DVL 333 Surface

333 kHz

Navigational aid for surface vessels



The DVL 333 Surface is a Doppler Velocity Log designed specifically for surface vessels. Traditional DVLs have a more vulnerable protruding head. The DVL 333 Surface mounts flush to the vehicle hull, alleviating this concern and minimizing drag and the risk of cavitation at the head.

When GNSS is lost, interfered with, or unavailable, relying on other navigational aids is key for uncrewed surface vessels (USVs) to complete missions. Combining a DVL with an INS constrains drift associated with INS-only navigation and ensures vehicle position or navigation in GNSS-denied environments. The DVL 333 Surface has been tested and proven in the challenging conditions of the Oslofjord to have impressive range and reliability.

DVL 333 Surface is available with multiple mounting options.

Download our guide to Nortek DVLs here.

Looking for a complete system requiring INS aiding, current profiling and display capability? The DVL 333 Surface can be upgraded to a full VM Operations system, adding current profiling, a processing unit, and VM Acquisition software.

Highlights

- Maintain position or navigate when GNSS is lost
- Ready for integration with leading INS
- Flush-mounting form factor mitigates traditional challenges with surface vehicle navigation

Applications

- USVs and crewed surface vessels requiring redundant navigation input
- Vehicles requiring flush-mounting form factor

Technical specifications

Bottom velocity	
Single ping std @ 1.5 m/s	0.8 cm/s at 1/2 max altitude
Long-term accuracy (1)	±0.3% / ±0.1 cm/s (export-controlled), >1% (license-free)
Minimum altitude	0.25 m
Maximum altitude	300m (2)
Velocity resolution	Better than 0.01 mm/s
Maximum ping rate (3)	8 Hz

Bottom velocity

(1) Following standard calibration procedures

(2) Bottom-track distance dependent upon bottom type

Water tracking

Minimum accuracy	0.3% of measured value ± 0.3 cm/s
Minimum range	4.0 m

Current profiling (only available with VM Operations upgrade)

Minimum accuracy	0.3% of measured value ± 0.3 cm/s
Velocity resolution	0.1 cm/s
Interval	Maximum sampling rate 2 Hz
Maximum range*	100 m
Blanking	0.5 m
Cell size	1-6 m
Max # cells	128

*Dependent on measurement conditions

Environmental

Operating temperature	-4 to +40 °C
Storage temperature	-20 to +60 °C
Vibration	IEC60068-2-64
EMC approval	IEC/EN 61000-6-2, 61000-6-3

Mechanical

Instrument materials	POM with titanium fastener
Weight	7 kg
Diameter	196 mm
Installation	Sea valve, hull mount and pole mounted solution available
Sea valve (option)	DNV type approval; TAS00002CU
Sea valve weight	85 kg
Bell housing material	Steel DIN17121
Bell housing weight	29 kg

Hardware

Frequency of operation	333 kHz
Beam width	4.3°
Configuration	4-beam Janus array concave transducer, 25° beam angle
Internal memory	16 GB / 64 GB optional
Bandwidth	25% centered at transmit frequency

Interfaces

Communication type	Ethernet with auxiliary serial output using Subcon 8-pin male connector.

Interfaces

Ethernet	10/100 Mbits Auto MDI-X. TCP/IP, UDP/IP, HTTP protocols. Fixed IP / DHCP client /Auto IP address assignment. UPnP and Nortek proprietary instrument discovery over Ethernet. IEEE1588/PTP and NTP for absolute time stamping. Multiple simultaneous data format transmission possible.
Data formats	Nortek proprietary w/ 1 ms time stamp accuracy, NMEA0183. PD0, PD4, PD5, PD6
Trigger	Internal 1, 2, 3, 4, 5, 6, 7 or 8 Hz or Trigger In. Trigger option through command (Ethernet) External TTL: (configurable Rising/Falling/Edges)

Sensors

Sensor	0.1% FS /precision better than 0.002% of full scale per sample
Temperature	-4° to +40 °C ± 0.1 °C

Power

DC input	12-48 V
Maximum continuous current	1.5 A
Average power	4.0 W (4)

(4) Power based on 1 Hz sampling and altitude with greatest transmit pulse

Materials

Standard models	POM housing