10/24/2024

Signature 500 - 300 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.

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 highenergy areas with optional AHRS for motion correction
- ✓ Wave measurements and ice monitoring using acoustic surface tracking (AST)

Technical specifications

| Maximum profiling range1)60 m (burst mode), 70 m (average mode)Cell size0.54 m (5m upon request)Minimum blanking0.5 mMaximum number of cells256 (burst)/200 (average)Velocity range (along beam)User-selectable 2.5 or 5.0 m/sVelocity range (horizontal)±10 m/s (typical) ±20 m/s (upon request)Minimum accuracy0.3% of measured value ± 0.3 cm/sVelocity presionBroadband processing, consult instrument softwareVelocity presolution0.1 cm/sMax sampling rate8 /2 (Hz using 5 beams) > HR option (On Sth beam only) Velocity rangeVelocity rangeN/ACell sizeNAPorfiling rangeN/ARange velocity limitationsN/AAuge velocity initiationsN/AAuge velocity initiationsN/AAuge velocity initiationsN/AAuge velocity limitationsN/ASingleBurst or averageConcurrentBurst and averageAlternateSingle and/or concurrentSamplingSame as velocityResolution/ dynamic rangeSind K/2Number of beams5.0 kHzNumber of beams1.000Protosoutic frequency50 kHzNumber of bins1.000Transmit pulse length32 µs - 1 msTransmit pulse length32 µs - 1 msArtenate number of bins0.01 dB /70 dBAuge velocity dynamic range0.01 dB /70 dBAuge velocity dynamic range0.01 dB /70 dBAuge velocity dynamic | → Water velocity measurements | |
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| Velocity rangeN/ACell sizeN/AProfiling rangeN/ARange velocity limitationsN/A→ AD2CP measurement modesSingleBurst or averageConcurrentBurst and averageAlternateSingle and/or concurrent→ Echo intensity (along slanted beams)SamplingSame as velocityResolution / dynamic range0.5 dB / 70 dBTransducer acoustic frequency500 kHzNumber of beams5; 4 slanted at 25°, 1 verticalBeam width2.9°Petho sounder option11,000Transmit pulse length32 μs - 1 msTransmit pulse length32 μs - 1 msTransmit pulse length0.01 dB / 70 dBAmsent pulseMonochromatic or pulse compressed (25% BW)Resolution / dynamic range0.01 dB / 70 dBArst frequency500 kHzAst frequency500 kHzAst frequency500 kHzAst frequency500 kHzAst frequency500 kHzAst max distance75 m | Max sampling rate | 8 Hz (4 Hz using 5 beams) |
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| Transmit pulseMonochromatic or pulse compressed (25% BW)Resolution / dynamic range0.01 dB / 70 dB→ Wave measurement optionAST frequency500 kHzAST max distance75 m | Number of bins | 11,000 |
| Resolution / dynamic range0.01 dB / 70 dBHardware measurement option500 kHzAST frequency500 kHzAST max distance75 m | Transmit pulse length | 32 μs - 1 ms |
| → Wave measurement option AST frequency 500 kHz AST max distance 75 m | Transmit pulse | Monochromatic or pulse compressed (25% BW) |
| AST frequency 500 kHz AST max distance 75 m | Resolution / dynamic range | 0.01 dB / 70 dB |
| AST max distance 75 m | \rightarrow Wave measurement option | |
| | AST frequency | 500 kHz |
| Maximum wave measurement depth 60 m | AST max distance | 75 m |
| | Maximum wave measurement depth | 60 m |
| Height range-15 to +15 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) |
| 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 | \pm 2° (dynamic)4), \pm 0.5° (static, \pm 30°) |
| Heading range / resolution | 360°, all axis /0.01° |
| Heading accuracy | \pm 3° (dynamic)4), \pm 2° (static, tilt < 20°) |
| Sampling rate | Same as measurement rate (up to 8 Hz) |
| → 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 | |
| | ± 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 retrieva and conversion (for Windows ${}^{(\! R)}$) |
| → 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 |
| Typical average consumption | 25 mW |
| Sleep consumption | 100 μ A, 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) |

| → Dimensions | |
|--|-------------------------|
| 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 |