

Enclosures PwrPak7D-E2™



OEM7® DUAL ANTENNA SPAN® GNSS+INS ENCLOSURE WITH IMPROVED PERFORMANCE AND HIGHER DATA RATES



DUAL ANTENNA INPUT

Multi-frequency, dual antenna input allows the PwrPak7D-E2 to harness the power of NovAtel CORRECT® with RTK and ALIGN functionality. This makes the PwrPak7D-E2 ideal for ground, marine or aircraft based systems, providing industry leading GNSS multi-constellation heading and position data in static and dynamic environments.

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 System (INS). 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.

SPAN ENABLED MEMS RECEIVER

The PwrPak7D-E2 contains an Epson G370N MEMS IMU to deliver world class NovAtel SPAN technology in an integrated, single box solution. Built on top of the reputable PwrPak7 family, with a higher performance Epson IMU, it provides seamless positioning, quick alignment and excellent performance. This product is commercially exportable and provides an excellent midrange price/performance/size GNSS+INS solution.

FUTURE PROOFED SCALABILITY

Capable of tracking all present and upcoming GNSS constellations and satellite signals, the PwrPak7D-E2 is a robust, high precision receiver that is software upgradable in the field to provide the custom performance required for your application demands.

The PwrPak7D-E2 has a powerful OEM7® GNSS engine, integrated MEMS IMU, built in Wi-Fi, on board NTRIP client and server support, and 16 GB of internal storage.

PRECISE THINKING MAKES IT POSSIBLE

Our GNSS products have set the standard in quality and performance for over 20 years. State-of-the-art, lean manufacturing facilities in our North American headquarters produce the industry's most extensive line of OEM receivers, antennas and subsystems.

FEATURES

- + SPAN enabled enclosure featuring NovAtel's tightly coupled GNSS+INS engine
- + Enhanced connection options including serial, USB, CAN and Ethernet
- + 555 channel, all-constellation, multi-frequency positioning solution
- + Multi-channel L-Band supports TerraStar correction services
- + INS data rates up to 200 Hz
- + Multiple communication interfaces for easy integration and installation
- + Built-in Wi-Fi support
- + 16 GB of internal storage
- + ALIGN® heading solution

If you require more information about our enclosures, visit www.novatel.com/products/gnss-receivers/enclosures



PwrPak7D-E2™



PERFORMANCE¹

Channel Configuration

555 Channels

Signal Tracking

Primary RF²

GPS L1 C/A, L1C, L2C, L2P, L5
GLONASS³ L1 C/A, L2 C/A, L2P,
L3, L5

Galileo⁴ E1, E5 AltBOC, E5a, E5b
BeiDou B1I, B1C, B2I, B2a
QZSS L1 C/A, L1C, L2C, L5
NavIC (IRNSS) L5
SBAS L1, L5
L-Band up to 5 channels

Secondary RF²

GPS L1 C/A, L1C, L2C, L2P, L5
GLONASS³ L1 C/A, L2 C/A, L2P,
L3, L5

Galileo⁴ E1, E5 AltBOC, E5a, E5b
BeiDou B1I, B1C, B2I, B2a
QZSS L1 C/A, L1C, L2C, L5
NavIC (IRNSS) L5

Horizontal Position Accuracy (RMS)

Single point L1 1.5 m
Single point L1/L2 1.2 m
SBAS⁵ 60 cm
DGPS 40 cm
TerraStar-L⁶ 40 cm
TerraStar-C PRO⁶ 2.5 cm
RTK 1 cm + 1 ppm
Initialization time <10 s
Initialization reliability >99.9%

ALIGN Heading Accuracy

Baseline	Accuracy (RMS)
2 m	0.08 deg
4 m	0.05 deg

Maximum Data Rate

GNSS Measurements up to 20 Hz
GNSS Position up to 20 Hz
INS Position/Attitude up to 200 Hz
IMU Raw Data Rate 200 Hz

Time to First Fix

Cold start⁷ <39 s
Hot start⁸ <20 s

Time Accuracy⁹ 20 ns RMS

Velocity Limit¹⁰ 515 m/s

IMU PERFORMANCE¹¹

Gyroscope Performance

Input range ±450 deg/s
Rate bias stability 0.8 deg/hr
Angular random walk
0.06 deg/√hr

Accelerometer Performance

Range ±10 g
Bias stability 0.01 mg
Velocity random walk
0.025 m/s/√hr

COMMUNICATION PORTS

1 RS-232 up to 460,800 bps
2 RS-232/RS-422 selectable
up to 460,800 bps
1 USB 2.0 (device) HS
1 USB 2.0 (host) HS
1 Ethernet 10/100 Mbps
1 CAN Bus 1 Mbps
1 Wi-Fi
3 Event inputs
3 Event outputs
1 Pulse Per Second output
1 Quadrature Wheel Sensor input

PHYSICAL AND ELECTRICAL

Dimensions 147 x 125 x 55 mm

Weight 560 g

Power

Input voltage +9 to +36 VDC
Power consumption¹² 4.15 W

2 Antenna LNA Power Outputs

Output voltage 5 VDC ±5%
Maximum current 200 mA

Connectors

2 Antenna SMA
USB device Micro A/B
USB host Micro A/B
Serial, CAN, Event I/O DSUB HD26
Ethernet RJ45
Data Logging Push button
Power SAL M12, 5 pin, male

Status LEDs

Power
GNSS
INS
Data Logging
USB

ENVIRONMENTAL

Temperature

Operating -40°C to +75°C
Storage -40°C to +85°C

Humidity 95% non-condensing

Waterproof IEC 60529 IPX7

Dust IEC 60529 IP6X

Random Vibration

MIL-STD-810G(CH1),
Method 514.7 – Profiles:
» Rail CAT 11 – 0.5 g RMS
» Composite Wheeled Vehicle
CAT 4 – 2.24 g RMS

» Aircraft Propeller

CAT 13 – 4.5 g RMS

Acceleration (operating)

MIL-STD-810G(CH1),
Method 513.7, Procedure II (16g)

Bump IEC 60068-2-27 (25g)

Shock (non-operating)¹³

MIL-STD-810G(CH1),
Method 516.7, Procedure 1,
40 g 11 ms terminal sawtooth

COMPLIANCE

FCC, ISED, CE

INCLUDED ACCESSORIES

- Power cable
- USB cable
- DSUB HD26 to DB9 RS-232 cable

OPTIONAL ACCESSORIES

- Full breakout cable for DSUB HD26 connector
- DSUB HD26 to M12 IMU cable
- RJ45 Ethernet cable
- VEXXIS® GNSS-500 and GNSS-800 series antennas
- Compact GNSS antennas
- GrafNav/GrafNet®
- Inertial Explorer®
- NovAtel Connect

For the most recent details of this product:

www.novatel.com/products/gnss-receivers/enclosures/pwrpak7D-E2

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
0 s	RTK ¹⁴	0.02	0.03	0.015	0.010	0.013	0.013	0.070
	SP	1.00	0.60	0.015	0.010	0.013	0.013	0.070
	PP ¹⁵	0.01	0.02	0.010	0.010	0.005	0.005	0.011
10 s	RTK ¹⁴	0.15	0.10	0.040	0.020	0.022	0.022	0.085
	SP	1.15	0.70	0.040	0.020	0.022	0.022	0.085
	PP ¹⁵	0.02	0.02	0.010	0.014	0.005	0.005	0.011
60 s	RTK ¹⁴	5.00	1.00	0.220	0.035	0.035	0.035	0.120
	SP	6.00	1.60	0.220	0.035	0.035	0.035	0.120
	PP ¹⁵	0.17	0.06	0.013	0.015	0.005	0.005	0.013

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 sources.

² Model-configurable to track L5/E5a (all / Galileo) through L2 (GPS) or L3/E5b/B2 (GLONASS / Galileo / BeiDou) through L2 (GLONASS). See manual for details.

³ Hardware ready for L3 and L5.

⁴ E1bc support only.

⁵ GPS only.

⁶ Requires a subscription to a TerraStar data service. Subscriptions available from NovAtel.

⁷ Typical value. No almanac or ephemerides and no approximate position or time.

⁸ Typical value. Almanac and recent ephemerides saved and approximate position and time entered.

⁹ Time accuracy does not include biases due to RF or antenna delay.

¹⁰ Export licensing restricts operation to a maximum of 515 metres per second, message output impacted above 500 m/s.

¹¹ Supplied by IMU manufacturer.

¹² Typical value. Consult the OEM7 User Documentation for power supply considerations.

¹³ GNSS only. IMU measurements may not be valid.

¹⁴ 1 ppm should be added to all position values to account for additional error due to baseline length.

¹⁵ Post-processing results using Inertial Explorer software. The survey data used to generate these statistics had frequent changes in azimuth.



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Version 0D Specifications subject to change without notice.

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Printed in Canada.

D24939 September 2019

