CURRENT PROFILER

Signature500

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Mean currents and turbulence, plus wave height, direction and ice tracking

The Signature500 ADCP is designed for flexibility. It measures current profiles at up to 8 Hz sampling frequency. It can also measure direct vertical velocity profiles, wave height and direction, and ice thickness and drift. The center beam also functions as a biological echosounder, enabling high-resolution measurements of biomass in the water column. All these features can be combined using Nortek's patented concurrent mode technology.

Highlights

- [/] Five beams for mean currents and turbulence
- [/] Wave height and direction
- [/] Acoustic ranging to ice

Applications

- [/] Turbulence studies
- [/] Tidal turbine operations
- [/] Studies of tidal currents
- [/] Sediment transport studies
- [/] Ice drift and draft studies
- [/] Vessel-mounted coastal surveying
- [/] Plankton migration studies
- [/] Biomass measurements
- [/] Directional wave measurements
- [/] Suitable for wave buoys

Technical specifications

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Water velocity measurements	
Maximum profiling range1)	60 m (burst mode), 70 m (average mode)
Cell size	0.5-4 m
Minimum blanking	0.5 m
Maximum number of cells	256 (burst)/200 (average)

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Water velocity measurements

Velocity range (along beam)	User-selectable 2.5 or 5.0 m/s
Minimum accuracy	0.3% of measured value ± 0.3 cm/s
Velocity precision	Broadband processing, consult instrument software
Velocity resolution	0.1 cm/s
Max sampling rate	8 Hz (4 Hz using 5 beams)

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HR option (on 5th beam only)

Velocity range	N/A
Cell size	N/A
Profiling range	N/A
Range velocity limitations	N/A

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AD2CP measurement modes

Single	Burst or average
Concurrent	Burst and average
Alternate	Single and/or concurrent

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Echo intensity (along slanted beams)

Sampling	Same as velocity
Resolution/ dynamic range	0.5 dB / 70 dB
Transducer acoustic frequency	500 kHz
Number of beams	5; 4 slanted at 25°, 1 vertical
Beam width	2.9°

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Echo sounder option

Resolution	6 mm - 0.5 m
Number of bins	11,000
Transmit pulse length	32 µs - 1 ms
Transmit pulse	Monochromatic or pulse compressed (25% BW)
Resolution / dynamic range	0.01 dB / 70 dB

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Wave measurement option

AST frequency	500 kHz
AST max distance	75 m
Maximum wave measurement depth	60 m
Height range	-15 to +15 m
Accuracy/resolution (Hs)	< 1% of measured value / 2 cm
Accuracy/resolution (Dir)	2° / 0.1°
Period range	1-50 s
Cut-off period (Hs)	5 m depth; 0.6 sec, 20 m depth; 1.1 sec, 60 m depth; 1.9 sec
Cut-off period (dir)	5 m depth; 1.5 sec, 20 m depth; 3.1 sec, 60 m depth; 5.5 sec
Sampling rate (velocity and AST)	4 Hz

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Ice measurement option

Parameters	Acoustic ranging to ice, speed and direction, echo sounder data

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Sensors

Temperature:	Thermistor in head (sampled at meas. rate)
Temp. range	-4 to +40 °C
Temp. accuracy/resolution	0.1 °C/0.01 °C
Temp. time response	2 min
Compass:	Solid State magnetometer (max 1 Hz samplerate)
Accuracy/resolution	2° for tilt < 30°/0.01°
Tilt:	Solid State accelerometer (max 1 Hz sample rate)
Accuracy/resolution	0.2° for tilt < 30°/0.01°
Maximum tilt	Full 3D
Up or Down	Automatic detect
Pressure:	Piezoresistive (sampled at meas. rate)
Standard range	0-100 m (inquire for options)
Accuracy/precision	0.1% FS / Better than 0.002% of full scale

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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)4), ± 0.5° (static, ±30°)
Heading range / resolution	360°, all axis /0.01°
Heading accuracy	± 3° (dynamic)4), ± 2° (static, tilt < 20°)
Sampling rate	Same as measurement rate (up to 8 Hz)

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Data recording

Capacity	16 GB, 64 GB or 128 GB (inquire for larger capacity)
Data record	Consult instrument software
Mode	Stop when full

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Real-time clock

Accuracy	± 1 min/year
Clock retention in absence of external power	1 year. Rechargeable backup battery.

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Data communications

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
Serial	Configurable RS-232/RS-422 300-1250000 bps
Recorder download baud rate	20 Mbit/s (Ethernet only) - 1 GB in 6 minutes
Controller interface	ASCII command interface over Telnet and serial

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Connectors

Depending on configuration	MCBH6F (Ethernet), MCBH8F (serial), MCBH2F-G2 (pwr), optional Souriau M-series metal connector for online use (10M)

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Software

Functions	Deployment planning, instrument configuration, data retrieval and conversion (for Windows®)

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Power

DC input	12-48 V DC
Maximum peak current	1.5 A
Max. average consumption at 1 Hz	8 W at 1 Hz, Ethernet adds 0.75 W
Typical average consumption	25 mW
Sleep consumption	100 µA, power depending on supply voltage
Transmit power per beam	0.3-30 W, adjustable levels
Ping sequence	Parallel

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Batteries

Internal	180 Wh alkaline, 540 or 1800 Wh with long canister
Duration	Depending on configuration, consult software

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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
Depth rating	300 m (for 6000 m version, contact Nortek for specifications)

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Materials

Standard model POM with titanium fasteners

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Dimensions

Maximum diameter	228 mm
Maximum length with room for internal batteries	274 mm (180 Wh), 464 mm (540 Wh or 1800 Wh Li)

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Dimensions

Maximum length without room for internal batteries	184 mm

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Weight

In air, no battery	6.4 kg (5.2 kg short)
In water, no battery	-0.35 kg (0.6 kg short)
Battery	1.8 kg