

# Navsight Marine Solution

## Motion & Navigation Solution FOR HYDROGRAPHIC APPLICATIONS



Courtesy of Cadden

### Navigation, Motion & Heave

Extremely easy to set up, and highly versatile, the NAVSIGHT MARINE SOLUTION makes hydrographers' surveying tasks easier on both shallow and deep waters.



# STATE-OF-THE-ART

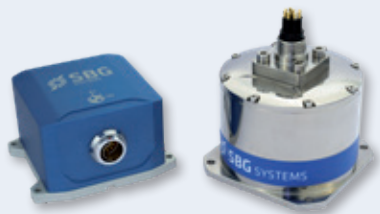
## Navsight Marine Solution

Navsight Marine Solution integrates the latest IMU and GNSS technologies to offer a modern, powerful, and easy-to-use motion and navigation solution for Hydrographers.



### Scalable Performance for Every Application

#### EKINOX GRADE



#### Economic

**Ideal for Shallow Water Applications**

- » 0.02° Roll/Pitch
  - » 0.05 ° Heading
  - » 5 cm Real-time Heave
  - » 2.5 cm Delayed Heave
  - » Up to 1 cm RTK Position
- Low Power Consumption  
Compact, Lightweight

#### APOGEE GRADE



#### Highly Versatile

**Ideal for Challenging Shallow to Deep Water Applications**

- » 0.008° Roll/Pitch
  - » 0.015 ° Heading
  - » 5 cm Real-time Heave
  - » 2 cm Delayed Heave
  - » Up to 1 cm RTK Position
- Amazing performance under  
GNSS Outage

#### HORIZON GRADE

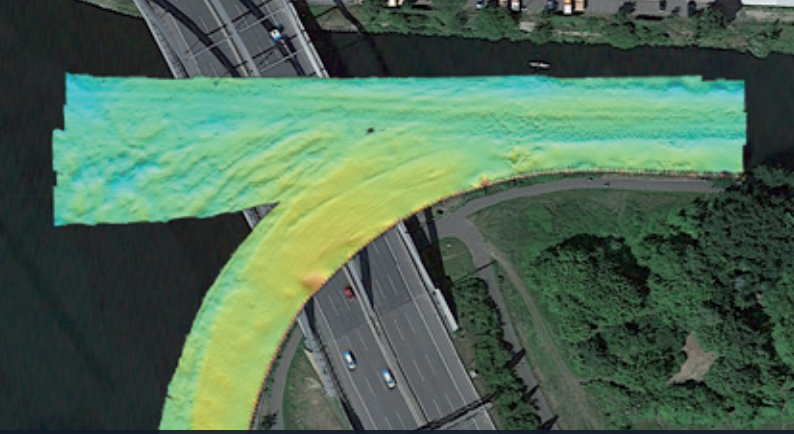


#### FOG Technology

**Large vessels with low Dynamics and Harsh Conditions**

- » 0.007° Roll/Pitch
  - » 0.01 ° Heading
  - » 5 cm Real-time Heave
  - » 2 cm Delayed Heave
  - » Up to 1 cm RTK Position
- Very Low Drift  
Single antenna Heading Capable





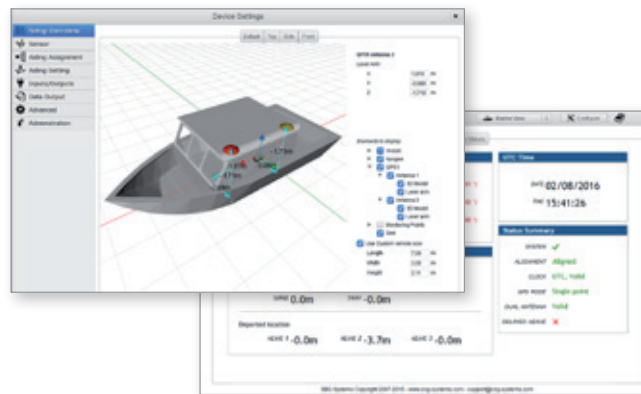
Charting under bridges with the Apogee sensor. The vessel «Spreegrund», property of WSA Berlin, has been equipped by MBT, part of MacArtney group.

**MRU or INS?** Inertial Navigation Systems greatly improves navigation data in all conditions. Position information are fused in real-time with inertial data to provide a robust trajectory when GNSS outages occur (crossing a bridge, surveying a river near several mountains, etc.). In this example, the Apogee sensor is connected to an external GNSS receiver and a DVL for even better performance.

### Configuration Made Easy

The interactive web interface helps you configuring the solution and checking in real-time your mechanical installation, especially your sensor position, your alignments, and GNSS main lever arm (the secondary lever arm is automatically calculated).

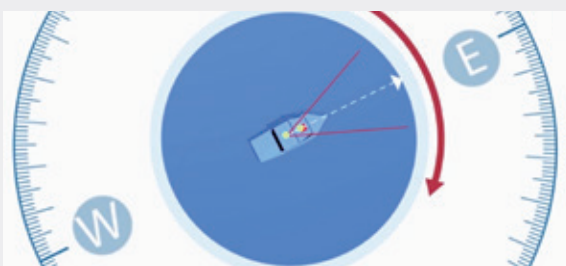
All configuration settings are then stored for further surveys.



Main Drivers available for



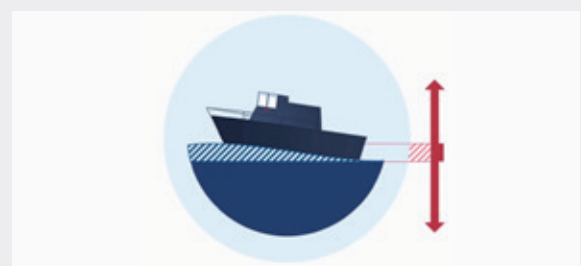
### Fast Initialization with GNSS-based Dual-Antenna Heading



Dual antenna GNSS provides accurate heading with fast initialization time, even if the vessel is mooring.

Additionally, it is not subject to latitude scaling faced by gyro-compass technology.

### Accurate Data in Rough Sea with Delayed Heave



When wave frequency is erratic or in case of long period swell, the delayed heave feature can save the day by allowing survey in rough conditions.

This specific algorithm allows a more extensive calculation, resulting in a heave accurate to 2 cm computed in real-time with a little delay.

# A Full Solution for Hydrographic Applications

## INS/GNSS Post-processing Software

Qinertia is the SBG Systems' in-house post-processing software. This full-featured software enhances SBG inertial navigation systems performance by post processing inertial data with raw GNSS observables.

The Fastest Processing

Tight Coupling INS/GNSS fusion

Modern & Intuitive User Interface

+ 7,000 Base Stations always up-to-date



**Why Post-processing ?** By processing all your INS and GNSS raw data forward and backward, Qinertia PPK software greatly increases accuracy, solves GNSS outages, installation errors, etc. Qinertia can save your survey, or allow you to survey in very complicated areas.

## SBG⊕SERVICES

**NO Surprise!** Navsight solution is based on proven and maintenance-free technologies. Technical assistance is free of charge and firmware upgrades are available during the life of the product without extra cost to secure your day to day operations.



Take advantage of our SBG⊕Services:

### + Warranty Extension

All SBG inertial sensors come with a 2-year warranty. This warranty can be extended up to 5 years. Secure your budget during 3, 4, or 5 years.

### + Check & Calibration

The Check & Calibration service includes a quality check, a firmware update, cleaning, and if required, a calibration in temperature and dynamics. A certificate is delivered with the sensor. It guarantees the quality of the sensor data during 3 years.

### + Back-up System

The back-up system consists in a complete inertial system set delivered in replacement of your sensor during repair operations and during the « check and calibration » service. This service is included into the PRE-MIUM and ELITE packages.



# Specifications

All parameters apply to -20 to 60°C temperature range, unless otherwise stated.

Full specifications can be found in the [Navsight Hardware Manual](#) available upon request.

IHO Compliant

## INERTIAL MEASUREMENT UNIT (IMU)

IMU	 Ekinox-I Surface	 Ekinox-I Subsea Enclosure	 Apogee-I Surface	 Apogee-I Subsea Enclosure	 Horizon-I Surface
Size	86 x 100 x 58 mm	94 x 94 x 112 mm	130 x 100 x 58 mm	94 x 94 x 177 mm	150 x 168 x 215 mm
Weight	425 g	1 kg	635 g	1.32 kg	4.29 kg
Rating	IP68	200 m Depth	IP68	200 m Depth	IP68

OEM Versions available upon request

## EKINOX ACCURACY

	RTK**	PPK***	RTK Outage (30 s)	PPK Outage (30 s)
Roll, Pitch	0.02 °	0.015 °	0.05 °	0.04 °
Heading* - 2 m / 4 m	0.08 ° / 0.05 °	0.03 ° / 0.03 °	0.15 ° / 0.13 °	0.05 ° / 0.05 °
Position (X,Y) / Altitude (Z)	0.01 m / 0.02 m	0.01 m / 0.02 m	3 m / 0.75 m	1 m / 0.3 m

## APOGEE ACCURACY

	RTK**	PPK***	RTK Outage (60 s)	PPK Outage (60 s)
Roll, Pitch	0.008 °	0.005 °	0.012 °	0.008 °
Heading* - 2 m / 4 m	0.03 ° / 0.015 °	0.015 ° / 0.015 °	0.05 ° / 0.04 °	0.025 ° / 0.025 °
Position (X,Y) / Altitude (Z)	0.01 m / 0.02 m	0.01 m / 0.02 m	4 m / 0.75 m	0.15 m / 0.05 m

## HORIZON ACCURACY

	RTK**	PPK***	RTK Outage (60 s)	PPK Outage (60 s)
Roll, Pitch	0.007 °	0.004 °	0.01 °	0.005 °
Heading* - 2 m	0.01 °	0.008 °	0.015 °	0.01 °
Position (X,Y) / Altitude (Z)	0.01 m / 0.02 m	0.01 m / 0.02 m	1 m / 0.5 m	0.1 m / 0.05 m

## HEAVE

	Ekinox	Apogee / Horizon	Wave period	Remarks
Real-time Heave	5 cm	5 cm	up to 20 sec	Automatic adjustment to the sea state
Delayed Heave	2.5 cm	2 cm	up to 40 sec	Internal computation

## VELOCITY AIDED POSITIONING

DVL < 0.2 % Travelled distance

## NAVSIGHT PROCESSING UNIT



Three modes available:

MRU	INS with GNSS	INS + external GNSS
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## PHYSICAL & ENVIRONMENTAL

Size (Rugged / Rack)	227 x 156 x 63 mm / 422 x 204 x 44 mm
Weight (Rugged / Rack)	1.9 kg / 1.95 kg
Wide input voltage range (isolated)	9 - 36V
EN-60945 compliant	Isolated Interfaces and power supply
Power consumption	<3 W, <7W with GNSS
Operating Temperature	-40 to 75°C
MTBF	50,000 hours

## INTERFACES

Aiding Sensors (input)	2X GNSS, RTCM, DVL
Protocols	Output: NMEA, ASCII, Binary, TSS, Simrad Input: NMEA, Trimble, Novatel, Septentrio, Hemisphere, Fugro, PDO, PD6
Logging Capacity	8 GB ≈ 48h, 200 Hz
Ports/Communication	5x RS-232/RS-422 Tx/Rx ports
Synchronization	2x Sync Out (PPS) + 5x Sync In signals
Ethernet	5x UDP / TCP bidirectional ports Web interface , FTP

## INTERNAL GNSS

Internal GNSS Receiver	GPS, GLONASS, GALILEO, BEIDOU, L1/L2/L5, RTK, RAW
PPP Ready	PPP Ready Omnistar/Marinestar

\*Baseline, dual antenna \*\*Real Time Kinematic \*\*\*Post-processing Kinematic RMS values for typical survey trajectories. Performance depends on velocity aiding accuracy. Performance may be affected by atmospheric conditions, signal multipath, and satellite geometry. All specifications subject to change without notice.



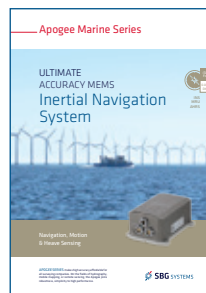


SBG Systems is a leading supplier of MEMS-based inertial motion sensing solutions. The company provides a wide range of inertial solutions from miniature to high accuracy. Combined with cutting-edge calibration techniques and advanced embedded algorithms, SBG Systems products are ideal solutions for industrial & research projects such as unmanned vehicle control, surveying applications, antenna tracking, and camera stabilization.

## PRODUCTS



Qinertia



Apogee Marine



Ekinox Series



Ellipse Series

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