EN-300 Precision Fiber Optic Inertial Measurement Unit (IMU)

DATASHEET | MAY 2021 NAVIGATION SYSTEMS

Applications

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

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 Pendulocity 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

NON ITAR

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 five-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 Specifications

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
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

* Future Offering

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

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Performance Specifications (continued)

Parameter	EN-300-1*	EN-300-3 & EN-300-5
Accelerometer Performance (1σ)		
Bias (Over Temperature)	150 µg	300 µg / 500 µg
Bias In-Run Stability	N/A	0.1 mg (EN-300-3)
Scale Factor Accuracy	100 ppm	100 ppm
Acceleration Range (special request)	30 g (70 g)	30 g (70 g)
Electrical/Mechanical		
Weight	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)
Power	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
Environmental		
Temperature: Operating	-40 °C to +71 °C	-40 °C to +71 °C
Shock: Operating	45 g, 10 msec	45 g, 10 msec
Vibration: Performance	4 g rms, 20-500 Hz	4 g rms, 20-500 Hz
Operating	11 g	11g
General		
Input/Output	RS 485 serial (SDLC available)	RS 485 serial (SDLC available)
Reliability @ 30°C (MTBF – AUF)	>20,000 hrs	>20,000 hrs
Temperature: Storage	-55 °C to +85 °C	-55 °C to +85 °C

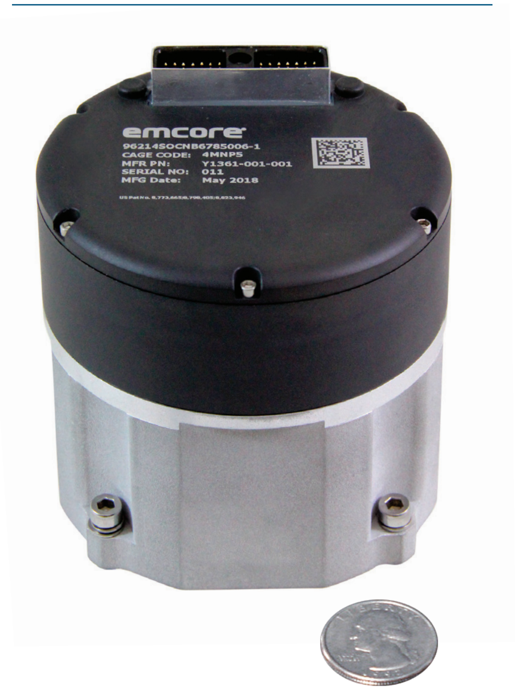
* Future Offering

** For compatibility with legacy IMU

Notes

Not procurement specifications. Subject to change

Scale Compared to U.S. Quarter



Transforming Navigation

MADE IN USA

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