IPADS-G

Improved Position and Azimuth Determining System with GPS

emcore®

DATASHEET | OCTOBER 2022

Transforming Navigation

Applications

Artillery Survey to Mark:

- Survey Control Point (SCP) Position; Used to Initialize Weapon Systems
- Orienting Line (OL) Position and Azimuth; Used to Initialize and Align Artillery Assets

Key Performance Features

- High-Precision Common Survey Enables Efficient Mass Fires
- Common Architecture and Components (MLRS, HIMARS, Firefinder, Paladin and Long-Range Air Surveillance Radar)
- Embedded Selective Availability Anti-Spoofing Module (SAASM)
- Impervious to jamming (inertial mode)
- Resistant to Jamming (GPS-aided mode)
- Navigation Aids (compass rose and digital maps)
- In-Vehicle and Offset Survey
- Combat-Proven
- Embedded Built-In Test (BIT)
- High-Reliability MTBF, Low Mean Time to Repair (MTTR)
- No Periodic Calibration Required

Inertial Surveying System

When You Need Precision, You Need IPADS-G

EMCORE's Improved Position and Azimuth Determining System with GPS (IPADS-G) is an inertial surveying system developed to meet today's demanding U.S. Army and Marine Corps survey needs. Survey operations functionality, navigational accuracy, transportability, survivability and affordability requirements drove the system design.

EMCORE's IPADS-G provides significant enhancements for today's Army and Marine Corps survey teams. While meeting PADS accuracy and environmental requirements, IPADS-G offers a proven, reliable, lightweight, off-the-shelf solution developed around four main components.

- Compact Position/Navigation Unit (CPNU)
- Control and Display Unit (CDU)
- Battery and Charger Unit (BCU)
- Porro Prism Assembly (PPA)

All components are housed in a robust frame that allows for easy component access and stability, while facilitating a ready two-person live transfer between vehicles.

Use of U.S. DoD visual information does not imply or constitute DoD endorsement.

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Specifications

Performance	
4th-Order Accuracy	
Orienting Line Azimuth	0.4 mil PE, (Probable Error), 0° to 65° N/S latitude 0.6 mil PE, 65° to 75° N/S latitude
Horizontal	4 m CEP (Circular Error Probable)
Vertical	2 m PE 5-min. ZUPT (Zero Velocity Update) Within 75 km radius of update point
5th-Order Accuracy	
Orienting Line Azimuth	0.4 mil PE, 0° to 65° N/S latitude 0.6 mil PE, 65° to 75° N/S latitude
Horizontal	7 m CEP
Vertical	3 m PE 10-min. ZUPT Within 75 km radius of update point
GPS-Aided Accuracy	
Orienting Line Azimuth	0.4 mil PE, 0° to 65° N/S latitude 0.6 mil PE, 65° to 75° N/S latitude
Horizontal	4 m CEP
Vertical	2 m PE No ZUPT necessary
Initialization Time	
Static Align	10 min. 0° to 65° N/S latitude 20 min., 65° to 75° N/S latitude
Hot Start Align	5 min., 0° to 65° N/S latitude 10 min., 65° to 75° N/S latitude
Moving Base Align	15 min

Characteristics	
Weight	137 lb., 62 kg (Standard configuration) 68 lb., 31 kg (Optional configuration using DRU-H-R, smaller/lighter CDU, and Li-Ion Batteries)
Dimensions	24.75 in. L x 15.75 in. W x 16.125 in. H (Standard configuration) 62.87 cm L x 40.01 cm W x 40.96 cm H 16.9 in. L x 8.9 in. W x 10.8 in. H (Optional configuration using DRU-H-R, smaller/lighter CDU, and Li-Ion Batteries) 43.0 cm L x 22.5 cm W x 27.5 cm H
Power Steady-State Voltage Options	 5.36 A @ 28 VDC (150 W) 9 to 36 VDC or 85 to 270 VAC
Interfaces	- One 10/100-BaseT Ethernet (Reprogramming port) - One optional/unused RS-232 port - One optional/unused RS-422 port - Six optional/unused USB 2.0 ports
Optional Interfaces	**For GPS** - GPS Antenna RF Input - Cryptographic key fill data port - One RS-422 Asynchronous data port for external Defense Advanced GPS Receiver (DAGR)
Environments	- Nuclear, Biological & Chemical (NBC) survivability - EMI/EMC-compliant (MIL-STD-461E/464A) - MIL-STD-810F-compliant - MIL-STD-1275D power input

Notes

This information has been released into the public domain in accordance with the International Traffic in Arms Regulation (ITAR) 22 CFR 120.11(a)(7).

Compact Position/Navigation Unit (CPNU)

The CPNU, a three-axis strap-down inertial navigation system of ring laser gyros and high-grade accelerometers, is the core component of IPADS-G. It is the compact version of our proven navigation system used on the Multiple Launch Rocket System (MLRS) and High-Mobility Artillery Rocket System (HIMARS) programs.

An embedded SAASM GPS receiver is provided in the CPNU

Control And Display Unit (CDU)

The CDU is a ruggedized tablet computer featuring an Intel Dual Core i7 @ 1.7 GHz, Windows® 10, 16 GB Main RAM, Two 480 GB Solid-State Drives (SSD), and a 10.4- inch XGA touch-screen color display.

Porro Prism Assembly (PPA)

The PPA in conjunction with customer-supplied Theodolite, provides 24-meter offset survey capability. This allows surveying locations that are inaccessible by vehicle. Offset distance may be extended using optional accessories such as a handheld laser rangefinder mounted on existing manual Theodolite or using auto-mated total stations.

Battery And Charger Unit (BCU)

The BCU uses a standard U.S. Army NSN 6130-01- 493-6643 Sealed-Lead Acid (SLA) battery. The BCU is based on the ABPAC.DC/ BT-TR-1 Transceiver Power Unit (TPU) that is currently fielded by the U.S. military. The unit allows for worldwide input of 9 to 36 VDC / 85 to 270 VAC, 47 to 440 Hz, single-phase power inputs and provides power and charge status indicators.

For More Information

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