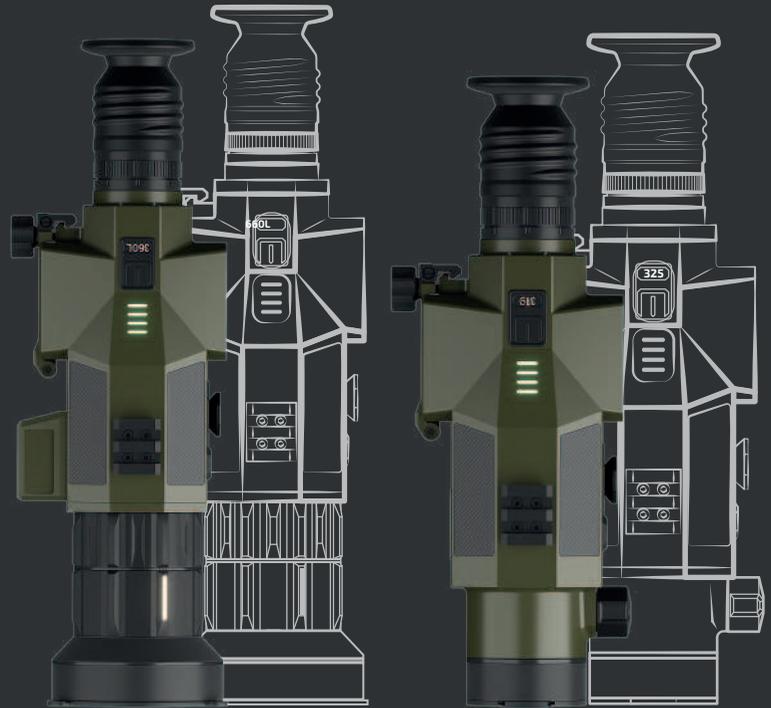
UKRAINE

FEATURES

The body is made of aviation aluminum alloy housing:
Impact resistance 10000J.

The new most sensitive sensor <20mK (384x288px, 640x512px)
Even faster, even more sensitive.

Height and temperature sensors:
Additional analysis of the of the environment.
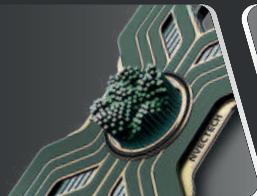
Rangefinder 1200m:
Multifunctional rangefinder.

The software is based on AI:
Thanks to more than five sensors the device adapts itself to the needs of the user.
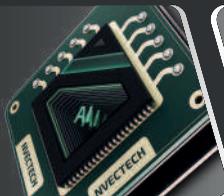
User-friendly controls:
Durable, comfortable and sensitive.

Wide range of lenses:
19 мм – 1200 м; 25 мм – 1500 м; 35 мм – 2000 м; 20-60 мм – 3400 м.

The latest lenses with double focus:
Allows you to clearly see more more distant objects.

DETECTION RANGE

LENS F	RANGE M

0.2M
- 19 — 150
- 25 — 195
- 35 — 260
- 60 — 500

0.3M
- 19 — 215
- 25 — 270
- 35 — 390
- 60 — 900

0.5M
- 19 — 250
- 25 — 470
- 35 — 650
- 60 — 1400

0.7M
- 19 — 480
- 25 — 650
- 35 — 910
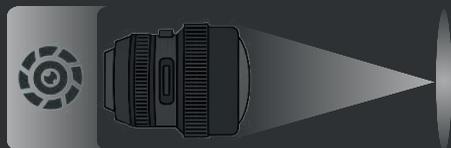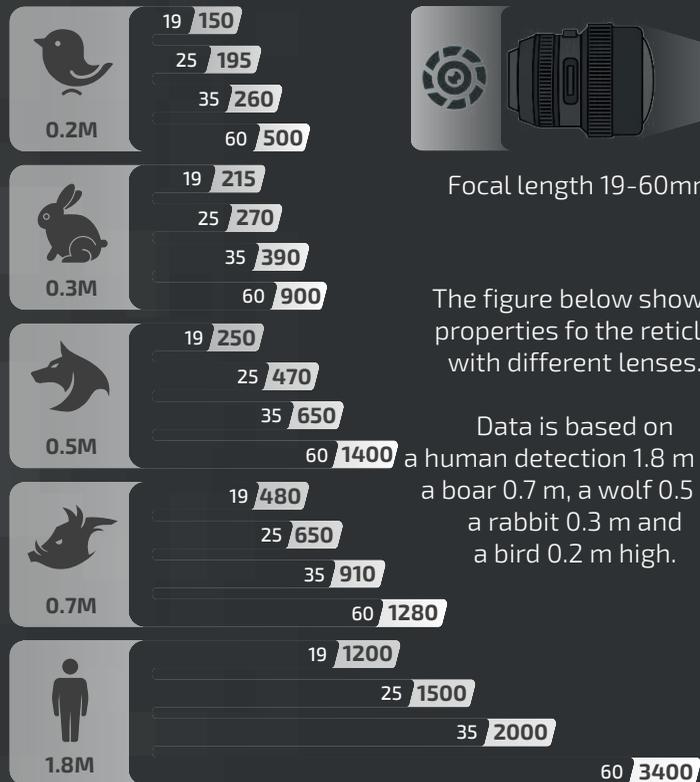- 60 — 1280

1.8M
- 19 — 1200
- 25 — 1500
- 35 — 2000
- 60 — 3400

Focal length 19-60mm

The figure below shows properties fo the reticle with different lenses.

Data is based on a human detection 1.8 m tall, a boar 0.7 m, a wolf 0.5 m, a rabbit 0.3 m and a bird 0.2 m high.

APPLICATION SCENARIOS

Observation of animals
Adventures in nature
Protection of law and order
Emergency search and rescue

WARNING

Avoid hard objects

Do not point the lens directly at the sun or high-temperature light sources

Do not overuse the device cold or hot environment

Charge the battery once every three months when it was not in use

Make sure the Type-C cover is tight closed in the water environment

Do not disassemble or modify the device in any way

PACKAGE CONTENT

ONE DEFENDER DEVICE

TWO VIEWERS (BASIC AND CAT'S EYE)

PORTABLE BATTERY CHARGER

CABLE TYPE-C -USB

2 SETS OF RECHARGEABLE BATTERIES 18650

FASTENERS WEAVER, SCREWS

ROBUST CASE

INSTRUCTION

OCULAR (OPTIONAL)
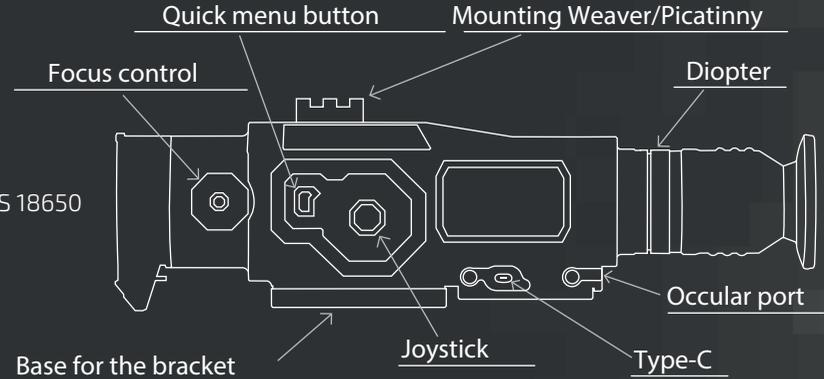
CHARGING

Before using the battery
should be fully charged before use.

Note: To charge the battery
the kit includes a charger

Quick menu button

Mounting Weaver/Picatinny

Focus control

Diopter

Base for the bracket

Joystick

Occular port

Type-C

Note: 1 bulb - <=25% charge,
2 bulb - <=50% charge,
3 bulb - <= 75% charge,
4 bulb - <=100% charge,
The indicator blinks while charging.

BUTTONS

ON/OFF
Hold for 3 seconds
to turn on/off.
Press to
enter/exit standby mode
Double-click to restart the matrix (shutter)

QUICK MENU BUTTON
Click to access the quick
menu functions

TILT THE JOYSTICK TO THE LEFT
Color palette selection

TILT THE JOYSTICK TO THE RIGHT
«Picture-in-picture» function

TILT THE JOYSTICK UPWARDS
Hide/show information panel

TILT THE JOYSTICK DOWN
On/Off Compass

PRESS THE CENTRE OF JOYSTICK
On/Off. Gyroscope (without LRF) | Target coordinates On/Off

QUICK MENU
Hide/Show information panel

On/Off PIP

Color palette

On/Off Compass

Determining the target coordinates
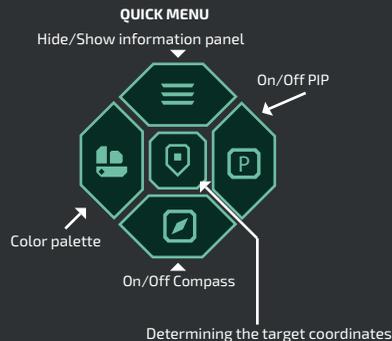
PRESS THE CENTRE OF JOYSTICK
Single click - take a photo, double click - take a video

TILT THE JOYSTICK TO THE LEFT
On/Off Ballistic calculator

TILT THE JOYSTICK TO THE RIGHT
On/Off Rangefinder (AI or LRF)

TILT THE JOYSTICK UPWARDS
Zoom in ⊕

TILT THE JOYSTICK DOWN
Zoom out ⊖

PRESS THE CENTRE OF JOYSTICK
On/Off Gyroscope

Zoom in

On/Off Rangefinder (AI or LRF)

+

LRF

Ballistic calculator

Zoom out

Photo-video

PSEUDO-COLORS PALLETE

 BLACKHOT

 VIOLET

 WHITEHOT

 GOLDEN

 REDHOT

 GREEN
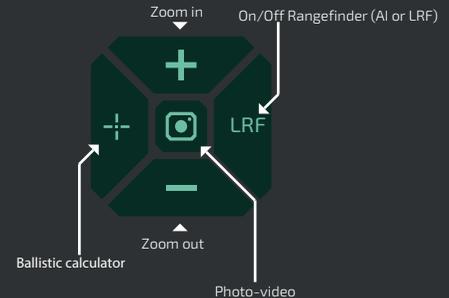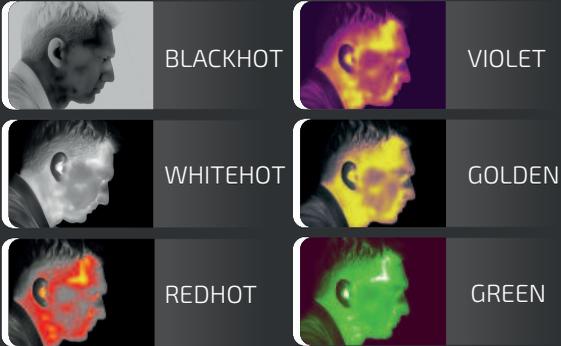
RIGHT JOYSTICK PRESS
Changes the pseudo-color to the following

Pseudo-color palette label

ADJUSTING LENSES

Diopter adjustment

Adjust the position by looking through the eyepiece
eyepiece diopter level to optimize sharpness
image on the AMOLED display.

AI RANGE-FINDER

90 M   91 M   86 M

LEFT JOYSTICK PRESS
Acnivate AI Range-finder function

AI Range-finder label

Focus

Adjust the lens focus manually.

MAIN INFO BAR

H 1057	N 00.000000	E 00.000000	1.0X	100% 19:04	-173° -152°	25° C	LRF 1048

NE | E | SE | S | SW | W | NW | A 180°

1 **2** **3** **4** **5** **6** **7** **8**
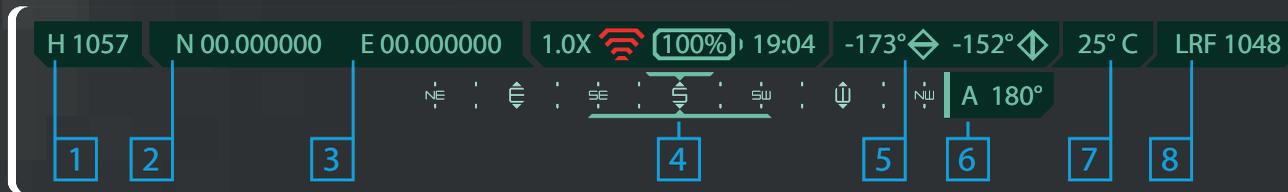
1   GPS H - Height above sea level in meters.

2   GPS N - North coordinate.

3   GPS E - East coordinate.

4   Compass
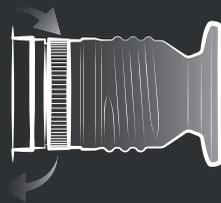
5   Vertical and horizontal tilt

6   Azimuth is always displayed when compass is on

7   Temperature

8   LRF data

80%   Battery charge level.

19:04   Time.

S	NorthEast	East	SouthEast	South	SouthWest	West	NorthWest	North
	NE	E	SE	S	SW	W	NW	N

TOP MENU BAR

Openable mod buttons
Process description

Image button ▶

Shooting (zeroing) ▶

WLAN + File ▶

Settings ▶

Sensors ▶

System ▶

To open the quick menu, press this button

| 1.0X | 100% | 19:04 |

| BRIGHT | SHARP | NOISE | CONTRAST | MENU | S. MENU | MOD |

Image button ▶	BRIGHT	SHARP	NOISE	CONTRAST	MENU	S. MENU	MOD
Shooting (zeroing) ▶	PROFILE	BALLISTIC	ZEROING	RETICLE			
WLAN + File ▶	HOTSPOT	FOTO	VIDEO	TARGETS	RAV		
Settings ▶	RAV	FIXPIXEL	DISPLAY	SCALE	TRACKING	RANGEF.	
Sensors ▶	GPS	TEMPER	GYRO	ORIENT	LRF	JOYSTICK	
System ▶	UPDATE	RESET	DATE	LANG	BATT. IND.	BLOCK	

IN MENU DESCRIPTION

IMAGE BUTTON
Description of the functions of the Picture menu

BALISTIC CALCULATOR
Description of the functions of the Ballistic Calculator menu

WIRE + FILE
Description of the functions of the "Wire + File" menu

SETTINGS
Description of the functions of the Settings menu

SENSORS
Description of the "Sensors" menu functions

SYSTEM
Description of the System menu functions

MAIN MENU

CENTRAL JOYSTICK DOUBLE PRESS
To enter the menu settings.

Note: select by moving the lever and short press the lever to confirm the selection.

IMAGE
Thermal image processing settings.

RETICLE
Adjusting the reticle properties.

WLAN+FILE
Wireless connection and saved files.

SETTINGS
General settings of monocular.

SENSORS
Monocular sensor settings.

SYSTEM
Basic settings and system lock.

IMAGE   Thermal image processing settings.

BRIGHTNESS
Brightness of the picture.

SHARPNESS
Sharpness of the picture.

NOISE
Noise level of the picture.

CONTRAST
Contrast of the picture.

MENU
Brightness of the menu buttons.

SHOW MENU
Show or hide the top menu.

MODE
Image enhancement mode – WDR or OBJECT.

BALLISTIC CALCULATOR

BC. DIST.
Saved setting profiles for the calculator.

BALLISTIC
Adjustment of ballistic calculator settings.

ZEROING
Settings for zeroing the scope.

RETICLE
Adjustment of the scope reticle.

WLAN+FILE Wireless connection and saved files.

Makes monocular position visible!!!

HOTSPOT
ON/OFF wireless connection.

FOTO
Saved photos.

VIDEO
Saved videos.

OBJECTIVE
Saved coordinates.

RAV
Saved videos of a shot

SETTINGS General settings of monocular.

PIP
ON/OFF picture in picture function.

BLINDPIXEL
Fixes damaged pixels on the thermal imaging matrix.

DISPLAY
Brightness, color, PIP (picture-in-picture).

ZOOM
Smooth & rapid zoom.

TRACKING
Turns the hottest areas on/off.

RANGEFINDER
AI set - set. AI distance, LRF and AI - on/off

⊤ SENSORS Monocular sensor settings.

GPS
ON/OFF GPS and separately height above sea level.

TEMPERAT.
Set the operating mode of the temperature sensor.

GYROSCOPE
On/Off. Gyroscope.

ORIENTATION
Compass and azimuth mode.

LRF
Changes mode of the Range-finder (AI or MIL).

JOYSTICK
Setting up the joystick operation and its sensitivity.

⑤ SYSTEM Basic settings and system lock.

UPDATE
Update software.

RESTART
Restart monocular.

DATE/TIME
Set the time and date.

LANGUAGE
Set the language.

BATTERY INDICATION
Setting the battery indicator.

BLOCK
Set the password to start the scope.

APPLICATION

Use application that you can find
in the AppStore or PlayMarket.

FUNCTIONALITY

The application allows you to control the device
in real time, view photos and video recordings
and share them.

Fix target coordinates and share them
(if the device supports this function or manual).

You can also find other NVECTECH products
in the application.
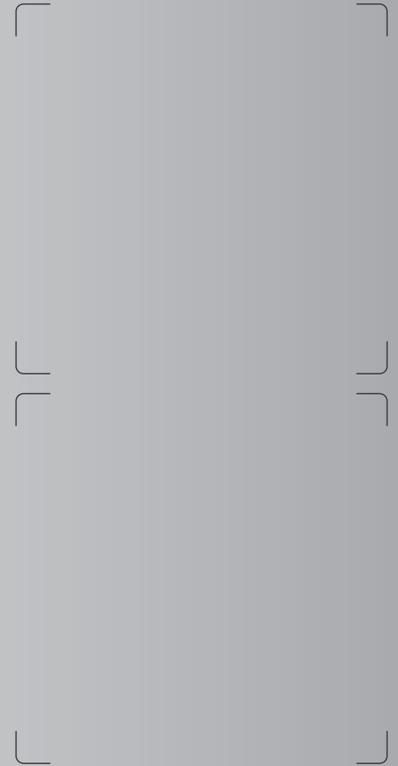
Ocular Defender

DESCRIPTION

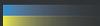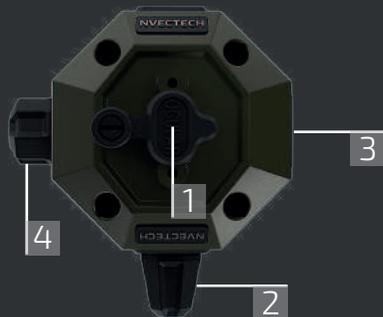NVECTECH Defender Ocular – an additional attachment for the Defender thermal scope.

Additional lens for the Defender thermal scope projects the image from
the scope via a cable, allowing firing from behind cover.

UKRAINE

1	Connector for cable
2	Zoom adjustment
3	Brightness adjustment
4	Diopters adjustment
5	Connection between cables
6	Connection to the scope/ocular

SPECIFICATION

MODELS	DEFENDER	319	325	335	335L	360L	660L
MICROBO LOMETER	RESOLUTION	384X288					640X512
	PIXEL PITCH	12μm					
	NETD	≤20mk@300k					
	SPECTRAL RANGE	8-14μm					
	FRAME RATE	50Hz					
OPTICS	OBJECTIVE LENS	19mm (F 0.8)	25mm (F 0.8)	35mm (F0.8)	35mm (F0.8)	20/60mm (F1)	
	FOV	13.8° x 10.4°	10.5° x7.9°	7.5° x5.6°	7.5° x5.6°	13.1° x9.8° /4.4° x3.3°	21.7° x17.4° /7.3° x5.9°
	MAGNIFICATION	1.8X	2.4X	3.3X	3.3X	1.8X/5.5X	1.1X/3.2X
	DIGITAL ZOOM	1.0 - 5 .0X smooth & rapid zoom					
	EYE RELIEF	45mm					
	EXIT PUPIL	6mm					
	DIOPTER	±5D					

MODELS	DEFENDER	319	325	335	335L	360L	660L
DISPLAY	TYPE	AMOLED					
	OLED COLORS	6					
	DISPLAY SIZE	0.39inch					
	COLOR PALETTE	6					
	IMAGE MODE	«WDR» (Wide Dynamic Range) mode and «OBJECT»					
BATTERY	BATTERY TYPE	REPLACEABLE high capacity lithium ion battery (18650 x 2)					
	BATTERY LIFE	Continuous working time ≥18h					≥16h
INTERFACE	TYPE-C	Supports battery charging, data transfer, UVC video output					
	WIRELESS	Hotspot connection, App remote control					
ENVIRON-MENT	WORK TEMPER.	-25°C — +50°C					
	IP RATING	IP67					
	SIZE	379x75x110				379x100x110	
ACCESSORY	ACCESSORIES	Video cable, USB data cable, charger, Protective bag, User manual, napkin					

MODELS	DEFENDER	319	325	335	335L	360L	660L
FUNCTION	PHOTO/VIDEO PLAY	YES					
	AI DIST. MEASURE.	YES					
	MIL DIST. MEASURE.	YES					
	RETICLE	YES					
	IN-BUILT MEMORY	64GB					
	PIP	YES					
	HEAT TRACK	YES					
	GPS	YES					
	TERMOMETER	YES					
	GYROSCOPE	YES					
	REAL TIME REC.	YES					
	OSD RECORDING	YES					
	AZIMUT	YES					
	COMPASS	YES					
	HEIGHT SENSOR	YES					

NVECTECH

Model:

Serial number:

Date of sale:

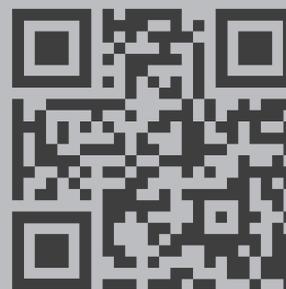Seal and signature of the seller:

Kosmichna st. 49-g,
Dnipro, Ukraine

site: www.nvectech.com
      www.nvectech.ua
e-mail: info@nvectech.com
Manufacturer: NVECTECH LLC

+38 093 698 11 67
+38 098 758 75 85
+38 063 785 78 55
+38 095 761 13 92

Warranty 2 years!

www.nvectech.com

✓ RoHS COMPLIANT CE

20

Ocular Defender

DESCRIPTION

NVECTECH Defender Ocular - an additional attachment
for the Defender thermal scope.

Additional lens for the Defender thermal scope
projects the image from
the scope via a cable, allowing firing from behind cover.

UKRAINE