VESSEL-MOUNTED CURRENT PROFILER

Signature VM Ocean - 100 kHz

Delivers vessel-mounted ADCP capabilities with an optional scientific echosounder for biomass measurements.

Until now, epipelagic ADCP surveys could deliver neither the resolution nor the range to examine the ocean boundary layer in detail. To study the biomass in this ocean boundary layer, you had to add a separate scientific echosounder.

Nortek's vessel-mounted ADCP current survey package, the Signature VM Ocean in the 100 kHz version, opens up new opportunities to measure currents in and beyond this boundary layer and to study its biomass simultaneously.

The optional center beam is a 70–120 kHz scientific echosounder. Both the echosounder and the current profiler have an effective range of 300–400 m, providing unprecedented insight into the dynamics of zooplankton, krill or even schools of fish. Furthermore, natural acoustic reflectors can give new insight into small-scale physical processes, such as density gradients and internal waves.

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Highlights

- Four beams for current profilingwith a range over 300 m
- Optional scientific echosounderwith multiple modes for biomassmeasurements
- A coherent and modern systemthat is quick and convenient tooperate

Applications

- Offshore operations
- Upper ocean boundary layer studies
- Detection of krill in the watercolumn
- Plankton migration studies
- Internal waves

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Technical specifications

⟶ Water Velocity Measurements	
Profiling range**	300-400 m
Cell size	3-15 m
Max no. cells	200
Min. blanking	2
Minimum accuracy	1.0% of the measured value ± 0.5 cm/s
Velocity resolution	0.1 cm/s
Maximum sampling rate	1 Hz (1/3 Hz with BT and echosounder)
Velocity range (along beam)	5 m/s
No. of beams	4 slanted at 20°
**) Depending on acoustic scattering condition.	
⟶ Bottom velocity measurements	
Single ping std @ 3 m/s	TBA
Long-term accuracy	TBA
Minimum altitude	5 m
Maximum altitude	560 m
Velocity resolution	0.01 mm/s
Maximum sampling rate	1 Hz (1/3 Hz with VP and echosounder)
⟶ Echo intensity (slanted beams)	
Sampling	Same as velocity for slanted beams
Resolution/dynamic range	0.5 dB/70 dB
Dynamic range	70 dB slanted beams
Transducer acoustic frequency	100 kHz
No. of beams	4 slanted at 20°
Beam width	6.1°
⟶ Echosounder option	
No. of beams	1 vertical

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→ Echosounder option	
Transducer acoustic frequency	70-120 kHz
Sampling	1 Hz (1/3 Hz with VP and BT)
Transducer beam width	15° @ 70 kHz, 8.7° @ 120 kHz
Resolution	0.375 –4 m
Resolution/ dynamic range	0.01 dB/130 dB
Transmit pulse	Monochromatic 70 kHz, 90 kHz and 120 kHz or frequency chirp (90 kHz, 50% BW)
Transmit power	7.5-120 W adjustable
Chirp signal processing	Pulse compression or binned frequency response
→ Other	
Temperature sensor range / accuracy	-4 °C to 40 °C / 0.1 °C
Pressure	Piezo resistive
Standard range	0-1500 m (inquire for options)
Accuracy/precision	0.1% FS / Better than 0.002% of full scale
Compass and tilt	Solid-state magnetometer and accelerometer
Data recording	16 GB (inquire for options)
Data cable	30 m Ethernet cable (inquire for options)
IO	Ethernet
DC input	15-48 V DC
→ Dimensions	
Maximum diameter	460 mm
Maximum length without room for internal batteries	350 mm
→ 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	1500 m – Bottom track is limited to surface vessels
Connectors	Straight fitted MCBH6F (Ethernet)

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⟶ Environmental	
Housing	Small instrument housing
Material	POM with titanium fasteners
⟶ 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 time stamping (GNSS/Signature VM)
Configuration	Signature VM (partly) GNSS Advanced navigation
Display	Vessel track in map, Bottom-track velocity, Velocity magnitude and direction, Echo amplitude (slanted beams), Echo correlation (slanted beams), Vertical echosounder: range-corrected echogram, Vertical depth
Status	Signature VM + AN_GNSS compass
Output	NMEA data strings online CSV, ASCII VMT, MATLAB VMT, MATLAB, KML
⟶ GNSS compass	
Brand and model	Advanced Navigation GNSS compass
Position accuracy (withdGNSS)/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

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→ GNSS compass	
Motion	9-axis IMU
Communication	Ethernet 10/100
Timing	PTP, NTP timeserver functionality
Protocol	NMEA 0183, AN Packet protocol, TSS1, Simrad