

# PD-PRO-Q

Panoramic Night Vision Goggle

### Safety

- This manual contains operating instructions and maintenance procedures which may cause injury to personnel, or damage to equipment if not properly followed.
- Prior to performing any task, the WARNINGS, CAUTIONS and NOTES included in that task shall be reviewed and understood.
- An internal component within the image intensifier tube contains toxic materials. During normal operation, the user will never come into contact with this component. However, if the tube is damaged or broken, avoid inhalation or ingestion of the phosphor screen materials, and avoid contact with open wounds. If the toxic material comes into contact with your skin, wash the affected area with soap and water. If any material is swallowed, drink large quantities of water, induce vomiting and seek medical advice as soon as possible.
- The objective protective cover must always be fitted on the device when the night vision goggle is not in use. Damage to the image intensifier can occur if subjected to a strong light source for extended periods, even when power is switched off.
- Never point the **PD-PRO-Q PANORAMIC NVG** towards a bright light source such as the sun. City lights, car lights or any brightly reflecting object will not damage Auto-Gated tubes.
- Always remove the battery after use and before repackaging.
- Dry the **PD-PRO-Q PANORAMIC NVG** completely before storage into the transit/carrying case.

### Warning

- Highlights an essential operating or maintenance procedure, practice, condition or statement which, if not strictly observed, could result in injury to personnel or long-term health hazards.
- Use of off-brand batteries poses a risk of fire or explosion. Ensure that only lithium batteries produced by a well-known battery manufacturer are installed in the **PD-PRO-Q PANORAMIC NVG**. These batteries are specifically designed for use in high performance, high-drain, devices, and contain built-in fault and heat protection features.
- Do not use the **PD-PRO-Q PANORAMIC NVG** with a mix of old and new batteries, or batteries of different brands.
- Emission of stray light from the eye pieces may be detectable to other observers.
- Isopropyl alcohol is flammable and toxic. To avoid injury, keep away from open fire and use in a well-ventilated area.

## Caution

- Highlights an essential operating or maintenance procedure, practice, condition or statement, which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.
- NOTE: Highlights an essential operating or maintenance procedure, conditions or statement.
- Do not ship or store the **PD-PRO-Q PANORAMIC NVG** battery packs with batteries installed.
- The **PD-PRO-Q PANORAMIC NVG** is a precision optical instrument and must be handled carefully at all times to minimize risk of damage.
- Pointing the **PD-PRO-Q PANORAMIC NVG** directly at the sun may permanently damage internal imaging components.

## Limited Warranty

The manufacturer of this device has provided a limited warranty to the original purchaser. It was attached to manufacturer's terms and conditions of sale.

Manufacturer proprietary

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# Chapter 1

## General Description

### 1. Scope of Manual

This manual provides description, operating instructions and field maintenance procedures for the **PD-PRO-Q PANORAMIC NVG**.

This manual is intended to help you to operate and properly maintain the device and promote trouble-free and efficient operation.

### 2. Abbreviations and Acronyms

<b>BNVIS</b>	Binocular Night Vision Imaging System
<b>C</b>	Celsius
<b>cm</b>	Centimeter
<b>FOV</b>	Field of View
<b>g</b>	Grams
<b>I<sup>2</sup></b>	Image Intensified
<b>IPD</b>	Interpupillary Distance
<b>ITAR</b>	International Traffic in Arms Regulations
<b>m</b>	Meter
<b>mm</b>	Millimeter
<b>N/A</b>	Not Applicable
<b>NVG</b>	Night Vision Goggle
<b>RECM</b>	Recommended
<b>RMA</b>	Return Material Authorization
<b>TBD</b>	To Be Determined
<b>V</b>	Volt

### 3. PD-PRO-Q PANORAMIC NVG

#### **CAUTION**

The **PD-PRO-Q PANORAMIC NVG** is a precision electro-optical device.

**HANDLE IT WITH CARE!**

#### 3.1. General Description

The **PD-PRO-Q PANORAMIC NVG** (see Figure 1 and Figure 2) is a ruggedized, metallic alloy hybrid construction Panoramic Night Vision Goggle system. It offers a high resolution and clear bright image in a lightweight configuration.

The **PD-PRO-Q PANORAMIC NVG** operation is passive; the light available at the scene is electronically intensified so that targets can be observed without artificial illumination.

The **PD-PRO-Q PANORAMIC NVG** is powered by 4 "AA" 1.5V, alkaline or lithium battery, for operation under every ambient temperature from -51°C to +55°C.

## Night Vision

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The **PD-PRO-Q PANORAMIC NVG** includes a yellow led in the field of view for indicate LOW BAT condition and a red led in the field of view for indicate IR light is active.

The **PD-PRO-Q PANORAMIC NVG** is equipped with a built-in Infra-Red (IR) light, which gives additional close-range covert illumination. The bandwidth is user definable at P.O.

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### **WARNING**

**When the IR light is activated, the emitted light can be detected by other image intensifying equipment.**

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Figure 1 PD-PRO-Q PANORAMIC Major Components



### 3.2. Major Components

Key	Major Component	Function
1	Hard Shell Case	Used to store and protect <b>PD-PRO-Q PANORAMIC NVG</b>
2	Goggle Case	Provides protection for the <b>PD-PRO-Q PANORAMIC NVG</b> and all accessories during use in missions
3	Battery Pack	Provides secure housing for up to four 1.5V "AA" alkaline or lithium batteries used to power the <b>PD-PRO-Q PANORAMIC NVG</b> , the IR illuminator and the IR back strobes. Additional connector for Clip-on IR thermal fusion device. Mounts to the back of the helmet with hook and loop fastener tape.
4	User's Manual	Provides detailed operating and maintenance procedures specific to the <b>PD-PRO-Q PANORAMIC NVG</b> .
5	Quick Reference Guide	Provides at-a-glance operating procedures for the <b>PD-PRO-Q PANORAMIC NVG</b> .
6	Power Cable	Provides a power connection between the battery pack and the <b>PD-PRO-Q PANORAMIC NVG</b> bridge assembly.
7	Snap-On Lens	Set of pair of lenses with a diopter power between -3 to +3 diopters whit intervals of 0.25 diopters
8	Sacrificial Lens	Set of four lenses for protect the objectives
9	NVLS-24	Is a universal adapter that allows use the <b>PD-PRO-Q PANORAMIC NVG</b> attached to a helmet or a face mask
10	<b>PD-PRO-Q PANORAMIC NVG</b> Assembly	The <b>PD-PRO-Q PANORAMIC NVG</b> is a helmet-mounted night vision device that allows for observation and target identification under adverse conditions including light rain, light snow, and low light.
11	Objective Cover	Set of four protectors for prevent day light and intense light sources damaging IIT
12	Soft Case	For carrying the goggle case and all accessories during use in missions

**Table 1 List of Major Components**

### 3.3 Features and Controls

The **PD-PRO-Q PANORAMIC NVG** is composed of the following main operational components (see Figure 2):

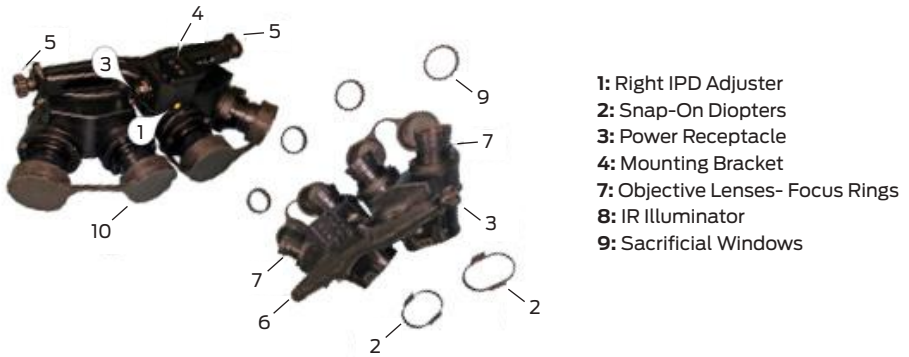


Figure 2 PD-PRO-Q PANORAMIC Controls

Key	Major Component	Function
1	Right and left IPD Adjuster	Used to adjust the distance between the right and left monocular assemblies.
2	Snap-On Diopters (16)	Fit over the PNVG eyepieces to compensate ametropia of individual users.
3	Power Receptacle	Connects the PNVG to a battery pack via the power cable.
4	Mounting Bracket	Provides for attachment to a helmet equipped with a BNVIS–style mount.
5	Lanyard Tie-Down Point (2)	May be used to secure the <b>PD-PRO-Q PANORAMIC NVG</b> to the user with a lanyard or other appropriate material.
6	Objective Lenses / Focus Rings	Used to focus the PNVG for viewing objects at near to far distances.
7	IR illuminator	Auxiliary IR illuminator.
8	Sacrificial Windows (4)	Protect the objective lenses from damage during operation.
9	Objective Cover (2 set)	Protect the IIT from high Light
10	Eyepiece Cover (2 set)	Protect Eyepiece while not in operation.
11	Cable Guide	Holds cable to the helmet.
12	Power Supply Unit (PSU)	Supplies energy to the goggle and holds the IR beacons.
13	Power Cable	Connects goggle and PSU.

Table 2 List of Features and Controls

**WARNING**

**IMPORTANT NOTE FOR YOUR SAFETY:**

The use of the IR illuminator in open spaces makes the user visible for friendly or hostile users with night vision. We recommend using it only in confined spaces or extreme situations.

**3.3.1 IR Illuminator/Beacon Switches**

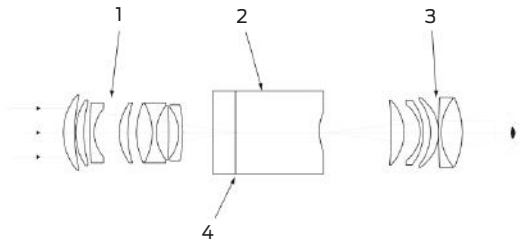
The **PD-PRO-Q PANORAMIC NVG IR** switch turns on a low-range IR illuminator (930nm) to use the system in very low light conditions.

The rear power pack features two switches in the bottom part, activating the frontal IR illuminator or the two IR beacons.

**3.3.2. Operating Principle**

The **PD-PRO-Q PANORAMIC NVG** operation principle is depicted in Figure 3 and is the same for four goggle arms. Light entering the objective lens (1) in the form of light energy, focused onto the photocathode (4). The photocathode is a light-sensitive surface, when light hits the surface it emits electrons.

The optical image is transformed into an electronic one, intensified by a micro-channel plate, and projected onto the phosphor screen at the rear of the image intensifier. This can then be seen through the eyepiece (3).



**Figure 3 PD-PRO-Q PANORAMIC Operating Principle**

The **PD-PRO-Q PANORAMIC NVG** uses 4G+, high performance image intensifier tubes, designed and manufactured for use in this system, characterized by a very high resolution and signal to noise; low weight, high gain, reduced halo and reduced blooming effect, which normally occurs when viewing a bright light source.

The tube also contains Automatic Brightness Control (ABC) and Bright Source Protection (BSP) and V4 Auto Gated power supply, that gives a steady state of screen brightness under varying light conditions and high resolution, including conditions normally too bright for a night vision device.

## Night Vision

### 3.4 Technical Data

#### Weight and Dimensions

Goggle Weight	760 g
Length	100 mm
Width	210 mm (variable IPD)
Height	90 mm

#### Positioning Adjustments

Fore and Aft	12.7 mm
Interpupillary Distance (IPD)	55 to 75 mm
Tilt	15°
Objective Focus	20 cm to infinity

#### Power and Performance

Batteries	4 "AA" Lithium or Alkaline (1.5 V)
Battery Life	> 35 hours (4x Lithium 1.5V)
IR Illuminator	Frontal 930 nm
2x IR back strobes	930 nm
Automatic shut-off/on	Flip up off / flip down on
Magnification	1x ( $\pm 2\%$ )
Horizontal Field of View	104° ( $\pm 1^\circ$ )
Vertical Field of View	38° ( $\pm 1^\circ$ )
Diopter Adjustment	+1.50 to -1.50 (with use of 0.25D or 0.5D stepped Snap-On lenses)
Operating Temperature	-51°C to +55°C
Storage Temperature	-55°C to +71°C
Immersion	1 m for 2 hours

### 3.5 Auto-Gating

When using auto-gated tubes there will be no shut down of the tubes, even at high light levels of 5000 lux. The center resolution stays at not less than 55 lp/mm under 200 lux, allowing a normal operation at dynamic light levels conditions.

## 4. NVLS-24 Adapter

The NVLS-24 adapter is necessary to power on the Goggle and enables head-mounted use of the **PD-PRO-Q PANORAMIC NVG** (using any standard VAS shroud assembly). The adapter features the following controls (see Figure 4):

- Emergency Quick Release Slider:** Slide in for a stable hold (parachuting) and slide out for using with emergency expulsion activated.
- Height Control:** Move CW in order to adjust height and then turn CCW to secure the position.
- VAS Shroud Locking Lid:** Press to release or inserts the NVLS-24 adapter.
- Flip-Up:** Press to release and flip up or down the PNVG from field of view and thus to switch off and on the device.
- Eye Relief Control:** Press the two buttons at the same time, slide forward and backward and release the buttons for final set.

6. **Goggle Release:** Press to release **PD-PRO-Q PANORAMIC NVG**.
7. **Tilt Control:** Turn CW or CCW to adjust the angle of vision. The battery pack is used as counterweight. User can decide if additional counterweight is needed.

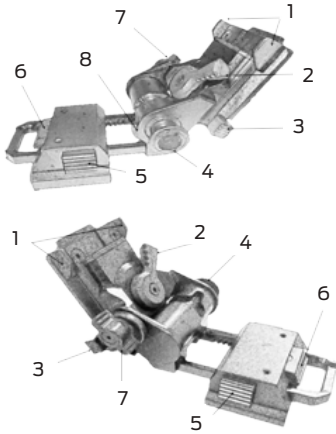


Figure 4 NVLS-24 Adapter



Figure 5 PD-PRO-Q  
Different Configurations

## 5. Cleaning

### CAUTION

- The goggles are 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 shields with lens paper while wet or with wet lens paper can damage the coating.
- Clean goggles with water if necessary and dry completely (preferable with dry pressured air). Clean lenses with lens paper (and water if necessary, except for demist shields). Demist shields must be dry before being cleaned with dry lens paper.

## 6. Optional Accessories

The **PD-PRO-Q PANORAMIC NVG** may be supplied with one or more of the optional accessories described in the following paragraphs.

### 6.1. Goggle Case

The goggle case (figure 6) is used for carrying the **PD-PRO-Q PANORAMIC NVG** under field conditions. The goggle case provides protection from field damages.



Figure 6 Goggle Case

### 6.2. Carrying and Storage Hard Shell Case

The hard-shell case (Figure 7) is used for storing the soft case with **PD-PRO-Q PANORAMIC NVG** and its accessories under field conditions. The case is water and air-tight and its interior is prepared to accommodate the soft case.

### 6.3. Snap-On Diopters Windows



Figure 7 Hard Shell Case

The Snap-On Diopters Windows (see Figure 8) are designed to correct the user's vision defects so that they can use the **PD-PRO-Q PANORAMIC NVG** without the need of corrective glasses.

The **PD-PRO-Q PANORAMIC NVG** is equipped with a set of Snap-On Diopters Windows capable to correcting a diopter range from -1.5 to +1.5 diopters with the following values:

-1.5; -1.0; -0.5; -0.25; +0.25; +0.5; +1.0; +1.5D.

An extended range of diopters or customized prescriptions are available under request.

The Snap-On Diopters Windows must be handled by the edge only. Special attention shall be paid to cleaning and handling of the shield.



Figure 8 Snap-On Diopters Windows

#### 6.4. Sacrificial Window

The **PD-PRO-Q PANORAMIC NVG** is provided with sacrificial windows (see Figure 9) to protect the objectives and lens from scratches caused by blowing sand or other abrasive conditions. In order to install them on the **PD-PRO-Q PANORAMIC NVG** the sacrificial windows should be screwed over the objectives or eyepieces lens. Position 2. Turn to final stop for momentary activation of IR illuminator.



Figure 9 Sacrificial Window

## Chapter 2 Operation

### 7. General

This chapter provides operating instructions for the **PD-PRO-Q PANORAMIC NVG**.

#### CAUTION

The **PD-PRO-Q PANORAMIC NVG** is a precision electro-optical device - handle it with care!

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### 8. Safety

An internal component within the image intensifier tube contains toxic materials. During normal operation, the user will never come into contact with this component. However, if the tube is damaged or broken, avoid inhalation or ingestion of the phosphor screen materials, and avoid contact with open wounds.

- a. If the toxic material comes into contact with your skin, wash the affected area with soap and water. If any material is swallowed, drink large quantities of water, induce vomiting and seek medical advice as soon as possible.
- b. The objectives protective covers must be fitted at all times when the night vision goggle is not in use. Damage to the image intensifier tubes can occur if subjected to a strong light source for extended periods, **even when power is switched off**.
- c. Never point the night vision goggles towards the sun, even when shut off and with an objective cover with pinhole. The center of the photocathode can be damaged. When training at daylight a totally shuttered objective cover or a neutral density filter has to be used. A searchlight, a camera flash or any brightly reflecting object, at distances of more than 5 meter will not damage auto-gated tubes. Never point a visible or IR laser towards eyepiece or objective as the tube will be damaged permanently.
- d. Rinse thoroughly in tap water after immersion in sea water to prevent drying of salt deposits.
- e. Dry the night vision goggle completely before replacing it in the tactical bag or hard-shell case.

### 9. Preparation for Use

#### 9.1. Unpacking the Equipment

- a. Open the shipping/storage case and verify that all major components listed in Table 1 are present. Check the **PD-PRO-Q PANORAMIC NVG** assemblies to ensure the following additional items are installed.
  - Sacrificial Window (4)
  - Snap-On Diopters (2)
- b. If any of the major components or items listed above is missing, try to replace with spare parts.



## 10. Inspection of the Equipment

Before use, inspect all pieces of equipment for any damage such as cracks, loose parts, faulty cables, or other visible defects. If any damage or defects are noted, seek guidance from the equipment issuing authority.

## 11. Features and Controls

### Important Note

To power on the **PD-PRO-Q PANORAMIC NVG GOGGLE**, NVLS 24 helmet adapter must be attached to the goggle by the dovetail and in "operation" position.

Table 4 provides a brief functional description of each item. The "Key" column in Table 4 corresponds to the label numbers in Figure 2.

Key	Major Component	Function
1	Right and Left IPD Adjuster	Used to adjust the distance between the right and left monocular assemblies. Accommodates differences in distance between the left and right eyes of individual users.
2	Snap-On Diopters (16)	Fit over the <b>PD-PRO-Q PANORAMIC NVG</b> eyepieces to compensate ametropia of individual users.
3	Power Receptacle	Connects the <b>PD-PRO-Q PANORAMIC NVG</b> to a battery pack via the power cable.
4	Mounting Bracket	Provides for attachment to a helmet equipped with a NVLS-24 adapter.
5	Lanyard Tie-Down Point (2)	Usually used to secure the <b>PD-PRO-Q PANORAMIC NVG</b> to the user with a lanyard or other appropriate material.
6	Objective Lenses / Focus Rings	Used to focus the <b>PD-PRO-Q PANORAMIC NVG</b> for viewing objects at near to far distances.
7	IR Illuminator	IR light to see under conditions of extreme lack of light.
8	Sacrificial Windows (4)	Protect the objective lenses from damage during operation.
9	IR illuminator Button (4)	Used to turn the IR illuminator on and off.
10	IR Beacon	Used to indicate user's presence to other team members.
11	IR Beacon Button	Used to turn the beacons on and off.
12	IR on indicator	Light indicator (colour red) within the eyepiece's field of view indicating that the IR is on.
13	Low Batt indicators	Light indicator (yellow) within the eyepiece's field of view indicating that the batteries are near empty.

Table 4 Features and Controls

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## 12. Battery Handling

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**WARNING**

Do not use the **PD-PRO-Q PANORAMIC NVG** with a mix of old and new batteries of different brands.

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**CAUTION**

Do not store or ship PNVG battery packs with batteries installed.

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### 12.1. Battery Inspection

Before installation, inspect batteries for any cracks, dents, leakage, or bulging. Never install a defective battery in the **PD-PRO-Q PANORAMIC NVG** battery pack.



Figure 10 Battery Installation

- Open the battery pack by completely unscrewing the thumbscrews located on top of the battery pack (see figure 10).
- Insert two batteries with proper polarity in battery port, and insert this in the battery pack. Proper battery orientation is clearly marked on the battery pack.
- Repeat the previous operation for the other port.
- Reseat the top cover of the battery pack and secure the two halves by turning the thumbscrew clockwise.

### 12.2. Activating the IR light

**WARNING**

When the IR light is activated, the emitted light can be detected by other image intensifying equipment.

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**NOTES**

- The Infra-red (IR) light is not visible to the naked eye.
- The use of a 930 nm IR diode will make it hardly visible for Gen 3 users.
- To activate the IR light, proceed as follows:
  - Turn the operation switch to IR position.
  - Make sure that a red LED illuminates in the field of view to indicate that the IR light is active.

### 12.3. Low battery indication

If a yellow led in the field of view is observed, indicate LOW BAT condition.

#### NOTE

-The battery in this condition will allow approximately 30 minutes of operation.

### 12.4. Activating the IR Beacons

#### WARNING

When the IR light is activated, the emitted light can be detected by other image intensifying equipment.

#### NOTES

- The Infra-red (IR) light is not visible to the naked eye.
- The use of a 930 nm IR diode will make it hardly visible for Gen 3 users.
- To activate the IR Beacons, turn the operation switch to IR position.

## 13. Snap-on Diopters

Snap-on diopters with a total pair of lens in a range between +1.5 to -1.5 diopters with increases of 0.25 or 0.5 diopter are provided on the **PD-PRO-Q PANORAMIC NVG** and will accommodate the individual eyesight of most users. The lens strength of each Snap-On diopter is printed on the tabs shown in Figure 12.



Figure 11 Snap-On Lents Installation

If a prescription diopter is known, the user should select Snap-On diopters of that lens strength; otherwise follow this procedure:

- Using the -0.50 Snap-On diopters as a baseline, install and remove it on a **PD-PRO-Q PANORAMIC NVG** focused at infinity and compare eyesight through each monocular assembly.
- If image clarity is improved with the lens is removed, install and test with lens strengths +0.25 through +1.5 until best image clarity is achieved.
- If eyesight is NOT improved with the 0.0 diopters installed, install and test with lens strengths -0.25 through -1.5 until best image clarity is achieved.

To remove, simultaneously lift the diopter tab off the raised monocular assembly tab and pull away from the eyepiece.

### 14. Objectives Adjustment

Select the correct Snap-On specs and install it in the eyepieces.

- Take off the objective protective cover (in low light conditions only) and position it under the **PD-PRO-Q PANORAMIC NVG**. Opposite side of the goggle bridge housing.
- Adjust one on one the four objective focus rings to obtain a clear image of a desired object.

### 15. Installing PD-PRO-Q on Helmet Mount

The **PD-PRO-Q PANORAMIC NVG** attaches to the NVLS-24 helmet mount by means of a dovetail bracket.

- Align the dovetail bracket of the PNVG.
- Push the parts together until they click into place. Without Head Mount or Helmet Mount)



Figure 12 Installing PD-PRO-Q on Helmet Mount

#### 15.1. Power Cable Installation

The power cable connects the battery pack or the auxiliary battery pack to receptacle on the **PD-PRO-Q PANORAMIC NVG** bridge assembly.

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#### **CAUTION**

**Do not damage the pins or receptacles by misaligning and forcing the connectors together. Do not twist the connectors when installing the power cable.**

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- **Align red dots** in the receptacle and the cable and connect one end of the power cable to the battery pack by aligning the white dots as shown in Figure 14. Push the power cable connector into the receptacle until it looks into place.
- Connect the other end of the power cable to the power receptacle on the **PD-PRO-Q PANORAMIC NVG** bridge assembly by aligning the red dots. Push the power cable connector into the receptacle until it looks into place.

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#### **CAUTION**

**The power cable automatically locks into place when properly connected to the battery pack and bridge assembly. To disconnect, pull back on the cable connectors. Do not disconnect by pulling the power cable itself.**

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Figure 13 Connection Power Cable

## 15.2. Removal Procedures

### CAUTION

Do not attempt to remove the **PD-PRO-Q PANORAMIC NVG** from the BNVIS helmet mount by pulling on it.

- To remove the **PD-PRO-Q PANORAMIC NVG** from the helmet mount, press the lock / release on the BNVIS helmet mount, and then grasp the bridge assembly with both hands. Firmly pull the **PD-PRO-Q PANORAMIC NVG** out and away from the helmet mount, in the direction of the mount channels.

## 15.3. Positioning Adjustments

### NOTE

The **PD-PRO-Q PANORAMIC NVG** cannot be properly adjusted unless the helmet itself is correctly fitted per manufacturer's instructions.

With the **PD-PRO-Q PANORAMIC NVG** attached to the helmet, positioning adjustments may be made for maximum comfort and performance. Proper positioning adjustments of the **PD-PRO-Q PANORAMIC NVG** are critical because best visual performance is possible only when the optical axis of the device is perfectly aligned with the visual axis of the eye.

When properly adjusted, the outside edges of the images as seen through each eyepiece will be clear and the field of view will appear, as shown in Figure 15. Final focus adjustment as described in section 2.13 cannot be made until proper alignment has been accomplished.

The following four procedures should be performed in the order presented and repeated as necessary, until the **PD-PRO-Q PANORAMIC NVG** is properly adjusted:

- Height Adjustment
- Fore and Aft Adjustment
- Tilt Adjustment
- IPD Adjustment



Figure 14 FOV After Correct Adjusts

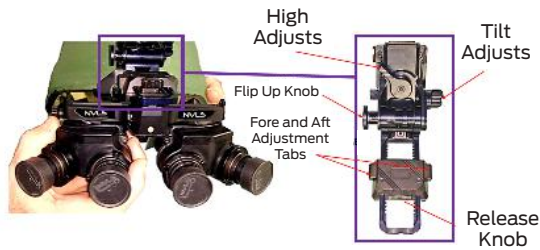


Figure 15 Helmet Mount Adjusts

### 15.4. Height Adjustment

Press the Height Adjustment tab on the NVLS-24 helmet mount adapter (see figures 4 and 16) and slide the unit up or down until the **PD-PRO-Q PANORAMIC NVG** eyepieces are level with the user's eyes.

### 15.5. Tilt Adjustment

Slightly turn till's control on the NVLS-24 adapter (see figures 4 and 16) clockwise for adjust to down or counterclockwise for adjust to up.

### 15.6. Fore and Aft Adjustment

#### NOTE

A 25mm eye-relief distance provides the optimal field of view. If the eyepiece assemblies are too close to the user's eyes, only a single circle will be seen through the eyepieces. Proper fore and aft alignment will result in a view of three overlapping circles (see Figure 15).

Squeeze the Fore and Aft Adjustment tabs shown in figures 4 and 16 and slide the **PD-PRO-Q PANORAMIC NVG** toward or away from the head until an optimum fit is achieved.

### 15.7. IPD Adjustment

Rotate each IPD Adjuster until each monocular assembly is positioned directly front of the user's eyes. Numbered hash marks (-2 to 2) on the bridge assembly indicate the user has preferred IPD setting. These can be used to establish a baseline between adjustments.

### 15.8. Field of View

Figure 15 shows the optimal field of view for the **PD-PRO-Q PANORAMIC NVG** when positioning adjustments are done correctly. The rows in Table 5 show unsatisfactory fields of view when positioning adjustments are done incorrectly, along with corrective action that can be taken to resolve the problem.

PNVG Field of View

Eye Piece Field of View

Obstructed PNVG Field of View



Figure 16 IPD Adjusts

Field of View	Remarks/ Corrective Action
	GPNVG positioned too low. Correct height adjustment.
	GPNVG positioned too high. Correct height adjustment.
	IPD too narrow. Correct IPD adjustment.
	IPD too wide. Correct IPD adjustment.
	IPD too narrow AND eye relief too long. Correct IPD adjustment and fore and aft adjustment.
	Eye relief too long. Correct fore and aft adjustment.
	Eye relief too short. Correct fore and aft adjustment.

Table 5 Positioning Adjustments

### 15.9. Flip-Up Position

The **PD-PRO-Q PANORAMIC NVG** can be placed in a stowed position by holding in the Flip-Up/Release knob on the BNVIS mount while pushing the **PD-PRO-Q PANORAMIC NVG** upward until it locks into place. The goggle will be powered off immediately after leaving the front eye position to prevent detection. To place back into an operational position, hold in the Flip-Up/Release knob and gently guide the PNVG downward until it locks into place. The goggle will automatically switch on in front of the eyes.

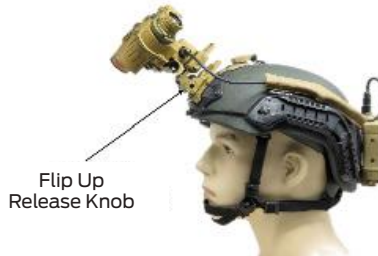


Figure 17 Flip-Up Adjusts

### 15.10. Power PD-PRO-Q PANORAMIC

Power is supplied to the **PD-PRO-Q PANORAMIC NVG** via the battery pack and power cable. For Turn ON the system two actions are mandatory:

1. The battery pack switch has three positions, in middle position the system is off, in right position the system is powered by the battery set 1 and in the left position the system is powered by the battery set 2.
2. The **PD-PRO-Q PANORAMIC NVG** must be attached to NVLS-24 and be in use position (front eyes).

The system features magnetic sensors that allow an automatic ON/OFF function. The system turns off automatically when flipped-up or when removed from the NVLS-24 adapter.

### 15.11. Objective Focus

The four objective lenses must be focused to the viewing distance being observed. A change in viewing distance requires that all four objective lenses be refocused. If already focused for a distance of at least 25 m, no change in focus is required between this distance and infinity. The procedures for focusing the objective lenses is provided below and is conducted with the helmet/**PD-PRO-Q PANORAMIC NVG** donned, all positioning adjustments completed (section 2.9), and the system powered on.

1. Rotate all objective lenses fully counterclockwise.
2. With the left hand, cover the objective lenses of the left monocular assembly. Do not close the left eye.



3. Select a target at the range for which the PNVG is to be focused. While looking through the innermost optics channel of the right monocular assembly, rotate the corresponding objective lens clockwise until the sharpest image is obtained.
4. With the right hand, cover the objective lenses of the right monocular assembly. Do not close the right eye.
5. While looking at the target through the innermost optics channel of the left monocular assembly, rotate the corresponding objective lens clockwise until the sharpest image is obtained.
6. Repeat steps 2 through 5 for the outermost optics channels.

## 16. Startup Procedures

To achieve maximum comfort and performance, the following procedures should be accomplished in the order presented, each time the **PD-PRO-Q PANORAMIC NVG** is used:

1. Select and install the appropriate Snap-On diopters (section 2.7).
2. Install batteries into battery pack (section 2.6.2).
3. Attach the **PD-PRO-Q PANORAMIC NVG** adapter to the helmet (section 2.9).
4. Connect the power cable to both the battery pack and the power receptacle on the PNVG bridge assembly (see section 2.9.1).
5. Turn on the **PD-PRO-Q PANORAMIC NVG** (see section 2.12). Pos. 1
6. Perform positioning adjustments in the following order (section 2.9.3):
  - a. Height Adjustment
  - b. Tilt Adjustment
  - c. IPD Adjustment
  - d. Fore and Aft Adjustment
7. Focus the objective lenses (section 2.13).
8. Make a final fine adjustment using interpupillary controls in order to get a perfect overlap (no blocked visual area) between the external channels and both internal central channels.

## 17. Operation Under Adverse Conditions

### 17.1. Operation at Low Temperature

At very low temperature (below zero) it can require more effort to operate the **PD-PRO-Q PANORAMIC NVG** controls than in warmer conditions. This is normal. Do not attempt to force the movement of controls as this can damage the working parts.

The capacity of the battery is reduced at low temperatures. This reduction in battery life is normal and battery depletion will increase as the temperature decreases.

### 17.2. Operation at High Temperature

The **PD-PRO-Q PANORAMIC NVG** can be operated up to 55°C, but wherever possible protect the battery from excessive heat.

The **PD-PRO-Q PANORAMIC NVG** can be subjected to sudden changes in temperature. But if the **PD-PRO-Q PANORAMIC NVG** is moved from a cold area (A/C acclimatized) into an area with a much higher temperature and humidity, condensation can occur on the optical surfaces.

### 17.3. Operation in Humid or Dusty Conditions

In humid or dusty conditions, extra care must be taken to keep all surfaces (particularly optical) clean at all times.

## 18. Transportation and Storage

When the equipment is to be transported or stored for long periods, proceed as follows:

- a. Remove the batteries from battery pack.
- b. Disconnect power cable.
- c. Make sure that the objective protective cover is in position.
- d. Install eyepiece protective caps.
- e. Carry out a visual inspection of the **PD-PRO-Q PANORAMIC NVG** and the accessories.
- f. Clean and dry the **PD-PRO-Q PANORAMIC NVG** and accessories.
- g. Place the **PD-PRO-Q PANORAMIC NVG** in the tactical bags and the accessories in the hard-shell case.

## Chapter 3 Maintenance

### 19. General

This chapter provides maintenance instructions for the **PD-PRO-Q PANORAMIC NVG**.

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#### **CAUTION**

The **PD-PRO-Q PANORAMIC NVG** is a precision electro-optical device – handle it with care!

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To ensure readiness of the **PD-PRO-Q PANORAMIC NVG**, it must be properly stored. Preventive maintenance must be performed prior to each mission.

### 20. Preventive Maintenance

Preventive maintenance procedures include inspection, cleaning and operational checks. They are used to keep the **PD-PRO-Q PANORAMIC NVG** in an operational condition and prevent malfunctions.

#### 20.1. Optical Surfaces

Inspect all lens surfaces for dirt, fingerprints, scratches or cracks. If necessary, clean and dry the surfaces. If the lens is cracked, chipped or scratched, send the unit for inspection at a higher maintenance level.

#### 20.2. External Surfaces

Inspect the **PD-PRO-Q PANORAMIC NVG** and accessories for damage and loose or missing parts. If damaged, lose or missing parts are found, send the unit for inspection at a higher maintenance level.

#### 20.3. Eyepieces Assembly

Make sure that the eyepiece and Snap-On supports do not have damages. If they have it, send the unit for inspection at a higher maintenance level.

#### 20.4. Snap-On

Inspect all Snap-On lens surfaces for dirt, fingerprints, scratches or cracks. If necessary, clean and dry the surfaces. If the lens is cracked, chipped or scratched, replace it with a spare.

#### 20.5. Objectives Assembly

Turn the objective focus nut all the way in both directions. Make sure that the objective cell assembly and the focus nut move freely. If they do not, send the unit for inspection at a higher maintenance level.

### 20.6. Power Pack

- a. Install a set of batteries and connect the power cable to **PD-PRO-Q PANORAMIC NVG**.
- b. If use stand-alone battery pack go to step “c”. If use a standard battery pack attach the system to NVLS-24 adapter and place the system in operate position.
- c. Set the operation switch to all positions. Make sure that the **PD-PRO-Q PANORAMIC NVG** operates correctly in each switch position. Make sure that a definitive stop is felt at each position.
- d. Make sure that the IR switch activates the IR beamer. Make sure that the IR beacons switch activates the backpack IR beacons.
- e. If any malfunctions are detected, send the unit for inspection at a higher maintenance level.

#### NOTE

The **PD-PRO-Q PANORAMIC NVG** have a sensor that prevents the system turn ON if it is not in use conditions. To test the **PD-PRO-Q PANORAMIC NVG** operation installed in the NVLS-24 adapter powered whit the standard battery pack, the **PD-PRO-Q PANORAMIC NVG** must be in the adapter in correct position in front of the eyes.

## 21. Cleaning

### 21.1. External Surfaces

- a. Use a soft brush to remove excess dirt and grit.
- b. Make sure that the battery compartment cap is tightly closed.
- c. Use soapy water and a lint-free cloth to wipe clean the **PD-PRO-Q PANORAMIC NVG** and the accessories.
- d. Use a lint-free cloth to dry the **PD-PRO-Q PANORAMIC NVG** and the accessories.
- e. After use of the **PD-PRO-Q PANORAMIC NVG** in salt water, wash it thoroughly with fresh tap water.

### 21.2. Optical Surfaces

#### NOTE

Only clean any optical surface if necessary.

- a. Use a soft brush to remove excess dirt and grit from optical surfaces.
- b. Clean the lens using lens paper dampened in lens cleaning liquid. Lightly wipe once in a circular motion. Turn the paper to a clean area. Repeat the procedure until the glass is clean. Follow up with a dry lens paper.

### 21.3. Demist Shield

- a. Never dry wipe!
- b. Before cleaning, always rinse first with cool, running water to remove surface grit.
- c. If necessary, wash gently with a mild soap solution, rinse and wipe dry with a soft cloth or tissue.
- d. Exercise care in wiping whenever the coating is wet. Shake off excess water and wipe gently in a single direction.
- e. Never use commercial glass cleaners or any product containing ammonia or abrasives.
- f. Additional polishes, sprays or rub-on are not recommended.

## 22. Troubleshooting Procedures

The procedures below will help correct some of the basic problems that may arise with the **PD-PRO-Q PANORAMIC NVG**. If the equipment malfunction is not listed, or the actions listed do not correct the fault, send the device to a superior maintenance depot.

Symptom	Malfunction	Corrective Action
One or more optics channels will not come on or is flashing, flickering, or intermittently operating.	Batteries / power cable improperly installed.	Verify that batteries are properly installed and that the power cable is connected to both the battery pack and BNVIS helmet mount
	Battery contacts require cleaning.	Clean battery contacts
	Battery power is low.	Replace batteries
	Power cable connectors and receptacles require cleaning.	Clean power cable connectors and receptacles on both the battery pack and <b>PD-PRO-Q PANORAMIC NVG</b> bridge assembly
Poor or degraded image.	Battery power is low.	Replace batteries.
	Sacrificial windows/Snap-On diopters obscured by dirt, dust, or grime.	Clean sacrificial windows/Snap-On diopters.
	Sacrificial windows/Snap-On diopters are cracked or scratched.	Replace sacrificial windows and/or Snap-On diopters.
	Objective / eyepiece lenses require cleaning.	Remove sacrificial windows and/or Snap-On diopters. Clean eyepieces and/or objective lenses.
	<b>PD-PRO-Q PANORAMIC NVG</b> has not been positioned correctly to user/on helmet mount.	Ensure that helmet is properly fitted to the user. Perform all <b>PD-PRO-Q PANORAMIC NVG</b> positioning adjustments.

Table 6 Troubleshooting Procedures

## 23. Elements Replacement

### 23.1. Replace Sacrificial/ Demist

- a. Turn the old lens CCW to remove it.
- b. Only if necessary, perform the step 3.3.2 for clean the new sacrificial lens
- c. Screw the lens into the eyepiece by turning CW

## 24. Components and Repair Parts

In this section are listed end item components and repair parts for the **PD-PRO-Q PANORAMIC NVG**.



Figure 18 PD-PRO-Q PANORAMIC  
Major Components

## 24.1 End Item Components

#	Part Number	Description	Qty.
1	TBD	Hard Shell Case	1
2	TBD	Goggle Case	1
3	TBD	Battery Pack	1
4	TBD	User's Manual	1
5	TBD	Quick Reference Guide	1
6	TBD	Power Cable	1
7	TBD	Snap-On Lens	16
8	TBD	Sacrificial Lens	4
9	TBD	NVLS-24	1
10	TBD	<b>PD-PRO-Q PANORAMIC NVG Assembly</b>	1
11	TBD	Objective Cover	2
12	TBD	Soft Bag	1
13	TBD	Cable Guide	1
14	TBD	Eyeiece Caps	1

## 24.2. Repair Parts for PD-PRO-Q PANORAMIC



#	Part Number	Description	Qty
1	TBD	Sacrificial Window	4
2	TBD	Snap-on dioptric lenses	2
3	TBD	<b>PD-PRO-Q PANORAMIC NVG Main body</b>	1
4	TBD	Standard Battery Pack	1
5	TBD	Power Cable	1

Figure 19 Repair Parts for PD-PRO-Q PANORAMIC





