

OS-1

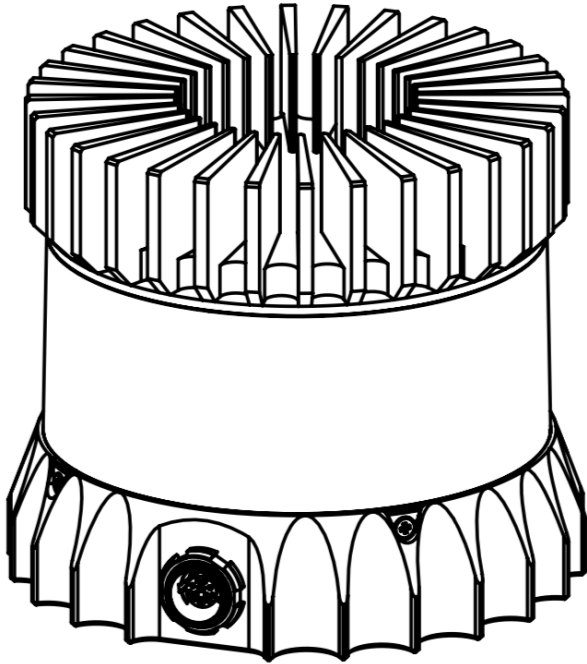
High Resolution Imaging LIDAR

SUMMARY

The OS-1 offers a market leading combination of price, performance, reliability and SWAP. It is designed for indoor/outdoor all-weather environments and long lifetime. As the smallest high performance LIDAR on the market, the OS-1 can be directly integrated into vehicle facias, windshield, side mirrors, and headlight clusters.

HIGHLIGHTS

- Fixed resolution per frame operating mode
- Camera-grade ambient and intensity data
- Multi-sensor crosstalk immunity
- Industry leading intrinsic calibration
- Open source drivers



OPTICAL PERFORMANCE

Range	0.8 m - 120 m @ 80% reflective lambertian target, 100 klx sunlight, false positive rate of 1/10,000 0.8 m - 40 m @ 10% reflective lambertian target, 100 klx sunlight, false positive rate of 1/10,000
Range Accuracy	Zero bias for lambertian targets, slight bias for retroreflectors
Range Resolution	1.2 cm
Range Repeatability (1 sigma / standard deviation)	SNR >250: ± 1.5cm SNR 100: ± 3 cm SNR 12: ± 10 cm
Vertical Resolution	128, 64, or 16 beams
Horizontal Resolution	2048, 1024, or 512 (configurable)
Field of View	Vertical: +16.6° to -16.6 ° (33.2°) for 64 and 16 channel; +22.5° to -22.5 ° (45°) for 128 channel Horizontal: 360°
Angular Sampling Accuracy	Vertical: ±0.01° / Horizontal: ±0.01°
Rotation Rate	10 to 20 hz (configurable)
# of Returns	1 (strongest)

LASER

Laser Product Class	Class 1 eye-safe per IEC/EN 60825-1: 2014
Laser Wavelength	850 nm
Beam Diameter Exiting Sensor	10 mm
Beam Divergence	0.13° (FWHM; 64 and 16 channel) 0.18° (FWHM; 128 channel)

LIDAR OUTPUT

Connection	UDP over gigabit ethernet
Point Per Second	2,621,440 (128-channel) 1,310,720 (64-channel) 327,680 (16-channel)
Data Per Point	Range, intensity, reflectivity, ambient, angle, time stamp
Time Stamp Resolution	10 ns
Data Latency	< 10 ms

IMU OUTPUT

Connection	UDP over gigabit ethernet
Samples Per Second	1,000
Data Per Sample	3 axis gyro, 3 axis accelerometer
Time Stamp Resolution	10 ns
Data Latency	< 10 ms

CONTROL INTERFACE

Connection	TCP over gigabit ethernet
Time Synchronization	Input sources: <ul style="list-style-type: none">• IEEE1588 precision time protocol• External PPS• Internal 10 ppm drift clock Output sources: <ul style="list-style-type: none">• Configurable 1-60Hz output pulse
LIDAR Operating Modes	Hardware triggered angle firing (guaranteed fixed resolution per rotation): <ul style="list-style-type: none">• 128, 64, 16 x 2048 @ 10hz• 128, 64, 16 x 1024 @ 10hz or 20hz• 128, 64, 16 x 512 @ 10hz or 20hz Fixed timing firing: <ul style="list-style-type: none">• Configurable measurement period between 50 µsec and 1 second
Additional Programmability	Multi-sensor rotation phase tuning Queryable intrinsic calibration information: <ul style="list-style-type: none">• Beam angles• IMU pose correction matrix

MECHANICAL/ELECTRICAL

Power Consumption	14-16 W typical, 20 W peak
Operating Voltage	22-26 V, 24 V nominal
Connector	Proprietary pluggable connector (Power + data + DIO)
Dimensions	Diameter: 85 mm (3.34 in) Height: 73 mm (2.87 in)
Weight	380 g (13.4oz)
Mounting	4 M3 screws / 2 locating 3mm pins

OPERATIONAL

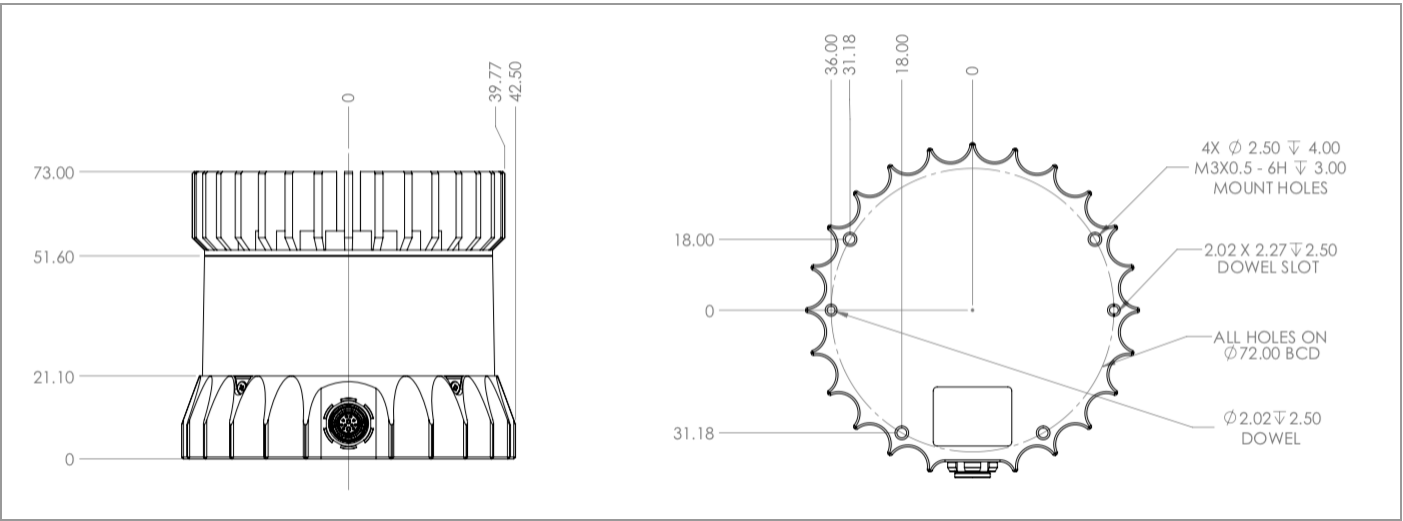
Operating Temperature	-20C to +50C (with Mount)
Storage Temperature	-40C to +105C
Ingress	IP67
Shock	500 m/s2 amplitude, 11 ms duration
Vibration	5 Hz to 1,000 Hz, 3 Grms
Compliance	Laser Safety: <ul style="list-style-type: none">• IEC/EN 60825-1:2014 Class 1• US 21CFR1040: Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated July 26th, 2001 Product Safety: IEC/EN 62368-1:2014 EMC: <ul style="list-style-type: none">• FCC 47Cfr Part 15B, Class A• EN 55032: 2012/AC: 2013, Class A• IEC/EN 61000-4-3,4,5,6• IEC/EN 61000-6-2:2005 Class A• IEC/EN 61000-6-4: 2007 CE Mark: Future ROHS

ACCESSORIES

Included Interface Box	PolyCarb/FR4, 100g, 75mm x 50mm x 25mm (LxWxH), 2m CAT6 cable, 24V power adapter, 5m sensor cable
Optional Mount	Aluminum, 530g, 110mm x 110mm x 20.5mm (LxWxH), 4x M8 thru holes

EXTERIOR DIMENSIONS

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*Specifications are subject to change without notice.

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