

# **LMO Laser Scanner**



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# **1**、**Product Description**

# **1.1 Product parameter**

Supply voltage	10~30VDC			
Power consumption	< 3W (Starting peak power :5W)			
Waterproof rating	IP65			
Weight	155g			
Dimension (L*W*H)	60mm×60mm×76.5mm			
Scanning frequency	25Hz			
Response time	40ms			
Light source	Laser (905nm)			
Scanning angle	270 °			
Angle resolution	0.5 °			
Work range	0.05m-10m			
Protection range	бт			
(reflectance:10%)				
Area quantity	Standard type: 32 Groups*3Area /Ethernet type: 16 Groups*3			
	Area			
Indicator	Blue: work	Green: Areal output		
indicator	Yellow: Area2 output	Red: Area3 output		

# **1.2 Environment parameter**

Anti-ambient light	80000lux
Anti-vibration	Double amplitude :1mm 10 to 55Hz, each axis for 2 hours
Operating ambient temperature	$-20^{\circ}C \sim +55^{\circ}C < 85\%$ RH (No condensation)
Storage ambient temperature	-30°C ~ +60°C



# **1.3 Interface options**

# Select model according to input / output mode

Interface	USB(Micro-B)			
Input communication port (Selecting area)	5*IO input	232 communication	485 communication	Ethernet communication
Output ports (Area output)	3*Area output +1* Synchronous output (NPN)		3* Area output +1* Synchronous output (PNP)	

## Note: Ethernet with only PNP output

# 2、Electrical connections

#### 2.1 Power cable



#### 14 core power cordRS485/RS232

No	Color	Definition	Function
1	Brown	24+	Power "+"
2	Blue	24-	Power "-"
3	White	OUT1	Area1 output
4	Yellow	OUT3	Area3 output
5	Red white	NC	NC
6	Black	RS232TX/RS485A	RS232TX/RS485A
7	Purple	RS232RS/RS485B	RS232RS/RS485B
8	Red	RS232_GND	RS232_GND/RS485NC
9	Grey	COM_OUT	Output "COM"
10	Green	OUT4	Area4 output
11	Blue white	RS232_GND	RS232_GND/RS485NC
12	Orange	OUT2	Area2 output
13	Brown white	NC	NC
14	Green white	NC	NC

#### **Input line sequence definition**



#### I/O Input line sequence definition

No	Color	Definition	Function	
1	Brown	24+	Power "+"	
2	Blue	24-	Power "-"	
3	White	OUT1	Area1 output	
4	Yellow	OUT3	Area3 output	
5	Red white	IN1	Area selecting input 1	
6	Black	IN2	Area selecting input 2	
7	Purple	IN3	Area selecting input 3	
8	Red	IN4	Area selecting input 4	
9	Grey	COM_OUT	Output "COM"	
10	Green	OUT4	Synchronous 4 output	
11	Blue white	IN5	Area selecting input 5	
12	Orange	OUT2	Area 20utput	
13	Brown white	COM_IN	Input"COM"	
14	Green white	NC	NC	

Note: NPN: COM\_OUT is "-", PNP: COM\_OUT is "+"

Ethernet Communication cable definition

No	Color	Definition	Function
1	Orange white	TX+E	Ethernet data transmission
2	Orange	ТХ-Е	Ethernet data transmission
3	Green white	RX+E	Ethernet data receiving
6	Green	RX-E	Ethernet data receiving

# 2.2 Input wiring

COM\_IN connect to "+" , IN is put in port (IN connected to low opt coupler is ON; Suspended or connected to "-"-" is OFF), Input voltage (DC12-30V 5mA)





#### 2.3 Output wiring



Note: NPN output connect Pull up load, PNP output connect Pull down load (DC30V 100mA)

# **3、** Function and Application

#### **3.1 Function**

The main functions of LMO lidar are safety protection, area detection, etc. Connect the LMO lidar with the area designer software through USB to configure the equipment, and set the data graphic display and detection area (the field application can select the area through rs232/rs485/io/ethernet); Then judge whether there is object intrusion. If there is object intrusion, warning output realizes obstacle avoidance function and safety protection. NPN/PNP synchronous area output.(the instructions for upper computer for specific setting details)



The zero point of lidar range detection is the Lidar center

# 3.2 Area Setting

Input1	Input2	Input3	Input4	Input5	Area
ON	ON	ON	ON	ON	Closing
					detection
OFF	ON	ON	ON	ON	Area 1
ON	OFF	ON	ON	ON	Area 2
OFF	OFF	ON	ON	ON	Area 3
ON	ON	OFF	ON	ON	Area 4
OFF	ON	OFF	ON	ON	Area 5
ON	OFF	OFF	ON	ON	Area 6
OFF	OFF	OFF	ON	ON	Area 7
ON	ON	ON	OFF	ON	Area 8
OFF	ON	ON	OFF	ON	Area 9
ON	OFF	ON	OFF	ON	Area 10
OFF	OFF	ON	OFF	ON	Area 11
ON	ON	OFF	OFF	ON	Area 12
OFF	ON	OFF	OFF	ON	Area 13
ON	OFF	OFF	OFF	ON	Area 14
OFF	OFF	OFF	OFF	ON	Area 15



ON	ON	ON	ON	OFF	Area 16
OFF	ON	ON	ON	OFF	Area 17
ON	OFF	ON	ON	OFF	Area 18
OFF	OFF	ON	ON	OFF	Area 19
ON	ON	OFF	ON	OFF	Area 20
OFF	ON	OFF	ON	OFF	Area 21
ON	OFF	OFF	ON	OFF	Area 22
OFF	OFF	OFF	ON	OFF	Area 23
ON	ON	ON	OFF	OFF	Area 24
OFF	ON	ON	OFF	OFF	Area 25
ON	OFF	ON	OFF	OFF	Area 26
OFF	OFF	ON	OFF	OFF	Area 27
ON	ON	OFF	OFF	OFF	Area 28
OFF	ON	OFF	OFF	OFF	Area 29
ON	OFF	OFF	OFF	OFF	Area 30
OFF	OFF	OFF	OFF	OFF	Area 31

# **3.3Application:**

- Robot environment recognition
- Building intrusion protection (security area)
- Automatic door / behavior recognition
- Automatic guided vehicle (AGV) obstacle avoidance, scanning area can be set and

has three-stage output (alarm, deceleration, emergency stop)

# 4、 **Dimension**



# **4.1 LMO Outline dimension**



# 4.2 Outline dimension drawing and installation diagram of bottom mounting

bracket



# 4.3 Outline dimension drawing and installation diagram of back mounting bracket



# 4.3 Outline dimension and installation diagram of anti-collision support









#### **5**, Installation

#### 5.1 Installation precautions

- LMO lidar shall be installed away from the environment with moisture, dirt and damage to sensors.
- In order to avoid external light sources such as sunlight, incandescent lamp, fluorescent lamp, strobe lamp or other infrared light sources, such external light sources shall not be within  $\pm 5^{\circ}$  of the detection plane.

he interference of similar light sources shall be avoided. When multiple sensors are installed at the same time, the following installation methods shall be selected to avoid

a. Install isolation plate between adjacent sensors.

b. Adjust the mounting height of each sensor so that the detection planes of the sensors are not within  $\pm 5$  degrees of each other's detection planes.

#### **Installation steps:**

1. Use 4 M2.5  $\times$  6 cross countersunk head screws, through the four threaded holes on the bottom surface of the lidar, fix the support to the lidar.

2. Use 2 M4 hexagon socket head cap screws to install the mounting bracket onto the desired mounting surface.

### 6、Troubleshooting

#### 6.1 Parameter configuration failure

It is necessary to reconfigure the machine working parameters through the upper computer and transmit them to the machine  $\circ$ 

#### **6.2 Front Lens cover fault**

The lens cover is an important part of LMO lidar. If the lens cover is polluted, it will affect the measurement light, and in serious cases, it will lead to large measurement error. Therefore, the mirror cover must be kept clean. When the mirror cover is found to be dirty, please wipe it in the same direction with a soft cloth dipped in neutral detergent. When there are particles on the lens cover, it should be cleaned up before wiping to avoid scratching the lens cover.



#### 6.3 Motor fault

Motor failure will cause the machine to be unable to scan and measure or cause inaccurate response time. It needs to be returned to the factory for maintenance.

#### 6.4 Power fault

Check whether there is a problem with the power cable or the machine fails, and return it to the factory for maintenance.

# 7、Appendix

### 7.1 File version information

The version number of this document is V1.4.1, which was updated on April 1, 2022



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