



Night-time navigation



Safety and security



Man overboard search



Gyro-stabilized multi-sensor thermal imager with Pan/Tilt for maritime applications

Voyager™

Gyro-stabilized multi-sensor thermal imager with Pan/Tilt for maritime applications



Thermal camera 1 (20° field of view, 35 mm lens)

Thermal camera 2 (5° field of view, 140 mm lens)

Daylight / low light camera

Gyro-stabilized Pan/Tilt providing continuous rotation

Connector (Mil Spec)
- power/video and control

Voyager™

use the power of a thermal imager for night time navigation and safety

A thermal imager is a camera which is capable of detecting extremely small temperature differences. These temperature differences can be converted into a real-time video image. Displayed on a monitor, this video image is extremely suited for night vision applications. Unlike other night vision systems that require low amounts of light to generate an image, a thermal imager needs no light at all. This makes it the perfect tool to see in absolute darkness, to see during the darkest night.

Thermal imaging in maritime environments

FLIR Systems has more than 50 years of experience in the development and production of thermal imaging cameras for night vision applications. Recent technological developments have brought technology which was reserved for military and high-end scientific users to many more applications. An obvious application is night vision on work and fishing boats, cruise ships and many other vessels.

Thermal imagers are very effective in maritime environments. They can detect objects floating in the water which may damage a vessel, or even worse, sink it. Other vessels, shipping lane traffic, buoys, bridges, ... it is all seamlessly detected by thermal imaging.

Even objects which can not be detected by a radar system such as sail boats, wooden boats, floating debris, ... become clearly visible when you are using a thermal imager.

Multi-purpose supply vessels, anchor handling tugs, platform supply vessels, terminal tugs, fast intervention vessels, crew boats, fire fighting tugs, tow and salvage vessels, fishing boats, cruise ships and many other types of vessels, they can all benefit from the power of thermal imaging.

Voyager: a reliable instrument for night vision applications on board of ships

Voyager was especially developed for maritime applications. It is a powerful, multi-sensor, mid range thermal night vision system. It features two thermal imaging cameras and one daylight / low light camera. One thermal imager has a wide angle field of view and is ideal for navigation and situational awareness. The other, with the narrow field of view, allows the user to zoom in onto objects that are very small or far away.

The Voyager will allow you to detect objects, which are the size of a human being, more than 2 km away. Objects floating in the water, the size of 2.3 x 2.3 meter, can be detected up to practically 6 km away. The Voyager will detect these objects even in total darkness, through smoke, light fog and in the most diverse weather conditions.

The Voyager comes with a fully integrated and gyro-stabilized Pan/Tilt. It provides you with a continuous 360° rotation and a steady image in any sea state.



Discover the Voyager™ and find out that it has been especially designed for maritime applications



Crisp thermal images – 320 x 240 pixels

The Voyager provides crisp, clear thermal imaging, 320 x 240 pixels, in total darkness, smoke and light fog. It allows you to see small details and detect more and smaller objects at further distance.

Advanced internal camera software delivers a crisp image without the need for user adjustments. The Voyager provides high quality thermal imaging in any night or daytime environmental conditions.

Uncooled system

Both thermal cameras in the Voyager use an uncooled microbolometer detector producing a 320 x 240 pixels high resolution image. An uncooled system means that there are no moving parts which virtually eliminates downtime and maintenance.

Two thermal imaging cameras

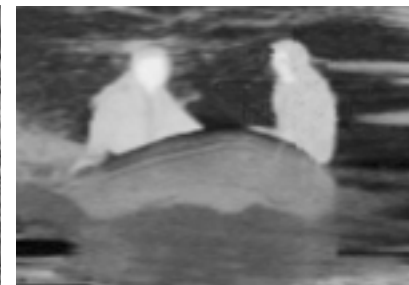
The Voyager is equipped with two separate thermal imaging cameras. One has a 35 mm (20° field of view) wide angle lens, the other is equipped with a 140 mm (5° field of view) narrow field of view lens.

Continuous zoom

The Voyager is equipped with a continuous zoom. The Voyager accomplishes this with two independent thermal cameras. It allows the captain to keep a broad situational awareness while at the same time giving him the possibility to zoom in onto objects that are very small or far away.



Continuous zoom allows the captain to have a closer look at objects which are far away.



Integrated long range daylight / low light camera with continuous zoom

By the touch of a button you can switch between the infrared and the daylight / low light camera. It provides you additional information and identification when conditions permit.

Designed for use in harsh maritime environments

The Voyager is an extremely rugged system. Its vital core is well protected, IP66 rated, against humidity and water. The Voyager can be cleaned with a hose just like any other equipment. The corrosion resistant housing protects drive motors and ensures long life. The Voyager operates between -32°C and +55°C.

The Voyager has a built-in heater to defrost its protective window. This ensures a clear lens and good quality infrared images displayed on your monitor even in extremely cold environments.





Advanced gyro-stabilization

The Voyager is gyroscopically stabilized. The system compensates for even uncomfortable sea-state and allows you to see a steady image even in rougher waters.

Fast, precision Pan/Tilt system

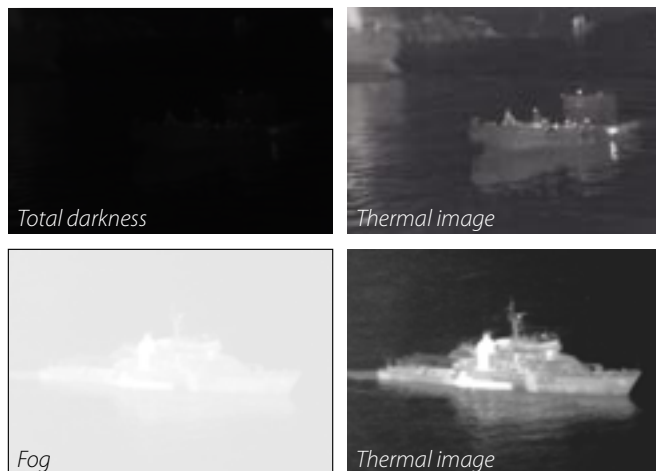
Thanks to its precision, fast, pan and tilt system, the Voyager allows for easy following of fast moving vessels or other objects.

Joystick control unit (JCU)

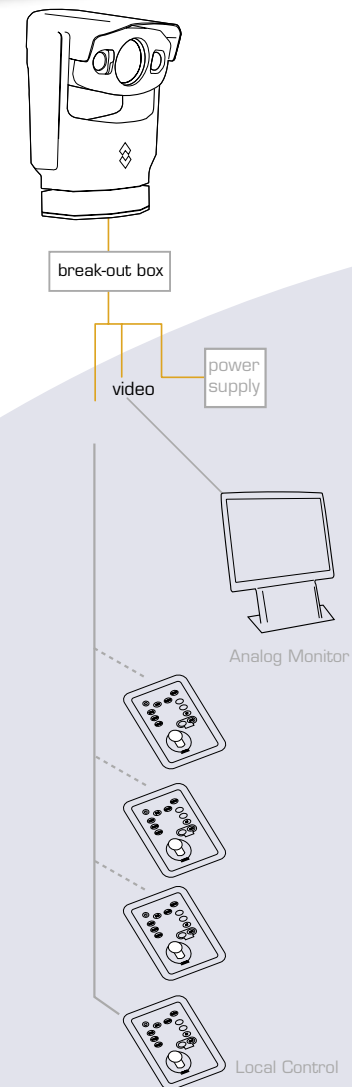
The Voyager comes standard with a Joystick Control Unit (JCU) to operate the pan and tilt, switch between thermal / daylight image and focus / autofocus, zoom in and out. The unit is equipped with back-light dimming so that you will always keep your night vision. Stabilization and azimuth stabilization can also be turned off/on through the JCU.

A "home" button on the JCU allows the user to automatically return the position of the Voyager to an operator defined position. Extra JCU's to control the Voyager from a maximum of 4 different positions are optionally available.

The images from the Voyager's thermal and daylight cameras can be displayed on virtually any existing multi-function display that accepts composite video.



The Voyager allows you to navigate through total darkness, light fog and smoke.



Easy-to-install

Simply connect the Voyager over the Joystick Control Unit. A video cable can be connected to any existing multi-function display that accepts composite video.

Voyager™ : numerous applications in maritime environments



Night time navigation – See in total darkness

Multi-purpose supply vessels, anchor handling tugs, platform supply vessels, fast intervention vessels, crew boats, fishing boats, cruise ships and many other vessels need to operate day and night. Some even 24 hours a day. Any hour that the ship is not performing is an hour that you are not getting paid. The Voyager allows you to see in total darkness and is well suited for night time navigation. You can clearly see channel markers, shipping lane traffic, outcroppings of land, bridge pilings, floating debris, exposed rocks, other vessels and any other floating object that might damage your ship when undetected.



Increase safety and security on board

Any accident at sea does not only have severe consequences for the vessel but also for its passengers and crew. Protect your fleet and the people on board, see clearly in the darkest environment by using the Voyager.



Short to medium range threat detection

A shipboard environment can be very isolated and vulnerable. Today, more than ever, shipboard security is important. The Voyager allows you to see what is around you, even at far distances. You can monitor activity in port or at anchor and see approaching vessels or people without alerting them that they are being watched.



Man overboard searches

Finding a person that has fallen overboard within the shortest possible time-frame is of the utmost importance. Not only can the person float away from the vessel but hypothermia is an important factor to take into account. Thanks to the FLIR Systems Voyager, you can quickly locate the drowning person and help him out of the water.



Day time navigation

The Voyager detects objects in any light condition. Also in broad daylight, the Voyager can detect objects that remain invisible for the naked eye. It is not affected by glare from the sun. The Voyager will allow you to see through the glare, and detect possible obstacles, when navigating during sunrise or sunset.



Anti-Piracy

Work boats are a huge investment and often contain a lot of expensive material. An approaching “blip” on your radar screen can also mean danger. The Voyager allows you to see vessels on the horizon and provides you with decision making capability before it is too late.



Voyager™

Voyager™ Technical specifications



IMAGING PERFORMANCE

Thermal:	
Detector type	Focal Plane Array (FPA), uncooled microbolometer 320 x 240 pixels
Spectral range	7.5 to 13µm
Number of fields of view	Two thermal imaging cameras with foveally merged video
Field of view camera 1	20° (H) x 15° (V) with 35 mm lens (NTSC) - 20° (H) x 16° (V) with 35 mm lens (PAL)
Field of view camera 2	5° (H) x 3.75° (V) with 140 mm lens (NTSC) - 5° (H) x 4.0° (V) with 140 mm lens (PAL)
Spatial resolution (IFOV)	1.1 mrad for 35 mm lens - 0.27mrad for 140 mm lens
Thermal sensitivity	65mK max
Image frequency*	7.5Hz (NTSC) or 8.3 Hz (PAL)*
Focus	Automatic or Manual
Electronic zoom	Foveal presentation 20° to 2° FOV
Image processing	Digital Detail Enhancement (DDE)
Visual:	
Built-in digital video	Sony FCB EX-980S High Telephoto Zoom Color Block Camera (NTSC) Sony FCB EX-980SP High Telephoto Zoom Color Block Camera (PAL) Approx. 680,000 pixels (NTSC) - approx. 800,000 pixels (PAL) f=3.5mm (wide) to 91.0 mm (tele), F1.6 to F3.8
Effective pixels	
Standard lens performance	

PAN - TILT

Az Range	Continuous 360° panning, speed tied to zoom
El Range	+/-60°

STABILIZATION

Type	Gyroscopically stabilized
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IMAGE PRESENTATION

Video output	NTSC thermal and visible or PAL thermal and visible
Connector types	Corrosion resistant BNC - BNC to RCA adapter included

POWER

Requirements	24 V DC
Consumption	<50 W nominal; 130 W peak; 270 W peak with heaters

ENVIRONMENTAL SPECIFICATIONS

Operating temperature range	-32°C to +55°C
Storage temperature range	-50°C to +85°C
Automatic Window defrost	Yes
Humidity	100% relative humidity salt spray
Sand/dust, icing	Mil-Std-810E
Encapsulation	IP 66
Shock	Mil-Std-810E
Vibration	Mil-Std-810E

PHYSICAL CHARACTERISTICS

Camera Weight	20.4 kg
Camera Size	38.1 cm diameter x 58.4 cm height - swept volume
Shipping weight (camera + packaging) (L x W x H)	32 kg
Shipping size (camera + packaging) (L x W x H)	85 cm x 59 cm x 41 cm

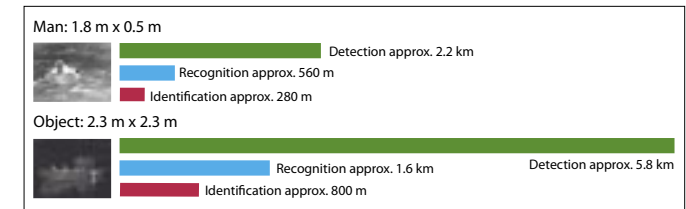
Standard Package

Stabilized pan/tilt head with integrated thermal imagers and DLTV camera, 30 m cable, breakout box and mating connectors - Voyager Joystick Control Unit custom developed for maritime environments and Voyager functions Operator manual

* 30 Hz NTSC or 25 Hz PAL available. Subject to approval of the US Department of Commerce for use outside the USA.



Voyager: range performance 140 mm lens



Actual range may vary depending on camera set-up, environmental conditions, user experience and type of monitor or display used.

Assumptions:

50 % probability of achieving objective at specified distance given 2°C temperature difference and 0.85 / km atmospheric attenuation factor.

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Your local dealer:



The Voyager is backed up by 2 years of full warranty.

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