Signature100

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

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 ± 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
→ 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	± 3° (dynamic)2), ± 2° (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	± 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)

→ Software

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

→ 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 µA, 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
→ 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)