

# OPAL

Obscurant penetrating LiDAR for harsh environments



## The new OPAL™ Performance Series 3D LiDAR

Introducing the completely redesigned OPAL™ 3D LiDAR scanner from Neptec Technologies.

The OPAL™ is one of the most powerful and versatile 3D LiDAR sensors, and features optimized perception capabilities for detecting small targets at range. OPAL™ scanners are fully compatible with the 3DRi™ Software Development Kit (SDK), a library of proprietary algorithms for developing applications for Object Detection, Tracking, and Classification.

OPAL™ incorporates the latest innovations in laser optics and intelligent 3D processing to deliver an unprecedented combination of range, data density, and acquisition speed in a rugged, all-weather package.

## Designed for real-world, mission-critical autonomy applications

### INNOVATIVE

Advanced laser optics and 3D processing in a size, weight and power optimized package

### OBSCURANT PENETRATING

Unparalleled performance in dust, smoke, rain and fog

### HIGH RESOLUTION

300,000 points per second (single return mode)

### CONSISTENT

Reliable low-reflectivity target detection in real-world scenarios

### LONG RANGE

Superior range performance up to 1,000 m

### CONNECTIVITY

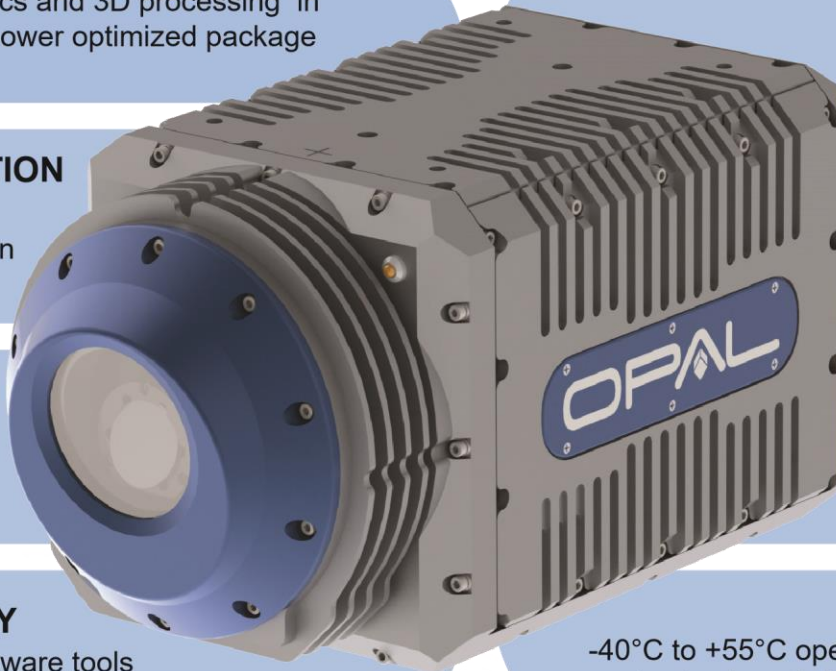
Integrated GigE switch and port for GPS/INS

### USER FRIENDLY

Intuitive 3DRi™ software tools for rapid application development

### RUGGED

-40°C to +55°C operating temperature, resistant to shock and vibration, with a sapphire glass window and certified to IP67



SECURITY



MARINE



AEROSPACE



TRANSPORT





OIL & GAS



CONSTRUCTION



MINING

Sensor	
Technology Type <sup>1</sup>	Time of Flight (TOF) 3D Laser Scanner with OPAL™ Obscurant-Penetrating LiDAR Technology
Scanning Mechanism	Risley Prisms
Range <sup>2</sup>	Up to 500 m <span style="margin-left: 250px;">Up to 1000 m</span>
Multi-return	Up to 7 returns
Accuracy <sup>3,4</sup>	<2.5 cm (typical)
Precision <sup>5</sup>	<2.0 cm (typical)
Field of View <sup>6</sup>	Conical 45°, 60°, 90°, and 120°
Scan Pattern	Rosette type, non-overlapping
Laser	
Product Classification	Class 1 - Eye safe
Wavelength	1550 nm
Output	
Pulse Repetition Frequency	25 kHz, 50 kHz, 100 kHz, 200 kHz, 300 kHz
Data Stream Format	IPv4 Multi-cast UDP packets
Data Format	Time-stamped position (x,y,z) plus intensity
Interfaces	
Ethernet (Integrated GigE switch with PoE)	4
PPS (Time Synchronization)	1
Physical	
Dimensions	17.8 x 17.8 x 33.8 cm (7.0 x 7.0 x 13.3 inches)
Weight (without cables)	11.8 kg (26.0 lbs)
Operating Voltage	18–36 VDC
Power Consumption <sup>7</sup>	110 W (typical), 220 W maximum
Ingress Protection Rating	Certified to IP66/IP67
Operating temperature <sup>8</sup>	-40°C to +55°C
Storage temperature	-40°C to +85°C
Shock	Designed to 5 G's
Vibration	Designed to 20 Hz - 2 kHz, 0.04 g <sup>2</sup> / Hz
Regulatory Compliance	 

- <sup>1</sup> Performance in obscurants is dependent on obscurant type and density, laser pulse energy, and target characteristics. Please contact [NTCSupport@neptec.com](mailto:NTCSupport@neptec.com) to discuss your specific requirements.
- <sup>2</sup> Achievable maximum range is dependent on target size, reflectivity, angle of incidence, and PRF, measured at the centre of the FOV in clear atmospheric conditions.
- <sup>3</sup> Accuracy is the degree of conformity of a measured quantity compared to its actual (true) value.
- <sup>4</sup> Some distortion effects at the edge of the FOV may impact accuracy as follows: <2.5 cm within 100°, <3.5 cm between 100° FOV and 120° FOV. One sigma at 12 m range as measured under Neptec test conditions.
- <sup>5</sup> Precision, or repeatability, is the degree to which further measurements provide the same result. One sigma at 12 m range as measured under Neptec test conditions.
- <sup>6</sup> OPAL Conical LiDARs exhibit a small (1° circular) area of distortion at 8° from the centre of the FOV. Data within this area may be excluded via a software feature.
- <sup>7</sup> Typical power consumption considers the OPAL LIDAR operating at typical processing demands, with no external peripherals connected to available PoE ports. Power available for peripherals connected to the PoE ports is 100 W total.
- <sup>8</sup> Assumes adequate convection airflow over the unit. For applications in environments exceeding +40°C, please contact [NTCSupport@neptec.com](mailto:NTCSupport@neptec.com) to discuss mounting options.

## Easy to integrate with IP connectivity

