TAC-450-340 IMU

Photonic Inertial Measurement Unit

emcore®

Key Features

- Non-ITAR and compliant with EU import regulations
- Exclusive EMCORE PIC technology
- Available with 2g, 10g, 16g and 30g inertial-grade MEMS accelerometers
- Highly accurate 6-degrees-of-freedom angular rate and acceleration data
- Compact design with improved SWaP
- Affordable commercial-off-the-shelf (COTS) system
- Excellent shock and vibration performance
- Robust performance and survivability
- Backward compatible with existing EMCORE IMU/FOG equipment

Applications

- Autonomous vehicle navigation
- Antenna, camera, laser pointing, and stabilization
- GNSS-aiding
- AHRS, EO/FLIR stabilization
- Flight controls
- Mapping & surveying
- Oil & gas exploration/maintenance
- Autonomous guidance and positioning
- Motion sensing

Versatile, Highly Accurate Photonic FOG-based IMU for Demanding Fully Autonomous and Manned Applications

The new EMCORE TAC-450-340 IMU delivers exceptional performance thanks to EMCORE's exclusive photonic integrated chip (PIC) technology and high-performance inertial-grade MEMS accelerometers. EMCORE's PIC technology provides more efficient fiber optic gyroscopes (FOGs) over traditional open-loop FOG technology by replacing previously high-touch optical components with a single precision-manufactured silicon chip.

The versatile TAC-450 340-IMU offers flexibility with its wide range of high-end inertial-grade accelerometers, selectable baud rates, and input power levels. The non-ITAR TAC-450-340 IMU is fully-configurable by the end-user and provides outstanding performance for demanding applications such as autonomous platforms operating in the air, on land, and at sea.

The TAC-450-340 IMU offers excellent shock and vibration tolerance over competing technologies. Tactical-grade photonic FOGs are integrated with three low noise, inertial-grade MEMS accelerometers. The high-performance TAC-450-340 IMU is designed for systems and applications where low Angle Random Walk (ARW), bias instability, high scale factor accuracy, very high bandwidth, and low latency are critical parameters for success.

PIC Technology for Superior Performance

EMCORE's exclusive PIC technology uses an integrated planar optic chip, resulting in a sensor that delivers robust performance and survivability in challenging environments. With three integrated photonic gyros at its core, the TAC-450-340 IMU provides the essential precision navigational support that autonomous navigation and other applications demand.

Improved SWaP for Ease of Integration

The high-performance EMCORE TAC-450-340 offers great SWaP in a sturdy, compact package. Designed for drop-in replacement for many available IMUs, the TAC-450-340 IMU's flexible interface and programmable digital data simplify the integration of the TAC-450 system. This inertial sensor offers ease of integration for designers of higher-level inertial navigation, guidance, and stabilization systems by providing user-selectable features, including an adjustable baud rate to adjust communication latency to receive accurate, timely data. To maximize versatility, the TAC-450-340 IMU enables programmable message outputs from both the TAC-450-340 IMU's photonic FOGs and integrated high-grade accelerometers.

The TAC-450-340 IMU is ideal for autonomous platform navigation, precision pointing and stabilization, GNSS-aiding, mapping and surveying, guidance, positioning, and motion sensing.

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Performance Specifications – Gyros

Input Rate	±490°/sec (max)
Bias Instability (25°C)	≤0.05°/hr, 1σ (typical) ≤0.1°/hr, 1σ (max)
Scale Factor Non-linearity (full rate, 25°C)	≤50 ppm, 1σ (typical)
Angle Random Walk (ARW) (25°C)	≤0.012°/√hr (≤0.7°/hr/√Hz)

Performance Specifications – Accelerometers

	2g	10g	16g	30g
Input Range	±2g (max)	±10g (max)	±16g (max)	±30g (max)
Bias Instability (25°C)	3 µg, 1σ	15 µg, 1σ	24 µg, 1σ	45 µg, 1σ
Velocity Random Walk (25°C)	7 µg/√Hz	34 µg/√Hz	54 µg/√Hz	102 µg/√Hz
Bandwidth (-3 dB)	≥200 Hz	≥200 Hz	≥200 Hz	≥200 Hz

Environment

	2g	10g	16g	30g
Temperature (operating)	-40°C to +75°C (-40°F to +167°F)	-40°C to +75°C (-40°F to +167°F)	-40°C to +75°C (-40°F to +167°F)	-40°C to +75°C (-40°F to +167°F)
Shock (operating)	9g (11 ms, sawtooth)	9g (11 ms, sawtooth)	15g (11 ms, sawtooth)	28g (11 ms, sawtooth)
Vibration (operating)	8g rms (20-2000 Hz, random)	8g rms (20-2000 Hz, random)	10g rms (20-2000 Hz, random)	12g rms (20-2000 Hz, random)

Electrical/Mechanical

Data Interface	RS-422 Full Differential, Asynchronous or Synchronous
Dimensions	88.9 mm Dia x 63.5 mm H (3.5" x 2.5")
Weight	0.7 kg (1.54 lbs)
Power Consumption	5 W (typical), 8 W (max)

For technical manuals, expanded specifications, and additional information, please visit: **emcore.com/nav/support**

RoHS Compliant

WEEE compliant

REACH

For More Information

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ISO9001 CERTIFIED