SDKELI®

CE

LS Series Laser Lidar

Obstacle Avoidance Type

OPERATION MANUAL

(January 2026)



(The picture is for reference only, the actual item may be different from the picture shown.)

Jining Keli Photoelectronic Industrial Co., Ltd.

■ Directives and standards

LS series laser lidar (referred to as LS) meets the following standards:

- **European Union Directive**

  EMC Directive 2014/30/EU
- **International standard**

  EMI: EN 61326-1: 2013

  EN 55011: 2009 + A1: 2010

  EMS: EN 61326-1: 2013

  EN 61000-4-2: 2009

  EN 61000-4-3: 2006 + A1: 2008 + A2: 2010

  EN 61000-4-4: 2004 + A1: 2010

  EN 61000-4-6: 2009

  EN 61000-4-8: 2010

  EN 61000-4-11: 2004
- **GB standard**

  GB 4208-2017 (IP65)

■ 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 LS, please carefully read this manual carefully to understand the procedures and requirements of installation, operation and setting.
- LS should be selected, installed, overhauled and maintained by professionals. Professionals refer to the people who have been professionally trained and accredited, or people who have a wealth of knowledge, training and experience and the ability to solve such problems.
- When configuring the lidar through the USB port, it is must be to confirm whether the housing of lidar is electrified first and make sure that the housing is connected without electrification. A multimeter is suggested to be used to measure the voltage between the lidar non-painted housing (e. g. , at the mounting screw hole) and the lidar power supply voltage of 0 V, confirming that the value is ≤10 V.
- Do not drop LS.
- LS should be used in accordance with local relevant standards and laws and regulations.
- Users should establish rules and regulations for safe operation and management and implement them effectively.

■ Applications

LS 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 LS must meet the following conditions:

➢ LS can only detect objects within its detection capability.

➢ LS 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 LS.

■ Do not install LS 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.

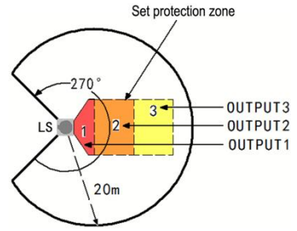
➢ Areas where substances such as dense smoke, particulates, or corrosive chemicals are present.

➢ Areas subject to strong optical interference (e.g., direct light exposure) that may affect LS performance.

1. Working principles and protection zone configuration

LS is designed based on pulsed laser ranging principles to realize the two dimensional zone detection with an angle of 270° and radius of 20m through rotational scanning.

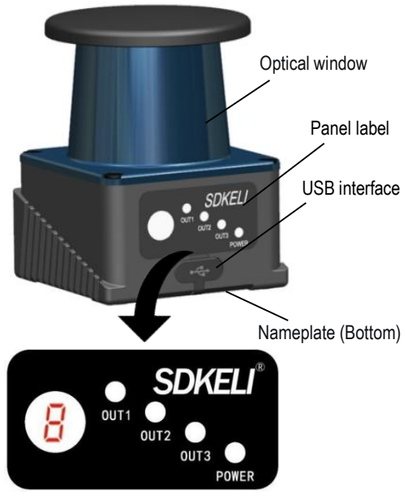
Users can configure the mode and shape of protection zone through the configuration software.



Introduction to the configuration of protection zone for mobile robot

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
LS	LS obstacle avoidance laser lidar	Scanning angle: 270 °, Radius: 20m @70% reflectance 8m @10% reflectance

2. Appearance information



⚠ CAUTION

Be sure to press the black sealing cover on the USB interface tightly to prevent moisture, dust, etc. from entering the LS, so as not to affect the use and life of the lidar.

Mark	Indicator	Status	Description
OUT1	Output 1	Red	Protection zone 1 status indicator: Lights up when an obstacle is detected in protection zone 1.
OUT2	Output 2	Red	Protection zone 2 status indicator: Lights up when an obstacle is detected in protection zone 2.
OUT3	Output 3	Red	Protection zone 3 status / System fault indicator (Mode-Configurable): Lights up when an obstacle is detected in protection zone 3 or when the system fault occurs, depending on the selected mode.
POWER	Power supply	Red	It will turns on after turning on the power
8	Digital tube	0	Protection zone is not configured or there is input signal failure
		1	The current scanning zone is Zone group 1
		2	The current scanning zone is Zone group 2
		3	The current scanning zone is Zone group 3
		4	The current scanning zone is Zone group 4
		5	The current scanning zone is Zone group 5
		6	The current scanning zone is Zone group 6
		7	The current scanning zone is Zone group 7
		8	The current scanning zone is Zone group 8
		9	The current scanning zone is Zone group 9
		A	The current scanning zone is Zone group 10
		b	The current scanning zone is Zone group 11
		C	The current scanning zone is Zone group 12
		d	The current scanning zone is Zone group 13
		E	The current scanning zone is Zone group 14
		F	The current scanning zone is Zone group 15
		H	The current scanning zone is Zone group 16
		6	Establish communication with the computer
		8	It is flashing during power-on initialization (with an interval of 1 second)
		9	LS configuration is successful
		F	LS system fails
		When multiple statuses coexist, multiple status words are displayed cyclically (with an interval of 1 second)	

3. Specification

Series	Maximum scan radius	Scan angle	Output form	Measurement accuracy	Angle resolution	Installation code
LS(2) —	□□	27	□□	/ □	□□	/ □□

Specification	Maximum scan radius	Output form	Measurement accuracy	Angle resolution
LS-0627BP/M05	6m@70% reflectance 2m@10% reflectance	PNP	±4cm@1sigma	0.5°
LS-0627BPH/M05		PNP		
LS-0627BN/M05		NPN		
LS-1027BP/M05	10m@70% reflectance 4m@10% reflectance	PNP	±4cm@1sigma	0.5°
LS-1027BPH/M05		PNP		
LS-1027BN/M05		NPN		
LS-2027BP/M05	20m@70% reflectance 8m@10% reflectance	PNP	±4cm@1sigma	0.5°
LS-2027BPH/M05		PNP		
LS-2027BN/M05		NPN		
LS2-0627BP/M05	6m@70% reflectance 2m@10% reflectance	PNP	±4cm@1sigma	0.5°
LS2-0627BPH/M05		PNP		
LS2-0627BN/M05		NPN		
LS2-1027BP/M05	10m@70% reflectance 4m@10% reflectance	PNP	±4cm@1sigma	0.5°
LS2-1027BPH/M05		PNP		
LS2-1027BN/M05		NPN		
LS2-2027BP/M05	20m@70% reflectance 8m@10% reflectance	PNP	±4cm@1sigma	0.5°
LS2-2027BPH/M05		PNP		
LS2-2027BN/M05		NPN		

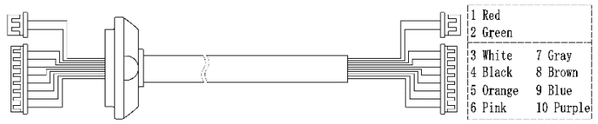
Scanning angle: 270° Installation code:

SZ: Horizontal installation/CZ: Vertical installation/FZ: Scatter shield installation

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4. Power cable

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



Wire core color	Signal definition	Signal description
Red	24V	Working power supply
Green	0V	
White	Z1	Zone group is used to select signals, and thus realize the switching among multiple protection zones through the changes in Z1, Z2, Z3 and Z4 input signals
Black	Z2	
Orange	Z3	
Pink	Z4	
Gray	INCOM+	Zone group is used to switch signal input shared terminal (connected to the positive pole of DC power)
Brown	OUTPUT1	Output signal, 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 by user)
Blue	OUTPUT2	
Purple	OUTPUT3	

5. Technical parameters

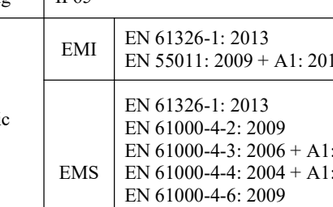
Optical properties	
Laser light source	905nm wavelength, Class 1 laser product
Max. scan radius	20m@ 70% reflectance 8m@ 10% reflectance
Scan angle	270°
Angle resolution	0.5°
Measurement accuracy	±4cm@1sigma
Electrical / mechanical parameters	
Supply voltage	DC9V to DC30V
Power-on time	Typical 6s
Power consumption	Typical 3W
Dimensions	62×64×84.2mm
Cable length	≤30m
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)

Environmental properties		
Ambient temperature	Operating	-10℃ to 50℃(non-condensing)
	Storage	-30℃ to 70℃
Ambient humidity	Operating	35%RH to 85%RH
	Storage	35%RH to 95%RH
Ambient light immunity	15000Lux	
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	
Enclosure rating	IP65	
Electromagnetic compatibility (EMC)	EMI	EN 61326-1: 2013 EN 55011: 2009 + A1: 2010
	EMS	EN 61326-1: 2013 EN 61000-4-2: 2009 EN 61000-4-3: 2006 + A1: 2008+ A2: 2010 EN 61000-4-4: 2004 + A1: 2010 EN 61000-4-6: 2009 EN 61000-4-8: 2010 EN 61000-4-11: 2004
Configurable functions		
Protection zone configuration	The user can configure the protection zone of LS 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 received, zone group 1 will work by default	
Working mode	LS provides 4 kinds of working modes, and the default is working mode 4	

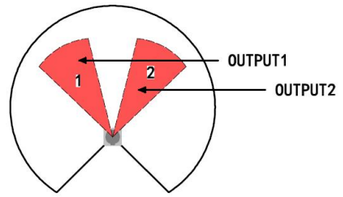
6. Working mode

LS 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 LS Type Laser Lidar – Configuration Software”.

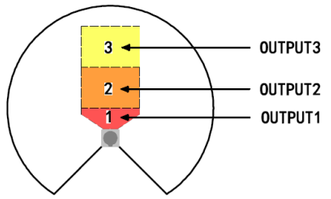
Mode 1: User can configure 2 protection zones from far and near corresponding to OUTPUT2 and OUTPUT1; meanwhile, provide system failure output OUTPUT3.



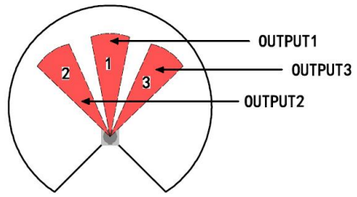
Mode 2: User can configure two independent protection zones corresponding to OUTPUT1 and OUTPUT2; meanwhile, provide system failure output OUTPUT3.



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

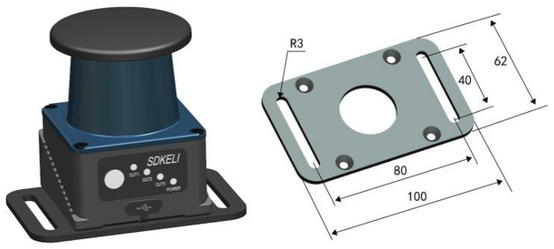


Mode 4: User can configure 3 independent protection zones corresponding to OUTPUT1, OUTPUT2 and OUTPUT3; not provide system failure output.

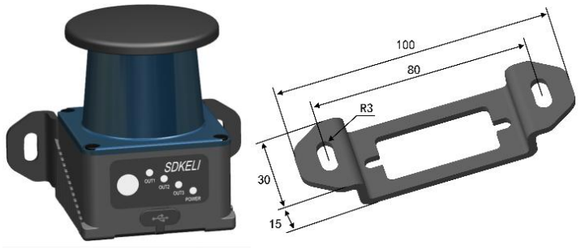


7. Installation

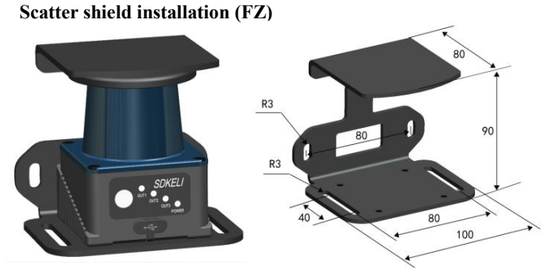
■ **Horizontal installation (SZ)**



■ **Vertical installation (CZ)**



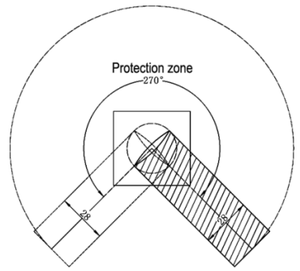
■ **Scatter shield installation (FZ)**



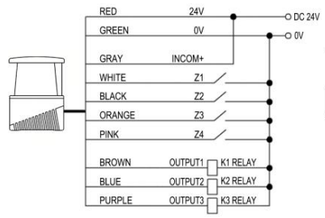
➢ To prevent the light from being projected to the ground, the installation height of LS should be more than200mm.

➢ Try to keep LS away from the vibration area during installation.

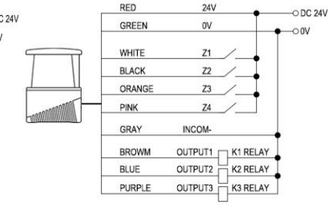
➢ During installation, there should be no obstacles in the optical receiving area shown in the figure below.



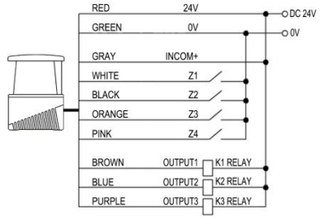
8. Wiring



PNP Output - BP type



PNP Output - BPH type



NPN Output

⚠ WARNING

- Please read this manual carefully before wiring.
- Wiring must be conducted after the power is cut off.
- Double insulation or reinforced insulation must be used between all input and output interfaces and dangerous voltages.
- LS cables must be kept away from high-voltage wires and power lines.
- Users should not replace the cable without permission.
- Conduct correct wiring after defining the signal meaning of all terminals.

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