

# Leddar™ Pixell

Cocoon LiDAR for Autonomous Vehicles



Robotaxis



Autonomous  
delivery  
vehicles



Commercial  
vehicles



Autonomous  
shuttles



Off-road  
vehicles



## Overview

The Leddar Pixell is a 3D flash LiDAR with 180-degree field of view (FoV) specifically designed for ADAS and autonomous driving applications. Powered by the LCA2 LeddarEngine™, the Leddar Pixell provides reliable detection of pedestrians, cyclists, and other obstacles in the vehicle's surroundings and is optimized for use in perception platforms that are meant to enhance detection capabilities of vulnerable road users (VRU). The robust, solid-state Pixell compensates for the limitations of mechanical scanning LiDARs used for geopositioning which generate blind areas that can reach several meters. The Pixell enables a comprehensive detection "cocoon" that surrounds the vehicle, enhancing detection coverage.

## 3D Cocoon LiDAR Technology

Using the latest in 3D flash LiDAR technology, the Pixell provides more scene coverage than most scanning LiDARs, which drastically reduces dead zones. Thanks to the Pixell's wide horizontal FoV, four sensors will cover the entire vehicle surroundings over 360 degrees and provide redundancy coverage in its corners. Data provided by Leddar Pixell allow for object tracking and identification of possible collisions based on object position, velocity, and directionality without overwhelming the vehicle's CPU with massive amounts of unnecessary data.

## Main Applications

- Proximity detection
- Blind spot coverage
- Collision avoidance
- Navigation

## Superior Robustness and Reliability

Deployments of detection systems on any type of commercial or industrial vehicle require highly durable technologies to ensure high MTBF and to minimize downtime and operational expenditures, all the while ensuring reliable and secure vehicle operation.

Based on a robust, 100% solid-state LiDAR design with no moving parts for superior reliability, the heavy-duty Leddar Pixell LiDAR delivers superior lifespan and MTBF, which makes it ideally suited for ADAS and autonomous vehicle deployments in any operating domain, including public transport, construction, mining, and military.

- 100% solid-state
- Meets stringent shock and vibration standards
- Wide operating temperature range
- IP67 rated enclosure
- Impact-resistant windows
- Automotive-grade connectors

## LeddarEngine™ at the Core

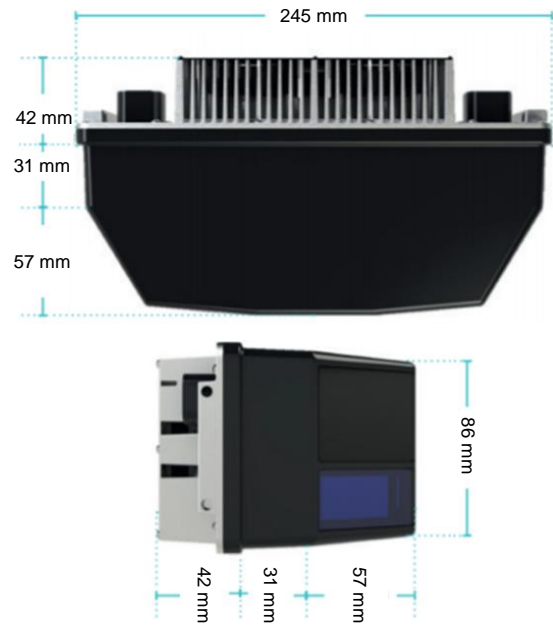
The Pixell has been designed using the state-of-the-art LCA2 LeddarEngine, the powerful LiDAR core for automotive and mobility applications, leveraging LeddarTech's patented signal acquisition and processing and highly integrated LiDAR SoC.

## Leddar Pixell Key Features

- Superior robustness, ideally suited for the most demanding commercial and industrial environments
- 96 horizontal and 8 vertical segments, providing 768 independent surfaces with simultaneous acquisitions
- 3D flash illumination technology, providing 8 times more vertical coverage than most scanning LiDARs
- Pedestrian detection range of up to 32 meters
- Ability to detect two objects within the same segment (demerging function)
- Wide operating temperature range

### Specifications<sup>1</sup>

|                                       |  |
|---------------------------------------|--|
| Field of view <sup>2</sup> (°)        | Horizontal: 177.5 ± 2.5<br>Vertical: 16.0 ± 0.5  |
| Surface size (°)                      | Horizontal: 1.9<br>Vertical: 2.0   |
| Range <sup>2</sup> (m)                | Pedestrian <sup>3</sup> : 32<br>10% reflectivity <sup>4</sup> : 20<br>50% reflectivity <sup>4</sup> : 45<br>80% reflectivity <sup>4</sup> : 56 |
| Accuracy <sup>2, 5</sup> (cm)         | ±3   |
| Operating wavelength (nm)             | 905  |
| Power supply (VDC)                    | 11 to 52   |
| Power consumption <sup>6</sup> (W)    | 20   |
| Communication interface               | Automotive Ethernet 100Base-T1   |
| Data refresh rate (Hz)                | 20   |
| Time synchronization<br>Input sources | IEEE1588-2008 Precision Time Protocol<br>External PPS (no embedded data)   |
| Operating ambient temperature (°C)    | -30 to +65   |
| Weight (kg)                           | 2.1  |



### Regulatory Compliance

|              |  |
|--------------|--|
| Shock        | IEC 60068-2-27:2008 (up to 100 g)<br>ISO 16750-3:2003    |
| Vibration    | IEC 60068-2-64:2008 (up to 2.2 Grms)<br>ISO 16750-3:2003 |
| Dust         | SAE J1455:2017   |
| Ingress      | IP67; IEC 60529:2013                                     |
| Laser safety | IEC EN 60825-1 Class 1<br>US 21CFR1040                   |
| CE           | Compliant  |
| EMC          | IEC/EN 61000-4-2, 3, 4, 6, 8<br>IEC/EN 61000-6-2, 3      |
| RoHS         | 2011/65/EU amended 2015/863                              |

Refer to the User Guide for more information on Leddar Pixell performances and limitations.

- 1 Environmental conditions, weather, and reflectivity level of elements in the scene may affect sensor performance.
- 2 Typical specification.
- 3 Euro NCAP Pedestrian, 50% reflectivity.
- 4 Full pixel coverage.
- 5 Ambient test performance with 3  $\sigma$  standard deviation. Non-saturated signal without crosstalk for non-merged events.
- 6 Nominal power consumption at +20 °C.

# LeddarTech®

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