ACOUSTIC WAVE AND CURRENT PROFILER

AWAC - 400 kHz

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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 and 1.5 Hz sampling of the surface elevation, the AWAC 400 kHz is the optimal tool for deeper-water current and wave measurements.

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

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Applications

- [/] Online measurements of currents and waves
- [/] Design data for planning of new coastal structures
- [/] Site studies for offshore wind platforms
- [/] Coastal erosion studies
- [/] Measurement campaigns where the full wave spectrum is needed
- [/] Monitoring of transient waves for channel wall protection
- [/] Studies of tidal currents

Technical specifications

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Water velocity measurements

Maximum profiling range	100 m
Cell size	1.0-8.0 m
Number of cells	Typical 20-40, max. 128
Velocity range	±10 m/s horizontal, ±5 m/s along beam

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Water velocity measurements

Accuracy	±1% of measured value ±0.5 cm/s
Velocity precision	Consult instrument software
Maximum output rate	1 Hz
Internal sampling rate	2 Hz

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Echo intensity (along slanted beams)

Sampling	Same as velocity
Resolution	0.45 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	2.4°
Beam width vertical beam	1.7°

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Wave measurement option (AST)

Maximum depth	100 m
Data types	Pressure, one velocity along each beam, AST
Sampling rate velocity (output)	0.75 Hz
Sampling rate AST (output)	1.5 Hz
No. of samples per burst	512, 1024 or 2048

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Wave estimates

Range	-15 to 15 m
Accuracy/resolution (Hs)	< 1% of measured value / 1 cm
Accuracy/resolution (Dir)	2° / 0.1°
Period range	1-50 s
Cut-off period (Hs)	20 m depth: 0.9 sec, 60 m depth: 1.5 sec, 100 m depth: 2 sec

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Wave estimates

Cut-off period (dir)	20 m depth: 3.1 sec, 60 m depth: 5.5 sec, 100 m depth: 7.1 sec

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Sensors

Temperature:	Thermistor embedded in housing
Temp. range	-4 to +40 °C
Temp. accuracy/resolution	0.1 °C/0.01 °C
Temp. time response	< 5 min
Compass:	Magnetoresistive
Accuracy/resolution	2°/0.1° for tilt < 15°
Tilt:	Liquid level
Accuracy/resolution	0.2°/0.1°
Maximum tilt	30°, AST requires < 10° instrument tilt
Up or Down	Automatic detect
Pressure:	Piezoresistive
Range	100 m
Accuracy	0.5% of full scale (optional 0.1% of full scale)
Resolution	0.005% of full scale

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Analog inputs

No. of channels	2
Supply voltage to analog output devices	Three options selectable through firmware commands: 1) Battery voltage/500 mA, 2) +5 V/250 mA, 3)+12 V/100 mA
Voltage input	0-5 V
Resolution	16-bit A/D

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Data recording

Capacity	9 MB standard, 4/16 GB (ProLog)
Profile record	Ncells*9 + 120 bytes
Wave record	Nsamples*24 + 1k bytes
Mode	Stop when full (default and Prolog) or wrap mode

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Real-time clock

Accuracy	±1 min/year
Backup in absence of power	1 year

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Data communications

I/O	RS-232 or RS-422. Software supports most commercially available USB– RS-232 converters
Communication baud rate	300-115200 Bd
Recorder download baud rate	600/1200 kBd for both RS-232 and RS-422
User control	Handled via ”AWAC AST” software, or ActiveX®controls. ”Seastate” for online systems
Output formats	NMEA, Binary. Prolog provides same types also for processed wave and current data

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Connectors

Bulkhead	MCBH-2-FS, MCBH-8-FS, optional Souriau M-series metal connector for online use
Cable	PMCIL-8-MP on 10 m polyurethane cable

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Software

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

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Power

DC input	9-18 V DC
Maximum peak current	3 A
Avg. power consumption	0.23 W
Sleep current	< 100 µA
Transmit Power	1-30 W, 3 adjustable levels

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Environmental

Operating temperature	-4 to +40 °C
Storage temperature	-20 to +60 °C
Shock and vibration	IEC 721-3-2
EMC approval	IEC 61000
Depth rating	300 m

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Materials

Standard model Delrin® and polyurethane plastics with titanium screws

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Dimensions

Maximum diameter	306 mm
Maximum length	203 mm

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Weight

Weight in air	7.3 kg
Weight in water	3.6 kg

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Online cable

Polyurethane jacket, Shore D hardness, 13 mm in diameter, max 2 km. Inquire for longer cables