

# Datasheet

## Gyro iUSBL



**Gyro iUSBL combines a Sonardyne 6th (6G<sup>®</sup>) generation high performance HPT Inverted Ultra-Short BaseLine (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 7,000 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 time and operational costs.

The HPT transceiver component of the instrument utilises the latest Sonardyne Wideband<sup>®</sup>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 set-up. 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.

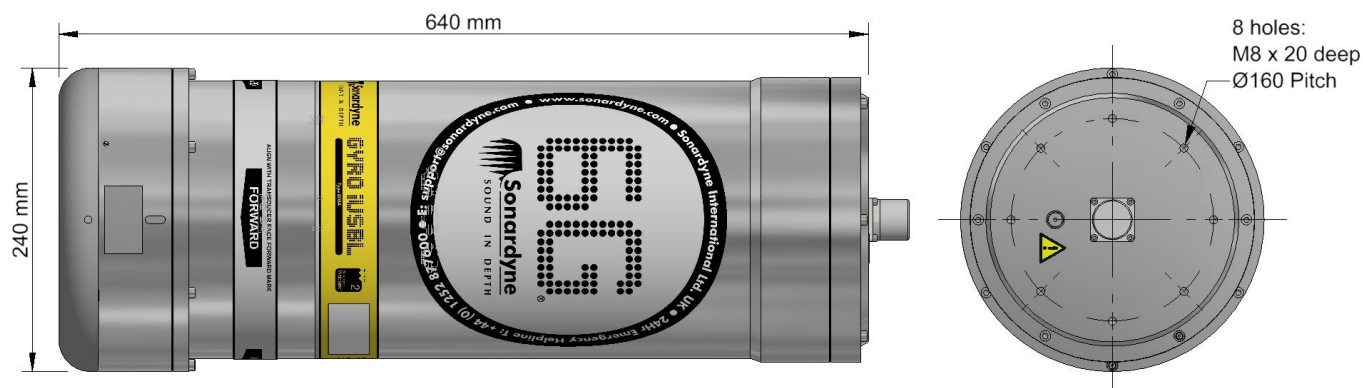
In case of operational damage to the iUSBL transducer array, all electronics are robustly protected behind a double-sealed, pressure-resistant bulkhead. This ensures that if the transducer face is breached, the Lodestar and acoustic transceiver do not flood.

### 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 setup
- 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

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Features		Type 8084-000-7535
Operational Frequency		MF (19–34 kHz)
Transceiver Performance	Operating Range	Up to 7,000 m
	Pressure Rating	Up to 7,000 m
	Acoustic Coverage	Up to $\pm 90^\circ$
	Range Accuracy Positioning Repeatability	Better than 15 mm All transceivers tested to Better Than 0.1% of Slant Range 1 drms
Transmit Source Level (dB re 1 $\mu$ Pa @ 1 m)		200 dB
Tone Equivalent Energy (TEE) <sup>1</sup>		206 dB
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	$\pm 180^\circ$ (No physical limit)
	Accuracy	0.01°
	Resolution	0.01°
Heave	Range	$\pm 99$ m
	Accuracy (Real Time)	5 cm or 5% (whichever the greater)
	Resolution	0.01 m
Electrical		+48 V dc maximum 160 W
Communication		RS485, baud rate switchable, ethernet 100 Mbps
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 <sup>2</sup>		56.4/32 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.

<sup>1</sup> WBv2+ signals are 4x the duration of Sonardyne tone signals (WBv1 & WBv2 are 2x). The TEE figure shows the operational performance when comparing wideband and tone systems.

<sup>2</sup> Estimated Weights.