

Fiber Optic 3D Inertial Navigation System with Embedded GNSS



Key Features and Attributes

- Compact full three-dimensional navigation
- 100% situational awareness with or without GNSS
- Dead reckoning accuracy within $\pm 0.2\%$ of distance travelled
- Heading accuracy within 0.05° RMS with GNSS
- Modular design for expandability
- Embedded GNSS
- Multiple interfaces for ease of integration: Ethernet, CANbus, RS-422
- Ethernet connectivity
- Integrates with a variety of military GNSS systems
- 1 PPS (pulse per second) Timing Assurance during GNSS signal loss

For situational awareness in GNSS-denied environments, three-dimensional navigation, and battlefield management, EMCORE's TACNAV 3D is the state-of-the-art navigation engine for today's military technology.

A-PNT-capable, Highly Accurate Fiber Optic Gyro-based 3D Navigation for all Terrains

The fiber optic gyro (FOG)-based TACNAV 3D tactical Inertial Navigation System provides an Assured Position, Navigation and Timing (A-PNT) solution with an embedded GNSS and optional Chip-scale Atomic Clock (CSAC). Its modular tactical design and flexible architecture allow it to function as either a standalone tactical navigation solution, or as the core of an expandable, multi-functional Battlefield Management System (BMS).

TACNAV 3D joins the line-up of EMCORE's inertial navigation systems and builds upon the success of the battle-proven EMCORE TACNAV family of products, and incorporates EMCORE's highest performing Inertial Measurement Unit (IMU).

Ideal Navigation and Pointing Solution for the Digital Battlefield

Providing extremely accurate heading and dead reckoning navigation and orientation, TACNAV 3D delivers 100% situational awareness in GNSS-denied environments with greater accuracy and at a lower cost than competing navigation systems.

Designed to easily integrate with BMS, TACNAV 3D provides reliable vehicle position, making it a vital component for effective battlefield management. Compact and lightweight, TACNAV 3D was designed for the close confines of turreted and non-turreted vehicles.

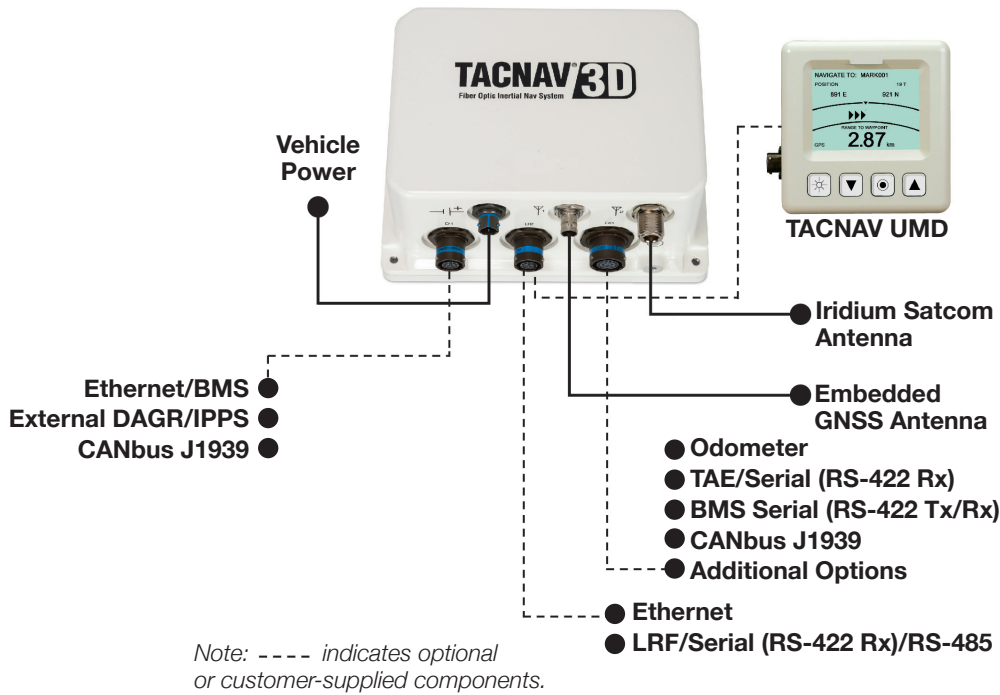
Built-in Options

- CSAC timing option maintains timing signal integrity during GNSS loss, a critical feature in preventing timing delays of PPS output to military radios, etc.
- Iridium transceiver option transmits/receives vehicle position, waypoint, and target location to/from command center or other vehicles. TACNAV 3D also receives messages from the BMS to pass on to the command center via the Iridium short burst message capability.
- TACNAV 3D can receive/transmit data over Ethernet, CANbus, or RS-422 serial data bus.



EMCORE's TACNAV 3D is a perfect solution for main battle tanks.

System Diagram



Technical Specifications

General Performance

Positional Accuracy	
With GNSS:	2-3 meters RMS
Without GNSS:	±0.2% distance travelled, typical
Heading Accuracy (dynamic)	
GNSS Align Heading:	0.05° RMS
Without GNSS:	±0.30° 1σ
Location Format:	User Selectable: over 200 grids and datums available
Pitch & Roll Accuracy:	0.05°
Latitude Capability:	Latitude independent with GNSS
GNSS:	Supports GPS, GLONASS, GALILEO, and Beidou
Timing:	1 PPS output (1μs, 5 hrs.)

Interfaces

CANbus:	J1939, CANOpen (optional)
Serial:	RS-422
Ethernet:	UDP (optional), TCP-IP (optional)

Physical

Input Voltage:	+28 VDC (18-36 VDC) MIL-STD-1275
Power Consumption:	15 watts
Dimensions:	148.6 mm (d) x 203.2 mm (w) x 101.6 mm (h) (5.85" x 8" x 4") measurements include flanges
Weight:	3.2 kg (7 lbs)

Environmental

Temperature:	MIL-STD-810G Operating: -40°C to +65°C
Altitude:	15,000 meters (50,000 feet)
Environment:	MIL-STD-810G - Humidity, Salt Fog, Sand, Dust & Fungus
Shock:	MIL-STD-810G
EMI/RFI:	MIL-STD-461F Class A3, digital equipment
Vibration:	MIL-STD-810G
MTBF:	45,264 hours

For More Information

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