

Super-Tactical (TAC) Inertial Measurement Unit (IMU)

The L-3 Super-TAC IMU bridges the performance gap between tactical grade and navigation grade inertial measurement units in a small, lightweight robust package.



DESCRIPTION

The Super-TAC IMU integrates three fiber optic gyros that exceed tactical grade performance with three high-accuracy Micro-Electro-Mechanical Systems (MEMS) accelerometers and state-of-the-art support electronics in a single small, lightweight package. This solution addresses the need for superior inertial performance in a tactical-grade package, critical for operation in GPS denied and contested environments.

The Super-TAC IMU measures change in velocity and angle, utilizing a configurable variable synchronous data link control (SDLC) digital serial bus. The Super-TAC is configured to offer customers the best value solution when designing new systems as well as provide the flexibility to upgrade existing platforms.

The Super-TAC IMU employs state-of-the-art optics with fewer components, providing significant performance and reliability improvements across standard military environments.

BACKGROUND

L-3 Space & Navigation, located in Budd Lake, NJ has been designing, developing and producing inertial components, sensors and navigation systems for Space, Ground, and Avionic applications for over 75 years. L-3 has been developing Fiber Optic Gyros (FOGs) since the early 1990s, producing and delivering IMU products with performance ranging from tactical to strategic grade.

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APPLICATIONS:

The L-3 Super-TAC IMU offers the highest bias stability and angle random walk available in tactical-grade inertial measurement units and is designed to be used in Avionic, Missile, Ground, Marine applications. The following is a representative list of system applications:

- Electro-optical/FLIR/Camera/Radar/
Laser Pointing / Stabilization
- Guidance/Navigation
- Motion Compensation
- Target Location Systems
- AHRS
- Autonomous Vehicle
- GNSS-aiding
- Oil and gas exploration
- Mapping/Survey
- UAV/UUV Flight Controls



CHARACTERISTICS

Interface	RS-422 Synchronous Data Link Control (SDLC) Gigabit Ethernet optional
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Power	10 W
Input Voltage	+5 VDC, ± 15 VDC

PHYSICAL

Weight	< 1.65 lb. (< 750 gm)
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Dimensions (not including connector)	3.52 in. diam. x 3.35 in. H 89.4 mm diam. x 85.1 mm H
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ENVIRONMENTAL

Temperature Range	-55 °C to 71 °C (continuous operation)
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Random Vibration	15 grms
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Shock	90 g, 6 ms terminal sawtooth
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Humidity	+60 °C 95% relative humidity
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NOTE: Product under qualification testing, performance and characteristics specifications are subject to change.

PERFORMANCE

GYRO PERFORMANCE

Bias Stability	< 0.05 °/hr. (1 σ)
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Angle Random Walk (ARW)	≤ 0.01 °/ $\sqrt{\text{hr}}$. (1 σ)
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Scale Factor Repeatability	≤ 100 ppm (1 σ)
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Scale Factor Linearity	≤ 50 ppm (1 σ)
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Angular Rate Range	1,000 °/sec
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Acceleration Range	100,000 °/sec ²
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ACCELEROMETER PERFORMANCE

Range	± 25 g
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Bias Variation	≤ 50 μ g (1 σ)
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Scale Factor Stability	≤ 300 ppm (1 σ)
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SYSTEM PERFORMANCE

Bandwidth (adjustable)	800 Hz (gyros) 150 Hz (accelerometers)
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MTBF	> 25,000 hr.
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