

## I2NS™

### Integrated Inertial Navigation System Option

#### Main Advantages:

- Seamless integration with R2Sonic MBES
- Compact IMU in waterproof housing
- Variable accuracy and price configurations
- Inertial aided RTK positioning
- High immunity to GNSS outages
- Export license not required to most countries
- Affordable price
- 3-Year standard warranty



#### Description:

The I2NS™ integrates seamlessly with R2Sonic Wideband Multibeam Echosounder Systems, providing accurate and robust geo-referencing and motion compensation for hydrographic surveys. The I2NS™ provides existing and new R2Sonic customers an industry proven, tightly coupled solution for vessel roll, pitch, heave, heading, position and velocity which is easy to set-up, operate and control through a graphical user interface. The elimination of additional processing modules reduces volume, size and cabling and allows all data flow through a single Ethernet port.

The I2NS™ is supplied in a compact waterproof housing which may be mounted on the vessel center of rotation or directly on the R2Sonic multibeam system mount bracket, to minimize patch-testing between mobilizations. All processing and interfaces are integrated into the compact Sonar Interface Module with connections for dual Global Navigation Satellite System (GNSS) antennas, the IMU and provision of serial input/outputs. The GNSS antennas track all available GPS, GLONASS, Galileo and Geostationary satellites, including support for Fugro Marinestar™ GPS and GNSS subscription service.

The I2NS™ is ideal for use on vessels operating in high multipath environments such as Ports, Harbors and around Structures as the system provides continuous positioning information even while surveying in areas where GPS reception is compromised by multipath effect and signal loss. The Integrated INS also enables the logging of raw GNSS and Inertial observables for later post-processing through GNSS aided inertial post-processing software, which can be optionally supplied.

R2Sonic offers three levels of accuracy and price options: Type I, II and III. All types are based on the Trimble Applanix line of industry standard INS systems and use the same I2NS™ waterproof 15m submersible IMU housing enclosure exceeding IP68 standards, SIM system architecture and Applanix POSView™ software interface, providing the customer maximum flexibility and choice of systems to suit job requirements and budget:

**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™

## Performance Summary:

### I2NS™ Type I – 0.01°

Integrated INS	DGPS	RTK	Accuracy During GNSS Outages
<b>Position</b>	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)
<b>Roll &amp; Pitch</b>	0.02°	0.01°	0.02°
<b>Heading</b>	0.01° w/4m baseline 0.02° w/2m baseline	Same	Negligible for outages < 60 s
<b>Heave</b>	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
<b>Position</b>	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) ~2m for 60 s total outages (IAPPK)
<b>Roll &amp; Pitch</b>	0.03°	0.02°	0.04°
<b>Heading</b>	0.015° w/4m baseline 0.03° w/2m baseline	Same	Negligible for outages < 60 s
<b>Heave</b>	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or 2% TrueHeave™	5cm or 5% 2cm or TrueHeave™

### I2NS™ Type III – 0.03°

Integrated INS	DGPS	RTK	Accuracy During GNSS Outages
<b>Position</b>	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)
<b>Roll &amp; Pitch</b>	0.04°	0.03°	0.05°
<b>Heading</b>	0.06° w/4m baseline 0.08° w/2m baseline	Same	0.2° (IAPPK, 60 s outage) 0.3° (RTK, 60 s outage)
<b>Heave</b>	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	10/100 Base-T
Serial RS232 Input Output	2 COM Ports bi-directional, user assignable to NMEA output
Base GNSS Correction Input	RTCM V2.x, RTCM V3.x, CMR and CMR+