The collection and transmission of quality metocean data in severe deepwater conditions relies on robust and stable multi-parameter buoy platforms with reliable communication links.

The SEAWATCH Wavescan buoy is a versatile instrumentation platform ideally suited for collection and measurement of oceanographic, meteorological (metocean) and water quality data.

It has been designed to provide less drag and large buoyancy. The Wavescan is suitable for severe environmental conditions, large water depth and remote locations or areas with strong current forces. It’s innovative “wells” for subsea sensor mounting, ensure easy servicing and maintenance.

Features

- Uniquely designed to optimise wave direction measurements
- Full on-board processing of all measured data
- Two-way communication link for data transfer and control
- Real-time data transfer and presentation
- Flexible configuration of sensors and data collection
- Modular shaped hull for easy transport and local assembly
- Carrier for sensor clusters attached to inductive string
- Provides hydro acoustic link to deep ocean observatories
- Designed for safe and easy handling and deployment
- Special design minimises mooring influence on buoy motion
- Robust and reliable in all temperature extremes
- Optional position tracker for increased safety and drift tracking
- Successful track record world-wide since 1985
Applications

- Offshore design and operations
- Meteorological and climatological studies
- Suitable for deepwater operations
- Harbour monitoring
- Coastal engineering
- Scientific studies
- Wave energy studies
- Maritime traffic control
- Water quality control studies

Data Communication

The SEAWATCH Wavescan buoy allows two-way communications via either satellite or radio. The buoy position can also be monitored by means of one-way satellite position tracking.

Directional Wave Measurements

The buoy is fitted with a sensor for wave direction measurements, based on the heave/slope measuring principle.

The sensor is tailor made for wave measurements, which gives it a number of advantages compared to other more general purpose motion sensors on the market, such as:

- Low power consumption
- Integration into the datalogger
- Low price
- Direct output of standard oceanographic wave parameters and statistics

Data Monitoring

The data monitor program is used to monitor the measured parameters from the remote stations. The user defined sensor parameters are continuously monitored so any unforeseen incident will trigger a message to a predefined set of email addresses. The data can also be presented online in real-time on a dedicated, secure website.

The Hull

The SEAWATCH Wavescan buoy has a discus-shaped hull that can be separated into two parts for easy transportation.

The hull design is based on the dynamic response and stability requirements from comprehensive wave tank testing. A keel with counterweight is mounted under the hull to prevent capsizing of the buoy. A cylinder at the centre of the buoy hull contains all the electronic modules, the power package and the wave sensor.

The different electronic modules are mounted in special splash-proof compartment boxes inside the central cylinder to ensure the safety of the sensitive electronics. The buoy is equipped with a mast to support the meteorological sensors and the antennae. The mechanical design objective was to construct a strong but lightweight buoy. Materials used are polyethylene, aluminium and stainless steel, ensuring the buoy is lightweight but strong.

Power Supply

Maintenance-free solar panels and sealed lead-acid backup batteries enable long-term unattended operations. For low sun radiation conditions, lithium batteries can be supplied.
Mooring

The SEAWATCH Wavescan buoy mooring is designed according to the environmental conditions on the site. Slack mooring is recommended for shallow water and heavily trafficked areas whilst an S-mooring is used for deep-water and more hostile environments.

The specific mooring design and choice of materials also takes into consideration factors such as current conditions and even the danger of fish bite on the mooring line. These mooring types are specially designed to minimise the effect of the mooring on the wave following performance of the buoy.

The upper part of the mooring can be combined with an inductive cable where various sensors can be mounted at user selectable depths.

SEAWATCH Wavescan Around The World

The SEAWATCH Wavescan buoy has been delivered to private and public clients in Europe, USA, South America, Middle East, Asia and Australia.

For many years the SEAWATCH Wavescan buoys have been used by oil companies like Shell, Statoil, BP, Conoco, Petrobras, Petergaz, ENI, Woodside, Repsol, QP, Total.

The SEAWATCH Wavescan buoy has been delivered and is operational as part of national, or international, buoy networks in Greece, Spain, Italy, Portugal, Ireland, Iceland, Sweden, Norway, Russia, Peru, Ecuador, Argentina, Brazil (projects), Australia, India, Kuwait, Qatar, Iran, India, Vietnam, Malaysia, and China.
# SEAWATCH Wavescan Buoy

## Technical Specifications

### General
- **Material**: Polyethylene, Aluminium, Stainless steel
- **Flash light**: LED based, 3-4 nautical miles range
- **Positioning**: GPS (Inmarsat-C, Iridium, Standalone Receiver)

### Buoy Dimensions
- Weight (approx): 924 kg
- Overall height: 5.6 m
- Diameter: 2.8 m
- Net buoyancy: 2700 kg
- Mast height (above water): 3.5 m

### Power Supply
- **Solar panels**: 180 W (45W x 4)
- **Solar panel angle**: 17° (to horizontal)
- **Lead-acid battery bank**: 248 - 736 Ah
- **Lithium backup**: 272 - 2176 Ah

### Processing
- 32-bit microprocessor
- 512MB flash memory, approx 10 years of raw data
- Real-time operating system (Linux)
- Low power consumption
- Large number of serial and analogue inputs
- Flexible data acquisition software

### Data Communication
- **Short Range**: GSM/GPRS
- **Long Range**: Inmarsat-C and Iridium (two-way)
- **ARGOS (one-way)**

### Oceanographic Sensors
- Wave height
- Wave direction
- Current velocity
- Current direction
- Water temperature
- Conductivity/Salinity
- Current profile
- CTD profile

### Meteorological Sensors
- Wind speed/direction
- Air pressure
- Air temperature
- Humidity
- Precipitation
- Solar radiation

### Water Quality Sensors
- CTD profile
- Dissolved oxygen
- Light attenuation
- Chlorophyll-a
- Hydrocarbon
- Turbidity

### Subsea Sensor Wells
- 4 large size for analyzers up to Ø250 mm
- 2 medium size for sensors up to Ø150 mm
- 2 well for hidden tracker, Ø200 mm x 270 mm (H)

* Various additional sensors can be delivered on request.