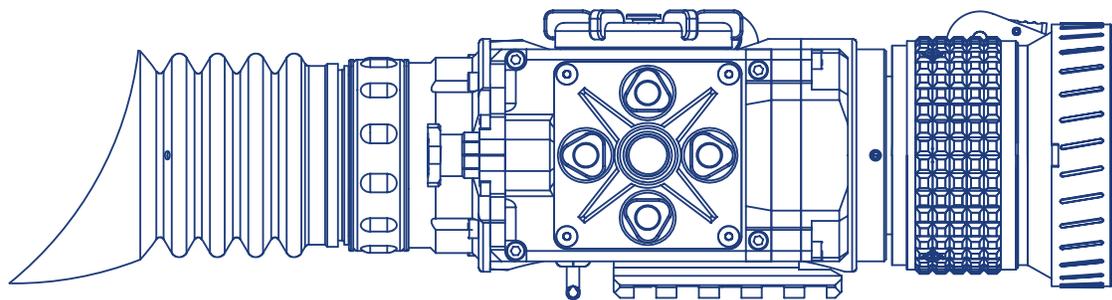


FLIR *THERMOSIGHT*[®] *PRO*

Thermal Imaging Weapon Sight



USER MANUAL



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This product is protected by patents, design patents, patents pending, or design patents pending.

If you have questions that are not covered in this manual, or need service, contact FLIR OTS customer support for additional information prior to returning a camera.

Phone: 1-888-959-2259

Email: OTS-Support@flir.com

This documentation is subject to change without notice.

Proper Disposal of Electrical and Electronic Equipment (EEE)



The European Union (EU) has enacted Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE), which aims to prevent EEE waste from arising; to encourage reuse, recycling, and recovery of EEE waste; and to promote environmental responsibility.

In accordance with these regulations, all EEE products labeled with the "crossed out wheeled bin" either on the product itself or in the product literature must not be disposed of in regular rubbish bins, mixed with regular household or other commercial waste, or by other regular municipal waste collection means. Instead, and in order to prevent possible harm to the environment or human health, all EEE products (including any cables that came with the product) should be responsibly discarded or recycled.

To identify a responsible disposal method where you live, please contact your local waste collection or recycling service, your original place of purchase or product supplier, or the responsible government authority in your area.

Business users should contact their supplier or refer to their purchase contract.

Important Instructions and Notices to the User:

Modification of this device without the express authorization of FLIR Commercial Systems, Inc. may void the user's authority under FCC rules to operate this device.

Note 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that of the receiver
- Consult the dealer or an experienced radio/television technician for help.

Industry Canada Notice:

This Class B digital apparatus complies with Canadian ICES-003.

Avis d'Industrie Canada:

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada

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Export Information

Equipment described herein may require US Government authorization for export purposes. Diversion contrary to US law is prohibited.

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CONTENT

Page

Safety Statement	4
1. Introduction	5
2. Getting Started	7
3. Operating the System	8
4. Main Menu	14
5. Display Indication	19
6. Maintenance	20
7. Warranty	21
8. Specifications	22

SAFETY STATEMENT

Be sure to observe all local, state and federal laws. Shooting a gun at night is highly dangerous and can lead to lethal consequences.

Know and understand your shooting field. Bullets travel farther than the range of thermal detectors so care must be taken to ensure there are no unintended targets beyond the actual target.

Be sure you identify your target - to hunters unfamiliar with thermal technology, hogs and farm animals and even people might appear similar in an IR image.

WARNING:

DO NOT DISASSEMBLE THE DEVICE.

Disassembly can cause permanent damage.

Important Safety Instructions

- Read and follow all instructions
- Heed all warnings
- Only use the attachments/accessories specified by the manufacturer
- All service must be provided by the manufacturer

WARNING:

Always make sure your firearm is unloaded before you place the scope on the firearm. Reconfirm that the chamber is empty if you stop the procedure then resume later. Safe handling rules should be followed at all times.

WARNING:

If a scope is mounted too far to the rear, the eyepiece can injure the shooter's brow. Shooting at an uphill angle also increases this hazard because it shortens the distance between the brow and the rear of the scope. For this reason, FLIR scopes are engineered to provide generous eye relief. Therefore, when mounting your scope, we recommend positioning it as far forward in the mounts as possible to take full advantage of this generous eye relief. With hard-recoiling rifles, serious injury or even death can result from eyepiece impact with the shooter during the recoil process when discharging the firearm. Be certain that your installation provides sufficient eye relief for the recoil generated by your rifle before shooting the firearm.

NOTE:

Give special attention to this warning when shooting uphill and/or from a prone position. These shooting conditions can dramatically reduce eye relief. PLEASE maintain maximum eye relief when shooting heavy recoiling and/or magnum firearms. THE USER ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR HAVING THE FLIR WEAPON SIGHT PROPERLY MOUNTED TO A FIREARM AND USING THE FLIR WEAPON SIGHT PROPERLY. ALWAYS CHECK THE CONDITION OF YOUR MOUNTING SYSTEM PRIOR TO USING YOUR FIREARM.

WARNING:

This product contains natural rubber latex, which may cause allergic reactions! The FDA has reported an increase in the number of deaths that are associated with an apparent sensitivity to natural latex proteins. If you are allergic to latex, it is a good idea to learn which products contain it and strictly avoid exposure to those products.

CAUTION:

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION:

- Do not point the camera at high-intensity radiation sources such as the sun, lasers, or arc welders
- Do not leave fingerprints on the camera's infrared optics. Clean only with low pressure fresh water and a lens cloth
- Keep the equipment clean. Protect it from moisture, dramatic temperature drops, and electrical shocks
- DO NOT force the equipment controls past their stopping points
- DO NOT leave the equipment activated during breaks in operation
- DO NOT store the equipment with the batteries installed
- Thoroughly clean and dry each item before placing them into the storage case

NOTES:

- ThermoSight Pro thermal imaging weapon sight must be zeroed each time it is mounted to a **new** weapon
- To avoid losing unsaved data, DO NOT remove the batteries or disconnect the external power source while the ThermoSight Pro is on
- Inadvertent sun damage is not considered a defect in material or workmanship, and is therefore not covered in the product warranty

ThermoSight® Pro Thermal Scope

The ThermoSight Pro thermal imaging weapon sight is used as a scope or a viewer, and it has the ability to save an image or a video clip.

Nevertheless, in the industry, and throughout this manual, this type of device is also referred to as a camera.

Throughout this manual, the images of the ThermoSight Pro model with 50mm lens are used as illustrations.

SECTION 1. INTRODUCTION

1.1 SCOPE

This manual covers the FLIR ThermoSight Pro thermal weapon sight and all applicable components. It is recommended that you read and understand this manual to optimize the scope's operation.

1.2 INTRODUCTION

The ThermoSight Pro is intended for use on a variety of hunting and sporting weapons equipped with a Picatinny/Weaver rail. Displaying the thermal differences in the scene, the high-performance thermal imaging system of the ThermoSight Pro provides around-the-clock, all-weather detection and discrimination of heat-generating objects (such as animals), including those that are hidden. The ThermoSight Pro scope is effective at close and long ranges irrespective of light and weather conditions, i.e., in total darkness, through smoke, haze, fog, and light rain.

The ThermoSight Pro is available in different versions with optical magnifications from 1.5x to 6x. ThermoSight Pro also provides up to 4x digital zoom.

The ThermoSight Pro scope is powered by two CR123A (2×3V) batteries.

The ThermoSight Pro scope has an internal storage for video and pictures recording. Also capable of digital video out via the USB-C. The files can be transferred directly to the computer.

NOTE: Internal recording and image capture cannot be used when USB-C is plug into a computer.

1.3 FEATURES

- FLIR BOSON 12µm Pitch Thermal Sensor
- Onboard video recording (internal storage)
- Shot activated video recording
- Onboard picture capture (internal storage)
- USB-C connectivity
- High resolution FLCOS display
- Multiple palettes
- Multiple selectable reticle patterns
- Battery status indicator
- Rapid start-up
- Water and fog-resistant design
- Rugged Aluminum construction
- MIL-STD-1913 (Picatinny rail) Quick Release Mount
- Limited 3-year warranty
- 10-year warranty on FLIR detector
- Made in the USA

1.4 REGISTER YOUR THERMOSIGHT PRO

You can register your product online at:
www.flir.com

1.5 INFRARED THERMAL VISION VERSUS IMAGE INTENSIFIED NIGHT VISION

The ThermoSight Pro makes images from heat, not light, a feat impossible for the naked eye or image intensified (I²) night vision devices. This allows you to see clearly without any visible light. People, animals, and objects all generate or reflect heat and are clearly seen by the ThermoSight Pro in even the most adverse conditions.

THERMOSIGHT PRO ENABLES THE OUTDOOR ENTHUSIAST TO:

- See animals and difficult terrain in reduced visibility or total darkness
- See through smoke, dust, and light fog
- See camouflage and foliage in any lighting conditions
- See more – and see farther – than with low-light night vision goggles

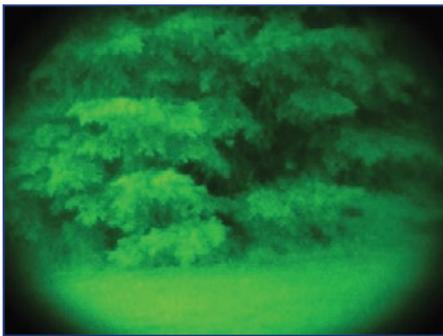


IMAGE INTENSIFIED I²



THERMAL IMAGING

1.6 DETECTION, RECOGNITION, IDENTIFICATION



DETECTION

I see something.



RECOGNITION

It's a four-legged animal.

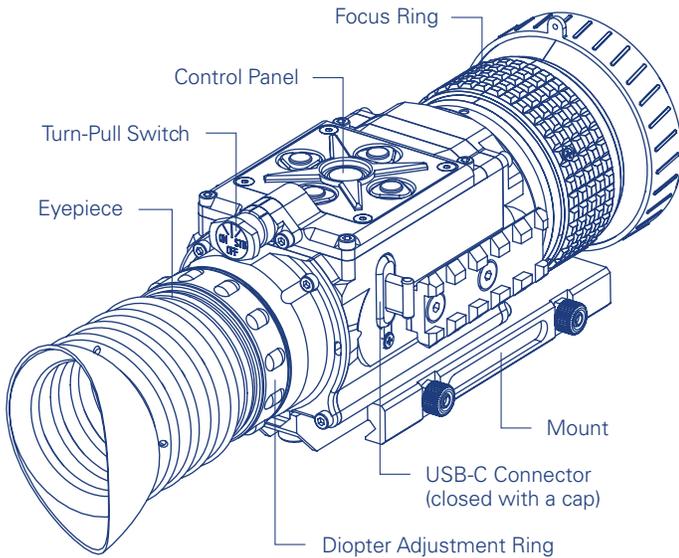


IDENTIFICATION

I can tell it is an Elk.

SECTION 3. OPERATING THE SYSTEM

3.1 SYSTEM CONTROLS



3.1.1 DIOPTER ADJUSTMENT

The diopter adjustment allows a user to alter the viewfinder to accommodate that individual's eyesight for optimum image sharpness. While looking through the eyepiece, rotate the diopter adjustment ring to optimize the sharpness of the image in the viewfinder.

3.1.2 FOCUS ADJUSTMENT

Bring the object into focus by turning the objective focus ring (CW for far focus, CCW for near focus). Rotate the focus ring until the subject looks sharp in the viewfinder.

NOTE: The focusing ring is not available on the ThermoSight Pro PTS233 model.

3.1.3 TURN-PULL SWITCH

The Turn-Pull Switch performs the following functions:

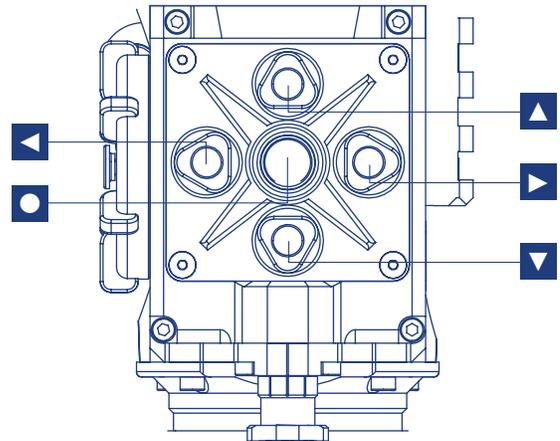
- Activates the ThermoSight Pro when turned to ON.

NOTE: You must pull the knob before turning in order to use either the ON or STB.

- Activates standby mode when turned to STB (see note above).
- Deactivates the ThermoSight Pro when turned to OFF.

3.1.4 CONTROL PANEL BUTTONS

The control panel buttons configures operational settings.



3.1.4.1 DISPLAY BRIGHTNESS CONTROL

Push the ▲ button to increase the screen brightness or push the ▼ button to decrease the screen brightness.

3.1.4.2 IMAGE PALETTE CONTROL

To scroll up through the available palettes push and hold ▲ or ▼ button to scroll down or up respectively. There are 7 palettes available.

Please see the following images for examples of ThermoSight Pro's color palettes.

WHITE HOT

Most commonly used palette. Hot objects appear white. Good for scenes with either high or low contrast.



BLACK HOT

Hot objects appear black. Scenes appear more lifelike than White-Hot, especially at night.



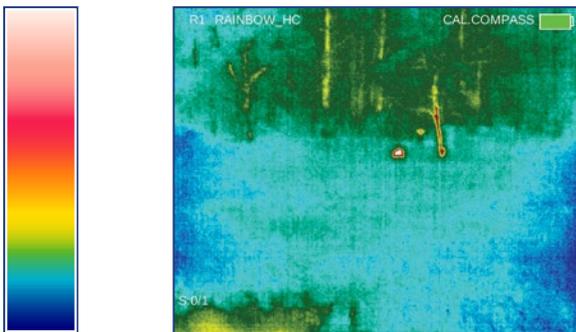
SEPIA

The Sepia is a thermal palette of three colors. It displays the heat intensity from black to yellow.



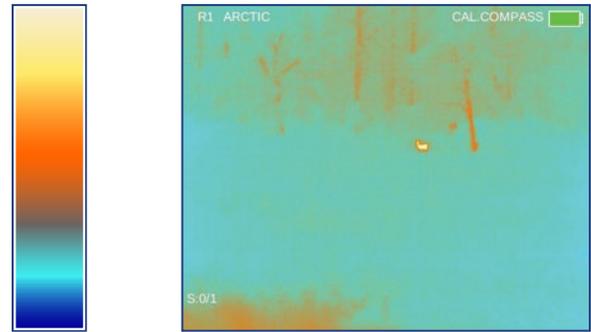
RAINBOW_HC

The Rainbow is a multi-color thermal palette that displays the temperature of objects in a wide color range.



ARCTIC

The Arctic is a thermal palette that sharply displays objects with higher temperature difference.



IRONBOW

Ironbow color palette simulates the glow of objects that are heated to visible incandescence, similar to an iron in the fire.



OUTDOOR ALERT

Outdoor Alert combines the life-like detail seen in Black Hot images with the easy to spot bright targets highlighted from dark red to bright yellow to help identify target features. It assumes that the target is hotter than its surroundings.



3.1.4.3 DIGITAL ZOOM CONTROL

Use ► button to switch the camera between no zoom (full resolution), 2x & 4x zoom. The central part of the image is magnified by the zoom level selected.

When zoom has been selected, the 2x or 4x symbols (maximum zoom factor is dependent of model) will appear on the display.

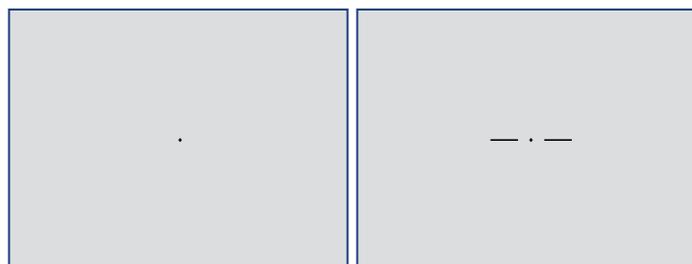
NOTE: Zooming does not affect the boresight.

3.1.4.4 RETICLE ON/ OFF

Pushing and holding ► button to reticle ON/ OFF.

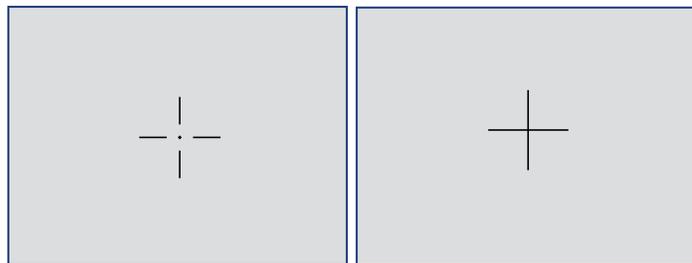
3.1.4.5 RETICLE PATTERN CONTROL

There are 6 types of reticles available: "Dot 4 MOA", "Line Dot", "Cross Center Dot", "Cross", "Crosshair" and "Crossdash". To scroll through the reticle types, push and hold ◀ button.



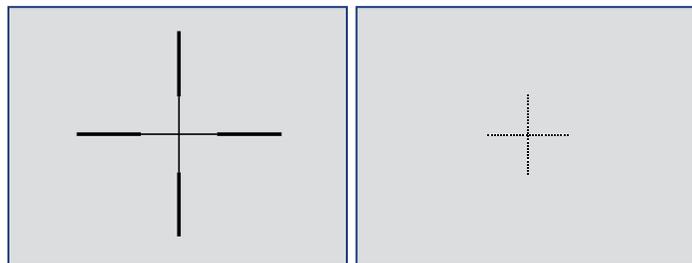
DOT 4 MOA

LINE DOT



CROSS CENTER DOT

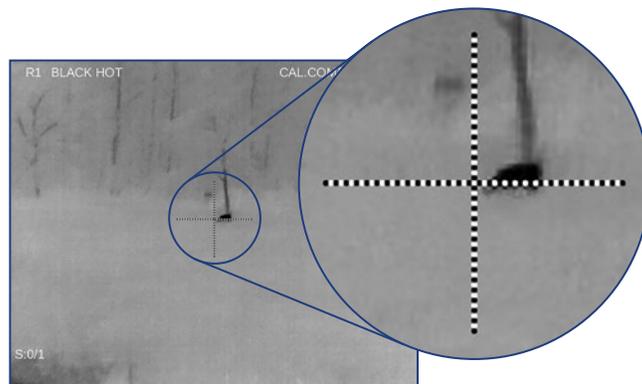
CROSS



CROSSHAIR

CROSSDASH

Crossdash uses FLIR's Patent Pending HVT (High Visiblitiy Technology). FLIR's Patent Pending HVT makes the CROSSDASH reticle clearly visible under all conditions with no adjustments ever required. For best results, Crossdash should be used in black and white mode.



BLACK CROSSDASH

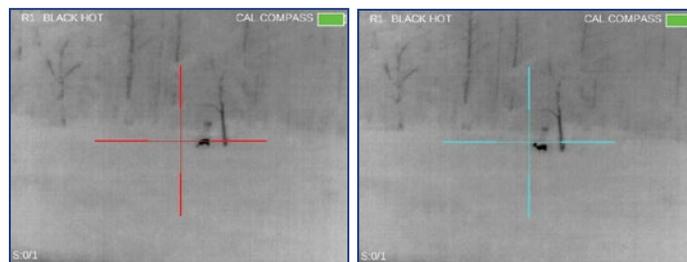
3.1.4.6 RETICLE COLOR CONTROL

There are 4 reticle colors available: Black, White, Red, and Cyan. To change the reticle color, push ◀ button.



BLACK RETICLE

WHITE RETICLE



RED RETICLE

CYAN RETICLE

3.1.4.7 USER-CONTROLLED MANUAL NON-UNIFORMITY CORRECTION/FLAT-FIELD CORRECTION (UCMNUC/FFC)

Use UCMNUC/FFC (User-Controlled Manual Non-Uniformity Correction/Flat-Field Correction) function to improve image quality. As the camera changes temperature, its pixels may drift due to internal and external temperature change. The pixels do not drift uniformly. The camera software compensates for the drift up to an accurate position point. The UCMNUC/FFC function is triggered when the limit is reached. A uniform mechanical shutter is placed between the lens and the detector for a moment, and the signal is processed.

Push the two control buttons ▲ and ▼ at the same time to manually trigger a User-Controlled Manual Non-Uniformity Correction/Flat-Field Correction.

If necessary, interrupt the automatic UCMNUC/FFC process by pushing the central ● button on the control panel during the 5 second countdown which appears at the bottom of the display. The shutter will not interrupt viewing.

3.1.4.8 SNAPSHOT

The snapshot function is used to capture images and to record video. Up to 1,000 pictures and up to 2.5 hours of recorded video can be stored in the camera's internal memory at one time.

TAKING A PICTURE

Perform a short press of the ● button to capture a single image. Image Capture # will appear in the middle of the display

RECORDING VIDEO

Double click ● button to begin video recording and double click again to stop recording.

3.1.4.9 MAIN MENU

Pushing and holding ● button will bring up the Main Menu selection.

Use ▲/▼ buttons to navigate through the items on the menu.

Push the ● button to view the settings available for the item selected.

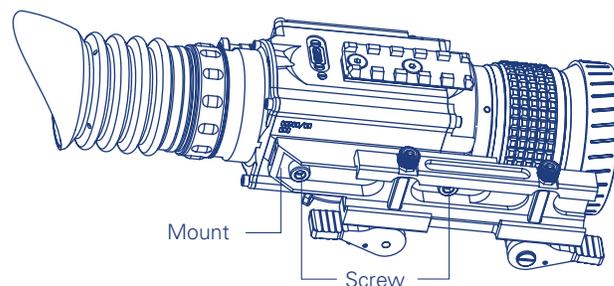
3.2 INSTALLING THE THERMOSIGHT PRO ON A PICATINNY/WEAVER RAIL

WARNING: Always make sure your firearm is unloaded before you place the scope on the firearm. Reconfirm that the chamber is empty. If you stop the procedure, then resume later. Safe firearms handling rules should be followed at all times.

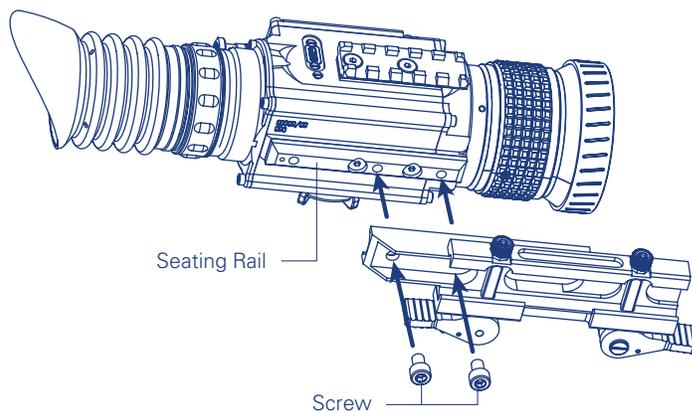
The ThermoSight Pro comes fully assembled with a Picatinny/Weaver mount.

The mount is attached to the scope seating rail with two M5×8 flathead socket cap screws.

To provide greater flexibility in mounting ThermoSight Pro weapon sight on the weapon, the dual lever mount can be installed in two different positions. On the bottom of the scope body there are two pairs of threaded mounting holes in the seating rail. You can shift the mounting position of your ThermoSight Pro by an extra 1.5 inches backwards.



MOUNT. POSITION 1



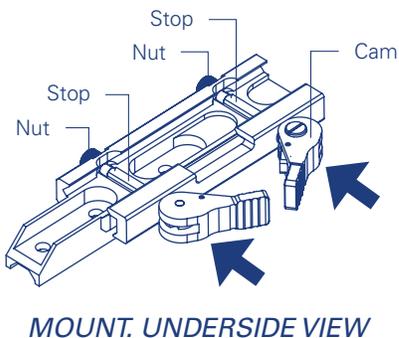
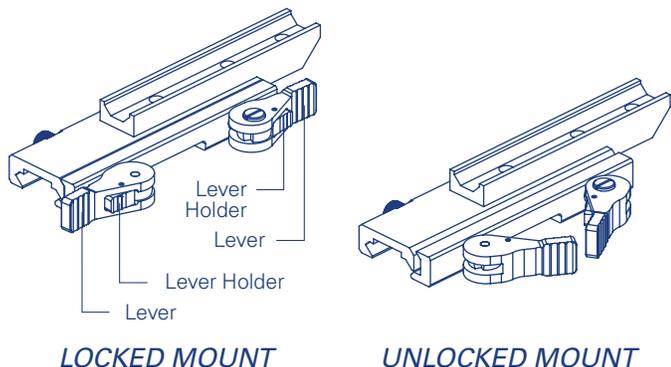
MOUNT. POSITION 2

To change the position of ThermoSight Pro mount, please follow the instructions below:

1. Remove the two screws that attach the mount to the seating rail.
2. Remove the mount.
3. Change the position of the mount.
4. Install the two screws into the mount and tighten the screws.

To install the ThermoSight Pro on a Picatinny/ Weaver rail, perform the following:

1. Unlock the clamping device of the scope mount by pushing down on the lever holders and unlocking the levers.
2. Install the scope on the Picatinny/ Weaver rail so that the stops slide into the transverse slots on the rail.
3. Affix the scope to the rail by locking the levers.
4. Verify that the clamping device is firmly holding the ThermoSight Pro. If necessary, adjust the clamping device's lever-cam locks as detailed in Part 3.3 (Clamping Device Adjustment).

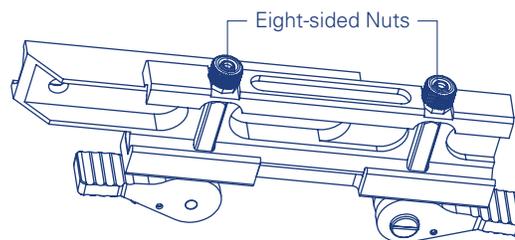


3.3 CLAMPING DEVICE ADJUSTMENT

To adjust the mount's clamping device, do the following:

1. Remove the ThermoSight Pro from the weapon.
2. With the clamping device unlocked, push the cam towards the arrow, which will cause the nut to slide out of its hole.
3. Turn the nut CW/ CCW respectively, in one-two increments (see note below). Much like when the cam is released, backward-moving springs will cause the nut to slide back into its hole.

NOTE: The eight-sided nuts of the mount lever-cam locks will only fit into their holes if turned in one of the discrete positions, using increments equal to $360^\circ/8$.



4. Verify that the adjusted lever-cam lock securely holds the weapon mounting rail.
5. Repeat the procedure to adjust the clamping device's second lever-cam lock.

3.4 BORE SIGHTING

Once the camera has been mounted, it is necessary to adjust the reticle so that the point of aim coincides with the desired Point of Impact (POI).

NOTE: The ThermoSight Pro must be zeroed each time it is mounted to a **new** weapon.

Since this unit is a thermal camera, it will be necessary to adjust the zero while observing a target with some level of thermal contrast.

To create a target with thermal contrast, it may be useful to tape one or more disposable hand warmers to the target to get some temperature difference. For longer distances, it may be necessary to use the larger heating pads.

The rifle should be secured or held in a steady position.

Take aim by centering the reticle on the target and fire a series of shots (3-4). Find the point of impact and measure its vertical and horizontal deviations from the center of the target. Work out the values of boresight correction required to compensate for the measured deviation of the point of impact from the center of the target.

To access the boresight function, push and hold down the central ● button on the control panel and then select BORESIGHT menu.

By default, the reticle will be set dead center at (0,0). Use the BORESIGHT MENU (See Part 4.5) to apply corrections required to bring the point of impact as close as possible to the center of the target.

Use ◀/▶ buttons to adjust for windage. Moving the reticle in the positive direction (to the right) will move the point of impact to the left. Moving the reticle in the negative direction (to the left) will move the point of impact to the right.

Use ▲/▼ buttons to adjust for elevation. Moving the reticle in the positive direction (up) will move the point of impact down. Moving the reticle in the negative direction (down) will move the point of impact up.

The following table is provided for convenience of calculating the zero adjust for the various ThermoSight Pro models:

MODEL	LENS	BORESIGHT INCREMENT
ThermoSight Pro PTS233	19mm	2.165 MOA
ThermoSight Pro PTS536	50mm	0.825 MOA
ThermoSight Pro PTS736	75mm	0.55 MOA

Fire a series of shots to check the boresight.

After completing the boresight adjustment procedure you can use RIFLE PROFILE function of Setting menu to save the boresighted reticle position map in the "Rifle Profile" tab. This can be done for the same scope equipped to up to 3 different rifles (Profile 1, Profile 2, and Profile 3).

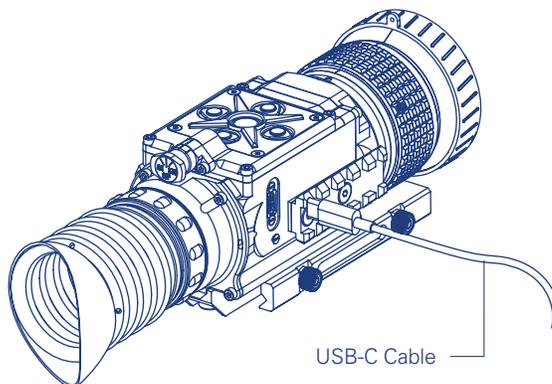
3.5 USING USB-C CONNECTOR

Remove the connector protective cap. Connect USB-C cable.

To view video using the USB-C, connect the cable to a USB input of a PC. Then it can be viewed like an external webcam.

To read/copy/delete files on the internal memory of the ThermoSight Pro, operate it like any external mass storage device connected by an USB cable.

To power the ThermoSight Pro from an external source plug the cable into any standard USB power source.



SECTION 4. MAIN MENU

4.1 MAIN MENU

Most setup options can be accessed from the MAIN MENU.

To display the MAIN MENU, hold down the central ● button on the control panel.



Once the MAIN MENU is displayed, use ▲/▼ buttons to navigate through the items on the menu.

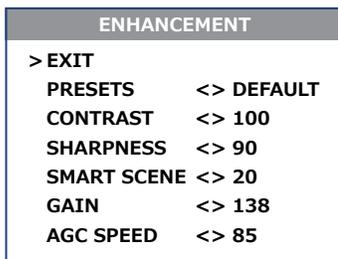
Push ● button to view the settings available for the item selected.

Use ◀/▶ buttons to adjust the settings when specified on the menu screen with <> symbols.

Select the EXIT item and then push ● button to return to the MAIN MENU.

4.2 ENHANCEMENT MENU

The ENHANCEMENT menu settings allow the user to take advantage of advanced signal processing algorithms, and improve the quality of the image under a variety of different thermal environments.



PRESETS

PRESETS— a group of default settings for various environmental conditions that are optimized toward best camera performance: Default, Sky/Sea, Indoors and Outdoors.

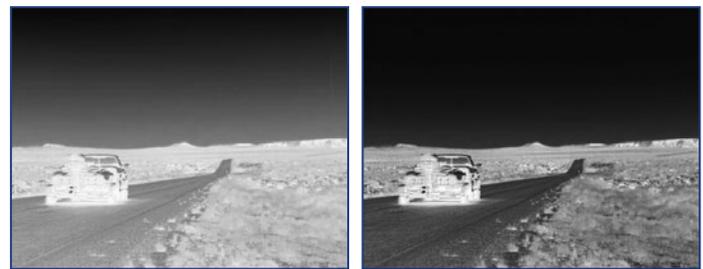
For example, turning the “Sky/Sea” preset will improve contrast, but at the possible loss of some scene content. This is especially helpful in scenes with great expanses of visible sky or water.

The following table is provided all presets and their settings.

ITEM	DEFAULT	SKY/SEA	INDOORS	OUTDOORS
Contrast	100	100	100	100
Sharpness	90	100	75	110
Smart Scene	20	30	10	80
Gain	138	120	110	138
AGC Speed	85	85	85	99

CONTRAST

Active Contrast Enhancement (ACE) – a digital contrast correction that allows for a smart scene optimization based on dynamic adjustments, where a variety of contrast levels occur. The adjustment range is from 50 to 200 with a default value of 100. Lower values will cause hotter objects to have greater contrast, and higher values will cause colder objects to have greater contrast.



Contrast 50

Contrast 200

CONTRAST

SHARPNESS

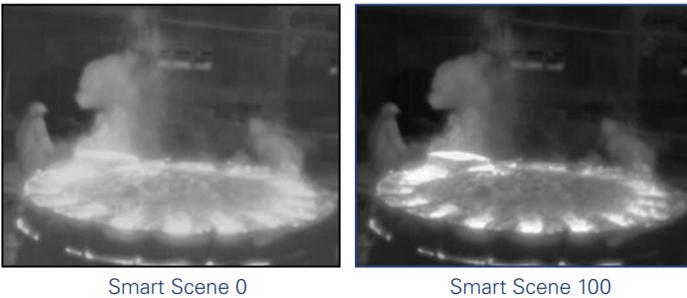
Second Generation Digital Detail Enhancement (DDE) – a sharpness correction that digitally enhances the picture, significantly improving edge sharpening and further reducing image noise. The adjustment range is from 0 to 800, with a default value of 90. Lower values will create an image with softer edges. Higher values will make objects sharper, enhance details, and increase the signal-to-noise ratio.



SHARPNESS

SMART SCENE

Smart Scene Optimization (SSO) – a fine-tuning computational correction that significantly improves overall visual acuity for targets with thermal signatures similar to the surrounding background. Higher values provide a more linear automatic gain control, and objects with similar, but not identical temperatures can be differentiated with greater accuracy. The adjustment range is from 0 to 100 with a default value of 20.



SMART SCENE OPTIMIZATION

GAIN

Automatic Gain Control (AGC) – a correction that used to automatically adjust the gain to an appropriate range, the weaker the image signal, the stronger the gain. The adjustment range is from 25 to 800 with default value 138.



GAIN CORRECTION

AGC SPEED

AGC Speed - parameter that allows the user to control the refresh rate of Automatic Gain Control (AGC). The adjustment range is from 0 to 200 with a default value of 85.

4.3 PALETTE MENU

The PALETTE menu allows you to select from a choice of temperature imaging modes.

The palettes act as color templates for visualization of temperature changes in the scene.

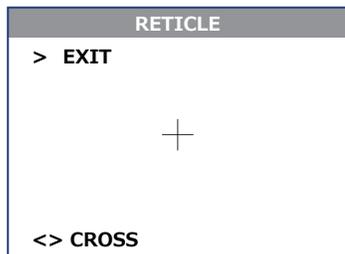
To navigate through the items on the PALETTE menu, press ▲ or ▼ button.



4.4 RETICLE MENU

The RETICLE menu allows you to select a reticle from a variety of patterns.

To navigate through items on the RETICLE menu, hold down ◀ or ▶ button.

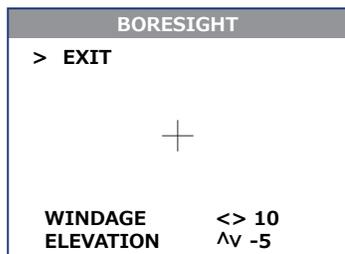


4.5 BORESIGHT MENU

The BORESIGHT function allows you to change the position of the reticle on the display.

Push ▲/▼ buttons and ◀/▶ buttons to shift the reticle on the display up and down, or to the left and right, respectively. Holding down ▲/▼ button and ◀/▶ buttons will cause accelerated movement of the reticle in 4 pixel increments.

Every time one of these buttons is pushed, the reticle shifts a single pixel increment corresponding to the minimum boresight correction value. The center of impact on the target moves based on the specified windage/elevation boresight increment in the **opposite direction** to the direction of the reticle shift.



The adjustment range for Windage is from -20 to 20. The adjustment range for Elevation is from -15 to 15.

To control the shift of the reticle, look for the running coordinates of the reticle center that is printed on the display.

Hold down button combo (◀+▶) to reset to zero Windage and Elevation. The reticle will shift to the center of the display.

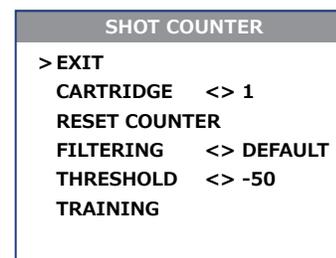
4.6 VIDEO RECORD MENU

The VIDEO RECORD menu allows the operator to delete selected image and video files stored in the camera.



4.7 SHOT COUNTER MENU

The SHOT COUNTER menu allows for the following values to be set.



CARTRIDGE

The number of rounds in the weapon magazine.

RESET COUNTER

Reset the number of shots to zero.

FILTERING

Filtering is the damping speed of the accelerometer output. It has 3 values default, high and low.

THRESHOLD

The value either positive or negative that indicates a shot has been fired.

TRAINING

Puts the system in shot training mode and displays the shot training submenu.

4.7.1 TRAINING SUBMENU

VISUAL ELEMENTS

RED line - threshold level (value at the right is the digital representation of the threshold level).

- This line is moved UP and DOWN when corresponding ▲ or ▼ buttons are pressed.
- Changed value is stored immediately as new threshold level for current rifle profile.
- Range of the level is +/-100.

YELLOW rectangle - this is the chart area.

WHITE grid lines - +50 and -50 markers for measurement and threshold level.

CYAN, BLUE, LIGHT BLUE vertical bars - min/max representation of the calculated differential value from acceleration sensor.

- Positive means weapon moving forward (away from the user).
- Negative means weapon moving backward (closer to the user).
- Various color represent the size of the bar - smaller, larger or largest.
- The bars might be offset to the zero line - this is so because the bar represents the extreme positive and extreme negative accelerations during period of 1000ms:
 - the bottom end of the bar represents the extreme minimum of the measured acceleration (e.g. -30);
 - the top end of the bar represents the extreme maximum of the measured acceleration (e.g. +25).



HOW TO SET THE THRESHOLD

- Start TRAINING mode.
- Perform one or more shots and observe the bars that represent measured acceleration.
- Decide if negative or positive part of the bar (above or below the zero line) is bigger.
- Set the threshold level. Move the red line by pressing ▲/▼ buttons. Holding down ▲/▼ buttons will cause accelerated movement of the line in 10 pixel increments.
- Press the center button to exit TRAINING mode.

NOTES:

- If you want to use the **positive acceleration** values as triggers you should move the RED line above the zero (positive value), close to the upper end of the bar.

Be sure to set the threshold a slightly below the bar top end - this will provide margin to correctly detect shots with some variation in the acceleration.

- If you want to use the **negative acceleration**, adjust the threshold to be negative (below the zero line).

Be sure to set the threshold a slightly above the bar bottom end - this will provide margin to correctly detect shots with some variation in the acceleration.

- The margin from top/bottom end of the bars could be estimated by observing variations of multiple shots - use the bar with weakest acceleration to select the threshold level (again with some margin of 2-5 units) - e.g. if the weakest of multiple shots is read as 30 then set the threshold to 25-27 to be sure that all shots will be recorded.

4.8 SETTINGS MENU

The SETTINGS menu allows you to change the contrast, brightness, video standard, compass calibration, and temperature scale settings (in certain models), as well as to restore the settings to their factory defaults. The Firmware (FW) revision number is listed at the bottom of the menu display.

SETTINGS	
> EXIT	
RIFLE PROFILE	<> 1
CAL. COMPASS	
LEFT MARGIN	<> 0
TOP MARGIN	<> 0
LEARN REMOTE	
PRE-SHOT REC	<> 5
POST-SHOT REC	<> 10
REC ENABLE	<> OFF
FACTORY RESET	
FW:	xxxxxxxxxxxx

RIFLE PROFILE

Supports 3 individual rifle profiles with individual boresight, reticle, and palette settings.

CALIBRATE COMPASS

Select to calibrate the compass. When selected, rotate the camera in all directions for best calibration results.

LEFT MARGIN

Shifts the screen left to right.

TOP MARGIN

Shifts the screen up and down.

LEARN REMOTE

Learns the remote channel and encryption. Select this to pair a new remote with the camera. When pushed, the phrase PUSH ANY REMOTE KEY will appear. Push any button on the remote. When calibration is successful, the phrase LEARN SUCCESSFUL will appear.

PRE-SHOT REC

Number of pre-recorded seconds in buffer to write to video file recorded by shot activation.

POST-SHOT REC

Number of post recorded seconds of video written to file recorded by shot activation.

REC ENABLE

Turns on shot activation video recording.

NOTE: Training shot counter must be done prior to enabling shot activated recording.

FACTORY RESET

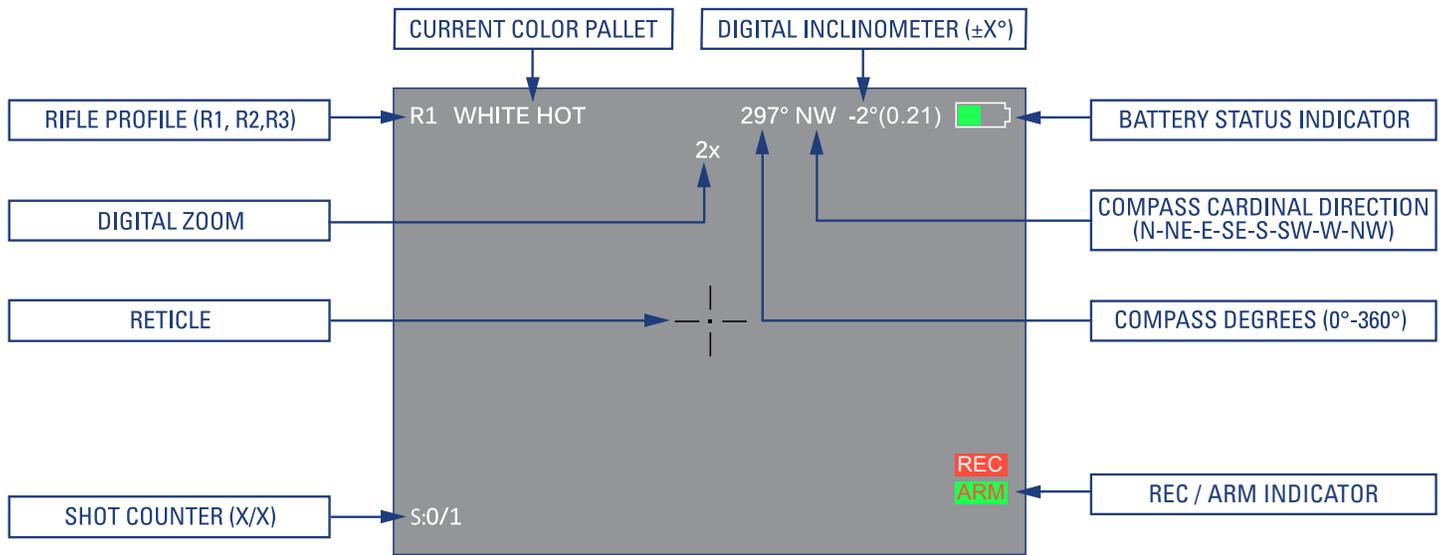
Resets the camera to factory defaults.

FW:

Displays the System software version and the thermal camera software version.

SECTION 5. DISPLAY INDICATION

Information on the current operating state (battery status, active function, the reticle running coordinate in the display etc.) is continuously displayed, making field operation of the FLIR ThermoSight Pro simple and convenient.



SECTION 6. MAINTENANCE

6.1 BATTERY REPLACEMENT

Refer to Part 2.2 for battery installation procedure.

6.2 CLEANING THE THERMOSIGHT PRO

Wipe the housing with a damp cloth as needed.

CAUTION: Do not use abrasives or solvents to clean the housing, lens, or display window. Do not use ammonia-based cleaning products to clean the lens. Doing so may damage the anti-reflective coating of the lens.

The ThermoSight Pro thermal camera lens is designed for the harsh outdoor environment and has a coating for durability and anti-reflection, but it may require cleaning occasionally. Avoid scratching the lens and/or leaving fingerprints on the optics. The camera optics can be damaged by improper cleaning. Clean the lens according to the instructions below when image quality degradation is noticed or excessive dirt or other contaminant is on the lens.

Do not use abrasive materials, such as paper or scrub brushes as this will possibly damage the lens by scratching it. Only wipe the lens clean when there is visible contamination on the surface.

PREFERRED METHOD FOR CLEANING THE LENS

Materials:

- Optical-grade cloth
- Pure water (de-ionized or other)
- Isopropyl alcohol (IPA)

Saturate a piece of the lens tissue with the water and drape it over the lens. Let the surface tension of the water pull the tissue onto the lens surface and then drag the tissue across the lens surface. Repeat several times with different pieces of tissue.

Repeat the same step using IPA instead of water. Drag the final piece of tissue over the lens several times to prevent pooling, which could leave a residue behind.

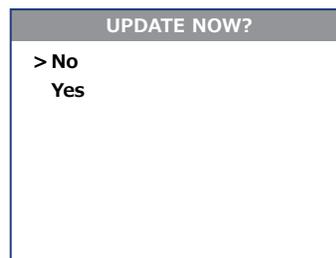
6.3 FIRMWARE UPDATE PROCEDURE

6.3.1 THERMOSIGHT PRO PTS SERIES UPDATE STEPS

1. Go to RESOURCES tab at www.flir.com/OTS.
2. Download the latest version of the software for the ThermoSight Pro PTS series `OTS_ThermoSightPro_Vxxx.x.bin`.

NOTE: ThermoSight Pro firmware, is compatible with all ThermoSight Pro series models.

3. Turn the ThermoSight Pro unit on.
4. Check to make sure the unit has a fully green battery indicator for approximately 30 seconds before connecting the USB.
5. Connect the ThermoSight Pro to your computer using the USB cable.
6. Copy or Drag the `OTS_ThermoSightPro_Vxxx.x.bin` file into the root directory of the FLIR USB drive folder.
7. Safely disconnect the unit from your computer.
 - a. After disconnecting, the screen will show “**Uploading PTS software**”. Upload will take up to 20 seconds. The camera is fully functional, the upload happens in background.
 - b. If the software version matches the existing loaded software the system will not run the update.
8. A menu will appear asking “**Update Now? Yes/No**”.
 - a. If “Yes” is selected, update will start immediately, and the screen will display “**Updating ThermoSight Pro Software**”.
 - i. The camera will self-restart to finish the update.
 - 1) A factory defaults reset is recommended after a successful software update.
 - 2) This will not reset the boresight setting.
 - 3) This will not reset compass calibration.
 - 4) This will not reset shot activation setting.
 - b. If “No” is selected the update will be seamless on the next restart.

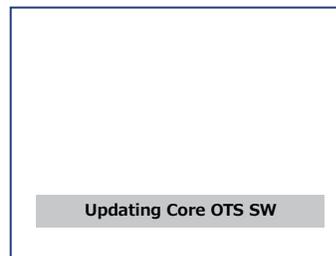
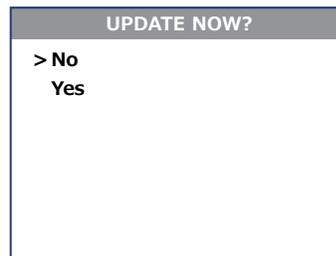


6.3.2 OTS SOFTWARE UPDATE STEPS

1. Go to RESOURCES tab at www.flir.com/OTS.
 2. Download the latest version of the software for the Boson based OTS product families **OTS_CORE_Vxxx.x.bin**
- NOTE:** OTS firmware, is compatible with all the Boson based OTS product families.
3. Turn the ThermoSight Pro unit on.
 4. Check to make sure the unit has a fully green battery indicator for approximately 30 seconds before connecting the USB.
 5. Connect the ThermoSight Pro to your computer using the USB cable.
 6. Copy or Drag the **OTS_CORE_Vxxx.x.bin** file into the root directory of the FLIR USB drive folder.
 7. Safely disconnect the unit from your computer.

- a. After disconnecting, the screen will show **"Uploading OTS software"**. Upload will take up to 6 minutes. The camera is fully functional, the upload happens in background.
 - b. If the software version matches the existing loaded software the system will not run the update.
8. A menu will appear asking **"Update Now? Yes/No"**
 - a. If **"Yes"** is selected, update will start immediately and the screen will display **"Updating Core OTS Software"**.
 - i. The update will take 1.2 minutes. During the update, the camera will lock. The camera will self-restart after the update.

- 1) After a successful software update a factory defaults reset is recommended.
 - 2) This will not reset the boresight setting
 - 3) This will not reset compass calibration.
 - 4) This will not reset shot activation setting
- b. If **"No"** is selected the menu will reappear on the next restart.



SECTION 7. WARRANTY

7.1 GLOBAL LIMITED WARRANTY

Follow the link <http://www.flir.com/uploadedFiles/Corporate/Support/FLIR-Personal-Vision-Systems-2-3-10-Limited-Warranty.pdf> to retrieve FLIR's Warranty document.

7.2 PRODUCT REGISTRATION

In order to validate the warranty on your product, FLIR Outdoor & Tactical Systems must receive a completed Product Warranty Registration Card for each unit, or the Customer can complete the warranty registration form on our website by completing and submitting FLIR Outdoor & Tactical Systems' PRODUCT REGISTRATION FORM (<http://www.flir.com/hunting-outdoor/display/?id=74583>).

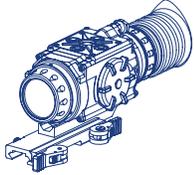
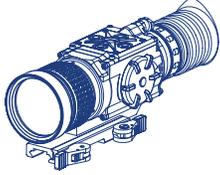
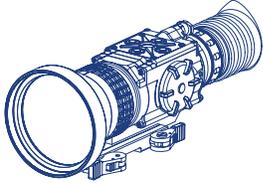
7.3 OBTAINING WARRANTY SERVICE

For service, repair or replacement, please contact:

FLIR Outdoor & Tactical Systems
815 Dubuque Avenue, South San Francisco, CA 94080
Phone: 1-888-959-2259 or (650) 492-7755
Fax: 1-888-959-2260
International Phone/Fax: (650) 492-7755
Email: OTS-Support@flir.com
www.flir.com/ots

SECTION 8. SPECIFICATIONS

The table below contains the latest product specifications for the ThermoSight Pro; however, with all of our products as they evolve and are further developed these specifications are subject to change without notice.

Item	 THERMOSIGHT PRO PTS233	 THERMOSIGHT PRO PTS536	 THERMOSIGHT PRO PTS736
SENSOR SPECIFICATIONS			
Detector Type	FLIR BOSON 12um 320 x 256 VOx Microbolometer		
Video Refresh Rate	60 Hz		
Image Processing	FLIR Proprietary Digital Detail Enhancement™		
SYSTEM SPECIFICATIONS			
Lens System	19 mm; F/1.0	50 mm; F/1.0	75 mm; F/1.0
Optical Magnification	1.5x	4x	6x
Field of View (H x V)	12° x 9.5°	4.5° x 3.5°	3° x 2.5°
Digital Zoom	2x, 4x		
Diopter Adjustment Range	-5 to +5 dpt		
Focusing Range	10m to infinity (not focusable)	10m to infinity	10m to infinity
Eye Relief	45 mm		
Display	Quad-VGA (1280 x 960) FLCOS		
Video Output	Digital Video		
Internal Memory	Up to 1,000 pictures and up to 2.5 hours of recorded video can be stored in the camera's memory		
Temperature Imaging Modes (Image Palettes)	Outdoor Alert, Arctic, Sepia, Ironbow HC, Rainbow, Black Hot, White Hot		
Reticle Type	Dot 4 MOA, Line Dot, Cross Center Dot, Cross, Crosshair, Crossdash		
Reticle Color	Black, White, Red, Cyan, and High Visibility		
Boresight Adjustment Type	Digitally Controlled		

SPECIFICATIONS TABLE CONTINUED

	THERMOSIGHT PRO PTS233	THERMOSIGHT PRO PTS536	THERMOSIGHT PRO PTS736
USER INTERFACE			
Operation Switch	On/ Off/ Standby Mode		
Control Panel Buttons	Configures Operational Settings: <ul style="list-style-type: none"> • Display Brightness Control • Image Palette Control • Digital Zoom Control • Reticle Pattern Control • Reticle Color Control • Boresighting Adjustment • On-Screen Menu Navigation 		
Diopter Adjustment Ring	Adjusts the Eyepiece Diopter		
Focus Ring	Not available	Adjusts the Objective Lens Focus	
INTERFACING			
USB-C Connector	Digital video out; Video and image file access		
POWER			
Battery Type	Two CR123A 3V Lithium batteries		
Battery Life (Operating)	Up to 4 hr at 20°C		
External Power	Through USB-C port (5 Vdc)		
ENVIRONMENTAL			
Operating Temperature Range	-20°C to +50°C (-4°F to +122°F)		
Storage Temperature Range	-40°C to +60°C (-40°F to +140°F)		
PHYSICAL			
Weight	0.65 kg (1.44 lbs)	0.81 kg (1.78 lbs)	0.97 kg (2.14 lbs)
Size	220 × 84 × 68 mm (8.7 × 3.3 × 2.7 in)	259 × 84 × 68 mm (10.2 × 3.3 × 2.7 in)	283 × 93 × 89 mm (11.1 × 3.7 × 3.5 in)
Weapon Mount Type	Picatinny, MIL-STD 1913, and Weaver Rails		
Height of the Scope Axis above Rail	42 mm (1.65 in)	42 mm (1.65 in)	48 mm (1.89 in)
Color (housing)	Black		
Country of Origin	USA		
PACKAGES INCLUDE			
Thermal Weapon Sight, Batteries (2), Battery Cassette, USB to USB Type C Cable (3'), Quick Start Guide, Cleaning Cloth, Hard Case			

OUTDOOR & TACTICAL SYSTEMS

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OTS-Export@flir.com

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OTS-Support@flir.com

www.flir.com

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18-0135-OTS

