

## NEXT LEVEL WAVE MEASUREMENTS

The Wave Module is a highly accurate real-time wave measurement system that reports the full wave spectrum including wave height, direction and period parameters.

Once affixed to a broad range of harbour and channel buoys or a variety of floats, the Wave Module offers a lightweight, flexible, reliable, and affordable method for measuring waves from most floating hull structures.

Based on recent advances in sensor and data technology and created by pairing the versatile Power & Telemetry Module with our accurate wave sensor, the Wave Module mounted to most standard hydrography and navigation buoys empowers the customer to accurately measure the full wave spectrum within a solar powered and rugged IP67 housing solution.



### KEY FEATURES

- Real-time data (4G with 2G fallback).
- Upgradable to satellite communication (Iridium).
- Wireless and solar powered.
- Significant and maximum wave heights.
- Peak and mean wave period.
- Peak wave direction and spreading.
- Real time temp., humidity, atmospheric pressure.
- GPS position & watch circle.
- Easy to affix & service.
- Low purchase & operational costs.
- Rugged IP67 housing.
- Versatile data portal included.

### MAIN APPLICATION AREAS

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

### ACCURATE FULL WAVE SPECTRUM

The Wave Module uses a combination of motion sensors and an electronic compass to measure the wave field with high accuracy. This yields the full 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, peak wave direction etc.).

### REAL-TIME ACCESSIBILITY

Real-time wave measurements are sent to the versatile Data Portal. 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, can be adjusted on the fly. The Wave Module offers 4G GSM network with 2G fallback as standard and for further afield based buoys an optional satellite network (Iridium) is available for an additional cost. While the GSM network offers low-cost data transfer in coastal



waters, optional 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

Harbour markers, offshore floating hulls and navigational buoys are designed to consistently withstand high shipping traffic areas, extreme swell and strong current conditions. By mounting the Obscape Wave Module to these types of stable floating structures, the bespoke Obscape engineered wave measurement system offers a reliable rugged IP67, accurate and steadfast solution to measure the full wave spectrum.

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 userspecified 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.

## EASY TO DEPLOY

Deployment of the Wave Module can be achieved by mounting the wireless and self-powered device to a floating hull structure prior to deployment or onsite at sea. Standard brackets are supplied, or a simple cage can be fabricated to enable mounting to most harbour markers, offshore floating hulls and navigational buoys.

## TECHNICAL SPECIFICATIONS

DATA SPECIFICATIONS	
WAVE SPECTRUM	Full Wave Spectrum
BULK WAVE PARAMETERS	$H_{m0}$ , $H_{max}$ , $T_p$ , $T_{m01}$ , $T_{m02}$ , $T_{m-10}$ , $T_{max}$ , Dirp, Dirr, $\sigma_p$ , $\sigma_m$
DIAGNOSTIC PARAMETERS	Latitude, Longitude, Battery voltage, Solar panel voltage, 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	
HOUSING WIDTH	87 mm
HOUSING DEPTH	87 mm
HOUSING HEIGHT	280 mm
HOUSING WEIGHT	2 kg

ELECTRICAL CHARACTERISTICS	
SOLAR PANEL CAPACITY	3W
BATTERY	1 single 18650 lithium battery
NOMINAL VOLTAGE	3.7 V

WEB-PORTAL SPECIFICATIONS	
ONLINE GRAPHS	Bulk wave parameters, interior temperature, humidity and atmospheric pressure, diagnostic parameters
DOWNLOADS	Bulk wave parameters, diagnostic parameters, 1D 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
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TELEMETRY SPECIFICATIONS	
COMMUNICATION MODE	Cellular (4G with 2G fallback- region determine prior to order), upgradable Satellite (Iridium).
REAL-TIME DATA INTERVAL	5 minutes – 24 hours (user selectable)
REAL-TIME DATA	Full wave spectrum, interior temperature, humidity and atmospheric pressure, diagnostic battery and solar voltage, GSM signal strength.
GSM DATA LOAD	Approx. 8 kB per message

FACTORS ADVERSELY AFFECTING OPERATION	
BREAKING WAVES	Reduced accuracy
CONSTRAINED MOORING LINE	Reduced accuracy

## DATA PORAL

The Data Portal is the ultimate tool to unify the office and the field. The portal supports you during each step of the measurement process: activation and preparation of your sensors, real-time data access, calamity management and operational maintenance of your devices.

### Free for the lifetime of your device:

- Unlimited devices per project - Up to 50 users per project
- Software updates
- Threshold alerts
- Reports
- Diagnostics
- Secure LoginLicence and secure sign-in
- Report generation
- Integral data management
- Data forwarding
- Maintenance log
- Monitoring alerts

