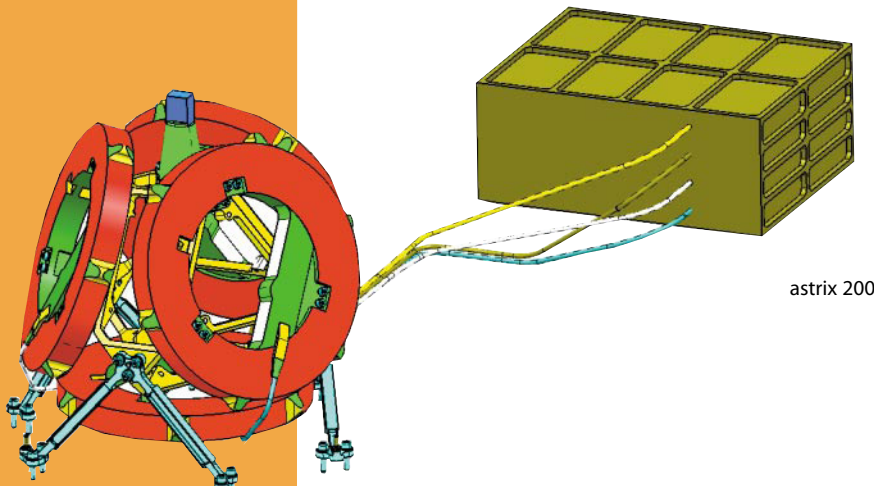


astrix 200

A Very High Performance FOG Inertial Measurement Unit for Accuracy demanding Satellites



astrix 200

astrix 200 is made of 4 independent closed loop FOG 200 gyroscope channels offering one redundancy and a failure detection capability.

The sensing fiber optic coils are skewed in a tetrahedral configuration on an ICU (Inertial Core Unit), deported from the associated GEU (Gyro Electronic Unit).

Moreover, the 4-axis configuration improves the nominal performances by using 4 channels ON at the beginning of the mission (then 3 channels ON after one failure).

Application Fields

- Earth observation satellite
- Accurate scientific satellite

References / Customers

- CNES

Availability

Flight models from mid 2005

Main features

	ICU	GEU
Mass	4,5 kg	5 kg
Volume	$\phi 300 \times h 260 \text{ mm}^3$	$260 \times 200 \times 105 \text{ mm}^3$
Power	6 W max per ON channel	

Benefits

- 4 independent angular rate detection axes in a skewed configuration
- ICU materials compatible with optical payload
- very high inertial performances (very low noise in particular)
- 5 year continuous operation
- 1553B digital interface
- electrical stimulation capability for internal testability and SCAO ground test.

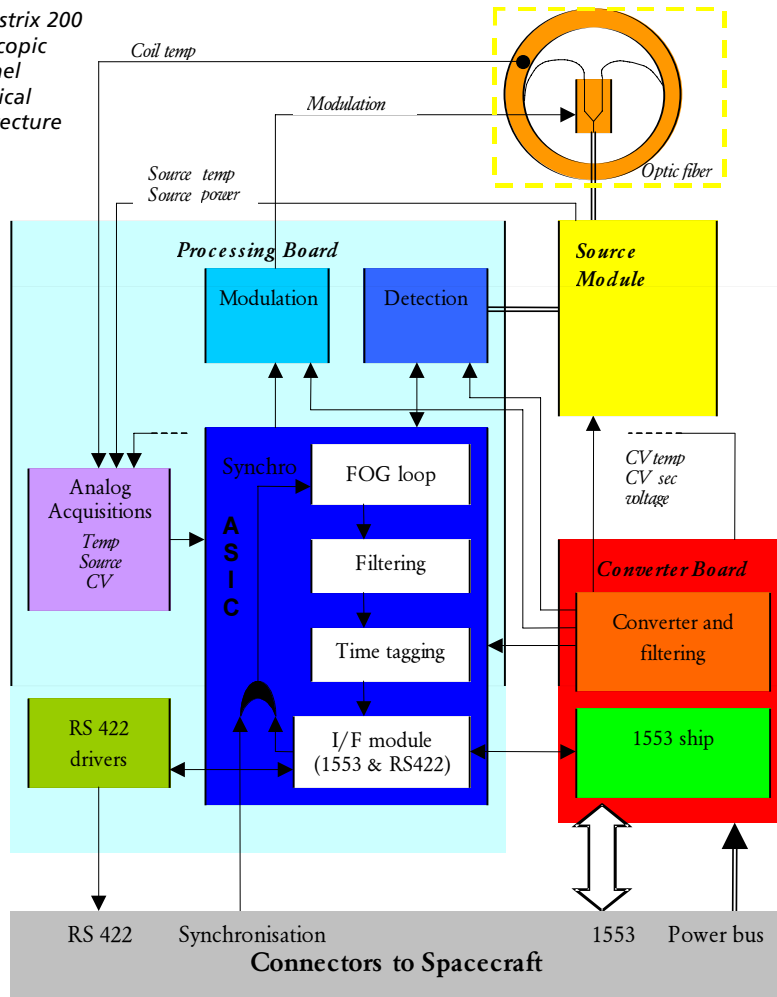
Interfaces

- 1553 data bus interface (one per channel)
- RS 422 stimuli and data interface
- external synchronisation link interface for high accuracy time tagging
- 21 - 51V power bus

Environments

- Thermal:
 - ICU: +20 to +30°C
 - GEU: -10 to +40°C
- Vibrations: 18.2 gRMS, 20g sine
- Shocks : 800g SRS 2000Hz/10kHz

one astrix 200
gyroscopic
channel
electrical
architecture



Performances, after compensation, at input axis level

Full performance measurement range		$\pm 5 \text{ }^\circ/\text{s}$
Measurement range		$\pm 10 \text{ }^\circ/\text{s}$
Scale factor value		0.005 arcsec/increment
Scale factor knowledge and stability		
- linearity - asymmetry	3σ	< 10 ppm
- stability over 1 month and orbital thermal range	max	< 15 ppm
- thermal sensitivity	max	< 100 ppm
- stability end of life (all effects included)	max	< 300 ppm
Bias knowledge and stability		
- bias repeatability between ON/OFF	3σ	< 0.01 $^\circ/\text{h}$
- stability over 1 hour	3σ	< 0.002 $^\circ/\text{h}$
- magnetic sensitivity	3σ	< 0.001 $^\circ/\text{h}/\text{G}$
ARW	1σ	< 0.0002 $^\circ/\sqrt{\text{h}}$ (end of life)
Alignment stability (over orbital thermal range)		
- relative (inter axes of a same ICU)	max	< 1 arcsec (half cone angle value)
- absolute (wrt mechanical reference)	max	< 1 arcsec (half cone angle value)

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