Velodyne LiDAR’s Puck Hi-Res is a higher resolution version of the Puck and used in applications that require greater resolution in the captured 3D image. The Puck Hi-Res has identical performance to VLP-16 with the only differences in the vertical field of view (FoV) which is 20° instead of 30° and therefore a tighter channel distribution where it is 1.33° instead of 2.00° between channels. No other changes have been made to Puck Hi-Res as it retains its patented 360° surround view to capture real-time 3D LiDAR data that includes distance and calibrated reflectivity measurements.

**Higher Resolution at Longer Distances while Maintaining High Point Density**

The Puck Hi-Res has a range of 100 m with dual return mode to capture greater detail in the 3D image at longer ranges while the power consumption is approximately 8 W. A compact footprint (Ø103 mm x 72 mm) with closer spacing between channels to enable greater resolution of 3D images, the Puck Hi-Res provides more detailed views in applications such as autonomous vehicles, surveillance and 3D mapping/imaging.

It supports 16 channels and generates 300,000 points/second from a 360° horizontal field of view and a 20° vertical field of view with ±10° from the horizon. The Puck Hi-Res has no visible rotating parts and is encapsulated in a package that allows it to operate over a wide temperature range (-10°C to +60°C) and environmental conditions (IP67).

**DIMENSIONS**

**M12 CONNECTOR ON SENSOR SIDE**

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

www.velodynelidar.com
# High Resolution Real-Time 3D LiDAR Sensor

The Puck Hi-Res provides high definition 3-dimensional information about the surrounding environment.

## Specifications:

<table>
<thead>
<tr>
<th>Sensor:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Time of Flight Distance Measurement with Calibrated Reflectivities</td>
</tr>
<tr>
<td>• 16 Channels</td>
</tr>
<tr>
<td>• Measurement Range: Up to 100 m</td>
</tr>
<tr>
<td>• Accuracy: ±3 cm (Typical)</td>
</tr>
<tr>
<td>• Single and Dual Returns (Strongest, Last)</td>
</tr>
<tr>
<td>• Field of View (Vertical): +10.0° to -10.0° (20°)</td>
</tr>
<tr>
<td>• Angular Resolution (Vertical): 1.33°</td>
</tr>
<tr>
<td>• Field of View (Horizontal): 360°</td>
</tr>
<tr>
<td>• Angular Resolution (Horizontal/Azimuth): 0.1° – 0.4°</td>
</tr>
<tr>
<td>• Rotation Rate: 5 Hz – 20 Hz</td>
</tr>
<tr>
<td>• Integrated Web Server for Easy Monitoring and Configuration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laser:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Laser Product Classification: Class 1 Eye-safe per IEC 60825-1:2007 &amp; 2014</td>
</tr>
<tr>
<td>• Wavelength: 903 nm</td>
</tr>
<tr>
<td>• Beam Size @ Screen: 12.7 mm (Horizontal) x 9.5 mm (Vertical)</td>
</tr>
<tr>
<td>• Beam Divergence Horizontal: 0.18° (3.0 mrad); Vertical: 0.07° (1.2 mrad)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical/Electrical/Operational</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Power Consumption: 8 W (Typical)</td>
</tr>
<tr>
<td>• Operating Voltage: 9 V – 18 V (with Interface Box and Regulated Power Supply)</td>
</tr>
<tr>
<td>• Weight: 830 g (without Cabling and Interface Box)</td>
</tr>
<tr>
<td>• Dimensions: 103 mm Diameter x 72 mm Height</td>
</tr>
<tr>
<td>• Shock: 500 m/s² Amplitude, 11 ms Duration</td>
</tr>
<tr>
<td>• Vibration: 5 Hz to 2,000 Hz, 3 G&lt;sub&gt;rms&lt;/sub&gt;</td>
</tr>
<tr>
<td>• Environmental Protection: IP67</td>
</tr>
<tr>
<td>• Operating Temperature: -10°C to +60°C</td>
</tr>
<tr>
<td>• Storage Temperature: -40°C to +105°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 3D LiDAR Data Points Generated:</td>
</tr>
<tr>
<td>- Single Return Mode: ~300,000 points per second</td>
</tr>
<tr>
<td>- Dual Return Mode: ~600,000 points per second</td>
</tr>
<tr>
<td>• 100 Mbps Ethernet Connection</td>
</tr>
<tr>
<td>• UDP Packets Contain:</td>
</tr>
<tr>
<td>- Time of Flight Distance Measurement</td>
</tr>
<tr>
<td>- Calibrated Reflectivity Measurement</td>
</tr>
<tr>
<td>- Rotation Angles</td>
</tr>
<tr>
<td>- Synchronized Time Stamps (μs resolution)</td>
</tr>
<tr>
<td>• GPS: $GPRMC$ NMEA Sentence from GPS Receiver (GPS not included)</td>
</tr>
</tbody>
</table>

## Product Ordering Information:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>SKU Ordering Number</th>
<th>Sensor</th>
<th>Interface Box</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Connector</td>
<td>Cable Length*</td>
</tr>
<tr>
<td>Puck Hi-Res</td>
<td>80-VLP-16-HI-RES</td>
<td>None</td>
<td>3.0 m</td>
</tr>
<tr>
<td>Puck Hi-Res</td>
<td>80-VLP-16-HI-RES-M12</td>
<td>M12 Female</td>
<td>0.3 m</td>
</tr>
</tbody>
</table>

*Note: *Cable Length includes the connector.

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**CLASS 1 LASER PRODUCT**