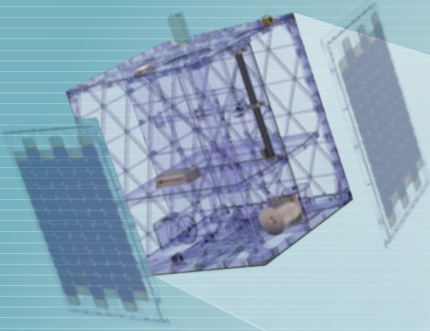


STELLAR GYRO



PERFORMANCE

NSGY

FUNCTIONAL CHARACTERISTICS

Rate estimation accuracy	≤ 0.05 degrees [3σ error]
Stellar visible magnitude	≥ 5.0 Mv
Maximum number of stars tracked	16
Maximum tracking rate	≥ 0.5 degrees/sec
Standard update rate	>1 Hz

PHYSICAL CHARACTERISTICS

Dimensions	90 x 95 x 40 mm ³ (CubeSat format)
Mass	70 g

ENVIRONMENTAL CHARACTERISTICS

Thermal (operational)	-25°C to +50°C
Vibration (qualification)	14g RMS (random)

INTERFACES

Power supply	3.3V + 5V DC, <200 mW (average)
Data	UART, I2C
Connector	PC/104 Bus Compatible
Mechanical	PC/104 Bus Compatible, 4 x M3 Through Hole

CONFIGURATION MANAGEMENT: Specifications are subject to change. Please refer to latest version.



FEATURES

- Active pixel CMOS detector
- Small size and low mass
- No baffle required
- Low power
- Simple to interface
- Immune to Moon and Earth in FoV

APPLICATIONS

- High performance 3-axis rate sensor
- Full sky sensor for agile satellites

QUALIFICATION

The Stellar Gyro has passed through qualification testing and is due for first launch in 2019.

UTILITY

The NewSpace stellar gyroscope uses a COTS sensor and optics resulting in a very low-cost attitude determination system that maintains accuracy during the eclipse phase. It can achieve this by using algorithms that tolerate noise and does not require a star database. It is thus far more robust against radiation damage than a standard star mapper solution would be if based on the same components.

The NewSpace stellar gyroscope can be used to propagate a spacecraft's attitude from a known initial condition, without drift, while sufficient stars are common across frames. The image-based rotation estimates can complement a set of MEMS rate gyroscopes to maintain a high accuracy attitude estimate at low angular rates (where MEMS gyroscope drift is most severe).