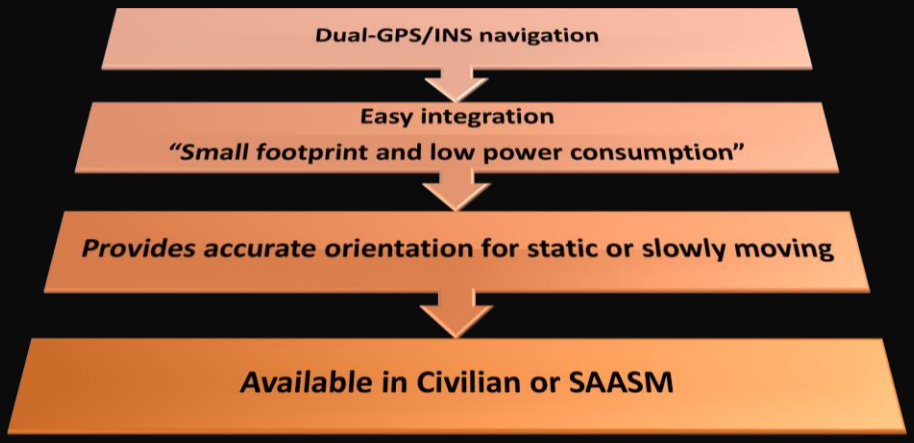
GEODETICS INCORPORATED

Precision in Motion.

Geodetics is an Advanced Sensing and Navigation Company Based in the USA



Geo-hNAV® Hybrid Dual-GPS/INS Navigation System

Geo-hNAV™ is a ruggedized, fully-integrated hybrid dual-GPS-aided inertial navigation system which delivers consistent position and attitude measurement accuracy whether the platform is static or moving.

Geo-hNAV is offered in several configurations designed to meet a wide range of navigation application requirements. Configurations are available for both commercial and military applications:

Geo-hNAV Commercial
Designed for civilian navigation applications (no ITAR restrictions)

Geo-hNAV SAASM
Designed for navigation applications that have a military SAASM GPS requirement

Flexibility

- Multiple IMU configurations available with internal MEMS or external FOG/RLG IMUs
- Multiple GPS configurations available with both civilian and SAASM receivers

High Navigation Performances

- Centimeter level positioning with dual-frequency RTK configuration
- 0.05° heading measurement accuracy both in low and high dynamic conditions (for 3 m GPS baseline separation)

Easy to Integrate into Your System

- SWaP, BIT with log
- Several types of data interface: RS-232 and Ethernet

Applications

- Geo-pointing for onboard sensors for low dynamic platforms such as aerostats, boats, tanks
- Camera, EO/IR sensor stabilization
- Antenna pointing
- Weaponry pointing
- Vehicle testing in static and mobile conditions
- Hovering UAS platforms

Geo-hNAV configurations can be customized to satisfy the most demanding inertial navigation accuracy and performance requirements


High Dynamic Antenna - Camera


Low Dynamic Camera - LiDAR


Static Camera - LiDAR


Static Antenna


Mortar


Weapon

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Geo-hNAV® Hybrid Dual-GPS/INS Navigation System

Geo-hNAV Configurations

Non-ITAR Configurations	GPS Sensor	IMU
Tactical-RTK	L1/L2, RTK-Enabled	Internal Quartz MEMS
Advanced	L1/L2, RTK-Enabled	External FOG
ITAR Configurations	**GPS Sensor**	**IMU**
Tactical RTK-SAASM	L1/L2 SAASM, RTK-Enabled	Internal Quartz MEMS
Advanced SAASM	L1/L2 SAASM, RTK-Enabled	External FOG or RLG (other IMU's available upon request)

IMU Performance

Configuration	IMU	Parameter	Accelerometer	Gyroscope
Tactical, Tactical-RTK, Tactical-RTK, SAASM	Internal MEMS 1	Range	±5g	±450°/sec
		Bias Stability (in-run)	< 0.07 mg	3°/hr.
		Random walk	0.03 (m/sec)/√hr.	0.2°/√hr.
	Internal MEMS 2	Range	±3g	±100 / ±200 °/sec
		Bias Stability (in-run)	< 0.05 mg	2.2°/hr.
		Random walk	0.025 (m/sec)/√hr.	0.09°/√hr.
Advanced, Advanced SAASM	External FOG	Range	±10g	±490°/sec
		Bias Stability (in-run)	< 0.05 mg	0.05°/hr.
		Random walk	0.07 (m/sec)/√hr.	0.012°/√hr.

Position Accuracy*

Configuration (GPS Receiver)	Standalone Mode Horizontal/Vertical Accuracy	Differential Mode Horizontal/Vertical Accuracy
Tactical-RTK (L1/L2) Tactical-RTK SAASM	1.5 m / 2.5 m	0.05 m / 0.1.m
Advanced (L1/L2) Advanced SAASM	1.0 m / 2.0 m	0.05 m / 0.1 m

Dynamic Attitude Accuracy*

Configuration (IMU)	Standalone Mode Roll-Pitch / Heading Accuracy	Differential Mode Roll-Pitch / Heading Accuracy
Tactical-RTK (L1/L2) Tactical-RTK SAASM (internal Quartz MEMS IMU)	±0.2° / ±0.5°	±0.1° / ±0.3°
Advanced (L1/L2) Advanced SAASM (external FOG)	±0.05° / ±0.1°	±0.01° / ±0.05°

Static Heading Accuracy*

Configuration	1-meter baseline	2-meters baseline	3-meters baseline
All	±0.26°	±0.09°	±0.05°

NOTE: Accuracy must be measured once dynamic alignment is complete

*Accuracy is dependent upon GPS satellite system performance, ionospheric conditions, GPS blockage, data link and other factors

Output Rates Through Serial or RS232 Interface

Configuration (IMU)	Navigation Data Output Rate
All Tactical Configurations	Up-to 125 Hz
All Advanced Configurations	Up-to 100 Hz

Technical Specifications

Power

- Input Voltage: 10-30 VDC
- **Civilian:**
  - Internal IMU: 8 W typical
  - External IMU: 15 to 20 W typical (external IMU powered by main unit)
- **SAASM:**
  - Internal IMU: 10 W typical
  - External IMU: 10 to 13 W typical (external IMU powered by main unit)

Data Recording / Logging

- Navigation solutions (position, velocity, acceleration, attitude, angular rate, …)
- Raw GPS and IMU data (for post processing with RTD-Post)
- Full diagnostics

External IMU Support

Fiber Optic Gyro is standard in Advanced configurations. Built-in support for:

- Honeywell HG1900
- Honeywell HG1700
- Honeywell HG9900
- Litton LN200
- Other IMU's on request

Safety and Diagnostics

- Internal safety and monitoring systems
- Internal BIT with operator notification

Environmental

- Civilian Operating Temperature: -40°C to +65°C (-40°F to 150°F)
- SAASM Operating Temperature: -40°C to +70°C (-40°F to 158°F)
- Storage: -55°C to +85°C (-67°F to +185°F)
- Humidity: 95% RH, non-Condensing
- Vibrations and Shock: MIL-STD 810G, 514.5 and 516.5
- EMC/EMI: MIL-STD 461

Geo-hNAV Enclosure

- Size: 120 x 100 x 55 mm (4.7" x3.9" x 2.2")
- Weight: 0.75 kg (1.7 lbs.)
- Mounting: On a plate, 4 through holes

Interfaces

- External power connector
- Dual TNC GPS antenna connector
- 1 Ethernet data port
- 3 RS232 serial ports
- 1 PPS output
- IMU connector for external IMU
- 4 status LEDs

SAASM Configurations

- SAASM Keyload connectors (DS-101)
- SAASM Zeroize buttons

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