

### Product Description

- TYPE 4, SIL3
- The maximum detection range can reach 16 m
- The resolution can be 14 mm, 30 mm, 50 mm detection accuracy

### Product Features

- Optical synchronization, simplified wiring and improved installation efficiency
- Unique vibration reduction design, good vibration resistance
- Excellent anti-light interference and EMC characteristics
- High protection degree: IP65



Model	Function	Resolution (mm)	Protect field height (mm)	Product overall height (mm)	Range
SE4P14-150	Emitter + Receiver	14	120	145	Max. 10 m
SE4P14-200	Emitter + Receiver	14	200	225	Max. 10 m
SE4P14-300	Emitter + Receiver	14	280	305	Max. 10 m
SE4P14-450	Emitter + Receiver	14	440	465	Max. 10 m
SE4P14-600	Emitter + Receiver	14	600	625	Max. 10 m
SE4P14-750	Emitter + Receiver	14	760	785	Max. 10 m
SE4P14-900	Emitter + Receiver	14	920	945	Max. 10 m
SE4P14-1000	Emitter + Receiver	14	1000	1025	Max. 10 m
SE4P30-150	Emitter + Receiver	30	120	145	Max. 10 m
SE4P30-200	Emitter + Receiver	30	200	225	Max. 10 m
SE4P30-300	Emitter + Receiver	30	280	305	Max. 10 m
SE4P30-450	Emitter + Receiver	30	440	465	Max. 10 m
SE4P30-600	Emitter + Receiver	30	600	625	Max. 10 m
SE4P30-750	Emitter + Receiver	30	760	785	Max. 10 m
SE4P30-900	Emitter + Receiver	30	920	945	Max. 10 m
SE4P30-1050	Emitter + Receiver	30	1080	1105	Max. 10 m
SE4P30-1200	Emitter + Receiver	30	1160	1185	Max. 10 m
SE4P30-1350	Emitter + Receiver	30	1320	1345	Max. 10 m
SE4P30-1500	Emitter + Receiver	30	1480	1505	Max. 10 m
SE4P30-1650	Emitter + Receiver	30	1640	1665	Max. 10 m
SE4P30-1700	Emitter + Receiver	30	1720	1745	Max. 10 m
SE4P50-150	Emitter + Receiver	50	120	145	Max. 10 m
SE4P50-200	Emitter + Receiver	50	200	225	Max. 10 m
SE4P50-300	Emitter + Receiver	50	280	305	Max. 10 m
SE4P50-450	Emitter + Receiver	50	440	465	Max. 10 m
SE4P50-600	Emitter + Receiver	50	600	625	Max. 10 m
SE4P50-750	Emitter + Receiver	50	760	785	Max. 10 m
SE4P50-900	Emitter + Receiver	50	920	945	Max. 10 m

Model	Function	Resolution (mm)	Protect field height (mm)	Product overall height (mm)	Range
SE4P50-1050	Emitter + Receiver	50	1080	1105	Max. 10 m
SE4P50-1200	Emitter + Receiver	50	1160	1185	Max. 10 m
SE4P50-1350	Emitter + Receiver	50	1320	1345	Max. 10 m
SE4P50-1500	Emitter + Receiver	50	1480	1505	Max. 10 m
SE4P50-1650	Emitter + Receiver	50	1640	1665	Max. 10 m
SE4P50-1800	Emitter + Receiver	50	1800	1825	Max. 10 m

Model	Function	Resolution (mm)	Protect field height (mm)	Product overall height (mm)	Range
SE4P14-150L	Emitter + Receiver	14	120	145	Max. 16 m
SE4P14-200L	Emitter + Receiver	14	200	225	Max. 16 m
SE4P14-300L	Emitter + Receiver	14	280	305	Max. 16 m
SE4P14-450L	Emitter + Receiver	14	440	465	Max. 16 m
SE4P14-600L	Emitter + Receiver	14	600	625	Max. 16 m
SE4P14-750L	Emitter + Receiver	14	760	785	Max. 16 m
SE4P14-900L	Emitter + Receiver	14	920	945	Max. 16 m
SE4P14-1000L	Emitter + Receiver	14	1000	1025	Max. 16 m
SE4P30-150L	Emitter + Receiver	30	120	145	Max. 16 m
SE4P30-200L	Emitter + Receiver	30	200	225	Max. 16 m
SE4P30-300L	Emitter + Receiver	30	280	305	Max. 16 m
SE4P30-450L	Emitter + Receiver	30	440	465	Max. 16 m
SE4P30-600L	Emitter + Receiver	30	600	625	Max. 16 m
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SE4P30-1350L	Emitter + Receiver	30	1320	1345	Max. 16 m
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SE4P30-1650L	Emitter + Receiver	30	1640	1665	Max. 16 m
SE4P30-1700L	Emitter + Receiver	30	1720	1745	Max. 16 m
SE4P50-150L	Emitter + Receiver	50	120	145	Max. 16 m
SE4P50-200L	Emitter + Receiver	50	200	225	Max. 16 m
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SE4P50-1650L	Emitter + Receiver	50	1640	1665	Max. 16 m
SE4P50-1800L	Emitter + Receiver	50	1800	1825	Max. 16 m

## 产品说明

- 安全四级TYPE4
- 检测距离最大可达16 m
- 分辨率可选 14 mm, 30 mm, 50 mm 检测高度

## 产品特点

- 光同步, 简化布线提高安装效率
- 独特的减振设计, 良好的抗振性
- 优秀的抗光干扰和EMC 特性
- 高防护等级: IP65 防护等级



型号	功能	分辨率(mm)	保护高度 (mm)	产品高度 (mm)	工作距离
SE4P14-150	发射器 + 接收器	14	120	145	Max. 10 m
SE4P14-200	发射器 + 接收器	14	200	225	Max. 10 m
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SE4P30-1700	发射器 + 接收器	30	1720	1745	Max. 10 m
SE4P50-150	发射器 + 接收器	50	120	145	Max. 10 m
SE4P50-200	发射器 + 接收器	50	200	225	Max. 10 m
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SE4P50-1800	发射器 + 接收器	50	1800	1825	Max. 10 m

型号	功能	分辨率(mm)	保护高度 (mm)	产品高度 (mm)	工作距离
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SE4P14-200L	发射器 + 接收器	14	200	225	Max. 16 m
SE4P14-300L	发射器 + 接收器	14	280	305	Max. 16 m
SE4P14-450L	发射器 + 接收器	14	440	465	Max. 16 m
SE4P14-600L	发射器 + 接收器	14	600	625	Max. 16 m
SE4P14-750L	发射器 + 接收器	14	760	785	Max. 16 m
SE4P14-900L	发射器 + 接收器	14	920	945	Max. 16 m
SE4P14-1000L	发射器 + 接收器	14	1000	1025	Max. 16 m
SE4P30-150L	发射器 + 接收器	30	120	145	Max. 16 m
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SE4P50-1800L	发射器 + 接收器	50	1800	1825	Max. 16 m

## SAFETY-RELATED PARAMETERS

<b>TYPE</b>	Type 4 (IEC61496-1)	<b>CATEGORY</b>	Category 4 (ISO13849-1)
<b>SAFETY INTEGRITY LEVEL</b>	SIL 3 (IEC61508)	<b>PERFORMANCE LEVEL</b>	PLe (ISO13849-1)

## TECHNICAL DATA

<b>SUPPLY VOLTAGE (VS)</b>	24 V DC	<b>SAFETY OUTPUT</b>	PNP transistor output x 2 ON state, load current ≤ 100 mA, output voltage ≥ Vs - 2 V OFF state, leakage current ≤ 1 mA, residual voltage ≤ 1 V (Excluding the effect of wire extension)
<b>RIPPLE VOLTAGE</b>	≤ 20 %		
<b>LIGHT SOURCE</b>	Infrared light (850 nm)		
<b>OPTICAL AXIS SPACING</b>	10 mm / 20 mm / 40 mm		
<b>RESOLUTION</b>	14 mm / 30 mm / 50 mm		
<b>SYNCHRONIZATION METHOD</b>	Optical synchronization		NPN transistor output x 2 ON state, load current ≤ 100 mA, output voltage ≤ 2 V OFF state, leakage current ≤ 1 mA, residual voltage ≤ 2 V (Excluding the effect of wire extension)
<b>SCANNING RANGE</b>	A: 0...10 m / B: 0...16 m		
<b>SECTION SIZE</b>	34 x 28 mm		
<b>LOAD CURRENT</b>	Emitter: < 200 mA Receiver: < 200 mA (No-load)		
<b>RESPONSE TIME</b>	4 ... 18 ms (Increase or decrease with the number of beams)	<b>DETECTION FUNCTION</b>	Power-on self-test, real-time self-test during the working process
<b>START TIME</b>	< 3 s	<b>SHORT-CIRCUIT PROTECTION</b>	Yes
		<b>OVERLOAD RESISTANCE</b>	Yes
		<b>REVERSE POLARITY PROTECTION</b>	Yes

## ENVIRONMENTAL CONDITIONS

<b>OPERATING ENVIRONMENT HUMIDITY</b>	35 % to 85 % RH (No condensation)	<b>SHOCK RESISTANCE (EN 60068-2-27)</b>	Acceleration 10 g, pulse duration 16 ms, X, Y and Z direction 1000 times each
<b>STORAGE ENVIRONMENT HUMIDITY</b>	35 % to 95 % RH	<b>VIBRATION RESISTANCE (EN 60068-2-6)</b>	Frequency 10 ... 55 Hz, amplitude 0.35±0.05 mm, X, Y and Z direction 20 times each
<b>PROTECTION CLASS</b>	IP65	<b>ANTI-AMBIENT LIGHT</b>	Incandescent lamp: 3000 lux Fluorescence: 3000 lux Sunlight: 10,000 lux
<b>STORAGE TEMPERATURE</b>	-40 ... +70 °C		
<b>AMBIENT TEMPERATURE</b>	-10 ... +55 °C		

## MTTF PARAMETERS

ELCO MODEL	MTTF (YEAR)	ELCO MODEL	MTTF (YEAR)
SE4P14-150	67	SE4P14-600	24
SE4P14-200	57	SE4P14-750	20
SE4P14-300	42	SE4P14-900	17
SE4P14-450	31	SE4P14-1000	16

## MTTF PARAMETERS

ELCO MODEL	MTTF (YEAR)	ELCO MODEL	MTTF (YEAR)
SE4P30-150	86	SE4P30-1050	27
SE4P30-200	72	SE4P30-1200	25
SE4P30-300	63	SE4P30-1350	23
SE4P30-450	49	SE4P30-1500	21
SE4P30-600	41	SE4P30-1650	19
SE4P30-750	35	SE4P30-1700	18
SE4P30-900	30		

## MTTF PARAMETERS

ELCO MODEL	MTTF (YEAR)	ELCO MODEL	MTTF (YEAR)
SE4P50-150	100	SE4P50-1050	43
SE4P50-200	90	SE4P50-1200	41
SE4P50-300	82	SE4P50-1350	38
SE4P50-450	70	SE4P50-1500	35
SE4P50-600	61	SE4P50-1650	33
SE4P50-750	53	SE4P50-1800	31
SE4P50-900	48		

### 安全参数

安全等级	Type 4 (IEC61496-1)	安全类别	Category 4 (ISO13849-1)
安全完整性等级	SIL 3 (IEC61508)	安全性能等级	PLe (ISO13849-1)

### 技术参数

工作电压	24 V DC	安全输出	PNP晶体管输出x 2; ON状态时,负载电流≤ 100 mA, 输出电压≥工作电压 - 2 V; OFF状态时,漏电流≤ 1 mA, 残留电压≤ 1 V(排除导线延长的影响)
纹波电压	≤ 20%		
光源类型	红外光(中心波长850 nm)		
光轴间距	10 mm / 20 mm / 40 mm		
检测精度	14 mm / 30 mm / 50 mm		
同步方式	光同步		
检测距离	A: 0 ... 10 m / B: 0 ... 16 m		
截面尺寸	34 x 28 mm		
工作电流	发射器:<200 mA 接收器:<200mA(无负载时)	功能检测	上电自检,工作过程中实时自检
响应时间	4 ... 18 ms(随光束数变化而增减)	短路保护	是
启动时间	< 3 s	过载保护	是
		反接保护	是

### 环境参数

工作湿度	35 % to 85 % RH (无结露)	抗冲击能力 (EN 60068-2-27)	加速度10g, 脉冲持续时间16ms, X、Y及Z方向各1000次
储存湿度	35 % to 95 % RH	抗振动能力 (EN 60068-2-6)	频率 10 Hz - 55 Hz, 振幅 0.35 ± 0.05 mm, X、Y及Z方向各20 次
防护等级	IP65	抗光干扰	白炽灯:3000 Lux 荧光类:3000 Lux 太阳光:10000 Lux
储存温度	-40 ... +70 °C		
工作温度	-10 ... +55 °C		

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SE4P50-600	61	SE4P50-1650	33
SE4P50-750	53	SE4P50-1800	31
SE4P50-900	48		

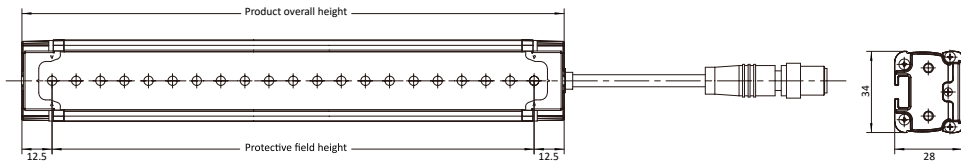
**STANDARDS AND DIRECTIVES**

EMC DIRECTIVE EN IEC 61000-6-2  
 2014/30/EU EN IEC 61000-6-4  
 ROHS DIRECTIVE 2011/65/EU EN IEC 63000

**APPROVALS**

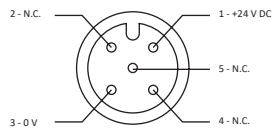


**DIMENSIONS**



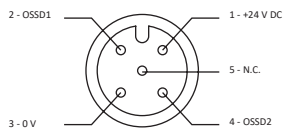
**WIRING DIAGRAMS**

Fig. 1 Emitter



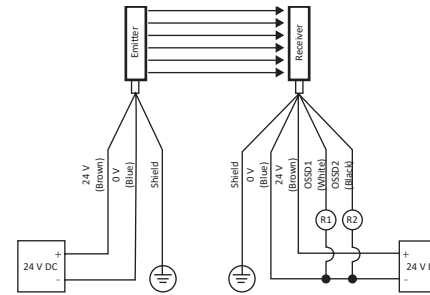
Pin	Color	Function
1	brown	+24 V DC
2	white	N.C.
3	blue	0 V
4	black	N.C.
5	grey	N.C.

Fig. 2 Receiver

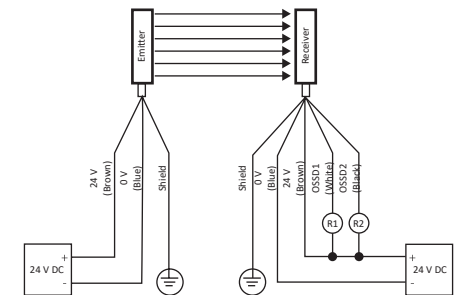


Pin	Color	Function
1	brown	+24 V DC
2	white	OSSD1
3	blue	0 V
4	black	OSSD2
5	grey	N.C.

**PNP Wiring**

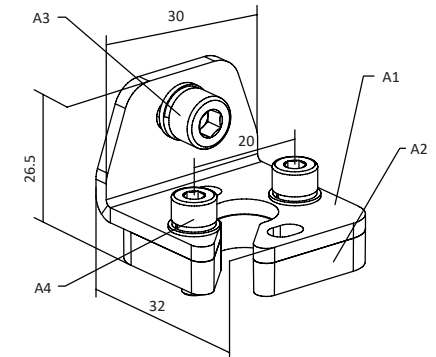


**NPN Wiring**



**MOUNTINGBRACKET**

Front and side mounting brackets, each pair of safety light curtains with four mounting brackets (BT-VC).  
 BT-VCS, 1 set, contains 4 pieces BT-VC.



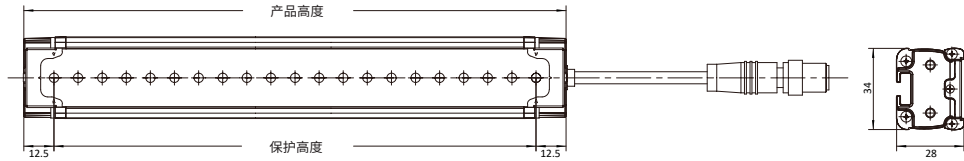
标准与指令

EMC DIRECTIVE EN IEC 61000-6-2  
 2014/30/EU EN IEC 61000-6-4  
 ROHS DIRECTIVE 2011/65/EU EN IEC 63000

认证

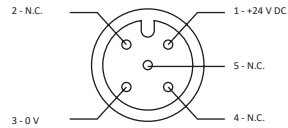


外形尺寸



接线图

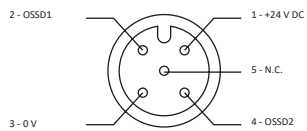
图 1 发射器



M12 5针 连接器

针脚	颜色	功能
1	棕	+24 V DC
2	白	N.C.
3	蓝	0 V
4	黑	N.C.
5	灰	N.C.

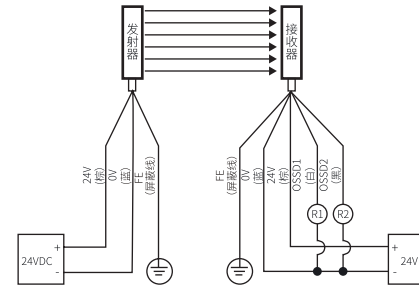
图 2 接收器



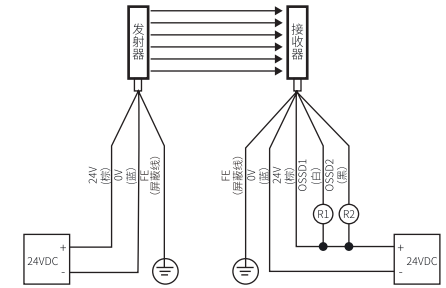
M12 5针 连接器

针脚	颜色	功能
1	棕	+24 V DC
2	白	OSSD1
3	蓝	0 V
4	黑	OSSD2
5	灰	N.C.

PNP 接线图

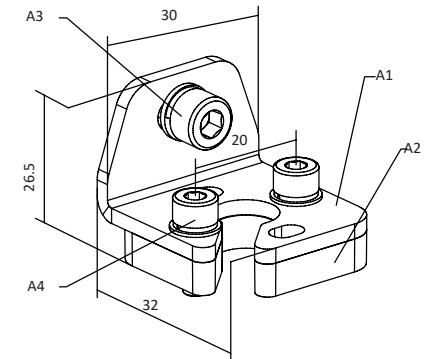


NPN 接线图



安装支架

正装侧装安装支架, 每一对安全光幕需要4个安装支架 (BT-VC)。BT-VCS, 1 组, 包含4 个 BT-VC.



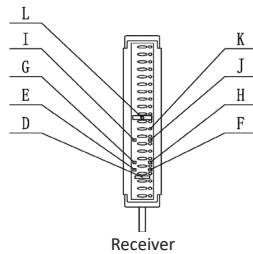
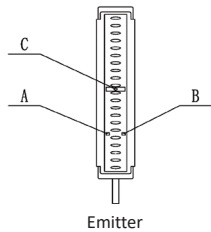
ACCESSORIES DETAIL LIST

Part Number	Part Name	Material
A1	Front and Side Mounting Bracket	Stainless Steel
A2	Front and Side Mounting Vibration Damping Pad	TPU
A3	Hex Socket Screw (M5*12)	Stainless Steel
A4	Hex Socket Screw (M4*12)	Stainless Steel

Connector	Adaptation	Connector cable model	Description
	Transmitter + Receiver	CO-M12-2000E-5GF	Female, M12, 5 pin, Straight, A-coded, 2 m
	Transmitter + Receiver	CO-M12-5000E-5GF	Female, M12, 5 pin, Straight, A-coded, 5 m
	Transmitter + Receiver	CO-M12-10000E-5GF	Female, M12, 5 pin, Straight, A-coded, 10 m
	Transmitter + Receiver	CO-M12-15000E-5GF	Female, M12, 5 pin, Straight, A-coded, 15 m
	Transmitter + Receiver	CO-M12-20000E-5GF	Female, M12, 5 pin, Straight, A-coded, 20 m
	Transmitter + Receiver	CO-M12-25000E-5GF	Female, M12, 5 pin, Straight, A-coded, 25 m
	Transmitter + Receiver	CO-M12-30000E-5GF	Female, M12, 5 pin, Straight, A-coded, 30 m
	Transmitter + Receiver	CO-M12-35000E-5GF	Female, M12, 5 pin, Straight, A-coded, 35 m
	Transmitter + Receiver	CO-M12-40000E-5GF	Female, M12, 5 pin, Straight, A-coded, 40 m

SENSORS

This manual utilizes the following symbols to warn of potential hazards or issues that require attention. Please read them carefully.



SENSOR INDICATOR LIGHT

Sensor	Location	Color	Identification	Function	Description
Emitter	A	Green / Red	CH-A / CH-B	Light Synchronization Channel	Default is CH-A (A channel), green light on, when configured as CH-B (B channel), red light on.
	B	Green	OK	Status Indicator	The sensor operates normally with the green light on; in case of a fault, the green light goes off.
	C	-	-	Infrared Configuration Port	Use a smartphone or remote control to emit towards this position for function configuration, as detailed in the "Infrared Configuration Function" section.
Receiver	D	Green / Red	ON/OFF	Light Blockage Indicator	Under normal light alignment, with no obstruction, the green light is on, and the OSSD output is in the ON state; when there is an obstruction, the red light is on, and the OSSD output is in the OFF state.
	E	Green	OK	Status Indicator	The sensor operates normally with the green light on; in case of a fault, the green light goes off.
	F	Green / Red	CH-A / CH-B	Light Synchronization Channel	Default is CH-A, green light on, when configured as CH-B, red light on.
	G	Green / Red	PNP / NPN	Output Type Indicator	The default is set to PNP output mode, with a green light on; when configured to NPN output mode, red light on.
	H	Green / Red	LONG / SHORT	LONG/SHORT Mode Indicator	The default is set to long-distance mode, with a green light on; when configured to short-distance mode, red light on.
	I/J	Green	LEVEL1 / LEVEL2	Light Receiving Strength Indicator	Displays the light reception intensity for alignment. When LEVEL 1 is on, it indicates a stable alignment; when both LEVEL 1 and LEVEL 2 are on, it indicates the optimal alignment state.
	K	Red	-	Branch Indicator	In a normal alignment state, if one path of light is blocked, the corresponding branch indicator lights up; the light goes off when the obstruction is removed.
	L	-	-	Infrared Configuration Port	Use a smartphone or remote control to emit towards this position for function configuration, as detailed in the "Infrared Configuration Function" section.

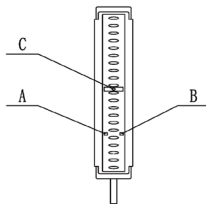
## 配件表

零件编号	零件名称	材料
A1	正侧安装支架	不锈钢
A2	正侧安装减震垫	TPU
A3	内六角螺钉 (M5*12)	不锈钢
A4	内六角螺钉 (M4*12)	不锈钢

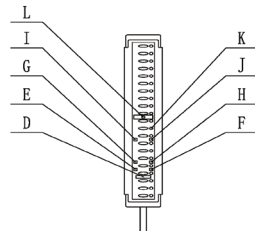
## 连接线缆

连接器	适配类型	连接线缆型号	描述
	发射器 + 接收器	CO-M12-2000E-5GF	母头, M12, 5针, 直插式, A编码, 2 m
	发射器 + 接收器	CO-M12-5000E-5GF	母头, M12, 5针, 直插式, A编码, 5 m
	发射器 + 接收器	CO-M12-10000E-5GF	母头, M12, 5针, 直插式, A编码, 10 m
	发射器 + 接收器	CO-M12-15000E-5GF	母头, M12, 5针, 直插式, A编码, 15 m
	发射器 + 接收器	CO-M12-20000E-5GF	母头, M12, 5针, 直插式, A编码, 20 m
	发射器 + 接收器	CO-M12-25000E-5GF	母头, M12, 5针, 直插式, A编码, 25 m
	发射器 + 接收器	CO-M12-30000E-5GF	母头, M12, 5针, 直插式, A编码, 30 m
	发射器 + 接收器	CO-M12-35000E-5GF	母头, M12, 5针, 直插式, A编码, 35 m
	发射器 + 接收器	CO-M12-40000E-5GF	母头, M12, 5针, 直插式, A编码, 40 m

## 光幕LED显示



发射器



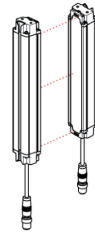
接收器

## 光幕指示灯

光幕	位置	颜色	区别	功能	描述
发射器	A	绿 / 红	CH-A / CH-B	光同步通道	默认为 CH-A (A 通道) 亮绿灯, 配置为 CH-B (B 通道) 时亮红灯。
	B	绿	OK	状态指示灯	光幕工作正常, 绿灯亮; 一旦出现故障, 绿灯就会熄灭。
	C	-	-	红外配置接口	使用智能手机或遥控器向该位置发射以进行功能配置, 详见“红外配置功能”一节。
接收器	D	绿 / 红	ON/OFF	光线遮挡指示灯	正常通光情况下, 无障碍物, 绿灯亮, OSSD 输出处于 on 状态; 当有障碍物时, 红灯亮, OSSD 输出处于 OFF 状态。
	E	绿	OK	状态指示灯	光幕工作正常, 绿灯亮; 一旦出现故障, 绿灯就会熄灭。
	F	绿 / 红	CH-A / CH-B	光同步通道	默认为 CH-A (A 通道) 亮绿灯, 配置为 CH-B (B 通道) 时亮红灯。
	G	绿 / 红	PNP / NPN	输出类型	默认设置为 PNP 输出模式, 绿灯亮; 配置为 NPN 输出模式时, 红灯亮。
	H	绿 / 红	LONG / SHORT	长 / 短距离模式	默认设置为远距离模式, 绿灯亮; 配置为短距离模式时, 红灯亮。
	I/J	绿	LEVEL1 / LEVEL2	接收光强度指示灯	显示用于校准光接收强度。当 LEVEL 1 打开时, 表示稳定对齐; 当 LEVEL 1 和 LEVEL 2 都开启时, 表示最佳对齐状态。
	K	红	-	分支指示灯	在正常对准状态下, 如果一条光路被阻挡, 对应的支路指示灯亮; 当障碍物被移除时, 灯恢复熄灭。
	L	-	-	红外配置接口	使用智能手机或遥控器向该位置发射以进行功能配置, 详见“红外配置功能”一节。

### INSTALLATION ORIENTATION

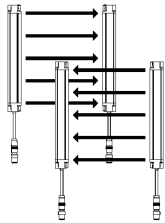
The correct Installation direction should align the detection surfaces of the two sensors parallel to each other, with their respective indicator lights at the same height.



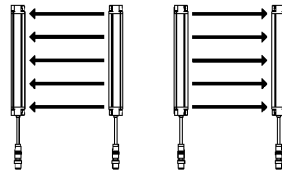
### ADJACENT INSTALLATION PRECAUTIONS

When multiple sets of safety light curtains are placed adjacent to each other, please refer to the diagram below for placement positions to prevent mutual interference between the curtains.

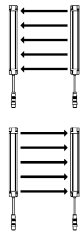
(1) Front-to-Back Placement



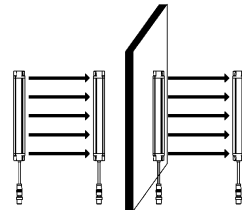
(2) Back-to-Back Placement



(3) Top-to-Bottom Placement



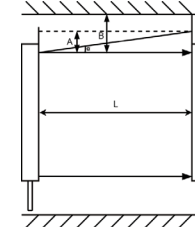
(4) Partitioned Placement



- The proximity between light curtains may lead to mutual interference due to the reflection of the detection surfaces.
- The aforementioned four installation methods may not always guarantee the elimination of light interference. Installation personnel must consider more comprehensive measures to prevent interference.

### PRECAUTIONS REGARDING SURROUNDING REFLECTIVE SURFACES

When there are metal plates, workpieces, glass, partition boards, or other reflective surfaces around the light curtain, the distance B between the light curtain and the reflective surface must not be less than A, as illustrated in the diagram.

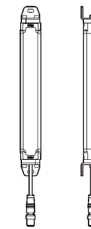


- Reflective surfaces around the light curtain may cause interference, preventing it from working normally.
- When installing the light curtain, please try to keep it as far away from reflective surfaces as possible, or cover or block these surfaces.

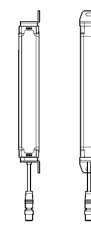
### BRACKET INSTALLATION DIAGRAM

This product has two types of installation methods, as shown in the diagram below. You can choose the appropriate installation method according to the installation environment.

Direct Mounting



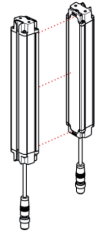
Side Mounting



- Wiring must be done with the power turned off.
- All input and output interfaces must be reinforced with insulation against hazardous voltages, otherwise, there is a risk of electric shock.
- Short circuits between OSSDs and the power source are strictly prohibited.
- Both safety outputs must be used simultaneously, otherwise, the system safety will be compromised.
- The signal lines of the SE4 type safety light curtain must not be connected to a DC power supply with an output voltage exceeding 24V + 20%, nor should they be connected to an AC power source, as this may lead to electric shock. as doing so could lead to potential electric shock risks.

## 安装方向

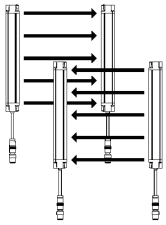
正确的安装方向应使光幕发射器与接收器的检测面平行,使其各自的指示灯高度一致即可。



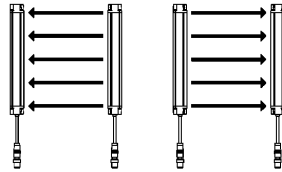
## 相邻安装注意事项

多套安全光幕相邻放置时,放置位置请参考下图,以免光幕之间相互干扰。

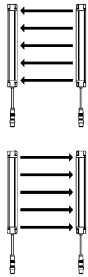
(1) 前-后布局摆放



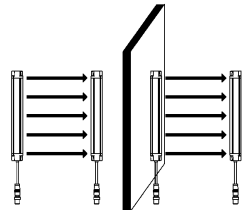
(2) 背-背布局摆放



(3) 上-下布局摆放



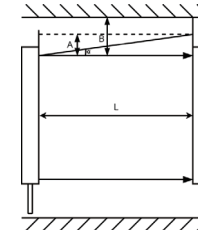
(4) 分区布局摆放



- 由于检测表面的反射,光幕之间的接近可能导致相互干扰。
- 上述四种安装方法可能并不一定保证能彻底消除光干扰。安装人员必须考虑更全面的防止干扰措施。

## 环境反射面影响注意事项

当光幕周围有金属板、工件、玻璃、隔板或其他反射面时,光幕与反射面之间的距离B不得小于A,如图所示。

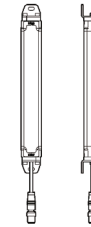


- 光幕周围的反射面可能会产生干扰,影响光幕的正常工作。
- 安装光幕时,请尽量远离反射面,盖住或遮挡反射面。

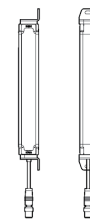
## 支架安装示意图

本产品有两种安装方式,如下图所示。您可以根据安装环境选择合适的安装方式。

正面安装



侧面安装



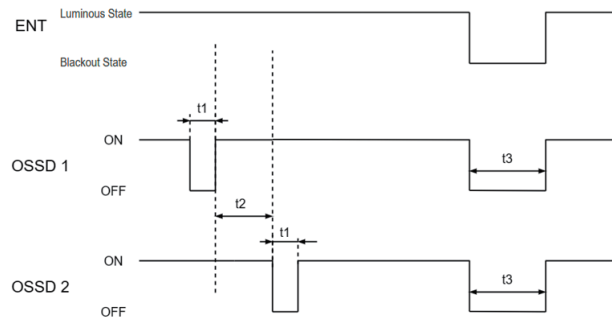
- 接线必须在断电的情况下进行。
- 所有输入、输出接口必须加强绝缘,防止危险电压,否则有触电危险。
- 严禁安全输出OSSD与电源短路。
- 两个安全输出必须同时使用,否则会影响系统的安全性。
- SE4型安全光幕的信号线不能接输出电压超过24V+20%的直流电源,也不能接交流电源,因为这样做可能会导致潜在的触电风险。



- The working power supply for the SE4 type safety light curtain should not exceed 24 V + 20%, as this may affect the stability of the SE4.
- Ensure all wiring is correctly done after clearly defining the signal definitions for all wires.
- The cables of the SE4 type safety light curtain must be kept away from high-voltage power lines or placed inside dedicated conduits.

## SAFETY OUTPUT

OSSD is a type of safety control output that connects to external devices. To self-diagnosis the output circuit, the SE4's internal control circuit generates a self-diagnosis signal. In an interference-free detection area, the OSSD periodically, forcibly, and temporarily enters an off state. Once the internal control circuit receives a feedback signal (off signal) based on the self-diagnosis, the SE4 determines that its output circuit is operating normally. If this off signal is not returned to the internal control circuit, the SE4 judges that there is a problem in its output circuit or wiring and enters a fault state.



- t1: Detection pulse time, approximately 200  $\mu$ s  
t2: Interval between OSSD1 and OSSD2 detection pulses, greater than 200  $\mu$ s  
t3: Light blocking time, minimum of 100 ms

## PRODUCT COMMISSIONING STEPS

### • Assemble the Bracket

Fix the bracket onto the product, ensuring there is an appropriate amount of adjustability.

### • Secure the Bracket

Secure the bracket in a location that ensures the safety light curtain can effectively perform its protective function, as per installation requirements.

### • Wire the Product

Verify the power supply and grounding for the emitter; complete the wiring. Confirm the power supply and grounding for the receiver, ensure the output signal interface is correct, complete the wiring, and upon verification of accuracy, power on. Observe whether the OK indicator lights on both the emitter and receiver remain solid green.

### • Aligning the Beams

Adjust the position and angle of the safety light curtain so that it is aligned correctly and at a consistent height. All segment indicator lights should be off, and the ON / OFF light should be green. If no level lights are on, the light curtain is aligned but the signal strength is insufficient for stable use (low tolerance for dirt and vibration); if the level1 light is on, the light curtain is properly aligned and can be used stably; if both level lights are on, the alignment of the light curtain is very good.

### • Tightening Screws

Tighten the screws to fix the installation position of the light curtain, ensuring it works reliably and stably.

### • Verifying Light Penetration and Blocking

Repeatedly verify the transition between light penetration and blocking states. Use an object with a diameter equal to the minimum detection accuracy to block any beam, causing the corresponding segment indicator light to turn on and the ON / OFF light to turn red. Removing the blockage turns the segment indicator light off and the ON / OFF light back to green, confirming that the light curtain is working correctly.

### • Commissioning Complete



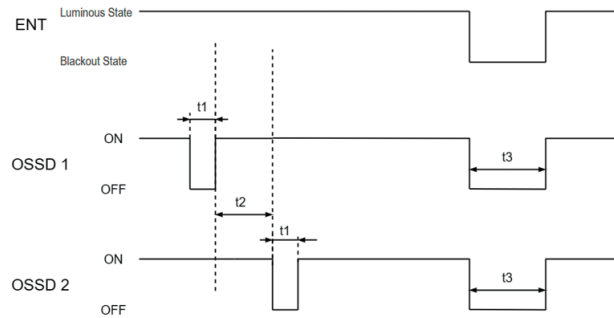
- During beam alignment, when the distance between the emitter and receiver is considerable, visually ensure that the emitter and receiver are aligned and at the same height. First, adjust the emitter left and right (and if necessary, make pitch adjustments) to find the best alignment position and then secure the transmitter. Next, adjust the receiver left and right to find the best alignment position and secure the receiver.
- If the protective distance is too long, even if the alignment is excellent, the level lights may still not illuminate.



- SE4型安全光幕的工作电源不应超过24v+20%，以免影响SE4的稳定性。
- 在明确所有电线的信号定义后，确保所有接线正确完成。
- SE4型安全光幕的电缆应远离高压电源线或置于专用线路导管内。

## 安全输出

OSSD是一种连接到外部设备的安全控制输出。为了自诊断输出电路，SE4安全光幕的内部控制电路产生一个自诊断信号。在无干扰检测区域，OSSD周期性、强制性、暂时性进入关闭状态。一旦内控电路根据自诊断接收到反馈信号(关断信号)，则SE4安全光幕确定其输出电路工作正常。如果该关断信号没有返回到内控电路，则SE4安全光幕判断其输出电路或接线有异常，进入故障状态。



t1:探测脉冲时间,约为200 $\mu$ s;  
t2:OSSD1和OSSD2探测脉冲间隔,大于200 $\mu$ s;  
t3:挡光时间,最少100ms;

## 产品调试步骤

### • 组装支架

将支架固定在产品上，确保有适当的可调节性。

### • 固定支架

按照安装要求，将支架固定在安全光幕能有效发挥保护作用的位置。

### • 连接产品

检查发射器的电源和接地，完成布线；检查接收器的电源和接地，确保输出信号接口正确，完成接线，确认无误后上电。观察发射器和接收器上的OK指示灯是否保持绿色常亮。

### • 调整光束

调整安全光幕的位置和角度，使其对准正确，高度一致。所有指示灯应熄灭，开/关指示灯应为绿色。若水平灯未亮，则光幕已对准，但信号强度不足，无法稳定使用(耐脏、耐振性低)；若1级灯亮，则光幕对准正确，可稳定使用；如果两个水平灯都开着，光幕的对齐精准光感应非常好。

### • 紧固螺钉

紧固光幕安装位置的螺丝，确保光幕工作可靠、稳定。

### • 验证通光和遮挡

反复验证通光和遮挡状态之间的转换。使用直径等于最小检测精度的物体阻挡任何光束，使相应的分段指示灯打开，开/关灯变为红色。移开遮挡物后，分段指示灯亮灭，开/关灯亮回绿色，确认光幕工作正常。

### • 完成测试



- 在光束对准时，当发射器和接收器之间的距离相当大时，目测要确保发射器和接收器对准并处于相同的高度。首先，调整发射器左右(如有必要，进行螺距调整)，以找到最佳对准位置，然后固定发射器。接下来，调整接收器左右，以找到最佳的对准位置，并确保接收器能顺利接收全部光束。
- 如果保护距离太长，即使对准很好，指示灯也可能不亮。

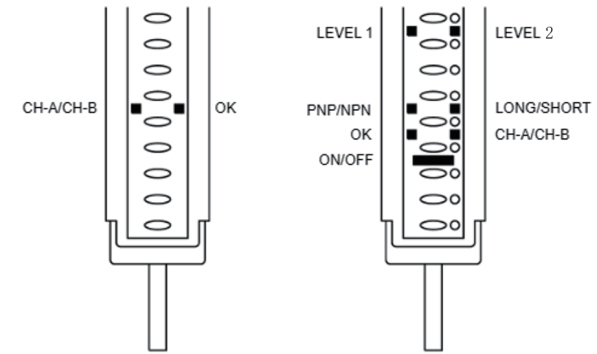
ROUTINE MAINTENANCE OF THE PRODUCT



- Before use, it is essential to check if the safety light curtain functions properly
- Do not arbitrarily change the position of the light curtain during use.
- In case of malfunction, it should be repaired by a professional.
- When dismantling or assembling the light curtain and cables, the power should be turned off first, and the operation should be performed by a professional.
- During use, be careful not to let workpieces, tools, waste materials, etc., collide with the light curtain.

Inspection Item	Inspection and Maintenance Methods	Inspection and Maintenance Cycle
Transmission Surface	Inspect the emission and reception surfaces to ensure there is no contamination and that light transmission is normal. If contamination is present, clean with a clean, soft cloth dampened with neutral soapy water (organic solvents are prohibited).	Before each shift
Minimum Detectable Object Confirmation	Use a stopper with a diameter equal to the minimum detection object of the light curtain (or fingers or arms as required by safety protection) to confirm the light curtain's transition between light penetration and blocking states and whether the output is normal. If the light cannot be blocked properly, stop the machine immediately for repair confirmation.	Before each shift
Wiring Terminal	Regularly inspect the wiring terminals to ensure they are properly connected and free from abnormalities. If there is looseness or abnormalities, disconnect the power, re-crimp the terminals, and verify proper connection before powering on again. Confirm the light curtain's transition between light penetration and blocking states and whether the output is normal.	Every 3-6 months
Fasteners	Regularly check if the fasteners at various locations of the bracket are loose. If there is looseness, reconfirm the alignment before tightening and verify again the light curtain's transition between light penetration and blocking states and whether the output is normal.	Every 3-6 months

TROUBLESHOOTING FOR PRODUCT FAULTS



Fault Phenomenon	Fault Cause	Troubleshooting Methods
Light curtain indicator: lights are not on	No voltage in the power supply	Check wiring or replace the power supply
Light curtain continuously blocks light, ON / OFF light is red, with segment indicator lights flashing or constantly on, and LEVEL light is off	Poor alignment causing the light curtain to enter blocking protection mode	1. Firstly, check if the transmission surface is contaminated affecting the alignment 2. Then, refer to the debugging steps to realign 3. If alignment remains poor, observe the LONG / SHORT lights. If they are red (SHORT mode), refer to the configuration method to adjust to green (LONG mode)
Light curtain switches between blocking and transmitting light normally, but the equipment does not function in the transmitting light state	1. Disconnection between light curtain output contacts and equipment 2. Mismatch between light curtain output mode and equipment wiring 3. Equipment malfunction	1. Re-crimp and check if the light curtain output wiring is properly connected 2. Check if the PNP / NPN light modes of the light curtain correspond to the equipment 3. Repair and maintain the equipment
Light curtain switches between blocking and transmitting light normally, but the equipment does not stop in the blocking state	Short circuit in the control circuit between output contacts	Re-crimp and check if the light curtain output wiring is properly connected
Light curtain blocks light abnormally, and the minimum detection object cannot block the light	1. Light curtain receiver affected by surrounding reflective surfaces 2. Light curtain receiver interfered with by surrounding coherent light sources	1. Investigate and adjust surrounding reflective surfaces affecting the light curtain receiver, refer to "Influence Of Environmental Reflective Surfaces" for adjustments before reconfirming 2. Investigate and adjust surrounding coherent light signals affecting the light curtain receiver, refer to "Adjacent Installation Considerations" for adjustments before reconfirming
Light curtain blocks light abnormally, and the OK light is off	Light curtain system failure	Contact after-sales service for return to factory repair

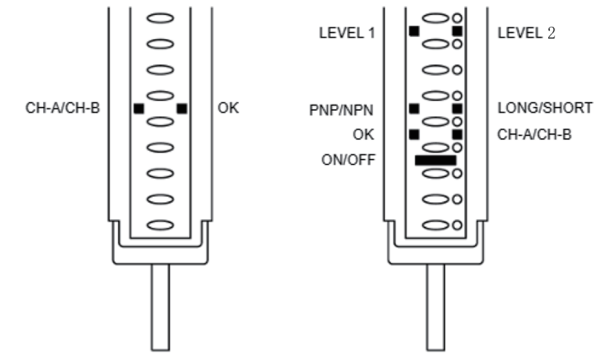
## 产品日常维护



- 在维护前, 必须检查安全光幕是否正常工作。
- 维护过程中不要随意改变光幕的位置。
- 如发生故障, 应由专业人员修理。
- 拆卸或组装光幕及电缆时, 应先关闭电源, 并由专业人员进行操作。
- 在维护过程中, 注意不要让工件、工具、废料等与光幕碰撞。

检查项目	检查和维护方法	检查及维修周期
光通讯表面状态	检查发射器和接收器表面, 确保没有污染, 光通讯正常。如果有污染, 用中性肥皂水浸湿的干净软布清洁 (禁止使用有机溶剂)。	设备每次使用之前
最小可检测对象确认	用直径等于光幕最小检测对象 (或安全防护要求的手指或手臂) 直径的塞子, 确认光幕在光穿透和阻挡状态之间的过渡以及输出是否正常。如果不能正确遮挡光线, 请立即停机进行维修确认。	设备每次使用之前
接线端子	定期检查接线端子, 确保接线端子连接正确, 无异常。如果有松动或异常, 请断开电源, 重新压接端子, 确认连接正确后再上电。确认光幕在透光和阻挡状态之间的转换, 以及输出是否正常。	每 3-6 个月
紧固件	定期检查支架各部位紧固件是否松动。如有松动, 拧紧前应重新确认对中, 并再次验证光幕在通光和遮挡状态之间的转换, 以及输出是否正常。	每 3-6 个月

## 产品故障处理



光幕指示灯未亮	电源无电压	检查接线或更换电源
光幕连续遮挡光线, ON/ OFF 灯亮红色, 分段指示灯闪烁或常亮, LEVEL 灯熄灭	对准不良导致光幕进入遮挡保护模式	1. 检查光通讯表面是否有污染影响光束对准不良; 2. 参考安装调试步骤重新进行调整; 3. 如果对准仍然不好, 请观察长 / 短距离模式灯。如果为红色 (SHORT 模式), 参照配置方法调整为绿色 (LONG 模式)
光幕在遮挡和通光之间正常切换, 但设备在通光状态下不工作	1. 光幕输出触点与设备断开连接 2. 光幕输出方式与设备接线不匹配 3. 设备故障	1. 重新压接, 检查光幕输出接线是否连接正确; 2. 检查光幕的 PNP / NPN 输出模式是否与设备对应; 3. 维修和调试设备;
光幕在遮挡和通光之间正常切换, 但设备不停止在遮挡状态	输出接点之间的控制电路短路	重新压接, 检查光幕输出接线是否连接正确
光幕异常遮挡光线, 最小检测对象无法遮挡光线	1. 受周围反射面影响的光幕接收器通光 2. 光幕接收器受周围其它相干光源干扰	1. 观察并调整影响光幕接收器的周围反射面, 参考“环境反射面影响”进行调整后再确认; 2. 调查并调整影响光幕接收机的周围相干光信号, 调整请参见“相邻安装注意事项”, 再确认;
光幕遮挡光线异常, OK 灯熄灭	光幕系统故障	联系售后服务进行返厂维修

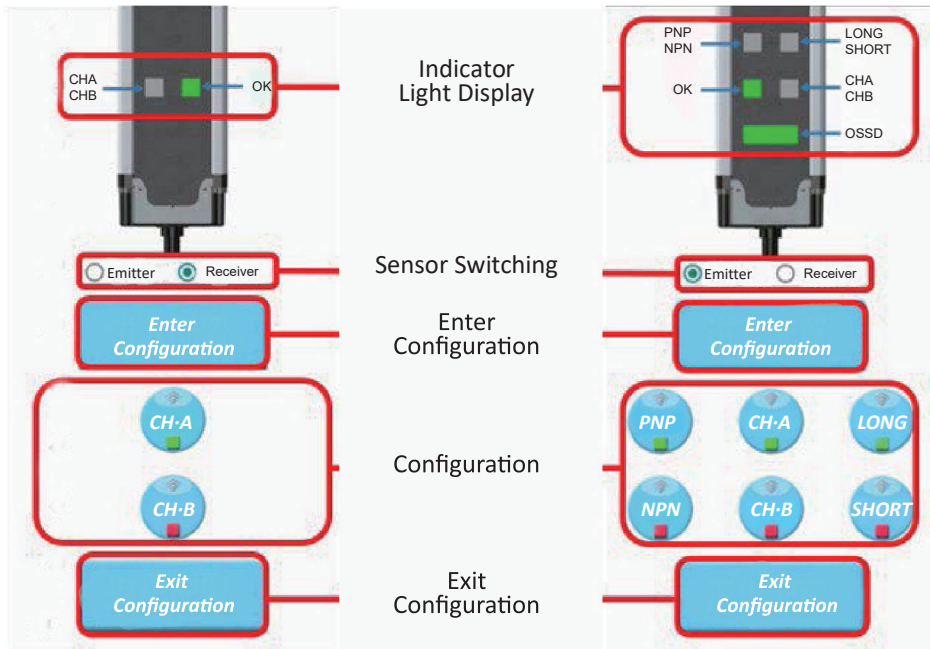
## INFRARED CONFIGURATION FUNCTION

### • Overview

SE4 type safety light curtains support an infrared remote control configuration function across the entire series. This function allows users to install the “Configuration Assistant” app on a smartphone with infrared remote control capabilities or purchase a matching infrared remote control device for configuration purposes. Specifically, the emitter side only supports configuration for channel switching via optical communication. On the other hand, the receiver side supports three types of configurations: channel switching via optical communication, switching between long and short distance modes, and switching between output modes.

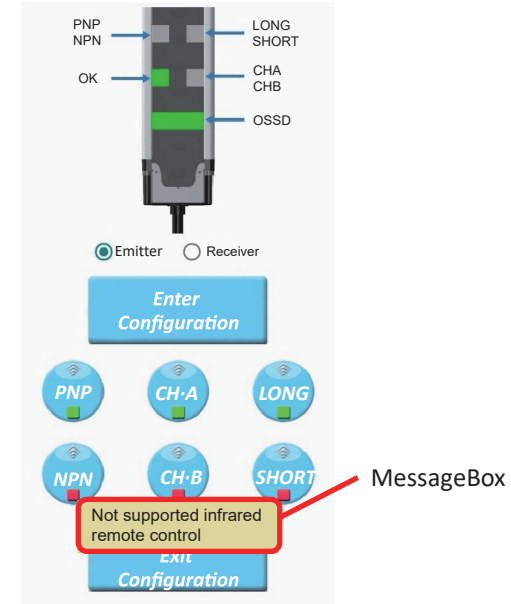
## THE USAGE INSTRUCTIONS FOR THE MOBILE APP

### • Introduction to the Interface of the “Configuration Assistant” App



- **Indicator Lights Display:** Used to display the current configuration status of the sensor, facilitating users in quickly locating the position of the corresponding indicator light for sensor configuration items.
- **Sensor Selection:** Used to choose the type of sensor to be configured.
- **Enter Configuration Button:** Establishes a configuration connection with the sensor, enabling the sensor to enter configuration mode.
- **Configuration Buttons:** Used to modify the configurable options of the current sensor.
- **Exit Configuration Button:** Confirms the current configuration changes and disconnects from the sensor’s configuration connection, causing the sensor to exit configuration waiting mode.
- **Error Prompt:** When the “Configuration Assistant” detects that the user’s smartphone does not support infrared functionality, it will display an error prompt.

## THE USAGE INSTRUCTIONS FOR THE MOBILE APP



- **Configuration Steps**
- **Select the Sensor for Configuration:** Open the “Configuration Assistant” app and choose either the emitter or receiver to enter the corresponding configuration interface.
- **Enter Configuration Mode:** Align the smartphone’s infrared emitter with the infrared receiver port of the ent safety light curtain transmitter or receiver (the receiver port location can be found in the “Product Overview - Sensor” chapter). Then, tap the “Enter Configuration” button on the smartphone interface. Observe whether the light curtain indicator lights start blinking. If they do not blink, adjust the angle and position of the smartphone, and tap the “Enter Configuration” button again until the indicator lights start blinking, indicating that the light curtain has entered the configuration waiting mode.
- **Configure Functions:** Keep the smartphone aligned with the infrared receiver port and click the corresponding function configuration button as needed. At this point, the corresponding function indicator lights on the light curtain will change to the corresponding colors as on the buttons, but they will still remain blinking. The smartphone interface will synchronously display the color changes of the corresponding indicator lights.
- **Complete Configuration:** After completing all configurations, confirm whether the colors of the function indicator lights match the requirements (refer to the “Product Overview - Sensor” chapter for indicator light descriptions). After confirming, tap the “Exit Configuration” button. The indicator lights on the light curtain will stop blinking. If unsuccessful, refer to the “Enter Configuration Mode” step, adjust the angle and position of the smartphone, and tap the “Exit Configuration” button again until the indicator lights on the light curtain stop



• The configuration method for the accompanying infrared remote control is essentially the same as the configuration method for the mobile app.

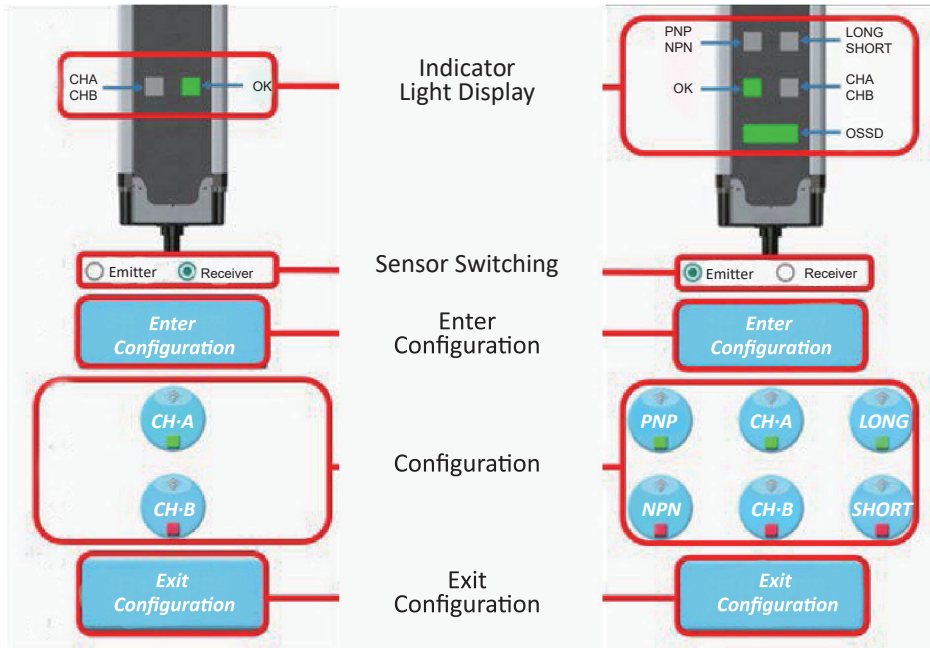
## 红外配置功能

### 概述

SE4型安全光幕在整个系列中支持红外遥控配置功能。该功能允许用户在具有红外遥控功能的智能手机上安装“配置助手”应用程序或购买专用的红外遥控器设备进行配置。

具体来说，发射器只支持通过光通信进行A/B通道切换的配置。另一方面接收器支持三种类型的配置：通过光通信进行A/B通道切换，长距离和短距离模式之间切换，以及输出模式之间切换。

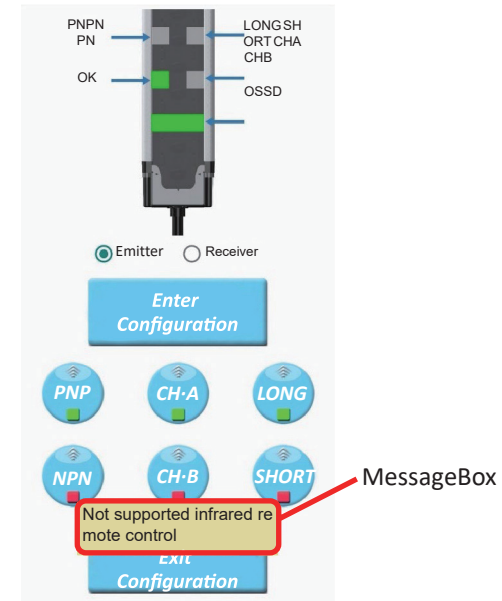
### 智能手机APP的使用说明



### “配置助手”App界面介绍

- 指示灯显示：用于显示传感器的当前配置状态，方便用户快速定位传感器配置项对应的指示灯位置。
- 光幕选择：用于选择要配置的光幕类型。
- 进入配置按钮：与光幕建立配置连接，使光幕进入配置模式。
- 配置按钮：用于修改当前传感器的可配置选项。
- 退出配置按钮：确认当前配置更改，断开光幕的配置连接，使光幕退出配置等待模式。
- 错误提示：当“配置助手”检测到用户的智能手机不支持红外功能时，会显示错误提示。

## 配置步骤

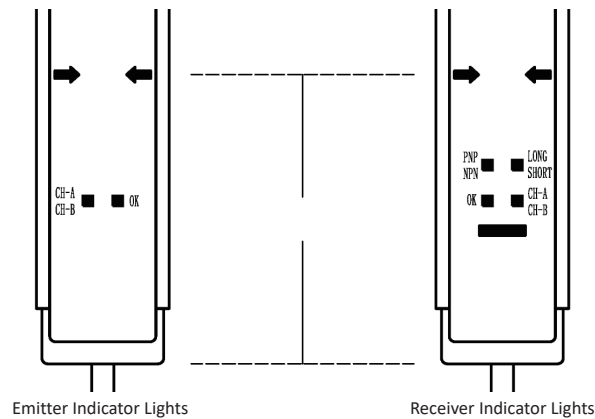


- 选择要配置的光幕：打开“配置助手”app，选择发射器或接收器，进入相应的配置界面。
- 进入配置模式：将智能手机的红外发射器与安全光幕发射器或接收器的红外接收端口对齐（接收端口位置可在“产品概述”说明部分中找到）。然后，点击智能手机界面上的“进入配置”按钮。观察灯幕指示灯是否开始闪烁。如果不闪烁，调整智能手机的角度和位置，再次点击“进入配置”按钮，直到指示灯开始闪烁，表示光幕进入配置等待模式。
- 配置功能：将智能手机对准红外接收端口，根据需要点击相应的功能配置按钮。此时，光幕上相应的功能指示灯将变为按钮上相应的颜色，但仍保持闪烁状态。智能手机界面将同步显示相应指示灯的颜色变化。
- 配置完成：所有配置完成后，请确认各功能指示灯的颜色是否符合要求（指示灯说明请参见“产品概述”说明部分）。确认后，点击“退出配置”按钮。灯幕上的指示灯停止闪烁。如果不成功，参考“进入配置模式”步骤，调整智能手机的角度和位置，再次点击“退出配置”按钮，直到光幕上的指示灯停止闪烁。



- 红外遥控器的配置方法与智能手机“配置助手”app的配置方法基本相同。

## EXPLANATION OF CONFIGURABLE FUNCTIONS



- When using the infrared configuration function, please aim the infrared remote control or smartphone at the arrow marked position. It is recommended to perform the configuration within the range of 0.3 m to 2 m.

## EMITTER CONFIGURABLE FEATURES

### Optical Synchronization Channel Switching

Configuration Markings: CH-A / CH-B represent channels A / B for optical synchronization.

Function Explanation: The optical synchronous channel switching function is typically used to improve light interference issues in installations where multiple sets of SE4 safety light curtains with the same design are installed nearby. (It is recommended to prioritise the installation method recommended in the "Considerations for Adjacent Installations" section for improvement.)

## RECEIVER CONFIGURABLE FEATURES

### Optical Synchronization Channel Switching

Configuration Markings: CH-A / CH-B represent channels A / B for optical synchronization.

Function Explanation: The optical synchronous channel switching function is typically used to improve light interference issues in installations where multiple sets of SE4 safety light curtains with the same design are installed nearby. (It is recommended to prioritise the installation method recommended in the "Considerations for Adjacent Installations" section for improvement.)

### Distance Mode Switching

Configuration Markings: LONG / SHORT represent long-distance and short-distance modes.

Function Explanation: Distance mode switching is generally used to improve light interference issues in close-range applications. SE4 safety light curtains typically have good anti-interference capabilities in general application scenarios, so switching adjustments are not necessary. However, if issues arise, switching attempts can be made based on the advice of the after-sales engineer.

### Output Mode Switching

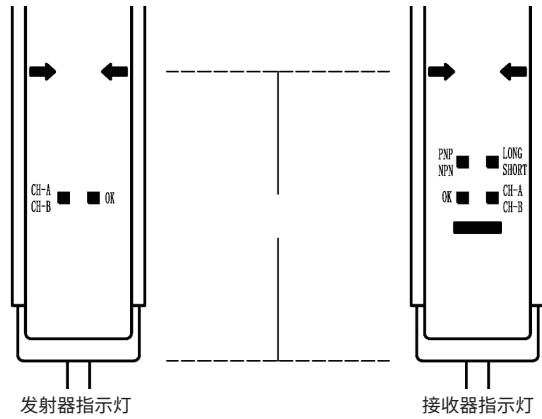
Configuration Markings: PNP / NPN represent PNP output mode and NPN output mode.

Function Explanation: Output mode switching is generally used for quick adjustment when the selected SE4 safety light curtain does not match the control method at the application site. After switching the output mode, the SE4 safety light curtain must undergo safety confirmation and inspection before being put into use.



- The emitter and receiver of the same set of SE4 safety light curtains must use the same optical synchronization channel.
- Switching back to the long-distance mode from the close-range mode may result in the SE4 safety light curtains not being able to detect light.
- During normal installation and use, do not switch the output mode of the SE4 safety light curtains, as it may cause the machinery to malfunction.
- Configuration should be performed by a qualified equipment safety officer after the equipment is shut down. During the configuration process, there should be no other working sensors of the same type nearby, or additional shielding should be added near the sensor being configured to avoid the remote control configuration affecting other sensors.

## 可配置功能说明



• 当使用红外配置功能时, 请将红外线遥控器或智能手机对准标有箭头的位置。建议操作配置距离范围在0.3m至2 m之间。

## 发射器配置特性

## • 光同步频道切换

配置标志: CH-A / CH-B表示光同步通道A / B。

功能说明: 在附近安装多套相同设计的SE4安全光幕时, 通常使用光同步通道切换功能来改善光干扰问题。

## 接收器配置特性

## • 光同步频道切换

配置标志: CH-A / CH-B表示光同步通道A / B。

功能说明: 在附近安装多套相同设计的SE4安全光幕时, 通常使用光同步通道切换功能来改善光干扰问题。

## • 距离模式切换

配置标志: LONG / SHORT表示长距离和短距离模式。

功能说明: 距离模式切换通常用于改善近距离应用中的光干扰问题。SE4安全光幕在一般应用场景下具有良好的抗干扰能力, 不需要进行距离模式调整。但是, 如果出现问题, 可以根据售后工程师的建议进行切换尝试。

## • 输出模式切换

配置标志: PNP / NPN分别代表PNP输出模式和NPN输出模式。

功能说明: 当选择使用的SE4安全光幕与应用现场的控制输入方式不匹配时, 可以采用输出模式切换进行快速调节。SE4安全光幕在切换输出模式后, 必须经过安全确认和检查, 才可投入使用。



- 同一套SE4安全光幕的发射器和接收器必须使用同一光同步通道。
- 从近距离模式切换回远距离模式可能导致SE4安全光幕无法检测光束。
- 在正常安装和使用过程中, 请勿切换SE4安全光幕的输出模式, 否则可能导致设备故障。
- 设备关闭后, 应由合格的设备管理人员进行配置。在配置过程中, 附近不能有其他同类型的光幕工作, 或者在被配置光幕附近增加额外的屏蔽, 以避免远程控制配置影响其他光幕。