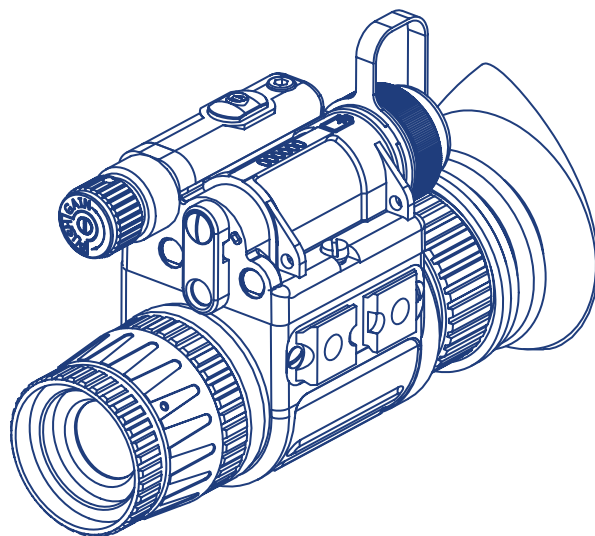


*ARMASIGHT* by FLIR **MNVD**<sup>®</sup>  
*Night Vision Monocular*



USER MANUAL

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This product is protected by patents, design patents, patents pending, or design patents pending.

If you have questions that are not covered in this manual, or need service, contact FLIR OTS customer support for additional information prior to returning a camera.

Phone: 1-888-959-2259

E-mail: [OTS-Support@flir.com](mailto:OTS-Support@flir.com)

This documentation is subject to change without notice.

## Proper Disposal of Electrical and Electronic Equipment (EEE)

The European Union (EU) has enacted Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE), which aims to prevent EEE waste from arising; to encourage reuse, recycling, and recovery of EEE waste; and to promote environmental responsibility.



In accordance with these regulations, all EEE products labeled with the “crossed out wheeled bin” either on the product itself or in the product literature must not be disposed of in regular rubbish bins, mixed with regular household or other commercial waste, or by other regular municipal waste collection means. Instead, and in order to prevent possible harm to the environment or human health, all EEE products (including any cables that came with the product) should be responsibly discarded or recycled.

To identify a responsible disposal method where you live, please contact your local waste collection or recycling service, your original place of purchase or product supplier, or the responsible government authority in your area.

Business users should contact their supplier or refer to their purchase contract.

## Important Instructions and Notices to the User:

Modification of this device without the express authorization of FLIR Commercial Systems, Inc. may void the user’s authority under FCC rules to operate this device.

Note 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that of the receiver
- Consult the dealer or an experienced radio/television technician for help.

## Industry Canada Notice:

This Class B digital apparatus complies with Canadian ICES-003.

## Avis d’Industrie Canada:

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

## FLIR Outdoor & Tactical Systems

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[www.flir.com](http://www.flir.com)

## Export Information

Equipment described herein may require US Government authorization for export purposes. Diversion contrary to US law is prohibited.

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## SAFETY STATEMENT

### WARNING:

The image intensifier's phosphor screen contains toxic materials.

- If an image intensifier is broken, be extremely careful to avoid inhaling the phosphor screen material. Do not allow the material to come in contact with the mouth or open wounds on the skin.
- If the phosphor screen material contacts your skin, wash it off immediately with soap and water.
- If you inhale/swallow any phosphor screen material, drink a lot of water, induce vomiting, and seek medical attention as soon as possible.

### WARNING:

**This product contains natural rubber latex, which may cause allergic reactions!** The FDA has reported an increase in the number of deaths that are associated with an apparent sensitivity to natural latex proteins. If you are allergic to latex, it is a good idea to learn which products contain it and strictly avoid exposure to those products.

## Important Safety Instructions

- Read and follow all instructions
- Heed all warnings
- Only use the attachments/accessories specified by the manufacturer
- All service must be provided by the manufacturer

### WARNING:

- DO NOT DISASSEMBLE THE DEVICE.  
Disassembly can cause permanent damage.
- Use of the MNVD in brightly lit conditions and in the places with bright light sources such as firelight, headlights, searchlights, etc. can damage the unit's intensifier tube. Avoid exposing the unit to these types of light sources.
- When operating the device in extremely dark conditions, the light from the unit's IR illuminator will be invisible to the unaided eye. However, the light can be detected by other night vision devices (NVD).
- To reduce the risk of detection by another NVD, avoid prolonged activation of the IR illuminator.
- The IR light is more easily detected by a NVD when used in smoke, fog and rain. Avoid prolonged activation of the unit's IR illuminator in these conditions.

### CAUTION:

- The MNVD is a precision optical instrument. To prevent damage to the unit, it should always be handled carefully.
- Do not scratch the external lens surfaces or touch them with your fingers.
- To protect the image intensifier, keep the lens cap securely fitted over the objective lens when the device is not in use, or when it is being used in daylight conditions.
- Keep the equipment clean. Protect it from moisture, dramatic temperature drops, and electrical shocks.
- DO NOT force the equipment controls past their stopping points.
- DO NOT leave the equipment activated during breaks in operation.
- DO NOT store the equipment with the batteries installed.
- Thoroughly clean and dry each item before placing them into the storage case.

### NOTES:

- Do not test the device in daylight conditions for more than ten (10) minutes, even with the daylight filter/ lens cap on.
- The purpose of the built-in IR illuminator is to provide additional illumination when necessary while viewing scenes at close distances (up to 3 meters).
- The equipment requires some ambient light (moonlight, starlight, etc.) to operate.
- Performance of the device in nighttime conditions depends on the level of ambient light in the environment. Please remember the following:
  - The level of ambient light is reduced by the presence of clouds, shade, or objects that block natural light (trees, buildings, etc.).
  - The equipment is less effective when operated in shadows and other darkened areas.
  - The equipment is less effective when operated in rain, fog, sleet, snow, dust or smoke.
  - The equipment will not "see" through dense smoke.

## MNVD® Night Vision Monocular

The MNVD® is used as a handheld, head-mounted, helmet-mounted or weapon-mounted night vision system. Nevertheless, in the industry, and throughout this manual, this type of device is also referred to as night vision monocular (NVM).

# SECTION 1. INTRODUCTION

## 1.1 MONOCULAR

This manual covers the MNVD night vision monocular and all applicable components. It is recommended that you read and understand this manual to optimize the monocular operation.

## 1.2 INTRODUCTION

The MNVD is a hand-held, head-mounted, helmet-mounted, or weapon-mounted night vision system that enables mobility, driving, weapon firing, short-range surveillance, map reading, vehicle maintenance and administering first aid during operation in both moonlight and starlight.

The MNVD uses advanced, multi-coated optics and a tough, compact, and ergonomic composite housing. The MNVD can be used as a goggle system, or stowed out of the way without removing. This device operates with a single On/Off/Gain Control knob and utilizes features like a flip-up turn off function, when used in conjunction with a head or helmet mount. There is also an integral infrared illuminator for reading a map and short distance observation.

## 1.3 FEATURES

- Manual system gain and focus adjustments for custom image quality optimization
- Integrated infrared (IR) illuminator with two switchable power levels
- Head, helmet, or weapon-mountable
- Automatic shut-off system
- Automatic turn off feature with flip-up head/ helmet mount
- Low-battery, bright light cutoff, and IR indicators in eyepiece
- Self-contained system operating on a single AA or CR123 battery
- Compact and lightweight, rugged construction
- Compatibility with most weapons, IR laser aiming/ illuminating devices, reflex sights, and scopes
- Limited 2-year warranty

## 1.4 REGISTER YOUR MNVD

You can register your product online at:

[www.flir.com](http://www.flir.com)

## 1.5 IMAGE INTENSIFIED NIGHT VISION VERSUS INFRARED THERMAL VISION

Image Intensification "I<sup>2</sup>" works by collecting tiny amounts of light, including the lower portion of the infrared light spectrum, that are present but may be imperceptible to our eyes, and amplifying it to the point that we can easily observe the image.

Thermal imaging technology operates by capturing the upper portion of the infrared light spectrum, which is emitted as heat by objects instead of simply reflected as light. Hotter objects, such as warm bodies, emit more of this light than cooler objects, like trees or buildings.

The thermal vision device makes images from heat, not light, a feat impossible for the naked eye or image intensified (I<sup>2</sup>) night vision devices. This allows you to see clearly without any visible light. People, animals, and objects all generate or reflect heat, and are clearly seen by the thermal vision device, in even the most adverse conditions.

Thermal is best used to detect the desired object. It is the best 24-hour imaging option.

Night vision devices provide a more natural image, wider field of view (FOV), wider operating temperature, and longer battery life.



I<sup>2</sup> IMAGE IN NEAR TOTAL DARKNESS

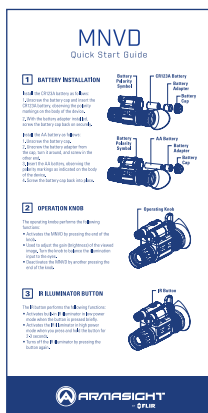
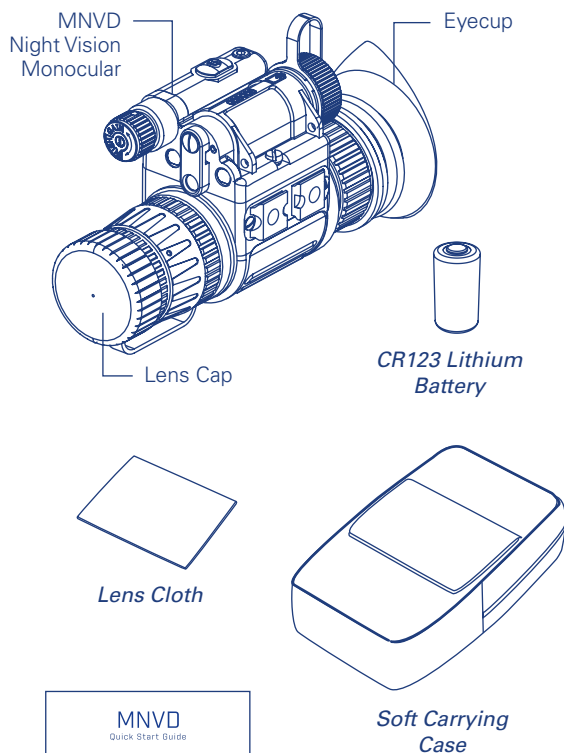


THERMAL IMAGING

# SECTION 2. GETTING STARTED

## 2.1 UNPACKING AND INSPECTING

The MNVD is available with the features, options, and accessories described in this manual. Refer to the packing list enclosed with your product to determine the actual contents of your product package.



Quick Start Guide



Thank You Card

## 2.2 BATTERY

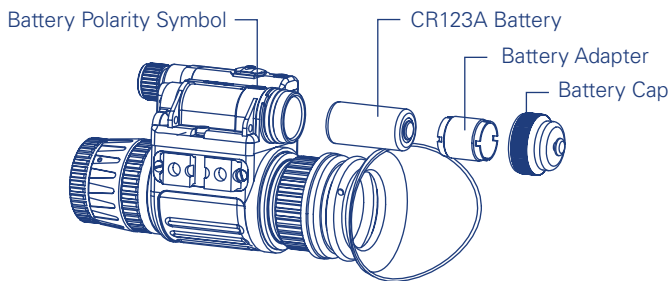
The MNVD operates on a single CR123A or AA battery. This is possible by repositioning the battery adapter in the battery cap.

### LOW BATTERY INDICATOR

When the monocular is ON, a flashing red LED indicator in the eyepiece viewing area indicates that the battery is low. This indicator provides an alert to replace the battery.

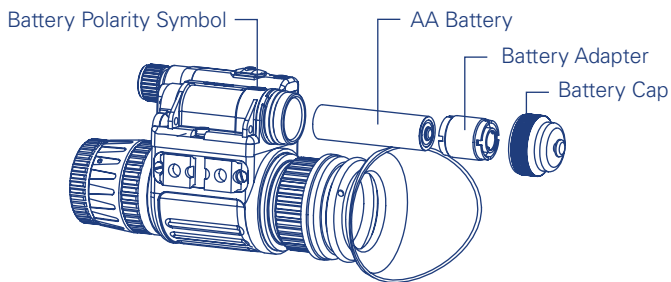
### CR123A BATTERY INSTALLATION

1. Unscrew the battery cap and insert the CR123A battery, observing the polarity markings on the body of the device.
2. With the battery adapter installed, screw the battery cap back on securely.



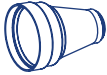





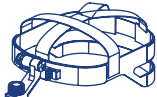
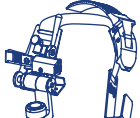


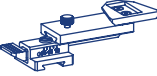
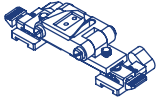

### AA BATTERY INSTALLATION

1. Unscrew the battery cap.
2. Unscrew the battery adapter from the cap, turn it around, and screw in the other end.
3. Insert the AA battery, observing the polarity markings as indicated on the body of the device.
4. Screw the battery cap back into place.





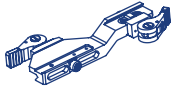
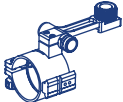
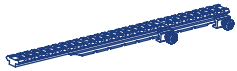

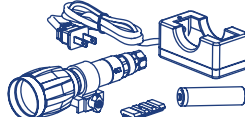


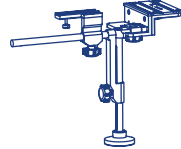



## 2.3 OPTIONAL EQUIPMENT

Optional items are shown and listed in the table below. The PART NO. column indicates the primary number used by the manufacturer to identify an item.

IMAGE	DESCRIPTION	PART NO.
	<b>3x Afocal Lens for MNVD-40</b> Quickly converts the MNVD-40 into a long-range night vision device. Ideal for middle range observation.	ANAF3X0002
	<b>3x Afocal Lens with Adapter #229 for MNVD-51</b> Quickly converts the MNVD-51 into a long-range night vision device. Ideal for middle range observation.	ANAF3X0229
	<b>5x Afocal Lens for MNVD-40</b> Quickly converts the MNVD-40 into a long-range night vision device. Ideal for long range observation.	ANAF5X0002
	<b>5x Afocal Lens with Adapter #229 for MNVD-51</b> Quickly converts the MNVD-51 into a long-range night vision device. Ideal for long range observation.	ANAF5X0229
	<b>ARFS3</b> Advanced Range Finding Stadia for 3x Afocal Lens.	ANAMRF0003
	<b>ARFS5</b> Advanced Range Finding Stadia for 5x Afocal Lens.	ANAMRF0005
	<b>Goggle Kit #2</b> Adjustable universal assembly that secures the MNVD to the operator's head providing hands-free operation.	ANHG000004
	<b>Helmet Mount #4</b> Adjustable universal helmet mount assembly that allows mounting of the MNVD onto a range of ballistic helmets for hands-free operations. The helmet mount has a flip-up mechanism which turns off the unit when it reaches its highest position.	ANHM000001
	<b>Helmet Mount #183</b> Shroud is a helmet mount assembly that allows mounting of the MNVD onto helmet with Wilcox type mount.	ANHM000183
	<b>Swing Arm #37</b> Mini Rail to Bayonet Adapter mounts NV Monocular to Standard US Mil Headset (PVS7/PVS14 type) and helmet.	ANHG000002
	<b>Swing Arm #172</b> Mini Rail to Dovetail Adapter mounts NV Monocular to Dovetail-Type Headsets and Helmet Mounts.	ANHM000172
	<b>Dual Bridge #188</b> Adapter for mounting of two MNVD with individual side flip-up mechanism. Use of two monoculars makes it dual-tube goggle/binocular.	ANHM000188
	<b>Demist Shield #34 for MNVD-40</b> When attached to the MNVD eyepiece, the demist shield prevents condensation on the optics under rapid temperature changes.	ANLC000001

CONTINUED

	<b>Demist Shield #134 for MNVD-51</b>	ANLC000134
	<b>Sacrificial Window #30 for MNVD-40</b> This feature is useful in environments with large amounts of dust, dirt or debris in the air, as can be found in environments with high-speed winds or storm conditions. The sacrificial window preserves the objective lens of the MNVD.	ANLC000002
	<b>Sacrificial Window #228 for MNVD-51</b>	ANLC000228
	<b>Shutter Eyeguard #82</b> Prevents light from being emitted by the MNVD eyepiece. If the user's face is illuminated, they become visible to others in the field, and their position becomes compromised.	ANEC000001
	<b>QRM - Quick-Release Weapon Mount #26/ #142</b> Small arms adapter that allows the MNVD to be mounted on a weapon using Picatinny rail.	ANAM000004
	<b>Scope Adapter Mount #6</b> Allows NV Monocular to be mounted behind standard daytime optics for nighttime use.	ANAM000001
	<b>Extended Rail Adapter #85 -</b> Dovetail Weaver Picatinny Rail Adapter extends scope base 7.5 " to 11.5".	ANAM000045
	<b>Dovetail #21</b> Weaver Transfer Piece allows the IR illuminator to be mounted on the MNVD.	ANRA000001
	<b>IR850-XLR Detachable Extra Long-Range Infrared Illuminator with Mount, Dovetail to Weaver Transfer Piece #21, Rechargeable Battery, and Charger</b> A detachable LED extra-long-range infrared illuminator with wide-angle adjustable beam. Comes fully assembled with a mount in order to be installed on a Picatinny/Weaver rail.	ANKIXLR017
	<b>IR850XLR Afocal Doubler</b> Doubles the distance of IR850-XLR IR beam.	ANAF18XXLR
	<b>Camera Adapter #46</b> An adapter with step down ring that allows the MNVD to be attached to any 35mm SLR camera or 8mm camcorder with threaded connection M52x0.75 and M37x0.75.	ANAM000029
	<b>Universal Camera Adapter #45</b> Allows the MNVD to be attached to a variety of video/photo camera systems.	ANAM000006
	<b>Hard Shipping/ Storage Case #101</b> A protective case used for the shipping/storage of the MNVD and its accessories.	ANH000001

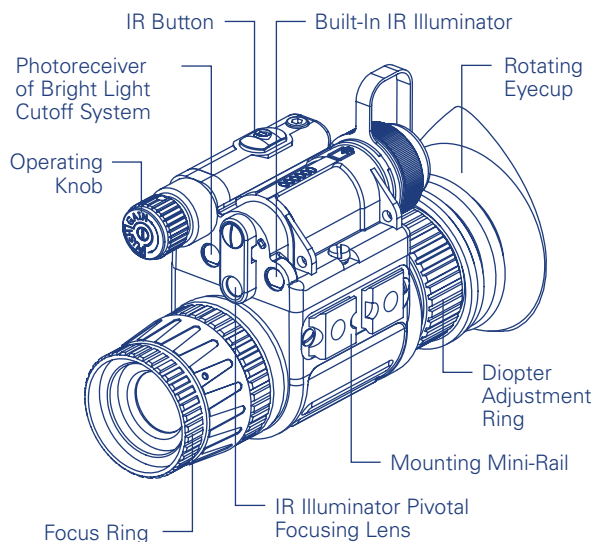


# SECTION 3. OPERATING THE SYSTEM

## 3.1 SYSTEM DESCRIPTION

The MNVD utilizes the principle of intensification of the residual light that is reflected from the surrounding objects. The optical system of the unit consists of a lens, an image intensifier tube (IIT), and an eyepiece.

This device operates with a single control knob for turning on/off the device and adjusting the gain. The device allows for vertical adjustment (using the head or helmet mount), fore-and-aft adjustment, objective lens focus, and eyepiece focus. The monocular is equipped with an infrared (IR) light-emitting diode (or IR illuminator) to provide additional illumination for close distance. There are two levels of IR illumination power. The operating modes of IR illuminator are controlled by a separate button. The monocular is also equipped a low battery indicator, a bright light cutoff system indicator, and IR illuminator indicator in the field of view of device.



## 3.2 SYSTEM CONTROLS

### 3.2.1 OPERATING KNOB

The operating knob performs the following functions:

- Activates the MNVD by pressing the end of the knob.
- Used to adjust the gain (brightness) of the viewed image. Turn the knob to balance the illumination input to the eyes.
- Deactivate the MNVD by pressing the end of the knob.

### 3.2.2 IR ILLUMINATOR BUTTON

The IR Illuminator button performs the following functions:

- Activates built-in IR illuminator when the button is pressed once.
- Activates the IR illuminator to higher power mode when button is pressed and held down for 2-3 seconds.
- Returns to low IR power mode when button is pressed and held down again.
- Turns off the IR illumination when pressed briefly.

### 3.2.3 DIOPTER ADJUSTMENT RING

The diopter adjustment allows a user to alter the viewfinder for optimum image sharpness. While looking through the eyepiece, rotate the diopter adjustment ring to optimize the sharpness of the image in the viewfinder.

### 3.2.4 FOCUS RING

Bring the object into focus by turning the objective focus ring (CCW for far focus, CW for near focus, if you look in the eyepieces). Rotate the focusing ring until the subject looks sharp in the viewfinder.

### 3.2.5 INDICATION

When the MNVD is ON, the color LED indicators can be shown in the field of view. The color LEDs indicate the following states of the device:

INDICATIONS	COLOR OF LED IN THE FOV
Built-in IR illuminator is activated	Red
Image intensifier tubes are exposed to excessive levels of light	Green
Battery is low	Flashing Red

### 3.3 AUTO POWER OFF FUNCTION

The monocular will automatically shut off when disconnected from the head mount or helmet mount, or when flipped up to the stowed position. The MNVD bright light cut-off feature shuts off power to the monocular when it is exposed to excessive levels of light for more than 10 seconds. Automatic shut-off system also automatically turns off the device when it is unused (controls are not touched) for 60 minutes. The automatic shut-off function preserves battery life should the device be inadvertently activated.

### 3.4 OPERATING PROCEDURES

1. Verify that the battery is installed as indicated on the unit body.
2. Remove the lens cap and place it over the housing of the lens.
3. Turn on the monocular by pressing the end face of the control knob. After a slight delay, a green glow will appear in the eyepiece of the unit.
4. Adjust the unit diopter by rotating the ring of the eyepiece.
5. Observe the scene. Rotate the focus ring until the image is clear and sharp.
6. Adjust the brightness and contrast of the image by rotating the control knob.

#### NOTE:

If the automatic shut-off system turns off the device when it is used, turn on the monocular again by double-clicking on the operating knob.

#### NOTE:

If the bright light cut-off feature turns off the device, the power will turn on automatically when the level of light decreases.

### 3.5 IR ILLUMINATOR OPERATIONS

#### NOTE:

The built-in IR illuminator is designed to provide additional illumination (when needed) while viewing scenes or targets from a short distance.

Built-in IR illuminator of MNVD has two levels of IR illumination power. The low power mode allows user to see in total darkness at a distance of up to 3 meters. The high power mode allows user to see in total darkness at a distance of up to 10 meters.

To turn on the built-in IR illuminator in low power mode, press the IR illuminator button briefly.

To turn on the built-in IR illuminator in high power mode, press and hold the IR illuminator button for 2-3 seconds.

A red LED indicator in field of view will appear in the eyepiece to indicate that the IR illuminator is operating.

To turn IR illuminator off, push the IR button again.

#### NOTE:

When you turn off the monocular, the IR illuminator will be off too.

To focus the IR lighting, place the pivotal focusing lens onto the IR illuminator output window.

### 3.6 OPERATING UNDER CHANGING LIGHT CONDITIONS

If the ambient light level exceeds the limit of 100-300 lx for more than 10 seconds, the MNVD automatic protective system will shut off the intensifier tube. If a mission must be carried out in changing light conditions, the user can shut down the protective system manually by closing the photoreceiver.

#### CAUTION:

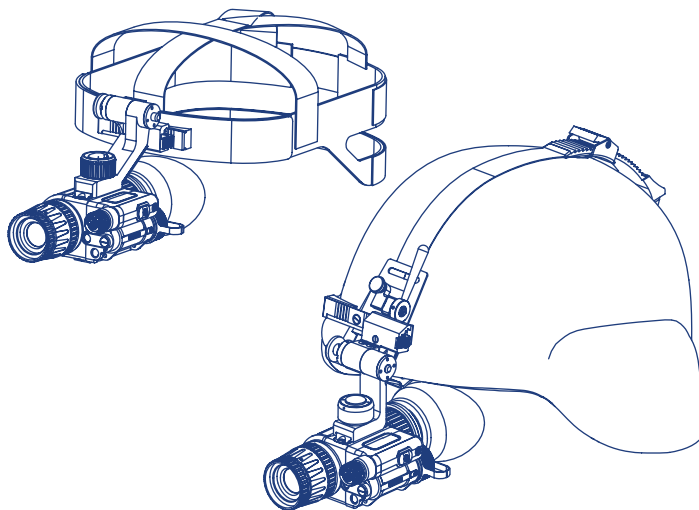
DO NOT forget to open the photoreceiver after completing your mission.

### 3.7 USING THE MNVD WITH A MINI-RAIL TYPE HELMET/ HEADGEAR ASSEMBLY

Use the MNVD hands-free by installing to the headgear and helmet mount equipped with bracket with mini-rail interface. With the bracket, the MNVD can be positioned directly in front of the user's right or left eye, or flipped out of the field of view.

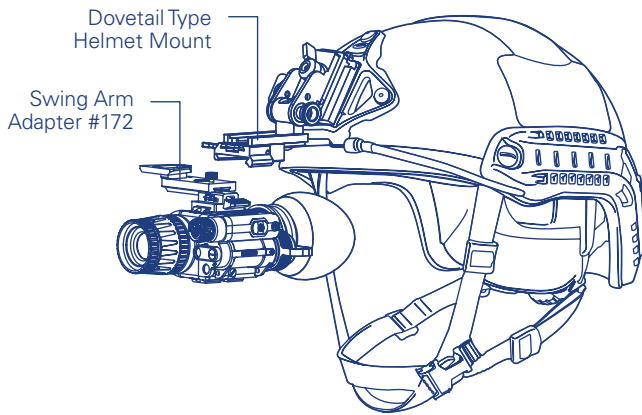
The MNVD will automatically turn off when disconnected from the head mount or helmet mount, or when flipped up to the stowed position. Turn on the monocular again by double-clicking the operating knob to continue your session, the device will return to correct viewing position.

For more information on the use of headgear/ helmet mount, see the User Manual.



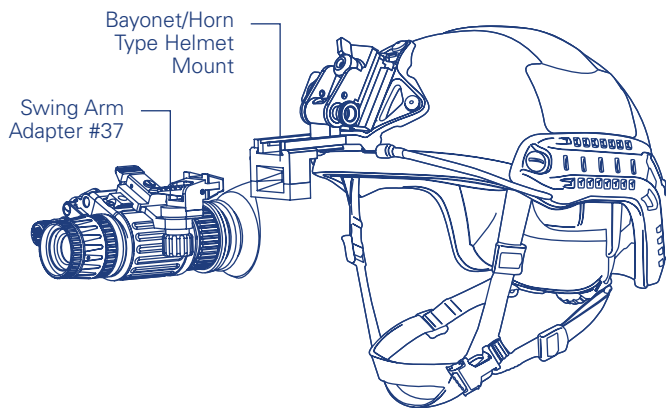
### 3.8 USING THE MNVD WITH A DOVETAIL TYPE HELMET/ HEADGEAR ASSEMBLY

For hand-free using the MNVD with either standard dovetail type headset and helmet mounts, use an optional transfer Swing Arm adapter #172. With the Swing Arm adapter, the MNVD can be positioned directly in front of the user's right or left eye.



### 3.9 USING THE MNVD WITH A BAYONET/ HORN TYPE HELMET/ HEADGEAR ASSEMBLY

For hand-free using the MNVD with either standard bayonet/horn type headset and helmet mounts, use an optional transfer Swing Arm adapter #37. With the Swing Arm adapter, the MNVD can be positioned directly in front of the user's right or left eye.

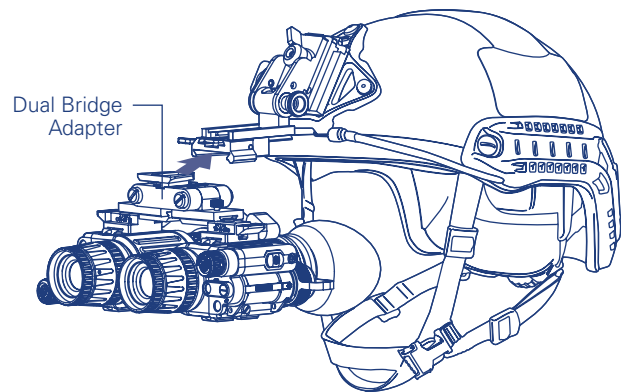


### 3.10 USING A PAIR OF MNVD WITH A DUAL BRIDGE

To make dual-tube goggles/binoculars use two MNVD monoculars and optional Dual Bridge adapter. The rotating binocular design allows ability to use the device as a monocular or binocular goggles and provides a low profile against head/helmet when in stowed position. Each monocular is automatically turned off when rotated to the side and upward or flipped up.

The Dual Bridge can be used with the mini-rail type or dovetail type headsets and helmet mounts by replacing the interface shoe.

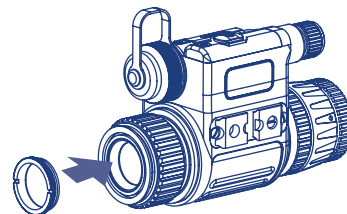
For more information on the use of an Dual Bridge, see the User Manual.



### 3.11 DEMIST SHIELD INSTALLATION

Mount a Demist Shield to the MNVD as follows:

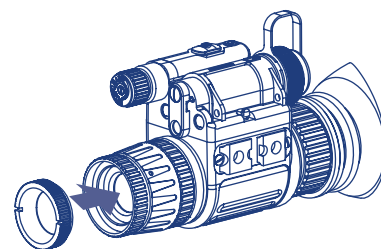
1. Remove the eyecup from the MNVD eyepiece.
2. Coat the Demist Shield with an anti-fogging compound, to prevent moisture condensation on the surface of the shield.
3. Screw the Demist Shield into the threading of the eyepiece.
4. Secure the eyecup back into place.



### 3.12 SACRIFICIAL WINDOW INSTALLATION

Mount a Sacrificial Window to the MNVD as follows:

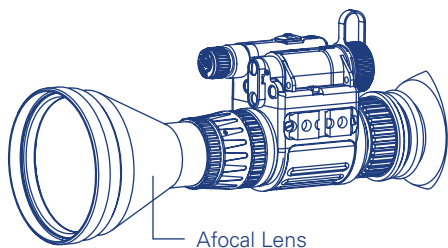
1. Remove the MNVD lens cap, if it is in place.
2. Screw the Sacrificial Window into the threading of the objective lens of MNVD.



### 3.13 USING THE OPTIONAL AFOCAL LENSES

The monocular can be used as a long-range viewer with an optional 3x or 5x afocal lenses.

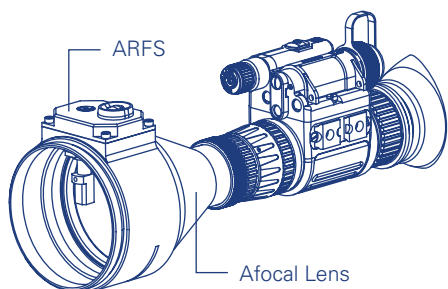
To mount the afocal lens to the monocular, screw it into the threading of the standard 1x objective lens on the MNVD.



### 3.14 USING A RANGE FINDING ATTACHMENT

The Advanced Range Finding Stadia (ARFS) is an optical projection attachment for night vision devices. The ARFS mounts to the MNVD's afocal magnifier. The built-in illuminated universal stadia range finder allows for accurate target measurements and range estimates. The removable ARFS module permits the user to remove the stadia rangefinder for use on other equipment or to restore the device to an unobscured field of view.

For more information on the use of an ARFS, see the ARFS User Manual.



### 3.15 MOUNTING MNVD TO A WEAPON

#### WARNING:

Always make sure your firearm is unloaded before you place the equipment on the firearm. Always verify that the chamber is empty, especially if you stop the procedure and resume later. Safe handling rules should be followed at all times.

#### WARNING:

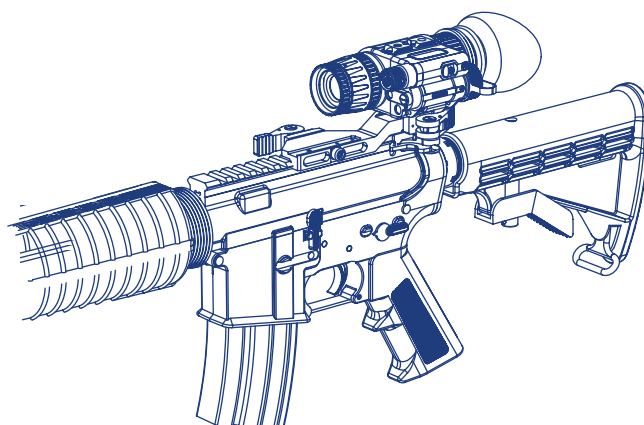
If equipment is mounted too far to the rear of a weapon, the eyepiece can injure the shooter's brow. Shooting at an uphill angle also increases this risk, because it shortens the distance between the brow and the rear of the equipment. When mounting your equipment, we recommend positioning it as far forward as possible.

**With hard-recoiling rifles, serious injury or even death can result from eyepiece impact when discharging the firearm.**

**THE USER ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR HAVING THE FLIR EQUIPMENT PROPERLY MOUNTED TO A FIREARM AND USING THE FLIR EQUIPMENT PROPERLY. ALWAYS CHECK THE CONDITION OF YOUR MOUNTING SYSTEM PRIOR TO USING YOUR FIREARM.**

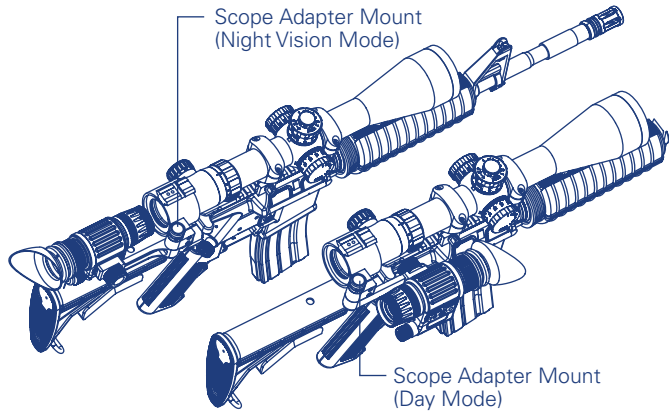
To mount the MNVD to a weapon, use an optional Quick-Release Picatinny Mount adapter (QRM). This small arms adapter allows the MNVD to be mounted on a weapon with Picatinny MIL-STD-1913 rail.

For more information on the use of an QRM, see the QRM User Manual.



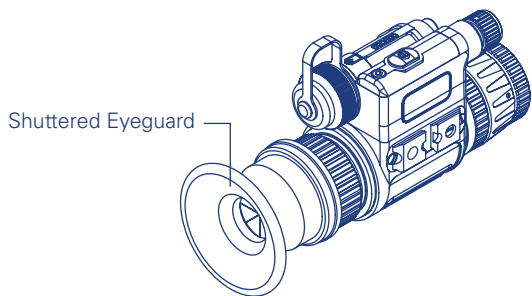
### 3.16 USING A SCOPE ADAPTER MOUNT

Scope Adapter Mount #6 allows MNVD monocular to be mounted behind standard daytime optics to convert it into a night vision system. The adapter has a flip-up mechanism for quick switching between day and night modes.



### 3.17 USING A SHUTTERED EYEGUARD

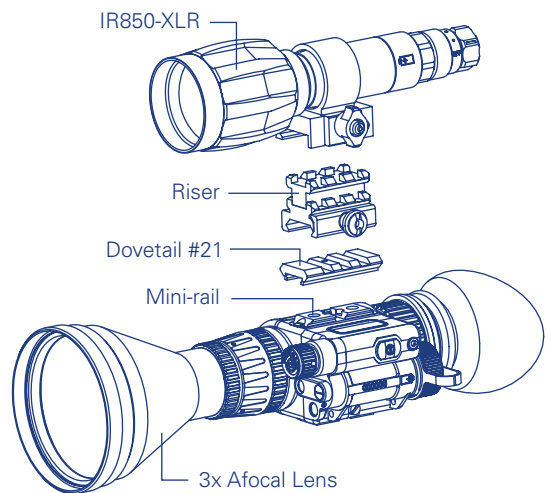
The Shuttered Eyeguard replaces the standard MNVD eyecup. This accessory allows users to maintain covert posture by preventing light from the monocular from illuminating the user's face. This rubber eyecup automatically shutters to prevent light splash. Simply pinch the side of the eyecup to look through the monocular.



### 3.18 USING A LONG-RANGE IR ILLUMINATOR

IR850-XLR Long-Range Infrared Illuminator provides greater, image-intensified viewing capabilities for operations in little-to-no ambient light. Infrared illuminators are used in areas where the level of natural light is not sufficient. The illuminator features adjustments for field-of-view divergence and output power. The IR850-XLR comes standard equipped with a rechargeable battery and charger unit. An optional Afocal Doubler for IR850-XLR doubles the distance of the IR beam for long-distance observation.

IR850-XLR illuminator mounts onto mini-rails of MNVD, using the Dovetail #21 Weaver Transfer Piece. When used with additional afocal lenses, the height of the IR illuminator installation can be increased by using the risers.

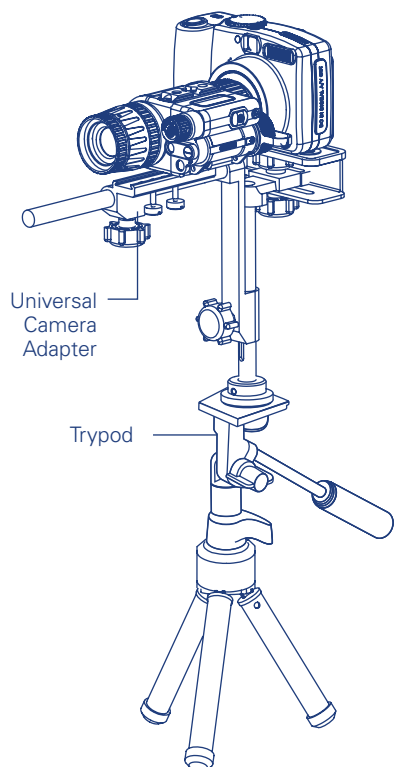


### 3.19 USING A CAMERA/CAMCORDER ADAPTER

The MNVD with the optional camera/camcorder adapter can take still photography or video in near-to-total darkness.

To mount the MNVD (affixed with a camera or video recorder) to a tripod, you will need the Universal Camera Adapter.

The MNVD also can be mounted directly to the objective of camera/camcorder using Camera Adapter #46. An adapter with step down ring allows the MNVD to be attached to any camera or camcorder with threaded connection M52x0.75 or M37x0.75.



## SECTION 4. MAINTENANCE

### 4.1 BATTERY REMOVAL AND REPLACEMENT

Refer to Part 2.2 for battery installation procedures.

### 4.2 CLEANING THE MNVD

Wipe the housing with a damp cloth as needed.

**CAUTION:** Do not use abrasives or solvents to clean the housing, lens, or display window. Do not use ammonia-based cleaning products to clean the lens. Doing so may damage the anti-reflective coating of the lens.

The MNVD lens is designed for the harsh outdoor environment and has a coating for durability and anti-reflection, but it may require cleaning occasionally. Avoid scratching the lens and/or leaving fingerprints on the optics. Optics can be damaged by improper cleaning. Clean the lens according to the instructions below when image quality degradation is noticed or excessive dirt or other contaminant is on the lens.

Do not use abrasive materials, such as paper or scrub brushes as this will possibly damage the lens by scratching it. Only wipe the lens clean when there is visible contamination on the surface.

#### *PREFERRED METHOD FOR CLEANING THE LENS*

Materials:

- Optical-grade cloth
- Pure water (de-ionized or other)
- Isopropyl alcohol (IPA)

Saturate a piece of the lens tissue with the water and drape it over the lens. Let the surface tension of the water pull the tissue onto the lens surface and then drag the tissue across the lens surface. Repeat several times with different pieces of tissue.

Repeat the same step using IPA instead of water. Drag the final piece of tissue over the lens several times to prevent pooling, which could leave a residue behind.

## SECTION 5. WARRANTY

### 5.1 GLOBAL LIMITED WARRANTY

Follow the link <http://www.flir.com/uploadedFiles/Corporate/Support/FLIR-Personal-Vision-Systems-2-3-10-Limited-Warranty.pdf> to retrieve FLIR's Warranty document.

### 5.2 PRODUCT REGISTRATION

In order to validate the warranty on your product, FLIR Outdoor & Tactical Systems must receive a completed Product Warranty Registration Card for each unit, or the customer can complete the warranty registration form on our website by completing and submitting FLIR Outdoor & Tactical Systems' PRODUCT REGISTRATION FORM (<http://www.flir.com/hunting-outdoor/display?id=74583>).

### 5.3 OBTAINING WARRANTY SERVICE

For service, repair or replacement, please contact:

#### **FLIR Outdoor & Tactical Systems**

815 Dubuque Avenue, South San Francisco, CA 94080

Phone: 1-888-959-2259 or (650) 492-7755

Fax: 1-888-959-2260

International Phone/Fax: (650) 492-7755

E-mail: [OTS-Support@flir.com](mailto:OTS-Support@flir.com)

[www.flir.com/ots](http://www.flir.com/ots)



# SECTION 6. SPECIFICATIONS

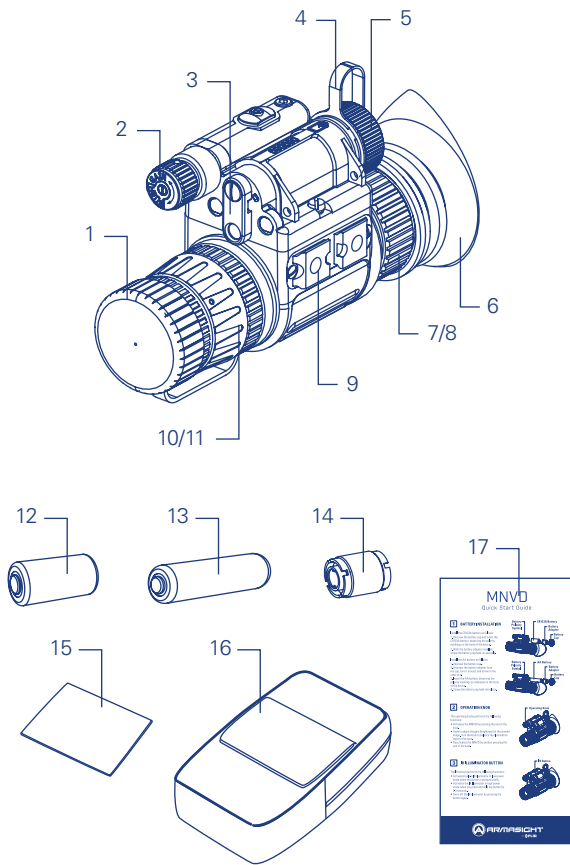
	MNVD-51	MNVD-40
<b>OPTICAL SPECIFICATIONS</b>		
Magnification	1x	
Lens System	19 mm; F/1.26	27 mm; F/1.3
FOV	51°	40°
Focus Range	0.25 m to Infinity	
Diopter Adjustment	-6 to +2 dpt	
Eye Relief	17 mm	25 mm
<b>USER INTERFACE</b>		
Operation Knob	Monocular ON/ OFF; variable gain control	
IR Button	IR illuminator ON/OFF; IR illuminator power mode	
Diopter Adjustment Ring	Adjusts the eyepiece diopter	
Focus Ring	Adjusts the objective lens focus	
LED Indicators	Indicates low battery, IR ON, and excessive light conditions	
<b>SYSTEM SPECIFICATIONS</b>		
Manual Gain Control	Yes	
Bright Light Cut-Off	Yes	
Automatic Shut-Off System	Yes	
Low Battery Indicator	Yes	
IR Indicator	Yes	
Bright Light Cutoff System Indicator	Yes	
Infrared Illuminator	Yes	
<b>POWER</b>		
Battery Type	Single AA 1.5V battery or CR123A Lithium 3V battery	
Battery Life (Operating)	Up to 40 hrs	
<b>ENVIRONMENTAL</b>		
Operating Temperature Range	-40°C to +50°C (-40°F to +122°F)	
Storage Temperature Range	-50°C to +50°C (-58°F to +122°F)	
<b>PHYSICAL</b>		
Weight	315 g (0.7 lb)	338 g (0.75 lb)
Size	109 × 48 × 73 mm (4.1" × 1.9" × 2.8")	115 × 48 × 73 mm (4.6" × 1.9" × 2.8")
<b>PACKAGE INCLUDES</b>		
Night Vision Monocular, Battery, Lens Cloth, Quick Start Guide, Soft Carrying Case		

# SECTION 7. SPARE PARTS

The parts authorized in the below list of spare parts are required for operator maintenance. This list includes parts that must be removed in order to replace authorized parts.

The ITEM NO. column indicates the number used to identify items in figure below.

The PART NO. column indicates the primary number used by the manufacturer to identify an item; this number controls the design and characteristics of the item by means of its engineering, specifications, standards, and inspection requirements.



ITEM NO.	DESCRIPTION	PART NO.
1	Lens Cap	MNVDFMLNCP
2	Operating Knob	MNVDFMOPK
3	Pivotal Focusing Lens	MNVDFMPFL
4	Battery Cap Retainer	MNVDFMBCR
5	Battery Cap	MNVDFMBTCP
6	Eyecup	MNVDFMEYCP
7	MNVD-51 Eyepiece Assembly	MNVDFM51EA
8	MNVD-40 Eyepiece Assembly	MNVDFM40EA
9	Mini-Rail	MNVDFMEYCP
10	MNVD-51 Objective Lens Assembly	MNVDFM51OLA
11	MNVD-40 Objective Lens Assembly	MNVDFM40OLA
12	CR123A Lithium Battery	ALT
13	AA Alkaline Battery	ALT
14	Battery Adapter	MNVDFMBTAD
15	Lens Cloth	ABFLNCL
16	Soft Carrying Case	ABFMOSCC
17	Quick Start Guide	MNVDFMQSG



**OUTDOOR & TACTICAL SYSTEMS**

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Fax: 1-888-959-2260  
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OTS-Sales@flir.com

Government Sales:  
OTS-Gov@flir.com

International Sales and Export:  
OTS-Export@flir.com

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OTS-Support@flir.com

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