

TRIAXYS™ WITH CURRENTS

FEATURES & BENEFITS:

- Advanced motion and directional wave analysis
- Integrated current profiling
- User configurable
- Low operating and deployment costs
- Easy deployment and recovery
- Solar powered
- Near real-time waves and currents data



The TRIAXYS™ with Currents Buoy was developed to meet the demand for a combined wave and current measuring solution that overcomes the limitations inherent to seabed-mounted instrumentation.



TRIAXYS™

**WITH
CURRENTS**

A Revolution in Wave and Current Measurement

The TRIAXYS™ with Currents Buoy measures directional waves and 3D currents accurately and precisely. The wave sensor unit is comprised of three accelerometers, three rate gyros, a Fluxgate compass and the proprietary TRIAXYS™ Processor. Current data is obtained from a fully integrated current profiler. The economical and rugged TRIAXYS™ with Currents Buoy can withstand the rigors associated with deployment and recovery operations including, impact shock, spinning and temporary submergence.

The buoy's modular components are easily accessed by removing the impact resistant polycarbonate clear dome. The buoy is solar powered with rechargeable lead acid batteries to minimize operating costs. The buoy's spun stainless steel corrosion resistant hull has a high strength to weight ratio and provides secure mooring and lifting points.

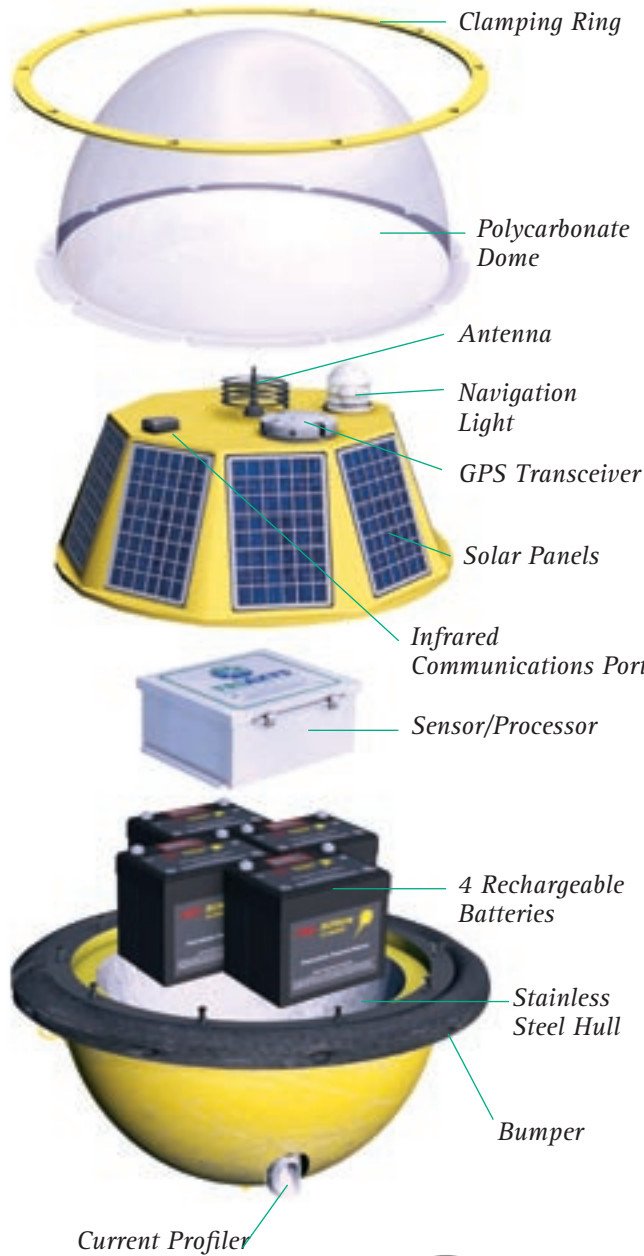
The heart of the TRIAXYS™ with Currents Buoy is developed from the AXYS WatchMan™ DCP, which integrates sensor systems and provides onboard data processing, data logging, telemetry, and diagnostic/set-up routines. Full directional wave spectra are computed by the CHC maximum entropy method. The onboard 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 current profiler works equally well in typical ocean surface water and in the high sediment suspensions found near the coast or in rivers. A variety of head designs ensures optimal measurement conditions, regardless of deployment surroundings. The current profiler is insensitive to biofouling and has no moving parts.

The current profiler provides current speed and direction in up to 128 different layers of the water column. The system electronics integrates Doppler velocity with temperature, pressure, tilt, and compass sensors – all standard with each instrument. The system also has a built-in solid state recorder and batteries. State-of-the-art power management and miniaturized electronics combine in a compact single-canister design.

The removal of an external magnetic key activates the buoy. Set-up and communication takes place through the dome via the infrared port, eliminating 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.

A variety of telemetry options are available, including VHF, Inmarsat D+, Iridium, GSM, and CDMA. The data transmitted from the buoy 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, and wave and current profile data are displayed on AXYS WaveView software (included).



Specifications

- Physical description**
Diameter: 1.10m (43.5 inches) outside bumper
0.91m (36 inches) hull
Weight (including four batteries): 200 kg (440 lb)
Weight (excluding batteries): 93 kg (205 lb)
Obstruction Light: Amber LED source. Programmable flash sequence with three miles visibility.
- Materials**
Hull: stainless steel
Dome: impact resistant polycarbonate
Solar Panel Assembly: fiberglass 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 $\pm 80^\circ/s$)
Compass: Microprocessor controlled Fluxgate (Accuracy $\pm 0.5^\circ$)
Microprocessor: PC104 and 80C552
GPS: 12 channel
- Nortek Aquadopp 600KHz or 400KHz ADP**
Acoustic frequency: 600 KHz 0-40m 400KHz 0-75m
Profiling range (nominal): 30-50 m
Minimum cell size: 1 m
Minimum blanking: 0.5m
Horizontal velocity range: ± 10 m/s
Sampling rate: 1 s to several hours
- Power System**
Operational system voltage: 11.0 to 14.1 VDC
Batteries: 4 @ GNB SunLyte 5000X 12 Volt, 100 Amp hr
Solar Panels: 10 @ 6 Watt
External On/Off Switch: Turns buoy on when Magnetic Key is removed.

Current Profiler Instrument 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°
Currents	0 - 10 m/s	1 cm/s	± 10 cm/s
Water Temp.	-5 to +50°C	0.1°C	$\pm 0.5^\circ\text{C}$

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