

# SURVEILLANCE BUOY ENVIRTECH MK-VI

## SYSTEM OVERVIEW

### SURVEILLANCE AND DETECTION BUOY

The Envirtech MKVI buoy consents to extend awareness about the marine environment beyond the horizon. As first goal the buoy detects, identifies and tracks cooperative maritime targets, equipped with active AIS and radar transmitter, relaying collected data to an on-shore control centre via LEO Satellite communication systems. Some additional payloads can also detect and track non-cooperative targets using passive sonar and radio interferometer. The buoy has been designed to operate as fixed (moored) node in large networks, to be deployed for long time in deep sea and to reduce maintenance interventions. Further modular and exchangeable payloads allow the buoy to collect meteorological, oceanographic and water quality data, including pollution agents.

Flexible solar panels and an emergency lithium power pack assure needed power in any condition. Reduced dimensions and technical solutions adopted in hull design consent to reach high survival ratio to sea storms (cyclones) and collisions.

### WHAT IS MDA ?

Maritime Domain Awareness, MDA, is "the effective understanding of anything associated with the Maritime domain that could impact the security, safety, economy, or environment. This is the definition in the USA - National Plan To Achieve Maritime Domain Awareness.

### WHY MDA ?

There exists limited awareness and effective understanding of vessels that do not emit electromagnetic signals and for emitting targets, it is difficult to correlate transmitted data with actual target behavior. Decision-making authorities require information necessary to identify and react to potential threats to national security arising in the maritime domain. Threats must be identified as early and as far off-shore as possible, requiring awareness of coastal waters out to the Exclusive Economic Zone and even on the high seas.

### ENVIRTECH DATA BUOY MKVI - TECHNICAL DESCRIPTION

Main features are:

- Surface and submerged modular payloads hosting platform
- Meteorological data and inertial sensor (Micro-Electro-Mechanical Systems) containing a digital compass that can measure buoy movements around the mooring area;
- A very low power consumption CPU with high processing capability;
- AIS receiver and marine X/S band radar detector
- LEO Satellite transceiver in burst data and switched circuit mode for data relay and remote maintenance;
- Primary solar power and Gel accumulators plus backup High power Lithium battery pack

Surface payloads:

- Radio interferometer
- Additional air analyser and meteorological sensors

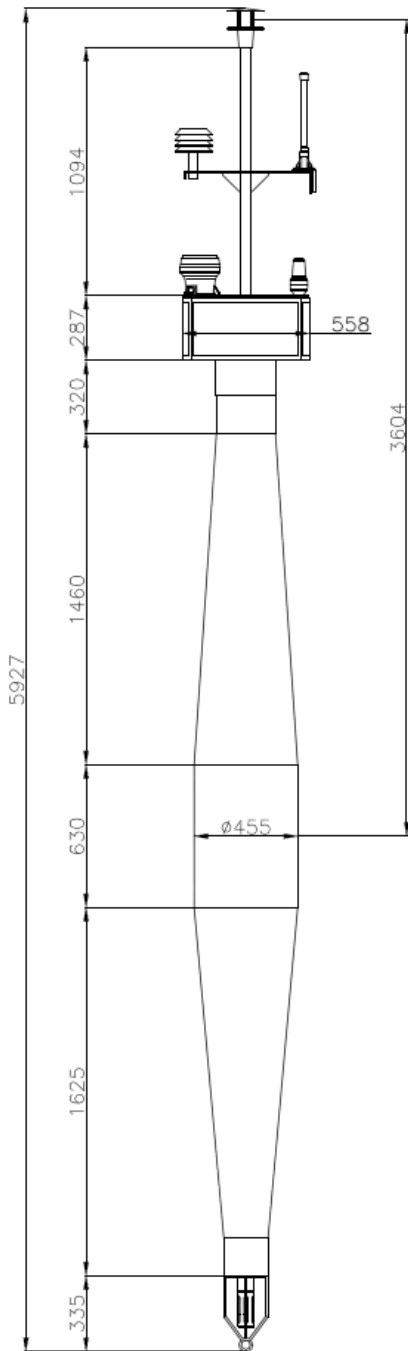
Submerged payloads:

- Passive sonar, hydrophones
- ADCP, Quality probes, pollution detectors, thermistor chain



*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 ISO9001-2000.

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GENERAL INFORMATION MK-VI Surveillance Buoy	
<b>Dimensions</b>	Buoyant 455 x 3545 mm Overall Length 4796 mm
<b>Buoyancy for centimeter of immersion</b>	1,6 Kg
<b>Buoyancy</b>	500 Kg (only buoyant w/o structures, could change)
<b>Construction</b>	Rotationally moulded Polyethylene, UV stabilized, foam filled + Stainless steel underwater frame and turret.
<b>Instrument case</b>	Aluminum
<b>Weight in air</b>	700 Kg (could change)
<b>Ballast</b>	Bridles/Chain with mooring line
<b>Operational Temperature</b>	-4°C +60°C (standard)
<b>Extended Operational Temperature</b>	-20°C +70°C (optional)
<b>Operational / Surviving</b>	Beaufort 11 / Extended Beaufort Scale : 14

STANDARD FEATURES (tailored systems available)	
<b>Cpu</b>	32 Bit - Ram 1024 Kb - Very low power consumption - NVRAM - 32 GB
<b>Attitude and heading</b>	Micromachined Electro-Mechanical System 360 degrees 3D orientation output 3D acceleration, 3D rate of turn and 3D earth-magnetic field data
<b>Basic telemetry</b>	IRIDIUM SBD (Short Burst) - MO 1960 Byte - MT 1890 Byte - Latency 20 seconds
<b>Real-time data relay</b>	IRIDIUM CIRCUIT SWITCHED DATA SERVICE
<b>Gps</b>	12 Channels
<b>Minimum available power</b>	4 x Flexible Solar Panels - minimum 18 W each, with independent DC regulators 1 x Gel Battery 280 Ah Option Lithium Power Pack

#### Meteorologic payload

<b>Air temperature</b>	Range -52 .. +60 °C Accuracy +/- 0.3°C
<b>Wind gauge</b>	2-axys Ultrasonic Range 0-60 m/s wind speed Range 0-359° wind direction range
<b>Sea Surface Temperature</b>	-5 .. + 60 °C ; Accuracy 0.2 °C

#### Surveillance payload

<b>Ais receiver</b>	Two simultaneous channels – Envirtech property algorithm for data relay
<b>Marine Radar detector</b>	Frequency range: X-Band 9300 .. 9600 MHz; S-Band 2900 .. 3100 MHz Pulse frequency and duration detector

#### Additional Payloads

Passive sonar, hydrophones iSSH – Instantaneous Sea Surface Height (TIDE) Multiparameter probe for bio-chemical data collection and polluting agents Additional meteorologic sensors ADCP in reverse mode or deployed on seabed Acoustic Modem for sea floor communications T/C chains Other on request
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*Specifications can change without notice*