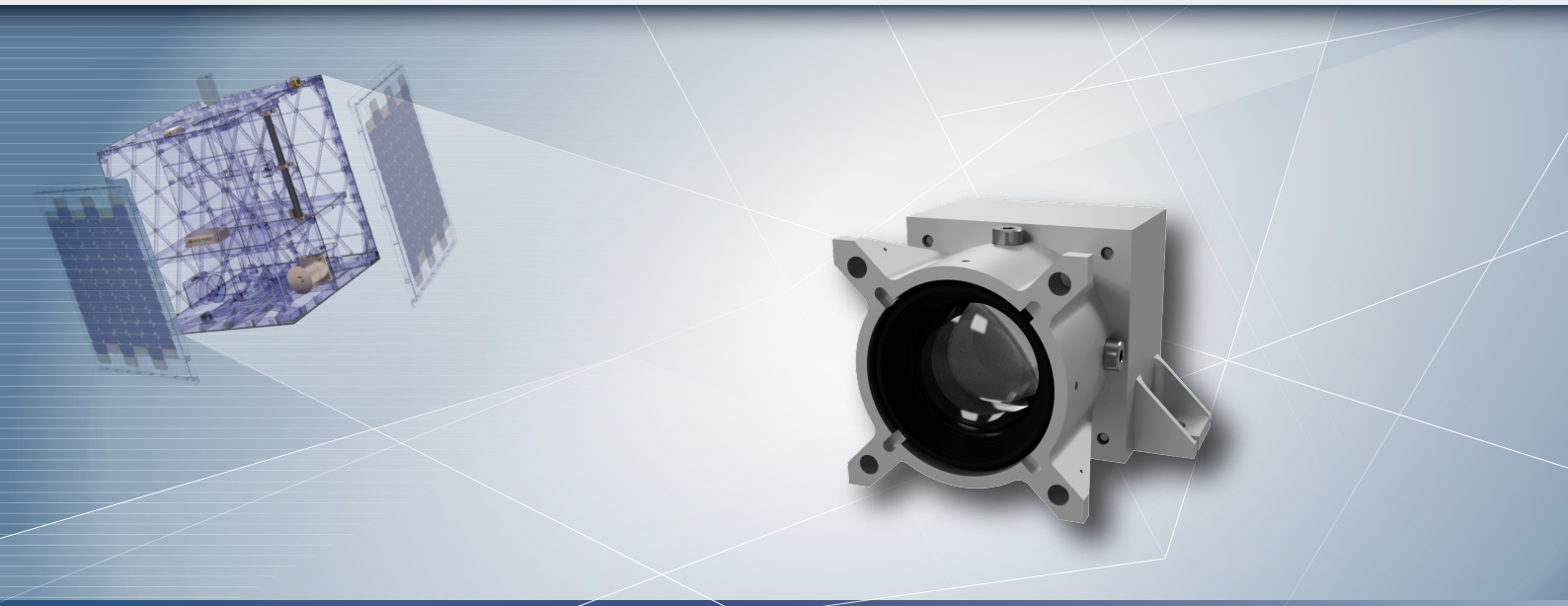
STELLAR GYRO



PERFORMANCE

	NSGY-001
FUNCTIONAL CHARACTERISTICS	
Rate estimation accuracy [3σ]	≤0.20 degrees/s (boresight) ≤0.05 degrees/s (cross-boresight)
Maximum slew rate	≥1.00 degrees/s
Detection capability	Mv ≥5.0
Maximum number of features tracked	15
Standard update rate	>1 Hz
Sky coverage	>99%
PHYSICAL CHARACTERISTICS	
Dimensions	37.0 mm x 35.5 mm x 49.0 mm
Mass	<55 g
ENVIRONMENTAL CHARACTERISTICS	
Thermal (operational)	-25 °C to +50 °C
Vibration (qualification)	14 g_{rms} (random)
INTERFACES	
Power supply	5 V_{DC}
Power Consumption	<200 mW (average)
Communication	SPI
Connector	nano-D (P15)
Mechanical	Front: 3 x M3 (w/ alignment slots) Top: 2 x M3 (w/ alignment slots)

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

NEWSPACE SYSTEMS

STELLAR GYRO

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 2020.

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).

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NEWSPACE SYSTEMS