R2Sonic I2NS Integrated Inertial Navigation System Specifications

The R2Sonic I2NS integrates seamlessly with R2Sonic Wideband Multibeam Echosounder Systems (MBES), providing accurate and robust geo-referencing and motion compensation for hydrographic surveys. The R2Sonic I2NS is an industry proven, tightly coupled solution for vessel roll, pitch, heave, heading, position and velocity, that is easy to set up with the Applanix POSView, operate and control through the monitoring window built into the Graphical User Interface (GUI). All MBES and I2NS data flow through a single Ethernet port, eliminating the need for additional processing modules and cabling, which makes for a neat, single cable, interfacing solution.

The R2Sonic I2NS IMU comes in a compact waterproof housing that can be mounted on the vessel center of rotation or directly on the R2Sonic MBES mount bracket to minimize patch testing between mobilizations. The R2Sonic I2NS processing and interface are integrated into the Sonar Interface Module (SIM). The SIM has connections for the dual GNSS antennas, the IMU, as well as serial input/output ports. The GNSS antennas track all available GPS, GLONASS, Galileo, Beidou, QZSS and Geostationary satellites, with support for Fugro Marinestar™ GPS and GNSS subscription service.

The R2Sonic I2NS provides continuous positioning information, even in areas where GPS reception is compromised by multipath effects and signal loss, making it ideal for vessels operating around structures and in high multipath environments such as ports and harbors.

It can also be upgraded to enable the logging of raw GNSS and inertial observables for later processing through GNSS aided inertial post-processing software.

R2Sonic offers three accuracy and options: Type I, II and III. All types are based on the Trimble Applanix line of industry standard INS and use the same R2Sonic waterproof IMU housing enclosure, SIM architecture and software interface, providing the customer with maximum flexibility and choice of systems to suit job requirements and budget.

Main Advantages:

- Seamless integration with R2Sonic MBES
- Compact IMU in waterproof housing
- Selectable accuracy configurations
- Inertial aided RTK (Real Time Kinematic) positioning
- High immunity to GNSS (Global Navigation Satellite System) outages
- Export license not required for most countries
- Affordable pricing options
- 3-year standard warranty

- I2NS Type I: 0.01° roll/pitch accuracy with RTK. Based on Trimble Applanix OceanMaster™
- I2NS Type II: 0.02° roll/pitch accuracy with RTK. Based on Trimble Applanix WaveMaster™
- I2NS Type III: 0.03° roll/pitch accuracy with RTK. Based on Trimble Applanix SurfMaster™

Spec-Sheet version 3.0. Subject to change without notice

5307 Industrial Oaks Blvd. Suite 120. Austin, Texas 78735 USA | r2sales@r2sonic.com | +1.512.891.0000 | r2sonic.com

Technical Specifications

I2NS Integrated Inertial Navigation System

I2NS Type I – 0.01°

Integrated INS	DGPS	RTK	Accuracy During GNSS Outages
Position	0.5-2m depending on quality of differential corrections	Horizontal: 1cm or better Vertical: 1.5cm or better	~3m for 60 s total outages (RTK) ~1m for 60 s total outages (IAPPK)
Roll & Pitch	0.02°	0.01°	0.03°
Heading	0.01° w/4m baseline 0.02° w/2m baseline	Same	Negligible for outages < 60 s
Heave	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or 2% TrueHeave™

I2NS Type II – 0.02°

Integrated INS	DGPS	RTK	Accuracy During GNSS Outages
Position	0.5-2m depending on quality of differential corrections	Horizontal: 1cm or better Vertical: 1.5cm or better	~3m for 30 s total outages (RTK) ~1m for 60 s total outages (IAPPK)
Roll & Pitch	0.03°	0.02°	0.04°
Heading	0.015° w/4m baseline 0.03° w/2m baseline	Same	Negligible for outages < 60 s
Heave	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or 2% TrueHeave™

I2NS Type III – 0.03°

Integrated INS	DGPS	RTK	Accuracy During GNSS Outages
Position	0.5-2m depending on quality of differential corrections	Horizontal: 1cm or better Vertical: 1.5cm or better	~6m for 30 s total outages (RTK) ~3m for 60 s total outages (IAPPK)
Roll & Pitch	0.04°	0.03°	0.05°
Heading	0.06° w/4m baseline 0.08° w/2m baseline	Same	0.2° (IAPPK, 60 s outage) 0.3° (RTK, 60 s outage)
Heave	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or 2% TrueHeave™

Input/Outputs

Ethernet Input Output	1000Base-T
Serial RS232 Input Output	2 COM Ports bi-directional, user assignable to NMEA output 1 COM Port connected directly to the internal GNSS receiver (for supplying corrections or firmware upgrades)
Base GNSS Correction Input	RTCM V2.x, RTCM V3.x, CMR and CMR+

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