

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.

Signature100



Highlights

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

Applications

- ✓ Detection of krill in the water column
- ✓ Cost-effective current profile measurements at mid-range
- ✓ Plankton migration studies
- ✓ Upwelling and downwelling studies
- ✓ Internal waves
- ✓ 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)

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

→ AD2CP Measurement modes*

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|------------|-------------------------|
| Single | Average |
| Concurrent | Average and echosounder |
| Alternate | N/A |

* US Patent 8223588

→ Echo Intensity (along slanted beams)

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|-------------------------------|--|
| 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

Signature100



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| 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 |
| 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° |

→ Sensors

| | |
|---------------------|--|
| 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

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|---------------------------------|---|
| 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), ± 2° (static, tilt < 20°) |
| Sampling rate | Same as measurement rate (up to 1 Hz) |

* Dynamic specifications depends on the type of motion

→ Data recording

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

→ Real-time clock

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

→ Data communications

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|-----------------------------|---|
| Ethernet | 10/100 Mbits Auto MDI-XTCP/IP, UDP, HTTP protocols Fixed 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

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| 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

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

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| 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

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| Internal | One or two 540 Wh alkaline or 1800 Wh lithium |
| Duration | Depending on configuration, consult software |

→ Environmental

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|-----------------------|--|
| 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

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

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| Maximum diameter | 460 mm |
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Signature100



→ Dimensions

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|---|----------------------|
| Maximum length with room for internal batteries | 765 mm (2 batteries) |
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| Maximum length without room for internal batteries | N/A |
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→ Weight

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