镭神智能
LeiShen Intelligent System

LS LIDAR
PRODUCT GUIDE

Content

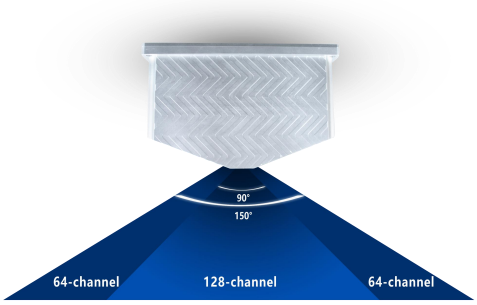
CH Series 128-Channel LiDAR

Abstract

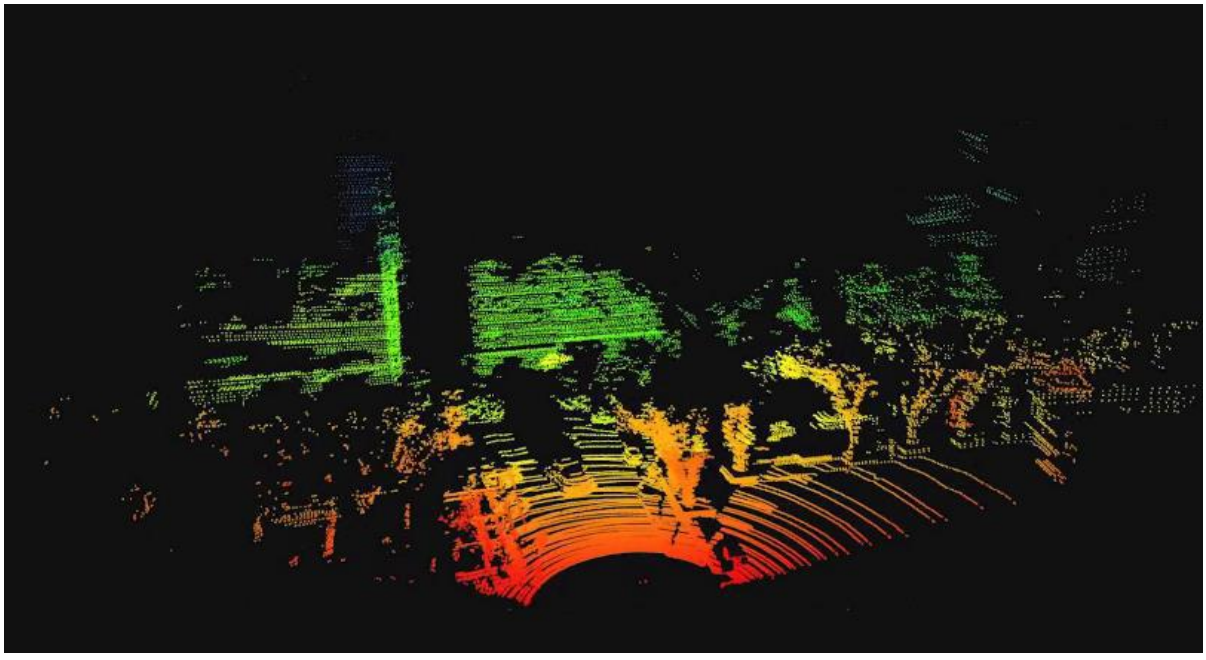
The CH Series 128-Channel LiDAR is designed for Automotive Grade Standards to meet demands of L4 and L5 autonomous cars. With a hybrid solid-state structure. The horizontal FOV is 150°. Its detection range is up to 300m, and the distance accuracy is ±2cm, which can work with high-speed, low-speed cars and other scenarios.

Features

- Long range, high density, rich point-cloud
- Automotive Grade design, stable structure and lower power consumption
- Mass production, high cost-effective



Demo



Specifications

Model		CH128
Channel		128
Measurement Technique		Time of Flight (TOF)
Wave Length		905nm
Classification		Class 1 Eye-safe/ IEC 60825-1:2007 & 2014
Measurement Range	Typical	100m / 150m / 200m （Reflectivity 20%）
	Min	90m / 135m / 185m （Reflectivity 20%）
Ranging Accuracy		±5cm（0.5m ~ 10m），±2cm（10m ~ 200m)
Data Points Generated		415,000 points per second
Rotation Rate		5 ~ 20Hz
Field of View (FOV)	Horizontal	150°
	Vertical	-17°~ 14.8°
Angular Resolution	Horizontal	5Hz: 0.18°/ 10Hz: 0.36°/ 20Hz: 0.72°
	Vertical	Vertical angle resolution between 0 ° ~ 0.84 °, with a minimum of 0.23 ° in the middle and a maximum of 0.25 °
Operating Voltage		9V~ 36VDC
Operating Temperature		-40℃ ~ 85℃
Communication Interface		1000M Ethernet，PPS
Power Consumption		15W
Shock Test		500m/sec^2，last11ms
Vibration		5Hz-2000Hz，3G rms
IP		IP 67
Weight		2.5kg
Dimension（L·W·H）		207 * 125 * 142mm

CH Series 120/64-Channel LiDAR (Hybrid Solid-State)

Specifications

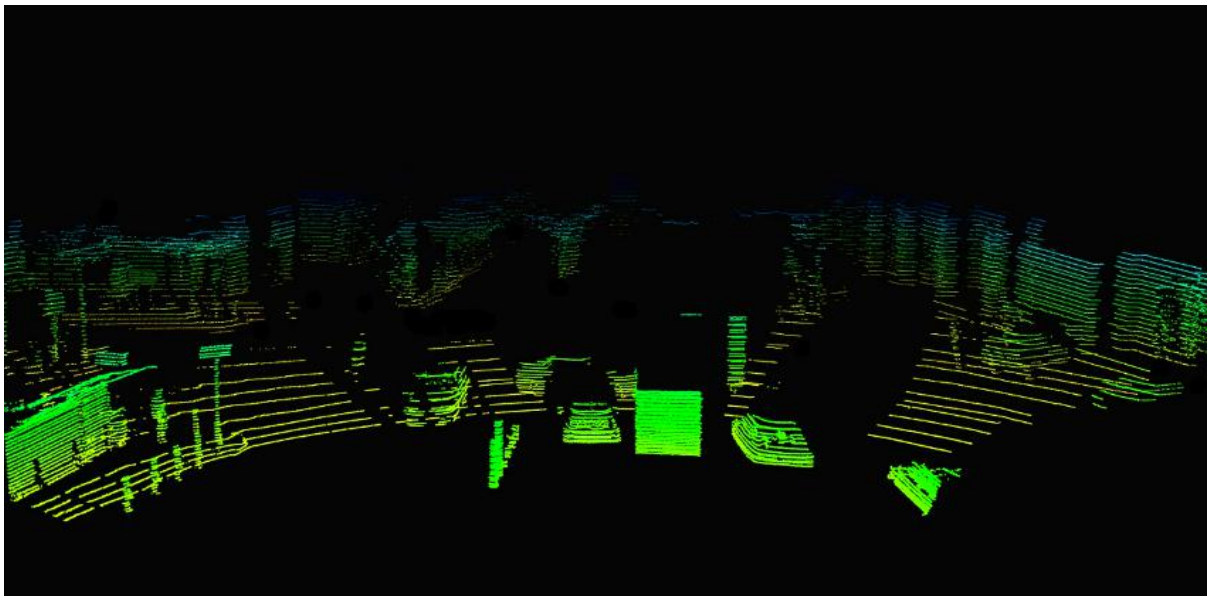
Model		CH120	CH64
Channel		120	64
Measurement Technique		TOF	TOF
Wave Length		905nm	905nm
Laser Classification		Class 1 Eye-safe/ IEC 60825-1:2007 & 2014	Class 1 Eye-safe/ IEC 60825-1:2007 & 2014
Measurement Range		100m	100m / 150m / 200m at 20%
Ranging Accuracy		±2cm	±2cm
Data Points Generated		MAX 480,000 points per second	MAX 426,000 points per second
Rotation Rate		5 ~ 20Hz	5 ~ 20Hz
Field of View (FOV)	Horizontal	48°	120°
	Vertical	-13°~ 7°	-13.33°~ 7.67°
Angular Resolution	Horizontal	5Hz:0.06°/ 10Hz:0.12°/ 20Hz:0.24°	5Hz:0.09°/ 10Hz:0.18°/ 20Hz:0.27
	Vertical	0.167°	0.33°
Operating Voltage		9V~ 36VDC	9V~ 36VDC
Operating Temperature		-40℃ ~ 85℃	-40℃ ~ 85℃
Communication Interface		1000M Ethernet，PPS	1000M Ethernet，PPS
Shock Test		500m/sec^2 ，last11ms	500m/sec^2 ，last11ms
Vibration		5Hz-2000Hz，3G rms	5Hz-2000Hz，3G rms
IP		IP 67	IP 67
Weight		2.5kg	1.5kg
Dimension (L·W·H)		152.5 * 98*133.2mm	155 * 107.5 * 90mm

CH Series 32/16-Channel LiDAR

Abstract

CH Series 32 / 16 channel LiDAR is designed for Automotive Grade Standards to meet demands of L4 and L5 autonomous cars. With a hybrid solid-state structure, its measurement range is up to 300 m(CH32 / 16), and the ranging accuracy is ±2cm, with 120° horizontal FOV, measuring rate up to 426k pts/s(CH32 / 64), 213k pts/s(CH16), which can work with high-speed, low-speed cars and other scenarios.

Demo



Specifications

Model		CH32	CH16
Channel		32	16
Measurement Technique		Time of Flight (TOF)	
Wave length		905nm	
Laser Classification		Class 1 Eye-safe / IEC 60825-1:2007 & 2014	
Measurement Range (Standard)	Typical	100m / 150m / 200m (Reflectivity 20%)	
	Min	90m / 135m / 180m (Reflectivity 20%)	
	Accuracy	±2cm (0.5m ~ 200m)	
Measurement Range (Enhanced)	Typical	200m (Reflectivity 10%) / 300m (Reflectivity 70%)	
	Min	180m (Reflectivity 10%) / 270m (Reflectivity 70%)	
	Accuracy	±3cm (0.5m ~ 300m)	
Data Points Generated		426,000 points per second	213,000 points per second
Rotation Rate		5 ~ 20Hz	
Field of View (FOV)	Horizontal	120°	
	Vertical	-6.67°~ 4.58°	-4°~ 2°
Angular Resolution	Horizontal	200m: 5Hz: 0.045° / 10Hz: 0.09°/ 20Hz: 0.18° 300m: 5Hz: 0.075° / 10Hz: 0.14°/ 20Hz: 0.27°	
	Vertical	Vertical angle resolution between 0 ~ 0.81 °, minimum 0.09 ° in the middle and a maximum of 0.47 °	
Operating Voltage		9V~ 36VDC	
Operating Temperature		-40℃ ~ 85℃	
Communication Interface		100M Ethernet，PPS	
Power Consumption		10 W	9 W
Shock Test		500m/sec^2，last11ms	
Vibration		5Hz-2000Hz，3G rms	
IP		IP 67	
Weight		1.5kg	
Dimension (L·W·H)		155 * 107.5 * 90mm	

CX Series 32 / 20-Channel LiDAR

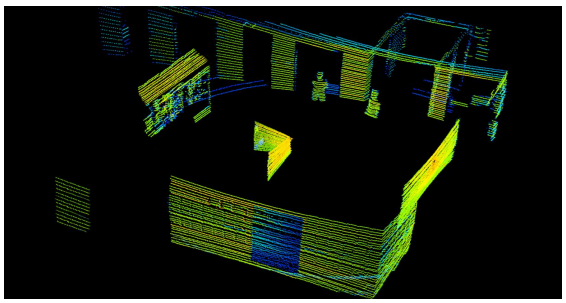
Abstract

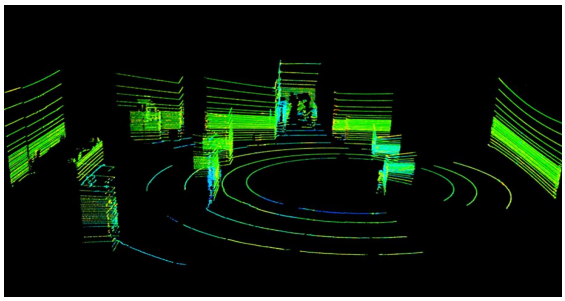
CX Series 32 / 20 channel LiDAR achieves 360° 3D high-speed scanning with 3 20-beam laser, measurement range up to 200 m, ±3cm accuracy, minimum vertical angle resolution up to 0.33°(C32) /1°(C20), C32 widely used in autonomous vehicle, ADAS, smart transportation, service robots, logistics, surveying and mapping, security and so on. The C20 channel LIDAR can detect moving targets on large-area scenes with 16-beam laser scanning down, which widely used in V2X , smart transportation

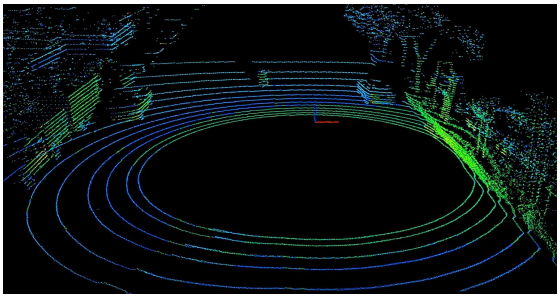
Features

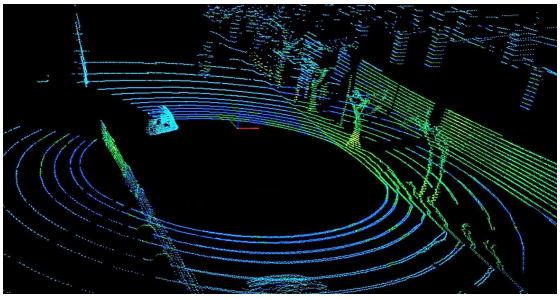
- High point density, capability of generating approximately 640,000 point per second (C32) / 400,000 point per second (C20) .
- Wide field of view, with 360° horizontal FOV and 32°vertical FOV.
- The C32 Vertical angular resolution up to 0.33°, focused on front area data acquisition.

Demo





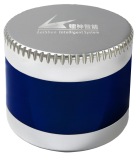




Specifications

Model		C32		C20
Channel		32		20
Measurement Technique		Time of Flight(TOF)		
Wavelength		905nm		
Laser Product Classification		Class 1 Eye-safe/ IEC 60825-1:2007 & 2014		
Measurement Range		70m / 120m /150m		
Ranging Accuracy		±3cm		
Data Points Generated		640,000points per second		400,000points per second
Rotation Rate		5Hz，10Hz，20Hz		
Field of View (FOV)	Horizontal	360°		
	Vertical	-16°~ 15°	-18°~ 14°	-16°~ 3°
Angular Resolution	Horizontal	5Hz: 0.09° / 10Hz: 0.18° / 20Hz: 0.36°		
	Vertical	0.33° / 1°		
Operating Voltage		9V~ 36VDC		
Operating Temperature		-20℃ ~ 60℃（Customized up to -40℃）		
Communication Interface		Ethernet，PPS		
Shock Test		500m/sec^2，last11ms		
Vibration		5Hz-2000Hz，3G rms		
IP		IP 67		
Dimension（D·H）		Φ120*110mm		
Weight		1600g		

CX Series 16-Channel LiDAR



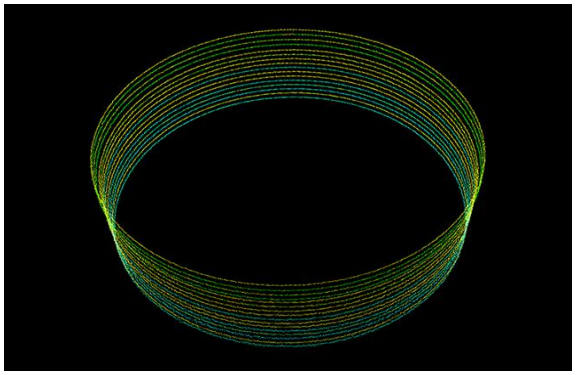
Abstract

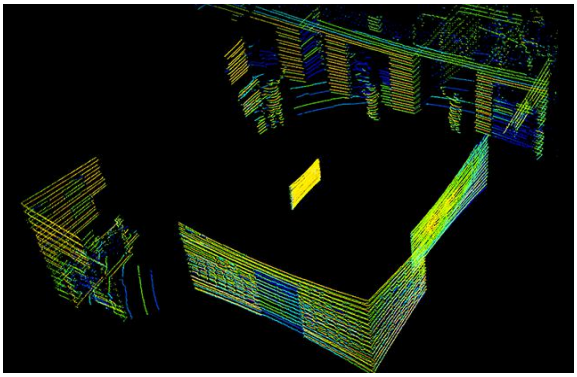
CX Series 16 channel LIDAR achieves 360 ° 3D high-speed scanning with 16-beam laser, measurement range up to 200 m, ±3cm accuracy, up to 1.33°vertical angle resolution, widely used in autonomous vehicle, ADAS, smart transportation, service robots, logistics, surveying and mapping, security and so on.

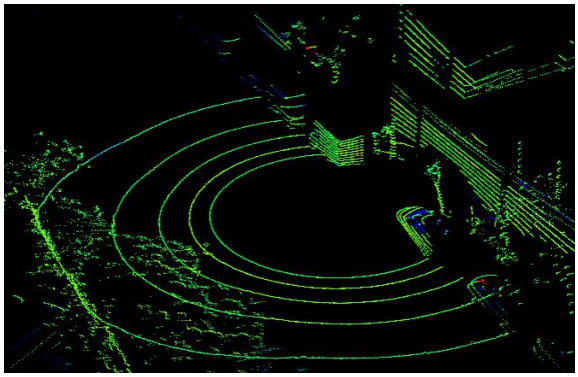
Features

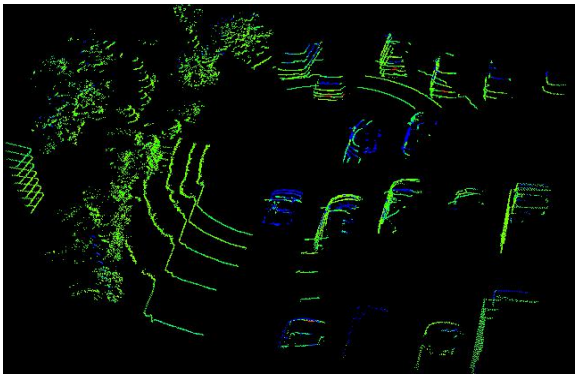
- High point density, capable of generating approximately 320,000 3D point cloud coordinates per second
- Wide field of view, with 360°horizontal FOV and 32°vertical FOV.
- Compact size and light weight

Demo









Specifications

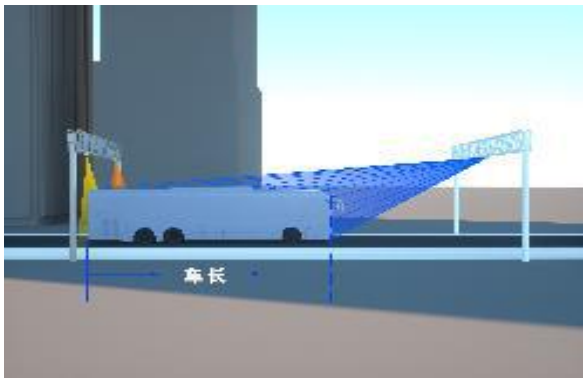
Model		C16			
Channel		16			
Measurement Technique		Time of Flight (TOF)			
Wavelength		905nm			
Laser Product Classification		Class 1 Eye-safe/ IEC 60825-1:2007 & 2014			
Measurement Range		70m / 120m / 150m			
Ranging Accuracy		±3cm			
Data Points Generated		320,000 points per second			
Rotation Rate		5Hz , 10Hz , 20Hz			
Field of View (FOV)	Horizontal	360°			
	Vertical	-15°~ 15°	-14°~ 16°	-15°~ 15°	-10°~ 10°
Angular Resolution	Horizontal	5Hz: 0.09° / 10Hz: 0.18° / 20Hz: 0.36°			
	Vertical	2°		2°	1.33°
Operating Voltage		9V~ 36VDC			
Communication Interface		Ethernet , PPS			
Operating Temperature		-20℃ ~ 60℃ (Customized up to -40℃)			
Shock Test		500m/sec^2 , last11ms			
Vibration		5Hz-2000Hz , 3G rms			
IP		IP 67			
Dimension (D·H)		120*110mm		102*78mm	
Weight		1600g		1000g	

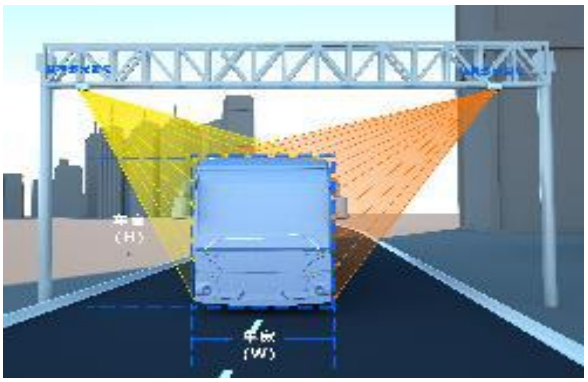
HS Series High-speed Scanning LiDAR

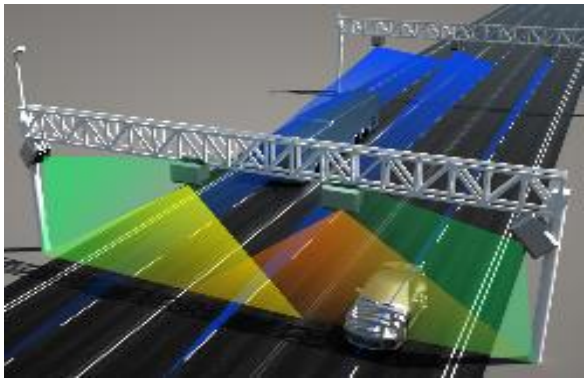
Abstract

HS series high-speed scanning LiDAR has excellent detection accuracy and anti-interference performance, Its measurement range is up to 100 m, and distance accuracy is ±2cm. 200Hz high scan frequency can easily sense high-speed movement objects in time, and accurately capture vehicle contour information. Widely used in vehicle detection ,V2X vehicle-road collaboration, high accuracy surveying and mapping, etc.

Demo







Specifications

Model		HS1	HS4	HS8
Channel		1	4	8
Measurement Technique		Time of Flight (TOF)		
Wavelength		905nm		
Laser Product Classification		Class 1 Eye-safe/ IEC 60825-1:2007 & 2014		
Measurement Range		100m (Reflectivity 10%)		
Ranging Accuracy		±2cm		
Data Points Generated		106,000 points per second	426,000 points per second	426,000 points per second
Rotation Rate		80Hz、120Hz 、160Hz		
Field of View (FOV)	Horizontal	120°		
	Vertical	/	-4°~ 0°	-6.66°~ 2.66°
Angular Resolution	Horizontal	80Hz: 0.09° 120Hz: 0.13° 160Hz: 0.18°		80Hz: 0.18° 120Hz: 0.27° 160Hz: 0.36°
	Vertical	/	1.33°	
Operating Voltage		9V~ 36VDC		
Communication Interface		1000M Ethernet，PPS		
Operating Temperature		-40℃ ~ 85℃		
Shock Test		500m/sec^2 ，last11ms		
Vibration		5Hz-2000Hz，3G rms		
IP		IP 67		
Dimension (D·H)		155 * 107.5 * 90mm		
Weight		1600g		

LS20 Series Solid State MEMS LiDAR (905nm)

LS20A

LS20B

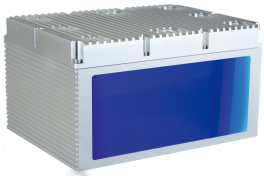
Abstract

LS20 Series MEMS Solid State LIDAR (905nm) uses MEMS technology can achieve a compact and stable structure. The measurement range is up to 200 m, ±3cm ranging accuracy , 120°/60°H x 20°V FOV and the minimum angular resolution is 0.2°

Specifications

Model		LS20A	LS20B
Wavelength		905nm	
Laser Product Classification		Class 1 Eye-safe/ IEC 60825-1:2007 & 2014	
Measurement Range		200m	
Ranging Accuracy		±3cm	
Rotation Rate		10 ~ 25Hz	
Field of View (FOV)	Horizontal	60°	120°
	Vertical	20°	
Angular Resolution		0.2°	
Communication Interface		100M Ethernet	
Time Synchronization		PPS/GPRMC	
Power Consumption		10W	
Operating Voltage		9V ~ 16VDC	
IP		IP 67	
Operating Temperature		-40℃ ~ 85℃	
Dimension (L·W·H)		130*88*90mm	161*180*64mm

LS21 Series Solid State MEMS LiDAR (1550nm)



Abstract

The LS21 series solid-state MEMS LIDAR (1550nm) adopts a MEMS technology can achieve a compact and stable structure. The measurement range is up to 300 m, the ranging accuracy is ±3cm, and there are three type with different field of view : 120° / 60° / 45°H x 20°V ,with a minimum angular resolution of 0.2°.

Specifications

Model		LS21	
Wavelength		1550nm	
Laser Product Classification		Class 1 Eye-safe/ IEC 60825-1:2007 & 2014	
Measurement Range		≥200m	
Ranging Accuracy		≤3cm	
Rotation Rate		10 ~ 25Hz	
Field of View (FOV)	Horizontal	60°	120°
	Vertical	20°	
Angular Resolution		0.2°	
Communication Interface		1000M Ethernet	
Time Synchronization		PPS/GPRMC	
Power Consumption		LIDAR Module≤15W ; Core Module≤55W	
Operating Voltage		9V ~ 32VDC	
IP		IP 67	
Operating Temperature		-40℃~ 85℃	
Dimension (L·W·H)		184*154*102.9mm	

LS30A Series Long Range LiDAR

Abstract

LS30 A series perform TOF full waveform scheme which can do 360° detection of the surrounding environment by 2D scanning. It's mainly used in subway anti-collision, train anti-collision system and other fields.

Specifications

Model	LS30A		
Wavelength	1550nm		
Laser Product Classification	Class 1 Eye-safe/ IEC 60825-1:2007 & 2014		
Data content	location, distance, reflection intensity information		
Rotation Rate	10 ~ 50Hz		
Measurement Range	500m	1000m	1500m
Ranging Accuracy	±3cm		
Scanning angle	360°		
Angular Resolution	0.0125°	0.025°	0.0375°
Data Points Generated	300kHz	150kHz	100kHz
Motor	Built-in Brushless Motor		
Communication Interface	Ethernet		
Operating Voltage	110V		
IP	IP 65		
Illumination intensity	200K lux		
Dimension (L·W·H)	180*180*270mm		

N301 Series TOF Navigation & Obstacle Avoidance LiDAR

Abstract

The N301 series of LiDAR adopt the TOF principle, with a 360° scanning and measurement range is up to 150m. The ranging accuracy is ±3cm, which can identify the position, size and moving direction of the detected object in real time.

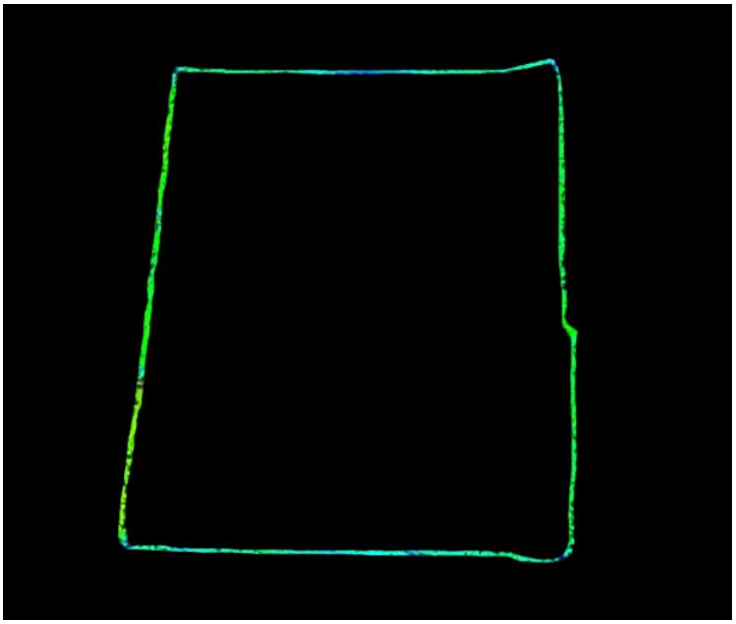
Features

- 360° FOV , long measurement range
- The minimum angular resolution reaches 0.18°, ensuring measurement data accurately and stably.
- Configuring an Ethernet interface for high-speed data transmission

Application field

- ADAS
- High-precision Autonomous positioning and navigation of service robots
- AGV navigation and obstacle avoidance, regional security

Demo



Specifications

Model	N301	N301HA
Wavelength	905nm	
Laser Product Classification	Class 1Eye-safe /IEC 60825-1:2007&2014	
Data content	Distance /Angle	
Measurement Range	10m/30m/50m/100m	
Ranging Accuracy	±3cm	
Positioning accuracy	±1cm	
Scanning angle	360°	
Rotation Rate	10Hz / 20Hz	
Pulse Repetition Rate	20,000 points per second	300,000 points per second
Angular Resolution	20Hz:0.36° 10Hz:0.18°	20Hz:0.024° 10Hz:0.012
Operating Voltage	9V ~ 36VDC	
Operating Temperature	-20℃ ~ 60℃	
Motor	Built-in Brushless Motor	
Communication Interface	Ethernet	
Weight	420g(±20g)	
Dimension (D·H)	Φ80*79.1mm	

N401 Series TOF Navigation Obstacle Avoidance LiDAR

Abstract

The N401 series of LiDAR adopt the TOF principle, with a 360°scanning and measurement range is up to 150m. the distance accuracy can reach ±1cm base on reflector.Widely used in robot, AGV High-precision positioning and navigation, obstacle avoidance.

Specifications

Model	N401	N401HA
Wavelength	905nm	
Laser Product Classification	Class 1Eye-safe /IEC 60825-1:2007&2014	
Data content	Distance /Angle /Reflectivity	
Measurement Range	10m/30m/50m/100m	
Ranging Accuracy	±3cm	
Positioning accuracy	±1cm	
Scanning angle	360°	
Rotation Rate	10Hz / 20Hz	
Pulse Repetition Rate	20,000 points per second	300,000 points per second
Angular Resolution	20Hz:0.36° 10Hz:0.18°	20Hz:0.024° 10Hz:0.012
Operating Voltage	9V ~ 36VDC	
Operating Temperature	-20℃ ~ 60℃	
Motor	Built-in Brushless Motor	
Communication Interface	Ethernet	
Weight	420g(±20g)	
Dimension (D·H)	Φ80*79.1mm	

W Series TOF Anti-collision LiDAR

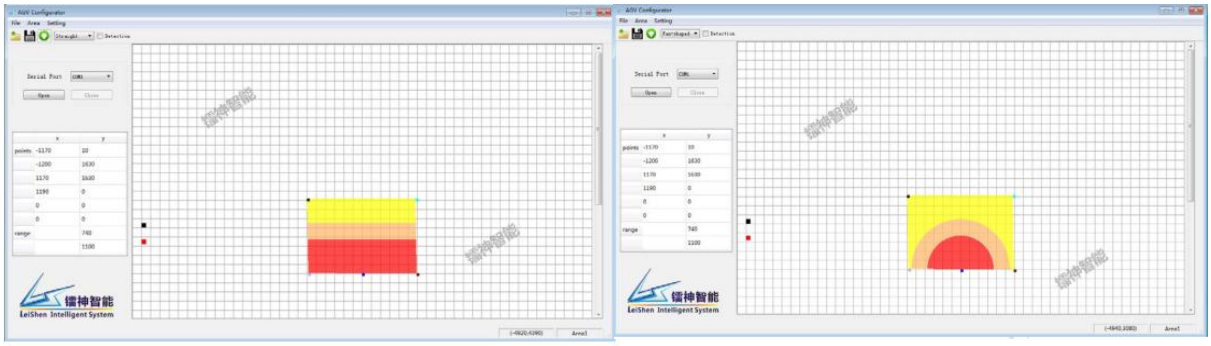
Abstract

LeiShen W series Anti-collision Laser Scanner is mainly applied to performs collision avoidance and area detection for AGV, RGV, Robot, ect. There are 15 field sets to be chosen and finally output with signals of switching values and point cloud

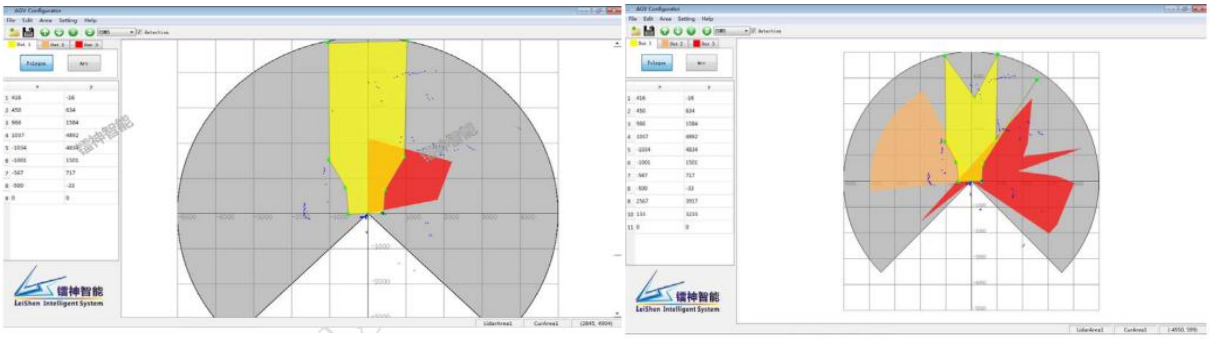
Features

- Simultaneous output of switch and point cloud data
- Flexible configuration to detection areas.
- With 15 detection areas selectable and two detecting mode: independent type and correlation type

Regional association



Regional independent



Specifications

Model	W Series
Output	Switching Value and Point Cloud Data/ Switching Value
Scanning angle	270°
Rotation Rate	10 Hz
Measurement Range	5m/10m/30m
Angular Resolution	1° / 0.36°
Monitoring area	Correlation/ Independent
Operating Voltage	9V~28VDC
Operating Temperature	-20℃ ~ 60℃
Shock Test	500m/sec^2 , last11ms
Vibration	5Hz-2000Hz , 3G rms
IP	IP 67
Weight	397g
Interface	NPN , PNP
Dimension (D·H)	Φ80*77.3mm

LS01 Series 360°Triangular LiDAR

Abstract

LS01 series LiDAR is a 2D LiDAR developed by Leishen. This series LiDAR can do 360° 2D scanning to generate spatial point cloud map .

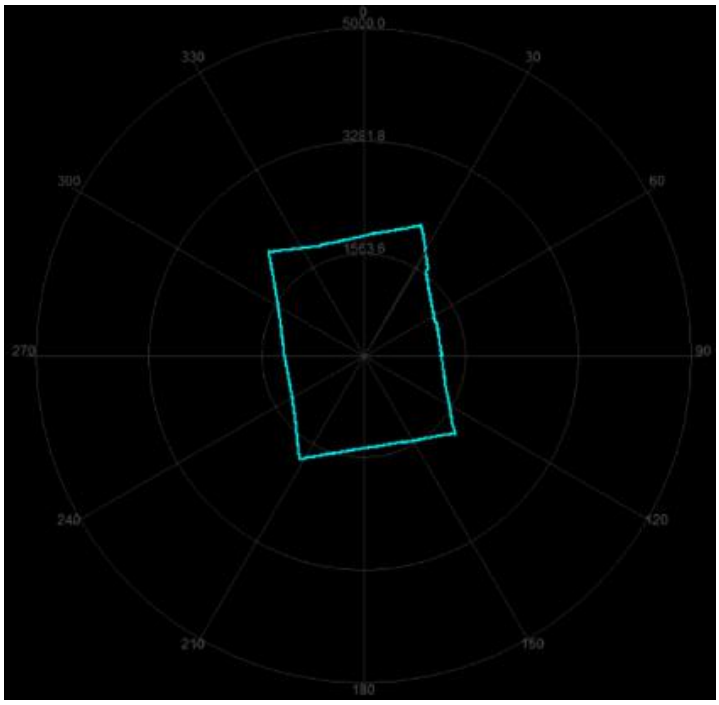
Features

- Triangulation principle , Cost-effective
- Max light intensity up to 20,000lux
- Compact, low power consumption, durable

Applications

- Robotic self-navigation and positioning
- AGV self-navigation and positioning

Demo (LS01B)



Specifications

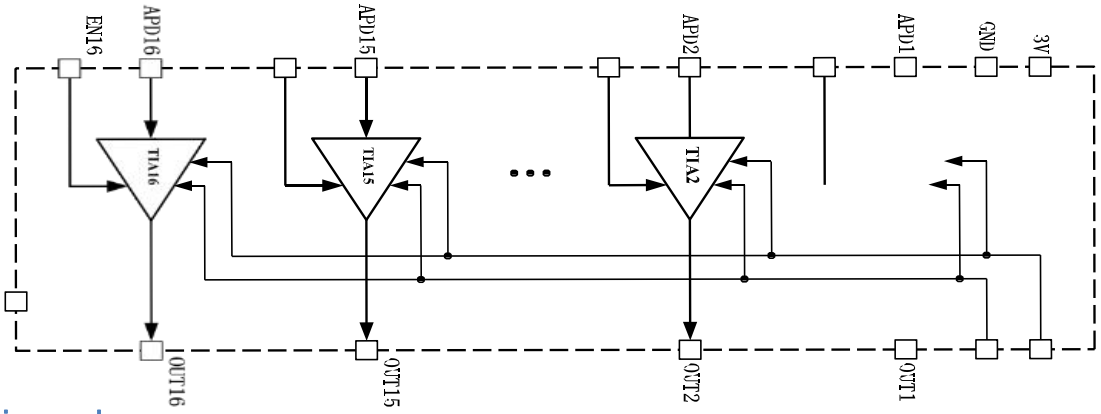
Model	LS01B
Rotation Rate	10Hz
Measurement Range	8m/ 16m/ 28m
Ranging Accuracy	Distance ≤ 1m: accuracy < 10mm; Distance > 1m : accuracy< 1% of distance
Data Points Generated	16000 points per second
Scanning angle	360°
Angular Resolution	0.25°(0.25°/ 0.5°/ 1°optional)
Illumination intensity	20000 lux
Operating Voltage	5V
Communication Interface	UART
Weight	180g
Dimension (D·H)	Φ75.54*40.37mm

16-Channel Transimpedance Amplifier LS1716M

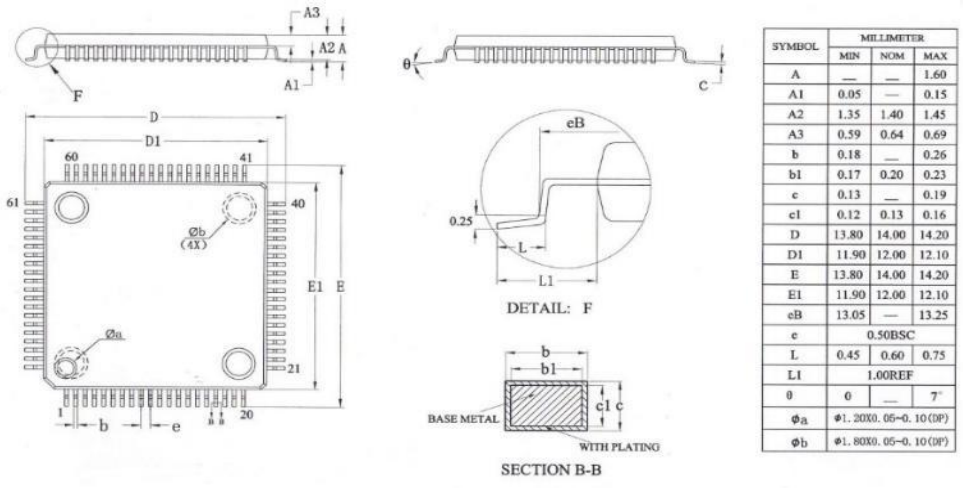
Abstract

- Voltage：3.3V
- The N pole of the APD is connected to the input, and the P pole is connected to the negative voltage.
- 16-channel transimpedance amplifier
- Single-ended input, single-ended output
- Four programmable transimpedance amplifier gain modes：86dBΩ / 80dBΩ / 74dBΩ / 68dBΩ
- Receiver bandwidth> 200MHz
- Minimum laser pulse half width：3.5ns
- Single channel power consumption< 70mW
- Optional output, channel switching time< 100ns
- Output impedance：50Ω
- LQFP80L Pack

Chip Frame Diagram

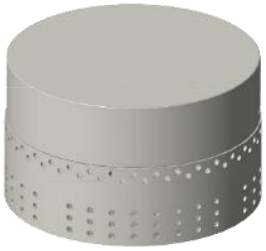


Chip package



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.60
A1	0.05	—	0.15
A2	1.35	1.40	1.45
A3	0.59	0.64	0.69
b	0.18	—	0.26
b1	0.17	0.20	0.23
c	0.13	—	0.19
c1	0.12	0.13	0.16
D	13.80	14.00	14.20
D1	11.90	12.00	12.10
E	13.80	14.00	14.20
E1	11.90	12.00	12.10
eB	13.05	—	13.25
e	0.50BSC		
L	0.45	0.60	0.75
L1	1.00REF		
θ	0	—	7°
Øa	Ø1.20X0.05~0.10(DP)		
Øb	Ø1.80X0.05~0.10(DP)		

1550nm High Peak Power Pulsed Fiber Laser



Abstract :

The 1550nm high peak power pulsed fiber laser adopts the main oscillator plus power amplifier (MOPA) structure design, and its pulse width, repetition frequency, peak power, single pulse energy, and linear polarization or random polarization can be selected, and it is safe for human eyes. The band is the excellent light source for LiDAR, remote sensing.

Specifications :

Items	LFP-1550		
Laser	1550nm		
Laser Mode	Pulse		
Polarization characteristics	Random		
Output average power	≥0.6 W	≥1 W	≥2 W
Peak Power	≥3kW		
Pulse Width	3 ~ 5 ns		
Repeat frequency	1-1000 kHz		
Single pulse energy	10 uj		
Adjustable output power	5 ~ 100%		
Power stability	<3%		
Beam quality	<1.2 M^2		
Output connector	FC/APC Jumper or custom collimator		
Operating Voltage	5 V		
Control connector	USB		
Cooling mode	Air-cooled or customer-provided cooling		
Dimension (D·H)	121.5 * 71mm		*

MGW Trade and Service Pty Ltd

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

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