LeiShen Intelligent System Co., Ltd.

Be an Innovative Global Leading Provider of LiDAR Sensors and Customized Solutions

MAKE DRIVING SAFER,
MACHINE SMARTER,
AND LIFE BETTER

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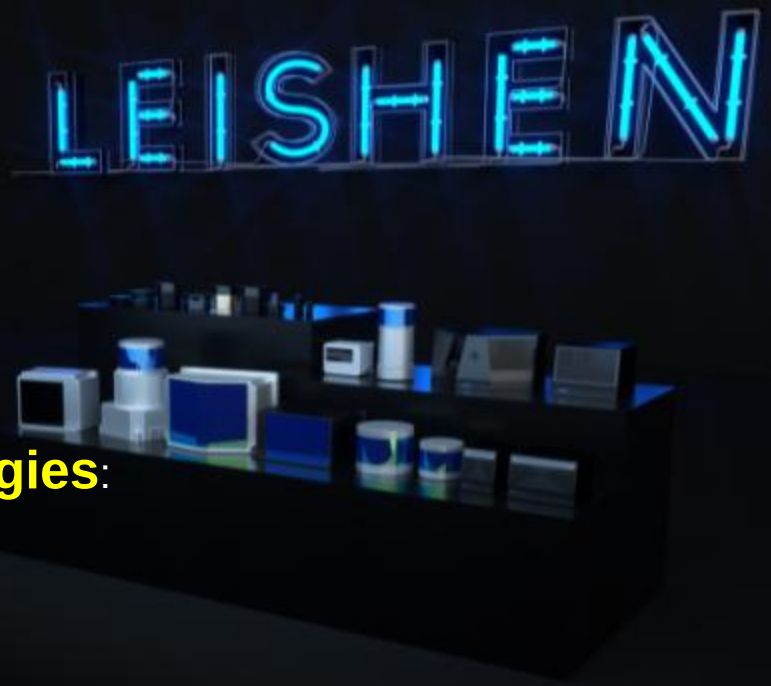
Company Introduction

Company Overview



Founded in 2015, LeiShen Intelligent System is an innovative global leading provider of LiDAR sensors and customized solutions, offering reliable and affordable LiDAR sensing technologies to deploy largely in automotive and other intelligent industries.

Be able to supply with **4 different Technologies**:

- **TOF (Time Of Flight)**
- **FMCW (Frequency-Modulated Continuous-Wave)**
- **Phase Method**
- **Triangular Method**

In the aim of building up the most intelligent LiDAR sensors matrix roadmap in the market

Global Business

350+ Employees

4 offices in China & **1** office in Europe & **1** Office in USA

2 Automation Plants

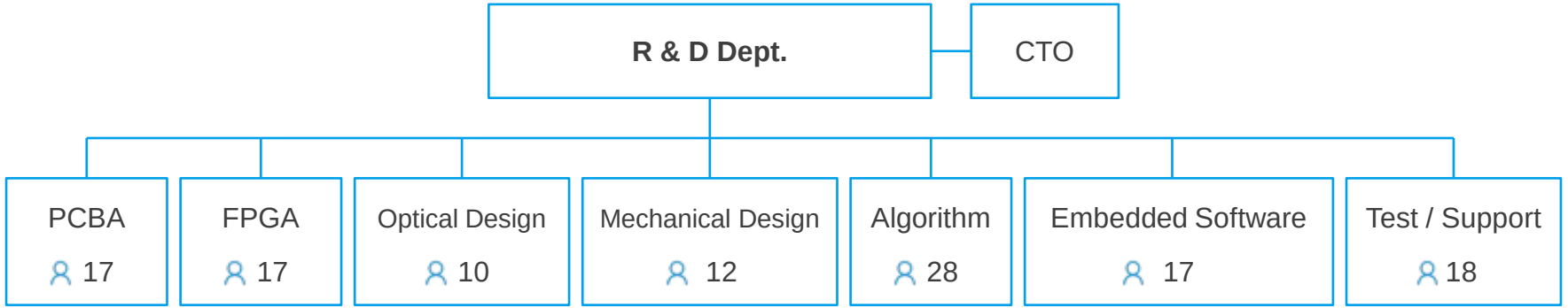
10,000+ units of 3D LiDARsold and shipped in 2019 in the world

Headquarters (R&D Center)

Shenzhen, China

2700㎡

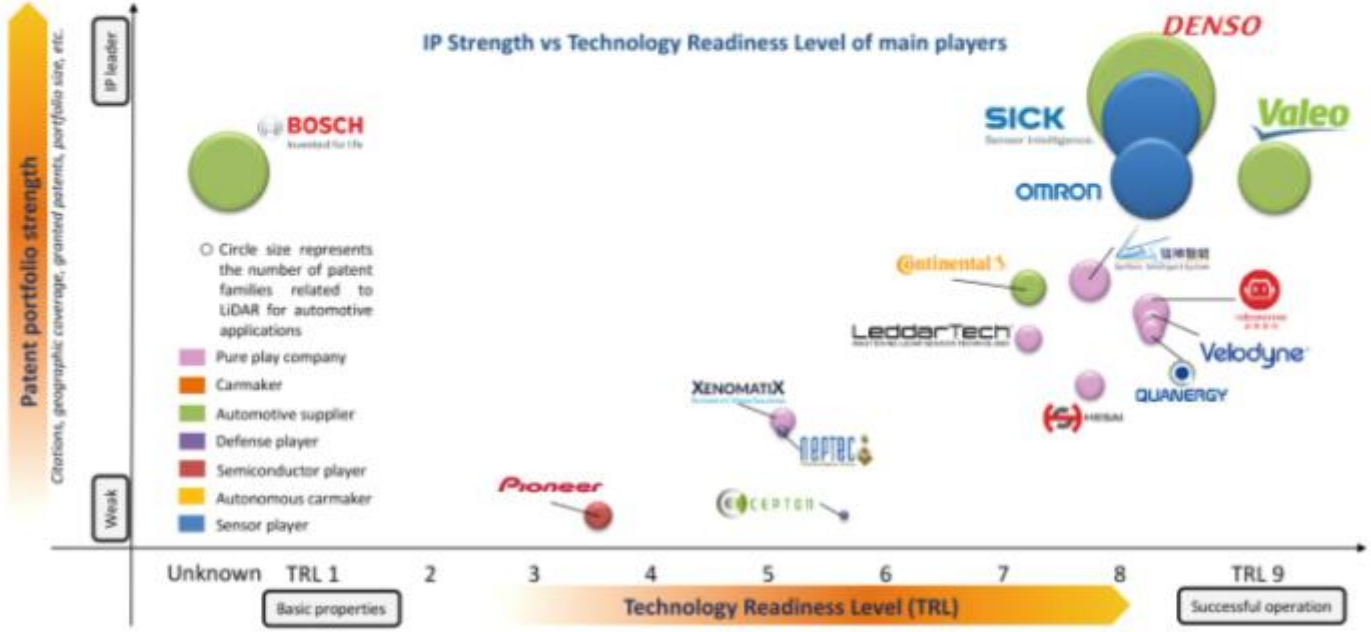
200+ Core Patents



LIDAR for automotive: IP landscape overview

Market position vs IP position

(Source: LIDAR for Automotive – Patent Landscape Analysis report, Knowmade, 2018)

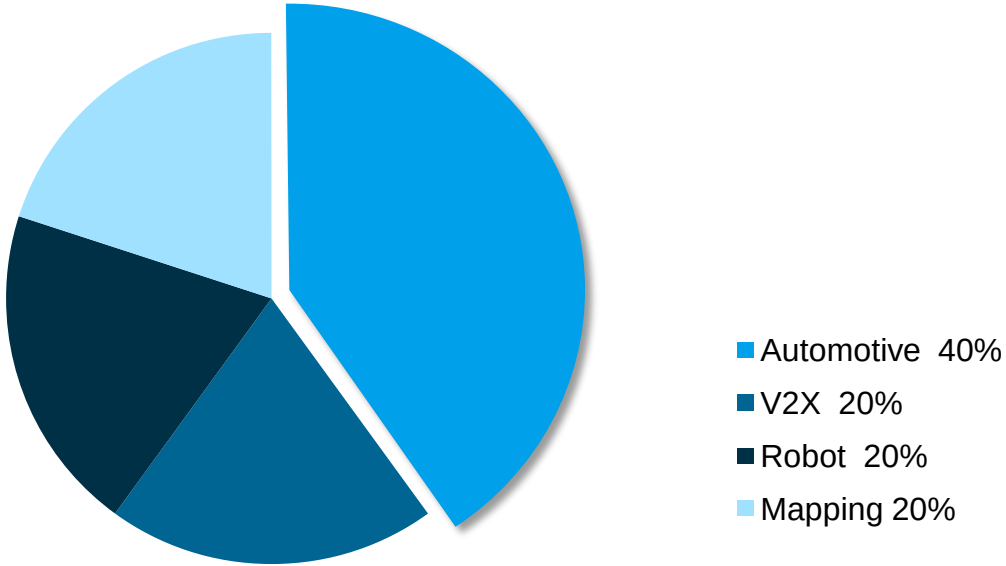


Automation Plants

Location	Area	Product Range	Capacity (pcs/season)	Output (pcs/season)	Workers
Shenzhen	4,600㎡	Automotive Grade Hybrid-Solid-State LiDAR	1,440	200	80+
		Mechanical 3D LiDAR	1,728	1,440	
		Mechanical 2D LiDAR	36,000	3,200	
		Triangular LiDAR	50,400	5,200	
Zhejiang	15,000㎡	Automotive Grade Hybrid-Solid-State LiDAR	7,200	520	40+
		Mechanical 3D LiDAR	17,280	0	

Marketing Strategy

- **Identification Global Key Tier 1(s) in automotive industry and domination Chinese market, as well as enhancement overseas market in Europe and USA**
- **Fully technical support and customized solution to fulfil Tier 1 and OEMs satisfaction**
- **Enhance market share in embedded functional Lidar sensors, as well as V2X applications**
- **In-House key components Independent Research and Development**



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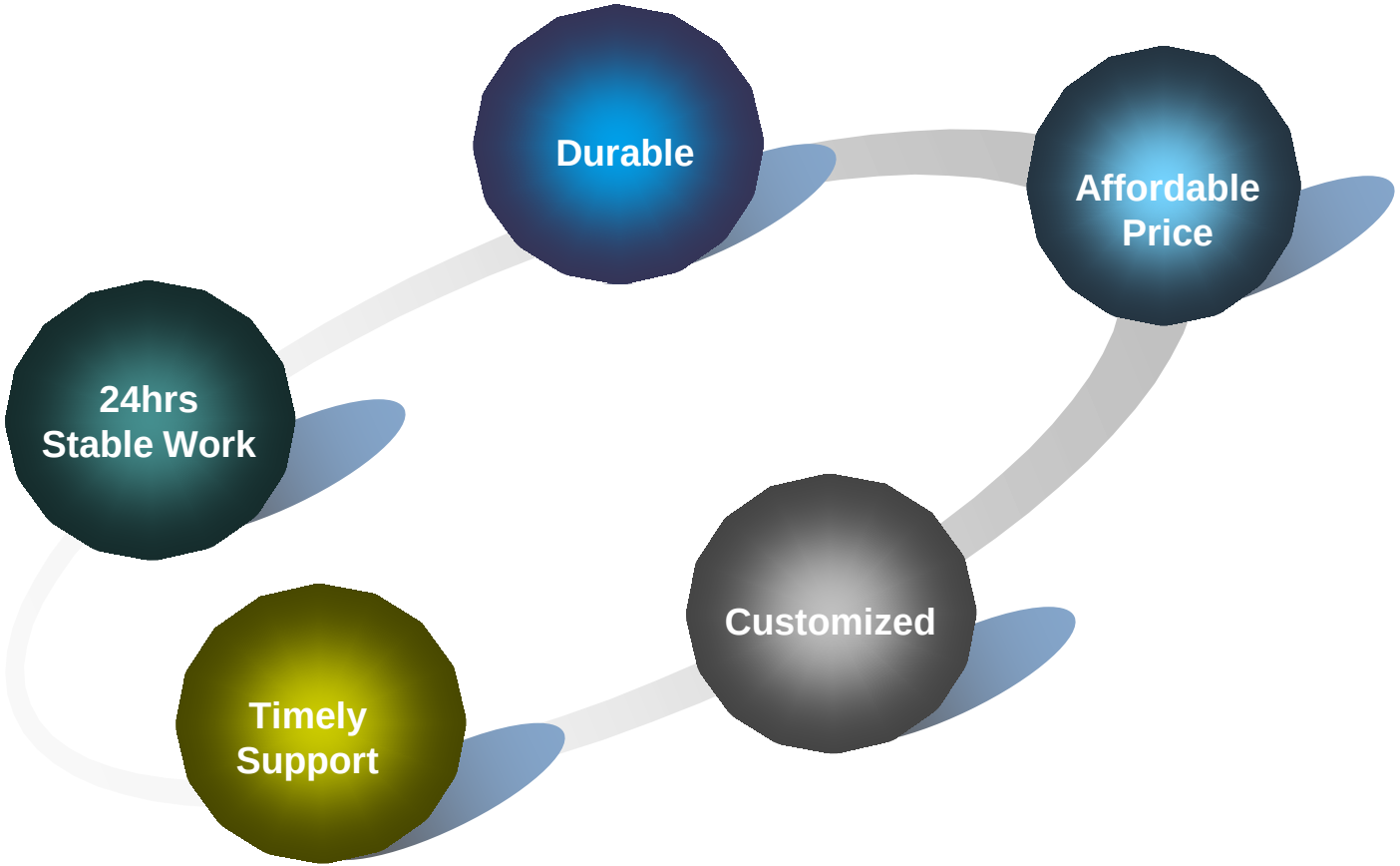
Automotive LiDAR

Customer Benefits



LiDAR Sensors Matrix Roadmap

LSLIDAR

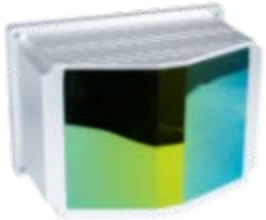
Building Up The Most Intelligent LiDAR Sensors Matrix Roadmap

Four Ranging Principles	LiDAR	Pre-R&D	R&D	☆ Prototype	★ MP	Product Image	Application Scene
TOF	**Automotive Grade** Hybrid-Solid-State LiDAR		160/200 channels		128/32/16 channels		Autonomous car, V2X, Smart traffic, AGV, 3D mapping, Security, Port ...
	Automotive Grade MEMS-Solid-State LiDAR		1550nm	905nm			
	Mechanical 360° LiDAR		48/64/128 channels		1/16/32 channels		
	Mapping LiDAR		Fixed Angle LiDAR	360° LiDAR			
	FLASH LiDAR	√					
	OPA LiDAR	√					
FMCW	FMCW LiDAR		√				
Phase	Phase LiDAR			√			Robot , AGV...
Triangular	Triangular LiDAR				√		Robot , ...

CH Series Multi-Channel LiDAR

- ✓ Specially designed for **L2-L5 autonomous driving**
- ✓ Fully meet the **Automotive Grade Requirement**
  (Undergoing **IATF16949** and **ISO26262**)
- ✓ **World's first** 32/16 channels Hybrid-Solid-State LiDAR
- ✓ **Highly integrated** & **Simplified installation**
  with reliable quality
- ✓ Long range, wide view, high resolution
- ✓ Complete anti-interference

CH Series Multi-Channel LiDAR



128 Channels

32/16 Channels

In House TIA Chipset

Highly compacted and embedded

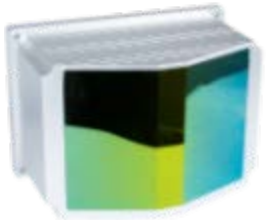
Laser Source - Feasibility & Stable

Assembly – Cost effective and efficient

Cost – Affordable for Mass Production

LSLIDAR

CH128



For L3 - L5

128 channels

100 / 150 / 200 m

±2cm accuracy

150° H. FOV

-17°~14.8° V. FOV

-40℃ ~ 85℃ working temp.

CH16 / CH32

For L2 - L4

16 / 32 channels

100 / 150 / 200 / 300 m

±2cm accuracy

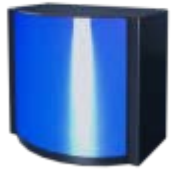
120° H. FOV

(CH32)-6.67° ~4.58° V. FOV

(CH16) -4° ~2° V. FOV

-40℃ ~ 85℃ working temp.

CH32W



For Blind Spot Detection

32 channels

30 / 50 / 70 / 100m

±2cm accuracy

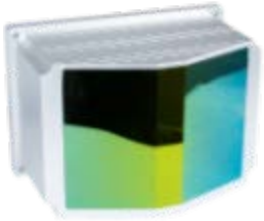
150° / 160° / 170° / 180° H. FOV

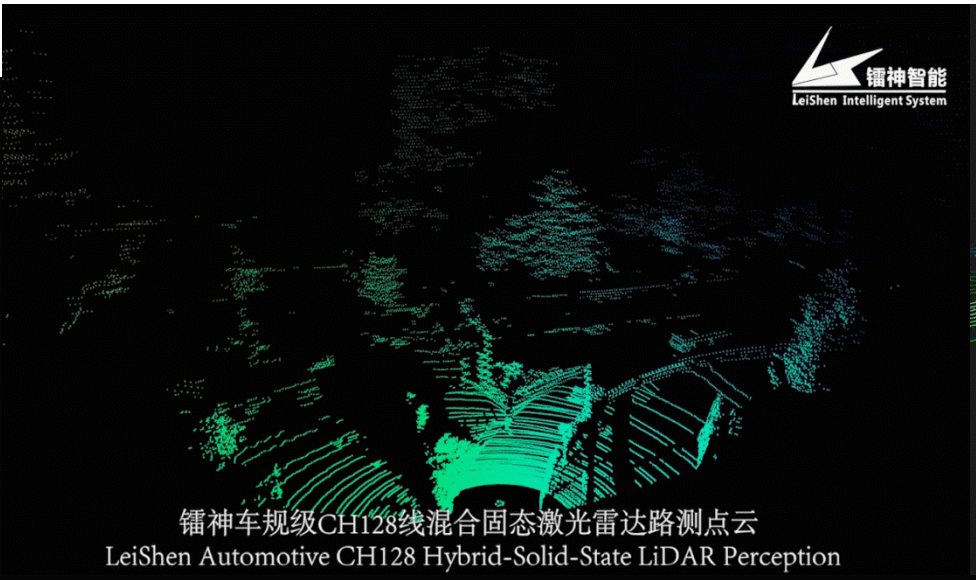
-30° ~30° V. FOV

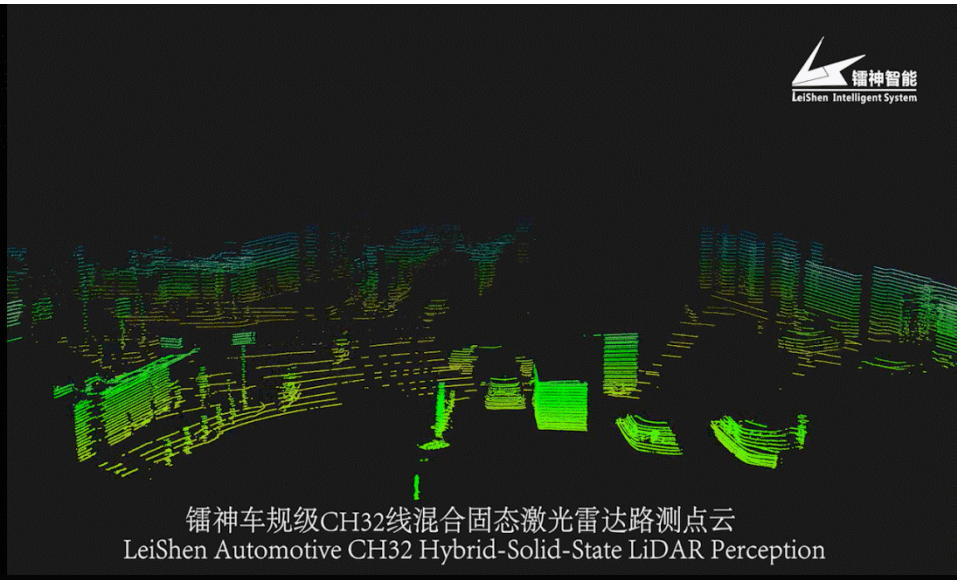
-40℃ ~ 85℃ working temp.

Customized for DONGFENG

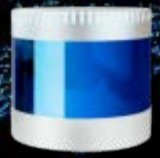
CH Series Multi-Channel LiDAR







CX Series Multi-Channel LiDAR



32 Channels

16 Channels

C32

- ✓ 360° 3D sensing responses
- ✓ Anti-vibration, impact resistance
- ✓ 24 hours working condition for more than 8 months
- ✓ Excellent performances for all kinds of autonomous driving system

CX Series Multi-Channel LiDAR

✓**Shot Test :**

anti-acceleration up to 40g last 11ms

✓**IP Rate :**

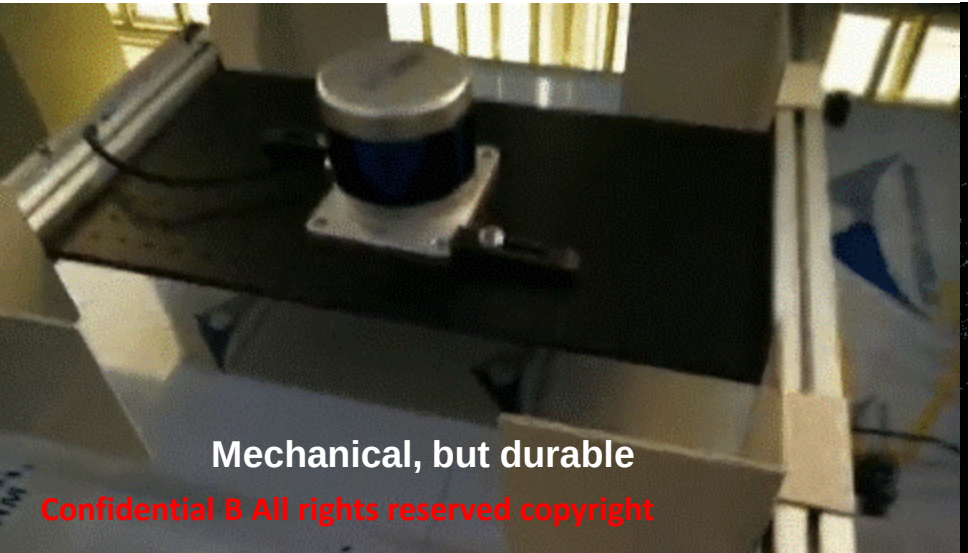
IP67

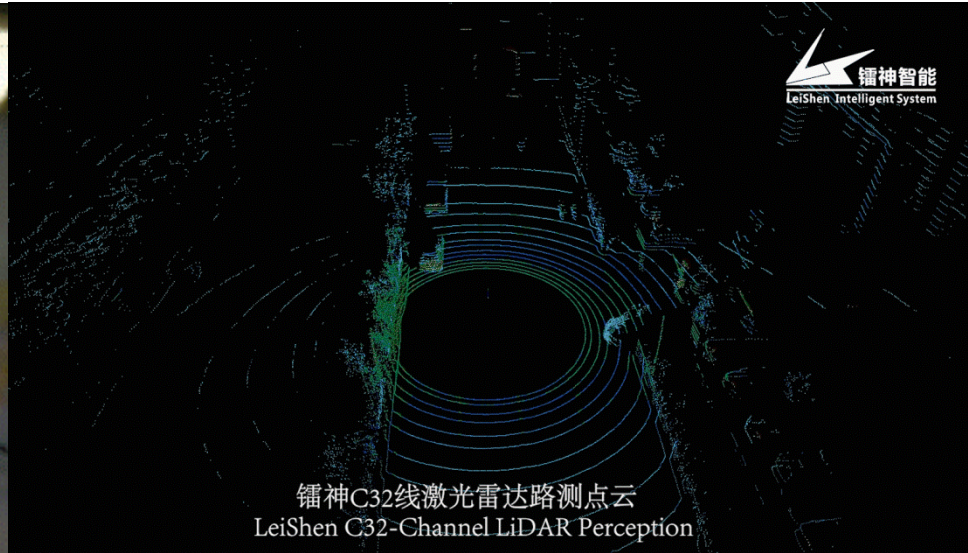
✓**Vibration Test:**

5Hz-2000Hz，3G rms

✓**Working Temp.:**

-20℃ ~ 60℃ (customized till -40 ℃)





Pre-develop since 2017...

Three Generations of LS20 Series MEMS LiDAR

2018 2019 2020

MEMS Solid-State LiDAR

In-House automotive grade Micro-mirror

Bottleneck breakthrough in MEMS LiDAR

✓ **Withstand higher working temp. :**
-40℃~105℃

✓**Anti vibration & impact resistance**

✓**Bigger size of the mirror :**
≥10mm

✓**Faster scanning rate:**
800~2000Hz(fast axis), 5~50Hz(slow axis)

MEMS Solid-State LiDAR

LS20C

Mid-range

905nm

150 m @10%

±3cm accuracy

120° H. FOV

20° V. FOV

-40℃ ~ 85℃ working temp.

LS20D

Mid-range

905nm

150 m @10%

±3cm accuracy

60° H. FOV

20° V. FOV

-40℃ ~ 85℃ working temp.

LS20E

Long-range

905nm

500m @70%

±3cm accuracy

20° H. FOV

20° V. FOV

-40℃ ~ 85℃ working temp.

LS20F

Blind Spot

905nm

100m @10%

±3cm accuracy

60°,90,120° H. FOV(optional)

20° V. FOV

-40℃ ~ 85℃ working temp.

MEMS Solid-State LiDAR

- ✓ **Wave Length: 1550nm**
- ✓ **Range: 300m**
- ✓ **Accuracy: ±3cm**
- ✓ **FOV: 60° x 20° (LS21A), 120° x 20° (LS21B)**
- ✓ **Scanning Rate: 10~25FPS(optional)**
- ✓ **Angular Resolution: 0.15° x 0.1°**
- ✓ **Working Temp. :-40℃ ~ 85℃**

In-House Independent Research and Development for 1550nm fiber laser

to gain excellent performance and affordable cost effective laser resource for long range scanning.

3

Customized Solutions

Autonomous Driving

CH Series 32-Channel LiDAR installed in DongFeng Sharing-VAN Platform

Four CH32 LiDARs are installed in each side of the van, collecting surrounding data for autonomous driving

Autonomous Driving

CH Series 32-Channel LiDAR installed in DongFeng Sharing-VAN Platform

DongFeng Sharing-VAN Platform can be transformed to shuttle bus, delivering car, mobile library, mobile store etc.

Autonomous Driving

Autonomous Driving Test with CH Series Multi-Channel LiDAR

Skywell 开沃汽车 (CH32)

DONGFENG (CH128)

Autonomous Driving

Autonomous Passenger Car with C32-Channel LiDAR

Autonomous Driving

Autonomous Shuttle with CX Series Multi-Channel LiDAR

(C16 x 2)

(C16 x 2)

(C16 x 2)

Autonomous Driving

Autonomous Bus with CX Series Multi-Channel LiDAR

(C16 x 2)

(C16 x 4)

(C32 x 2)

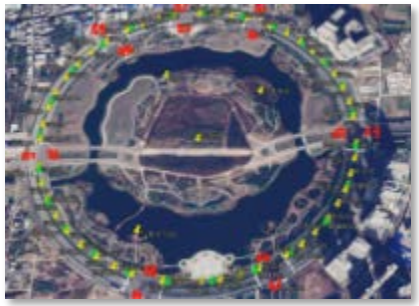
V2X

Location & Started on

Beijing 9/2019	Xuchang 4/2019	Zhengzhou 5/2019



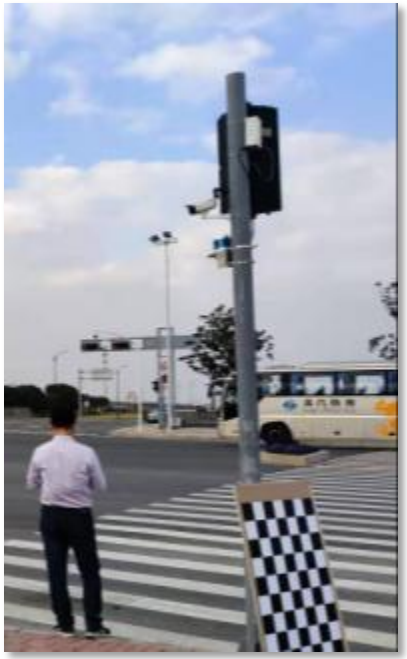




V2X

Location & Started on

Guangzhou	Shanghai	Chongqing	Suzhou
12/2019	8/2019	10/2019	10/2019



LS LiDAR In Anti-NCP

1) Patrol & disinfection robot 2) Sweeper 3) Disinfection robot 4) 5) Delivery robot

MGW Trade and Service Pty Ltd

Dealer of Leishen LIDAR products and technical solutions in Australia and New Zealand Region

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