



Single Enclosure GPS/INS Receiver Delivers 3D Position, Velocity and Attitude Solution

Benefits

Continuous, stable positioning

Easy to integrate into space constrained applications

Minimizes import/export issues

Withstands harsh environments

Proven OEMV® technology

Features

Fiber optic gyros and MEMS accelerometers

SBAS, L-band and RTK support

100 Hz raw data and solution

Wheel sensor input for ground applications

Optional dual antenna

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.

SPAN-CPT Overview

SPAN-CPT is a compact, single enclosure GPS+INS system, powered by NovAtel's world class, professional-grade OEMV technology. Capable of delivering up to one centimetre level accuracy, customers can choose from a variety of positioning modes to ensure they have the optimal level of accuracy for their application. Available modes including SBAS, L-band (OmniSTAR® and CDGPS) and RTK.

The IMU components, integrated within the SPAN-CPT enclosure, are comprised of fiber optic gyros (FOG) and micro electrical mechanical systems (MEMS) accelerometers, and provide the best price/performance available. FOGs offer exceptionally long life and stable performance compared with other similar gyro technologies.

SPAN-CPT Advantages

The tight coupling of the GPS and IMU measurements delivers the most satellite observations and the most accurate, continuous solution possible. Further, SPAN-CPT is comprised entirely of commercial components, which means cross-border difficulties involved with traditional GPS/INS systems are greatly minimized.

Improve SPAN-CPT Accuracy

Take advantage of our Advance RTK as well as support for satellite-based augmentation systems such as OmniSTAR or SBAS to improve real-time performance and accuracy. For more demanding applications Inertial Explorer® (IE) post processing software from our Waypoint® products group can be used to post process SPAN 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

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SPAN System Performance¹

Horizontal Position Accuracy (RMS)	
Single Point L1	1.5 m
Single Point L1/L2	1.2 m
SBAS	0.6 m
DGPS	0.4 m
OmniSTAR	
VBS	0.6 m
XP	0.15 m
HP	0.1 m
RT-20 ^{®2}	0.2 m
RT-2 TM	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 ³	20 ns RMS

Maximum Velocity⁴ 515 m/s

IMU Performance

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

Physical and Electrical

Dimensions	152 x 168 x 89 mm
Weight	2.36 kg
Power	
Power Consumption	15 W Max
Input Voltage	+9 to +18 VDC

Antenna Port Power Output

Output Voltage	+5 VDC
Maximum Current	100 mA

Connectors

Power and I/O	MIL-DTL-38999 Series 3
Antenna Input	TNC Female

Communication Ports

RS232 UART COM	2
USB Device	1
CAN	1
Event Input Trigger	1
Configurable PPS	1

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

- GPS-700 series antennas (dual frequency required)
- ANT series antennas (dual frequency required)
- RF cables – 5, 10 and 30 m lengths
- Inertial Explorer post-processing software

Optional Dual Antenna⁵

Baseline	Accuracy
0.5 m	0.4°
1.0 m	0.2°
2.0 m	0.1°

For additional GNSS Specifications, please see:
novatel.com/Documents/Papers/OEMV3.pdf

Performance During GNSS Outages¹

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 ⁶	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 ⁶	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 ⁶	0.290	0.100	0.030	0.020	0.018	0.018	0.049



Version 4-Specifications subject to change without notice.

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For the most recent details of this product:

novatel.com/assets/Documents/Papers/SPAN-CPT.pdf

¹ Typical values. 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 Expected accuracy after static convergence.

³ Time accuracy does not include biases due to RF or antenna delay.

⁴ Export licensing restricts operation to a maximum of 515 metres/second.

⁵ Dual antenna requires a second NovAtel receiver to be paired with the SPAN-CPT.

⁶ Post-processing accuracy using Inertial Explorer processing software.



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