

# Astrix NS

## The new 3-axis Fiber-Optic Gyroscope for space applications

Based on FOG technology mastered by Exail and qualified for space by Airbus Defence and Space, Astrix NS addresses the new challenges of the space industry. It brings high inertial performance and reliability in a compact design and at a very competitive price.



### FEATURES

- ARW at  $0.005^{\circ}/\sqrt{h}$  (standard performance) and down to  $0.0025^{\circ}/\sqrt{h}$  (high performance)
- Compact and lightweight product
- Electronic design based on automotive components qualified for space operation by Airbus Defence & Space
- Competitive price
- Radiation compatible for GEO and LEO missions including EOR
- ITAR free

### APPLICATIONS

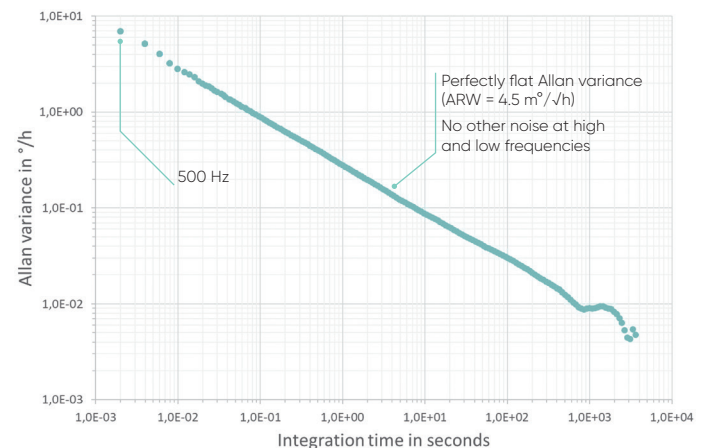
Astrix NS is compatible with missions in low Earth orbits and in geostationary orbit including electrical orbit rise.

Astrix NS is the perfect choice for both telecom satellites with its high reliability and Earth observation satellites with its unrivaled inertial performance.

Astrix NS is also well-suited for constellations that require compact and competitive equipments that can be produced in volume and with short lead time.

### BENEFITS

- Highly reliable thanks to the FOG technology and 20 years of experience in space products.
- Solid-state technology proven with more than 6 000 000 hours of cumulative flight on more than 40 major satellites without incident
- Quick start-up and relevant data availability ( $< 1$  s) allowing a stop&go use of the gyro
- No complex and costly recalibration needed during operation
- Pure ARW noise, i.e. no disturbing AWN, flicker noise or white noise (see figure below)



## TECHNICAL SPECIFICATIONS

### Performance

Bias stability over 1 h (steady temperature)	< 0.005°/h
Bias knowledge	< 0.2°/h
Scale factor knowledge @ 3σ	< 200 ppm
Scale factor stability over the mission lifetime @ 3σ	< 200 ppm
Orthogonality knowledge	< 175 μrad
Measurement range (full performance)	60°/s qualified. Higher speed on demand
ARW standard performance design	< 0.005°/√h
ARW high performance design	< 0.0025°/√h
No other noise than ARW for FOG technology i.e. no AWN, no flicker noise and no white noise...	

### Environment / Operating conditions

Temperature	-20°C to 65°C (operating)
Vibration	25 g sine and 25 g rms random
Shock	2 000 g from 1 000 Hz to 10 kHz
Radiation	> 25 krad at component level i.e. compatible with GEO 15 years with its integrated shielding
Lifetime	up to 15 years and compatible GEO, EOR and LEO

### Mechanical interfaces

Mass	1.4 kg
Volume	100 x 100 x 100 mm

### Electrical interfaces

Power bus	20 V – 52 V
Start-up and access to relevant data	< 1 s
Communication	2x RS422 / RS485 full duplex
Power	8W (BOL)

## FOG TECHNOLOGY

Exail is recognized throughout the world for its pioneering work on the development of the ultimate-performance Fiber-Optic Gyroscope (FOG), a unique technology at the heart of its inertial navigation systems.

The FOG is an extremely high-performance rotation sensing device based on the Sagnac Effect discovered at the beginning of the 20th century.

A fiber-optic gyroscope uses optical waves propagating in a fiber-optic coil to accurately measure a rotation rate. This apparently simple design takes full advantage of the reciprocity principle in the propagation of light which enables a perfect device to be created from imperfect components. Exail is providing FOG products for many challenging applications like submarines, deep-sea AUV, naval force, satellites...