



# LN-EBG 1

*NIGHT VISION BI-OCULAR GOGGLES*

# LN-EBG 1-PRO

*NIGHT VISION BI-OCULAR GOGGLES*

## INSTRUCTION MANUAL

**IMPORTANT:** Please read this manual in its entirety prior to using this device!

## INTRODUCTION

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Thank you for purchasing a quality LUNA OPTICS® product. With proper care and maintenance your device will provide many hours of operation and outstanding reliability. Please read this manual – it is your key to enjoying this exciting and hi-tech product!

## NIGHT VISION

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Without getting too technical and confusing, let's try to understand how this device works and what it can and cannot do:

1. Your night vision device works on the principle of amplifying (intensifying) available light. The process is called light amplification. A special tube inside the device does the job – all you have to do is to power the device on and the tube starts amplifying whatever the light is available at the moment – therefore it is important to understand that this device is not suitable for daylight operation, since there is already enough light available during daytime to see without any additional help. **Therefore, the first and most important rule of any night vision device is – never use it during daylight, or in any bright light conditions, which allows you to see well with your naked eyes!**

2. Your night vision device operates with batteries. Unlike a daylight binocular, where you see the image due to light traveling through the glass and the prisms, the night vision device works by projecting the amplified image onto a screen. While the tube is the crucial component of any night vision device, the optical parts of the unit are also very important, as they gather the light into the tube and bring the projected image to your eye. Since the image is projected on the screen, just like any TV, it has certain limited resolution...so please

do not expect your night vision device to provide the same crystal clear image, as you see through your daylight binoculars – after all, you are using this device in the dark environment, where normally your vision would

be very limited...oh, and another important point – all night vision devices have green monochrome image – why green? Because human eye can distinct most details of the viewing image when presented in green color...other colors do not show you everything...

**3.** Another very important notice – since your night vision device amplifies available light thousands of times – please be sure not to turn the unit on during daylight or in a well-lit room – the image will be way too bright for your comfortable viewing and it also may permanently burn the tube inside the unit and will surely void your warranty. Please note that for the safety of this device it has a lens cover with a little pinhole – to test the unit during daytime when you bring your newly bought unit home, or in the shop before you buy it. Please keep this lens cover on during daytime – even if the unit is turned off. In addition to the lens cover, as a protection, this unit is equipped with automatic gain control, which protects the tube from being exposed to bright light. It is an effective way to escape most dangerous situations however we urge you to still care for this unit as if this protection is not present and please avoid any prolonged exposure to bright light.

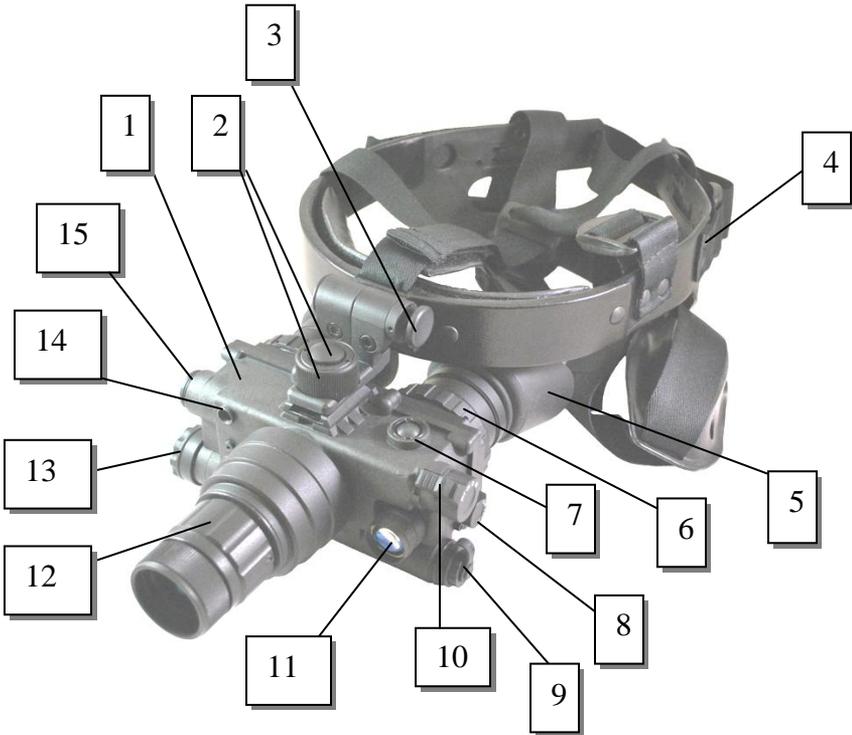
## **OPERATION:**

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Now that we've covered some of the basics of the technology behind the night vision, let's learn how to operate your new device:

Please look at the next page to identify all the parts of the unit.

## LN-EBG1-PRO ELITE NIGHT VISION BI-OCULAR GOGGLES



### Glossary:

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- 1 – Body
  - 2 – Release mechanism (button and wheel)
  - 3 – Flip-up button
  - 4 – Head-mask
  - 5 – Eyecup
  - 6 – Ocular
  - 7 – Momentary IR Switch
  - 8 – Menu Switch (PRO model only!)
  - 9 – External Power Jack (PRO model only!)
  - 10 – Power and IR illuminator switch
  - 11 – Distant IR illuminator (IR2)
  - 12 – Objective lens
  - 13 – Battery Compartment Cover
  - 14 – Close-Up IR illuminator (IR1)
  - 15 – Dehydrator cartridge
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## **INSTALLING THE BATTERIES:**

Your night vision unit operates on commonly available 2 AA-type batteries.

To install the batteries, unscrew the battery compartment cover (13), and install the batteries inserting the positive (+) end first. Once the batteries are inside, replace the cover.

## **USING THE UNIT AS A HANDS-FREE GOGGLES SYSTEM:**

**IMPORTANT: FOR MODEL LN-EBG1-PRO PLEASE READ SECTION "MENU SWITCH" ON PAGE 9 ENTIRELY PRIOR TO USING YOUR GOGGLES WITH THE HEAD-MASK!**

Your night vision bi-ocular can be used on a head-mask, providing hands-free operation. Mounting is easy and convenient:

1. Slide in the rail of the head-mask into the pathway located on top of the unit near the Momentary Switch button.
2. Tighten the wheel of the release mechanism (2) (Please note that you may not need to slide the rail all the way into the pathway – make sure that the distance between the bi-ocular eyecups (5) and your eyes is comfortable – if it is not, loosen the release system wheel and while pressing the release button, slide the unit inward or outward until your eyes are comfortably positioned next to the eyecups)
3. When goggles are not needed, you may conveniently flip-up the entire binocular by pressing the flip-up button (3) with your index or large finger while grasping onto the body of the bi-ocular with the rest of the hand and pulling the body upwards. Repeat the procedure in reverse way to flip the bi-ocular down
4. To completely remove the bi-ocular from the head-mask, loosen the release wheel and while pressing on the release button, slide the unit outward



## **TURNING THE UNIT ON AND OFF:**

Your night vision unit has a special power and IR switch (10), which allows you to easily switch between ON and OFF modes, while protecting you from accidentally switching on the IR illuminator. To turn the unit ON, first remove the objective lens cover (ONLY IN THE DARK!) and rotate the switch by one dial to ON position. Look through the oculars – you should see green glow. Even if the image is not yet sharp, the unit is operating. To turn the unit OFF rotate the same switch backwards one dial to OFF position. The green glow will disappear if you turn the unit off correctly. Always replace the objective lens cover after the unit is turned off and no longer is in use.



## **FOCUSING THE UNIT:**

To obtain the sharp image, you must first rotate each ocular wheel (6) one-by-one in either direction, until you notice in which position the image is at its best. After that, rotate the objective lens (12) also until the image is at its best. You may have to repeat the process again, until the image is sharp and clear. Once the clear image is obtained, you no longer need to adjust the oculars, just rotate the front objective lens to adjust the distance to the object you are viewing.

## **ADJUSTING DISTANCE BETWEEN EYEPIECES:**

Your LN-EBG1 (EBG1-PRO) feature adjustable oculars (eyepieces). This feature helps to ensure the image appears as one circle, which provides the most comfortable viewing, even when using your goggles for a long period of time. After you turn the



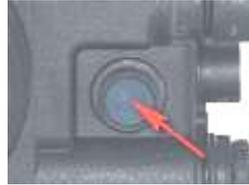
power on and after you adjust the focusing to the best possible image, make notice of the image and see if it appears as one single circle. If it does, then there is no need to adjust the distance between the eyepieces. If the image appears as if one circle is on top of another, then you need to either pull apart the eyepieces or push them in together until the image appears as one perfect circle (see image on the right).

## USING INFRARED ILLUMINATOR:

Your night vision monocular is equipped with two separate built-in Infrared illuminator lights. The Infrared light operates in a spectrum, which is normally invisible to a naked human eye, however with the help of the tube, located inside the unit, you will see a beam of light when looking through the ocular lens. This Infrared light is here to assist you in especially dark conditions, where there is not enough light for the tube to amplify.



The first illuminator (IR1) (see insert image on the right) operates on wavelength of 860nm and provides close-up illumination while being completely invisible to the naked eyes and animals (even if looked directly at the illuminator lens).



Second illuminator (IR2) (see insert image on the right) operates at a wavelength of 805nm and provides distant illumination. This illuminator light can be seen if looked directly at the illuminator lens, however its beam of light is still invisible to the naked human eyes.

To turn the close-up Infrared illuminator (14) ON, first make sure the unit is ON then rotate the Power Switch (10) to the IR1 position. To do that, you must gently pull the top slide lever of the switch with your index finger and then rotate the switch one



dial. When looking through the ocular lens, you will notice a faint green indicator light at approximately 6 o'clock position outside of the field of view – this is to remind you that the infrared light is on. To turn the infrared light off, rotate the power switch one dial back to ON position.

Please note that it is possible to momentarily turn the 805nm illuminator on by pressing the momentary IR button (7). This button will only turn on the distant illuminator (11), not the close-up illuminator (14)



To turn the second (distant) IR illuminator (11), rotate the switch one more dial to the IR2. Look through the oculars and you will notice a faint red light indicator at approximately 7 o'clock position outside of the field of view. This is an indication of the IR illuminator working. The second IR illuminator is much more powerful and will provide approximately 25-35yds of light beam to assist your viewing in complete darkness. To turn the second IR off, rotate the switch either one dial back to IR1, or two dials back to ON position.

The second IR illuminator comes with a removable focusing head lens (see insert image below) allowing you to either narrow the light beam (for increased distance) or to spread the beam across the entire field of view when



operating on shorter distances. Rotate the head lens gently outward to narrow the beam, but stop rotating once you feel the lens hit a barrier. Rotate the lens inward until full stop to widen the beam. Your goggles are shipped with head lens installed and we do not recommend to ever removing the IR lens.

When using the infrared illuminator it is important to remember that like a flashlight, it is brightest when used in short distances. As the distance increases, the intensity of the infrared light fades away.

### **AUTOMATIC GAIN CONTROL AND PROTECTION SENSOR:**

Please note that the unit is equipped with the special Auto-Gain control, which would not allow you to turn on the unit without the lens cover in a well-lit area, as well as will protect your unit in case of an accidental, or sudden exposure to a bright light. Please note that even though this is an



effective protection source, we at Luna Optics still strongly recommend avoiding any such exposures to bright light, especially prolonged ones in order to preserve the full life of the tube. In addition to the gain control, you may choose to activate the additional light protection sensor by rotating the Menu Switch (8) to P position.

### **MENU SWITCH (PRO model only!):**

Your night vision goggles come with special Menu Switch (8) which allows you to select 4 different levels of operation:



- The default selector level is **L+P**, which provides manual operation without head-mask and relies on auto-gain feature to protect the unit from excess light. **It is recommended to switch to this level when using the device as hand-held binocular (not on the head-mask) and at the nighttime when risk of bright light exposure is limited.**
- Next level is **L** – it is used when goggles are mounted on a head-mask and provides an automatic power shutoff when goggles are flipped up and automatic power on when goggles are flipped down. **This level can only be used while unit is mounted on the head-mask – the unit will not turn on if the menu switch is at this level while using the device as hand-held binocular.**
- Next level is **ALL** and it is identical to level **L** except it turns on the light protection sensor in addition to the automatic gain control. **This level is only useful when mounted on the head-mask and a risk of bright light exposure exists.**
- Last level is **P**, which turns on the light protection sensor in addition to the gain control, providing extra level of light protection especially in situations when you are suddenly exposed to the excessive and dangerous amounts of light. This feature immediately shuts off the unit in such situations. **It is recommended to switch to this level while using the device as a hand-held binocular and if risk of bright light exposure exists.**

## **EXTERNAL POWER SUPPLY (PRO model only!):**

It is possible to connect an optional external power supply to the goggles in order to operate them during extreme cold of greater than minus 10 degrees Centigrade. Please inquire about the external power supply availability from your local dealer or write to us at [info@lunaoptics.com](mailto:info@lunaoptics.com)



## **NITROGEN GAS FILLING (PRO model only!):**

It is possible to fill your LN-EBG1-PRO with dry air or nitrogen gas to prevent lens fogging in extremely cold temperatures. Please inquire about the nitrogen gas filling kit from your local dealer, or you may buy an aftermarket kit, or write to us at [info@lunaoptics.com](mailto:info@lunaoptics.com)



## **DEHYDRATOR CARTRIDGE:**

Your LN-EBG1 (LN-EBG1-PRO) is equipped with a special cartridge, which allows you to remove any moisture from the unit in the unlikely event of uncontrolled depressurization. (See image on the right). Each unit is shipped with an additional replacement cartridge, which can be found in the front compartment of the carry case.



## **TROUBLESHOOTING:**

**1. Unit does not turn on:**

- a) please check if the batteries are inserted according to the diagram
- b) please make sure the batteries are fresh
- c) make sure the Menu Switch is in **L+P** mode (when not attached to the head-mask), or in **L** mode (when attached onto the head-mask)

**2. Unable to obtain sharp and clear image:**

- a) you may need to repeat the process of rotating each ocular and objective lens several times until you get a good feel of it
- b) You may be viewing an object that it too close – the minimum focusing distance is approximately 25cm or 10 inches
- c) You may have dirty objective or ocular lens – you may clean them with soft lens cleaning cloth

**3. There are black dots (specs) in the field of view:**

**THIS IS NORMAL – BLACK DOTS ARE MICROSCOPIC PARTICLES INSIDE THE TUBE AND RESULT FROM THE TUBE MANUFACTURING PROCESS, WHICH IS NEVER COMPLETELY SPEC-FREE**

## **IMPORTANT INFORMATION:**

**NEVER:**

1. Intentionally turn on the unit without lens cover during daylight or in a well-lit area
2. Allow laser beam or projector light to hit the objective lens without the lens cover on.
3. Try to disassemble the unit by yourself or by anyone who is not our authorized technician. Doing so may result in injury and will void any warranty claims
4. Leave the batteries inside the unit for a long period of time – the batteries may overheat and leak, which will render the unit inoperable and will void the warranty
5. Submerge the unit into water – the unit does have water-resistant protection, but is not submersible on any depths for any period of time

## AVAILABLE ACCESSORIES:

Your night vision goggles may be accessorized with the following products to enhance the viewing experience:

1. EXTENDED RANGE LED IR ILLUMINATOR

**MODEL LN-EIR1** provides powerful IR beam for up to 300m

2. HIGH MARGNIFICATION OBJECTIVE LENS

**MODEL LN-L100** for 4x image magnification

**MODEL LN-L165** for 7x image magnification

Please e-mail us at: [info@lunaoptics.com](mailto:info@lunaoptics.com) for accessories pricing and availability. Please indicate the product model (**LN-EBG1** / **LN-EBG1-PRO**) when contacting us.

## TECHNICAL SPECIFICATIONS:

Magnification \_\_\_\_\_ 1x  
Focusing Distance \_\_\_\_\_ 0.25m - ∞  
Objective Lens \_\_\_\_\_ F 1.1/27mm  
Field Of View \_\_\_\_\_ 40°  
Diopter Adjustment \_\_\_\_\_ +/- 4  
Eye base adjustment \_\_\_\_\_ 58mm – 72mm  
Detection range (1.8m object /  $3 \times 10^{-3}$ lux) \_\_\_\_\_ 150 – 250m  
Power Supply \_\_\_\_\_ 2 x AA batteries  
Working time (w/o IR) \_\_\_\_\_ 60hrs  
Temperature Range:  
AA Batteries \_\_\_\_\_ -10C / +50C  
External Power Supply (PRO model only!) \_\_\_\_\_ -40C / +50C  
Dimensions \_\_\_\_\_ 158mm x 139mm x 64mm  
Weight \_\_\_\_\_ 550g

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