NAVIGATION 12/21/2024

DVL 333 - 6000 m, Generation 3





Bottom-track from 0.1 to 375 m range; 6000 m operational depth

The DVL 333 is a long-range Doppler Velocity Log that benefits from increased range with no compromise in performance or form factor. It allows vehicles to maintain bottom lock in a greater range of environments, increasing mission duration on long-range subsea vehicles. This 333 kHz DVL is used by innovators in the uncrewed vehicle sector looking to expand vehicle capabilities into new environments.

Highlights

- ✓ Bottom track from 0.1-375 m range
- Per-ping and per-beam data quality estimates
- ✓ No change in form factor compared to higher-frequency options

Applications

- ✓ Large UUVs/ AUVs operating at high altitudes in deep water
- ✓ Deep-water large ROVs with high accuracy and long range requirements
- ✓ Increase range of vehicles with existing DVL500 without vehicle redesign

Technical specifications

Single ping std @ 1.5 m/s 0.8 cm/s at 1/2 max altitude Long-term accuracy (1) ±0.1% / ±0.1 cm/s (export-controlled), >1% (license-free) Minimum altitude 0.1 m Maximum altitude 375 m (2) Velocity resolution Better than 0.01 mm/s Maximum ping rate (3) 8 Hz (1) Following standard calibration procedures (2) Bottom-track distance dependent on bottom type (3) Inquire for more options ****		
Long-term accuracy (1) ±0.1% / ±0.1 cm/s (export-controlled), >1% (license-free) Minimum altitude 0.1 m Maximum altitude 375 m (2) Velocity resolution Better than 0.01 mm/s Maximum ping rate (3) 8 Hz (1) Following standard calibration procedures- (2) Bottom-track distance dependent on bottom type (3) Inquire for more options *** → Water tracking Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → 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	→ Bottom velocity	
Minimum altitude 0.1 m Maximum altitude 375 m (2) Velocity resolution Better than 0.01 mm/s Maximum ping rate (3) 8 Hz (1) Following standard calibration procedures: (2) Bottom-track distance dependent on botts type (3) Inquire for more options **** ***Water tracking Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum range 4.0 m ***Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 **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	Single ping std @ 1.5 m/s	0.8 cm/s at 1/2 max altitude
Maximum altitude 375 m (2) Velocity resolution Better than 0.01 mm/s Maximum ping rate (3) 8 Hz (1) Following standard calibration procedures (2) Bottom-track distance dependent on bottom type (3) Inquire for more options ★ Water tracking Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum range 4.0 m ★ Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 ★ 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	Long-term accuracy (1)	$\pm 0.1\%$ / ± 0.1 cm/s (export-controlled), >1% (license-free)
Velocity resolution Better than 0.01 mm/s Maximum ping rate (3) 8 Hz (1) Following standard calibration procedures *** (2) Bottom-track distance dependent on bottsm type *** (3) Inquire for more options *** → Water tracking *** Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum range 4.0 m → Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → 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	Minimum altitude	0.1 m
Maximum ping rate (3) (1) Following standard calibration procedures (2) Bottom-track distance dependent on bottom type (3) Inquire for more options → Water tracking Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum range 4.0 m → Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → Environmental Operating temperature 4 to +40 °C Storage temperature 7-20 to +60 °C Vibration EMC approval HEC60068-2-64 EMC approval → Mechanical	Maximum altitude	375 m (2)
(1) Following standard calibration procedures (2) Bottom-track distance dependent on bottom type (3) Inquire for more options → Water tracking Minimum accuracy	Velocity resolution	Better than 0.01 mm/s
(2) Bottom-track distance dependent on bottom type (3) Inquire for more options → Water tracking Minimum accuracy Minimum range 4.0 m → Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells → Environmental Operating temperature -4 to +40 °C Storage temperature -20 to +60 °C Vibration IEC60068-2-64 EMC approval → Mechanical	Maximum ping rate (3)	8 Hz
(3) Inquire for more options → Water tracking Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum range 4.0 m → Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → Environmental Operating temperature -4 to +40 °C Storage temperature -20 to +60 °C Vibration IEC60068-2-64 EMC approval → Mechanical	(1) Following standard calibration procedure	s
Minimum accuracy Minimum range 4.0 m Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Minimum range 0.3% of measured value ± 0.3 cm/s Velocity profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → 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	(2) Bottom-track distance dependent on bott	tom type
Minimum accuracy Minimum range 4.0 m Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → Environmental Operating temperature -4 to +40 °C Storage temperature -20 to +60 °C Vibration IEC60068-2-64 EMC approval → Mechanical	(3) Inquire for more options	
Minimum range 4.0 m Current profiling Minimum accuracy 0.3% of measured value ± 0.3 cm/s Velocity resolution 0.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → 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	→ Water tracking	
Minimum accuracy Velocity resolution Interval Maximum range Blanking Cell size O.5-4.0 m Max # cells Penvironmental Operating temperature City resolution IEC60068-2-64 EMC approval Minimum accuracy 0.3% of measured value ± 0.3 cm/s O.3 cm/s 0.1 cm/s User-specified Nth ping 0.5 m 0.5 m 0.5 m 0.5-4.0 m 140 Cell size -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	Minimum accuracy	0.3% of measured value ± 0.3 cm/s
Minimum accuracy Velocity resolution O.1 cm/s Interval User-specified Nth ping Maximum range 100 m Blanking O.5 m Cell size O.5-4.0 m Max # cells I40 ► Environmental Operating temperature -4 to +40 °C Storage temperature -20 to +60 °C Vibration IEC60068-2-64 EMC approval ► Mechanical	Minimum range	4.0 m
Velocity resolution Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → Environmental Operating temperature -4 to +40 °C Storage temperature -20 to +60 °C Vibration IEC60068-2-64 EMC approval → Mechanical	→ Current profiling	
Interval User-specified Nth ping Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 ➤ 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	Minimum accuracy	0.3% of measured value ± 0.3 cm/s
Maximum range 100 m Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → Environmental -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	Velocity resolution	0.1 cm/s
Blanking 0.5 m Cell size 0.5-4.0 m Max # cells 140 → 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	Interval	User-specified Nth ping
Cell size 0.5-4.0 m Max # cells 140 → 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	Maximum range	100 m
Max # cells → Environmental Operating temperature -4 to +40 °C Storage temperature -20 to +60 °C Vibration IEC60068-2-64 EMC approval → Mechanical	Blanking	0.5 m
→ 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	Cell size	0.5-4.0 m
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	Max # cells	140
Storage temperature -20 to +60 °C Vibration IEC60068-2-64 EMC approval IEC/EN 61000-6-2, 61000-6-3 → Mechanical	→ Environmental	
Vibration IEC60068-2-64 EMC approval IEC/EN 61000-6-2, 61000-6-3 → Mechanical	Operating temperature	-4 to +40 °C
EMC approval IEC/EN 61000-6-2, 61000-6-3 → Mechanical	Storage temperature	-20 to +60 °C
→ Mechanical	Vibration	IEC60068-2-64
	EMC approval	IEC/EN 61000-6-2, 61000-6-3
	→ Mechanical	
Depth rating 6000 m	Depth rating	6000 m
Weight 7.0 kg	Weight	7.0 kg
Weight in water 4.1 kg	Weight in water	4.1 kg
Height 203 mm	Height	203 mm
Diameter ø186 mm	Diameter	ø186 mm
→ Hardware	→ Hardware	
Frequency of operation 333 kHz	Frequency of operation	333 kHz
Beam width 4.3°		4.3°
Configuration 4-beam Janus array convex transducer, 25° beam angle	Configuration	4-beam Janus array convex transducer, 25° beam angle
Internal memory 16 GB / 64 GB optional		16 GP / 64 GP optional

→ Hardware		
Bandwidth	25% centered at transmit frequency	
→ Interfaces		
Serial (either serial or ethernet)	Configurable RS-232 or RS-422 Subconn connector, 8-pin male	
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. OD0, PD4, PD5, PD6	
Trigger	Internal 1, 2, 3, 4, 5, 6, 7 or 8 Hz or Trigger In. Trigger option through command (Ethernet or serial) External TTL or 485 lines: (configurable Rising/Falling/Edges)	
→ Sensors		
Pressure	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 and titanium housing	