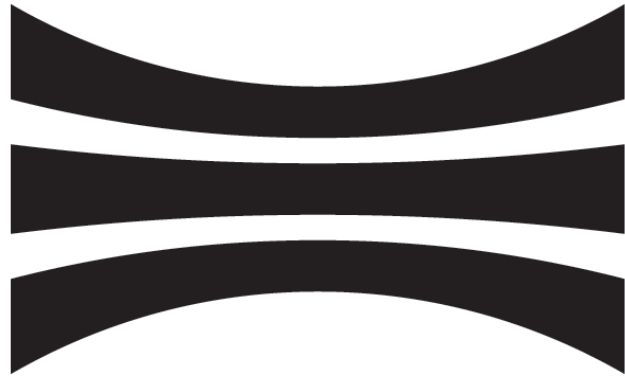




OUSTER

Product Catalog
Apr. 2020

Prices: Sensors

Sensors	Price	Non-profit Price	Part Number
OS0-32	\$6,000	\$6,000	860-102307-B
OS0-64	\$8,000	\$7,000	860-102305-B
OS0-128	\$12,000	\$10,000	860-102294-B
OS1-32 (Gen 2)	\$8,000	\$7,000	860-102312-B
OS1-64 (Gen 2)	\$12,000	\$10,000	860-102309-B
OS1-128 (Gen 2)	\$18,000	\$15,000	860-102308-B
OS2-32	\$16,000	\$16,000	860-102315-B
OS2-64	\$20,000	\$16,000	860-102314-B
OS2-128	\$24,000	\$20,000	860-102313-B
OS1-16 (Gen 1)	\$3,500	\$3,500	910-855016-02
OS1-32 (Gen 1)	\$6,000	\$6,000	910-855032-02
OS1-64 (Gen 1)	\$8,000	\$8,000	910-855064-02

Standard Kits	Price	Part Number
Standard Kit, OS0/OS1 Radial Heatsink	Included	910-102286-A
No Ibox Kit, OS0/OS1 Radial Heatsink	Included	910-102290-A
Standard Kit, OS2	Included	910-102289-A
No iBox Kit, OS2	Included	910-102293-A

Note: "Standard Kit" includes (1) 5 m light gauge sensor cable w/ interface box; (2) 24V power converter; (3) 2 m CAT 6 ethernet cable; (4) 1 standard mount. For a different sensor cable, your PO will have the "No Ibox" Kit (with a power converter, ethernet cable, and mount) and an additional line item for the cable. Every sensor comes with one cable (any one of our cable options) included in the cost.



Prices: Accessories

Cable Options	Price	Part Number
1 m light gauge w/ interface box	\$200	840-102068-02
2 m light gauge w/ interface box	\$200	840-102069-02
5 m light gauge w/ interface box	\$200	840-101986-03
10 m light gauge w/ interface box	\$300	840-102061-02
1 m light gauge pigtail	\$100	820-101938-01
2 m light gauge pigtail	\$100	820-101939-01
5 m light gauge pigtail	\$100	820-101904-01
10 m light gauge pigtail	\$150	820-101940-01
5 m heavy gauge w/interface box	\$200	840-101615-05
10 m heavy gauge w/ interface box	\$300	840-102047-02
5 m heavy gauge pigtail	\$100	820-101411-01
10 m heavy gauge pigtail	\$150	820-101936-01

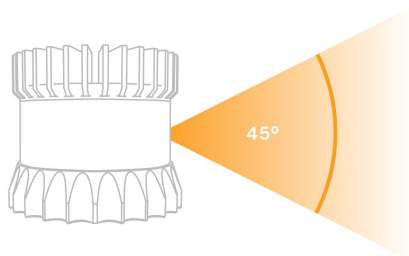
Note: Each sensor comes with one cable at a cost of \$0. Prices are for additional cables.

Baseplates	Price	Part Number
Additional Mount	\$20	320-101890-05
PuckToOS1Adapter	\$150	300-101401-01

Beam Configurations	Price	Part Number
Gen 2 128 Uniform	\$0	OBC-870-102514-02
Gen 2 64 Uniform	\$0	OBC-870-102515-02
Gen 2 64 Gradient	\$1,000	OBC-870-102516-02
Gen 2 64 Below Horizon	\$1,000	OBC-870-102517-02
Gen 2 32 Uniform	\$0	OBC-870-102518-02
Gen 2 32 Gradient	\$1,000	OBC-870-102519-02
Gen 2 32 Below Horizon	\$1,000	OBC-870-102520-02



What's new with Gen 2 sensors



128 channels of vertical resolution

OS1 Gen 2 sensors have up to 128 channels of vertical resolution with an angular resolution of 0.35° to power perception for the next generation of autonomous vehicles.

Improved precision and accuracy

Second generation OS1 sensors improve precision by approximately 2x, down to ± 1.5 cm, coupled with improved range accuracy for enhanced mapping and localization.

Wider field of view

The new generation of OS1 sensors has an expanded 45° field of view, improving spatial awareness and localization for autonomous applications.

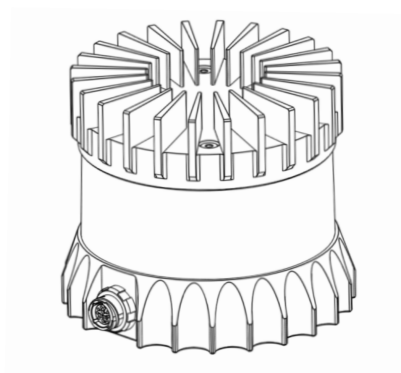
Shorter minimum range

The minimum range of the Gen 2 OS1 drops down to effectively 0 m. The sensor captures data down to 25 cm from the window and has a blockage detection flag to signal when objects are within 25 cm.

Expanded dynamic range

The dynamic range of intensity and ambient data is 10x more granular, allowing the sensor to pick up on more detail and improve object identification.

OS0: Ultra-wide view lidar sensor (Gen 2)



Sensor	OS0 (Gen 2) Ultra-wide view		
	32	64	128
Vertical resolution (channels)	32	64	128
Maximum range*	55 m	55 m	55 m
Range (10% reflective target @ 90% detection prob.)	15 m	15 m	15 m
Minimum range**	0 m	0 m	0 m
Precision	±1.5 cm to ±5 cm	±1.5 cm to ±5 cm	±1.5 cm to ±5 cm
Vertical field of view	90°	90°	90°
Vertical angular resolution	3.0°	1.5°	0.75°
Horizontal resolution	512, 1024, or 2048	512, 1024, or 2048	512, 1024, or 2048
Horizontal field of view	360°	360°	360°
Horizontal angular resolution	0.18°	0.18°	0.18°
Points per second	655,000	1,311,000	2,621,000
Frame rate	10 or 20 Hz	10 or 20 Hz	10 or 20 Hz
Ingress protection	IP68, IP69K	IP68, IP69K	IP68, IP69K
Typical power consumption***	14-20 W	14-20 W	14-20 W
Operating voltage	24 V	24 V	24 V
Operating temperature	-20 to +50°C	-20 to +50°C	-20 to +50°C
Time synchronization	PTP; \$GPRMC	PTP; \$GPRMC	PTP; \$GPRMC
Weight	445 g	445 g	445 g
Embedded IMU	Yes	Yes	Yes
Ambient Imagery	Yes	Yes	Yes
Beam Configuration Options	Yes	Yes	No
Price (before volume discounts)	\$6,000	\$8,000	\$12,000
Non-Profit Price	\$6,000	\$7,000	\$10,000
Part number	860-102307-B	860-102305-B	860-102294-B

*80% reflective lambertian target, 100 klx sunlight, 50% detection probability

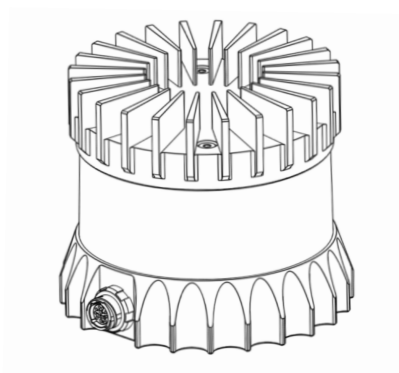
**Blockage detection binary flag between 0 m - 0.25 m

***The OS0 can briefly reach a peak of 22 W at start-up

****Class 1 Eye Safe per IEC/EN 60825-1:2014



OS1: Mid-range lidar sensor (Gen 2)



Sensor	OS1 (Gen 2) Mid-range		
	32	64	128
Vertical resolution (channels)	32	64	128
Maximum range*	120 m	120 m	120 m
Range (10% reflective target @ 90% detection prob.)	40 m	40 m	40 m
Minimum range**	0 m	0 m	0 m
Precision	±1.5 cm to ±5 cm	±1.5 cm to ±5 cm	±1.5 cm to ±5 cm
Vertical field of view	45°	45°	45°
Vertical angular resolution	1.5°	0.7°	0.35°
Horizontal resolution	512, 1024, or 2048	512, 1024, or 2048	512, 1024, or 2048
Horizontal field of view	360°	360°	360°
Horizontal angular resolution	0.18°	0.18°	0.18°
Points per second	655,000	1,311,000	2,621,000
Frame rate	10 or 20 Hz	10 or 20 Hz	10 or 20 Hz
Ingress protection	IP68, IP69K	IP68, IP69K	IP68, IP69K
Typical power consumption***	14-20 W	14-20 W	14-20 W
Operating voltage	24 V	24 V	24 V
Operating temperature	-20 to +50°C	-20 to +50°C	-20 to +50°C
Time synchronization	PTP; \$GPRMC	PTP; \$GPRMC	PTP; \$GPRMC
Weight	455 g	455 g	455 g
Embedded IMU	Yes	Yes	Yes
Ambient Imagery	Yes	Yes	Yes
Beam Configuration Options	Yes	Yes	No
Price (before volume discounts)	\$8,000	\$12,000	\$18,000
Non-Profit Price	\$7,000	\$10,000	\$15,000
Part number	860-102312-B	860-102309-B	860-102308-B

*80% reflective lambertian target, 100 klx sunlight, 50% detection probability

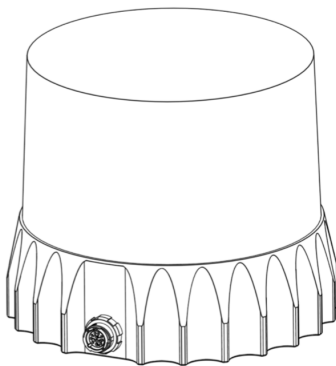
**Blockage detection binary flag between 0 m - 0.25 m

***The OS1 can briefly reach a peak of 22 W at start-up

****Class 1 Eye Safe per IEC/EN 60825-1:2014



OS2: Long-range lidar sensor (Gen 2)



Sensor	OS2 (Gen 2) Long-range		
	32	64	128
Vertical resolution (channels)	32	64	128
Maximum range*	240 m	240 m	240 m
Range (10% reflective target @ 90% detection prob.)	80 m	80 m	80 m
Minimum range**	0 m	0 m	0 m
Precision	±2 cm to ±5 cm	±2 cm to ±5 cm	±2 cm to ±5 cm
Vertical field of view	22.5°	22.5°	22.5°
Vertical angular resolution	0.7°	0.36°	0.18°
Horizontal resolution	512, 1024, or 2048	512, 1024, or 2048	512, 1024, or 2048
Horizontal field of view	360°	360°	360°
Horizontal angular resolution	0.18°	0.18°	0.18°
Points per second	655,000	1,311,000	2,621,000
Frame rate	10 or 20 Hz	10 or 20 Hz	10-20 Hz
Ingress protection	IP68, IP69K	IP68, IP69K	IP68, IP69K
Typical power consumption***	14-20 W	14-20 W	14-20 W
Operating voltage	24 V	24 V	24 V
Operating temperature	-20 to +50°C	-20 to +50°C	-20 to +50°C
Time synchronization	PTP; \$GPRMC	PTP; \$GPRMC	PTP; \$GPRMC
Weight	930 g	930 g	930 g
Embedded IMU	Yes	Yes	Yes
Ambient Imagery	Yes	Yes	Yes
Beam Configuration Options	Yes	Yes	No
Price (before volume discounts)	\$16,000	\$20,000	\$24,000
Non-profit price	\$16,000	\$16,000	\$20,000
Part number	860-102315-B	860-102314-B	860-102313-B

*80% reflective lambertian target, 100 klx sunlight, 50% detection probability

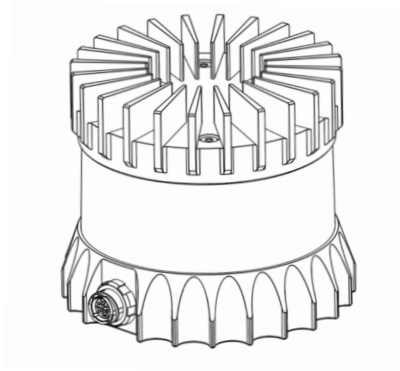
**Blockage detection binary flag between 0 m - 0.25 m

***The OS2 can briefly reach a peak of 28 W on start-up

****Class 1 Eye Safe per IEC/EN 60825-1:2014



OS1: Mid-range lidar sensor (Gen 1)



Sensor	OS1 (Gen 1) Mid-range		
	16	32	64
Vertical resolution (channels)	16	32	64
Maximum range*	120 m	120 m	120 m
Range (10% reflective target @ 90% detection prob.)	40 m	40 m	40 m
Minimum range	0.8 m	0.8 m	0.8 m
Precision	±3 cm to ±10 cm	±3 cm to ±10 cm	±3 cm to ±10 cm
Vertical field of view	33.2°	33.2°	33.2°
Vertical angular resolution	2.2°	1.1°	0.53°
Horizontal resolution	512, 1024, or 2048	512, 1024, or 2048	512, 1024, or 2048
Horizontal field of view	360°	360°	360°
Horizontal angular resolution	0.18°	0.18°	0.18°
Points per second	328,000	655,000	1,311,000
Frame rate	10-20 Hz	10-20 Hz	10-20 Hz
Ingress protection	IP68, IP69K	IP68, IP69K	IP68, IP69K
Typical power consumption**	14-20 W	14-20 W	14-20 W
Operating voltage	24 V	24 V	24 V
Operating temperature	-20 to +50°C	-20 to +50°C	-20 to +50°C
Time synchronization	PTP; \$GPRMC	PTP; \$GPRMC	PTP; \$GPRMC
Weight	425 g	425 g	425 g
Embedded IMU	Yes	Yes	Yes
Ambient Imagery	Yes	Yes	Yes
Beam Configuration Options	Yes	Yes	No
Price (before volume discounts)	\$3,500	\$6,000	\$8,000
Non-Profit Price	\$3,500	\$6,000	\$8,000
Part number	910-855016-02	910-855032-02	910-855064-02

*80% reflective lambertian target, 100 klx sunlight, 50% detection probability

**The OS1 can briefly reach a peak of 22 W at start-up

***Class 1 Eye Safe per IEC/EN 60825-1:2014



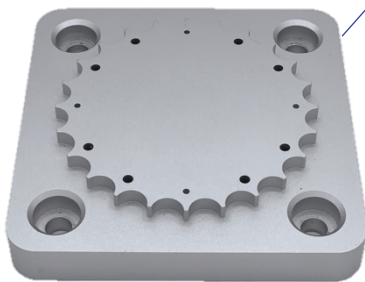
Standard Kit: OS0 and OS1

Part number: 910-102286-A (Price: Included with sensor)



Radial cap - modular cap, standard on all OS0 and OS1 sensors

OS0 or OS1 lidar sensor - available in 128, 64, 32, and 16 (OS1-16 in Gen1 only) channels of vertical resolution. For Gen 1 sensors, the part number for the sensor includes the standard kit. For Gen 2 sensors, the sensor and the standard kit have different part numbers.



Sensor baseplate - 530 g baseplate for mounting and heat dissipation. 4 x M3x0.5 - 6H mount holes for sensor, 4 x M8 thru holes for affixing baseplate



Straight-angle connector - attaches to the port on the sensor. Standard cable is 5 m. Custom options: heavy-gauge ruggedized cable, without interface box, various lengths (1 m, 2 m, 5 m, or 10 m). First cable is included in sensor cost (any gauge, length, or with/without interface box)

Interface box - comes with one RJ45 Ethernet connector, one 24V power supply connection (5.5 mm barrel)



24V adapter - Input: 100-240V~50/60Hz, Output: 24V/1.5A. Includes Type B electrical plug and 5.5 mm barrel output to interface box



Ethernet cable - 2 m CAT6 ethernet cable

Standard Kit: OS2

Part number: 910-102289-A (Price: Included with sensor)



OS2 lidar sensor - available in 128, 64, 32 channels of vertical resolution. For Gen 2 sensors, the sensor and the standard kit have different part numbers.



Straight-angle connector - attaches to the port on the sensor. Standard cable is 5 m. Custom options: heavy-gauge ruggedized cable, without interface box, various lengths (1 m, 2 m, 5 m, or 10 m). First cable is included in sensor cost (any gauge, length, or with/without interface box)

Interface box - comes with one RJ45 Ethernet connector, one 24V power supply connection (5.5 mm barrel)



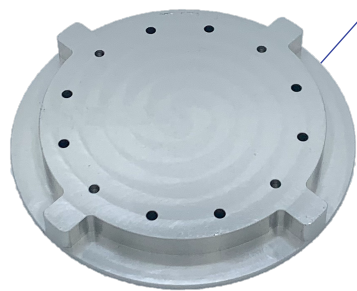
24V adapter - Input: 100-240V~50/60Hz, Output: 24V/1.5A. Includes Type B electrical plug and 5.5 mm barrel output to interface box



Ethernet cable - 2 m CAT6 ethernet cable

Accessories and Customization

Baseplates:

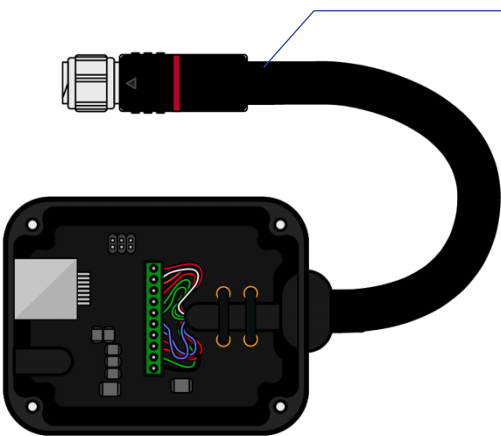


Puck converter – available for converting the dimensions of an Ouster OS1 or OS0 sensor to an existing VLP-16 or VLP-32 integration.

Part Number: 300-101401-01
Price: \$150

Straight-angle cable options:

The first cable is free with any sensor purchase. Prices listed below are for replacement or back-up cables



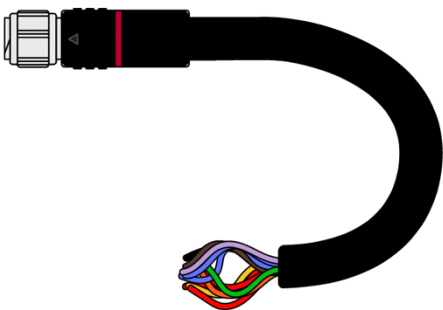
Straight angle connector w/ interface box

Light gauge:

Length	Price	Part Number
1 m	\$200	840-102068-02
2 m	\$200	840-102069-02
5 m	\$200	840-101986-03
10 m	\$300	840-102061-02

Heavy gauge:

Length	Price	Part Number
5 m	\$200	840-101615-05
10 m	\$300	840-102047-02



Straight-angle connector pigtail (no interface box)

Light gauge:

Length	Price	Part Number
1 m	\$100	820-101938-01
2 m	\$100	820-101939-01
5 m	\$100	820-101904-01
10 m	\$150	820-101940-01

Heavy gauge:

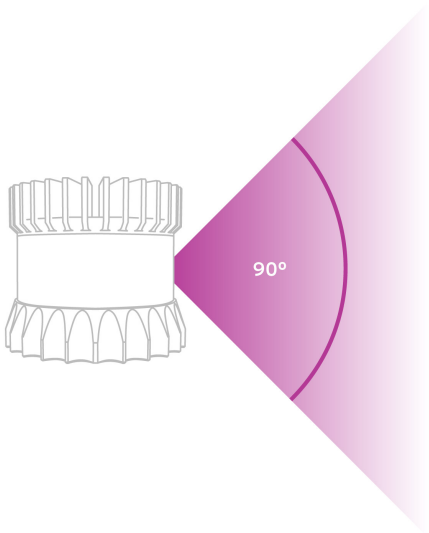
Length	Price	Part Number
5 m	\$100	820-101411-01
10 m	\$150	820-101936-01



OS0-32 Beam Spacing Options

Uniform

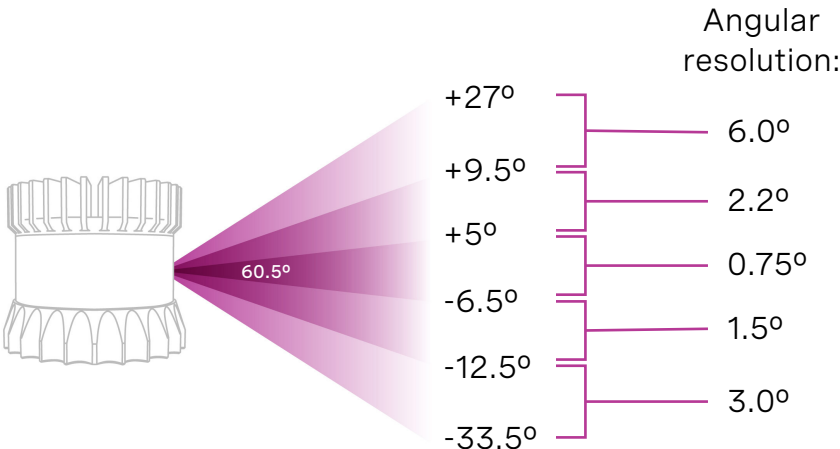
Part Number:
OBC-870-102518-02
Cost: \$0



Angular resolution: 2.9°

Gradient

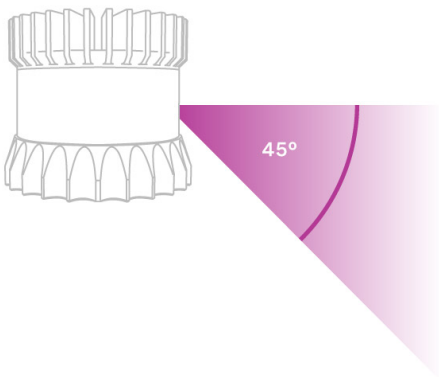
Part Number:
OBC-870-102519-02
Cost: \$1,000



Angular resolution:

Below horizon

Part Number:
OBC-870-102520-02
Cost: \$1,000

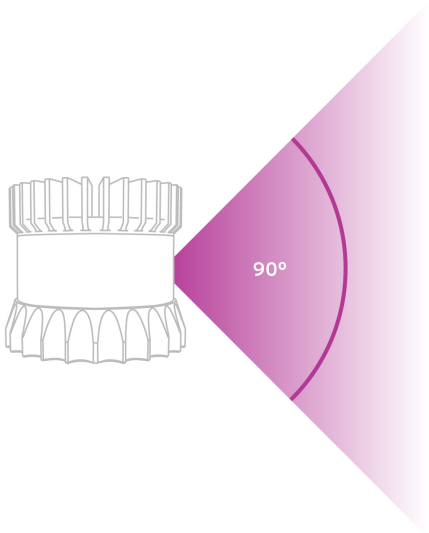


Angular resolution: 1.5°

OS0-64 Beam Spacing Options

Uniform

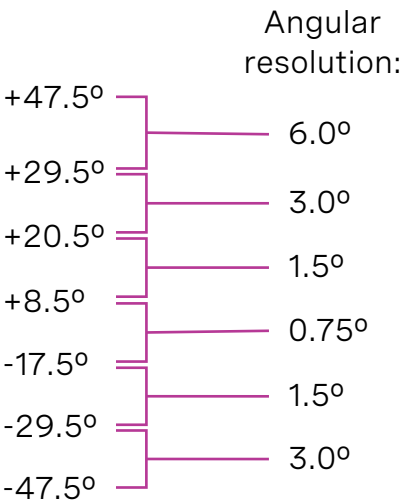
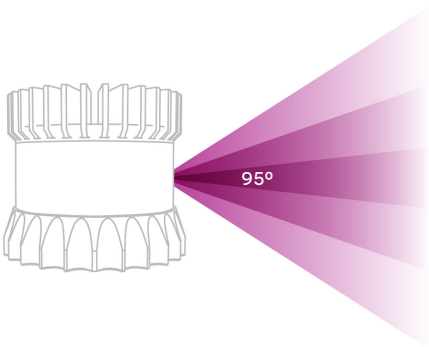
Part Number:
OBC-870-102515-02
Cost: \$0



Angular resolution: 1.5°

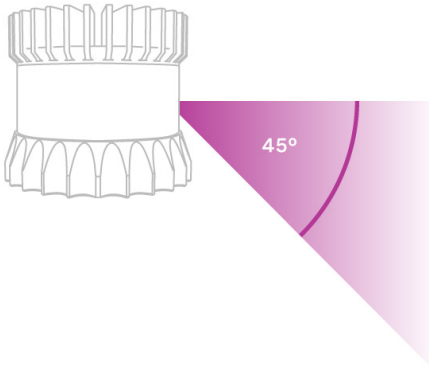
Gradient

Part Number:
OBC-870-102516-02
Cost: \$1,000



Below horizon

Part Number:
OBC-870-102517-02
Cost: \$1,000



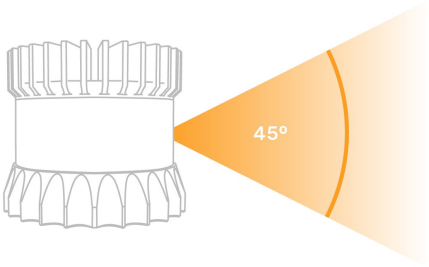
Angular resolution: 0.7°



OS1-32 Beam Spacing Options

Uniform

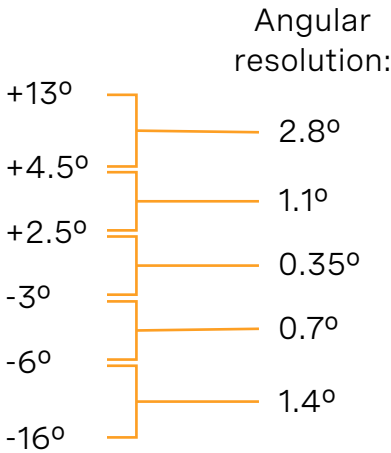
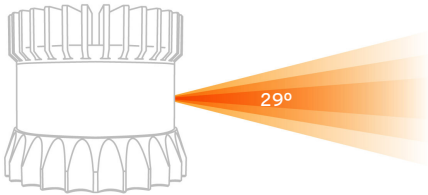
Part Number:
OBC-870-102518-02
Cost: \$0



Angular resolution: 1.4°

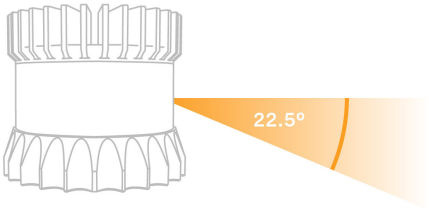
Gradient

Part Number:
OBC-870-102519-02
Cost: \$1,000



Below horizon

Part Number:
OBC-870-102520-02
Cost: \$1,000

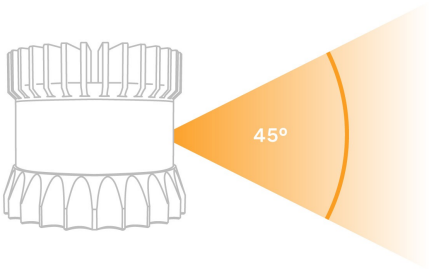


Angular resolution: 0.7°

OS1-64 Beam Spacing Options

Uniform

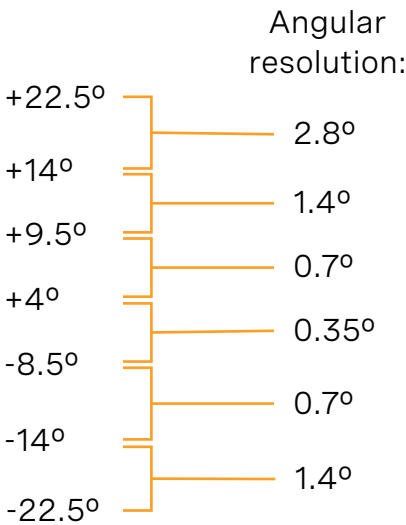
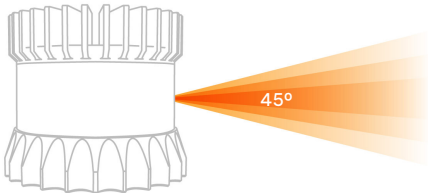
Part Number:
OBC-870-102515-02
Cost: \$0



Angular resolution: 0.7°

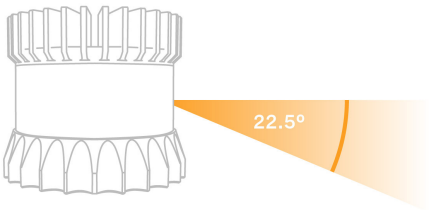
Gradient

Part Number:
OBC-870-102516-02
Cost: \$1,000



Below horizon

Part Number:
OBC-870-102517-02
Cost: \$1,000

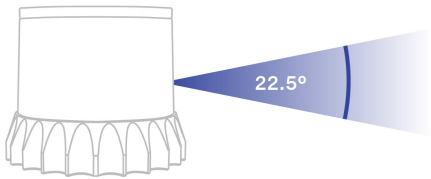


Angular resolution: 0.35°

OS2-32 Beam Spacing Options

Uniform

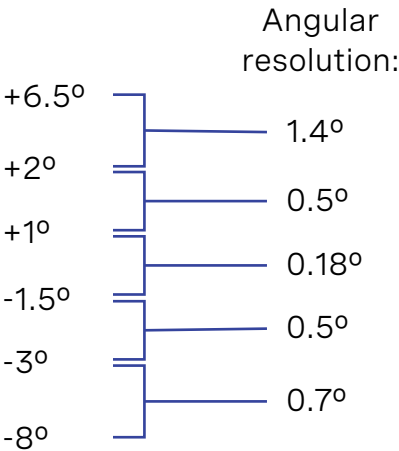
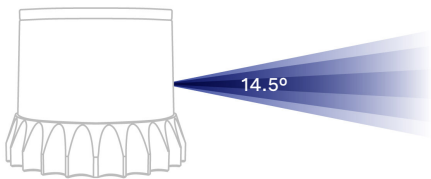
Part Number:
OBC-870-102518-02
Cost: \$0



Angular resolution: 0.7°

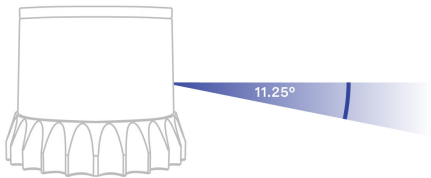
Gradient

Part Number:
OBC-870-102519-02
Cost: \$1,000



Below horizon

Part Number:
OBC-870-102520-02
Cost: \$1,000

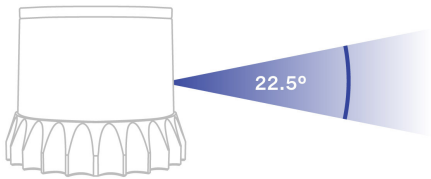


Angular resolution: 0.35°

OS2-64 Beam Spacing Options

Uniform

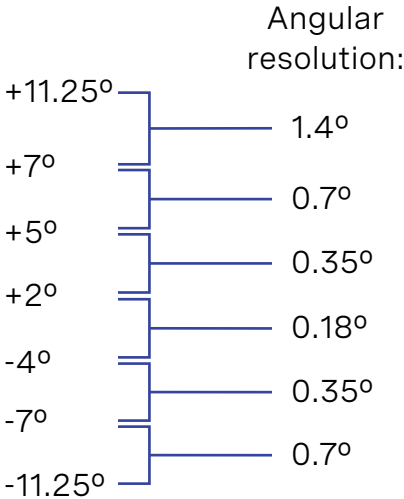
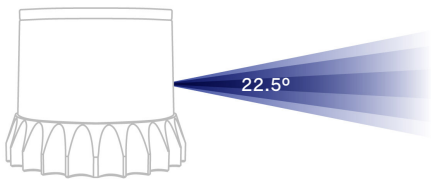
Part Number:
OBC-870-102515-02
Cost: \$0



Angular resolution: 0.35°

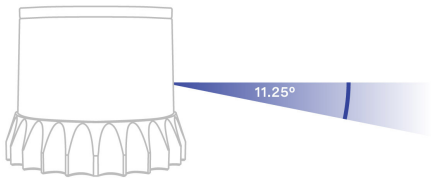
Gradient

Part Number:
OBC-870-102516-02
Cost: \$1,000



Below horizon

Part Number:
OBC-870-102517-02
Cost: \$1,000

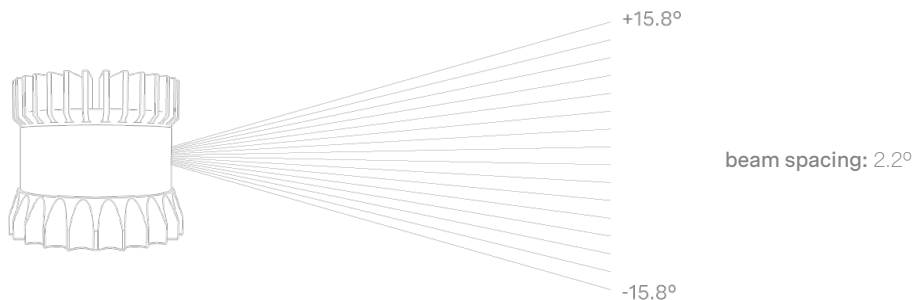


Angular resolution: 0.18°

OS1-16 (Gen 1) Beam Spacing Options

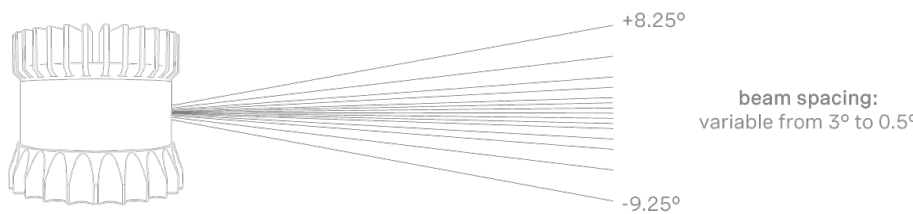
Uniform

Cost: Included



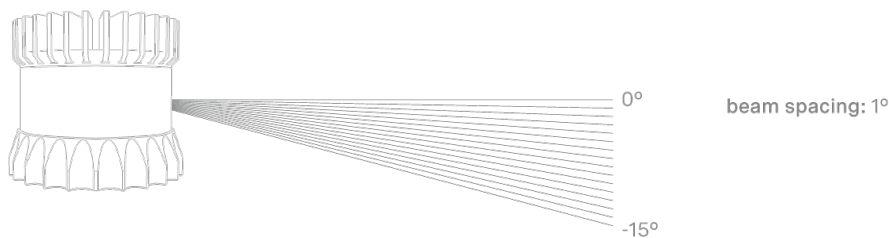
Gradient

Cost: Included



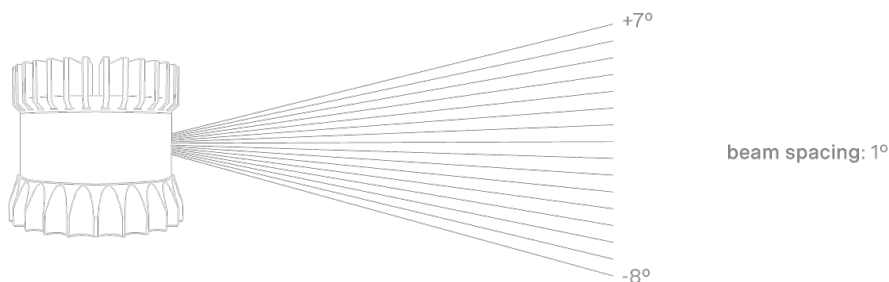
Below horizon

Cost: Included



Tight column

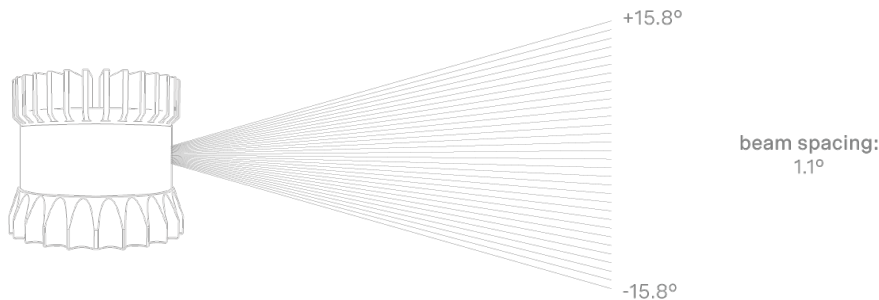
Cost: Included



OS1-32 (Gen 1) Beam Spacing Options

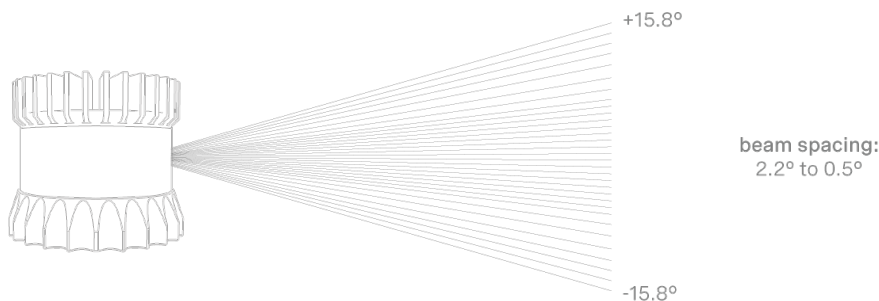
Uniform

Cost: Included



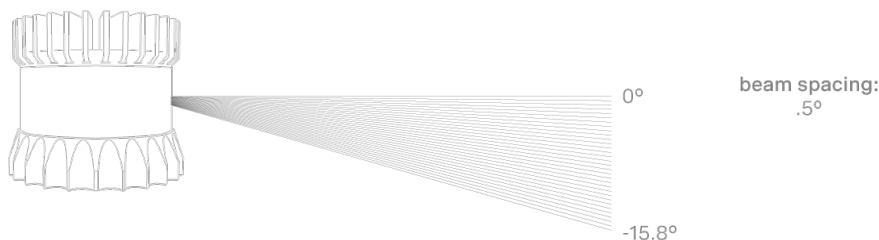
Gradient

Cost: Included



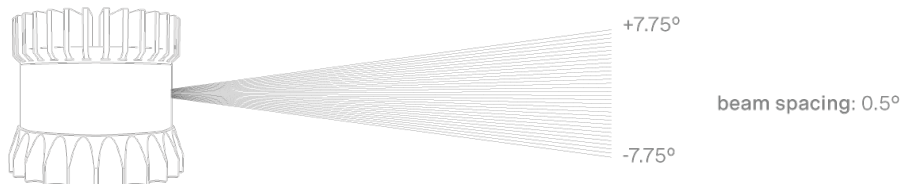
Below horizon

Cost: Included



Tight column

Cost: Included



Resources

Blog Posts

1. How multi-beam flash lidar works: <https://ouster.com/blog/how-multi-beam-flash-lidar-works/>
2. The lidar IS the camera: <https://ouster.com/blog/the-camera-is-in-the-lidar/>
3. Putting the OS1 through a battery of reliability tests: <https://ouster.com/blog/putting-the-os1-through-a-battery-of-reliability-tests/>
4. Upgrading to IP69K sensors: <https://ouster.com/blog/upgrading-our-sensors-with-space-grade-connectors/>
5. Lidar performance in the rain: <https://ouster.com/blog/lidar-vs-camera-comparison-in-the-rain/>

Sensor details

1. Sensor guide: <http://data.ouster.io/downloads/Ouster-lidar-sensor-guide.pdf>
2. OS0: <http://data.ouster.io/downloads/OS0-lidar-sensor-datasheet.pdf>
3. OS1: <http://data.ouster.io/downloads/OS1-lidar-sensor-datasheet.pdf>
4. OS2: <http://data.ouster.io/downloads/OS2-lidar-sensor-datasheet.pdf>

User Guides

1. Software User Guide: <https://data.ouster.io/downloads/software-user-guide-v1.13.0.pdf>
2. Hardware User Guide: <https://data.ouster.io/downloads/hardware-user-guide-v1.13.0.pdf>

Ouster Studio (evaluation software)

1. Ouster Studio download: <https://www.paraview.org/ousterstudio/>
2. Ouster Studio sample data: https://data.ouster.io/downloads/lombard_street_OS1.pcap
3. Ouster Studio User Guide: <https://data.ouster.io/downloads/Ouster-Studio-user-guide.pdf>

Sample drivers and raw data

1. Sample drivers and visualizer: https://github.com/ouster-lidar/ouster_example
2. Sample raw data: <http://data.ouster.io/sample-data-1.13/index.html>

CAD Models

1. OS0/OS1 w/ radial cap CAD: <https://data.ouster.io/downloads/OS0-lidar-sensor-externals-radial-cap.STEP>
2. OS0/OS1 flat cap CAD: <https://data.ouster.io/downloads/OS0-lidar-sensor-externals-no-cap.STEP>
3. OS2 CAD: <http://data.ouster.io/downloads/OS2-lidar-sensor-externals.STEP>