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NIVISYSTM_{LLC}

OPERATOR MANUAL

SCORPIONTM

Multi-Purpose Thermal Imager



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**OPERATOR
MANUAL
for**

SCORPION™
Multi-Purpose Thermal Imager

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ADVISORY OVERVIEW

The following description categorizes the level of risk associated with each cautionary statement displayed throughout the manual.

WARNING

HIGHLIGHTS AN OPERATION OR PROCEDURE WHICH, IF NOT STRICTLY OBSERVED, COULD RESULT IN INJURY TO OR DEATH OF PERSONNEL.

CAUTION

HIGHLIGHTS AN OPERATION OR PROCEDURE WHICH, IF NOT STRICTLY OBSERVED, COULD RESULT IN DAMAGE TO OR DESTRUCTION OF EQUIPMENT OR LOSS OF MISSION EFFECTIVENESS.

NOTE

HIGHLIGHTS AN ESSENTIAL OPERATION, PROCEDURE, CONDITION OR STATEMENT.

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CHAPTER 1:

GENERAL INFORMATION

1.1 Introduction:

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

1.2 Equipment Description:

The SCORPION is an advanced thermal imaging weapon sight that uses an amorphous silicon focal plane array and IR lens to capture thermal images of any scene. Its uses are wide-ranging including military, law enforcement, security, marine and many other applications. The SCORPION may be used as a hand-held viewer or weapon mounted for directed fire.

Infrared imaging uses a longer wavelength of the electromagnetic spectrum than visible light and has some key differences. All objects at normal temperatures emit infrared energy in the waveband of this imager, depending on the temperature of the object and the nature of the surface material.

Slight temperature differences show up as brighter or darker parts of the scene and create the thermal image of what we see. Some materials, such as window glass, do not transmit infrared energy and so that windows appear as opaque objects in a thermal image.

1.3 Standard Kit Parts List:

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

Item	Part No.	Description	Qty.
1	5000-001	SCORPION	1
2	111-0009-0	Soft Carrying Case	1
3	1407-501	Shoulder Strap	1
4	580-0002-0	Battery, CR123 Lithium	4
5	170-12	Lens Cleaning Kit	1
6	NVM-033	Demist Shield	1
7	1406-400	Neck Lanyard	1
8	830-0049-0	Operator Manual	1
9	830-0050-0	Quick Reference Guide, QRG	1
10	5000-600	Interface Cable	1
11	790-0015-0	Mount Adjustment Tool	1

Table 1-1 Standard Kit Parts List

1.4 Standard Kit Parts Illustration:

The illustration below is provided for quick identification of the standard parts of the SCORPION kit.

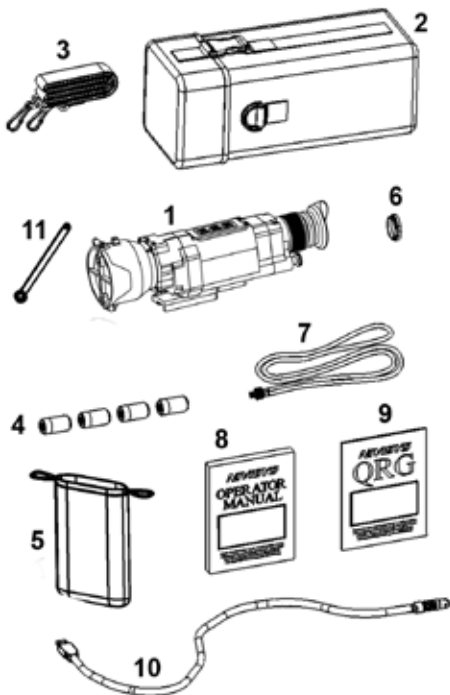


Figure 1-1 Standard Kit Parts Illustration

1.5 **Optional Items List:**

The SCORPION is compatible with the following optional items and accessories listed in the following table.

Item	Part No.	Description	Qty.
1	7B257-2F	Shipping/Storage Case	1
2	A3256345	Shuttered Eye Guard	1
3	5000-550	Tripod Adapter Rail	1
4	106-0032-0	1913 to 1913 Riser Mount (not shown)	1

Table 1-2 Optional Items List

1.6 Optional Items Illustration:

The illustration is provided as a visual key to optional items that can be used with the standard SCORPION.

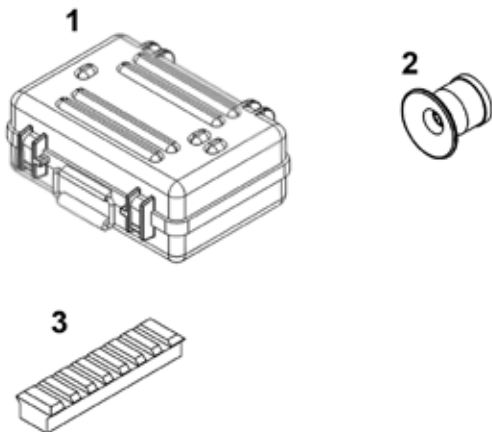


Figure 1-2 Optional Parts Illustration

1.7 System Performance and Data:

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

Focal Plane Array Detector	
Type	Amorphous-Silicon 320x240 pixel array Microbolometer
Spectral Response	7 to 14 microns
Thermal Sensitivity	<50mK
Thermal Imaging Performance	
Time to Operation	Approximately 4 seconds
Contrast/Level	Fully Automatic (Advanced Image Processing)
Calibration	Automatic (mechanical shutter)
Polarity	Selectable White-Hot or Black-Hot
Range to Detect Human Activity	Approximately 3000 feet (914 meters)
Optics	
Field of View	12°(H) x 9°(V)
Magnification	2X
Objective Focus Range	4 feet to infinity
Eyepiece Diopter Range	+2 to -6
Eye Relief	27mm
Video	
Viewfinder Display	Monochrome OLED
Digital Zoom	2X and 4X
Viewfinder Brightness	Adjustable

Table 1-3 System Performance and Data

Auxiliary Video Out	NTSC or PAL (Model dependant)
Reticles	User selectable with electronic bore-sight adjustment
Image Capture	200 Images (on board storage, download via USB)
Power	
Power Source	4 CR123 Batteries
Battery Life	Over 6 hrs (lithium batteries)
Auxiliary Power In	12 VDC (input through SCORPION Interface Cable)
Physical Specifications	
Size (L x W x H)	11 x 2.75 x 3 (inches) or 27.94 x 6.9 x 7.6 (cm)
Weight (with batteries)	12° Lens 34 oz. (964g)
Environmental	
Operating Temperature	-4° to 140°F (-20° to +60°C)
Storage Temperature (not including batteries)	-4° to 167°F (-20° to +75°C) Store batteries separately per manufacturer's instructions.
Submersion	Water resistant to 9ft (3m) depth
Shockproof	4ft (1.2m) drop
Weapon Shock	Tested for 5.56 and 7.62 cal.
EMC Compliance	FCC Part 15, class B and CE Mark EN61000-6-1 and EN61000-6-3

Table 1-3 System Performance and Data, (cont.)

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CHAPTER 2: PREPARATION FOR USE

2.1 Introduction:

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

2.2 Battery Precautions:

WARNING

DO NOT MIX BRANDS OF BATTERIES. DO NOT MIX DISPOSABLE AND RECHARGEABLE BATTERIES. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN DEATH, INJURY OR IMPOSITION OF LONG-TERM HEALTH HAZARDS.

WARNING

INSPECT BATTERIES FOR BULGING PRIOR TO USE. IF THE BATTERY SHOWS SIGNS OF BULGING, DO NOT USE.

WARNING

DO NOT HEAT, PUNCTURE, DISASSEMBLE, SHORT CIRCUIT, INCINERATE, ATTEMPT TO RECHARGE OR OTHERWISE TAMPER WITH THE BATTERIES.

WARNING

TURN OFF EQUIPMENT IF BATTERY COMPARTMENT BECOMES UNDULY HOT. IF POSSIBLE, WAIT UNTIL THE BATTERIES HAVE COOLED BEFORE REMOVING THEM

WARNING

DO NOT REPLACE BATTERIES IN A POTENTIALLY EXPLOSIVE ATMOSPHERE. CONTACT SPARKING MAY OCCUR WHILE INSTALLING OR REMOVING BATTERIES AND CAUSE AN EXPLOSION. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN DEATH OR INJURY OR IMPOSITION OF LONG-TERM HEALTH HAZARDS.

CAUTION

OBEY THE BATTERY MANUFACTURER'S DIRECTIONS FOR BATTERY DISPOSAL.

2.3 Opening the Battery Compartment:

1. Turn off the SCORPION before replacing batteries or removing the external power supply.
2. Locate the battery module knob on the right side of the SCORPION.
3. Turn the knob counter-clockwise to release the battery module from its sealed compartment.
4. Pull the battery module from the battery compartment once the battery module knob begins to spin freely.



Figure 2-1 Battery Compartment Knob

2.4 **Battery Installation:**

1. Follow the “+” and “-” symbols on the side of the battery module for orienting the batteries.
2. Load batteries into battery module.
3. Install the battery module into the battery compartment
4. Press the battery module knob and turn clockwise to engage the threads of the battery module knob to the battery compartment.
5. Continue to turn the battery module knob clockwise until the battery module is securely fastened.

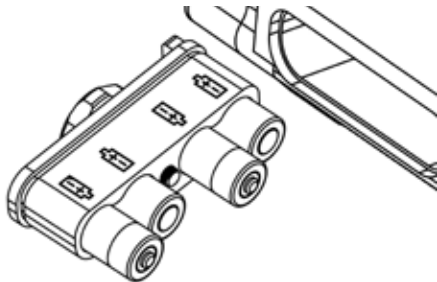


Figure 2-2 Battery Installation

2.5 **Attaching the Neck Lanyard to the SCORPION:**

To prevent damage due to dropping the SCORPION, use the neck lanyard included in the kit. To use the neck lanyard, do the following:

1. Screw the lanyard screw into the attachment point below the eyepiece.
2. Ensure the lanyard is securely fastened before use.

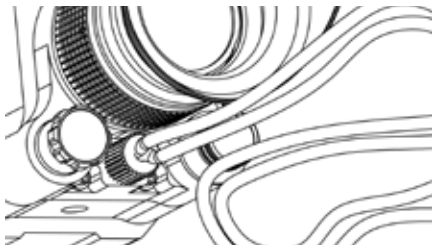


Figure 2-3 Attaching the Neck Lanyard

2.6 Integrated Tripod Mount:

The SCORPION features an integrated 1/4-20 thread for standard tripod mounting. It is located in the middle of the mounting block. To access the integrated tripod mount, use a 3/32" hex key to remove the 2ea. 10-24 shallow socket cap head screws located under the throw lever mount.

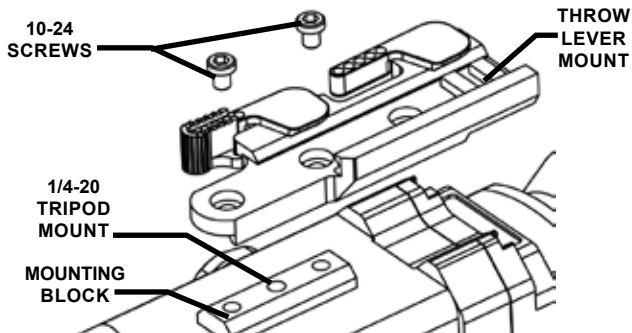


Figure 2-4 Integrated Tripod Mount Location

2.7 Double Throw Lever Mount Installation:

The SCORPION is issued with a double throw lever mount pre-installed. When reinstallation is necessary, perform the following procedure.

1. Arrange the double throw lever mount so that it sits on the receiving mounting block of the weapon mount adapter.

NOTE

CORRECT ALIGNMENT OF THE DOUBLE THROW LEVER MOUNT SITUATES THE THROW LEVERS ON THE BATTERY CAPSIDE OF THE SCORPION. WHEN IN THE CLOSED POSITION, THE THROW LEVERS SHOULD POINT TOWARD THE EYEPIECE.

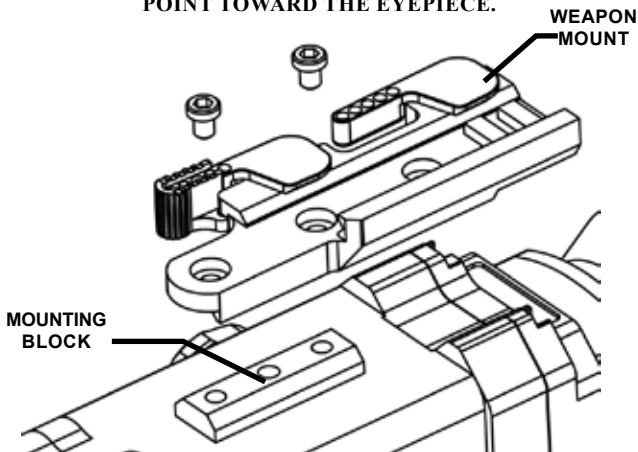


Figure 2-5 Double Throw Lever Mount Installation

- Using a 3/32" hex key, fasten the double throw lever mount onto the mounting block using 2 ea. 10-24 x .25" shallow socket cap screws. (Loctite 242 is recommended.)
- Ensure that the double throw lever mount is securely fastened to the weapon before firing.

2.8 Attaching the SCORPION to a Weapon:

To attach the SCORPION to a MIL-STD-1913 rail system perform the following procedure.

- Ensure that the double throw lever mount is securely fastened to the SCORPION.
- Set the slide lock to the unlocked position by pulling it back.

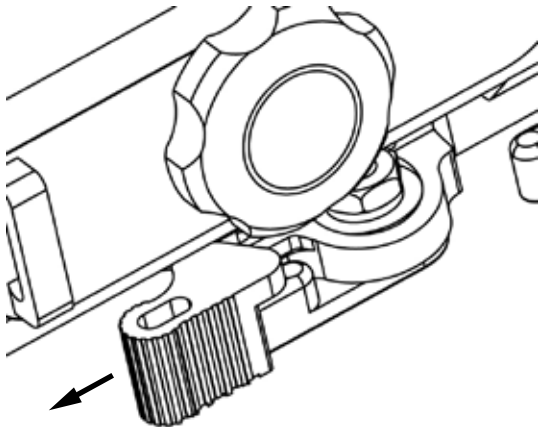


Figure 2-6 Slide Lock in Unlocked position

3. Rotate the two throw levers to the open position

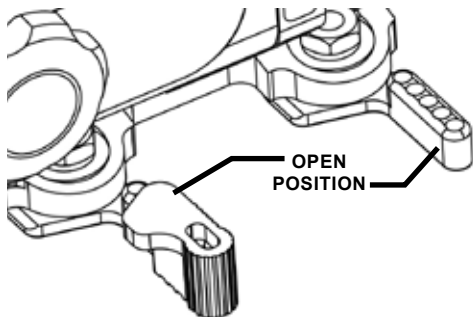


Figure 2-7 Throw Levers in Open Position

4. Place the SCORPION on the rail system of the weapon so that it seats squarely on the rail.
5. Rotate the throw levers to the closed position.

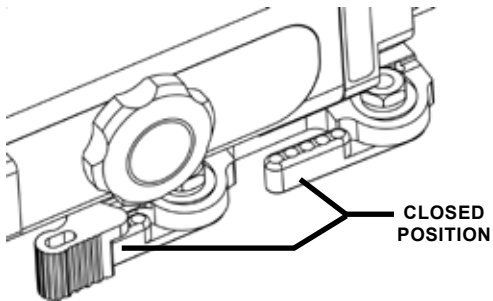


Figure 2-8 Throw Levers Closed

6. Secure the slide lock to the locked position by pushing it forward.

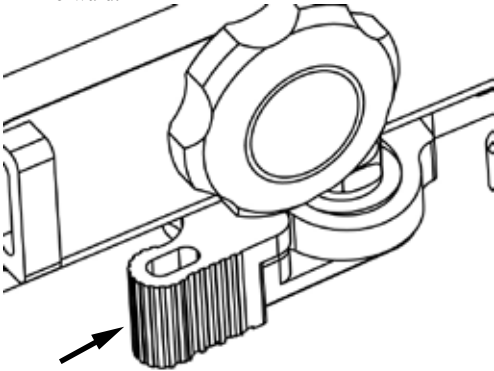


Figure 2-9 Slide Lock in Locked Position

7. If needed, tighten the tension of the locking lever with the provided mount adjustment tool. Turning the locknuts clockwise make it more difficult to remove the mount. Turning the locknuts counter-clockwise make mount removal easier.

NOTE

THE LOCKNUTS REQUIRE ONLY SLIGHT MOVEMENT FOR TENSION ADJUSTMENT.

CAUTION

NEVER REMOVE THE LOCKNUTS.

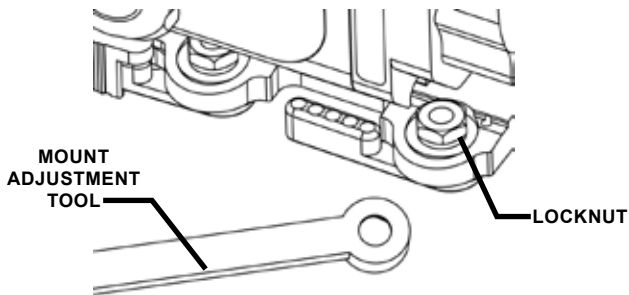


Figure 2-10 Locknut Adjustment

- 2.9 **Attaching the SCORPION to a Rail Riser (Optional):**
Optional rail risers are available as accessories to adapt the SCORPION to special weapon mount needs.

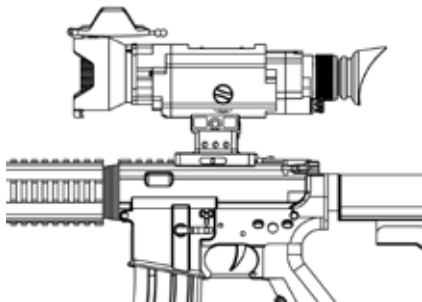


Figure 2-11 Unit Mounted with Optional Rail Riser

2.10 Tripod Adapter Rail (Optional):

An optional tripod adapter rail is available for attaching the SCORPION to a standard tripod without having to remove the double throw lever mount. To use the optional tripod adapter rail perform the following.

1. Thread the tripod shaft (not supplied) into the tripod adapter rail (optional).
2. Attach the tripod adapter rail to the SCORPION using the double throw lever mount.

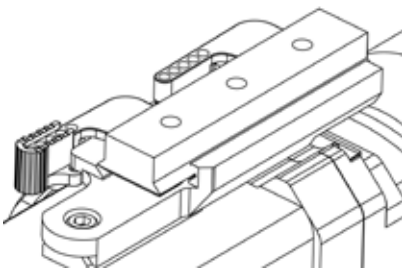


Figure 2-12 SCORPION with Tripod Adapter Rail

2.11 Eyecup Removal and Installation:

The SCORPION comes with an open eyecup. Use the optional shuttered eyecup to prevent the display from being detected during covert operations. To switch the eyecups, do the following:

1. Gently pull the installed eyecup straight back from the SCORPION to remove it.
2. Press the other eyecup over the mating collar on the eyepiece until the eyecup snaps into place.

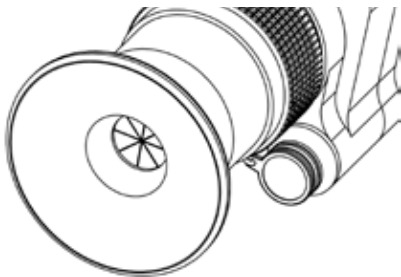


Figure 2-13 Shuttered Eyecup

2.12 Installing the Eyepiece Demist Shield:

The SCORPION has a demist shield to protect the eyepiece optics. To use the demist shield, do the following:

1. Gently pull the eyecup straight back from the SCORPION to remove it.
2. Thread the demist shield into the eyepiece mating thread.
3. Replace the eyecup by pressing it over the mating collar on the eyepiece until the eyecup snaps into place.

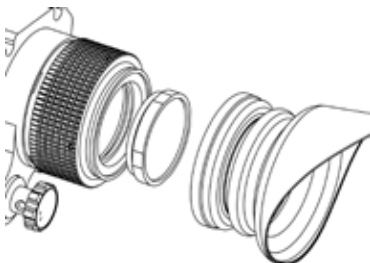


Figure 2-14 Demist Shield

NOTE

IF INCLEMENT OPERATING CONDITIONS ARE EXPECTED TO EXIST (E.G. SIGNIFICANT TEMPERATURE CHANGE AND HIGH HUMIDITY), INSTALL DEMIST SHIELD TO MINIMIZE EYEPiece LENS FOG PRIOR TO EXECUTION OF MISSION.

CAUTION

IF THE DEMIST SHIELD IS WIPED WHILE WET OR WITH WET LENS TISSUE, THE COATING WILL BE DAMAGED.

CHAPTER 3: OPERATING INSTRUCTIONS

3.1 Introduction:

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

CAUTION

DO NOT POINT THE SCORPION DIRECTLY AT ANY HIGH-INTENSITY SOURCES THAT YOU WOULD NOT VIEW WITH YOUR EYES (SUCH AS THE SUN OR A WELDING ARC). DOING SO WILL DAMAGE THE SCORPION.

CAUTION

TURN THE SCORPION OFF BEFORE REMOVING BATTERIES OR DISCONNECTING EXTERNAL POWER SUPPLY.

3.2 Controls and Indicators:

The controls and indicators for the SCORPION are shown in Table 3-1 and are described in Figure 3-1.

Control and Indicators	Functions
Power Switch Knob/	Controls weapon sight ON or OFF and Polarity.
Polarity (momentary action)	Toggles between white HOT and black HOT.

Table 3-1 Controls and Indicators

Diopter Adjustment	Focuses eyepiece lens for use without the need for glasses. Adjust for sharpest image of image display.
Keypad/Menu Control	Used to control the digital zoom, display brightness, camera and internal menu functions.
Focus Ring	Adjusts for sharpest image of viewed object.

Table 3-1 Controls and Indicators, cont.

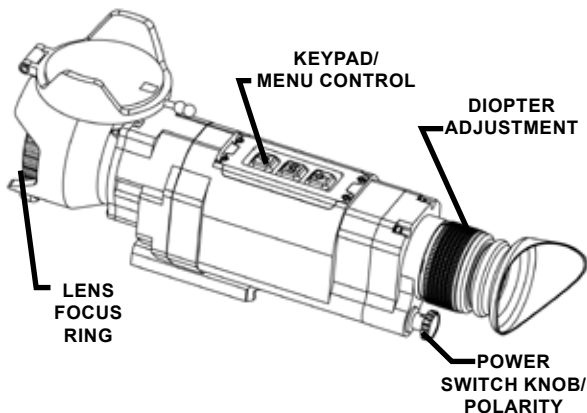


Figure 3-1 Controls and Indicators

3.3 Powering ON/OFF the SCORPION:

1. To set the unit to the “ON” position, turn the power knob clockwise until you hear a click.
2. To set the unit to the “OFF” position, turn the power knob counter-clockwise until you hear a click.

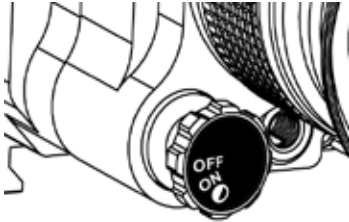


Figure 3-2 Power Switch Knob

3.4 SCORPION Warm-up Time:

During the unit warm-up time of approximately 4 seconds, a logo comes into view on the display. After the 4 seconds of warm-up time, the thermal image replaces the logo.

3.5 Automatic Contrast:

The SCORPION automatically adjusts the video contrast based on the information available in the scene, as follows:

1. People, automobiles, boats, or other warm objects that are near the SCORPION will cause a decrease in video gain. The result is more detail on facial features and flat surfaces.
2. A scene such as a park, field, or roadway will cause an increase in video gain. The result is more detail in the background objects such as trees, bushes, and roadway edges.

NOTE

**DURING THE SCORPION STARTUP ROUTINE,
THE EYEPIECE DISPLAY IMAGE WILL
AUTOMATICALLY ADJUST TO IMPROVE
IMAGE CONTRAST AND OFFSET LEVEL AS
WELL.**

3.6 Calibration:

Calibration is necessary as surrounding temperature changes or any time a fixed, non-uniform shading appears on the display screen. The SCORPION calibrates itself at 30 to 90 second intervals to continuously optimize the image. During calibration, the viewed image will hold for approximately ½ a second and a click sound may be heard.

Although the SCORPION features automatic calibration at regular intervals, an operator may choose to manually calibrate the system at any time by performing the following procedure.

1. Press the Zoom and the Camera button simultaneously.



Figure 3-3 Manual Calibration

3.7 Monitoring Available Battery Power:

To monitor available battery power, see the battery icon in the eyepiece display:



Figure 3-4 Battery Power Icons

Two conditions determine the length of time the SCORPION will operate on a set of batteries:

1. The brightness setting on the SCORPION display, and
2. The temperature at which the SCORPION operates.

A maximum brightness setting and very low or high temperatures can reduce the expected time of operation by as much as 50%. New lithium batteries usually provide enough charge for over 6 hours of operation.

NOTE

THE PERFORMANCE OF LITHIUM BATTERIES IS CHARACTERIZED BY A STEADY VOLTAGE OUTPUT FOR THE MAJORITY OF THEIR OPERATING LIFE AND THEN A QUICK DROP-OFF TO A “DEAD CELL” STATE. THIS TRAIT MAY RESULT IN A QUICK SCORPION SHUTDOWN, SO CARRYING REPLACEMENT BATTERIES FOR EXTENDED PERIODS OF USE IS HIGHLY RECOMMENDED.

3.8 Diopter Adjustment:

The SCORPION has an adjustable eyepiece with a range of +2 to -6 diopters and a 27mm eye relief to accommodate various users. To focus the eyepiece, do the following:

1. Rotate the textured eyepiece ring clockwise or counter-clockwise to sharpen the reticle in the display.
2. Rotate the open eyecup to accommodate use over the left or right eye.

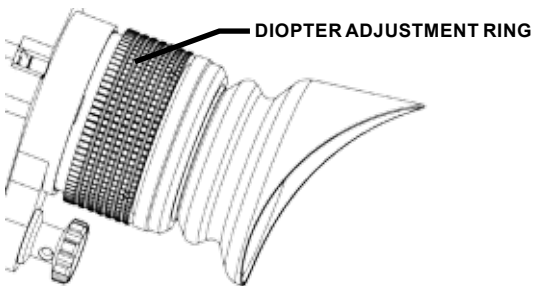


Figure 3-5 Diopter Adjustment Ring

3.9 Adjusting the Lens Focus:

The lens focus ring is used to focus the objective lens for objects viewed at varied distances. Perform the following to focus the objective lens.

1. Rotate the lens focus ring clockwise for far focus,
2. Rotate the lens focus ring counter-clockwise for near focus.

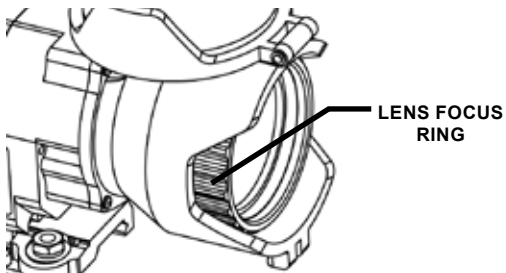


Figure 3-6 Lens Focus Ring

3.10 Opening and Closing the Lens Cover:

1. Pull the rubber “dog bone” strap out from between the two posts on the bottom of the lens cover to release the front cover flap.
2. Rotate the front lens cover up and over the lens.
3. Press it down on the retainer post to secure it during operation.

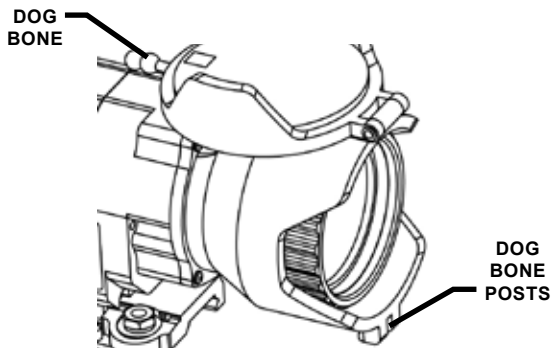


Figure 3-7 Focusing the Lens

3.11 Switching Polarity (White Hot/Black Hot):

To optimize the thermal scene, switch the polarity between white hot and black hot modes. To switch the polarity, do the following:

1. Set the SCORPION switch knob to the “ON” position.
2. Turn the power knob clockwise and release. (To switch back, turn the power knob clockwise again.)



Figure 3-8 Polarity Momentary Switch

3.12 Primary Keypad Functions:

The SCORPION features a three button keypad located on the top of the unit. The buttons have both primary and secondary functions. The primary functions are represented with the symbology on the keypad buttons which are Zoom, Still Capture, and Brightness.

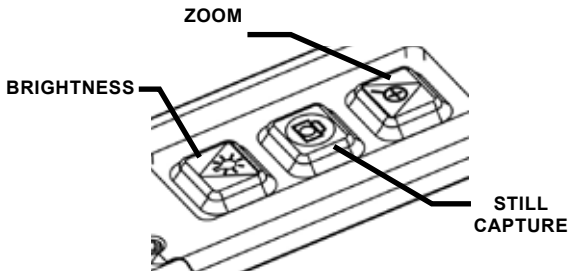


Figure 3-9 Primary Keypad Functions

3.12.1 Adjusting the Display Brightness:

1. Press the Brightness button to increase the brightness by one level at a time until the desired brightness level is

- reached. Brightness levels will cycle through levels 1-8.
2. View the current Brightness level on the left side of the eyepiece display.

NOTE

TO MAXIMIZE BATTERY LIFE, THE DEFAULT BRIGHTNESS LEVEL IS SET TO A LOW LEVEL APPROPRIATE FOR USE IN LOW-LIGHT SITUATIONS.



Figure 3-10 Brightness Button

3.12.2 Using the Digital Zoom:

The SCORPION optical magnification is 2X. To increase the range performance by digitally zooming the display, perform the following.

1. Press the Zoom button to digitally zoom the magnification by 2X (system magnification 4X), and press again to digitally zoom by 4X (system magnification 8X)
2. Press the Zoom button again to return to 1X digital zoom.



Figure 3-11 Zoom Button

3.12.3 Capturing Still Images:

1. Press and release the Still Capture button. The captured image number will be displayed for a few seconds in the upper right of the display.



Figure 3-12 Still Capture Button

NOTE

THE ASSIGNMENT OF A NUMBER TO AN IMAGE CONFIRMS THAT AN IMAGE HAS BEEN STORED.

NOTE

THE CAMERA FEATURE WILL CAPTURE UP TO 200 INFRARED IMAGES AND STORE THEM IN ITS ON-BOARD MEMORY.

3.13 Menu System/Secondary Keypad Functions:

The SCORPION uses a menu system to manage the on board image storage, reticle selection and boresighting features. The SCORPION keypad buttons secondarily function as navigation tools for the menu system. The secondary functions of the keypad buttons are Scroll-Up, Menu/Select and Scroll-Down. To access the menu system, do the following:

1. Press and hold the Still Capture button until the drop-down Main Menu appears in the display (approximately

3 seconds). Once the menu system is displayed, use the keypad to navigate through the menu:

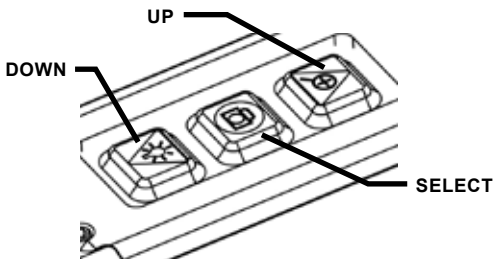


Figure 3-13 Secondary Keypad Functions

3.13.1 Main Menu:

The main menu is the first menu that is displayed when entering the menu system. The main menu options and functions are listed in the following table.

MAIN MENU	
Options	Functions (Press SELECT button to:)
Camera	Go to CAMERA menu and display last captured image
Reticle	Go to RETICLE menu
Exit	Exit Main Menu

Table 3-2 Main Menu Options and Functions



Figure 3-14 Main Menu

3.13.2 Camera Menu:

The camera menu is secondary to the main menu and displays the options associated with the images stored within the SCORPION. The camera menu options and functions are listed in the following table.

CAMERA MENU	
Options	Functions (Press SELECT button to:)
Next	Display NEXT image. Press SELECT again to increment image number
Previous	Display PREVIOUS image. Press SELECT again to decrement image number
Delete	Go to DELETE menu
Menu Off	Remove menu from display. Scroll function still active, using UP and DOWN buttons. Press SELECT button again to restore menu display
Exit	Return to Main Menu

Table 3-3 Camera Menu Options and Functions

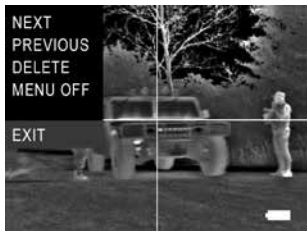


Figure 3-15 Camera Menu

3.13.3 Reviewing Still Images:

1. Access the menu system by holding the still capture button for three seconds.
2. Press the Up button until the word Camera is highlighted in the eyepiece display.
3. Press the Select button to select the Camera Menu

NOTE

SELECT MENU OFF TO REMOVE THE MENU FROM THE DISPLAY (THE MENU REMAINS ENGAGED); PRESS THE SELECT (CAMERA) BUTTON TO MAKE THE SCORPION MENU REAPPEAR.

4. Using the Up, Down, and Select buttons, choose NEXT and/or PREVIOUS to review currently stored images.
5. Select EXIT once to return to the Main Menu; select it again to exit the menu system.

3.13.4 Delete and Confirm Delete Menus:

The SCORPION does not allow for the removal of a single captured image. The delete menu options and functions are listed in the following tables.

DELETE MENU	
Options	Functions (Press SELECT button to:)
All	Go to CONFIRM DELETE menu
Exit	Return to Camera Menu
CONFIRM DELETE MENU	
Options	Functions (Press SELECT button to:)
Confirm	Delete all images in memory
Exit	Return to Delete Menu

Table 3-4 Delete/Confirm Delete Menu Options and Functions



Figure 3-16 Delete and Confirm Delete Menus

3.13.5 Deleting Still Images:

1. Access the menu system.
2. Press the Up button until the word Camera is highlighted in the eyepiece display.
3. Press the Select button to select the Camera Menu.
4. Scroll and select DELETE to access the Delete Menu.
5. Select ALL to choose all images for deletion.

6. Select CONFIRM to delete the images and to exit the menu.

NOTE

SELECT MENU OFF TO REMOVE THE CAMERA MENU FROM THE DISPLAY (THE CAMERA MENU REMAINS ENGAGED); PRESS THE SELECT BUTTON TO MAKE THE MENU REAPPEAR.

3.13.6 Reticle Menu:

The Reticle menu is the second option listed on the main menu of the SCORPION and allows the operator to customize and save reticle options as well as boresight the SCORPION to a weapon. The reticle menu options and functions are listed in the following tables.

RETICLE MENU	
Options	Functions (Press SELECT button to:)
Azimuth	Display adjustment grid (Static) Press UP to move reticle RIGHT one click, press DOWN to move reticle LEFT one click
Elevation	Display adjustment grid (Static) Press UP to move reticle UP one click, press DOWN to move reticle DOWN one click
Type	Increment reticle TYPE to the next pattern
ON-OFF	Changes reticle state from ON to OFF or OFF to ON
Exit	Return to Main Menu

Table 3-5 Delete Menu Options and Functions



Figure 3-17 Reticle Menu

3.13.7 Selecting a Reticle:

Before selecting a reticle, ensure the reticle option is turned ON in the reticle menu.

1. Enter the main menu by holding the still capture button down for three seconds.
2. Scroll to highlight RETICLE and press Select button.
3. Scroll to highlight TYPE and press Select button
4. Scroll through the five available reticles.
5. Press the Select button to choose a reticle and return to the reticle menu.
6. Select EXIT and EXIT again to leave menu system.

NOTE

TO REMOVE THE FROM THE DISPLAY, SELECT ON/OFF IN THE RETICLE MENU.

NOTE

THE FIRST FOUR RETICLES SHARE A COMMON, INTERCHANGEABLE BORESIGHT SETTING FOR WEAPON FIRE, BUT THE LAST 'LASER DOT' RETICLE HAS A SEPARATE BORESIGHT SETTING TO ALLOW FOR A LASER POINTER ALIGNMENT.

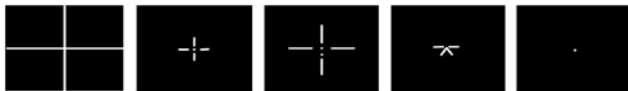


Figure 3-18 Available Reticle Patterns

NOTE
**RETICLE WILL AUTOMATICALLY
CHANGE BLACK/WHITE DEPENDING ON
BACKGROUND TARGET TO GIVE BEST
CONTRAST.**

3.13.8 Boresighting a Reticle:

When boresighting a reticle, ensure the cross hair reticle type is selected and use the 2X digital zoom mode for optimal accuracy.

1. Enter the main menu by holding the still capture button down for three seconds.
2. Scroll to highlight RETICLE and press Select button.
3. Scroll to highlight AZIMUTH and press Select button.
4. Use the Up and Down buttons to position the reticle at the desired azimuth.

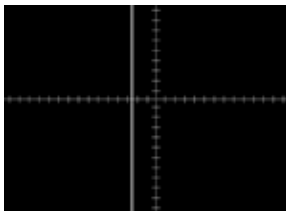


Figure 3-19 Azimuth Adjustment Screen

5. Press the Select button to return to the reticle menu.
6. Scroll to highlight ELEVATION and press Select button.

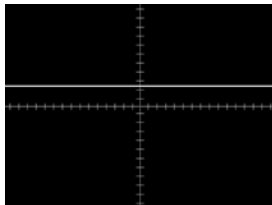


Figure 3-20 Elevation Adjustment Screen

7. Use the Up and Down buttons to position the reticle at the desired elevation.
8. Press the Select button to return to the reticle menu.
9. Select EXIT and EXIT again to leave menu system.

NOTE

ALL RETICLES REMAIN BORESIGHTED AT 2X AND 4X DIGITAL ZOOM MAGNIFICATION LEVELS, HOWEVER ONLY THE RETICLE WITH THE TWO VERTICAL DOTS CHANGES SIZE WHEN ZOOMED TO ALLOW RETAINING AN AIM POINT IN DIFFERENT MAGNIFICATION LEVELS.

NOTE

THE DISTANCE BETWEEN EACH INDEX MARK REPRESENTS 20 PIXELS ON THE DISPLAY

3.14 Connecting the Interface Cable:

Use the Interface Cable to connect the SCORPION to an

external 12VDC power supply, video display or recorder, or to download images to a computer. To connect the interface cable, simply align and press the cable connector into the connection port located below the eyepiece.

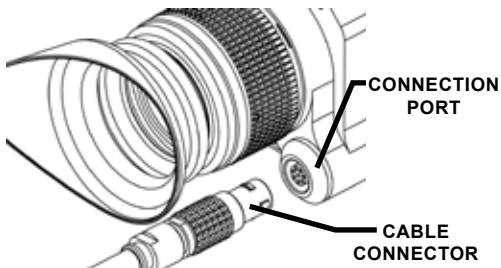


Figure 3-21 Interface Cable Connection

3.15 Removing the Interface Cable:

1. Pull back on the grooved collar of the cable plug to disengage the lock mechanism.
2. Pull the plug out of the socket.
3. Replace the protective cap on the socket to keep foreign material out of the connector.

3.16 Connecting an External Power Supply:

1. Connect the Interface Cable to the SCORPION.
2. Connect the power jack socket of the Interface Cable to a 12 VDC power supply.

NOTE

**THE EXTERNAL POWER SUPPLY PLUG MUST
SUPPLY AT LEAST 500MA.**

3. The external power supply plug must have a 3.50mm OD, 1.35mm ID contact with center pin negative. Use either the optional AC/DC power adapter (5000-600) or another suitable 12 VDC power supply (such as an appropriate car power cord).
4. The supply voltage should be nominal 12 VDC, but it can range from 8 VDC to 16 VDC with no dangerous result.
5. When operating the SCORPION with an external power supply:
 - A. The SCORPION will bypass the batteries and operate on the external supply.
 - B. The external power supply will NOT recharge the batteries in the SCORPION.
 - C. Turn OFF SCORPION before disconnecting the power supply from the cable when not in use.

3.17 Connecting an External Display/Recorder:

1. Connect the Interface Cable to the SCORPION.
2. Connect the BNC plug of the Interface Cable to a compatible jack on an external display, video recorder, or extension cable.

NOTE

**THE SCORPION PROVIDES NTSC OR PAL
VIDEO OUTPUT, DEPENDING ON THE
SCORPION MODEL PURCHASED.**

3.18 Downloading Images to a Computer:

1. Connect the SCORPION Interface Cable to the SCORPION.
2. Set the SCORPION to the ON position.
3. Connect the USB connector of the Interface Cable to a computer USB port.
4. Wait a few seconds for the computer to recognize the

SCORPION as “New Hardware” and designate it as a “Removable Disk” drive.

5. Open the drive and copy the .BMP images to the computer using standard file management methods.

NOTE

IMAGES STORED IN THE SCORPION CANNOT BE DELETED USING THE COMPUTER FILE MANAGEMENT SYSTEM. TO DELETE IMAGES IN THE SCORPION, SEE DELETING STILL IMAGES.

3.19 Preparation for Storage:

1. Remove batteries from the weapon sight.
2. Inspect the battery compartment for corrosion or moisture. Clean and dry if necessary.
3. Replace the battery module.
4. Close the objective lens cap.

NOTE

PRIOR TO PLACING SCORPION INTO CARRYING CASE, ENSURE SCORPION AND CASE ARE FREE OF DIRT, DUST, AND MOISTURE.

5. Place the SCORPION and accessories in the soft carrying case. It is best to place the items in their original locations to prevent any possible damage to the unit and/or accessories.
6. Return to storage area.

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CHAPTER 4:

MAINTENANCE INSTRUCTIONS

4.1 Introduction:

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

CAUTION

THE WEAPON SIGHT IS A PRECISION ELECTRO-OPTICAL INSTRUMENT AND MUST BE HANDLED CAREFULLY.

CAUTION

DO NOT SCRATCH THE EXTERNAL LENS SURFACES OR TOUCH THEM WITH YOUR FINGERS.

CAUTION

DO NOT WIPE DEMIST SHIELD WITH LENS TISSUE WHILE WET OR WITH WET LENS TISSUE. THIS WILL DAMAGE THE COATING.

4.2 Preparing for Maintenance:

Before performing any maintenance or cleaning of the SCORPION it is necessary to power the system OFF. Do this by removing all batteries and/or external power sources.

4.3 Cleaning the SCORPION:

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

the use of a very diluted detergent solution is permissible. Dry with a soft clean cloth, or allow unit to air-dry before storing it.

4.4 Cleaning the Optics:

When cleaning of the lens is required, first blow any loose dirt or grit away from the surface of the lens. EXCEPT FOR THE DEMIST SHIELD, use the supplied lens tissue lightly moistened with water or lens cleaning fluid to lightly wipe the optical surfaces, using a circular motion. Discard each lens tissue after one use to avoid transferring grit or foreign matter onto the lens surfaces. If the lens remains dirty use a cotton swab lightly moistened with lens cleaning fluid to remove the foreign matter from the lens. Dry with a clean unused lens tissue.

4.5 Checking for Damage and Corrosion:

As a general guideline, conduct an inspection of the SCORPION, accessories, and the case after every use. Look for heavy wear and cracks in rubber or plastic. Inspect for moisture or corrosion in the battery compartment. Check for scratches, condensation and foreign matter on optical surfaces. Report missing or damaged items, for replacement.

CHAPTER 5: TROUBLESHOOTING

5.1 Troubleshooting Procedures:

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

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

Malfunction	Test or Inspection	Corrective Action
After the 3-second warm-up time, the video does not appear, but the logo keeps flashing.	Low battery power.	Replace batteries.
No image in the LCD display (no logo, no battery icon, and no video).	The display brightness is too low	Press the Brightness button to adjust the display brightness.
	Batteries are completely discharged.	Replace batteries.

Table 5-1 Troubleshooting

Weapon sight fails to activate.	Visual. Check for defective, missing or improperly installed batteries.	Power the system ON. Replace batteries or install correctly. Tighten battery module securely. If SCORPION still fails to activate, refer to higher level of maintenance.
Flickering Image on firing.	Check for loose battery module that may cause the batteries to lose contact during weapon fire.	Tighten battery module securely.
No display in eyepiece.	Visual check to see if lens cap is still on.	Flip lens cap open.
Poor image quality.	Check for fogging or dirt on objective lens or eyepiece. Visual.	Clean optics. Adjust lens focus.

Table 5-1 Troubleshooting, cont.

APPENDIX A: SPARE AND REPAIR PARTS LIST

A.1 Introduction:

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

A.2 Contact Information:

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

Nivisys, LLC
400 S. Clark Drive, Suite #105
Tempe, Arizona 85281 USA

Phone: 1-480-970-3222

Fax: 1-480-970-3555

A.3 Spare Parts List:

The following is a list of parts that may be ordered for spare parts for the SCORPION.

Part No.	Description	Qty.
111-0009-0	Soft Carrying Case	1
1407-501	Shoulder Strap	1
580-0002-0	Battery, CR123 Lithium	4
NVM-033	Demist Shield	1

Table A-1 Spare and Repair Parts List

170-12	Cleaning Kit	1
4500-202	Eyecup	1
1406-400	Neck Lanyard	1
830-0049-0	Operator Manual	1
830-0050-0	Quick Reference Guide, QRG	1
5000-550	Tripod Adapter Rail	1
4500-600	Interface Cable	1
4500-802	12 Degree Lens Cover Assembly	1
NVM-035	Eyepiece with O-ring	1
3500-900	Double Throw Lever Mount	1
5000-410	Battery Compartment Assembly	1
5000-400	Battery Retainer Assembly	1
784-0034-A	O-ring, Battery Compartment	1
BRA.18.200.PCSN	Cap, Connection Port	1
106-0032-0	Riser Mount	1
4500-605	Dog Bone	1
210-0036-0	Cord End	1
630-0001-0	Para Cord, Black, 6"	1

Table A-1 Spare and Repair Parts List, (cont.)

APPENDIX B: WARRANTY INFORMATION

Equipment Warranties And Remedy:

Seller warrants that each newly manufactured item sold hereunder and such portion of a repaired/refurbished item as has been repaired or replaced by Seller under this warranty, shall be free from defects in material or workmanship at the time of shipment and shall perform during the warranty period in accordance with the specifications incorporated herein. Should any failure to conform to these warranties be discovered and brought to Seller's attention during the warranty period and be substantiated by examination at Seller's factory or by authorized field personnel, then at its own cost, Seller shall correct such failure by, at Seller's option, repair or replacement of the non-conforming item or portion thereof, or return the unit purchase price of the non-conforming item or component. Buyer agrees that this remedy shall be its sole and exclusive remedy against Seller and that no other remedy shall be available or pursued by Buyer against Seller. In no event shall the Seller be liable for any cost or expense in excess of those described in this paragraph and expressly excluding any liability or damages for special, incidental or consequential damages.

The warranty period for newly-manufactured items shall extend 12 months from the date of shipment by Seller unless a different warranty period is agreed in writing to by Seller. The warranty period for repaired/refurbished electronic components shall extend for the unexpired warranty period or 90 days, whichever is longer, of the item repaired or replaced.

This warranty shall not extend to any item that upon examination by Seller is found to have been subject to:

- A. Mishandling, misuse, negligence or accident.

- B. Installation, operation or maintenance that either was not in accordance with Seller's specifications and instructions, or otherwise improper.
- C. Tampering, as evidenced, for example, by broken seals, damaged packaging containers, etc.
- D. Repair or alteration by anyone other than Seller without Seller's express advance written approval.

Failure to promptly notify Seller in writing upon discovery of any non-conforming item during the warranty period shall void the warranty as to such item. Buyer shall describe any such non-conformity in detail, expressing its position as to return of any article under the remedy provided herein. No returns shall be accepted without prior approval by Seller.

Return Material Authorization Number (RMA#):

Warranty and non-warranty items returned to Nivisys for repair or replacement require a RMA#. Email support@nivisys.com, call 1-480-970-3222 or fax 1-480-970-3555 with a serial number and detailed information to obtain a RMA#.

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

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LLC

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