

POWERED
BY TRUST

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ELECTRONICS & DEFENSE



NAVAL NAVIGATION SYSTEMS

A game changer for naval superiority



YOUR REQUIREMENTS INDEPENDANCE & DISCRETION

ALL YOUR MISSIONS
require precise navigation,
autonomy & endurance.

PRECISE NAVIGATION
IN AN ENVIRONMENT
WITHOUT LANDMARK

ACCURATE **WEAPON &
SENSORS** STABILIZATION

LONG **ENDURANCE**

ACCURATE & AUTONOMOUS
LOCALIZATION IN GNSS
DENIED ENVIRONMENT

NAVIGATION
SOLUTIONS INTEGRITY



70 YEARS OF EXPERIENCE
AS A MARKET LEADER



PERFORMANCE & RELIABILITY
AT YOUR SERVICE



TAILORED TO YOUR
REQUIREMENTS



COMBAT PROVEN



OPTIMIZED LIFE CYCLE COST

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SAFRAN INERTIAL NAVIGATION SYSTEMS PORTFOLIO:
DESIGNED TO MEET THE REQUIREMENTS
OF ALL NAVAL PLATFORMS



HRG Crystal™ embedded



IMO Certified + Wheelmark

Product range
Position (TDRMS**)
Heading (° seclat RMS)
Roll & Pitch (° RMS)
MTBF
Heave/Surge/Sway

MARITIME

BLUENAUTE®



BLUENAUTE® COMPASS	BLUENAUTE® PREMIUM	BLUENAUTE® TITANIUM	BLUENAUTE® PLATINIUM
			1Nm/1h
0.4	0.2	0.08	0.08
0.01			
200,000 h			
5 cm			

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		

BLACK-ONYX™



SUBMARINES*

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	Up to 1Nm/480h
0.01					
0.01					
200,000 h					

* Subject to French export license approval
**Time Distance Root Mean Square (TDRMS)

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™.
- **Easy interchangeability** with Sigma 40.

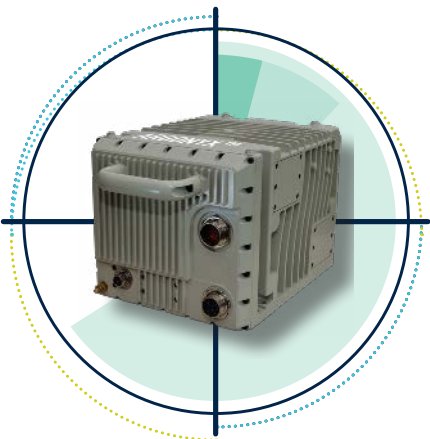
BLACK-ONYX™ FAMILY

TECHNOLOGICAL REVOLUTION FOR SUBMARINE APPLICATIONS

- **Submergibility & Autonomy:** Black-Onyx™ offers the highest autonomous navigation performance ever reached in the non strategic submarines market.
With Black-Onyx™ Dual Core family those performances are multiplied, reaching navigation accuracies for the most submarines demanding applications.
- **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™.
- **Easy interchangeability** with Sigma 40.

ARGONYX™

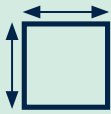


Trustful navigation



MTBF :
200,000h
5 year warranty

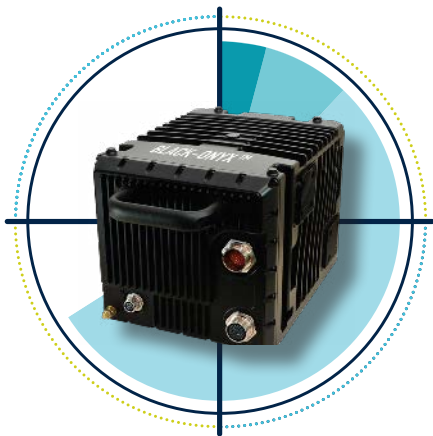


ITAR free

 Optimized architecture	 Flexible interfaces	 Full naval MIL SPEC certified
The world's lightest naval INS	New user friendly HMI ¹	Shock: MIL STD 810 E & MIL S 901
Weight < 14 kg	Optimized interface with CMS ²	Vibration (w/o external dampers): IEC 60945 & MIL STD 167-1
Dimensions (mm) 253 x 262 x 414	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)

BLACK-ONYX™

Unlimited autonomy



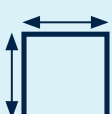


MTBF :
200,000h
5 year warranty



ITAR free



Unrivalled submergibility performance

 Optimized architecture	 Flexible interfaces	 Full naval MIL SPEC certified
The world's lightest submarine INS	New user friendly HMI ¹	Shock: MIL STD 810 E & MIL S 901
SWAP: Weight < 18 kg for Black-Onyx (< 25 kg for Dual Core)	Optimized interface with CMS ²	Vibration (w/o external dampers): IEC 60945 & MIL STD 167-1
Dimensions (mm) 253 x 262 x 414	Ethernet, RS-422, NMEA	Electromagnetic: MIL STD 461F
Consumption < 25 W (< 50 W for Dual Core)	Flexible interface library	Temperature: -10 °C to +55 °C (operation) -40 °C to +70 °C (storage T °C)
Strapdown, no moving parts		
Immune to magnetic stress		
Stealthy		

¹ Human Machine Interface
² Combat Management System

BLUENAUTE® FAMILY

COMPETITIVENESS FOR MARITIME OPERATIONS

- Best value maintenance free system.
- Outstanding reliability.
- Latest state of the art HRG technology.
- Immune to severe environmental conditions.

BLUENAUTE®

Robust & reliable
gyrocompass, AHRS & INS



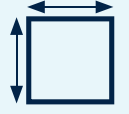


MTBF :
200.000h



in house



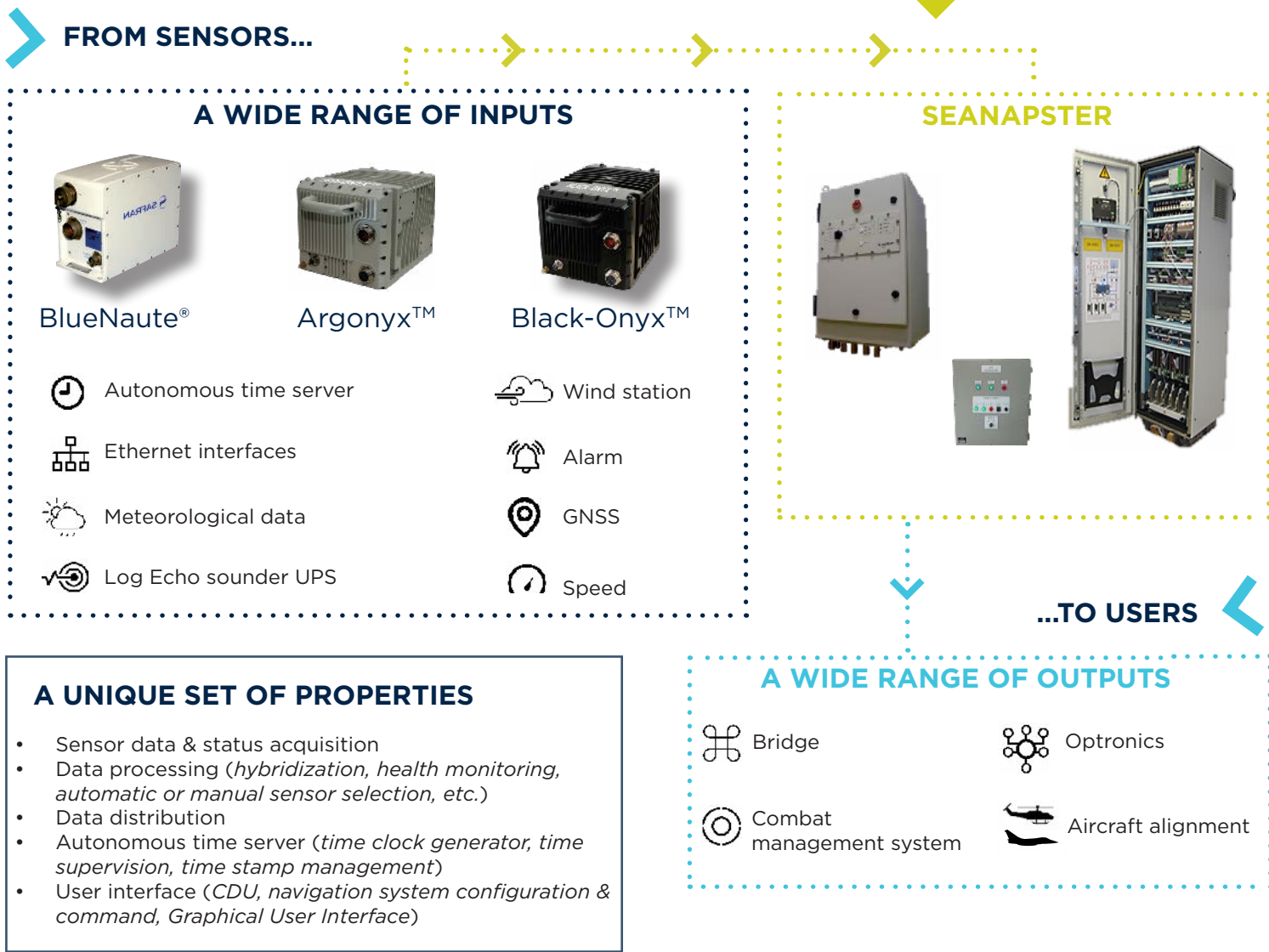
IMO & IMO HSC
certified

 Optimized architecture	 Robustness	 User friendly
Weight < 4.7 kg	Operational : -20°C to +60°C	COTS
Dimensions (mm) 208x275x136	Waterproofness : IP66	Easy installation
Consumption < 28 W		Maintenance free

SEANAPSTER, DATA DISTRIBUTION & PROCESSING CENTER FAMILY

SMART DATA ANALYSIS FOR NAVAL APPLICATIONS

Extracting the right information from a growing volume of data available onboard is increasingly challenging and time-consuming. Always attentive to its customers and partners, Safran has worked hard to offer new robust and capable Data Distribution & Processing Center, able to take up this new challenge. Because many ships require bespoke information distribution solutions, Seanapster is able to suit a large panel of military ships from patrol boats to frigates and submarines, and collects, processes & prioritizes real time data from various sensors. Seanapster then distributes the consolidated information to the relevant systems across your ship.

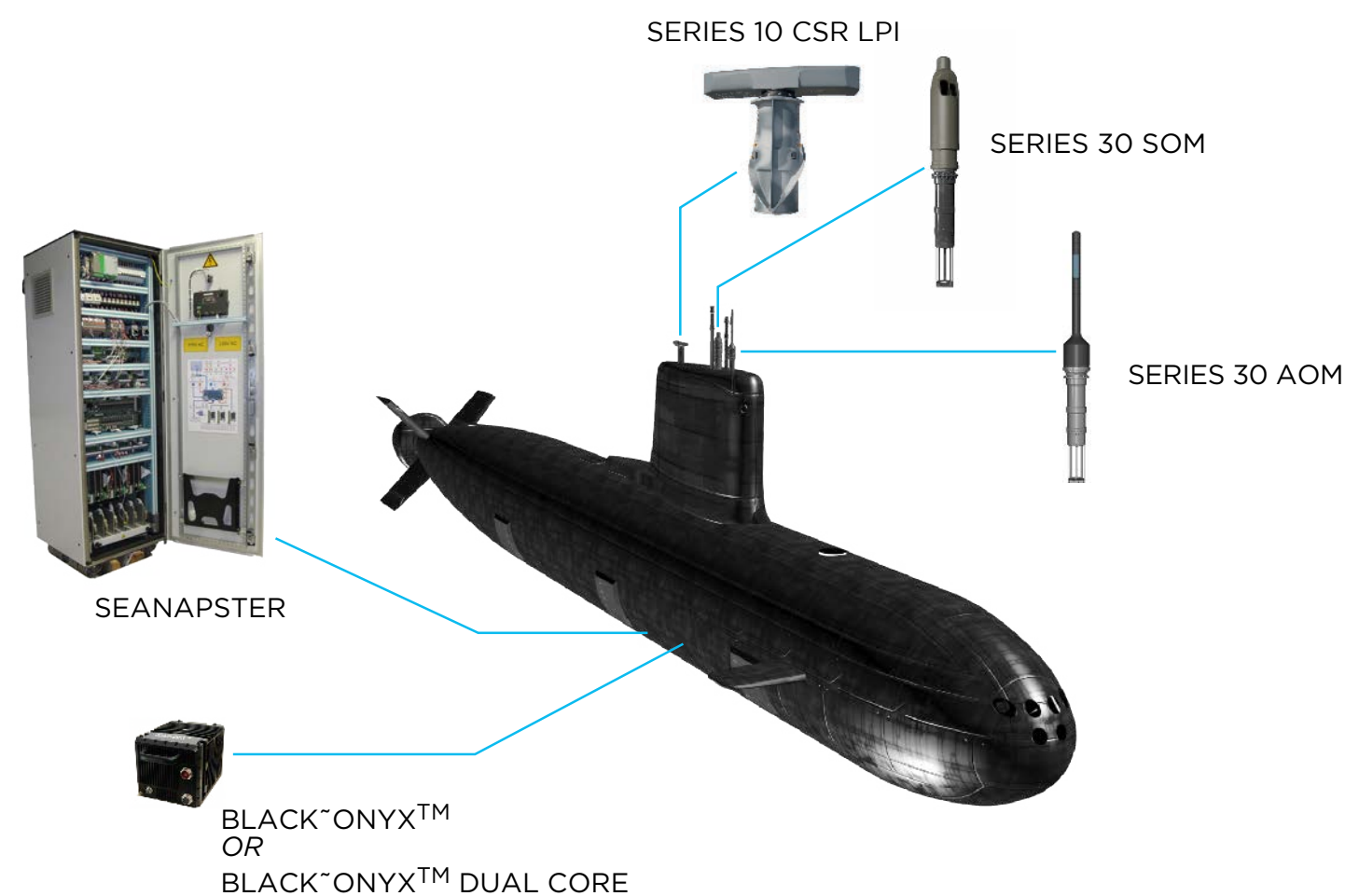


SAFRAN'S FULL SPECTRUM OF NAVIGATION SYSTEMS FOR COMBAT MISSIONS SUCCESS

FROM SURFACE VESSELS



TO SUBMARINES



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.



SIGMA 40, MAINTAINING THE NAVAL INS REFERENCE

For decades, Sigma 40 has been the world reference in naval applications. Safran will keep manufacturing and supporting Sigma 40 in order to meet costumers' requirements. Since flexibility is part of Safran's culture, interchangeability between Sigma 40 and Argonyx™ & Black-Onyx™ is ensured to provide customers a wide range of options and prepare the integration of the disruptive new Inertial Navigation Systems families.

OUR NAVAL REFERENCES

40 navies equipped with Safran's inertial systems worldwilde

