

AIRBORNE NAVIGATION SOLUTIONS

PNT

► THE RIGHT TECHNOLOGY FOR THE RIGHT APPLICATION

DECADES OF INERTIAL MASTERY, EVOLVING WITH EVERY NEEDS

RLG



Built a robust inertial foundation to replace legacy mechanical technology.

HRG



Extended performance, reliability and lifetime for demanding high-end missions.

MEMS



Enabled compact, scalable and cost-effective solutions for small UAV applications.

ONE HERITAGE

MULTIPLE MISSION-READY TECHNOLOGIES

Safran has developed proven expertise in all inertial technologies (Ring-laser, Fiber-optics, Hemispherical resonator, Micro-Electro-Mechanical Systems), based on 70 years of experience in designing and producing navigation systems for civil and military platforms operating in all environments.

Adapted PNT Resilience for Every Mission Need



BlackNaute™

Ultimate PNT resilience with integrated IDM, Atomic Clock, and Military Multi-constellation GNSS

SkyNaute™ + SkyLight™



Secure mono or bi-constellation GNSS with anti-spoofing/jamming capability via SkyLight™

SkyNaute™



Robust baseline resilience with HRG Crystal™ and hybrid INS/GNSS



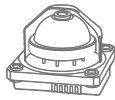
BlackNaute™

Embedded GNSS and Time INS (EGTI)

BlackNaute™ delivers next-generation Positioning, Navigation and Timing **resilience** for **advanced airborne platforms**.

Powered by Safran's patented **HRG Dual Core** technology, the **Skylight** multi-mode GNSS receiver **board** and an integrated **atomic clock**, BlackNaute™ sets a **new standard** for **resilient navigation**.

Designed to maintain **reliable performance** in **GNSS-denied** and **electronically contested environments**, it ensures exceptional **accuracy, autonomy** and **continuity** of operation under the most **demanding mission** conditions.



HRG Dual Core Technology

Virtually unlimited operational lifetime



GNSS-Denied Resilience

Easy integration of Alternate Hybridization Navigation (AHN)



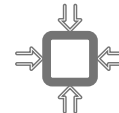
Atomic Clock Precision

Ultra-accurate time delivery for critical missions



Multi-Constellation GNSS

Combines military and civilian GNSS signals



Optimized SWaP

Up to 25% reduction versus market standards



Anti-Jam & Anti-Spoofing Capability

Advanced anti-spoofing and interference mitigation



Modular Open Architecture

Designed to ease integration with external sensors



ITAR-Free Design

Exportable solution without regulatory constraints

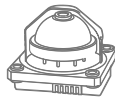


SkyNaute™

Inertial Navigation System (INS)

Perfectly suited to **civil** and **military transport aircraft, helicopters** and **UAVs**, SkyNaute™ sets the new standard for cost-effective, performance and Size, Weight & Power (**SWaP**) oriented solution.

Thanks to the **HRG** Crystal Hemispherical Resonator Gyroscopes, SkyNaute™ is the **most competitive aeronautical navigation system** on the market.



HRG Technology

Virtually unlimited operational lifetime



Modular Architecture

Adaptable design tailored to mission needs



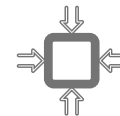
Life-Cycle Efficiency

Unmatched cost efficiency over product lifetime



Easy Installation

Flexible integration with minimal constraints



Optimized SWaP

Up to 35% reduction versus market standards



RNP/RNP-AR Compliance

Enhanced protection for precision approach operations



Avionics Integration Ready

Native compatibility with FBW, SVS, and HUD



ITAR-Free Design

Exportable solution without regulatory constraints



SkyNaute™ seamlessly **integrates** with Safran's **Skylight™** secure GNSS receiver to deliver a **resilient hybrid PNT solution**, combining high-precision HRG-based inertial navigation with multi-constellation and military-grade GNSS (**GPS M-Code** and **Galileo PRS**).



SkyLight™

Civil/Military GNSS Mono or Bi-constellations GNSS Receiver



SkyLight™ is a **dual** civil and military **GNSS receiver** designed to deliver **secure, flexible** and **high-precision positioning** across a wide range of platforms.

Supporting **mono** or **bi-constellation** operations, it enables access to both standard and encrypted signals, including **M-Code** and **Galileo PRS**, ensuring **reliable navigation** in **contested environments**.

Designed to operate with **anti-jamming antennas** and **fully compatible** with the **SkyNaute™** inertial navigation system, SkyLight™ integrates seamlessly into resilient Position Navigation and Timing (PNT) architectures.



Dual Civil/Military GNSS

Supports both civil and military signals



Multi-Constellation Flexibility

Mono or bi-constellation configuration



Secure GNSS Access

Access to encrypted GNSS services including M-Code and PRS



Anti-Jam & Anti-Spoofing Capability

Embedded anti-jam protection with CRPA-compatible positioning resilience



Dual-Frequency Accuracy

Improves positioning precision through multi-frequency GNSS reception



Modular Architecture

Scalable architecture with optional atomic clock integration



Certified Integration

Compliant with civil and military standards



Platform Versatility

Designed for seamless integration across air, land and defense systems



Sigma 95N

Inertial and Hybridized Navigation System



Designed for advanced fighters, helicopters, and tactical aircraft, SIGMA 95N integrates **high-performance hybrid inertial navigation** into a **compact, single LRU**, ensuring precision and robustness across all mission phases.

Leveraging Safran's **32 cm digital Ring Laser Gyros** and **advanced Kalman filtering**, it delivers accurate navigation and reliable alignment in both static and dynamic conditions.

Its **open architecture** enables seamless integration of multi-constellation GNSS and **onboard sensors**, offering high flexibility for platform integration.



High-Grade Navigation Performance

Precision navigation in GNSS-denied environments



Combat-Proven Reliability

Trusted performance across real operational missions



Modular Interfaces

Flexible connectivity for multiple system integrations



High-Accuracy RLG technology

32 cm digital gyros for superior precision



Multi-Sensor Integration

Compatible with all major navigation sensors



High Availability Design

Reliable system ensuring maximum aircraft readiness



Flexible Maintenance

Support from operational to depot-level maintenance



ITAR-Free Design

Exportable solution without regulatory constraints

Combat-proven on over **1,000 aircraft** for more than **15 years**, SIGMA 95N combines **reliability, performance**, and **simplified maintenance** to maximize operational availability.





ICONYX™ HP

Tactical Grade Inertial Measurement Unit

The **ICONYX™ HP** IMU, featuring Safran's **HRG Crystal™ technology**, offers **unparalleled navigation performance** in GNSS-denied environments.

Designed for **precision** and **reliability**, ICONYX™ HP integrates **three HRG Crystal™ gyroscopes** and **three closed-loop MEMS accelerometers**, delivering exceptional accuracy in a compact package.

With **best-in-class SWaP** (Size, Weight, and Power) characteristics, ICONYX™ is an ideal choice for **demanding missions** requiring **proven, combat-tested technology**.



Tactical-Grade Precision

High-performance guidance for demanding missions



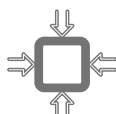
Combat-Proven HRG

Superior accuracy with proven gyro technology



GNSS-Denied Capability

Reliable operation in contested environments



Compact High-End Design

Top-tier performance in a compact form



Extreme Environment Readiness

Maintains high performance in harsh conditions



Mission-Tailored Range

HP-15, HP-30 and HP-100 tailored to different needs



Fully Controlled Technology

100% in-house design and supply chain

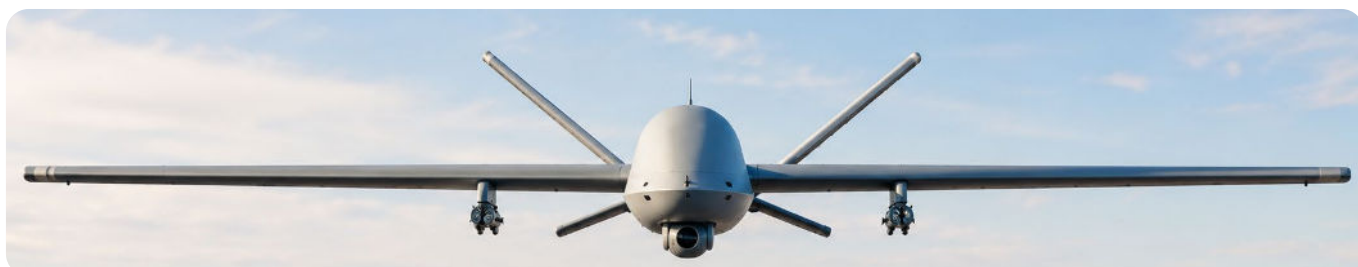


ITAR-Free Design

Exportable solution without constraints



Safran proposes an IMU based on **Hemispherical Resonator Gyroscope**, the HRG Crystal™. This **technology** is **combat proven** for **15 years** and is extremely accurate, reliable and can navigate in the most contested GNSS-denied environments.



STIM300

Tactical Grade Inertial Measurement Unit



STIM300 is a small, **tactical grade**, low weight, high performance non-GPS aided Inertial Measurement Unit. It contains 3 highly accurate **MEMS gyros**, 3 high stability **accelerometers** and 3 **inclinometers**. The IMU is **factory calibrated** and compensated over its entire operating temperature range.

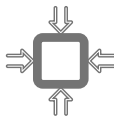
STIM300 is a cost-effective **ITAR free solution** for systems that only had FOGs as an alternative when reaching for the performance level of that STIM300 can offer.

Suited for **stabilization**, **guidance** and **navigation** applications in Industrial, Aerospace and Defense markets.



Rugged MEMS Performance

Reliable precision in harsh environments



Compact Tactical Design

High performance in ultra-compact form



Multi-Sensor Integration

Gyros, accelerometers, and inclinometers combined



Field-Proven Reliability

Trusted across defense and aerospace missions



Low Sensitivity Design

Stable performance under vibration/shock and Insensitive to magnetic fields



Flexible Data Configuration

Tailored outputs for diverse applications



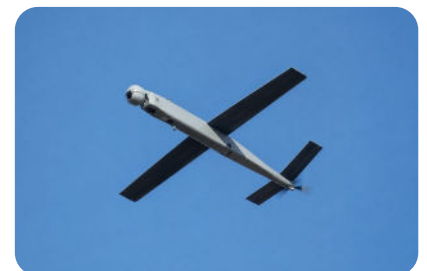
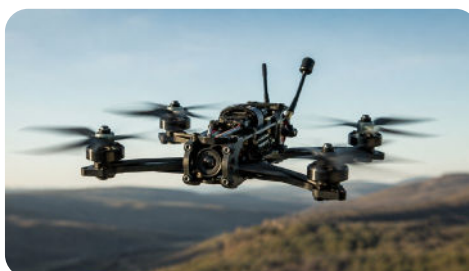
Embedded Health Monitoring

Continuous system integrity tracking



Cost-Efficient Alternative

High-performance replacement for FOG systems

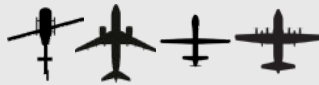




SCALING NAVIGATION RESILIENCE TO EVERY MISSION NEED

**SAFRAN INS PORTFOLIO
TAILORED TO YOUR MISSIONS**

INS PORTFOLIO

	 SkyNaute™ (HRG) 	 Sigma 95N (RLG) 	 BlackNaute™ (HRG) 
Size & Weight	3L/3kg	16L/15kg	7L/7kg
Interfaces	ARINC 429 ; RS 422 ; Ethernet ; Ship Alignment	MIL-STD-1553 ; RS 422	MIL-STD-1553 ; RS 422 ; ARINC 429 ; Ethernet ; CRPA Compatible ; Ship Alignment ; TSN (Growth Potential)
Position Drift*	1Nm/h	0.5Nm/h	<0.4Nm/h
Attitudes*	0.05°	0.03°	<0.01°
Heading*	0.2°	0.06°	<0.06°
Alignment Time	5 min	4 min	4 min
MTBF	55,000FH	20,000FH	>33,000FH
NAVWAR capability	4 hours autonomy in GNSS Denied/Spoofed missions	8 hours autonomy in GNSS Denied/Spoofed missions	Full PNT autonomy for 18 hours in GNSS denied/spoofed missions
GNSS Receiver	Two external multi- constellation (civil ARINC 743 or military) ; Compatible SBAS hybridization	Internal GNSS (GPS, GLONASS, IRNSS, BEIDOU)	Multi-constellation: GPS M-Code, Galileo PRS Add-ons : GLONASS, IRNSS, BEIDOU SBAS
Precise Timing	-	-	Embedded Atomic Clock Output: 1PPS, IRIG-B, HQ, 10MHz, Ethernet 1Gbps NTP/PTP
Certifications	TSO: C201/C220 DAL A (DO-178/DO-254)	Military Certification	TSO: C201/C220/C145d DAL A (DO-178/DO-254) MOSA

*TCEP50/RMS

**POWERED
BY TRUST**

