

# Velodyne LiDAR™ HDL-32E

HIGH DEFINITION REAL-TIME 3D LiDAR SENSOR



## HDL-32E



Stylishly small and ruggedly built with an unrivaled field of view, Velodyne's HDL-32E LiDAR sensor was designed to exceed the demands of the most challenging, real-world industrial applications including autonomous vehicle control and operation, mobile terrestrial mapping, aerial 3D mapping and security surveillance.

The HDL-32E measures only 144 mm by 85 mm and weighs 1.0 kg (plus 0.3 kg for cabling). Its compact size and weight makes it for all LiDAR applications, in particular those with constrained form factors and pricing requirements but still demand high performance.

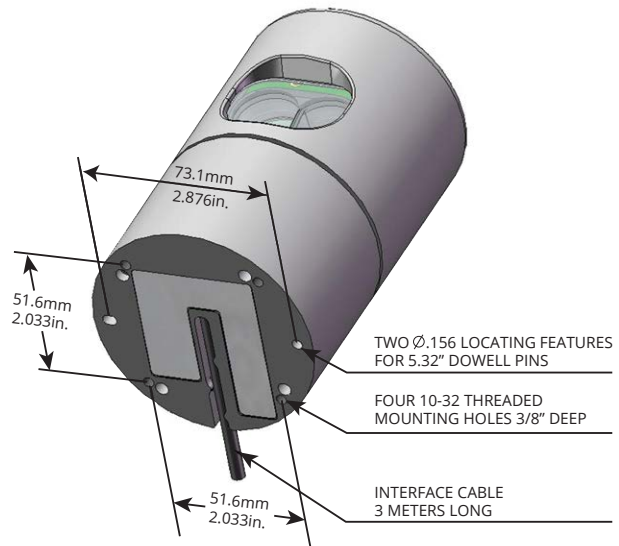
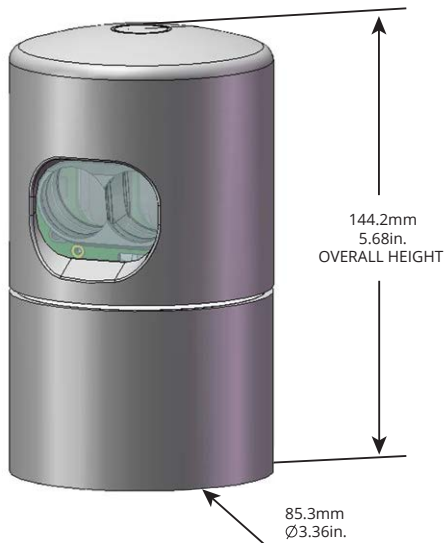
### Unprecedented Field of View and Point Density

The HDL-32E's innovative multi-channel array enables navigation and mapping systems to observe more of their environment than any other LiDAR sensor. The HDL-32E utilizes 32 LiDAR channels aligned from +10.67° to -30.67° to provide an unmatched vertical field of view, and its patented rotating head design delivers a real-time 360° horizontal field of view. The HDL-32E generates a point cloud of up to 695,000 points per second with a range of up to 100 m and a typical accuracy of ±2 cm. The resulting comprehensive point cloud coverage within a single data stream makes the HDL-32E an indispensable part of any sensor suite.

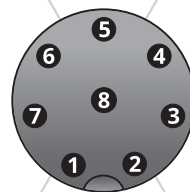
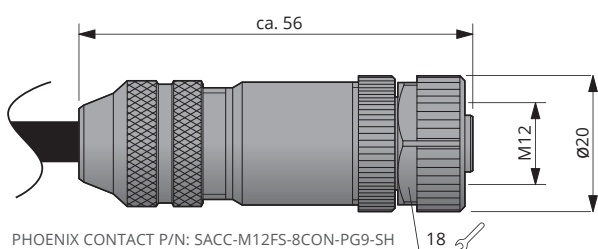


HDL-32E

## DIMENSIONS



## M12 CONNECTOR ON SENSOR SIDE



Pin	Wire Color	Function
8	Black	Ground
7	Red	+12 V
6	Yellow	GPS Pulse Per Second (PPS)
5	White	GPS Serial Data
4	Light Orange	Ethernet TX+
3	Orange	Ethernet TX-
2	Light Blue	Ethernet RX+
1	Blue	Ethernet RX-

PHOENIX CONTACT P/N: SACC-M12FS-8CON-PG9-SH



## High Definition Real-Time 3D LiDAR Sensor

The HDL-32E provides high definition 3-dimensional information about the surrounding environment.

### Specifications:

Sensor:	<ul style="list-style-type: none"> <li>• Time of Flight Distance Measurement with Calibrated Reflectivities</li> <li>• 32 Channels</li> <li>• Measurement Range: Up to 100 m</li> <li>• Accuracy: <math>\pm 2</math> cm (Typical)</li> <li>• Single and Dual Returns (Strongest, Last)</li> <li>• Field of View (Vertical): <math>+10.67^\circ</math> to <math>-30.67^\circ</math> (<math>41.33^\circ</math>)</li> <li>• Angular Resolution (Vertical): <math>1.33^\circ</math></li> <li>• Field of View (Horizontal): <math>360^\circ</math></li> <li>• Angular Resolution (Horizontal/Azimuth): <math>0.1^\circ - 0.4^\circ</math></li> <li>• Rotation Rate: 5 Hz – 20 Hz</li> <li>• Integrated Web Server for Easy Monitoring and Configuration</li> </ul>
Laser:	<ul style="list-style-type: none"> <li>• Laser Product Classification: Class 1 Eye-safe per IEC 60825-1:2007 &amp; 2014</li> <li>• Wavelength: 903 nm</li> <li>• Beam Size @ Screen: 9.5 mm x 12.7 mm</li> <li>• Beam Divergence: 3.0 mrad</li> </ul>
Mechanical/ Electrical/ Operational	<ul style="list-style-type: none"> <li>• Power Consumption: 12 W (Typical)</li> <li>• Operating Voltage: 9 V – 18 V (with Interface Box and Regulated Power Supply)</li> <li>• Weight: 1.0 kg (without Cabling and Interface Box)</li> <li>• Dimensions: 85 mm Diameter x 144 mm Height</li> <li>• Shock: 500 m/s<sup>2</sup> Amplitude, 11 ms Duration</li> <li>• Vibration: 5 Hz to 2,000 Hz, 3 G<sub>rms</sub></li> <li>• Environmental Protection: IP67</li> <li>• Operating Temperature: <math>-10^\circ\text{C}</math> to <math>+60^\circ\text{C}</math></li> <li>• Storage Temperature: <math>-40^\circ\text{C}</math> to <math>+105^\circ\text{C}</math></li> </ul>
Output:	<ul style="list-style-type: none"> <li>• 3D LiDAR Data Points Generated:             <ul style="list-style-type: none"> <li>- Single Return Mode: ~695,000 points per second</li> <li>- Dual Return Mode: ~1,390,000 points per second</li> </ul> </li> <li>• 100 Mbps Ethernet Connection</li> <li>• UDP Packets Contain:             <ul style="list-style-type: none"> <li>- Time of Flight Distance Measurement</li> <li>- Calibrated Reflectivity Measurement</li> <li>- Rotation Angles</li> <li>- Synchronized Time Stamps (<math>\mu\text{s}</math> resolution)</li> </ul> </li> <li>• Orientation: 6DoF Inertial Sensor Measurements</li> <li>• GPS: \$GPRMC NMEA Sentence from GPS Receiver (GPS not included)</li> </ul>

97-0038 Rev-H

### Product Ordering Information:

Product Name	SKU Ordering Number	Sensor		Interface Box			
		Connector	Cable Length	Included	Connector to Sensor	Cable Length	I/O Connectors
HDL-32E	80-HDL-32E	None	3.0 m	Yes	None	-	RJ45, GPS and Power
HDL-32E	80-HDL-32E M12-IFB	M12 Female	0.3 m	Yes	M12 Male	1.6 m	RJ45, GPS and Power
HDL-32E	80-HDL-32E M12-0.3M	M12 Female	0.3 m	No	-	-	-
HDL-32E	80-HDL-32E M12	M12 Female	1.6 m	No	-	-	-



CLASS 1 LASER PRODUCT

