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NIVISYSTM_{LLC}

OPERATOR MANUAL

TAWSTM **Series**

Thermal Acquisition Weapon Sight



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OPERATOR MANUAL
for
TAWS Series
Thermal Acquisition Weapon Sight

PART NUMBER	MODEL DESCRIPTION (LENS, CORE)
3415-000	PHOENIX-W (35mm, 25 μ)
3410-000	TAWS-16cM (35mm, 25 μ)
3417-000	TAWS-16iM (35mm, 25 μ)
3505-000	TAWS-32cM (35mm, 25 μ)
3507-000	TAWS-32cM (35mm, 17 μ)
3510-000	TAWS-32iM (35mm, 25 μ)
3512-000	TAWS-32iM (35mm, 17 μ)
3535-000	TAWS-32cE (100mm, 25 μ)
3537-000	TAWS-32cE (100mm, 17 μ)
3540-000	TAWS-32iE (100mm, 25 μ)
3550-000	TAWS-32iE (100mm, 17 μ)
3605-000	TAWS-64cM (35mm, 17 μ)
3610-000	TAWS-64iM (35mm, 17 μ)
3625-000	TAWS-64cE (100mm, 17 μ)
3630-000	TAWS-64iE (100mm, 17 μ)
3621-000	TAWS-64iL (50mm, 17 μ)

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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 TAWS. 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 TAWS Series is our dedicated thermal weapon sight line. Of course it is versatile enough to be used as a hand-held unit when needed and can easily be mounted and detached from any standard Picatinny rail system using the double throw lever mount. The TAWS Series gives the operator enhanced surveillance and targeting capability during night and adverse weather conditions. User selectable reticles and digital windage and elevation adjustments are readily available through the onboard software and the monocular can be easily bore-sighted to any weapon. An included remote control switch provides increased flexibility for the user, integrating the sight and the weapon.

The TAWS Series units are easy to operate with simple and intuitive controls, with standard features such as polarity, display brightness and digital zoom. The user menu provides a selection of display modes including color or monochrome and contrasting reticle color, enabling the user to optimize the viewed image for the target and scene conditions.

The TAWS Series objective lens is offered in a variety of focal lengths providing a choice of fields of view and target detection ranges. The TAWS Series models include image capture to an internal memory and review of still images on the internal micro-display. Video and still images may be downloaded and captured to a SD card using our optional Audio Visual Kit.

1.3 Standard Kit Parts List:

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

Item	Part No.	Description	Qty.
1	See page i for Part Numbers	Thermal Acquisition Weapon Sight	1
2	1407-500	Soft Carrying Case	1
3	1407-501	Shoulder Strap	1
4	580-0002-0	Battery, CR123 Lithium	4
5	170-12	Cleaning Kit	1
6	790-0015-0	Mount Adjustment Tool	1
7	3255-000	RS-16, Remote Switch (Not a standard item with the -16 or Phoenix Models)	1
8	830-0071-0	Operator Manual, TAWS Series	1
9	830-0072-0	Quick Reference Guide, TAWS Series	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 TAWS kit.

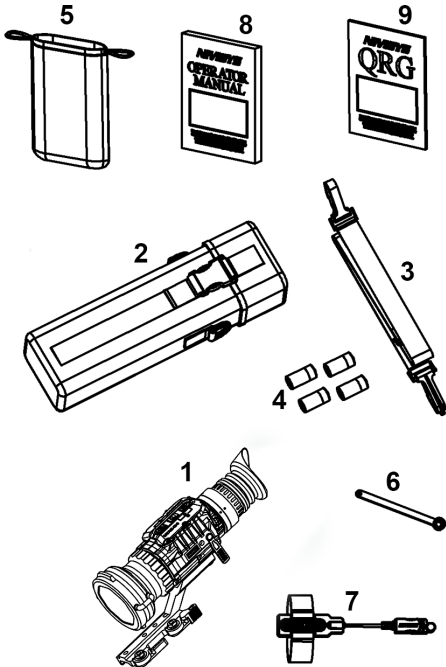


Figure 1-1 Standard Kit Parts Illustration

1.5 Optional Items List:

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

Item	Part No.	Description
1	7B257-2F	Shipping/Storage Case
2	A3144306	Neck Cord
3	3500-900	Dual Throw Lever Low Profile Mount (35mm lenses only)
4	A3256345	Shuttered Eyeguard
5	3490-000	Video Power Download Module
6	NVM-033	Demist Shield

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 TAWS.

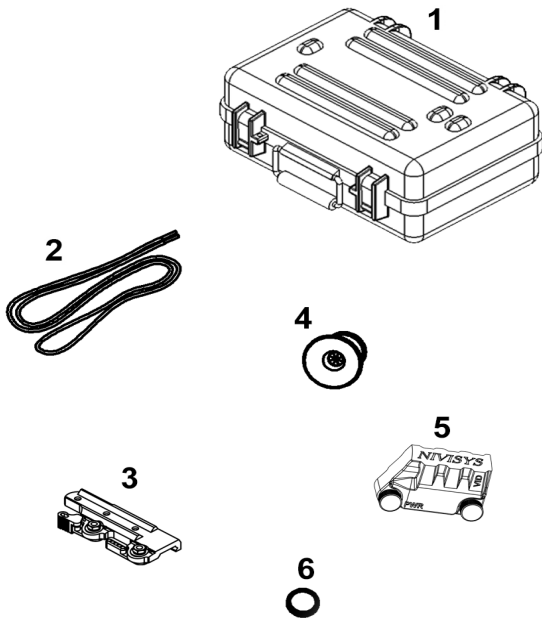


Figure 1-2 Optional Parts Illustration

1.7 System Performance and Data:

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

ITEM	LIMITS		
Electrical			
Power Source	Battery (3.0V DC max.)		
Battery Requirements	CR123 Lithium (2ea.)		
Battery Life	>4 hrs @ 21°C (70°F)		
Physical			
	-M	-L	-E
Overall Dimensions (L x H x W)	15.2 x 6.8 x 6.8cm	18.0 x 9.5 x 7.4cm	24.9 x 8.6 x 8.6cm
Weight (with batteries)	590g	851g	1167g
Environmental			
	“c”		“i”
Operating Temperature	-10° to +45° C		-40° to +55° C
Storage Temperature	-40°C to +70°C		

Table 1-3 System Performance and Data

Thermal Core				
	-16 (25μ)	-32 (25μ)	-32 (17μ)	-64 (17μ)
Sensor Resolution	160 x 120	324 x 256	336 x 256	640 x 480
Pixel Pitch	25 μ m	25 μ m	17 μ m	17 μ m
Sensor	Vanadium Oxide (VOx) Microbolometer Uncooled 60Hz frame rate			
Thermal Sensitivity	<50mK			
Spectral Response	7 – 14 μ m			
Video Output	Composite, NTSC			
Optical				
	-M	-L	-E	
Objective Lens Focal Length	35mm,	50mm	100mm	
Objective Lens F Number	f/1.4	f/1.2	f/1.4	
Diopter Range	+2 to -6 diopters			
Eye Relief	25mm			

Magnification and Field of View by Model				
Model	PN	Pixel Pitch	MAG	FOV (H x V)
PHOENIX-W	3415-000	25 μ	2.3	7° x 5°
TAWS-16cM	3410-000	25 μ	2.3	7° x 5°
TAWS-16iM	3417-000			
TAWS-32cM	3505-000	25 μ	1.8	13° x 10°
TAWS-32cM	3507-000	17 μ	2.7	9° x 7°
TAWS-32iM	3510-000	25 μ	1.8	13° x 10°
TAWS-32iM	3512-000	17 μ	2.7	9° x 7°
TAWS-32cL	3516-000	25 μ	2.0	9° x 7°
TAWS-32cL	3518-000	17 μ	2.9	6° x 5°
TAWS-32iL	3521-000	25 μ	2.6	9° x 7°
TAWS-32iL	3531-000	17 μ	3.8	6° x 5°
TAWS-32cE	3535-000	25 μ	5.4	5° x 4°
TAWS-32cE	3537-000	17 μ	7.7	3° x 2.5°
TAWS-32iE	3540-000	25 μ	5.4	5° x 4°
TAWS-32iE	3550-000	17 μ	7.7	3° x 2.5°
TAWS-64cM	3605-000	17 μ	1.4	18 x 13°
TAWS-64iM	3610-000			
TAWS-64cL	3616-000	17 μ	1.9	12° x 9°
TAWS-64iL	3621-000			
TAWS-64cE	3625-000	17 μ	4.0	6° x 5°
TAWS-64iE	3630-000			

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

CHAPTER 2: PREPARATION FOR USE

2.1 Introduction:

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

2.2 Battery Precautions:

WARNING

**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,
ATTEMPT TO RECHARGE OR OTHERWISE
TAMPER WITH THE BATTERIES. TURN OFF
THE TAWS 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) Lithium CR123 cells. Install the batteries as follows.

1. Remove the battery cap by turning it counter-clockwise.
2. Check to ensure the orange o-ring is present and undamaged. Replace o-ring if necessary.
3. Insert batteries into the battery compartment, negative (-) ends first, positive ends toward the battery cap.
4. Replace battery cap, turning it clockwise until a stop occurs. When fully engaged the orange o-ring should no longer be visible.

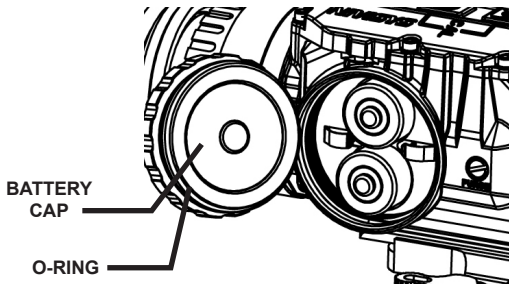


Figure 2-1 Battery Installation

2.4 Eyecup or Shuttered Eyeguard Installation:

Perform the following procedure to install eyecup or the shuttered eyeguard onto the weapon sight.

1. Carefully press the eyecup or shuttered eyeguard over the

- end of the eyepiece lens.
2. Rotate the eyecup into proper viewing position. Adjust for best fit.

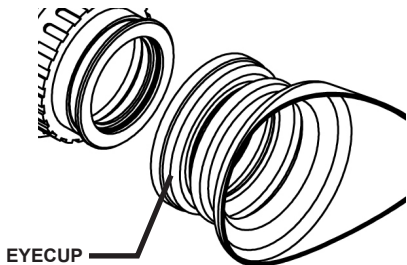


Figure 2-2 Eyecup Installation

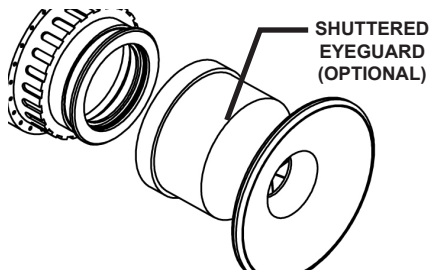


Figure 2-3 Shuttered Eyeguard Installation

2.5 Demist Shield Installation (Optional):

Perform the following procedures to install the demist shield on the eyepiece lens.

1. Carefully remove the eyecup or shuttered eyeguard.
2. Carefully screw the demist shield onto the eyepiece in a

- clockwise direction. Be careful not to smudge the eyepiece lens or demist shield.
3. Replace the eyecup or shuttered eyeguard.

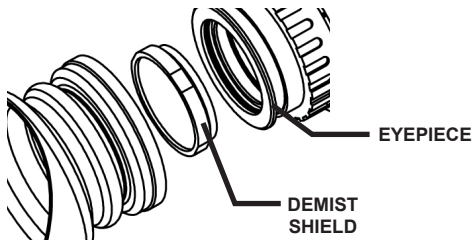


Figure 2-4 Demist Shield Installation

CAUTION

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

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.

2.6 35mm Lens Cover Installation:

The TAWS units are issued with the lens covers pre-installed. In the event installation or re-installation is necessary, perform the following procedure.

1. Close the lens cover assembly.
2. Ensure the lens cover catch is facing up.
3. Press the lens cover assembly onto the objective lens.
4. Gently rock the lens cover assembly back and forth while continuing to press firmly onto the objective lens.
5. The lens cover is fully seated as the lens cover base and the TAWS body meet.

NOTE

PROPER INSTALLATION OF THE LENS COVER MATCHES THE PROFILE OF THE LENS COVER BASE TO THE PROFILE OF THE TAWS BODY.

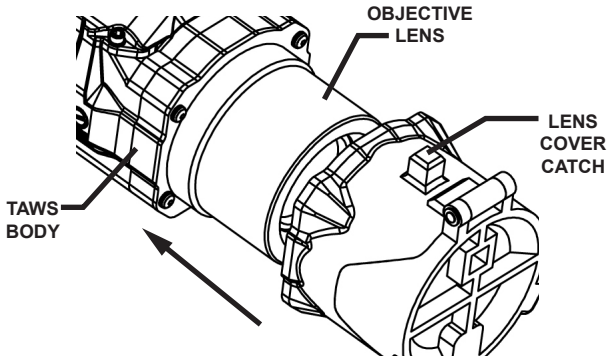


Figure 2-5 35mm Lens Cover Installation

2.7 50mm and 100mm Lens Cover Installation:

The TAWS units are issued with the lens covers pre-installed. In the event installation or re-installation is necessary, perform the following procedure.

1. Stretch the lens cover base over the lens housing.

2. Push the lens cover base onto the lens housing until it is securely seated.
3. Ensure the lens cover operates properly before use.

NOTE
**THE 50MM AND 100MM LENS COVERS
CAN BE ROTATED FOR OPERATOR
PREFERENCE.**

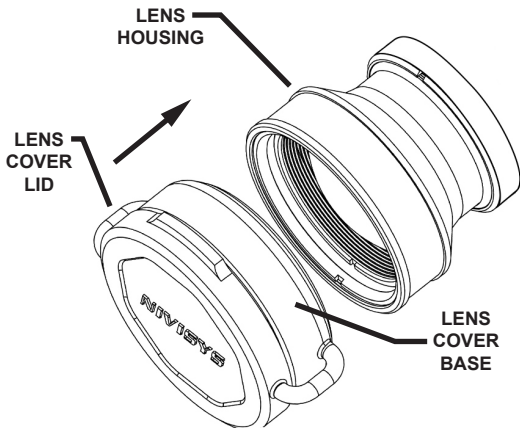


Figure 2-6 50mm and 100mm Lens Cover Installation

2.8 Weapon Mount Installation:

All TAWS units are issued with a high profile double throw lever mount pre-installed. A low profile mount is available as an option if desired. When installation or reinstallation is necessary, perform the following procedure.

1. Arrange the weapon mount v-block so that it sits in the

- receiving v-block of the main housing.
2. Align the counter-bored holes of the weapon mount with the threaded inserts in the main housing.
 3. Using a 3/32" hex key, fasten the double throw lever mount onto the mount adapter using 2 ea. 10-32 x .375" socket low-head cap screw.
 4. Ensure that the mount is securely fastened to the weapon before firing.

NOTE

CORRECT ATTACHMENT OF THE HIGH PROFILE WEAPON MOUNT SITUATES THE THROW LEVERS ON THE DUST COVER SIDE OF THE TAWS.

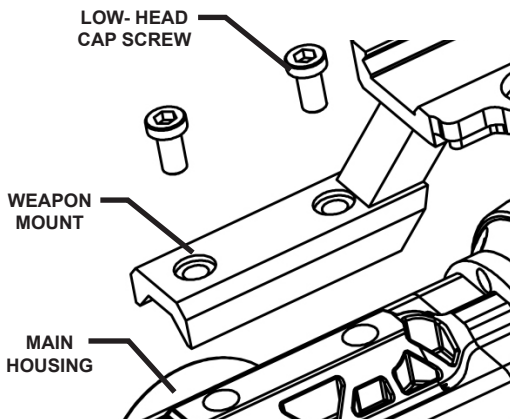


Figure 2-7 High Profile Weapon Mount Installation

2.9 Attaching the TAWS to a Weapon:

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

1. Ensure that the mount is securely fastened to the TAWS.
2. Set the slide lock to the unlocked position by pulling it back.

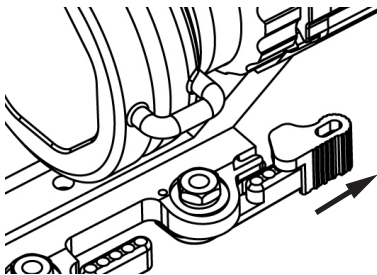


Figure 2-8 Slide Lock in Unlocked Position

3. Rotate the throw levers to the open position.

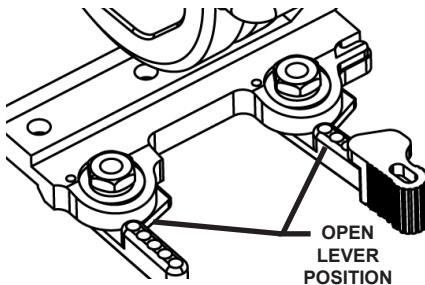


Figure 2-9 Throw Levers in Open Position

4. Place the TAWS on the rail system of the weapon so that it seats squarely on the rail.
5. Rotate the throw lever to the closed position. Ensure that both throw levers engage the 1913 rail.

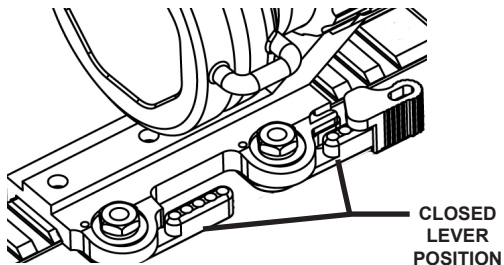


Figure 2-10 Throw Lever Closed

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

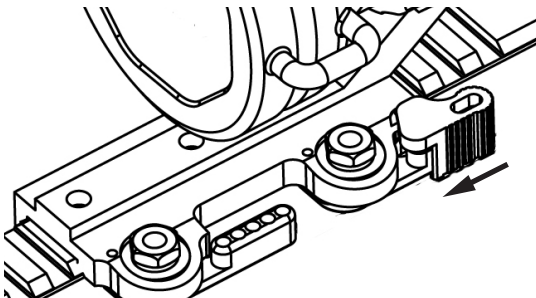


Figure 2-11 Throw Lever Mount Locked

7. If needed, tighten the tension of the locking lever with the provided mount adjustment tool. Turning the locknut clockwise makes it more difficult to open or close the levers. Turning the locknut counter-clockwise makes lever positioning easier.

NOTE

**LOCKNUT REQUIRES ONLY SLIGHT
MOVEMENT FOR TENSION ADJUSTMENT.**

CAUTION

NEVER REMOVE THE LOCKNUT.

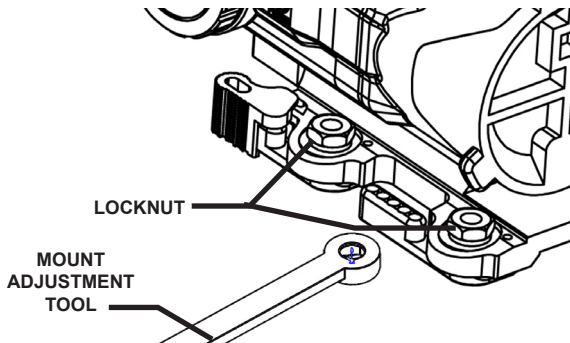


Figure 2-12 Locknut Adjustment

2.10 Installing the Remote Switch to the TAWS:

To install the remote switch perform the following procedure:

CAUTION

**THE RS-16 REMOTE SWITCH IS NOT
DESIGNED FOR IMMERSION OR
UNDERWATER OPERATIONS.**

CAUTION

**ENSURE THAT THERE IS NO WATER, DUST
OR DEBRIS IN THE CONNECTOR BEFORE
ATTACHING THE REMOTE SWITCH.**

NOTE

**THE RS-16 CAN BE INSTALLED WHEN
THE TAWS IS EITHER ACTIVATED OR
DEACTIVATED.**

1. Move the hot shoe dust cover so that it is out of the way of the connector.
2. Align the mating connectors and push the remote switch into the hot shoe receptacle.
3. Tighten the thumbscrews.



Figure 2-13 Remote Switch Installation

2.11 Attaching the Remote Switch to the Weapon:

The remote switch comes with the hook and loop tape preinstalled. When replacement is necessary perform the following procedure.

1. Determine the best placement of the remote switch to the weapon.
2. Starting from the label side, feed the hook and loop tape into one of the slots in the keypad housing.
3. Fold approximately two (2) inches of the hook and loop tape onto itself and press firm.
4. Place the keypad housing on the weapon so that its cord travels onto the weapon heading toward the TAWS.

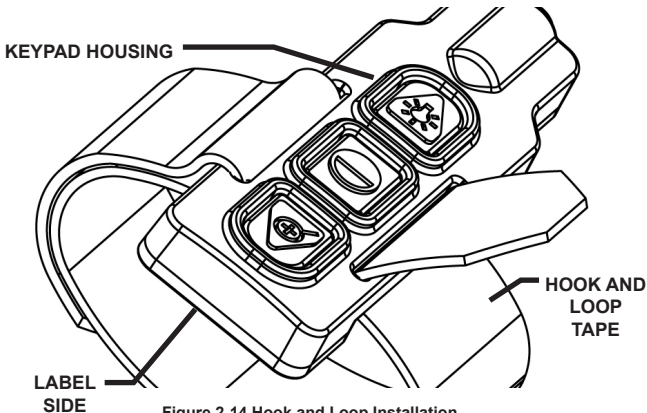


Figure 2-14 Hook and Loop Installation

NOTE

**ENSURE THAT THE SMOOTH SIDE FACES THE
BUTTONS OF THE KEYPAD HOUSING SO THE
HOOK AND LOOP CAN ADHERE TO ITSELF
WHEN FOLDED OVER.**

5. Wrap the loose hook and loop tape around the weapon and feed the tape through the remaining open slot in the keypad housing.
6. Cinch tight and fold the hook and loop tape back onto itself.
7. Trim any excess.
8. Check for a secure attachment before use.

CAUTION

**REMOVE SLACK IN THE CORD TO PREVENT
SNAG HAZARDS.**

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CHAPTER 3:

OPERATING INSTRUCTIONS

3.1 Introduction:

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

3.2 Operating Precautions:

WARNING

THE THERMAL FOCAL-PLANE ARRAY UTILIZED WITHIN THE TAWS IS SENSITIVE TO EXPOSURE TO EXTREMELY HIGH LEVELS OF RADIANT FLUX. NEVER EXPOSE THE TAWS, EITHER POWERED OR UN-POWERED, DIRECTLY TO THE SUN OR ANY OTHER SOURCE OF RADIANT FLUX THAT THE HUMAN EYE CANNOT TOLERATE.

NOTE

INADVERTENT SUN DAMAGE IS NOT CONSIDERED A DEFECT IN MATERIAL OR WORKMANSHIP, AND IS NOT COVERED IN THE PRODUCT WARRANTY.

3.3 Controls and Indicators:

The TAWS is designed to adjust for different users and corrects for most differences in eyesight. The controls and indicators for the TAWS are shown in Figure 3-1 and are described in Table 3-1.

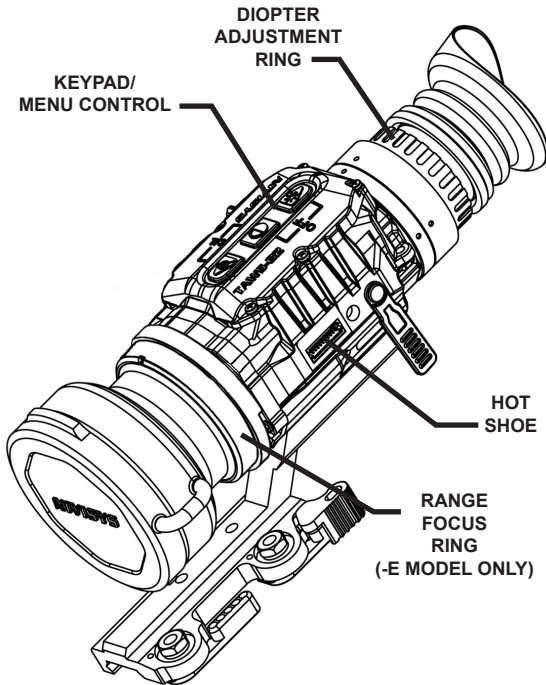


Figure 3-1 Controls and Indicators

Control and Indicators	Functions
Keypad/ Menu Control	Switches unit ON or OFF. Activates Calibration, Polarity, Display Brightness and Digital Zoom. Controls Internal Menu System such as reticle selection, azimuth adjustment and elevation adjustment.
Battery Indicator (not shown)	Icon located in the eyepiece display that shows battery life of the unit.
Diopter Adjustment Ring	Focuses eyepiece lens. Adjust for sharpest image of display screen.
Hot Shoe	Controls the interface between the TAWS and accessories such as the RS-16 (remote switch).
Range Focus Ring	Adjusts the focus of the viewed scene from 10m to infinity. Available in the TAWS 100mm lens versions.

Table 3-1 Controls and Indicators

3.4 Powering ON the TAWS:

When the TAWS is powered ON, the circuit will energize and the start up screen will appear for a few seconds in the display. To power ON the TAWS perform the following procedure.

1. Close the objective lens cover.
2. Press and hold (approx. 2 seconds) the center and rear buttons as indicated on the keypad bezel by “PWR.”

NOTE

THE OBJECTIVE LENS COVER MUST BE CLOSED WHILE POWERING ON TO ALLOW THE CALIBRATION OF THE SYSTEM. CALIBRATION IS COMPLETE WITHIN TWO SECONDS OF ACTIVATION.

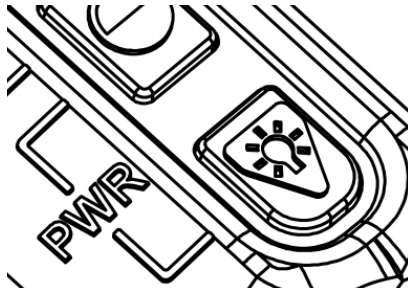


Figure 3-2 Keypad Buttons

NOTE

WHEN THE REMOTE SWITCH IS ATTACHED, THE TAWS CAN ONLY BE POWERED ON THROUGH THE MAIN TAWS KEYPAD. ALL OTHER FUNCTIONS CAN BE EXECUTED USING THE REMOTE SWITCH KEYPAD.

3.5 Battery Indicator:

To monitor available battery power, press and hold the rear button until the battery icon appears. When battery life is low, a flashing low battery indicator will appear near the center of the eyepiece display.



Figure 3-3 Battery Power Icons

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

1. The brightness setting on the display.
2. The temperature at which the unit operates.

NOTE

WHEN THE FLASHING LOW BATTERY INDICATOR APPEARS, THE UNIT HAS APPROXIMATELY 5 MINUTES OF BATTERY LIFE BEFORE AUTOMATIC SHUTDOWN.

3.6 Thermal Calibration:

The TAWS Series features shutterless core technology and the lens cover unit must be closed when calibrating the system. Calibration gives the user the clearest picture possible. To calibrate the system perform the following procedure.

1. Fully close the lens cover.
2. Simultaneously press the front and center buttons.

The TAWS Series will automatically perform an initial calibration at power up. For this reason it is necessary to keep the lens cover closed for a minimum of 2 seconds at power up.

A second calibration is suggested at 30 seconds after powering ON the unit. This allows the thermal sensor to adjust to the surrounding temperatures. Additional calibrations may be required as surrounding temperature changes or any time a fixed, non-uniform shading appears on the display screen.

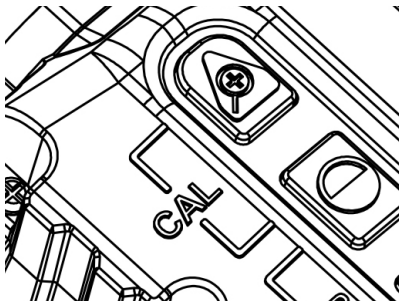


Figure 3-4 Calibration

3.7 Range Focus Adjustment (100mm Lens):

The range focus ring is used to focus the objective lens for objects viewed at varied distances. Rotate the range focus ring counter-clockwise for distant objects up to infinity. Rotate the range focus ring clockwise for close objects.

The 100mm lens is indicated by an “E” in the model name and can focus to 10 meters.

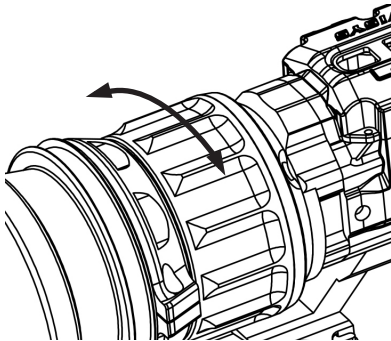


Figure 3-5 Range Focus Adjustment 100mm

3.8 Digital Zoom:

Press the Zoom button to cycle through the electronic zoom presets.

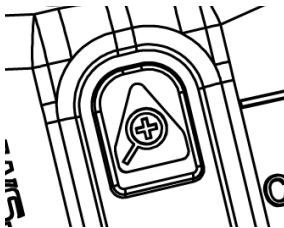


Figure 3-6 Zoom Button

3.9 Polarity (White-Hot/Black-Hot):

The TAWS Polarity button determines one of two viewing modes to identify environmental temperature differences: HOT temperatures are seen as WHITE on the screen or HOT temperatures are seen as BLACK on the screen. Press the Polarity button to toggle between the viewing modes.

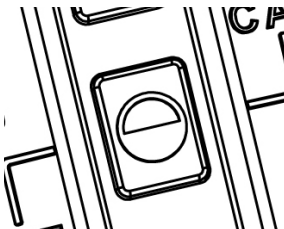


Figure 3-7 Polarity Button

3.10 Display Brightness:

When the system is first turned on, the unit activates white-hot with a midrange display brightness setting. The unit has 6 brightness settings. When adjusting the brightness, each time the Display Brightness button is pressed, the level of intensity will increase. A corresponding brightness level icon will appear in the field of view.

NOTE

AFTER THE UNIT REACHES ITS MAXIMUM BRIGHTNESS SETTING IT WILL CYCLE BACK TO ITS LOWEST SETTING.

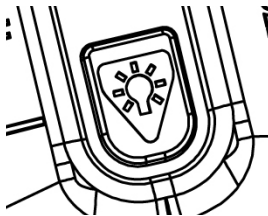


Figure 3-8 Display Brightness Button

3.11 Menu Activation and Use:

To activate Menu Mode:

1. Press and hold the center button until the menu appears on the display (approximately 2 seconds).
2. Use the front and rear buttons to scroll through the menu items.
3. Use the center button to select an item.
4. The menu mode will time out after 7 seconds of non-use, except in the Adjust sub-menu.



Figure 3-9 Main Menu

3.12 Selecting Display Mode:

1. Push and hold the center button until the Main Menu is displayed.
2. Press the center button to select the DISPLAY sub-menu.

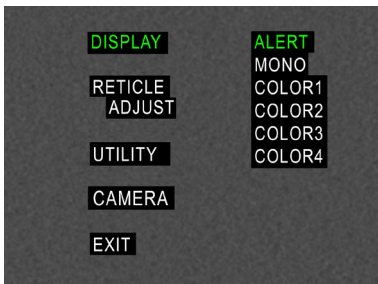


Figure 3-10 Display Sub-menu

The 6 display modes to choose from are:

- ALERT mode shows a Monochrome image with the hot

- spots in orange and red.
- MONO mode shows a Monochrome image.
 - COLOR 1 mode shows hot as orange and cold as purple.
 - COLOR 2 mode shows gradients of brown and green with hot temperatures shown in white.
 - COLOR 3 mode shows gradients of white, yellows and orange with hotter temperatures in white.
 - COLOR 4 is a full color spectrum with hotter temperatures in reds and orange and cooler temperatures in blue and purples.

NOTE:

WHEN ANY ONE OF THE COLOR VIEWING MODES IS ACTIVE, PRESSING THE CENTER BUTTON WILL CYCLE TO THE NEXT COLOR MODE.

3.13 Selecting a Reticle Pattern:

When the TAWS is used as a stand alone thermal weapon sight, an internal reticle is available. To choose a specific reticle perform the following:

NOTE

UPON START UP, THE UNIT WILL DISPLAY THE LAST RETICLE SELECTED BY THE USER PRIOR TO SHUTDOWN OR BATTERY REMOVAL.

1. Push and hold the center button until the Main Menu is displayed.
2. Scroll until RETICLE is highlighted.
3. Press the center button to select the RETICLE sub-menu.

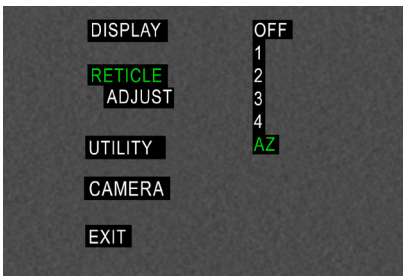


Figure 3-11 Reticle Sub-menu

4. Scroll until desired reticle appears in display.
5. Press the center button to select the reticle desired.
6. Press the center button to exit menu.

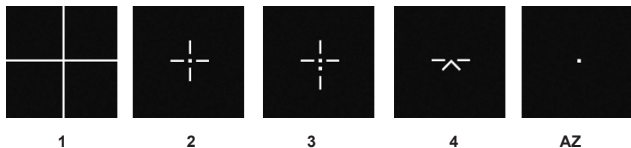


Figure 3-12 Reticle Types

NOTE

RETICLE WILL AUTOMATICALLY CHANGE BLACK/WHITE TO GIVE BEST CONTRAST.

3.14 Removing Reticle:

To remove the reticle from the display screen perform the following:

1. Select OFF under the Reticle sub-menu.

NOTE

THE RETICLE TYPE AND POSITION WILL BE MAINTAINED THROUGH THE POWERING DOWN AND STARTING UP OF THE SYSTEM.

NOTE

WHEN AZ IS SELECTED, THE ACCU-ZOOM DOT RETICLE IS SHOWN. THIS RETICLE HAS INDEPENDENT AZIMUTH (H) AND ELEVATION (V) ADJUSTMENT MEMORY AND WILL BE DISPLAYED WHEREVER IT WAS LAST MOVED TO ON THE SCREEN. ADJUSTING THE POSITION OF THE AZ RETICLE WILL NOT AFFECT THE POSITION OF THE OTHER RETICLES.

3.15 Adjusting Reticle Position:

1. Push and hold the center button until the Main Menu is displayed.
2. Scroll until ADJUST is highlighted.
3. Press the center button to select the ADJUST sub-menu.



Figure 3-13 Adjust Sub-menu

- Adjust the reticle horizontally when the H is highlighted by using the front and rear buttons.

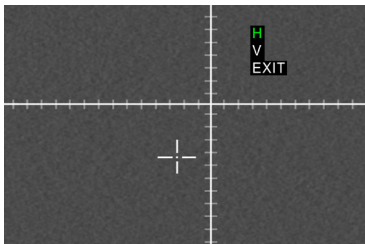


Figure 3-14 Reticle Adjustment

- Press the center button when the desired position is reached.
- Adjust the reticle vertically when the V is highlighted by using the front and rear buttons.
- Select EXIT.

NOTE

**EACH BUTTON PUSH MOVES THE RETICLE
ONE INCREMENT. PRESS AND HOLD FOR
FASTER ADJUSTMENT.**

3.16 Zeroing as a Weapon Sight:

To zero the TAWS Series, perform the following:

- Fix a thermal target at 100 meters distance. Ensure a sufficient thermal contrast is viewed through the TAWS Series before continuing.
- Ensure that the weapon mount is securely fastened to the TAWS Series so there is no movement.
- Securely fasten the TAWS Series to the weapon so there is no movement.
- Power ON the TAWS Series.
- Set the Digital Zoom at 2X.
- Select a reticle type.

7. Adjust the brightness of the display to provide a good contrast between the target and reticle image.
8. Adjust the diopter ring as necessary to ensure an in-focus image of the reticle.
9. Use the center of the reticle to aim the weapon at the target and fire 3-5 rounds.
10. After clearing the weapon, visually check the center of the shot grouping on the target.
11. Find your TAWS model in the charts below. Each button press will move the Point of Impact a specific incremental distance. The data below is calculated for a target placed at 100m.
12. Make reticle adjustments as necessary according to the table below.

NOTE

MOVING THE RETICLE UP ON DISPLAY WILL RESULT IN SHOT IMPACT MOVING DOWN ON TARGET. MOVING THE RETICLE LEFT ON DISPLAY WILL RESULT IN SHOT IMPACT MOVING RIGHT ON TARGET

“c” Version Reticle Adjustment Per Click (at 100 meters)									
16cM	32cM	32cM	32cL	32cL	32cE	32cE	64cM	64cL	64cE
1.8cm	3.6cm	2.6cm	2.5cm	1.8cm	1.3cm	0.9cm	4.9cm	3.4cm	1.7cm

Table 3-2 Reticle Adjustment Per Click - “c” versions

“i” Version Reticle Adjustment Per Click (at 100 meters)									
16iM	32iM	32iM	32iL	32iL	32iE	32iE	64iM	64iL	64iE
1.5cm	3.1cm	2.1cm	2.2cm	1.6cm	1.1cm	0.8cm	3.9cm	2.8cm	1.4cm

Table 3-3 Reticle Adjustment Per Click - “i” versions

13. Fire and adjust the reticles until the center of the shot grouping and the reticle are coincident.

3.17 Determining Installed Firmware:

Perform the following to determine the firmware installed on the unit:

1. Push and hold the center button until the Main Menu is displayed.
2. Scroll until UTILITY is highlighted.
3. Press the center button to enter the UTILITY sub-menu.
4. Press the center button again to select INFO.
5. At this point the information about the system appears on the screen.
6. Press the center button again to EXIT.



Figure 3-15 Utility Sub-menu

3.18 Enabling the Video Output (for Optional VPDM):

In order to utilize the video export feature of the unit, the video output feature must be selected from the menu.

NOTE

IT IS RECOMMENDED THAT THE VIDEO OUT SELECTION REMAINS IN THE OFF POSITION WHEN NOT IN USE IN ORDER TO MAXIMIZE BATTERY LIFE.

1. Push and hold the center button until the Main Menu is displayed.
2. Scroll until **UTILITY** is highlighted
3. Press the center button to select the **UTILITY** sub-menu.
4. Scroll until **VIDEO** is highlighted, then press center button to select.
5. Scroll to choose **ON** or **OFF**.
6. Press the rear button to **EXIT** the video enable.
7. Press the center button twice to **EXIT** the menu system.

3.19 Camera Operation

1. Hold the center button until the menu appears.
2. Scroll and select **CAMERA**.
3. Select **CAPTURE** to enter the camera mode.
4. Press the center button to take a picture and advance the counter located in the upper left corner of the screen.
5. Exit the Camera mode by holding down the center button and selecting **CAPTURE** or powering down the unit.

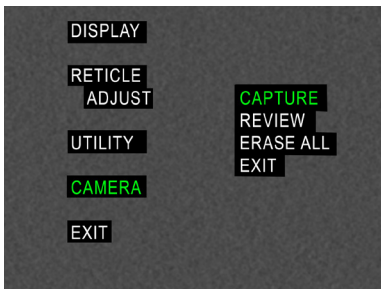


Figure 3-16 Camera Sub-menu

NOTE

**THE INTERNAL MEMORY IS LIMITED TO
APPROXIMATELY:**

250 IMAGES FOR THE -16 MODELS

100 IMAGES FOR THE -32 MODELS

50 IMAGES FOR THE -64 MODELS

NOTE

**ONCE THE MAXIMUM CAPACITY OF
IMAGES HAVE BEEN STORED, THE ERASE
ALL FUNCTION MUST BE PERFORMED TO
CAPTURE MORE IMAGES.**

3.20 Image Review

1. Hold the center button until the menu appears.
2. Scroll and select CAMERA.
3. Scroll and select REVIEW to review the stored images.
4. Use the front and rear buttons to advance through the stored images.



Figure 3-17 Image Review Counter

NOTE

THE REVIEW COUNTER IN THE UPPER LEFT CORNER OF THE SCREEN SHOWS THE SPECIFIC NUMBER OF IMAGE YOU ARE VIEWING AS WELL AS THE TOTAL NUMBER OF IMAGES CAPTURED.

5. Exit the Review mode by pressing the center button and selecting EXIT.

3.21 Downloading Images

Still images stored on the TAWS are currently exported via an analog video feed. In order to download images, the operator must have the Nivisys VPDM (Video Power and Download Module). This can be purchased as an accessory.

With a VPDM the operator can record the stored images using:

- an external DVR
- or computer equipped for analog video capture

3.22 Erasing Images

1. Hold the center button until the menu appears.
2. Scroll and select CAMERA.
3. Scroll and select ERASE ALL to erase the stored images.

NOTE

THERE IS NO WAY TO ERASE SELECTED IMAGES. ERASING IMAGES ERASES ALL STORED IMAGES AND CAN TAKE UP TO 30 SECONDS.

NOTE

THE UNIT CAN NOT BE POWERED DOWN USING THE KEYPAD WHILE ERASING IMAGES.

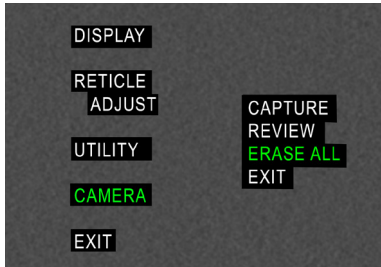


Figure 3-18 Erase All Function

3.23 Powering OFF the TAWS Series:

To power OFF the system, perform the following:

1. Simultaneously press the center and rear buttons. Visually check that the unit is OFF by looking through the eyepiece.

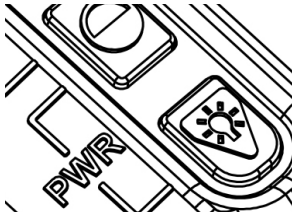


Figure 3-19 Powering OFF the TAWS Series

3.24 Use with the RS-16 Remote Switch:

The TAWS Series may be used with the supplied remote switch. When attached, all keypad functions of the TAWS Series, except for powering ON, can be executed using the remote switch.

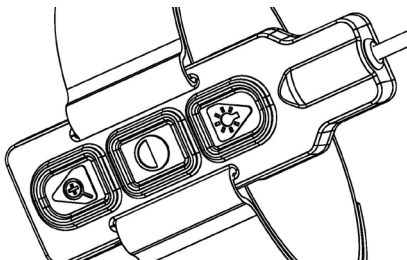


Figure 3-20 Remote Switch

3.25 Preparation for Storage:

1. Remove batteries from the TAWS Series.
2. Inspect the battery housing for corrosion or moisture. Clean and dry if necessary.
3. Replace the battery cap.
4. Remove the demist shield if installed.
5. Install objective lens cover.

NOTE

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

6. Place the TAWS Series, accessories and cleaning supplies back into their storage/carrying cases. It is best to place the items in their original locations to prevent any possible damage to the unit and/or accessories.
7. Return to storage area.

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CHAPTER 4:

MAINTENANCE INSTRUCTIONS

4.1 Introduction:

The TAWS 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

**THIS WEAPON SIGHT IS 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 SHIELD WITH LENS TISSUE
WHILE WET OR WITH WET LENS TISSUE CAN
DAMAGE THE COATING.**

4.2 Preparing for Maintenance:

Before performing any maintenance or cleaning of the system, remove all power sources from the TAWS including batteries and/or external power supplies.

4.3 Cleaning the TAWS:

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 TAWS, 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 equipment. 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
Unit fails to power ON.	Visual. Check for defective, missing or improperly installed battery.	Power OFF the system and then ON. Replace battery or install correctly. Tighten battery cap until the orange o-ring is no longer visible. If TAWS still fails to power ON, refer to higher level of maintenance.

Table 5-1 Troubleshooting

Flickering Image on firing.	Check for loose battery cap that may cause the battery to lose contact during weapon fire.	Tighten battery cap until the orange o-ring is no longer visible.
No display in eyepiece.	Visual check to see if lens cover is still on. Check to see if shuttered eyeguard is installed.	Flip lens cover open. Press eye firmly against shuttered eyeguard.
Poor image quality.	Check focus of the eyepiece lens. Check for fogging or dirt on objective lens or eyepiece lens. Check eye relief distance.	Refocus. Clean optics. Readjust for proper eye relief distance.
Light visible around eyecup.	Check eyecup for resiliency.	If eyecup is defective, refer to higher level of maintenance.

Table 5-1 Troubleshooting, (cont.)

<p>Remote Switch keypad not working.</p>	<p>Check to ensure hot shoe connector is completely installed into unit.</p> <p>Check to ensure connectors are free from debris, dirt and corrosion.</p>	<p>Firmly push connector into mating connector on TAWS unit and tighten thumbscrew.</p> <p>Clean connectors.</p> <p>If remote switch keypad is still not working, refer to higher level of maintenance.</p>
<p>Optics hard to turn or grinding.</p>	<p>Check for dirt or debris on traveling eyepiece cell.</p> <p>Check to see if the diopter adjustment is bent or broken.</p>	<p>Clean with a soft dry cloth.</p> <p>If damaged, refer to higher level of maintenance.</p>

Table 5-1 Troubleshooting, (cont.)

<p>Will not zero.</p>	<p>Check to see if TAWS is securely fastened to weapon mount.</p> <p>Check to see that weapon mount is correctly and securely fastened to weapon.</p> <p>Check to see if zeroing is being done in digital zoom mode.</p>	<p>Tighten the weapon mount to the TAWS.</p> <p>Correctly and securely fasten to weapon mount to weapon.</p> <p>Press the digital zoom button to enter digital zoom mode when zeroing.</p> <p>If problem persists, refer to higher level of maintenance.</p>
-----------------------	--	--

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 TAWS.

A.2 Contact Information:

To order spare or repair parts for the TAWS or any other night vision products contact:

Nivisys, LLC
1120 Alza Drive
El Paso, TX 79907 USA

Phone: 1-915-633-8354
Fax: 1-915-633-8529

A.3 Spare Parts List:

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

Part No.	Description	Qty.
A3256345	Shuttered Eyeguard	1
7B257-2F	Shipping/Storage Case	1
830-0071-0	Operator Manual, TAWS Series	1
830-0072-0	Quick Reference Guide, TAWS Series	1
830-0057-0	Quick Reference Guide, RS-16	1
3501-900	High Profile Double Throw Lever Mount	1
3500-900	Low Profile Double Throw Lever Mount	1

Table A-1 Spare and Repair Parts List

790-0015-0	Mount Adjustment Tool	1
310-0024-0	Mount Adapter, V-Block	1
3255-000	RS-16 (Remote Switch)	1
1407-500	Soft Carrying Case	1
1407-501	Shoulder Strap	1
580-0002-0	Battery, CR123 Lithium (2ea. required for operation)	1
NVM-033	Demist Shield	1
170-12	Cleaning Kit	1
4500-202	Eyecup	1
A3144306	Neck Cord	1
A3144315	Purge Screw	1
A3144316	Purge Screw O-Ring	1
3200-114	Dust Cover Retaining Pin	1
3200-112	Hot Shoe Dust Cover	1
640-0003-0	Hook and Loop Tape (16 in)	1
220-0013-0	50mm Lens Cover	1
A3187392	Soft Carrying Case - Green	1
4200-800	Lens Cap Assembly (35mm)	1
3200-620	Battery Cap Assembly	1
111-0009-0	Soft Carrying Case - Black	1
310-0015-0	Eyepiece Eyecup Retainer	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 24 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 1-915-633-8354 or fax 1-915-633-8529 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[™]_{LLC}

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