

ELECTRONICS & DEFENSE



EUROFLIR™ 410

Extend your mission, Reveal the unseen

 **SAFRAN**



SAFRAN ELECTRONICS & DEFENSE, A SAFRAN HIGH-TECH COMPANY,

holds world or European leadership positions in optronics, avionics, electronics and critical software for both the civil and military markets. Safran Electronics & Defense is the European leader and No.3 worldwide for inertial navigation systems (INS*) used in space, 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 more than 9,500 people in Europe, Asia-Pacific, North America and South America.

www.safran-group.com

* INS: Inertial Navigation System

EUROFLIR™ EXTEND YOUR MISSION, REVEAL THE UNSEEN

Safran Electronics & Defense has introduced Euroflir™ 410 to meet users' evolving mission requirements, even for the most critical tasks, while also keeping workload manageable.

Euroflir™ family capitalizes on Safran Electronics & Defense's 40 years of experience in developing high-performance airborne electro-optical (optronic) systems. The combat-proven Euroflir™ 410 has been fitted on several fixed and rotary wing aircrafts worldwide and deployed in today's most demanding theaters.

Euroflir™ 410 provides ultra-long-range observation and precision targeting capabilities thanks to high-definition sensors and advanced embedded functions, all in a single LRU.



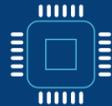
MULTISPECTRAL & ULTRA-LONG-RANGE OBSERVATION, DAY/NIGHT, ALL WEATHER

Wide field-of-view and ultra-long-range observation at the same time



ACCURATE TARGETING

Precise target geolocation & designation thanks to full laser functions and embedded INS

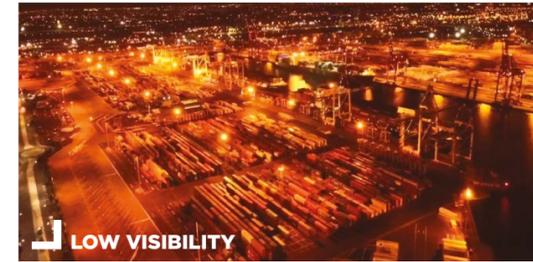


EMBEDDED DECISION-AID FUNCTIONS

Enhanced detection and identification for greater mission effectiveness

MULTISPECTRAL & ULTRA LONG-RANGE OBSERVATION, DAY/NIGHT, ALL WEATHER

Euroflir™ 410 operates in four spectral wavebands (TV/NIR/SWIR/MWIR), allowing it to function at standoff distance any time day or night, and quickly identify persons in danger or different kinds of threats. Thanks to its multispectral spotter, Euroflir™ 410 allows the operator to always be focused on a target while changing of spectral wavebands.



UP TO 10 SENSORS AT THE SAME TIME, WITHOUT ANY COMPROMISE

One of the major challenges faced by military and security forces today is the wide range of threats and missions they have to address: ISR, ISTAR, smuggling, trafficking, terrorism, search and rescue, illegal fishing, pollution, piracy, trafficking etc. They have to carry out these missions by day or night, quickly, and often in degraded visual environment.

TV



Daytime full situation awareness with wide-field-of-view / continuous optical zoom & unmatched identification with ultra-narrow field-of-view (spotter) TV sensors.

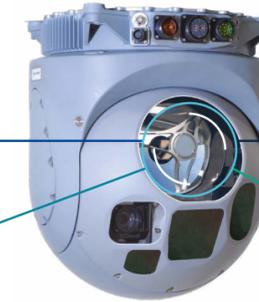
NIR



Nightfall identification and pointer visualization with ultra-narrow field-of-view NIR sensor.



Target marking or zone illumination for either crew members or allied ground forces with night vision goggles (NVG).



SWIR



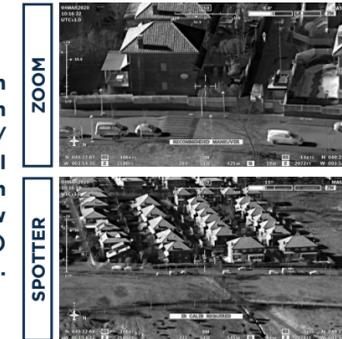
Degraded visual environment (DVE) identification and "see-spot" function with ultra-narrow field-of-view SWIR sensor.



Accurate designation with suitable laser coding for laser-guided weapons.



MWIR



24/7 full situation awareness with wide-field-of-view / continuous optical zoom & identification with ultra-narrow field-of-view (spotter) MWIR sensors.

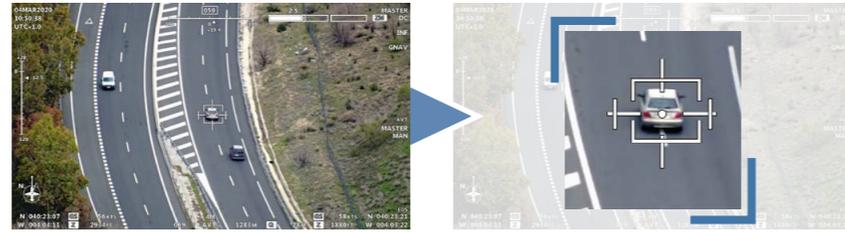
INS: Inertial Navigation System / TV: color day / IR: InfraRed / NIR: Near InfraRed / SWIR: Short Wave InfraRed / MWIR: Middle Wave InfraRed / DVE: Degraded Visual Environment / FOV: Field-Of-View / NFOV: Narrow Field-Of-View / WFOV: Wide Field-Of-View / VMTI: Video Moving Target Indicator / HSD: Hot Spot Detection / GNSS: Global Navigation Satellite System / ISR: Intelligence, Surveillance, Reconnaissance / ISTAR: Intelligence, Surveillance, Target Acquisition, Reconnaissance / RPAS: Remotely Piloted Aircraft System / EEZ: Exclusive Economic Zone / SAR: Search And Rescue / LOS: Line-Of-Sight / EOS: Electro-Optical System / IMSI: International Mobile Subscriber Identity.

ADVANCED EMBEDDED FUNCTIONS

Safran offers advanced functions fully embedded in the system, enhancing the flight crew's situational awareness, while keeping workload manageable.

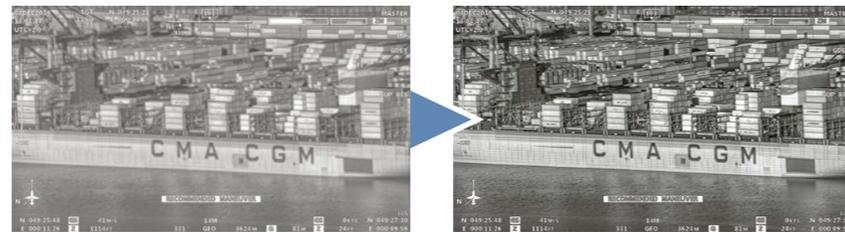
AUTOMATIC VIDEO TRACKING

Allow to lock on a target of interest automatically without any continuous input from the operator, by day or by night. Video tracking allows to determine the speed of the target.



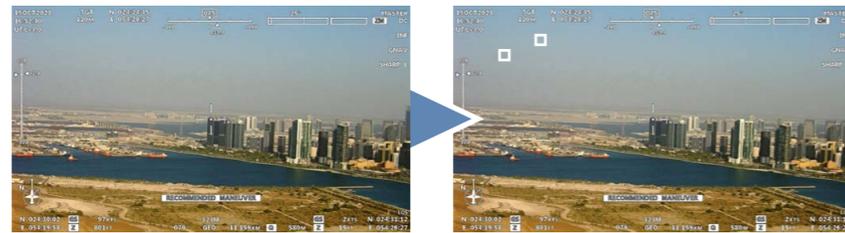
ENHANCED RESOLUTION

Improve real-time image quality thanks to a proprietary algorithm that sharply increases detail recognition and identification range.



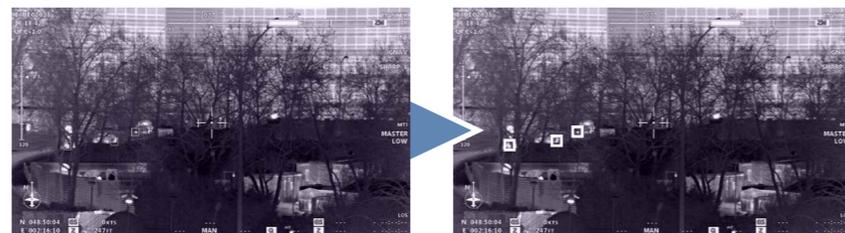
HOT SPOT DETECTION (HSD)

Reveal objects that are invisible to the naked eye by highlighting hot targets in the image background.



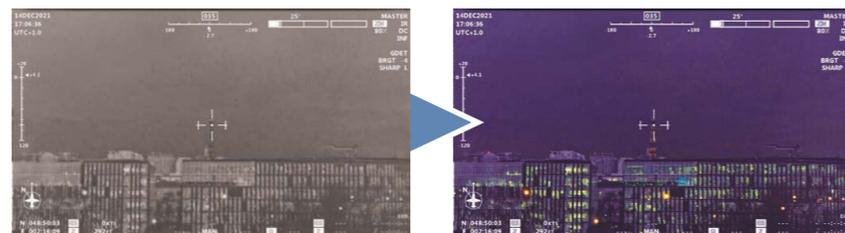
VIDEO MOVING TARGET IDENTIFICATION (VMTI)

Highlight moving objects to help operators to detect moving points in the video stream.



BLENDING & FUSION

Fusion of different wavebands into a single video stream, providing operators with the advantages of each wavelength.



IR

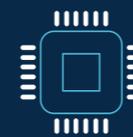
TV/IR

TAILORED TO YOUR NEEDS

Defense and security missions both entail a wide variety of theaters and types of operations: surveillance, high-value site monitoring, maritime surveillance, the fight against drug traffickers, combat support, etc. The systems deployed by these forces have to be especially versatile to rise to the challenge of this mission diversity.

The Euroflir™ 410 family of electro-optical systems incorporates up to ten latest-generation digital video and laser sensors. **Safran Electronics & Defense offers customers a choice of configurations** to address their exact needs, thanks to the modular Euroflir™ system, available in **three main versions: Euroflir™ 410 Surveillance, Euroflir™ 410 Marking and Euroflir™ 410 Designation.**

		SURVEILLANCE	MARKING	DESIGNATION
	INTEGRATED INS	✓	✓	✓
	TV ZOOM	✓	✓	✓
	TV SPOTTER	✓	✓	✓
	NIR SPOTTER	OPTIONAL	✓	✓
	SWIR SPOTTER	OPTIONAL	OPTIONAL	✓
	MWIR ZOOM	✓	✓	✓
	MWIR SPOTTER	✓	✓	✓
	RANGE FINDER	✓	✓	✓
	ILLUMINATOR	OPTIONAL	✓	✓
	POINTER	N/A	✓	✓
	DESIGNATOR	N/A	N/A	✓
	AUTOMATIC VIDEO TRACKING	✓	✓	✓
	BLENDING & FUSION	✓	✓	✓
	ENHANCED RESOLUTION	OPTIONAL	OPTIONAL	OPTIONAL
	VMTI	OPTIONAL	OPTIONAL	OPTIONAL
	HSD	OPTIONAL	OPTIONAL	OPTIONAL

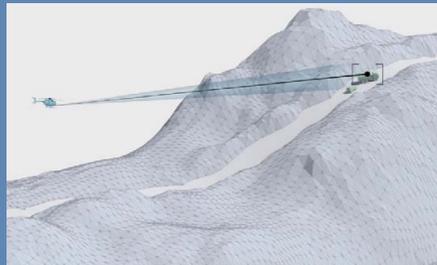


LINE-OF-SIGHT (LOS) STEERING MODES

Safran offers advanced functions fully embedded in the system, enhancing the flight crew's situational awareness, while keeping workload manageable. All modes include automatic aircraft/helicopter attitude compensation.

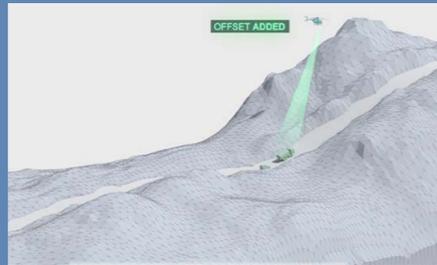
Always focused on scene thanks to the embedded digital terrain elevation data.

GEO MODE



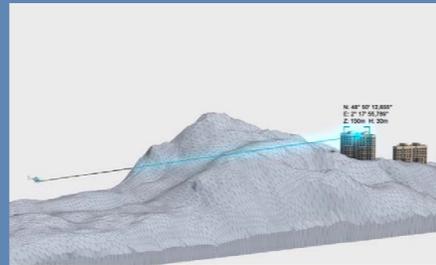
GEO AUTO

The line-of-sight focuses on a fixed target thanks to embedded digital terrain elevation data.



GEO AIDED

In addition, an offset can be adjusted to the speed of a moving target.

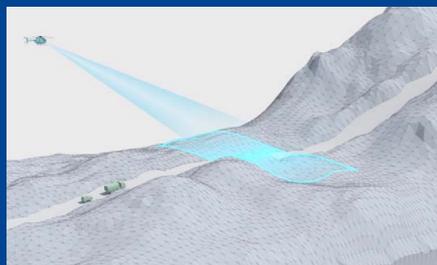


GEO LOCK

Enables locking the line-of-sight on georeferenced hidden or visible targets.

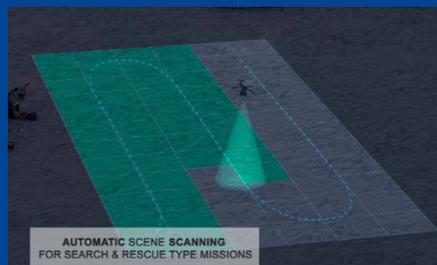
Automatic scene scanning assistance for navigation or SAR type missions

PATTERN



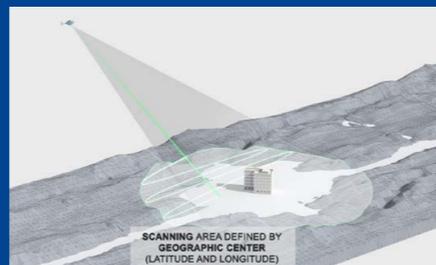
ANGULAR

Angular scanning pattern.



SAR SCANNING

Automatic scene scanning for search & rescue type missions.



STAND-OFF OBSERVATION

Scanning area defined by geographic center (latitude & longitude).



EASY INTEGRATION & INSTALLATION

Euroflir™ 410 was designed with common interfaces facilitating integration on any type of platform and coupling with off-the-shelf mission systems. No specific tools are required for installation.

COMMUNICATION PROTOCOLE

- ▶ ARINC 29*
- ▶ Ethernet
- ▶ RS 422
- ▶ STANAG 4609 with H-264 compression*

VIDEO OUTPUTS

- DIGITAL OUTPUTS:
- ▶ HD-SDI
 - ▶ Ethernet

GNSS CONNECTIONS

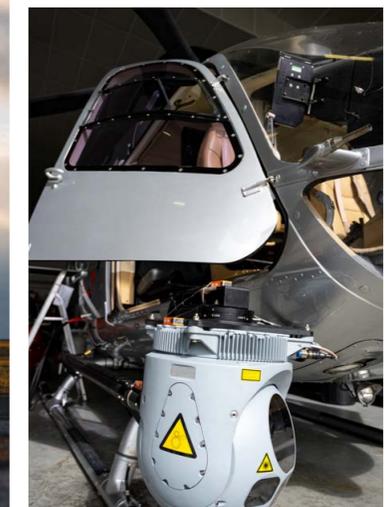
- ▶ GNSS Antenna input
- ▶ External GNSS*

POWER

- AIRCRAFT POWER:
- ▶ 28VDC

OTHER EQUIPMENT

- ▶ Hand controller
- ▶ Recorder
- ▶ Moving Maps
- ▶ Searchlight
- ▶ Radar
- ▶ Microwave datalink
- ▶ IMSI-Catcher



SAFRAN TRAINING SERVICES

TRAINING FOR EUROFLIR OPERATORS AND MAINTAINERS

Safran offers a full range of comprehensive training solutions.

► AT CUSTOMER OR WITHIN SAFRAN PREMISES

- Initial and refresh training
- Training of trainers

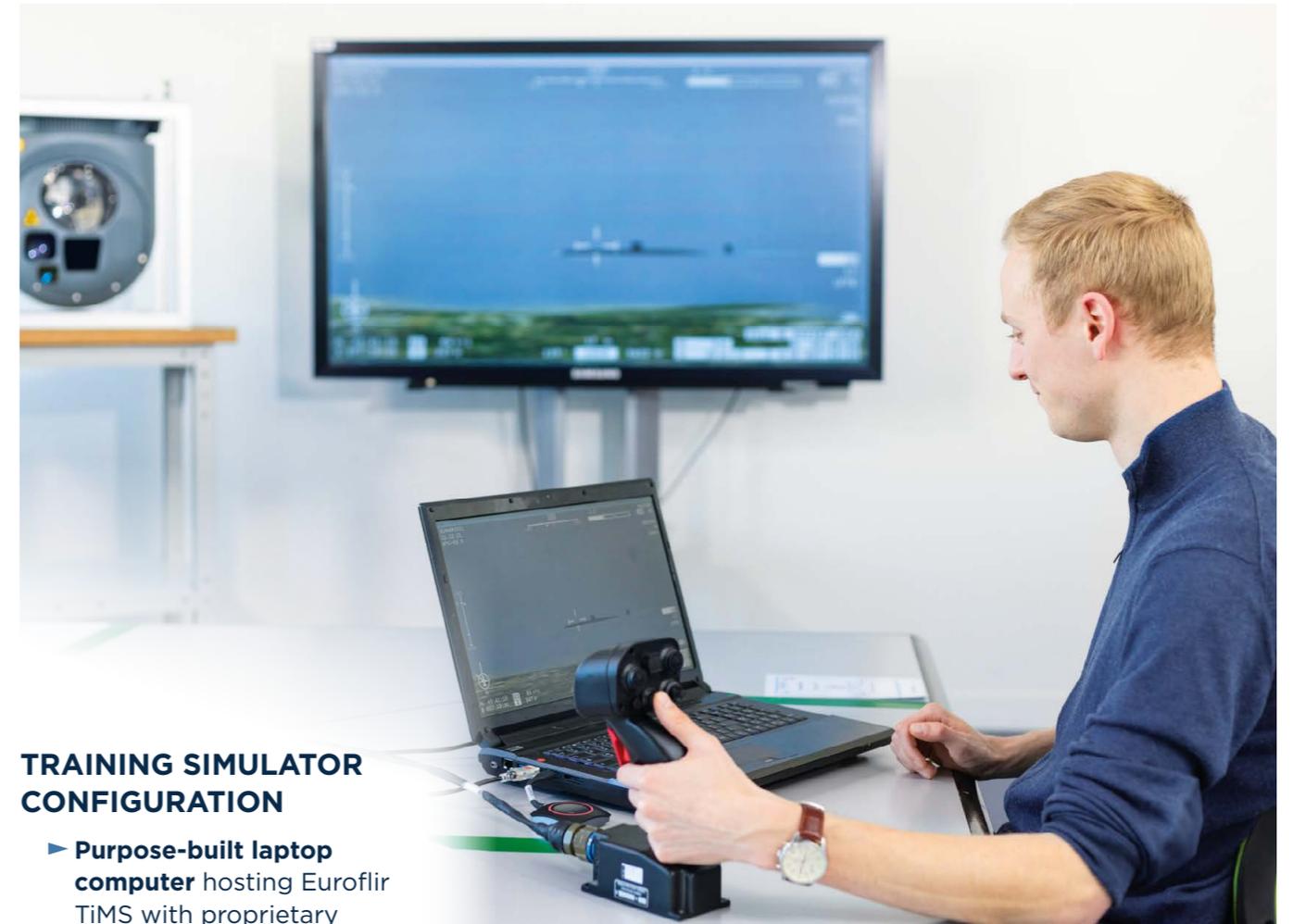
► LEARNING CLASS

- Available through our online portal
- Skills preservation with refresh courses



EUROFLIR 410 TiMS™

TRAINING MANAGEMENT SYSTEM



TRAINING SIMULATOR CONFIGURATION

- **Purpose-built laptop computer** hosting Euroflir TiMS with proprietary software and scenario modules
- **Simulated Euroflir 410 turret** including all relevant Euroflir 410 Human Machine Interface (HMI)
- **Simulation environment** providing a representation of a geographic scene including land, maritime and airborne targets


FLEXIBLE AND DEPLOYABLE
OPERATOR TRAINING


CUSTOMIZABLE MISSIONS
AND CONDITIONS


COST EFFECTIVE
TRAINING SOLUTION

OPERATORS



TARGET

MAINTAINERS

System architecture,
functions and HMI



CONTENT

System checkup,
O-level maintenance

3 days



DURATION

2 days

100% IN-HOUSE & ITAR-FREE TECHNOLOGY

Safran Electronics & Defense has full capabilities for the development, production and maintenance of commercial-off-the shelf electro-optical systems.

With over 40 years of experience in this cutting-edge sector, Safran Electronics & Defense has developed expertise in every facet of these products, and continue to invest in state-of-the-art production resources to ensure superior product quality and total customer satisfaction.



PRODUCTION LINE EUROFLIR FAMILY

- ▶ Clean room dedicated to Euroflir Family
- ▶ 340 engineers, technicians & workers committed to ensure the highest product quality.
- ▶ Manufacturing process 100% digitalized.

INTEGRATION & TESTS

- ▶ **Modules integration, adjustment and testing.**
- ▶ Safran Electronics & Defense deploys an ISO 9001-certified Quality Management System, based on the aeronautical standards EN9100 and EN9110, to meet customer expectations for quality, cost and deadlines.



PARIS AREA (R&D)
France

DIJON
France

POITIERS & MONTLUÇON
France



OPTICS & MECHANICS

- ▶ **In-house optics & coating capabilities**
- ▶ **Precise mechanical parts.**
- ▶ From lens design, polishing and coating, to precision mounting and alignment, Safran Electronics & Defense develops state-of-the-art optical assemblies for airborne multispectral observation systems.

ELECTRONICS

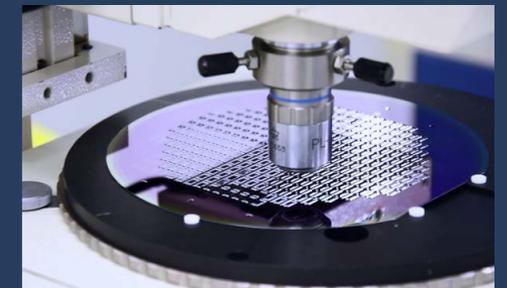
- ▶ **Modules integration, adjustment and testing.**
- ▶ At Safran Electronics & Defense we have developed our own critical software and printed circuit boards (PCB) to deliver very-high-performance image processing systems.



FOUGERES
France

HIGH-DEFINITION DETECTORS

- ▶ Safran Electronics & Defense provides highly sensitive HD detectors operating in wavebands from visible to infrared. Our sophisticated detectors are purpose-designed for the most demanding applications, including operation in extremely harsh environments.



A PORTFOLIO TO COVER ALL YOUR NEEDS

EUROFLIR™ 410



Integrating up to 10 sensors, the Euroflir™ 410 packs more capability than any gimbal of its size available, making it the most capable EOS on the market, whatever the visibility conditions, for the full spectrum of airmobile operations. Euroflir™ 410 provides unrivaled observation capabilities under any conditions of visibility, in particular due to its very-long-range telescope and high-performance line-of-sight stabilization.

EUROFLIR™ 510 for attack helicopters



Euroflir™ 510 optronics system carries 12 sensors, around a multi-spectral telescope, including several observation channels (TV, NIR, SWIR, MWIR and LWIR), 4 types of lasers as well as an integrated see spot capacity. Thanks to all its sensors, combined with powerful embedded image processing capacities, Euroflir™ 510 reduces the cognitive load for operators during their missions: flying in degraded conditions, remote identification of missile security, gunnery and guiding of missiles and rockets.

EUROFLIR™ 610



Euroflir™ 610 is an ultra-long-range electro-optical system proposed for the European MALE RPAS (Remotely Piloted Aircraft System) for Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) missions. Integrating up to 11 latest-generation sensors providing unmatched capabilities, Euroflir™ 610 provides 24/7 long endurance mission capabilities in all weather and is an optimal decision making tool.

FOR ALL YOUR PLATFORMS, FOR ALL YOUR MISSIONS



► INTELLIGENCE, SURVEILLANCE & RECONNAISSANCE (ISR)

► EEZ, TERRITORY & BORDER MONITORING



► SEARCH & RESCUE (SAR)

► LAW ENFORCEMENT



► SURVEILLANCE

► HOMELAND SECURITY



TRANSPORT AIRCRAFT



AEROSTAT



MISSION AIRCRAFT



RPAS



ATTACK HELICOPTER



MEDIUM & HEAVY HELICOPTER



LIGHT HELICOPTER

POWERED BY TRUST

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Safran Electronics & Defense
Établissement de Malakoff
55 Boulevard Charles de Gaulle - 92245 Malakoff Cedex - France
Tél. : +33 (0)1 55 60 38 00 - Fax : +33 (0)1 55 60 01 95
www.safran-group.com

