

# LeddarTech®



Sensing and Perception  
Solutions That Enable  
Autonomous Vehicles  
and Advanced Driver  
Assistance Systems



# A Leader in Environmental Sensing Solutions

LeddarTech is a leader in environmental sensing solutions for autonomous vehicles and advanced driver assistance systems.

Founded in 2007, LeddarTech has evolved to become a comprehensive end-to-end environmental sensing company by enabling customers to solve critical sensing and perception challenges across the entire value chain of the automotive and mobility market segments with its LeddarVision™ sensor-fusion and perception platform.

LeddarTech delivers a cost-effective, scalable, and versatile LiDAR development solution to Tier-1 and 2 automotive suppliers and system integrators, enabling them to develop automotive-grade solid-state LiDARs based on the foundation of the LeddarEngine™. LiDAR solutions based on this auto and mobility platform are actively deployed in autonomous shuttles, trucks, buses, delivery vehicles, robotaxis, smart city, and industrial applications.

LeddarTech also offers technical consulting and R&D professional services in optics, electronics, and software to support its customers' and partners' product and system development leveraging Leddar sensing and perception technologies.

- Unique sensor fusion and perception solution for the automotive and mobility markets
- 14 generations of solid-state LiDARs based on the LeddarEngine™ platform
- Over 10 years of field-proven technology development and more than 40 000 sold
- Over 95 patented technologies (granted or pending)
- Scalable SoC and signal processing library as a platform for solid-state LiDARs
- Ecosystem partnerships to accelerate technology development and reduce risks
- Disruptive business model enabling faster widespread adoption
- Widely adopted LiDAR platform with Tier-1 and Tier-2 automotive suppliers



# Making a Difference Through Purposeful Innovation

## Our Mission

LeddarTech's mission is to improve safety and quality of life for travelers, commuters, workers, and mobility industry professionals by enabling applications that reduce traffic congestion, minimize the risk of road accidents, and improve the overall efficiency of road transport.

# LeddarVision™ Sensor-Fusion and Perception Platform



Passenger cars



Robotaxis



Commercial vehicles



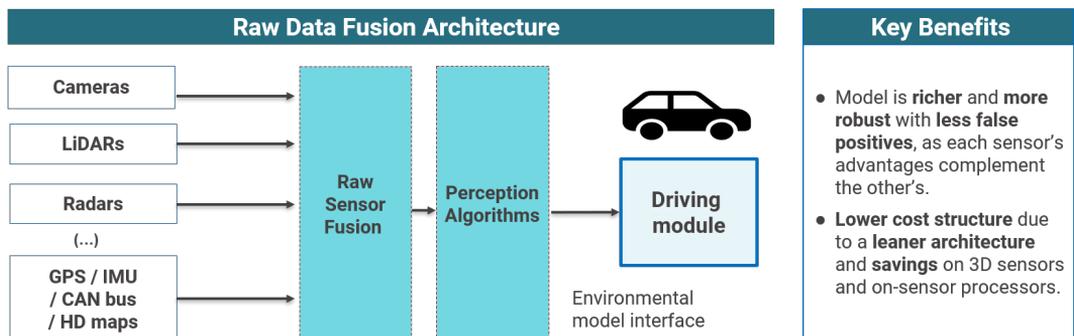
Autonomous shuttles

## A Better Perception Paradigm for Autonomous Driving

LeddarVision is a sensor fusion and perception solution that delivers highly accurate 3D environmental models for autonomous cars, shuttles, and more. The full software stack supports all SAE autonomy levels by applying AI and computer vision algorithms to fuse raw data from radar and camera for L2 applications and camera, radar, and LiDAR for L3-L5 applications.

Bringing together the technologies from LeddarSense™ and VAYADrive™ software, the LeddarVision software platform combines AI and computer vision technologies as well as deep neural networks with computational efficiency to scale up the performance of AV sensors and hardware essential for planning the driving path.

Combining the strengths of each sensor type, our state-of-the-art sensor fusion solution uses raw sensor data to enable the detection of the various objects in the scene, including vehicles, pedestrians, bicycles, drivable road, obstacles, signs, lanes, lane lines, and more. LeddarVision also detects very small obstacles on the road with better detection rates and less false alarms than legacy “object fusion” solutions. Unclassified obstacles are also detected, providing an additional layer of safety to the vehicle.



# Creating the Only, Truly Open, Flexible, and Scalable Sensing Platform for All Automotive and Mobility Applications

LeddarTech<sup>®</sup>



VAYAVISION  
A LeddarTech Company

## LeddarSense<sup>™</sup>

- LiDAR sensor perception calibration
- Object detection & tracking
- Waveform-based classification

## VAYADrive<sup>™</sup>

- Environmental perception software solution
- Raw data sensor fusion with upsampling
- State-of-the-art AI and computer vision
- Computational efficiency

## LeddarVision<sup>™</sup>

- Best-in-class perception platform
- Custom embedded solutions
- Raw data fusion from multiple sensors



Detection of small objects absent in training sets



Depth data assigned to every pixel in camera picture



Accurate shape definition of vehicles, humans, and any other object

# Automotive LiDAR Solutions

Powered by Leddar Technology

## LeddarEngine

The Power Driving Automotive and Mobility LiDARs

At the core of our LiDAR platform, the LeddarEngine™ sets a new standard for integrated and customizable solid-state LiDAR solutions that are optimized for high-volume production. LeddarEngine consists of a suite of automotive-grade, functional safety certified SoCs working in tandem with proprietary LeddarSP™ signal processing software.

- Support of multiple LiDAR architectures
- Designed for functional safety (ISO-26262 ASIL-B)
- Automotive-grade (AEC-Q100)
- Multi-SoC capability
- Support of linear MEMS

LeddarEngine enables automotive Tier-1 suppliers and system integrators to design their own differentiated LiDAR solution by providing the technology, tools, and resources they need to meet the specific requirements of various advanced driver assistance systems (ADAS) and autonomous driving applications (AD).



Passenger cars



### LeddarEngine LCA2

For short-to medium-range LiDARs

32 channels  
1.6 billion samples/sec.  
Up to 48,000 waveforms/sec.



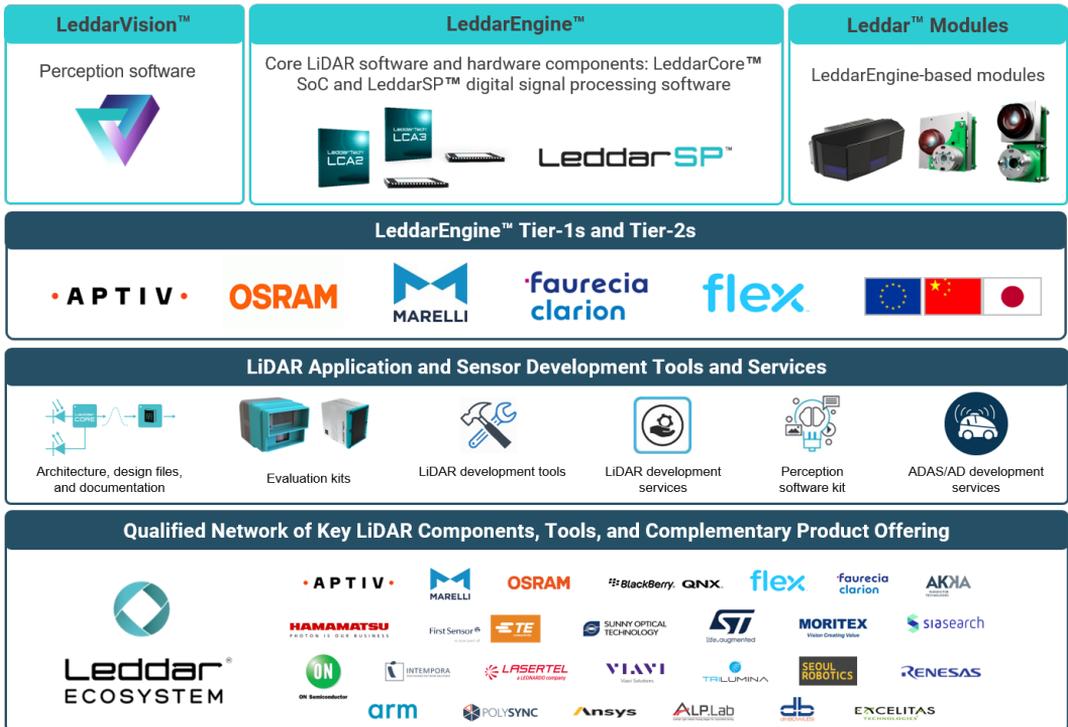
### LeddarEngine LCA3

For medium-to long-range LiDARs

64 Channels  
5.12 billion samples/sec.  
Up to 935,000 waveforms/sec.

# Auto and Mobility LiDAR Platform

The Auto and Mobility Platform is at the heart of LeddarTech's business model. This versatile, scalable LiDAR platform for Tier-1 suppliers and AD system integrators enables the development and mass deployment of ADAS and autonomous driving solutions for automotive and mobility OEMs, in collaboration with the Leddar Ecosystem partners.



## Scalable, Versatile

- Software-based LiDAR solution
- Single architecture covers various use cases
- Architecture and software compatibility enables central architecture or local processing
- Meets high-volume production requirements
- Ecosystem partnerships support the rapid deployment of enabling technologies
- Compatible with a variety of LiDAR technologies

## Optimal Cost/Performance

- Allows the selection of building blocks and components according to market needs
- Enables higher performance from lower cost, standard components

## Automotive-Grade

- SoC architecture and software designed to meet ISO 26262 functional safety standards
- Roadmap supports multiple generations of automotive integration meeting AECQ-100

# Mobility LiDAR Sensors

## Powered by Leddar™ Technology

LeddarTech serves the mobility market by providing new designs of high-performance solid-state LiDAR modules for use in a variety of vehicles, including autonomous shuttles, trucks, buses, delivery vehicles, and robotaxis.

LiDAR modules such as the Leddar Pixell demonstrate all the power and possibilities of the LeddarEngine, the LiDAR core for automotive and mobility applications based on our patented signal acquisition and processing and highly integrated LiDAR SoC.



Robotaxis



Autonomous delivery vehicles



Commercial vehicles



Autonomous shuttles



Industrial vehicles

## Leddar Pixell

### The Most Robust 3D LiDAR for Mobility Applications

The most robust LiDAR on the market, Leddar™ Pixell enables a complete detection “cocoon”, providing dependable object and vulnerable road user detection as well as exceptional robustness and durability.

Designed from the ground up for operation in the harshest mobility environments, the heavy-duty Leddar Pixell complies with demanding industry standards for resistance to shock, vibration, and dust, delivering superior lifespan and reliability. As such, this 3D solid-state LiDAR represents the ideal solution for commercial, public transit, military, and industrial vehicles' ADAS and AD applications.



- 100% solid-state design
- Fanless IP67 enclosure
- Best-in-class shock and vibration resistance
- Wide operating temperature range
- Impact-resistant windows
- Automotive-grade connectors





## Leddar Sight

### Robust, Reliable 16-Segment 2D LiDAR Sensor

The Leddar Sight sensor is a robust, cost-effective 2D solid-state LiDAR housed in a weatherproof enclosure that uses flash illumination and combines 16 independent active detection elements to deliver rapid, continuous, and accurate detection and range—including lateral discrimination—in the entire wide beam, without any moving parts.

- 400,000 hours MTBF, up to 26X longer than mechanical LiDARs
- Meets stringent shock and vibration standards
- IP67/IP69 rated, impact-resistant enclosure



## Leddar Vu8

### 8-Segment Solid-State LiDAR Sensor Module

Leddar Vu8 is an affordable, versatile solid-state LiDAR sensor module that delivers exceptional detection and ranging performance in a small, robust package. Leddar Vu8 modules provide the ability to detect and track multiple objects simultaneously over 8 distinct segments with superior lateral discrimination capabilities.

- Detection range up to 185 m
- Compact and lightweight
- Various beam options for optimized field of view



## Leddar M16

### 16-Segment Solid-State LiDAR Sensor Modules

Leddar M16 sensor modules are proven solid-state LiDAR solutions that combine wide-beam flash illumination with 16 independent detection segments to simultaneously deliver rapid, continuous, and precise detection and ranging for multiple objects along with excellent lateral discrimination.

- Detection range up to 165 m
- Proven reliability for indoor and outdoor operation
- Various beam options for optimized field of view

# Specialty LiDAR Sensors

## Powered by Leddar™ Technology



ITS



ITS



Drones



Industrial  
automation

### Leddar d-tec

#### Above-Ground Stop-Bar Detection System

The Leddar d-tec is a LiDAR-based stop-bar detection system offering advanced sensing capabilities for traffic light management, representing the perfect alternative to legacy induction loop detectors. The Leddar d-tec provides accurate and reliable detection of all types of traffic (vehicles, bicycles, motorcycles, pedestrians) in all weather and lighting conditions.



### Leddar T16

#### Solid-State LiDAR Traffic Sensor

Packaged in a weatherproof housing, the powerful Leddar T16 Traffic Sensor is specifically designed for traffic management systems—from city to highway applications. It offers cost-efficient and highly accurate vehicle detection for various Intelligent Transportation System (ITS) applications, such as free-flow electronic tolling, traffic monitoring, and law enforcement.



### LeddarOne™

#### Single-Segment LiDAR Sensor Module

The LeddarOne sensor module is dedicated to single-point detection and precise distance measurements. This low-cost module integrates patented Leddar digital signal processing technology for reliable performance at distance ranges up to 40 m.



### Leddar IS16

#### Industrial Solid-State LiDAR Sensor

Specifically designed for the industrial market, the Leddar IS16 is a robust, multi-segment flash LiDAR sensor that delivers consistent performance and reliability in the harshest conditions. With its weather-resistant enclosure, this solid-state LiDAR is perfectly suited to both outdoor and indoor applications.



# Leddar Technology:

## The Key Enabler for Mass-Market LiDAR Deployments

Leddar is LeddarTech's proprietary LiDAR technology which provides advanced LiDAR signal acquisition and processing to deliver significant and distinct cost and performance advantages. Its optimized light signal digitization and signal processing expands the sampling rate and time resolution, and recovers distance, reflectivity, and quality information of objects. Through mitigation of interference, environmental conditions, and other limiting conditions intrinsic to traditional LiDAR sensors, Leddar provides highly reliable detection and ranging to the automotive and mobility market.

At the core of our LiDAR platform is the LeddarEngine, which is supported by more than 95 patents (granted or pending). The technology stems from more than a decade of R&D by leading engineers and scientists in the field and has been validated and optimized through various commercial deployments in challenging environments.

### Leddar Benefits

#### Higher sensitivity and range, for unmatched performance

Leddar's cleaner, digitized signal enables detection of weaker signals for significantly increased range using existing standard technology/components.



#### Less signal degradation, providing high robustness in inclement weather and changing light conditions

Multi-pulse measurement method statistically increases quality of measurements and full-waveform processing ensures high adaptability of sensors in all conditions.



#### No interference from sensors' overlapping fields of view or from other light sources

Multi-pulse measurement method combined with low duty cycle and spectrum spreading minimizes mutual sensor interference. Additional intelligent interference rejection enabled by full-waveform processing.



#### Enabling enhanced object detection, classification, and tracking

Detection segments provide complete sensing of the environment and better long-range object detection, classification, and tracking and with less data compared to point-based methods.



#### Affordable solid-state LiDAR suited to large-scale deployment

Leveraging affordable components and designed with no moving parts, Leddar-based sensors are designed for large-scale automotive grade production and deployment.



# The Leddar Ecosystem

The Leddar™ Ecosystem comprises a select group of world-class partners, suppliers, and collaborators that support the customer development of automotive sensing solutions for ADAS and autonomous driving applications.

In tandem with LeddarTech, The Ecosystem provides technical expertise, components, software, tools, and services, leveraging a hardware-agnostic platform that is both open and scalable.

Members are prequalified for integration with LeddarTech's LeddarEngine platform and LeddarVision sensor fusion and perception stack.

This collaborative approach maximizes design agility and reduces cycle time and costs, leading to a shorter time-to-market, reduced risks and a faster path to high-volume commercial deployments.



**Leddar**  
ECOSYSTEM

“TOGETHER, WE CAN SCALE  
THE MARKET THROUGH  
COLLABORATION AND  
HANDS-ON ENGAGEMENT”

## STRATEGIC PARTNERS

RENESAS

• APTIV •

MARELLI

flex

ON

ON Semiconductor

OSRAM

STI  
Authorized Partner

First Sensor  
is now part of

TE  
CONNECTIVITY

SUNNY OPTICAL  
TECHNOLOGY

## STRATEGIC SUPPLIERS

BlackBerry QNX

Clarion

HAMAMATSU  
PHOTON IS OUR BUSINESS

RENESAS

## ECOSYSTEM COLLABORATORS

arm

LASERTEL  
a LEONARDO company

Ansys

ALP.Lab

EXCELITAS  
TECHNOLOGIES

MORITEX  
Vision Creating Value

AKYA  
TECHNOLOGIES

POLYSYNC

db  
databases

siasearch

VIAYI  
Vivi Solutions

dSPACE

TRILUMINA

INTEMPORA  
TECHNOLOGIES

SEOUL  
ROBOTICS

# Engage with LeddarTech – Both Virtually and In Person:

## Digital Events

- **Move America Virtual**  
March 7-8, 2021
- **ON Semiconductor Technology Webinars**  
March 23, 2021
- **Propulsion Québec Digital Event**  
March 29-30, 2021
- **ADAS Sensors**  
April 6-8, 2021
- **RVIAQ-Rendez-vous en intelligence artificielle de Québec**  
April 12-13, 2021
- **Automotive Israel-Japan Virtual event**  
April 12-13, 2021
- **Hannover Messe**  
Quebec Export Delegation, April 12-16, 2021
- **Innovation Review on Connected Cars**  
Autotech council, April 15, 2021
- **B2B matchmaking program with TCS**  
The Canadian Trade Commissioner Service  
April 20-22, 2021
- **21IC Webinar-Asia**  
EETech Asia, April 27, 2021
- **6th Auto Sensors & Electronics Summit**  
April 28-29, 2021
- **Panel IA - Reso360**  
May 5, 2021
- **CIBC's Technology & Innovation Conference**  
May 12-13, 2021
- **EcoMotion Week**  
May 18-20, 2021
- **Autonomous Vehicles Online**  
Automotive IQ, May 26-27, 2021
- **IQPC-LeddarTech Webinar**  
June 22, 2021
- **IQPC-LeddarTech Webinar**  
June 29, 2021
- **All About Circuits Webinar**  
July 6, 2021
- **TRB Automated Road Transportation Symposium (AVS)**  
July 12, 2021
- **Industry Tech Days**  
September 13-17, 2021
- **ICCV 2021**  
October 11-17, 2021
- **Autonomous Chapter Event**  
November 25, 2021

## In-Person Events

-  **Tech.AD Europe**  
Berlin, Germany/July 1-2, 2020
-  **SSI Conference**  
Brussels, Belgium/November 9-10, 2021
-  **4th DVN Automotive LiDAR Conference**  
Frankfurt, Germany/November 15-16, 2021
-  **CES 2022**  
Las Vegas, USA/January 5-8, 2022

Consult [leddartech.com/events](https://leddartech.com/events) for complete listings

# Associations and Memberships

**APMA** – Automotive Parts Manufacturers Association of Canada

**AQT** – Association québécoise des technologies

**Autotech Council** – Better and faster innovation

**CCI** – Council of Canadian Innovators

**CCIQ** – Québec Chamber of Commerce and Industry

**CTA** – Consumer Technology Association (USA)

**FCCQ** – Fédération des chambres de commerce du Québec

**InnovÉÉ** – Innovation in Electrical Energy (Québec)

**Linux Foundation**

**INO** – National Optics Institute

**IWPC** – International Wireless Industry Consortium

**MIPI Alliance** – Mobile Industry Processor Interface Alliance

**Propulsion Québec** – Intelligent and Electrical Transports

**Québec Innove** – Network for Acceleration of Innovation

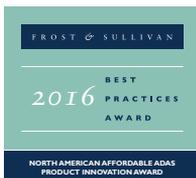


SAI GLOBAL  
ISO 9001  
Quality

## ISO 9001:2015 Certified Quality Management Systems certification

Since January 2019, LeddarTech's management system is certified to ISO 9001 by SAI Global, a leading global management systems certification body.

# Awards & Recognitions



Jalon<sup>mtl</sup>



# Notes

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# Specialized Expertise, Global Presence.



# LeddarTech®

CANADA – USA – AUSTRIA – FRANCE – GERMANY – ITALY – ISRAEL – HONG KONG – CHINA

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