SEAWATCH Wavescan Buoy

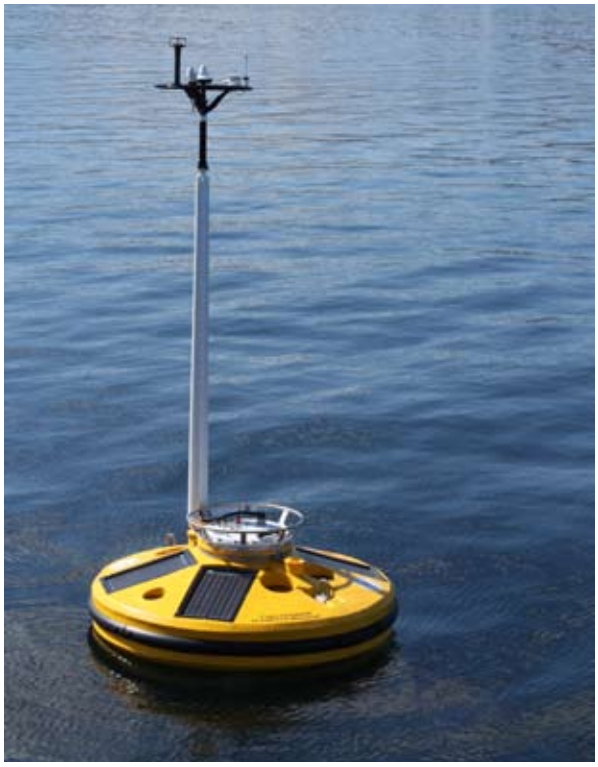
The collection and transmission of quality metocean data in severe deepwater conditions relies on robust and stable multi-parameter buoy platforms with reliable communication links.

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

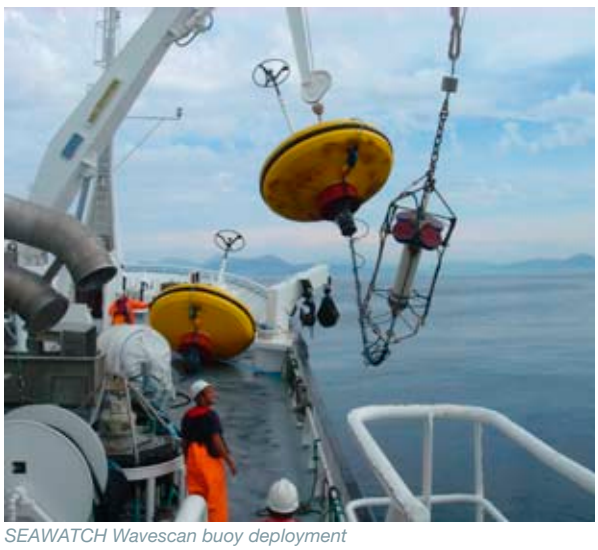
It has been designed to provide less drag and large buoyancy suitable for deep offshore and remote locations or areas with strong current forces. It's innovative "wells" for subsea sensor mounting, ensure easy servicing and maintenance.

Features

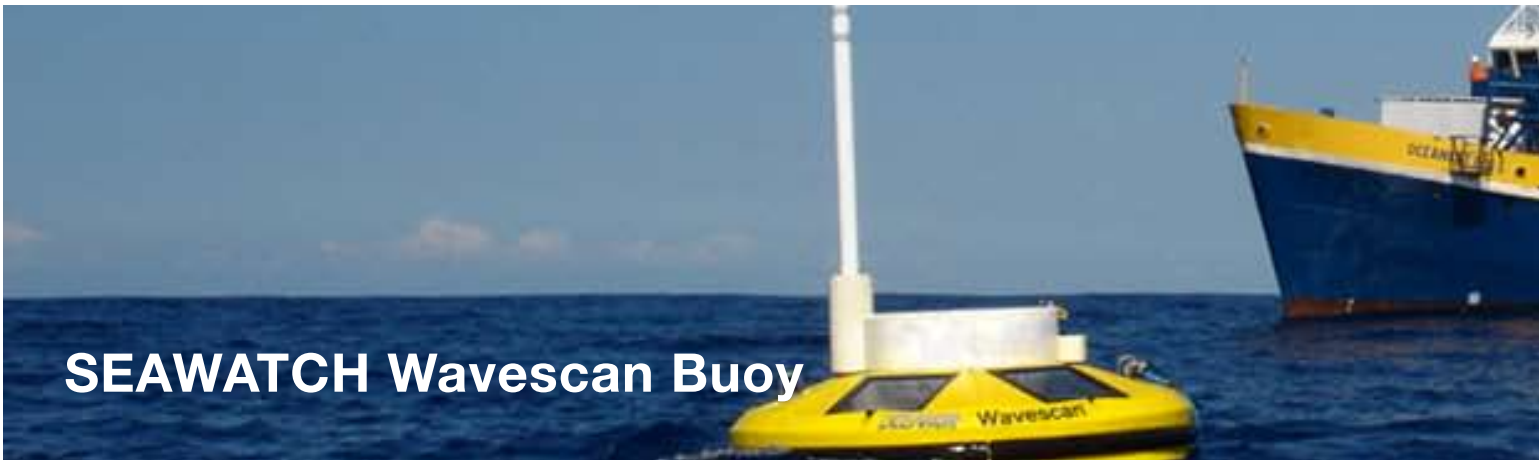
- Uniquely designed to optimise wave direction measurements
- Full on-board processing of all measured data
- Two-way communication link for data transfer and control
- Real-time data transfer and presentation
- Flexible configuration of sensors and data collection
- Modular shaped hull for easy transport 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



SEAWATCH Wavescan buoy with met mast



SEAWATCH Wavescan buoy deployment



SEAWATCH Wavescan Buoy

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

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.

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 Presentation

The Station Guard program is used for presenting data and monitoring Fugro OCEANOR'S remote stations.

The state of selected sensor parameters are constantly monitored so any unforeseen incident will trigger an email message to a predefined address. Reports are easily generated and configured for automatic export to multiple file formats, making it ideal for presenting real-time data on the internet. The program also contains methods for quality checking of data.

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.

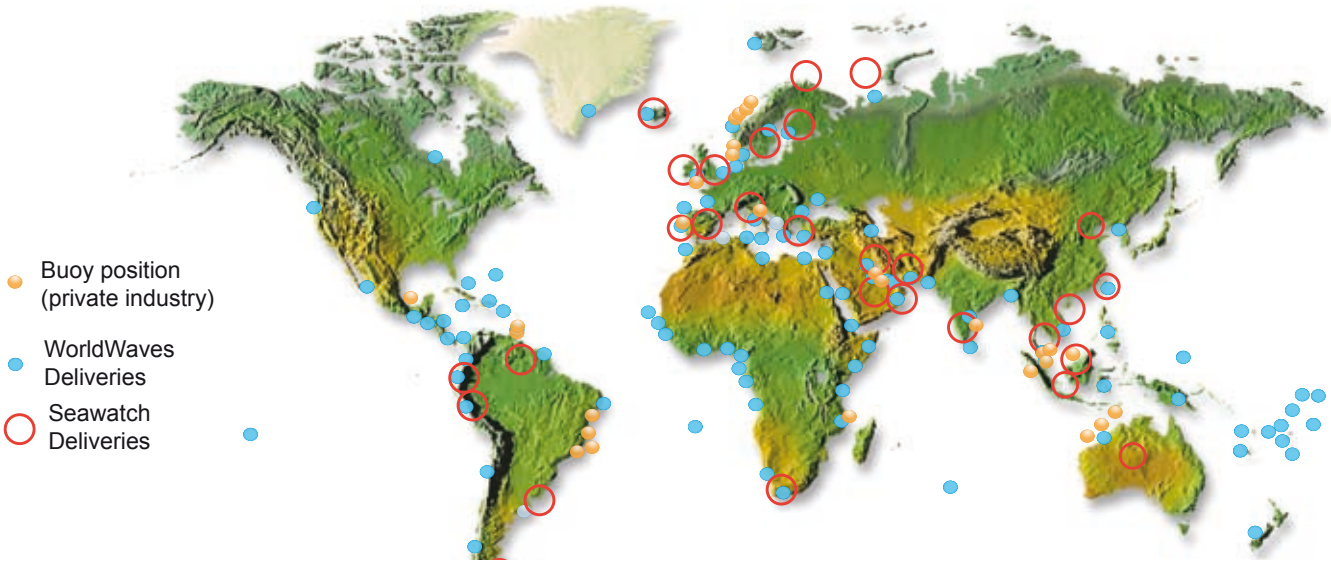
SEAWATCH Wavescan Around The World

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, Saudi Aramco.

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 World Wide Distribution



SEAWATCH Wavescan Buoy

Technical Specifications

General

Material	Polyethylene, Aluminium, Stainless steel
Flash light	LED based, 3-4 nautical miles range
	IALA recommended characteristic
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
	UHF/VHF radio (two-way)
Long Range	Inmarsat-C and Iridium (two-way)
	ARGOS (one-way)

Directional Wave Data Sensor

Parameter	Range	Accuracy
Heave, Surge, Sway	± 25m (adjust)	< 10 cm
Direction	0 - 360°	0.3°
Wave Period	2 - 30 sec	< 2% of value

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

Oceanographic Sensors

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.

Fugro GEOS Ltd, Wallingford, UK
Tel: +44 1491 820 500
Email: uk@geos.com

Fugro GEOS, Structural Monitoring, Glasgow, UK
Tel: +44 141 774 8828
Email: fsm@geos.com

Fugro GEOS, Abu Dhabi, UAE
Tel: +971 2 554 5101
Email: gulfmet@geos-uae.com

Fugro GEOS Pte Ltd, Singapore
Tel: +65 6885 4100
Email: singapore@geos.com

Fugro GEOS, Perth, Australia
Tel: +61 8 6477 4400
Email: perth@geos.com

Fugro GEOS Sdn Bhd, KL, Malaysia
Tel: +60 3 2164 6210
Email: malaysia@geos.com

Fugro GEOS Inc, Houston, USA
Tel: +1 713 346 3600
Email: geosusa@fugro.com

Fugro OCEANOR AS, Trondheim, Norway
Tel: +47 7354 5200
Email: trondheim@oceanor.com

Fugro OCEANOR AS, Sandnes, Norway
Tel: +47 5163 4330
Email: sandnes@oceanor.com