

AWAC - 1 MHz

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Real-time current profiles and directional waves for shallow water

The AWAC 1 MHz 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 35 m maximum range for wave measurements and 4 Hz sampling of the surface elevation, the AWAC 1 MHz is the optimal tool for shallow current and wave measurements.

Applications

Highlights

- [/] Real-time current profiles to 30 m range
- [/] Real-time directional waves to 35 m range
- [/] Acoustic surface tracking (AST) with vertical beam
- [/] Can be used both with fixed frames and subsurface buoys
- [/] 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

[arrow] Water velocity measurements

Maximum profiling range	30 m
Cell size	0.25-4.0 m
Number of cells	Typical 20-40, max. 128
Velocity range	± 10 m/s horizontal, ± 5 m/s along beam
Accuracy	$\pm 1\%$ of measured value ± 0.5 cm/s
Velocity precision	Consult instrument software
Maximum output rate	1 Hz
Internal sampling rate	7 Hz

[arrow] Echo intensity (along slanted beams)

Sampling	Same as velocity
Resolution	0.45 dB
Dynamic range	90 dB
Transducer acoustic frequency	1 MHz

[arrow]

Echo intensity (along slanted beams)

Number of beams	3 beams 120° apart, one vertical beam (90° apart, one at 5° for platform mount)
Beam width	1.7°
Beam width vertical beam	1.7°

[arrow]

Wave measurement option (AST)

Maximum depth	35 m
Data types	Pressure, one velocity along each beam, AST
Sampling rate velocity (output)	2 Hz
Sampling rate AST (output)	4 Hz
No. of samples per burst	512, 1024 or 2048

[arrow]

Wave estimates

Range	-15 to 15 m
Accuracy/resolution (Hs)	< 1% of measured value / 1 cm
Accuracy/resolution (Dir)	2° / 0.1°
Period range	0.5-50 s
Cut-off period (Hs)	5 m depth: 0.5 sec, 20 m depth: 0.9 sec, 60 m depth: 1.5 sec
Cut-off period (dir)	5 m depth: 1.5 sec, 20 m depth: 3.1 sec, 60 m depth: 5.5 sec

[arrow]

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	50 m
Accuracy	0.5% of full scale (optional 0.1% of full scale)
Resolution	0.005% of full scale

[arrow]

Analog inputs

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

Data Recording

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

Real Time Clock

Accuracy	±1 min/year
Backup in absence of power [arrow]	1 year

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 [arrow]	NMEA, Binary. Prolog provides same types also for processed wave and current data.

Connectors

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

Software

Functions [arrow]	Deployment planning, instrument configuration, data retrieval and conversion. (for Windows®)
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Power

DC input	9- 18V DC
Maximum peak current	3 A
Avg. power consumption	0,65 W

[arrow]

Power

Sleep current < 100 ?A
Transmit power 1-30W, 3 adjustable levels
[arrow]

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 300m
[arrow]

Materials

Standard model POM and polyurethane plastics with titanium fasteners
[arrow]

Dimensions

Maximum diameter 210 mm
Maximum length 175 mm
[arrow]

Weight

Weight in air 6.1 kg
Weight in water 2.9 kg
[arrow]

Online cable

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