



*HIGH PERFORMANCE
THERMAL NIGHT
VISION CAMERAS*

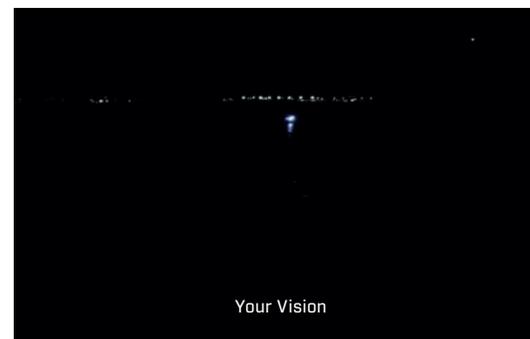


The World's *Sixth Sense*®

NIGHT-TIME ON THE WATER MADE SAFER – WITH FLIR

FLIR maritime thermal imaging systems turn night into day, keeping you safe and secure on the water, and letting you boat with confidence.





Your Vision



FLIR Thermal Vision

SEE THE HEAT

Thermal imaging cameras detect and display images based on tiny differences in heat, not light. From pitch black to moonlight to severe midday glare—FLIR detectors capture the thermal energy emitted or reflected by everything, even ice. FLIR cameras then convert changes in temperature into easy-to-interpret infrared video images, allowing you to see at night and navigate in total darkness.

M400 & M500 THERMAL CAMERAS

FLIR M400 MULTI-SENSOR THERMAL NIGHT VISION SYSTEM

FLIR M400's advanced 640x480 thermal sensor delivers crisp thermal video images in total darkness and lowlight conditions. An integrated HD Color visible camera and tight-beam LED spotlight augment target identification for added safety. M400 features a 4x optical zoom plus a 4x digital zoom enabling you to see targets at long range, day or night. The HD color lowlight camera has a 30x optical zoom which lets you positively ID contacts from a distance day or night. M400 also supports integration with major marine radar systems and multifunction navigation displays. The M400 camera system sits on a marine-grade, gyro-stabilized gimbal system for horizon-to-horizon viewing in all conditions.

FLIR M400XR WITH VIDEO TRACKING AND FIREFIGHTING MODE

The M400XR has all the standard features of the M400 plus the added benefits of video tracking and marine firefighting mode. Video tracking uses FLIR's advanced video analytics algorithms to keep any target of interest in the camera's field of view, automatically. Monitor tenders or small craft headed ashore. Keep watch on a scene while orbiting from a safe distance. Fix the camera on a landmark, NAVAID, or target of concern while maneuvering. M400XR automatically pans and tilts its sensors to keep the target in-track, until it drops over the horizon.

Marine Firefighting mode is designed for first responders, workboats and other vessels responding to vessels in distress and shoreside fire scenes. M400XR's isothermic color palette instantly reveals fire and hotspots through smoke, steam, and darkness. On-screen temperature display helps pinpoint trouble areas helping you to plan your firefighting response to save lives and property.

FLIR M500 COOLED THERMAL NIGHT VISION SYSTEM

The FLIR M500 is our most technologically advanced M-Series camera ever. Designed around a cryogenically cooled Mid Wave Infrared (MWIR) thermal sensor, the M500 excels at both short and ultra-long range target detection and identification. Its thermal camera has a 14x optical and 4x digital zoom, plus its HD color lowlight camera can zoom to 30x magnification. Even at full zoom you'll see incredibly clear, stable imagery thanks to M500's advanced gyro stabilization. M500 brings high performance FLIR thermal vision to the superyacht and commercial shipping markets with unmatched range, clarity and detail.



FLIR **M400™ / M400XR™**

MULTI-SENSOR MARINE CAMERA SYSTEM

THERMAL VISION WITH CONTINUOUS OPTICAL ZOOM

M400's thermal imager features a 4x optical zoom lens plus an additional 4X digital zoom. See beyond visual range to identify distant contacts, or magnify small objects for easy identification. With continuous optical zoom, targets remain in clear, crisp focus right up to maximum magnification. Use the digital zoom to further expand the thermal image, making maximum usage of even the smallest pixels.





Normal wide field of view



Intermediate zoom



Intermediate zoom



Maximum zoom - narrow field of view

The M400's optical zoom helps to positively identify distant targets



High intensity LED spot-beam can highlight targets of interest while preserving the night vision of on-deck personnel



HD Color lowlight camera with 30x optical zoom



Gyro stabilized to ensure steady viewing in heavy sea conditions



High resolution 640 x 480 thermal sensor, optical zoom 18° to 6° horizontal field of view



Rugged, waterproof gimbal enclosure with automatic window heaters for ice management.



360° pan and +/-90° tilt capability



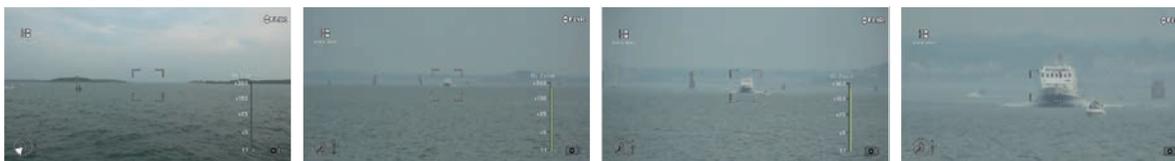
IP Video, HD-SDI, and Analog video outputs and integration with navigation displays



Video tracking: follow objects in the camera's view (M400XR only)



Firefighting mode optimizes color palette to see hot spots and measure temperature on scene (M400XR only)



HD ZOOM VIDEO CAMERA

Better than binoculars, M400 is equipped with a built-in color high-definition camera with optical zoom and lowlight imaging. Use the video camera to make positive identification of other vessels, navigation aids, and more. Use its 30× optical zoom to see all the details, and assess situations from a safe distance. Video and thermal zoom controls can be linked for easy comparison or simultaneous viewing.



FLOATING ICE DETECTION AND AVOIDANCE

Night-time collisions with sea ice are a legitimate hazard to expedition yachts, commercial vessels and rescue craft operating in high latitudes and wintery conditions. FLIR systems with IceAlert™ mode can enhance situational awareness by highlighting growlers, bergy bits, and icebergs in shades of blue.



MARINE FIREFIGHTING MODE [M400XR MODEL ONLY]

The M400XR adds a marine firefighting mode engineered for fireboats and rescue craft. Survey the scene and immediately see hotspots with a firefighting-specific isothermic color palette. M400XR instantly shows you temperatures on-screen to help you visualize your plan of attack, locate hot spots, and save lives and property. M400XR sees through smoke, steam and darkness and identify targets in scenes with extreme temperature dynamics.



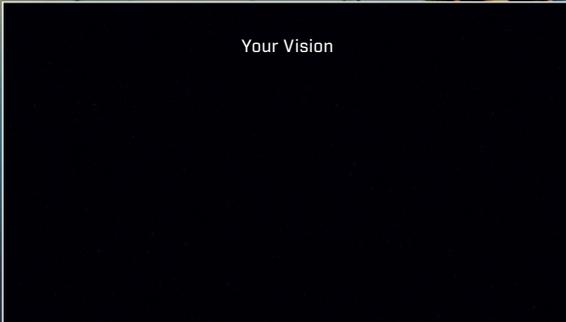
VIDEO TRACKING

Video tracking keeps the M400XR locked on any target using the visible or thermal cameras. Once engaged the system will pan and tilt the camera automatically to keep that target in view until it drops over the horizon.

FLIR M400 / M400XR



Your Vision



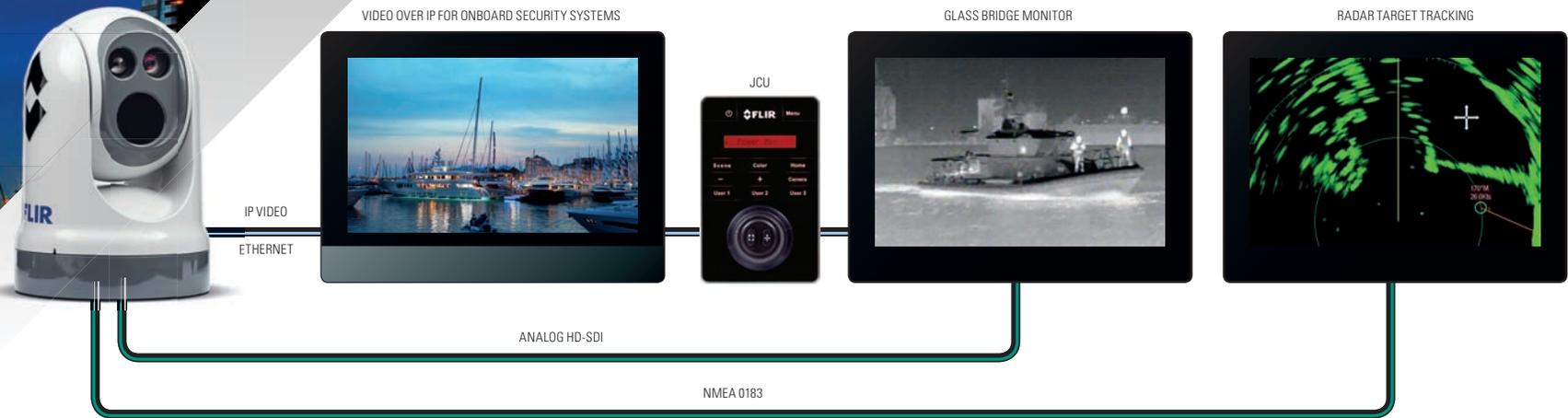
Thermal Vision



HD Visible Camera and Spotlight

**INTEGRATED LED SPOT LIGHT**

Use the M400's integrated spotlight to point out targets of interest, confirm navigational aids, light up the rescue zone, or just signal *I see you*. The narrow-beam LED spotlight is precisely aligned with the thermal and video camera payloads making it easy to illuminate any target without embarrassing other vessels or spoiling the night vision of on-deck crew.



ADVANCED INTEGRATION

The M400 and M400XR offer multiple integration options. View and control them from leading marine MFDs from Furuno, Garmin, Raymarine and Simrad. The supplied JCU-3 joystick also offers primary control and access to all the M400 features. IP video allows the camera to network with onboard video surveillance systems and HD-SDI output provides broadcast quality video to compatible displays. Analog output is also available for most marine displays and monitors. NMEA0183 integration allows the M400/M400XR to slew to radar cursor location, ARPA targets or active waypoint location.

M400/400XR DETECTION RANGES*



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

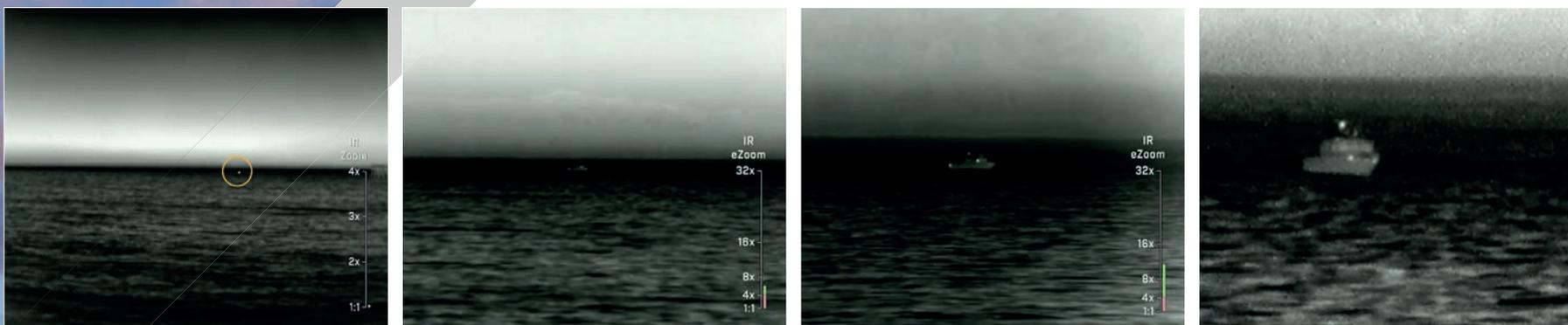
FLIR M500™

M500 ULTRA HIGH PERFORMANCE MULTI-SENSOR CAMERA SYSTEM

CRYOGENICALLY COOLED FOR EXTREME LONG-RANGE DETECTION

M500's liquid helium cooling system chills its internal sensor to a frigid -387°F (-233°C) making it super-sensitive even at long range. M500 can detect a man-sized target at ranges approaching 5-nautical miles, and small vessels at over 8 nautical miles. M500 lets you detect vessels and classify onboard activities at extreme standoff ranges.

**FLIR**



See well beyond visual range to identify distant contacts, or magnify small objects for easy identification.

THERMAL VISION WITH CONTINUOUS OPTICAL ZOOM

M500's thermal camera core features a 14x optical zoom lens plus an additional 4X digital zoom. See well beyond visual range to identify distant contacts, or magnify small objects for easy identification. With continuous optical zoom, targets remain in clear, crisp focus right up to maximum magnification. Use the digital zoom to further expand the thermal image, making maximum usage of even the smallest pixels.



High intensity LED spot-beam can highlight targets of interest, while preserving the night vision of on-deck personnel



HD Color lowlight camera with 30x optical zoom



Gyro stabilised to ensure steady viewing in heavy sea conditions



Cooled MWIR Thermal imager with 640 x 512 resolution and 14x Optical Zoom



Rugged, waterproof gimbal enclosure with automatic window heaters for ice management.



360° pan and +/-90° tilt capability



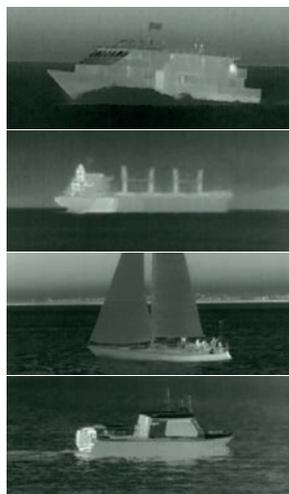
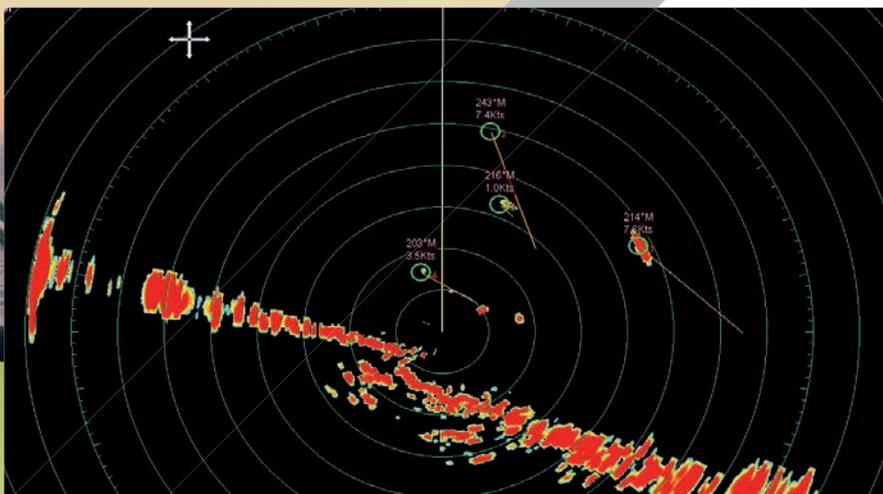
Video tracking: follow objects in the camera's view (M400XR only)



IP Video, HD-SDI, and Analog video outputs and integration with navigation displays

FLIR M500™





ADVANCED RADAR INTEGRATION

Link the M500 with your NMEA0183 compatible radar system and enjoy features like radar target tracking, cursor following, and next waypoint viewing. M500's pan and tilt gimbal can receive coordinates from the radar system and slews the camera automatically. Quickly identify tracked ARPA or MARPA targets. Place the radar cursor on an unknown target and let M500 show you what's there. M500 can even auto-slew to show you visually the bearing to your next GPS waypoint.



HD ZOOM VIDEO CAMERA

Better than binoculars, M500 is equipped with a built-in color high-definition camera with optical zoom and lowlight imaging. Use the video camera to make positive identification of other vessels, navigation aids, and more. Use its 30X optical zoom to see all the details, and assess situations from a safe distance. Video and thermal zoom controls can be linked for easy comparison or simultaneous viewing.



VIDEO TRACKING

Video tracking uses advanced video analytics technology to keep the camera locked on a selected moving or stationary target. Video tracking technology lets you keep a target of interest in view without any manual camera control.

FLIR M500™





INTEGRATED LED SPOT LIGHT

Use the M500's integrated spotlight to point out targets of interest, confirm navigational aids, light up the rescue zone, or just signal *I see you*. The narrow-beam LED spotlight is precisely aligned with the thermal and video camera payloads making it easy to illuminate any target without embarrassing other vessels or spoiling the night vision of on-deck crew.



SUPERIOR ALL-WEATHER THERMAL IMAGING

M500's cooled thermal sensor has twice the sensitivity of uncooled systems. This gives enhanced contrast, clarity and detail in every image. Plus, M500 sees in the Mid-Wave Infrared (MWIR) spectrum. Fog, smoke, haze and offshore marine layer are nearly invisible in this spectral range.

M500 allows you to observe human activity at extremely long ranges



High sensitivity mid wave detector offers the best image quality and long range object recognition

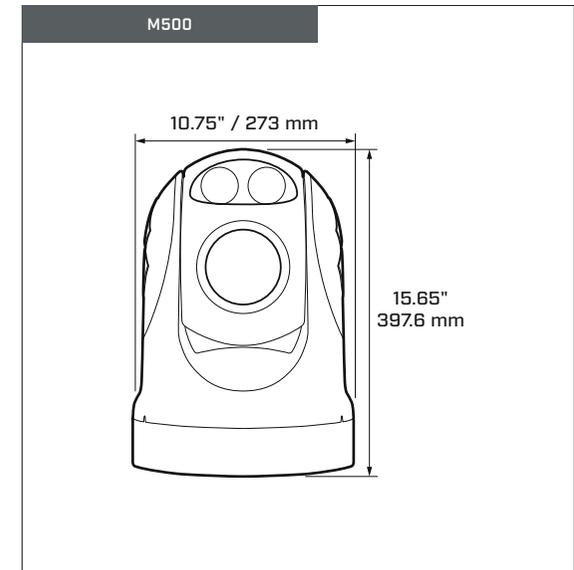
M500 DETECTION RANGES*

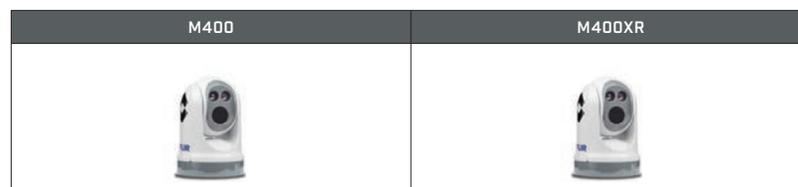


*Actual range may vary depending on camera set-up, environmental conditions, and user experience.

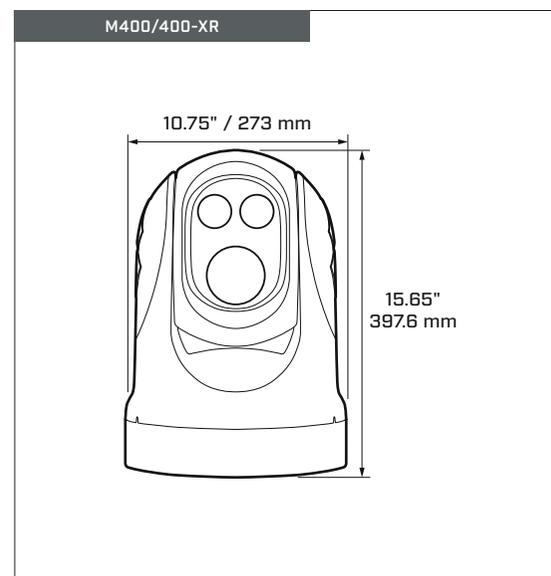


THERMAL CAMERA	
Detector Type	Cooled MWIR InSb 640x512 Focal Plane Array
Video Refresh Rate	25 Hz (PAL) / 30 Hz (NTSC)
Field of View Limits	Optical 28° x 21° WFOV to 2° x 1.5° NFOV
Optical Zoom	1x to 14x (continuous)
E-Zoom	4x
NETD	<30 mK
Spectral Response	3-5 μm
COLOR CAMERA	
Visible Sensor	1/2.8" CMOS
Resolution	1920 x 1080
Field of View Limits	Optical 63.7° x 35.8° WFOV to 2.3° x 1.29° NFOV
E-Zoom	12x
SYSTEM SPECIFICATIONS	
Pan/Tilt Range	
Video Interface	Analog video, HD-SDI
Video over Ethernet	2 channels of streaming MPEG-4, H.264, or M-JPEG
NMEA0183	TCP/IP, RS-422, NMEA 0183, Pelco D
Communications	TCP/IP, RS-422, Pelco D
Video Formats	NTSC or PAL NTSC or PAL, 720p30, 1080p30
Power Requirements	12 VDC to 24 VDC (-10%+30% per IEC 60945)
Power Consumption	250 W (max w/heaters)
Output Modes	Black hot, white hot, false color palettes
Contrast Enhancement	AGC or manual, histogram equalization, local contrast enhancement algorithms available
Sharpness Enhancement	Automatic, adjustable Digital Detail Enhancement
Overlays	Integrated graphics overlays to indicate azimuth, AGC, active camera and menu control
ENVIRONMENTAL	
Operating temp	-25°C to +55°C
Storage temp	-50°C to +80°C
PHYSICAL	
Weight	45 lb (20.4 kg)
Size	10.75" (273 mm) dia. x 15.65" (397.5 mm) ht
RANGE PERFORMANCE	
Person in the Water	-4.9 nm (9.0 km)
Small Vessel	-8.3 nm (15.4 km)





MAIN THERMAL CAMERA		
Detector Type	640 × 480 VOx Microbolometer	
Video Refresh Rate	<9 Hz or 30 Hz (NTSC and PAL)	
Field of View	18° to 6° HFOV / 1.5° HFOV with E-Zoom	
Focal Length	35 mm (Wide) to 105 mm (Narrow)	
Optical Zoom	1× to 4×	
E-Zoom	1× to 4×	
Image Processing	FLIR Proprietary Digital Detail Enhancement	
MAIN VISIBLE CAMERA		
Detector Type	Long-range color daylight and low-light viewing	
Lines of Resolution	High Definition up to 1080/30p	
Minimum Illumination	>0.5 lux at 50 IRE / .05 lux in ICR Mode (B/W)	
Zoom	30× Optical Zoom	
Focal Length	129 mm to 4.3 mm	
Field of View	64° to 2.3° Optical HFOV / 0.2 NFOV E-Zoom	
SPOTLIGHT SPECIFICATIONS		
Type, Lumens, Beam°	LED, 580 Lumens, 5° Divergence Angle	
SYSTEM SPECIFICATIONS		
Video Tracking	No	Yes
Radar Target Tracking	Yes	Yes
Firefighter Mode	No	Yes
Pan/Tilt Adjustment Range	360° Continuous Pan, +/-90° Tilt	
Analog Video Output	NTSC or PAL, 30 Hz or <9 Hz	
Analog Video Connector Types	F-type BNC with BNC-to-RCA adapter included for video out	
Network Video Output	Dual, Independent H.264 Network Video Streams	
HD-SDI Lossless Video Output	Yes	
Power Requirements	24V DC	
Power Consumption	<50 W nominal; 130 W peak, 270 W 2/heaters	
ENVIRONMENTAL		
Operating Temperature Range	-13°F to +131°F (-25°C to +55°C)	
Storage Temperature Range	-56° F to + 176°F (-50°C to +80°C)	
Automatic Window Defrost	Standard at Power-Up	
Sand/Dust Ingress	Mil-Std-810E	
Water Ingress	IPX 6 (heavy seas, powerful jets of water)	
Shock	15 g vertical, 9 g horizontal	
Vibration	IEC 60945; MIL-STD-810E	
Lightning Protection	Standard	
Salt Mist	IEC60945	
Wind	100 knot (115.2 mph)	
EMI	IEC 60945	
PHYSICAL		
Weight	28 lbs (12.7 kg)	
Size	10.75" (273.1 mm) x 15.65" (397.6 mm) – 18.05" (458.7mm) high with top down riser	
RANGE PERFORMANCE		
Person in the Water	1.3 nm (2.45 km)	
Small Vessel	3.2 nm (6.0 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, 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.

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