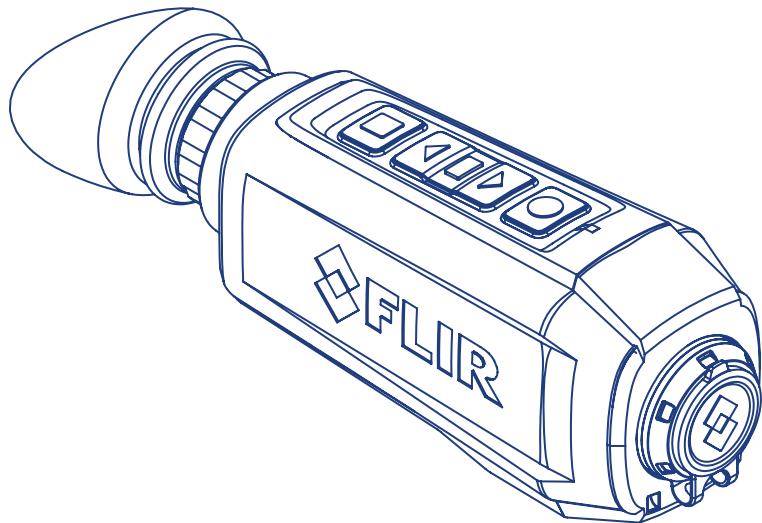


FLIR SCION™

Thermal Monocular



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: US_CBUsupport@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

FLIR Outdoor & Tactical Systems

9 Townsend West Nashua, NH 03063

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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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SAFETY STATEMENT

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

WARNING:

DO NOT DISASSEMBLE THE DEVICE.
Disassembly can cause permanent damage and void the warranty.

WARNING:

This product contains natural rubber latex, which may cause allergic reactions!

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:

- To avoid losing unsaved data, DO NOT remove the batteries or disconnect the external power source while the product is on
- Inadvertent sun damage is not considered a defect in material or workmanship, and is therefore not covered in the product warranty

Scion™ Thermal Monocular

The Scion thermal imaging monocular is used as a handheld 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.

SECTION 1. INTRODUCTION

1.1 Monocular

This manual covers the FLIR Scion thermal monocular and all applicable components. It is recommended that you read and understand this manual to optimize the monocular's operation.

1.2 Introduction

The FLIR Scion™ OTM captures clear thermal imaging and leverages a refined user interface to quickly detect objects of interest in complete darkness and through glaring light or haze. Built around FLIR's powerful Boson core, the Scion OTM produces 9 or 60 Hz thermal imaging and records geotagged video and still images for playback long after the day is done. A rugged, IP67-rated housing and intuitive controls allow single-hand operation in harsh weather conditions, maintaining reliable thermal imaging in the most demanding outdoor environments.

Built to equip law enforcement professionals with superior thermal surveillance, the FLIR Scion™ PTM packs the same features as Scion OTM's, coupled with FLIR TruWITNESS® compatibility. That package can instantly stream encrypted thermal footage of any pursuit, evidence recovery, or search and rescue effort to the command center via wireless network. The Scion PTM is only available in 60 Hz.

NOTE:

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

1.3 Features

- FLIR BOSON 320 x 256 or 640 x 512 (depending on model) 12 µm VO_x Microbolometer
- High definition display
- 6 thermal palette choices
- Picture-in-Picture mode
- Digital zoom up to 8x (depending on model)
- 2 GB internal storage, expandable up to 128 GB with optional micro SD™ Card
- Bluetooth® and Wi-Fi enabled
- IP67-rated
- Up to 4.5 hours of battery life at 20°C
- Limited 3-year warranty
- 10-year warranty on FLIR detector

1.4 Register Your SCION

In order to validate the warranty on your product, FLIR Outdoor & Tactical Systems must register the product at:

www.flir.com/support-center/support-hq/

1.5 Infrared Thermal Vision versus Image Intensified Night Vision

Breach 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 Breach in even the most adverse conditions.

Scion enables the user to:

- See people or objects in difficult terrain, reduced visibility, or total darkness
- See through smoke, dust, and light fog
- See more and further than low light night vision



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 2. GETTING STARTED

2.1 UNPACKING AND INSPECTING

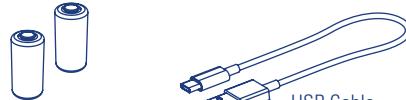
The FLIR Scion monocular is available with the features, options, and accessories described in this manual. Refer to the packing list enclosed with your product to determine the actual contents of your product package.

In addition to the product, the following items are included in the product package:

- FCC Declaration of Conformity
- CE Declaration of Conformity



Thermal Monocular



2 (Two) CR123A
Lithium Battery



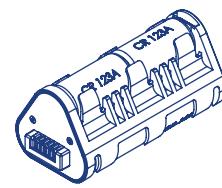
Lens Cloth



Thank You Card



Battery Door



Battery Tray

2.2 Battery

The FLIR Scion monocular uses 2, 4, or 6 standard CR123A Lithium batteries.

BATTERY STATUS INDICATOR

While the monocular is ON, a battery status indicator is always shown in the corner of the display. This indicator provides an estimation of the remaining battery charge.

Battery Installation

Verify that the equipment is off before installing battery.

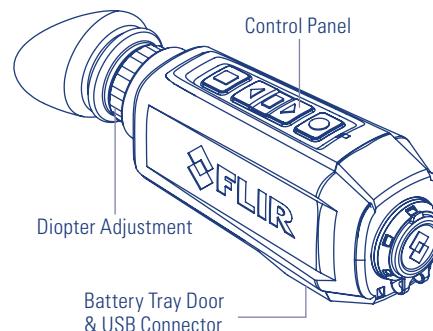
Install battery as follows:

1. Open battery door by turning door latch 90 degrees
2. Remove battery tray
3. Install 2, 4, or 6 CR123 batteries in tray following proper polarity
4. Install tray inside battery compartment
5. Securely close battery compartment with screw latch

SECTION 3. OPERATING THE SYSTEM

3.1 System Controls

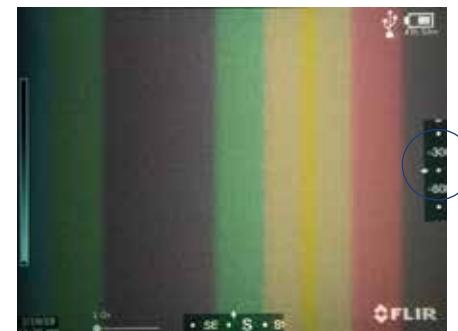
This section details the use of the Breach controls.



3.1.2.1 Digital Zoom Control

- Short press the UP arrow to zoom in using step e-zoom
- Short press the DOWN arrow to zoom out using step e-zoom
- Long press the UP arrow to zoom in using progressive e-zoom
- Long press the DOWN arrow to zoom out using progressive e-zoom

The actual e-Zoom value will be displayed at the top of the scale. The scale will continue to display until e-Zoom is returned to 1x.

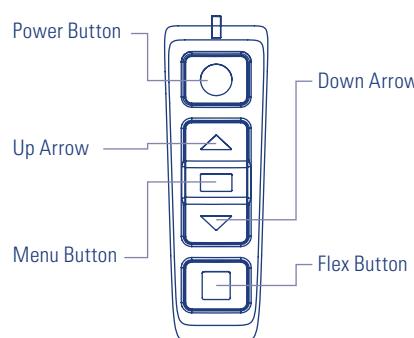


3.1.1 Diopter Adjustment

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 Control Panel Buttons

The control panel buttons configures operational settings.



3.1.2.5 SNAPSHOT

The snapshot function is used to capture images and to record video.

Taking A Picture

Short press the FLEX button to capture an image. The image file name will briefly appear on the bottom-right section of the display.

Recording Video

Long press the FLEX button to START/STOP recording. A REC icon will appear in the top-right corner of the screen while the camera is recording. A total recorded time will also be visible next to the REC icon. When completed, the recording file name will be displayed on the bottom-right section of the display.

3.1.2.6 UCMNUC/FFC

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. This 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 for three seconds to manually trigger a **User-Controlled Manual Non-Uniformity Correction / Flat-Field Correction**.

3.2 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 computer. Then it can be viewed like an external webcam.

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

To power the Scion from an external source plug the cable into any standard USB power

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 MENU button on the control panel.



Once the MAIN MENU is displayed, use the UP and DOWN arrows buttons to navigate through the items on the menu.

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

Use the UP and DOWN arrows buttons to adjust the settings when specified on the menu screen when highlighted.

Short press the POWER button to return to previous menu level or exit menu structure.

4.2 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.



Navigate through the PALETTE menu with the UP and DOWN arrows.

There are six palettes available. Please see the following images for examples of Scion's color palettes.

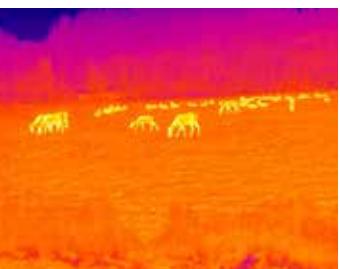
WHITE HOT

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



IRONBOW

Ironbow uses color to show heat distribution and identify subtle details. Hot objects are shown in lighter, warm colors while colder objects are dark, cool colors.



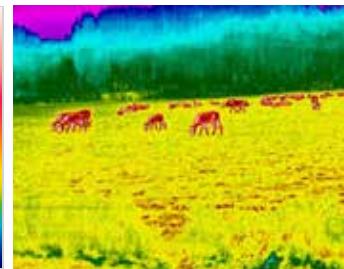
LAVA

The Lava palette identifies warm objects with light, warm colors. Cooler objects appear blue. Lava quickly detects body heat and captures detail in low-contrast environments.



RAINBOW

The Rainbow palette pinpoints small temperature changes and uses vibrant colors to identify objects in areas with minimal heat differences.



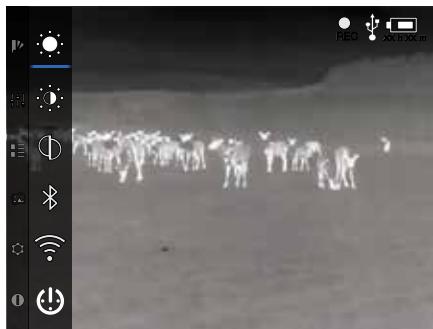
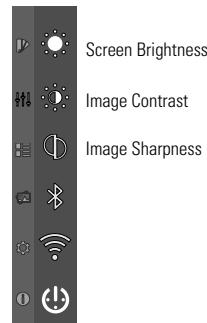
GRADED FIRE

Graded Fire combines the lifelike detail of White Hot with easy-to-spot highlighted areas. Ranging from dark red to bright yellow, bursts of color help detect targets and capture key details.



4.3 LEVELS MENU

The LEVELS 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.



Screen brightness level:

For example This menu allows for the adjustment of the screen brightness level. Press OK to select option, use arrows to change value. Press power button to exit selection.

PRESETS

A group of default settings for various environmental conditions that are optimized toward best camera performance is available: 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	RANGE	DEFAULT
Contrast	50 to 250	100
Sharpness	0 to 800	90
Gain	25 to 800	138
AGC Speed	0 to 100	85

CONTRAST

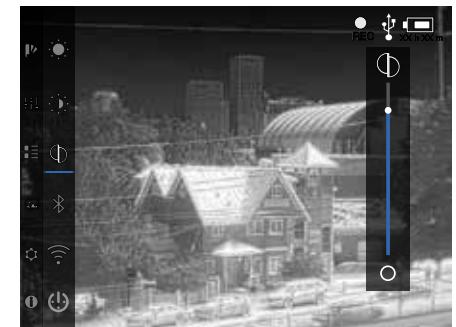
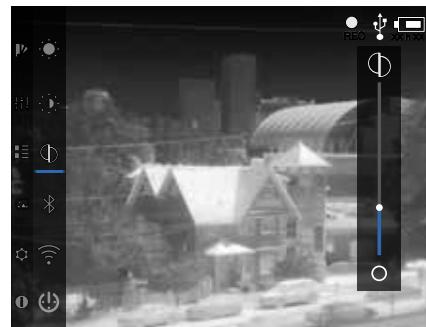
Active Contrast Enhancement (ACE) – a digital contrast correction that allows for a smart scene optimization based on dynamic adjustments, where a variety of contrast levels occur. See presets table for adjustment range and default value. Lower values will cause hotter objects to have greater contrast,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



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. See presets table for adjustment range and default value. 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

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. See presets table for adjustment range and default value.



Gain 25



Gain 800

GAIN CORRECTION

AGC SPEED

AGC Speed - parameter that allows the user to control the refresh rate of Automatic Gain Control (AGC). See presets table for adjustment range and default value.

4.4 IMAGE GALLERY

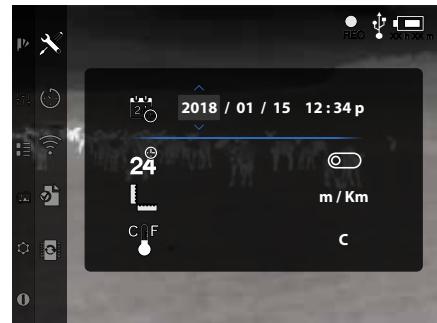
The IMAGE GALLERY allows the operator to delete selected image and video files stored in the camera.



IMAGE GALLERY

4.5 SETTINGS MENU

The SETTINGS MENU allows for the settings of time and date, clock style, units selection.



SETTINGS MENU

SECTION 5. VIEW MODES

CHANGING VIEW MODES

Short press MENU button to cycle through different view modes



1. FULL mode

- Minimal overlay for best situational awareness



2. Picture-in-Picture (PiP)

- 2x zoomed-in view of center area
- Sample area size: 160 × 120 pixels
- Display area size: 320 × 240 pixels



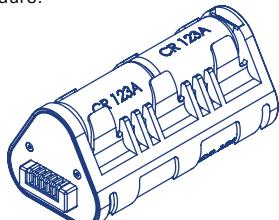
3. Lock Span mode

- Auto Gain Control (AGC) is locked at current level to view rich details even in low dynamic range scenes
- Short press POWER button to lock and unlock AGC

SECTION 6. MAINTENANCE/WARRANTY

6.1 BATTERY REPLACEMENT

Refer to Part 2.2 for battery installation procedure.



Battery Tray

6.2 CLEANING SCION

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 Scion 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.

6.3 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.

6.4 GLOBAL LIMITED WARRANTY

Visit: flir.com/support-center/warranty to view the Scion's warranty policy.

PRODUCT REGISTRATION

In order to validate the warranty on your product, FLIR Outdoor & Tactical Systems must register the product at:

www.flir.com/supportcenter/support-hq/

OBTAINING WARRANTY SERVICE

9 Townsend West Nashua, NH 03063

Phone: 1-888-959-2259 or (603) 324-7600

Fax: 1-888-959-2260

E-mail: OTS-Support@flir.com

www.flir.com

SECTION 7. SPECIFICATIONS

The table below contains the latest product specifications for the Scion. These specifications are subject to change without notice.

SCION OTM 9 Hz Models

SCION MODEL	OTM130	OTM230	OTM260
Core Technology	BOSON 12 μ m VOx Microbolometer		
Detector Resolution	320 x 256	640 x 512	
Refresh Rate	9 Hz		
Lens System	13.8 mm	18 mm	
Field of View (H x W)	16° x 12°	12° x 9°	24° x 18°
Optical Magnification	1.5x	1.9x	1x
Digital Zoom	1X 2X 4X	1X 2X 4X 8X	
Video Recording	Yes		
Image Capturing	Yes		
Internal Memory	2 GB Internal Storage / Optional microSD™ Card (up to 128 GB)		
Focusing Range	∞		
Eye Relief	16 mm		
Display	Quad-VGA (1280x960) High definition display		
Display Focus	Manual		
User Interface			
Temperature Imaging Modes (Thermal Palettes)	White Hot; Black Hot; Iron Bow; Rainbow; Graded Fire; Lava		
Viewing Modes	Scouting, Picture-in-Picture, Lock Span Mode		
Picture White Recording (PWR)	Yes		
Date/Time Stamp	Yes		
Auto Power OFF	Yes		
Magnetic Compass	Yes		
Accelerometer	Yes		
Interfacing			
USB Type	USB-C; Power In; Video Out; Video and Image File Transfer		

SCION MODEL	OTM130	OTM230	OTM260
Power			
Battery Life	Up to 4.5 hours at 20°C		
Battery Type	6x CR123A 3V Lithium Battery		
Communications			
NFC (Near-Field Communication)	Yes		
Bluetooth™	BLE 4.1+		
Wi-Fi	Video Streaming		
GPS	No		Yes
Physical			
Weight	Without Batteries: 452 g; With Batteries 572 g		
Size	227 x 76.8 x 60.5 mm (9 x 3 x 2.4 in)		
Color (Housing)	Gray / Black		
Mounting	1/4-20 Tripod Mount		
Country of Origin	USA		
Included in Box	SCION, Battery tray, 2xCR123, USB-C cable, Black MOLLE pouch, Quick Start Guide		

SECTION 7. SPECIFICATIONS

SCION OTM 60 Hz Models

SCION MODEL	OTM 136	OTM 236	OTM 266	OTM 336		
Core Technology	BOSON 12 μm VOx Microbolometer					
Detector Resolution	320 × 256		640 × 512			
Refresh Rate	60 Hz					
Lens System	13.8 mm	18 mm		25 mm		
Field of View (H × W)	16° × 12°	12° × 9°	24° × 18°	18° × 13°		
Optical Magnification	1.5x	1.9x	1x	1.3x		
Digital Zoom	1X 2X 4X		1X 2X 4X 8X			
Video Recording	Yes					
Image Capturing	Yes					
Internal Memory	2 GB Internal Storage / Optional microSD™ Card (up to 128 GB)					
Focus	∞		Manual			
Eye Relief	16 mm					
Display	Quad-VGA (1280×960) High definition display					
Display Focus	Manual					
User Interface						
Temperature Imaging Modes (Thermal Palettes)	White Hot; Black Hot; Iron Bow; Rainbow; Graded Fire; Lava					
Viewing Modes	Scouting, Picture-in-Picture, Lock Span Mode					
Picture While Recording (PWR)	Yes					
Date/Time Stamp	Yes					
Auto Power OFF	Yes					
Magnetic Compass	Yes					
Accelerometer	Yes					
Interfacing						
USB Type	USB-C; Power In; Video Out; Video and Image File Transfer					
Power						
Battery Life	Up to 4.5 hours at 20°C					
Battery Type	6x CR123A 3V Lithium Battery					

SCION MODEL	OTM 136	OTM 236	OTM 266	OTM 336
Communications				
NFC (Near-Field Communications)	Yes			
Bluetooth™	BLE 4.1+			
Wi-Fi	Video Streaming			
GPS	No	Yes		
Physical				
Size	239 × 76.8 × 60.5 mm (9 × 3 × 2.4 in)	227 × 76.8 × 60.5 mm (9.4 × 3 × 2.4 in)		
Weight	With Batteries: 452 g; Without Batteries 572 g			
Color (Housing)	Green / Black			
Mounting	¼-20 Tripod Mount			
Country of Origin	USA			
Included in Box	SCION, Battery tray, 2xCR123, USB-C cable, Black MOLLE pouch, Quick Start Guide			

SCION PTM 60 Hz Models

SCION MODEL	PTM166	PTM336	PTM366		
Core Technology	BOSON 12 μm VOx Microbolometer				
Detector Resolution	640 × 512	320 × 256	640 × 512		
Refresh Rate	60 Hz				
Lens System	13.8 mm	25 mm			
Field of View (H × W)	31° × 24°	9° × 6.5°	18° × 13°		
Optical Magnification	.7x	2.6x	1.3x		
Digital Zoom	1X 2X 4X	1X 2X 4X	1X 2X 4X 8X		
Video Recording	Yes				
Image Capturing	Yes				
Internal Memory	2 GB Internal Storage / Optional microSD™ Card (up to 128 GB)				
Focus	∞	Manual			
Eye Relief	16 mm				
Display	Quad-VGA (1280×960) High definition display				
Display Focus	Manual				
User Interface					
Temperature Imaging Modes (Thermal Palettes)	White Hot; Black Hot; Iron Bow; Rainbow; Graded Fire; Lava				
Viewing Modes	Scouting, Picture-in-Picture, Lock Span Mode				
Picture While Recording (PWR)	Yes				
Real Time Clock (RTC)	Yes				
Date/Time Stamp	Yes				
Auto Power OFF	Yes				
Magnetic Compass	Yes				
Accelerometer	Yes				
NFC (Near Field Communications)	Yes				

SCION MODEL	PTM166	PTM336	PTM366		
Interfacing					
USB Type	USB-C; Power In; Video Out; Video and Image File Transfer				
Power					
Battery Type	6x CR123A 3V Lithium Battery				
Battery Life	Up to 4.5 hours at 20°C				
Communications					
NFC (Near Field Communications)	Yes				
Bluetooth™	BLE 4.1+				
Wi-Fi	Video Streaming				
GPS	No	Yes			
FLIR TruWITNESS® Integration	Yes				
Physical					
Weight	Without Batteries: 452 g; With Batteries 572 g				
Size	227 × 76.8 × 60.5 mm (9 × 3 × 2.4 in)	239 × 76.8 × 60.5 mm (9.4 × 3 × 2.4 in)			
Color (Housing)	Black				
Mounting	¼-20 Tripod Mount				
Country of Origin	USA				
Included in the Box	SCION, Battery tray, 2xCR123, USB cable, Black MOLLE pouch, Quick Start guide				

FLIR OUTDOOR & TACTICAL SYSTEMS

9 Townsend West,
Nashua, NH 03063

Phone: 1-888-959-2259 or (603) 324-7600
Fax: 1-888-959-2260

FLIR PRODUCT REPAIR CENTER

email: US_CBUrepair@flir.com
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ORDER PLACEMENT, RETURN TO STOCK & INQUIRIES

email: OTS-Orders@flir.com

PRODUCT REGISTRATION

flir.com/support-center/support-hq/

TECHNICAL SUPPORT

email: US_CBUsupport@flir.com

www.flir.com
NASDAQ: FLIR

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18-2713-OTS

