



FEDERAL SYSTEMS

NAVAL NAVIGATION SYSTEMS

A game changer for naval superiority



YOUR REQUIREMENTS

INDEPENDENCE & DISCRETION

ALL YOUR MISSIONS

accurate and autonomous localization in GNSS denied environment



PRECISE NAVIGATION
IN AN ENVIRONMENT
WITHOUT LANDMARK



ACCURATE **WEAPON & SENSORS** STABILIZATION



EXTREMELY HIGH RELIABILITY



INDUSTRY LEADING **SWAP**



NAVIGATION **SOLUTIONS INTEGRITY**



75 YEARS OF EXPERIENCE AS
A MARKET LEADER



UP TO 360 HOURS OF
OPERATION WITH 1 NM DRIFT



200,000 HOURS
MTBF



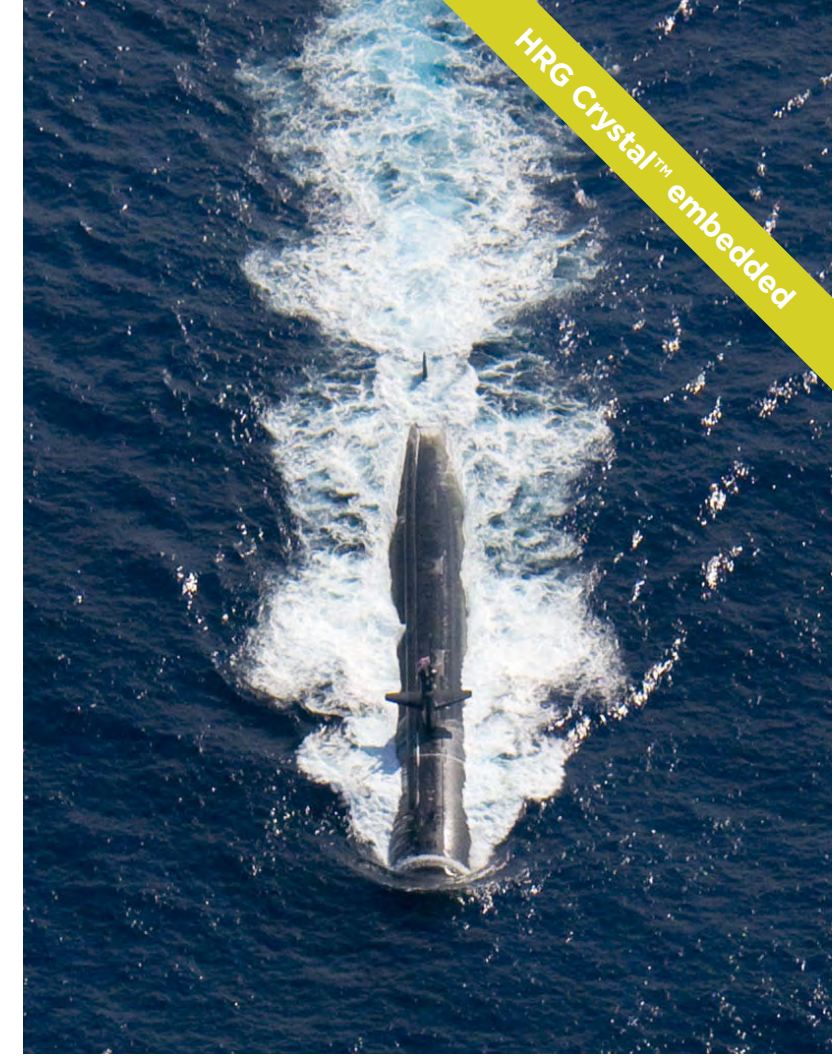
COMBAT PROVEN



OPTIMIZED LIFE CYCLE COST

SAFRAN INERTIAL NAVIGATION SYSTEMS PORTFOLIO:

DESIGNED TO MEET THE REQUIREMENTS OF ALL NAVAL PLATFORMS



HRG Crystal™ embedded



IMO Certified + Wheelmark

SMALL BOAT

GEONYX-M™

Product range	NAVAL AHRS	NAVAL PLATFORM	LAND PLATFORM
Position (TDRMS*)	N/A	up to 1Nm/24h	0.15% DT
Heading (° seclat RMS)	0.05		1 mils (≈ 0.35 mils)
Roll & Pitch (° RMS)	0.03		0.5 mils
MTBF	> 100,000 h		

SURFACE VESSELS*

ARGONYX™

ARGONYX™ SP	ARGONYX™ HP	ARGONYX™ XP
1Nm/4h 1Nm/16h	1Nm/24h	1Nm/48h 1Nm/72h
0.01		
0.01		
200,000 h		

SUBMARINES*

BLACK-ONYX™

BLACK-ONYX™ DUAL CORE

BLACK-ONYX™ SP	BLACK-ONYX™ HP	BLACK-ONYX™ XP	BLACK-ONYX™ DUAL CORE SP	BLACK-ONYX™ DUAL CORE HP	BLACK-ONYX™ DUAL CORE XP
1Nm/4h	1Nm/24h	1Nm/48h 1Nm/72h	1Nm/96h 1Nm/120h	1Nm/240h	< 1Nm/360h
0.01					
0.01					
200,000 h					

The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

* Time Distance Root Mean Square (TDRMS)

GEONYX-M™ FAMILY

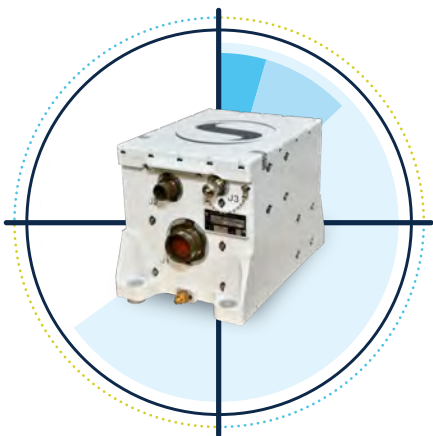
INERTIAL NAVIGATION SYSTEM FOR AMPHIBIOUS VEHICLES AND SPEED BOATS

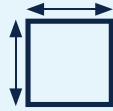


- Operates in extreme conditions.
- Versatile, compact, and modular
- Latest state of the art HRG technology.
- No external sensors needed.



GEONYX-M

Navigation and Pointing in GNSS-denied environments



 <p>Optimized architecture</p>	 <p>Flexible interfaces</p>	 <p>Full naval MIL SPEC certified</p>
<p>Weight 14.1 lbs</p>	<p>Operational: -20° C to +60° C</p>	<p>COTS</p>
<p>Dimensions (in) 8/9.6 x 6.2 x 6.6</p>	<p>Waterproofness: IP66</p>	<p>Easy installation</p>
<p>Consumption < 17 W</p>		<p>Maintenance free</p>



MTBF:
200,000h



in house



IMO & IMO HSC
certified



1Nm/24hr

ARGONYX™ FAMILY

ACCURACY & COST EFFECTIVENESS
FOR SURFACE APPLICATIONS

- **Scalability:** from small patrol boats to aircraft carriers.
- **Operational efficiency:** accurate attitudes & precise localization for sensors stabilization & weapons employment, even in GNSS denied environments.
- **Reliability:** Argonyx™ offers the highest MTBF of the market, and is maintenance free thanks to HRG Crystal™.



ARGONYX™

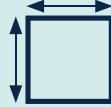


Trustful navigation



MTBF:
200,000h
5 year warranty



1Nm/72hr

 Optimized architecture	 Flexible interfaces	 Full naval MIL SPEC certified
The world's lightest naval INS	New user friendly HM ¹	Shock: MIL STD 810 E & MIL S 901
Weight < 31 lbs	Optimized interface with CMS ²	Vibration (w/o external dampers): IEC 60945 & MIL STD 167-1
Dimensions (in) 10 x 10.3 x 16.3	Ethernet, RS-422, NMEA	Electromagnetic: MIL STD 461F
Consumption < 25 W	Flexible interface library	Temperature: -10° C to +55° C (operation) -40° C to +70° C (storage)

¹ Human Machine Interface
² Combat Management System

BLACK-ONYX™ FAMILY

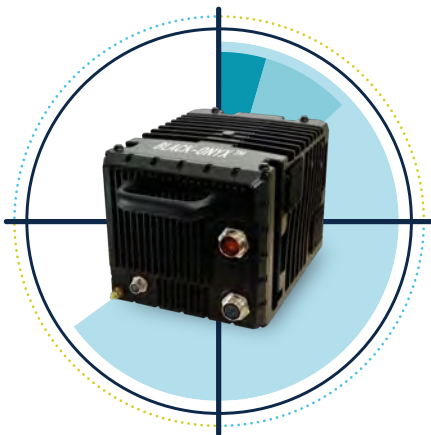
TECHNOLOGICAL REVOLUTION FOR SUBMARINE APPLICATIONS

- **Submergibility & Autonomy:** Black-Onyx™ offers the highest autonomous navigation performance ever reached in the non strategic submarines market
- **Stealth:** totally silent inertial navigation systems.
- **Reliability:** Black-Onyx™ family offers the highest MTBF of the market and is maintenance-free thanks to HRG-Crystal™



BLACK-ONYX™

Unlimited autonomy



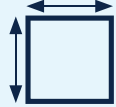


MTBF:
200,000h
5 year warranty



Unrivalled
submergibility
performance



1Nm/360hr

 <p>Optimized architecture</p>	 <p>Flexible interfaces</p>	 <p>Full naval MIL SPEC certified</p>
<p>The world's lightest submarine INS: < 40 lbs (< 56lbs for Dual Core)</p>	<p>New user friendly HM¹</p>	<p>Shock: MIL STD 810 E & MIL S 901</p>
<p>Dimensions (in) 10 x 10.3 x 16.3</p>	<p>Optimized interface with CMS²</p>	<p>Vibration (w/o external dampers): IEC 60945 & MIL STD 167-1</p>
<p>Consumption < 25 W (< 50 W for Dual Core)</p>	<p>Ethernet, RS-422, NMEA</p>	<p>Electromagnetic: MIL STD 461F</p>
<p>Strapdown, no moving parts</p>	<p>Flexible interface library</p>	<p>Temperature: -10° C to +55° C (operation) -40° C to +70° C (storage T° C)</p>
<p>Immune to magnetic stress</p>		
<p>Stealthy</p>		

¹ Human Machine Interface
² Combat Management System

OUR SUPPORT SOLUTIONS

Thanks to HRG Crystal™ reliability, Argonyx™, Black-Onyx™ and Black-Onyx™ Dual Core families have the best life-cycle costs on the market. This allows Safran to propose innovative support solutions that will boost your vessels and submarines' availability rate.

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



ABOUT SAFRAN FEDERAL SYSTEMS

Safran Federal Systems (SFS) provides Resilient PNT solutions and custom engineering services to U.S. Government agencies, defense organizations and their contractors. SFS is authorized to work on the full spectrum of U.S. Government classified and unclassified projects, in addition to supporting strategic partnerships for key defense PNT technologies. SFS is a proxy-regulated company, Free of Foreign Ownership, Control, or Influence (FOCI).

OUR CUSTOMER REFERENCES

40 militaries equipped with Safran's inertial systems worldwide



**POWERED
BY TRUST**



safranfederalsystems.com

