More than Inertial+GNSS positioning

Inertial+

Cost effective add-on for improved GNSS measurements

The Inertial+ family of inertial navigation systems from OxTS improve your existing GNSS receiver by combining it with high-grade accelerometers and gyros to deliver superior performance at an affordable price.

>> Key features

- Integrate with external GNSS receivers
- Smooth, stable outputs
- Low cost, high accuracy
- Software suite with post-processing included
- Tightly coupled GNSS/INS
- Improved performance with gx/ix technology
- 100 or 250 Hz output
- Single or dual antenna models
- Odometer input
- Shutter time capture
- Low latency
- ITAR free
- ISO 17025 calibration available

>> Applications

- Aerial survey
- Agriculture
- Asset management
- GIS data acquisition
- Rail survey
- Road monitoring
- Mobile mapping
- And more...

>> Small addition, big results

Designed as a drop-in component, the Inertial+ takes the serial NMEA data from your current GNSS receiver and seamlessly blends it with inertial sensors to produce a smooth, real-time 3D navigation solution. It then outputs the improved data in the same NMEA format for compatibility with existing sensors and instruments. Other input and output formats are also available.

>> Experts in GNSS and inertial technology

Advanced algorithms in the Inertial+ combine the absolute positioning accuracy of GNSS with the stable orientation measurements of the inertial measurement unit to give a navigation solution that outperforms either technology. The Inertial+ can provide continuous position measurements free from jumps, even when satellite signals are blocked or obstructed. A wheel speed odometer can be used to reduce the drift even further.

>> Improve accuracy with advanced processing

The NAVsuite software package, included free of charge with all Inertial+ systems, comes with powerful post-processing software allowing you to process data forwards and backwards in time for an optimal combination and highest level accuracy. Our custom gx/ix processing engine can further improve performance with single satellite aiding algorithms for position updates even in poor GNSS environments. The optional gxRTK feature allows users to download RINEX files post-mission and process their data with 2 cm accuracy.

>> More than GNSS positioning

As well as improving position and velocity measurements, the Inertial+ measures heading, pitch, roll, and many other quantities. These are important for georeferencing and correcting data from cameras, laser scanners and other external sensors. Dual antenna models use internal dual GNSS receivers to deliver accurate and stable heading in all conditions.

>> Performance[1]

External GNSS type	L1/L2	L1	DGPS	SPS	Internal GPS
Position accuracy (CEP)	0.02 m	0.2 m	0.4 m	1.8 m	3.0 m
Velocity accuracy (RMS)	0.05 km/h	0.08 km/h	0.1 km/h	0.1 km/h	0.1 km/h
Heave accuracy[2] (1σ)	10 cm or 5%	10 cm or 5%	10 cm or 5%	10 cm or 5%	10 cm or 5%
Roll/pitch accuracy (1σ)	0.03°	0.04°	0.05°	0.05°	0.05°
Heading accuracy (1σ)					
Single antenna	0.1°	0.1°	0.1°	0.1°	0.2°
Dual antenna[3]	0.06°	0.06°	0.06°	0.06°	0.06°

>> Sensors

Type	Accelerometers	Gyros
Technology	Servo	MEMS
Range	10 *g*	100°/s
Optional	30 *g*	300°/s
Bias stability	2 μ*g*	2°/hr
Linearity	0.01%	0.05%[4]
Scale factor	0.1%	0.1%
Random walk	0.005 m/s/√hr	0.2°/√hr
Axis alignment	<0.05°	<0.05°

>> Interfaces

Ethernet	10/100 Base-T
Serial	2x configurable RS232
Digital I/O	Odometer input Event trigger input 1PPS output Camera trigger IMU sync output

>> Hardware

Dimensions	234 x 120 x 76 mm
Mass	2.3 kg
Input voltage	10–18 V dc
Power consumption	15 W
Operating temp.	-10° to 50° C
Vibration	0.1 g^2/Hz, 5–500 Hz
Shock survival	100 *g*, 11 ms
Internal storage	2 GB
Output rate	100 Hz (Inertial+, Inertial+2) 250 Hz (Inertial+ 250, Inertial+2 250)
Dual antenna	Inertial+2, Inertial+2 250
Calculation latency	3.5 ms

[1] Performance dependent on the accuracy of the external GNSS receiver. Typical figures shown.
[2] Heave output not available on 250 Hz systems.
[3] With 4 m antenna separation.
[4] With SuperCAL adjustment.

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