



OBSCAPE
WAVE BUOY

SETTING A NEW STANDARD FOR WAVE MEASUREMENTS

Ocean wave measurements are an indispensable part of any MetOcean project. The Obscape Wave Buoy is based on recent advances in sensor and data technology, ensuring a light-weight, flexible, reliable and affordable wave buoy.



The Wave Buoy will suit your wave observation needs on any project, regardless of location and budget. Accurate wave data makes its way to your desktop in real-time through a robust telemetry solution. The Wave Buoy was designed to make your life easy: no receiver station needed, solar-powered, a simple mooring solution, deployable by hand and transportable as check-in luggage.

KEY FEATURES

- Real-time data (4G & Satellite)
- Solar-powered
- Bulk wave parameters
- Directional wave spectrum
- GPS position & watch circle
- Low purchase & operational costs
- Compact & light weight
- Easy to deploy & service
- Suitable as check-in luggage
- Versatile data portal included

MAIN APPLICATION AREAS

- Marine & Coastal engineering
- Oceanographic research
- Environmental monitoring
- Work compliance monitoring

ACCURATE, FULLY DIRECTIONAL WAVE DATA

The Wave Buoy uses a combination of motion sensors and an electronic compass to measure the directional wave field with high accuracy. This yields the directional wave spectrum and all parameters that can be derived from it, such as the 1-dimensional energy-density spectrum and a range of bulk wave parameters (significant wave height, peak wave period, peak wave direction, etc.).

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REAL-TIME ACCESSIBILITY

Wave data is sent to the Obscape servers in real-time. The secure Obscape Data Portal enables you to view and download the data or forward them to your own server. Key settings, such as the real-time output interval and the location of the GPS fence, can be adjusted on the fly. The Wave Buoy offers two main modes of communication: the GSM network (4G) and a satellite network (Iridium). While the GSM network offers low-cost data transfer in coastal waters, satellite communication ensures global data coverage. A FIFO queue is able to close connectivity gaps up to 50 days. Additionally, it is possible to work with a hybrid data transfer mode that will attempt to send data over the GSM network first, before switching to satellite communication.

RELIABLE

While satellite communication ensures a stable real-time data connection, the use of GPS positioning combined with automated status notifications emails make the system reliable. The GPS position reported by the buoy is continuously compared to the user-specified deployment location. If the distance between the actual and intended position of the buoy exceeds a pre-defined threshold (the watch circle), an email notification is sent to the user. Similar notifications are sent in case of a data gap, low battery level or exceedance of a user-specified wave height threshold. For high-latitude environments with limited solar input, a battery-powered version of the Wave Buoy is available.

EASY TO DEPLOY

Deployment of the Wave Buoy at sea is a simple operation. A mooring can be constructed using low-cost, easy-to-source materials in accordance with Obscape's mooring guideline. In low-current environments, the buoy can be anchored with a relatively light-weight ship anchor (ship crane not needed).

TECHNICAL SPECIFICATIONS

DATA SPECIFICATIONS	
WAVE SPECTRUM	Fully directional (Maximum Entropy Method)
BULK WAVE PARAMETERS	H_{m0} , H_{max} , T_p , T_{m01} , T_{m02} , T_{m-10} , T_{max} , D_{irp} , D_{irm} , σ_p , σ_m
DIAGNOSTIC PARAMETERS	Latitude, Longitude, Battery voltage, Solar panel voltage, Internal temperature, Signal strength
SAMPLE FREQUENCY	6.25 Hz
FILTERED FREQUENCY RANGE	0.05 Hz – 1.00 Hz (20 sec – 1 sec)
BURST DURATION	30 minutes
STORAGE	Data Portal & on-board micro SD card

PHYSICAL CHARACTERISTICS	
BUOY DIAMETER	500 mm
BUOY HEIGHT	350 mm
MOORING EYE INNER DIAMETER	15 mm
WEIGHT	17 kg
SAFETY SYSTEMS	Navigation light, GPS watch circle

ELECTRICAL CHARACTERISTICS	
SOLAR PANEL CAPACITY	6 W
BATTERY	18650 lithium battery
NOMINAL VOLTAGE	3.7 V

WEB-PORTAL SPECIFICATIONS	
ONLINE GRAPHS	Bulk wave parameters & diagnostic parameters
DOWNLOADS	Bulk wave parameters, diagnostic parameters, 1D wave spectra, directional wave spectra (text files, png or pdf report)
FORWARDERS	JSON API or HTTP post
STATUS NOTIFICATION EMAILS	Online/offline, GPS watch circle, battery level, wave height threshold

TELEMETRY SPECIFICATIONS	
COMMUNICATION MODES	GSM (4G with 2G fallback), Satellite (Iridium), Hybrid (GSM with Satellite fallback)
REAL-TIME DATA INTERVAL	30 minutes – 24 hours (user selectable)
REAL-TIME WAVE DATA	Bulk wave parameters, compressed directional wave spectrum
GSM DATA LOAD	8 kB per message (bulk parameters only) or 14 kB per message (bulk parameters & spectra)
SATELLITE DATA LOAD	1 credit per message (bulk parameters only) or 6 credits per message (bulk parameters & compressed spectra)

FACTORS ADVERSELY AFFECTING OPERATION	
BREAKING WAVES	Reduced accuracy
STRONG CURRENTS > 0.5 M/S	Reduced accuracy
WATER DEPTH < 4 M	Reduced accuracy, risk of excessive mooring wear

PRICING	
WAVE BUOY	€5,000 including web-portal license and 5,000 satellite communication credits
GSM COMMUNICATION	Micro SIM card and sufficient data credit to be arranged by user
SATELLITE COMMUNICATION	€0,05 per credit, line rental €14 per month (invoiced to user every 3 months)
MOORING	€500 (optional, can alternatively be constructed by user based on Obscape's guidelines)

Version: April 2021

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