Technical Specifications

Buoy Overall Dimensions
Weight: 710 kg
Overall height: 8.6 m
Diameter with fender: 1.76 m
Buoyancy: 1400 kg

Power Supply
Solar panels: 60 W
Lead-acid battery bank: 216 Amph
Optional battery bank: 770 Amph Lithium battery backup substituting half of the lead-acid battery bank.

Navigation
Navigation light and radar reflection in compliance with IALA requirements.

On Board Processor
32-bit microprocessor, flash disk data storage
Large number of serial and analogue inputs
Flexible data acquisition software

Data Communication Systems
Satellite Inmarsat-C and ORBCOMM two-way communication
ARGOS one-way communication
Telephone GSM, two-way communication
Radio UHF/VHF two-way radio communication

Operating temperature: -5 to 55°C
Storage temperature: -20 to 50°C

Engineering Wave Parameters:
Based on validation intercomparison trials (papers sent on request).

Significant wave height	< 5cm bias
Mean period	< 0.15sec bias
Direction	< 2° bias
Maximum wave height	< 5cm bias

Directional Wave Data Sensor:

Parameter	Range	Accuracy
Heave, Surge, Sway	±15m (adjust.)	< 10cm
Direction	0 - 360°	0.3°
Wave Period	2-30sec	< 2% of value

Full wave directional analysis on-board based on spectral analysis and user-friendly configuration tools.

Surface Current Velocity:
Range 0 to 600cms^{-1}
Accuracy 1cms^{-1} or 2% of reading

Surface Current Direction:
Range 0 to 360°
Accuracy ±2.5°

Sea Surface Temperature: (from current meter)
Range -5 to +32°C
Accuracy ±0.03°C

Sea Surface Conductivity: (from current meter)
Range 0 to 9.0S/m
Accuracy ±0.002S/m

Wind Direction Sensor:
Range 0 to 360°
Accuracy ±3°

Wind Velocity Sensor:
Range 0 to 60ms^{-1} (0-70 on request)
Accuracy ±0.3ms^{-1}

Air Pressure Sensor:
Range 800 to 1100hPa
Accuracy ±0.15hPa

Air Temperature Sensor:
Range -30 to +75°C
Accuracy ±0.1°C

Buoy Position:

Inmarsat-C	GPS
ORBCOMM	GPS
ARGOS	ARGOS one-way position transfer
Radio	GPS optional
GSM	GPS optional

Additional Sensors:
CTD profiler
Dissolved oxygen
Gamma radiation
Light attenuation
Chlorophyll-a
Hydrocarbon

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Seawatch Buoy

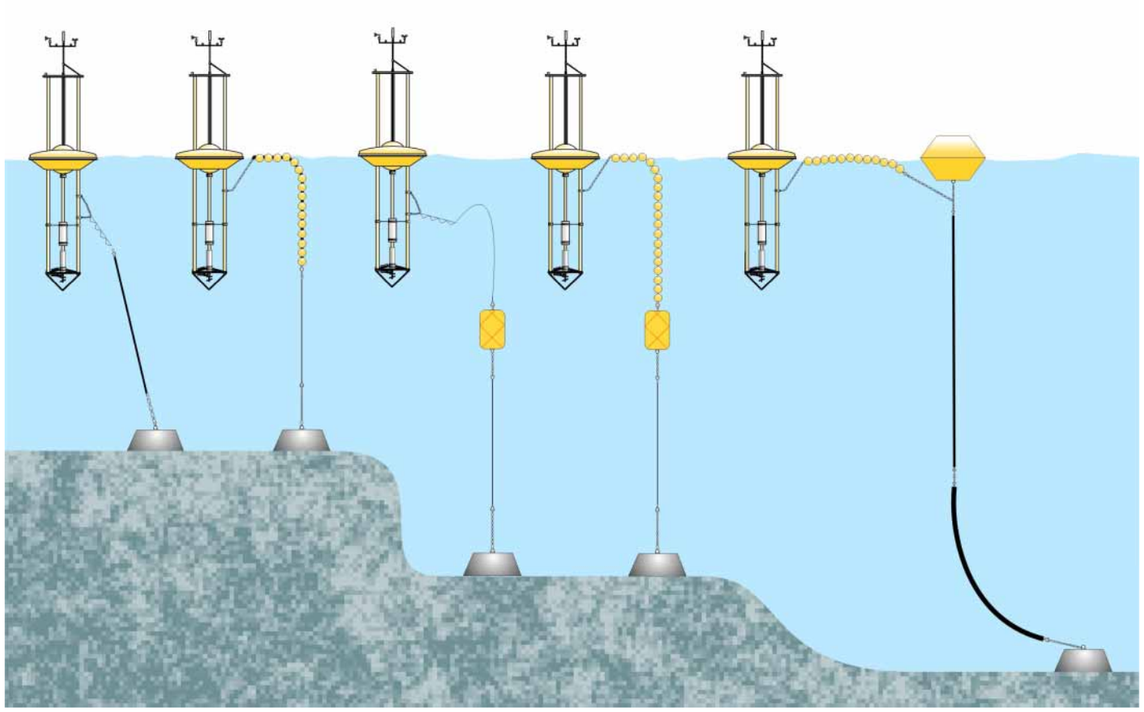
- **Multi-sensor wave directional buoy**
- **Unique design optimises wave direction measurements**
- **Special mooring design minimises mooring influence on buoy motions**
- **Flexible configuration of sensors and data collection**
- **Full on-board processing of all measured data**
- **Two-way communication link for data transfer and remote control of buoys**
- **Data presentation in real-time**
- **Designed for safe and easy handling**
- **Modular hull for easy transport and local assembly**
- **Easily deployed**
- **Insensitive to extreme temperatures**
- **Proven track record since 1985**

The Seawatch Buoy

A multi-sensor data buoy capable of measuring wave height and direction, ocean current speed and direction, meteorological parameters, sea surface temperature, salinity and temperature and salinity profiles. The Seawatch buoy is essentially a sensor carrier for a series of oceanographic, meteorological and water quality measurements. The buoy can also be equipped with numerous other sensors, satisfying the customer's specific configuration needs, such as oxygen, hydrocarbon, gamma radiation measurement and an optical sensor for algae detection.

The buoy is vertically stabilised giving low pitch/roll motions and is ideal for making current, wind and ocean wave measurements. Experience gained since 1985 has shown that the Seawatch buoy design is stable even in extreme sea conditions.

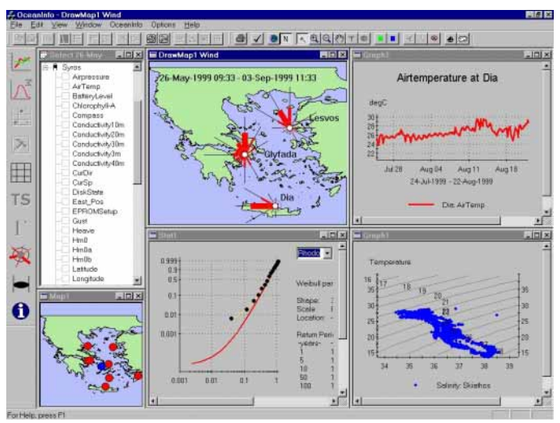
Servicing a Seawatch buoy



The Seawatch buoy can be deployed with a variety of configurations

Directional Wave Sensor

The buoy is fitted with a Motion Reference Unit (MRU) for wave direction measurements based on the heave/ translation principle. This sensor offers the unique advantage of being insensitive to extremes of temperatures as well as spinning and rough handling.



OceanInfo data presentation screen

The MRU incorporates an accurate 3-axis fluxgate compass for buoy orientation measurements. This is important for high quality wind and wave directional data.

Data Presentation

OceanInfo is a PC-based system for the presentation of metocean data collected by the buoys or from other sources. It has the following functions: time series plots and wind roses; simple univariate statistics, univariate and bivariate distribution tables and curves; extreme analysis (based on a 3-parameter Weibull distribution fit), gamma spectrum and TS diagram (temperature/ salinity); and print, copy or export of graphs, maps and data.

The Hull

The vertically stabilised buoy is built around a spherical instrument container. The instrument container is surrounded by three, 6-metre long, seawater-resistant, vertical aluminium legs that are kept together by a top frame, a middle deck and a bottom frame. The top and bottom frames serve as support for the meteorological and submerged sensors, whilst the middle deck contains the main buoyancy elements and fendering. The water-line runs through the middle deck, so that the part of the buoyancy above the middle deck serves as extra buoyancy.

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

There are five major types of mooring design used with the Seawatch Buoy. The design used for a particular deployment depends on several factors. The most important are the current speed in the water column and the water depth. Further, surface activities such as ship traffic and even the likelihood of fish bite on the mooring must be taken into consideration.

A Seawatch buoy on board ready for deployment in Greek Waters

Fabrication of Seawatch buoys in Norway

Applications

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

Seawatch around the World

More than 60 Seawatch buoys are presently operating and providing data around the world.

Some of our customers are:

- International Maritime Academy (IMO), Italy
- International Atomic Energy Agency (IAEA), Monaco
- National Centre for Marine Research Institute of Oceanography, Athens, Greece
- Puertos del Estado, Spain
- Agency for the Assessment and Application of Technology, Indonesia
- National Research Council, Bangkok, Thailand
- National Institute of Ocean Technology, India
- SMHI - Swedish Meteorological and Hydrological Institute, Sweden