OEM-IMU-EG320N

Commercial MEMS IMU combines with SPAN GNSS+INS technology from Hexagon | NovAtel to deliver 3D position, velocity and attitude

Deeply-coupled GNSS+INS technology

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

Low noise commercial MEMS

The EG320N is a Micro Electromechanical System (MEMS) IMU from Epson. It features low noise gyros and accelerometers in a small, lightweight enclosure. The EG320N enables precision measurements for applications that require low-cost, high-performance and rugged durability in a very small form factor. When integrated with SPAN GNSS+INS technology from NovAtel, this IMU is ideal for size constrained applications that require accurate 3D position, velocity and attitude (roll, pitch and azimuth) data.

Require higher 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 offers the highest level of accuracy.

Benefits

- Economical
- Ideal for size constrained applications
- Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- Commercially exportable
- Low 3.3 VDC power input

Features

- Low noise commercial grade gyros and accelerometers
- Small size and lightweight
- IMU data rates: 125Hz or 200Hz
- Direct SPI interface to OEM7 receivers
- SPAN GNSS+INS capability with configurable application profiles

SPAN System Performance[1]

Horizontal Position Accuracy (RMS)

Single Point L1	1.5 m
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 Rates

IMU Raw Data Rate	125Hz or 200Hz
INS Solution	Up to 200 Hz

Time Accuracy[5] 20 ns RMS

Max Velocity[6] 515 m/s

IMU Performance[7]

Gyroscope Performance

Technology	MEMS
Input rate (max)	±150 deg/sec
Bias repeatability	0.5 deg/sec
Bias instability	3.5 deg/hr
Angular random walk	0.1 deg/√hr

Accelerometer Performance

Range	±5 g
Bias repeatability	15 mg
Bias instability	0.1 mg
Velocity random walk	0.05 m/s/√hr

Physical and Electrical

Dimensions 24 × 24 × 10 mm

Weight 10 g

Power

Input voltage	+3.3 VDC
Power consumption	0.1 W

Communication Interface SPI

Environmental

Temperature

Operating	-40°C to +85°C
Storage	-40°C to +85°C

Vibration (operating) MIL-STD-810G, 7.7 g RMS, 20 - 2000 Hz

Shock (operating) MIL-STD-810G, 40 g, 11ms

Shock (survival) 1000 g, half sine, 0.5 ms

Performance During GNSS Outages[8]

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	0.020	0.010	0.020	0.020	0.090
	PPP	0.06	0.15					
	SP	1.00	0.60					
	Post-Processed[10]	0.01	0.02	0.020	0.010	0.009	0.009	0.042
10 s	RTK[9]	0.27	0.13	0.070	0.020	0.040	0.040	0.130
	PPP	0.31	0.25					
	SP	1.25	0.70					
	Post-Processed[10]	0.02	0.02	0.020	0.010	0.009	0.009	0.042
60 s	RTK[9]	15.02	1.63	0.720	0.065	0.095	0.095	0.210
	PPP	15.06	1.75					
	SP	16.00	2.20					
	Post-Processed[10]	0.35	0.10	0.030	0.011	0.014	0.014	0.048

1. Typical values. 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. 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. Outage statistics were calculated by taking the RMS of the maximum errors over a minimum of 30 complete GNSS outages. Each outage was followed by 120 seconds of full GNSS availability before the next outage was applied. High accuracy GPS updates (fixed ambiguities) were available immediately before and after each outage. The survey data used to generate these statistics is ground vehicle data collected with frequent changes in azimuth (i.e., as normally observed in ground vehicle environments). 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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For the most recent details of this product: novatel.com

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