

UIMU-HG1700-AG62

Economical, tactical grade IMU combines with SPAN GNSS+INS technology from Hexagon | NovAtel to deliver 3D position, velocity and attitude solution



World-leading GNSS+INS technology

SPAN GNSS+INS technology brings together two different but complementary technologies: Global Navigation Satellite System (GNSS) positioning and inertial navigation. The absolute accuracy of GNSS positioning and the stability of Inertial Measurement Unit (IMU) gyro and accelerometer measurements are deeply coupled to provide an exceptional 3D navigation solution that is stable and continuously available, even through periods when satellite signals are blocked.

UIMU-HG1700-AG62 overview

The UIMU-HG1700-AG62 contains a Honeywell HG1700-AG62 tactical grade IMU containing ring-laser gyros and servo accelerometers. The UIMU-HG1700 handles the power requirements of the IMU from a 12-28 VDC power input and provides the IMU data to a SPAN enabled GNSS+INS receiver such as the PwrPak7 using a custom NovAtel interface. IMU measurements are used by the GNSS+INS receiver to compute a blended GNSS+INS position, velocity and attitude solution at up to 100 Hz. The HG1700 is a commercial product that can be licensed under the jurisdiction of the U.S. Department of Commerce for customers outside the United States.

Advantages of UIMU-HG1700-AG62

Honeywell's high production volume of HG1700 IMUs enables excellent tactical grade performance for an economical price with short delivery times. The UIMU-HG1700-AG62 is available as a complete assembly including the IMU and environmentally sealed enclosure. For customers who already have the HG1700-AG62 IMU, the enclosure can be purchased separately and the IMU easily integrated.

Improve UIMU-HG1700-AG62 accuracy

Receivers from NovAtel provide your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Waypoint Inertial Explorer post-processing software can be used to post-process real-time SPAN data on the UIMU-HG1700-AG62 and offers the highest level of accuracy with the system.

Benefits

- High performance IMU
- Optimal for aerial, hydrographic survey and industrial applications
- Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- Rugged design ideal for challenging environments
- High sensor dynamic range

Features

- Ring-laser gyros and servo accelerometers
- Stationary INS alignment capable
- IMU data rate: 100 Hz
- SPAN GNSS+INS capability with configurable application profiles

SPAN System Performance¹

Horizontal Position Accuracy (RMS)

| | |
|--------------------------------|--------------|
| Single point L1/L2 | 1.2 m |
| SBAS ² | 60 cm |
| DGPS | 40 cm |
| TerraStar-L ^{3,4} | 40 cm |
| TerraStar-C PRO ^{3,4} | 2.5 cm |
| TerraStar-X ^{3,4} | 2 cm |
| RTK | 1 cm + 1 ppm |

Data Rate

| | |
|-------------------|--------------|
| IMU Raw Data Rate | 100 Hz |
| INS Solution | Up to 200 Hz |

Time Accuracy⁵

20 ns RMS

Max Velocity⁶

515 m/s

IMU Performance⁷

| | |
|----------------------------------|---------------|
| Gyro input range | ±1000 deg/sec |
| Gyro rate bias | 5.0 deg/hr |
| Gyro rate scale factor | 150 ppm |
| Angular random walk | 0.5 deg/√hr |
| Accelerometer range ⁸ | ±50 g |
| Accelerometer linearity | 500 ppm |
| Accelerometer scale factor | 300 ppm |
| Accelerometer bias | 2.0 mg |

Physical and Electrical

| | |
|-------------------|-------------------------|
| Dimensions | 168 x 195 x 146 mm |
| Weight | 4.5 kg |
| Power | |
| Power consumption | 8 W (typical) |
| Input voltage | +12 to +28 V |
| Connector | MIL-C-38999-III, 22 pin |

Environmental

Temperature

| | |
|-----------|----------------|
| Operating | -30°C to +60°C |
| Storage | -45°C to +80°C |

Humidity

95% non-condensing

MTBF

2,000 hrs

Waterproof

IEC 60259 IPX7

Dust

IEC 60259 IP6X

Compliance

FCC, ISED, CE

Optional Accessories

- Inertial Explorer post-processing software

Performance During GNSS Outages¹

| Outage Duration | Positioning Mode | Position Accuracy (M) RMS | | Velocity Accuracy (M/S) RMS | | Attitude Accuracy (Degrees) RMS | | |
|-----------------|------------------------------|---------------------------|----------|-----------------------------|----------|---------------------------------|-------|---------|
| | | Horizontal | Vertical | Horizontal | Vertical | Roll | Pitch | Heading |
| 0 s | RTK ⁹ | 0.02 | 0.03 | 0.015 | 0.010 | 0.010 | 0.010 | 0.025 |
| | PPP | 0.06 | 0.15 | | | | | |
| | SP | 1.00 | 0.60 | | | | | |
| | Post-Processed ¹⁰ | 0.01 | 0.02 | | | | | |
| 10 s | RTK ⁹ | 0.17 | 0.11 | 0.035 | 0.015 | 0.020 | 0.020 | 0.035 |
| | PPP | 0.21 | 0.23 | | | | | |
| | SP | 1.15 | 0.68 | | | | | |
| | Post-Processed ¹⁰ | 0.01 | 0.02 | | | | | |
| 60 s | RTK ⁹ | 4.02 | 0.53 | 0.165 | 0.025 | 0.035 | 0.035 | 0.060 |
| | PPP | 4.06 | 0.65 | | | | | |
| | SP | 5.00 | 1.10 | | | | | |
| | Post-Processed ¹⁰ | 0.13 | 0.02 | | | | | |

1. Typical values (open sky conditions). Performance specifications subject to GNSS system characteristics, Signal-in-Space (SIS) operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources. 2. GPS-only. 3. Requires subscription to TerraStar data service. Subscriptions available from NovAtel. 4. TerraStar service available depends on the SPAN enabled receiver used. See the receiver product sheet for details. 5. Time accuracy does not include biases due to RF or antenna delay. 6. Export licensing restricts operation to a maximum of 515 metres/second. 7. Supplied by IMU manufacturer. 8. GNSS receiver sustains tracking up to 4 g. 9. 1 ppm should be added to all values to account for additional error due to baseline length. 10. Post-processing results using Inertial Explorer software.

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