DTNVS
Binocular Night Vision Device

OPERATOR MANUAL

Inside Cover

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DTNVS

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CHAPTER 1:
GENERAL INFORMATION

1.1 Introduction:

This manual provides operation and field level maintenance instructions for the DTNVS. It also provides specifications and data on the performance of the Binocular. To ensure the safety of the operator and the correct operation of the Binocular it is recommended that this manual is read carefully in its entirety before any deployment or field application.

1.2 Equipment Description:

The DTNVS is a self-contained night vision device that enables improved night vision using ambient light from the night sky. Typically, the moon, star and/or sky glow.

Optically, it is made up of two sets of objective lens, image intensifier and eyepiece lens. The objective lens collects light reflected from the night scene by the moon, stars, or night sky, inverts the image and focuses that image on the image intensifier. The image intensifier converts the captured light into a visible image and reinverts the image which can then be viewed through the eyepiece lens.

In situations where there is no light at all the unit can be switched into the infrared (IR) mode. The DTNVS is equipped with an internal IR LED enabling the unit to use this to the human eye invisible light to operate.

The DTNVS is designed for differences in the physical features of individuals. This allows for a wide range of operators to use the system safely and comfortably. Some of these design features are the power switch, eye relief adjustment, dioptre adjustment, and objective focus. Lightweight and versatile, the DTNVS can be hand-held, head-mounted, helmet-mounted.

The DTNVS consists of two identical monoculars mounted to a body assembly. The monoculars may be pivoted sideways (when pivoted outside the field of view, the monocular will individually turn off.) When the DTNVS is mounted to a helmet or head mount, the DTNVS may be flipped up and temporarily stowed, the DTNVS will automatically go into Standby Mode turning off the monoculars. The DTNVS will automatically Turn On when flipped down again. Each monocular is comprised of three identical primary subassemblies: objective lens assembly, monocular housing with image intensifier assembly and eyepiece lens assembly.

1.3 Standard Kit Parts List:

The standard DTNVS kit comes with the items listed in the following table.

Item	Description	Qty
1	DTNVS Binocular Assembly	1
2	Demist Shield	2
3	Sacrificial Lens	2
4	Bikini Covers	2
5	Day Caps	2
6	Padded MOLLE Pouch	1
7	Manual Download Card	1
8	Hard Carrying Case	1

Table 1-1 Standard Kit Parts List

1.4 System Performance and Data:

The chart below lists the technical specifications and data of the DTNVS system. The data contained herein is subject to change without notice.

ITEM	LIMITS
Electrical Data	
Power Source	Battery (3.0V DC)
Battery Requirements	1x CR123A Lithium
Battery Life (CR123A)	25 hrs at 18°C (65°F)
Physical Data	
Hard Carrying Case Dimensions	33.6cm x 30cm x 14.8cm (13.2” x 11.8”
Binocular Dimensions	10.3cm x 10.8cm x 7.8cm
Binocular Weight (Depending on optics and IITs)	415-515g
Optical Data	
Magnification	1.0X
Field of View	40° (+/-2°)
Eyepiece of Focus	+2 to -6 dioptres

Table 1-2 System Performance and Data

Focus Range	25cm to infinity
Eye Relief	25 mm

Objective Lens	F/1.2 25mm (PVS14)
Resolution	up to 1.3 cy/mR with 64 lp/mm IIT
Environmental Data	
Operating Temperature	-30°C to 50°C
Storage Temperature	-50°C to 70°C
Illumination Required	Overcast starlight to moonlight
Immersion	20 meter for 120 minutes

Table 1-2 System Performance and Data, (cont.)

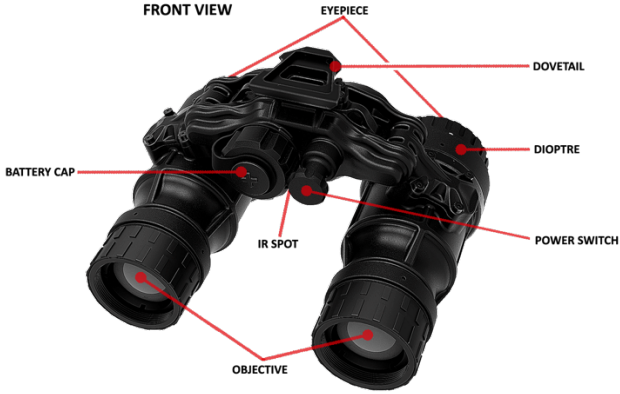


Figure 1-1 Product Illustration

CHAPTER 2:
PREPARATION FOR USE

2.1 Introduction:

This section contains instructions for installing and attaching various components and accessories to the DTNVS for operation under normal conditions.

2.2 Battery Precautions:

WARNING

Inspect batteries for bulging prior to use. If the battery shows signs of bulging, do not use.

WARNING

Do not heat, puncture, disassemble, short circuit, incinerate, attempt to recharge or otherwise tamper with the batteries. Turn OFF the DTNVS if the battery compartment becomes unduly hot. If possible, wait until the batteries have cooled before removing them.

WARNING

Do not replace batteries in a potentially explosive atmosphere. Contact sparking may occur while installing or removing batteries and cause an explosion. Failure to follow these instructions could result in death or injury.

2.3 Battery Installation:

Install one CR123A battery as follows.

1. Remove the battery cap by turning it counter-clockwise.
2. Check to ensure the O-ring is present. If not, replace it.
3. Observe polarity as indicated on the battery cap.
4. Insert battery into the battery compartment, Minus (-) end first.
5. Replace battery cap by pushing and turning it clockwise. Tighten it firmly to ensure a watertight seal.

2.4 Eyecup Installation:

Perform the following procedure to install eyecup onto the Binocular.

1. Carefully press the eyecup over the end of the eye cup retainer ring. Rotate the eyecup into proper viewing position. Adjust for best fit. The eyecup must seal around your eye and prevent the green glow from escaping.

2.5 Demist Shield Installation:

Perform the following procedures to install the demist shield on the eyepiece lens.

1. Carefully remove the eyecup.
2. Carefully remove the eye cup retainer ring by rotating it counter clockwise
3. Screw the demist shield assembly in clockwise
4. Screw the eye cup retainer ring into the demist shield
5. Carefully replace the eye cup on the eye cup retainer ring.

CAUTION

If the demist shield is wiped while wet or with wet lens tissue, you will damage the coating.

NOTE

If inclement operating conditions are expected to exist (e.g. significant temperature change and high humidity), install demist shield to minimize eyepiece lens fog prior to execution of mission.

2.6 Sacrificial Window Installation:

Perform the following procedure to install the sacrificial window onto the objective lens assembly.

CAUTION

If adverse operating conditions (blowing dust or sand) are expected to exist, attach the sacrificial window to protect the objective lens from scratches or other damage.

1. If the objective lens cap is in place, remove it.
2. Carefully push the sacrificial window onto the objective lens until it stops. Turn the sacrificial window clockwise until it snaps into place.
3. The demist shield can be utilized as a screw-in sacrificial window. Note warnings in 2.5

2.7 Device Helmet Flip-Up Deactivation Sequence:

Perform the following procedure if you want to deactivate the automatic on-off feature when device is flipped up onto the helmet or head gear.

1. Turn the device so the dovetail is pointing downwards.
2. Observe first the orange LED lighting up for 200ms, then the red LED lighting up for 200ms
3. Once the Orange LED turns on steady, the user has 2 seconds to turn the device so the dovetail is pointing upwards to enter the Setup Mode.
4. If Setup Mode entered successfully, LEDs start flashing on one side.

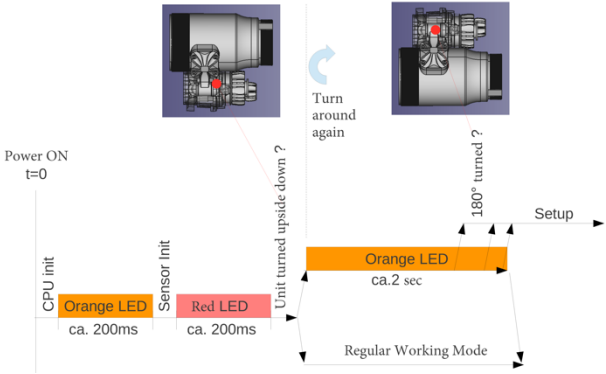
NOTE

- If LEDs flash on the left side, automatic flip up shut off is deactivated
- If LEDs flash in the right side, automatic flip up shut off is deactivated

5. Tilt the device to the side that corresponds to the mode you want to activate in order to switch setting.
6. Tilt the device forwards (towards the objective side) save the setting.

NOTE

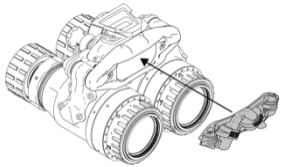
Repeat above steps to change setting again.



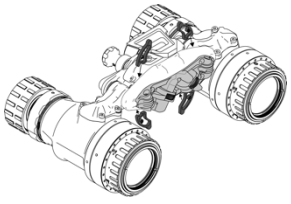
2.8 IPD Locking System Installation

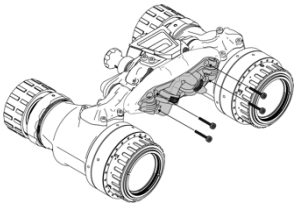
Perform the following procedure to install the IPD Locking System onto DTNVS housing.

1. Place the IPD Locking System on the back of the unit.

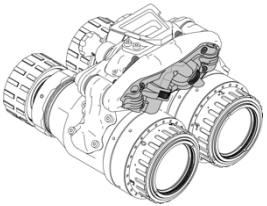


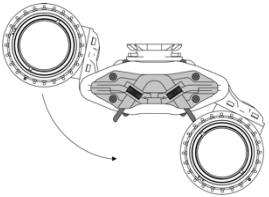
2. Place the shims individually in the space behind the backplate and secure with supplied screws.





3. Use dials to adjust and set desired interpupillary distance for the system.





CHAPTER 3:
OPERATING INSTRUCTIONS

3.1 Introduction:

This chapter contains instructions for the safe operation of the DTNVS under normal circumstances and environments.

3.2 Controls and Indicators:

The DTNVS is designed to adjust for different users and corrects for most differences in eyesight. The controls and indicators for the DTNVS are shown in Figure 3-1 and are described in Table 3-1.

CAUTION

The DTNVS requires some ambient (moonlight, starlight, or artificial light, etc.) to operate. The level of performance depends on the level of light.

Night light is reduced by passing cloud cover, while operating under trees, in building shadows, etc.

The DTNVS is less effective viewing into shadows and other darkened areas.

The DTNVS is less effective through rain, fog, sleet, snow, smoke, and other reflective material.

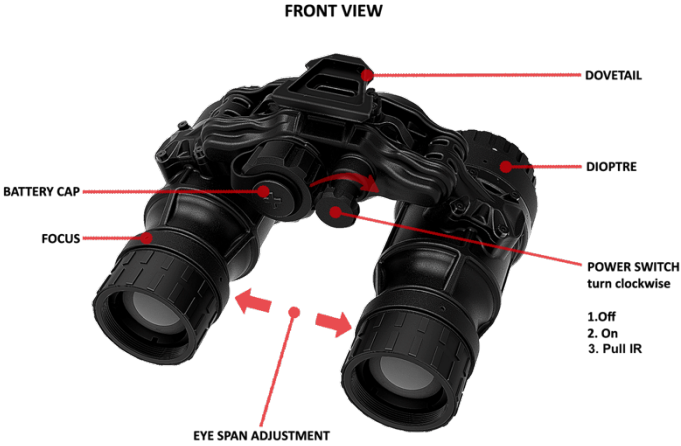


Figure 3-1 Controls and Indicators

Control and Indicators	Functions
Power Switch	Controls Binocular and IR source, ON or OFF. OFF System OFF. ON activates the Binocular. IR/PULL Pull and turn the knob clockwise from the ON position to continuously activate the IR source. **CAUTION** Do not use excessive force to place the power switch into the momentary IR position
Low Battery Indicator	An orange light indicates a low battery with less than 30 minutes of battery life remaining. It is visible through the eyepiece just outside the intensified field-of-view.

Table 3-1 Controls and Indicators

IR Source On Indicator	A steady red light indicates that the IR source is ON. It is visible through the eyepiece just outside the intensified field-of-view.
Objective Focus	Focuses objective lens. Adjusts for sharpest image of viewed object.
Dioptre Adjustment	Focuses eyepiece lens to user's eye. Adjust for sharpest image of intensifier screen.
Interpupillary Adjustment	Adjusts the distance between your eye and the Binocular.
Battery Polarity Indicator	This feature, moulded into the battery cap, shows the proper orientation of the batteries.

Table 3-1 Controls and Indicators, (cont.)

3.3 Operation:

CAUTION

Operate the binocular only under darkened conditions or use the objective lens cap to cover the objective lens for daylight conditions.

CAUTION

Cover the objective and ocular lenses by using bikini covers when device not in use.

NOTE

When using the binocular without a mounting device, make sure to place a neck cord around your neck.

1. Ensure that the battery is installed correctly.
2. Turn the power switch to ON.

NOTE

The sharpest image will be observed only when the objective lens and eyepiece lens are properly focused.

NOTE

Both indicator LEDs, red and orange, blink once when turned on as a self-test.

3. Rotate the dioptre adjustment for the clearest view of the image intensifier screen.
4. Focus the objective lens while observing an object until the sharpest image is obtained.

3.4 Operations with IR Source:

WARNING

The IR source is a light that is mostly invisible to the unaided eye for use during conditions of extreme darkness. however, the light from the IR source can be detected by the enemy using night vision devices. In close proximity of below 5m an enemy might spot a faint red glow on the IR illuminator.

NOTE

The purpose of the IR source is for viewing at close distances up to 5 meters when addition illumination is needed.

1. Pull the power switch knob out and rotate clockwise to the IR position. With the Binocular held to the eye, observe that a red light appears in the eyepiece. This indicates that the IR source is operating.

3.5 Operation in conditions of blowing Dust or Sand:

CAUTION

Operation in conditions of blowing dust or sand can pit and scratch the optical elements and damage the mechanical components unless the precautions given below are observed.

1. Ensure that the sacrificial windows are in place.
2. Avoid pointing the Binocular into the wind unless necessary for operation.
3. Keep the carrying case closed unless removing or replacing items.
4. Ensure that all dust and sand is removed from the DTNVS and carrying case after operation.

3.6 Operation in Rainy or Humid conditions:

CAUTION

Operation in rainy or humid conditions can cause corrosion and deterioration of the DTNVS unless the precautions given below are observed

1. Install the demist shield as instructed in this manual.
2. Keep the carrying case closed unless removing or replacing items.
3. Dry the Binocular, mounts, and accessories after exposure to rain or high humidity and before storage.
4. Do not store Binocular in a wet carrying case.

3.7 Operation in Salt Water Areas:

After exposure to salt water, clean the unit as instructed in this manual, after rinsing with fresh water.

3.8 Shutting Down the Unit:

Perform the following procedures to shut down the Binocular.

1. Turn the Binocular power switch to the OFF position.
2. Remove the Binocular from the head mount or helmet mount.

NOTE

It is recommended to turn the battery cap twist counter-clockwise for one full turn to break the electric circuit. This will preserve battery life if device is not operating for long duration.

3.9 Preparation for Storage:

1. Remove battery from the Binocular.
2. Inspect the battery housing for corrosion or moisture. Clean and dry if necessary.
3. Replace the battery cap.
4. Remove the demist shield or sacrificial window if installed. Install objective lens cap or utilize bikini covers.

NOTE

Prior to placing DTNVS into carrying case, ensure DTNVS and case are free of dirt, dust, and moisture.

5. Place the Binocular, accessories and cleaning supplies back into their storage/carrying case. It is best to place the items in their original locations to prevent any possible damage to the unit and/or accessories.
6. Return to storage area.

CHAPTER 4:
MAINTENANCE INSTRUCTIONS

4.1 Introduction:

The DTNVS is designed to be used in diverse environments and rugged conditions. It is recommended that regular and simple maintenance be performed for optimal system performance.

CAUTION

The binocular is a precision electro-optical instrument and must be handled carefully.

Do not scratch the external lens surfaces or touch them with your fingers.

Wiping demist shield with lens tissue while wet or with wet lens tissue can damage the coating.

4.2 Deactivation:

Power down the system by turning the power switch knob to OFF.

4.3 Battery Removal:

Open battery compartment, remove battery and store in carrying case. Close the battery compartment before cleaning.

4.4 Cleaning the DTNVS:

When necessary, use a moist clean cloth to wipe the outside of the unit, EXCEPT FOR THE OPTICAL SURFACES. Be sure to wipe away excess dirt and dust that may restrict the performance of and damage moving and mating parts.

If needed, the use of a very diluted detergent solution is

permissible. Dry with a soft clean cloth, or allow unit to air-dry before storing it.

4.5 Cleaning the Optics:

When cleaning of the lens is required, first blow any loose dirt or grit away from the surface of the lens. EXCEPT FOR THE DEMIST SHIELD, use dedicated lens tissue lightly moistened with water or lens cleaning fluid to lightly wipe the optical surfaces, using a circular motion.

Discard each lens tissue after one use to avoid transferring grit or foreign matter onto the lens surfaces.

If the lens remains dirty use a cotton swab lightly moistened with lens cleaning fluid to remove the foreign matter from the lens. Dry with a clean unused lens tissue.

4.6 Checking for Damage and corrosion:

As a general guideline, conduct an inspection of the DTNVS, accessories, and the case after every use.

Look for heavy wear and cracks in rubber or plastic. Inspect for moisture or corrosion in electronic housings and in the battery compartment. Check for scratches, condensation and foreign matter on optical surfaces. Report missing or damaged items, for replacement.

As a general guideline, conduct an inspection of the DTNVS, accessories, and the case after every use.

4.7 Neck Cord:

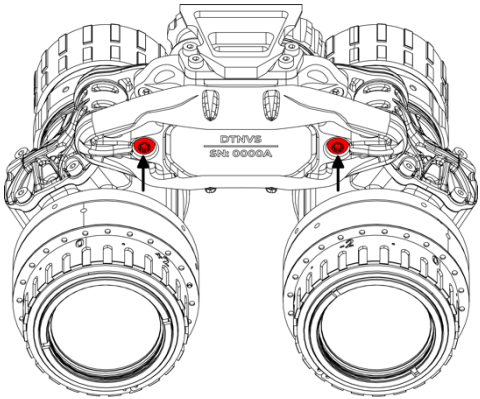
If the neck cord becomes frayed or broken, cut it off or untie the knot at the attachment points and pull free. To install a new cord. Thread the ends through the holes next to the dovetail back to front and tie a knot.

4.8 Tension Adjustment Screws:

If the tension of the arms drops over the lifetime of the device, only a technician, officially approved by ACTinBlack shall adjust the tension of the system. The tension can be readjusted and friction washers can be swapped if necessary by a technician officially approved by ACTinBlack.

CAUTION

If tension screws are over tightened, this may result in irreparable damage to the device.



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CHAPTER 5:
TROUBLESHOOTING

5.1 Troubleshooting Procedures:

Table 5-1 lists common malfunctions that may occur with the equipment. Perform the tests, inspections and corrective actions in the order they appear in the table.

This table cannot list all the malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or actions listed do not correct the fault, notify your service department.

Malfunction	Test for Inspection	corrective Action
Binocular fails to activate.	Visual.	Turn switch to RESET/OFF position and then ON.
	Check for defective, missing or improperly installed battery.	Replace battery or install correctly.
		If DTNVS still fails to activate, refer to higher level of maintenance.

Table 5-1 Troubleshooting

IR source fails to activate.	In a dark location with system turned on, activate IR source. Visually check IR source operation; scene should brighten.	If IR source still fails to activate, refer to higher level of maintenance.
IR source indicator fails to activate.	Visual.	Refer to higher level of maintenance.
Poor image quality.	Check objective lens or eyepiece. Check for fogging or dirt on objective lens or eyepiece lens. Check eye relief distance.	Refocus. Clean lens surface per paragraph 4.5. Readjust for proper eye relief distance.
Light visible around eyecup.	Check eyecup for resiliency.	If eyecup is defective, refer to higher level of maintenance.
Dioptre adjustment cannot be made.	Check to see if the dioptre adjustment is bent or broken.	If damaged, refer to higher level of maintenance.

Table 5-1 Troubleshooting, (cont.)

APPENDIX A:
REPAIR & SPARES

A.1 Introduction:

This section provides information needed to identify, contact and order spare and/or repair parts for the DTNVS.

A.2 Contact Information:

To order spare or repair parts for the DTNVS or any of your night vision products contact:

ACTinBlack Europe S.à r.l.
Rue de l'Industrie,
L-3895 Foetz,
Grand Duchy of Luxembourg
info@actinblack.com

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APPENDIX B:
WARRANTY INFORMATION

Defects after Delivery and Warranty

Subject to the following provisions, ACTinBlack warrants to Purchaser that the goods manufactured by ACTinBlack shall be free from defects in material and workmanship. ACTinBlack's obligations, set forth below, shall apply only to failures to meet the foregoing warranties for parts only occurring within twelve (12) months from the date of shipment, if not otherwise agreed between the parties.

The warranty terms may be modified on the basis of the ruling Warranty Policy of ACTinBlack only with written agreement.

The Purchaser shall grant ACTinBlack such adequate time and opportunity as deemed reasonable to remedy failures to meet the foregoing warranties. To remedy such failures, ACTinBlack shall repair or, at its option, replace the defective product.

ACTinBlack's obligation to repair or replace as aforesaid shall not apply to any goods which are normally consumed in operation, or have a normal life inherently shorter that the warranty period specified above, or are not properly stored, installed, used, maintained or repaired or are modified other than pursuant to ACTinBlack's instructions or approval, or have been subjected to any other kind of misuse or detrimental exposure, or have been involved in an accident.

ACTinBlack shall have no warranty obligations with respect to defects resulting from inexpert alterations or repairs carried out by the Purchaser or his agent.

Return Material Authorization Number (RMA#):
Warranty and non-warranty items returned to ACTinBlack for repair or replacement require a RMA#.

Email info@ACTinBlack.com, with a serial number and detailed information to obtain a RMA#.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PURPOSE.

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Declaration of Conformity

We, ACTinBlack Europe S.àr.l
12 Rue de l'Industrie,
L-3895 Foetz,
Grand Duchy of Luxembourg

Declare under our sole responsibility that our product:

Product name:	**DTNVS**
Trade name:	**ACTinBlack®**
Type of model:	

to which this declaration relates is in conformity with the appropriate standards:

following the provisions of

EMC Directive 2014/30/EU
RoHS 2 Directive (EU) 2017/2102

The product is marked with

CE

Signed by or for the manufacturer :

Name (in writing) : Fergal Maher
Title : Co-CEO
Place and date of issue : Luxembourg Sept. 1st 2020

Certificate of Conformity

We, ACTinBlack Europe S.àr.l
12 Rue de l'Industrie,
L-3895 Foetz,
Grand Duchy of Luxembourg

Declare under our sole responsibility that our product:

Product name:	**THE14**
Trade name:	**ACTinBlack®**

Fulfils the essential requirements of:

MIL-STD-810G

The following standards were applied:

MIL-STD_810G: 501.5: High Temperature
MIL-STD_810G: 502.5: Low Temperature
MIL-STD_810G: 507.5: Humidity
MIL-STD_810G: 514.6: Vibration
MIL-STD_810G: 516.6: Shock
MIL-STD_810G: 512.5: Immersion: Procedure I

Signed by or for the manufacturer : 

Name (in writing) : Fergal Maher
Title : Co-CEO
Place and date of issue : Luxembourg Sept 1st 2020

ACTinBlack Europe S.à r.l.

12 Rue de l'Industrie,

L-3895 Foetz,

Grand Duchy of Luxembourg

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