

System features and performance

Maximum installation depth	A typical system can be used at a depth of up to 50 meters. (This depth can be increased by using optional components.)
Communication protocol and speed	TCP/IP and UDP/IP 10/100/1000BASE. (The optical transmission and communication speed can be increased to 1 GbE by using optional components.)
Processing and monitor	The system integrates and displays detection and tracking results obtained by several sensors such as acoustic sensors. Graphs, hydrographic charts and aerial photos in the JPEG format can be imported. Imported images can be freely modified.

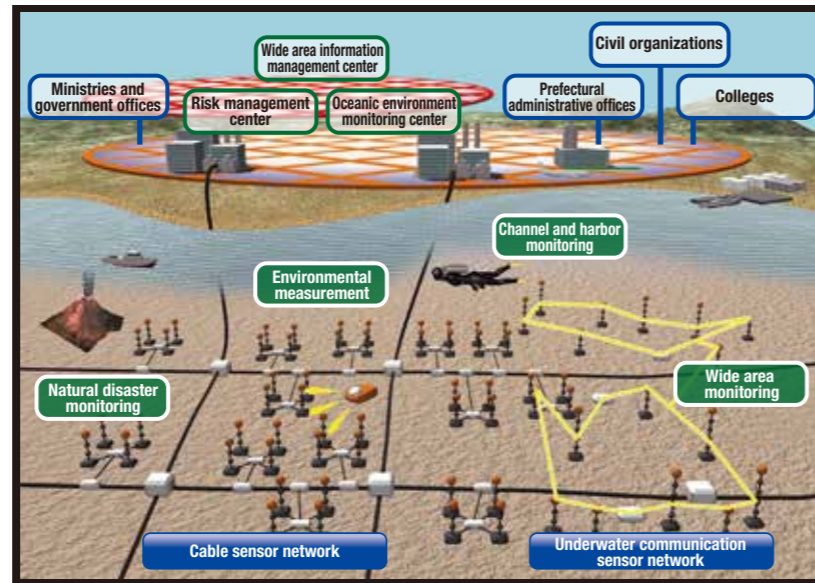
Customer feedback has helped improve the oceanic sensor network

What is the oceanic sensor network?

This system allows you to deploy fixed or inserted sensors under the sea and build a network to obtain high-density information about the ocean over a long period of time and in a wide area, without concern for the weather. This information is provided in real time, 24 hours a day.

Features of the oceanic sensor network

- You can replace sensors and customize software to build various types of surveillance and monitoring systems.
- The oceanic sensor network is flexible, allowing you to build a system that suits your purposes and usage environment, regardless of scale.
- The network offers high maintainability and expandability, so that even after you start using it, it can be expanded or reduced, and sensors can be added, modified, or replaced.



Examples of using the oceanic sensor network

- Oceanic environment monitoring systems (including water temperature and salinity sensors)
- Natural disaster prevention monitoring systems (including earthquake, tsunami, and wave height sensors)
- Underwater reef and fishery invasion monitoring systems (including acoustic, magnetic, and ion sensors)
- Diver support systems

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Oceanic sensor network

Harbor monitoring network system



Monitoring by using a combination of sensors enhances security in underwater environments where it is difficult for light and radio waves to penetrate.

Underwater and surface invasions can be detected early regardless of the weather or time of day. Monitoring by using a combination of sensors improves the detection performance and reduces false alarms.

System overview

The harbor monitoring network system uses various types of sensors installed both on land and underwater to detect, track, and monitor small suspicious ships and divers (including those with underwater scooters) who trespass upon important facilities along the coastline.

The system uses radar and ITV* to detect and track small suspicious ships that travel by sea, and is also equipped with a hypersensitive camera and an infrared camera to allow monitoring at night and in other poorly lit environments, regardless of the time of day. The ITV, hypersensitive camera, and infrared camera automatically search the target area in response to information about suspicious objects detected by radar.

The system also uses multiple sensors installed on the ocean floor to detect and track divers invading underwater and small suspicious submersibles that cannot be detected by radar. Like the radar information, information about suspicious objects is sent to the ITV, hypersensitive camera, and infrared camera, which automatically search the target area to capture images of divers or submersibles when they surface.

Information obtained by this system can be sent to related organizations, surveillance ships defending the periphery, other surveillance vehicles, and defense personnel via various types of networks such as wireless LANs.

*ITV: Industrial television

System features

- According to customer requirements, multiple sensors of various types can be connected.

(Examples)

- Active acoustic sensors
- Underwater imaging sonar
- Sensors developed by the user (information transmitted via Ethernet interface)
- Passive acoustic sensors

- High-density information can be obtained in real time over a long period of time and in a wide area, without concern for the weather or time of day.
- Suitable sensors (such as acoustic sensors, magnetic sensors, ion sensors and underwater imaging sonar) can be selected and connected according to the characteristics of the target (small suspicious ship, unmanned small submersible, or underwater scooter).
- Information from the sensors on land and on the ocean floor can be collectively managed, processed, and displayed.
- Sensor information can be superimposed on a map, an aerial photo or a satellite image, which enables us to predict entry points and orientations of targets.
- It is displayed the course, speed, distance to important facilities, etc. of targets derived from sensor information.
- To facilitate maintenance, divers can add, modify, or replace sensors, making it easy to expand or reduce the network and build the best system for each situation.
- A high survivability network system can be built to circumvent damage in the case of cable failure.
- Detected information can be sent to related organizations, surveillance ships defending the periphery, other surveillance vehicles, and security guards via various types of networks, such as wireless LANs.

