

# DATA BUOY - MAWS ENVIRTECH MK-IV 3M BUOY

## SYSTEM OVERVIEW

### AUTOMATIC MARINE MOORED LABORATORY

The Envirtech MKIV, 3-Meter buoy, is state of the art in met-ocean data gathering. The buoy is composed of a multi-sector rotationally moulded, foam-filled floats, and stainless steel mechanical frame and turret. It can host many payloads. In standard configuration it includes a solid-state MEMS directional wave measurement pack, an automatic weather station (AWS) and a sea surface temperature transducer. Payloads can be expanded with further instrumentation to measure bio-chemical and physical parameters, like multi-parameter probes, ADCPs (both reversed assembling or on-seabed deployed), multi-satellite, multi-channel receiver for iSSH measurement (tide). The buoy dimensions, the focal light height, and the radar corner reflector allow good visibility in any conditions, day or night. The buoy is the ideal solution for permanent floating laboratories.

#### 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?

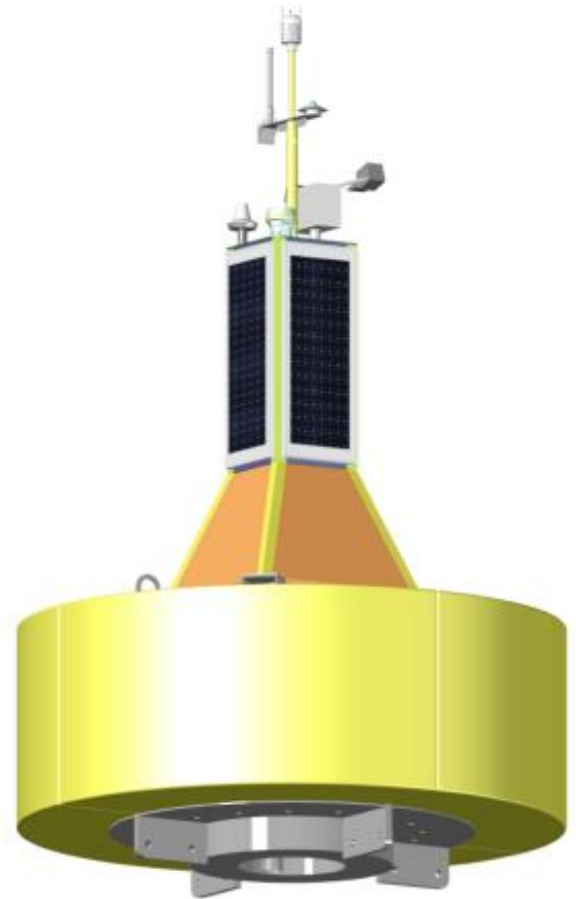
To measure the Instantaneous Sea Surface Height (the tide) in the open sea requires an ADCP or a pressure sensor deployed on the sea bottom. It is also possible to measure the absolute buoy height respect the ellipsoid with accurate measurements obtained via multi-channel, multi-satellite (GPS, Glonass,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

## ENVIRTECH DATA BUOY MKIV - TECHNICAL DESCRIPTION

Main features are:

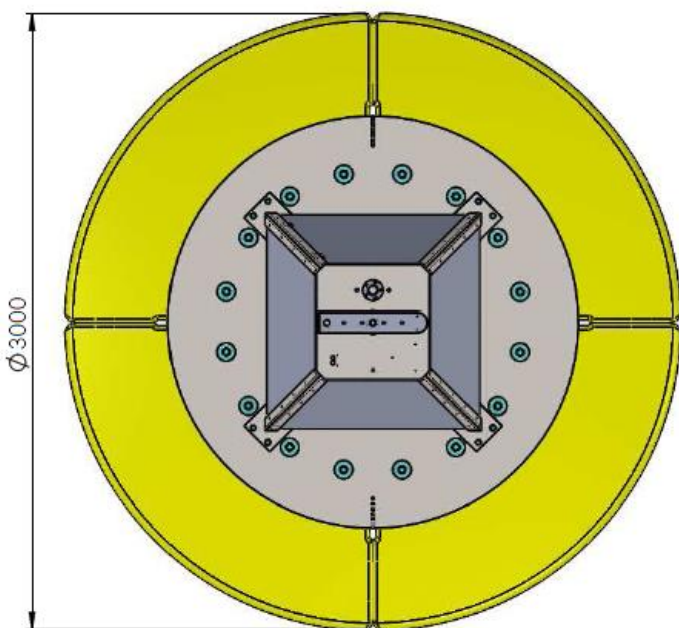
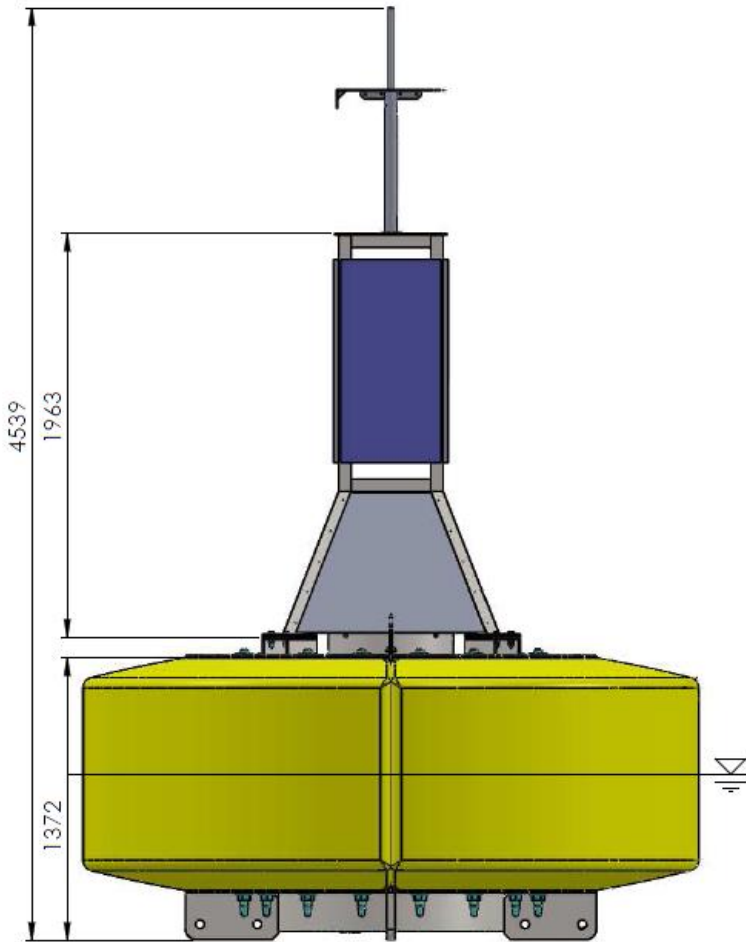
- AHRS Attitude Heading Reference System (Micro-Electro-Mechanical) containing a digital compass that can measure the directional waves parameters and spectra;
- A very low power consumption CPU with high processing capability;
- A VHF or UHF radio modem, 100mW to 5W in power;
- An Iridium satellite 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, ADCP) 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 Subsea Systems is a private Italian company. It invests more than 30% of annual revenue in research. Envirtech manufactures according to strict standards of quality control and is ISO9001- 2000 certified.

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## STANDARD FEATURES

(tailored systems available) –

<b>Directional Wave Pack</b>	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°
<b>Wind Gauge</b>	2-axys Ultrasonic Range 0-60 m/s wind speed Range 0-359° wind direction range
<b>Barometric pressure</b>	Range 600-1100 hPa Accuracy +/- 0.5 hPa at 0..30 °C
<b>Air Temperature</b>	Range -52 .. +60 °C Accuracy +/- 0.3°C
<b>Relative Humidity</b>	Range 0 ... 100 %RH ±3 %RH within 0 ... 90 %RH
<b>Water Temperature</b>	-5 .. + 60 °C Accuracy 0.2 °C
<b>Compass</b>	Micromachined Electro-Mechanical System (MEMS), Gyro-stabilized Azimuth accur. 0.5° RMS, 0.1° resolution Inclination accur. 0.2° RMS, 0.1° resolution
<b>GPS</b>	12 Channels
<b>CPU</b>	32 Bit Ram 1024 Kb Very low power consumption
<b>Telemetry</b>	VHF/UHF RF Power 0.1 to 5 Watt Iridium OPTIONS: Inmarsat mini-C/Iridium/GSM-GPRS-Edge
<b>Datalogger</b>	NVRAM - 32 GB
<b>Power Autonomy</b>	4 x Solar Panels 65 W each 4 x Gel Battery 80 Watt each (option: 8) Option Lithium Power Pack, 2 Years
<b>Options</b>	iSSH – Instantaneous Sea Surface Height (TIDE) Multiparameter probe for bio-chemical data collection Radiometers (radiance/irradiance) ADCP in reverse mode or deployed on seabed Acoustic Modem for sea floor communications T/C chains Other on request

*Specifications can change without notice*

## GENERAL INFORMATION MK-IV Buoy

<b>Dimensions</b>	Buoyant 3000 x 1372 mm Overall Length 4539 mm
<b>Buoyancy</b>	70 Kg for each cm of immersion
<b>Construction</b>	Rotationally moulded Polyethylene, UV stabilized, foam filled + Stainless steel frame and turret
<b>Instrument case</b>	Stainless Steel
<b>Weight in air</b>	3,200 Kg (only buoy w/o payloads)
<b>Ballast</b>	none
<b>Operational Temperature</b>	-4°C +60°C (standard)
<b>Extended Operational Temperature</b>	-20°C +70°C (optional)
<b>Operational</b>	Beaufort 14