

# Neptec's Prototype 360 Scanning LiDAR

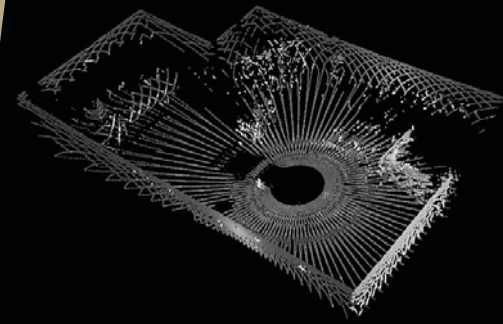
This LiDAR was developed for planetary rover applications with a focus on situational awareness, mapping and hazard avoidance. Using a novel, patented spinning design, it is able to scan rapidly over a field of view of 360° in azimuth and 45° in elevation. The sensor is random-access, meaning the operator can command any beam trajectory desired. Several pre-programmed trajectories are provided that are tuned to rover-based mission objectives. High-rotation rate scans are employed for situational awareness and hazard avoidance. High resolution (lower rate) scans are also possible for detailed mapping requirements. Hybrid scans provide the best of both worlds employing phase-shifted high rate scans that evolve over time to fill the gaps left in previous passes.

The sensor can gather range measurements at 200 KHz, which corresponds to a 200m max range, or at 25 KHz with a maximum range of 1km.

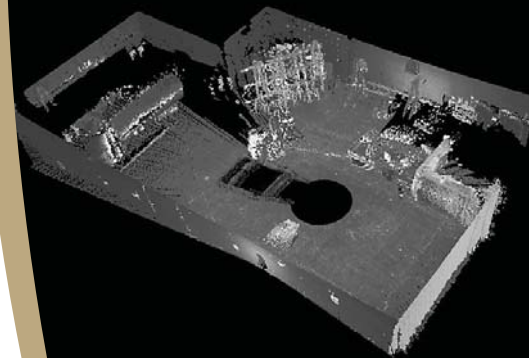
The prototype sensor mass is 7.3kg and requires no external power conditioning or processing. External connections are 28V power and Ethernet. Communications are handled with a delivered API or through Neptec's user interface software (which adds data analysis capabilities).

## Prototype Specifications

- **Laser:** 1540 nm pulsed laser
- **Laser Beam Divergence:** 0.3mrad
- **Laser Safety:** Eye safe (through hardware interlock, NOHD <50cm)
- **Sensor Field of View:** 360° x 45° (elevation -35° to +10°)
- **User configurable Field-of-View:** Yes (dynamically under software control)
- **Data Acquisition (user configurable):** 25kHz to 200kHz
- **Scan Speed:** 30 revolutions per second
- **Range @ 80% reflectivity (max/min):** 200m @ 200kHz, 1km @ 25kHz
- **Range Accuracy / Range Precision @ 150m:** 1cm / 0.5cm
- **Size:** 46cm x 17cm x 17cm
- **Weight:** 7.3kg
- **Power consumption:** 100 Watts (at max scan speed)



1 second scan of a 30x20m high-bay  
(~200k pts)



10 second scan of a 30x20m high-bay  
(~2M pts)



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