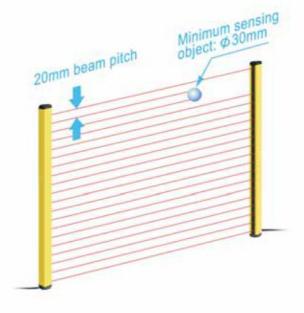




SL2 SERIESPhotoelectric Area Sensor





- 20mm beam pitch
- 8,12,16,20,24,28,32 beam channels
- · Long sensing range: 8m
- . NPN, PNP, Relay SPDT Output mode
- Supply Voltage: 12-24VDC
- Aluminum alloy shell
- CE Approvals

SL2 SERIES PHOTOELECTRIC AREA SENSOR



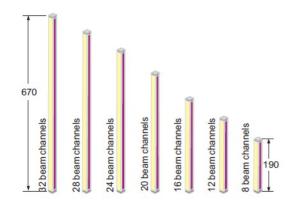






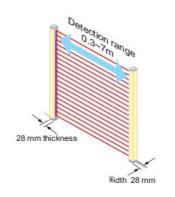
Wide variety

There are eight types of sensors having a sensing height ranging from 190mm(8 beam channels) to 670mm (32 beam channels).



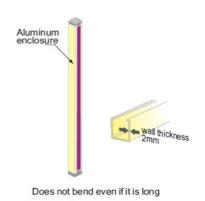
Space-saving design

With its 28 mm width and 28 mm thickness, it is small and requires the least installation space in the industry. It can be installed in small spaces incorporated within equipment.

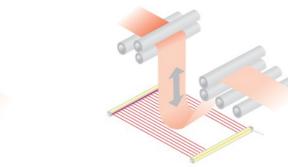


Robust Aluminum Enclosure

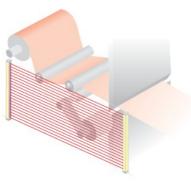
The modules are protected by a robust aluminum enclosure comforming to IP65 protection.



Detecting a loop



detecting falling objects whose path is uncertain





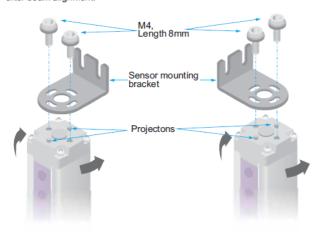
/ WARNING

Guard against blade

Never use this product in any personnel safety application. It is a normal object detection sensor

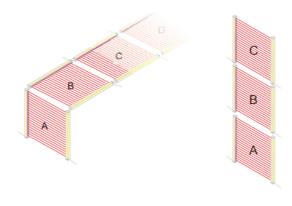
Mounting

Choose the mounting direction for the sensor mounting bracket based on the mounting direction (side or back), and temporarily tighten the brackets with the two hexagon-socket-head bolts for adjusting the mounting angle (M4 length 8mm). Tighten two hexagon-socket -head bolts securely, after beam alignment.

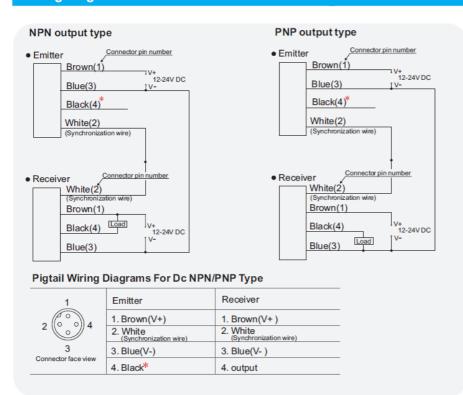


Interference Prevention Function

By synchronous sampling of software and hardware, two or more units of SL2 can be mounted close together, as shown in the figures below.



Wiring Diagram



Relay SPDT output type Emitter Brown 12-24V DC Blue V Black* White (Synchronization wire) Orange Black Gray Brown Blue 12-24V DC

* Note: Black wire is connected to V- for emitter off; Black wire is connected to V+ or open for emitter on.

| LED indicator: | | | |
|-------------------|-------------|--|--|
| Emitter ON | Emitter OFF | | |
| One LED lights up | Two LEDs | | |

Sensing Characteristics(typical)

Parallel deviation (all models) Angular deviation all models Emitter angular deviation Receiver Horizontal direction Horizontal direction (Down)Left — Center — Right (Up) Operating angle θ ()

8 beam channels and 12 beam channels

| Number | of beam channels | | | 8 beam chann | nels | | | | 12 beam chanr | nels | | | |
|-----------------------------------|------------------------|--------------|--|-------------------|---|------------------|----------------------|---|---------------------|---|------------|--|--|
| Connect | | | Cable Pigtail | | | | Cable Pigtail | | | | | | |
| Output | | NPN output | | Relay SPDT | | PNP output | NPN output | | Relay SPDT | NPN output | | | |
| Emitter | | SL2-08ES-C2 | | | | | SL2-12ES-C2 | | SL2-12ES-C2 | | SL2-12ES-E | | |
| Receiver | N.O. | SL2-08NO-C2 | SL2-08PO-C2 | | SL2-08NO-E4 | SL2-08PO-E4 | SL2-12NO-C2 | SL2-12PO-C2 | | SL2-12NO-E4 | SL2-12PO-E | | |
| 110001101 | N.C. | SL2-08NC-C2 | SL2-08PC-C2 | | SL2-08NC-E4 | SL2-08PC-E4 | SL2-12NC-C2 | SL2-12PC-C2 | | SL2-12NC-E4 | SL2-12PC-E | | |
| | N.C.+N.O. | , | | SL2-08RS-C2 | | | | | SL2-12RS-C2 | | | | |
| | | | | | | | | | | | | | |
| Sensing he | - | , | | 140mm | | | 7 | | 220mm | | | | |
| Sensing ra | | _ | | | | | 7m | | | | | | |
| Beam pitch Sensing of | | | | | - | | mm opaque object | | | | | | |
| Supply vol | | / | | | | | | or loss | | | | | |
| | nsumption(at DC 24V) | _ | Emitter: 19 5 | mA, Receiver | | 24 V DC 10% | Ripple p-p 10% | | Receiver:58m | Δ | | | |
| Culterit CO | NPN | | Ellitter. 16.5 | | | stor May load o | current:100mA; V | | | IA . | | | |
| Output | PNP | | | | | | | | | | | | |
| | Relay | / | PNP open-collector transistor, Max.load current:100mA; Votage Drop: <1.5V Relay SPDT, 5A/250VAC, 5A/30VDC | | | | | | | | | | |
| Output ope | eration | | | ON wher | | | when one or mor | | terrupted. | | | | |
| Short-circu | it ptotecton | , | | | | Incom | oorated | | - | | | | |
| Response | time for NPN/PNP type | , | | | | | or less | | | | | | |
| Indicators | Emitter | _ | | | | | f emitter is off tha | | • | | | | |
| | Receiver | Operation in | dicator: Red LED | O(lights up when | one or more bea | | d), Stable indicator | : Green LED(ligh | ts up when all be | eams are stably re | eceived) | | |
| | ce prevention function | , | Incorporated 40 to 155 % Storage 10 to 160 % | | | | | | | | | | |
| | emperature | | -10 to +55 °C, Storage:-10 to +60 °C 35 to 85 % RH, Storage: 35 to 85 % RH | | | | | | | | | | |
| Ambient il | | / | Sunlight: 10,000\earties at the light-receiving face, Incandescent light: 3,000\eartie x at the light-receiving face | | | | | | | | | | |
| Ambient illuminance EMC immunity | | | RFI>10V/m(in 30-1000MHZ), EFT>1KV, ESD>4KV(contact) | | | | | | | | | | |
| | thstand ability | | 1,000 V AC for one min. between all supply terminals connected together and enclosure | | | | | | | | | | |
| Insulation | | | 20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure | | | | | | | | | | |
| Vibration r | esistance | , | 10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each | | | | | | | | | | |
| Shock res | istance | , | 490m/s², acceleration(50G approx) in X, Y and Z directions for three times each | | | | | | | | | | |
| Emitting e | lement | Infrared LED | | | | | | | | | | | |
| Material | | | | | En | closure: Alumin | ium, lens: polye | ster | | | | | |
| Cable or p | igtail | Ø 5.0 PVC 2m | , 4x0.5mm² | Ø5.0 PVC 2m, | Φ5.0 PVC 2 | | Ø 5.0 PVC 2m | , 4x0.5mm ² | Ø 5.0 PVC 2m, | Ø5.0 PVC 2 | | | |
| Weigh(ap | | , 220 | ~ | 6x0.25mm² 240g | | connector 20g | 29 | 5.5g | 6x0.25mm² 295.5g | Euro style | 5.5g | | |
| weign(ap | prox.) | 230 | g | 240g | 2. | zog | 20 | 5.5g | 295.5g | 21 | 5.5g | | |
| | | 190 170 | 28 20 20 | - 28 | 190 170 C C C C C C C C C C C C C C C C C C C | | 270 250 | 28 20 20 20 20 20 20 20 20 20 20 20 20 20 | 28 | 270 250 C C C C C C C C C C C C C C C C C C C | P=0 | | |
| | | | | | 3 | | | | | | | | |

16 beam channels and 20 beam channels

| Number of beam channels | | | 16 beam char | | | | | 20 beam chann | | | |
|---------------------------------|---|------------|-------------------|------------------|------------------|----------------------|----------------------|------------------|-----------------|-------------|--|
| Connect | | able | | | igtail | / | Cable | I | | igtail | |
| Output | | | Relay SPDT | NPN output | | NPN output | PNP output | | NPN output | | |
| Emitter | | | SL2-16ES-C2 | SL2-16ES-E4 | | SL2-20ES-C2 | SL2-20ES-C2 | | | | |
| Receiver N.O. | SL2-16NO-C2 SL2-1 | | | | SL2-16PO-E4 | _ | SL2-20PO-C2 | | SL2-20NO-E4 | | |
| N.C. N.C.+N.O. | SL2-16NC-C2 SL2-1 | 6PC-C2 | SL2-16RS-C2 | SL2-16NC-E4 | SL2-16PC-E4 | SL2-20NC-C2 | SL2-20PC-C2 | SL2-20RS-C2 | SL2-20NC-E4 | SL2-20PC-E4 | |
| 14.0.₹14.0. | | | 3L2-10K3-C2 | | | | | 3L2-20R3-02 | | | |
| | | | | | | | | | | | |
| Sensing height | , | | 300mm | | | HS | | 380mm | | | |
| Sensing range | | | Joonnin | | 7 | 'm | | 30011111 | | | |
| Beam pitch | _ | | | | | mm | | | | | |
| Sensing object | | | | đ | 30mm or more | | | | | | |
| Supply voltage | | | | | | Ripple p-p 10% | orless | | | | |
| Current consumption(at DC 12V) | Fm | nitter: 19 | .5mA, Receiv | | 21120 1070 | Таррю р р толо | | A, Receiver:87 | mA | | |
| NPN | | | | | stor. Max.load c | urrent:100mA; V | | | | | |
| Output PNP | | | | | | urrent:100mA; Vo | <u> </u> | | | | |
| Relay | | | | Re | elay SPDT, 5A/2 | 50VAC, 5A/30VI | OC . | | | | |
| Output operation | | | ON wh | nen all beams a | re received, OF | F when one or m | ore beams are | interrupted. | | | |
| Short-circuit ptotecton | | | | | | orated | | • | | | |
| desponse time for NPN/PNP type | | | | | 10ms | or less | | | | | |
| ndicators Emitter | | | - | • . | | If emitter is off th | | • | | , | |
| Receiver | / Operation indica | or: Red L | ED (lights up whe | en one or more b | | ted), Stable indicat | or: Green LED(I | gnts up when all | beams are stabl | / received) | |
| nterference prevention function | | | | | Incorp | | °C | | | | |
| Ambient temperature | | | | | | orage:-10 to +60 | | | | | |
| Ambient humidity | | 0!! | -L+-40 0000 | | | rage: 35 to 85 % | | E-14 1-1 | | | |
| Ambient illuminance | | Sunii | | | | andescent light: | | | grace | | |
| EMC immunity | | | | | | EFT>1KV, ESD | | | | | |
| /oltage withstand ability | | | | | | terminals conne | | | ele euro | | |
| nsulation resistance | | | | | | supply terminal | | | | | |
| /ibration resistance | | | | | | itude in X, Y and | | | ach | | |
| Shock resistance | 490m/s², acceleration(50G approx) in X, Y and Z directions for three times each | | | | | | | | | | |
| Emitting element | _ | | | | | red LED | _ | | | | |
| Material | | | | | | um, lens: polyes | ter | | | | |
| Cable or pigtail | φ 5.0 PVC 2m, 4x0.5r | nm² | φ5.0 PVC 2m, | Ø5.0 PVC 2r | | Ø 5.0 PVC 2m, | 4x0.5mm ² | Φ 5.0 PVC 2m, | Ø5.0 PVC 2r | | |
| Veigh(approx.) | 341g | | 6x0.25mm² 351g | Euro style | connector 1g | | 96.7g | 6x0.25mm² | Euro style o | | |
| veign(approx.) | , J419 | | 33 ig | 33 | rig | 3 | 90.7g | 406.7g | 3 | 86.7 | |
| | | | | | | | | | | | |

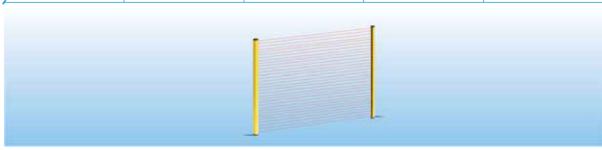
24 beam channels and 28 beam channels

| Number of beam channels | | 24 beam channels | | | | | 28 beam channels | | | | |
|----------------------------------|--|--------------------|-----------------------|-------------------|-------------------|----------------------|--|-----------------------|--|-------------|--|
| Connect | , | Cable | | Pi | igtail | | Cable | | Pi | gtail | |
| Output | NPN output | PNP output | Relay SPDT | NPN output | PNP output | NPN output | PNP output | Relay SPDT | NPN output | PNP output | |
| Emitter | SL2-24ES-C2 | SL2-24ES-C2 | SL2-24ES-C2 | SL2-24ES-E4 | SL2-24ES-E4 | SL2-28ES-C2 | SL2-28ES-C2 | SL2-28ES-C2 | SL2-28ES-E4 | SL2-28ES-E4 | |
| Receiver N.O. | SL2-24NO-C2 | SL2-24PO-C2 | | | SL2-24PO-E4 | SL2-28NO-C2 | SL2-28PO-C2 | | SL2-28NO-E4 | SL2-28PO-E4 | |
| N.C. | SL2-24NC-C2 | SL2-24PC-C2 | | SL2-24NC-E4 | SL2-24PC-E4 | SL2-28NC-C2 | SL2-28PC-C2 | | SL2-28NC-E4 | SL2-28PC-E4 | |
| N.C.+N.O. | | | SL2-24RS-C2 | | | | | SL2-28RS-C2 | | | |
| | | | | | | | | | | | |
| Sensing height | <i></i> | | 460mm | | 7 | 7m | | 540mm | | | |
| Sensing range Beam pitch | _ | | | | | mm | | | | | |
| Sensing object | / | | | đ | 30mm or more | | | | | | |
| Supply voltage | | | | | | Ripple p-p 10% | orless | | | | |
| Current consumption(at DC 12V) | | Emitter: 20 |).5mA, Receiv | | 247 20 1070 | Тарра р р тол | | A, Receiver:11 | 7mA | | |
| NPN | _ | | | | stor, Max.load o | current:100mA; V | | | | | |
| Output PNP | | | | | | urrent:100mA; V | 0 | | | | |
| Relay | | | | | | 250VAC, 5A/30VI | | | | | |
| Output operation | | | ON wh | nen all beams a | re received, OF | F when one or n | nore beams are | interrupted. | | | |
| Short-circuit ptotecton | | | | | Incorp | oorated | | - | | | |
| Response time for NPN/PNP type | | | | | 10ms | or less | | | | | |
| Indicators Emitter | Po | ower indicator: | green LEDX2(I | ight up when th | e power is ON; | If emitter is off th | at is indicated | by the number | of LEDs lighting | up) | |
| Receiver | Operation | n indicator: Red L | ED(lights up whe | en one or more b | eams are interrup | ited), Stable indica | tor: Green LED(I | ights up when all | beams are stably | received) | |
| Interference prevention function | | | | | Incorp | orated | | | | | |
| Ambient temperature | , | | | -1 | 0 to +55 ℃, Sto | orage:-10 to +60 |)°C | | | | |
| Ambient humidity | , | | | 35 t | o 85 % RH, Sto | rage: 35 to 85 % | 6 RH | | | | |
| Ambient illuminance | , | Sunli | ght: 10,0000x | at the light -rec | eiving face, Inc | andescent light: | 3,000ℓ x at the | light-receiving | gface | | |
| EMC immunity | | | I | RFI>10V/m(in | 30-1000MHZ), | EFT>1KV, ESD |)>4KV(contact | t) | | | |
| Voltage withstand ability | | | 1,000 VAC for | rone min. betw | veen all supply | terminals conne | cted together | and enclosure | | | |
| Insulation resistance | 20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure | | | | | | | | | | |
| Vibration resistance | 10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each | | | | | | | | | | |
| Shock resistance | | 490 | 0m/s², accelera | ition(50G appr | ox) in X, Y and | Z directions for t | three times ead | ch | | | |
| Emitting element | , | Infrared LED | | | | | | | | | |
| Material | Enclosure: Aluminum, lens: polyester | | | | | | | | | | |
| Cable or pigtail | # F 0 DV 0 0- | - 4.0 F2 | φ5.0 PVC 2m, | Ø5.0 PVC 2 | m, with m12 | 4 E 0 D)/O 0 | 4.0 52 | Ø5.0 PVC 2m, | Ø5.0 PVC 2 | m, with m12 | |
| . • | Ø 5.0 PVC 2n | - | 6x0.25mm ² | | connector | Ø 5.0 PVC 2m | | 6x0.25mm ² | Euro style | | |
| Weigh(approx.) | 4 | 52.3g | 462.3g | 4 | 142.3g | 50 | 8g | 518g | 49 | 98g | |
| | 510 490 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | 28 | 28 | 510 490 0 | 8 | 590 570 | 28 + 20 + 20 - 20 - 20 - 20 - 20 - 20 - 20 | *28 | \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ | -28 | |
| | | | | -5- | | 1 | 658 <u> </u> | a | 1 600 | ق_ ا | |

32 beam channels

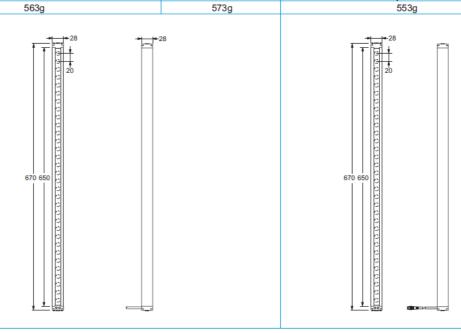
| Number of | f beam channels | | | | |
|-------------------|-----------------|--|--|--|----------|
| Connect | | | | | |
| Output Emitter | | | | | |
| | | | | | Receiver |
| Neceivei | N.C. | | | | |
| | N C +N O | | | | |

| , | | | 32 beam channels | | | |
|----|-------------|-------------|------------------|-------------|-------------|--|
| 7 | | Cable | Pigtail | | | |
| 7 | NPN output | PNP output | Relay SPDT | NPN output | PNP output | |
| 1 | SL2-32ES-C2 | SL2-32ES-C2 | SL2-32ES-C2 | SL2-32ES-E4 | SL2-32ES-E4 | |
| ĺ, | SL2-32NO-C2 | SL2-32PO-C2 | | SL2-32NO-E4 | SL2-32PO-E4 | |
| 7 | SL2-32NC-C2 | SL2-32PC-C2 | | SL2-32NC-E4 | SL2-32PC-E4 | |
| | | | SL2-32RS-C2 | | | |



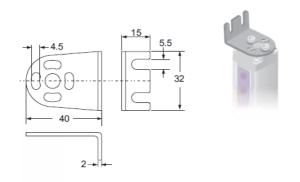
| Sensing he | ight | | | | | | |
|----------------------------------|----------------------|--|--|--|--|--|--|
| Sensing ra | Sensing range | | | | | | |
| Beam pitch | | | | | | | |
| Sensing ob | Sensing object | | | | | | |
| Supply voltage | | | | | | | |
| Current con | sumption(at DC 12V) | | | | | | |
| | NPN | | | | | | |
| Output | PNP | | | | | | |
| | Relay | | | | | | |
| Output oper | ration | | | | | | |
| Short-circuit | t ptotecton | | | | | | |
| Response t | ime for NPN/PNP type | | | | | | |
| Indicators | Emitter | | | | | | |
| IIIulcators | Receiver | | | | | | |
| Interference prevention function | | | | | | | |
| Ambient ter | mperature | | | | | | |
| Ambient hu | midity | | | | | | |
| Ambient illu | ıminance | | | | | | |
| EMC immu | ınity | | | | | | |
| Voltage with | hstand ability | | | | | | |
| Insulation r | esistance | | | | | | |
| Vibration re | sistance | | | | | | |
| Shock resis | stance | | | | | | |
| Emitting ele | ement | | | | | | |
| Material | | | | | | | |
| Cable or pi | gtail | | | | | | |
| Weigh(approx.) | | | | | | | |
| - 0 (-11 - 7 | | | | | | | |

| | _ | | | | | | | |
|--|---|--|--|--|--|--|--|--|
| , | | | | | | | | |
| 620mm | | | | | | | | |
| 7m | | | | | | | | |
| , | 20mm | | | | | | | |
| Ø30mm or more opaque object | | | | | | | | |
| 12 to 24V DC 10% Ripple p-p 10% or less | | | | | | | | |
| Emitter:21.9mA, Receiver:130mA | | | | | | | | |
| · | NPN open-collector transistor, Max.load current:100mA; Votage Drop: <1.5V | | | | | | | |
| , | tor, Max.load current:100mA; V | | | | | | | |
| | lay SPDT, 5A/250VAC, 5A/30V | | | | | | | |
| ON when all beams | are received, OFF when one of | r more beams are interrupted. | | | | | | |
| , | Incorporated | | | | | | | |
| | 10ms or less | | | | | | | |
| , | <u> </u> | that is indicated by the number of LEDs lighting up) | | | | | | |
| Operation indicator: Red LED (lights up when one or more | Operation indicator: Red LED(lights up when one or more beams are interrupted), Stable indicator: Green LED(lights up when all beams are stably received) | | | | | | | |
| , | Incorporated | | | | | | | |
| _10 | 0 to +55 ℃, Storage:-10 to +60 |) ℃ | | | | | | |
| , 35 to | 85 % RH, Storage: 35 to 85 % | 6 RH | | | | | | |
| Sunlight: 10,000ℓx at the light -rece | eiving face, Incandescent light | : 3,000ℓ x at the light-receiving face | | | | | | |
| RFI>10V/m(in 3 | 30-1000MHZ), EFT>1KV, ESI | D>4KV(contact) | | | | | | |
| 1,000 VAC for one min. betw | een all supply terminals conne | ected together and enclosure | | | | | | |
| 20 MΩ, or more, with 250 V DC megg | er between all supply termina | ls connected together and enclosure | | | | | | |
| 10 to 150 Hz frequency, 0.75 mm | 0.030 in amplitude in X, Y and | d Z directions for two hours each | | | | | | |
| 490m/s ² , acceleration(50G appro | ox) in X, Y and Z directions for | three times each | | | | | | |
| | Infrared LED | | | | | | | |
| End | losure: Aluminum, lens: polye | ster | | | | | | |
| 45 0 DVO 0 4-0 5 ² | Ø5.0 PVC2m, | φ5.0 PVC 2m, with m12 | | | | | | |
| φ5.0 PVC 2m, 4x0.5mm² | 6x0.25mm ² | Euro style connector | | | | | | |
| 563a | 573 a | 553a | | | | | | |

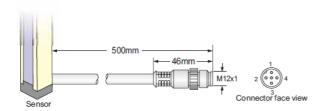


SL2 SERIES PHOTOELECTRIC AREA SENSOR

Bracket Dimensions



Diameter for Pigtail connect



Selection Guide

