

# Signature100



## Long-range current profiler designed for combined current profile and biomass measurements

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The Signature100 combines a four-beam current profiler operating at 100 kHz with an optional scientific echosounder.

Both the current profiler and the biomass measurements have an effective range of 300-400 m providing unprecedented insight into the dynamics of zooplankton, krill or even schools of fish. Likewise, acoustic tracer material can give new insight into small-scale physical processes.

## Highlights

- ✓ 300–400 m current profiling range
- ✓ Optional center beam with 70–120 kHz echosounder

## Applications

- ✓ Detection of krill or plankton in the water column with scientific echosounder
- ✓ Upwelling and downwelling studies
- ✓ Suitable for buoy mounting with internal AHRS

## Technical specifications

### → Water velocity measurements

Maximum profiling range	300-400 m*
Cell size	3-15 m
Minimum blanking	2 m
Maximum number of cells	200
Velocity range (along beam)	User-selectable 2.5 or 5.0 m/s
Minimum accuracy	1% of measured value $\pm$ 0.5 cm/s
Velocity precision	Broadband processing, consult instrument software
Velocity resolution	0.1 cm/s
Max sampling rate	1 Hz (1/2 Hz at max output power)

\*Maximum range depends on acoustic scattering conditions.

### → HR option (on 5th beam only)

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

### → AD2CP Measurement modes\*

Single	Average
Concurrent	Average and echosounder
Alternate	N/A

- US Patent 8223588

### → Echo Intensity (along slanted beams)

Sampling	Same as velocity
Resolution/dynamic range	0.5 dB/70 dB
Transducer acoustic frequency	100 kHz
Number of beams	4 slanted at 20°, optional vertical beam for echosounder
Beam width	6.1° (slanted)

### → Echosounder option

Transducer acoustic frequency	70-120 kHz
Transducer beam width	15° @ 70 kHz, 8.7° @ 120 kHz
Resolution	0.375-4 m
Number of bins	1800
Transmit pulse length	0.5-6 ms
Transmit pulse	Monochromatic 70 kHz, 90 kHz and 120 kHz or frequency chirp (90 kHz, 50% BW)
Transmit power	1.2-120 W, adjustable

### → Echosounder option

Chirp signal processing	Pulse compression or binned frequency response
Raw complex data storage	Configurable rate
Resolution/dynamic range	0.01 dB / 130 dB
Linearity	TBA

### → Wave measurement option

AST frequency	N/A
AST max distance	N/A
Maximum wave measurement depth	N/A
Height range	N/A
Accuracy/resolution (Hs)	N/A
Accuracy/resolution (Dir)	N/A
Period range	N/A
Cut-off period (Hs)	N/A
Cut-off period (dir)	N/A
Sampling rate (velocity and AST)	N/A

### → Ice measurement option

Parameters	N/A
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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 sample rate)
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	0-1500 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°

### → AHRS option

Heading accuracy	$\pm 3^\circ$ (dynamic) <sup>2)</sup> , $\pm 2^\circ$ (static, tilt < 20°)
Sampling rate	Same as measurement rate (up to 1 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	$\pm 1$ min/year
Clock retention in absence of external power	1 year. Rechargeable backup battery

### → Data communications

Ethernet	10/100 Mbits Auto MDI-XTCP/IP, UDP, HTTP protocolsFixed IP/DHCP client/AutoIP, UPnP
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 (14M)
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### → Software

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

DC input	15–48 V DC
Maximum peak current	1.5 A
Max. average consumption at 1 Hz	15 W
Typical average consumption*	2 W
Sleep consumption	100 $\mu$ A, power depending on supply voltage
Transmit power per beam	4–200 W, adjustable levels
Ping sequence	Multiplexing or parallel

- 10 min. avg. profile, 1 cm/sec hor. prec., max cell size, max power, long range mode. Consult SW for other configurations

### → Batteries

Internal	One or two 540 Wh alkaline or 1800 Wh lithium
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	1500 m (for 6000 m version, contact Nortek for specifications)

## → Materials

Standard model	POM with titanium fasteners. Titanium/POM transducer cups
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## → Dimensions

Maximum diameter	460 mm
Maximum length with room for internal batteries	765 mm (2 batteries)
Maximum length without room for internal batteries	N/A

## → Weight

In air, no battery	37.5 kg
In water, no battery	13 kg
Battery	10.0 kg (2x540 Wh), 5.8 kg (2x1800 Wh)