

NightShot® II

OWNER'S MANUAL



NIGHT VISION RIFLE SCOPE

by

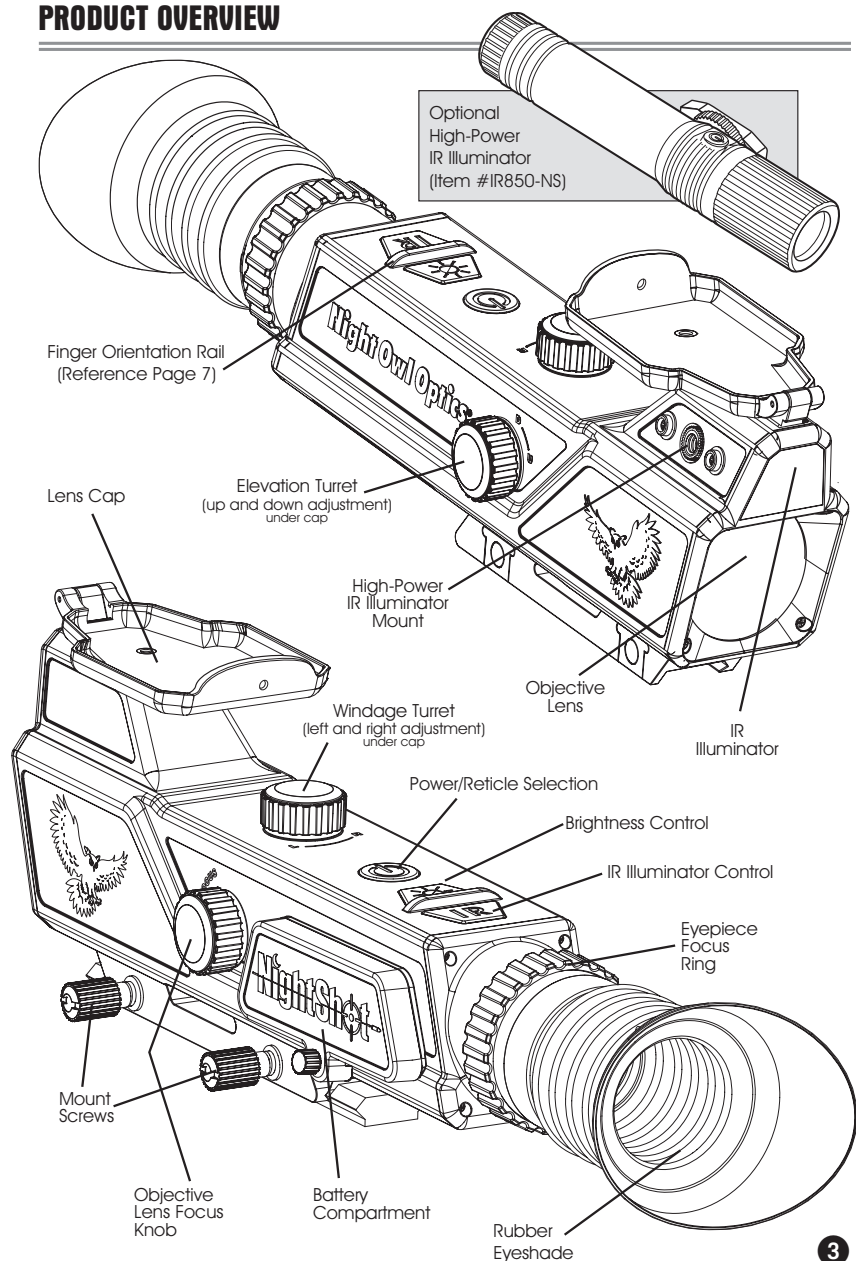
Night Owl Optics®

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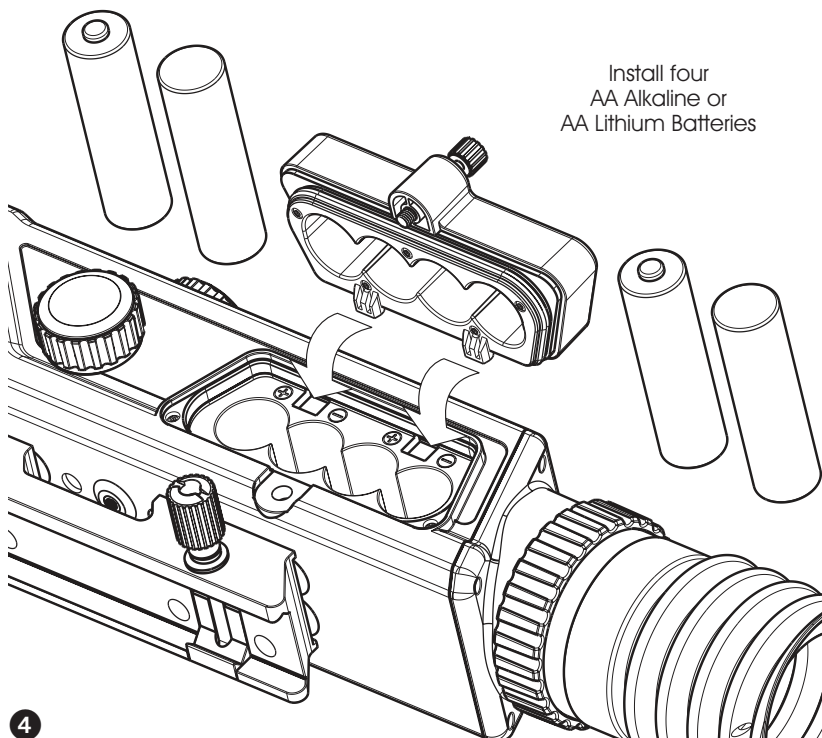
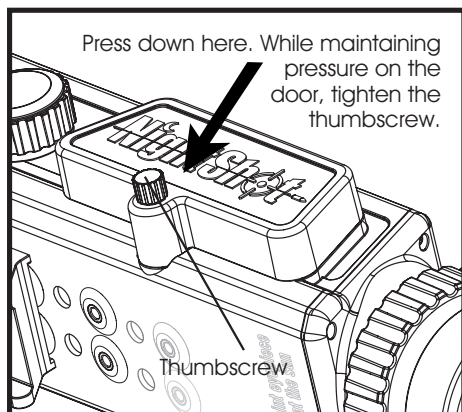
PRODUCT OVERVIEW



INSTALLING THE BATTERIES

The battery door is designed for a tight fit.

1. Remove door by rotating thumbscrew counterclockwise approximately two turns. The thumbscrew is attached to the door and stays attached.
2. To install door, insert the two tabs into position, pivot door shut and tighten thumbscrew.

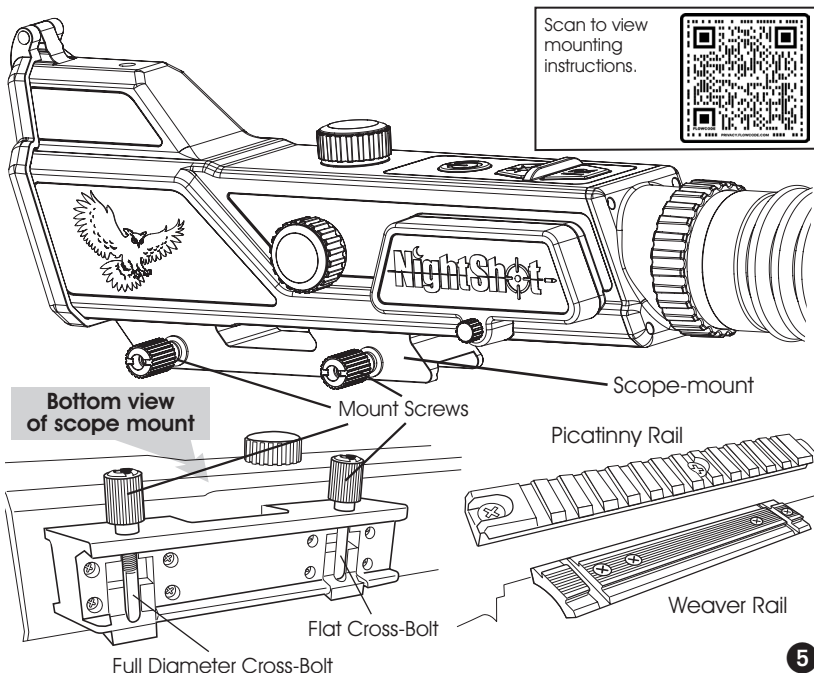


MOUNTING THE RIFLE SCOPE (Weaver or Picatinny)

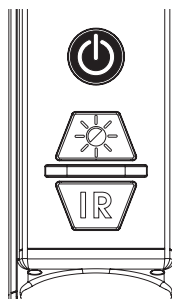
A mounting rail must be attached to your firearm; NightShot II attaches to your rail. If your firearm does not have a rail, have a qualified gunsmith install a mounting rail (Picatinny or Weaver) on your firearm. If you choose to self-install your mounting rail, use a high quality mounting rail and carefully follow the instructions that come with it.

NightShot II has three different mounting positions. To move the NightShot II's scope-mount position on the scope, remove the eight screws holding the scope-mount to the scope, move the scope-mount to the front, middle or rear position, and secure it by reinstalling the eight screws. Choose the position that fits best for you.

There are two different cross-bolts on the scope-mount. The cross-bolt with the full diameter locates the scope onto your firearm's rail and prevents it from moving fore and aft. The flat cross-bolt tightens the mount to the rail, but does not locate into a slot on the rail. These two cross-bolts are interchangeable, to be reversed as required to fit to your particular rail. Picatinny rails have evenly spaced cross-cuts and therefore should not necessitate moving the cross-bolts. On Weaver-style rails the location of, and spacing between, the cross-cuts can vary and thus may require reversing the cross-bolt positions. In mounting the scope to your rail, adjust the scope to suit your natural shooting position. The scope should sit at a safe distance away from your eye, in a comfortable position to optimize sighting and shooting. The eye relief to the lens is approximately 2.7 inches (7 cm).



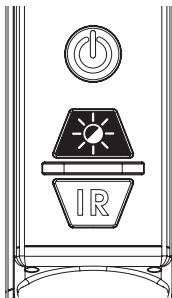
OPERATION



1. Power On/Off

ON: Press and hold the power button for 3 seconds.

OFF: Press and hold the power button for 3 seconds.



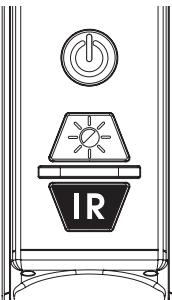
2. Brightness Control

Press the brightness control button. The brightness of the display screen will be adjusted in the following cycle (the symbol will be displayed on the screen, and will disappear after 3 seconds):

Low  

Medium  

High  

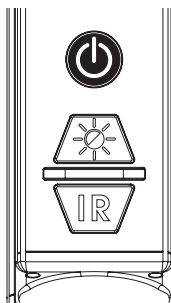


3. IR Intensity Control

Press the IR control button. The IR intensity will be adjusted in the following cycle (one of these symbols will remain on the screen):

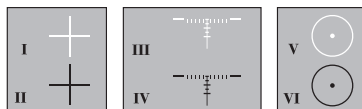
IR Low  
IR Medium  
IR High   (default)
IR Off  OFF

Note: If sighting in during daylight, remember to turn off IR to conserve battery power.



4. Reticle selection

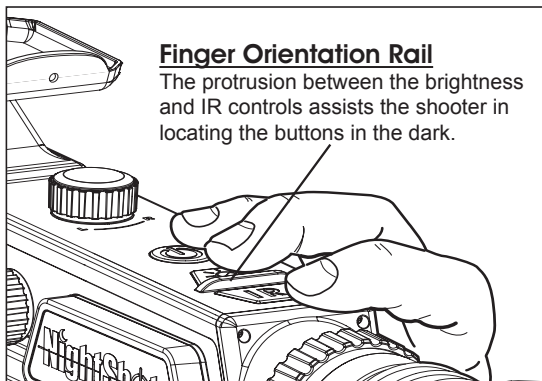
Quick-pressing the power button cycles between 3 different reticle types. Each of the 3 reticle types can be configured in white or black, allowing the shooter to adjust the reticle type and color to best suit the current shooting environment.



5. Memory

The following settings are saved to memory even if power is off or batteries are removed:

- IR setting
- Reticle selection
- Brightness
- Windage and Elevation (as long as the protective caps are installed)



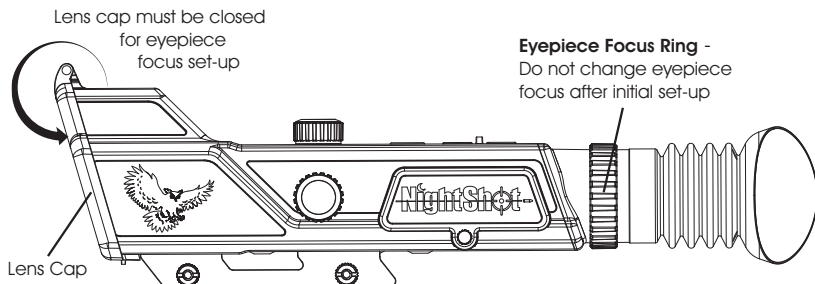
Pinhole light refraction artifacts

NOTE: With the lens cap closed, the "pinhole" lens will cause spec-like anomalies that are not defects in the lens. Do not attempt to clean the lens. These artifacts of restricted pinhole-only light are within the manufacturer's specification and will not be present during field operation with the lens cap lifted.

FOCUSING

Eyepiece focus - Step 1

- ① Close the lens cap and secure it to the retaining pin on the bottom of the scope.
- ② Quick-press  to choose the reticle with the best contrast and image.
- ③ Set eyepiece focus to your individual eyesight by pressing any button to display the graphics on the screen. Rotate the **eyepiece focus ring** until the graphics come into sharp focus on the display.
- ④ Pinhole lens artifacts: see bottom of page 7.

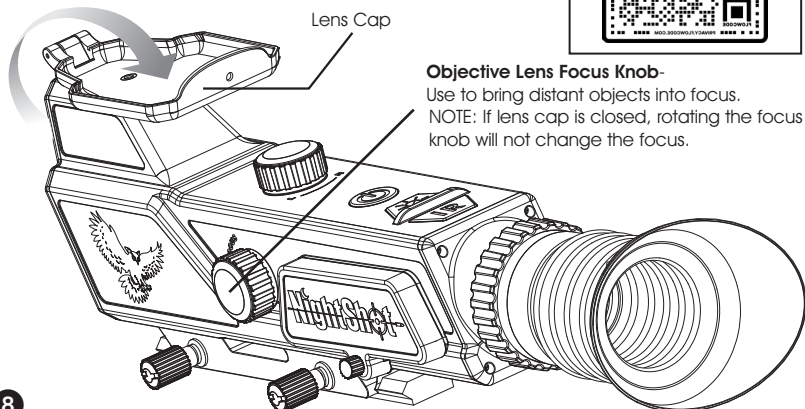


Set eyepiece focus once only. **Do not readjust** unless a different shooter uses the scope.

Objective lens focus - Step 2

After setting eyepiece focus:

- ① Open lens cap.
- ② Use **objective lens focus knob** to bring distant objects into focus.

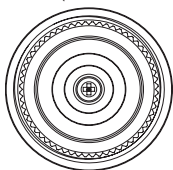


Follow this link for focusing instructional video



WINDAGE and ELEVATION ADJUSTMENTS

WINDAGE (LEFT AND RIGHT)

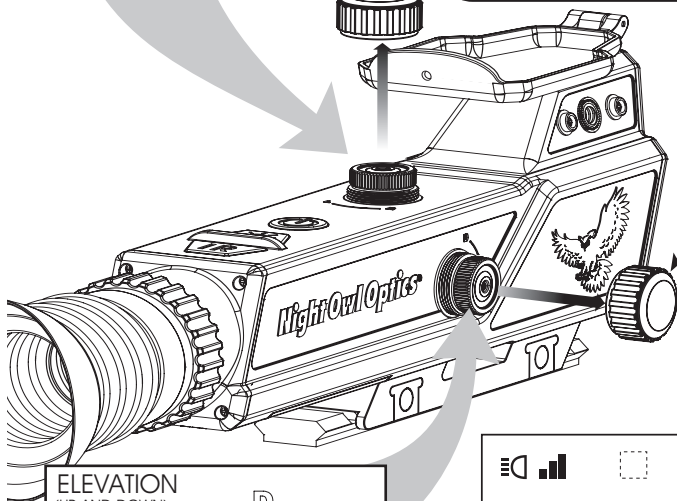


L - Moves impact point left

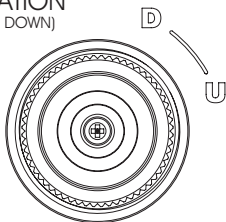
R - Moves impact point right

- Unscrew protective cap.
- Rotate turret in the U or D and/or L or R direction.
- One click equals approximately 1/4 in (~ 0.6 cm) adjustment at 50 yards (~ 46 meters).
- If doing this in daylight:
 - It is best to do so with lens cap down to prevent overexposure.
 - Focus knob does not adjust the focus with lens cap closed (focus becomes fixed).

Protective caps are designed to avoid overtightening. Rotate to fit snug & seal. Thread will slip if too tight.

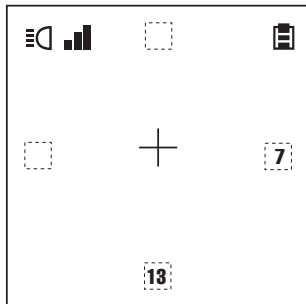


ELEVATION (UP AND DOWN)



D - Moves impact point down

U - Moves impact point up



Reticle settings
will appear on the screen

WINDAGE and ELEVATION ADJUSTMENTS Continued

Bore Sighting:

Bore sighting is the procedure required to align the scope with the rifle bore. This can be done with the assistance of a bore sight device or, if one is not available, this can be accomplished as follows:

1. Lock or mount the gun in a stationary device so it cannot move. Remove the bolt and look through the barrel at a target that is set at 50 yards or beyond. Identify the center point spot inside the barrel window on the target.
2. Now look through the scope and set your reticle to the same center point spot on the target by utilizing the scope's windage and elevation adjustments.
3. After bore sighting the firearm, it is necessary to perform a final sight-in at the range to insure accuracy. **Important:** make final sight-in adjustments with the ammunition you intend to use.
4. **Take note of the numerical windage and elevation values.** This is your new center-point for this scope on this rifle. If you remove the scope from this rifle and then later reinstall, reset the windage and elevation to these values.

WARNING: Do not point EYEPIECE directly at the sun. Exposure to sun can damage optic.

Zeroing:

Final zeroing should be done at the distance where you do most of your shooting. For most hunters using night vision, this will be in the 50-100 yard range.

Windage and Elevation:

To adjust windage and elevation on the NightShot II rifle scope:

1. Remove the protective caps from the windage and elevation adjustment turrets by rotating counterclockwise.
2. On the windage adjustment, Left and Right are indicated by L and R. On the elevation adjustment, Up and Down adjustments are indicated by U and D.
3. To make adjustments to the point of impact (POI), click the turret in the required direction, taking into account that 1 click equals 1/4 inch at 50 yards. For example, at 50 yards, to adjust POI by 1 inch to the right, you would click the windage turret towards "R" 4 times.
4. Once complete, re-install the protective caps.

AUXILIARY SHIM KIT (for extra elevation adjustment)

Your firearm may require more than the standard range of elevation adjustment for one of these reasons:

1. Rail sits high or low on barrel
NightShot II is designed for a standard 2.5 inch distance from the center line of the barrel to the center line of the scope lens.
2. Rail is not perfectly parallel to the barrel
Your scope may be pointed askew. If you mount a boresite, you will immediately see this misalignment of your rail.

Solution

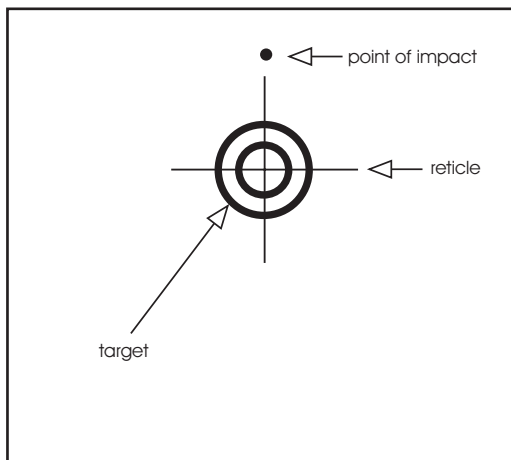
Night Owl Optics offers a special **Shim Kit** to degree your scope up or down an additional amount.

Questions?

Call us at 800-444-5994 to request a no-charge Shim Kit.

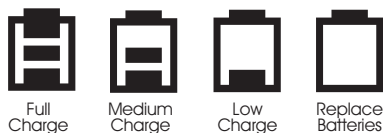
Example

Rail sits too high.
No more elevation adjustment available.
Need "Shim Kit."



POWER, DISPLAY and BATTERY LIFE

This device uses 4 x AA alkaline or lithium batteries. When the battery voltage is too low, the device will not operate. The battery indicator will flash when the battery voltage is low.



Expect approximately 4 to 7 hours of battery life under normal use with quality alkaline batteries. The use of lithium batteries is highly recommended, as lithium batteries will significantly increase battery life. **Tip:** Leaving IR on decreases battery life significantly. Consider setting IR to “Off” or “Low”, then switch to a “High” setting IR intensity when targeting.

Expected operating time on one set of good-quality alkaline batteries:

4 hours with IR on High.

7 hours with IR on Low.

Device will not turn off automatically. To conserve battery power consider turning the IR to “Low” or “Off” when extra illumination is not required.

INFRARED ILLUMINATOR (IR)

The NightShot II is equipped with an active infrared emitter (IR); it emits an invisible beam of infrared light. The beam of light exiting the emitter is not visible to human or animal eyes, but is detected by the NightShot II sensor. Also notice that while the light emitting from the IR is invisible, the diode does glow inside the emitter and you can detect it from a distance. Extensive testing concludes that animals are not influenced by the glow of the infrared emitter.

IMPORTANT

While invisible, the IR is a bright light. If reflective objects are at close range between you and your target, the IR can reflect back at you, introducing excess light into the scope and causing a bright, overexposed, image.

The following can reflect the IR light back at you:

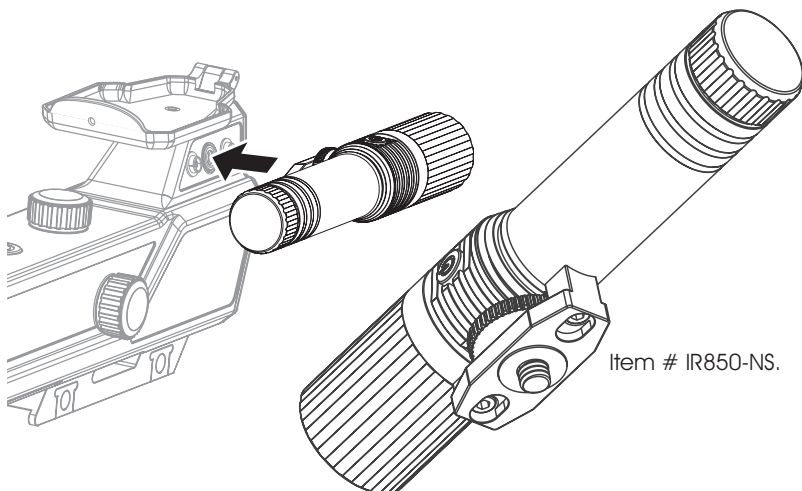
1. A reflective surface on the firearm or in front of the NightShot II. This might be a shiny/reflective target, an iron sight or, for example, a nickel-plated barrel.
2. Using the NightShot II in closed spaces may cause the IR to reflect back into the scope.
3. Looking through windows can cause the IR to reflect back into the scope.

INFRARED ILLUMINATOR (IR) Continued

ACCESSORY INFRARED ILLUMINATOR

An optional high-power infrared illuminator is available.

Consider purchasing the optional accessory high-power IR Illuminator. It attaches to the side of the scope. Using the accessory IR, you can turn off the main IR, and almost double NightShot II's battery life. The accessory IR uses CR123 batteries.



- Custom designed for use with Night Owl Optics NightShot II Digital Night Vision Rifle scope
- High-Power Infrared LED Emitter
- Power: 1000 mW
- IR Wavelength: 850 nm
- Easy-To-Use
- Weatherproof
- Weight: (without batteries) 3.427 oz (97.2 g)
- Weight: (including 2xCR123-type batteries) 4.573 oz (129.7 g)
- Dimensions: 135 mm x 40.4 mm
- Lens diameter: 22.8 mm
- Power: 2 x CR123-type batteries
- Attaches to NightShot II built-in mount.

Do not look directly into the IR emitter at close range. The IR, while not visible, is still a bright light. As with any bright light, avoid pointing directly into your eye.

Safety warning: Keep this device out of the reach of children.

SPECIFICATIONS

Electronic Viewing System

Resolution	640 X 480 pixels (VGA)
Effective Spectral Range	400 nm to 900 nm
Frame Rate	30 fps (frames per second)

Illumination

IR LED (collimated)	15 deg. 850 nm, 1000 mW
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Eyepiece

Eye Relief	68.50 mm (2.7 in)
Entrance Pupil	9.0 mm (.35 in)
Dioptr Adjustment	+4D ~ -4D

Objective Lens

Focal Length	52 mm (2.05 in)
Field of View	5.6 deg.
Aperture	40 mm Dia., (1.57 in) F:1.3
Focusing Distance	3 m to Infinity - (10 ft to infinity)

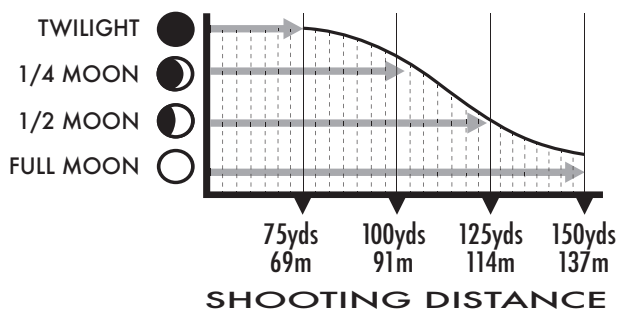
Scope

Effective Magnification	2.7X
Weight without batteries	500 g (1.10 lb)
Dimensions	335 X 69 X 102 mm 13.19 X 2.71 X 4.01 in

Power	4 pieces, AA-type Battery
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Weatherproof	IPX4
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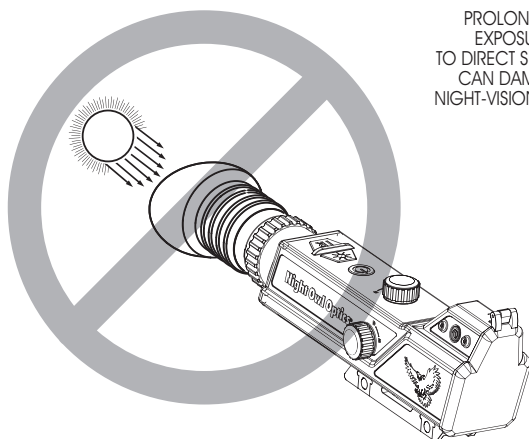
RANGE



The ability to see at greater distances is relative to the amount of available ambient light. Shooters report targeting up to 250 yards at night.

WARNING

DO NOT POINT EYEPIECE DIRECTLY AT THE SUN



PROLONGED EXPOSURE TO DIRECT SUNLIGHT CAN DAMAGE NIGHT-VISION OPTIC.

KEEP OUT OF REACH OF CHILDREN

TROUBLESHOOTING GUIDE

PROBLEM	SOURCE	SOLUTION
Short battery life.	Using low quality batteries.	Use high-quality alkaline or lithium batteries. Good batteries can last 4 to 7 hours (7-17 hours with lithium).
Cannot focus.	Night Scopes focus differently than day scopes.	Follow a 3-step process (Reference p.8) 1. Shut lens cap and focus on display. 2. Open lens cap; then use objective focus knob.
Shooting high or low; Cannot adjust reticle to get impact point to center of target.	High rail; the rail is higher than 2 inches above the center line of the gun barrel.	Call us at 1-800-444-5994, and we will send you, at no charge, a SHIM-KIT. You can install it in approx. 5 minutes with a phillips head screwdriver.
- Bright spot - Reflection - Excessively bright image - Washed-out - Overexposed image	1. Highly reflective surfaces on firearm or in front of the NightShot II. 2. Using the NightShot II in closed spaces may cause IR to reflect back into the scope. 3. Looking through windows can cause the IR to reflect back.	1. Cover up shiny surfaces. 2. Remove Iron Sight. 3. Move free of obstructions
Cannot see paper target if the target is reflective or light colored.	Reflective or light colored targets.	1. Use darker targets. 2. Don't use high-gloss targets 3. Tilt the target so IR reflection is not directly back at you.
At very close range the IR is not centered or reflects back.	IR is aligned for shooting distance, not indoor testing.	Shoot at appropriate hunting distance; stay clear of obstructions.
Specs appear with lens cap closed.	Artifacts of pinhole lens are not defects.	Lift lens cap. Anomalies will disappear.

FREQUENTLY ASKED QUESTIONS

Q: *How far can I see?*

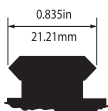
A: Users report targeting out to 100/250 yards at night. The ambient light conditions will determine how far you can see. Most night hunting is at a range of 50 to 100 yards.

Q: *Will NightShot II hold zero after dismount and remount?*

A: Yes, it will maintain zero. Be sure to place the scope back at the same position on the rail.

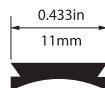
Q: *Will the NightShot II mount directly to your firearm?*

A: You must have a mounting rail attached to your firearm. The NightShot II attaches to the rail of the firearm using a Weaver or Picatinny rail mount.



NightShot II mounts directly to
WEAVER or PICATINNY RAIL MOUNT

Note: Weaver and Picatinny
have the same 0.835 dimension



DOVETAIL RAIL MOUNT

If you have a Dovetail rail as shown, you will need an adapter rail to convert this from Dovetail to Picatinny. Most Dovetails are 11mm, however, they can range in size for 9.5mm to 19.0mm. In any case, an adapter rail will be required.

Q: *Can I use the NightShot II with the IR Off?*

A: While IR illumination is not required in elevated ambient light conditions, in low-light conditions (e.g. twilight) the IR is required.

Q: *How do I use the IR for hunting in the shadows?*

A: If hunting by moonlight, the IR may not be required at full power in an open field. But if you aim into the shadows (e.g. under a tree), you will need the IR Illumination, usually at full power.

Q: *Can the NightShot II zoom?*

A: No. The NightShot II is fixed 2.7X magnification night vision technology. It does not zoom the same way a day scope does.

FREQUENTLY ASKED QUESTIONS Continued

Q: *How is using a Night Scope different from using a day scope?*

A: 1. **FOCUS:** Setting the optical focus to your individual eyesight is different with a night scope. When adjusting the focus on a day scope, you look at the target and then adjust the eyepiece, **Night Scopes require you to look at the display screen and focus your eyesight onto the screen.**

2. **VARIABLE MAGNIFICATION:** Day scopes use an adjustment ring for variable optical magnification. A night scope does not have this ring. The ring in front of the rubber eyeshade is for **ADJUSTING** to the user's eyesight.

3. **OPTICAL CLARITY:** Day scopes look directly at the target through lenses. Night scopes reproduce a light-amplified image on a pixelated display screen.

Q: *Can I use the NightShot II in daylight?*

A: Yes, it is okay to use during the day. If using in daylight leave the lens cover closed to avoid over-exposure. The NightShot II is designed to amplify light, so pointing toward the sun will over-expose the image. If sighting in the scope during the day, keep the sun at your back or close the lens cap.

Note: If the lens cap is closed, rotating the focus knob will not change the focus. The focus is fixed while the lens cap (with pinhole) is closed over the objective lens.

Q: *Will bright light damage the scope?*

A: The NightShot II is **not subject to bright light damage** the way traditional intensifier tube technology is. **CAUTION:** Prolonged exposure of the eyepiece to direct sunlight can damage the eyepiece optic.

Q: *What is a Digital Night Vision Scope?*

A: NightShot II uses optics, electronics and, if necessary, an active infrared illuminator to amplify light. Bright light will not damage the sensors. Conventional night scopes use image intensifier tubes that degrade with use and can burn out when exposed to bright light.

Q: *Can prey animals see the glow of the IR?*

A: Extensive testing and user feedback concludes that animals do not react to, or perceive, the IR glow.

FREQUENTLY ASKED QUESTIONS Continued

Q: *How can I increase battery life?*

- A:**
1. Purchase the accessory IR (IR850-NS), so that the 4xAA batteries are not powering IR.
 2. Operate at max-IR only when required.
 3. Set IR at low to start. Increase IR intensity only as required of each shooting environment.

Q: *Does NightShot II work straight out of the box? Any software updates?*

- A:** NightShot II is turn-on-and-go. No complicated set-up or software loading is required.

Q: *Why is the image not green, like some other night vision scopes?*

- A:** Traditional night vision, containing an image intensifier tube, has a green-colored screen for high resolution. NightShot II uses digital monochrome technology.

Q: *Can I use NightShot II together with another scope?*

- A:** No. NightShot II is a stand-alone night vision scope.

Q: *How is NightShot II technology different than Gen1, Gen2 or Gen3?*

- A:** Night scopes using Gen1, 2 or 3 image intensifier technology use vacuum tubes. Such tubes degrade with use and can be damaged by bright light. NightShot II is solid-state technology and is not damaged by exposure to bright light.

Q: *Why can't I lock down the turret protective caps?*

- A:** The protective caps are designed to slip a thread if overtightened. Rotate clockwise until snug to secure in place. They are designed this way to protect the turret components.

One-Year Limited Warranty

The NightShot II Rifle Scope is warranted against defects in materials and workmanship under normal use for one year from the date of purchase to the original owner. Damage due to neglect, accidental damage or misuse of this product is not covered under this warranty. Decisions regarding abuse or misuse of the product are made solely at the discretion of the manufacturer.

Proof of Purchase is required to make a claim under this warranty.

Liability under this warranty is limited to replacing or repairing, at our option, the NightShot II returned, shipping cost prepaid, to Night Owl Optics.

To return your scope for service, please first contact us for a Return Authorization (RA) Number.

NOTICE TO CUSTOMERS OUTSIDE THE U.S.A.

This warranty may vary in other countries; check with your distributor for details. Warranty does not cover shipping costs to or from the U.S.A.



Keep this device out of the reach of children.

Follow this link for
summary of scope
operation



Night Owl Optics®

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Warranty Service:

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www.nightowloptics.com

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