

# ***NIVISYS***<sup>TM</sup> LLC

## **OPERATOR MANUAL**

### **VITAL**<sup>TM</sup> **Series**

Variable Intensity Tactical Aiming Light



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**OPERATOR  
MANUAL  
for**

**VITAL™ SERIES**  
Variable Intensity Tactical Aiming Light  
**VITAL-2™**  
**VITAL-100™**

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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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## LASER SAFETY DATA

This electronic product has been exempted from FDA radiation safety performance standards prescribed in the Code of Federal Regulations, Title 21, Chapter I, Subchapter J, pursuant to Exemption No. 76EL-01DOD issued on July 26, 1976.

<b>Laser Safety Data*</b>		
<b>Description</b>	<b>VITAL-2</b>	<b>VITAL-100</b>
Laser Power Output	.7mW max	100mW max
Laser Beam Divergence	0.5mR max	
Laser Safety Class	Class 1	Class 3B
Nominal Ocular Hazard Distance (NOHD) for the unaided eye	0ft (0m)	925ft (282 m)
Laser Wavelength	830 – 840 nm ± 20 nm	
<b>Description</b>	<b>CQB ILLUMINATOR</b>	
CQB LED Output Power	15 mW ± 5 mW	
LED Beam Divergence	20°(+)	
LED Wavelength	880nm ± 20nm	

\*The above data is based on Laser Hazard Safety Analysis, Air Force Research Lab Human Effectiveness Directorate Optical Software. Data is based on a <10 second exposure for IR wavelength. All output power readings are maximum values at 73°F (23°C).

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# **SAFETY INFORMATION**

The following section outlines general risks, safety precautions and warnings associated with the safe use of a laser. Read the following before any operation of the VITAL SERIES.

## **WARNING**

**THERE ARE EYE AND OTHER HAZARDS ASSOCIATED WITH THE USE OF THE VITAL SERIES. SAFE OPERATION OF THIS PRODUCT REQUIRES FOLLOWING WARNINGS, CAUTIONS AND NOTES CONTAINED IN THIS OPERATOR MANUAL.**

## **WARNING**

**A LASER SAFETY OFFICER (LSO) SHOULD BE ASSIGNED TO SUPPORT OPERATIONAL AND TRAINING ACTIVITIES USING THE VITAL. THE LSO SHOULD BE ADEQUATELY TRAINED AND PROVIDE TRAINING IAW ANSI Z136.1-2007 (OR LATEST VERSION).**

## **WARNING**

**ALL PERSONNEL PARTICIPATING IN TRAINING OR OPERATIONS THAT INVOLVE THE USE OF LASERS SHOULD COMPLY WITH COMMAND / ORGANIZATIONAL UNIT AND LSO GUIDANCE.**

**WARNING**

IT IS NECESSARY AND INTENDED THAT LASER EYE PROTECTION (NIGHT VISION DEVICES) BE WORN BY THE OPERATOR WHEN OPERATING, MAINTAINING, SERVICING, OR TESTING THE VITAL SERIES.

**WARNING**

WHEN IN HOSTILE TERRITORY, OPERATE THE VITAL WITH CAUTION. ANY PERSON USING NIGHT VISION DEVICES CAN DETECT THE IR SOURCE USED IN THE VITAL.

**WARNING**

NEVER VIEW THE BEAM DIRECTLY ON AXIS THROUGH MAGNIFYING OPTICS SUCH AS BINOCULARS OR TELESCOPES WITHOUT APPROPRIATE SAFETY FILTERS AS MAGNIFYING OPTICS HAVE THE ABILITY TO REFOCUS LASER LIGHT AND TO INCREASE THE NOMINAL OCULAR HAZARD DISTANCE (NOHD).

**WARNING**

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIC HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

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# CHAPTER 1:

## GENERAL INFORMATION

### 1.1 Introduction:

This manual provides operation and maintenance instructions for the VITAL. It also provides specifications and data on the performance of the laser. The instructions will cover all variants of the VITAL. 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 VITAL SERIES are weapon mountable IR Pointers/Aimers and LED Illuminators. The IR light is invisible to the unaided eye but fully visible to Gen II, Gen III image intensified night vision devices.

The VITAL-2 is a Class 1 aimer/pointer and has a maximum peak output power of 0.7mW (eye- safe). The VITAL-100 is a Class 3B IR aimer/pointer and has a maximum power of 100mW. The illuminator is a LED IR light source with two intensity levels for close quarter battle target illumination.

The VITAL incorporates a removable local control paddle switch, conveniently placed for easy thumb activation. A remote control switch is included with the VITAL. It is 12in (30cm) long. Custom lengths are available on request. The laser aimer can be activated on a momentary basis through either the thumb switch or remote switch.

### 1.3 Standard Kit Parts List:

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

Item	Part No.	Description	Qty.
1	M002IR M100IR	VITAL-2 Variable Intensity Tactical Aiming Light VITAL-100 Variable Intensity Tactical Aiming Light	1
2	P-VIT-NV	Soft Carrying Case	2
3	NVEC #16	1913 Rail Mount Kit (NSN: 5855-01-468-3689)	1
4	170-12	Lens Cleaning Kit	1
5	SWCH510	Remote Switch (Black)	1
6	SWCH512	Paddle Switch (Black)	1
7	830-0055-0	Operator Manual	1
8	580-0001-0	AA Battery Alkaline	2
9	TARVIT10	10 Meter Boresight Target	1
10	TARVIT25	25 Meter Zero Target	1
11	SWCH514	Remote Switch (Blue), VITAL-100 only	1
12	SWCH515	Paddle Switch (Blue), VITAL-100 only	1
13	HC-VITAL	Shipping/Storage Case, VITAL-100 only	1
14	830-0056-0	Quick Reference Guide	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 VITAL kit.

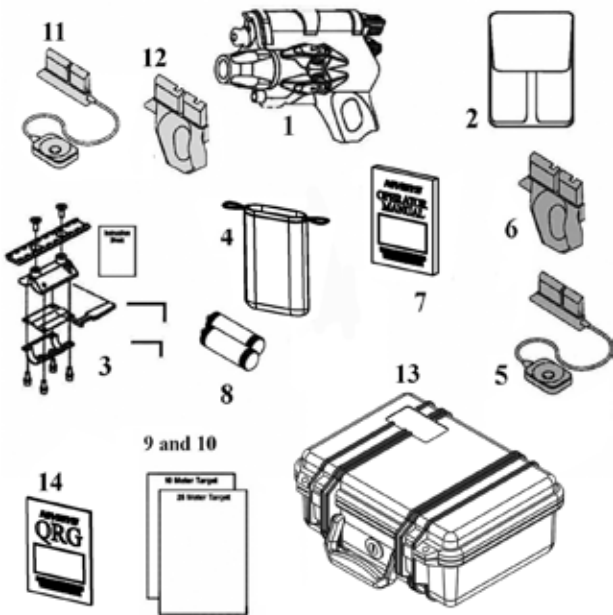


Figure 1-1 Standard Kit Parts Illustration

### 1.5 Optional Items List:

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

Item	Part No.	Description
1	BA-AA	Battery AA, Lithium
2	HC-VITAL	Hard Shipping and Storage Case, VITAL-2

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 VITAL.

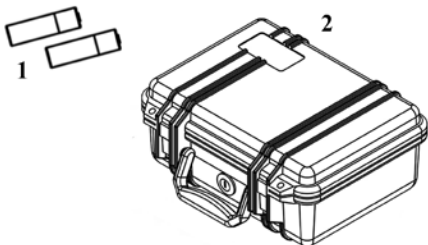


Figure 1-2 Optional Parts Illustration

## 1.7 System Performance and Data:

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

ITEM	LIMITS	
<b>Electrical</b>		
	<b>VITAL-2</b>	<b>VITAL-100</b>
Power Source	3.6 VDC Maximum	
Battery Type	Alkaline 1.5 V AA (2ea)	Lithium 1.5 V AA (2ea)
Battery Life @ 73°F (23°C)	20+hrs	25+hrs
<b>Physical</b>		
Overall Dimensions	5.5 x 2.75 x 2.25in (14 x 7 x 5.7cm)	
Weight (with batteries) and Paddle Switch	7.8oz (221g)	
<b>Environmental</b>		
Operation Temperature	-32°C to +51°C	
Storage	-57°C to +71°C	
<b>Laser</b>		
<b>Description</b>	<b>VITAL</b>	
Laser Power Output (max) @ 73°F (23°C)	.7mW	100mW

**Table 1-3 System Performance and Data**

ITEM	LIMITS	
<b>Laser</b>		
	VITAL-2	VITAL-100
Laser Safety Class	1	3B
Nominal Ocular Hazard Distance (NOHD) for the unaided eye	0ft (0m)	925ft (282m)
Laser Beam Divergence (max)	0.5mR	
Laser Wavelength	830± 20 nm	
Description	CQB ILLUMINATOR	
CQB LED Output Power	15mW ± 5mW	
LED Beam Divergence (max)	20°(+)	
LED Wavelength	880nm ± 20nm	

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

## 1.8 Nominal Ocular Hazard Distance (NOHD)

The distance at which beam irradiance or radiant exposure becomes equal to the maximum allowable exposure on the cornea. Care must be taken against laser exposure within this distance. However, it does not mean that continuously looking at the laser beam at a distance longer than NOHD is safe or has no hazardous influence.

NOHD Summary for the VITAL Series		
	Type of Viewing	NOHD
VITAL-2	Unaided	0ft (0m)
	5 cm optics (7x50 binoculars)	0ft (0m)
	8 cm optics (Tanks)	0ft (0m)
	12 cm optics (Big Eyes)	0ft (0m)
VITAL-100	Unaided	925ft (282m)
	5 cm optics (7x50 binoculars)	5249ft (1600m)
	8 cm optics (Tanks)	9843ft (3000km)
	12 cm optics (Big Eyes)	14436ft (4400)

Table 1-4 NOHD Summary

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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 VITAL for operation under normal conditions.

### 2.2 Battery Precautions:

#### **WARNING**

**DO NOT MIX ALKALINE AND LITHIUM BATTERIES. DO NOT MIX OLD AND NEW BATTERIES. 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, SHORT CIRCUIT, INCINERATE, ATTEMPT TO RECHARGE OR OTHERWISE TAMPER WITH THE BATTERIES. TURN OFF THE VITAL IF THE BATTERY COMPARTMENT BECOMES UNDULY HOT. IF POSSIBLE, WAIT UNTIL THE BATTERIES HAVE COOLED BEFORE REMOVING THEM.**

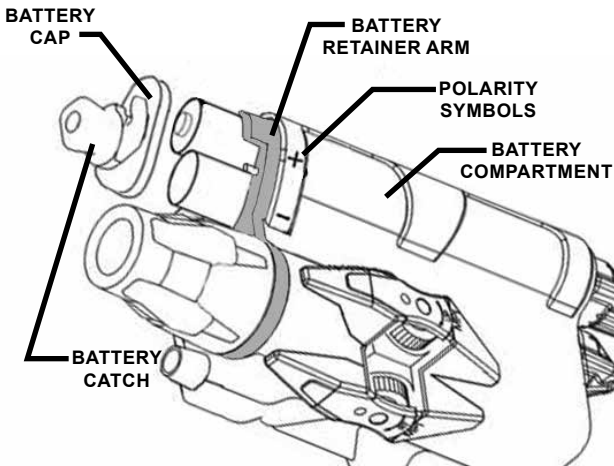
**CAUTION**

**OBEY THE BATTERY MANUFACTURER'S  
DIRECTIONS FOR BATTERY DISPOSAL.**

**2.3 Battery Installation:**

The electronic circuit is powered by two (2) AA battery cells. Install the batteries as follows.

1. Release the battery catch by turning it in a clockwise direction.
2. Release the battery retainer arm by rotating it in a clockwise direction.



**Figure 2-1 Battery Installation**

3. Remove the battery cap by pulling the battery cap out of the battery compartment.
4. Observe the polarity symbols on the edge of the battery compartment.
5. Place two batteries into the compartment.
6. Replace the battery cap.
7. Replace the battery retainer arm.
8. Turn the battery catch in a counter-clockwise direction until a stop occurs.

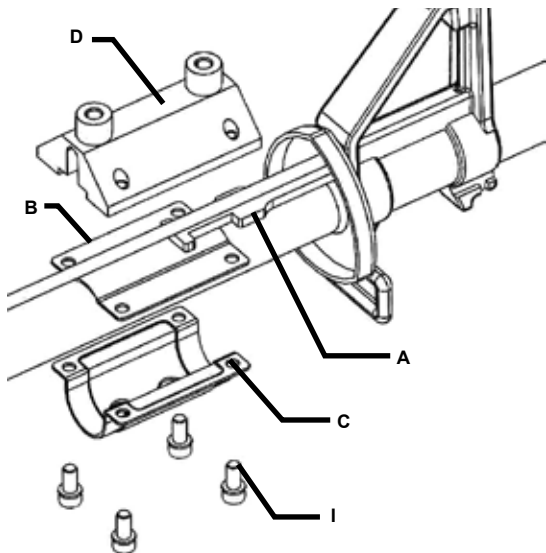
## **2.4 NVEC #16 Installation on an M16:**

The VITAL is configured to attach to a MIL-STD-1913 rail system. The standard VITAL kit includes the NVEC#16, which is a rail that can be attached to a M16 style gun. To install the NVEC#16 perform the following.

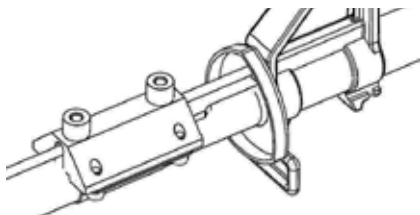
### **WARNING**

**ENSURE THE WEAPON IS FREE AND CLEAR AND THAT THE WEAPON'S SAFETY MECHANISM IS SWITCHED TO SAFE.**

1. Place spacer "A" between gas tube and barrel.
2. Place upper clamp "B" between spacer tube and barrel.
3. Place lower clamp "C" under barrel and align the holes in the upper and lower clamps.
4. Place mount body "D" over gas tube and align holes with the clamp holes (spacer "A" fits into slot on mount body "D").
5. Install #6 screws and washers (I).
6. With screws loose, slide assembly forward to the stop snug screws but **DO NOT TIGHTEN FURTHER.**

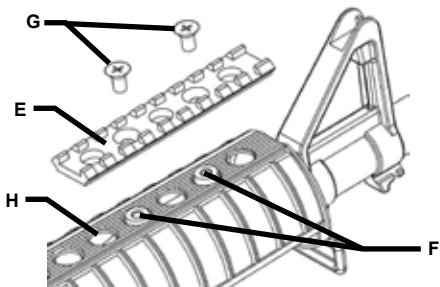


**Figure 2-2 NVEC#16 Installation, Steps 1-6 Exploded**



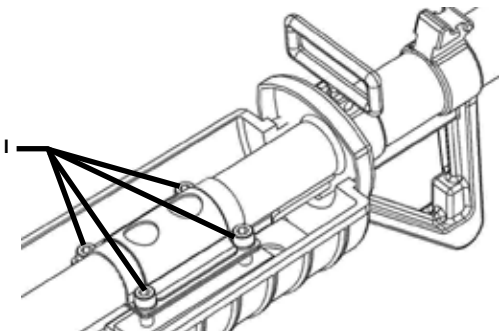
**Figure 2-3 NVEC#16 Installation, Steps 1-6 Completed**

7. Replace hand guard “H” and rail “E” over mount posts “F.”
8. Install and tighten flat head screws “G”.



**Figure 2-4 NVEC#16 Installation, Steps 7-8 Exploded**

9. Tighten screws “I”.



**Figure 2-5 NVEC#16 Installation, Step 9**

10. Install hand guard “J”.

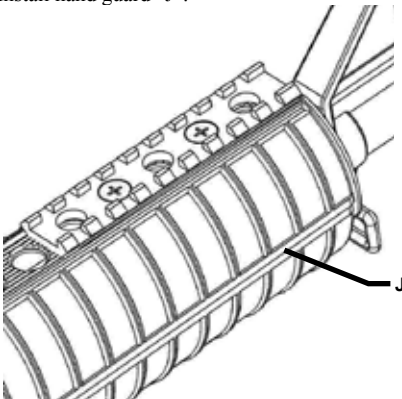


Figure 2-6 NVEC#16 Installation, Step 10

## 2.5 Attaching to a Weapon:

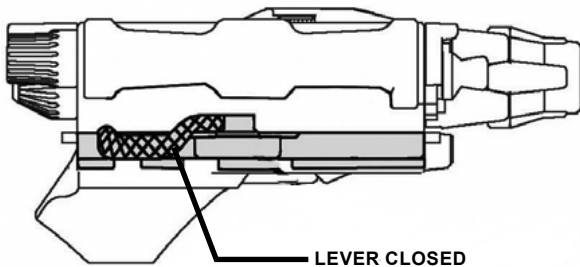
Perform the following procedure to install the VITAL onto a MIL-STD-1913 rail system:

### **WARNING**

**ENSURE THE WEAPON IS FREE AND CLEAR AND THAT THE WEAPONS SAFETY MECHANISM IS SWITCHED TO SAFE.**

1. Open the lever of the mount perpendicular to the length of the VITAL.
2. Place the VITAL on the MIL-STD-1913 rail system of the weapon.

3. Ensure that the mount is seated squarely on the rail.
4. Close the lever of the mount in line with the length of the VITAL.



**Figure 2-7 Weapon Mount Installation**

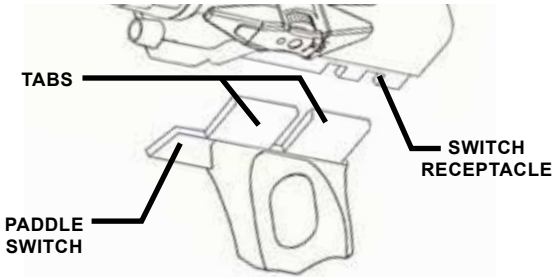
## **2.6 Remote or Paddle Switch Installation:**

The VITAL comes with two types of switches to be used to fire the laser. Both are installed using the same method. To install a remote or paddle switch into the VITAL perform the following.

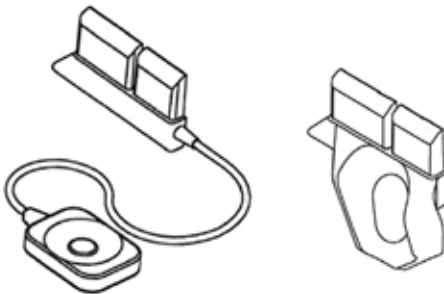
1. Locate the remote/paddle switch that will be used. Note the two tabs with metal strips on one side.
2. Identify the switch receptacle on the VITAL located under the windage and elevation adjusters.
3. Ensure that the switch receptacle is free and clear of moisture and dirt.
4. Insert the tabs of the remote/paddle switch into the VITAL switch receptacle.
5. Ensure that the switch is fully seated into the switch receptacle.

**NOTE**

**THE REMOTE/PADDLE SWITCH CAN ONLY BE INSERTED IN ONE DIRECTION.**



**Figure 2-8 Remote/Paddle Switch Installation**



**Figure 2-9 Paddle and Remote Switches**



# CHAPTER 3: OPERATING INSTRUCTIONS

## 3.1 Introduction:

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

## 3.2 Operating Precautions:

### **WARNING**

**THERE ARE EYE AND OTHER HAZARDS ASSOCIATED WITH THE USE OF THE VITAL SERIES. SAFE OPERATION OF THIS PRODUCT REQUIRES FOLLOWING WARNINGS, CAUTIONS AND NOTES CONTAINED IN THIS OPERATOR MANUAL.**

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**WARNING**

**WHEN IN HOSTILE TERRITORY, OPERATE THE VITAL WITH CAUTION. ANY PERSON USING NIGHT VISION DEVICES CAN DETECT THE IR SOURCE USED IN THE VITAL.**

**WARNING**

**NEVER VIEW THE BEAM DIRECTLY ON AXIS THROUGH MAGNIFYING OPTICS SUCH AS BINOCULARS OR TELESCOPES WITHOUT APPROPRIATE SAFETY FILTERS AS MAGNIFYING OPTICS HAVE THE ABILITY TO REFOCUS LASER LIGHT AND TO INCREASE THE NOMINAL OCULAR HAZARD DISTANCE (NOHD).**

**WARNING**

**USE OF CONTROLS, ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIC HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.**

### 3.3 Controls and Indicators:

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

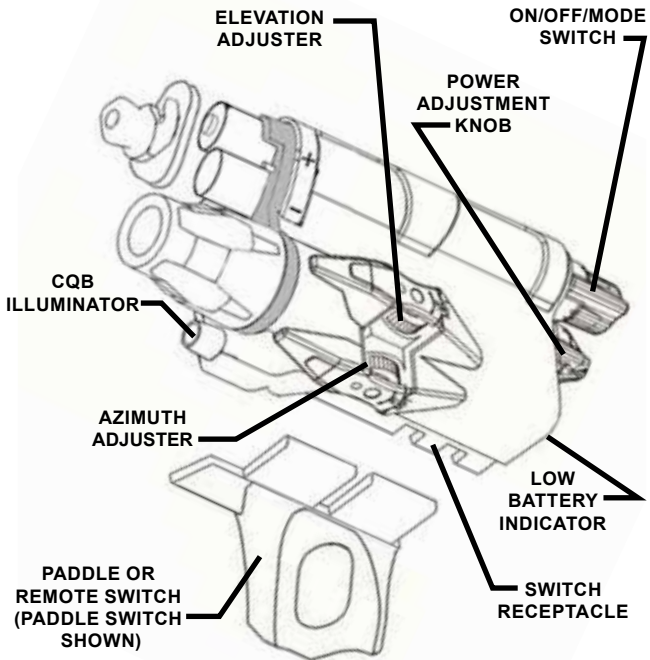


Figure 3-1 Controls and Indicators

<b>Control and Indicators</b>	<b>Functions</b>
ON/OFF/MODE SWITCH	The ON/OFF switch is the master power switch and beam mode selector. The unit does not operate until the momentary switch is activated.
Power Adjustment Knob	The power adjustment knob is used to select the best beam intensity level for the ambient lighting condition.
Elevation Adjuster	An elevation adjustment knob on top of the unit is used to adjust the strike of the bullet up and down, during the zeroing process, at a rate of 0.4 mR per click, 4.0cm at 100m.
Azimuth Adjuster	An azimuth adjustment knob on the left side of the unit is used to adjust the strike of the bullet left and right, during the zeroing process, at a rate of 0.4 mR per click, 4.0cm at 100m.
Low Battery Indicator	An LED located on the rear of the housing that glows amber to indicate low battery power.
Switch Receptacle	Receives the paddle or remote switch.
Paddle or Remote Switch	Used to fire the laser.
CQB Illuminator	Used to illuminate areas in Close Quarter Battle.

**Table 3-1 Controls and Indicators**

### 3.4 **Safe Operation:**

Once the batteries are installed, do not point the laser toward any person within the NOHD. Night vision goggles will provide protection by blocking the laser beam from directly entering the eye but the goggles themselves may be damaged. Other than the enemy, do not intentionally illuminate anyone with or without NVG within the NOHD, whether during operations or training. Refer to the section 1.8 for NOHD distances.

#### **WARNING**

**NEVER VIEW THE BEAM DIRECTLY ON AXIS THROUGH MAGNIFYING OPTICS SUCH AS BINOCULARS OR TELESCOPES WITHOUT APPROPRIATE SAFETY FILTERS AS MAGNIFYING OPTICS HAVE THE ABILITY TO REFOCUS LASER LIGHT, INCREASING THE DISTANCE FROM THE LASER WHERE HAZARDS MAY OCCUR (NOMINAL OCULAR HAZARD DISTANCE – NOHD). THE NOHD FOR THE VITAL SERIES IS LISTED IN 1.8.**

#### **WARNING**

**DO NOT POINT THE LASER AT SPECULAR SURFACES (I.E. MIRROR-LIKE).**

### 3.5 **Firing the Laser:**

The VITAL fire button is a momentary switch, on both the paddle and remote switch. It will only fire as long as it is depressed. When the fire button is not depressed, the laser is not activated. To fire the VITAL perform the following procedure.

1. Ensure the paddle or remote switch is correctly installed.

- Turn the ON/OFF/MODE switch in a clockwise direction and select a beam mode.
- Press the momentary switch.

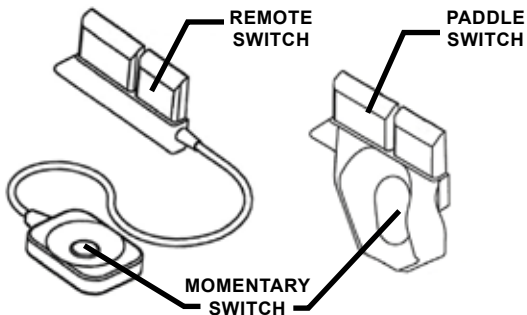


Figure 3-2 Momentary Switch on Paddle and Remote Switches

### 3.6 Beam Modes:

The VITAL features 5 different modes for beam output. To adjust the beam mode, turn the ON/OFF/MODE switch clockwise from the OFF position. The switch will give audio and tactile feedback as each mode is selected. To ensure a specific mode, turn the ON/OFF/MODE switch until the selection indicator is in line with the printed mode icon.

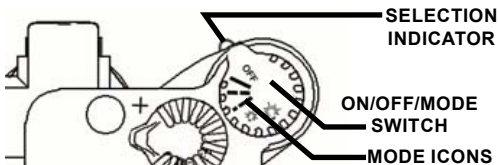







Figure 3-3 ON/OFF/MODE Switch

The five printed mode icons are explained in the following table.

VITAL BEAM MODES	
Mode Icon	Description
	ON - Steady
	ON - Slow Pulse, 3Hz
	ON - Fast Pulse, 6Hz
	ON - Steady with Low Power Close Quarter Battle (CQB) Illumination
	ON - Steady with High Power CQB Illumination

**Table 3-2 Beam Modes**

### 3.7 Power Adjustment Knob:

The power adjustment knob is used to regulate output power of the aimer beam. Lowering the power can lessen washout, halo effect or excessive reflective luminance from close proximity to a target. The power adjustment knob is used in the following manner.

1. Turn the knob counter-clockwise until a stop occurs. This will slowly reduce output power by more than 90%.
2. Turn the knob clockwise until a stop occurs. This will increase the output power up to a maximum output power level.

#### **NOTE**

**THE POWER KNOB MUST BE HELD IN PLACE  
TO MAKE A POWER LEVEL ADJUSTMENT.  
AFTER DESIRED POWER IS REACHED,  
RELEASE THE KNOB.**

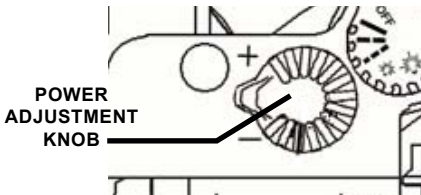


Figure 3-4 Power Adjustment Knob

### 3.8 CQB Illuminator:

The Close Quarter Battle (CQB) LED illuminator provides wide angle infrared light to aid night vision viewing in very dark conditions. The CQB illuminator can be set in the high or low power mode by the ON/OFF/MODE switch.

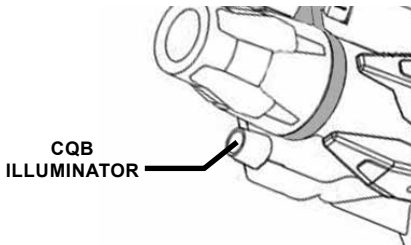


Figure 3-5 CQB Illuminator

### 3.9 Elevation and Azimuth Adjusters:

Adjusters at top and left are used to zero the beam (dot) position relative to the bullet strike.

1. An elevation adjustment knob on top of the unit is used to adjust the strike of the bullet up and down, during the zeroing process, at a rate of 0.4mR per click, 4.0cm at 100m.



2. An azimuth adjustment knob on the left side of the unit is used to adjust the strike of the bullet left and right, during the zeroing process, at a rate of 0.4mR per click, 4.0cm at 100m.

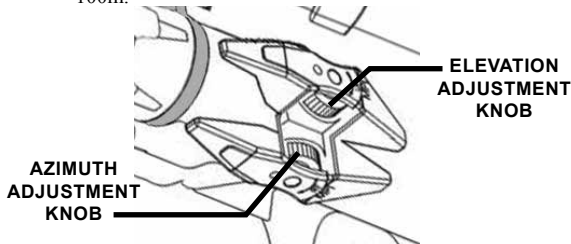


Figure 3-6 Elevation and Azimuth Adjuster Knobs

### 3.10 Preparing the VITAL for Zeroing:

This manual contains a comprehensive zero procedure to align the beam of the VITAL to the point of impact of the bullet. It is recommended that the aim dot and the point of impact not be coincident but that they be offset on the boresight or zeroing target in the same relationship as they are mounted on the weapon. This will ensure the same aiming point to bullet strike relationship at all engagement ranges. To zero the VITAL to the weapon perform the following.

1. Install the VITAL onto the weapon rail with appropriate momentary switch.

#### **NOTE**

**WHEN REINSTALLING THE VITAL TO THE WEAPON, BE SURE TO RETURN IT TO THE EXACT RAIL LOCATION FOR AN ACCURATE ZERO TO WEAPON.**

2. Set the power adjustment knob to its lowest setting by rotating it in a counter-clockwise direction.
3. Achieve a neutral adjustment setting by turning each adjuster clockwise until a stop occurs. Return the adjuster knobs approximately three rotations counter-clockwise until the white dot on the adjuster knob is visible through the adjuster window.

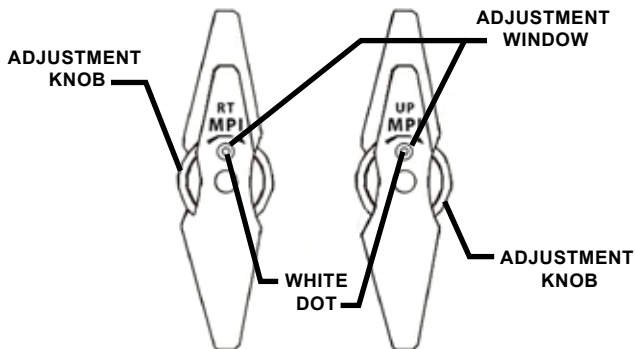


Figure 3-7 Neutral Adjustment Setting

**CAUTION**

**TO PREVENT JAMMING THE ADJUSTMENT KNOBS, DO NOT FORCE THE ADJUSTERS TO ROTATE PAST THEIR END OF TRAVEL.**

**CAUTION**

**DO NOT USE TOOLS TO TURN ADJUSTER KNOB.**

### 3.11 Zeroing the VITAL to a M16/M4 using the NVEC#16:

The equipment listed below is required to perform the following procedure.

#### **WARNING**

**ENSURE THE WEAPON IS FREE AND CLEAR AND THAT THE WEAPON'S SAFETY MECHANISM IS SWITCHED TO SAFE.**

- M16/M4 rifle with NVEC#16 mount installed
- VITAL aiming light kit
- Stand or flat area to secure target (wall, clipboard, etc.)
- Weapons vise, sand bags or clamp
- Laser boresight with proper size bore mandrel
- Night vision system with day light cover
- 10m boresight target (TARVIT10)
- 82ft (25m) space away from personnel.

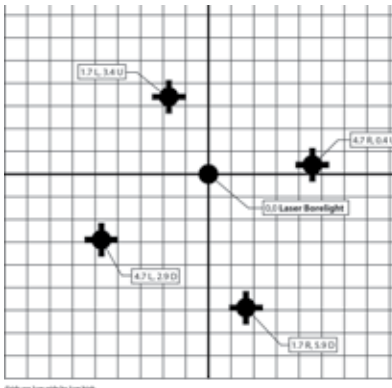


Figure 3-8 Example Target for Zeroing Using the NVEC#16

**NOTE**

**USE THE FULL SIZE TARGET SUPPLIED WITH THE VITAL KIT WHEN PERFORMING THE FOLLOWING ZEROING PROCEDURE.**

1. Mount the VITAL on the weapon.
2. Place the target on flat area at 33ft (10 m) from the weapon position. Target area should be out of direct bright light, an indoor location is best.
3. Lock the weapon in a weapon vise, clamp or stabilize it with sand bags pointing in the direction of the target (CRITICAL).
4. With the proper size mandrel, insert a laser boresight in the barrel in accordance with laser boresight instructions.
5. Adjust the weapon and/or target position to project the laser boresight beam to the laser boresight position on the target.
6. Station a night vision equipped assistant near the target, WITH BACK TOWARDS IR LASER APERTURE.

**CAUTION**

**KEEP DAYLIGHT COVER ON TO AVOID DAMAGE TO NIGHT VISION DEVICE.**

7. Fire the VITAL and have night vision equipped assistant provide directions to person at the weapon to adjust VITAL beam (elevation and azimuth).

**CAUTION**

**NIGHT VISION DEVICE SHOULD ONLY BE TURNED ON LONG ENOUGH TO MARK THE PAPER.**

8. VITAL is boresight zeroed when IR laser is in the circle of the VITAL laser box crosshair on the target.

**NOTE**

**THIS ZEROING METHOD WILL ALIGN THE VITAL TO BE PARALLEL TO THE LINE OF SIGHT OF THE BORE OF THE WEAPON.**

**WARNING**

**LIVE FIRE ZEROING IS RECOMMENDED TO DETERMINE EXACT PLACEMENT AT KNOWN DISTANCES.**

**NOTE**

**THE VITAL WILL RETAIN ZERO AFTER IT HAS BEEN REMOVED AND REPLACED ON THE SAME WEAPON IN THE SAME SLOT ON THE NVEC#16.**

**WARNING**

**THE VITAL MUST BE RE-ZEROED WHENEVER THE MOUNTING (BASE) BRACKET IS REMOVED AND REPLACED.**

**3.12 Zeroing the VITAL to Any Weapon:**

After performing the dry boresighting of the VITAL series laser aimer to the weapon bore, it is recommended to conduct a live fire boresight at the 150m designated zero range. The procedure is as follows:

1. Arrange a target at 150m range downrange.
2. Adopt a secure and stable firing position.
3. Don night vision goggles and switch ON.
4. Activate the VITAL laser and bring the laser dot onto target center.

5. Fire a group of 5 rounds, single shot, maintaining a steady aim on the target center
6. Clear weapon and switch to SAFETY.
7. Check impact position of 5 rounds on the target, determine the center of the shot group, or mean point of impact (MPI).
8. If any adjustments are necessary, use the following table for MPI adjustments at 150m range:

	Azimuth	Elevation
Direction to move adjuster	Clockwise moves MPI <b>down</b>	Clockwise moves MPI <b>right</b>
Movement per click	6cm (2.4in) at 150m	

**Table 3-4 Live Fire Adjustments at 150m**

9. Repeat steps 2 through 8 until the center of the shot group is located at or near the target center.

If a full 150m range is not available, a 25m live fire boresighting may be performed, using the supplied target 25m boresight target for 150m zero (TARVIT25).

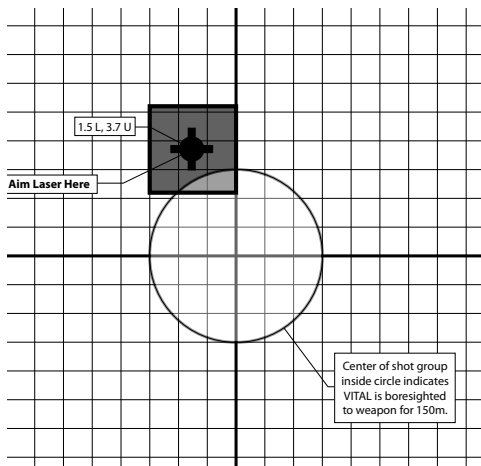
1. Arrange the TARVIT25 at 25m range downrange.
2. Adopt a secure and stable firing position.
3. Don night vision goggles and switch ON.
4. Activate the VITAL laser and bring the laser dot onto designated rectangle aiming area.
5. Fire a group of 5 rounds, single shot, maintaining a steady aim on the target aiming area.
6. Clear weapon and switch to SAFETY.
7. Check impact position of 5 rounds on the target, determine the center of the shot group, or mean point of impact (MPI).

8. If any adjustments are necessary, use the following table for MPI adjustments at 150m range:

	Azimuth	Elevation
Direction to move adjuster	Clockwise moves MPI <b>down</b>	Clockwise moves MPI <b>right</b>
Movement per click	1cm (0.4in) at 25m	

**Table 3-4 Live Fire Adjustments at 25m**

9. Repeat steps 2 through 8 until the center of the shot group is located at or near the target center.



**Figure 3-9 Example Target for Zeroing Any Weapon**

**NOTE**

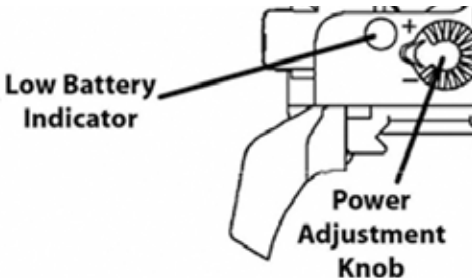
**THE VITAL WILL RETAIN ZERO AFTER IT HAS BEEN REMOVED AND REPLACED ON THE SAME WEAPON IN THE SAME SLOT ON THE NVEC#16.**

**WARNING**

**THE VITAL IT MUST BE RE-ZEROED WHENEVER THE MOUNTING (BASE) BRACKET IS REMOVED FROM THE VITAL AND REPLACED.**

**3.13 IR Low Battery Indicator**

The VITAL features a low battery indicator located on the rear of the unit near the power adjustment knob. It can only be viewed through a night vision device and will illuminate when the battery power is low, indicating that the batteries need to be replaced.



**Figure 3-10 IR Low Battery Indicator Location**



### 3.14 Preparation for Storage:

#### **WARNING**

**WHEN NOT IN USE, STORE THE VITAL SERIES  
IN A SECURE AREA.**

1. Ensure that the ON/OFF/MODE switch is in the OFF position.
2. Remove batteries from the laser device.
3. Inspect the battery compartment for corrosion or moisture.
4. Clean and dry if necessary.
5. Replace the battery cap.
6. Remove any paddle or remote switch.

#### **NOTE**

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

7. Place the laser device and all accessories in the soft or hard (optional) carrying case. It is best to place the items in their original locations to prevent any possible damage to the unit and/or accessories.
8. Return to secure storage area.

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# CHAPTER 4:

## MAINTENANCE INSTRUCTIONS

### 4.1 Introduction:

The VITAL 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 LASER DEVICE A PRECISION ELECTRO-OPTICAL INSTRUMENT AND MUST BE HANDLED CAREFULLY.**

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

### 4.2 Battery Removal:

Open battery compartment, remove batteries and store in carrying case. Close the battery compartment before cleaning.

### 4.3 Cleaning the VITAL:

When necessary, use a moistened clean cloth to wipe the outside of the unit. 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 Optical Surfaces:

To clean the lens, wipe using a soft cloth with clean water, alcohol, or general purpose glass cleaner. Polish with lens tissue. Clean only the external surface of the lens.

#### 4.5 Checking for Damage and Corrosion:

As a general guideline, conduct an inspection of the VITAL, 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.

#### 4.6 Preventive Maintenance Checks and Services (PMCS):

Action					Not Usable If
		Before	During	After	
1	Inspect kit and components for presence and serviceability	X		X	Key components are missing
2	Lenses are clean and free of large scratches that affect performance	X		X	Scratches affect the pointer performance
3	Check activation switches and power controls for proper function	X	X		Controls do not work properly
4	Check housing for signs of damage	X		X	Housing is cracked

**Table 4-1 Preventive Maintenance Checks and Services**

# CHAPTER 5: TROUBLESHOOTING

## 5.1 Troubleshooting Procedures:

Table 5-1 lists common malfunctions that may occur with the VITAL. 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 for Inspection	Corrective Action
Aimer and Illuminator fail to operate.	Dirty battery contacts.	Clean battery cap and contacts.
	Reversed batteries.	Reinstall batteries with correct polarity observed.
	Dead batteries.	Replace batteries.
	Bad switch	Turn in for replacement.
Paddle or remote switch will not activate the system.	Defective paddle or remote switch	Replace paddle or remote switch.
	Dirty or bent contacts on aiming laser assembly.	Clean contacts with cotton swab and alcohol if dirty. Turn in unit if bent.

**Table 5-1 Troubleshooting**

Aiming laser will not hold zero.	Damaged or bent mounting rail.	Replace rail.
	Mount assembly is loose.	Turn in for replacement.
	Defective aiming laser.	Turn in for replacement.
Intermittent operation of aimer and illuminator.	Dirty battery cap or battery housing.	Clean contacts with alcohol and cotton swab or pencil eraser.
	Loose battery cap	Tighten battery cap.
Aiming beam is not sharply defined	Dirty lens.	Clean lens.
	Scratched lens.	Turn in for replacement.

**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 VITAL.

## A.2 Contact Information:

To order spare or repair parts for the VITAL or any 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 VITAL.

Part No.	Description	Qty.
VITU511	Battery Cap Assembly	1
781-0019-A	O-ring, Battery Cap	1
P-VIT-NV	Soft Carrying Case	1
NVEC #16	Throw Lever Weapon Mount Kit	1
170-12	Lens Cleaning Kit	1

**Table A-1 Spare and Repair Parts List**

SWCH510	Remote Switch (Black)	1
SWCH512	Paddle Switch (Black)	1
830-0055-0	Operator Manual	1
580-0001-0	AA Battery Alkaline (2 required)	1
581-0002-0	AA Battery Lithium (2 required)	1
TARVIT10	10 Meter Boresight Target	1
TARVIT25	25 Meter Zero Target	1
HC-VITAL	Hard Case	1
830-0056-0	Quick Reference Guide	1
SWCH514	Remote Switch (Blue)	1
SWCH515	Paddle Switch (Blue)	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](mailto: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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***NIVISYS***<sup>TM</sup><sub>LLC</sub>

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