

Velodyne Lidar[®]

Alpha Prime[™]

POWERING SAFE AUTONOMY



Alpha Prime



With the Alpha Prime, Velodyne Lidar delivers the optimal long-range sensor for autonomous mobility. The Alpha Prime's world-class combination of range, image clarity and field of view detects roadway objects with reliability and precision.

This state-of-the-art sensor generates high quality perception in a wide variety of light conditions, with advanced sensor-to-sensor interference mitigation, power efficiency, and thermal performance.

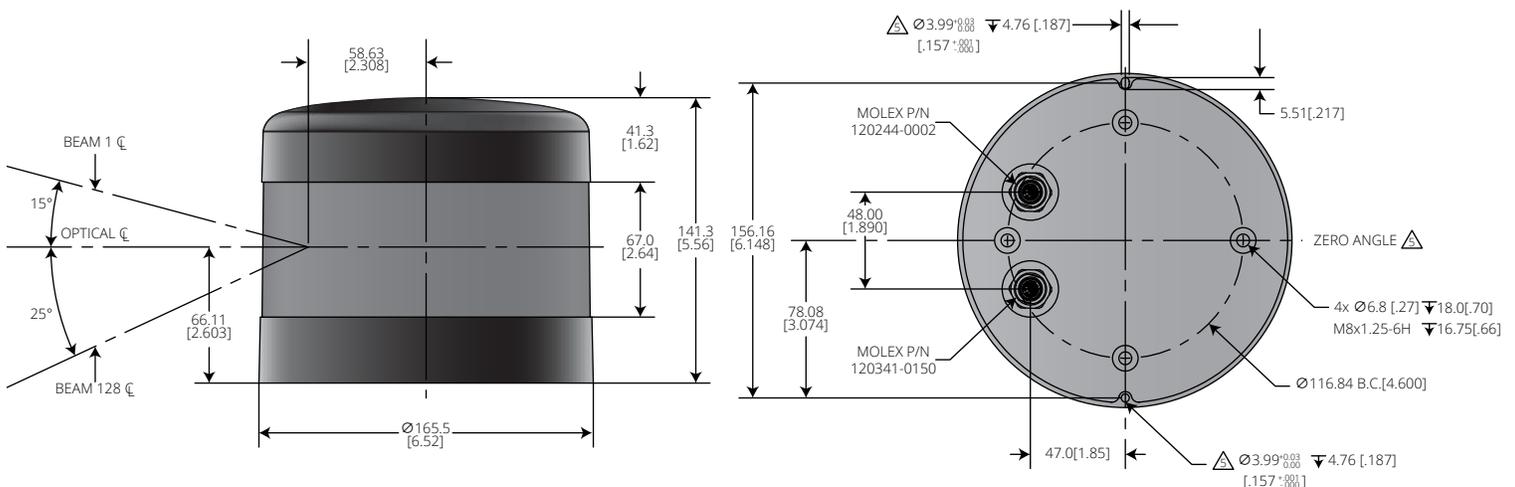
Providing long-range detection of low reflectance objects such as tire fragments, dark vehicles, asphalt, and pedestrians, the Alpha Prime enables autonomous operation within a broad range of settings, including urban and highway environments. A culmination of Velodyne's decade-plus experience engineering and manufacturing lidar, the Alpha Prime is powering safe autonomy.

Alpha Prime at a glance

- **Best horizontal (360°) and vertical (40°) long-range sensor**
 - 10% targets >220m typical
 - 5% targets >150m typical
 - Ground plane hits >90m typical
- **High resolution (0.2° x 0.1°) and point density at full frame rate**
- **Industry-leading, proprietary sensor-to-sensor interference mitigation**
- **Strong performance with retro reflectors & sunlight**
- **New power efficiencies for maximum operating temperature**
- **Proven, Class 1 eye-safe 903 nm technology**
- **Bottom connector, with cable length options**
- **6 to 8-week lead time standard**
- **Multiple manufacturing sources available for qualified production projects**



DIMENSIONS *(Subject to change)*



Real-Time Lidar Sensor

The Alpha Prime provides ultra-high resolution 3-dimensional point clouds of the surrounding environment.



Alpha Prime™

Specifications¹

(Subject to change)

Sensor	<ul style="list-style-type: none"> • Channels: 128 • Measurement Range: up to 245m² • Detection: 150m on 5% NIST and 220m on 10% NIST • Range Accuracy: +/- 3 cm (Typical)³ • Return Modes: 1 or 2² • Horizontal Field of View: 360° • Vertical Field of View: 40° (-25° to +15°) • Minimum Angular Resolution (Vertical): 0.11° (non-linear distribution) • Angular Resolution (Horizontal/Azimuth): 0.1° to 0.4°⁴ • Frame Rate: 5 Hz to 20 Hz⁴ • Integrated Web Server for Easy Monitoring and Configuration
Laser	<ul style="list-style-type: none"> • Laser Product Classification: Class 1 - Eye -safe per IEC60825-1:2014 • Wavelength: ~ 903 nm
Mechanical/Electrical/Operational	<ul style="list-style-type: none"> • Power Consumption: 22W (under typical conditions)⁵ • Operating Voltage: 9V - 28V (including regulated power supply) • Weight: ~ 3.5 kg (without cabling) • Dimensions: See diagram on previous page • Environmental Protection: IP67 • Operating Temperature: -20°C to 60°C (under typical conditions)⁶ • Storage Temperature: -40°C to 105°C
Output	<ul style="list-style-type: none"> • 3D Lidar Data Points Generated² <ul style="list-style-type: none"> - Single Return Mode: ~ 2,400,000 points per second - Dual Return Mode: ~ 4,800,000 points per second • Ethernet Connection: 1000Base-T • UDP Packets Contain: <ul style="list-style-type: none"> - Time of Flight Distance Measurement - Calibrated Reflectivity Measurement - Synchronized Time Stamps (µs resolution) - System Diagnostic Data • GPS: \$GPRMC and \$GPGGA NMEA Sentence from GPS Receiver (GPS not included)

1. These are projected specifications for final production parts. The specifications for any sample, prototype, or other non-final or pre-production products may be different from the specifications in this document. For more information, please contact Velodyne Sales.

2. Configuration dependent.

3. Typical accuracy refers to ambient wall test performance, excluding Retro, across most channels and may vary based on factors including but not limited to range, temperature and target reflectivity.

4. Fully characterized at 10 Hz.

5. Operating power may be affected by factors including but not limited to range, reflectivity and environmental conditions.

6. Operating temperatures may be affected by factors including but not limited to air flow and sun load.