Vessel-mounted current profiler

Signature VM

The Signature VM package delivers vessel-mounted AD2CP capabilities based on present-day technology

Until now, ADCP current surveys have been complex and time-consuming processes. A successful current survey depends on highly skilled personnel and the hardware set-up is unique, and challenging, for each vessel. This leads to concerns regarding interfacing, synchronization, offsets and mounting. A miscalculation in connection with any one of these factors can lead to errors that affect the final velocity data quality.

Nortek's vessel-mounted ADCP current survey package – called Signature VM – opens up new and unprecedented opportunities to the community, while offering operational convenience and reduced complexity. Data quality can be safeguarded, and both errors and initial installation time can be substantially reduced by using an integrated system where each is module is pre-qualified

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Highlights

- ✓ Five beams for current and depth
- ✓ Outstanding bottom-track performance
- ✓ A coherent system that is quick and convenient to operate

Applications

- ✓ Coastal research
- ✓ Port and harbor mapping
- ✓ Studies of tidal currents
- ✓ Sediment transport studies

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Technical specifications

⟶ Water velocity measurements for Signature VM1000	
Profiling range*	30 m
Cell size	0.2–2 m
Max no. cells	128
Min. blanking	0.1 m
Minimum accuracy	0.3% of the measured value ± 0.3 cm/s
Velocity resolution	0.1 cm/s
Maximum sampling rate	14 Hz
No. of beams	4 slanted at 25 degrees

*) Maximum range depends on acoustic scattering conditions and transmit power.

⟶ Water velocity measurements for Signature VM500	
Profiling range*	70 m
Cell size	0.5–4 m
Max no. cells	128
Min. blanking	0.5 m
Minimum accuracy	0.3% of the measured value ± 0.3 cm/s
Velocity resolution	0.1 cm/s
Maximum sampling rate	6 Hz
No. of beams	4 slanted at 25 degrees

*) Maximum range depends on acoustic scattering conditions and transmit power.

⟶ Bottom velocity measurements for Signature VM1000	
Single ping std @ 3 m/s	0.5 cm/s
Long-term accuracy	± 0.1% / ± 0.1 cm/s
Minimum altitude	0.2 m
Maximum altitude	30 m

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⟶ Bottom velocity measurements for Signature VM1000	
Velocity resolution	0.01 mm/s
Maximum sampling rate	4 Hz
⟶ Bottom velocity measurements for Signature VM500	
Single ping std @ 3 m/s	0.5 cm/s
Long-term accuracy	± 0.1% / ± 0.1 cm/s
Minimum altitude	0.3 m
Maximum altitude	70 m
Velocity resolution	0.01 mm/s
Maximum sampling rate	2 Hz
⟶ Depth measurements for Signature VM1000	
No. of beams	1 vertical
Maximum sampling rate	2 Hz
Max. range	30 m
Vertical resolution / accuracy	0.001 m / 1% of the measured value**
**) Assuming a constant speed of sound	
⟶ Depth measurements for Signature VM500	
No. of beams	1 vertical
Maximum sampling rate	2 Hz
Max. range	70 m
Vertical resolution / accuracy	0.001 m / 1% of the measured value**
**) Assuming a constant speed of sound	
⟶ Echo intensity	
Sampling	Same as velocity for slanted beams
Resolution	0.5 dB
Dynamic range	70 dB slanted beams
No. of beams	4 slanted at 25 degrees

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⟶ Echo intensity	
Beam width	2.9°
⟶ Other	
Temperature sensor range /accuracy	-4 °C to 40 °C / 0.1 °C
Pressure	Piezo resistive
Standard range	0-100 m (inquire for options)
Accuracy/precision	0.1% FS / better than 0.002% of full scale
Compass and tilt	Solid-state magnetometer
Data recording	16 GB (inquire for options)
Data cable	20 m Ethernet cable (inquire for options)
IO	Ethernet
DC Input	12–48 V DC
⟶ Environmental	
Operating temperature	-4 °C to 40 °C
Storage temperature	-20 °C to 60 °C
Shock and vibration	IEC 60068-1 / IEC 60068-2-64
EMC approval	IEC 61000
Depth rating	300 m – Bottom track is limited to surface vessels
Connectors	Straight fitted MCBH6F (Ethernet)
Housing	Small instrument housing
Material	POM with titanium fasteners
⟶ Rack-mount processing unit	
Processor/memory	Intel i7, 8 GB
Hard disk	SSD 240 GB
Operating system	Windows® 10
Housing	19" rack-mountable 1 HE
Dimensions	480x45x220 mm (19" rack-mountable 1 HE)
PC Input	100-240V AC, Max. 25W

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⟶ Rack-mount processing unit	
Interface box Input	100-240V AC as standard or 12-34V DC. Max. 15W
Dimensions	240x45x300 mm (0.5x19” rack mountable 1 HE)
Total weight	4 kg PC, 3 kg Interface box
Connections	Power, Signature VM, GNSS, Ethernet, USB,HDMI, VGA
Operator control	Optional 19" rack mount
LCD panel	Optional 19" rack mount
⟶ Nortek Signature VM acquisition software	
Acquisition	Signature VM - binary, GNSS compass - binary
Timing	< 0.6 s, IEEE1588/PTP for absolute timestamping (GNSS compass/Signature VM)
Configuration	Signature VM (partly)Advanced navigation GNSS compass
Display	Vessel track in map, Bottom-track velocity, Velocity magnitude and direction, Echo amplitude, Echo correlation, Vertical depth
Status	Signature VM + GNSS compass
Output	NMEA data string online (velocity and depth) CSV, ASCII VMT, MATLAB VMT, KML
⟶ GNSS compass	
Brand and model	Advanced navigation GNSS compass
Position accuracy (with dGNSS) / post-processed	Horizontal: 0.6 m / 0.01m, Vertical: 1.0 m / 0.02 m
Heading accuracy / post-processed	0.2°/ 0.09°
Supported navigation systems	GPS L1, GLONASS G1, GALILEO E1, Beidou B1
Optional High AccuracyRTK variant	GPS L1_L2, GLONASS G1_G2, GALILEO E1_E5b, BeiDou B1_ B2
Motion	9-axis IMU
Communication	Ethernet 10/100
Timing	PTP, NTP timeserver functionality
Protocol	NMEA0183, AN Packet protocol, TSS1, Simrad