

## IMU-CPT COMBINED WITH NOVATEL'S GNSS TECHNOLOGY TO PROVIDE 3D POSITION, VELOCITY AND ATTITUDE SOLUTION



### SPAN: WORLD-LEADING GNSS+INS TECHNOLOGY

Synchronous Position, Attitude and Navigation (SPAN) 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 the NovAtel OEM6<sup>®</sup> line of receivers. It is comprised of Fiber Optic Gyros (FOG) and Micro Electromechanical 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 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.

### IMPROVE IMU-CPT ACCURACY

Take advantage of NovAtel CORRECT<sup>™</sup> to receive your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Inertial Explorer<sup>®</sup> post-processing software from our Waypoint<sup>®</sup> Products Group can be used to post-process IMU-CPT data and offers the highest level of accuracy with the system.

### BENEFITS

- + Continuous, stable positioning
- + Minimizes import/export issues
- + Withstands harsh environments
- + Easy integration with NovAtel's OEM6 series GNSS+INS receivers

### FEATURES

- + Fiber optic gyros and MEMS accelerometers
- + Wheel sensor input for ground applications
- + SPAN INS functionality

If you require more information about our SPAN products, visit [www.novatel.com/span](http://www.novatel.com/span)

# IMU-CPT™

## SPAN SYSTEM PERFORMANCE<sup>1</sup>

### Horizontal Position Accuracy (RMS)

Single point L1/L2	1.2 m
NovAtel CORRECT™	
» SBAS <sup>2</sup>	60 cm
» DGPS	40 cm
» PPP <sup>3, 4</sup>	4 cm
» RTK	1 cm + 1 ppm

### Data Rate

IMU measurement	100 Hz
INS solution	Up to 100 Hz

**Time Accuracy<sup>5</sup>** 20 ns RMS

**Max Velocity<sup>6</sup>** 515 m/s

## IMU PERFORMANCE<sup>7</sup>

### Gyroscope Performance

Gyro technology	FOG
Output range	±375°/s
Bias	20°/hr
Bias stability	±1°/hr
Scale factor	1500 ppm
Angular random walk	0.0667°/√hr (max)

### Accelerometer Performance

Range	±10 g
Bias	50 mg
Bias stability	±0.75 mg
Scale factor	4000 ppm

## 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

For the most recent details of this product:

[www.novatel.com/products/span-gnss-inertial-systems/span-imus/imu-cpt/](http://www.novatel.com/products/span-gnss-inertial-systems/span-imus/imu-cpt/)

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**Version 8** Specifications subject to change without notice.

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D16051 May 2016

Printed in Canada.



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## PERFORMANCE DURING GNSS OUTAGES<sup>1,8</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
0 s	RTK <sup>9</sup>	0.02	0.03	0.015	0.010	0.020	0.020	0.060
	SP	1.00	0.60	0.020	0.010	0.020	0.020	0.060
	PP <sup>10</sup>	0.01	0.02	0.015	0.010	0.008	0.008	0.035
10 s	RTK <sup>9</sup>	0.25	0.18	0.045	0.025	0.030	0.030	0.080
	SP	1.20	0.75	0.050	0.025	0.030	0.030	0.080
	PP <sup>10</sup>	0.02	0.02	0.015	0.010	0.008	0.008	0.035
60 s	RTK <sup>9</sup>	6.10	2.05	0.255	0.080	0.045	0.045	0.100
	SP	7.00	2.60	0.260	0.080	0.045	0.045	0.100
	PP <sup>10</sup>	0.23	0.11	0.020	0.012	0.013	0.013	0.038

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. GPS-only.

3. Requires subscription to TerraStar data service. Subscriptions available from NovAtel.

4. An OEM628, OEM638, FlexPak6 or ProPak6 receiver is required.

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

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.

