

Variti Thermal Night Vision Systems **SFLID** 60 LIR LIR



Nighttime on the Water is Safer with FLIR®

Boating gives you the sense of freedom and independence you can't find anywhere else. Don't let darkness limit your pursuit of adventure and escape from everyday stresses.

FLIR thermal night vision technology is available to keep you safe all day, every day. Professional mariners and militaries around the world have been utilizing FLIR thermal night vision for years. Now that same technology is accessible to every boater, from the palm of your hand to the dashboard in your wheelhouse:

- First Mate II: Affordable, handheld thermal imaging for every boater, now featuring the InstAlert[™] detection palette
- MD-Series: Affordable, fixed mounted cameras, ideal for collision avoidance and vessel security
- M-Series: FLIR's family of premier pan and tilt, single and multi-sensor cameras are ideal for collision avoidance and situational awareness on the water
- Voyager: 2 thermal imagers, 1 low-light color camera and full gyro-stabilization

Whether you enjoy fishing, cruising, sailing, or just exploring your world, all boaters have the same basic goals in mind: Enjoy the ride and bring everyone home safe.

Why Thermal is Better

Thermal imaging cameras detect and display tiny differences in heat, not light. So no matter how much light is available from pitch black to moonlight to severe midday glare—thermal imagers display clear infrared video. The "detectors"—the key to FLIR technology for decades—pick up the thermal energy emitted by everything, even ice! FLIR cameras then convert that data into the crisp infrared video you see on the display.





Your Vision

FLIR Vision

First Mate II



MD-Series



M-Series



Voyager Series



How FLIR Helps you Stay Safe

Collision Avoidance – Crystal-clear video helps you see natural and man-made hazards such as buoys, floating debris, rocks, land, bridge abutments, and other vessels night and day.

Finding People In The Water – Thermal night vision helps you to find a person in the water faster than any other night vision technology.

Easy To Use - FLIR cameras and video are intuitive and easy to use. Quite simply, what you see is what you get.



Dock safely

640 x 480



ldentify buoys and other obstacles in the water 320 x 240



Find crew overboard faster

320 x 240



Locate other vessels

320 x 240

See at Night.

A Camera for Every Vessel

All FLIR thermal night vision cameras let you see clearly in total darkness, but you can also get color or lowlight cameras, gyro stabilization, radar interfacing and other helpful features. Which FLIR is right for you?

- How far do you need to see?
- Are you going to integrate with your other on-board systems?
- Do you want to be able to take it off of your boat?

First Mate II & First Mate II MS

- Handheld, lightweight
- Complements other thermal cameras
- Use it anywhere: Docking assistance, vessel inspection, search and rescue, situational awareness, off boat

Thermal Range Performance[†]

MS-224 & HM-224 Pro (24° Lens)	
~1,050 ft (17 nm)	
~2,940 ft (.48 nm)	
MS-324, & HM-324 XP+ (24° Lens)	
~1,450 ft (.24 nm)	
~4,100 ft (.67 nm)	
HM-324 XP+ with 2x Extender ^{1†} (12° Lens)	
~2,890 ft (.47 nm)	
~1.4 nm	
HM-307XP (7° Lens)	
> ~4,000 it (79 litti)	~2.4 nm



- Affordable, fixed mount thermal imager
- Easy install and use
- Standard & High resolution thermal camera options
- Ethernet-enabled



Thermal Range Performance[†]



Stay Safe.



M-Series

- Premium Pan/Tilt thermal imager
- Thermal only or thermal/lowlight multi-sensor configurations
- Standard- and high-resolution thermal camera options
- Network-ready
- Auto-scan feature
- Easy to use joystick control

Thermal Range Performance[†]

M-324L & M-324XP
-4,200 ft (.67 nm)
M-625L & M-625XP
M-618CS
-17 n

Voyager Series

- Long-range
- Gyro-stabilized Pan/Tilt platform
- 2 thermal cameras
- Daylight/lowlight color camera
- Network-ready
- NMEA interfaces
- Radar slew-to-cue
- Video Tracker
- IP Addressability
- Temperature indication



Thermal Range Performance[†]

Voyager III

-1.2 nm

† = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display used.

†† - 2x Extender pertains to HM-Series only

All specifications are subject to change without notice. Visit www.flin.com for the most up-to-date specifications.

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~3.4 nm

FLIR

See at Night.

First Mate II MS-Series



Ultra-compact and loaded with features, First Mate II MS-Series literally fits in the palm of your hand. Keep one in your pocket or in an easy-to-reach spot on your yacht, powerboat, fishing boat, sailboat, or anything else from an ocean liner to a dinghy. MS-Series is effective as your only thermal imaging device or as a complement to your mounted thermal imaging system because you can take it anywhere on the boat and everywhere off of it.

Learn more at www.FLIR.com/MS-Series.



Go-Anywhere Thermal Night Vision

First Mate II isn't mounted permanently on your boat, so you can use it to see at night everywhere!



Portable thermal systems go anywhere



Observe Wildlife: Great for Camping & Hiking



NEW: InstAlert[™]



Key Features:

- **InstAlert detection:** By adding a red highlight to the hottest elements in a scene, day or night, the First Mate II will help you locate a man-overboard faster than any other technology available.
- **Easy to use:** One-handed, push-button functionality means you can steer or point with one hand while zooming or switching palettes on your MS-Series with the other.
- **Compact & dependable:** Only 12 ounces. Less than 7 inches long. IP-67 rated, submersible to 1 meter. You'll rely on it often, night and day.







Thermal Imaging Specifications	MS-224	MS-324	
Detector Type	240 × 180 VOx Microbolometer	320 × 240 VOx Microbolometer	
FOV	24° × 18°		
Focal Length	19 mm		
Waveband	7.5 - 10	3.5 μm	
Start-up Time	< 5 se	conds	
Focus	Fix	ed	
Image Processing	FLIR Proprietary Digita	al Detail Enhancement	
User Interface			
Power Button	On,	/Off	
Picture Button	N/A	N/A	
Zoom Button	Freeze Frame	2× E-Zoom	
Polarity	Toggles White Hot,	Black Hot, InstAlert	
Brightness	Adjusts Displa	ay Brightness	
Image Presentation			
Built-In Display	Color LC	D Display	
Video Output	N/A	N/A	
Video Refresh Rate	<9 Hz		
Image Polarity	White Hot; Black Hot; InstAlert		
Power			
Battery Type	Internal Camera	Battery / Li-Ion	
Battery Life (Operating)	5 Hours + (typical)		
Battery Life (Stand-By)	N/A		
Environmental			
Rating	IP-67 - Submersible to 1 meter		
Operating Temp.	-4°F to 122°F (-20°C to 50°C)		
Physical			
Weight (incl. lens)	12 oz (340 g)		
Size (L × W × H)	6.70" × 2.31" × 2.44" (172 × 58.7 × 62 mm)		
Packages Include	First Mate MS Handheld Maritime Thermal Night Vision Camera, Wrist Strap, Product CD, Drawstring Pouch		
Thermal Range performance [†]			
Detect Man (1.8 m x 0.5 m)	~1,050 ft (0.17 nm)	~1,450 ft (0.24 nm)	
Detect Small Vessel (2.3 m x 2.3 m)	~2,940 ft (0.48 nm)	~4,100 ft (0.67 nm)	
Warranty	3 Year (with product registration)		





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First Mate II HM-Series



The most versatile thermal handheld available, First Mate II HM-Series can be customized to achieve optimal performance for you. Resolution and optics configuration options enable *you* to detect a person 1,050 feet away with HM-224 or up to 5,000 feet away with HM-307 XP+. Still image and video storage is available if you need it. And length and weight are also variable depending on lens choice or if you want the optional 2x extender. You can configure your HM-Series to how you want to use it on your boat, as well as at home or on the trail.

Learn more at www.FLIR.com/HM-Series.

Key Features:

- InstAlert detection: By adding a red highlight to the hottest elements in a scene, day or night, the First Mate II will help you locate a man-overboard faster than any other technology available.
- Video out: Connect a video monitor to HM-Series' RCA jack to view or record NTSC or PAL composite video.
- **SD card capability:** HM-224 Pro, HM-324XP+ and HM-307XP+ offer image/video storage.
- **Compact & dependable:** Submersible to 1 meter. You'll rely on it often, night and day.

First Mate II HM-Series Control Panel



* These features available on specific camera configurations



Home Security: Investigate strange noises



Portable thermal systems go anywhere



NEW: InstAlert[™]

Stay Safe





HM-307









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Thermal Imaging Specifications	HM-224	HM-224 Pro	HM-324 XP+	HM-307 XP+
Detector Type	240 × 180 V0x	Microbolometer	320 × 240 V0x	Microbolometer
FOV	24° × 18° NTSC			7° × 5° NTSC
Focal Length		19 mm		
Waveband		7.5 - 13.5 µm		
Start-up Time (From Stand-By)		< 5	seconds	
Focus		1	Fixed	
Image Processing		FLIR Proprietary Dig	jital Detail Enhancement	
User Interface				
Power Button		On/Of	f/Stand-By	
Picture Button	Freeze Frame	Still im	age capture and video capture to	SD card
Zoom Button	N/A		2× E-Zoom	
Polarity		Toggles White Ho	t, Black Hot, InstAlert	
Brightness		Adjusts Dis	play Brightness	
Image Presentation				
Built-In Display		Color L	.CD Display	
Video Output		NTSC or PAL com	posite video; RCA jack	
Video Refresh Rate		<	:9 Hz	
Image Polarity		White Hot; Bl	ack Hot; InstAlert	
Other				
SD Card	_	Stores still images	Stores still images and video	Stores still images and video
Power				
Battery Type		4 Rechargeable AA Batte	eries; NiMH, Li-Ion, or Alkaline	
Battery Life (Operating)	>5 Hours On NiMH batteries			
Battery Life (Stand-By)	120 Hours on NiMH batteries			
Environmental				
Rating	IP-67			
Operating Temp.	32°F to 122°F (0°C to 50°C) -4°F to 122°F ((-20°C to 50°C)	
Physical				
Weight (incl. lens)			2.2 lb (984 g) with batteries	
Size (L × W × H)	9.36" × 3.3" × 2.6" (10.5" × 3.3" × 2.6" w/ Extender) 11" × 3.33" × 2.62" (279.4 × 84.5 × 66.5 mm)			
Packages Include	HM-Series Handheld Thermal Camera, Hot Shoe Charging & Video Output Accessory, 4 Rechargeable AA Batteries, AC Power Adapter/Charger, Neck Lanyard, Operator's Manual, Video Output Cable.			
Thermal Range Performance [†]				
Detect Man (1.8 m x 0.5 m)	~1,050 ft (0.17 nm) ~1,600 ft (0.26 nm)		~1,600 ft (0.26 nm)	~4,800 ft (0.79 nm)
Detect Small Vessel (2.3 m x 2.3 m)	~2,940 ft	(0.48 nm)	~4,900 ft (0.80 nm)	~2 nm
Warranty	3 Year (with product registration)			

See at Night.



MD-Series

This affordable, fixed-mount thermal night vision system helps with steering around obstacles, collision avoidance and finding people in the water at night. Simple to mount and easy to integrate into your existing electronics, MD-Series' outputs standard analog video that can be easily displayed on any monitor at the helm or other monitors on the vessel.

Key Features:

- Available in 320 x 240 and 640 x 480 resolutions
- 2x e-zoom standard; 4x e-zoom included on MD-625
- Ethernet-enabled for simple integration into your current electronics
- Compact, all weather, water proof enclosure provides for easy mounting options
- Ball up or ball down mounting options

Learn more at www.FLIR.com/MD-Series.

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Thermal Imaging Specification	MD-324	MD-625	
Sensor Type	320 × 240 VOx Microbolometer	640 × 480 VOx Microbolometer	
FOV	24° × 18° (NTSC)	25° × 20° (NTSC)	
Focal Length	19 mm	25 mm	
E-zoom	2×	2×, 4×	
Image Processing	FLIR Proprietary	Digital Detail Enhancement	
System Specifications			
Size	6'	' dia. × 7" ht.	
Weight		~ 3 lbs	
Pan/Tilt Adjustment Range	Pan: ±30° per key, Tilt: +	-34°, -27° (Locked in at Installation)	
Video Output	NTSC or F	PAL, 30 Hz or <9 Hz	
Connector Types	F-type BNC with BNC-to-	RCA adapter included for video out	
Power Requirements	PoE injector re	equired per IEEE 802.3af	
PoE Injector Power Requirement		12-24 VDC	
Power Consumption	4.8 W nominal; 12.5 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	Mil-Std-810E		
Water Ingress	IPx6 (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		
Thermal Range Performance			
Detect Man (1.8 m x 0.5 m)	~1,500 ft (0.24 nm)	~2,700 ft (0.44 nm)	
Detect Small Vessel (2.3 m x 2.3 m)	~4,200 ft (0.67 nm)	~1.2 nm	
Standard Package	Camera Head with 11" pigtails, 25' Analog Video cable, 25' Ethernet cable, PoE injector and Operator Manual CD		
Warranty	3 Year (with product registration)		
Optional Accessories	Low Smoke Zero Halogen Ethernet Cables		



Stay Safe.



Dual payload M-Series with thermal and low-light cameras

Single payload M-Series with thermal camera.



M-Series®

The award-winning M-Series is FLIR's premium line of maritime thermal night vision systems. Available with a variety of sensors and resolutions to meet a wide range of maritime navigation, collision avoidance, security, and search and rescue needs, M-Series is easy to install, integrate and operate.

M-Series systems use Ethernet connectivity for easy installation, control, and interface with other onboard electronics. The rugged, waterproof gimbal enclosure provides a continuous 360° pan and a +/- 90° tilt field of regard.





- Available in 320 x 240 standard resolution or 640 x 480 high-resolution thermal vision (higher resolution provides improved image detail and range performance).
- 2x e-zoom standard on all models (high-resolution models also include 4x e-zoom).
- Mount ball-up or ball-down.
- Dual-payload versions include extreme lowlight micro-lux TV camera for improved visibility in low ambient light.
- M-618CS gyro-stabilization provides steady imagery even in rough seas. Mounts ball up only
- On screen position feedback
- Learn more at www.FLIR.com/M-Series.







Black hot White hot



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High-resolution detail image

Low-light Video



Joystick Control Unit

Ergonomic, effortless control of all critical M-Series functions, even in rough conditions



User: Programmable "hot key" provides instant access to most common functions

Home: Instantly return camera position to user defined home position

Scene: Pre-Set Automatic Gain Control adjustments to optimize thermal image in a variety of maritime conditions

> Joystick: Sealed 8-way control knob provides precise control in rough conditions

Other Features:

- Heated LCD Screen: Instant, always legible system status display.
- Auto Scan Controls: Program automatic scan speed and pointing angle arc ranging from 40° to 160°
- Ethernet Connectivity: Install Multiple control stations to control M-Series from Anywhere on your Vessel



On-Screen Icons

M-Series uses FLIR's color on-screen symbology to let you see where the system is pointing, and to give you instanaeous updates regarding the camera's configuration and status.





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M-Series					
Thermal Imaging Specifications	M-324XP	M-625XP	M-324L	M-625L	M-618CS
Sensor Type	320 × 240 VOx Microbolometer	640 × 480 VOx Microbolometer	320 × 240 VOx Microbolometer	640 × 480 VOx Microbolometer	640 × 480 VOx Microbolometer
FOV	24° × 18° (NTSC)	25° × 20° (NTSC)	24° × 18° (NTSC)	25° × 20° (NTSC)	18° × 14° (NTSC)
Focal Length	19 mm	25 mm	19 mm	25 mm	35 mm
E-zoom	2×	2× & 4×	2×	2× & 4×	2× & 4×
Image Processing		FLIR Pro	oprietary Digital Detail Enh	ancement	
Daylight Imaging Specifications					
Detector Type		N/A	1/2" Interline Tr	ansfer Lowlight CCD	Color CCD
Lines of Resolution		N/A	768 (H	I) x 494 (V)	530
Minimum Illumination		N/A	100 µ	x (@ f/1.4)	1.4 lux
FOV	N/A Matched to IR		~58° (h) x 43° (V) w/10x optical zoom matched to IR		
System Specifications					
Size		7" dia. × 11.2" ht. 7" dia. × 11.4"			7" dia. × 11.4" ht.
Weight		~ 9 lbs ~ 11.5 lbs			~ 11.5 lbs
Pan/Tilt Coverage		360° Continuous Pan, +/-90° Tilt			
Video Output	NTSC or PAL				
Connector Types		BNC with BNC-to-RCA adapter included for video out			
Power Requirements		12	2 VDC to 24 VDC (-10%/+3	30%)	
Power Consumption		25 W nominal; 50 W max			
Environmental					
Operating Temperature Range		-1:	3°F to +131°F (-25°C to +5	i5°C)	
Storage Temperature Range	-40°F to +185°F (-40°C to +85°C)				
Automatic Window Defrost	Standard				
Sand/Dust		Mil-Std-810E			
Water Ingress	IPx6 (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				
Thermal Range Performance [†]					
Detect Man (1.8 m x 0.5 m)	~1,500 ft	~2,700 ft (0.44 nm)	~1,500 ft (0.24 nm)	~2,700 ft (0.44 nm)	~3,900 ft (0.64 nm)
Detect Small Vessel (2.3 m x 2.3 m)	~4,200 ft	~1.2 nm	~4,200 ft (0.67 nm)	~1.2 nm	~1.7 nm
Standard Package	Camera Head with 18-inch Pigtails for Power, Analog Video, and Ethernet; Joystick Control Unit; 25' LSZH Ethernet Cable, Operator Manual				
Warranty	3 Year (with product registration)				
Optional Accessories		Dual Station JCU; Low Smoke Zero Halogen Ethernet Cables; Top-Down Mounting Riser			



Secat Night.

Voyager Series



Key Features:

Voyager II & III

- 4x optical zoom & 15x total zoom: Voyager || & ||| lets you see even farther at night
- Powerful, long-range daylight/lowlight color TV camera: With 26x optical zoom, and 312x digital zoom
- Active gyro-stabilization: Provides steady imagery, even in rough seas, which is critical for getting the most out of Voyager's long range imaging capability
- Radar Tracking[†]: Identify and track specified radar returns
- Internet remote control: Operates Voyager from anywhere in the world with a suitable Internet connection
- Expanded interface capability: Integrates Voyager feed with other marine electronics

Voyager III

- Video Tracker: Automatically stays locked onto an object or vessel to follow its every movement
- Temperature Indication Scale: Determines temperature of objects in image
- Surveillance Mode: Automatically pans left and right
- † = Some Maritime Radars do not output the NMEA 0183 data required for this feature.

Long-Range Multi-Sensor Thermal Night Vision Systems

With two best-in-class thermal night vision cameras, and a dual-function daylight/lowlight color TV camera that lets you see harbor entrances and other vessels clearly in the half-light of dawn and dusk, the Voyager family provides 24-hour imaging capability that lets you see to the horizon.

Voyager's wide-angle thermal camera lets you detect other boats or hazards more easily, while its long-range 140 mm thermal camera lets you zoom in on them to get the valuable information you need to react in time.

Learn more at www.FLIR.com/Voyager





Voyager III Joystick Control Unit

Ergonomic, effortless control of all critical Voyager III functions, even in rough conditions



common functions



On-Screen Icons

Voyager uses FLIR's color on-screen symbology to let you see where the system is pointing, and to give you instantaneous updates regarding the camera's configuration and status.

precise control in rough conditions





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Video Tracker

Other Features:

- Heated LCD Screen: Instant, always legible system status display.
- Auto Scan Controls: Program automatic scan speed and pointing angle arc ranging from 40° to 160°
- Ethernet Connectivity: Install Multiple control stations to control Voyager Series from Anywhere on your Vessel

*Some models of Voyager feature alternate joystick control units.



Foveal View

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Voyager II & Voyager III

Thermal Imaging Specifications		
Sensor Type	Two 320 × 240 V0x Microbolometers	
FOV	20° × 15° (Wide FOV); 5° × 3.75° (Narrow FOV)	
Focal Length	35 mm (Wide FOV); 140 mm (Narrow FOV)	
E-zoom	4x (15x Total Magnification)	
Image Processing	FLIR DDE	
Daylight Imaging Specifications		
Detector Type	1/4" Super HAD Daylight/Lowlight Color CCD	
Lines of Resolution	768 (H) × 494 (V)	
Minimum Illumination	2 lux (@ f/1.6)	
FOV	42° (h) to 1.7° (h) plus 12x E-zoom for 312x Total Magnification	
System Specifications		
Camera Head Size	15.18" × 18.68"; 15.5" × 22" Swept Volume Cylinder	
Bulkhead Box	10.42"(w) x 14.25"(l) x 6.26"(d)	
Weight	45 lb	
Pan/Tilt Coverage	360° Continuous Pan, +/-90° Tilt	
Video Output	NTSC or PAL	
Connector Types	BNC	
Power Requirements	24 VDC	
Power Consumption	<50 W nominal; 130 W peak, 270 W w/heaters	
Environmental		
Operating Temperature Range	-4°F to 131°F (-20°C to 55°C)	
Storage Temperature Range	-58°F to 176°F (-50°C to 80°C)	
Automatic Window Defrost	Standard	
Thermal Range Performance [†]		
Detect Man (1.8 m x 0.5 m)	~1.2 nm	
Detect Small Vessel (2.3 m x 2.3 m)	~3.4 nm	
Typical Configuration	Camera Head; Bulkhead Box; Joystick Control Unit; Cables; Operator Manual	
Warranty	2 Year	



Voyager Series Radar Tracking



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Voyager III Temperature measurement

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Resolution Matters

When people talk about a thermal camera's resolution, they're talking about the number of pixels used to capture thermal energy. The bigger the number, the higher the camera's resolution. The higher the resolution, the more pixels you have gathering energy. This means that a higher resolution camera will typically let you see more detail, see smaller objects, and see them from farther away.



640 x 480

320 x 240

What's a Field of View, and Why Do I Care?



A camera's field of view (FOV) is the angular measurement of the area the lens can see. The wider the FOV the more you can see from side to side; the narrower the FOV the farther away you can see things. So, a 24° FOV is good for general viewing, collision avoidance, and hazard or man overboard detection, while a 7° FOV is better for seeing other vessels, hazards, and obstructions from farther away. While narrower fields of view help you see farther, they need to be steady to be most effective, so they can be more difficult to use as seas get heavier.



19mm lens at 50yds



65mm lens at 50yds



35mm lens at 50yds



100mm lens at 50yds



FLIR.com/Maritime

There's no better way to fully comprehend the power of thermal imaging than to try a camera for yourself. The next best thing is watching thermal video, which is exactly what you can do at www.FLIR.com/Maritime. You can also try the First Mate II Product Selector and thermal simulator, read about the different ways thermal imaging is used in a maritime environment, and learn more about all FLIR thermal night vision systems for maritime use.





Visit FLIR.com/Maritime and try the new Maritime Thermal Simulator

Compare products online with the First Mate II Product Selector

About FLIR Systems

As the world's largest commercial infrared company, FLIR Systems has fielded more high-quality maritime thermal night vision systems than anyone in the world. Our rugged, stabilized imagers are on thousands of civil and maritime platforms in the U.S. and around the world, more than every other manufacturer combined.

With thousands of our thermal cameras on the job in military, scientific, law enforcement, and security applications, FLIR brings an unmatched level of experience and dedication to the creation of cutting-edge thermal night vision systems. We design and manufacture all critical technologies inside our products, including detectors, electronics, and special lenses, and we assemble it all right here in the U.S.

Whether you're heading out early, coming home late, or cruising around the clock, FLIR has a thermal night vision system to meet your needs.



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