AWAC 400 kHz

300 m, Generation 2

Real-time current profiles and directional waves with up to 100 m range



The AWAC 400 kHz ADCP has become the standard reference technology in submerged wave-measurement applications. Thousands of these ADCPs have been deployed to capture the full wave spectrum, in combination with current profiles. With a 100 m maximum range for wave measurements, 1.5 Hz sampling of the surface elevation and onboard wave processing for real-time applications, the AWAC 400 kHz is the optimal tool for deeper-water current and wave measurements.

The AWAC 2 design offers future-proof electronics, better performance and easier instrument maintenance.

See the details of the Generation 2 AWAC updates in the release notes here.

Highlights

- Real-time current profiles and waves to 100 m range
- Acoustic surface tracking (AST) with vertical beam
- Can be used both with fixed frames and subsurface buoys
- Onboard wave processing for real-time applications.

Applications

- Online measurements of currents and waves at long ranges
- Site studies for offshore wind platforms
- Measurement campaigns where the full wave spectrum is needed
- Monitoring of transient waves for channel wall protection

Technical specifications

Water velocity measurements	
Maximum profiling range*	100 m
Cell size	1.0-8.0 m
Number of cells	200
Velocity range (along beam)	User-selectable 1.0 to 5.0 m/s
Accuracy	±1% of measured value ±0.5 cm/s
Velocity precision	Consult instrument software
Maximum output rate	1 Hz or 2 Hz
Internal sampling rate	4 Hz

*Dependent on measurement conditions

Echo intensity (along slanted beams)

Sampling	Same as velocity
Resolution	0.5 dB
Dynamic range	90 dB
Transducer acoustic frequency	400 kHz, 600 kHz for vertical beam
Number of beams	3 beams 120° apart, one vertical beam, (90° apart, one at 5° for platform mount)
Beam width	1.18 (2,36° total)
Beam width vertical beam	1.93° total

Wave measurement option (AST)

Maximum depth	100 m
Data types	Pressure, one velocity along each beam, AST
Max. Sampling Rate (output)	2Hz
No. of samples per burst	512, 1024 or 2048 (Contact Nortek for other burst configurations)

Wave estimates

Range	-15 to 15 m
Accuracy/resolution (Hs)	< 1% of measured value / 1 cm
Accuracy/resolution (Dir)	2° / 0.2°
Period range	TBC
Cut-off period (Hs)	20 m depth: 0.9 sec, 60 m depth: 1.5 sec, 100 m depth: 2 sec
Cut-off period (dir)	20 m depth: 3.1 sec, 60 m depth: 5.5 sec, 100 m depth: 7.1 sec

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)
Range	0-100 m (inquire for options)
Accuracy / Precision	0.1% FS / Better than 0.002% of full scale

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
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	
Standard	MCBH6F (Ethernet) + MCBH8F (serial and/or battery)
Optional	MCBH6F (Ethernet) + Souriau M-series metal connector for online use (10M) + MCBH2F (battery)

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

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	15 mW
Sleep consumption	100 µA, power depending on supply voltage
Transmit power per beam	0.3-30 W, adjustable levels
Ping sequence	Parallel

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

Materials	
Standard model	POM with titanium fasteners

Dimensions	
Maximum diameter	306 mm
Maximum length	203 mm

Weight	
Weight in air	6.9 kg
Weight in water	1.6 kg

Online cable	
Online cable	Polyurethane jacket, Shore D hardness, 13mm in diameter, max 500m. Inquire for longer cables

Batteries

External	540Wh (alkaline) or 1800 W (lithium)