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 space probe with un-limited life time

ENVIRONMENTS / RELIABILITY
• Thermal: -25°C, +60°C (operating)
• Vibrations: 25g sine, 20g rms 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
Performances, end of Life, after 15 years continuous operation

**Full performance measurement range**
- 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
- Thermal sensitivity (over 15°C) 3 σ: < 400ppm
- Stability after launch environment 3 σ: < 300ppm
- Stability end of life 3 σ: < 500ppm
  (all effects included)

**Bias knowledge and stability**
- Stability over 1 hour: < 0.01˚/h
- Thermal sensitivity (over 15°C): < 0.03˚/h
- Stability after launch environment: < 0.09˚/h
- Stability end of life: < 0.30˚/h
  (all effects included)

**Noise**
- ARW 1 σ: < 0.005˚/√h
  No other noise contributor (AWN, RF, etc.)

**Alignment stability (over mechanical and Thermal environment)**
- Absolute (wrt mechanical reference) max: < 1100 arcsec (0.03°)
- Relative (inter axes) max: < 5 arcmin (0.08°)

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