



IMU-CPT Combined with NovAtel's GNSS Technology to Provide 3D Position, Velocity and Attitude Solution

Benefits

Continuous, stable positioning

Minimizes import/export issues

Withstands harsh environments

Easy integration with NovAtel's
SPAN-SE™ and OEM6™ series
GNSS/INS receivers

Features

Fiber optic gyros and MEMS
accelerometers

Wheel sensor input for
ground applications

SPAN INS functionality

SPAN: World-Leading GNSS + INS Technology

SPAN (Synchronous Position, Attitude and Navigation) 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 tightly coupled to provide an exceptional 3D navigation solution that is stable and continuously available, even through periods when satellite signals are blocked.

IMU-CPT Overview

The IMU-CPT is designed to be paired with NovAtel's SPAN-SE or OEM6 line of receivers. It is comprised of Fiber Optic Gyros (FOG) and Micro Electrical Mechanical Systems (MEMS) accelerometers. FOGs offer exceptionally long life and stable performance compared with other similar gyro technologies.

Advantages of IMU-CPT

Paired with NovAtel's SPAN-SE or OEM6 receiver, the IMU-CPT offers a fully integrated, tightly coupled GNSS and IMU system delivering the most satellite observations and the most accurate, continuous position, velocity and attitude solution possible. Further, the IMU-CPT is comprised entirely of commercial components, greatly minimizing cross border difficulties encountered with traditional GNSS/INS systems. The IMU-CPT also provides the best price to performance value available on NovAtel's SPAN platform.

Improve IMU-CPT Accuracy

Take advantage of our AdVance® RTK as well as support for other satellite based augmentation systems such as L-Band or SBAS to improve real-time performance and accuracy. For more demanding applications, Inertial Explorer® post-processing software from our Waypoint® Products Group can be used to post-process IMU-CPT data and offers the highest level of accuracy with the system.

If you require more information about our SPAN products,
visit novatel.com/products/span-gnss-inertial-systems



novatel.com

sales@novatel.com

1-800-NOVATEL (U.S. and Canada)
or 403-295-4900

China 0086-21-54452990-8011

Europe 44-1993-848-736

SE Asia and Australia 61-400-883-601

SPAN System Performance¹

Horizontal Position Accuracy (RMS)	
Single Point L1	1.5 m
Single Point L1/L2	1.2 m
SBAS	0.6 m
CDGPS	0.6 m
DGPS	0.4 m
L-Band	
VBS	0.6 m
XP	0.15 m
HP	0.1 m
RT-2™	1 cm+1 ppm
Data Rates	
GNSS Measurement	5 Hz
GNSS Position	5 Hz
IMU Measurement	100 Hz
INS Solution	Up to 100 Hz
Time Accuracy ³	20 ns RMS
Maximum Velocity⁴	515 m/s

IMU Performance¹

IMU-CPT	
Gyro Technology	FOG
Gyro Output Range	±375°/s
Gyro Bias	20°/hr
Gyro Bias Stability	±1°/hr
Gyro Scale Factor	1500 ppm
Angular Random Walk	0.0667°/√hr (max)
Accelerometer Range	±10 g
Accelerometer Bias	50 mg
Accelerometer Bias Stability	±0.75 mg
Accelerometer Scale Factor	4000 ppm

IMU Physical and Electrical

Dimensions	152 x 168 x 89 mm
Weight	2.29 kg
Power	
Power Consumption	13 W Max
Input Voltage	+9 to +18 VDC
Input/Output Connectors	
Power and I/O	MIL-DTL-38999 Series 3

Environmental

Temperature	
Operating	-40°C to +65°C
Storage	-50°C to +80°C
Humidity	95% non-condensing
Waterproof	MIL-STD-810F, 506.4, Procedure I

Included Accessories

- Combined I/O and Power Cable

Optional Accessories

- Inertial Explorer post-processing software

Performance During GNSS Outages^{1,4}

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	0.020	0.050	0.020	0.010	0.015	0.015	0.050
	HP	0.100	0.080	0.020	0.010	0.015	0.015	0.050
	SP	1.200	0.600	0.020	0.010	0.015	0.015	0.060
	PP ⁵	0.010	0.0150	0.020	0.010	0.015	0.015	0.030
10 s	RTK	0.230	0.010	0.050	0.016	0.020	0.020	0.060
	HP	0.770	0.750	0.051	0.023	0.020	0.017	0.060
	SP	1.380	0.680	0.034	0.014	0.020	0.017	0.065
	PP ⁵	0.030	0.020	0.020	0.010	0.018	0.018	0.047
60 s	RTK	5.710	1.600	0.212	0.059	0.028	0.028	0.090
	HP	6.470	1.690	0.240	0.071	0.028	0.028	0.095
	SP	7.120	1.890	0.260	0.075	0.028	0.028	0.100
	PP ⁵	0.290	0.100	0.030	0.020	0.018	0.018	0.049



Version 2 - Specifications subject to change without notice.

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For the most recent details of this product:
novatel.com/assets/Documents/Papers/IMU-CPT.pdf

¹ Typical SPAN system performance values when using this IMU. Performance specifications subject to GPS system characteristics, US DOD operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference.

² Time accuracy does not include biases due to RF or antenna delay.

³ Export licensing restricts operation to a maximum of 515 metres/second.

⁴ RMS, incremental error growth from steady-state accuracy. Computed with respect to full GPS, RTK trajectory.

⁵ Post-processing accuracy using Inertial Explorer processing software.



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