

TRIAXYS™ Sensors

The “Next Wave”

FEATURES & BENEFITS:

- Designed for low power applications
- No moving parts
- Continuous wave sampling
- Supports any telemetry
- Supports other sensor inputs
- >5 years data storage capacity



- ▶ TRIAXYS™ Directional Wave Sensor
- ▶ TRIAXYS™ Motion Sensor
- ▶ TRIAXYS™ Heave Sensor

AXYS Technologies is leading the “next wave” of monitoring standards for wave buoys.

TRIAXYS™ SENSORS

TRIAXYS™ Directional Wave Sensor

TRIAXYS™ Motion Sensor

TRIAXYS™ Heave Sensor

TRIAXYS™ Wave Sensors are precision instruments that have set a new standard for wave measurement. The innovative design incorporates new technologies that makes them easy to use, rugged and the most reliable and most accurate sensors for measuring waves and directional wave spectra.

Physical Attributes

The sensor is packaged in a small stainless steel box that needs only a single connector for power and data. The output from the sensor is fully processed wave data. Data is stored in the sensor on a compact flash disk.

Sampling Regime

The sampling regime for the sensor is user-selectable, with sample lengths from 5 to 34 minutes (or continuous), and sample intervals from 5 to 1440 minutes.

Location

TRIAXYS™ wave sensors can be located anywhere on the floating body to measure motion at a specific point or - using embedded software - to calculate the motion at another point on the body (e.g. the centre of gravity).

Sensors

The TRIAXYS™ Directional Wave Sensor is comprised of three accelerometers and three rate sensors that ultimately measure the total displacement along the three orthogonal axes of the floating platform, x, y, z or HNE. In addition, this

sensor is equipped with a gimballed fluxgate compass to measure true magnetic direction.

The TRIAXYS™ Heave Sensor uses the same technology as the Directional Wave Sensor, but without the compass. This provides the same six degrees of freedom analysis but without a magnetic direction reference.

The TRIAXYS™ Motion Sensor also contains three accelerometers and three angular rate sensors and outputs the raw motion of the platform.

These sensors use software developed by the National Research Council of Canada for data processing within the sensor. All sensors have the option of onboard data logging of both the raw collected data and the final processed data.

Software

The processor in the TRIAXYS™ Heave Sensor uses the measured sensor motions to perform wave analyses which include:

- a zero crossing analysis of the wave elevation record to produce time domain wave statistics.
- a spectral analysis that computes the non-directional wave energy spectrum, which defines the distribution of wave energy as a function of frequency.

In the TRIAXYS™ Directional Wave Sensor the analysis also includes:

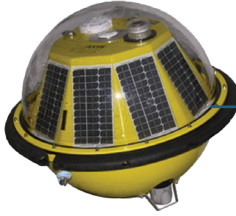
- a directional spectral analysis, using the wave elevation and the north and east velocity components, that computes the directional wave spectrum. This defines the distribution of wave energy as a function of frequency and direction of propagation.
- calculation of the mean wave direction and the directional spreading width as functions of frequency.
- first 4 Fourier coefficients which can be used to reconstruct the directional spectra for analysis by your software and algorithms.

The Next Revolution in Wave Measurement

A Proven Technology



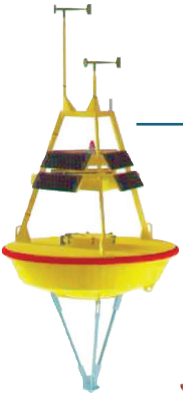
Military Vessels
Heave
Motion



Wave Buoys
Directional



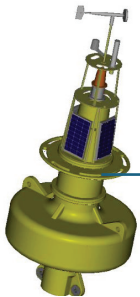
Drill Ships
Heave
Motion



Weather Buoys
Directional



Heave



Navigation Buoys
Directional



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TRIAXYS™ Sensors were the result of a collaborative development and testing program between AXYS and the Canadian Hydraulics Centre (CHC) of the National Research Council of Canada. The wave analysis software in the sensors was adapted from CHC software that has been in use in their wave testing facilities for decades.

The TRIAXYS™ Sensors use the AXYS WatchMan500™ processor to provide desktop to sensor monitoring and control.

APPLICATIONS

For the TRIAXYS™ Directional and Heave Wave Sensors:

- weather forecasting
- oceanographic research
- environmental monitoring
- marine and coastal engineering
- marine traffic safety
- climate studies

For the TRIAXYS™ Motion Sensor:

- wave energy system control
- vessel response information
- naval architectural design
- platform loading and design
- structural and stress analyses

These sensors have been integrated numerous times into existing navigation and data buoys as upgrades to allow users to measure wave and motion.

SPECIFICATIONS

	TRIAXYS™ Directional Wave Sensor			TRIAXYS™ Motion Sensor			TRIAXYS™ Heave Sensor		
	Range	Resolution	Accuracy	Range	Resolution	Accuracy	Range	Resolution	Accuracy
Wave Height/Heave	±20m	0.01m	Better than 2%	±20m	0.01m	Better than 2%	±20m	0.01m	Better than 2%
Period	1.6 - 33 secs	0.1sec	>2%	1.6 - 33 secs	0.1sec	>2%	1.6 - 33 secs	0.1sec	>2%
Direction	0-360°	3°	3°	0-360°	3°	3°	0-360°	3°	3°
Sensor Size	35cm x 35cm x 20cm (13" x 13" x 6")			35cm x 35cm x 20cm (13" x 13" x 6")			35cm x 35cm x 20cm (13" x 13" x 6")		
Sensor Weight	13 Kg (29lbs)			13 Kg (29lbs)			13 Kg (29lbs)		
Power Supply	10.5 to 19 VDC			10.5 to 19 VDC			10.5 to 19 VDC		
Input/Output	Power and data through Bulgin connector			Power and data through Bulgin connector			Power and data through Bulgin connector		
Communications	19,200 baud, 8 bits, 1 stop bit, no parity			9,600 baud, 8 bits, 1 stop bit, no parity			9,600 baud, 8 bits, 1 stop bit, no parity		
Operating Temperature Range	-30°C to +65°C			-30°C to +65°C			-30°C to +65°C		
Storage Temperature Range	-40°C to +70°C			-40°C to +70°C			-40°C to +70°C		
Sampling Frequency	4 Hz (up to 50 Hz)			4 Hz (up to 50 Hz)			4 Hz (up to 50 Hz)		
Frequency Range	0.64 Hz (1.56 seconds) to 0.030 Hz (33.33 seconds)			N/A			0.64 Hz (1.56 seconds) to 0.030 Hz (33.33 seconds)		
Frequency Interval	0.005 Hz			N/A			0.005 Hz		
Sample Length	Variable (1 to 34 minutes)			Variable (1 to 34 minutes) or continuous			Variable (1 to 34 minutes)		
Sample Interval	Variable (5 to 1440 minutes)			Variable (5 to 1440 minutes) or continuous			Variable (5 to 1440 minutes)		
Frequency Bands	Up to 123			N/A			Up to 123		
Location of Sensor	Ability to calculate waves at any point of the body			Ability to calculate motion at any point of the body			Ability to calculate waves at any point of the body		
Data Storage	Internal 8GB: >5 years; (expandable to 32GB)			Internal 8GB: >5 years*; (expandable to 32GB) *@ 4 Hz			Internal 8GB: >5 years; (expandable to 32GB)		



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