

Productivity improvement technology
Autonomous Topographical Survey Robot

3-Dimensional Underwater Measurement using ASV

Don't miss out on this valuable on-site survey opportunity to obtain data that will help you solve the problem!

This is a compact measurement system that is equipped with a multi-beam sonar and a laser scanner on an autonomous unmanned measurement vessel, the ASV (Autonomous Surface Vehicle). Compared to conventional survey vessels, the ASV is small, lightweight, has a small draft, and is highly maneuverable, allowing it to obtain 3D data above and below the water surface at the same time.

Featured Technology 1

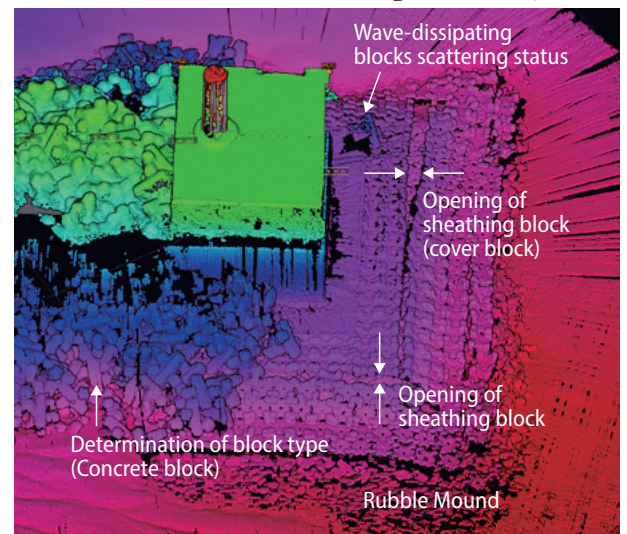
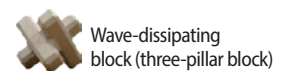
Equipped with high-performance multi-beam sonar

The multi-beam sonar installed on the ASV uses 512 beams to obtain highly accurate 3D data. By adjusting the swath angle (deflection/narrowing), it is possible to measure objects in a targeted manner and obtain data in vertical areas. In addition, the sonar beam angle in the direction of travel can be set, which helps reduce blind spots.

Multi-beam sonar (NMB: Narrow Multi Beam) Specification			
Number of beams	256 to 512	Swath angle	5 to 210°
Depth Range	0.2 to 275m	Weight	9.2kg

Laser scanner (LiDAR: Light Detection and Ranging) Specifications			
Number of data acquired	300,000 points/s	maximum measuring distance	100m

Case study of deformation of breakwater Structure



*UAV lasers are also used from the air



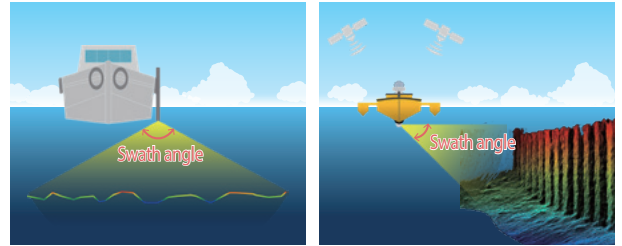
The compact vehicle has outstanding mobility

Compared to general 3D underwater survey vessel with a multi-beam sonar, our ASV is compact in size and can be loaded and retrieved by two people. It is also capable of taking measurements in narrow and shallow areas.

Major Technical Points

- ▶ Compact, lightweight, and with a low draft, it has high maneuverability and can measure in narrow areas and shallow waters.
- ▶ Various navigation systems depending on the purpose (Autonomous, remote, towed)
- ▶ During autonomous navigation, measurements can be taken regardless of the pilot's skill or sea conditions, resulting in labor savings.

Survey vessel / General multibeam sonar ASV High-performance multibeam sonar



The ASV is compact enough for two people to carry and retrieve it.



ASV specifications			
Weight	40kg	Length	1.7m
Width	1.0m	Height	0.6m
Draft	20cm	Navigation speed	2.5m/s (During autonomous navigation)

Technical skills proven in the field

Example of deformation investigation of curtain type breakwater

Inside the harbor Outside the harbor

Exterior Protection Layer

Piling inside the harbor Rubble stone Piling outside the harbor

External Protection Layer (falling off)

Outside the harbor Inside the harbor

External Protection Layer

Inside the harbor Outside the harbor

Piling outside the harbor Local corrosion (hole)

Scouring situation:

Slight accumulation (-2.5m) safe (-3.0m)

Gentle slope

Scouring (-4.0m)

Structure data in left figure is hidden

Piling outside the harbor Localized corrosion (hole)

Achievements

Case Studies:

- River: Riverbed topography survey
- Ports: Undersea topography survey
- Dams: Sediment surveys, dam lake bottom topography surveys

Our main Clients:

Ministry of Land, Infrastructure Transport and Tourism
local governments, etc.