VESSEL-MOUNTED CURRENT PROFILER

Signature VM Coastal - 1000|500|250 kHz

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

The Signature VM Coastal safeguards data quality, opens up new and unprecedented opportunities to the scientific community, and offers operational convenience and reduced complexity.

The Signature VM Coastal package includes the Signature1000, 500 or 250, allowing for great versatility in both the vessel-mounted and bottom-mounted configurations. By using a state-of-the-art and user-friendly vessel-mounted package, measurement errors and initial installation time can be greatly reduced.

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Highlights

- A coherent system that is quick and convenient to operate
- Fifth echosounder beam for sediment measurements down to the bottom (1000/500)
- Ethernet ADCP and GNSS hardware, offering tight network timing
- Simultaneous current and depth information in one place (1000/500)
- Outstanding bottom-track performance, even under challenging conditions
- Straightforward data-acquisition and processing software

Applications

- Coastal surveys, up to 200 m depth
- Port and harbor mapping
- Studies of tidal currents
- Sediment transport studies
- Large-scale mixing studies

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Technical specifications

⟶ Water velocity measurements for Signature VM 1000 KHZ	
Profiling range*	30 m
Cell size	0.2–2 m
Max no. cells	256
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 VM 500 KHZ	
Profiling range*	70 m
Cell size	0.5–4 m
Max no. cells	256
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.	

⟶ Water velocity measurements for Signature VM 250 KHZ	
Profiling range*	200 m
Cell size	1–8 m
Max no. cells	256
Min. blanking	0.5 m
Minimum accuracy	1% of the measured value ± 0.5 cm/s
Velocity resolution	0.1 cm/s
Maximum sampling rate	2 Hz
No. of beams	4 slanted at 20 degrees
*) Maximum range depends on acoustic scattering conditions and transmit power.	

⟶ Bottom velocity measurements for Signature VM 1000 KHZ	
Single ping std @ 3 m/s	0.5 cm/s
Long-term accuracy	± 0.1% / ± 0.1 cm/s
Minimum altitude	0.2 m

VESSEL-MOUNTED CURRENT PROFILER

Signature VM Coastal - 1000|500|250 kHz

⟶ Bottom velocity measurements for Signature VM 1000 KHZ	
Maximum altitude	30 m
Velocity resolution	0.01 mm/s
Maximum sampling rate	4 Hz
⟶ Bottom velocity measurements for Signature VM 500 KHZ	
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
⟶ Bottom velocity measurements for Signature VM 250 KHZ	
Single ping std @ 3 m/s	TBA
Long-term accuracy	TBA
Minimum altitude	5 m
Maximum altitude	205 m
Velocity resolution	0.01 mm/s
Maximum sampling rate	1 Hz
⟶ Depth measurements for Signature VM 1000 kHz	
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 VM 500 kHz	
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	
⟶ Depth measurements for Signature VM 250 kHz	
No. of beams	N/A*
Maximum sampling rate	N/A
Max. range	N/A
Vertical resolution / accuracy	N/A
*) Depth measurement via the 4 slanted beams.	
⟶ Echo intensity Signature VM 1000 and 500 kHz	

Signature VM Coastal - 1000|500|250 kHz

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
Beam width	2.9°
⟶ Echo intensity Signature VM 250 kHz	
Sampling	Same as velocity for slanted beams
Resolution	0.5 dB
Dynamic range	70 dB slanted beams
No. of beams	4 slanted at 20 degrees
Beam width	2.3°
⟶ Echosounder option for Signature VM 1000 kHz	
No. of beams	1 vertical
Maximum sampling rate	2 Hz
Max. range	30 m
Resolution	3 mm - 0.25 m
Number of bins	10,000
Transmit pulse length	16 ?s - 0.5 ms
Transmit pulse	Monochromatic or pulse compressed (25% BW)
Resolution / dynamic range	0.01 dB / 70 dB
⟶ Echosounder option for Signature VM 500 kHz	
No. of beams	1 vertical
Maximum sampling rate	1 Hz
Max. range	70 m
Resolution	6 mm - 0.5 m
Number of bins	11,000
Transmit pulse length	32 ?s - 1 ms
Transmit pulse	Monochromatic or pulse compressed (25% BW)
Resolution / dynamic range	0.01 dB / 70 dB
⟶ Echosounder option for Signature VM 250 kHz	
No. of beams	N/A
Maximum sampling rate	N/A
Max. range	N/A
Resolution	N/A
Number of bins	N/A
Transmit pulse length	N/A
Transmit pulse	N/A

Signature VM Coastal - 1000|500|250 kHz

⟶ Echosounder option for Signature VM 250 kHz	
Resolution / dynamic range	N/A
⟶ Other	
Temperature sensor range /accuracy	-4 °C to 40 °C / 0.1 °C
Pressure	Piezoresistive
Standard range	VM 1000/ VM 500: 0-100 m (inquire for options), VM 250: 0-300m (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
Vibration	IEC 60068-1/IEC60068-2-64
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 and additional, reinforced transducer cups for VM 250
⟶ Processing unit	
Processor/memory	Intel i5/8 GB
Hard disk	SSD, 500 GB
Operating system	Windows® 10
Housing	Half 19" 2 HE case or 19" rack-mountable 1 HE
Dimensions	265x110x340 mm or 480x45x325 mm
Input	24 V DC, 20 W typical
Total weight	5.75 or 3.80 kg
Connections	Power, Signature ADCP, AN_GNSS, 2x HDMI, 2xLAN, 3x USB, 1x RS-232 (optional)
⟶ 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

VESSEL-MOUNTED CURRENT PROFILER

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⟶ Nortek Signature VM acquisition software	
Display	Vessel track in map, Bottom-track velocity, Bottom-track depth, Velocity magnitude and direction, Echo amplitude, Echo correlation, Vertical depth*, Vertical echogram; corrected relative volume backscatter (1000/500)*
Status	Signature VM + AN_GNSS compass
Output	Online: NMEA data formats and AD2CP format. Off-line CSV, ASCII VMT, MATLAB, MATLAB VMT, MATLAB QRev, KML
*) Signature1000 and 500	
⟶ GNSS compass	
Brand and model	Advanced navigation GNSS compass
Position accuracy (with dGNSS) / post-processed	Horizontal: 0.6 m / 0.01 m, 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 Accuracy RTK 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
⟶ AHRS option	
Accelerometer dynamic range	± 2 g
Gyro dynamic range	± 250°/sec
Magnetometer dynamic range	± 1.3 Gauss
Pitch and roll range / resolution	± 90° (pitch), ± 180° (roll)/0.01°
Pitch and roll accuracy	± 2° (dynamic)3), ± 0.5° (static, ± 30°)
Heading range / resolution	360°, all axes /0.01°
Heading accuracy	± 3° (dynamic)3), ± 2° (static, tilt < 20°)
Sampling rate	Same as measurement rate