Schmersal offers a comprehensive range of active optoelectronic devices (AOPD) to provide non-separating safeguarding of hazardous areas, ranging from point of operation to danger zone or perimeter guarding. These "virtual safety guards" are available as safety light barriers, safety light grids and safety light curtains. They are available with different functions such as blanking, muting, cascading, or cyclic operation. IP69K versions are also available. A large assortment of accessories such as deflecting mirrors and mounting brackets helps the user in installing and using AOPD in his specific application.

Our safety light curtains and grids feature one-piece extruded aluminum housings, in rectangular and circular profiles. This closed housing profile has proven to be less susceptible to mechanical damage, misalignment from torsion or bending, and relieves the stress normally put on the lens in other light curtains.

Further detailed information on this product group can be found in the Optoelectronics catalog.

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<th>Safety light curtains and light grids</th>
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<tr>
<td>Accessories</td>
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</table>

<table>
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<td></td>
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<tr>
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</tr>
</tbody>
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<tr>
<th>Safety distance calculations</th>
<th>A-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>see appendix</td>
<td></td>
</tr>
</tbody>
</table>
# Safety light curtains and safety light grids

## SLC 440-E/R-01

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>xxxx</td>
<td>Protected heights (mm) 0170, 0250, 0330, 0410, 0490, 0570, 0650, 0730, 0810, 0890, 0970, 1050, 1130, 1210, 1290*, 1370*, 1450*, 1530*, 1610*, 1690*, 1770*</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>Resolution 14 mm with a range of 0.3 m ... 7 m</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Resolution 30 mm with a range of 0.3 m ... 10 m</td>
</tr>
</tbody>
</table>

## SLG 440-E/R-01

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distance between outermost beams: 0500-02 500 mm, 2-beam 0800-03 800 mm, 3-beam 0900-04 900 mm, 4-beam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range 0.3 ... 12 m</td>
<td></td>
</tr>
</tbody>
</table>

- **SIL:** up to 3
- **PFH-value:** - SLC 440 11,4 x 10^-9/h - SLG 440 8,14 x 10^-9/h
Safety light curtains and safety light grids

**SLC 425I**

- Safety light curtain
- Type 4 to IEC/EN 61496-1, -2
- Resolution 14 and 30 mm
- Protection field heights 170 mm ... 1770 mm
- Integrated start/restart interlock
- Integrated contactor control
- Integrated muting and override function
- Integrated blanking function (fixed and mobile blanking)
- Cyclic operation (1 ... 8 Cycles)
- Fail-safe transistor outputs
- Optical synchronisation
- Status display
- Different muting sequences can be parameterized
- Protection class IP67

**SLG 425I**

- Safety light grid
- 2-, 3-, 4-beam light grid
- Protection field heights 500, 800 or 900 mm
- Range 0.3 ... 18 m

**Technical data**

- Standards: IEC/EN 61496-1/-2
- Category: Type 4
- Enclosure: aluminum
- Enclosure dimensions: Ø 49 mm
- Connection: Connector plug
- - Emitter: M12, 4-pole,
- - Receiver: M12, 8-pole,
- - Muting sensors: 2 x connector plugs
- - Muting lamp: M8, 3-pole
- - Muting sensors: 2 or 4 external sensors
- - Light emission wavelength: 880 nm (infrared)
- - Ue: 24 VDC ± 10%
- - Safety outputs: 2 x PNP, 500 mA
- - Power consumption: Emitter 4 W, Receiver 8 W
- - Data interface: RS 485
- - Status and diagnostics: LED display
- - Ambient temperature: −10 °C ... +50 °C
- - Storage and transport temperature: −20 °C ... +70 °C

**Ordering details**

- Connector: Female connector M12, 4-pole straight
- for emitter
  - cable length 5 m: KA-0804
  - cable length 10 m: KA-0805
  - cable length 20 m: KA-0808
- for receiver
  - cable length 5 m: KA-0904
  - cable length 10 m: KA-0905
  - cable length 20 m: KA-0908
- Connecting cable for the muting sensors
  - M8, 3-pole to M12, 4-pole, 2 m: KA-0965

For more information, see our online product catalog: [www.usa.schmersal.net](http://www.usa.schmersal.net)
### Technical data

- **Standards:** IEC/EN 61496-1/-2
- **Category:** Type 4
- **Enclosure:** aluminum
- **Enclosure dimensions:** Ø 49 mm
- **Deflecting mirror:** 50 x 50 x 606 mm
- **Connection:** Connector plug
- **- emitter/receiver:** M12, 8-pole
- **Max. cable length:** 100 m / 1 Ω
- **Protection class:** IP67 to EN 60529
- **Response time:** 15 ms
- **Detection sensitivity (Resolution):** 500 mm
- **Protection field height:** 500 mm
- **Protection field width, Range:** 0.3 m ... 7 m
- **Start/restart interlock:** Integrated
- **Light emission wavelength:** 880 nm (infrared)
- **Ue:** 24 VDC ± 10%
- **Safety outputs:** 2 x PNP, 500 mA
- **Power consumption:** 10 W
- **Data interface:** RS 485
- **Status and diagnostics:** LED display
- **Ambient temperature:** −10 °C ... +50 °C
- **Storage and transport temperature:** −20 °C ... +70 °C

### Classification:

- **Standards:** EN ISO 13849-1; IEC 61508; IEC 60947-5-3
- **PL:** up to e
- **Category:** up to 4
- **PFH-value:** 7.42 x 10⁻⁹/h
- **SIL:** up to 3
- **Service life:** 20 years

### Ordering details

- **Connector:**
  - Female connector M12, 8-pole straight
  - Cable length 5 m: KA-0904
  - Cable length 10 m: KA-0905
  - Cable length 20 m: KA-0908

### Note

- Mounting brackets are included in the delivery.
- **Converter for the parametrization NSR 0801**
## Safety light curtains and safety light grids

### LF 50-11P

![Image of LF 50-11P](image)

- Range up to 5.5 m
- Connector plug can be rotated
- LED status display
- Protection class IP67
- Infrared light 660 nm
- Laser protection class 1
- Polarisation filter
- Antivalent switching outputs

### Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards</td>
<td>EN 60974-5-2</td>
</tr>
<tr>
<td>Laser protection class 1</td>
<td>EN 60825-1-10/03</td>
</tr>
<tr>
<td>Enclosure</td>
<td>ABS</td>
</tr>
<tr>
<td>Enclosure dimensions</td>
<td>50 x 50 x 17 mm</td>
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<tr>
<td>Connection</td>
<td>M12, 4-pole, can be rotated</td>
</tr>
<tr>
<td>Max. cable length</td>
<td>100 m</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP67</td>
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<tr>
<td>Switching frequency</td>
<td>2500 Hz</td>
</tr>
<tr>
<td>Range</td>
<td>0 ... 5.5 m</td>
</tr>
<tr>
<td>Infrared laser light</td>
<td>660 nm</td>
</tr>
<tr>
<td>$U_e$</td>
<td>10 ... 30 VDC</td>
</tr>
<tr>
<td>Switching output</td>
<td>2 x PNP 200 mA</td>
</tr>
<tr>
<td>Beam diameter</td>
<td>5 ... 24 mm</td>
</tr>
<tr>
<td>LED status display</td>
<td>soiling, switching condition and power on</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>−20 °C ... +60 °C</td>
</tr>
<tr>
<td>Storage and transport</td>
<td>−20 °C ... +80 °C</td>
</tr>
</tbody>
</table>

### System components

- **Reflector R 51 x 61-L**
- **Reflector R D83**
- **Mounting angle BF 50**
- **Mounting angle BF UNI 1**

### Ordering details

**LF 50-11P**

**Note:**
System components (cables, mounting angles, etc.) not included in the delivery.

**Connector**

- **M12, 4-pole straight** without cable
- **M12, 4-pole straight** with cable 2 m
- **M12, 4-pole straight** with cable 5 m

**Connecting cable to connect SLG 425I**

- **M12, 4-pole to M8, 3-pole, 2 m**

**Reflector**

- **R 51 x 61-L**
- **R D83**

**Mounting angle**

- **BF 50**
- **BF UNI 1**

**KA-0965**
Safety light curtains and safety light grids

**SLC 420 standard**
- **Safety light curtain**
  - Type 4 to IEC/EN 61496-1/-2
  - Resolution 14, 30 and 50 mm
  - Protection field heights 170 mm ... 1770 mm
  - Integrated start/restart interlock
  - Integrated contactor control
  - Integrated blanking function (fixed and mobile blanking)
  - Diagnostic and parameterization interface
  - Fail-safe transistor outputs
  - Optical synchronisation
  - Status display
  - Protection class IP67

**Technical data**
- Standards: IEC/EN 61496-1/-2
- Category: Type 4
- Enclosure: aluminum
- Enclosure dimensions: Ø 49 mm
- Connection: Connector plug
  - Emitter: M12, 4-pole
  - Receiver: M12, 8-pole
- Max. cable length: 100 m / 1 Ω
- Protection class: IP67 to EN 60529
- Response time: 10 ... 27 ms (depends on length and resolution)
- Detection sensitivity (Resolution): 14, 30 and 50 mm
- Range: 0.3 m ... 18 m
- Safety outputs: 2 x PNP, 500 mA
- Power consumption: Emitter 4 W, Receiver 8 W
- Data interface: RS 485
- Status and diagnostics: LED display
- Ambient temperature: -10 °C ... +50 °C
- Storage and transport temperature: -20 °C ... +70 °C
- Classification:
  - Standards: EN ISO 13849-1; IEC 61508; IEC 60947-5-3
  - PL: up to e
  - Category: up to 4
  - PFH-value: 7.42 x 10^-9/h
  - SIL: up to 3
  - Service life: 20 years

**SLG 420 standard**
- **Safety light grid**
  - 2-, 3- or 4-beam light grid
  - Range 0.3 ... 40 m

**Ordering details**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distance between outermost beams:</td>
</tr>
<tr>
<td></td>
<td>0500-02 500 mm, 2-beam</td>
</tr>
<tr>
<td></td>
<td>0800-03 800 mm, 3-beam</td>
</tr>
<tr>
<td></td>
<td>0900-04 900 mm, 4-beam</td>
</tr>
<tr>
<td>2</td>
<td>Range 0.3 m ... 18 m</td>
</tr>
<tr>
<td></td>
<td>Range 8 m ... 40 m</td>
</tr>
</tbody>
</table>

Mounting brackets are included in the delivery.

**Note:**
* only for resolution 30 mm, 50 mm
** only for resolution 14 mm
*** only for resolution 30 mm

Converter for the parametrization NSR 0801
Safety light curtains and safety light grids

SLC 420 Master / Slave

• Safety light curtain
• Type 4 to IEC/EN 61496-1, -2
• Resolution 14, 30 and 50 mm
• Protection field height:
  - Master 170 mm ... 1770 mm
  - Slave 170 mm ... 650 mm
• Integrated start/restart interlock
• Integrated contactor control
• Integrated blanking function
• Diagnostic and parameterization interface
• Cascading of Master and Slave devices
• Range 0.3 m ... 18 m
• Fail-safe transistor outputs
• Optical synchronisation
• Status display

Legend: A = Total length
A = 84.5 mm + Protection field height

Approvals

Ordering details

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| ① | xxxx  | Protected heights (mm)
|     |        | available lengths: 0170, 0250, 0330, 0410, 0490, 0570, 0650, 0730, 0810, 0890, 0970, 1050, 1130, 1210, 1290, 1370, 1450, 1530*, 1610*, 1690*, 1770* |
| ② | 14, 30, 50 | Resolution 14, 30, 50 mm
|     |        | Range 0.3 m ... 7 m**
|     |        | Range 0.3 m ... 10 m*
|     |        | High Range 0.3 m ... 18 m
| ③ | H* | Resolutions 14, 30 and 50 mm

Technical data

Standards: IEC/EN 61496-1/-2
Category: Type 4
Enclosure: aluminum
Enclosure dimensions: Ø 49 mm
Connection: Connector plug
- Master emitter: M12, 4-pole
- Master receiver: M12, 8-pole
- Slave emitter: M12, 4-pole
- Slave receiver: M12, 8-pole
Max. cable length: 100 m / 1 Ω
Max. cable length: (Master/Slave) 0.8 m
Protection class: IP67 to EN 60529
Response time: 10 ... 37 ms (Depends on length and resolution)
Detection sensitivity (Resolution): 14, 30 and 50 mm
Protection field height:
  - Resolution 14 mm 170 ... 2100 mm
  - Resolution 30, 50 mm 170 ... 2420 mm
Protection field width, Range:
  - Resolution 14 mm 0.3 m ... 7 m
  - Resolution 30, 50 mm 0.3 m ... 10 m
  - High Range 0.3 m ... 18 m
Start/restart interlock: Integrated
Contactor control: Integrated
Blanking function: Integrated
Cascading: (Master/Slave) Possible
Light emission wavelength: 880 nm (infrared)
Ue: 24 VDC ± 10%
Safety outputs: 2 x PNP, 500 mA
Power consumption: Emitter 4 W,
Receiver 8 W
Data interface: RS 485
Status and diagnostics:
LED display
Ambient temperature: −10 °C ... +50 °C
Storage and transport temperature: −20 °C ... +70 °C
Classification:
Standards: EN ISO 13849-1; IEC 61508;
IEC 60947-5-3
PL: up to e
Category: up to 4
PFH-value: 7.42 x 10^-9/h
SIL: up to 3
Service life: 20 years

Ordering details

<table>
<thead>
<tr>
<th>Connector: Female connector M12, 4-pole straight for emitter</th>
<th>KA-0804</th>
</tr>
</thead>
<tbody>
<tr>
<td>cable length 5 m</td>
<td>KA-0904</td>
</tr>
<tr>
<td>cable length 10 m</td>
<td>KA-0905</td>
</tr>
<tr>
<td>cable length 20 m</td>
<td>KA-0908</td>
</tr>
<tr>
<td>Female connector M12, 8-pole straight for receiver</td>
<td>KA-0805</td>
</tr>
<tr>
<td>cable length 5 m</td>
<td>KA-0904</td>
</tr>
<tr>
<td>cable length 10 m</td>
<td>KA-0905</td>
</tr>
<tr>
<td>cable length 20 m</td>
<td>KA-0908</td>
</tr>
<tr>
<td>Converter for the parametrization NSR 0801</td>
<td>KA-0810</td>
</tr>
<tr>
<td>Female connector M12, 8-pole straight for Master/Slave connection</td>
<td>KA-0901</td>
</tr>
<tr>
<td>cable length 0.8 m</td>
<td>KA-0810</td>
</tr>
</tbody>
</table>

For more information, see our online product catalog: www.usa.schmersal.net
Safety light curtains and safety light grids

### SLC 420 IP69K

- **Safety light curtain**
- Type 4 to IEC/EN 61496-1/-2
- Resolution 14 mm, 30 mm
- Protection field heights 170 mm ... 1450 mm
- Protection class IP69K
- Integrated start/restart interlock
- Integrated contactor control
- Integrated blanking function (fixed and mobile blanking)
- Diagnostic and parametrization interface
- Range 0.3 m ... 10 m
- Fail-safe transistor outputs
- Optical synchronisation
- Status display

**Legend:**

- A = Total length
- A = 97 mm + Protection field height

### SLG 420 IP69K

- **Safety light grid**
- 2-, 3- or 4-beam light grid
- Range 0.3 ... 18 m

**Legend:**

- A = Total length
- 2-beam A = 747 mm
- 3 and 4-beam A = 1067 mm

### Technical data

- **Standards:** IEC/EN 61496-1/-2
- **Category:** Type 4
- **Enclosure:**
  - Protective tube housing PMMA
- **Enclosure dimensions:** Ø 60 mm
- **Connection:**
  - Receiver: connector M12, 8-pole
  - Emitter: connector M12, 4-pole
- **Max. cable length:** 100 m / 1 Ω
- **Protection class:** IP69K to EN 60529
- **Response time:** 10 ... 27 ms (depends on length and resolution)
- **Detection sensitivity** (Resolution): 14, 30 mm
- **Protection field height:**
  - Resolution 14, 30 mm: 170 ... 1450 mm
  - 2-, 3-, 4-beam: 500, 800, 900 mm
- **Protection field width, Range:**
  - Resolution 14 mm: 0.3 m ... 7 m
  - Resolution 30 mm: 0.3 m ... 10 m
  - 2-, 3-, 4-beam: 0.3 m ... 18 m
- **Start/restart interlock:** Integrated
- **Contactor control:** Integrated
- **Blanking function:** (fixed and mobile blanking)
- **Light emission wavelength:** 880 nm (infrared)
- **Ue:** 24 VDC ± 10%
- **Safety outputs:** 2 x PNP, 500 mA
- **Power consumption:**
  - Emitter 4 W
  - Receiver 8 W
- **Data interface:** RS 485
- **Status and diagnostics:** LED display
- **Ambient temperature:** −10 °C ... +50 °C
- **Storage and transport temperature:** −20 °C ... +70 °C
- **Classification:**
  - Standards: EN ISO 13849-1; IEC 61508; IEC 60947-5-3
  - PL: up to e
  - Category: up to 4
  - PFH-value: 7.42 x 10⁻⁹/h
  - SIL: up to 3
  - Service life: 20 years

### Approvals

![TUV] ![UL] ![CE]

### Ordering details

#### SLC 420-E/R➀-69-RFB

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>➀</td>
<td>xxxx</td>
<td>Protected heights (mm) available lengths: 0170, 0250, 0330, 0410, 0490, 0570, 0650, 0730, 0810, 0890, 0970, 1050, 1130, 1210, 1290, 1370, 1450</td>
</tr>
</tbody>
</table>

#### SLG 420-E/R➀-69-RF

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>➀</td>
<td>Distance between outermost beams: 0500-02 500 mm, 2-beam 0800-03 800 mm, 3-beam 0900-04 900 mm, 4-beam</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

Converter for the parametrization NSR 0801

---

For Info: sales@switchesunlimited.com  www.switchesunlimited.com  Phone: 800-221-0487  Fax: 718-672-6370
Safety light curtains and safety light grids

SLG 422-P

- Safety light grid
- Emitter and receiver in one enclosure (retro reflector)
- Type 4 to IEC/EN 61496-1-2
- Protection field heights 500 mm
- 2-beam light grid
- Integrated start/restart interlock
- Integrated contactor control
- Range 0.3 m ... 7 m
- Fail-safe transistor outputs
- Status display
- Protection class IP67

Technical data

- Standards: IEC/EN 61496-1/-2
- Category: Type 4
- Enclosure: aluminum
- Enclosure dimensions: Ø 49 mm
- Deflecting mirror: 50 x 50 x 606 mm
- Connection: Connector plug
- Max. cable length: 100 m / 1 Ω
- Protection class: IP67 to EN 60529
- Response time: 10 ms
- Detection sensitivity (Resolution): 500 mm
- Protection field height: 500 mm
- Protection field width, Range: 0.3 m ... 7 m
- Start/restart interlock: Integrated
- Contactor control: Integrated
- Light emission wavelength: 880 nm (infrared)
- $U_{	ext{e}}$: 24 VDC ± 10%
- Safety outputs: 2 x PNP, 500 mA
- Power consumption: 10 W
- Data interface: -
- Status and diagnostics: LED display
- Ambient temperature: -10 °C ... +50 °C
- Storage and transport temperature: -20 °C ... +70 °C

Classification:

- Standards: EN ISO 13849-1; IEC 61508;
  IEC 60947-5-3
- PL: up to e
- Category: up to 4
- PFH-value: 7.42 x 10^-9/h
- SIL: up to 3
- Service life: 20 years

Approvals

TUV UL CE

Ordering details

SLG 422-P-E/R0500-02-RF Light grid
ULS-P-0501 Deflecting mirror

Note

Mounting brackets are included in the delivery.

Converter for the parametrization NSR 0801

Connector:

- Female connector M12, 8-pole straight
  - cable length 5 m
  - cable length 10 m
  - cable length 20 m

Contact details:

For Info: sales@switchesunlimited.com www.switchesunlimited.com Phone: 800-221-0487 Fax: 718-672-6370

4-9
Safety light curtains and safety light grids

SLC 421

Technical data

- Standards: IEC/EN 61496-1/2
- Category: Type 4
- Enclosure: aluminum
- Enclosure dimensions: Ø 49 mm
- Connection: M12, 4-pole
- Max. cable length: 100 m / 1 Ω
- Protection class: IP67 to EN 60529
- Response time: 15 ... 32 ms (depends on length and resolution)

- Detection sensitivity (resolution): 14 and 30 mm
- Protected height:
  - Resolution 14 mm: 170 ... 1450 mm
  - Resolution 30 mm: 170 ... 1770 mm
- Protection field width, range:
  - Resolution 14 mm: 0.3 m ... 7 m
  - Resolution 30 mm: 0.3 m ... 10 m
- Start/restart interlock: Integrated
- Contactor control: Integrated
- Blanking function: Integrated
- Cyclic operation: 1 cycle or 2 cycles
- Light emission wavelength: 880 nm (infrared)
- \( U_e \): 24 VDC ± 10%
- Safety outputs: 2 x PNP, 500 mA
- Power consumption:
  - Emitter: 4 W
  - Receiver: 8 W
- Data interface: RS 485
- Status and diagnostics: LED display
- Ambient temperature: -10 °C ... +50 °C
- Storage and transport temperature: -20 °C ... +70 °C

Classification:

- Standards: EN ISO 13849-1; IEC 61508
- PL: up to e
- Category: up to 4
- PFH-value: 7.42 x 10^-9/h
- SIL: up to 3
- Service life: 20 years

Legend:

A: Total length
Transmitter: \( A = 84.5 \text{ mm} + \) protected field height
Receiver: \( A = 148.5 \text{ mm} + \) protection field height

Approvals

TUV

Ordering details

<table>
<thead>
<tr>
<th>SLC 421-E/R</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
<td>Resolution 14 mm</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Resolution 30 mm</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>Integrated status indication (rt/gn) (optional)</td>
</tr>
</tbody>
</table>

* only 30 mm

Control units ordered separately, see next page

Note

Ordering details

Connector:
- Female connector for emitter
  - M12, 4-pole, straight
  - Cable length: 5 m
  - KA-0804
  - Cable length: 10 m
  - KA-0805
  - Cable length: 20 m
  - KA-0808
- Female connector for receiver
  - M12, 12-pole, straight
  - Cable length: 5 m
  - KA-0980
  - Cable length: 10 m
  - KA-0981
- Female connector for receiver/control unit
  - M8, 6-pole, angled
  - Cable length: 2 m
  - KA-0053
  - Cable length: 5 m
  - KA-0054

For Info: sales@switchesunlimited.com  www.switchesunlimited.com  Phone: 800-221-0487  Fax: 718-672-6370
Safety light curtains and safety light grids

**BDB 01**

- Blanking control unit
- Smooth parameter assignment using external command devices, no PC software required
- Modular enclosure in ABS version
- 3 Command devices:
  - 1 key-operated switch (Pos. 0, 1)
  - 1 selector switch, latching
  - 1 restart button

**BDT 01**

- Control unit cyclic operation
- Smooth parameter assignment using external command devices, no PC software required
- Modular enclosure in ABS version
- 3 Command devices:
  - 1 key-operated switch (Pos. 0, 1, 2)
  - 1 teach-in button
  - 1 restart button

---

**Technical data**

<table>
<thead>
<tr>
<th></th>
<th>BDB 01</th>
<th>BDT 01</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standards:</strong></td>
<td>IEC/EN 60947-5-1</td>
<td>IEC 60947-5-1</td>
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<tr>
<td><strong>Enclosure:</strong></td>
<td>ABS</td>
<td>ABS</td>
</tr>
<tr>
<td><strong>Protection class:</strong></td>
<td>IP40</td>
<td>IP40</td>
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<tr>
<td><strong>Contact type BDB 01:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Key-operated switch:</td>
<td>2 NC / 2 NO</td>
<td>2 NC / 4 NO</td>
</tr>
<tr>
<td>- Selector switch:</td>
<td>2 NC / 4 NO</td>
<td>2 NC / 4 NO</td>
</tr>
<tr>
<td>- Restart button:</td>
<td>1 NO</td>
<td>1 NO</td>
</tr>
<tr>
<td><strong>Contact type BDT 01:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Key-operated switch:</td>
<td>2 NC / 4 NO</td>
<td>2 NC / 4 NO</td>
</tr>
<tr>
<td>- Teach-in button:</td>
<td>1 NO</td>
<td>1 NO</td>
</tr>
<tr>
<td>- Restart button:</td>
<td>1 NO</td>
<td>1 NO</td>
</tr>
<tr>
<td><strong>Switching principle:</strong></td>
<td>IEC 60947-5-1</td>
<td>IEC 60947-5-1</td>
</tr>
<tr>
<td><strong>Connection:</strong></td>
<td>PVC cable, 5 m long</td>
<td>PVC cable, 5 m long</td>
</tr>
<tr>
<td><strong>Cable section:</strong></td>
<td>8 x 0.25 mm²</td>
<td>8 x 0.25 mm²</td>
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<tr>
<td><strong>Cable entry:</strong></td>
<td>M20</td>
<td>M20</td>
</tr>
<tr>
<td><strong>U_{imp}:</strong></td>
<td>4 kV</td>
<td>3 A</td>
</tr>
<tr>
<td><strong>I_{imp}:</strong></td>
<td>3 A</td>
<td>3 A</td>
</tr>
<tr>
<td><strong>Utilization category:</strong></td>
<td>DC-13</td>
<td>1 A / 24 VDC</td>
</tr>
<tr>
<td><strong>Max. fuse rating:</strong></td>
<td>6 A gL D-fuse</td>
<td>6 A gL D-fuse</td>
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<tr>
<td><strong>Ambient temperature:</strong></td>
<td>−10 °C ... +50 °C</td>
<td>−10 °C ... +50 °C</td>
</tr>
<tr>
<td><strong>Mechanical life:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Key-operated switch:</td>
<td>1 million operations</td>
<td>1 million operations</td>
</tr>
<tr>
<td>- Selector switch:</td>
<td>1 million operations</td>
<td>1 million operations</td>
</tr>
<tr>
<td>- Button:</td>
<td>1 million operations</td>
<td>1 million operations</td>
</tr>
<tr>
<td><strong>Switching frequency:</strong></td>
<td>max. 50/h</td>
<td>max. 50/h</td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H):</strong></td>
<td>160 x 80 x 85mm</td>
<td>160 x 80 x 85mm</td>
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</table>

**Approvals**

- CE

**Ordering details**

<table>
<thead>
<tr>
<th>BDB 01</th>
<th>101213356</th>
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<tbody>
<tr>
<td>BDT 01</td>
<td>101213358</td>
</tr>
</tbody>
</table>
Safety light curtains and safety light grids

**SLC 220 standard**

- **Safety light curtain**
  - Type 2 to IEC/EN 61496-1, -2
  - Resolution 30 and 80 mm
  - Protection field heights 175 mm ... 1675 mm
  - Integrated start/restart interlock
  - Integrated contactor control
  - Integrated blanking function
  - Diagnostic and parametrization interface
  - Range 0.3 m ... 14 m
  - Integrated self-test
  - Fail-safe transistor outputs
  - Status display
  - Protection class IP65
  - Signaling output

Legend: A = Total length
A = 216 mm
Protection field height 175 mm
A = 28.5 mm + Distance between outermost beams

**SLG 220 standard**

- **Safety light grid**
  - 2-, 3- or 4-beam light grid
  - Range 0.3 ... 30 m

Legend: A = Total length
A = 78.5 mm + Distance between outermost beams

**Technical data**

- **Standards:** IEC/EN 61496-1/-2
- **Category:** Type 2
- **Enclosure:** aluminum
- **Enclosure dimensions:** Ø 40 mm
- **Connection:** Connector plug M12, 8-pole
- **Max. cable length:** 100 m / 1Ω
- **Protection class:** IP65 to EN 60529
- **Response time:** 9 ... 45 ms (depends on length and resolution)
- **Detection sensitivity:**
  - (Resolution): 30 and 80 mm
- **Protection field height:**
  - Resolution 30 mm: 175 ... 1675 mm
  - Resolution 80 mm: 325 ... 1675 mm
  - 2-, 3-, 4-beam: 500, 800, 900 mm
- **Protection field width:**
  - SLC: 4 ... 14 m (High range)
  - SLG: 5 ... 30 m (High range)
- **Start/restart interlock:** Integrated
- **Contactor control:** Integrated
- **Blanking function:** Integrated
- **Light emission wavelength:** 880 nm (infrared)
- **Ue:** 24 VDC ± 10%
- **Safety outputs:** 2 x PNP, 200 mA
- **Signaling output:** PNP 100 mA
- **Power consumption:**
  - Emitter: 4 W
  - Receiver: 8 W
- **Data interface:** RS 485
- **Status and diagnostics:** LED display
- **Ambient temperature:** −10 °C ... +50 °C
- **Storage and transport temperature:** −20 °C ... +70 °C
- **Classification:**
  - Standards: EN ISO 13849-1; IEC 61508; IEC 60947-5-3
  - PL: up to d
  - Category: up to 2
  - PFH-value: 3.59 x 10⁻⁸/h
  - SIL: up to 2
  - Service life: 20 years

**Ordering details**

**SLC 220-E/R①-②-RFB③**

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>①</td>
<td>xxxx</td>
<td>Protected heights (mm), available lengths: 0175*, 0250*, 0325, 0475, 0625, 0775, 0925, 1075, 1225, 1375, 1525, 1675</td>
</tr>
<tr>
<td>②</td>
<td>30, 80</td>
<td>Resolution 30, 80 mm</td>
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<tr>
<td>③</td>
<td>H</td>
<td>High Range 4 m ... 14 m</td>
</tr>
</tbody>
</table>

Note: * only for resolution 30 mm

**SLG 220-E/R①-RF②**

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Distance between outermost beams: 0500-02 500 mm, 2-beam</td>
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</tr>
<tr>
<td></td>
<td>0800-03 800 mm, 3-beam</td>
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<tr>
<td></td>
<td>0900-04 900 mm, 4-beam</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>H</td>
<td>Range 0.3 m ... 6 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Range 5 m ... 30 m</td>
</tr>
</tbody>
</table>

Mounting brackets are included in the delivery.

Note: Converter for the parametrization NSR 0700

---
  
*For Info: sales@switchesunlimited.com  www.switchesunlimited.com  Phone: 800-221-0487  Fax: 718-672-6370*
Safety light curtains and safety light grids

SLG 220-P

- Safety light grid
- Emitter and receiver in one enclosure (retro reflector)
- Type 2 to IEC/EN 61496-1, -2
- Protection field heights 500 mm
- 2-beam light grid
- Range 0.3 m ... 6 m
- Fail-safe transistor outputs
- Status display
- Protection class IP65

Technical data

| Standards: | IEC/EN 61496-1/-2 |
| Category: | Type 2 |
| Enclosure: | aluminum |
| Enclosure dimensions: | Ø 40 mm |
| Deflecting mirror: | 50 x 50 x 606 mm |
| Connection: | Connector plug M12, 8-pole |
| Max. cable length: | 100 m / 1 Ω |
| Protection class: | IP65 to EN 60529 |
| Response time: | 12 ms |
| Detection sensitivity (Resolution): | 500 mm |
| Protection field height: | 500 mm |
| Protection field width, Range: | 0.3 m ... 6 m |
| Light emission wavelength: | 880 nm (infrared) |
| $U_e$: | 24 VDC ± 10% |
| Safety outputs: | 2 x PNP, 200 mA |
| Signaling output: | PNP, 100 mA |
| Power consumption: | 10 W |
| Data interface: | - |
| Status and diagnostics: | LED display |
| Ambient temperature: | -10 °C ... +50 °C |
| Storage and transport temperature: | -20 °C ... +70 °C |

Classification:

- Standards: EN ISO 13849-1; IEC 61508; IEC 60947-5-3
- PL: up to d
- Category: up to 2
- PFH-value: 3.59 x 10^{-7}/h
- SIL: up to 2
- Service life: 20 years

Approvals

TUV

UL

CE

Ordering details

SLG 220-P-E/R0500-02RF
ULS-P-0500

Light grid
Deflecting mirror

Mounting brackets are included in the delivery.

Note:

- Converter for the parametrization NSR 0700

Ordering details

Connector:
Female connector M12, 8-pole straight

- cable length 5 m: KA-0904
- cable length 10 m: KA-0905
- cable length 20 m: KA-0908
Safety light curtains and safety light grids

**SLC 220 Master / Slave**

- **Safety light curtain**
- Type 2 to IEC/EN 61496-1/-2
- Resolution 30 and 80 mm
- Protection field height:
  - Master 175 mm ... 1675 mm
  - Slave 325 mm ... 775 mm
- Integrated start/restart interlock
- Integrated contactor control
- Diagnostic and parameterization interface
- Cascading of Master and Slave devices
- Range 0.3 m ... 6 m
- Fail-safe transistor outputs
- Status display
- Protection class IP65
- Signaling output
- Integrated self-test

**Technical data**

<table>
<thead>
<tr>
<th>Standards:</th>
<th>IEC/EN 61496-1/-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Type 2</td>
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<tr>
<td>Enclosure:</td>
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<td>Enclosure dimensions:</td>
<td>Ø 40 mm</td>
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<tr>
<td>Connection:</td>
<td>Connector plug</td>
</tr>
<tr>
<td>- Master emitter:</td>
<td>M12, 8-pole</td>
</tr>
<tr>
<td>- Master receiver:</td>
<td>M12, 8-pole</td>
</tr>
<tr>
<td>- Slave emitter:</td>
<td>M12, 6-pole</td>
</tr>
<tr>
<td>- Slave receiver:</td>
<td>M12, 6-pole</td>
</tr>
<tr>
<td>Max. cable length:</td>
<td>100 m / 1Ω</td>
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<tr>
<td>Max. cable length: (Master/Slave)</td>
<td>0.3 m</td>
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<tr>
<td>Protection class:</td>
<td>IP65 to EN 60529</td>
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<tr>
<td>Response time:</td>
<td>12 … 65 ms (depends on length and resolution)</td>
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<tr>
<td>Detection sensitivity (Resolution):</td>
<td>30 and 80 mm</td>
</tr>
<tr>
<td>Protection field height:</td>
<td>- Resolution 30 mm 175 ... 2450 mm</td>
</tr>
<tr>
<td></td>
<td>- Resolution 80 mm 325 ... 2450 mm</td>
</tr>
<tr>
<td>Protection field width, Range:</td>
<td>0.3 ... 6 m</td>
</tr>
<tr>
<td>Start/restart interlock:</td>
<td>Integrated</td>
</tr>
<tr>
<td>Contactor control:</td>
<td>Integrated</td>
</tr>
<tr>
<td>Cascading: (Master/Slave)</td>
<td>Possible</td>
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<tr>
<td>Light emission wavelength:</td>
<td>880 nm (infrared)</td>
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<tr>
<td>$U_e$:</td>
<td>24 VDC ± 10%</td>
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<tr>
<td>Safety outputs:</td>
<td>2 x PNP, 200 mA</td>
</tr>
<tr>
<td>Signaling output:</td>
<td>PNP, 100 mA</td>
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<tr>
<td>Power consumption:</td>
<td>Emitter 4 W,</td>
</tr>
<tr>
<td></td>
<td>Receiver 8 W</td>
</tr>
<tr>
<td>Data interface:</td>
<td>RS 485</td>
</tr>
<tr>
<td>Status and diagnostics:</td>
<td>LED display</td>
</tr>
<tr>
<td>Ambient temperature:</td>
<td>$-10 , ^{\circ}C \ldots +50 , ^{\circ}C$</td>
</tr>
<tr>
<td>Storage and transport temperature:</td>
<td>$-20 , ^{\circ}C \ldots +70 , ^{\circ}C$</td>
</tr>
</tbody>
</table>
| **Classification:**
| Standards: | EN ISO 13849-1; IEC 61508; IEC 60947-5-3 |
| PL: | up to d |
| Category: | up to 2 |
| PFH-value: | 3.59 x 10^-8/h |
| SIL: | up to 2 |
| Service life: | 20 years |

**Ordering details**

<table>
<thead>
<tr>
<th>SLC 220-E/R</th>
<th>Option</th>
<th>Description</th>
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<tr>
<td>2</td>
<td>30</td>
<td>Resolution 30mm</td>
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<tr>
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<td>80</td>
<td>Resolution 80mm</td>
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<tr>
<td>3</td>
<td>M</td>
<td>Master function</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>Slave function**</td>
</tr>
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</table>

**Note:**

* only for resolution 30 mm
** only protected heights 325 mm ... 775 mm

Converter for the parametrization NSR 0700

Different lengths and resolutions can be combined for Master/Slave.

Mounting brackets are included in the delivery.

**System components**

- **Connector**

For more information, see our online product catalog: www.usa.schmersal.net
### Safety light curtains and safety light grids

**SLC 220 IP69K**

- Safety light curtain
- Type 2 to IEC/EN 61496-1, -2
- Resolution 30 and 80 mm
- Protection field heights 175 mm ... 1675 mm
- Protection class IP69K
- Integrated start/restart interlock
- Integrated contactor control
- Integrated blanking function
- Diagnostic and parametrization interface
- Range 0.3 m ... 14 m
- Integrated self-test
- Fail-safe transistor outputs
- Status display
- Signaling output

**Legend:**
- **A** = Total length
- **A** = 54 mm + Protection field height

### Technical data

<table>
<thead>
<tr>
<th>Standards:</th>
<th>IEC/EN 61496-1/-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Type 2</td>
</tr>
<tr>
<td>Enclosure:</td>
<td>aluminum protective tube housing PMMA</td>
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<tr>
<td>Connection:</td>
<td>Cable (5 m) with connector M12, 8-pole</td>
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<tr>
<td>Max. cable length:</td>
<td>100 m / 1Ω</td>
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<tr>
<td>Protection class:</td>
<td>IP69K</td>
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<tr>
<td>Response time:</td>
<td>9 ... 45 ms (depends on length and resolution)</td>
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<tr>
<td>Detection sensitivity (Resolution):</td>
<td>30 and 80 mm</td>
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<tr>
<td>Protection field height:</td>
<td>- Resolution 30 mm 175 ... 1675 mm</td>
</tr>
<tr>
<td>- Resolution 80 mm 325 ... 1675 mm</td>
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<tr>
<td>- 2-, 3-, 4-beam 500, 800, 900 mm</td>
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<tr>
<td>Protection field width, Range:</td>
<td>- SLC 0.3 ... 6 m (Standard)</td>
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<tr>
<td>- SLG 4 ... 14 m (High range)</td>
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<tr>
<td>- SLG 5 ... 30 m (High range)</td>
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<tr>
<td>Start/restart interlock:</td>
<td>Integrated</td>
</tr>
<tr>
<td>Contactor control:</td>
<td>Integrated</td>
</tr>
<tr>
<td>Blanking function:</td>
<td>Integrated</td>
</tr>
<tr>
<td>Light emission wavelength:</td>
<td>880 nm (infrared)</td>
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<tr>
<td>$U_e$:</td>
<td>24 VDC ± 10%</td>
</tr>
<tr>
<td>Safety outputs:</td>
<td>2 x PNP, 200 mA</td>
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<tr>
<td>Signaling output:</td>
<td>PNP, 100 mA</td>
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<tr>
<td>Power consumption:</td>
<td>Emitter 4 W, Receiver 8 W</td>
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<tr>
<td>Data interface:</td>
<td>RS 485</td>
</tr>
<tr>
<td>Status and diagnostics:</td>
<td>LED display</td>
</tr>
<tr>
<td>Ambient temperature:</td>
<td>$-10 \degree C ... +50 \degree C$</td>
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<tr>
<td>Storage and transport temperature:</td>
<td>$-20 \degree C ... +70 \degree C$</td>
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<tr>
<td>Classification:</td>
<td>Standards: EN ISO 13849-1; IEC 61508; IEC 60947-5-3</td>
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<td>up to d</td>
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<tr>
<td>Category:</td>
<td>up to 2</td>
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<tr>
<td>PFH-value:</td>
<td>$3.59 \times 10^{-8}$/h</td>
</tr>
<tr>
<td>SIL:</td>
<td>up to 2</td>
</tr>
<tr>
<td>Service life:</td>
<td>20 years</td>
</tr>
</tbody>
</table>

**SLG 220 IP69K**

- Safety light grid
- 2-, 3- or 4-beam light grid
- Range 0.3 ... 30 m

**Legend:**
- **A** = Total length
- **A** = 104 mm + Distance between outermost beams

### Approvals

- TÜV
- UL
- CE

### Ordering details

#### SLC 220-E/R-69-RFB-

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>xxxx</td>
<td>Protected heights (mm), available lengths: 0175&quot;, 0250&quot;, 0325, 0475, 0625, 0775, 0925, 1075, 1225, 1375, 1525, 1675</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>Resolution 30 mm</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>Resolution 80 mm</td>
</tr>
<tr>
<td>2</td>
<td>H</td>
<td>High Range 4 m ... 14</td>
</tr>
</tbody>
</table>

*only for resolution 30 mm

#### SLG 220-E/R-69-RF-

<table>
<thead>
<tr>
<th>No.</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distance between outermost beams:</td>
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</tr>
<tr>
<td>0500-02</td>
<td>500 mm, 2-beam</td>
<td></td>
</tr>
<tr>
<td>0800-03</td>
<td>800 mm, 3-beam</td>
<td></td>
</tr>
<tr>
<td>0900-04</td>
<td>900 mm, 4-beam</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>H</td>
<td>Range 0.3 m ... 6 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Range 5 m ... 30 m</td>
</tr>
</tbody>
</table>

### Connector:

- Female connector M12, 8-pole straight
  - cable length 5 m
  - cable length 10 m
  - cable length 20 m

Mounting brackets (V4A) are included in the delivery.

**Note:**
Converter for the parametrization NSR 0700

For more information, see our online product catalog: www.usa.schmersal.net
# Safety light curtains and safety light grids

## System components

<table>
<thead>
<tr>
<th>System components</th>
<th>System components</th>
<th>System components</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Programming cable KA-0974" /></td>
<td><img src="image2" alt="Mounting kit MS-1010" /></td>
<td><img src="image3" alt="Mounting kit MS-1073" /></td>
</tr>
<tr>
<td><img src="image4" alt="Alignment kit EA-5" /></td>
<td><img src="image5" alt="Mounting kit MS-1031 for ULS-A4" /></td>
<td><img src="image6" alt="Vibration damper MSD-2 / MSD-4" /></td>
</tr>
<tr>
<td><img src="image7" alt="Muting lamp with wall bracket MK2" /></td>
<td><img src="image8" alt="Mounting kit MS-1038" /></td>
<td><img src="image9" alt="Test rod PLS-01, PLS-02" /></td>
</tr>
<tr>
<td><img src="image10" alt="Mounting kit MS-1000 / MS 1072" /></td>
<td><img src="image11" alt="Mounting kit MS-1051" /></td>
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## Ordering details

<table>
<thead>
<tr>
<th>Ordering details</th>
<th>Ordering details</th>
<th>Ordering details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming cable for SLC/SLG 440</td>
<td>Mounting kit for central fixation for SLC /SLG 220</td>
<td>Mounting kit for deflecting mirror ULS-M</td>
</tr>
<tr>
<td>KA-0974 2 x angle</td>
<td>KA-0974 2 x angle</td>
<td>MS-1073 2 x angle</td>
</tr>
<tr>
<td>Laser alignment tool for SLC / SLG</td>
<td>Mounting kit for ULS-A4 2 x angle incl. screws</td>
<td>Mounting kit for SLC 420 4 x angle incl. screws</td>
</tr>
<tr>
<td>EA5</td>
<td>Mounting kit for SLC/SLG 420-425 (V4A) 4 x angle incl. screws</td>
<td>MS-1030 4 x angle incl. screws</td>
</tr>
<tr>
<td>Muting lamp with LED block</td>
<td>Mounting kit for SLC/SLG 420-425 (V4A) 4 x angle incl. screws</td>
<td>Vibration damper MSD-2 / MSD-4 8 x vibration damper for SLC/SLG 220</td>
</tr>
<tr>
<td>MS-1000 4 x angle incl. screws</td>
<td>Mounting kit for lateral fixation for SLC/SLG 420-425 Consisting of 2 steel angles, 4 screws and 4 T-slot nuts</td>
<td>for SLC/SLG 420-425 MSD-2</td>
</tr>
<tr>
<td>MS-1072 2 x angle incl. screws</td>
<td></td>
<td>for SLC/SLG 440 MSD-4</td>
</tr>
<tr>
<td>Lighting element Muting lamp with wall bracket</td>
<td></td>
<td>Test rod for resolution 30 mm PLS-01</td>
</tr>
<tr>
<td></td>
<td>Lighting element Muting lamp with wall bracket</td>
<td>for resolution 14 mm PLS-02</td>
</tr>
</tbody>
</table>

For Info: sales@switchesunlimited.com  www.switchesunlimited.com  Phone: 800-221-0487  Fax: 718-672-6370
## System components

<table>
<thead>
<tr>
<th>Bus converter</th>
<th>Deflecting mirror</th>
<th>Protective enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSR-0801</td>
<td>ULS-A4, Ø 49 mm</td>
<td></td>
</tr>
<tr>
<td>NSR-0700</td>
<td>ULS-M</td>
<td></td>
</tr>
</tbody>
</table>

### Deflection Mirror Application Notes

**ULS-M**: Must be used when range is greater than 6m. With 1 mirror, range reduced by 10%, with 2 or more mirrors range reduced by 15% for each mirror.

**ULS-A4**: Must be used when range is less than 6m. With a loss of 20% at each mirror, only 1 mirror per emitter/receiver pair is recommended.

### Ordering details

<table>
<thead>
<tr>
<th>Bus converter</th>
<th>Deflecting mirror UL-SMC</th>
<th>Deflecting mirror UL-SMC incl. mounting angle</th>
<th>Protective enclosure with deflecting mirror</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converter for the parametrization of SLC/SLG 420-425</td>
<td>Mirror height 200 mm</td>
<td>Mirror height 400 mm</td>
<td>Version for 2-beam light grid</td>
</tr>
<tr>
<td>Converter for the parametrization of SLC / SLG 220</td>
<td>Mirror height 500 mm</td>
<td>Mirror height 550 mm</td>
<td>Version for 3-beam light grid</td>
</tr>
<tr>
<td>RS232 interface</td>
<td>Mirror height 700 mm</td>
<td>Mirror height 850 mm</td>
<td>Version for 4-beam light grid</td>
</tr>
<tr>
<td>Deflecting mirror ULS-M</td>
<td>Mirror height 1000 mm</td>
<td>ULS-A4-0200</td>
<td>ULS-ST2</td>
</tr>
<tr>
<td>Mirror height 200 mm</td>
<td>ULS-M-0200</td>
<td>ULS-A4-0400</td>
<td>ULS-ST3</td>
</tr>
<tr>
<td>Mirror height 350 mm</td>
<td>ULS-M-0350</td>
<td>ULS-A4-0550</td>
<td>ULS-ST4</td>
</tr>
<tr>
<td>Mirror height 500 mm</td>
<td>ULS-M-0500</td>
<td>ULS-A4-0700</td>
<td></td>
</tr>
<tr>
<td>Mirror height 650 mm</td>
<td>ULS-M-0650</td>
<td>ULS-A4-0850</td>
<td></td>
</tr>
<tr>
<td>Mirror height 800 mm</td>
<td>ULS-M-0800</td>
<td>Mirror height 1000 mm</td>
<td></td>
</tr>
<tr>
<td>Mirror height 950 mm</td>
<td>ULS-M-0950</td>
<td>ULS-A4-1000</td>
<td></td>
</tr>
<tr>
<td>Mirror height 1250 mm</td>
<td>ULS-M-1250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mirror height 1550 mm</td>
<td>ULS-M-1550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mirror height 1700 mm</td>
<td>ULS-M-1700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 x aluminum profile</td>
<td></td>
<td></td>
<td>MT-0400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Muting Carrier Set</th>
<th>Protective enclosure with deflecting mirror</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULS-SG-1000</td>
<td>ULS-ST2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protective enclosure</th>
<th>Powder coated steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG5</td>
<td>Height 1334 mm</td>
</tr>
<tr>
<td>SG6</td>
<td>Height 2134 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deflecting mirror for protective enclosures</th>
<th>Safety screen for protective enclosures (PMMA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mirror height 1000 mm</td>
<td>for SG5: height 1310 mm</td>
</tr>
<tr>
<td></td>
<td>for SG6: height 2110 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deflecting mirror</th>
<th>Protective enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror height 1000 mm</td>
<td>SG5-0500</td>
</tr>
<tr>
<td>Mirror height 1500 mm</td>
<td>SG6-0500</td>
</tr>
<tr>
<td>Mirror height 2000 mm</td>
<td>SG5-1500</td>
</tr>
</tbody>
</table>

For Info: sales@switchesunlimited.com  www.switchesunlimited.com  Phone: 800-221-0487  Fax: 718-672-6370
Safety light barriers

SLB 200

• Range to 4 m
• LEDs visible from both sides
• Protection class IP67

Technical data

Standards: IEC/EN 61496
Control Category: 2
Enclosure: ABS 10 % GF
Enclosure dimensions: 31 x 50.5 x 19 mm
Connection:
  - emitter: 10 cm cable with male connector M8, 3-pole
  - receiver: 10 cm cable with male connector M8, 4-pole
Max. cable length: 50 m
Protection class: IP67
Response time: 30 ms *
Range: 4 m
Start/Restart interlock: *
Contactor control: *
Light emission wavelength: 880 nm
Ue: 24 VDC ± 20%
Safety outputs: *
Angle of radiation: ± 4°
Min. size of object: 9 mm Ø
LED status indication: soiling, switching condition and power on
Ambient temperature: −10 °C … +55 °C
Storage and transport temperature: −20 °C … +80 °C

* only in combination with safety monitoring module SLB 200-C04-1R

Approvals

TUV

Ordering details

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E</td>
<td>Emitter</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Receiver</td>
</tr>
</tbody>
</table>

System components

SLB 200-C04-1R

Connector plug

Mounting angle BF 31

Mounting angle BF UNI 1

Ordering details

Monitoring of safety light barriers
SLB 200-C04-1R refer to page 4-22

Connector plug (female) for emitter: 3-pole straight
- without cable KDE M8-3
- with cable 2 m KDE M8-3-2M
- with cable 5 m KDE M8-3-5M

for receiver: M8, 4-pole straight
- without cable KDR M8-4
- with cable 2 m KDR M8-4-2M
- with cable 5 m KDR M8-4-5M

Mounting angles
- BF 31
- BF UNI 1

Note

The system components (safety monitoring module, cable, etc.) are not included in delivery.

For more information, see our online product catalog: www.usa.schmersal.net
Safety light barriers

SLB 400

Technical data

- Range to 15 m
- Connecting plug can be rotated
- LED switching conditions display
- Protection class IP67

Standards: IEC/EN 61496
Control Category: 4*
Enclosure: ABS
Enclosure dimensions: 50 x 50 x 17 mm
Connection: M12, 4-pole coupler socket, can be rotated
Max. cable length: 100 m
Protection class: IP67
Response time: 25 ms*
Range: 15 m
Start/Restart interlock: *
Contactor control: *
Light emission wavelength: 880 nm
Ue: 24 VDC ± 20%
Safety outputs: *
Angle of radiation: ± 2°
Min. size of object: 13 mm Ø
LED status indication: soiling, switching condition and power on
Ambient temperature: 0 °C … +60 °C
Storage and transport temperature: -20 °C … +80 °C

* only in combination with safety monitoring module SLB 400-C10-1R

Approvals

Ordering details

SLB 400-C10-1R
Nr. | Option | Description
---|---|---
1 | E | Emitter
1 | R | Receiver

Note

The system components (safety monitoring module, cable, etc.) are not included in delivery.

System components

Connector plug (female) for emitter/receiver: M12, 4-pole straight
- without cable: KD M12-4
- with cable 2 m: KD M12-4-2M
- with cable 5 m: KD M12-4-5M

Mounting angles
- BF 50
- BF UNI 1

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# Safety light barriers

## System components

<table>
<thead>
<tr>
<th>Component</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror SLB 200/400 SMA 80</td>
<td><img src="image" alt="Mirror SLB 200/400 SMA 80" /></td>
</tr>
<tr>
<td>Mounting angle BF SMA 80-1</td>
<td><img src="image" alt="Mounting angle BF SMA 80-1" /></td>
</tr>
<tr>
<td>Mounting angle BF SMA 80-2</td>
<td><img src="image" alt="Mounting angle BF SMA 80-2" /></td>
</tr>
<tr>
<td>T-slot nut NST 20-8</td>
<td><img src="image" alt="T-slot nut NST 20-8" /></td>
</tr>
<tr>
<td>Mounting post ST 1250</td>
<td><img src="image" alt="Mounting post ST 1250" /></td>
</tr>
<tr>
<td>Floor-stand base STB 1</td>
<td><img src="image" alt="Floor-stand base STB 1" /></td>
</tr>
</tbody>
</table>

## Ordering details

<table>
<thead>
<tr>
<th>Component</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror</td>
<td>SMA 80</td>
</tr>
<tr>
<td>Mounting angles for mirror</td>
<td>BF SMA 80-1</td>
</tr>
<tr>
<td>Mounting angles for mirror</td>
<td>BF SMA 80-2</td>
</tr>
<tr>
<td>T-slot nut</td>
<td>NST 20-8</td>
</tr>
<tr>
<td>Mounting post</td>
<td>ST 1250</td>
</tr>
<tr>
<td>Floor-stand base</td>
<td>STB 1</td>
</tr>
</tbody>
</table>
Safety light barriers

SLB 200-C

- Up to two pairs of light barrier devices can be connected
- Co-ordinated for use with SLB 200 R/E safety light barriers
- 1 safety contact, STOP 0
- 1 signaling output
- Operating voltage 24 VDC
- Test input
- LED display of switching conditions
- Response time ≤ 30 ms
- Start/Restart interlock can be switched active or inactive
- Contactor monitoring can be switched active or inactive
- Additional cyclic testing

Technical data

Standards: IEC/EN 61496-1/-2, IEC 60947-5-3, IEC 61508
Start conditions: Test button, start-reset button, ON/OFF coding
Feedback circuit (Y/N): yes
Max. switching frequency: 10 Hz
Rated operating voltage \( U_e \): 24 VDC ± 20%
Rated operating current \( I_e \): 180 mA

Outputs:
- Stop category 0: 1
- Stop category 1: 0
- Number of safety contacts: 1
- Number of auxiliary contacts: 0
- Number of signaling outputs: 1
- Max. switching capacity of the safety contacts: 8 A
- Switching capacity of the signaling outputs: 500 mA
- Max. fuse rating of the safety contacts: 4 A gG D-fuse

Utilization category to EN 60947-5-1:
- AC-15: 250 V / 2 A
- DC-13: 24 V / 2 A

Ambient conditions:
- Environmental temperature: 0 °C … +50 °C
- Storage and transport temperature: −20 °C … +80 °C
- Protection class:
  - Enclosure: IP40
  - Terminals: IP20
  - Clearance: IP54
Mounting: Snaps onto standard DIN rail to EN 60715
Connection type: Screw connection
max. cable section: 4.0 mm² (incl. conductor ferrules)
Dimensions (Height/Width/Depth): 84 x 45 x 118 mm

Approvals

Ordering details

SLB 200-C04-1R
Safety light barriers

Note

- Monitoring two pairs of light barrier devices and the power contactor using the SLB 200-C safety monitoring module
- Test push button
  The test push button is connected to X13 and X14 in order to carry out a check of the light barrier monitoring function. The terminals X15 and X16 must be bridged.
- The wiring diagram is shown for the de-energized condition.
- Contactor check
  To monitor an external contactor, the feedback circuit is connected to X17 and X18. The terminals X19 and X20 must be bridged.
- Start push button
  The start push button can be used to start the monitoring of the light barriers for a new start or after an interruption. The terminals X3 and X4 must be bridged.
- It is also possible to connect only one pair of light barrier devices.

Wiring diagram

Note

In order to set for the desired mode of operation and number of light barriers connected, remove the front cover of the safety monitoring module. As supplied all switches are in Position 1.

The required functions can be selected by means of the internal DIP switches.

<table>
<thead>
<tr>
<th>DIPswitch 1</th>
<th>DIPswitch 2</th>
<th>DIPswitch 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Position 1</strong></td>
<td>With contactor check</td>
<td>With start/restart interlock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connection of two light barriers</td>
</tr>
<tr>
<td><strong>Position 2</strong></td>
<td>Without contactor check</td>
<td>Without start/restart interlock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connection of one light barrier</td>
</tr>
</tbody>
</table>

Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.
Safety light barriers

**SLB 400-C**

- Up to 4 light barrier pairs SLB 400 can be connected
- Co-ordinated for use with SLB 400 R/E safety light barriers
- 2 safety contacts, STOP 0
- 2 signaling outputs
- Cross-wire monitoring
- ISD Integral System Diagnostics
- Operating voltage 24 VDC
- Feedback circuit to monitor external contactors
- Two short-circuit proof additional transistor outputs
- Response time ≤ 30 ms
- Start/Restart interlock can be switched active or inactive
- Contactor monitoring can be switched active or inactive
- Can be coded

### Technical data

| Standards: | IEC/EN 61496-1/-2, IEC 60947-5-3, IEC 61508 |
| Start conditions: | Start-reset button, ON/OFF coding |
| Feedback circuit (Y/N): | yes |
| Max. switching frequency: | 10 Hz |
| Rated operating voltage $U_{e}$: | 24 VDC ± 15% |
| Rated operating current $I_{e}$: | 0.3 A without additional transistor outputs and safety light barriers |
| Max. fuse rating of the operating voltage: | 1 A |
| Outputs: | |
| Stop category 0: | 2 |
| Stop category 1: | 0 |
| Number of safety contacts: | 2 |
| Number of auxiliary contacts: | 2 |
| Number of signaling outputs: | 2 |
| Max. switching capacity of the safety contacts: | 2 A |
| Switching capacity of the auxiliary contacts: | 2 A |
| Switching capacity of the signaling outputs: | 100 mA |
| Max. fuse rating of the safety contacts: | 2 A gG D-fuse |
| Utilization category to EN 60947-5-1: | |
| AC-15: 250 V / 2 A |
| DC-13: 24 V / 2 A |
| LED display: | ISD |
| Ambient conditions: | |
| Environmental temperature: | 0 °C … +55 °C |
| Storage and transport temperature: | −25 °C … +70 °C |
| Protection class: | |
| Enclosure: IP40, Terminals: IP20, Clearance: IP54 |
| Mounting: | Snaps onto standard DIN rail to EN 60715 |
| Connection type: | Screw connection |
| max. cable section: | 4.0 mm² (incl. conductor ferrules) |
| Dimensions (Height/Width/Depth): | 75 x 99.7 x 110 mm |

### Approvals

![Approvals](image)

### Ordering details

SLB 400-C10-1R

For more information, see our online product catalog: www.usa.schmersal.net
Safety light barriers

Note

- Monitoring up to four pairs of light barrier devices and the power contactors using the SLB 400-C safety monitoring module
- The wiring diagram is shown for the de-energized condition.
- Connection of two pairs of safety light barrier devices
  When two pairs of safety light barriers are connected, the terminals X9-X10 and X11-X12 must be bridged.
- Restart push button
  The restart function can be selected by means of the DIP switches. When a start push button is connected to X5 and X6, it must be operated for min. 250 ms and max. 5 s after an interruption of the safety light barriers.

Wiring diagram

-24 VDC

SCHMERSAL

SLB 400-C
Made in Germany

Note

The ISD tables (Integral System Diagnostics) for analysis of the fault indications and their causes are shown in the manual.

Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

ISD

The following faults are registered by the safety monitoring modules and indicated by ISD
- Short-circuit on the connecting leads
- Interruption of the connecting leads
- Failure of the safety relay to pull-in or drop-out
- Fault on the input circuits or the relay control circuits of the safety monitoring module
- Mutual influence between the connected pairs of light barrier device and others on neighbouring systems