



## Applications

- Inertial Navigation System for UAVs/Drone
- Applications Where GPS is Unavailable
- Dismounted Soldier Applications
- Ground Vehicle Navigation
- 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
- FOG Sensor Coil Diameters are Optimized for Navigation
- Three Precision Traditional Mechanical or MEMS Accelerometers
- Next-Generation Field Programmable Gate Array (FPGA) Electronics
- Programmable (factory) I/O with Exceptional Flexibility with Options for IMU, Navigation or Combined Data
- More Economical than Competing Systems

## Suitable for Applications Where GPS is Unavailable or Denied

The new EMCORE-Orion™ EN-1000 high-precision Micro Inertial Navigation System (MINAV) is developed primarily for applications where navigation aids such as GPS are unavailable or denied. EMCORE's advanced technology has enabled the unit to provide performance close to that of a traditional RLG INS with 1/3 the Size, Weight and Power (SWaP).

The EMCORE-Orion™ MINAV is a state-of-the-art, fiber optic gyro-based Inertial Navigation System incorporating EMCORE's proprietary integrated optics devices to enhance performance, providing stand-alone aircraft grade navigator performance in 1/3 the size of competing systems. There is an option for internal or external GPS. In a GPS denied environment the EN-1000 MINAV will gyrocompass to approximately 1 milliradian.

## Advantages

The EMCORE-Orion™ MINAV's design provides lower noise and greater stability than competitor INS or IMUs in a similar volume. Its low SWaP makes it the ideal inertial navigation system for drones/UAVs and dismounted soldier applications.

## Size, Weight & Power Comparison

Specifications	Competitor	EMCORE MINAV
Length, Inches	7.64	5.0
Width, Inches	5.5	4.9
Height, Inches	10.2	3.95
Volume, Cubic Inches	327	90
Weight, Lbs.	12.5	3.2
Power, Watt	25	12

## Functionality

Designed to operate as a navigator or very precise Inertial Measurement Unit (IMU), the EMCORE-Orion™ MINAV's digital interface is fully programmable within EMCORE's factory enabling it to directly replace competing units.

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

# EMCORE-Orion™ EN-1000 High-Precision Micro Inertial Navigation System (MINAV)

emcore®

## Performance Specifications

Parameter	Typical*
<b>Free Inertial Navigation (1σ)</b>	
Position	1.5 nm/hr CEP
Velocity (rms)	1.5 m/sec
Pitch & Roll (Heading)	0.1 deg (1.5 mrad)
<b>GPS Aided Navigation</b>	
Position	5 m SEP
Velocity	0.015 m/sec
Pitch & Roll (Heading)	0.02 deg (0.35 mrad)
<b>Gyro Performance</b>	
Bias Repeatability	0.015 deg/hr
Bias In-Run Stability	0.01 deg/hr
ARW (Angle Random Walk)	0.002 deg/rt-hr
Scale Factor	50 ppm
Rate Range	1,500 deg/sec
<b>Accelerometer Performance</b>	
Null	0.75 mg
In-Run Stability	0.01 mg
Scale Factor	50 ppm
Acceleration Range	30 g
<b>Electrical/Mechanical</b>	
Weight	3.2 lb
Size	5.0" L x 4.9" W x 3.9" H
Power	5V 10W nominal 18W @ temp extremes
Dissipation	Conduction cooling. Air cooled over limited environment
<b>Environmental</b>	
Temperature: Operating	-40 °C to +75 °C
Shock: Operating	30 g, 5 msec half-sine
Vibration: Operating	8 g rms, 20-2000 Hz
<b>General</b>	
Input/Output	RS 485 serial
MTBF	>50,000 hrs
Temperature: Storage	-55 °C to +85 °C

## Scale Compared to U.S. Quarter



### Notes

Not a procurement specifications. Subject to change

MADE IN USA

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