Space Equipment
Avionics

ASTRIX® 1000 SERIES

A three axis inertial measurement unit, versatile, multipurpose, with the inherent characteristics of Astrix family: reliability and performance

Astrix® 1000 provides the satellite AOCS with a three axis measurement of the rotation with a very high reliability level, adapted to 15 years GEO mission in continuous operation.

One compact box implements three gyros oriented on the three faces of a corner cube, and their relevant electronics. The use of 2 Astrix® 1000 offers very simple and reliable redundancy architecture.

It is proposed as an option with 3 additional accelerometers as a full navigation capability, for deep space missions.

Astrix® 1000 is designed to operate within the radiation worst case environment, compatible with the environment of 15 years life time GEO Telecom missions.

The EEE, opto-electronics and opto components are fully compliant to HiRel Telecom satellite standard (ECSS-Q-ST-60 C class 1 or equivalent).

KEY FEATURES

- High inertial performance: high resolution and stability, very low noise from low to high frequency
- Two version to fit with system need: Astrix® 1120 and Astrix® 1090
- 3 axis inertial detection, redundant by the use of two Astrix® 1000 Series
- Improved reliability thanks to the limitation of the number of component and the use of HiRel component
- More than 15 years continuous operation (no life limited item) thanks to FOG technology
- Built-In-Test at equipment level
- Option for a full inertial measurement unit with the implementation of 3 accelerometers in the same box
- 1553B and RS422 digital interface
- Stimulation capability for AOCS ground test

MAIN APPLICATION FIELDS

- LEO, MEO and GEO satellite
- Deep sapce probe with un-limited life time

ENVIRONMENTS / RELIABILITY

- Thermal: -25°C, +60°C (operating)
- Vibrations: 25g sine, 20grms random
- Shocks: 2000g over 1000Hz to 10kHz
- Radiation: 100krad total dose, SEP tolerant, latchup immune
- Lifetime: up to 15 years, no wear out
- EMI/EMC: MIL-STD-461

BUDGETS

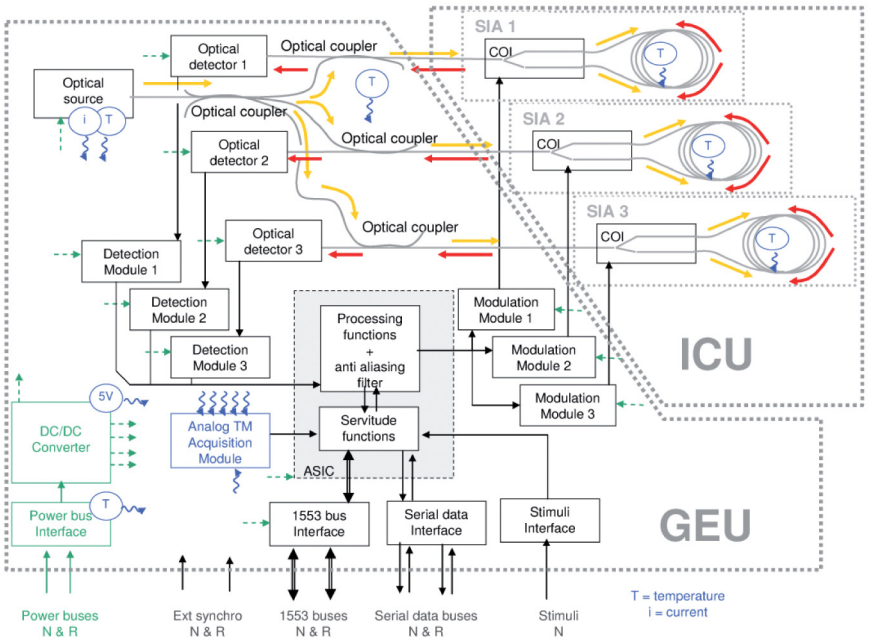
- Mass: 4.5kg
- Volume: ø 263 x h 192mm footprint
- Power: 13.5W

INTERFACES

- Power bus: 22-50V
- Turn-on: < 3s
- Dialog: 1553, RS422
- Synchro hardware 1553/RS422 broadcast or autonomous mode
- Testability BIT, RS422 stimulation for AOCS test

AIRBUS

Astrix® 1000 gyroscopic channel architecture



Performances, end of Life, after 15 years continuous operation

	Astrix® 1090	Astrix® 1120
Full performance measurement range	± 20°/s	
- Start up time	3s	
- Measurement range	± 20°/s	
- Scale factor value	± 140°/s 0.0132 arcsec/LSB	
Scale factor knowledge and stability		
- Linearity - Asymmetry 3 σ	< 500ppm	< 40ppm
- Thermal sensitivity (over 15°C) 3 σ	< 400ppm	< 50ppm
- Stability after launch environment 3 σ	< 300ppm	< 130ppm
- Stability end of life 3 σ (all effects included)	< 500ppm	< 300ppm
Bias knowledge and stability		
- Stability over 1 hour	< 0.01°/h	< 0.003°/h
- Thermal sensitivity (over 15°C)	< 0.03°/hv	< 0.01°/h
- Stability after launch environment	< 0.09°/h	< 0.02°/h
- Stability end of life (all effects included)	< 0.30°/h	< 0.05°/h
Noise		
ARW 1 σ	< 0.005°/√h	< 0.002°/√h
No other noise contributor (AWN, RF, etc.)		
Alignment stability (over mechanical and Thermal environment)		
- Absolute (wrt mechanical reference) max	< 1100 arcsec (0.03°)	< 40 arcsec
- Relative (inter axes) max	< 5 arcmin (0.08°)	< 0.5 arcmin

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