

OEM-IMU-STIM300

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 STIM300 is a Micro Electromechanical System (MEMS) IMU from Sensoror. It features low noise gyros and accelerometers in a small, lightweight, environmentally sealed enclosure. The STIM300 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, this IMU is ideal for airborne and ground applications that require accurate 3D position, velocity and attitude (roll, pitch and azimuth) data.

Combining SPAN and MEMS technology

A proprietary NovAtel MEMS Interface Card (MIC) couples the STIM300 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

- Ideal for size constrained applications
- Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- Commercially exportable
- Low 5.0 VDC power input

Features

- Low noise commercial grade gyros and accelerometers
- Small size and lightweight
- IMU data rate: 125 Hz
- Direct UART interface to OEM7 receivers
- 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 Rates

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

Time Accuracy⁵ 20 ns RMS

Max Velocity⁶ 515 m/s

IMU Performance⁷

Gyroscope Performance

Input range	±400 deg/sec
In-run bias stability	0.5 deg/hr
Angular random walk	0.15 deg/√hr

Accelerometer Performance

Range	±10 g
In-run bias stability	0.05 mg
Velocity random walk	0.06 m/s/√hr

Physical and Electrical

IMU dimensions 39 × 45 × 22 mm

IMU weight 55 g

Power

Input voltage	+5.0 VDC
Power consumption	1.5 W

Communication Interface RS-422 UART

Environmental

Temperature

Operating	-40°C to +85°C
Storage	-55°C to +90°C

Performance During GNSS Outages⁸

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					
	PPP	0.06	0.15	0.020	0.010	0.015	0.015	0.080
	SP	1.00	0.60					
	Post-Processed ¹⁰	0.01	0.01	0.020	0.010	0.007	0.007	0.022
10 s	RTK ⁹	0.27	0.13					
	PPP	0.31	0.25	0.055	0.017	0.025	0.025	0.095
	SP	1.25	0.70					
	Post-Processed ¹⁰	0.02	0.02	0.020	0.010	0.007	0.007	0.022
60 s	RTK ⁹	6.52	1.43					
	PPP	6.56	1.55	0.280	0.055	0.045	0.045	0.130
	SP	7.50	2.00					
	Post-Processed ¹⁰	0.26	0.10	0.024	0.011	0.009	0.009	0.024

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).

Contact Hexagon | NovAtel

sales.nov.ap@hexagon.com 1-800-NOVATEL (U.S. and Canada) or 403-295-4900 | China: 0086-21-68882300 | Europe: 44-1993-848-736 | SE Asia and Australia: 61-400-883-601. For the most recent details of this product: novatel.com

Inertial Explorer, NovAtel, OEM7, SPAN, TerraStar and Waypoint are trademarks of NovAtel, Inc., entities within the Hexagon Autonomy & Positioning division, their affiliated entities, and/or their licensors. All other trademarks are properties of their respective owners.

©2021 NovAtel Inc. All rights reserved. NovAtel is part of Hexagon. NovAtel makes no representation or warranty regarding the accuracy of the information in this publication. This document gives only a general description of the product(s) or service(s) offered by NovAtel, and, except where expressly provided otherwise, shall not form part of any contract. Such information, the products and conditions of supply are subject to change without notice.