ESM Series

Measuring Light Curtain

Product Introduction

ESM series measuring light curtain is mainly used for measuring the scale, outline and volume of objects; Compact and beautiful in appearance, diverse installation; The detection accuracy can reach up to 2.5mm, with various parameter configurations, perfect fault detection and fault monitoring, and the digital tube can visually display various working states; Hold the function of shielding lamp beads through the upper computer; The light curtain has strong anti-interference ability and can work normally in various servo motors and harsh environments.

Product Feature

- Wide voltage power supply: the operating voltage is DC12~30V.
- Detection accuracy: the detection accuracy of light curtain can reach 2.5mm at most.
- Long sensing distance: 2.5mm spacing can reach more than 3m sensing distance, 5mm and 10mm spacing can reach more than 5m sensing distance.
- A variety of data output: light spot blocking beam, light spot status, edge shading position.
- Flexible configuration: the system parameters such as communication parameters, output data type, shielding lamp beads can be modified by the upper computer. And the user parameters can be restored to factory settings.
- Standard protocol: Modbus-RTU communication protocol is adopted.
- Visual display of operation status: adopt digital tube and indicator light to display curtain working status.
- Strong seismic performance: the interior of the light curtain adopts seismic structure and aluminum shell structure design, which has good seismic performance.
- Suitable for installation in various environments: there are various installation types and a variety of installation brackets.
- Small appearance size: 32mm*30mm sectional dimension

Product Parameter

Power Supply	DC12V~30V
Capacity	<5W
Beam Space	2.5mm, 5mm, 10mm
Detection Accuracy	2.5mm, 5mm, 10mm
Sensing Distance	15mm, 25mm, 45mm
Beam	2.5mm: 32, 64……640
	5mm: 16, 24……640
	10mm: 16, 24……400
Protective Height	Protection height=(N-1)*beam space, N is beams
Wavelength	940nm
Response Time	Response time=(N*0.1ms)+0.4ms N is beams
Safety Output (OSSD)	NPN or PNP
	Analog voltage: 0~5V, 0~10V, 4~20mA
Communication	Communication: RS485
	Baud rate:9600bps(default), 19200bps, 38400bps, 57600bps, 115200bps
	Protocol: Modbus-RTU
	Data sending: active mode, passive mode
Sensing Distance	2.5mm:0.1~3m (Remark: please let us know when with reflectivity)
	5mm:0.1~5m (Remark: please let us know when with reflectivity)
	10mm:0.1~5m (Remark: please let us know when with reflectivity)
Sensing Method	Thru-beam
Synchronization	Wire-syn
Enclosure Material	Aluminum alloy
Enclosure Rate	IP65
Sectional Size	32*30mm
Vibration Resistance	Frequency 10Hz-55Hz, amplitude 0.35±0.05mm, 20time each X, Y and Z direction.
Ambient Temperature	-10℃~55℃ (no freezing)
Store Temperature	-30℃~70℃ (no freezing)
Ambient Humidity	When temperature 20℃, the humidity max. 85%

Model Selection (e.g.: ESM-1610NL-3)

Product Series	Beams	Beam Space	Output Option	Installation		Sensing Distance
ESM	– 16	10	N	L	–	3
	16,24, 32…	2.5mm 5mm 10mm	N:2 NPN outputs P:2 PNP outputs U1:0~5V analog voltage output U2:0~10V analog voltage output I:4~20mA analog current output PP:1-channel p-type pulse transmission	L: L side mounting Q2: Q2end cover mounting		1: 0.1~1m 3: 0.1~3m 5: 0.1~5m (Remark: please let us know when with reflectivity)

Note: 1. When PP(1-channel P-pulse transmission) is selected, the shooting distance is 3m at the farthest.
2. The product has RS485 digital output response by default; Among them, active, baud rate, address, output data content, OSSD trigger, analog output data and shielding settings can be configured on the upper computer. Please refer to the EMLCC_ESM Operation Manual for specific operation procedures.

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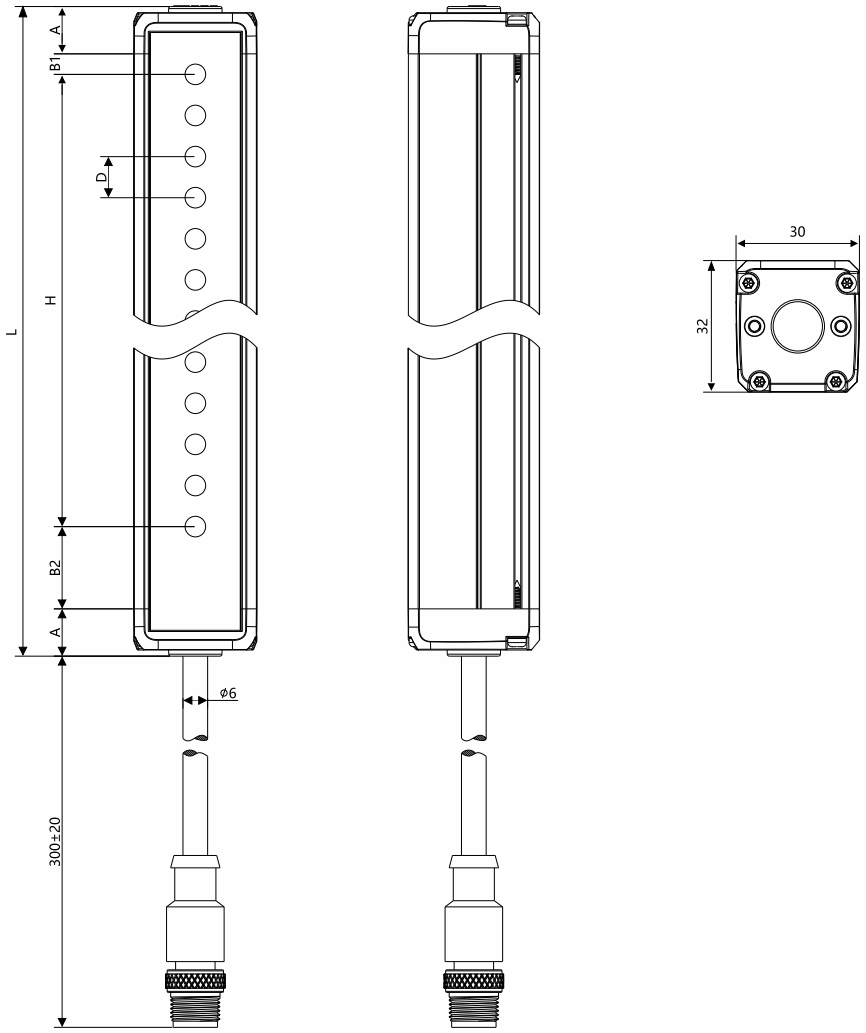
Product Size



A:upper & lower end caps
B1: up blind area
B2: bottom blind area
D: beam space
H:protective height
L: total length

Cover A=11.5mm

When the optical axis spacing D=2.5mm, the upper blind zone B1=1.25mm and the lower blind zone B2 = 16.25 mm..

When the optical axis spacing D=5.0mm, the upper blind zone B1=2.5mm and the lower blind zone B2 = 17.5 mm..

When the optical axis spacing D=10.mm, the upper blind zone B1=5.0mm and the lower blind zone B2 = 20. mm..

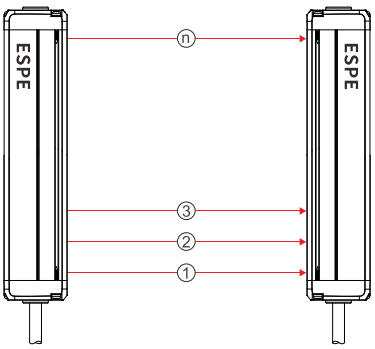
H is the detection degree of the light curtain:
H= (number of optical axes -1)* optical axis spacing.

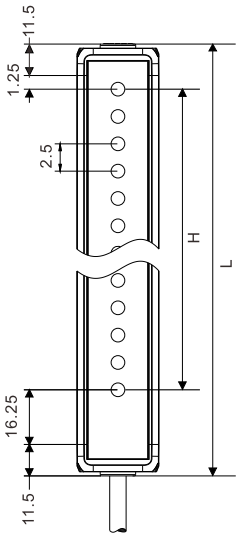
L is the total degree of light curtain:
L= end cover degree *2+ upper and lower blind spots + detection degree.

ESM Model Selection Table

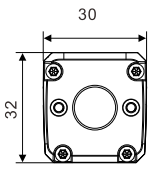
- Detection accuracy 2.5mm

Picture (mm)	Beams (n)	Protection Height (mm)	Total Height (mm)	Model
	32	77.5	118	ESM32025
	64	157.5	198	ESM64025
	96	237.5	278	ESM96025
	128	317.5	358	ESM128025
	160	397.5	438	ESM160025
	192	477.5	518	ESM192025
	224	557.5	598	ESM224025
	256	637.5	678	ESM256025
	288	717.5	758	ESM288025
	320	797.5	838	ESM320025
	352	877.5	918	ESM352025
	384	957.5	998	ESM384025
	416	1037.5	1078	ESM416025
	448	1117.5	1158	ESM448025
	480	1197.5	1238	ESM480025
	512	1277.5	1318	ESM512025
	544	1357.5	1398	ESM544025
	576	1437.5	1478	ESM576025
	608	1517.5	1558	ESM608025
	640	1597.5	1638	ESM640025





Front View



Top View

H is protective height: H= (beams -1)* beam space.
L is total height: L= A+B1+B2+H

Remark: Beside above models, other light curtains can be customized

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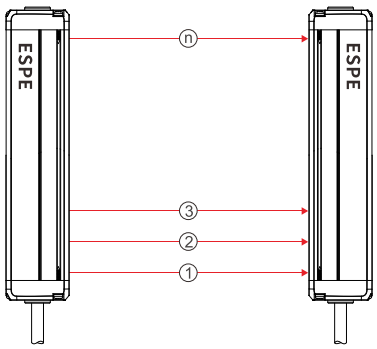
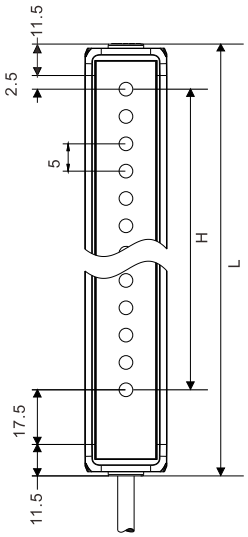
ESM Model Selection Table

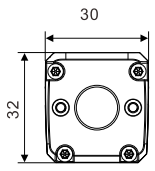
- Detection accuracy 5mm

Picture (mm)	Beams (n)	Protection Height (mm)	Total Height (mm)	Model
	16	75	118	ESM1605
	24	115	158	ESM2405
	32	155	198	ESM3205
	40	195	238	ESM4005
	48	235	278	ESM4805
	56	275	318	ESM5605
	64	315	358	ESM6405
	72	355	398	ESM7205
	80	395	438	ESM8005
	88	435	478	ESM8805
	96	475	518	ESM9605
	104	515	558	ESM10405
	112	555	598	ESM11205
	120	595	638	ESM12005
	128	635	678	ESM12805
	136	675	718	ESM13605
	144	715	758	ESM14405
	152	755	798	ESM15205
	160	795	838	ESM16005
	168	835	878	ESM16805
	176	875	918	ESM17605
	184	915	958	ESM18405
	192	955	998	ESM19205
	200	995	1038	ESM20005
	208	1035	1078	ESM20805
	216	1075	1118	ESM21605
	224	1115	1158	ESM22405
	232	1155	1198	ESM23205
	240	1195	1238	ESM24005
	248	1235	1278	ESM24805
	256	1275	1318	ESM25605
	.....	.....	.....	.....
	640	3195	3238	ESM64005





Front View



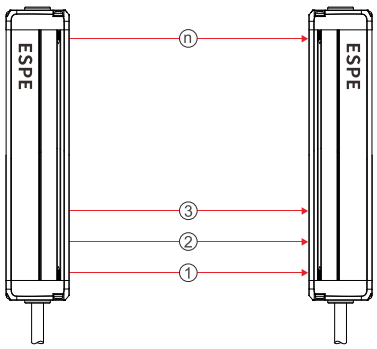
Top View

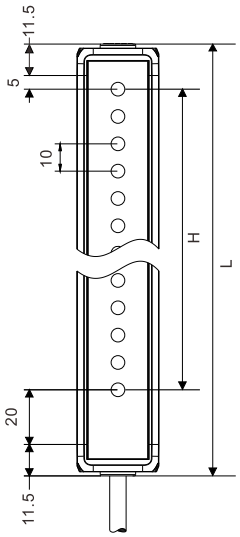
H is protective height: H= (beams -1)* beam space.
L is total height: L= A+B1+B2+H

Remark: Beside above models, other light curtains can be customized

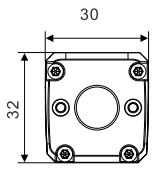
ESM Model Selection Table

- Detection accuracy 10mm





Front View



Top View

H is protective height: H= (beams -1)* beam space.
L is total height: L= A+B1+B2+H

Picture (mm)	Beams (n)	Protection Height (mm)	Total Height (mm)	Model
	16	150	198	ESM1610
	24	230	278	ESM2410
	32	310	358	ESM3210
	40	390	438	ESM4010
	48	470	518	ESM4810
	56	550	598	ESM5610
	64	630	678	ESM6410
	72	710	758	ESM7210
	80	790	838	ESM8010
	88	870	918	ESM8810
	96	950	998	ESM9610
	104	1030	1078	ESM10410
	112	1110	1158	ESM11210
	120	1190	1238	ESM12010
	128	1270	1318	ESM12810
	136	1350	1398	ESM13610
	144	1430	1478	ESM14410
	152	1510	1558	ESM15210
	160	1590	1638	ESM16010
	168	1670	1718	ESM16810
	176	1750	1798	ESM17610
	184	1830	1878	ESM18410
	192	1910	1958	ESM19210
	200	1990	2038	ESM20010
	208	2070	2118	ESM20810
	216	2150	2198	ESM21610
	224	2230	2278	ESM22410
	232	2310	2358	ESM23210
	240	2390	2438	ESM24010
	248	2470	2518	ESM24810
	256	2550	2598	ESM25610
	.....	.....	.....	.....
	400	3990	4038	ESM40010

Remark: Beside above models, other light curtains can be customized

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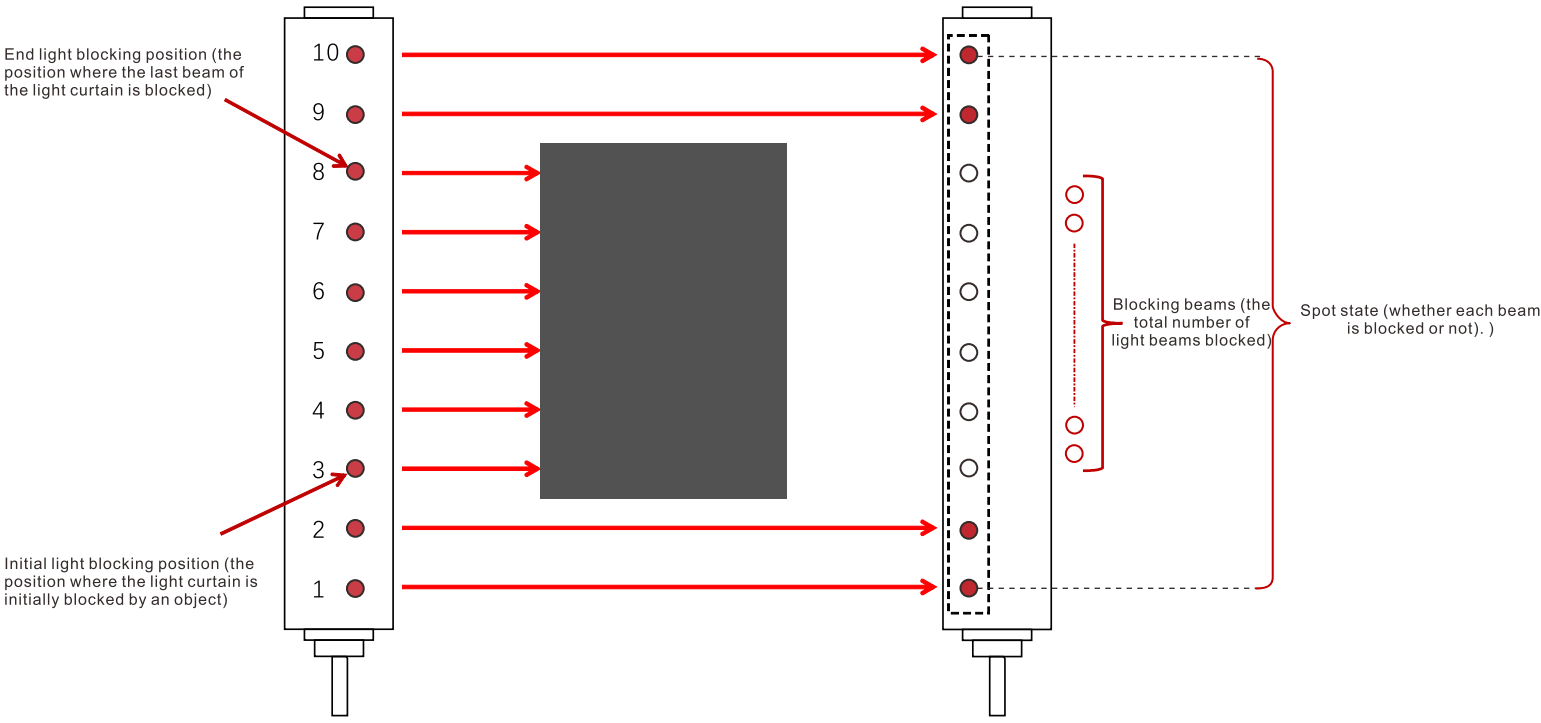
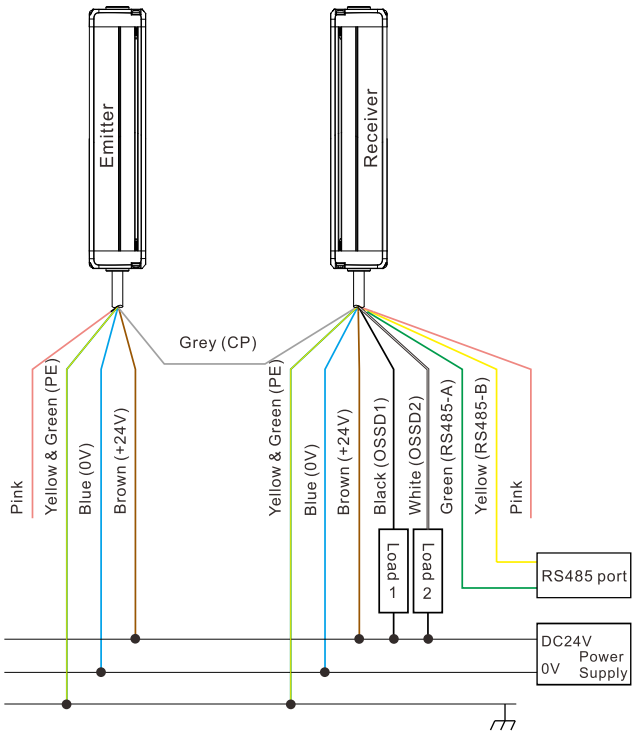
Light Curtain Output Data Description

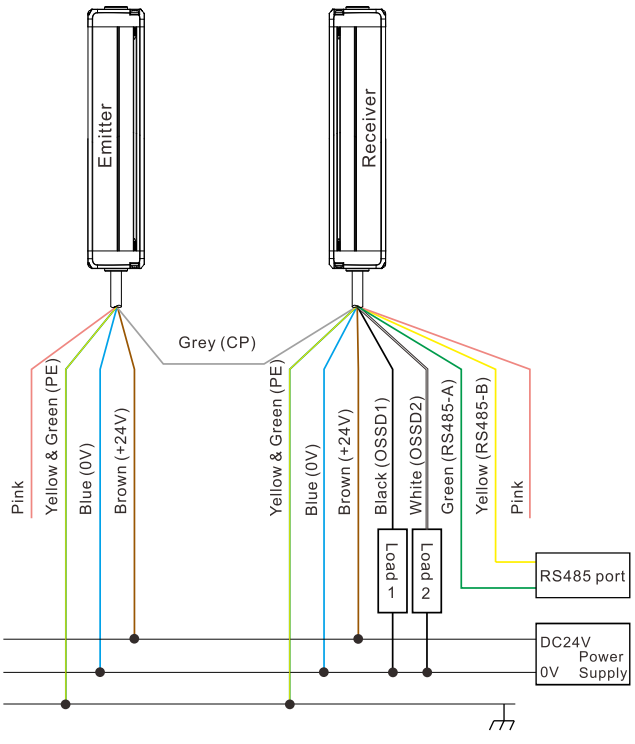


Wire Diagram

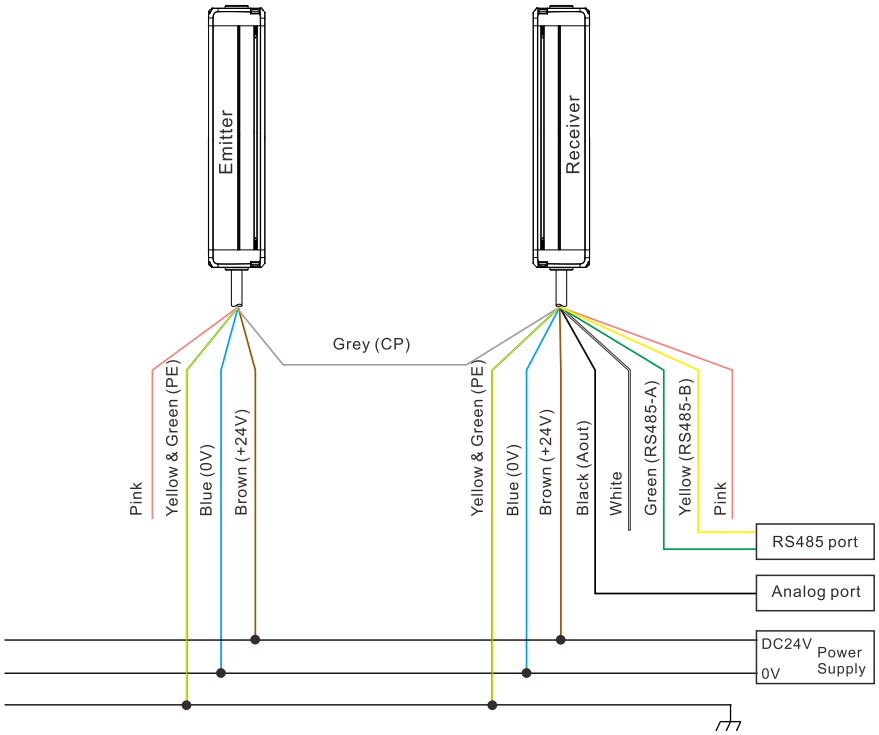
NPN



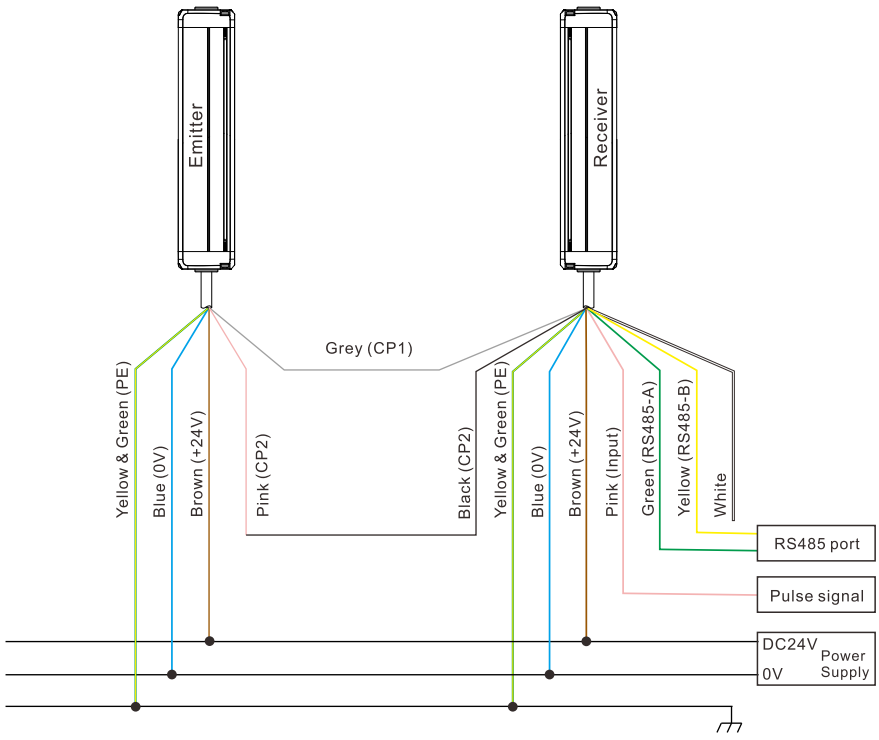
PNP



Analog Wiring Diagram



Pulse Transmission Wiring Diagram



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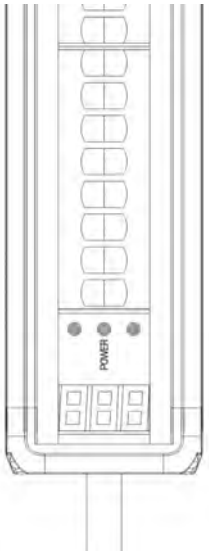
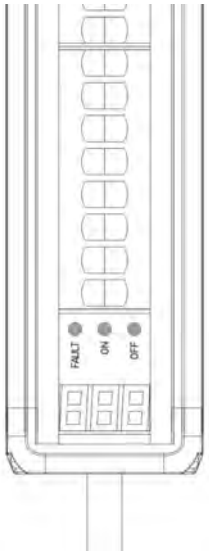
Connection

Barrier	Color	Wire Mark	Function	Connection
Emitter	Brown	24V	Positive of power	Connect to 24V of power
	Blue	0V	Negative of power	Connect to 0V of power
	Grey	CP/CP1	Synchronization wire	Connect to CP/CP1 of emitter
	Black	CP2/NC	Wire synchronization/reservation	Connect the receiver CP2/ Suspend
	Yellow & Green	PE	Shielding wire	Grounding after short circuit with receiving PE.
Receiver	Brown	24V	Positive of power	Connect to 24V of power
	Blue	0V	Negative of power	Connect to 0V of power
	Grey	CP/CP1	Synchronization wire	Connect to CP/CP1 of emitter
	Black	OSSD1/Aout/CP2	Switch output 1/ analog output signal/synchronization signal	Connect the switch signal input 1/connect the analog input terminal/connect the transmitting CP2.
	White	OSSD2/NC	Switch output 2/ NULL	Connect switch signal input 2/NULL
	Green	RS485-A	RS485 communication interface	Connected to RS485 bus A
	Yellow	RS485-B		Connected to RS485 bus B
	Pink	Input/NC	Pulse transmission/reservation	Connect pulse signal/suspend
	Yellow & Green	PE	Shielding wire	Ground after short circuit with transmitting PE.

Indication of Indicator Light





Indication of Indicator Light

Indication Code of ESM Equipment Receiver

Power on and light all LEDs for 1s: to judge whether the LEDs can work normally.

On power-up, the communication parameters of the equipment are shown as follows:
baud rate: 9600,
Digital tube display: 96n.
Parity: None

The red, green and orange indicator lights flash at the frequency of 2.5Hz. After the configuration parameters and system parameters are modified, the digital tube displays: set.

Fault-free, lighting:
The green finger light is on,
Digital tube display: 000,
The red finger light goes out,
The orange light goes out.

Fault-free, light blocking shows the position of the lowest blocking spot. For example, the position of the lowest blocking light spot is the 111th lamp bead.
Digital tube display: 111,
The green finger light goes out,
The red finger light is on,
The orange light goes out..

Fault, EEPROM parameters are not configured, or EEPROM parameters are wrong.Digital tube display: E0,
Red finger lights go out.
Green finger lights go out.
Orange means flashing at 1 Hz frequency.

Fault, CP open circuit.
Digital tube display: CP,
The red finger light goes out,
The green finger light goes out,
Orange means flashing at 1 Hz frequency.

Fault, CP overcurrent.
Digital tube display: 0c,
The green finger light goes out,
Orange means flashing at 1 Hz frequency.
The red finger light goes out,

Fault, overvoltage of power supply voltage.
Digital tube display: 0v,
The green finger light goes out,
Fault, overvoltage of power supply voltage.
The red finger light is always on,
Orange means flashing at 1 Hz frequency.

Fault, undervoltage of power supply voltage.
Digital tube display: UV,
The red finger light is always on,
The green finger light goes out,
Orange means flashing at 1 Hz frequency.

ESM Equipment Transmitter Explicit Coding Instructions

Power on and light all LEDs for 1s: to judge whether the LEDs can work normally.

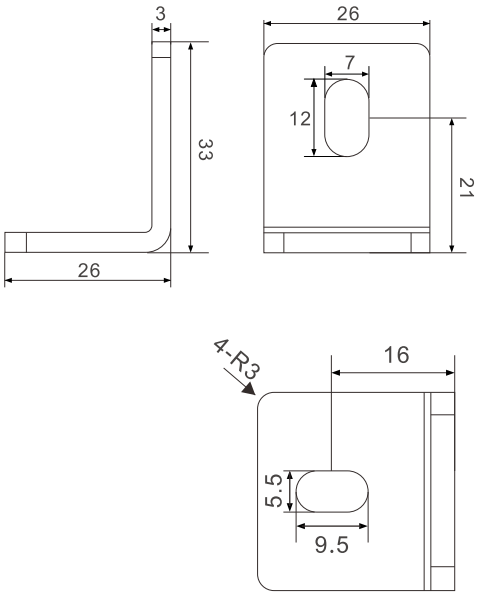
Fault-free:
The digital tube has no display,
The red finger light goes out,
The green finger light is always on
The orange light goes out.

Fault, overvoltage of power supply voltage.
Digital tube display: 0v,
The red finger light is always on,
The green finger light goes out,
Orange indicates 0.5Hz frequency flashing.

Fault, undervoltage of power supply voltage.
Digital tube display: UV,
The red finger light is always on,
The green finger light goes out,
Orange indicates 0.5Hz frequency flashing.

Measuring Light Curtain

Option of Bracket

Picture	Name & Accessories	Size
	L bracket: L bracket (4pcs) M5 Slider (4pcs) M6 gasket (4pcs) M6 spring washer (4pcs) M6*16 screw (4pcs) M5*6 screw (4pcs)	
	Q4 bracket: Q4 bracket (4pcs) M3*7 screw (4pcs) M6 gasket (4pcs) M6 spring washer (4pcs) M6*16 screw (4pcs)