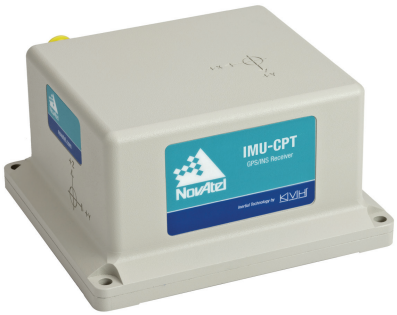
IMU-CPT

Combines with SPAN GNSS+INS technology from Hexagon | NovAtel to provide 3D position, velocity and attitude solution



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. The absolute accuracy of GNSS positioning and the stability of Inertial Measurement Unit (IMU) gyro and accelerometer measurements are deeply 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 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 a receiver from NovAtel, the IMU-CPT offers a fully integrated, deeply 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

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 can be used to post-process IMU-CPT data and offers the highest level of accuracy with the system.

Benefits

- Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- Commercially exportable
- Continuous, stable positioning

Features

- Fiber optic gyros and MEMS accelerometers
- Dedicated wheel sensor input
- IMU data rate: 100 Hz
- Direct UART 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 Rate

IMU Raw Data Rate	100 Hz
INS Solution	Up to 200 Hz

Time Accuracy[5] 20 ns RMS

Max Velocity[6] 515 m/s

IMU Performance[7]

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 1

Included Accessories

- Combined I/O and power cable

Optional Accessories

- Inertial Explorer post-processing software

Performance During GNSS Outages[1,8]

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	0.020	0.020	0.070
	PPP	0.06	0.15					
	SP	1.00	0.60					
	Post-Processed[10]	0.01	0.02	0.015	0.010	0.008	0.008	0.026
10 s	RTK[9]	0.24	0.18	0.055	0.025	0.030	0.030	0.090
	PPP	0.28	0.30					
	SP	1.22	0.75					
	Post-Processed[10]	0.02	0.02	0.015	0.010	0.009	0.009	0.026
60 s	RTK[9]	6.02	1.78	0.260	0.080	0.045	0.045	0.110
	PPP	6.06	1.90					
	SP	7.00	2.35					
	Post-Processed[10]	0.22	0.12	0.022	0.012	0.015	0.015	0.032

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 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. 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.

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For the most recent details of this product: novatel.com

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