

DATA BUOY - MAWS ENVIRTECH MK-I BUOY

SYSTEM OVERVIEW

AUTOMATIC MARINE WEATHER STATION

The DeepSea MKI buoy is state of the art in directional wave measurement and oceanographic data gathering. 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 biochemical and physical parameters, and a multi-satellite, multi-channel receiver for iSSH measurement (tide). The buoy is composed of a central metal pole 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?

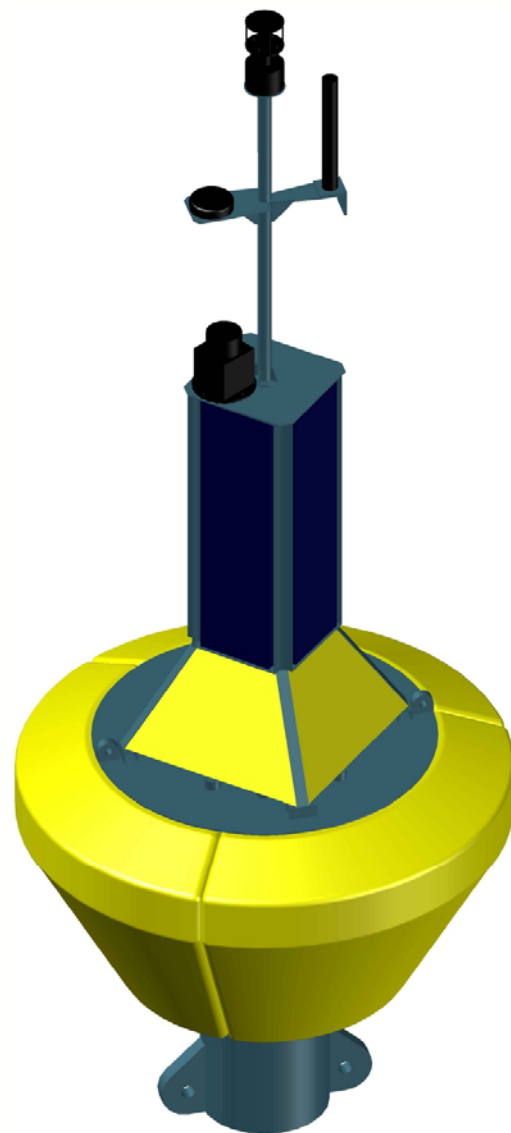
To measure the Instantaneous Sea Surface Height (the tide) in the open sea requires an ADCP or a pressure sensor deployed on the sea bottom. It is also possible to measure the absolute buoy height respect the ellipsoid with accurate measurements obtained via multi-channel, multi-satellite (GPS, Glonass,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

ENVIRTECH DATA BUOY MKI - TECHNICAL DESCRIPTION

Main features are:

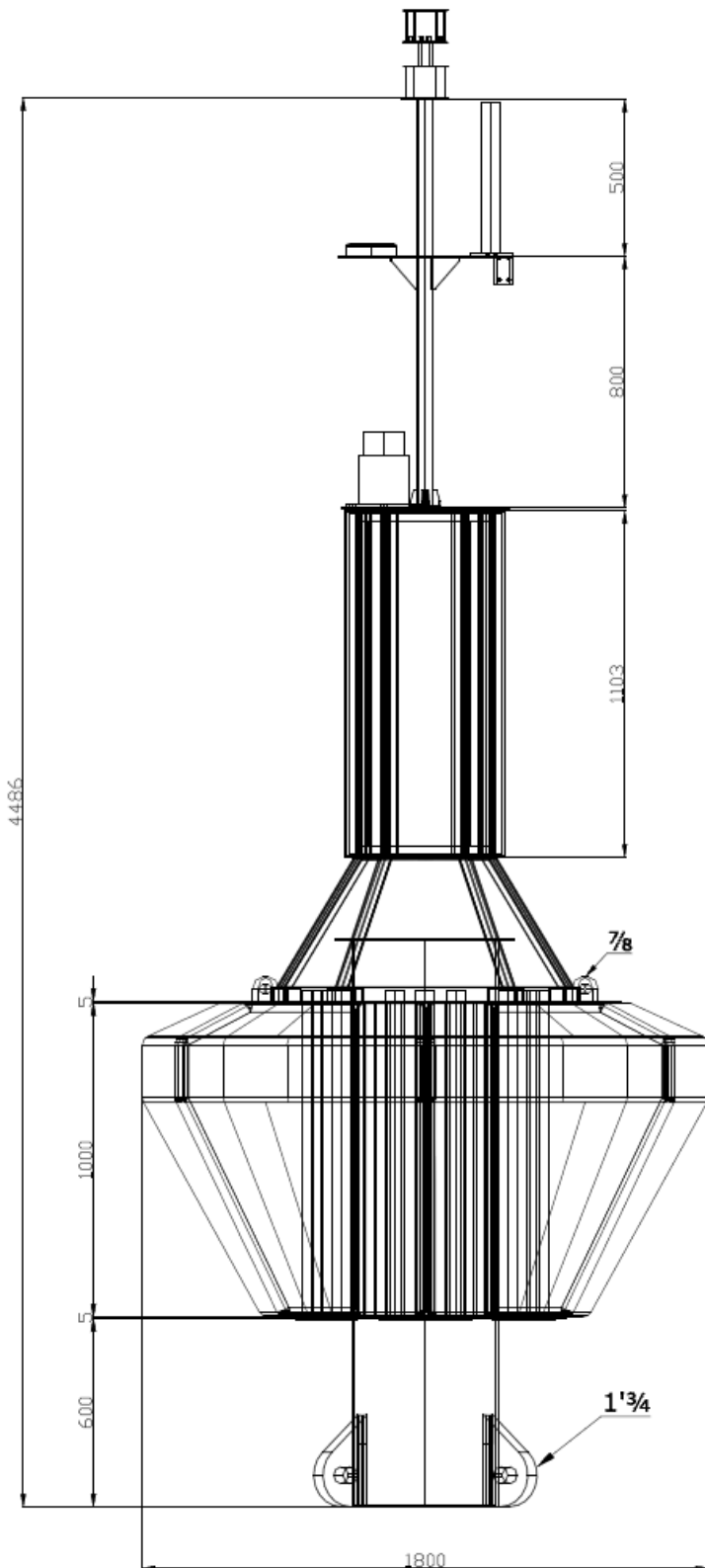
- inertial sensor (Micro-Electro-Mechanical Systems) containing a digital compass that can measure the directional waves parameters and spectra;
- A very low power consumption CPU with high processing capability;
- A VHF or UHF radio modem, 100mW to 10W in power;
- An Inmarsat D+ satellite transceiver 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 or 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. The MKI CPU includes three axial acceleration and the three axial gyros to obtain the wave directional spectra and to address the zero crossing analysis. The electronic unit is protected inside a waterproof cylinder 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. The pole and the floats can be disassembled to facilitate the transport of the buoy: the pole can be split into two parts and the float can be divided into three segments.



Envirtech is a private Italian company that is completely owned by its management. It invests more than 30% of its annual revenue in research. Envirtech manufactures according to strict standards of quality control and is ISO9001- 2000 certified.

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Buoyant particular showing moon pool for multiparameter probe to collect bio-chemical data, ADCP and further sensors.

GENERAL INFORMATION MK-I Buoy	
Dimensions	Buoyant 1800 x 1000 mm Overall Length 4510 mm
Construction	Rotationally molded Polyethylene, UV stabilized, foam filled + AISI 316L Stainless steel
Instrument case	Aluminum
Weight in air	782 Kg
Ballast	143 Kg – Bridles for mooring line
Operational Temperature	-4°C +60°C (standard)
Extended Operational Temperature	-20°C +70°C (optional)
Operational	Beaufort 10

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-axis Ultrasonic Range 0-60 m/s wind speed Range 0-359° wind direction range
Barometric pressure	Range 600-1100 hPa Accuracy +/- 0.5 hPa at 0..30 °C
Air Temperature	Range -52 .. +60 °C Accuracy +/- 0.3°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
Telemetry	VHF 150 MHz RF Power 0.1 to 10 Watt Inmarsat D+ OPTIONS: Inmarsat mini-C/Iridium/GSM-GPRS-Edge
Datalogger	NVRAM - 32 GB
Power Autonomy	4 x Solar Panels 65 W each 4 x Gel Battery 80 Watt each (option: 8) Option Lithium Power Pack, 2 Years
Options	iSSH – Instantaneous Sea Surface Height (TIDE) Multiparameter probe for bio-chemical data collection Radiometers (radiance/irradiance) ADCP Acoustic Modem for sea floor communications

Specifications can change without notice