

WATCHKEEPER™ DIRECTIONAL WAVE – METOCEAN BUOY



The Watchkeeper™ platform, is designed to carry the standard TRIAXYS™ wave direction sensor and to provide an enhanced platform for wave measurements. Like the Triaxys 0.9m spherical hull the sensor is undamaged by spinning, impact or low temperatures. The 1.75m diameter 2.3m FPH buoy carries a large format radar reflector, nav light and optional AIS transponder. Its high visibility makes it much less likely to be in collision with shipping, or stolen. Although larger and non spherical, the buoy produces excellent directional data. The basic Wave system can be enhanced with Metocean sensors for currents, wind speed & direction, temperature, RH, Pressure etc.

The buoy hull is constructed from Medium density UV stabilized polyethylene rotationally moulded to form a seamless 9.5mm thick hull filled with expanded polystyrene foam at 16kg/m³ to prevent water ingress in the event of hull damage. Steel rods are internally cross-braced and connected to stainless steel bushings in the mooring and lifting eyes to achieve maximum long-term strength. Colour pigment is blended into the polyethylene eliminating the need for painting. These buoys are in use worldwide as navigation aids.

Features:

- High visibility, better suited to extreme, vulnerable locations.
- User configurable remotely via INMARSAT D+
- Rugged and reliable wave sensor
- Advanced motion and directional wave analysis
- Successfully deployed worldwide
- Easy to service

Description:

The heart of the WATCHKEEPER™ 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 defines directional wave properties.

Set-up and communication with the Buoy takes place via the infrared port, mitigating the need to remove covers. 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, CDMA and ARGOS. 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. The enhanced height of the buoy means higher antennas and better line of sight communications ranges.

The buoy uses 400 AH batteries and concrete as ballast, and with the vertical solar panels, optimally located, should provide many years maintenance free operation. The buoy can be fitted with a variety of Metocean sensors, including the Aquadopp down looking ADCP to provide current profiles. Together with wave data in real-time, Watchkeeper is the ideal buoy for port and harbor operations.

The Inmarsat D+ module not only provides for GPS position monitoring and warnings, but also provides a secondary, bi-directional telemetry channel. The buoy can be monitored, interrogated and set up from anywhere in the World.



Specifications:

• Physical Description

Diameter: 1.7m hull
2.3m FPH
Weight including four Batteries typical sensors etc 540 kg
Obstruction Light: Solat powered Amber LED source. Programmable flash sequence with up to three miles visibility.

• Finish

Colour pigment blended into polyethylene. No painting required.

• Ballast

Concrete and batteries (internal).

• Weight

Approximately 540kg fully loaded with typical sensors, Watchman™ payload and batteries.

• Dimensions

1.7m diameter.
Anemometer height 3.3m.

• Mooring

Reverse catenary, chain, semi-taut, or false bottom.

• Navigation Marks and Light

IALA standard lamp. Radar reflector equivalent to 10 m² (X-band). Optional AIS transponder.

• Sensors/Processor

Water temperature: Thermilinear composite network
Accelerometers: Flexure suspension servo (Range ±2g)
Rate: Piezoelectric vibrating gyroscope (Maximum angular velocity ±80°/s)
Compass: Microprocessor controlled fluxgate (Accuracy ± 0.5°)
A/D and sampling frequency: 8 channel 14 bit at 4 Hz
Microprocessor: PC104 and 80C552
GPS: 12 channel

• Power System

Operational system voltage: 11.0 to 14.1 VDC
Batteries: 4 @ GNB SunLyte 5000X 12 Volt, 100 Amp hr/battery
Solar Panels: 4 x 20Wt
Smart Charger: SunSaver-6

• Telemetry Options

- VHF
- INMARSAT D+
- ARGOS
- IRIDIUM
- CDMA, GSM

Ask for details about TriAxys & TriAxys Mini

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