

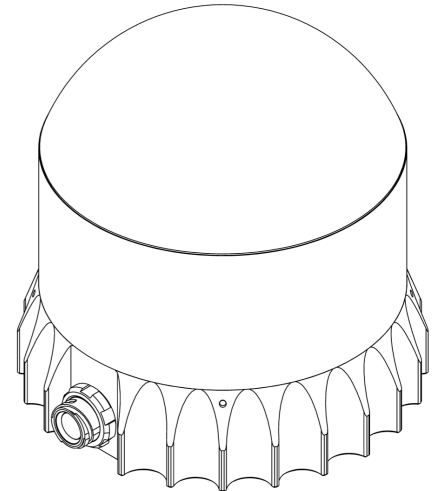
# OSDome

## Hemispherical View High-Resolution Imaging Lidar

FIRMWARE VERSION: 3.2.x  
HARDWARE VERSION: REV7.0

### SUMMARY

The OSDome offers a complete 180° hemispherical field of view, up to 20 m of range at 10% reflectivity, and high resolution. The OSDome delivers full coverage for indoor people tracking, and near-range detection for mobile robots and vehicles.

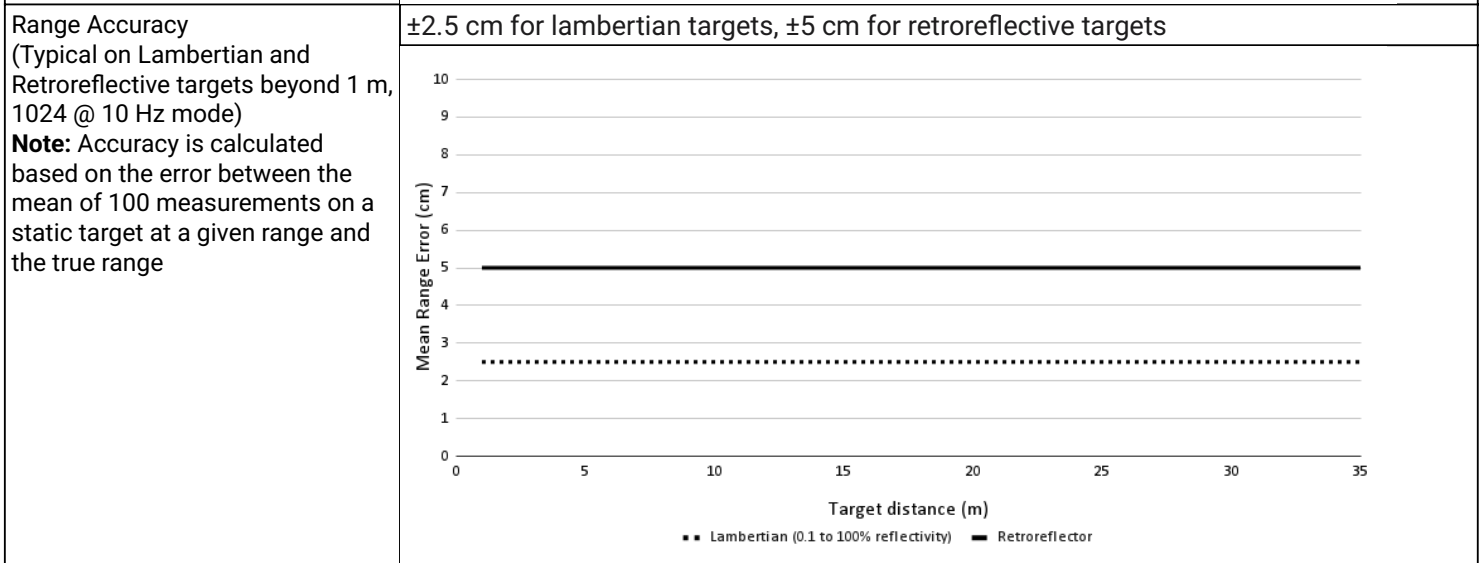
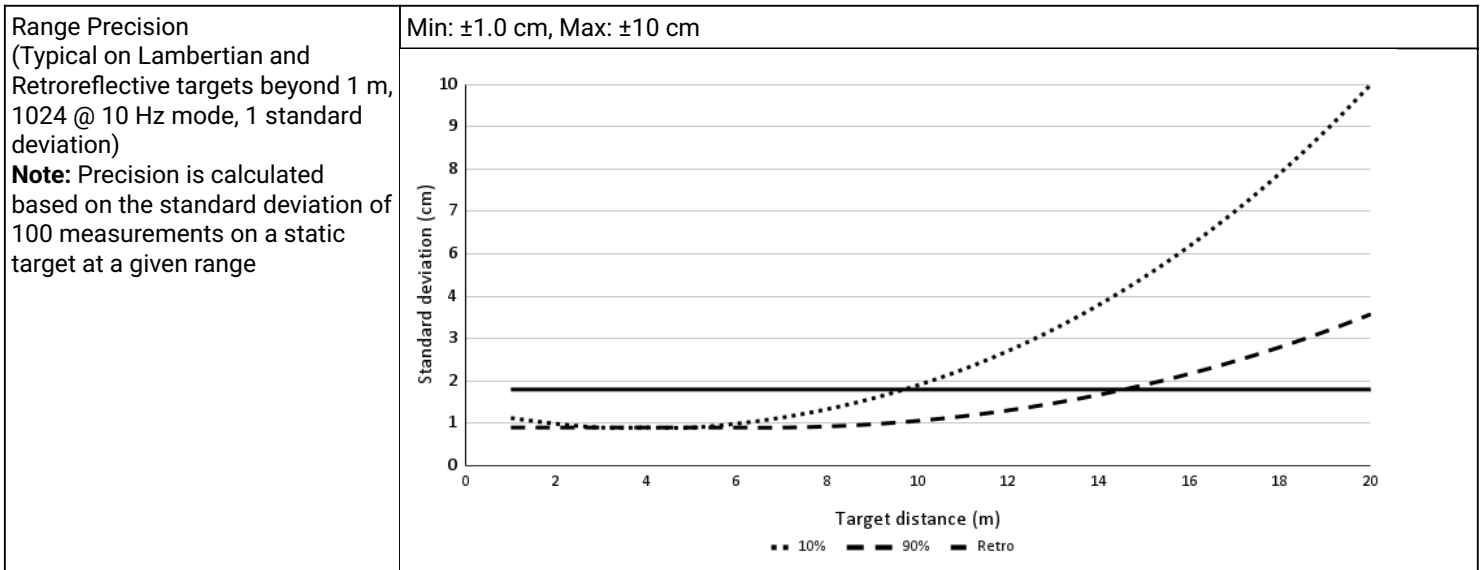


### HIGHLIGHTS

- Configurable Minimum Range and Return Ordering
- Low Data Rate Profile now available with Dual Returns
- Camera-grade near-infrared and signal data
- Multi-sensor crosstalk suppression
- Ouster Studio for pointcloud evaluation
- Ouster SDK, ROS, and C++ drivers for SW development

### OPTICAL PERFORMANCE

Range (80% Lambertian reflectivity, 1024 @ 10 Hz mode)	45 m @ 100 klx sunlight, >90% detection probability
Range (10% Lambertian reflectivity, 1024 @ 10 Hz mode)	20 m @ 100 klx sunlight, >90% detection probability
Minimum Range	0.0 m (0.3 m optional, and 0.5 m default)
Vertical Resolution	32, 64, or 128 channels
Horizontal Resolution	512, 1024, or 2048 (configurable)
Rotation Rate	10 or 20 Hz (configurable)
Field of View	Vertical: 180° Horizontal: 360°
Angular Sampling Accuracy	Vertical: ±0.01° / Horizontal: ±0.01°
False Positive Rate	1/10,000
Range Resolution	0.1 cm <b>Note:</b> For <i>Low Data Rate Profile</i> the Range Resolution = 0.8 cm
Vertical Angular Resolution	Up to 0.7° angular resolution
# of Returns	up to 2
Return Order	Strongest to Weakest, Farthest to Nearest, and Nearest to Farthest



**LASER**

Laser Product Class	Class 1 eye-safe per IEC/EN 60825-1: 2014
Laser Wavelength	865 nm
Beam Diameter Exiting Sensor	5 mm
Beam Divergence	0.35° (FWHM)

**LIDAR OUTPUT**

Connection	UDP over gigabit Ethernet
Points Per Second	1,310,720 (32 channel) 2,621,440 (64 channel) 5,242,880 (128 channel)
Data Rate (megabits per second) (Low Data Rate Profile, 1 return, 1024 @ 10 Hz mode)	up to 11.83 Mbps (32 channel) up to 22.32 Mbps (64 channel) up to 43.29 Mbps (128 channel)
Data Rate (megabits per second) (Low Data Rate Profile, 2 returns, 1024 @ 10 Hz mode)	up to 22.32 Mbps (32 channel) up to 43.29 Mbps (64 channel) up to 85.24 Mbps (128 channel)

Data Rate (megabits per second) (Single Return Profile, 1024 @ 10 Hz mode)	up to 32.81 Mbps (32 channel) up to 64.26 Mbps (64 channel) up to 127.18 Mbps (128 channel)
Data Rate (megabits per second) (Dual Return Profile, 1024 @ 10 Hz mode)	up to 43.29 Mbps (32 channel) up to 85.24 Mbps (64 channel) up to 169.12 Mbps (128 channel)
Data Per Point	Range, Signal, Reflectivity, Near-infrared, Channel, Azimuth angle, and Timestamp
Timestamp Resolution	< 1 $\mu$ s
Data Latency	< 10 ms
Data Integrity	End to End CRC that covers entire data packet

#### IMU OUTPUT

Connection	UDP over 1000Base-T or 1000Base-T1
Samples Per Second	640
Data Per Sample	3 axis gyro, 3 axis accelerometer
Timestamp Resolution	< 1 $\mu$ s
Data Latency	< 10 ms
Additional Details	InvenSense IAM-20680HT; datasheet for more details: <a href="https://invensense.tdk.com/download-pdf/iam-20680ht-datasheet/">https://invensense.tdk.com/download-pdf/iam-20680ht-datasheet/</a>

#### CONTROL INTERFACE

Connection	HTTP API	
Time Synchronization	Input sources: <ul style="list-style-type: none"> <li>• IEEE1588 Precision Time Protocol (PTP); Accuracy: &lt;1 ms error</li> <li>• gPTP; Accuracy: &lt;1 ms error</li> <li>• NMEA \$GPRMC UART message support</li> <li>• External PPS; Accuracy: &lt;1 ms error</li> <li>• Internal 10 ppm drift clock; Accuracy: &lt;20 ppm error</li> </ul> Output sources: <ul style="list-style-type: none"> <li>• Configurable 1 - 60 Hz output pulse</li> </ul>	
Lidar Operating Modes	<ul style="list-style-type: none"> <li>• x 512 @ 10 Hz or 20 Hz</li> <li>• x 1024 @ 10 Hz or 20 Hz</li> <li>• x 2048 @ 10 Hz</li> </ul>	
Additional Programmability	<ul style="list-style-type: none"> <li>• Multi-sensor phase lock</li> <li>• Queryable intrinsic calibration information:               <ul style="list-style-type: none"> <li>• Beam angles</li> <li>• IMU pose correction matrix</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Return ordering</li> <li>• Minimum range</li> <li>• Azimuth masking</li> <li>• Low-power standby mode</li> </ul>

#### MECHANICAL/ELECTRICAL

Power Consumption	14 - 20 W <ul style="list-style-type: none"> <li>• 16 W nominal</li> <li>• 28 W peak at startup if operating at -40 °C</li> </ul> <b>Note:</b> Ouster recommends use of a power supply of no less than 30 W if using in cold conditions
Connector	Standard 1000BASE-T or Automotive Standard 1000BASE-T1
Operating Voltage	9.5 V - 51 V <ul style="list-style-type: none"> <li>• Suitable for 12 VDC to 24 VDC nominal systems</li> <li>• Not suitable for 48 V nominal battery based systems</li> <li>• Under-voltage WARNING level alert occurs at 9.5 VDC at the connector</li> <li>• Under-voltage ERROR level alert occurs at 9.0 VDC at the connector</li> <li>• Below 9.0 VDC at connector, sensor may shutdown</li> <li>• Over-voltage conditions/alarms occur at 51 VDC at the connector</li> <li>• Over-voltage lockout onset at 58 VDC (<math>\pm</math>1 V) at the connector</li> <li>• Over-voltage lockout release at 55 VDC (<math>\pm</math>1 V) at the connector</li> </ul>

Dimensions	Diameter: 87 mm (3.42 in) Height: • Without baseplate: 85.27 mm (3.35 in) • With baseplate: 107.77 mm (4.2 in)
Weight	470 g (16.6 oz)
Mounting	Bottom: 4x M3 screws, 2x locating 2 mm pin holes

**OPERATIONAL**

Operating Temperature	-40 °C to +60 °C (with mount) Between +53 °C and +60 °C, sensor automatically reduces range (max 20% range reduction)
Storage Temperature	-40 °C to +85 °C
Ingress Protection	IP68 (1 m submersion for 1 hour, with I/O cable attached) IP69K (with I/O cable attached)
MTTF	>250,000 hours
Shock	IEC 60068-2-27 (Amplitude: 100 g, Shape: 11 ms half-sine, 3 shocks x 6 directions)
Vibration	IEC 60068-2-64 (Amplitude: 1 G-rms, Shape: 10 - 1000 Hz, Mounting: sprung masses, 3 axes w/ 8 hr duration each)
Compliance	<p><b>For US</b> Laser Safety: • IEC 60825-1:2014 • FDA US 21CFR1040 Notice 56 Class 1</p> <p>Product Safety: • UL 62368-1 • UL 60950-22 (outdoor use) • CSA-C22.2 No. 62368-1-19 • CSA-C22.2 No. 60950-22-07 (outdoor use)</p> <p>EMC: FCC 47CFR Part 15, Subpart B, Class A</p> <p><b>For EU</b> Laser Safety: EN 60825-1:2014/A11:2021</p> <p>Product Safety: EN/IEC 62368-1</p> <p>EMC: • EN 55032:2012/AC 2013; CISPR 32:2015 • EN 55035:2017/A11:2020 • EN 61000-3-2:2014 • EN 61000-3-3:2013</p> <p><b>For Korea</b> • KS C 9832:2023 • KS C 9835:2019</p> <p><b>For Australia</b> AS/NZS CISPR 32: 2015</p>



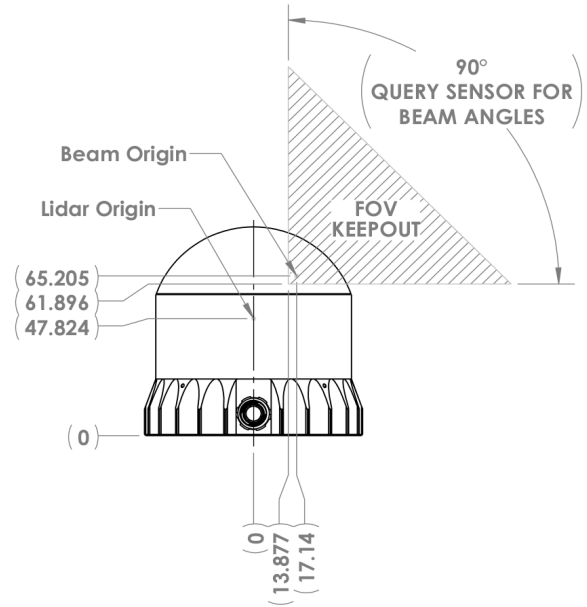
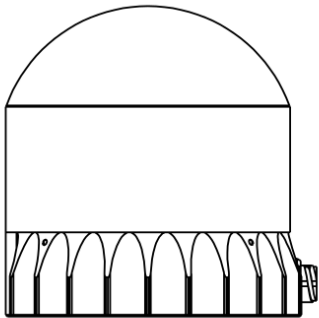
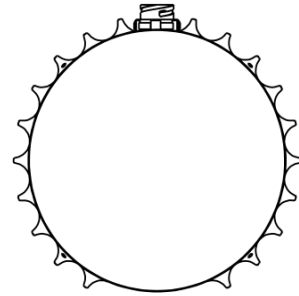
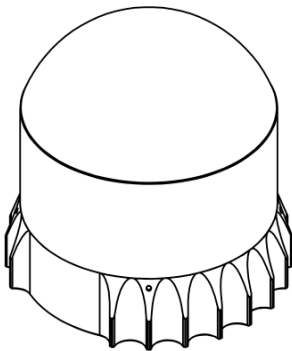
**ACCESSORIES**

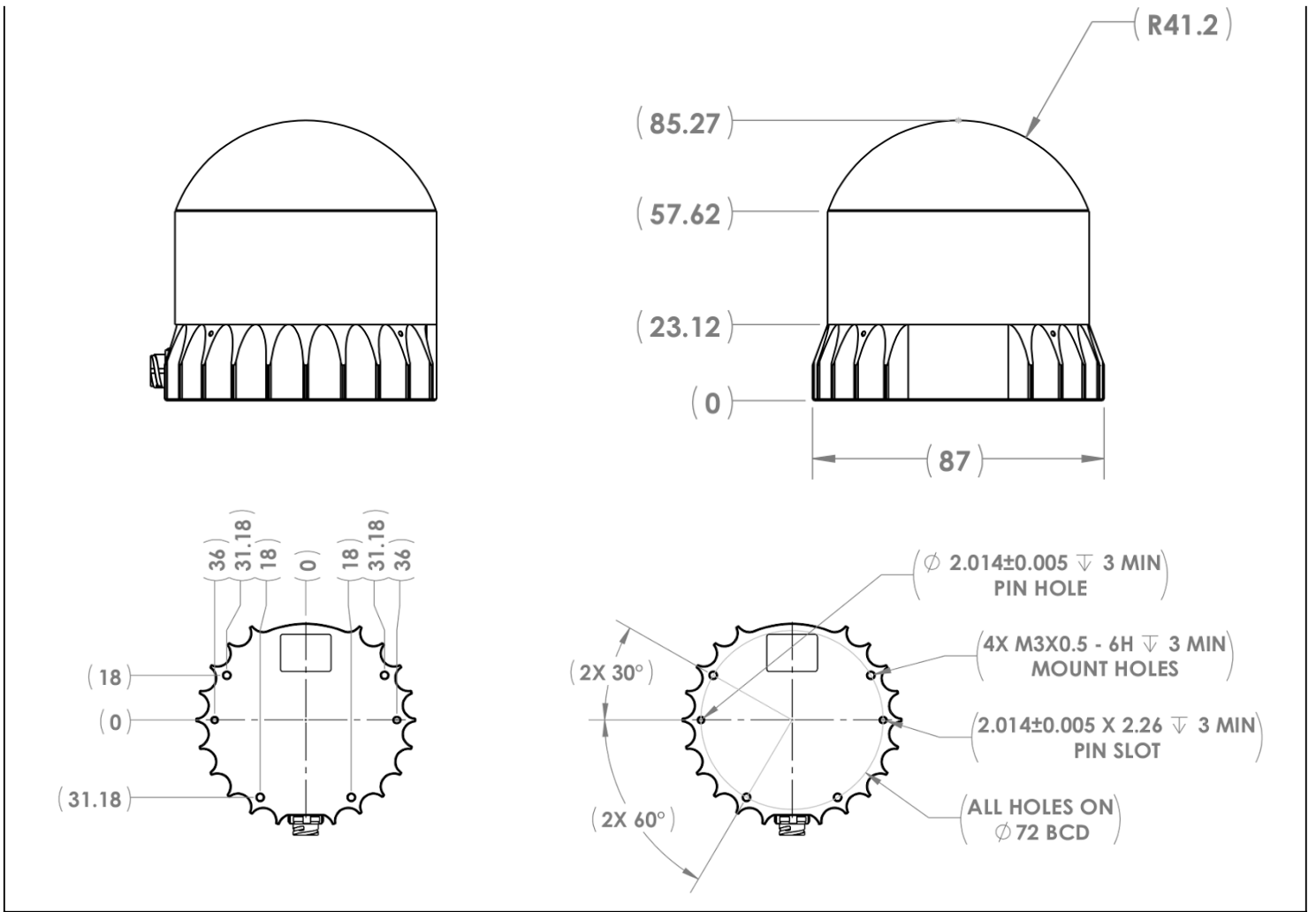
Interface Box	Polycarb/FR4, 100 g, 75 mm x 50 mm x 25 mm (LxWxH), 2 m CAT6 cable, 24 V power adapter, 5 m sensor cable
Optional Mount	Aluminum, 530 g, 110 mm x 110 mm x 20.5 mm (LxWxH), 4 x M8 thru holes

**SOFTWARE**

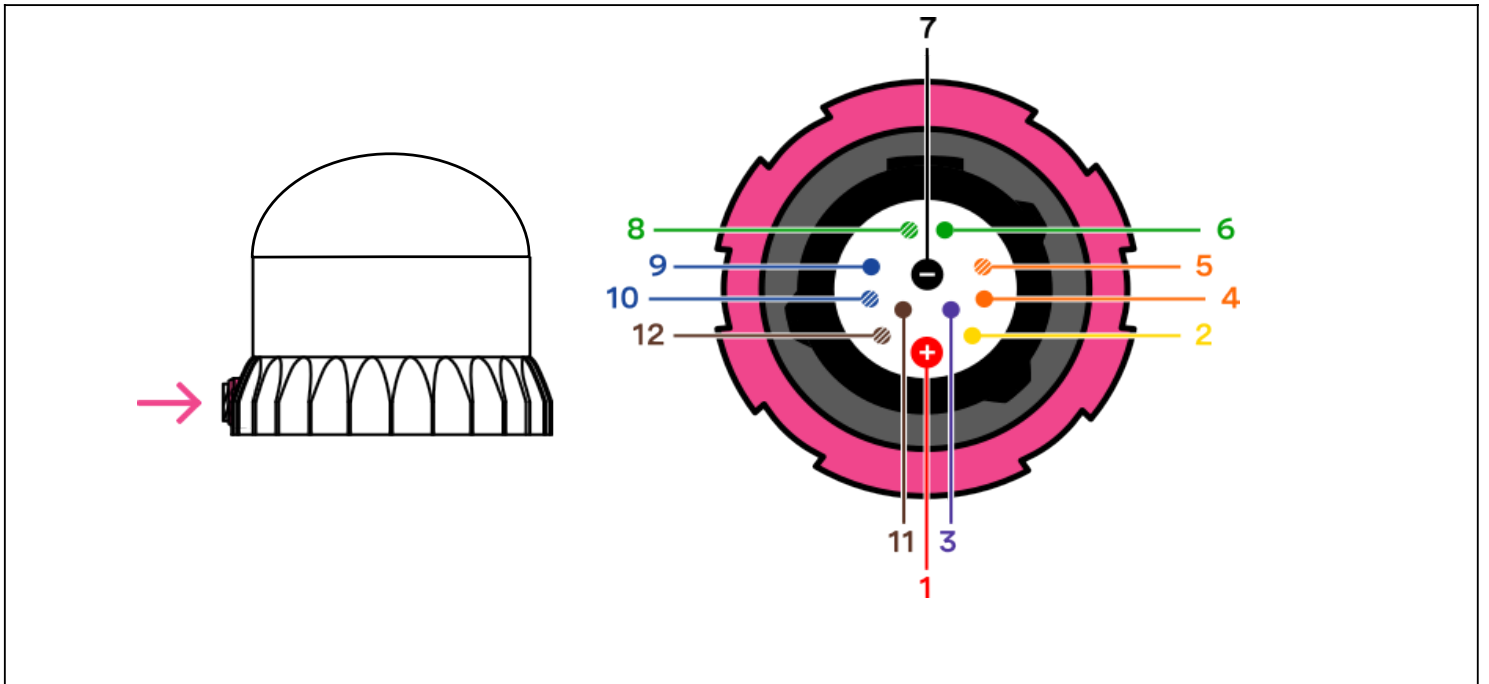
Sample Drivers	Ouster SDK, ROS, C++
Visualizer	Ouster Studio

**EXTERIOR DIMENSIONS**







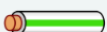









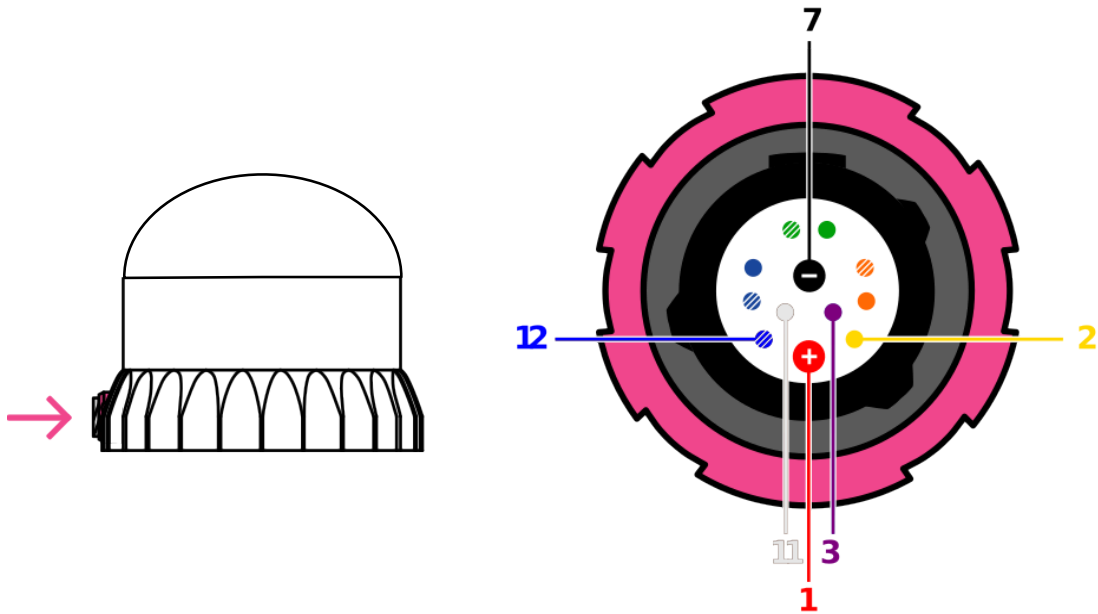
**CABLE PINOUT DIAGRAM FOR TYPE 1, 2 and 3 (1000BASE-T)**





Pinout and wire gauges for Types 1, 2, and 3 (1000BASE-T) cables

Function	Pin No.	Wire Color	Type-1, 24V	Type-2, 24V	Type-3, 12V	Twisted with	Color (Display)
VCC	1	Red	22 AWG	22 AWG	18 AWG	N/A	
GROUND	7	Black	22 AWG	22 AWG	18 AWG	N/A	
MULTI-PURPOSE_IO	3	Purple	26 AWG	28 AWG	28 AWG	N/A	
SYNC_PULSE_IN	2	Yellow	26 AWG	28 AWG	28 AWG	N/A	
Ethernet BI_DA+	5	White /Orange	26 AWG	28 AWG	28 AWG	Orange	
Ethernet BI_DA-	4	Orange	26 AWG	28 AWG	28 AWG	White /Orange	
Ethernet BI_DB+	8	White /Green	26 AWG	28 AWG	28 AWG	Green	
Ethernet BI_DB-	6	Green	26 AWG	28 AWG	28 AWG	White /Green	
Ethernet BI_DC+	9	Blue	26 AWG	28 AWG	28 AWG	White /Blue	
Ethernet BI_DC-	10	White /Blue	26 AWG	28 AWG	28 AWG	Blue	
Ethernet BI_DD+	12	White /Brown	26 AWG	28 AWG	28 AWG	Brown	
Ethernet BI_DD-	11	Brown	26 AWG	28 AWG	28 AWG	White /Brown	

### CABLE PINOUT DIAGRAM FOR TYPE 4 (1000BASE-T1)



Pinout and wire gauges for Type 4 (1000BASE-T1) cables

Net Name	Pin No.	Wire Color	Type-4, Base 1000 T1	Twisted with	Color (Display)
VCC	1	Red	18 AWG	NA	
GROUND	7	Black	18 AWG	NA	
MULTIPURPOSE_IO	3	Purple	28 AWG	NA	
SYNC_PULSE_IN	2	Yellow	28 AWG	NA	
Ethernet BI_DA+	12	Blue	26 AWG	White	
Ethernet BI_DA-	11	White	26 AWG	Blue	

\*Specifications are subject to change without notice.