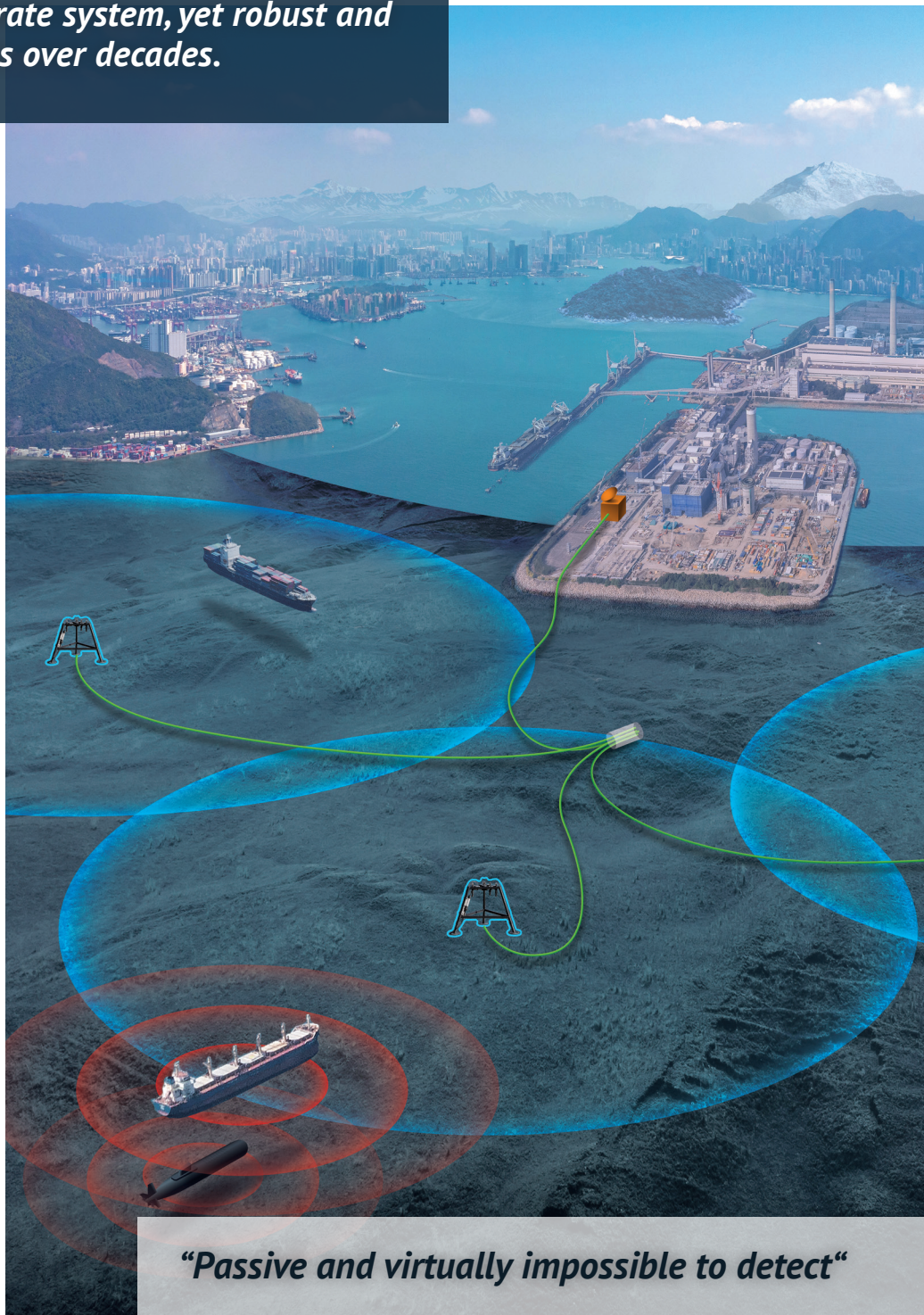
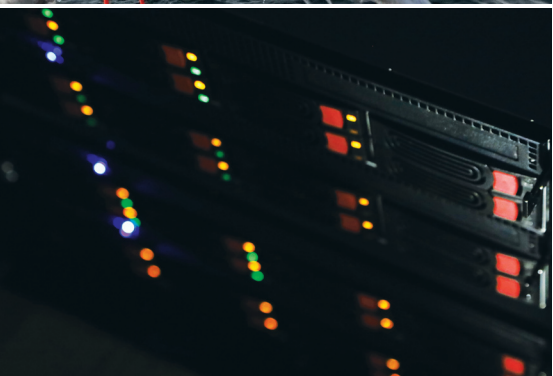


UNWAS™

IS UNDERWATER SURVEILLANCE SYSTEM

A highly sensitive and accurate system, yet robust and tested in extreme conditions over decades.



“Passive and virtually impossible to detect”

Image Soft Underwater Surveillance System

- passive, distributed, modular and sensitive

Underwater Surveillance System

Image Soft Underwater Surveillance System (IS UNWAS™) is designed for detecting and tracking both underwater and surface targets. It is a distributed and modular system that uses passive hydrophone arrays to track acoustic targets and is deployed to protect both point targets as well as to cover surveillance of large areas. IS UNWAS™ provides real-time tactical view of the underwater and surface situation and integrates to overall command and control systems for improved situational awareness of the naval battlefield.

The modular design of UNWAS™ system supports an extensive range of user applications including:

- Protection of underwater infrastructure like gas pipelines and communication cables
- Detection and tracking of illegal drug- and people smuggling on small boats in coastal areas
- Port and harbor protection against sabotage, infiltration, or espionage by divers or underwater drones
- Maritime border enforcement against submarine threat

UNWAS™ system can track approaching underwater or surface objects at extreme distances and provide accurate positioning and bearing of targets as well as automatic target classification and appropriate alerting functions. UNWAS™ also supports quick deployments with semi-portable version to cover specific event or point target. Target detection and classification is based on acoustic noise that the targets make, and the passive and stealthy UNWAS™ sensors are practically impossible for the enemy to locate and destroy. The hydrophone signals are recorded locally for weeks and operators can easily make permanent recordings from desired channels and periods of time for offline analysis and archiving. They can also be used in building libraries of target sounds. The system's highly evolved user interface (with LOFAR/DEMON/BTR/FRAZ/Spectrogram signal analysis views) together with sophisticated signal processing algorithms with machine learning, make the system highly accurate, sensitive and intuitive. UNWAS™ system offers reliable and persistent way of monitoring large sea areas against underwater and surface threats with 24/7/365 surveillance and with minimal maintenance and operational costs.

Main components of the system are:

Hydrophone arrays:

- A set of sensor units with hydrophones that are deployed on the sea floor
- Frequency band 1Hz - 120 kHz
- 24-bit sampling
- Optical digital data transmission to recording units

MultiStore - Digital recording unit:

- Records hydrophone signals: 9 channels (i.e. three sensor stands) per recording unit
- Continuous recording capacity of several weeks into a ring buffer
- Enables operators to make permanent recordings for offline analysis
- Performs DSP calculations for input signals (target detection/classification, tracking and alerting)

Surveillance workstation:

- Map display for controlling operation of the system and displaying results from detection algorithms
- Enables focusing on selected hydrophone signals and frequencies; support for e.g. diver detection
- Several concurrent sound sources can be followed simultaneously
- LOFAR/DEMON/BTR/FRAZ/Spectrogram signal analysis tools for each channel
- Audio equipment for high quality audio playback
- Deep Learning algorithms and highly automated alerts for advanced operator assistance & automation

Training simulator

Sophisticated training simulators to train operator skills and tactical co-operation are also available.

IS UNWAS™ advantage

Optimal cost-to-performance ratio for

- Littoral waters with complex underwater topology (shoals, sand/gravelbars, islands)
- Tested for depths of 0 – 250 meters
- Quick installations and low-cost deployment
- Mature and verified system, currently in a fully operational state with several national navies

