



WESTMINSTER

INTERNATIONAL LTD

Telephone : +44 (0)1295 756300

Fax : +44 (0)1295 756302

E-Mail : info@wi-ltd.com

Website : www.wi-ltd.com

WG Diver Detection Sonar System

The WG Diver Detection Sonar System (DDSS) is a single- or multi-head active sonar system designed to automatically detect and track underwater and surface threats, principally divers (scuba or closed-circuit, with or without propulsion aids), surface swimmers and un-manned underwater vehicles.

The system will track simultaneously multiple targets up to a range of 900 metres in ideal conditions, with classification of targets such as divers occurring at 450 metres, the system also provides upon classification the targets previous trail. The maximum location depth is 50 metres

Applications

The practicality of the DDSS design makes the system a realistic option for protecting a wide range of maritime assets: -

Expeditionary warfare units in overseas ports are widely recognised as the most visible and vulnerable of targets.



Oil & Gas refineries, liquefied natural gas terminals and power stations, many of these facilities are already deploying conventional security systems including: thermal imaging, CCTV, Radar and ground sensing devices, the DDSS completes the security circle against intruders.



Harbours, Ships - The system can be used to protect security sensitive fixed installations that have water perimeters, harbours, private moorings or individual passenger ships, luxury yachts etc.

The reliable detection of underwater targets and their discrimination from marine mammals is a notoriously difficult problem.

The system addresses this challenge by combining state-of-the-art sonar technology and automated detection, classification and tracking software which has been tested and proven in many installations carried out worldwide.

The system will function in a wide a range of acoustically complex subsea environments and will only alert when genuine threats are detected. This minimises potential false alarms and reduces the dangerous tension and operator fatigue that these can generate.

The system user interface has been designed with ease of use as a priority, it can be easily operated by operators whom have not been trained to use sonar systems.

Deployment

The system is designed for a wide range of installation configurations: -

- Freely suspended over the side of vessels;
- Jetty / harbour wall mounting;
- Pole mounting over the side of vessels;
- Sea bed mounting frame;
- Through-hull deployment.
- Tripod seabed mounting;

For a permanent installation of the sonar heads either the Sea bed mounting or the Jetty / harbour wall mounting can be utilised or a combination of both types depending on the actual layout of the harbour to be protected. The Tripod sea bed mounting is normally used for rapid deployment and temporary installations.

Harbour Entrance / Fixed Point Protection

The reliable detection of underwater targets in the acoustic environment of a harbour is a well-known problem. Constant vessel traffic, noise from continually active depth sounders and a complex thermal structure typify this scenario.

The DDSS has been specifically designed to cope with these adverse conditions and is capable of tracking thousands of targets in real time with only genuine threats causing an alarm that the operator or observer need react to.

Mounted in either a seabed frame looking upwards or on a permanent harbour wall mount looking across the entrance, the system is easy to install and configure for autonomous operation from a remote monitoring station.



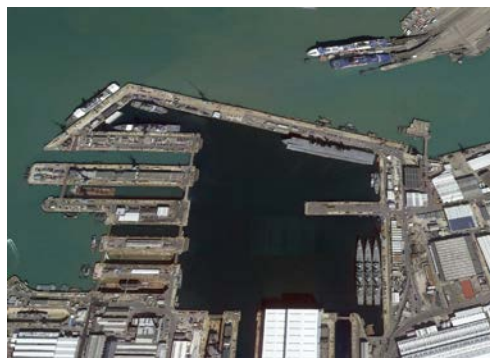
Networked Port Installation

Under the International Ship and Port Facility Code (ISPS code) it is vital to ensure protection against foreseeable events. The DDSS has been designed to operate in a stand-alone or networked mode with multiple sonar heads to enable complete protection of assets within the defined security zone.

The overlay will increase the level of domain awareness in an estuary, coastal environment or complex port and can be totally integrated into a central command system with above water surveillance.

A typical multi-head network can be integrated into a single command workstation, with each head requiring using own sonar processor.

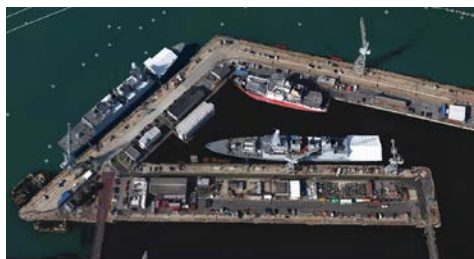
The DDSS unique detection, classification and tracking software has been proven to operate in the harshest environmental conditions including noisy, shallow and tidal harbours where vessel activity results in a lot of disturbance in the water column.



Asset Protection

The systems compact size and lightweight design make it a practical solution for rapid mobilisation to meet an evolving threat.

Being compact, the system can be carried on board as part of a mobile or expeditionary security unit, providing a secure underwater perimeter for high value assets.



Being very light, the sonar head can be deployed over the side of a vessel or from a jetty by one person using only minimal equipment. The sonar processor and command workstation set-up is can be carried out quickly and easily with the system typically configured and working in less than 20 minutes.

Providing wide area coverage, the system is designed to provide secure underwater perimeters for both military and civilian assets. These include: naval vessels at anchor in overseas ports, cruise liners in harbour and super yachts moored off the coast.

Energy Infrastructure

The threat of insurgency, vandalism or criminal activity is not restricted to ports or military assets. Any oil and gas installation, whether coastal or offshore, is extremely vulnerable to attack from below and represents a significant threat to a region's energy supplies.

The DDSS open system architecture allows integration of the subsea security zone with conventional terrestrial security systems, including thermal imaging, radar and ground sensing devices.



Flexible Rapid Deployment

The DDSS system has been developed so that it can be mounted from a pole based deployment system, suspended from its combined signal and power cable or mounted on the seabed. Considerations such as ease of installation by divers in low visibility have been taken into consideration.

Sonar Head

The DDSS sonar array is considerably smaller than many other similar systems on the market, it provides a full 360 degrees of coverage and is capable of reliably detecting and tracking underwater targets up to 900 metres away.

The compact size of the sonar head makes it ideal for expeditionary operation as it is capable of being easily palletised and rapidly deployed. This enables the system to be suspended by its own cable from oil rigs, moving platforms or drifting patrol boats or ships on single point moorings. The head is also small enough to be mounted on an unmanned underwater vehicle

The sonar head contains the electronics to control the transmitters and digitise and multiplex the received signals from the transducers.

The multiplexed data is transmitted to the topside equipment via a copper-based cable for cable lengths up to 75 metres, or via a fibre optic cable for up to 30 km lengths.

Command Workstation

The Command Workstation configures and controls the sonar head processors using the beam-formed, normalised sonar data and track data from each sonar processor.

The combined outputs from the sonar head(s) are shown on a single screen. Processor and Software Pulse compression, beam forming and automatic detection and tracking are carried out by a high-performance PC installed in a rugged case. The case also contains the power distribution unit for the sonar head.

The command workstation provides a tactical-style display for the system, showing the sonar data, track data and alerts overlaid on a chart. The tactical display shows all the sonar coverage in the correct geographical locations on the chart.

Example of a Multi-Sonar Head System Deployment



Integrated Solution

If the required solution is a fixed permanently installed system and there are other security sensors being deployed such as Marine Radar, Combined Thermal Day Cameras Westminster recommends the client considers installing a fully integrated control and command system connecting all the sensors together.

This will provide overall detection, verification and tracking of intruders underwater or on the surface.

Example if the Marine Radar or Diver Detection Sonar detects an intruder they will automatically "slew to cue" the Combined Thermal Day Cameras to visually verify the target and continue track the target.

Typical Threats

- Fast RIBB's;
- Leisure craft;
- Divers;
- Unmanned Under water vehicles.

