GEODETICS
INCORPORATED

Precision in Motion.

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

Dual-GPS/INS navigation

Easy integration
"Small footprint and low power consumption"

Provides accurate orientation for static or slowly moving

Available in Civilian or SAASM

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 (RMS) with dual-frequency RTK configuration
- 0.05° heading measurement accuracy (RMS) 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

2649 Ariane Drive
San Diego, CA 92117

(858) 729-0872

info@geodetics.com

www.geodetics.com

Geo-hNAV Configurations

Non-ITAR Configurations	GPS Sensor	IMU
Tactical	L1/L2, RTK-Enabled	Internal Quartz MEMS
Advanced	L1/L2, RTK-Enabled	External FOG
ITAR Configurations	**GPS Sensor**	**IMU**
Tactical 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

Config.	IMU	Parameter	Accelerometer	Gyroscope
Tactical Commercial & Tactical SAASM	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.
	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.
	MEMS-3	Range	±4G/±10G	±450°/sec
		Bias Stability (in-run)	< 0.03 mg	0.8 deg/h
		Random walk	0.014(m/sec)/√hr.	0.06°/√hr.
Advanced Commercial & Advanced SAASM	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 (RMS)	Differential Mode Horizontal/Vertical Accuracy (RMS)
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 (RMS)	Differential Mode Roll-Pitch/Heading Accuracy (RMS)
Tactical-RTK (L1/L2) Tactical-RTK SAASM	MEMS-1	±0.2° / ±0.5°	±0.1° / ±0.3°
	MEMS-2	±0.2° / ±0.5°	±0.1° / ±0.3°
	MEMS-3	±0.1° / ±0.3°	±0.05 ° / ±0.1°
Advanced (L1/L2) Advanced SAASM	FOG	±0.05° / ±0.1°	±0.01° / ±0.05°

Static Heading Accuracy*, **

Configuration	1-meter baseline	2-meters baseline	3-meters baseline
All	±0.13° (±2.2 mrad)	±0.07° (±1.2 mrad)	±0.04° (±0.7 mrad)

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

NOTE: Accuracy must be measured once dynamic alignment is complete
*Accuracy is dependent upon GPS satellite system performance, ionospheric conditions, GPS blockage, environmental conditions, data link and other factors.
**The GPS-based heading accuracy and baseline length have approximately linear relationship

GEODETICS INCORPORATED
Precision in Motion.