

Signature 1000

300 m | 6000 m

High-performance mean currents and turbulence, wave height and direction



The Signature 1000 ADCP is the optimal tool for turbulence measurements. With a maximum sampling frequency of 16 Hz, it gives the scientific community an unprecedented opportunity to study a part of the turbulence spectrum that has never been accessible before. Vertical resolution current profiles of 2 cm over a range of up to 8 m further increase the Signature 1000's versatility, as does its ability to measure wave height and direction. The center beam also functions as a biological echosounder, enabling high-resolution measurements of biomass in the water column.

Download our guide to Signature ADCPs here.

Highlights

- ✓ Five beams for mean currents and turbulence
- ✓ Wave height and direction
- ✓ Ice thickness and ice drift
- ✓ Very small size and weight

Applications

- ✓ Simultaneous current and turbulence studies up to 30m 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*	25 m (burst mode), 30 m (average mode)
Cell size	0.2-2 m
Minimum blanking	0.1 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 \pm 0.3 cm/s
Velocity precision	Broadband processing, consult instrument software
Velocity resolution	0.1 cm/s
Max sampling rate	16 Hz (8 Hz using 5 beams)

^{*}Dependent on measurement conditions

HR option	
Velocity range	3 cm/s - 1.4 m/s
Cell size	2-25 cm
Profiling range	10 cm - 8 m
Range velocity limitations	Product of profiling range and velocity should not exceed 3.0 m2/s.
Minimum blanking	10 cm

AD2CP measurement modes (US patent 8223588)		
Single Burst or average		
Concurrent	Burst and average	
Alternate	Single and/or concurrent	

Echo intensity (along stanted beams)	
Sampling	Same as velocity
Resolution/ dynamic range	0.5 dB / 70 dB
Transducer acoustic frequency	1 MHz
Number of beams	5; 4 slanted at 25°, 1 vertical
Beam width	2.9°

Echo sounder option	
Resolution	3 mm - 0.25 m
Number of bins	10,000
Transmit pulse length	16 μs - 0.5 ms
Transmit pulse	Monochromatic or pulse compressed (25% BW)
Resolution / dynamic range	0.01 dB / 70 dB

Wave measurement option	
AST frequency	1 MHz
AST max distance	34 m
Maximum wave measurement depth	30 m
Height range	-15 to +15 m
Accuracy/resolution (Hs)	< 1% of measured value / 2 cm
Accuracy/resolution (Dir)	2° / 0.1°
Period range	0.5-50 s
Cut-off period (Hs)	5 m depth; 0.6 sec, 20 m depth; 1.1 sec
Cut-off period (dir)	5 m depth; 1.5 sec, 20 m depth; 3.1 sec
Sampling rate (velocity and AST)	8 Hz

Sampling rate (velocity and AST)	8 Hz
Ice measurement option	
Parameters	Acoustic ranging to ice, speed and direction, echosounder

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 AHRS option Accured range ± 2 g Gyro dynamic range ± 2 50°/sec Magnetometer dynamic range ± 2.50°/sec Magnetometer dynamic range ± 2.60 (roll) / 0.01° Pitch and roll range / resolution ± 90° (pitch) ± 180° (roll) / 0.01° Pitch and roll accuracy ± 2° (dynamic)*, ± 0.5° (static, ±30°) Heading range / resolution ± 90° (pitch) ± 180° (roll) / 0.01° Pitch and roll securacy ± 3° (dynamic)*, ± 2° (static, tilt < 20°) Sampling rate Same as measurement rate (up to 16 Hz) * Dynamic specifications depends on the type of motion. * Data record ing Capacity 16 GB, 64 GB or 128 GB (inquire for larger capacity) Data record Consult instrument software * Oronsult instrument software * 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, UPAP and Nortek proprietary instrument, discovery over Ethernet * Configurable RS-232/RS-422 300-1250000 bps Recorder download baud rate 20 Mbit/s (Ethernet only) - 1 GB in 6 minutes * Connectors * Depending on configuration MCBH6F (Ethernet), MCBH8F (serial), MCBH2F-G2 (pwr), optional Souriau M-series metal connector for online use (10M) * Software	Sensors	
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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% F5 / Better than 0.002% of full scale AHRS option Accuracy/precision 2± 2 g Gyro dynamic range ± 250°/sec Magnetometer dynamic range ± 250°/sec Magnetometer dynamic range ± 1.3 Gauss Pitch and roll range / resolution ± 90° (pitch) ± 180° (roll) /0.01° 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 16 Hz) **Dynamic specifications depends 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 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®)		
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## Spro dynamic range ## 250°/sec Magnetometer dynamic range ## 1.3 Gauss	AHRS option	
# 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 16 Hz) * Dynamic specifications depends on the type of motion. Data recording	Accelerometer dynamic range	± 2 g
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Heading range / resolution 360°, all axis /0.01° Heading accuracy ± 3° (dynamic)*, ± 2° (static, tilt < 20°) Sampling rate Same as measurement rate (up to 16 Hz) † Dynamic specifications depends 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 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®)	Pitch and roll range / resolution	± 90° (pitch) ± 180° (roll) /0.01°
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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 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®)	Capacity	16 GB, 64 GB or 128 GB (inquire for larger capacity)
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Data communications Ethernet	Real-time clock	
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®)	Accuracy	± 1 min/year
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®)	Clock retention in absence of external power	1 year. Rechargeable backup battery
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®)	Data communications	
proprietary instrument, discovery over Ethernet 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®)	Ethernet	10/100 Mbits Auto MDI-X, TCP/IP, UDP/IP, HTTP protocols, Fixed IP /
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®)		DHCP client /Auto IP address assignment, UPnP and Nortek
Recorder download baud rate 20 Mbit/s (Ethernet only) - 1 GB in 6 minutes 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®)		proprietary instrument, discovery over Ethernet
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®)	Serial	Configurable RS-232/RS-422 300-1250000 bps
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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	Controller interface	ASCII command interface over Telnet and serial
Souriau M-series metal connector for online use (10M) Software Functions Deployment planning, instrument configuration, data retrieval and conversion (for Windows®) Power	Connectors	
Deployment planning, instrument configuration, data retrieval and conversion (for Windows®) Power	Depending on configuration	
conversion (for Windows®) Power	Software	
	Functions	
DC input 12-48 V DC	Power	
	DC input	12-48 V DC

Power	
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	15 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	90 Wh alkaline
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	142 mm
Maximum length with room for internal batteries	212 mm
Maximum length without room for internal batteries	152 mm
Weight	
In air, no battery	2.21 kg (1.9 kg short)
In water, no battery	-0.09 kg (0.3 kg short)
Battery	0.71 kg