

THERMAL VISION FOR PROFESSIONAL MARITIME





CUTTING EDGE THERMAL TECHNOLOGY

WHY THERMAL IS BETTER

Thermal imaging cameras detect and display images based on tiny differences in heat, not light. No matter how much light is available—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 crisp infrared video images, allowing you to see at night and navigate in total darkness.

NIGHTTIME ON THE WATER MADE SAFER— WITH FLIR

Whether you're a commercial pro or first responder, FLIR maritime thermal imaging systems turn night into day, keeping you safe, secure and underway with confidence.

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From the smallest patrol boats to the largest ocean-going vessels, FLIR Maritime offers cutting-edge solutions that are rugged, reliable, and simple to use.





THERMAL IMAGING BASICS

SAFETY AND SECURITY

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.

ENHANCED AWARENESS

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

SEARCH AND RESCUE

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

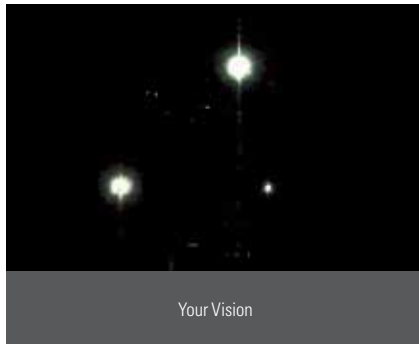
EASY TO USE

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

VISION IN TOTAL DARKNESS

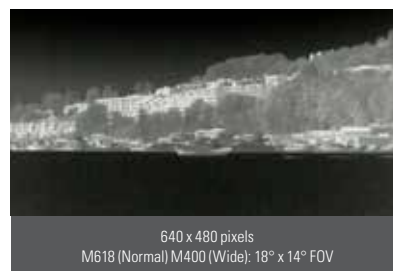
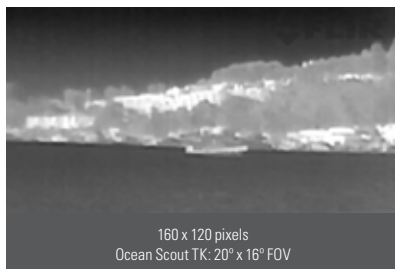
Daylight cameras, image intensified night vision (I²), and the human eye all create images from reflected light. Traditional I² night vision scopes and goggles all take in small amounts of visible light and magnify it. However, traditional imagers have the same limitations as the human eye: if there 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.



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.





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.



Monitor crew on deck



Track potentially threatening vessels



Locate icebergs

RECOMMENDED COMMERCIAL SYSTEMS:



M-Series



M-Series Stabilized



M-400



MU/MV-Series



FLIR FOR FIRST RESPONDERS

FLIR THERMAL VISION GIVES MARITIME FIRST RESPONDERS TACTICAL ADVANTAGE 24/7

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.



See suspects in the dark



Gain situational awareness when approaching vessels



Observe late night activity on shore

RECOMMENDED FIRST RESPONDER SYSTEMS:



Ocean Scout



LS-Series



BHM-Series



MD Series



M-Series



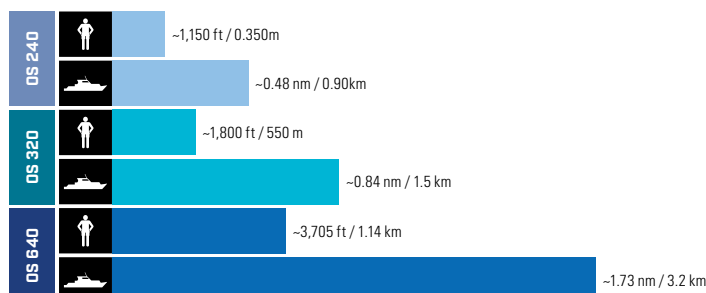
M-400

OCEAN SCOUT HANDHELD

Ocean Scout is a rugged, compact thermal night vision camera that reveals other vessels, landmarks, buoys, and floating debris day or night. Now 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



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 recognise people and pets overboard.
- InstAlert™ mode highlights the hottest objects in red.

For technical specifications, turn to page 30



Identify other vessels



Find people overboard faster with InstAlert™



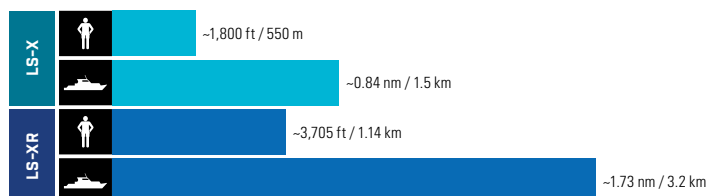
Use Ocean Scout off the water in the outdoors

LS-SERIES TACTICAL THERMAL NIGHT VISION

FLIR's LS-X and LS-XR handheld thermal night vision monoculars are built specifically for those who serve and protect. As a proven force-multiplier, the LS-Series helps maritime first responders see clearly at night while conducting search and rescue missions, patrolling ports and harbours, assisting disabled boaters, and even responding to HAZMAT emergencies. The new LS-X and the LS-XR feature enhanced resolution displays, extended zoom capabilities, a tactical marking laser, and video output.



DETECTION RANGES



IMPROVED AWARENESS

- Enhanced high-resolution LCD display
- Video output capability
- Up to 8x magnification

SIMPLE OPERATION

- Starts up in seconds
- Multiple InstAlert™ levels call attention to hot objects
- Intuitive menu navigation
- Red marking laser for highlighting targets of interest or hidden suspects

PORTABLE AND RUGGED

- Fits in packs, pockets or included Molle bag
- Rubberized armor protection from accidental drops
- Waterproof, all-weather construction

For technical specifications, turn to page 30



Monitor port activities



Investigate suspicious behavior



Find oil slicks and other toxic spills

BHM-SERIES BI-OCULAR THERMAL HANDHELDS

BHM-Series cameras are the most powerful handheld thermal night vision camera for search and rescue operations on the water. With interchangeable 35, 65, and 100 mm lenses, the BHM-Series handhelds can detect a small vessel at a distance of more than five nautical miles (up to 8.8 km). The bi-ocular design lets you use both eyes, and features a full-coverage eyepiece, interocular adjustment, and ergonomic comfort—a must for extended use. The BHM-Series also captures still images and video using an onboard SD card.



DETECTION RANGES





SIMPLE OPERATION

- Intuitive menu options
- Fast power & battery swap
- Multiple InstAlert™ levels call attention to hot objects
- Record stills and NTSC / PAL video to SD card

LONG RANGE DETECTION

- Up to 640 x 480 thermal resolution
- Interchangeable 35/65/100 mm lenses
- Detect small vessels up to distance of 5.5 miles (8.8 km)

PORTABLE AND RUGGED

- IP-67, submersible
- Camera body withstands 1 m drop
- Ergonomic comfort

For technical specifications, turn to page 31



BHM-X with 35 mm lens



BHM-X with 65 mm lens



BHM-X with 100 mm lens

MD-SERIES FIXED MOUNT THERMAL IMAGER

This affordable, fixed-mount thermal night vision system helps you steer around obstacles, avoid collisions, and find people in the water, day or night. The MD camera body is simple to mount and easy to integrate into existing electronics. Mount the display separately on your helm, or view the video feed using existing multifunction navigation displays from leading manufacturers, including Raymarine®, Garmin, Furuno, and Simrad.



320 x 240 or 640 x 480 resolutions produces clear, detailed images



2x and 4x e-Zoom for extended range performance



Automatic window heaters keep optics free of ice

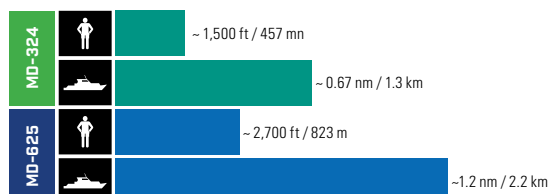


Ethernet-enabled for simple integration into your current electronics



Slim profile (7" high and only 1.36 kg/3 lbs) for an unobtrusive mount

DETECTION RANGES



MD Series can be installed ball down or ball up

HIGH RESOLUTION THERMAL VISION

- Available in 320 x 240 / 640 x 480 resolutions
- 2x E-Zoom standard; 4x E-Zoom (MD-625)
- Detects small vessels up to 1.2 nm away

COMPACT, UNOBTRUSIVE MOUNTING

- Only 7" high and weighs 1.36 kg (3 lbs).
- All-weather, waterproof enclosure
- Ball-up or ball-down mounting options

INTEGRATES WITH EXISTING ELECTRONICS

- Ethernet-enabled, connects to most popular MFDs
- Optional control using iOS device via onboard Wi-Fi network
- Analog video output for easy connection to onboard monitors, recorders, or DVR systems.

For technical specifications, turn to page 32



Easily see navigation aids masked by bright urban background lighting



Spot crossing traffic, obstacles and hazards



Detect small craft, kayakers and other unlit vessels

M-SERIES PAN AND TILT SYSTEMS

The M-Series pan/tilt re-defines maritime multi-sensor system design, drawing on FLIR's 25 years of experience in building combat-proven airborne and maritime thermal imagers for militaries, coast guards, and governmental agencies around the world. With up to 640 x 480 thermal imaging, M-Series cameras let you see more – and see farther – than ever before. Even in the dead of night.



Automatic window heaters keep optics free of ice



2× and 4× E-Zoom functions

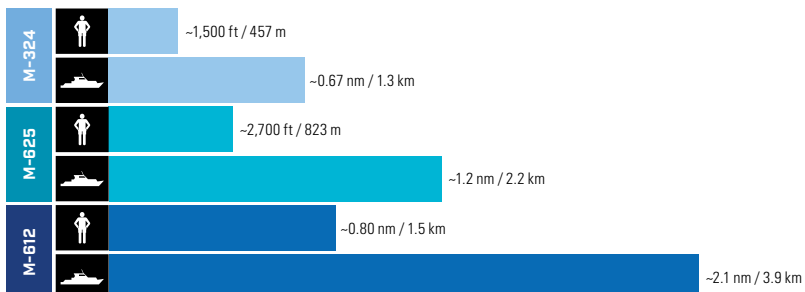


Ethernet control link for easy networking to FLIR joysticks or multifunction displays



Standard analog video signal displays on any monitor with an auxiliary video input

DETECTION RANGES



Compatible with multifunction navigation displays from Raymarine®, Garmin, Furuno and Simrad or display on any onboard screen or monitor with an analog video input.



M-Series non-stabilised thermal cameras can be installed ball down or ball up

STEER CLEAR OF DANGER

- Advanced features improve situational awareness
- Detects other vessels, small craft, floating objects, and hazards—day or night—through darkness, glare, dust and light fog
- Display on any marine monitor, or integrate M-Series thermal imaging right on your marine multifunction display alongside charting and radar
- Simple joystick control of pan, tilt and zoom. Optional advanced touchscreen control from select marine multifunction displays

SIMPLE TO INSTALL

- Integrates seamlessly with existing electronics including select multifunction displays from Raymarine®, Furuno™, Garmin™, and Simrad™
- Slew-to-Cue target tracking from compatible radar, AIS and chart systems
- Composite video output for easy connection to MFDs and monitors

WEATHERPROOF, CONTROLLABLE PAN & TILT SYSTEM

- Engineered especially for harsh marine environments
- Color symbology on-screen gives instant access to system status, position, and configuration
- 360° Continuous Pan, +/-90° Tilt with joystick control

For technical specifications, turn to page 33



See river traffic without being blinded by sun glare



Maneuver between docks at night



Remain aware of channel landmarks

M-SERIES WITH GYRO-STABILISATION

The M-618CS is the most advanced member of FLIR's industry-leading M-Series line of thermal night vision systems. Combining long-range thermal night vision with a color zoom camera and gyro-stabilisation, the M-618CS is the most capable system in its class.



640 x 480 resolution produces clear, detailed images



2x and 4x thermal E-Zoom for extended range performance



Automatic window heaters keep optics free of ice



High resolution Sony color camera system with 36x Optical Zoom and low-light mode

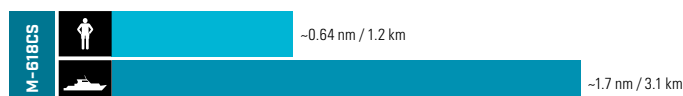


Active gyro-stabilization automatically keeps the image steady in rough seas



Automatically follow targets cued from compatible multifunction navigation displays

DETECTION RANGES





The M-618CS features a high resolution 640 x 480 thermal imager with 2× and 4× E-Zoom, and extended range performance from its 35 mm thermal lens.

The M-618CS can detect small vessels at ranges of over 2 miles. Active gyro-stabilisation provides steady imagery in rough seas, critical to getting the most from the system's advanced, long-range optics.

The system's second payload is a color daylight FCBEX1010 Sony Block Camera with 36× Optical Zoom, and low-light capability, too. Continuous zoom can match the thermal camera's E-Zoom for easy operation when switching between cameras.

For technical specifications, turn to page 34



Detect floating debris and jettisoned contraband



Gyro-stabilisation for clear viewing in rough conditions



Color daylight camera with 36x zoom and lowlight mode

M400 MULTI-SENSOR CAMERA SYSTEM

The M400's advanced 640 x 480 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 has a continuous optical thermal zoom lens (up to 4x) that allows operators to see other vessels and targets at longer ranges. Active gyro-stabilisation ensures a steady image, plus radar tracking keeps potentially dangerous targets in view at all times.



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



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

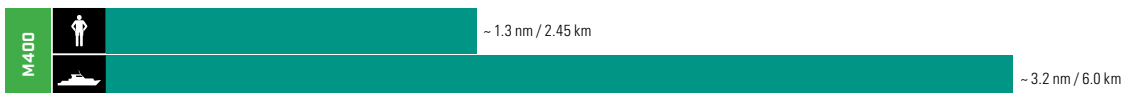


Rugged, waterproof gimbal enclosure with automatic window heaters for ice management.



360° pan and +/-90° tilt capability

DETECTION RANGES



SHORT AND LONG-RANGE DETECTION

- Recognise marine traffic and key landmarks at night
- Continuous variable zoom allows you to easily identify vessels or navigation aids in the distance
- Quickly recognise nearby buoys in channels or open water
- Detect key landmarks, such as islands or docks

THERMAL AND VISIBLE-LIGHT PAYLOADS

- Combination thermal detection and visible identification
- Up to 3× optical thermal zoom for 18° to 6° HFOV
- HD Color 30× Zoom provides 64° to 2.3° HFOV
- Illuminate and identify nearby targets with powerful LED beam

ENHANCED TARGET IDENTIFICATION

- InstAlert™ mode depicts the hottest object in shades of red and orange for easy identification
- IceAlert™ – helps identify floating ice by depicting the coolest objects in shades of blue and green
- Radar integration lets the M400 follow specific radar targets.
- Intuitive, easy-to-use joystick for effortless operation

For technical specifications, turn to page 35



6° to 18° Thermal Horizontal Field of View



Passengers clearly visible on the deck of the ferry



Continuous optical zoom and gyro-stabilisation for superior long-range performance



M400XR MULTI-SENSOR CAMERA SYSTEM

The M400XR incorporates all the features of the M400 but adds integrated video tracking – lock on and automatically follow objects as long as they’re in view of camera – and a firefighting mode.



Video tracking:
follow objects in the
camera's view



Firefighting mode
optimizes the
color palette to
see hot spots and
take temperature
measurements on
scene

ENHANCED VISUAL NAVIGATION

The M400's thermal and visual cameras with optical zoom provide exceptional long range performance, giving captains the ability to visually confirm distant targets with greater clarity.



ENHANCED USER INTERFACE

The M400's enhanced user interface simplifies camera operation and configuration.



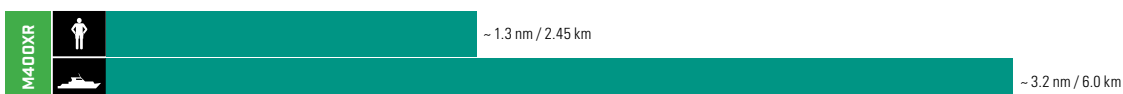
Typical screen showing on-screen menu bar



JOYSTICK CONTROL

The joystick is the primary control for the M400. It is used to wake the system or put it in standby, operate the pan and tilt movement, zoom the camera, control cameras modes and features, and configure system settings by means of OSD menus.

DETECTION RANGES





FIREFIGHTING MODE

The M400XR's firefighting mode provides enhanced awareness with a target temperature meter and isotherm displays.



ICEALERT™ MODE

In IceAlert™ mode the coldest temperatures in the image are highlighted in Blue-Green shades, while warmer temperatures are all in shades of gray. Especially useful for locating ice in the dark.

For technical specifications, turn to page 35



Small cruise ship at dusk viewed with the low-light video camera. Tracking mode engaged to follow the ship.



Party vessel at night with the low-light video camera. Tracking mode is engaged to follow the vessel as it sails around the harbour.



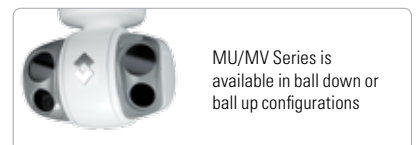
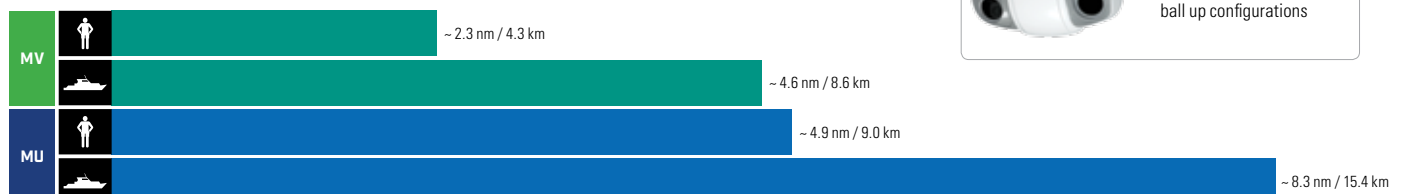
Small ferry leaving port with aircraft on final approach at nearby airport

MU & MV-SERIES MULTI-SENSOR SYSTEMS

The MU and MV-Series multi-sensor, gyro-stabilised systems give you unparalleled range performance and high-definition imaging flexibility. Available with either a cooled infrared detector for extra long-range performance and image detail (MU-Series), or an uncooled infrared detector for stellar thermal imagery to the horizon (MV-Series), both systems come with a high-resolution color camera, and an optional lowlight TV camera.



DETECTION RANGES



SAFER NAVIGATION, ALL DAY & ALL NIGHT

- Spot other marine traffic, navigation hazards, and people in the water any time
- See other vessels, debris on the water, rocks, and people in the water stand out during the day and at night
- Navigate more safely and with more confidence than ever
- Make entering harbors at night stress-free

FLEXIBLE THERMAL NIGHT VISION & TV CAMERAS

- Combines thermal detection and optional visual identification
- Choice of cooled or uncooled thermal imagers with up to 14× optical zoom
- Standard high resolution color visible camera and optional lowlight visible camera
- Radar tracking, video tracking, and picture-in-picture display modes for ultimate versatility

For technical specifications, turn to page 36



Up to 14X continuous optical zoom



1,500 ft to 1.7 nm range performance



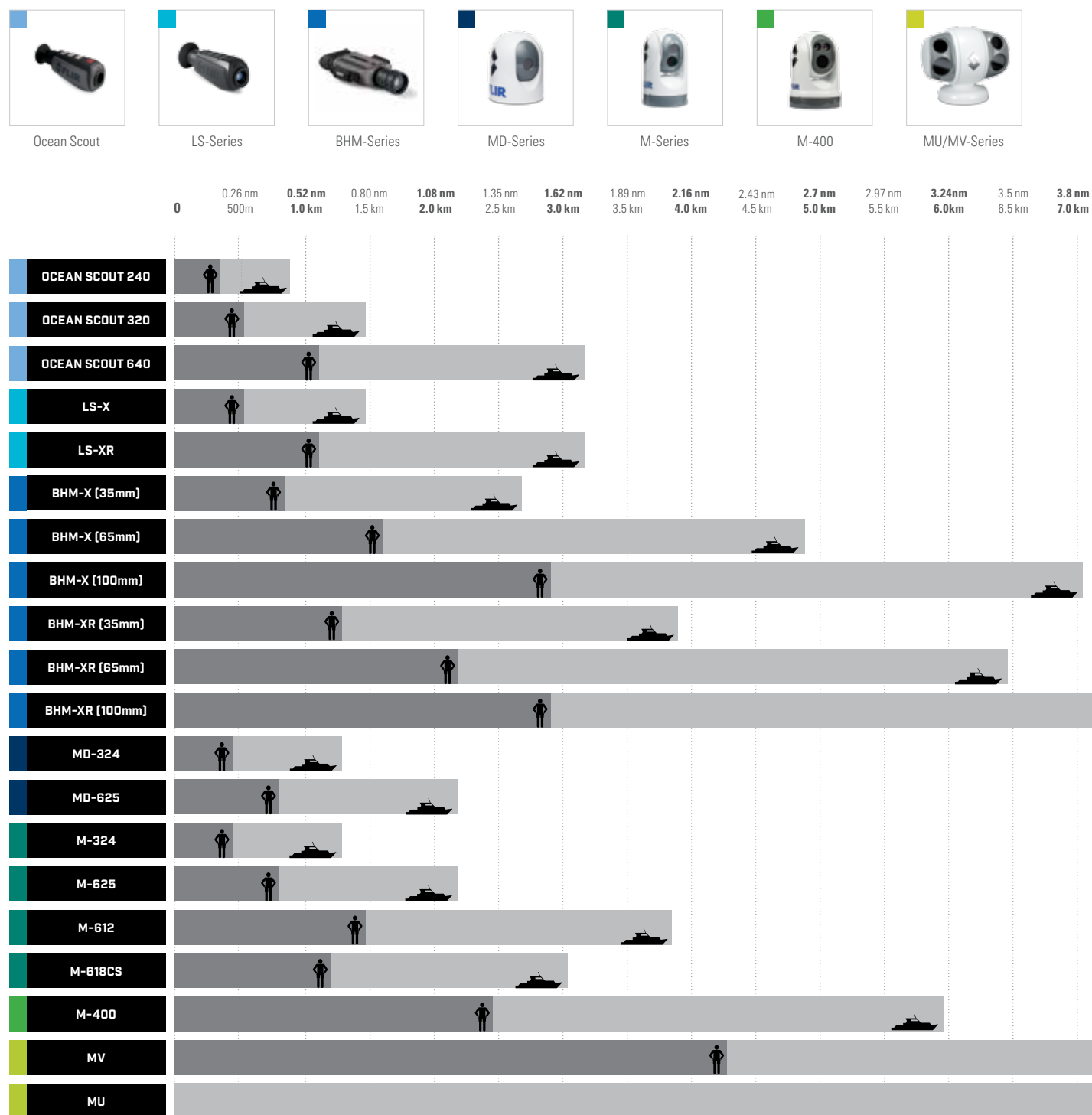
MU's cooled camera increases detail

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



Man in canoe – black hot mode



Man in canoe – white hot mode



Man overboard – white hot mode



Man overboard – InstAlert™

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



Man overboard – black hot mode



Sailboat and coastline – white hot mode

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



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



M-SERIES: MULTI-SENSOR THERMAL NIGHT VISION

The M-Series creates thermal images with tremendous detail for such an affordable night vision system. You will see more—and see farther—even in the dead of night. An optional lowlight TV camera provides enhanced navigational abilities during twilight hours. And M-Series cameras also feature detailed, color on-screen symbology for instant access to system status, position, and configuration. Resolution (320 x 240 or 640 x 480 pixels) is model dependent.



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



M400: ADVANCED MULTI-SENSOR THERMAL NIGHT VISION

The FLIR M400's advanced 640x480 sensor delivers crisp thermal video images in total darkness and low-light conditions. An integrated HD color visible camera and tight-beam LED spotlight augment target identification for added safety.



M400	M400-XR
640 x 480 pxl	640 x 480 pxl



MU/MV-SERIES: PREMIUM MULTI-SENSOR THERMAL NIGHT VISION

FLIR MU/MV-Series is a multi-sensor, gyro-stabilised system offering unparalleled long-range performance. The MU comes standard with a cooled 640 x 512 pixel thermal camera and a color daylight camera. Optional payloads include a low-light B/W camera and an uncooled 640 x 480 thermal camera. The MV-Series features an uncooled thermal 640 x 480 detector, with optional color and B/W camera.



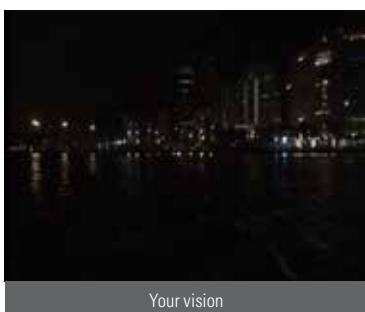
MV-SERIES	MU-SERIES
640 x 480 pxl	640 x 512 pxl



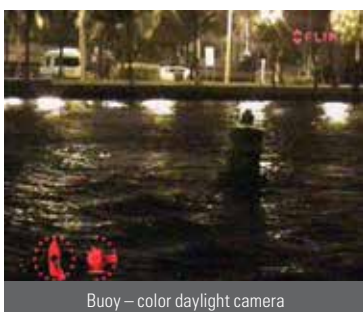
Person on jetty



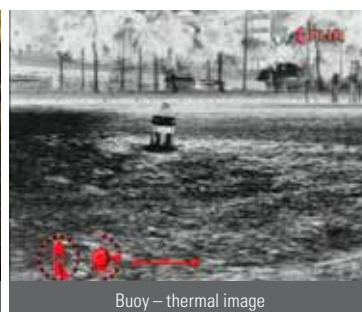
Navigation marker zoomed in



Your vision



Buoy – color daylight camera



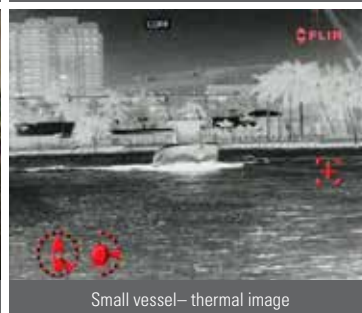
Buoy – thermal image



Your vision



Small vessel – color daylight camera



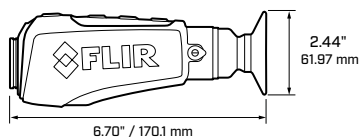
Small vessel– thermal image

OCEAN SCOUT SPECIFICATIONS


	OCEAN SCOUT 240	OCEAN SCOUT 320	OCEAN SCOUT 640
			
GENERAL			
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)		
RANGE PERFORMANCE			
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)

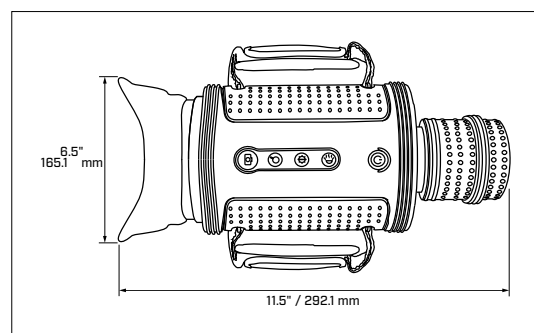
LS-SERIES SPECIFICATIONS

	LS-X	LS-XR
		
GENERAL		
Detector Resolution	336 x 256	640 x 512
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)	
RANGE PERFORMANCE		
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)





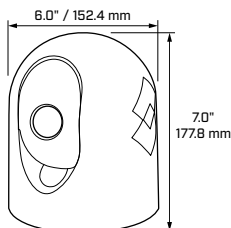
BHM-SERIES SPECIFICATIONS

	BHM-X+	BHM-XR+
		
GENERAL		
Detector Resolution	320 x 240	640 x 480
Field of View: 35 mm lens 65 mm lens 100 mm lens	13° x 10° 7° x 5° 5° x 3°	18° x 13° 10° x 8° 6° x 4°
Zoom	2× E-Zoom	2× and 4× 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 with 65 mm lens with 100 mm lens	0.84 lbs (0.38 kg) 3.05 lbs (1.38 kg) 3.06 lbs (1.39 kg)	
RANGE PERFORMANCE		
Person in the Water (6 x 1.6 ft / 1.8 x 0.5 m): 35 mm lens 65 mm lens 100 mm lens	2,887 ft (880 m) 0.89 nm (1.65 km) 1.30 nm (2.4 km)	0.70 nm (1.3 km) 1.18 nm (2.2 km) 1.59 nm (2.95 km)
Small Vessel (13 x 5.0 ft / 4.0 x 1.5 m): 35 mm lens 65 mm lens 100 mm lens	1.46 nm (2.7 km) 2.65 nm (4.9 km) 3.83 nm (7.1 km)	2.1 nm (3.9 km) 3.5 nm (6.5 km) 4.75 nm (8.8 km)








MD-SERIES SPECIFICATIONS

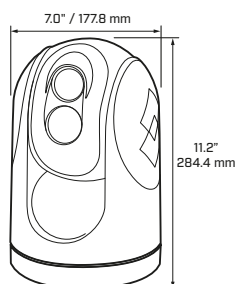
	MD-324	MD-625
		
MAIN THERMAL CAMERA		
Detector Type	320 × 240 VOx Microbolometer	640 × 480 VOx Microbolometer
Video Refresh Rate	<9 Hz or 30 Hz (NTSC and PAL)	<9 Hz or 30 Hz (NTSC and PAL)
Field of View	24° × 18° (NTSC)	25° × 20° (NTSC)
Focal Length	19 mm	25 mm
Focus	Fixed 12ft (3.6m) to infinity	Fixed 12ft (3.6m) to infinity
Optical Zoom	N/A	N/A
E-ZOOM	2×	2×, 4×
Image Processing	FLIR Proprietary Digital Detail Enhancement	FLIR Proprietary Digital Detail Enhancement
SYSTEM SPECIFICATIONS		
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
ENVIRONMENTAL		
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
PHYSICAL		
Weight	~ 3 lbs (1.36 kg)	~ 3 lbs (1.36 kg)
Size	6" (152.4 mm) dia. × 7" (177.8 mm) ht.	6" (152.4 mm) dia. × 7" (177.8 mm) ht.
RANGE PERFORMANCE		
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)



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

M-SERIES SPECIFICATIONS

	M-324XP	M-324L	M-625XP	M-625L	M-612L
					
MAIN THERMAL CAMERA					
Detector Type	320 × 240 VOx Microbolometer	320 × 240 VOx Microbolometer	640 × 480 VOx Microbolometer	640 × 480 VOx Microbolometer	640 × 480 VOx Microbolometer
Video Refresh Rate	<9 Hz or 30 Hz (NTSC and PAL)	<9 Hz or 30 Hz (NTSC and PAL)	<9 Hz or 30 Hz (NTSC and PAL)	<9 Hz or 30 Hz (NTSC and PAL)	<9 Hz or 30 Hz (NTSC and PAL)
Field of View	24° × 18°	24° × 18°	25° × 20°	25° × 20°	12° × 10°
Focal Length	19 mm	19 mm	25 mm	25 mm	50 mm
Focus	Fixed 12ft (3.6m) to infinity	Fixed 12ft (3.6m) to infinity	Fixed 12ft (3.6m) to infinity	Fixed 12ft (3.6m) to infinity	Fixed 12ft (3.6m) to infinity
Optical Zoom	N/A	N/A	N/A	N/A	N/A
E-ZOOM	2×	2×	2×, 4×	2×, 4×	2×, 4×
Image Processing	FLIR Proprietary Digital Detail Enhancement			FLIR Proprietary Digital Detail Enhancement	
MAIN VISIBLE CAMERA					
Detector Type	N/A	1/2" Interline Transfer Lowlight CCD	N/A	1/2" Interline Transfer Lowlight CCD	1/2" Interline Transfer Lowlight CCD
Lines of Resolution	N/A	768 (H) x 494 (V)	N/A	768 (H) x 494 (V)	768 (H) x 494 (V)
Minimum Illumination	N/A	100 μpLUX (@ F/1.4)	N/A	100 μpLUX (@ F/1.4)	100 μpLUX (@ F/1.4)
Zoom	N/A	N/A	N/A	N/A	N/A
Focal Length	N/A	N/A	N/A	N/A	N/A
Field of View	N/A	Matched to IR	N/A	Matched to IR	Matched to IR
SYSTEM SPECIFICATIONS					
Video Tracking	No	No	No	No	No
Firefighter Mode	No	No	No	No	No
Pan/Tilt Adjustment Range	360° Continuous Pan, +/-90° Tilt	360° Continuous Pan, +/-90° Tilt	360° Continuous Pan, +/-90° Tilt	360° Continuous Pan, +/-90° Tilt	360° Continuous Pan, +/-90° Tilt
Analog Video Output	NTSC or PAL, 30 Hz or <9 Hz	NTSC or PAL, 30 Hz or <9 Hz	NTSC or PAL, 30 Hz or <9 Hz	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	No	No	No
HD-SDI Lossless Video Output	No	No	No	No	No
Power Requirements	12-24 V DC	12-24 V DC	12-24 V DC	12-24 V DC	12-24 V DC
Power Consumption	25 W nominal; 50 W max	25 W nominal; 50 W max	25 W nominal; 50 W max	25 W nominal; 50 W max	25 W nominal; 50 W max
ENVIRONMENTAL					
Operating Temperature Range	-13°F to +131°F (-25°C to +55°C)	-13°F to +131°F (-25°C to +55°C)	-13°F to +131°F (-25°C to +55°C)	-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)	-40°F to +185°F (-40°C to +85°C)	-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	Standard at Power-Up	Standard at Power-Up	Standard at Power-Up
Sand/Dust Ingress	Mil-Std-810E	Mil-Std-810E	Mil-Std-810E	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	15 g vertical, 9 g horizontal	15 g vertical, 9 g horizontal	15 g vertical, 9 g horizontal
Vibration	IEC 60945; MIL-STD-810E	IEC 60945; MIL-STD-810E	IEC 60945; MIL-STD-810E	IEC 60945; MIL-STD-810E	IEC 60945; MIL-STD-810E
Lightning Protection	Standard	Standard	Standard	Standard	Standard
Salt Mist	IEC60945	IEC60945	IEC60945	IEC60945	IEC60945
Wind	100 knot (115.2 mph)	100 knot (115.2 mph)	100 knot (115.2 mph)	100 knot (115.2 mph)	100 knot (115.2 mph)
EMI	IEC 60945	IEC 60945	IEC 60945	IEC 60945	IEC 60945
PHYSICAL					
Weight	~ 9 lbs (4 kg)	~ 9 lbs (4 kg)	~ 9 lbs (4 kg)	~ 9 lbs (4 kg)	~ 9 lbs (4 kg)
Size	7" (177.8 mm) dia. × 11.2" (284.4 mm) ht.	7" (177.8 mm) dia. × 11.2" (284.4 mm) ht.	7" (177.8 mm) dia. × 11.2" (284.4 mm) ht.	7" (177.8 mm) dia. × 11.2" (284.4 mm) ht.	7" (177.8 mm) dia. × 11.2" (284.4 mm) ht.
RANGE PERFORMANCE					
Person in the Water	1,500 ft (457 m)	1,500 ft (457 m)	2,700 ft (823 m)	2,700 ft (823 m)	4,900 ft (1,494 m)
Small Vessel	4,200 ft (1,280 m)	4,200 ft (1,280 m)	1.2 nm (2.2 km)	1.2 nm (2.2 km)	2.1 nm (3.9 km)



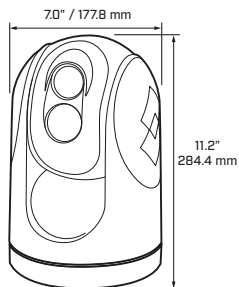
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M-SERIES SPECIFICATIONS

M-Series 618CS

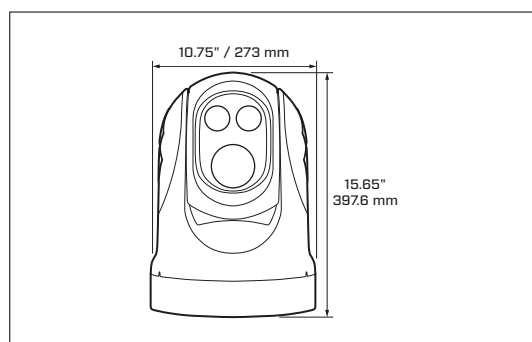


MAIN THERMAL CAMERA	
Detector Type	640 × 480 VOx Microbolometer
Video Refresh Rate	<9 Hz or 30 Hz (NTSC and PAL)
Field of View	18° × 14°
Focal Length	35 mm
Optical Zoom	N/A
E-Zoom	2×, 4×
Image Processing	FLIR Proprietary Digital Detail Enhancement
Main Visible Camera	
Detector Type	Sony Block Color CCD
Lines of Resolution	530
Minimum Illumination	1.4 LUX
Zoom	10x Optical Zoom
Focal Length	N/A
Field of View	~58° (h) x 43° (V) w/10x optical zoom matched to IR, 36x overall
SYSTEM SPECIFICATIONS	
Video Tracking	No
Radar Target Tracking	Yes, through third party software
Firefighter Mode	No
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	No
HD-SDI Lossless Video Output	No
Power Requirements	12-24 V DC
Power Consumption	25 W nominal; 50 W max
ENVIRONMENTAL	
Operating Temperature Range	-13°F to +131°F (-25°C to +55°C)
Storage Temperature Range	-40°F to +185°F (-40°C to +85°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	~ 11.5 lbs (5.2 kg)
Size	7" (177.8 mm) dia. × 11.2" (284.4 mm) ht.
RANGE PERFORMANCE	
Person in the Water	0.64 nm (1.2 km)
Small Vessel	1.7 nm (3.1 km)






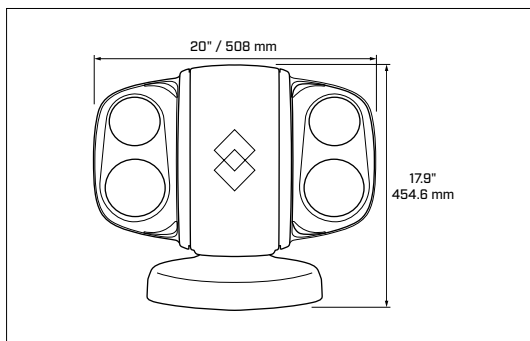
M-400 SPECIFICATIONS

	M400	M400XR
		
MAIN THERMAL CAMERA		
Detector Type	640 × 480 VOx Microbolometer	640 × 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	18° to 6° HFOV / 1.5° HFOV with E-Zoom	18° to 6° HFOV / 1.5° HFOV with E-Zoom
Focal Length	35 mm (Wide) to 105 mm (Narrow)	35 mm (Wide) to 105 mm (Narrow)
OPTICAL ZOOM	1× TO 4×	1× TO 4×
E-Zoom	1x to 4x	1x to 4x
Image Processing	FLIR Proprietary Digital Detail Enhancement	FLIR Proprietary Digital Detail Enhancement
MAIN VISIBLE CAMERA		
Detector Type	Long-range color daylight and low-light viewing	Long-range color daylight and low-light viewing
Lines of Resolution	High Definition up to 1080/30p	High Definition up to 1080/30p
Minimum Illumination	>0.5 lux at 50 IRE / .05 Lux in ICR Mode (B/W)	>0.5 lux at 50 IRE / .05 Lux in ICR Mode (B/W)
Zoom	30x OPTICAL ZOOM	30x OPTICAL ZOOM
Focal Length	129 mm to 4.3 mm	129 mm to 4.3 mm
Field of View	64° TO 2.3° OPTICAL HFOV / 0.2 NFOV E-ZOOM	64° TO 2.3° OPTICAL HFOV / 0.2 NFOV E-ZOOM
SPOTLIGHT SPECIFICATIONS		
Type, Lumens, Beam°	LED, 580 Lumens, 5° Divergence Angle	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	360° Continuous Pan, +/-90° Tilt
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	Dual, Independent H.264 Network Video Streams	Dual, Independent H.264 Network Video Streams
HD-SDI Lossless Video Output	Yes	Yes
Power Requirements	24V DC	24V DC
Power Consumption	<50 W nominal; 130 W peak, 270 W 2/heaters	<50 W nominal; 130 W peak, 270 W 2/heaters
ENVIRONMENTAL		
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	-56° F to +176°F (-50°C to +80°C)	-56° F to +176°F (-50°C to +80°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
PHYSICAL		
Weight	28 lbs (12.7 kg)	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)	1.3 nm (2.45 km)
Small Vessel	3.2 nm (6.0 km)	3.2 nm (6.0 km)



MU/MV SERIES SPECIFICATIONS

	MU-602CLW	MV-604C	MV-604CL
			
MAIN THERMAL CAMERA			
Detector Type	Focal Plane Array (FPA), Cooled MWIR, 640 x 512 Pixels	Focal Plane Array (FPA), Uncooled LWIR 640 x 480 Pixels	Focal Plane Array (FPA), Uncooled LWIR 640 x 480 Pixels
Field of View	WFOV 28° x 22.4° to NFOV 2° x 1.6°	WFOV 24.5° x 18.5° to NFOV 4.1° x 3.1°	WFOV 24.5° x 18.5° to NFOV 4.1° x 3.1°
Focus	Focus free at infinity/Manual/Auto/Wide	Focus free at infinity/Manual/Auto/Wide	Focus free at infinity/Manual/Auto/Wide
Image Processing	FLIR Proprietary Digital Detail Enhancement	FLIR Proprietary Digital Detail Enhancement	FLIR Proprietary Digital Detail Enhancement
MAIN VISIBLE CAMERA			
Detector Type	Long-range color daylight and low-light viewing	Long-range color daylight and low-light viewing	Long-range color daylight and low-light viewing
Lines of Resolution	550 TV Lines	550 TV Lines	550 TV Lines
Minimum Illumination	0.25 Lux	0.25 Lux	0.25 Lux
Zoom	28x Optical Zoom	28x Optical Zoom	28x Optical Zoom
Focal Length			
Field of View	~56° to 2° HFOV	~56° to 2° HFOV	~56° to 2° HFOV
SECONDARY VISIBLE CAMERA			
Lines of Resolution	570 TV Lines	N/A	570 TV Lines
Minimum Illumination	0.0002 Lux (front plate)	N/A	0.0002 Lux (front plate)
Focus	Manual/AF	N/A	Manual/AF
Field of View	25° to 2.5° (H) 10x optical zoom	N/A	25° to 2.5° (H) 10x optical zoom
SECONDARY THERMAL CAMERA			
Detector Type	Focal Plane Array (FPA), uncooled microbolometer 640 x 480 pixels	N/A	N/A
Field of View	32° (athermalized)	N/A	N/A
Digital Zoom	Continuous up to 4x	N/A	N/A
SYSTEM SPECIFICATIONS			
Video Tracking	Yes	Yes	Yes
Firefighter Mode	No	No	No
Pan/Tilt Adjustment Range	360° Continuous Pan, +/-90° Tilt	360° Continuous Pan, +/-90° Tilt	360° Continuous Pan, +/-90° Tilt
Analog Video Output	x2, NTSC or PAL, 30 Hz or <9 Hz	x2, NTSC or PAL, 30 Hz or <9 Hz	x2, NTSC or PAL, 30 Hz or <9 Hz
Analog Video Connector Types	F-type BNC	F-type BNC	F-type BNC
Network Video Output	Yes	Yes	Yes
HD-SDI Lossless Video Output	No	No	No
Power Requirements	12-24 V DC	12-24 V DC	12-24 V DC
Power Consumption	100 W nominal; 200 W ma	100 W nominal; 200 W ma	75 W nominal; 200 W max
ENVIRONMENTAL			
Operating Temperature Range	-32°C to +55°C	-32°C to +55°C	-32°C to +55°C
Storage Temperature Range	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
Automatic Window Defrost	Standard at Power-Up	Standard at Power-Up	Standard at Power-Up
Water Ingress	IPX 6 (heavy seas, powerful jets of water)	IPX 6 (heavy seas, powerful jets of water)	IPX 6 (heavy seas, powerful jets of water)
Shock	9g vertical, 9g horizontal	9g vertical, 9g horizontal	9g vertical, 9g horizontal
PHYSICAL			
Weight	60 lbs	60 lbs	60 lbs
Size	20" wide x 17.9" tall (nominal)	20" wide x 17.9" tall (nominal)	20" wide x 17.9" tall (nominal)
RANGE PERFORMANCE			
Person in the Water	4.9 nm (9.0 km)	2.3 nm (4.3 km)	2.3 nm (4.3 km)
Small Vessel	8.3 nm (15.4 km)	4.6 nm (8.6 km)	4.6 nm (8.6 km)



NOTES

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CAMERA FORMAT AND EXPORT NOTES

FLIR thermal cameras come standard in NTSC video format for US domestic customers. PAL versions are also available.
EXPORT REQUIREMENT: 9Hz versions are available and required for products being exported outside of the US and Canada.
Add an "S" to the end of the product part number on your order to indicate 9 Hz versions. For more information please see your authorized FLIR Maritime dealer or representative.

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.

MU-Series cooled thermal cameras are warranted for 1-Year or 5,000 hours (whichever comes first.)

In North America, FLIR also offers On-Board Repair Service, a Warranty Service Program and Advance Warranty Replacement for some products. These programs and services, when available, are designed to help minimize the down - time of products that may require warranty repair.

For complete details on FLIR's industry-leading warranty please visit
www.flir.com/maritime.

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