



The World's Sixth Sense®

# THERMAL VISION FOR PROFESSIONAL MARINERS





## THERMAL IMAGING BASICS

Thermal imaging works night and day, in total darkness or bright sunlight, through smoke, dust, and even light fog to keep your passengers and crew safe from hazards and threats.

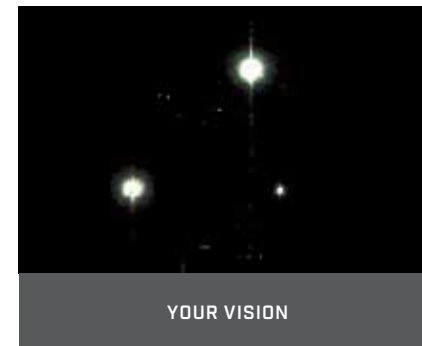
See natural and man-made hazards, such as floating debris, rocks, ice, land, bridge abutments, and other vessels.

Thermal night vision helps you find a person in the water faster than any other night vision technology.

FLIR cameras and thermal video are incredibly intuitive and easy to understand. Quite simply, what you see is what you get.

Daylight cameras, image intensified night vision (I<sup>2</sup>), and the human eye all create images from reflected visible light. Traditional night vision scopes and goggles all take in small amounts of visible light and magnify it. However, traditional imagers have the same limitations as the human eye: if there isn't enough light available, they don't work well. Plus, during daylight and twilight hours, they aren't useful either because there is too much light for them to work effectively.

FLIR thermal cameras work both day and night, regardless of light. They're totally immune to the effects of darkness, glare, or even direct sunlight.



YOUR VISION



TRADITIONAL GEN3 IMAGE INTENSIFIED NIGHT VISION



FLIR THERMAL IMAGE

## RESOLUTION, DETAIL, AND RANGE

FLIR offers a range of thermal imaging cameras with varying levels of image resolution. Much like a digital camera, FLIR cameras with higher pixel counts offer more detail, clarity, and range than models with less resolution. FLIR also offers models with advanced optics for extreme long-range performance.



LOWER RESOLUTION IMAGERS PROVIDE GOOD, BASIC TARGET DETECTION



HIGHER RESOLUTION THERMAL IMAGERS OFFER INCREASED LEVELS OF DETAIL AND LONG-RANGE PERFORMANCE

## FLIR FOR COMMERCIAL MARINERS

### THE SEA CAN BE A DANGEROUS PLACE, ESPECIALLY AT NIGHT

But professional mariners can't call it a day when the weather turns foul. FLIR thermal imagers offer an "early warning system" against common hazards so mariners can sail with confidence, whatever the conditions. FLIR maritime thermal imagers display the invisible heat energy from a myriad of potential hazards, including floating debris, shipping lane traffic, vessels riding at anchor, and small boats. FLIR imagers can also reveal man-made structures, such as buoys, bridge abutments, docks and piers. They can even spot icebergs and surfacing whales.



## FLIR FOR FIRST RESPONDERS

### THERMAL VISION: THE 24/7 TACTICAL ADVANTAGE

First responders gain critical tactical awareness using FLIR thermal cameras, day or night, in good weather and bad. With FLIR thermal vision you can observe suspicious activity in total darkness, quickly locate people in the water, and avoid obstacles while going full throttle in response to emergencies. From border patrols to port security, search and rescue to drug interdiction, FLIR thermal imaging cameras can greatly enhance critical mission success.



### RECOMMENDED COMMERCIAL SYSTEMS:



### RECOMMENDED FIRST RESPONDER SYSTEMS:



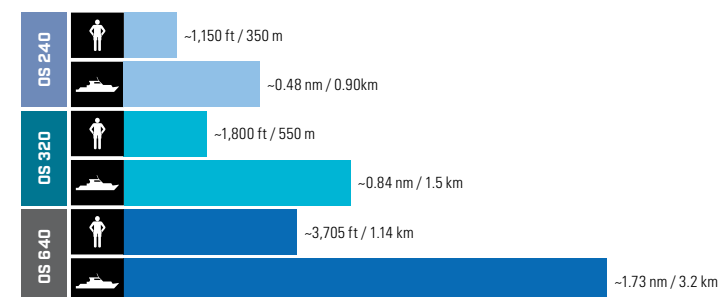
## OCEAN SCOUT HANDHELD

### PORTABLE THERMAL NIGHT VISION

Ocean Scout is a rugged, compact thermal night vision camera that reveals other vessels, landmarks, buoys, and floating debris day or night. Equipped with a high-resolution LCD display and FLIR's industry-leading sensor technology, Ocean Scout puts enhanced situational awareness in your hand at a moment's notice.



### DETECTION RANGES\*



\*Actual range may vary depending on camera set-up, environmental conditions, and user experience.

### ENHANCED AWARENESS

- See marine traffic and navigational aids at night.
- Quickly scan your surroundings for other vessels.
- Easily recognize buoys in river channels or open water.
- Detect key landmarks like islands or docks.

### STEER CLEAR

- Navigate with confidence day or night.
- Avoid obstacles, such as exposed rocks, floating logs, ice, and other debris.
- Be aware of kayakers, personal watercraft, and small boats without lights.
- Detect marine mammals on the surface of the water.

### STAY SAFE

- A lifesaving tool for a "man overboard" emergency.
- Locate the body heat of anyone in the water.
- Quickly recognize people and pets overboard.
- InstAlert™ mode highlights the hottest objects in red.

For technical specifications, turn to page 32



IDENTIFY OTHER VESSELS



FIND PEOPLE OVERBOARD FASTER WITH INSTALERT™



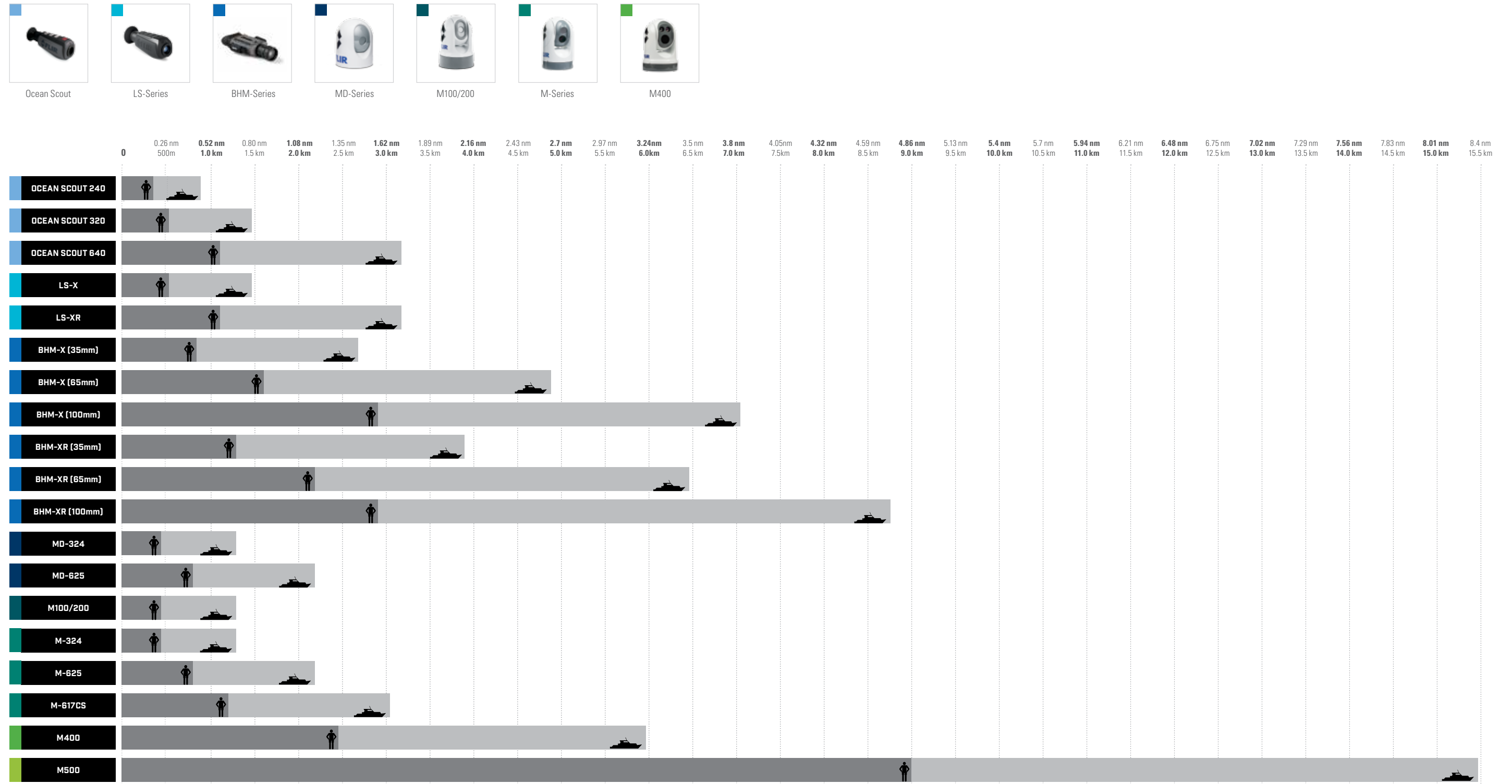
SEARCH FOR EVIDENCE OR PURSUE A SUSPECT IN TOTAL DARKNESS

[www.flir.com](http://www.flir.com)

Specifications subject to change without prior notice. Images for reference purposes only

## RANGE COMPARISON CHART

The following chart compares the man-overboard and small vessel detection distances for the FLIR range of thermal cameras.



Specifications subject to change without prior notice. Images for reference purposes only.

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## IMAGE RESOLUTION AND SAMPLE IMAGES

### OCEAN SCOUT – HANDHELD

The FLIR Ocean Scout puts advanced thermal imaging in the palm of your hand. With thermal vision, you can peer into darkness and see objects and your surroundings as clear as day, keeping you safer, and making your time on the water more relaxing. Resolutions range from 280 x 180 to 640 x 512 pixels, depending upon the model.



OS-240	OS-320	OS-640
240 x 180 pxl	336 x 256 pxl	640 x 512 pxl



### BHM-SERIES – HANDHELD

With powerful interchangeable lenses, BHM-Series cameras are the most powerful handheld, battery-powered, thermal night vision cameras available, making them the right choice for use on vessels of any size, and giving you the edge in all of your nighttime travels. There are two models to choose from: BHM-X (320 x 240 pixels) and the BHM-XR (640 x 480 pixels).



BHM-X SERIES	BHM-XR SERIES
320 x 240 pxl	640 x 512 pxl



### LS SERIES – HANDHELD

This powerful, yet simple imager gives Law Enforcement an unfair advantage whether searching for evidence or pursuing a suspect, all in the palm of your hand. The newest additions to this field-proven line, LS-X and the LS-XR, feature enhanced resolution displays, extended zoom capabilities, and video output.



LS-X SERIES	LS-XR SERIES
336 x 256 pxl	640 x 512 pxl

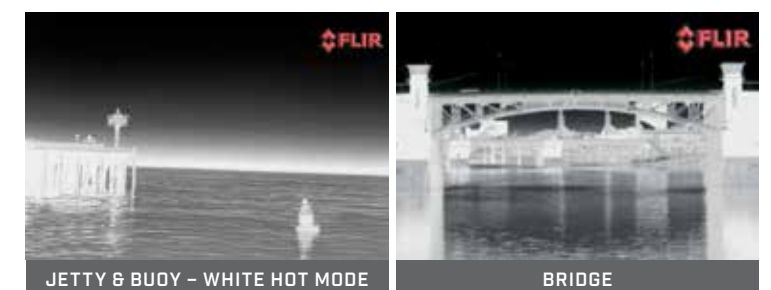


### MD-SERIES – COMPACT THERMAL NIGHT VISION CAMERAS

These fixed-mount thermal night vision cameras help with steering around obstacles, collision avoidance and finding people in the water at night. There are two models to choose from: MD-324 (320 x 240 pixels) and the MD-625 (640 x 480 pixels).

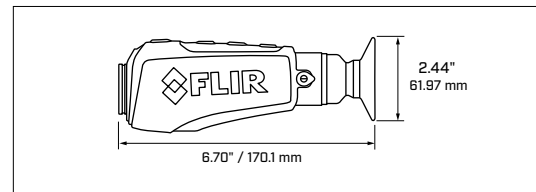


MD-324	MD-625
320 x 240 pxl	640 x 480 pxl



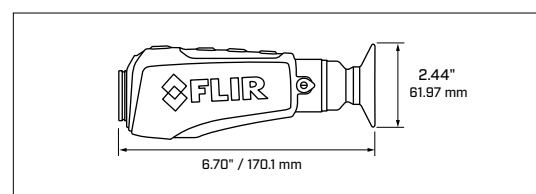
**OCEAN SCOUT SPECIFICATIONS**

	OCEAN SCOUT 240	OCEAN SCOUT 320	OCEAN SCOUT 640
<b>GENERAL</b>			
Detector Resolution	240 x 180	336 x 256	640 x 512
Refresh Rate	9 Hz		
Field of View	24° x 18°	17° x 13°	18° x 14°
Zoom	NA	2x E-Zoom	2x, 4x, and E-Zoom
Color Palettes	White Hot / Black Hot / InstAlert™		
Battery	Internal Lithium Ion rechargeable (5-hour typical life)		
Waterproofing	IP-67 Submersible to 1 Meter		
Weight	0.75lb (0.34 kg)		
<b>RANGE PERFORMANCE</b>			
Man	1,150 ft (350 m)	1,800 ft (550 m)	3,705ft (1.14 km)
Vehicle/vessel	0.48 nm (0.90 km)	0.84 nm (1.5 km)	1.73 nm (3.2 km)





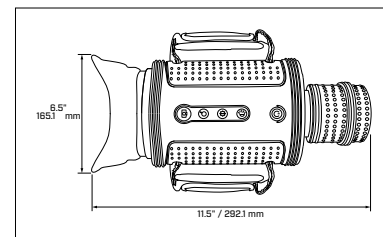
**LS-SERIES SPECIFICATIONS**

	LS-X	LS-XR
<b>GENERAL</b>		
Detector Resolution	336 x 256	640 x 512
Refresh Rate	9 Hz or 30 Hz	
Field of View	17° x 13°	18° x 14°
Zoom	2x and 4x E-Zoom	2x, 4x, and 8x E-Zoom
Color Palettes	White Hot / Black Hot / InstAlert™	
Battery	Internal Lithium Ion rechargeable, (5-hour typical life)	
Laser Pointer	Red Laser Pointer	
Video Output	NTSC or PAL composite via supplied cable	
Waterproofing	IP-67 Submersible to 1 meter	
Weight	0.75lb (0.34 kg)	
<b>RANGE PERFORMANCE</b>		
Person in the Water (6 x 1.6 ft / 1.8 x 0.5 m)	1,870 ft (570 m)	0.62 nm (1.14 km)
Small Vessel (13 x 5.0 ft / 4.0 x 1.5 m)	0.84 nm (1.55 km)	1.62 nm (3 km)





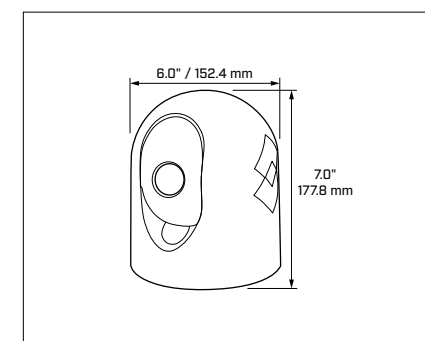
**BHM-SERIES SPECIFICATIONS**

	BHM-X+	BHM-XR+
<b>GENERAL</b>		
Detector Resolution	320 x 240	640 x 480
Refresh Rate	9 Hz or 30 Hz	
Field of View:		
35 mm lens	13° x 10°	18° x 13°
65 mm lens	7° x 5°	10° x 8°
100 mm lens	5° x 3°	6° x 4°
Zoom	2x E-Zoom	2x and 4x E-Zoom
Color Palettes	White Hot / Black Hot / InstAlert™; Selectable	
Battery	4 AA Batteries, NiMH Li-Ion or Alkaline	
Video Output	NTSC or PAL composite via supplied cable	
Waterproofing	IP-67 Submersible to 1 Meter	
Weight:		
with 35 mm lens	0.84 lbs (0.38 kg)	
with 65 mm lens	3.05 lbs (1.38 kg)	
with 100 mm lens	3.06 lbs (1.39 kg)	
<b>RANGE PERFORMANCE</b>		
Person in the Water (6 x 1.6 ft / 1.8 x 0.5 m):		
35 mm lens	2,887 ft (880 m)	0.70 nm (1.3 km)
65 mm lens	0.89 nm (1.65 km)	1.18 nm (2.2 km)
100 mm lens	1.30 nm (2.4 km)	1.59 nm (2.95 km)
Small Vessel (13 x 5.0 ft / 4.0 x 1.5 m):		
35 mm lens	1.46 nm (2.7 km)	2.1 nm (3.9 km)
65 mm lens	2.65 nm (4.9 km)	3.5 nm (6.5 km)
100 mm lens	3.83 nm (7.1 km)	4.75 nm (8.8 km)




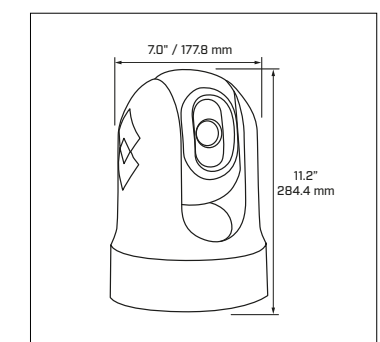
**MD-SERIES SPECIFICATIONS**

	MD-324	MD-625
<b>MAIN THERMAL CAMERA</b>		
Detector Type	320 x 240 VOx Microbolometer	640 x 480 VOx Microbolometer
Video Refresh Rate	<9 Hz or 30 Hz (NTSC and PAL)	<9 Hz or 30 Hz (NTSC and PAL)
Field of View	24° x 18° (NTSC)	25° x 20° (NTSC)
Focal Length	19 mm	25 mm
Focus	Fixed 12ft (3.6m) to infinity	Fixed 12ft (3.6m) to infinity
Optical Zoom	N/A	N/A
E-Zoom	2x	2x, 4x
Image Processing	FLIR Proprietary Digital Detail Enhancement	FLIR Proprietary Digital Detail Enhancement
<b>SYSTEM SPECIFICATIONS</b>		
Video Tracking	No	No
Firefighter Mode	No	No
Pan/Tilt Adjustment Range	Pan: ±30° per key, Tilt: +34°, -27° (Locked in at Installation)	Pan: ±30° per key, Tilt: +34°, -27° (Locked in at Installation)
Analog Video Output	NTSC or PAL, 30 Hz or <9 Hz	NTSC or PAL, 30 Hz or <9 Hz
Analog Video Connector Types	F-type BNC with BNC-to-RCA adapter included for video out	F-type BNC with BNC-to-RCA adapter included for video out
Network Video Output	No	No
HD-SDI Lossless Video Output	No	No
Power Requirements	12-24 V DC via included PoE injector	12-24 V DC via included PoE injector
Power Consumption	4.8 W nominal; 12.5 W max	4.8 W nominal; 12.5 W max
<b>ENVIRONMENTAL</b>		
Operating Temperature Range	-13°F to +131°F (-25°C to +55°C)	-13°F to +131°F (-25°C to +55°C)
Storage Temperature Range	-40°F to +185°F (-40°C to +85°C)	-40°F to +185°F (-40°C to +85°C)
Automatic Window Defrost	Standard at Power-Up	Standard at Power-Up
Sand/Dust Ingress	Mil-Std-810E	Mil-Std-810E
Water Ingress	IPX 6 (heavy seas, powerful jets of water)	IPX 6 (heavy seas, powerful jets of water)
Shock	15 g vertical, 9 g horizontal	15 g vertical, 9 g horizontal
Vibration	IEC 60945; MIL-STD-810E	IEC 60945; MIL-STD-810E
Lightning Protection	Standard	Standard
Salt Mist	IEC60945	IEC60945
Wind	100 knot (115.2 mph)	100 knot (115.2 mph)
EMI	IEC 60945	IEC 60945
<b>PHYSICAL</b>		
Weight	~ 3 lbs (1.36 kg)	~ 3 lbs (1.36 kg)
Size	6" (152.4 mm) dia. x 7" (177.8 mm) ht.	6" (152.4 mm) dia. x 7" (177.8 mm) ht.
<b>RANGE PERFORMANCE</b>		
Person in the Water	1,500 ft (457 m)	2,700 ft (823 m)
Small Vessel	4,200 ft (1280 m)	1.2 nm (2.2 km)



**M100/200 SPECIFICATIONS**

	M100/M200
<b>GENERAL</b>	
Detector Type	320 x 240 VOx Microbolometer
Video Refresh Rate	9 Hz
Field of View	24° x 18°
Focal Length	19 mm
E-Zoom	4x
Image Processing	FLIR Proprietary Digital Detail Enhancement
<b>SYSTEM SPECIFICATIONS</b>	
Pan/Tilt Range	M100 – Tilt: +110°, -90° M200 – Pan: 360° (continuous), Tilt: +110°, -90°
Video Output	H264 IP Video stream
Power Requirements	12 or 24 VDC
Power Consumption	15 W (typical) 18 W (max)
<b>ENVIRONMENTAL</b>	
Operating Temperature Range	-13°F to +131°F (-25°C to +55°C)
Storage Temperature Range	-30°F to +158°F (-30°C to +70°C)
Relative Humidity	95% max
Automatic Window Defrost	Standard at Power-Up
Water Ingress	IPX 6 (heavy seas, powerful jets of water)
Shock	15 g vertical, 9 g horizontal
Vibration	IEC 60945; MIL-STD-810E
Salt Mist	IEC 60945
Wind	100 mph (161 kph)
EMI	IEC 60945
<b>PHYSICAL</b>	
Weight	6.0 lb (2.7 kg) w/o top-down riser 6.6 lb (3.0 kg) w/ top-down riser
Size	6.34" (dia. @ base) x 9.03" (ht.) 161.1 (dia.) x 229.3 (ht.) mm
<b>RANGE PERFORMANCE</b>	
Person in the Water	~1,500 ft (457 m)
Small Vessel	~0.67 nm (1.3 km)



## US EXPORT REGULATIONS

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## WARRANTY

FLIR's service commitment of outstanding warranty and technical support now offers you even more; by registering your system with FLIR at [www.flir.com/productreg](http://www.flir.com/productreg), the 2-Year Standard Limited Warranty is upgraded and replaced by the 3-Year Extended Limited Warranty for FREE.

For complete details on FLIR's industry-leading warranty please visit [www.flir.com/maritime](http://www.flir.com/maritime).

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