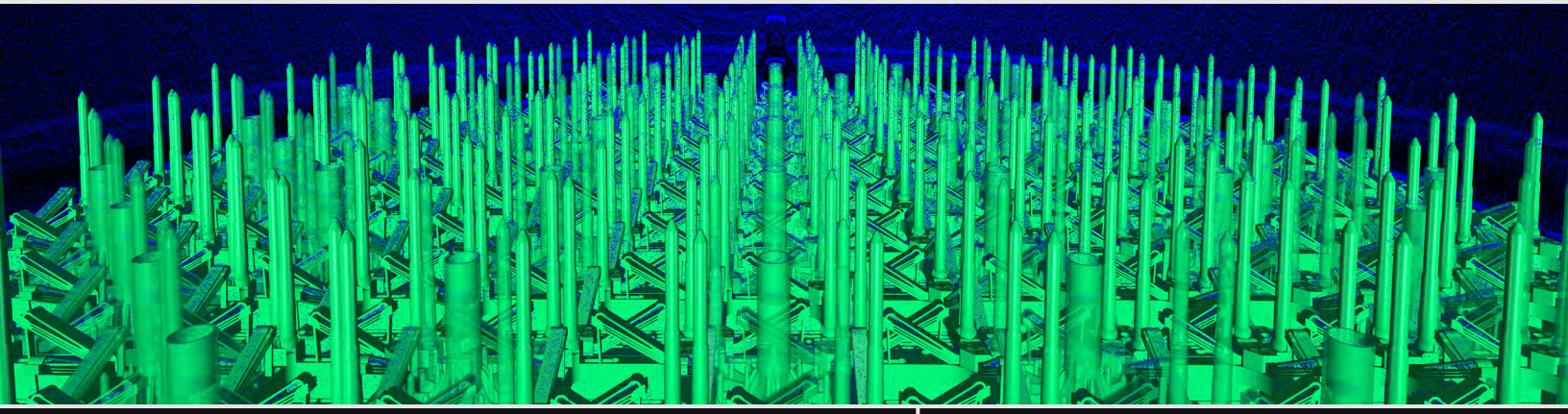
KRAKEN ROBOTICS | Subsea LiDAR



Nuclear LiDAR Solutions

Kraken Nuclear LiDAR Key Features

Unmatched Measurement Precision

- Proven range precision of less than 1 mm under controlled conditions
- Noncontact, nondestructive data collection enhances safety and eliminates inspection risk
- Real-time, high-density 3D point clouds support informed decision-making and proactive maintenance

Flexible Data Collection

- Laser beam direction precisely controlled in both azimuth and elevation for multiple data collection methodologies
- Capable of single-point vibration measurements, rapid wide-area scans, or focused high-density imaging
- Enhanced precision mode improves accuracy through repeated range averaging

Optimized for Nuclear Environments

- Enables rapid, contactless gap verification during reactor maintenance or refuelling outages
- Reduces critical path duration with faster, more accurate alignment confirmation of reactor core components
- Supports consistent, proactive inspection of critical assets while minimizing exposure and downtime

Advanced LiDAR for Safer, Smarter Nuclear Operations

Kraken Robotics' SL4n delivers advanced underwater LiDAR technology purpose-built for nuclear applications. It enables rapid, millimetric-resolution inspection and monitoring of critical assets, supporting predictive maintenance, risk mitigation, and informed decision-making. Proven effective in gap verification during reactor refuelling or maintenance outages, the SL4n completes precision alignment and spacing measurements in about an hour, significantly reducing critical path duration and outage costs. Designed for contactless operation, it enhances safety and efficiency while minimizing disruption to facility operations. With precise laser control for vibration analysis, high-density scans, and ultra-accurate range measurements, it provides engineering-grade 3D data for asset assessment and lifecycle management.

Kraken Subsea LiDAR SL4n Specifications

Operational Parameters	Value	Note
Measuring Method	Time of Flight (ToF) Pulsed	
Pulse Repetition Rate	35kHz to 40kHz	
Range	Min 1m, Max 45m	Turbidity Dependent
Field of View	360° Pan 90° Tilt	30° x 30° Sectors
Improved Range Precision	<2.5mm single-point @2-40m	<0.5mm multi-point @2-40m
Angle Precision	<100µrad, horizontal and vertical (0.005°)	
Beam Divergence, 1/e2, Full Width	0.025°	Typical. Varies with water conditions
Beam Footprint, 1/e2, Full Width	@10m = 4.5mm, @20m = 8.6mm	Typical. Varies with water conditions
Max Number of Points per Scan	14.4 million points per scan	
Pan and Tilt Resolution	0.088° Standard (0.0007° Optional)	Calibrated Pan and Tilt
Pitch and Roll Accuracy	0.025° RMS for Static Applications	
Operating Temperature	Water: -5C to 40C Air: -5C to 36C	
Laser Class	Class 1 (Air) to Class 3B (Underwater)	
Ambient Lighting	Unaffected by ambient lighting conditions, including complete darkness	
Point Cloud Format	RIAAT (Proprietary data format) + Industry Standard (LAS, E57, XYZ)	
Power Supply	110V/220V AC	
Power Consumption	130W with Pan Tilt @120VAC 80W without Pan Tilt @ 120VAC	
Data Transfer	Ethernet 1Gbps LAN	Internal 1 TB SSD
Pan and Tilt	Pan - 350° bi-directional	Tilt +/- 30° bi-directional
Physical Properties	**Optical Canister**	**Electronics Canister**
Length	15.625in (397mm)	21 x 12 x 7in Box (533 x 305 x 178mm)
Outside Diameter	6.94in (176mm)	
Weight	Air: 39lb Water: 16.4lb	Air: 31lb (not submersible)
Depth	30m	
Single Sector Scan Speed	52 seconds	

Performance specifications represent maximum sensor values and may vary due to environmental conditions, platform stability, and operational specifics.