SDKELI®

LSE Series Laser Lidar -
Obstacle Avoidance Type

OPERATION MANUAL

(January 2026)



Jining Keli Photoelectronic Industrial Co., Ltd.

■ Directives and standards

LSE series laser lidar (referred to as LSE) meets the following directive and standards:

- RoHS directive 2011/65/EU
- International standard

  EN 61326-1: 2013

  EN 61010-1:2010 + A1: 2019

  UL 61010-1: 2012

  EN 60825-1: 2014

  IEC 60825-1: 2014

■ Safety precautions

The following safety warning signs are used to warn potential personal injury hazards, please follow all safety information with this symbol to avoid possible injury.

⚠ CAUTION

This is a key information prompt symbol.
The contents indicated under this symbol are very important.
Operators must understand and strictly comply with the requirements to avoid potential unexpected safety incidents.

⚠ WARNING

This is a safety warning symbol.
The contents indicated under this symbol are very important.
Operators must strictly adhere to the safety information indicated by the symbol to prevent potential unexpected safety incidents.

■ Safety precautions for use

⚠ CAUTION

- Before using LSE, carefully read this manual to understand the procedures and requirements for installation, operation, and configuration.
- LSE should be selected, installed, maintained, and serviced by qualified personnel. Qualified personnel refer to those who have received professional training and hold recognized qualifications, or individuals with extensive knowledge, training, and experience who have demonstrated the ability to handle such tasks.
- To avoid the optical path striking the ground, the installation height of LSE should be greater than or equal to 200mm. During installation, LSE should be kept as far away as possible from vibration-prone areas.
- Do not drop LSE.
- The use of LSE must comply with local standards, laws, and regulations.
- The user should establish and effectively implement safety operation management rules and regulations.

■ Applications

LSE for obstacle avoidance is suitable for collision prevention of mobile robots. The typical application is automated guided vehicle (AGV) and rail guided vehicle (RGV).

■ The protection object of LSE must meet the following conditions:

- LSE can only detect objects within its detection capability.
- LSE cannot detect transparent or semi-transparent objects.
- Objects within the protection area must be equal to or larger than the minimum detectable size specified for LSE.

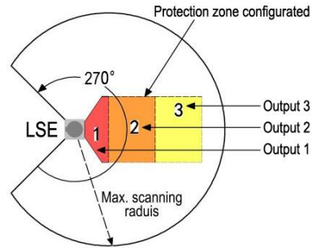
■ Do not install LSE in the following environments:

- Locations where environmental conditions (such as temperature, humidity, stray light, shock, and vibration, etc.) fall outside the ranges specified in this manual.
- Areas where flammable and explosive gases are present.
- Areas where substances such as dense smoke, particulates, or corrosive chemicals are present.
- Areas subject to strong optical interference (e.g., direct light exposure) that may affect LSE performance.

1. Working principles and protection zone configuration

LSE is designed based on pulsed laser ranging principles to realize the two dimensional zone detection with an angle of 270° and radius of 10m through rotational scanning.

Users can configure the mode and shape of protection zone through the configuration software.



Introduction of the protection zone

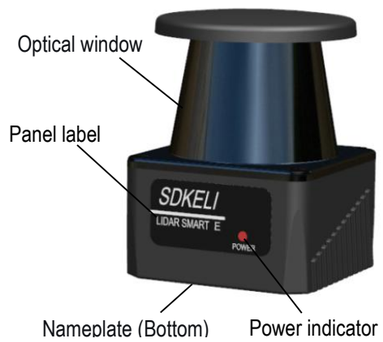
Identification	Meaning	Description
3	Protection zone 3 configured by user	OUTPUT3 will enter OFF state when any obstacle is detected
2	Protection zone 2 configured by user	OUTPUT2 will enter OFF state when any obstacle is detected
1	Protection zone 1 configured by user	OUTPUT1 will enter OFF state when any obstacle is detected
LSE	Laser lidar	Scanning angle: 270 °, radius: 10m@ 70% reflectance radius: 4m@10% reflectance

2. System description

LSE supplies power to its system and monitors the external equipment through the power cable. Users can use the USB configuration cable to connect the lidar with the computer, and set the relevant parameters such as the protection area through the configuration software.



3. Appearance information



State of power indicator	Corresponding sate of lidar
Slow flashing	Starting state
Continuous on	Operating state
Fast flashing	Fault state

4. Specification

Series	Max. scan radius	Scan angle	Output form	Max. measurement error	Angle resolution	Installation code
LSE —	□□	27	□□/	□	□□/	□□

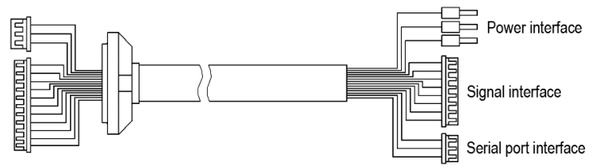
Specification	Max. scan radius	Output form	Measurement accuracy	Angle resolution
LSE-0627BP/H05	6m@70% reflectance	PNP	±3cm@1sigma	0.5°
LSE-0627BN/H05	2m@10% reflectance	NPN		
LSE-1027BP/H05	10m@70% reflectance	PNP	±3cm@1sigma	0.5°
LSE-1027BN/H05	4m@10% reflectance	NPN		

Scanning angle: 270°

Installation code: SZ—Horizontal installation

5. Power cable

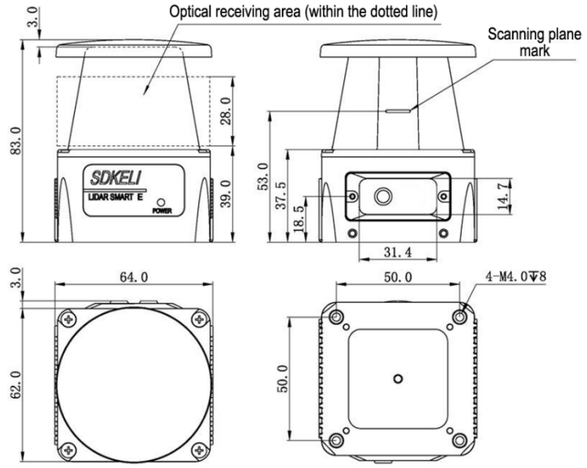
The power cable structure is shown below, and the standard length is 1m.



Wire core color	Signal definition	Signal description	Interface
Red	24V	Supply voltage +	Binding post
Green	0V	Supply voltage -	Binding post
Y/G	PE	Shielded line	Binding post
Green	0V	0V	3Y connector
Cyan	TXD	Connect RXD for user	
Yellow	RXD	Connect TXD for user	
White	Z1	Zone group selection signal, realize the switching among multiple protection zones through the changes in Z1, Z2, Z3 and Z4 input signals	8Y connector
Black	Z2		
Orange	Z3		
Pink	Z4		
Gray	INCOM+/-		
Brown	OUTPUT1	Output signal of each protection zone, PNP or NPN, OUTPUT enters OFF-state when an obstacle is detected in the corresponding detection zone	
Blue	OUTPUT2		
Purple	OUTPUT3		

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6. Dimensions



⚠ CAUTION

In the scanning area set by the user, when the scanning optical axis is at any angle, it must be ensured that there is no obstacles in the optical receiving area.

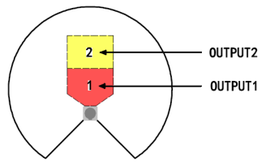
7. Technical parameters

Optical properties		
Laser light source	Wavelength: 905nm; Class 1 laser product	
Max. scanning radius	10m@70% reflectance, 4m@10% reflectance	
Scanning angle	270°	
Angle resolution	0.5°	
Pitch angle	±1.0°	
Measurement accuracy	Typical ±3cm	
Electrical / mechanical parameters		
Supply voltage	DC9V to DC28V	
Power-on time	Typical 6s	
Power consumption	Typical 3W	
Output	OUTPUT1: Protection zone 1 will enter the OFF state when any obstacle is detected. OUTPUT2: Protection zone2 will enter the OFF state when any obstacle is detected. OUTPUT3: Protection zone3 will enter the OFF state when any obstacle / system failure is detected (alternative, it can be configured)	
Dimensions	62mm×64mm×83m	
Cable length	1m (Standard length); Max. length≤30m	
Environmental properties		
Ambient temperature	Operating	-10°C to 50°C (non-condensing)
	Storage	-40°C to 70°C
Ambient humidity	Operating	35%RH to 85%RH
	Storage	35%RH to 95%RH
Ambient light immunity	15000Lux	
Enclosure rating	IP65	
Shock resistance	Acceleration: 10g; Pulse duration: 16ms; Number of collision times: three axes, 1000 ± 10 times per axis	
Vibration resistance	Frequency 10Hz to 55Hz; Amplitude: 0.35 ± 0.05mm; Number of scans: three axes, 20 times per axis	
Configurable functions		
Protection zone configuration	The user can configure the protection zone of LSE to the desired shape by configuring the software	
Response time	Adjustable (40ms/r)	
Zone group switching	4 groups of external input signal (Z1, Z2, Z3, Z4) to achieve the switching among 16 zone groups; when Z1, Z2, Z3 and Z4 are not connected, zone group 16 will work for PNP output and zone group 15 will work for PNP output by default	
Working mode	LSE provides 4 kinds of working modes, and the default is working mode 4	

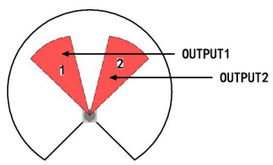
8. Working mode

LSE provides 4 kinds of working modes, and the default is working mode 4, and user may modify the working mode by configuring software. See "Operation Instructions of LSE Laser Lidar–Configuration Software".

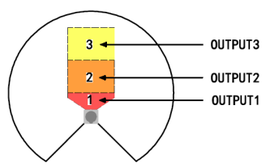
Mode 1: User can configure 2 protection zones from far and near corresponding to OUTPUT2 and OUTPUT1; meanwhile, provide system failure output OUTPUT3.



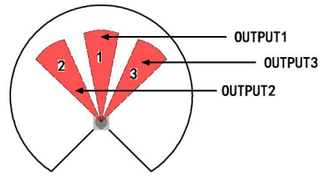
Mode 2: User can configure two independent protection zones corresponding to OUTPUT1 and OUTPUT2; meanwhile, provide system failure output OUTPUT3.



Mode 3: User can configure 3 protection zones from far and near corresponding to OUTPUT3, OUTPUT2 and OUTPUT1; not provide system failure output.



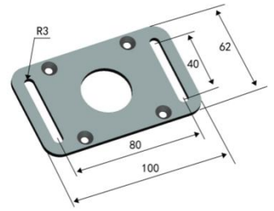
Mode 4: User can configure 3 independent protection zones corresponding to OUTPUT1, OUTPUT2 and OUTPUT3; not provide system failure output.



9. Installation

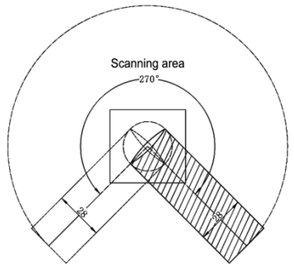
■ **Horizontal installation (SZ)**



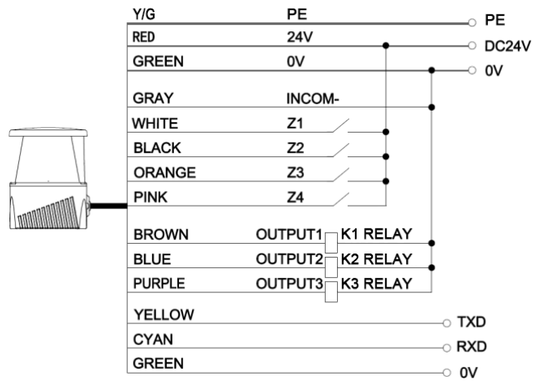


■ **Installation precautions**

- To prevent the light from being projected to the ground, the installation height of LSE should be more than 200mm.
- Try to keep LSE away from the vibration area during installation.
- During installation, there should be no obstacles in the optical receiving area shown in the following below.

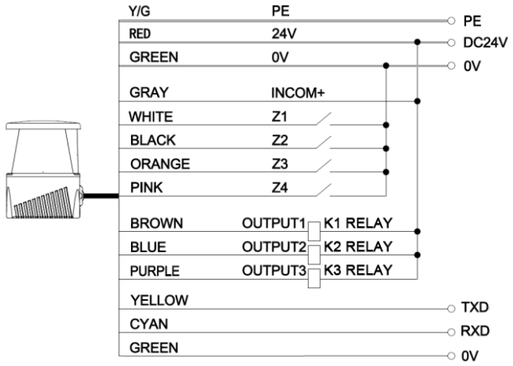


10. Wiring



TXD and RXD are signals from the user's terminal.

PNP output



TXD and RXD are signals from the user's terminal.

NPN output

⚠ WARNING

- Please read this manual carefully before wiring.
- Wiring must be conducted when the power is cut off.
- Double insulation or reinforced insulation must be used between all input and output interfaces and dangerous voltage. Otherwise, electric shock may be caused.
- The cable of LSE must be kept away from high-voltage wires and power lines.
- It is strictly forbidden for users to replace the cable without permission.
- Conduct correct wiring after defining the signal meanings of all terminals.

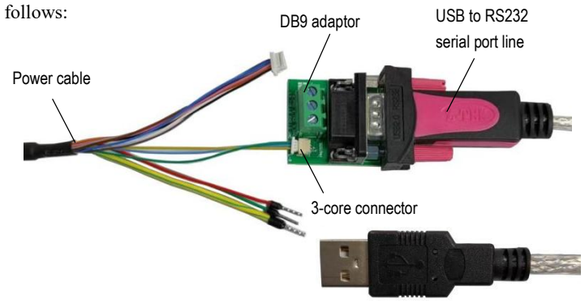
11. Instructions for use of configuration cable

The configuration cable consists of DB9 adaptor and USB to RS232 serial port line.





The connection between the configuration cable and the lidar is as follows:



⚠ CAUTION

To simplify wiring for users, the yellow and cyan serial communication cables and the green OV cable (thinner one) are pre-connected to the three-pin connector during factory assembly. If users remove the connector for their own use and the yellow/cyan serial communication cables and green OV cable (thinner one) are left unconnected to any other interface, they must be properly insulated.

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