







# Signature VM Coastal - 1000|500|250 kHz found or type

## 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.

## 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

## Technical specifications

### Water velocity measurements for Signature VM 1000 KHZ

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.

[ arrow ]

### Water velocity measurements for Signature VM 500 KHZ

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 $\pm$ 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.

[ arrow ]

### Water velocity measurements for Signature VM 250 KHZ

Profiling range*	200 m
Cell size	1–8 m
Max no. cells	200 (average)
Min. blanking	0.5 m
Minimum accuracy	1% of the measured value $\pm$ 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.

[ arrow ]

### Bottom velocity measurements for Signature VM

#### 1000 KHZ

Single ping std @ 3 m/s	0.5 cm/s
Long-term accuracy	$\pm$ 0.1% / $\pm$ 0.1 cm/s
Minimum altitude	0.2 m
Maximum altitude	30 m
Velocity resolution	0.01 mm/s
Maximum sampling rate	4 Hz

[ arrow ]

### Bottom velocity measurements for Signature VM

#### 500 KHZ

Single ping std @ 3 m/s	0.5 cm/s
Long-term accuracy	$\pm$ 0.1% / $\pm$ 0.1 cm/s
Minimum altitude	0.3 m
Maximum altitude	70 m
Velocity resolution	0.01 mm/s



[ arrow ]

### Echo intensity Signature VM 1000 and 500 kHz

Resolution 0.5 dB  
Dynamic range 70 dB slanted beams  
No. of beams 4 slanted at 25 degrees  
Beam width 2.9°  
[ arrow ]

### 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°  
[ arrow ]

### 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  $\mu$ s - 0.5 ms  
Transmit pulse Monochromatic or pulse compressed (25% BW)  
Resolution / dynamic range 0.01 dB / 70 dB  
[ arrow ]

### 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  $\mu$ s - 1 ms  
Transmit pulse Monochromatic or pulse compressed (25% BW)  
Resolution / dynamic range 0.01 dB / 70 dB  
[ arrow ]

### Echosounder option for Signature VM

#### 250 kHz

No. of beams N/A  
Maximum sampling rate N/A  
Max. range N/A

[ arrow ]

### Echosounder option for Signature VM

#### 250 kHz

Resolution	N/A
Number of bins	N/A
Transmit pulse length	N/A
Transmit pulse	N/A
Resolution / dynamic range	N/A

[ arrow ]

#### 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

[ arrow ]

#### 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

[ arrow ]

#### 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

[ arrow ]

### Processing unit

Connections Power, Signature ADCP, AN\_GNSS, 2x HDMI, 2xLAN, 3x USB,  
[ arrow ] 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  
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  
[ arrow ]

### 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  
[ arrow ]

### AHRS option

Accelerometer dynamic range  $\pm 2$  g  
Gyro dynamic range  $\pm 250^\circ/\text{sec}$   
Magnetometer dynamic range  $\pm 1.3$  Gauss  
Pitch and roll range / resolution  $\pm 90^\circ$  (pitch),  $\pm 180^\circ$  (roll)/0.01°  
Pitch and roll accuracy  $\pm 2^\circ$  (dynamic)3),  $\pm 0.5^\circ$  (static,  $\pm 30^\circ$ )  
Heading range / resolution 360°, all axes /0.01°  
Heading accuracy  $\pm 3^\circ$  (dynamic)3),  $\pm 2^\circ$  (static, tilt < 20°)  
Sampling rate Same as measurement rate