

**POWERED
BY TRUST**

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ELECTRONICS & DEFENSE



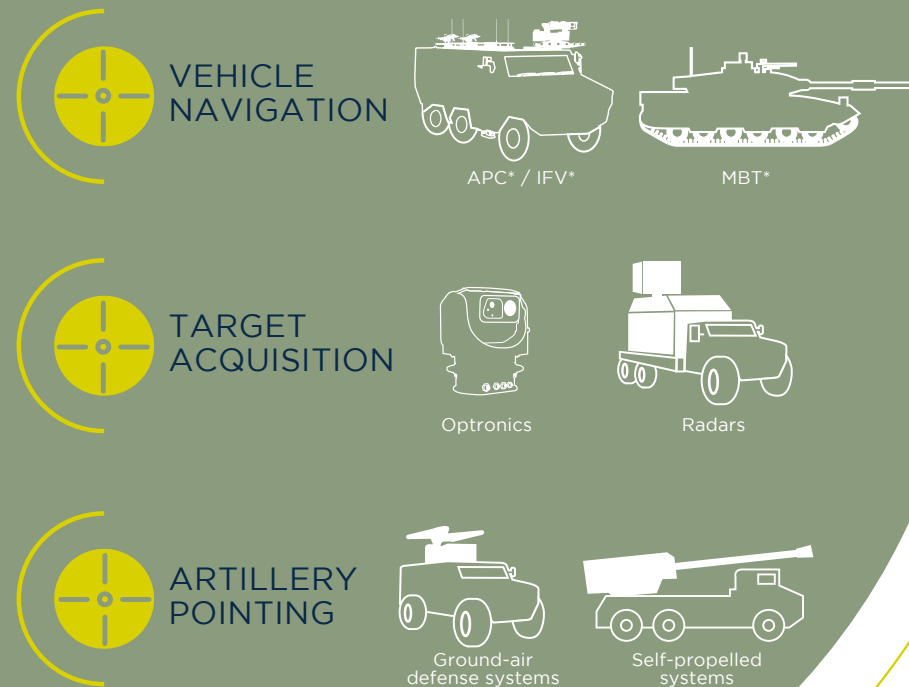
LAND INERTIAL NAVIGATION SYSTEMS

Highly reliable navigation and precision strikes under any conditions



HIGH PRECISION FOR SUCCESSFUL MISSIONS

ALL YOUR MISSIONS require precision navigation & pointing, even in GNSS* denied environment.



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* Definitions on the last page

SAFRAN INS* PORTFOLIO: TAILORED TO YOUR NEEDS



THE FARTHER YOU GO OR STRIKE, THE MORE PRECISION YOU NEED

GPS BACK-UP SYSTEM

EPSILON™ 

INS FOR HIGH PRECISION NAVIGATION & POINTING

GEONYX™ 

INS FOR SPECIFIC APPLICATIONS

SIGMA 30 

Product range	EPSILON™ ONE	EPSILON™ 10
Heading (RMS*)	< 0.75°	< 0.75°
Pitch & Roll (RMS)	0.3° (static)	0.3° (dynamic)
H.Position (CEP*)	1% DT	1% DT
Size	1 L	
Weight	1.5 kg	
MTBF*	> 75,000 h	
Alignment time	15 s	

GEONYX™ SP	GEONYX™ HP	GEONYX™ XP
2 mils	1 mils	0.9 mils
0.75 mils	0.5 mils	0.35 mils
0.15% DT	0.1% DT	0.05% DT
6 L		7 kg
> 100,000 h		
Full performance in less than 5 min without GNSS		

SIGMA 30-700
0.6 mils
0.2 mils
0.05% DT
22.2 L
22.5 kg
> 17,000 h
Full performance in less than 5 min without GNSS

OUR REFERENCES

More than 50 different land platforms equipped worldwide



Our understanding of your requirements combined with our expertise in inertial and electro-optics solutions.



APC: Armoured Personnel Carrier - **BMS:** Battle Management System - **CEP:** Circular Error Probable - **GNSS:** Global Navigation Satellite System - **HMI:** Human Machine Interface - **HRG:** Hemispherical Resonator Gyro - **IFV:** Infantry Fighting Vehicle - **INS:** Inertial Navigation System - **MBT:** Main Battle Tank - **MTBF:** Mean Time Between Failure - **RCWS:** Remote Controlled Weapon Station - **RMS:** Root Mean Square Error - **RLG:** Ring Laser Gyro - **SIL:** Safety Integrity Level - **SWAP:** Size Weight & Power - **SWAP-C:** Size, Weight, Power and Cost - **TAT:** Turn Around Time.

* Definitions on the last page

OUR SUPPORT SOLUTIONS

Thanks to resonator gyros' reliability, Epsilon™ and Geonyx™ families have the best life-cycle costs on the market. This allows Safran to propose innovative support solutions that will boost your armored vehicles' availability rate: challenging reduced TAT*, up to 10 years of warranty extensions, etc.

Safran offers flexible training programs and cost effective service support to assist you in your operations.



SIGMA 30, MAINTAINING THE ARTILLERY REFERENCE

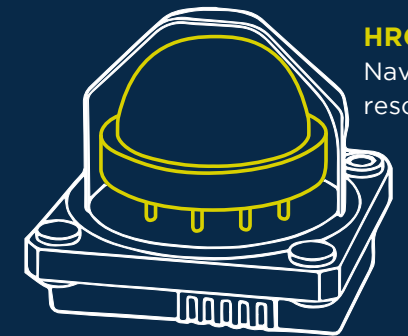
For decades, Sigma 30 has been the world reference in the artillery field. Safran will keep manufacturing and supporting the Sigma 30 in order to meet customers' requirements. Since flexibility is part of Safran's culture, interchangeability between Sigma 30 and Geonyx™ is ensured to provide customers with a wide range of options and prepare for the integration of the disruptive positioning & pointing inertial system.

* Definitions on the last page

RESONATOR GYROS: THE NEW HEART OF LAND NAVIGATION & POSITIONING

Epsilon™ and Geonyx™ are based on the new generation of gyroscopes: the resonator gyros. This technology has already proven its superiority in terms of performance, robustness, SWAP-C* and unparalleled reliability in all environments.

➤ **Two complementary gyros exploiting the same resonating principles**

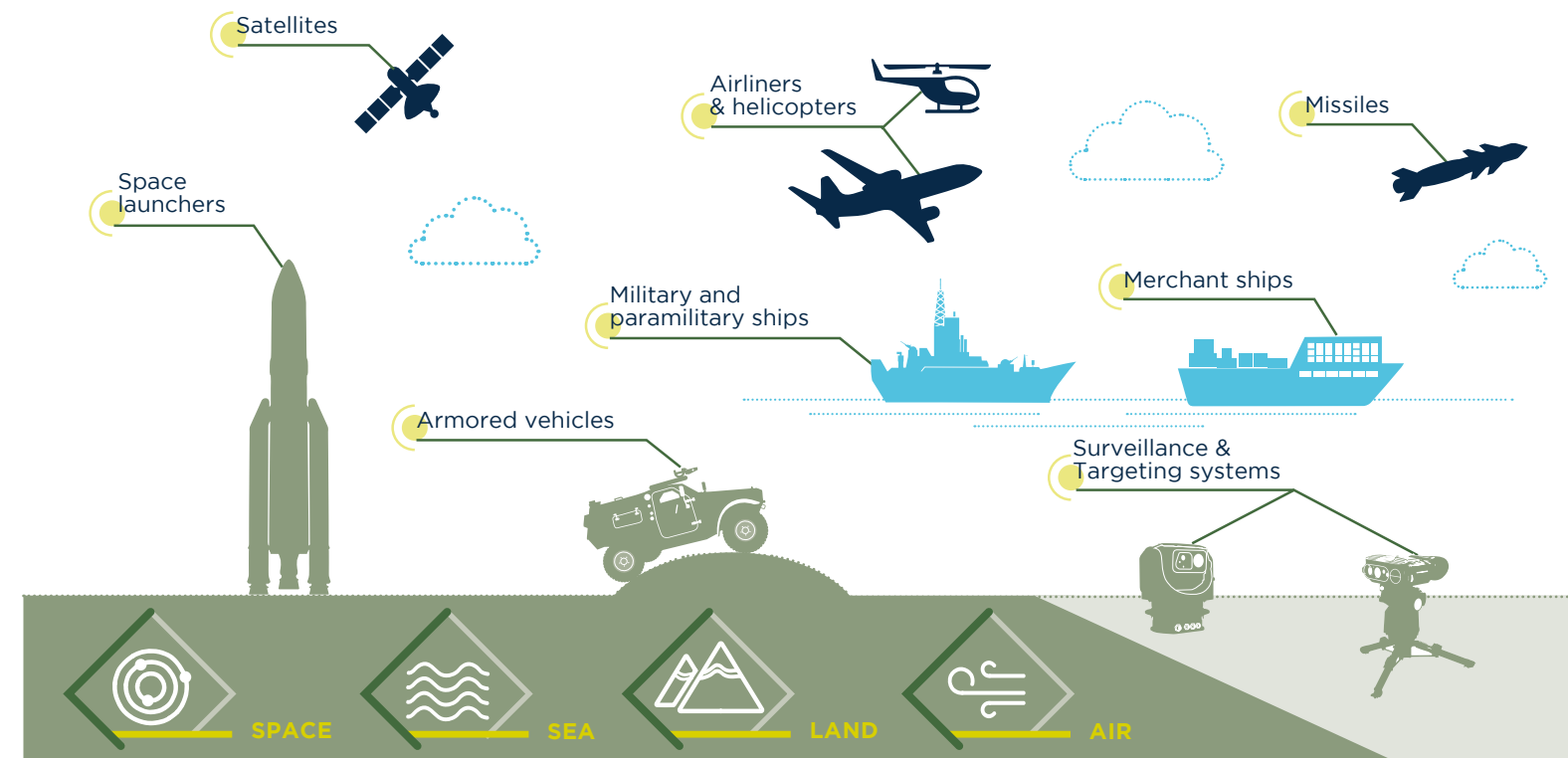


HRG CRYSTAL™
Navigation grade resonator gyroscope



QUAPASON™
Tactical grade resonator gyroscope

➤ **Safran's resonator gyros cover many demanding applications, from tactical to navigation grade, in any environment**



* Definitions on the last page

EPSILON™ FAMILY

TRUSTFUL COORDINATES UNDER ANY CONDITIONS

With the Epsilon™ family, Safran offers long lasting navigation performance INS*/GNSS* hybrid land navigation systems. Even in GNSS denied environment, Epsilon™ provides accurate position and heading for hours thanks to the outstanding inertial performance of the Quapason™. Epsilon™ can also be integrated with small caliber guns like RCWS* to provide precision pointing.

GEONYX™ FAMILY

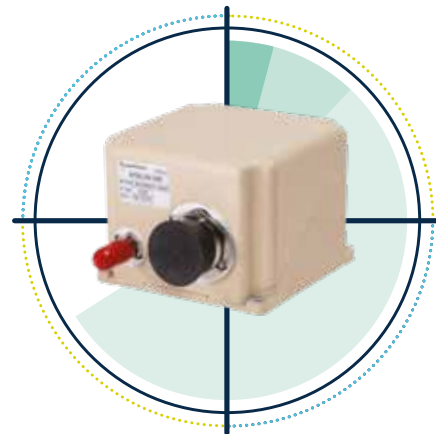
RELIABLE STRIKES UNDER ANY CONDITIONS

Integrating the HRG* Crystal™, Geonyx™ offers a real breakthrough in the INS navigation grade market in terms of:

- **Operational efficiency:** Geonyx™ pointing accuracy is first-of-class under the harshest conditions and offers the market's shortest alignment time in any configuration (with or without hybridization).
- **Flexible systems integration:** Geonyx™ is the most compact INS for its class of performance and can be mounted on any orientation on vehicles, turrets and artillery weapons.
- **Robustness and reliability:** being hard-mounted, Geonyx™ withstands high shocks of artillery guns, without the need of external support. Moreover, Safran has extended its INS lifetime by integrating the most reliable gyroscope of the market, the HRG Crystal™.

EPSILON™

Most compact & life-cycle cost effective GNSS back-up system



Long-lasting navigation performances



Connectable to any BMS*



Small caliber RCWS pointing

Optimized SWAP*	Up to date INTERFACES	Compliant with latest NAVIGATION STANDARDS
Dimensions (mm) 110 x 110 x 83	GNSS Embedded (external GNSS possible)	Environnement MIL-STD-810
Weight < 1.5 kg	CANBUS Ethernet RS-422	Electrical I/F MIL-STD-1275
Consumption < 13 W		
Reliability MTBF* > 75,000 h	Turrets compatible	EMC MIL-STD-461

GEONYX™

High performance & ultra effective life-cycle cost Inertial Navigation System



Pointing accuracy < 1 mils



Quick & flexible alignment



Hard-mounted on guns

Optimized SWAP*	Up to date INTERFACES	Compliant with latest NAVIGATION STANDARDS
Dimensions (mm) 205/245 x 158 x 162	GNSS Embedded (external GNSS possible)	Environnement MIL-STD-810
Weight 7 kg	CANBUS Ethernet RS-422	Electrical I/F MIL-STD-1275
Consumption < 17 W		
Reliability MTBF* > 100,000 h	Interchangeable with SIGMA 30	EMC MIL-STD-461

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