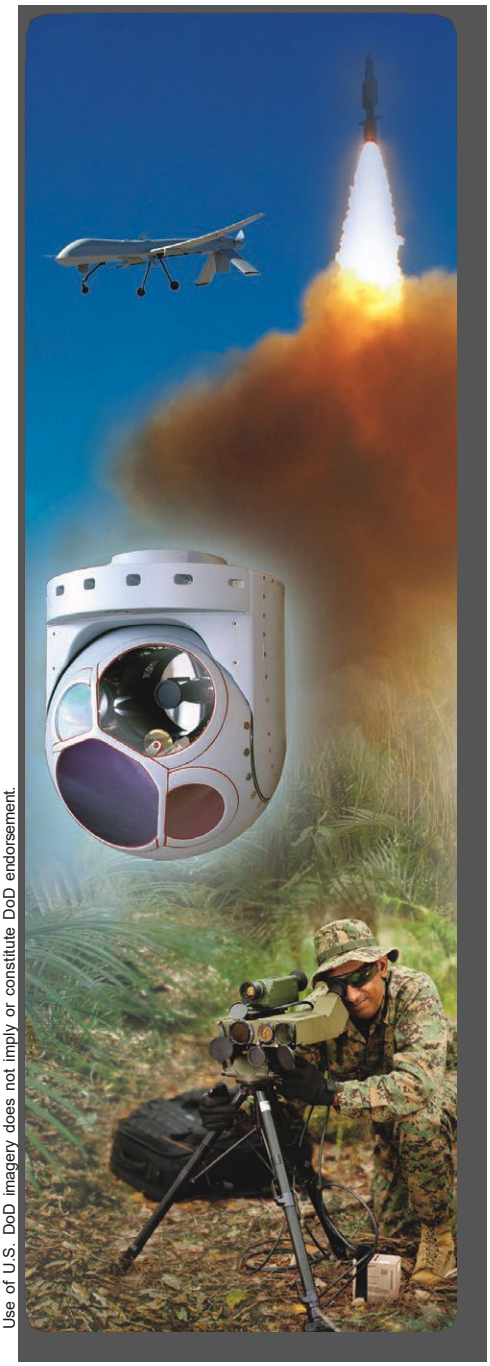
Super-Tactical (TAC) Inertial Measurement Unit (IMU)

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



Use of U.S. DoD imagery does not imply or constitute DoD endorsement.

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

EMCORE 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. EMCORE has been developing Fiber Optic Gyros (FOGs) since the early 1990s, producing and delivering IMU products with
performance ranging from tactical to strategic grade.

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

APPLICATIONS:

The EMCORE 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/FUR/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

PERFORMANCE

GYRO PERFORMANCE	
Bias Stability	< 0.05 °/hr. (1σ)
Angle Random Walk (ARW)	≤ 0.01 °/√hr. (1σ)
Scale Factor Repeatability	≤ 100 ppm (1σ)
Scale Factor Linearity	≤ 50 ppm (1σ)
Angular Rate Range	1,000 °/sec
Acceleration Range	100,000 °/sec^2

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

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

CHARACTERISTICS

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

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

ENVIRONMENTAL	
Temperature Range	-55 °C to 71 °C (continuous operation)
Random Vibration	15 grms
Shock	90 g, 6 ms terminal sawtooth
Humidity	+60 °C 95% relative humidity

NOTE: Product under qualification testing, performance and characteristics specifications are subject to change.

EMCORE Space & Navigation

450 Clark Drive

Budd Lake, NJ 07828

Tel: 973.446.4000

Fax: 973.446.4268