CPT7
Compact dual-antenna enclosure with SPAN GNSS+INS technology from Hexagon | NovAtel delivers 3D position, velocity and attitude

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 System (INS). The absolute accuracy of GNSS positioning with the stability of inertial measurement unit (IMU) gyro and accelerometer measurements generate a 3D navigation solution that is stable and continuously available. Deeply coupling the GNSS and inertial measurements through SPAN technology enables better bridging through GNSS interruptions and rapid reacquisition of signals.

CPT7 overview
The CPT7 is a compact, single enclosure GNSS+INS receiver powered by world-class OEM7 technology from NovAtel. Capable of delivering up to centimetre-level accuracy, customers can choose from a variety of positioning modes to ensure they have the optimal level of accuracy for their application.

The CPT7 contains a high performing and highly reliable Honeywell HG4930 Micro Electromechanical System (MEMS) IMU to deliver leading-edge SPAN technology from NovAtel in an integrated single enclosure solution. It provides tactical grade performance for unmanned vehicles, mobile mapping and other commercial and/or military guidance applications. The CPT7 is a small, lightweight and low-power solution with multiple communication interfaces for easy integration on multiple platforms.

CPT7 advantages
The deep coupling of the GNSS and IMU measurements delivers the most satellite observations and the most accurate, continuous solution possible. Further, the CPT7 is comprised entirely of commercial components, simplifying export restrictions involved with traditional GNSS+INS systems.

Improve CPT7 accuracy
CPT7 provides your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Inertial Explorer post-processing software can be used to post-process the real-time SPAN GNSS+INS solution to provide the system’s highest level of accuracy.

Benefits
- High-performance SPAN GNSS+INS solution
- Small, low-power, all-in-one GNSS+INS enclosure
- Easy integration into space and weight constrained applications
- Commercially exportable system
- Rugged design ideal for challenging environments
- Enhanced connection options including serial, USB, CAN and Ethernet
- Future-proof for upcoming GNSS signal support

Features
- MEMS gyros and accelerometers
- Small size, rugged and lightweight
- Dedicated wheel sensor input
- TerraStar Correction Services supported over multi-channel L-Band and IP connections
- Spoofing detection, interference detection and mitigation provided by GNSS Resilience and Integrity Technology (GRIT)
- SPAN GNSS+INS capability with configurable application profiles
- Dual-antenna ALIGN heading
- 16 GB of internal storage
- Four receiver status LEDs
### SPAN system performance

**Signal tracking**
- GPS L1/C/A, L1C, L2C, L2P, L5
- GLONASS L1/C/A, L2 C/A, L2P, L5
- Galileo E1, E5a, E5b
- QZSS L1/C/A, L1C, L1S, L2C, L5
- NavIC (IRNSS) L5

**Baseline accuracy (RMS)**
- Single point L1: 1.5 m
- Single point L1/L2: 1.2 m
- SBAS: 60 cm
- DGPS: 40 cm
- TerraStar-L: 40 cm
- TerraStar-C PRO: 2.5 cm

**Initialization time**
- Standard: 10 s
- Initialization reliability: > 99.9%

**ALIGN heading accuracy**
- Baseline: 0.03 deg
- Accuracy: 0.05 deg

**Heave performance**
- Instantaneous Heave: 5 cm or 5%
- Delayed Heave: 3.5 cm or 3.5%
- Post-Processed Heave: 2.5 cm or 2.5%

**Maximum data rate**
- GNS measurements: up to 20 Hz
- GNSS position: up to 20 Hz
- INS solution: up to 2 Hz
- IMU raw data at 100 Hz or 400 Hz

**Time to first fix**
- Cold start: < 39 s (typ)
- Hot start: < 20 s (typ)

**Status LEDs**
- Power
- Position
- Logging

**Communication ports**
- RS-422
- RS-232
- USB device
- Ethernet
- CAN Bus
- Event input
- Event output
- Wheel sensor input

**Environmental**
- Temperature: 0°C to 70°C
- Humidity: 5% to 95%

### Performance during GNSS outages

<table>
<thead>
<tr>
<th>Outage Duration</th>
<th>Positioning Mode</th>
<th>Position Accuracy (m) RMS</th>
<th>Velocity Accuracy (m/s) RMS</th>
<th>Attitude Accuracy (Degrees) RMS</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
<td>Horizontal</td>
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<tr>
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<td>RTK(20)</td>
<td>0.02</td>
<td>0.03</td>
<td>0.015</td>
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<td></td>
<td>PPP</td>
<td>0.06</td>
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<tr>
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<td>0.035</td>
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<td>SP</td>
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<td>SP</td>
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</table>

1. Typical SPAN system performance values when using this IMU. 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. Model compatible to track L5/E6a (all / Galileo) through L2 (GPS) or L3/E5b/E5b (GLONASS / Galileo / Beidou) through L2 (GLONASS). See manual for details.
3. The secondary antenna input does not support L-band or SBAS signals.
4. Hardware ready for L5. 5. ETB support only.
5. Requires MFD model receiver. 6. Requires sub-sampled to TerraStar data service. Consult the OEM/Installation & Operation User Manual for power supply considerations.
11. Configuration with appropriate models.
20. Requires SPAN Marine Profile.
22. Outage performance achieved with one antenna.

### Contact Hexagon | NovAtel

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

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