Datasheet
Gyro USBL 7000 LMF

Gyro USBL combines a Sonardyne 6th (6G®) generation high performance HPT Ultra-Short BaseLine (USBL) LMF transceiver and a Lodestar Attitude and Heading Reference System (AHRS) / Inertial Navigation System (INS) in the same mechanical assembly.

With the AHRS / INS in fixed mechanical alignment to the USBL's acoustic array, and 'in-water' pre calibrated at the factory, Gyro USBL can be quickly deployed without need for a USBL calibration. This enables significant savings in vessel time and operational costs. Depending on the array type, Gyro USBL can offer precision of better than 0.1% of slant range out of the box.

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

Lodestar is tightly integrated with the HPT transceiver, providing highly accurate time-stamped 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 ship flexing.

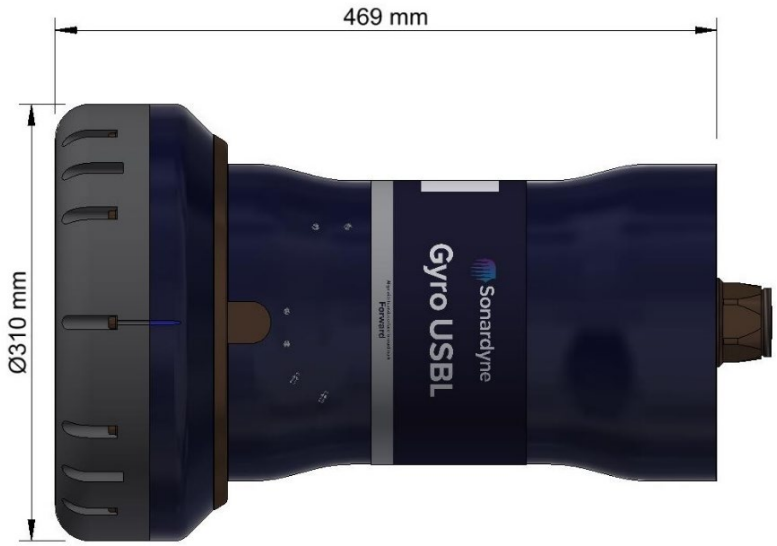
Two accuracy versions of Lodestar are available. A cost-effective version for standard USBL operations and a "plus" variant optimised for long layback tracking and touch-down monitoring.

Manufactured in aluminium bronze the Gyro USBL is ideally suited for installations on vessels of opportunity using through-hull or over-the-side poles. It is also ideal for permanent installation on flexible stem tubes and on very small vessels such as USVs.

Key features

- Integrated Sonardyne 6G Wideband 2 USBL transceiver and Lodestar AHRS / INS offering high performance
- Small form factor
- Available in two inertial performance versions; standard for typical top down operations and "plus" optimised for long layback tracking and touch-down monitoring.
- Calibration free offering rapid deployment
- Class leading system precision and accuracy.
- Sonardyne Marksman LUSBL, DP-INS (plus variant) and Ranger 2 USBL compatible
- Compatible with Sonardyne's through-hull, over-the-side and stem tube deployment systems
- Ethernet and RS485 connectivity

Specifications
Gyro USBL 7000 LMF



Feature			Gyro USBL 7000 LMF 8084-0426 Gyro USBL 7000+ LMF 8084-0456
Operational frequency			LMF (14–19 kHz)
Transceiver performance	Operating range		Up to 12,000 m
	Acoustic coverage		Up to ±90° optimised for deepwater
	Range accuracy		Better than 15 mm
	Expected system slant range accuracy 1 drms (20 dB)[1]		All transceivers tested to better than 0.12% of slant range 1 drms
Transmit source level (dB re 1 µPa @ 1 m)			200 dB
Tone equivalent energy (TEE)[2]			206 dB
Heading	Accuracy	Plus variant	0.1° secant latitude
		Standard variant	0.2° secant latitude
	Settle time		<5 minutes in dynamic conditions
Pitch & roll (accuracy)			0.01°
Heave	Range		±99 m
	Accuracy (real time)		5 cm or 5% (whichever the greater)
Electrical			+48 V dc maximum 160 W
Connector			AGP-2716
Communication			RS485, baud rate switchable, Ethernet 100 Mbps
Operating temperature			-5 to 40°C
Storage temperature			-20 to 45°C
Dimensions (length x diameter)			469 x 310 mm
Weight in air/water[3]			55/35 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

[1] System performance is directly affected by frequency of operation. These figures are taken at top end of the band of operation, i.e. 33.5 kHz for MF band.
[2] 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.
[3] Estimated weights.