

TRIAXYS™ DIRECTIONAL WAVE BUOY

FEATURES & BENEFITS:

- Easy deployment & recovery
- Low operating and deployment costs
- User configurable
- Rugged and reliable wave sensor
- Advanced motion and directional wave analysis
- Solar powered
- Supports variety of telemetry options
- Near real-time directional wave data



The TRIAXYS™ Directional Wave Buoy is the result of a collaborative development and testing program between AXYS Technologies Inc. and the Canadian Hydraulics Centre (CHC) of the National Research Council of Canada.



TRIAXYS™

**DIRECTIONAL
WAVE BUOY**

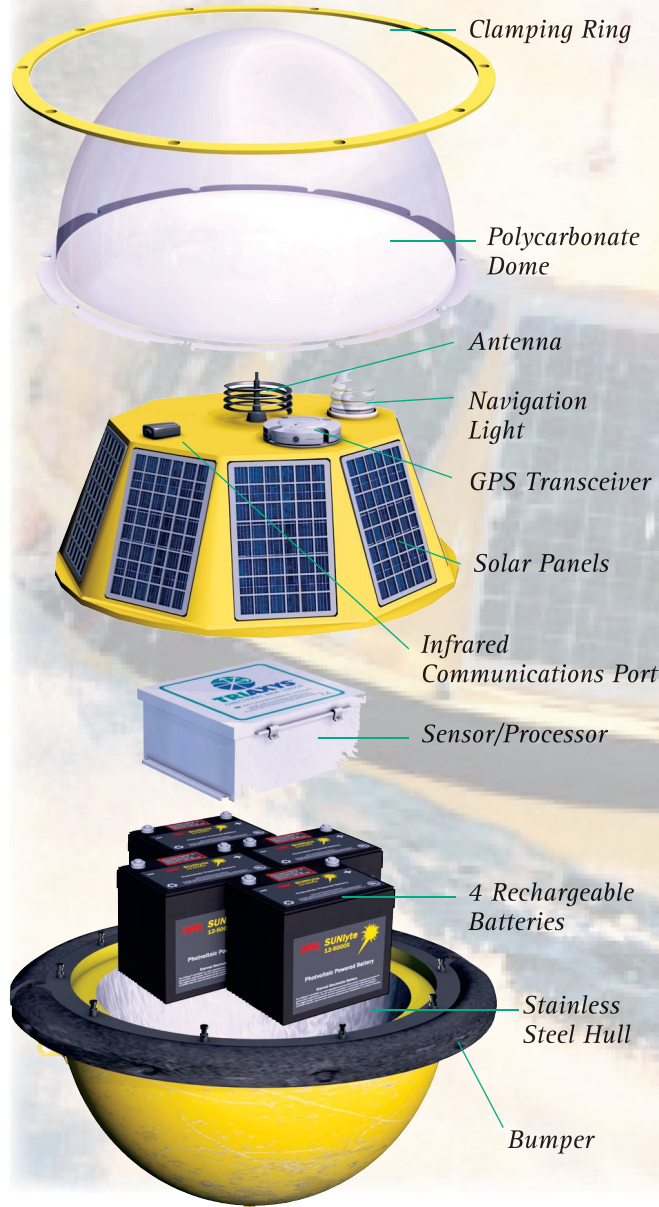
A Revolution in Wave Measurement

The TRIAXYS™ Directional Wave Buoy precisely measures directional waves and is easy to use. The sensor unit is comprised of three accelerometers, three rate gyros, a Fluxgate compass and the proprietary TRIAXYS™ Processor. Economical and rugged, the TRIAXYS™ Directional Wave Buoy can withstand the rigours associated with deployment and recovery operations, specifically: impact shock, spinning, and temporary submergence. The buoy's spun stainless steel hull has a high strength to weight ratio and corrosion resistance, and provides secure mooring and lifting points. The buoy's modular components are easily accessed by removing the polycarbonate dome. The clear dome allows sunlight to reach the solar panels, while maintaining a low profile and impact resistance. The buoy is solar powered with rechargeable batteries to reduce annual operating costs. The buoy can operate for years before the batteries need replacement.

The heart of the TRIAXYS™ Directional Wave Buoy is developed from the AXYS WatchMan™ DCP, which integrates sensor systems and provides onboard data processing, data logging, telemetry, and diagnostic/set-up routines. Full directional wave spectra is computed by the CHC maximum entropy method. Mean wave direction and spreading width are computed as functions of frequency. The software also performs a zero-crossing analysis to compute various time-domain wave parameters. The onboard computer uses an iterative algorithm based on Fast Fourier Transform analysis to solve the full non-linear equations of motion in six degrees of freedom, as measured by accelerometers and angular rate gyros. The buoy is capable of accurate motion data for roll and pitch angles up to 60 degrees. Surge and sway velocities measure wave kinematics that define directional wave properties.

The removal of an external magnetic key activates the buoy. Set-up and communication with the TRIAXYS™ Directional Wave Buoy takes place through the dome via the infrared port, mitigating the need to remove the dome. All the set-up parameters and buoy activity can be adjusted and monitored using this port; enabling easy field configuration and testing.

Several telemetry options are available, including VHF radio, Inmarsat D+, Iridium, GSM and CDMA. The data transmitted from the buoy can include wave statistics, HNE (Heave, North and East Displacements), MeanDir (Wave Direction and energy as a function of frequency), directional and non-directional wave spectra, buoy configuration, status data, position and WatchCircle™ alarm messages. All data is stored on the internal data logger.



Specifications

- Physical Description**
Diameter: 1.10m (43.5 inches) outside bumper
0.91m (36 inches) hull
Weight (including four batteries): 197 kg (435 lb)
Weight (excluding batteries): 90 kg (199 lb)
Obstruction Light: Amber LED. Programmable ODAS flash sequence with three miles visibility.
- Materials**
Hull: Stainless steel
Dome: Impact resistant polycarbonate
Solar Panel Assembly: Fibreglass over foam
Clamping ring: Stainless steel
- Sensors/Processor**
Water temperature: Thermilinear composite network
Accelerometers: Flexure suspension servo (Range $\pm 2g$)
Rate: Piezoelectric vibrating gyroscope (Maximum angular velocity $\pm 80^\circ/s$)
Microprocessor: PC104 and 80C552
GPS: 12 channel
- Power System**
Operational system voltage: 11.0 to 14.1 VDC
Batteries: 4 @ 12 Volt, 100 Amp hr/battery
Solar Panels: 10 @ 6 Watt
Smart Charger: Sunsaver-6
External On/Off Switch: Turns buoy on when Magnetic Key is removed.
- Telemetry Options**
 - VHF
 - INMARSAT D+
 - IRIDIUM
 - CDMA, GSM (cellular)



Resolution/Accuracy

	Range	Resolution	Accuracy
Heave	± 20 m	0.01 m	< than 2%
Period	1.6 to 30 seconds	0.1 sec	< than 2%
Direction	0 to 360°	3°	3°
Water Temp.	-5 to +50°C	0.1°C	$\pm 0.5^\circ C$

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