



# LS LIDAR

## PRODUCT GUIDE



深圳市镭神智能系统有限公司

Leishen Intelligent System Co.,LTD



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第 I 类激光产品，人眼安全

## LS01 Series 360° 2D LiDAR

**LS01A**



**LS01D**



**LS01E**



**LS01B**



### ABSTRACT

LS01 Series 2D LiDAR sensor is a laser scanner solution developed by LeiShen Intelligent System Co., Ltd. It performs 360 degree laser scan and produces 2D point cloud data map which can be used in mapping navigation (SLAM), obstacle avoidance, route planning, etc.

### FEATURES

- Low cost applying triangulation principle, high-speed linear CMOS imaging sensor and FPGA high-speed computing unit.
- Operating in standard indoor environment, and strong-light outdoor environment (under 20,000 lx).
- Compact, low power consumption, and long service life.

### APPLICATIONS

- Navigation & anti-collision of cleaning robot.
- Navigation & anti-collision of service robot.
- Navigation & anti-collision of AGV.

### PC Software Display ( take LS01A as example )



## PARAMETERS

Mode	LS01A	LS01D	LS01E	LS01F	LS01B1	LS01B2	LS01B3
<b>FOV</b>	360°						
<b>Detection Range</b>	8m	8m	16m	28m	8m	16m	28m
<b>Angular Resolution</b>	1°	1° (Customizable to 0.5°)	1° (Customizable to 0.5°)	0.18°	Typical 0.25° ( 0.5°, 1° )		
<b>Sampling Frequency</b>	Default value of 2000Hz	Default value of 3600 Hz , Customizable to 4000 Hz	Default value of 3600 Hz , Customizable to 4000 Hz	20000Hz	14400Hz		
<b>Distance Accuracy</b>	<10mm, within 1m  <1% of distance, >1m						
<b>Scan Frequency</b>	5.5Hz	Default value of 10Hz ( Customizable from 3-11Hz )	Default value of 10Hz ( Customizable from 3-11Hz )	10Hz	Default value of 10Hz ( Customizable from 3-11Hz )		
<b>Anti-glare Interference</b>	20000Lx						
<b>Power Supply</b>	5V	5V	5V	12V	5V		
<b>Communication Interface</b>	URAT ( customizable to I2C , SPI , ,RS485 etc )	URAT ( customizable to USB、Bluetooth etc )	URAT ( customizable to USB、Bluetooth etc )	Ethernet Port	URAT		
<b>Weight</b>	159g ( added USB-to-serial-port module 187g )	197g	197g	385g	180g		
<b>Size(W×L×H)</b>	70×95.1×56.9 mm	Φ80×54.66mm	Φ80×54.66mm	Φ80×71.6mm	Φ80×71.6mm		

## LS02 Series Solid State LiDAR

**LS02A/ LS02B**



**LS02C/ LS02D**



### ABSTRACT

LS02A sensor is a low-cost 2D Solid LiDAR developed by LeiShen Intelligent System Co., Ltd. It performs 86 degree laser scanning and ranging with structured light through a semiconductor laser. Comparing with rotating sensors, it has longer service lifetime, higher stability, and lower cost.

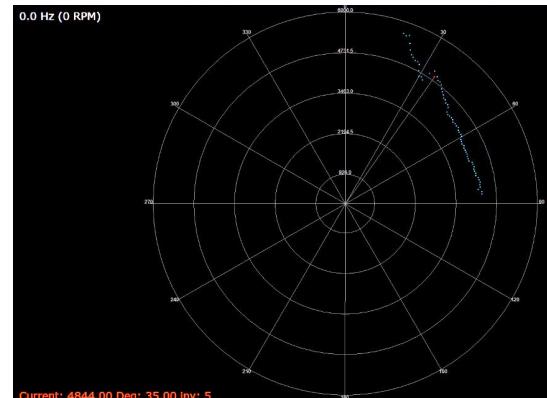
### FEATURES

- Solid State, High reliability, Long service lifetime.
- Light and small, 50g weight at most.
- High Accuracy, Low-cost.
- Strong anti-disturbance capacity

### Application

- Navigation & anti-collision of service robot, Cleaning robot, AGV.
- Anti-collision of ADAS.

### PC Software Display ( take LS02A as example )



### Parameter

Mode	LS02A	LS02B
FOV		86°
Detection Range		0.1~4m (under 70% reflectivity)
Angular Resolution	1°	0.5°
Distance Accuracy		≤1.5% of distance
Scan rate		10Hz
Weight		50g
Size(W×L×H)		40×30×65mm
Data output		UART

Mode	LS02C	LS02D
FOV		86°
Detection Range		0.1~4m (under 70% reflectivity)
Angular Resolution	1°	0.5°
Distance Accuracy		≤1.5% of distance
Scan rate		10Hz
Weight		50g
Size(W×L×H)		40×37×45mm
Data output		UART

## N301 LIDAR 360° TOF 2D Laser Scanner



### ABSTRACT

N301 performs 2D scan and detection to the surrounding environment. It adopts TOF ranging principle, wireless electricity transmission and wireless FSK signal communication mode. According to different detecting method and distance range, N301 series are segmented into N30101、N30103、N30105、N30110、N30120. The detecting frequency can reach up to 20KHz, with ranging accuracy in 3cm.

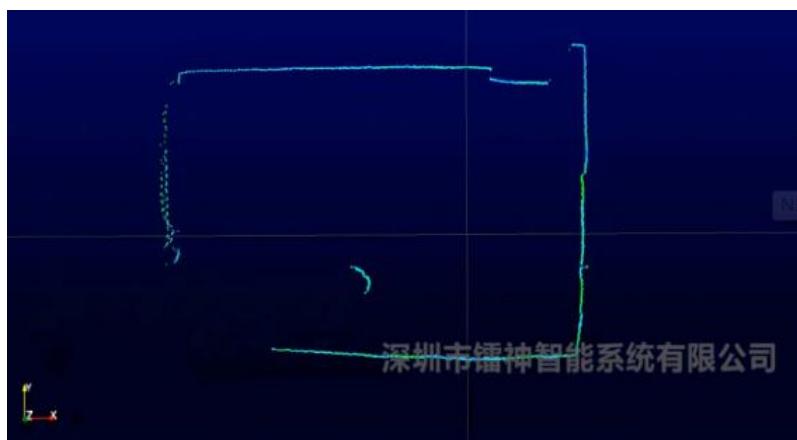
### FEATURES

- 360° 2D planar scanning detection.
- Distance accuracy within 3cm.
- Power of laser strictly limited to assure eye safety.

### APPLICATIONS

- ADAS, Driverless vehicle.
- Navigation & anti-collision of service robot , Vacuum robot, AGV
- Area security.

### PC Software Display ( take N30101A as example )



## Parameter

Features	N30101A	N30101B	N30101C		
Type	Short Range Series				
Filed of View	360°				
Angular Resolution	0.18°~0.45°	0.05°~0.2°	0.27°~1°		
Scan Frequency	10~25Hz	3~11 Hz	3~11 Hz		
Sampling Frequency	20K	20K	4K		
Distance Accuracy	+/-3cm				
Laser	905nm				
Detection Distance	10m				
Data	Distance, Angle, Light Intensity				
Power Supply	9V~36V				
Drive Mode	Brushless Motor				
Communication Interface	Ethernet Port	RS232			
Size(W×L×H)	Φ 80*79.1				
Weight	406g				

Note : Sampling frequency=Scan rate × ( FOV /Angular resolution )

Features	N30103A	N30103B	N30105A	N30105B		
Type	Middle-Long distance series					
Filed of View	360°					
Angular Resolution	0.18°~0.45°	0.05°~0.2°	0.18°~0.45°	0.05°~0.2°		
Scan Frequency	10~25Hz	3~11 Hz	10~25Hz	3~11HZ		
Sampling Frequency	20KHz					
Distance Accuracy	+/-3cm					
Laser	905nm					
Detection Distance	30m		50m			
Data	Distance, Angle, Light Intensity					
Power Supply	9V~36V					
Drive Mode	Brushless Motor					
Communication Interface	Ethernet Port					
Size(W×L×H)	Φ 80*79.1					
Weight	406g					

Features	N30110	N30120
Type	Remote series	
Filed of View	360°	
Angular Resolution	0.09°~0.54°	
Scan Frequency	5~25 Hz	
Sampling Frequency	20K Hz	
Distance Accuracy	+/-3cm	
Laser	905nm	
Detection Distance	100m	200m
Data	Distance, Angle, Light Intensity	
Power Supply	9V~36V	
Drive Mode	Brushless Motor	
Communication Interface	Ethernet Port	
Size(W×L×H)	Φ 80*79.1	
Weight	406g	

## WXXOX Series AGV Anti-collision LiDAR



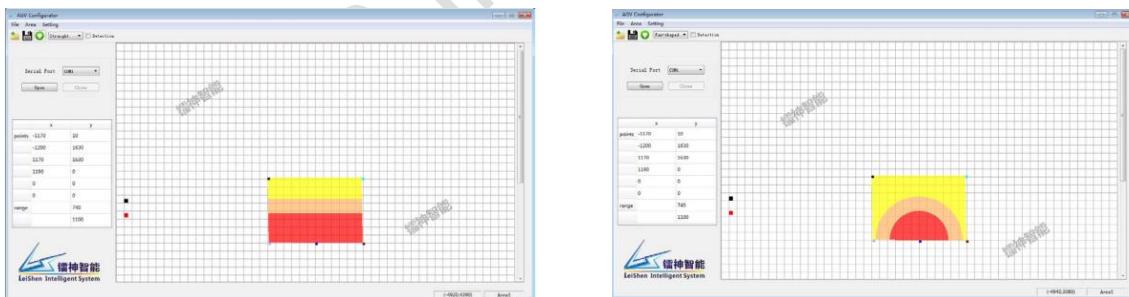
### ABSTRACT

LeiShen WXXOX Anti-collision Laser Scanner is mainly applied to perform indoor collision avoidance and area detection for AGV, RGV, Robot, ect. There are 15 field sets to be chosen through input signals of 4 switching values. According to different ranging distance, WXXOX Series Laser Scanner can be divided into different types as W050A, W050B, W050C, W050I etc.

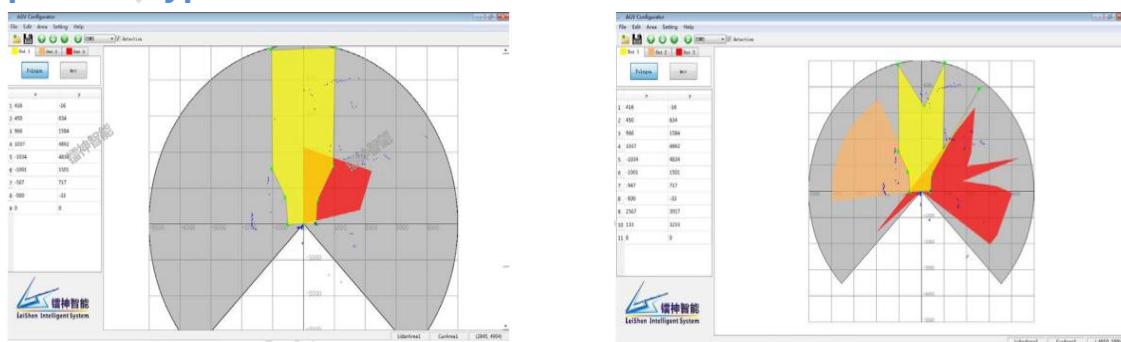
### FEATURES

- Flexible configuration to detection areas.
- 15 detection areas at most to be chosen.

### Associated type



### Independent type



## Parameter

Mode	W050A	W050B	W100A	W100B
Output	Switching Value and Points Cloud			
Scan rate	10 Hz			
Angular resolution	1° ( customizable )			
FOV	270°			
Area Type	Asociated type	Independent type	Asociated type	Independent type
Detection distance	0.15~5m	0.15~5m	0.15m-10m	0.15m-10m
Power supply	24VDC(9~28VDC)			
Size	Φ80×77.3mm			

Mode	W050C	W050I	W100C	W100I
Output	Switching Value			
Scan rate	10 Hz			
Angular resolution	1° ( Customizable )			
FOV	270°			
Area Type	Asociated type	Independent type	Asociated type	Independent type
Detection distance	0.15~5m	0.15~5m	0.15m-10m	0.15m-10m
Power supply	24VDC(9~28VDC)			
Size	Φ80×77.3mm			

Mode	W050E	W050F	W100E	W100F	W050G	W050H	W100G	W100H						
<b>Output</b>	Switching Value													
<b>Scan rate</b>	10 Hz													
<b>Angular resolution</b>	1°				0.36°									
<b>FOV</b>	270°													
<b>Area Type</b>	Asociate d type	Indepen dent type	Asociate d type	Indepe ndent type	Asociate d type	Indepen dent type	Asociat ed type	Indepe ndent type						
<b>Detection distance</b>	0.15~5m		0.15m-10m		0.15m-5m		0.15m-10m							
<b>Power supply</b>	24VDC(9~28VDC)													
<b>Size</b>	Φ80×77.3mm													

## CX Series Multi-Channel LiDAR



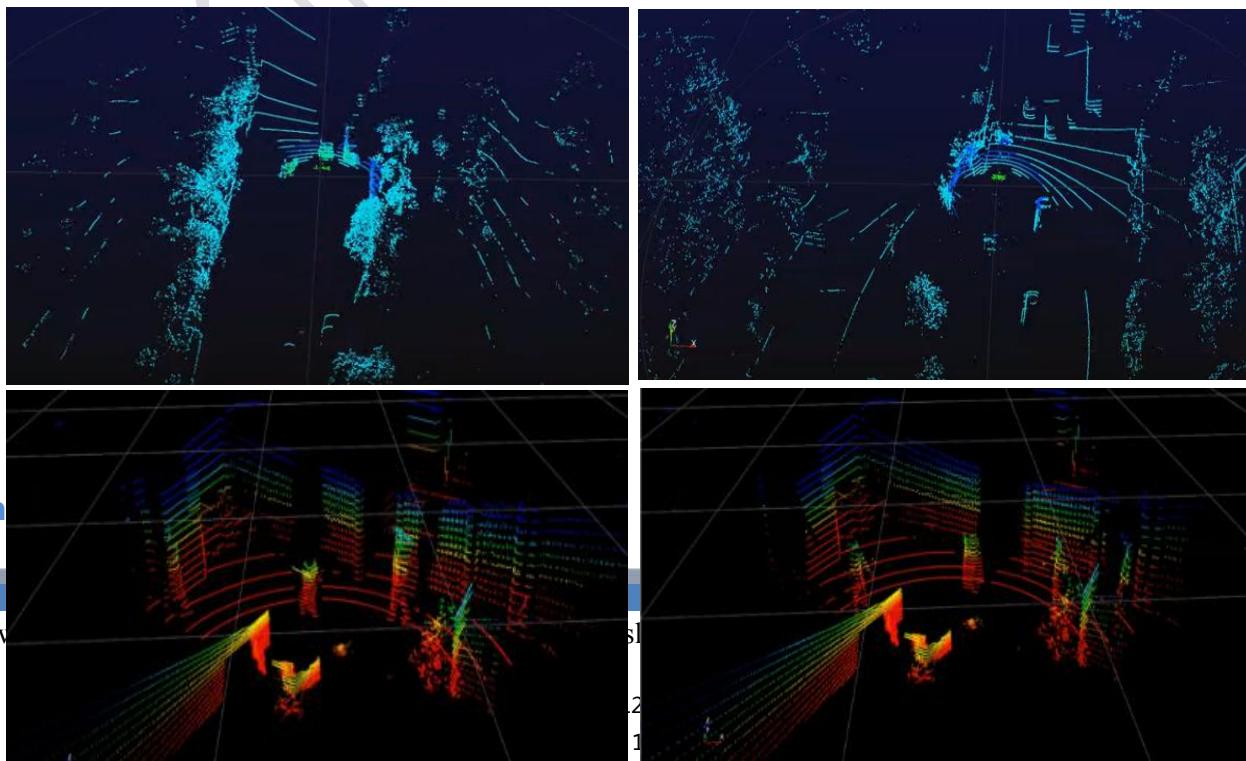
### Abstract

CX series Multi-Channel LiDAR performs 3D detection to surrounding environment. According to different channels, CX Series LiDAR has 4 channels, 8 channels, 16 channels, 32 channels, 48 channels LiDAR. And all these Multi-Channel LiDARs can be widely applied in ADAS, Self-driving car, Industrial automation, Security, etc.

### FEATURES

- Real-time, 360°, 3D coordinate
- Good cost performance

### PC Software Display



Features		C4			C8			C16								
		C4-700A	C4-121A	C4-151A	C8-700A	C8-121A	C8-151A	C16-700A	C16-121A	C16-151A						
<b>Channel</b>		4			8			16								
<b>Detection Range</b>		50~70m	120m	150m	50~70m	120m	150m	50~70m	120m	150m						
<b>Distance Accuracy</b>		±10cm	±3 cm		±10cm	±3 cm		±10cm	±3 cm							
<b>Scan Rate</b>	<b>Horizontal</b>	5Hz、10Hz、20Hz			5Hz、10Hz、20Hz			5Hz、10Hz、20Hz								
<b>VFOD</b>		±3°			±7°			±15°								
<b>HFOV</b>		360°			360°			360°								
<b>Angel Resolution</b>	<b>Vertical</b>	2°			2°			2°								
	<b>Horizontal</b>	5Hz: 0.09°; 10Hz: 0.18°; 20Hz: 0.36°														
<b>Data receiving speed</b>		Max: 80K points per second			Max: 160K points per second			Max: 320K points per second								
<b>Weight</b>		-			-			约 1500g								

Mode	C32			C48						
<b>Channel</b>	32			48						
<b>Detection Range</b>	50~70m	120m	150m	50~70m	120m	150m				
<b>Distance Accuracy</b>	±10cm	±3 cm		±10cm	±3 cm					
<b>Scan Rate</b>	5Hz、10Hz、20Hz			5Hz、10Hz、20Hz						
<b>VFOD</b>	-16°~+16°			-16°~+9°						
<b>HFOV</b>	360°			360°						
<b>Angel Resolution</b>	<b>Vertical</b>	1°			-16°~+9° [Middle part 0.33° (-7°~+3°), the others 1°]					
	<b>Horizontal</b>	5Hz: 0.09°; 10Hz: 0.18°; 20Hz: 0.36°								
<b>Data receiving speed</b>		Up to 640K points per second			Up to 960K points per second					

## C1 Series TOF Vehicle LiDAR



### Abstract

**C1** Series 2D LiDAR performs 360 degree detection to surrounding environment. According to different kinds of detection range, **C1** Series LiDAR has different mode. All **C1** LiDARs can be widely applied in ADAS, Self-driving car. By consisting with ADAS software is able to realize Vehicle

forward collision warning, Vehicle side direction warning, Vehicle blind spot area warning, Lane departure warning etc.

### Features

- High IP Level.
- Car rules-grade Quality.
- Customizable for customer requirement.

## Parameter

Mode	C1-100A	C1-300A	C1-500A	C1-101A	C1-151A	C1-201A
FOV	360°					
Detection Range	10m	30m	50m	100m	150m	200m
Scan rate	10H					
Angular Resolution	0.18°					
Distance Accuracy	+/-10cm					
Sampling Frequency	20KHz					
Anti-glare Interference	Distance, Angle, Light Intensity					
Power Supply	9~36V Wide power supply					
Communication Interface	100M Ethernet port					
Size	Φ80mm×79.1mm					

## M006 Laser Range Finder



### ABSTRACT

M006 is a laser range finder developed by LeiShen Intelligent System Co., Ltd. It performs accurate real-time detection within 6 meters range. The optics design of ingenuity enables it to operate well in dark night as well as strong-light environment. Its compact size and light weight make it a perfect choice for altitude hold of drones, terrain simulation by UAV, etc.

### FEATURES

- Distance Range : 6m
- Weight : 25g
- Accuracy : 1% ( 0.2~1.5m ) , ( 1.5~6m ) 2% , 3% ( 4~6m )
- Ranging Frequency : 10~4000 Hz
- Class I -eyesafe
- Anti-glare interference : < 70000lx.

### APPLICATIONS

- Altitude Hold of UAV
- Range finding

## PARAMETERS

Features	M006
Filed of View	Single direction
Distance Range	6m
Sample Frequency	50Hz ( customizable up to 4000Hz )
Distance Accuracy	1% of 0.2~1.5m , 2% of 1.5~4m , 3% of 4~6m.
Anti-glare Interference	70000 lx
Power Supply	3.3V
Communication Interface	URAT ( customizable to I <sup>2</sup> C , SPI , RS485, etc. )
Anti-glare Interference	25g
Size(W×L×H)	62.08x 26.1x 20.8 mm

## LSLIDAR SLAMWARE

LSLIDAR SLAMWARE is a LIDAR-based module, which provides solution for autonomous navigation and localization system of robots. It integrates autonomous localization and mapping, as well as supporting route planning and obstacle avoidance.

- ◆ Instant Localization & Mapping :

Localization & mapping in unknown environment , incremental global mapping

- ◆ Route Planning & Obstacle Avoidance :

SLAM (simultaneous localization and mapping) adopted , optimum point-to-point route planning and navigation

- ◆ High Accuracy:

High-distance-accuracy ranging LSLIDAR provides maps of high definition.

- ◆ Easy to use :

Availability the minute connected to LSLIDAR , with power supply only 5V at lowest level

## Development & Applications( cleaning robot for example )



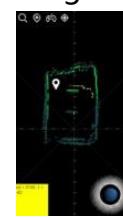
optimum route planning,  
mapping



continue at breakpoint,  
return to get charged



autonomous obstacle avoidance



remote control on APP

## LS LiDAR System Solution and Algorithm Board

Model	SLAM-01A	MC-01A	SLAM-02A	MC-02A
Product images				
Product name	Service Robot SLAM Algorithm Board	Service Robot Movement Control Panel	SLAM Algorithm Board	Movement Control Panel
Product Profile	Integrate automatic localization and mapping, and matched path planning and anti-collision performance based on LiDAR	Offer interfaces integrated with underlying sensors, and at the same time, the interfaces in serial communication with core algorithm board and those of the underlying motor controller, so as to facilitate the user to develop and integrate hardware and software	Integrate LS SLAM algorithm, automatic mapping dynamic path planning and offer a package solution of automatic positioning and navigation	Movement Control Panel for AGV
Application	For real-time automatic localization and navigation of service robots	As a movement control panel for service robot	For real-time automatic localization and navigation of AGV	For movement control of AGV

## LS Fittings: boards and cables I

Model	PA00A	PB00A	PB01A	PB02A
Product name	12V power adapter	UART adapter plate	UART adapter plate	UART adapter plate
Product Profile	12V power adapter optional for LiDAR and applicable to equipment electrified by a separate power supply	Commissioning adapter plate optional for LiDAR, with one end connected with LiDAR UART data interface and power interface, and the other end with independent 9-12V power interface and USB interface	Commissioning adapter plate optional for LiDAR, with one end connected with LiDAR UART data interface and power interface, and the other end with Micro USB interface	Commissioning adapter plate with serial cable, optional for LiDAR, with one end connected with LiDAR UART data interface and power interface, and the other end with Micro USB interface
Remarks	Non-standard power adapter for LiDAR	Non-standard power adapter for LiDAR, applicable to N301 C-Series LiDARs (the version with UART interface)	Non-standard power adapter for LiDAR, applicable to LS01-Series triangulation LiDAR	Non-standard power adapter for LiDAR, applicable to LS02-Series triangulation LiDAR

## LS Fittings: boards and cables II

Model	CA00A	CA01A	CA02A	CA03A
Product name	Ethernet cable terminal box	UART serial cable	RS232 serial cable	Aviation-plug discrete cable
Product Profile	8-core aviation-plug Ethernet cable optional for LiDAR, with one end connected with a 8-core aviation interface, and the other end with RJ45 socket and 2-wire 12V DC power adapter socket	8-core aviation-plug serial cable optional for LiDAR, with one end connected with a 8-core aviation interface, and the other end with 3-wire UART plug and 2-wire DC plug	8-core aviation-plug RS232 cable optional for LiDAR, with one end connected with a 8-core aviation interface, and the other end with 3-wire RS232 plug and 2-wire DC plug	12-core aviation-plug cable optional for LiDAR, with one end connected with a 12-core aviation interface, and the other end being discrete wires
Remarks	Non-standard terminal box for LiDAR, applicable to N301/C1 vehicle-borne LiDARs (the series with aviation plug for Ethernet connection)	UART serial cable, non-standard fitting for LiDAR	RS232 serial cable, non-standard fitting for LiDAR	Non-standard cable for LiDAR, applicable to W-Series anti-collision pre-warning LiDARs (the version with aviation plug)

## LeiShen helps to create more intelligent machines, safer driving and a better world!

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