OCEAN PHYSICS
Underwater Scenario Expert



# LaserScope

## 3D Subsea Laser Scanning System

Structured-light 3D imaging
0.5 — 10 m · 400 / 2,000 m

## Description

LaserScope is a 3D subsea laser scanning system developed by Ocean Physics on the structured-light imaging principle. It scans underwater structures and terrain at close range. Two versions split the work by range and carrier: the 5 m version (0.5 — 5 m) mounts on a standard ROV for close-range detail; the 10 m version (1 — 10 m) rides on a mid-size ROV for longer range and depths to 2,000 m.

The system records video frames that carry the 3D geometry of the target. Pre-processing, laser-line extraction and point-cloud conversion turn these frames into a 3D point cloud of the target surface. **LaserScope is in service with multiple users and has completed field scans over flat sandy slopes, extensive carbonate-crust rock and flat sediment areas.**

## Application

- Underwater structure inspection
- Lake, canal and dam inspection
- Underwater topographic mapping
- Pipeline survey and measurement
- Offshore wind farm monitoring and maintenance
- Underwater archaeological survey
- Harbour and wharf inspection
- Hull inspection of large vessels

## Features

- **Two versions, 0.5 to 10 m**
  The 5 m version scans 0.5 — 5 m for close-range detail; the 10 m version reaches 1 — 10 m. Both give 2.04 mm vertical resolution at 5 m.
- **Depth to match the task**
  5 m version: 400 m working depth, pressure housing 2,000 / 4,000 / 6,000 m optional. 10 m version: working depth up to 2,000 m.
- **ROV-ready, pan & tilt included**
  Body lengths of 450 mm and 900 mm suit standard and mid-size ROVs. Structured light needs no subsea lighting. An underwater pan & tilt comes as standard.
- **Point cloud while you scan**
  Real-time imaging and point-cloud output support on-site decisions. Onboard storage of at least 2 TB.
- **Wide-range power, network link**
  9 — 36 VDC input and a network link of at least 100 Mbps fit standard ROV power and telemetry.

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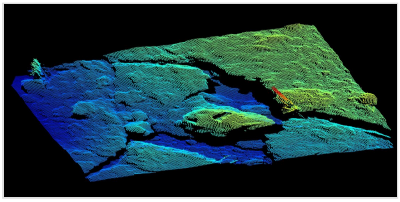
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# Technical Specifications of LaserScope

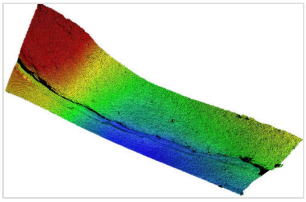
| Technical | 5 m version | 10 m version |
|---|---|---|
| Scan Range | 0.5 — 5 m | 1 — 10 m |
| Along-track Resolution | 1.29 mm @ 0.25 kn; 2.57 mm @ 0.5 kn<br>10.29 mm @ 2 kn; 20.58 mm @ 4 kn | |
| Vertical Resolution | 0.41 mm @ 1 m; 1.23 mm @ 3 m<br>2.04 mm @ 5 m | 0.41 mm @ 1 m; 1.23 mm @ 3 m<br>2.04 mm @ 5 m; 2.86 mm @ 7 m<br>4.08 mm @ 10 m |
| Range Resolution | 0.05 mm @ 1 m; 0.45 mm @ 3 m<br>1.30 mm @ 5 m | 0.03 mm @ 1 m; 0.21 mm @ 3 m<br>0.62 mm @ 5 m; 1.25 mm @ 7 m<br>2.60 mm @ 10 m |
| **Physical** | **5 m version** | **10 m version** |
| Dimensions (L × W × H) | 450 × 190 × 100 mm | 900 × 190 × 100 mm |
| Pressure Housing (optional) | aluminium alloy / titanium<br>rated 2,000 / 4,000 / 6,000 m | — |
| Depth Rating (working) | 400 m | up to 2,000 m |
| Carrier | standard ROV | mid-size ROV |
| Power Supply | 9 — 36 VDC, 50 W | |
| Data Interface | network, at least 100 Mbps | |
| Lighting | no subsea lighting required | |
| Water Clarity | turbidity up to 20 NTU | |
| Data Storage | onboard, at least 2 TB | |

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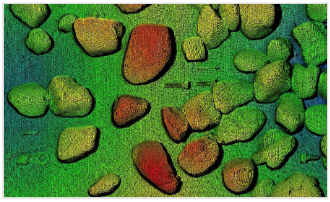
# Data Examples by LaserScope



Seabed survey



Pipeline inspection

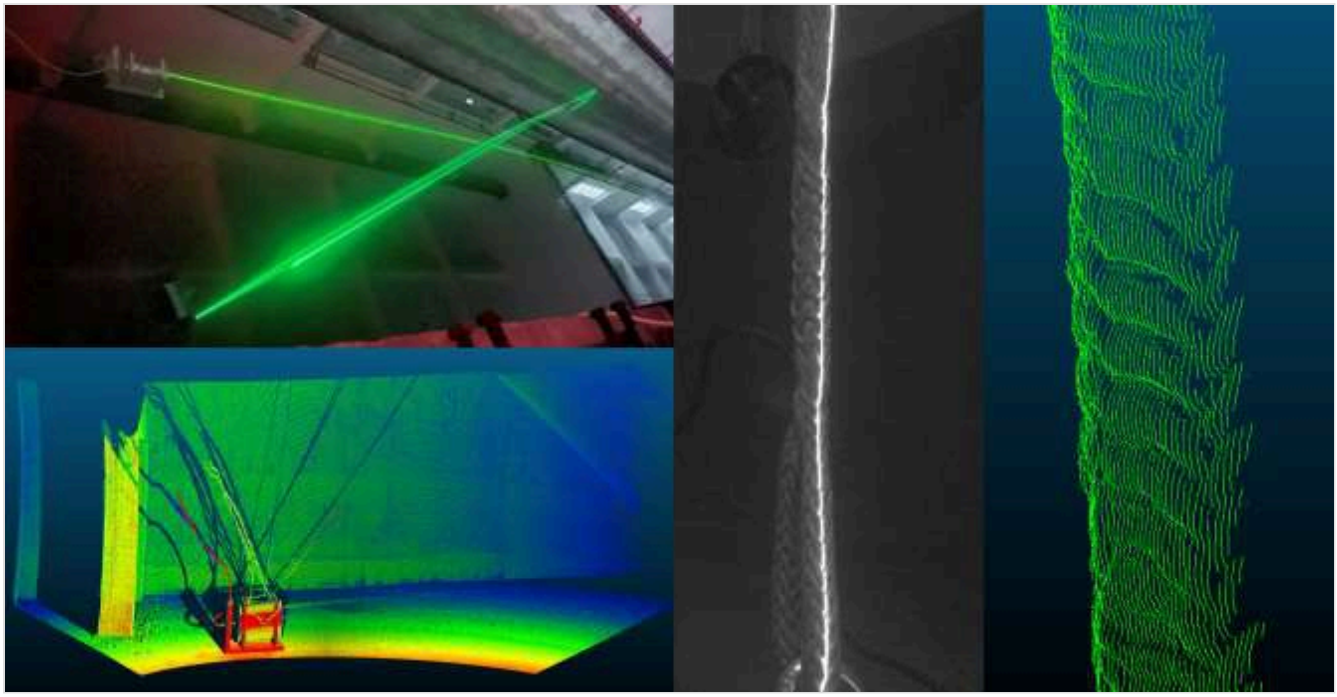


Details of seabed

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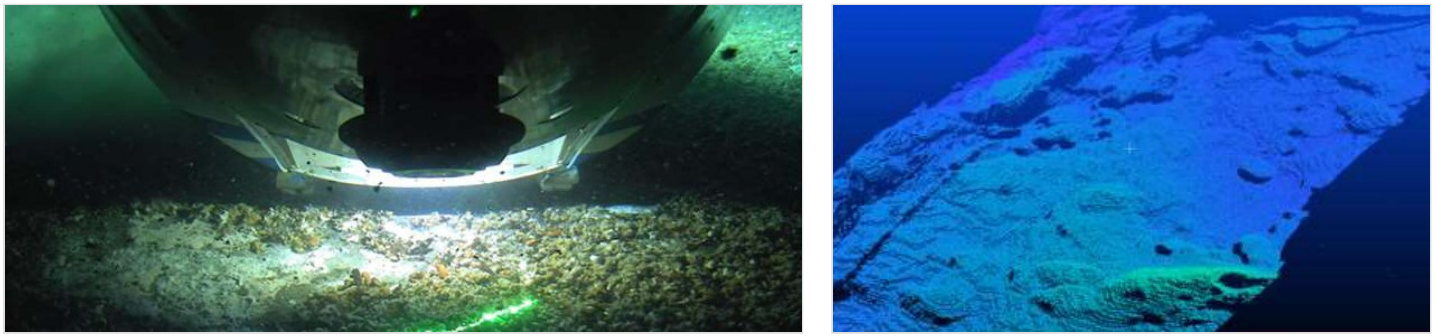
# Data Examples by LaserScope



3D inspection of subsea engineering targets and mooring lines (laser scan · point cloud · line detail)



3D inspection of an offshore wind turbine foundation surface (left: on-site photo; middle: surface photo; right: 3D point cloud)



Deep-sea seabed mapping on ROV / HOV (left: on-dive view; right: seabed 3D point cloud)

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