

ELECTRONICS & DEFENSE



SURFACE VESSELS

optronics



Safran Electronics & Defense, a Safran high-tech company, holds world or European leadership positions in optronics, avionics, electronics and critical software for both civil and military markets. Safran Electronics & Defense is the No. 1 company in Europe and No. 3 worldwide for inertial navigation systems (INS) used in air, land and naval applications. It is also the world leader in helicopter flight controls and the European leader in optronics and tactical UAV systems. Operating across the globe through the Safran international network, Safran Electronics & Defense and its subsidiaries employ 7,600 people in Europe, Asia-Pacific, North America and South America.

N°1
in Europe
optronic systems
inertial navigation



Always one sense ahead

Safran is a long-standing leader in naval optronics (electro-optical and infrared equipment), whether for surface vessels or submarines, as well as merchant ships. Along with our inertial navigation systems, Safran's optronics are used by navies around the world for the full spectrum of missions. Our proven expertise and innovative solutions mean that our products and services cover all your needs, including complete support packages.

600
optronic systems
delivered to 30
navies worldwide

150
decoy launchers
delivered for
warships

70
warships equipped with our
infrared search & track systems

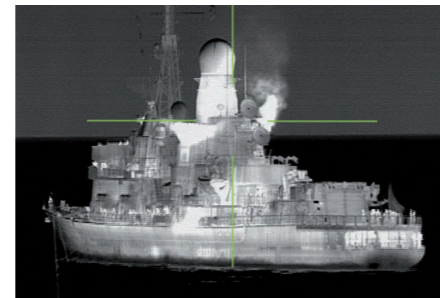
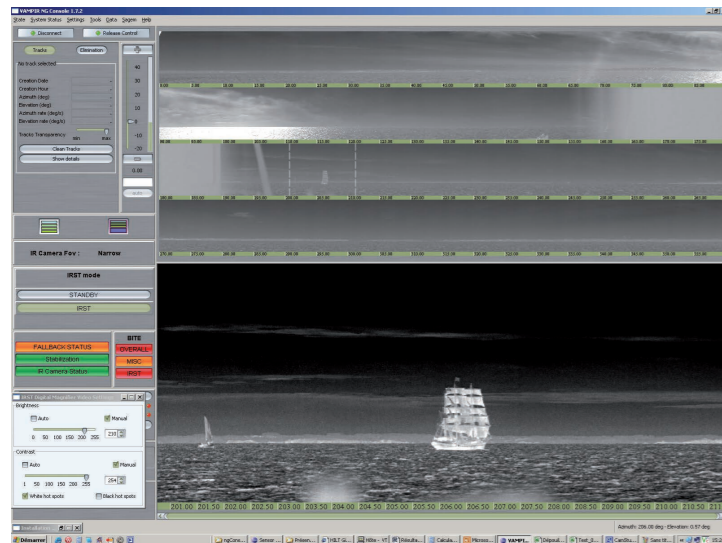


SELF PROTECTION

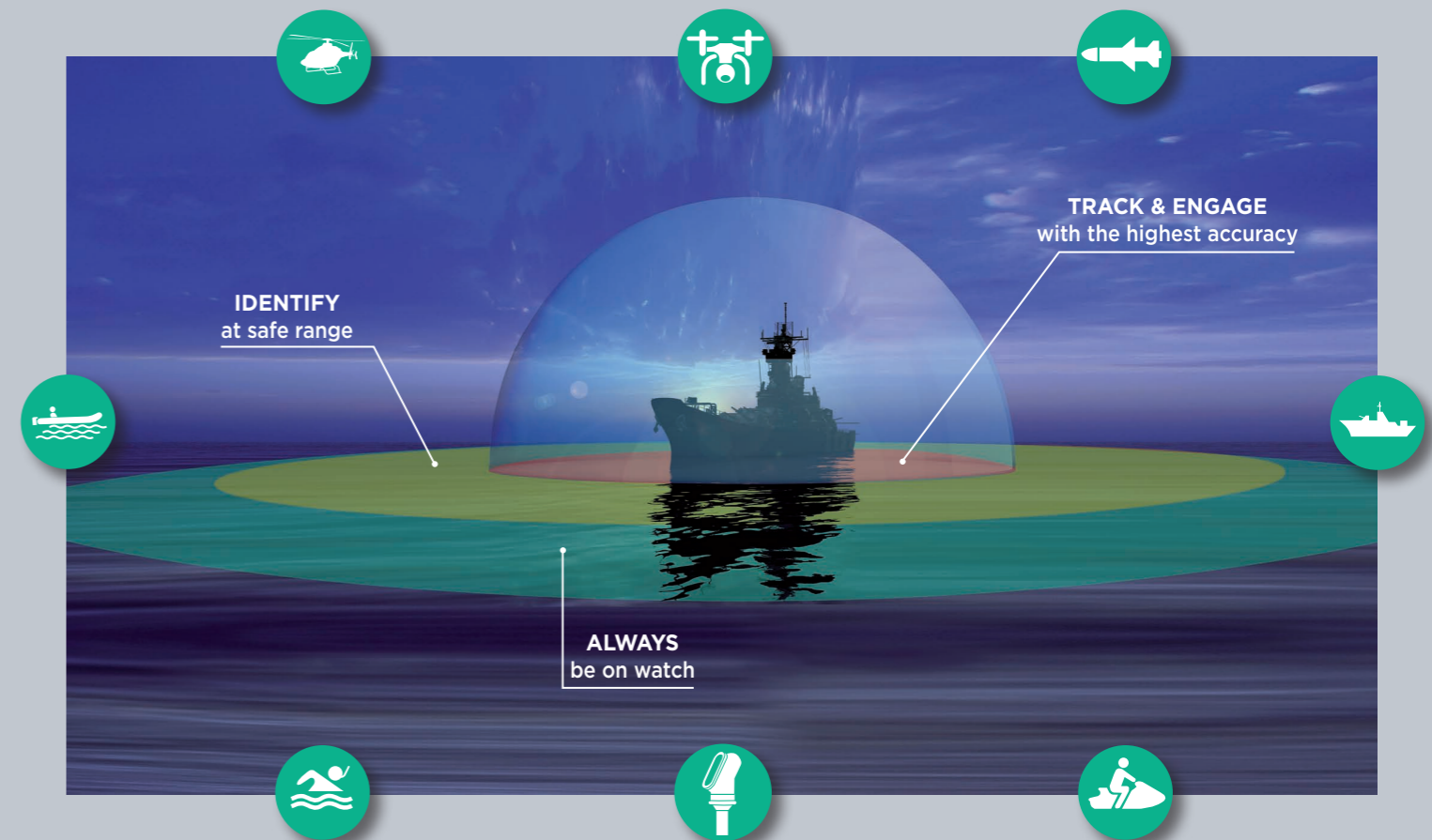
“ Always be on watch
Identify at safe range
Track & engage with
the highest accuracy ”

Very early warning

Navies have to provide protection for different sized zones around their ships, depending on the assigned mission. All threats approaching this zone or already inside it must be detected, identified and, if necessary, neutralized in timely fashion. Whether at sea or along the coast, this protection has to be constant, day or night, in fair weather or under the worst maritime conditions.



Detecting all threats
within the
air and surface
self-defense zone



> ALWAYS BE ON WATCH

“ Long-range detection
Constant surveillance
Low false-alert rate ”

See threats from afar

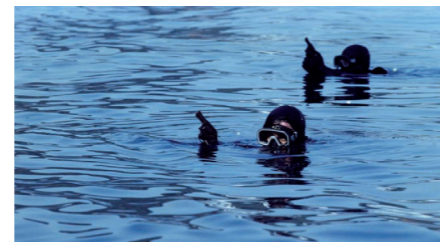
Detecting threats is the first step in protecting your forces. Navies have to be able to detect threats as soon as possible and under all conditions so they can come up with the best response. **Advanced optronic systems** perfectly complement with existing systems because they can detect platforms with weak radar signatures, using long-range sensors and high-resolution images.

In addition to their ability to detect stealthy and/or high-speed threats, such as aircraft and missiles, optronic systems can also detect more unconventional objects:

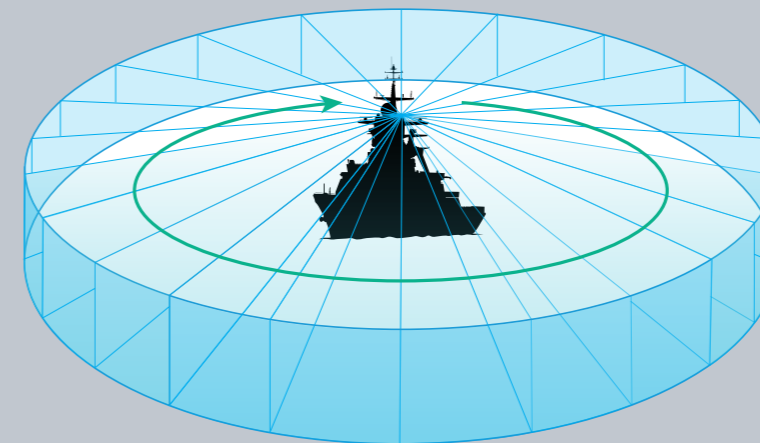
- asymmetric or emerging threats, including drones, jet skis and periscopes;
- floating obstacles;
- “man overboard”.

Constant surveillance, even under harsh conditions

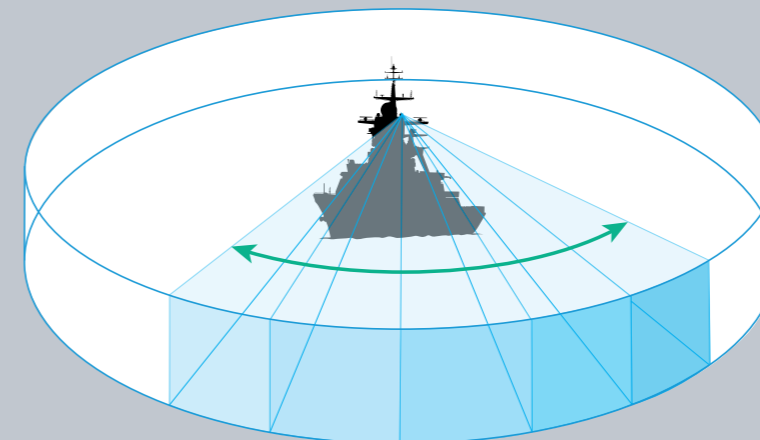
Safran is a **pioneer in automated tracking**, with systems deployed in a dozen countries worldwide. Our infrared search & track systems (IRST) are widely recognized as highly robust and reliable, while being easy to integrate and maintain. They are proven shipborne solutions, offering the best combination of long-range detection, high refresh rates and low false alarm rates. Using classical sighting systems, an alerting in a user defined sector can be offered as an alternative to full-blown IRST.



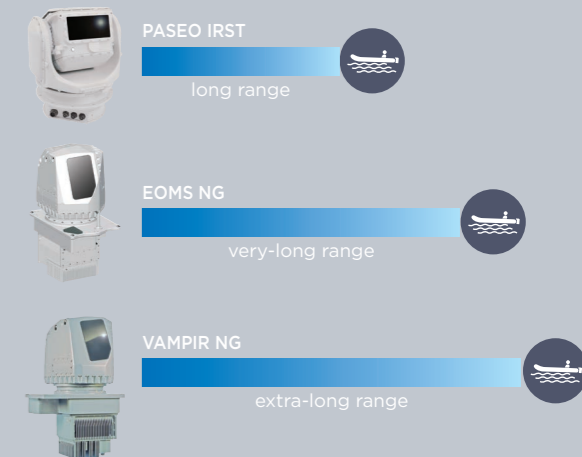
A world leader
in 360° IRST systems



360° multiple target automatic detection and tracking



Sector-automatic detection and tracking



(IR detection range)

> IDENTIFY AT SAFE RANGE

“ All-weather, very-long-range identification
Maximum data gathering
Information shared in real time ”

Ample warning

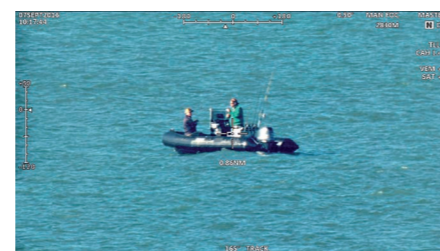
Today's navies are performing more and more intelligence gathering missions along coasts. With maritime traffic becoming increasingly dense, navies can identify threats as quickly as possible using Safran's tracking solutions. Getting ample warning of threats is a decisive advantage, especially when you're facing asymmetric threats. Unlike radar which can only distinguish an object's kinetic characteristics, optronics is the only technology that provides **visual identification of a threat**.

Precise information

Safran offers a **wide range of complementary sensors** (visible, color, near/short-wave/medium-wave/long-wave infrared bands) to positively identify **threats under all conditions**. Our robust, high-precision optics are ideal for long-range identification. These systems are also stabilized to ensure a perfectly stable image at any magnification. Safran's solutions provide spectral band fusion to improve image processing, especially in terms of contrast, contours and identification in general. They also reflect today's connected, collaborative world, with the capability to **record and share data** that is essential for post-mission analysis and deciding whether to engage.



MWIR - Image fully stabilized



Visible (spotter) - Image fully stabilized

A complete family
tailored to the needs
of each ship



VIGY observer/engage

Medium range



PASEO NS - EOMS NG
Multi-mission & Multi-function

Long range



PASEO XLR

Extra-Long range



(IR identification range)

ENGAGE WITH THE HIGHEST ACCURACY

“ Automatic, decoy-resistant tracking of multiple targets
Precise trajectory calculation for all targets
Can be integrated with any type of weapon system ”

Guaranteed precision

Navies regularly have to fire warning shots. To avoid any collateral damage, they have to ensure **total fire control precision** – provided by metrology-based technologies in conjunction with optronics. Safran’s solutions guarantee high angular precision, along with the ability to align all sensors at any temperature and with high shock-resistance.

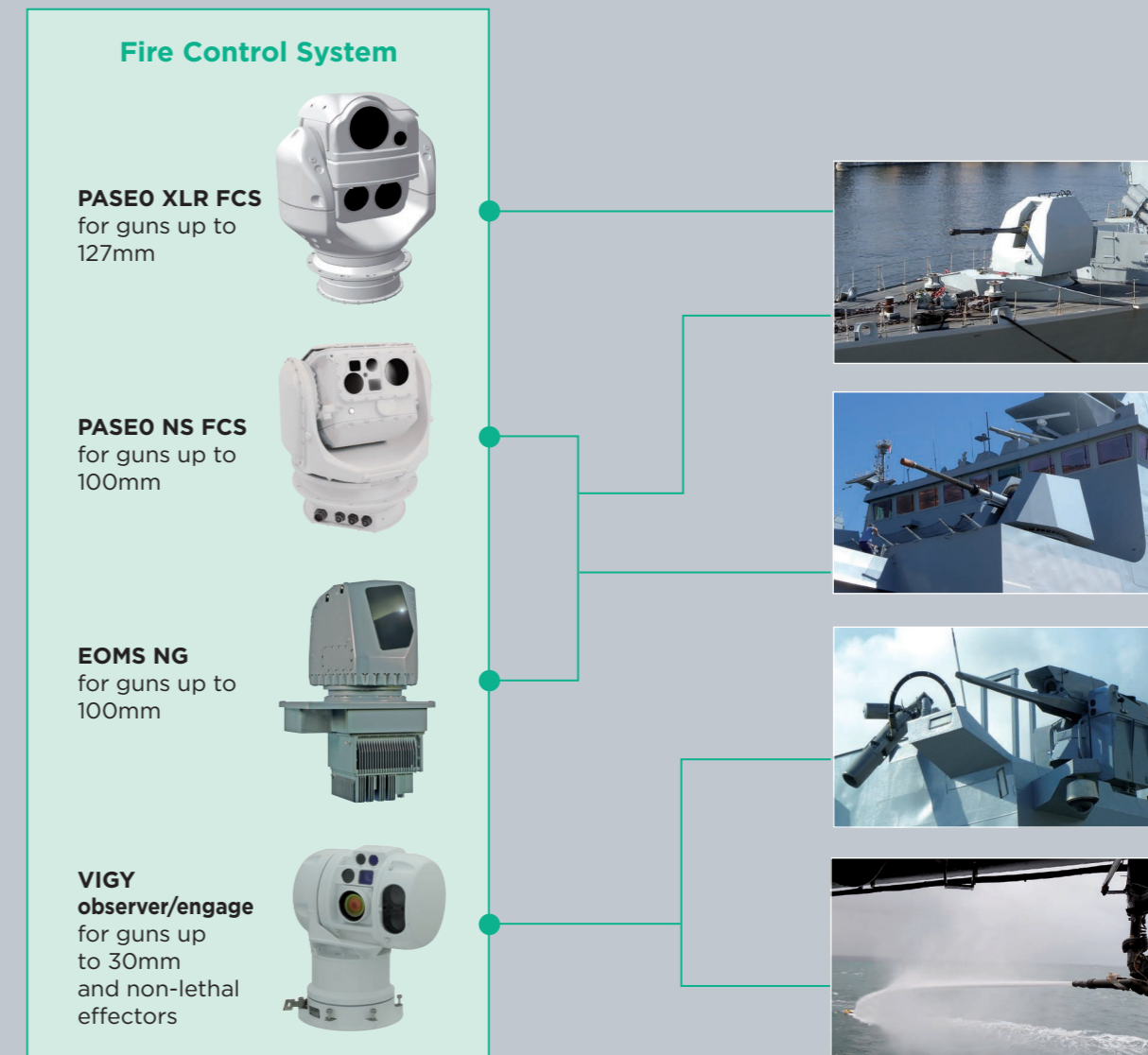


Weapon control under any circumstances

Building on more than 50 years of experience in fire control and inertial technologies, Safran’s systems ensure **outstanding target trajectory measurement**. They call on precision auto-tracking and laser rangefinding functions, along with advanced ballistic and filtering calculations. Our systems thus offer target designation for shipborne weapons, whether guns or missiles. The result is complete fire control systems, including safety aspects.



high precision tracking & firing



> SYSTEMS INTEGRATION

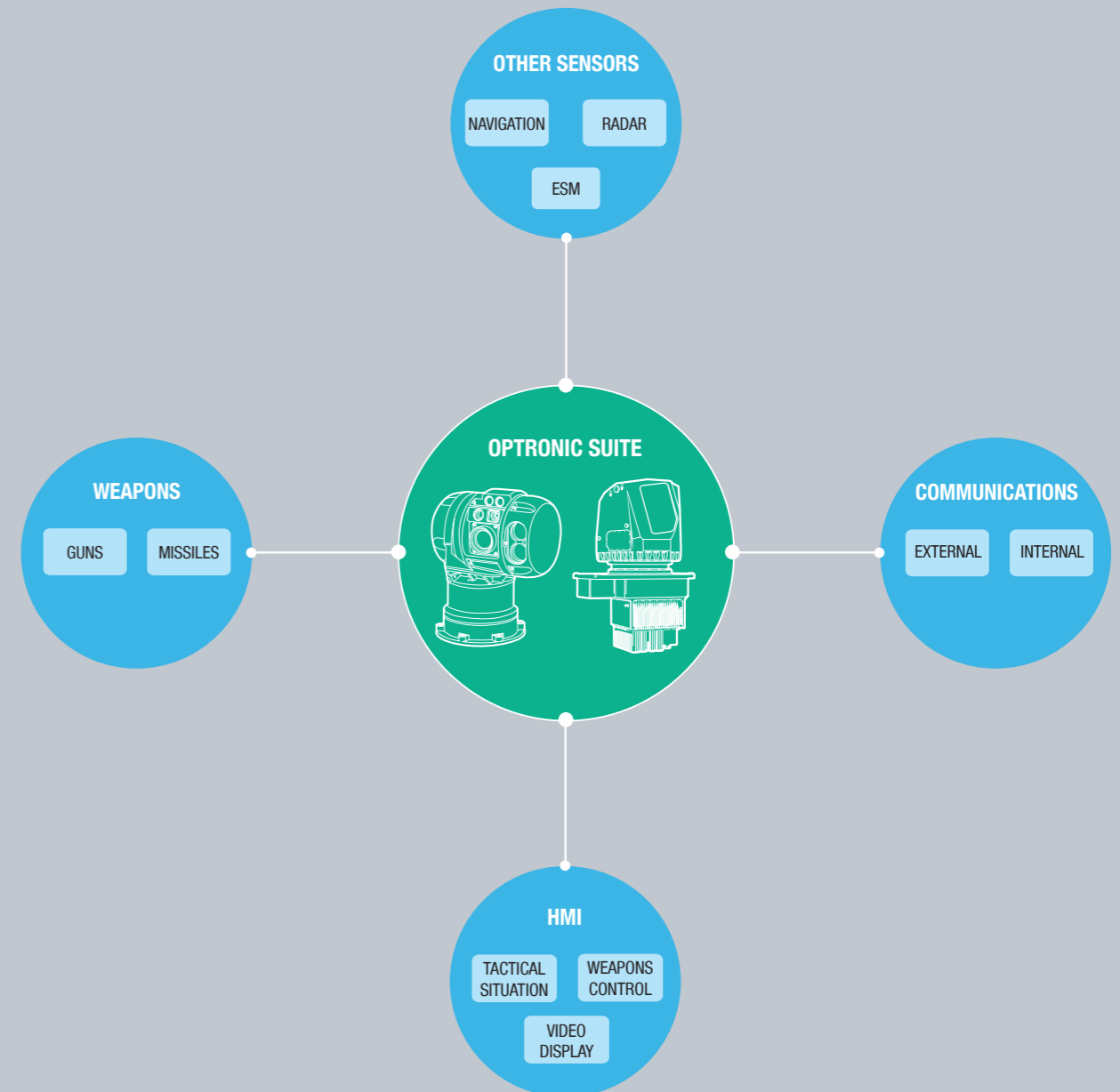
“ Easy to integrate
Command & control ”

Our expertise

Drawing on our broad experience in many different theaters of operation, Safran Electronics & Defense's equipment is **easy to integrate** in larger systems. This equipment can be fully integrated in a shipborne combat system, or operate in standalone mode with its **own control console**. It can also be used in intermediate configurations with powerful human-machine interfaces from Safran, to minimize integration costs.



combat proven
integrated solutions









> A WIDE RANGE OF PRODUCTS

“ High performance
Compact
Reliable ”

A specific solution for each mission

Drawing on our broad experience in many different theaters of operation, Safran will **help you to elaborate** the most appropriate optronics solution for your vessel.

		IRST		IRST + E.O + GUN DIRECTORS	E.O + GUN DIRECTORS		
		 PASEO IRST	 VAMPIR NG	 EOMS NG	 VIGY observer/engage	 PASEO NS	 PASEO XLR
DETECT	Panoramic 360° auto S&T	Long range (MWIR - 1 t/sec)	Extra Long range (MWIR - 1 t/sec)	Very Long range (MWIR + 1 tour/sec)			
	Panoramic Sector scan S&T				Option	Option	Option
IDENTIFY	IR observation			Long range	Medium range	Long range	Extra Long range (SWIR option)
	Daytime observation			Long range	Medium range	Long range	Extra Long range (spotter)
ENGAGE	Auto-tracking			Yes	Yes	Yes	Yes
	Laser rangefinder			Yes	Yes	Yes	Yes
	Fire control system			≤ 100mm (option)	≤ 30mm (option)	≤ 100mm (option)	≤ 127mm (option)

A range designed for
all surface
vessels

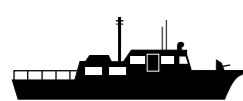


> FOR A WIDE RANGE OF VESSELS

“ Effectiveness
Robustness
Full range of optronic systems ”

A solution for each type of ship

Safran's wide range of optronic means offers solutions that address all requirements of a modern navy.



COMPACT DESIGN, EASY INTEGRATION, FIRE CONTROL

- Vigy Observer: observation + sector scan (option)
- Vigy Engage: observation + fire control



LONG-RANGE, HIGH PRECISION

- Paseo IRST: 360° detection
- Paseo NS: long range identification and engagement or
- EOMS NG: multifunction system



AUTOMATIC 360° DETECTION

- EOMS NG: multifunction system or
- Vampir NG: 360° detection and
- Paseo XLR: extra-long range identification & engagement



cutting-edge
technologies



PATROL BOAT



RHIB



CORVETTE



MARITIME PATROL



HELICOPTER-CARRIER



FRIGATE

> SUPPORT SERVICES

“ Customized services,
e-services
Low cost of ownership
ITAR-free ”

Customized services

Safran designs-in maintainability right from the outset, to facilitate servicing throughout the product lifecycle.

Our systems feature:

- **Robust design**, adapted to even the harshest naval environments: saltwater, extreme temperatures, constant use.
- **Modular design**, to allow on-site maintenance.
- **High availability**, with few failures requiring removal for depot-level maintenance.

e-Services

Modern e-maintenance solutions track key parameters to forecast wear and failures, **focusing on preventive** rather than corrective maintenance.

Low cost of ownership

Our maritime products are big sellers worldwide, enabling large-scale production to keep unit cost down. This is particularly true of the Paseo sight for armored vehicles, sold around the world. We also constantly integrate the **latest innovative solutions** to keep technology at the cutting edge and deliver cost-effective products.

ITAR-free

Products that are not subject to the U.S. ITAR (International Traffic in Arms Regulations) greatly facilitate acquisition and maintenance. **Safran's independent technologies** mean that we can easily manage product obsolescence and upgrades, and also support technology transfers.

proven
processes &
expertise



POWERED
BY TRUST

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