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 SPAN capable GNSS+INS receivers from NovAtel

- 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

IMU performance[1, 2]

Gyroscope performance

Technology	MEMS
Dynamic range	150 °/s
Bias instability[3]	3.5 °/hr
Angular random walk[3]	0.1 °/√hr

Accelerometer performance

Technology	MEMS
Dynamic range	5 g
Bias instability[3]	0.1 mg
Velocity random walk[3]	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
Connection to receiver	Receiver SPI port

Data rates

IMU raw data rate	125 Hz or 200 Hz
INS solution	Up to 200 Hz

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[4, 5, 6]

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[7]	0.02	0.03	0.020	0.010	0.020	0.090
	TerraStar-C PRO PPP	0.025	0.05				
	Single point	1.00	0.60				
10 s	RTK[7]	0.27	0.13	0.070	0.020	0.040	0.130
	TerraStar-C PRO PPP	0.27	0.15				
	Single point	1.25	0.70				
60 s	RTK[7]	15.00	1.63	0.720	0.065	0.095	0.210
	TerraStar-C PRO PPP	15.00	1.65				
	Single point	16.00	2.20				
	RTK with Land profile and DMI	3.50	0.80	0.220	0.040	0.095	0.210
0 s	Post-Processed using Inertial Explorer	0.01	0.02	0.020	0.010	0.009	0.042
10 s		0.02	0.02	0.020	0.010	0.009	0.042
60 s		0.35	0.10	0.030	0.011	0.014	0.048

1. *Supplied by IMU manufacturer.*
2. *Peak vibration amplitude in the frequency range of 700-900 Hz must be minimized to achieve optimal SPAN performance.*
3. *From room temperature Allan variance method.*
4. *Performance may be impacted in conditions with unmitigated vibration or significant temperature variations. May vary from part to part.*
5. *Performance with one antenna, no DMI, and default SPAN profile unless otherwise specified.*
6. *Typical. Based on mixed urban road vehicle dynamics and benign GNSS conditions.*
7. *1 ppm should be added to all values to account for additional error due to baseline length.*

Contact Hexagon | NovAtel