

OEM-IMU-ADIS-16488

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



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 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 ADIS-16488 is a Micro Electromechanical System (MEMS) IMU from Analog Devices. It features low noise gyros and accelerometers in a small, light weight, environmentally sealed enclosure. The ADIS-16488 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 airborne and ground applications that require accurate 3D position, velocity and attitude (roll, pitch and yaw) data.

Combining SPAN and MEMS technology

A proprietary NovAtel MEMS Interface Card (MIC) couples the ADIS-16488 with SPAN enabled receiver cards, offering a unique, powerful GNSS+INS system for weight and size constrained applications. Designed as a board stack configuration for ease of integration, the MIC interfaces directly with NovAtel's small form factor OEM719 receiver.

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 light weight
- IMU data rate: 200 Hz
- 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/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	200 Hz
INS Solution	Up to 200 Hz

Time Accuracy ⁵ 20 ns RMS

Max Velocity ⁶ 515 m/s

IMU Performance ⁷

Gyroscope Performance

Input range	±450 deg/sec
In-run bias stability	6.25 deg/hr
Angular random walk	0.30 deg/√hr

Accelerometer Performance

Range	±18 g
In-run bias stability	0.1 mg
Velocity random walk	0.029 m/s/√hr

Physical and Electrical

IMU dimensions	47 × 44 × 14 mm
IMU weight	48 g
Power	
Input voltage	+3.3 VDC
Power consumption	254 mA
Communication Interface	SPI

Environmental

Temperature	
Operating	-40°C to +85°C
Storage	-40°C to +105°C

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	0.035	0.035	0.150
	PPP	0.06	0.15					
	SP	1.00	0.60					
	Post-Processed ¹⁰	0.01	0.01					
10 s	RTK ⁹	0.47	0.13	0.100	0.020	0.072	0.072	0.210
	PPP	0.51	0.25					
	SP	1.45	0.70					
	Post-Processed ¹⁰	0.02	0.02					
60 s	RTK ⁹	25.02	1.73	1.170	0.070	0.185	0.185	0.350
	PPP	25.06	1.85					
	SP	26.00	2.30					
	Post-Processed ¹⁰	0.55	0.13					

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 a 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 accuracy using Inertial Explorer processing software. 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).



Sea and Land Technologies Pte Ltd
Global Technologies | Seamless Solution

Main Office & Asia Pacific Service Centre

7 Tuas Basin Link Singapore 638761

+65 6716 0777 +65 6563 0366