

MIDA

UNDERWATER SURVEILLANCE SYSTEM

INTRODUCTION

MIDA is a passive underwater surveillance system which provides continuous 24/7 round-the-clock acoustic surveillance against surface ships and submarines.

MIDA is specifically designed for portability and deployment as a sensor barrier within coastal and littoral waters to detect intrusion by surface or underwater vessels. Using only the hydro-acoustic noise generated by a vessel, the system passively tracks the intruder covertly, to maintain the element of surprise and tactical advantage.

MIDA is modular and scalable to meet the unique and specific requirements of each customer; including customisation of the acoustic array to adapt to the water depth, Sound Velocity Profile and other environmental conditions.

MIDA is based on more than 40 years of R&D and delivering proven high performance underwater acoustics systems.

OVERVIEW

MIDA comprises of one Shore Station (SS) and up to 32 Acoustics Buoys (AcB). Each AcB is independently deployed and moored to the seabed. When an intruder is detected, the AcB would collect and process the hydro-acoustic noise generated by the vessel; and transmits the information to the SS via radio datalink. The SS is capable to simultaneously receive and analyse the information transmitted from up to 32 AcB

Shore Station (SS) comprises:

- Multi-channel wireless radio network equipment
- Computer system with proprietary software for analysis and visualization of the hydro-acoustic information received from the AcB.

Acoustic Buoy (AcB) comprises:

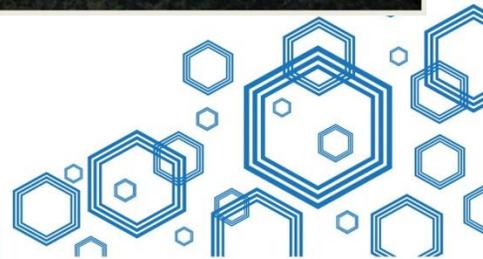
- Radio Buoy
- Acoustic Receiver and Processor
- Power supply and Mooring System..



OPERATION

Within the Acoustic Buoy (AcB), the MIDA proprietary acoustic array and receiver is designed to process hydro-acoustic noise from 200 Hz to 10 kHz. The deployed depth of the array shall be dependent on the environmental conditions; such as the relief of the area and Sound Velocity Profile. As a vessel approaches the sensor barrier comprising several AcB's, the received level of hydro-acoustic noise would exceed the pre-set threshold in the nearest buoy. Depending on the disposition of the buoys, the pre-set threshold in the adjacent buoys may also be exceeded. Consequently, the receiver would activate the elevating mechanism controlling the position of the radio buoy. Upon breaking the sea surface, the radio transmitter would commence transmission of the received hydro-acoustic noise. Upon receiving the hydro-acoustic data from the AcB's, the Shore Station would analyse and classify the vessel. If there is a record of the vessel in the database, it may even be identified.

MIDA SENSOR BARRIER OUTSIDE A HARBOUR



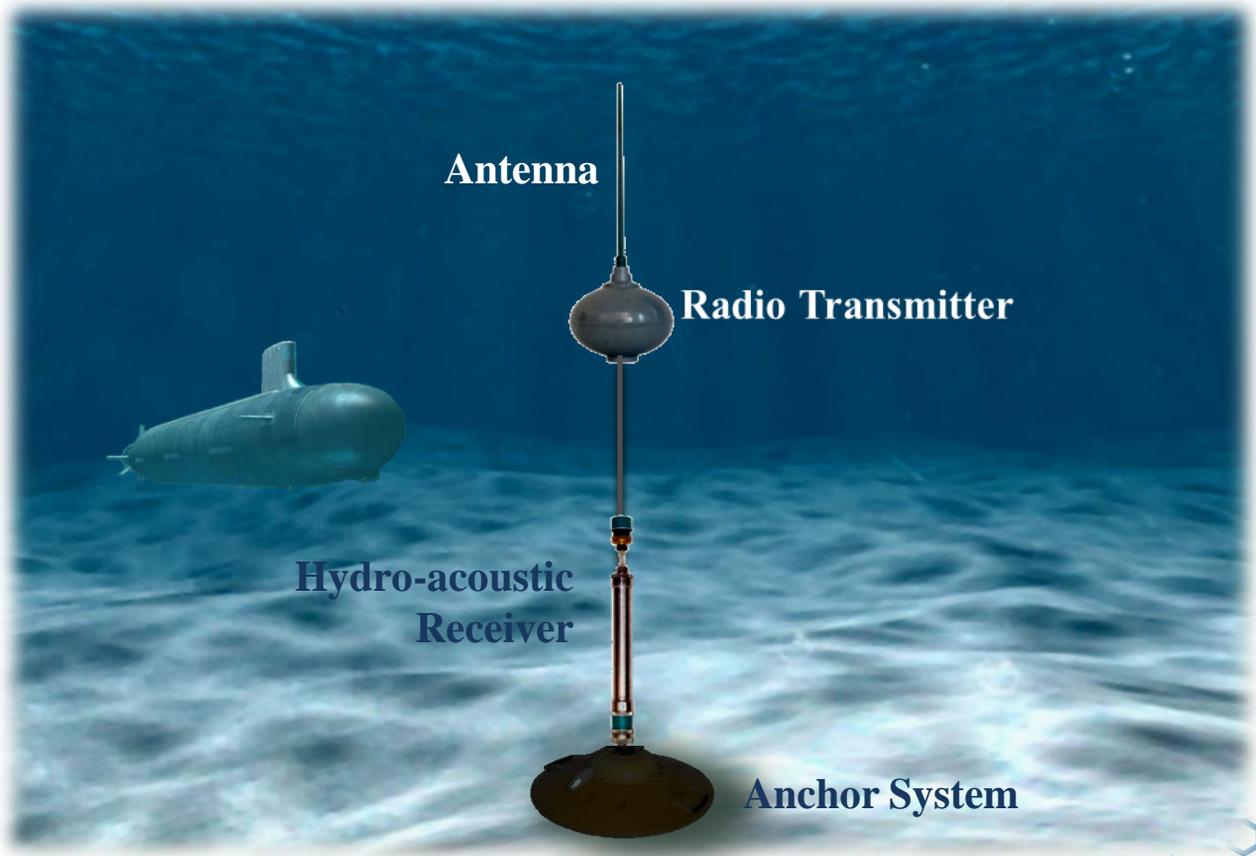
The AcB's which are active and transmitting the hydro-acoustic data are indicated on the GIS.

As the vessel moves away and the received hydro-acoustic noise drops below the pre-set threshold, the AcB returns to "Standby" mode; and the radio buoy is retracted by the elevating mechanism.

If the vessel has been detected by more than one AcB, the track of the vessel may be estimated. From the vessel's hydro-acoustic noise, its acoustic signature may be compiled and built into an "acoustic signature classifier" to aid future classification and identification of the vessel.

Power for the AcB is provided by a battery pack, sufficient to support 90 to 180 days of normal operation.

Larger battery packs may be provided upon customer's request.





MAIN CHARACTERISTICS

Detection range of hydro-acoustic level 0.6 Pa/1kHz/1Hz: up to 8000 m; depending on environmental conditions. Maximum depth of deployment: up to 100 m. System may be customised for greater depths if required. Maximum range between Acoustic Buoy and Shore Station: up to 30 km Line-of-Sight. Endurance of Acoustic Buoy's battery pack: between 90 to 180 days; depending on vessel traffic density. Typical deployment distance between Acoustic Buoys: 2 to 3 km; depending on vessel's hydro-acoustic noise level and environmental conditions.

KEY ADVANTAGES

MIDA is designed to be modular and configurable to meet the specific operational requirements and environmental constraints of each customer's unique surveillance needs.

Compatibility. MIDA is designed to be scalable with potential for future growth and upgradability. The system can be easily expanded or upgraded to meet customer's future surveillance requirements; with the benefits of common supply, training and support for greater operating cost effectiveness. The system is also designed for ease of integration with customer's existing and future Command & Control (C2) systems.

Proven Technology and Products. With more than 40 years of R&D and continuous product development, the technology behind the MIDA is proven, with similar systems already deployed in active field service. Under the harsh operating and environmental conditions, the system has demonstrated high reliability and availability required for continuous 24/7 round-the-clock surveillance over prolonged deployments with low maintenance downtime.

Ease of Operation. The system is easy to operate with an intuitive and user-friendly Man Machine Interface (MMI) which greatly assists the operator to analyse and evaluate the vessel's hydro-acoustic noise, to allow timely and effective actions against any threat. With advanced signal processing and analysis tools, the probability of false alerts is considerably low, thereby reducing the processing workload on the human operator. Overall, with the robust and highly automated operations, operator numbers are reduced to the minimum of only 1 operator per Shore Station; with consequently low manning costs.

