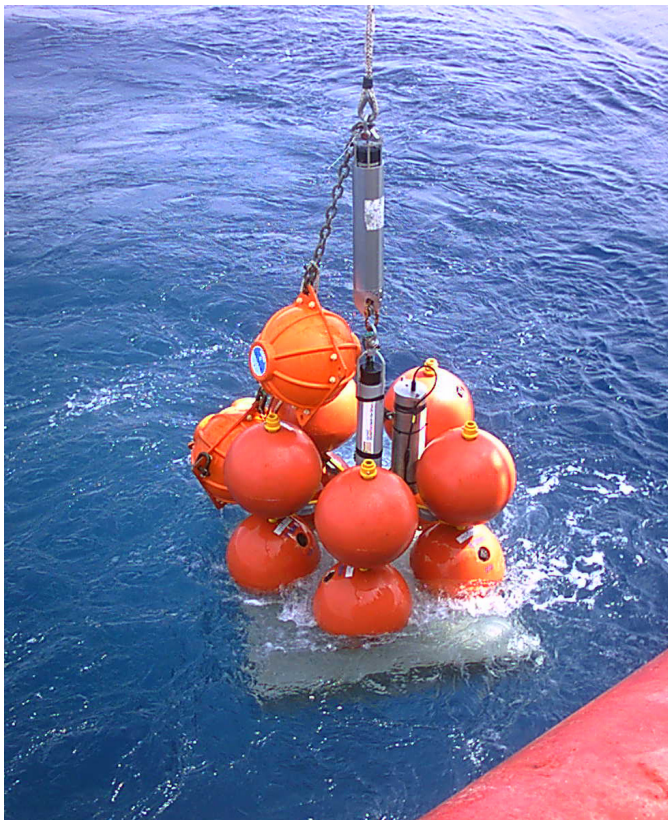


SEAWATCH Deep Sea Module (SDSM)

The SEAWATCH Deep Sea Module (SDSM) is designed specifically for the detection of tsunamis. The module may be fitted to existing SEAWATCH systems or be an integrated part of new systems. The SDSM consisting of a pressure sensor, a processor, batteries and an acoustic modem, is located on the seafloor. The SDSM is mounted to a bottom anchor using an acoustic release. This enables easy recovery of the unit when the batteries are drained after approximately one year of operation. The SDSM is released for retrieval by the acoustic release.



The SDSM continuously measures the water pressure at the seafloor. Once per hour a measurement is transmitted to surface buoy enabling verification of the system's operation. The pressure measurements are processed by the seafloor processor in real-time and the tidal variations and the variations due to sensor instability are subtracted from the time series. The resulting data are then analysed for tsunami events. In the case of a likely tsunami event, the SDSM switches into fast data transmission mode, sending the pressure

time series to the surface buoy, which in turn sends the data to shore using the satellite link.

Onshore, in the Tsunami warning centre, the data reception system would indicate an alarm situation. The data would at this stage be readily available for the expert team to evaluate, together with seismic data and other possible sources of information.

So far the SEAWATCH Deep Sea Module has been delivered to Malaysia (3), India (2) and Greece (1). This turnkey system is delivered as a complete package and is ready to setup and operate on receipt. It can be configured with hardware and software for operation in shallow or deep water. The integration of the SDSM with a surface buoy enables the collection of data sets for many meteorological and oceanographic parameters, providing a truly multi-hazard detection system.



Technical Specifications

WAVESCAN BUOY

Buoy Overall Dimensions

Weight	924kg
Diameter of hull	2.8m (with fender)
Buoy total height	6.75m (mast to keel)
Buoyancy	3000kg

Power Supply

Solar panels	80W
Lead acid battery bank	240Amph
Lithium backup	385, 770, 1155 or 1540Amph

Navigation

Navigation light and radar reflector in compliance with IALA requirements

On Board Processor

32-bit microprocessor, flash disk data storage
Real-time operating system, low power consumption
A 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 communication
Other options available	
Operating Temperature	-5 to 55°C (min.)
Storage Temperature	-20 to 50°C (min.)

Sensor options:

Directional waves, surface current speed and direction, surface temperature and salinity, temperature and salinity profiles, dissolved oxygen, light attenuation, chlorophyll-a, hydrocarbons, air temperature, air pressure, wind speed and direction.

Enquire for other parameters

Specifications available

SEAWATCH DEEP SEA MODULE (SDSM)

Acoustic modem (other depth ratings may also be supplied)

Baud rate	140 2400 bits / second
Maximum depth	6000 meters
Transmit power consumption	2A average, 5A peak @21V
Receive power consumption	25mA
Low power consumption	0.5mA
Operating frequency	9 to 14 kHz

Pressure sensor

Repeatability(*):	±0.01 % of range
Hysteresis(*):	±0.01 % of range
Maximum overpressure:	1.2 times the range with no change in calibration
Temperature sensitivity:	45 ppm/°C
Sensitivity:	0.001 meter
Maximum depth:	700, 1400, 2100, 4200 or 7000 meters
(*) not important in this application	

Temperature Sensor

Accuracy:	±0.1°C
Resolution:	±0.05°C
Range:	-5 to +30 °C

Processor

Program memory size:	64 kB
RAM size	36 kB
Serial ports	2
Counter inputs	4
Analog inputs:	8
Analog to Digital resolution:	16 bit
Processing power:	4 MIPS
Onboard watchdog circuit	

Batteries

Chemistry:	Alkaline
Nominal voltage:	10.5V max, 6.3V min
Capacity:	60 Ah (1 year of operation)

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