Leddar™ IS16

Industrial Solid-State LiDAR Sensor

Industrial Automation

Multi Segment Flash LiDAR with IP67 Enclosure for Harsh Industrial Environment

Specially designed for the industrial market, the Leddar® IS16 Industrial solid-state sensor is optimized for 0 to 50 meter (165 ft.) detection and ranging applications, providing both distance and angular positioning while performing fast, continuous and accurate analysis of the area.

The 48-degree beam, produced by diffused light pulses and processed through innovative algorithms, enables this unique sensor to detect, locate and measure a wide range of objects under various environmental conditions.

Features

- 16 independent segments with simultaneous acquisition and lateral discrimination capabilities
- 48-degree beam, for optimized field of view
- 0 to 50 meter detection range (165 ft.)
- Rapid data acquisition time up to 50 Hz
- LCD display for configuring and monitoring ongoing operations
- Fast setup and integration

Benefits

- IP67 weather-resistant enclosure
- Proven reliability in harsh conditions
- Immune to ambient light
- No moving parts, for superior robustness
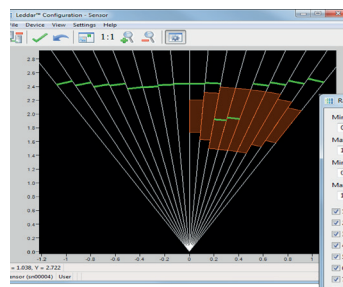- Low power consumption

Presence Detection Mode

The IS16 software includes Presence Detection Mode, where the PNP/NPN outputs can be set according to whether or not there are objects within the configured detection zones (two zones, one per output).

With the Teach Configuration feature, the sensor can define the perimeter of its surroundings as a detection zone. In Quick Mode, a near limit and a far limit can be easily configured to quickly define detection zones. Alternatively, zones can also be configured manually in Advanced Mode where near and far limits can be set for each segment and unwanted segments can be deactivated.

Raw Measurements Mode

The IS16 also provides the capabilities to acquire and log all measurements from all segments in real time through the RS-485 link. Each measurement provides the distance of the detected object, the index of the segment it was detected in, and the intensity of the measurement (indication of how much light was reflected of the object and captured by the sensor).

Presence Detection Mode

Raw Measurements Mode

A custom zone can be defined and unneeded segments may be disabled

Features

- **Field of view** 48° Horizontal, 6° Vertical
- **Discrete output** 2 x PNP/NPN
- **Analog output** 4-20 mA [2], 0-10 V [2]
- **Interfaces** USB, RS-485, CAN
- **Wavelength** 940 nm
- **Power supply** 12 to 30 VDC
- **Dimensions** 136 mm x 86 mm x 70 mm
- **Weight** 430 g
- **Connector** M12
- **Display** Optional control panel with LCD and 4 buttons

*2. Provision for future use.*

System performance

- **Detection range** 0 to 50 meters (165 ft.) [1]
- **Accuracy** 5 cm
- **Data refresh rate** up to 50 Hz
- **Operating temperature range** -40°C to +50°C
- **Meets IEC 62471 2006 criteria:** Exempt lamp classification
- **Acquisition** 16 segments simultaneously
- **Distance precision** ±6 mm
- **Distance resolution** ±10 mm
- **Ingress protection** IP67
- **Power consumption** 5.6 W
- **Regulatory compliance** CE, FCC, RoHS

1.Varies according to target.

Configurations

- **IS16-75E0001** RS-485 & USB with LCD and Advanced Detection mode
- **IS16-75E0003** RS-485 & USB no LCD, no Advanced Detection mode
- **IS16-75E0004** CAN Bus & USB no LCD, no Advanced Detection mode
- **IS16-75E0005** CAN Bus & USB with LCD and Advanced Detection mode

Segmentation of a 48° beam
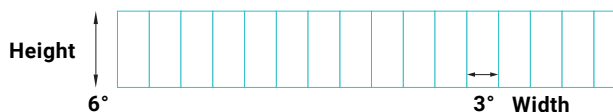
Amplitude vs. Distance
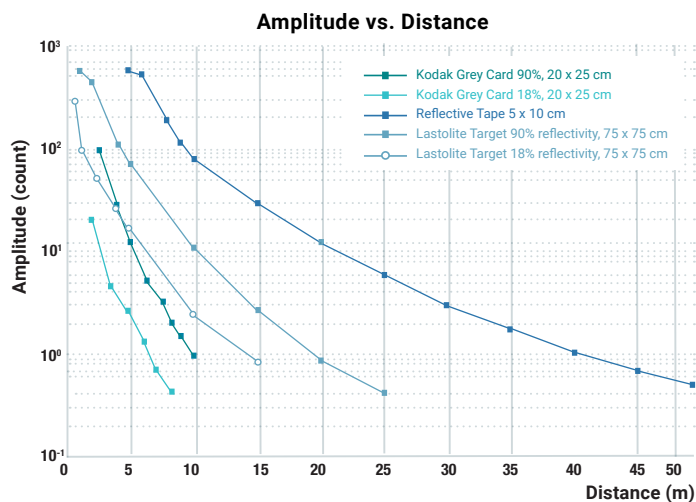
The chart above displays the detection amplitude of a 48° sensor for five reference objects (photography grey cards and reflective tape) of varying size and reflectivity.

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Leddar™ Pixell

Cocoon LiDAR for Autonomous Vehicles

Robotaxis

Autonomous delivery vehicles

Commercial vehicles

Autonomous shuttles

Off-road vehicles

Overview

Introducing the Leddar Pixell, 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.

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
- Wide operating temperature range

Main Applications

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

Specifications[1]

Field of view[2] (°)	Horizontal: Vertical:	177.5 ± 2.5 16.0 ± 0.5
Surface size (°)	Horizontal: Vertical:	1.9 2.0
Range[2] (m)	Pedestrian[3]: 10% reflectivity[4]: 50% reflectivity[4]: 80% reflectivity[4]:	32 20 45 56
Accuracy[5] (cm)	± 5	
Precision (1 σ / standard deviation)	SNR > 250: SNR 100: SNR 12:	± 0.2 cm ± 0.6 cm ± 4.8 cm
Operating wavelength (nm)	905	
Power supply (VDC)	11 to 52	
Power consumption[6] (W)	20	
Communication interface	Automotive Ethernet 100Base-T1	
Frame rate (Hz)	20	
Time synchronization Input sources	IEEE1588-2008 Precision Time Protocol External PPS (no embedded data)	
Operating ambient temperature (°C)	-30 to +65	
Weight (kg)	2.1	

245 mm
42 mm
31 mm
57 mm
86 mm
42 mm
31 mm
57 mm
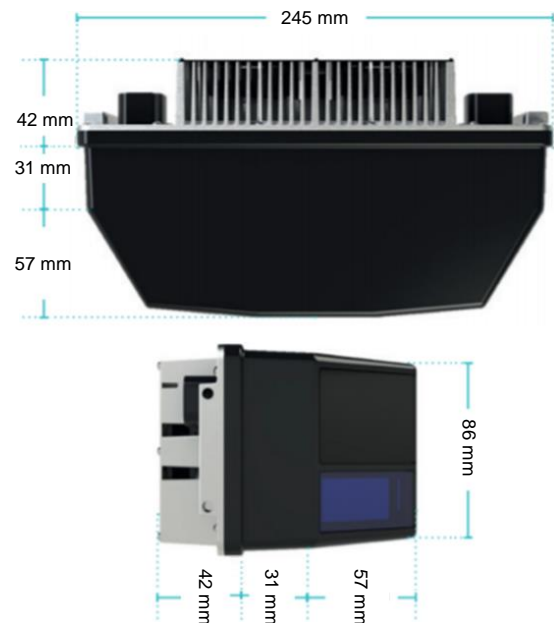
Regulatory Compliance

Shock	IEC 60068-2-27:2008 (100 g, 11 ms) ISO 16750-3:2003
Vibration	IEC 60068-2-64:2008 (2.2 Grms, 10 to 2000 Hz) ISO 16750-3:2003
Ingress	Dust: SAE J1455:2017; water: IP67
Laser safety	IEC EN 60825-1 Class 1 US 21CFR1040
CE	Compliant
EMC	IEC/EN 61000-4-2, 3, 4, 6, 8 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] Non-saturated signal without crosstalk for non-merged events.
[6] Nominal power consumption at +20 °C.

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