



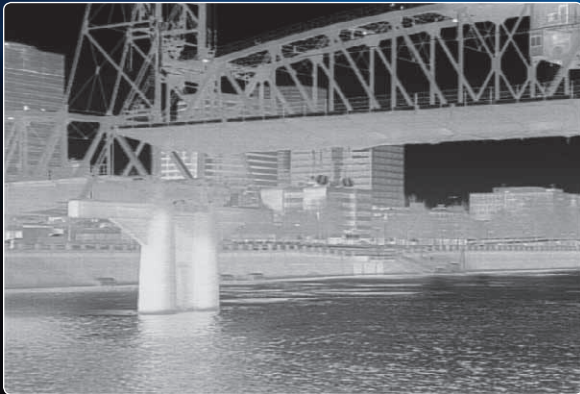
Commercial Maritime

Thermal Night Vision Systems





Your Vision: Video camera frame-grab



FLIR Vision: White-hot thermal image

Thermal Imaging for the Professional Mariner

The sea can be a dangerous place, especially at night or in bad weather. Vessels can run aground, ram other vessels, or collide with floating debris resulting in heavy damages or worse. Piracy, terrorism, and other security threats continue to be a real and significant danger to commercial vessels. FLIR thermal imaging provides professional mariners with the tools they need to stay safe.

Thermal imagers can detect myriad potential maritime hazards, like debris floating in the water, vessels underway or riding at anchor, shipping lane traffic, small boats crossing shipping channels, buoys, and structures like bridge abutments, docks, or piers. In addition, thermal imagers are being used for applications as diverse as iceberg detection and oil spill recovery.

Thermal imaging is used extensively by the US and international military for maritime operations including recent counter-piracy efforts. In fact, the International Maritime Community recommends using nightvision as "best practice" for piracy deterrence. FLIR thermal imagers also interface well with on-board video security, surveillance, and navigation systems used by cruise liners and tankers as well as complementing and extending radar capabilities. Thermal imaging is intuitive to use and requires minimal training.

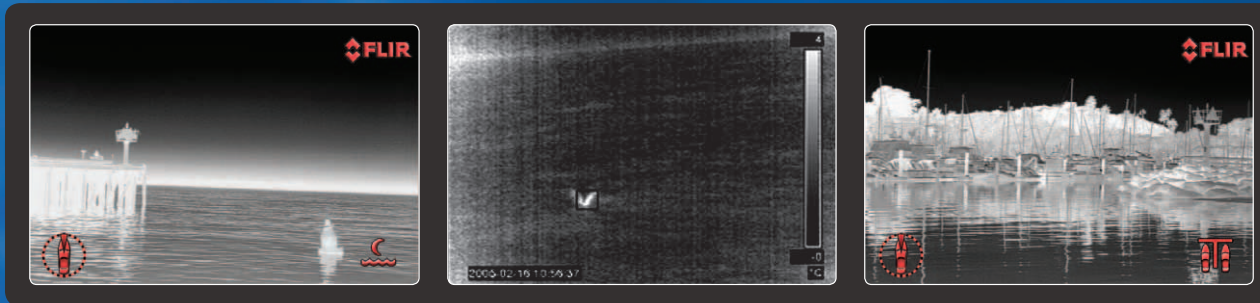
If seeing your world clearly 24/7, no matter what the conditions, is an absolute necessity, FLIR has the right thermal imaging product for your vessel.

- **First Mate** – Affordable, fully submersible, high-performance, handheld thermal imager perfect for 24/7 navigation and man overboard recovery
- **Navigator II** – Rugged, flexible, and economical, Navigator II is the world's most popular maritime thermal imager
- **M-Series** – FLIR's premium multi-sensor maritime thermal imaging system
- **Voyager** – Quad-sensor performance and full gyro-stabilization make Voyager the best around
- **SeaFLIR** – Compact, combat-proven, high-performance system with long-range thermal imager, daylight TV camera, and laser options

You Don't Have the Luxury of Staying in Port at Night. Keep Boat and Crew Safe-Take FLIR With You.

Security and Navigation

Today, more than ever, maritime security is of vital concern. There's no better piece of equipment to have on board than a thermal imager to give your crew early warning that other vessels are approaching. This gives you the time you need to conduct evasive maneuvers, call for help, and secure your crew in a safe location. FLIR's powerful thermal imagers make pictures from heat, not light, so you can see other vessels, obstructions, outcroppings of land, buoys, nets, and floating debris in total darkness, and through haze, smoke, and light fog.

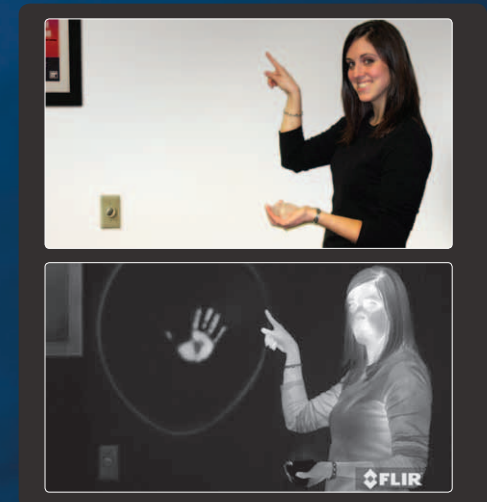


Crew Safety

When a crew member or passenger falls over the side, survival time is measured in heartbeats, so not losing sight of the person in the water is vital for a safe rescue. Thermal night vision cameras can help you to find a person in the water faster than any other night vision technology. Thermal imagers see the difference in heat between the swimmer's head and the surrounding water, giving crew members the ability to keep them in sight and execute an efficient rescue. That's why more Coast Guards, Police Agencies, and Militaries around the world put their trust in FLIR for search and rescue than all other brands combined.

Complement Existing Systems

Thermal imagers augment your other on-board electronics perfectly; visually verifying radar returns, seeing things that radar might miss, and showing you what a chart plotter can't. Available with active gyro-stabilization for steady imagery in rough seas, FLIR thermal imagers plug into existing video displays with standard video connections. Don't let darkness drive you off the water; stay on the job with FLIR.



Thermal Imaging: The science behind the technology

Call it infrared energy, call it thermal energy, call it heat energy. It's really all the same. Thermal imagers make pictures from heat, not light, detecting and displaying the tiny differences in heat energy that are around us all the time. Day and night, in good weather and bad, everything gives off thermal energy. What's more, the hotter something is, the more thermal energy it gives off. Thermal imagers take this energy in and make video images that look like black and white TV video.

Everything generates thermal energy – even the ice cubes she's holding in her left hand. The friction from her finger and the heat from her hand left enough heat on the wall to show up clearly to the thermal imager.

Any Camera For Any Vessel

You can do lots of different things with FLIR's line of maritime thermal night vision cameras. They all let you see clearly in total darkness, and you can also get color or lowlight cameras, gyro-stabilization, radar interfacing, and other helpful features. This variety often leads people to ask: which FLIR camera is right for me?

Well, it's not just a matter of big cameras going on big boats; any of FLIR's cameras can go on any vessel. It's more a matter of what you need it to do. How far away do you need to see things? Do you need to install it on an on-board network? Are you going to interface it with your other on-board systems?

This overview can help you decide which camera is right for you.



First Mate

- Short-range thermal imager
- Handheld, lightweight
- Complements other thermal cameras
- Take it anywhere: perfect for docking assistance, vessel inspection, search and rescue, and finding your way through smoke from on-board fires



Navigator II

- Short-range thermal imager
- Fixed and Pan/Tilt configurations
- Easy to install and use



M-Series

- Short- to medium-range thermal imager
- Full Pan/Tilt capability
- Thermal only or thermal/lowlight multi-sensor configurations
- Standard- and high-resolution thermal camera options
- Network-ready
- Auto-scan feature

Camera



Voyager

- Long-range thermal imager
- Gyro-stabilized Pan/Tilt platform
- Two thermal cameras
- Daylight/lowlight color camera
- Network-ready
- NMEA interfaces
- Radar slew-to-cue
- Autotracker



SeaFLIR

- Long-range thermal imager
- Choice of color CCD-TV camera, B&W Near-IR CCD-TV camera, or Laser Rangefinder
- Autotracker and Auto-scanning features
- Gyro-stabilized platform
- Combat-proven, rugged, fully marinized turret

FLIR's Maritime Thermal Night Vision Cameras Come with these Standard Features:

- Rugged, fully marinized construction to withstand harsh operating environments
- Window de-ice heaters for clear vision even in ice and snow*
- Proprietary, patent-pending image enhancement algorithms called Digital Detail Enhancement (DDE) that bring out faint image details that you might otherwise miss
- Standard NTSC or PAL video outputs that can be viewed on any monitor with an auxiliary video input
- Pre-set gain adjustments for optimal picture quality in a variety of conditions
- FLIR's exclusive on-screen symbology instantly tells you what's going on with the camera and where it's pointing*

* Features not available on First Mate or SeaFLIR.

First Mate

Portable, Handheld
Thermal Night Vision

Perfect for use on vessels of any size, First Mate is a handheld thermal night vision camera that runs off batteries and displays its video on a built-in screen. It also runs on vessel power and displays video on most multi-function monitors.

First Mate provides go-anywhere thermal imaging for clear vision and navigation assistance in total darkness as well as through smoke and light fog. Because it's not permanently mounted to your vessel, you can take it anywhere.

Six available models make it certain that you'll find the First Mate that's right for you.



Rugged, all-weather design keeps First Mate going day in and day out. It's even submersible!


Two-sided hand strap makes First Mate easy to use for right-handed operators and southpaws alike.


The First Mate handheld thermal night vision systems come in six configurations and are available in two resolutions with a variety of optional features:

- Available with **240 × 180** and full **320 × 240 thermal resolution**; the higher resolution option provides improved imaging detail and range performance.
- All configurations are **easy to use** and let you see clearly in total darkness.
- **2x E-zoom** and freeze frame functions are available for greater image utility.
- **Capture still images and video**, and store the files on an onboard SD card.


Detection Range Performance†


HM-224 & HM-224 Pro (24° Lens)

Man  ~1,033 ft

Small Vessel  ~2,940 ft


With 2x Extender (12° Lens)

Man  ~1,815 ft


Small Vessel  ~4,938 ft


HM-324 XP and HM-324 XP+ (24° Lens)

Man  ~1,500 ft


Small Vessel  ~4,200 ft

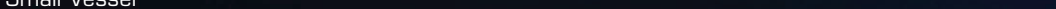
With 2x Extender (12° Lens)

Man  ~2,590 ft

Small Vessel  ~1.3 mi

HM-307 XP and HM-307 XP+ (7° Lens)

Man  ~4,757 ft

Small Vessel 

† = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display use. All specifications are subject to change without notice. Visit www.flir.com for the most up-to-date specifications.



FLIR vision



Your vision



First Mate

Control Panel

First Mate's control panel provides direct, push-button access to all camera functions, making it easy to use and comfortable to operate.

Brightness – Adjusts the brightness of the internal viewfinder, minimizing impact to the operator's natural night vision.

Polarity – Toggles the image display between white-hot and black-hot.

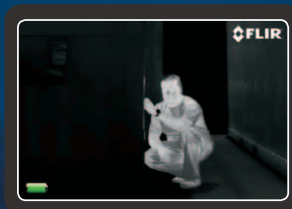
Zoom – Toggles the 2x E-zoom function on and off.

Picture – Activates the Freeze Frame function, or captures still images and video to the on-board SD card (see the specification table in the back for more details).

Power – Turns the First Mate on and off, and puts it into the power-saving Standby mode.

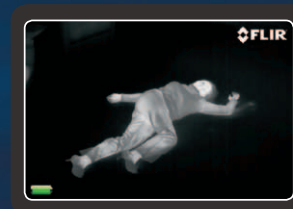
Take First Mate Anywhere You Need to See at Night

Because First Mate isn't permanently mounted to the vessel you can take it anywhere you need to see clearly after dark.



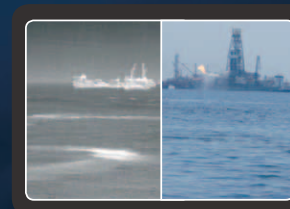
Vessel Security

Use First Mate to explore the numerous dark spots on a large vessel in both stowaway discovery and repair situations.



Crew Safety

Use First Mate to find crew or passengers in smoke-filled compartments or during blackouts.



Oil Location

Use First Mate to locate oil spills in glaring sunlight or complete blackness.

Navigator II

Affordable Thermal Night Vision System

The award-winning Navigator II delivers crisp, clear thermal video in total darkness. Its wide-angle field of view is perfect for navigation, collision avoidance, and finding people in the water.

What's more, FLIR offers two configurations of Navigator II: fixed-forward, and a full Pan/Tilt system. Both styles are simple to use – if you can watch TV, you can use the Navigator II.

The Navigator II has American Bureau of Shipping (ABS) Type Approval. FLIR has demonstrated that it can consistently produce the Navigator II in compliance with product specifications and high quality standards. Extensive testing has demonstrated that the Navigator II will perform reliably in demanding maritime environments.



Pan/Tilt Navigator II

36° field of view for excellent situational awareness

2x E-zoom lets you see even farther at night

Full Pan/Tilt configuration available for maximum flexibility and added security



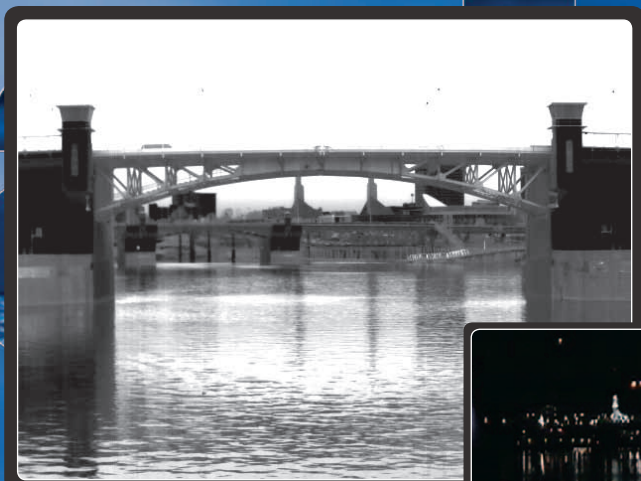
Fixed-forward Navigator II

Detection Range Performance[†]

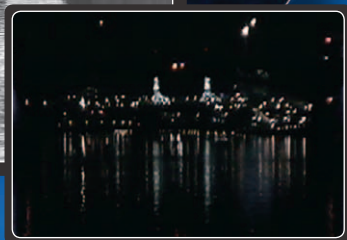
Man ~1,020 ft

Small Vessel ~2,900 ft

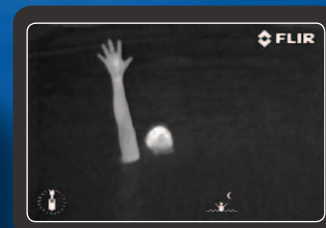
[†] = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display use. All specifications are subject to change without notice. Visit www.flir.com for the most up-to-date specifications.



FLIR vision

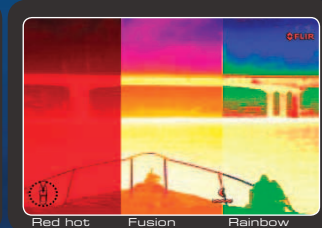


Your vision



Black-hot

White-hot



Red hot

Fusion

Rainbow

Joystick Control Unit

The Pan/Tilt version comes with an ergonomic Joystick Control Unit; its simple controls provide easy system control, even in rough seas.

Joystick – Providing precision control of the camera's pan and tilt angles, the Joystick lets operators see all around their vessel day and night

Home – This programmable feature allows operators to define a Home position as a reference they can use when navigating for long periods.

Zoom – Activate the 2x E-zoom feature to see faint targets from farther away.

Scene – Provides a variety of pre-set gain and level adjustments so that operators can get the best image quality possible throughout a wide range of conditions.

B/W – Different display settings let the operator choose between two black and white or three color display schemes that are easy on the eyes and help operators see better.



On-Screen Icons

Navigator II uses FLIR's exclusive 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.

M-Series

Premium Maritime Thermal Night Vision Systems

Powerful, flexible, and built to last, the award-winning M-Series is FLIR's premier 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 cutting-edge Ethernet connectivity for easy installation, control, and interface with other on-board electronics. The rugged, waterproof gimbal enclosure provides a continuous 360° pan and +/-90° tilt field of regard for horizon-to-horizon visibility.



Single payload M-Series with thermal camera.



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

M-Series thermal night vision systems are available with a variety of resolution and performance options:

- Their thermal night vision cameras come in either **320 x 240 standard resolution**, or **640 x 480 high-resolution** format; higher resolution provides improved image detail and range performance.
- All M-Series thermal cameras come with a **2x E-zoom** function that lets you see farther at night; the high-resolution option provides an additional **4x E-zoom** for even greater reach.
- Installers can mount all M-Series gimbals in either **ball-up or ball-down orientation**.
- The dual-payload M-Series incorporates an **extreme lowlight micro-lux TV camera** for improved visibility during twilight hours, and when operating in areas with some ambient light like intracoastal waterways and harbor entrances.

Detection Range Performance†

M-625L & M-625XP

Man ~2,700 ft

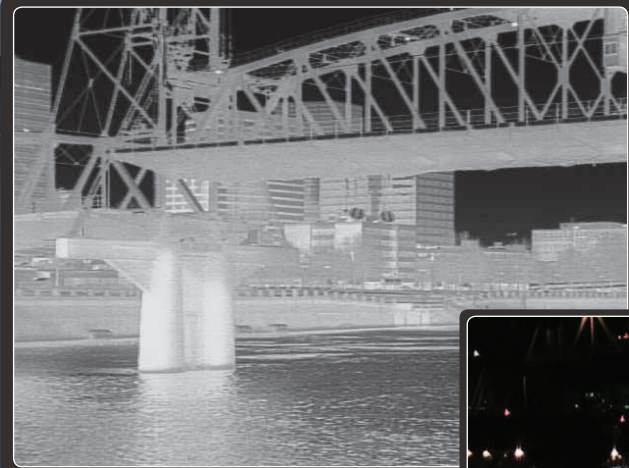
Small Vessel ~1.4 mi

M-324L & M-324XP

Man ~1,500 ft

Small Vessel ~4,200 ft

† = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display use. All specifications are subject to change without notice. Visit www.flir.com for the most up-to-date specifications.



FLIR vision



Your vision



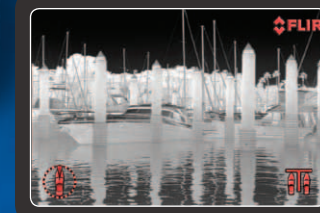
Black hot



Red hot

Fusion

Rainbow



Low-light Video

Joystick Control Unit

The ergonomic M-Series controller provides ready access to all critical system functions and smooth, effortless control, even in rough seas.

Heated LCD Screen – Provides instant display of system status.

User-Programmable "Hot Key" – Lets operators have instant access to commonly-used functions.

Home – A programmable feature that lets operators define a Home position as a reference they can use when navigating for long periods.

Color – Different display settings let the operator choose between two black and white or three color display schemes that are easy on the eyes and help operators see better.

Scene – Provides a variety of pre-set gain and level adjustments so that operators can get the best image quality possible throughout a wide range of conditions.

Joystick – The custom, sealed, 8-way control knob provides precise control in rough seas.

Autoscan Controls – Automatically scans an arc 20° to 80° to the left and right of a user-defined pointing angle. The operator can also select the speed at which the camera scans through the arc.

Ethernet Connectivity – Lets you install multiple control stations around your vessel so you can control M-Series from anywhere on board.



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 instantaneous updates regarding the camera's configuration and status.

Voyager

Long-Range Multi-Sensor Thermal Night Vision System

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 award-winning Voyager 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 easily, while its long-range 140 mm thermal camera lets you zoom in on them to get the valuable information you need to react appropriately. Voyager is the proven anti-piracy system of choice for yachts, police boats, and cargo vessels around the world.



Detection Range Performance†

Man Detection: ~1.4 mi

Small Vessel Detection: ~4 mi



Wide-angle and long-range thermal night vision cameras give you the ultimate combination of imaging performance.

- **2x and 4x E-zoom** functions with thermal cameras let you see even farther at night. (Total system magnification is **15x**).
- **Powerful, long-range daylight/lowlight color TV camera** with 26x optical zoom, and 312x digital zoom, allows you to identify other boats and monitor activity onshore from farther away.
- **Active gyro-stabilization** provides steady imagery, even in rough seas; this is critical for getting the most out of Voyager's long-range imaging capability.
- **Optional Radar Tracking** feature allows operators to use the Voyager to identify and track specified radar returns, enhancing vessel safety in low visibility conditions.
- **Optional internet remote control** feature lets you operate your Voyager from any location in the world with a suitable internet connection.
- **Expanded interface capability** lets Voyager work hand-in-hand with your other marine electronics.
- **Optional Autotracker** lets you follow selected targets without manual control inputs.

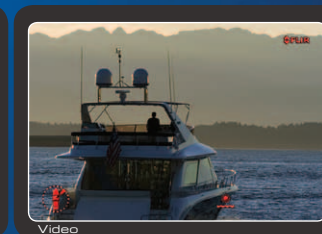
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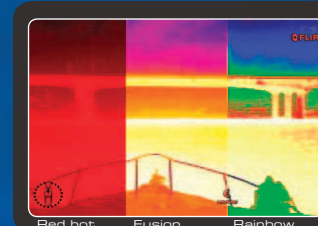
Voyager Zoom



Black hot White hot



Video



Red hot Fusion Rainbow

Joystick Control Unit*

The ergonomic Voyager controller provides ready access to all critical system functions and smooth, effortless control, even in rough seas.

Heated LCD Screen – Provides instant display of system status.

User-Programmable "Hot Key" – Lets operators have instant access to commonly-used functions.

Home – A programmable feature that lets operators define a Home position as a reference they can use when navigating for long periods.

Color – Different display settings let the operator choose between two black and white or three color display schemes that are easy on the eyes and help operators see better.

Scene – Provides a variety of pre-set gain and level adjustments so that operators can get the best image quality possible throughout a wide range of conditions.

Joystick – The custom, sealed, 8-way control knob provides precise control in rough seas.

Autoscan Controls – Automatically scans an arc 20° to 80° to the left and right of a user-defined pointing angle. The operator can also select the speed at which the camera scans through the arc.

Ethernet Connectivity – Lets you install multiple control stations around your vessel so you can control Voyager from anywhere on board.

*Some models of Voyager feature alternate joystick control units.



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.

SeaFLIR

Powerful Long-Range Multi-Sensor Imager

SeaFLIR's powerful optics and sensitive thermal imager allow you to see potential threats at the horizon, giving you the reaction time needed to safeguard your passengers and crew. SeaFLIR improves navigation and collision avoidance, and aids in detecting icebergs, fires, vessels in distress, or long-range inbound vessels. SeaFLIR is also widely used in anti-terrorism efforts and vessel, crew, and passenger protection. SeaFLIR is defense-grade thermal imaging technology made available to the commercial maritime market by FLIR – not defense technology de-rated for commercial use.

The heart of the SeaFLIR is the 2-axis stabilized, ruggedly marinized Turret FLIR Unit that contains the thermal imager and one of three optional secondary sensors. Three fiber-optic gyros isolate the sensors from platform vibration and ensure precise control over the system's line-of-sight.

The powerful, sensitive thermal imager (mid-wave IR with up to 450 mm of continuous zoom) detects targets at distances greater than 10km, delivers crisp imagery in total darkness and through heavy atmospheric obscurants, and is ideally suited for use in maritime environments. Built-in operations include Autotracker and Autoscan features that reduce operator fatigue and scan most effectively in different situations.

Long-range Vision

See to the horizon

Navigation

See buoys at long range

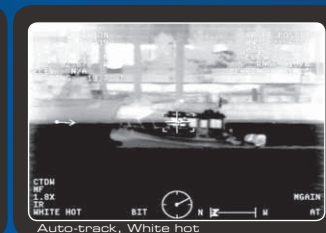
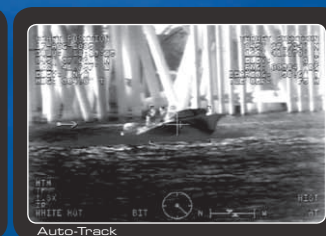
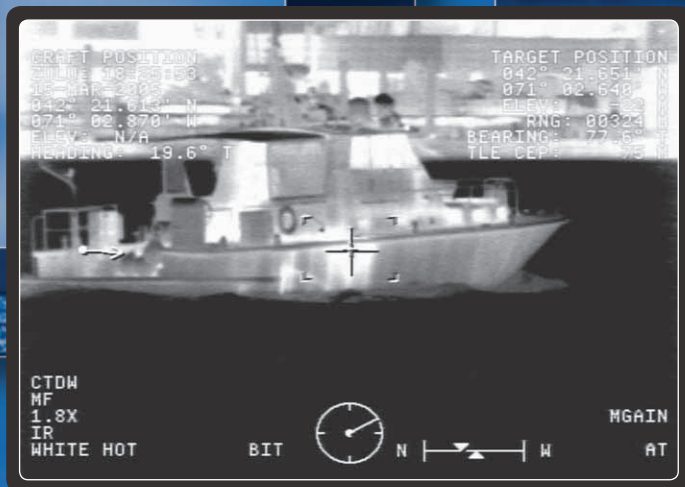
Anti-piracy

Early threat detection



SeaFLIR offers a variety of options allowing you to customize it for your application including:

- **Color CCD-TV camera** with standard 10:1 continuous zoom optics package
- **Mid-wave thermal imager** with moveable 1.8x optical increases maximum focal length to 450 mm
- Eye-safe **Laser Rangefinder** as a secondary sensor
- **Lowlight monochrome CCD-TV camera** as a secondary sensor
- Operator-controlled **de-icing system**



Control Unit

The Hand Control Unit (HCU) is ergonomically designed for comfort over long missions, and provides instant, intuitive access to all mission-critical control functions. The hand controller has dimmable backlighting and – because it is primarily designed for use in maritime environments – is fully sealed and watertight.

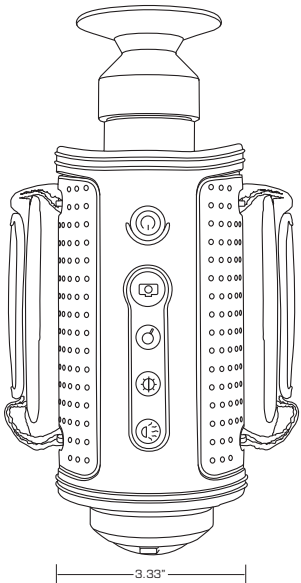
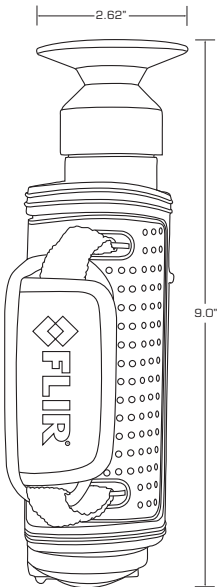
- **Gimbal Position Controls** – Choose to control the gimbal with either Hand Controller buttons or the Joystick thumb controller, gyro-stabilized in either mode.
- **Joystick** – Control the gimbal's pointing angle and slew rate in Rate Mode with a maximum slew rate of 50°/second.
- **Autotracker Controls** – Select tracking mode appropriate to the scene and customize the size of the Track Window.
- **Autoscan Controls** – Perform automatic scans of 60° arc from any selected azimuth position with adjustable Gimbal elevation and a potentiometer to increase or decrease the Scan Rate.
- **Sensor Select/Laser Rangefinder** – Toggle between IR and CCD-TV or Laser Rangefinder depending on the model.
- **Zoom** – Control the active sensor's continuous zoom optics.
- **Polarity** – Toggle polarity between Black-hot and White-hot.

Specs

First Mate



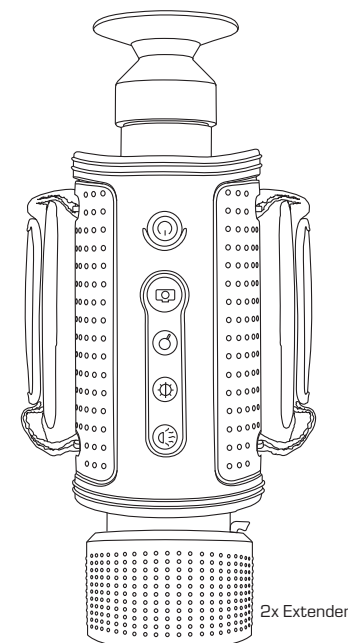
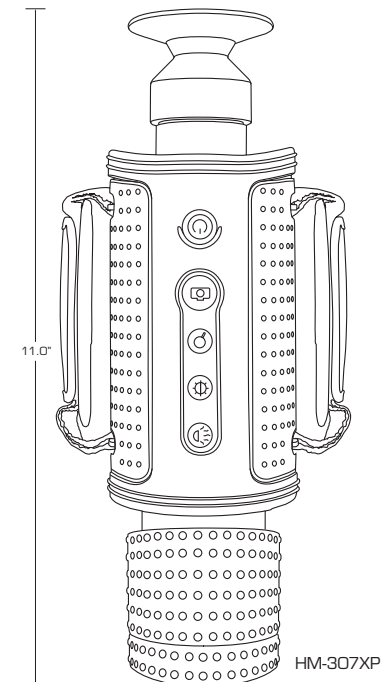
| System | HM-224 Basic | | HM-224 Pro |
|-------------------------------------|---|--------------------------------|---------------------|
| Sensor Type | 240 × 180 VOx Microbolometer | | |
| FOV | 24° × 18° NTSC | | |
| Focal Length | 19 mm | | |
| Start-Up from Stand-By | < 1.5 seconds | | |
| Image Processing | FLIR Proprietary Digital Detail Enhancement | | |
| User Interface | | | |
| Power Button | On/Off/Standby | | |
| Picture Button | Freeze Frame | Still image capture to SD card | |
| Zoom Button | Non-Operable | 2× E-zoom | |
| Polarity | Toggles White Hot/Black Hot Display | | |
| Brightness | Brightness | | |
| Image Presentation | | | |
| Built-In Display | LCD Display | | |
| Video Output | NTSC or PAL composite video; RCA jack | | |
| Image Polarity | White Hot/Black Hot; Selectable | | |
| On-Screen Symbology | Standard | | |
| Other | | | |
| SD Card | — | | Stores still images |
| Upgradeability | Upgrade to HM-224 Pro via software update through SD card slot | | N/A |
| Power | | | |
| Battery Type | 4 AA Batteries; NiMH, Li-Ion, or Alkaline | | |
| Battery Life (Operating) | >5 Hours On NiMH batteries | | |
| Battery Life (Stand-By) | 120 hours on NiMH batteries | | |
| Environmental | | | |
| Water Ingress | IP-67, Submersible | | |
| Operating Temp. | 32°F to 122°F (0°C to 50°C) | | |
| Storage Temp. | -4°F to 158°F (-20°C to 70°C) | | |
| Drop | 1 m drop | | |
| Physical | | | |
| Weight (incl. lens) | 1.45 lb (653 g) with batteries | | |
| Size (L × W × H) | 9.36" × 3.33" × 2.62" (238 × 84.5 × 66.5 mm) | | |
| Standard Package | HM-Series Handheld Thermal Camera, Hot Shoe Charging & Video Output Accessory, 4 Rechargeable AA Batteries, AC Power Adapter/Charger, Car Adapter/Charger, Neck Lanyard, Operator's Manual, USB Cable, Video Output Cable, SD Card. | | |
| Warranty | 2 Year | | |
| Accessories | 2x Extender, Soft Case, Hard Case | | |
| Range Performance | 24° Lens / 12° Lens (2x Extender) | | |
| Detect Man (1.8 m × 0.5 m) | ~1,033' (315 m)/~1,815' (553 m) | | |
| Detect Small Vessel (2.3 m × 2.3 m) | ~2,940' (896 m)/~4,938' (1,505 m) | | |



† = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display use.
‡ = Range performance models for the 12° lens are preliminary and subject to change.
Models meet or exceed these specifications. All specifications are subject to change without notice. Visit www.flir.com for the most up-to-date specifications.



| System | HM-324 XP | HM-324 XP+ | HM-307 XP | HM-307 XP+ |
|-------------------------------------|---|--|--|--|
| Sensor Type | 320 x 240 VOx Microbolometer | | | |
| FOV | 24° x 18° NTSC | | 7° x 5° NTSC | |
| Focal Length | 19 mm | | 65 mm | |
| Start-Up from Stand-By | < 1.5 seconds | | | |
| Image Processing | FLIR Proprietary Digital Detail Enhancement | | | |
| User Interface | | | | |
| Power Button | On/Off/Standby | | | |
| Picture Button | Freeze Frame | Still image capture and video capture to SD card | Freeze Frame | Still image capture and video capture to SD card |
| Zoom Button | 2x E-zoom | | | |
| Polarity | Polarity Toggles White Hot/Black Hot/Red Hot Display | | | |
| Brightness | Brightness | | | |
| Image Presentation | | | | |
| Built-In Display | LCD Display | | | |
| Video Output | NTSC or PAL composite video; RCA jack | | | |
| Image Polarity | White Hot/Black Hot; Selectable | | | |
| On-Screen Symbology | Standard | | | |
| Other | | | | |
| SD Card | — | Stores still images and video | — | Stores still images and video |
| Upgradeability | Upgrade to HM-324 XP+ via software update through SD card slot | N/A | Upgrade to HM-307 XP+ via software update through SD card slot | N/A |
| Power | | | | |
| Battery Type | 4 AA Batteries; NiMH, Li-Ion, or Alkaline | | | |
| Battery Life (Operating) | >5 Hours On NiMH batteries | | | |
| Battery Life (Stand-By) | 120 hours on NiMH batteries | | | |
| Environmental | | | | |
| Water Ingress | IP-67, Submersible | | | |
| Operating Temp. | -4°F - 140°F (-20°C – 60°C) | | | |
| Storage Temp. | -40°F - 167°F (-40°C to +75°C) | | | |
| Drop | 1 m drop | | | |
| Physical | | | | |
| Weight (incl. lens) | 1.45 lb (653 g) with batteries | | 2.2 lb (984 g) with batteries | |
| Size (L x W x H) | 9.36" x 3.33" x 2.62" (238 x 84.5 x 66.5 mm) | | 10.96" x 3.33" x 2.69" (278.4 x 84.5 x 68.3 mm) | |
| Standard Package | HM-Series Handheld Thermal Camera, Hot Shoe Charging & Video Output Accessory, 4 Rechargeable AA Batteries, AC Power Adapter/Charger, Car Adapter/Charger, Neck Lanyard, Operator's Manual, USB Cable, Video Output Cable, SD Card. | | | |
| Warranty | 2 Year | | | |
| Accessories | 2x Extender, Soft Case, Hard Case | | | |
| Range Performance | 24° Lens / 12° Lens (2x Extender) | | 7° Lens | |
| Detect Man (1.8 m x 0.5 m) | ~1,500' (450 m)/~2,590' (790 m) | | ~4,757' (1,450 m) | |
| Detect Small Vessel (2.3 m x 2.3 m) | ~4,200' (1,280 m)/~1.3 mi (2,150 m) | | ~2.4 mi (3,900 m) | |

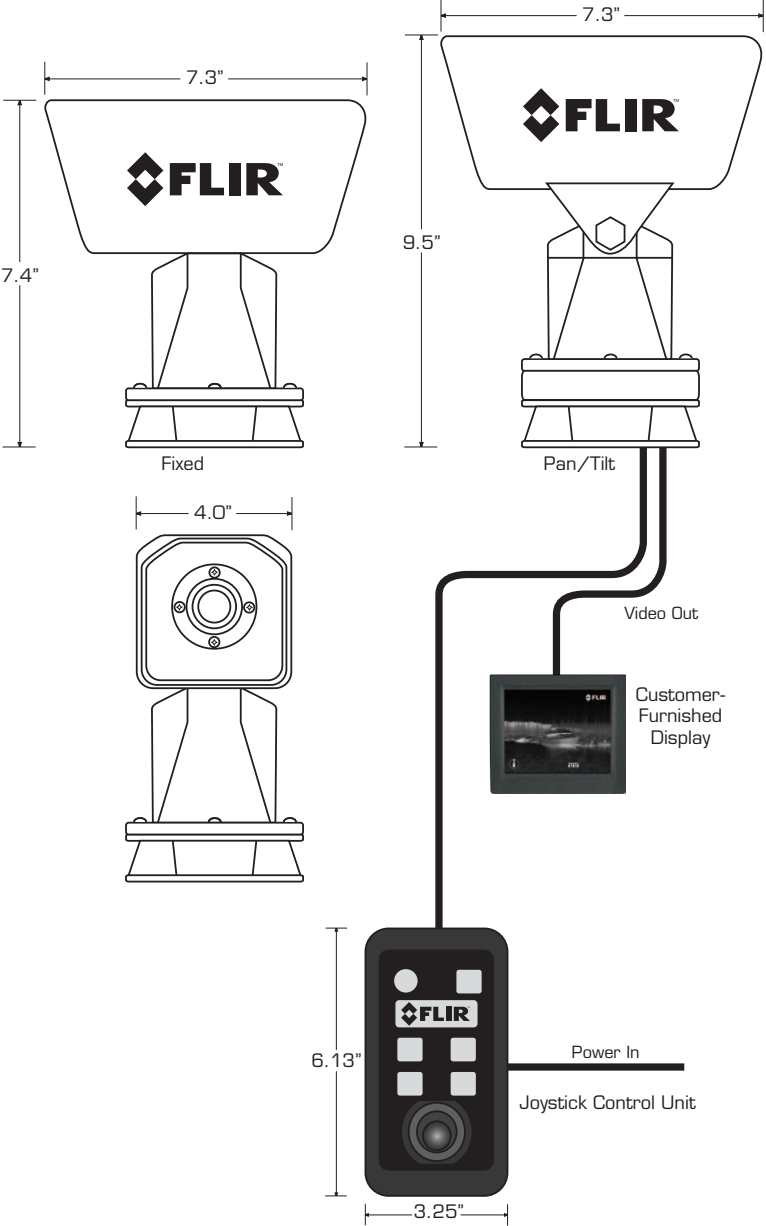


Specs

Navigator II®



| Thermal Imaging Specifications | Fixed | Pan/Tilt |
|-------------------------------------|--|---|
| Sensor Type | 320 x 240 VOx Microbolometer | 320 x 240 VOx Microbolometer |
| FOV | 36° x 27° | 36° x 27° |
| Focal Length | 19 mm | 19 mm |
| E-zoom | N/A | 2x |
| Image Processing | FLIR DDE | FLIR DDE |
| Daylight Imaging Specifications | | |
| Detector Type | N/A | N/A |
| System Specifications | | |
| Size | 7.3" x 4.0" x 7.4" | 7.3" x 4.0" x 9.5" |
| Weight | 6 lb | 7 lb |
| Pan/Tilt Coverage | N/A | 360° Continuous Pan, +/-45° Tilt |
| Video Output | NTSC or PAL | |
| Connector Types | BNC with BNC-to-RCA adapter included for video out | |
| Power Requirements | 12 VDC | |
| Power Consumption | 3 W nominal, 30 W peak | 5 W nominal, 45 W peak |
| Environmental | | |
| Operating Temperature Range | -10°C to 55°C | |
| Storage Temperature Range | -50°C to 80°C | |
| Automatic Window Defrost | Standard | |
| Sand/Dust | Mil-Std-810E | |
| Water Ingress | IP-x6 | |
| Shock | Mil-Std-810 | |
| Vibration | Mil-Std-810E | |
| Lightening Protection | Standard | |
| Standard Package | Camera Head with 25' Power and Video Cables; Power Switch; Operator Manual | Camera Head with 25' Power and Video Cables; Joystick Control Unit; Operator Manual |
| Warranty | 2 Year | |
| Optional Accessories | Mounting Accessories | Dual Station JCU; Mounting Accessories |
| Range Performance† | | |
| Detect Man (1.8 m x 0.5 m) | ~1,020 ft (310 m) | |
| Detect Small Vessel (2.3 m x 2.3 m) | ~2,900 ft (880 m) | |

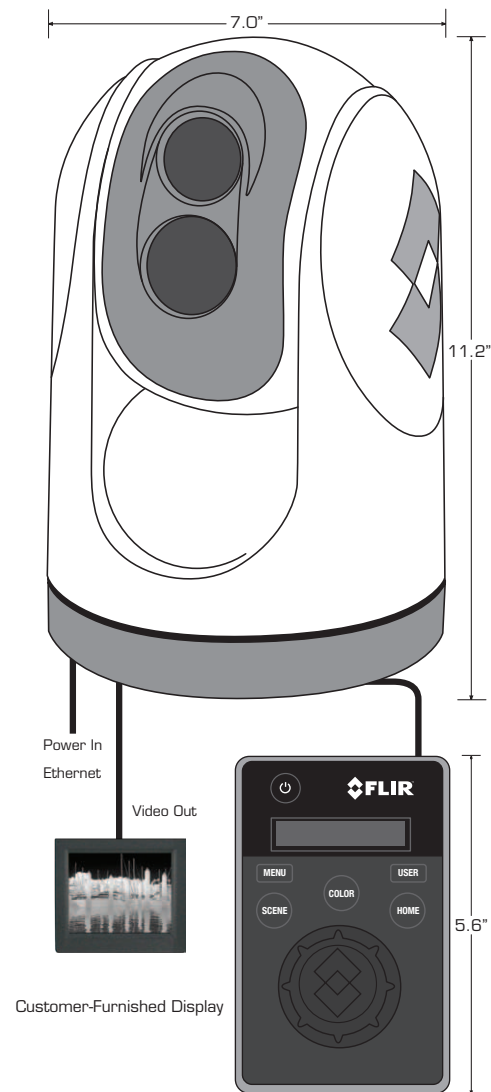


† = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display use. All specifications are subject to change without notice. Visit www.flir.com for the most up-to-date specifications.

M-Series®



| Thermal Imaging Specificatio | M-625L | M-324L | M-625XP | M-324XP |
|-------------------------------------|---|------------------------------|------------------------------|------------------------------|
| Sensor Type | 640 × 480 VOx Microbolometer | 320 × 240 VOx Microbolometer | 640 × 480 VOx Microbolometer | 320 × 240 VOx Microbolometer |
| FOV | 25° × 20° (NTSC) | 24° × 18° (NTSC) | 25° × 20° (NTSC) | 24° × 18° (NTSC) |
| Focal Length | 25 mm | 19 mm | 25 mm | 19 mm |
| E-zoom | 2x & 4x | 2x | 2x & 4x | 2x |
| Image Processing | FLIR DDE | FLIR DDE | FLIR DDE | FLIR DDE |
| Daylight Imaging Specifications | | | | |
| Detector Type | 1/2" Interline Transfer Lowlight CCD | | N/A | |
| Lines of Resolution | 768 (H) × 494 (V) | | | |
| Minimum Illumination | 100 µlx (@ f/1.4) | | | |
| FOV | Matched to IR | | | |
| System Specifications | | | | |
| Size | 7" dia. × 11.2" ht. | | | |
| Weight | ~ 9 lb | | | |
| 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 VDC to 24 VDC (-10%/+30%) | | | |
| Power Consumption | 25 W nominal; 50 W max | | | |
| Environmental | | | | |
| Operating Temperature Range | -25°C to +55°C | | | |
| Storage Temperature Range | -40°C to +85°C | | | |
| Automatic Window Defrost | Standard | | | |
| Sand/Dust | Mil-Std-810E | | | |
| Water Ingress | IPx6 | | | |
| Shock | 15 g vertical, 9 g horizontal | | | |
| Vibration | IEC 60945; MIL-STD-810E | | | |
| Lightening Protection | Standard | | | |
| Salt Mist | IEC60945 | | | |
| Wind | 100 knot (115.2 mph) | | | |
| EMI | IEC 60945 | | | |
| Standard Package | Camera Head with 18-inch Pigtails for Power, Analog Video, and Ethernet; Joystick Control Unit; Operator Manual | | | |
| Warranty | 2 Year | | | |
| Optional Accessories | Dual Station JCU; Low Smoke, Zero Halogen Ethernet Cables; Standard Cat 5e Ethernet Cables; Top-Down Mounting Riser | | | |
| Range Performance† | | | | |
| Detect Man (1.8 m × 0.5 m) | ~2,700 ft (820 m) | ~1,500 ft (450 m) | ~2,700 ft (820 m) | ~1,500 ft (450 m) |
| Detect Small Vessel (2.3 m × 2.3 m) | ~1.4 mi (2.25 km) | ~4,200 ft (1.3 km) | ~1.4 mi (2.25 km) | ~4,200 ft (1.3 km) |



† = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display use. All specifications are subject to change without notice. Visit www.flir.com for the most up-to-date specifications.

Specs

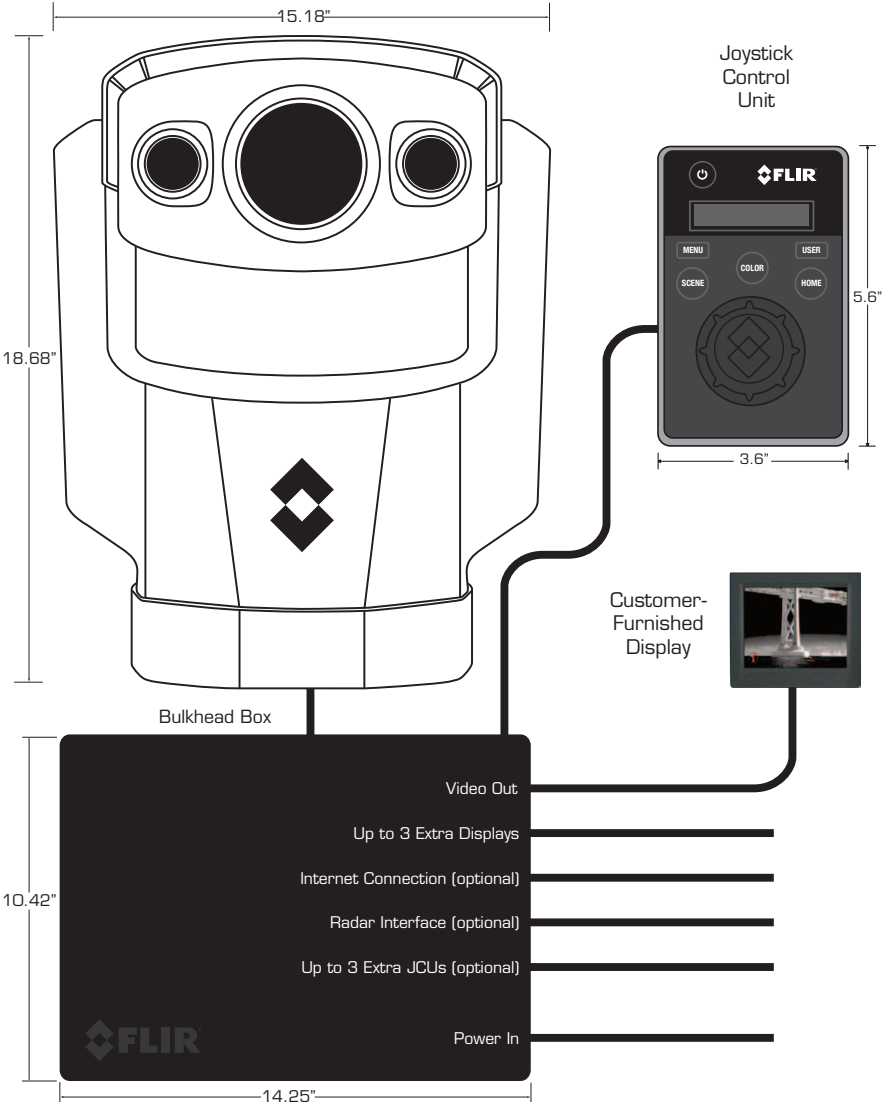
Voyager™



| Thermal Imaging Specifications | |
|---|--|
| Sensor Type | Two 320 x 240 VOx Microbolometers |
| FOV | 20° x 15° (Wide FOV); 5° x 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) x 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" x 18.68"; 15.5" x 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 | -20°C to 55°C |
| Storage Temperature Range | -50°C to 80°C |
| Automatic Window Defrost | Standard |
| Typical Configuration | |
| Camera Head; Breakout Box; Joystick Control Unit; Cables; Operator Manual | |
| Warranty | |
| 2 Year | |
| Optional Accessories | |
| 3 Additional JCU's, Up to 4 Total | |
| Range Performance† | |
| Detect Man (1.8 m x 0.5 m) | ~ 1.4 mi (2.25 km) |
| Detect Small Vessel (2.3 m x 2.3 m) | ~ 4 mi (6.4 km) |

| New Features | Voyager II | Voyager III |
|------------------------|------------|-------------|
| Updated JCU | N/A | • |
| EtherNet | N/A | • |
| Video Tracking | N/A | • |
| Fire-Fighting Software | N/A | Optional |

† = Actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience, and type of display use. All specifications are subject to change without notice. Visit www.flir.com for the most up-to-date specifications.



SeaFLIR™



Thermal Imaging Specifications

| | |
|------------------|--|
| Sensor Type | Cooled InSb; 320 x 240 |
| FOV | 21.7° x 16.4° (Wide) to 1.2° x 0.9° (Narrow) |
| Focal Length | 25 mm to 450 mm |
| E-zoom | N/A |
| Image Processing | AGC & Histogram |

Daylight Imaging Specifications

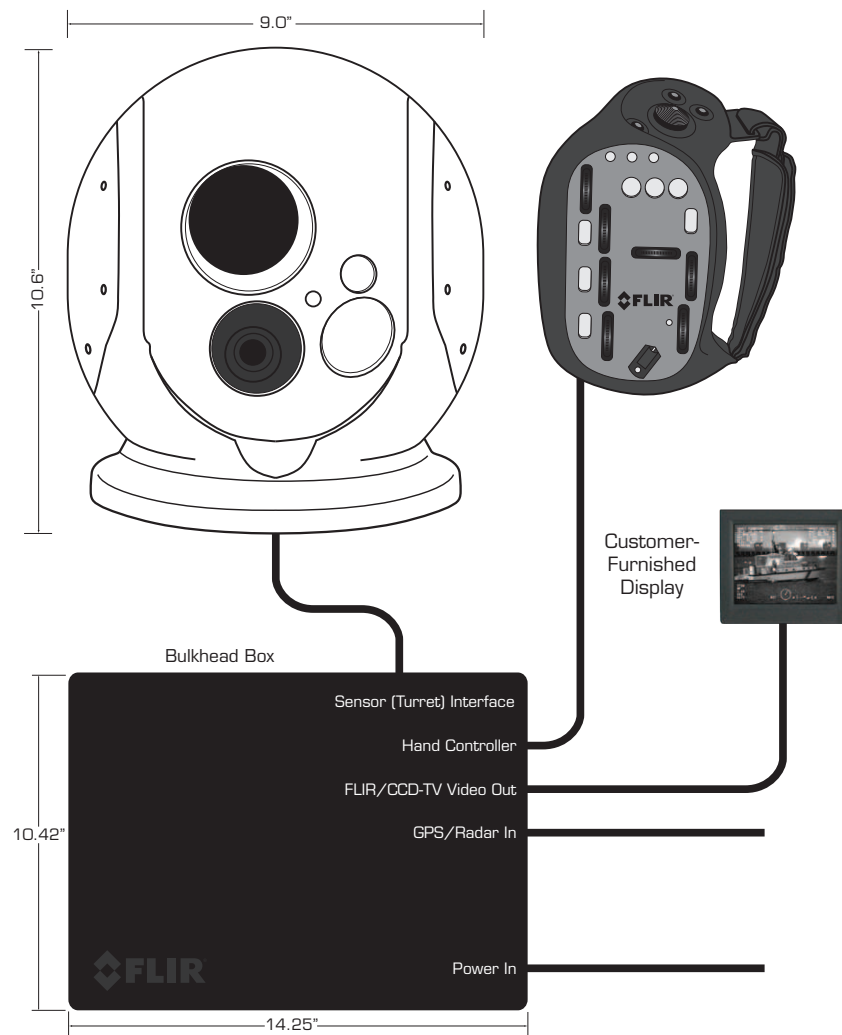
| | |
|----------------------|--|
| Detector Type | 1/4" Super HAD Daylight/Lowlight Color CCD |
| Lines of Resolution | 768 (H) x 494 (V) |
| Minimum Illumination | 2 lux (@ f/1.6) |
| FOV | 48° (h) to 1.2° (h) |

System Specifications

| | |
|---------------------|---|
| Size | 9.0" x 15.2" |
| Weight | 28 lb |
| Pan/Tilt Coverage | 360° Continuous Pan & Tilt; Gyro-Stabilized |
| Video Output | NTSC or PAL |
| Connector Types | BNC |
| Power Requirements | 19-32 VDC |
| Power Consumption | 200 W nominal; 650 W max |
| Image Polarity | White Hot/Black Hot; Selectable |
| On-Screen Symbology | Standard |

Environmental

| | |
|---|----------------------------|
| Operating Temperature Range | -40°C to 55°C |
| Storage Temperature Range | -40°C to 55°C |
| Automatic Window Defrost | Standard |
| Sand/Dust, Water Ingress, Shock, Vibration, Lightening Protection, Salt Mist, Wind, EMI | MIL-STD-810 & RTCA DO-160D |



About FLIR

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 US and around the world. That's more than every other manufacturer combined.



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PORTLAND

Corporate Headquarters

FLIR Systems, Inc.
27700 SW Parkway Ave.
Wilsonville, OR 97070
USA

PH: +1 877.773.3547

PH: +1 503.498.3547

FX: +1 503.498.3153

www.flir.com

NASDAQ: FLIR

SANTA BARBARA

FLIR Systems, Inc.
70 Castilian Dr.
Goleta, CA 93117
USA

PH: +1 877.773.3547

PH: +1 805.964.9797

FX: +1 805.685.2711

BOSTON

FLIR Systems, Inc.
25 Esquire Road
North Billerica, MA 01862
USA

PH: +1 877.773.3547

PH: +1 978.901.8000

FX: +1 978.901.8885

NETHERLANDS

FLIR Systems BV
Charles Petitweg 21
4847 NW Teteringen - Breda
The Netherlands

PH: +31 (0) 765 79 41 94

FX: +31 (0) 765 79 41 99