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. It can also measure direct vertical velocity profiles, wave height and direction, and acoustic ranging to ice. 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.

Download our guide to Signature ADCPs here.

Highlights

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

Applications

- Simultaneous current and turbulence studies at up to 70m range
- Sediment transport studies or biomass estimates using 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)

Technical specifications

Water velocity measurements	
Maximum profiling range*	60 m (burst mode), 70 m (average mode)
Cell size	0.5-4 m (5m upon request)
Minimum blanking	0.5 m
Maximum 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

HR option (on 5th beam only)	
Velocity range	N/A

HR option (on 5th beam only)	
Cell size	N/A
Profiling range	N/A
Range velocity limitations	N/A

AD2CP measurement modes	
Single	Burst or average
Concurrent	Burst and average
Alternate	Single and/or concurrent

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°

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

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

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

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)

Sensors

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

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

*Dynamic specifications depend on the type of motion.

Data recording

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

Real-time clock

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

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

Connectors

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

Software

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

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

Power

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

Batteries

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

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)

Materials

Standard model	POM with titanium fasteners

Dimensions

Maximum diameter	228 mm
Maximum length with room for internal batteries	274 mm (180 Wh), 464 mm (540 Wh or 1800 Wh Li)
Maximum length without room for internal batteries	184 mm

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