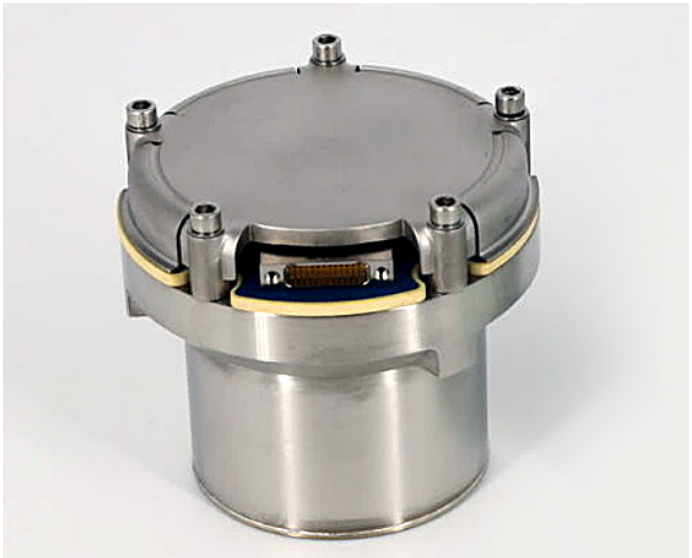
LR-450 Inertial Measurement Unit (IMU)

High Performance Space IMU

Introducing the LR-450—the new standard for long-life and high-performance space missions, as an alternative to first-generation ring laser gyroscopes (RLG). Measuring just 341 cubic-inches, weighing under 10 pounds and requiring less than 15 watts of power, the LR-450 is well suited for mid-size satellite and deep space applications.



mHRG™ Precision Space Gyroscope

The LR-450 incorporates Northrop Grumman's milli-HRG™ (mHRG™) Precision Space Gyroscope, which uses the same critical quartz components—high-Q resonator and inner electrode assembly—employed in Northrop Grumman's proven hemispherical resonator gyroscope (HRG) technology. The HRG has achieved more than 70 million error-free hours in space missions.

A single LR-450 can take the place of two RLG IMUs, optimizing SWaP-C for a typical 15-year mission.

DESCRIPTION

The mHRG™, known for its unmatched reliability in commercial, government and civil space missions, is inherently stable, with no wear-out mechanism, and has high tolerance to radiation effects.

LR-450 configurations include:

- Three mHRGs™. The inertial instruments are arranged as an orthonormal set
- Single integrated interface to power supply, communications bus, digital processor and control electronics
- Optional—a fourth gyro
- Optional—a set of three accelerometers

NORTHROP GRUMMAN

northropgrumman.com

APPLICATIONS

The LR-450 is ideally suited for pointing, stabilization and platform attitude control applications, including:

- Deep space missions
- Planetary missions
- Orbital missions, including GEO, MEO and LEO at all inclinations

ADVANTAGES

The LR-450 provides customers with a robust and high-reliability system.

- Supports 1553, RS-422 and Ethernet protocols for easy integration into new and existing platforms
- Stable, low-noise gyros with no wear-out mechanism
- Inherent radiation hardness of mHRG™, along with space-hardened and high-reliability components
- Designed for 15-year lifetime
- Components proven in the HRG, with more than 70 million error-free hours of operation in space

SPECIFICATIONS

SWaP	
Size	8.6" x 6.3" x 6.3"; 341 in^3
Weight	<10 lbs
Power	<15W, 28V Input Voltage
Performance	
ARW	< 0.003 deg/rt-hr
Bias	< 0.003 deg/hr
Scale Factor	10 ppm
Range	±15 deg/sec / ±400 deg/sec
Environments	
Temperature	-35°C to 65°C
Radiation	100 kRad Total Dose
Vibration	18.86 Grms (20 – 2000 Hz)
Mission Life	15 years

FOR MORE INFORMATION, PLEASE CONTACT:

Northrop Grumman
Mission Systems
1-866-NGNAVSYS (646-2879)
www.northropgrumman.com

northropgrumman.com

NORTHROP GRUMMAN