



## 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™ GNSS/INS receiver

### Features

Fiber optic gyros and MEMS  
accelerometers

Wheel sensor input for  
ground applications

### SPAN: World-Leading GPS+INS Technology

SPAN (Synchronous Position, Attitude and Navigation) technology brings together two different, but complementary technologies: GPS positioning and inertial navigation. The absolute accuracy of GPS 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 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. The IMU-CPT provides the best price/performance available on NovAtel's SPAN platform.

### Improve IMU-CPT Accuracy

Paired with NovAtel's SPAN-SE receiver platform the IMU-CPT allows customers to benefit from a feature rich and ruggedized enclosure offering excellent price to performance value. This pairing 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, which means cross-border difficulties involved with traditional GPS/INS systems are greatly minimized. Additionally for more demanding applications Inertial Explorer® (IE) 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](http://novatel.com/products/span-gnss-inertial-systems)

[novatel.com](http://novatel.com)

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**SPAN System Performance<sup>1</sup>****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
OmniSTAR	
VBS	0.6 m
XP	0.15 m
HP	0.1 m
RT-20 <sup>®2</sup>	0.2 m
RT-2 <sup>™</sup>	1 cm+1 ppm

**Data Rates**

GPS Measurement	5 Hz
GPS Position	5 Hz
IMU Measurement	100 Hz
INS Solution	Up to 100 Hz
Time Accuracy <sup>3</sup>	20 ns RMS

**Maximum Velocity<sup>4</sup>** 515 m/s

**IMU Performance<sup>1</sup>**

<b>IMU-CPT</b>	
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<sup>1</sup>**

Outage Duration	Positioning Mode	Position Accuracy (m) RMS		Velocity Accuracy (m/s) RMS		Attitude Accuracy (degrees) RMS		
		Horizontal	Vertical	Horizontal	Vertical	Roll	Pitch	Heading
0s	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 <sup>6</sup>	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 <sup>6</sup>	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 <sup>6</sup>	0.290	0.100	0.030	0.020	0.018	0.018	0.049



Version 1 - Specifications subject to change without notice.

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For the most recent details of this product:

[novatel.com/assets/Documents/Papers/](http://novatel.com/assets/Documents/Papers/)

<sup>1</sup> 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.

<sup>2</sup> Expected accuracy after static convergence.

<sup>3</sup> GPS only.

<sup>4</sup> Time accuracy does not include biases due to RF or antenna delay.

<sup>5</sup> Export licensing restricts operation to a maximum of 515 metres/second.

<sup>6</sup> RMS, incremental error growth from steady-state accuracy. Computed with respect to full GPS, RTK trajectory.

<sup>7</sup> Post-processing accuracy using Inertial Explorer processing software.



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