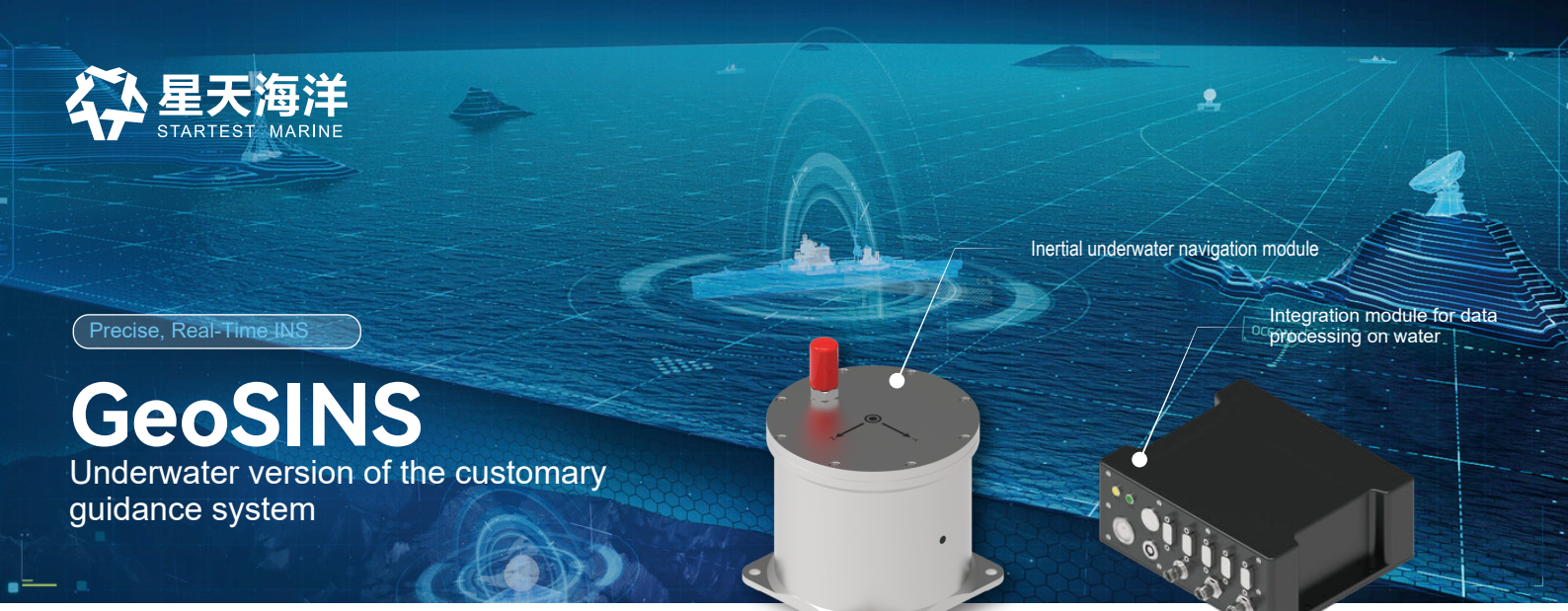
星天海洋
STARTEST MARINE



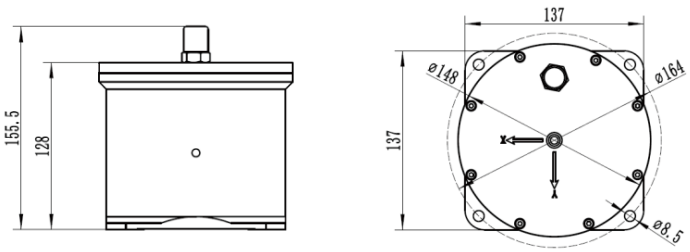
Precise, Real-Time INS

GeoSINS

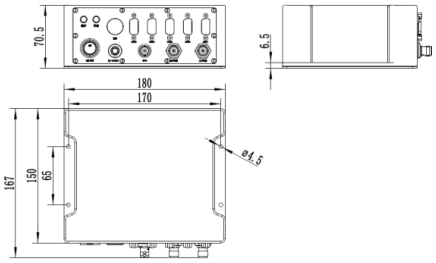
Underwater version of the customary guidance system

Product Overview

The GeoSINS underwater combination inertial guidance system is a high-performance positional attitude reference system designed for multibeam bathymetric sound. The system consists of underwater inertial navigation units integrated with underwater data processing units. The core task is to provide full-dimensional space compensation (position, attitude, sinking, course and time) using built-in high-precision IMUs and integrating external GNSS, PPS signals. The system supports industry-wide agreements such as NMEA0183 and TSS1 to meet the full process needs from real-time operations to offline processing, ensuring excellent georeferenced consistency in complex underwater acoustic environments.



Line drawings for underwater inertial navigation units



Linechart of the water data-processing integration module

[System Features]

Superpower configuration. Secure pressure.

50 m deep seal: The underwater unit uses 316 L high-strength stainless steel, which is protected by a 0.5 MPa pressure test for 12 hours without leakage. Full-sealed thermal stability: The structure has excellent heat conductivity to ensure that the core IMU components work for long periods of time in a closed environment. High performance water-enrichment cables: with a special 15-metre shielded cable, with an extremely strong tensile strength and resistance to seawater corrosive properties.

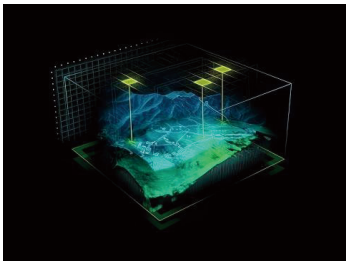
Excellent performance, industry leader.

Centimetre-level positioning accuracy: Centimetre-level positioning accuracy: Supporting RRTK/PPP precision positioning model, RRTK horizontal accuracy up to > (8mm+1ppmx baseline length). High Dynamic Posture Response: Scrolling and Swing Precisions up to 0.01° and Supporting Data Up to 200Hz to refresh. TrueHeaveTM technology: provides real-time up to 2 cm or 2% downfall compensation for high-level underwater mapping requirements.

Smart surveillance, real-time alert.

Full state monitoring: The software interface visualizes the number of satellite blocks, the DOP values, the solvency state and the RMS real time standard accuracy limit ultra-alert: supports the custom threshold, and alerts in real time by colour, bullet window when attitude drifts or signals are lost. Synchronization is better than 10ns: Ensure strict alignment with the time axis of the multibeam processing mainframe, deck unit.

[Applications]



Unmeasured



Supersane water measurement



River & Lake Surveys



Inshore underwater mapping

[Specifications]

Performance Specifications				
	Single point GPS	DGPS	RTK	GNSS lapse accuracy
Course	1.5~2m	0.5~2m	Horizontal: +/- (8 mm + 1 ppm x baseline length) Vertical: +/- (15 mm + 1 ppm x baseline length)	——
Swinging/Throwing	0.02°		0.01°	0.02°
Course	0.05°, 4 m baseline, 0.1°, 2 m baseline			Decline per hour < 0.1° (<60 seconds, lapse is negligible)
Sliding. True eTM	5 cm or 5% 2cm or 2%			

*Note: 1, initialization time: less than 5min, 2, range: Heating: 0 to 360°, Roll: -180° to +180°, Pitch: -90° to +90°.

Physical Specifications			
Component	Inertial underwater navigation module	Integration module for data processing on water	GNSS antenna
Power	DC24V	220V/50Hz, less than 30W	< 0.5Kg
Weight	< 6Kg	< 3Kg	
Dimensions (mm)	Long x width x height: 164*164*156 Installation aperture: 8.5 Holes equally spaced on a Ø148 circle	Long x width x high: 180*167*70.5 Installation aperture: 4.5 Hole spacing: 170*165	
Operating Temp.	-2 ºC to +36 ºC	-2 ºC to +36 ºC	-30 ºC to +65 ºC
Storage Temp.	-30 ºC to +65 ºC	-30 ºC to +65 ºC	-30 ºC to +65 ºC
IP Level	IP68, at 50 m water depth (about 0.5 MPa pressure) at 12 small pressure No leakage at times, no significant change in internal humidity sensor values	IP67	

*Coordinate system requires:

One, Port up, Roll > 0, Port up positive, Two, Bow up, Pitch > 0, Ship up positive, Heating > 0, Clockwise increasing in the direction of clockwise, and Four, Goes up, Heave > 0, up positive.

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