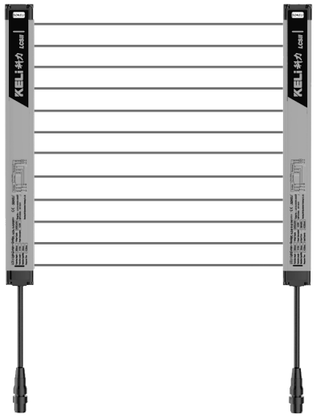
SDKELI®

LCSII Light Curtain

Operation Manual

(2020.09)



Jining KeLi Photoelectronic Industrial Co., Ltd.

Legislation and standards

LCSII light curtain complies with the following legislations and standards:

- EU legislations
  Machinery Directive 2006/42/EC
  EMC Directive 2014/30/EU
- International Standards
  IEC 61496-1, IEC 61496-2
  ISO 13849-1
- National Standards
  GB/T 19436.1, GB/T 19436.2, GB 4584

Precautions on safety

The following special information may appear at any place in the manual or on LCSII , as a warning of potential risk or promotion of special attention to information about clarifying or simplifying certain procedures.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ WARNING

WARNNING indicates an actual or potential risk or health hazard. They are designed to help you to prevent accidents. Read carefully and follow the warnings!

⚠ CAUTION

CAUTION indicates the key information which, if not avoided, can result in expected legal dispute, or equipment damage.
Read carefully and follow the cautions!

Precautions for safe use

CAUTION

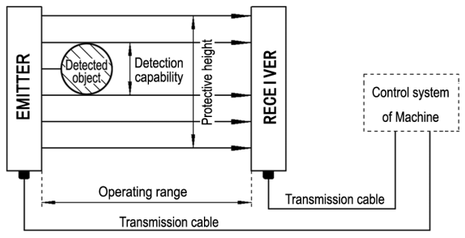
- Thoroughly read this manual and understand the installation procedures, operation check procedures, and maintenance procedures before using the product.
- LCSII should only be installed, checked, and maintained by a qualified person. A qualified person is defined as “a person or persons who, by possession of a recognized degree or certificate of professional training, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work”.
- OSSDs must satisfy the following conditions:
  Not short-circuited with 24V
  The OSSDs should not be used with a current that is higher than the rating.
- Do not drop the product.
- Dispose of the product in accordance with the relevant rules and regulations of the country or area where the product is used.
- The user should establish the rules and regulations for safe operation and carry out them effectively.

Applications

LCSII designed for industrial automation specially, the typical applications are as follows: automated assembly production lines, industrial robots, packaging equipment, automation equipment, welding lines, and so on.
LCSII can only detect objects which intrude into the detection zone. Detection zone is the rectangular area between the emitter and the receiver, formed by protective height and operating range.
LCSII can onlycannot detect transparent and/or translucent objects.
The size of the guarded object must not be less than the detection capability. Detection capability is the sensing function parameter limit specified by the supplier that will cause actuation of the system.

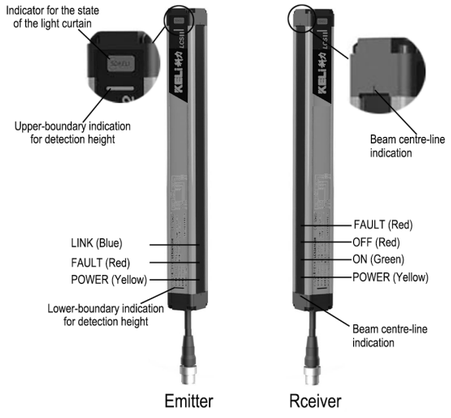
1. System components

LCSII is composed of an emitter, a receiver and two transmission cables, as shown in the following figure.



2. Appearance

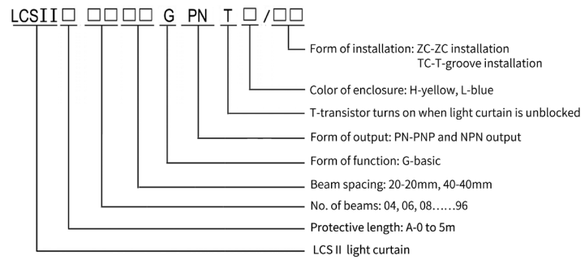
LCSII is composed of emitter and receiver, using the outlet mode integrated in the end cap, connecting to the external signals with high flexible cable, shown in the following figure.



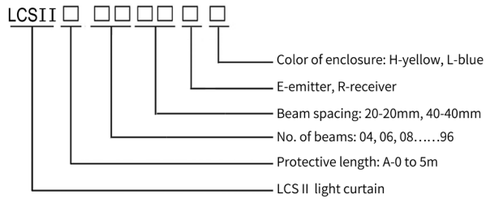
	LED Indicator	Colour	Description
Emitter	POWER	Yellow	Turns on while the power is on.
	FAULT	Red	Turns on when the system is in fault state or the communication is wrong. The OSSDs output OFF-state and the guarded machine can’t work.
	LINK	Blue	Turns on while there is communication between emitter and receiver.
	End cap indicator	Red/Green	Display green when the OSSDs output ON-state, display red when the OSSDs output OFF-state or the system is in fault state.
Receiver	POWER	Yellow	Turns on while the power is on.
	ON	Green	Turns on when the OSSDs output ON-state. The guarded machine works.
	OFF	Red	Turns on when the OSSDs output OFF-state and the guarded machine can’t work.
	FAULT	Red	Turns on when the system is in fault state. The OSSDs output OFF-state and the guarded machine can’t work.
	End cap indicator	Red/Green	Display green when the OSSDs output ON-state, display red when the OSSDs output OFF-state or the system is in fault state.

3. Specifications

Specification of the system

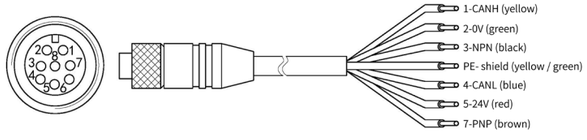


Specification of emitter/receiver

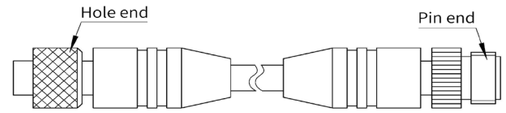


4. Transmission cable

The transmission cable is used for signal transmission between the sensor and the control circuit of the guarded machine. Transmission cable is divided into standard cable and high flexible cable, high flexible cable can be used in frequently moving occasions.
The standard length of transmission cable is 2m, 3m, 4m, and 5m.
The connection points are shown in the figure below.



Transmission cable is the 6-core butyl sheath shield cable, with the waterproof plug at one end connected with the sensor and the other end connected to the guarded machine.
If the standard transmission cable can not meet the requirements of the use, the extension cable can be used to increase the length of transmission cable. Extension cable is divided into standard cable and flexible cable, high flexible cable can be used in frequently moving occasions.
Extension cable is the 6-core butyl sheath shield cable, with the hole seat at one end and the pin seat at the other end. The standard length of transmission cable is 5m, 10m and 20m. The picture is as follows:



The number, color and function of the cores are shown in following table.

Pin number	Signal label	Meaning of signal	Wiring
1	Yellow	CANH communication signal	Connect CANH between emitter and receiver
2	Green	Cathode of input DC24V	Connect with cathode of input DC24V
3	Black	NPN control output interface	Control output interface 1
4	Blue	CANL communication signal	Connect CANL between emitter and receiver
5	Red	Anode of input DC24V	Connect with anode of input DC24V
7	Brown	PNP control output interface	Control output interface 2
	Yellow/ Green	Shield layer	Short circuited with the cathode of power supply negative short and connect

Note: LCSII integrates NPN and PNP outputs together , while black wire is for NPN interface and brown wire is for PNP interface.

The specifications of transmission cable and extended cable are shown in the following table.

No.	Type	Material code	Specification	Length	Unit	Remarks
1	Transmission cable	CTL2XDC0001	CTL2X1D020C	2m	Piece	
2		CTL2XDC0002	CTL2X1D030C	3m	Piece	
3		CTL2XDC0003	CTL2X1D040C	4m	Piece	
4		CTL2XDC0004	CTL2X1D050C	5m	Piece	
5		CTL2XTC0001	CTL2X1T020C	2m	Piece	High flexible
6		CTL2XTC0002	CTL2X1T030C	3m	Piece	High flexible
7		CTL2XTC0003	CTL2X1T040C	4m	Piece	High flexible
8		CTL2XTC0004	CTL2X1T050C	5m	Piece	High flexible
9	Extension cable	CT6MXSC0003	CT6MX3S050C	5m	Piece	
10		CT6MXSC0004	CT6MX3S100C	10m	Piece	
11		CT6MXSC0005	CT6MX3S200C	20m	Piece	
12		CT6MXTC0001	CT6MX3T050C	5m	Piece	High flexible
13		CT6MXTC0002	CT6MX3T100C	10m	Piece	High flexible
14		CT6MXTC0003	CT6MX3T200C	20m	Piece	High flexible

5. Technical parameters

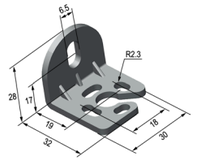
Optical characteristics		
Light source	Infrared LED (wavelength 850nm)	
Beam spacing	20mm	40mm
Detection capability	30mm	50mm
No. of beams	8, 12, 16 ⋯ 96	4, 6, 8 ⋯ 48
Protective length	0 to 5m	
Protective height	20mm beam spacing : 20 × (beam number -1) units : mm	
	40mm beam spacing : 40 × (beam number -1) + 20 units : mm	
EAA	＜5°	
Environmental characteristics		
Ambient temperature	Operation	-10 to 55°C (non-condensing)
	Storage	-40 to 70°C
Ambient humidity	Operation	35% to 85%RH
	Storage	35% to 95%RH
Enclosure rating	IP54	
Ambient illumination	10000 Lux	
EMC	Meet the standard of Type4 light curtain	
Vibration resistance	10 to 55Hz frequency range, 1 octave/min. sweep rate, 0.35mm + 0.05 amplitude, 20 sweeps per axis	
Shock resistance	10g, 16 ms duration, 1000 bumps for each axis (applies to all 3 axes)	
Dimensions	26.5×30×J mm （J- length of emitter/receiver）	
Electrical characteristics		
Supply voltage	DC21.6V ～ 26.4 V	
Consumption current	Emitter	⩽ 30mA
	Receiver	⩽ 80mA (No load); ⩽ 300mA (200mA load current)
Response time	Vary with the number of beams, see the list of specifications	
Output NPN	Load current ⩽ 200mA max, Output voltage ⩽ 2V when OSSD is in ON-state;Output voltage ⩾ VCC-2V when OSSD is in OFF-state	
Output PNP	Load current ⩽ 200mA max, Output voltage ⩾ VCC-2V when OSSD is in ON-state; Output voltage ⩽ 2V when OSSD is in OFF-state	

6. List of specifications

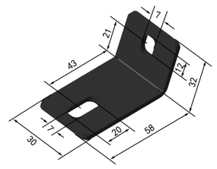
H-protective height,J-length of emitter/receiver,L-length of steel pipe,C-length of scatter shield

Detection capability 30mm					
Specification	H(mm)	J(mm)	L(mm)	C(mm)	Response time(ms)
LCSIIA0820GPNT	140	190	500	260	＜10.1
LCSIIA1220GPNT	220	270	500	340	＜13.5
LCSIIA1620GPNT	300	350	750	420	＜16.8
LCSIIA2020GPNT	380	430	750	500	＜20.2
LCSIIA2420GPNT	460	510	750	580	＜23.5
LCSIIA2820GPNT	540	590	1000	660	＜26.9
LCSIIA3220GPNT	620	670	1000	740	＜30.3
LCSIIA3620GPNT	700	750	1000	820	＜33.6
LCSIIA4020GPNT	780	830	1200	900	＜37.0
LCSIIA4420GPNT	860	910	1200	980	＜40.4
LCSIIA4820GPNT	940	990	1200	1060	＜43.7
LCSIIA5220GPNT	1020	1070	1500	1140	＜47.1
LCSIIA5620GPNT	1100	1150	1500	1220	＜50.4
LCSIIA6020GPNT	1180	1230	1500	1300	＜53.8
LCSIIA6420GPNT	1260	1310	1500	1380	＜57.2
LCSIIA6820GPNT	1340	1390	1750	1460	＜60.5
LCSIIA7220GPNT	1420	1470	1750	1540	＜63.9
LCSIIA7620GPNT	1500	1550	1750	1620	＜67.3
LCSIIA8020GPNT	1580	1630	2000	1700	＜70.6
LCSIIA8420GPNT	1660	1710	2000	1780	＜74.0
LCSIIA8820GPNT	1740	1790	2000	1860	＜77.3
LCSIIA9220GPNT	1820	1870		1940	＜80.7
LCSIIA9620GPNT	1900	1950		2020	＜84.1
Detection capability 50mm					
Specification	H(mm)	J(mm)	L(mm)	C(mm)	Response time(ms)
LCSIIA0440GPNT	140	190	500	260	＜8.4
LCSIIA0640GPNT	220	270	500	340	＜10.1
LCSIIA0840GPNT	300	350	750	420	＜11.8
LCSIIA1040GPNT	380	430	750	500	＜13.5
LCSIIA1240GPNT	460	510	750	580	＜15.1
LCSIIA1440GPNT	540	590	1000	660	＜16.8
LCSIIA1640GPNT	620	670	1000	740	＜18.5
LCSIIA1840GPNT	700	750	1000	820	＜20.2
LCSIIA2040GPNT	780	830	1200	900	＜21.9
LCSIIA2240GPNT	860	910	1200	980	＜23.5
LCSIIA2440GPNT	940	990	1200	1060	＜25.2
LCSIIA2640GPNT	1020	1070	1500	1140	＜26.9
LCSIIA2840GPNT	1100	1150	1500	1220	＜28.6
LCSIIA3040GPNT	1180	1230	1500	1300	＜30.3
LCSIIA3240GPNT	1260	1310	1500	1380	＜31.9
LCSIIA3440GPNT	1340	1390	1750	1460	＜33.6
LCSIIA3640GPNT	1420	1470	1750	1540	＜35.3
LCSIIA3840GPNT	1500	1550	1750	1620	＜37.0
LCSIIA4040GPNT	1580	1630	2000	1700	＜38.7
LCSIIA4240GPNT	1660	1710	2000	1780	＜40.4
LCSIIA4440GPNT	1740	1790	2000	1860	＜42.0
LCSIIA4640GPNT	1820	1870		1940	＜43.7
LCSIIA4840GPNT	1900	1950		2020	＜45.4

7. Mounting bracket dimensions



ZC-bracket



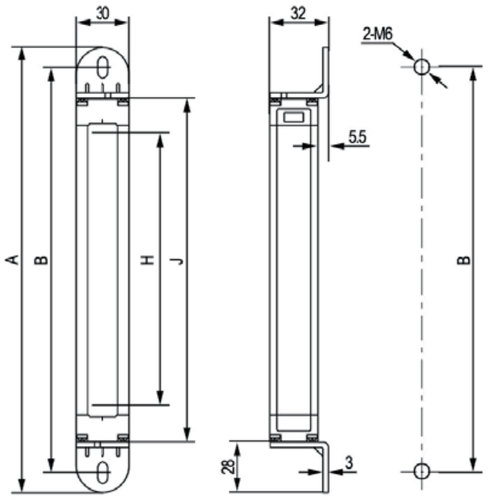
L-bracket

8. Installation

8.1. ZC Installation（ZC）

Dimensions A, B, H, and J

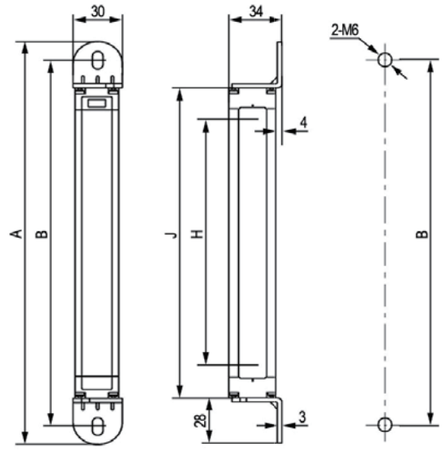
A	20mm beam spacing	H+106
	40mm beam spacing	H+106
B	20mm beam spacing	H+84
	40mm beam spacing	H+84
H	Protective height	
J	Length of emitter/receiver	



ZC Installation（ZC）— Common front mounting

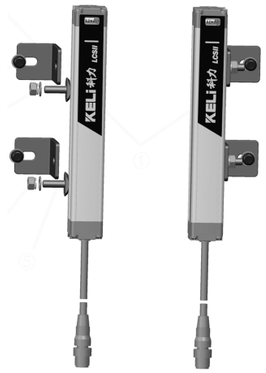
Dimensions A, B, H, and J

A	20mm beam spacing	H+106
	40mm beam spacing	H+106
B	20mm beam spacing	H+84
	40mm beam spacing	H+84
H	Protective height	
J	Length of emitter/receiver	



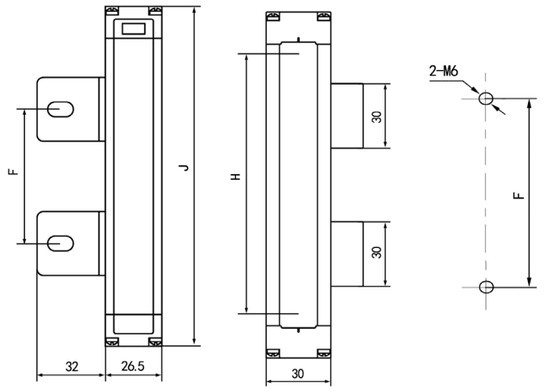
ZC Installation（ZC）— Common side mounting

8.2.T-groove Installation (TC)



Dimensions F, H, and J

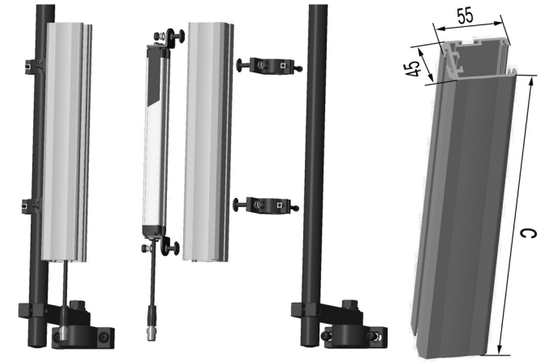
F	J/2≤F＜J
H	Protective height
J	Length of emitter/receiver



8.3.Scatter shield mounting (FZC)

Scatter shield front mounting (FZ)　　Scatter shield side mounting (FC)

8.4.Scatter shield pipe mounting (GF)



9. Wiring

⚠WARNING

- Wiring when the power of LCSII is turned OFF.
- Double or reinforced insulation must be applied between the input/output interface and dangerous voltage, otherwise may lead to electric shock.
- Do not short-circuit OSSD to the power supply, otherwise the OSSD is always ON.
- The two OSSDs must not be short-circuited, otherwise LCSII can not work in normal.
- Do not connect each line of LCSII to a DC power supply higher than 26.4V. Also, do not connect to an AC power supply. Failure to do so may result in electric shock.
- The power supply of LCSII should not be higher than 24V±10%, otherwise it may affect the stability of the light curtain.
- Change the cable without permission is strictly forbidden.
- Properly perform the wiring after confirming the signal names of all the terminals.
- Be sure to route the LCSII cable separate from high-potential power lines or through an exclusive conduit.

LCSII adopts DC24V power supply and outputs transistor control signals directly . The output can provide one channel of PNP and one channel of NPN. Wiring is as shown in the figure below, where the control signal lines (brown and black) of the emitter should be left floating.