



Operation Manual

NIGHTWITNESS NIGHT VISION MONOCULAR



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In Canada: 105 Sparks Ave., Toronto, ON M2H 2S5

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LIGHTWEIGHT NV SYSTEM HIGH SENSITIVITY

Compact lightweight night vision system Nightwitness is intended for low light observation & photo/video surveillance. This miniature monocular device is equipped with high gain, high resolution Image Intensifier of II+SUPER or III Generation for selective performance.

Nightwitness is the most versatile observation & orientation electro-optical system for law-enforcement and rescue team. Durable waterproof corrosion-proof body made from light aluminum and titanium alloys guarantees long trouble-free operation. Replaceable desiccant cartridge improves its reliability substantially.

Nightwitness is distinguished by its handy modular design along with an intelligent control system. On client' request it can be equipped with wide variety of accessories including interchangeable lenses, adapters for coupling CCTV, 35 mm, digital photo and video cameras.

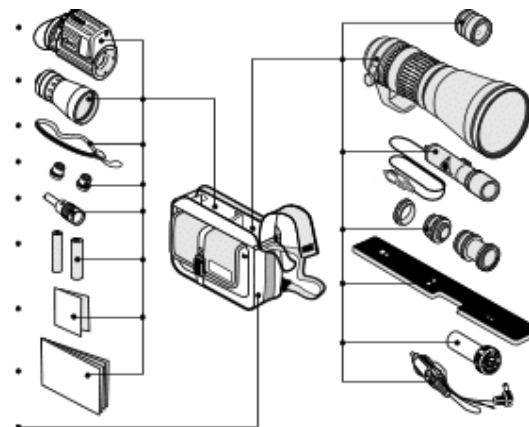
Nightwitness is provided with a unique high-light cut off circuit to protect image intensifier tube.

'Intellectual' TTL sensor measures a luminance level directly on the photocathode surface. If it exceeds the overload capacity for an Image Intensifier used in the device— blue LED in a field of view warns an operator that after 5 – 7 seconds power supply of the device will be switched off. When the illuminance goes down below that level – the Image Intensifier power supply recovers automatically. So the operator has plenty of time to protect the device from bright light sources and at the same time not to lose the sight of an object to be controlled.

COMPONENTS

COMPLETE SET

- Nightwitness body
- 100 mm / F 1.7 standard lens
- wrist wrap
- Desiccant cartridge (2 pcs)
- Spanner for the cartridge
- AA cell (2 pcs)
- Cleaning tissue
- User's manual
- Soft carrying bag



- **Optional**
Interchangeable 25mm/ F 1.3 lens
- Interchangeable tele-lens
- External IR illuminator
- Adapters and brackets for photo-video & CCTV cameras
- External power adapter
Car adapter

TECHNICAL SPECIFICATIONS

SPECIFICATIONS:

Magnification:	5 ± 0,3 ð; 1,25 ± 0,1 ð
Field of View : 5 ð	10,5°
1,25 ð	40°
Focusing Range:	3 ì to Infinity

IMAGE INTENSIFIERTUBE

Type	18 ì, Gen II+ Extra Definition.	18 ì, Gen III GaAs
Photocathode sensitivity:		
integral	350 - 600 uA/lm	500 - 1600 uA/lm
spectral(at λ= 850 nm),	18 - 40 mA/W	70 - 120 mA/W
Resolution	36 - 64 lp/mm	
Gain	18 000 - 25 000	

LENS

Lens mount	C-mount, 1"-32 TPI
Standard	100 ì/F1.7; 25 ì/F1.3
Interchangable	The whole line of 1" C-mount lenses including zoom, tele & wide-angle SLR camera lenses using corresponding adapters(e.g. Canon EOS & Nikon AF to C-mount)

TECHNICAL SPECIFICATIONS (con't)

SPECIFICATIONS:

EYEPIECE

Focal Length	20 ì
Eye relief	16 ì
Exit pupil dia	7 ì
Diopter adjustment	+4, -4 dpt

ELECTRICAL

Power supply	1 AA Ni-MH rechargeable cell 1.2V (not less 2300 mAh) or 1 AA alkaline cell 1.5 V
Continuous operation time (20°Ñ)	10 h (observation) 5 h (with IR illumination)
IR LED illuminator (t λ= 850 nm)	5mW

MECHANICAL

Dimensions (L ð W ð H)	150ð47ð70 ì (1,25 ð); 220ð60ð70 ì (5 ð)
Weight	400 ä (1,25 ð); 550 ä (5 ð)
Tripod thread	1/4"-20 TPI

ENVIRONMENTAL

Operational temperature	- 20°Ñ ... +40°Ñ
Storage temperature	- 30°Ñ ... +50°Ñ
Humidity	98%

TECHNICAL SPECIFICATIONS (CONT)

Warning !

Image Intensifier possible defects table.

Clarity of Image Intensifier tube is check against the table below:

ZONE NUMBER	CIRCULAR ZONE DIMENTIONS, MM	FIELD OF VIEW CLEANNESS:			ADMITTED TOTAL AREA OF DEFECTS, MM ²
		NEGLECTED	ADMITTED		
			DIAMETER, MM	QUALITY	
1	0...9,0	0,06	0,15	1	0,12
2	9,0...14,5	0,08	0,25	2	0,27
3	14,4...18,0	0,1	0,35	2	0,45

PRECAUTIONS

Nightwitness is a sophisticated precise optical instrument equipped with electronics.

Therefore, it should be handled with due care.

- Try to avoid strong heat, direct sunlight, impacts, dust, moisture and sudden changes of temperatures. Keep it in mind that, although being very durable, Nightwitness contains fragile components.
- Do not touch the optical surfaces with fingers. Doing so may damage the antireflection coating.
- Cleaning of optical surfaces should only be performed with professional camera lens cleaning supplies.
- Use only a soft clean cloth to clean the exterior of the device.
- Do not take the cover off the lens if not necessary.
- Keep away from heating appliances and central heating.
- Make sure to switch off the unit and remove the battery during periods of non-operation and when storing the device for long period of time.
- Do not apply unnecessary pressure to the lens assembly, agile elements & thread connections.
- Due to considerable optical magnification of the eyepiece some small structures inside the tube coating in the form of dark and/or white points may be seen in the field of view which does not affect the serviceability of the device.

UNIT STRUCTURE

Operation switches as well as the battery compartment and a place for wrist strap for NVD are located on the back surface of the unit .

Moisture collector cartridge is located of the left side of the body of NVD.

The standard tripod socket 1/4" is located on the right side of the NVD.

OVERVIEW

The night vision device (NVD) Nightwitness is observational opto-electronic monocular, intended for examining objects and orientation at night or under dark conditions. The unit utilizes a generation 2+XT or 3 image intensifier tube, which amplifies available moonlight, starlight or man-made light. The device was designed to be easy to use and provide many years of operation.

Some of the typical activities where Nightwitness can be useful:

- Law enforcement
- Security
- Search and rescue
- Hunting
- Photography (dark room operation) or with camera adaptable feature

UNIT STRUCTURE (con't)

Ocular of NVD

Nightwitness has a high quality wide angle ocular with magnification of 12,5 \times . The dioptic correction is $-4...+4$ dtp, as well long eye relief allows for user who wear glasses to use the unit with out removing them. Ocular is supplied with rubber eye guard which allows for proper and steady position of the eye, witch is very important especially when the unit is used on a moving platform (i.e. Boat, plane, vehicle). The rubber Eye piece can rotate 360° to allow for proper functionality with either right or left eye. The ocular is design as video recording or interchangeable adapter to allow for Photo-, Video- and CCTV-camera.

HIGH-LIGHT CUT OFF CIRCUIT

Nightwitness is provided with a unique high-light cut off circuit to protect image intensifier tube. 'Intellectual' TTL sensor measures a luminance level directly on the photocathode surface. If it exceeds the overload capacity for an Image Intensifier used in the device– blue LED in a field of view warns an operator that after 5 – 7 seconds power supply of the device will be switched off. When the luminance goes down below that level – the Image Intensifier power supply recovers automatically. So the operator has plenty of time to protect the device from bright light sources and at the same time not to lose the sight of an object to be controlled

UNIT STRUCTURE (con't)

POWER SOURCE

Power source for NVD is provided by one Ni-MH power cell voltage 1.2V (not less 2300 mAh) type «AA» or one Alkaline battery voltage 1.5V type «AA».

This is enough for continued operation for up to 20 hours at 20°N in observation mode and 6 hour of operation with IR illuminator turned on. The batteries are easy to replace in any environment and the construction of battery house is designed so the even if polarities are reversed the unit is protected.

Besides normal operation the NVD is able to use external power supply from any external source with voltage of 3.5 - 1.5V, as an example the NVD work of a car adapters or CCTV-systems. In order to use external power source in the battery compartment instead of «AA» battery you need to instal external power adapter (optional), which ensures that voltage is stabilized at 1.5V, as well as it protects from reverse polarities and a transition cycle in the chain of external source range to $\pm 60V$. Adapter is equipment with low voltage slot type size 5,5/2,1 for continuous power supply.

UNIT STRUCTURE (con't)

LOW BATTERY AND IR "ON" INDICATORS

Unit "ON" indicator (green color), Low battery indicator "Low Battery" (red light), IR indicator "IR ON" (yellow color) & high light cut off indicator "Bright Light" (blue color) located in the top portion of visible field of view of the NVD.

IR Illuminator

NVD is equipped with build in IR light for illumination of close by objects located in front portion of the body of module. Brightness of the IR light is bright enough to read the map in complete darkness (with objective lens 25mm/F1.3) it is also allows to conduct small repairs and maintenance work.

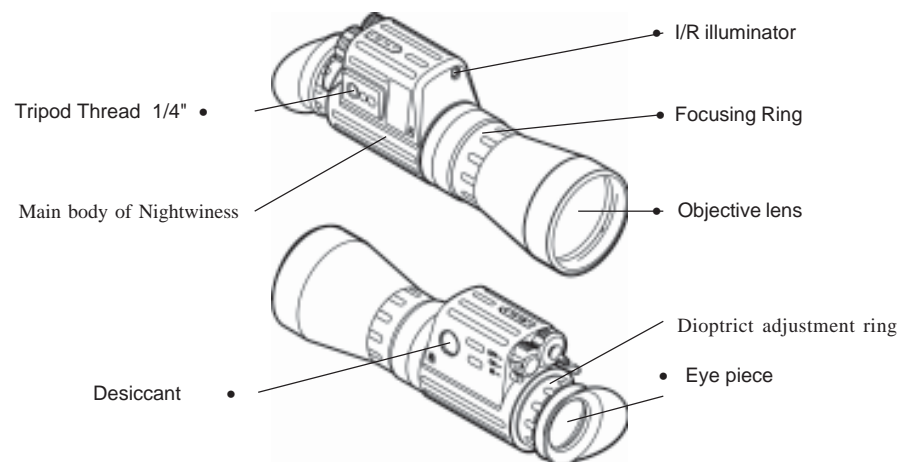
Moisture collector

Moisture collector is design to collect moisture inside the NVD during operation. If Moisture collector is dry the color inside the window is blue. If on the other hand, moisture collector is full of moisture than the color is pale pink or grey. You can replace Moisture collector cartridge using the key provided with the unit.

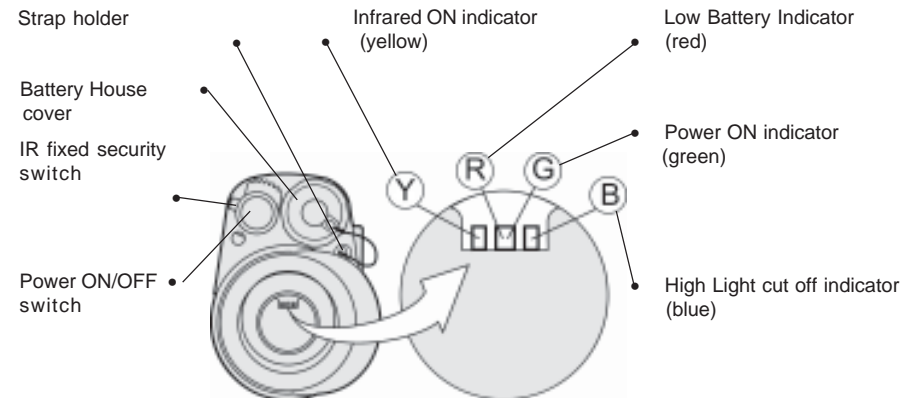
Soft padded carrying case

Carrying case is design to accommodate the unit as well as all accessories that are included in the standard package. The case is made from nylon with soft padded inserts designed to absorb the shock of impact as well additional packets for other tools. The case also has adjustable shoulder strap.

FUNCTIONS AND INDICATORS



FUNCTIONS AND INDICATORS



OPERATION INSTRUCTIONS

Precautions

Never disassemble the unit by yourself.

There are no wires or modules that requires user to clean or modify.

Operation procedures

- Twist off the battery house cap.
- Insert one battery type «AA» 1.5V, make sure that polarity is correct..

- Screw the battery cap back on.
- Take the unit into your hand. Put on the wrist wrap.
- Take the protective cover off the objective lens.

⇒ **NEVER OPERATE YOUR NIGHT VISION DEVICE IN DAYLIGHT WITH-
OUT THE LENS COVER ON**

- Turn ON the unit, by moving the position of the switch to **(ON)**.

The Green Indicator light will come on and will be visible at the top portion of the ocular

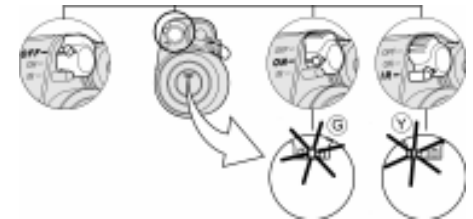


OPERATION INSTRUCTIONS (con't)

- Adjust the ocular to your eye sight, rotating the dioptic adjustment ring .
- Point the unit towards the object of your surveillance.

⇒ **NEVER DIRECT THE LENS IN
THE DIRECTION OF BRIGHT LIGHT**

- For maximum performance focus in on your object by rotating the focusing ring on the objective lens.
- For IR operation: depress fixated button IR illuminator , keeping the button depressed move it in to IR "ON" position. At this stage the Yellow light indicator light will come on the top portion of the ocular.
- After the operation make sure that the unit is turned OFF, by moving the switch to OFF position on the unit.
- Close the objective cover.



OPERATION INSTRUCTIONS (con't)

LOW BATTERY INDICATOR

Low battery indicator is RED and is located in ocular field of view, the indicator will start to blink if voltage of the power supply is between 0.9 - 1.0 V, in this case the Green unit ON indicator is off. If the voltage is very low (less than 0.9V), all indicators of NVD will automatically turn off. Turn OFF the unit and replace the battery.



INDICATOR HIGH-LIGHT CUT OFF

High-light indicator is blue color and is located in the ocular field of view, this indicator light will blink if the unit is exposed to bright light source that can damage the unit. If the unit is exposed continuously for more than 5 - 7s, the unit will turn OFF and the indicator light will glow continuously. At low light levels below normal parameters High-Light indicator will turn off, and the unit is operational again automatically. Should you require to operate the unit in high light situations cover the objective lens with protective cap.



OPERATION INSTRUCTIONS (con't)

USE OF ACCESSORIES

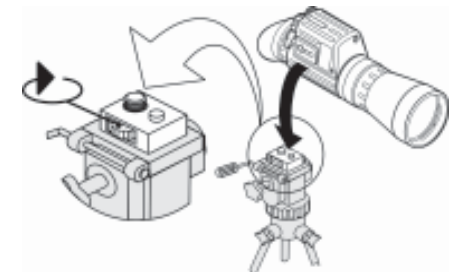
Wrist wrap

- Insert the end of the wrist wrap in the hole located on the back of the unit.
- Tighten the wrist wrap by passing it through hinge, as it is shown on the picture in the right.



Mounting the unit on a tripod

- Align tripod screw with tripod thread 1/4" located on the right hand side of the body of the unit.
- Tighten the tripod screw.
- Place the tripod on a stable ground and fully extend the legs of a tripod.



OPERATION INSTRUCTIONS (con't)

Using the unit with external power supply of car adapter

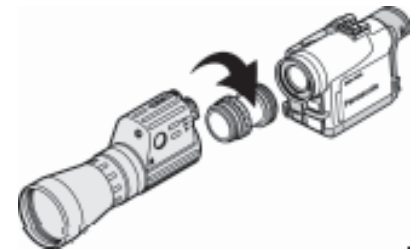
- Remove battery house cover.
- Remove the battery «AA» and insert a external power adapter (optional). Lock the cap of an adapter into place.
- Connect the power source to slot of external power supply cable(or car adapter) with a standard low voltage plug type 5,5/2,1.
- Connect second end of the cable to external power source, make sure that polarities are correct or connect the cable to cigarette lighter slot.
- Turn ON the unit.



OPERATION INSTRUCTIONS (con't)

Operation with Photo cameras, Video Cameras and CCTV-Systems

- Remove the ocular from the unit by unscrewing it from the body of the unit.
- Install instead of the ocular, proper photo-video or CCTV-adapter.
- Connect the NVD with an adapter to photo-, video- or CCTV - camera (further referred to as camera) with reference to instruction related to specific adapter.
- If required place the unit along with the camera on a tripod.
- Turn on the unit and the camera.
- Focus the unit with the help of focusing ring on a adapter or camera.
- Point the NVD with the camera on the object of your choice.
- Establish maximum resolution of the image by focusing the objective ring located on the objective lens of the unit.
- At this stage you can take photos or make a video at night.



OPERATION INSTRUCTIONS (con't)

Environmental Conditions

Nightwitness functions equally reliable in normal as well as extreme weather conditions. Although the unit performs reliably in harsh weather conditions and high moistures it is expected that user will do due diligence and pay more close attention to operation instructions, in order to keep unit in good working order and prevent early demise of the unit.

Low temperature operation

- Unit functions properly at temperatures below -20°C . In low temperatures the objective focusing ring as well as dioptic correction ring may become more stiff. Do not force the adjustment rings as they may become nonoperating.
- The unit should never be subjected to extreme weather fluctuations. If it is required to move the unit from one extreme environment to other, the unit should be placed in waterproof container and closed it tight etc... The container should not be opened until it reaches same temperature as the new environment, if this is not performed the unit will have moisture condensation on optical surfaces.

OPERATION INSTRUCTIONS (con't)

- The capacity of the battery in low temperature is decreased. If possible the batteries should always be protected from low temperatures.

High temperature operation

- Unit functions properly at temperatures up to $+40^{\circ}\text{C}$.
- If possible please make sure that battery is protected from high heat and direct sun light.

Operation in high moisture environments

In the areas of high moisture the optical surfaces of the unit should always be clean and dry.

Moisture on surfaces of the unit can be discarded with clean dry cloth. Optical surfaces should be cleaned with special optical cloth.

WARRANTY

NEWCON OPTIK warrants this product against defects in material and workmanship for one year from the date of the original date of consumer's purchase, but no more than 18 months from the date of manufacturing. Longer warranty periods are available, subject to the terms of specific sales contract. Should your Newcon product prove defective during this period, please bring the product securely packaged in its original container or an equivalent, along with proof of the date of original purchase, to your Newcon Dealer. Newcon will repair (or at its option replace with the same or comparable model), the product or part thereof, which, on inspection by Newcon, is found to be defective in materials or workmanship.

What This Warranty Does Not Cover:

NEWCON is not responsible for warranty service should the product fail to be properly maintained or fail to function properly as a result of misuse, abuse, improper installation, neglect, damage caused by disasters such as fire, flood, lightning, improper electrical current, or service other than by a NEWCON Authorized Service. Postage, insurance, or shipping costs incurred in presenting your NEWCON product for warranty service are your responsibility. Please include a cheque or money order made out to NEWCON OPTIK for the amount of \$15.00 to cover shipping and handling within North America

Moisture collector cap replacement

Replacing the moisture cap

Moisture cap should be replaced in a clean dry place. New Moisture cap can be exposed for no more than 1-2 minutes.

The following is required for replacement of cartridge:

- Prepare spare cartridge supplied with your unit;
- With supplied key unscrew the moisture collector cartridge that is full of moisture from the NVD and immediately replace it with a new cartridge;
- Screw in the replacement cartridge until rubber O-ring is visibly deformed.



- In order to restore moisture filled cartridge it is required to unscrew the cap of Moisture collector cartridge with the key provided, empty the silica gel into clean metallic container and place the container in the heat source (i.e. electric stove, camping stove etc.)

Silica gel can never be directly exposed to fire. To restore silica gel the temperature should be between 150 to 170°Ñ. Silica gel will dry with in 3 to 4 hours.

CUSTOMER SUPPORT

Should you experience any difficulties with your Newcon OPTIK product, consult the enclosed manual. If the problem remains unresolved, contact our customer support department at (416) 663-6963 or Toll free at 1-877-368-6666. Our operating hours are 9am-5pm, Monday - Friday, Eastern Standard Time.

At no time should the equipment be sent back to Newcon without following the instructions of our technical support department. Newcon accepts no responsibility for unauthorized returns.

To locate NEWCON Authorized Dealer call:

Tel: (416) 663-6963 Fax: (416) 663-9065

Email: newconsales@newcon-optik.com Web: www.newcon-optik.com

The defective products should be shipped to:

From USA only: 2331 Superior Ave. Cleveland, OH 44114

From all other countries: 105 Sparks Ave., Toronto, ON M2H 2S5, CANADA

ACCEPTANCE CERTIFICATE FOR NIGHTWITNESS

Image Intensifier Tube

	Minimum	Measured
Resolution, lines/mm	30	
Photocathode sensitivity, integral, $\mu\text{A}/\text{lm}$	400	
Light amplification	20,000	

Image Intensifier Tube Serial Number: _____

Date of production: _____

Quality Inspector signature: _____

The unit with the serial Number _____

corresponds to all technical specifications and has passed the inspection.

Date of production: _____

Quality Inspector signature: _____

Quality assurance seal