ACOUSTIC DOPPLER CURRENT PROFILER (ADCP)

Nortek Signature 500

300 m | 6000 m · mean currents and turbulence, plus wave height, direction and ice tracking

The **Signature 500** ADCP is designed for flexibility. It measures current profiles at up to 8 Hz sampling frequency, and can also measure direct vertical velocity profiles, wave height and direction, and acoustic ranging to ice.

The centre beam also works as a biological echosounder, enabling high-resolution biomass measurements 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
- Onboard wave processing

APPLICATIONS

- Simultaneous current and turbulence studies up to 70 m range
- Sediment transport studies or biomass estimates with the optional scientific echosounder
- Buoy-mounted measurements in high-energy areas, with optional AHRS for motion correction
- Wave measurements and ice monitoring using acoustic surface tracking (AST)

WATER VELOCITY MEASUREMENTS	
Max profiling range*	60 m (burst mode), 70 m (average mode)
Cell size	0.5 – 4 m
Minimum blanking	0.5 m
Max number of cells	256 (burst) / 200 (average)
Velocity range (along beam)	User-selectable, 1.0 to 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)

* Dependent on measurement conditions.

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Technical specifications (continued)

AD2CP MEASUREMENT MODES

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

ECHO INTENSITY (SLANTED BEAMS)

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

ECHOSOUNDER OPTION

Resolution	6 mm – 1 m
Number of bins	11,674
Transmit pulse length	32 µs – 1 ms
Transmit pulse	Monochromatic or pulse compressed (25 % BW)
Resolution / dynamic range	0.01 dB / 100 dB

ICE MEASUREMENT OPTION

Parameters	Acoustic ranging to ice, speed and direction, echosounder

DATA RECORDING & CLOCK

Capacity	16, 64 or 128 GB (larger on request)
Data record	Consult instrument software
Mode	Stop when full
RTC accuracy	±1 min/year
Clock retention without power	1 year, rechargeable backup battery

WAVE MEASUREMENT OPTION

AST frequency	500 kHz
AST max distance	75 m
Max 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)	0.6 s at 5 m depth; 1.1 s at 20 m; 1.9 s at 60 m
Cut-off period (dir.)	1.5 s at 5 m depth; 3.1 s at 20 m; 5.5 s at 60 m
Sampling rate (velocity, AST)	4 Hz

SENSORS

Temperature: thermistor in head (sampled at measurement rate)	
Range	−4 to +40 °C
Accuracy / resolution	0.1 °C / 0.01 °C
Time response	2 min
Compass: solid-state magnetometer (max 1 Hz)	
Accuracy / resolution	2° for tilt < 30° / 0.01°
Tilt: solid-state accelerometer (max 1 Hz)	
Accuracy / resolution	0.2° for tilt < 30° / 0.01°
Maximum tilt	Full 3D orientation sensing; recommended orientation and allowable tilt depend on the application
Up or down	Automatic detection
Pressure: piezoresistive (sampled at measurement rate)	
Standard range	0 – 100 m (other options on request)
Accuracy / precision	0.1 % FS / better than 0.002 % of full scale

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Technical specifications (continued)

AHRS OPTION

Accelerometer range	±2 g
Gyro range	±250 °/s
Magnetometer range	±1.3 gauss (±130 µT)
Pitch and roll range / resolution	±90° (pitch), ±180° (roll) / 0.01°
Pitch and roll accuracy	±2° (dynamic)*, ±0.5° (static, ±30°)
Heading range / resolution	360°, all axes / 0.01°
Heading accuracy	±3° (dynamic)*, ±2° (static, tilt < 20°)
Sampling rate	Same as measurement rate (up to 8 Hz)
Power	Draws more power than the standard compass and tilt sensor; see Signature Deployment software

ENVIRONMENTAL

Operating temperature	−4 to +40 °C
Storage temperature	−20 to +60 °C
Vibration	IEC 60068-2-64
EMC	IEC/EN 61000-6-2, 61000-6-3
Depth rating	300 m (6000 m version: contact Nortek)

POWER & BATTERIES

DC input	12 – 48 VDC
Max peak current	1.5 A
Max average consumption at 1 Hz	8 W (Ethernet adds 0.75 W)
Typical average consumption	25 mW
Sleep consumption	100 µA (power depends on supply voltage)
Transmit power per beam	0.3 – 30 W, adjustable
Ping sequence	Parallel
Internal battery	180 Wh alkaline (540 or 1,800 Wh with long canister); duration depends on configuration

MECHANICAL

Materials	POM with titanium fasteners
Max diameter	228 mm
Max length with battery compartment	274 mm (180 Wh), 464 mm (540 Wh or 1,800 Wh Li)
Max length without battery compartment	184 mm
Weight in air, no battery	6.4 kg (5.2 kg short)
Weight in water, no battery	−0.35 kg (0.6 kg short)
Battery weight	1.8 kg

COMMUNICATIONS & SOFTWARE

Ethernet	10/100 Mbit/s Auto MDI-X; TCP/IP, UDP/IP, HTTP; fixed IP, DHCP or auto IP; UPnP and Nortek instrument discovery
Serial	Configurable RS-232 / RS-422, 300 – 1,250,000 bit/s
Recorder download	20 Mbit/s (Ethernet only): 1 GB in 6 minutes
Controller interface	ASCII commands over Telnet and serial
Connectors	Depending on configuration: MCBH6F (Ethernet), MCBH8F (serial), MCBH2F-G2 (power); optional Souriau M-series metal connector for online use (10M)
Software	Deployment planning, configuration, data retrieval and conversion (Windows®)

* Dynamic specifications depend on the type of motion.

Designed and manufactured by Nortek (Signature 500 specifications, 11/2026). Specifications may change; contact EquipOcean for the configuration suited to your project.

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