# HG1930 INERTIAL NAVIGATION SYSTEM

High performance 5 cubic inch MEMS INS for demanding environments and applications.

**Possibilities of Navigation**. *Made Easy*.

# HG1930 Inertial Navigation System

## Proven – Dependable – Accurate

The HG1930 Inertial Navigation System (INS) is designed to meet the evolving needs for applications requiring high performance flight control and navigation under the most demanding environmental conditions. It utilizes a dual-core processor enhancement to provide integrated navigation capability while maintaining minimal size, weight, and power consumption, which makes it ideal for customers with ground and oceanographic surveying, robotics, commercial camera stabilization, control and navigation of unmanned aerial vehicles, missiles, munitions and projectiles applications with space constraints, and limited navigation software development capabilities.

## Description

Integrated navigation capability is achieved by combining Micro-Electro-Mechanical Systems (MEMS) inertial sensors technology with Honeywell modular INS software, which integrates SAASM and commercial GPS receivers for PVT, LOS, and UTC. This allows the INS to have smoothed navigation outputs, automatic navigation initialization, and additional capabilities including magnetic heading, barometric altitude, transfer alignment aiding, and shock and vibration event compensation. The MEMS gyros and accelerometers are environmentally sealed in a rugged aluminum housing that employs an internal environmental isolation system to attenuate unwanted inputs commonly encountered in real world applications. The Honeywell modular INS software includes a host of integrated navigation features, and command and control is via the Honeywell Tactical Navigation Digital Interface Control Document (HTN DICD).

## Configurations

The HG1930 INS offers three inertial performance grades. It also offers configurable features, such as data rate output and flight control filtering to simplify system integration.

### HG1930 INS KEY CHARACTERISTICS

| | |
|---|---|
| Volume | 5 in$^3$ (82 cm$^3$) |
| Weight | <0.35 Lbs (0.16 kg) |
| Power Consumption | <4 Watts typical |
| Operating Temperature Range | -54°C to +85°C |
| Data Rate | 100 Hz (Guidance) and 600 Hz (Control) – other rates available |
| Built-In-Test Coverage | >89% |
| Gyro Operating Range | Varies by configuration. Up to 7,200 deg/sec in the X axis and 1,440 deg/sec in the Y and Z axes. |
| Accelerometer Operating Range | Varies by configuration. Up to 85g in the X axis and 45g in the Y and Z axis. |
| Supply Voltages | +5V |

### HG1930 INS STANDARD MODELS & PERFORMANCE

| | HG1930CN50 | HG1930BN50 | HG1930AN50 |
|---|---|---|---|
| **Navigation Performance[1]** | | | |
| Position (m) CEP Drift - 30s GPS Outage | | <3 | |
| **Gyro Performance** | | | |
| Bias Repeatability[2] (°/hr 1σ) | 20 | 40 | 60 |
| Bias In-Run Stability[3] (°/hr 1σ) | 1.0 | 1.5 | 1.5 |
| Angle Random Walk[4] (°/√hr) | 0.125[5], 0.09[6] | 0.125[5], 0.09[6] | 0.175 |
| **Accelerometer Performance** | | | |
| Bias Repeatability[2] (mg 1σ) | 5 | 10 | 10 |
| Bias In-Run Stability[3] (mg 1σ) | 0.3 | 0.5 | 0.5 |
| Velocity Random Walk[4] (fps/√hr) | 0.3 | 0.3 | 0.4 |

### HG1930 INS INERTIAL TYPICAL PERFORMANCE OVER FULL OPERATING TEMPERATURE RANGE

| | HG1930CN50 | HG1930BN50 | HG1930AN50 |
|---|---|---|---|
| **Gyro Performance** | | | |
| Bias Repeatability (°/hr 1σ) | 7 | 10 | 20 |
| Bias In-Run Stability (°/hr 1σ) | 0.25 | 0.35 | 0.40 |
| Angle Random Walk (°/√hr) | 0.06 | 0.07 | 0.08 |
| **Accelerometer Performance** | | | |
| Bias Repeatability (mg 1σ) | 0.5 | 1.0 | 1.5 |
| Bias In-Run Stability (mg 1σ) | 0.02 | 0.03 | 0.04 |
| Velocity Random Walk (fps/√hr) | 0.10 | 0.15 | 0.20 |

*Notes:*
*1. Navigation performance is dependent on trajectory dynamics and mission timeline.*
*2. Bias repeatability measurements calculated as the Root Square (RMS) of combined bias thermal model + residuals from dynamic tumble test.*
*3. Bias in-run stability measurements based on Allan Variance Bias Instability (BI) coefficient.*
*4. Angular Random Walk (ARW) and Velocity Random Walk (VRW) measurements based on Allan Variance Random Walk (VRW) coefficient.*
*5. Applies to the Roll channels.*
*6. Applies to the Pitch and Yaw channels.*

## KEY HONEYWELL ADVANTAGES

- All inertial sensors utilized in our tactical IMUs are designed, developed and manufactured by Honeywell

- Proven navigation and inertial sensor performance in a wide range of military and commercial applications

- Standard, qualified configuration includes asynchronous 1 Mbit/sec serial HTN DICD port, dedicated INS/GPS integration serial port and discrete signals, Synchronous Data Link Control (SDLC) inertial data output, and Hardware-in-the-Loop mode. Other interface protocols and configurations are available

- ECTOS™ Modular INS Software

- Solid-state electronics improve dependability and reliability throughout unit operational life

### Find Out More

Visit us at: aerospace.honeywell.com/imu