



DATASHEET | MAY 2022

Transforming Navigation



Applications

- Inertial Navigation System for UAVs/Drones
- Dismounted Soldier Applications
- Applications Where GPS Unavailable
- Oil and Gas Exploration
- Aeronautics and Civil Aviation

Key Performance Features

- Three-Axis, Precision Closed-Loop FOG:
 - Using EMCORE's proprietary FOG transceiver that enhances performance, increases reliability and lowers cost
 - More than double the fiber length of the legacy IMU
- Three Precision MEMS Accelerometers with Greater Pendulosity than Legacy Designs
- Next-Generation Field Programmable Gate Array (FPGA) Electronics
- Programmable (factory) I/O with Exceptional Flexibility
- Algorithms and Software:
 - Calibration parameters
 - Unit calibration and modeling
- The EN-300 is a Commercial Product that can be Licensed Under U.S. Department of Commerce for International Use

For Applications Where GPS is Unavailable or Denied

EMCORE has developed the Commercial Off-The-Shelf (COTS) EN-300 Precision Fiber Optic Inertial Measurement Unit (IMU) as a higher accuracy inertial system to be form, fit and function compatible with a legacy equivalent, but with better performance needed for:

- GPS denied navigation
- Precise targeting
- Line-of-sight stabilization

The EMCORE EN-300 is a state-of-the-art design incorporating EMCORE's proprietary integrated optics devices to enhance performance, providing up to ten-times better performance than competing systems. The internal signal processing provides full stand-alone navigation, and as an option can provide standard inertial measurement unit (IMU) delta velocity and delta theta.

Advantages

The EMCORE EN-300 provides lower noise and greater stability than competing IMUs and is able to statically find North to less than one degree through gyro-compassing. The EN-300's digital interface is fully programmable within EMCORE's factory allowing it to directly replace lower performing competing units. It has the same style connector, pinouts and signals as a commonly used FOG IMU from a leading competitor.

The EN-300 contains:

- Three precision FOGs
- Three precision MEMS accelerometers
- Electronics performing:
 - Embodying calibration parameters
 - System modeling



Performance Highlights

Parameter	EN-300-1	EN-300-3	EN-300-5
Gyro Performance (1σ)			
Bias (Over Temperature)	0.1°/hr	0.2°/hr	0.4°/hr
Bias In-Run Stability	0.02°/hr	0.04°/hr	0.08°/hr
ARW (Angle Random Walk)	0.008°/√hr	0.015°/√hr	0.03°/√hr
Bandwidth	<1000 Hz		
Accelerometer Performance (1σ)			
Bias (Over Temperature)	300 μg	500 μg	500 μg
VRW (Velocity Random Walk)	0.026 m/s/√hr	0.026 m/s/√hr	0.026 m/s/√hr

U.S. Patent No. 7,746,476; 8,773,665; 8,798,405; 8,823,946

EN-300

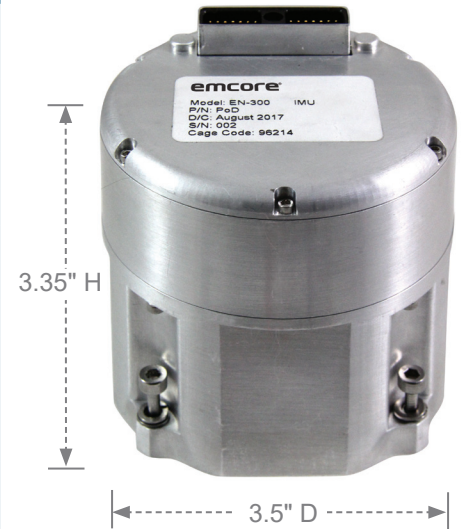
Precision Fiber Optic Inertial Measurement Unit (IMU)

Transforming Navigation

Performance Specifications

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Gyro Performance (1σ)			
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Bias In-Run Stability	0.02°/hr	0.04°/hr	0.08°/hr
ARW (Angle Random Walk)	0.008°/√hr	0.015°/√hr	0.03°/√hr
Scale Factor Accuracy	100 ppm	100 ppm	100 ppm
Rate Range	1,500°/sec (max)	1,500°/sec (max)	1,500°/sec (max)
Bandwidth	<1000 Hz	<1000 Hz	<1000 Hz
Accelerometer Performance (1σ)			
Bias (Over Temperature)	300 μg	500 μg	500 μg
VRW (Velocity Random Walk)	0.026 m/s/√hr	0.026 m/s/√hr	0.026 m/s/√hr
Scale Factor Accuracy	200 ppm	200 ppm	200 ppm
Acceleration Range (special request)	30 g	30 g	30 g
Electrical/Mechanical			
Weight	1.8 lb	1.8 lb	1.8 lb
Size	3.5" D x 3.35" L (excluding connector)	3.5" D x 3.35" L (excluding connector)	3.5" D x 3.35" L (excluding connector)
Power	5V (or 5V, +/- 15V**) 10W nominal 18W @ temp extremes	5V (or 5V, +/- 15V*) 10W nominal 18W @ temp extremes	5V (or 5V, +/- 15V*) 10W nominal 18W @ temp extremes
Data Message Rate	3,600 Hz 400 Hz Optional	3,600 Hz 400 Hz Optional	3,600 Hz 400 Hz Optional
Environmental			
Temperature: Operating	-40 °C to +71 °C	-40 °C to +71 °C	-40 °C to +71 °C
Shock: Operating	45 g, 10 msec	45 g, 10 msec	45 g, 10 msec
Vibration: Performance	9 g rms, 20-2000 Hz	9 g rms, 20-2000 Hz	9 g rms, 20-2000 Hz
General			
Input/Output	RS 485 serial (SDLC available)	RS 485 serial (SDLC available)	RS 485 serial (SDLC available)
Reliability @ 30°C (MTBF – AUF)	>20,000 hrs	>20,000 hrs	>20,000 hrs
Temperature: Storage	-55 °C to +85 °C	-55 °C to +85 °C	-55 °C to +85 °C

Dimensions/Scale



* For compatibility with legacy IMU

Notes

Not procurement specifications. Subject to change

For More Information

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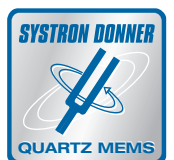
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USA

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