

DATA BUOY – MAWS - ODAS ENVIRTECH MKI-3 BUOY

SYSTEM OVERVIEW

ODAS - OCEANOGRAPHIC DATA BUOY

The DeepSea MKI-3 buoy is the *state of the art* in directional wave measurement and oceanographic data gathering. It has been conceived to implement large data buoy networks as well as single installation both for coastal water or deep sea.

The buoy includes a solid-state MEMS directional wave measurement pack, an automatic weather station and a sea surface temperature transducer. The payload can be expanded with further underwater instrumentation to measure bio-chemical and physical parameters. The buoy is composed of a central metal frame in AISI 316 stainless steel, and three rotationally moulded, foam-filled floats that are assembled to form the shape of a truncated cone. The buoy dimensions, the focal light height, and the radar corner reflector allow good visibility in any conditions, day or night.

WHAT IS A MOORED DATA BUOY?

A data buoy is a buoy equipped with sensors, computers and transceivers. It can collect, process and transmit meteorological and oceanographic data to a shore station. Typically, each buoy is powered by solar panels and is moored in a fixed position by a mooring line and an anchor.

WHAT IS A DIRECTIONAL WAVE BUOY?

A directional wave buoy is a special data buoy that can record the sea motion, using an inertial platform and a compass. The buoy itself works as the sensor.

WHAT IS A GPS PAYLOAD FOR ISSH?

To measure the Instantaneous Sea Surface Height (the tide) in the open sea requires a pressure sensor deployed on the sea bottom. It is also possible to measure the absolute buoy height respect the ellipsoid with accurate measurements obtained via multi-channel, multi-satellite (GPS, Glonass, Galileo, Beidou) payloads on board moored buoys.

ENVIRTECH DATA BUOY MKI-3 - TECHNICAL DESCRIPTION

Main features are:

- inertial sensor (Micro-Electro-Mechanical Systems) containing a digital compass that can measure the directional waves parameters and spectra;
- A very low power consumption CPU with high processing capability, Linux embed
- A VHF or UHF radio modem, 100mW to 10W in power or an Iridium/Inmarsat miniC
- An Inmarsat D+ satellite transceiver containing a GPS receiver to be used as a back-up relay system and to track the buoy position and/or an Inmarsat mini-C;
- Autonomous power supply system based on solar panels, Gel batteries and, if needed, a primary lithium battery pack.

All data provided by sensors (wave sensors, meteo sensors, multi-parameter probes) are stored using a compact flash NVRAM with capacity up to 32 Gb and transmitted using the selected telemetry system. The electronic units are protected inside waterproof cases equipped with waterproof connectors to interface the radio antenna, the meteo sensors, the satellite modem and the optional multiparameter probe (CTD + other sensors) that can be fixed using one or more moon-pools through the floats or directly coupled to the mechanical frame. The turret and the floats can be disassembled to facilitate the transport of the buoy: the Turret can be split into two parts and the float can be disassembled into three segments.



OPTIONS

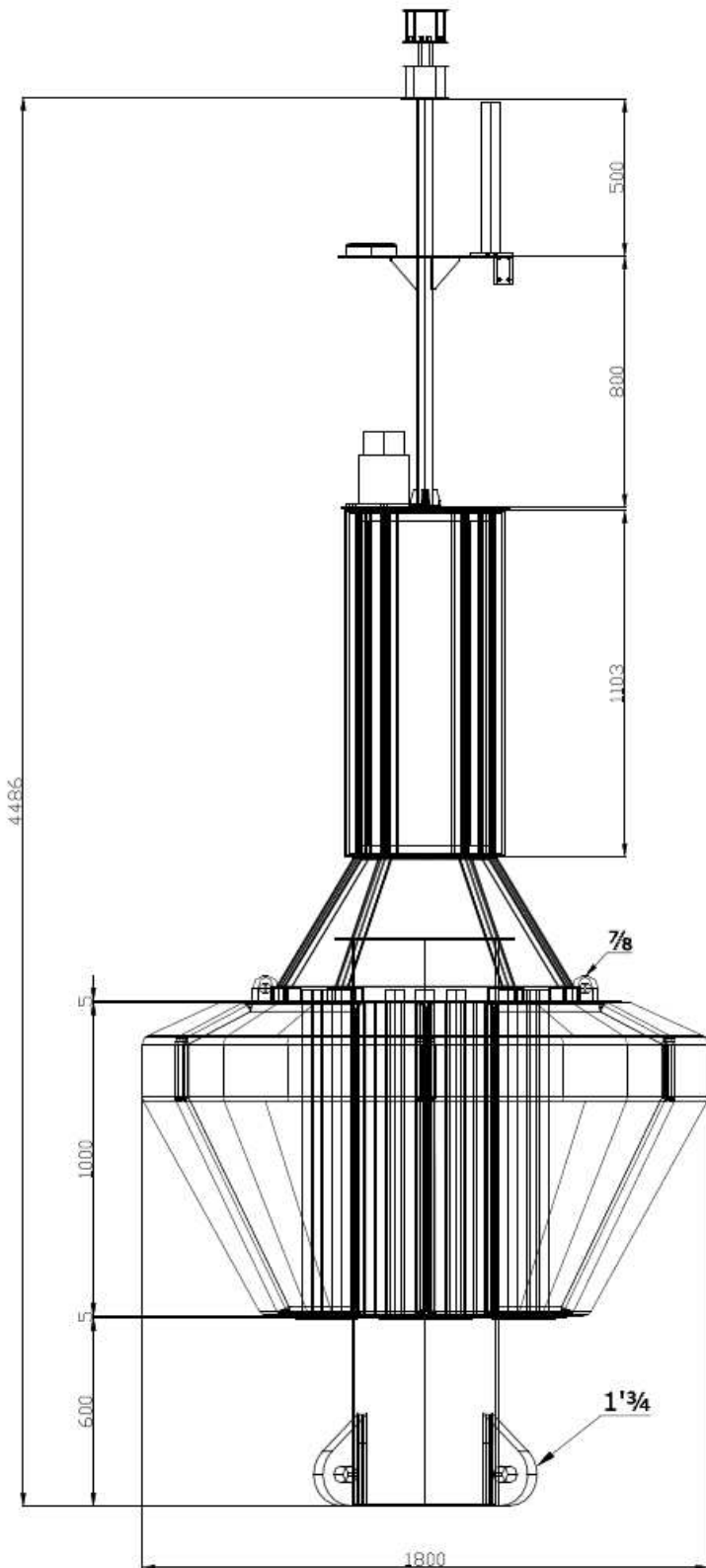
- Acoustic Doppler Current Profiler, mounted in reverse mode, to measure currents in the water column up to -100 m, in up to 128 layers
- Multiparameter probe to measure Temperature, salinity, dissolved Oxygen, Redox, pH, Turbidity, Chlorophyll etc.
- Telemetry: Skywave Surelinx combined GPRS/Inmarsat transceiver;
- Telemetry: InmarsatC, Inmarsat IsatM2M, Iridium, other on request.
- Additional primary lithium battery pack
- Underwater telemetry: Acoustic modem and inductive modem for sea bottom instrumentation and moored sensors.



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Envirtech is a private European company that manufactures according to strict standards of quality control ISO9001-2000.

DATA BUOY ENVIRTECH MKI-3



The assemblage of the turret on the buoyants few minutes before deployment. The turret contains all electronic in water proof cases.

GENERAL INFORMATION MKI-3 Buoy	
Dimensions	Buoyant 1800 x 1000 mm Overall Length 4486 mm
Construction	Rotationally molded Polyethylene, UV stabilized, syntactic foam filled + AISI 316L stainless steel
Instrument case	Diamagnetic stainless Steel
Weight in air	750 Kg w/ 4 batteries
Buoyancy	1,500 Kg
Ballast	200 Kg composed of Bridles + 5 meters chain, related swivels and shackles as top part of the mooring line
Suggested mooring line weight on the buoy	Max 350 kg, including above ballast
Operational Temperature	-4°C +60°C (standard)
Operational	Up to Beaufort 10
Survive	Up to Beaufort 14

STANDARD FEATURES (tailored systems available)

Directional Wave Pack	Micromachined Electro-Mechanical System (MEMS) Wave height -25..+25 m / Accuracy 5 mm / Resolution 1 mm Wave Period 1.5 .. 35 s / Accuracy 0.1 s Wave direction 0.360° / Accuracy 0.1° / Resolution 0.05°
Wind Gauge	2-axys Ultrasonic Range 0-60 m/s wind speed Range 0-359° wind direction range
Barometric pressure	Range 600-1100 hPa Accuracy +/- 0.1 hPa at 0..30 °C
Air Temperature	Range -52 .. +60 °C Accuracy +/- 0.2°C
Relative Humidity	Range 0 ... 100 %RH ±3 %RH within 0 ... 90 %RH
Water Temperature	-5 .. + 60 °C Accuracy 0.2 °C
Compass	Micromachined Electro-Mechanical System (MEMS), Gyro-stabilized Azimuth accur. 0.5° RMS, 0.1° resolution Inclination accur. 0.2° RMS, 0.1° resolution
GPS	12 Channels
CPU	32 Bit Ram 1024 Kb Very low power consumption / Linux embed
Telemetry	VHF 150 MHz RF Power 0.1 to 10 Watt Inmarsat D+ , Surelinx (GPRS/Inmarsat/GPS) OPTIONS: Inmarsat mini-C/Iridium/GSM-GPRS-Edge
Datalogger	SD – Up to 32 Gb – Storage autonomy 2 years
Power Autonomy	4 x Solar Panels 65 W each 4 x Gel Battery 80 Watt each (option: 8 batteries) Option Lithium Power Pack, 1 KW
Options	Multiparameter probe for bio-chemical data collection Radiometers (radiance/irradiance) ADCP, Visibilimeter, Rain gauge Acoustic Modem for sea floor communications Induction modem for data gathering from moored sensors

Specifications can change without notice – Many tailored built available with different measures and weights - Please contact us for details.