Datasheet
Gyro iUSBL

Description
Gyro iUSBL combines a Sonardyne 6th generation high performance HPT Inverted USBL transceiver and a Lodestar Attitude and Heading Reference System (AHRS) / Inertial Navigation System (INS) in the same pressure rated mechanical assembly capable of operating at depths of 7000 m.

With the AHRS / INS in fixed mechanical alignment to the iUSBL’s pressure balanced acoustic array, the Lodestar Gyro iUSBL can be quickly deployed without need for a calibration to determine the alignment of the ship’s motion sensors to the acoustic transceiver. For many applications, this can enable significant savings in time and operational costs.

The HPT transceiver component of the instrument utilises the latest Sonardyne Wideband® 2 signal processing and is fully compatible with other products in the new Sonardyne 6G equipment range.

Lodestar is tightly integrated into the iUSBL system providing power and communications to the HPT transceiver and embedded highly accurate time-stamping of all motion and acoustic data.

This enables unparalleled precision and accuracy of position estimation by removing many of the sources of error associated with all USBLs such as lever arm offsets, pole bending, and vehicle flexing.

In addition, because many of the system parameters are now fixed, no USBL calibration is required during installation so the system is easier to install and setup. Precision of better than 0.3% of slant range is achievable out of the box, or a one-off calibration can push this figure to less than 0.1% of slant range.

Manufactured in Titanium, the Lodestar Gyro iUSBL is ideal for both short and long term installations.

In case of operational damage to the iUSBL transducer array, all electronics are robustly protected behind a double-sealed, pressure-resistant bulkhead. This ensures that if the transducer face is breached, the Lodestar and acoustic transceiver do not flood.

Key features
- Integrated Sonardyne 6G Wideband 2 iUSBL transceiver and Lodestar AHRS / INS offering high performance
- Available in two versions; standard and deepwater optimised
- Calibration free offering rapid set-up
- Class leading system precision and accuracy.
- Sonardyne Ranger 2 USBL and Fusion LBL compatible
- Water-blocked transducer array protects electronics in the event of damage
- Compatible with Sonardyne’s through-hull, over-the-side and stem tube deployment systems
- Ethernet connectivity
Specifications
Gyro iUSBL

Features

Operational Frequency
Type 8084-000-7535
Transceiver Performance
Operating Range
Pressure rating
Acoustic Coverage
Range Accuracy
Positioning Repeatability
Up to 7,000 Metres
Up to 7,000 Metres
Up to ± 90°
Better Than 15 mm
All Transceivers Tested to Better Than 0.1% of Slant Range 1 Drms

Transmit Source Level
SL = dB re 1 uPa @ 1 m
Tone Equivalent Energy (TEE)**
200 dB
206 dB

Specifications

Heading
Range
0.360°
Accuracy
0.04 to 0.1° secant latitude
Settle Time
<5 minutes
Follow-up Speed
500° / second
Resolution
0.01°

Pitch & Roll
Range
±180° (No physical limit)
Accuracy
0.01°
Resolution
0.01°

Heave
Range
±99 m
Accuracy (Real Time)
5 cm or 5% (Whichever the greater)
Resolution
0.01 m

Electrical
+48 V d.c. Max 160 W

Communication
RS485, baud rate switchable, Ethernet 100 Mbps

Environmental
Operating Temperature
-5 to 40°C
Storage Temperature
-20 to 55°C

Dimensions, Length x Diameter
640 mm x 240 mm (without end connector)

Weight in Air (Water)**
56.4 kg (32 kg)

Note: The absolute accuracy of the system is dependent upon the beacon source level, vessel noise, water depth, mechanical rigidity of the transceiver deployment machine, SV knowledge and proper calibration of the total system using CASIUS.

* TEE = W6v2+ signals are 4x the duration of Sonardyne tone signals (W8v1 & W9v2 are 2x). The TEE figure shows the operational performance when comparing wideband and tone systems.

** Estimated Weights.