Super Bright IR Through-Beam
The **SMARTEYE®** light sources and receivers have been designed to perform Beam Break or thru-beam sensing tasks where the material or container is dense, the lens is subject to contamination buildup, or for long range sensing in harsh environments. A complete system includes a Dual LED High-Intensity Light Source and a Complementary Receiver.

**Features**
- Two or ten LED infrared light source
- 10-LED contrast indicator
- Screwdriver adjustable offset
- Fiber optic or lensed models
- Asynchronous light source

**Benefits**
- Penetrates through many opaque objects and cartons.
- Easy to align and adjust.
- Flexible available configurations.
- Uses standard fiber optic mounting and tip configurations.

**Applications**
- Paper box contents verification/inspection
- Opaque liquid level detection
- Paper insert/instruction verification/inspection
- Paper box contents orientation
Applications

FIBEROPTIC BEAM BREAK DETECTION

Dual LED light source model SLS-2F1 and dual detector receiver model SR-2F1.

The F1 block allows the use of fiber optic light guides. Utilizing a bifurcated light guide, the light energy available from the two LED light sources is used to create a very high intensity light beam. The dual detector receiver can be used with one bifurcated light guide and one or two straight light guides.

CONTAINER CONTENTS DETECTION

Dual LED light source model SLS-1 and dual detector receiver model SR-1.

This basic system is used without optical blocks. Designed for closeup through-beam sensing through dense containers and materials. Applications include: detecting the presence or absence of contents in plastic containers or cardboard boxes; detecting overlap splices in dense materials, etc.

LONG RANGE HARSH ENVIRONMENT PENETRATION

Dual LED light source model SLS-2R1 and dual detector receiver model SR-2R1.

The R1 block allows the light source and receiver to be placed as far apart as 100 feet. This system is capable of penetrating severe contamination buildup on the lenses. Applications include detecting opaque objects under the most adverse conditions found in the lumber, paper, and steel industries.
# Optical Block Selection

## Sensing Range Guidelines

<table>
<thead>
<tr>
<th>Light Source Model #</th>
<th>Receiver NPN Model #</th>
<th>Receiver PNP Model #</th>
<th>Range Guidelines</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Intensity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLS-1</td>
<td>SR-1</td>
<td>PSR-1</td>
<td>Up to 1ft (0.30m)</td>
<td>Short range, high power opacity sensing. Use in shortest range possible for maximum penetration.</td>
</tr>
<tr>
<td>SLS-2R1</td>
<td>SR-2R1</td>
<td>PSR-2R1</td>
<td>Up to 100ft (30.5m)</td>
<td>Long range, Beam Break object sensing.</td>
</tr>
<tr>
<td>SLS-2F1 (with fiber optic light guide)</td>
<td>SR-2F1</td>
<td>PSR-2F1</td>
<td>Up to 3ft (0.9m) without lens</td>
<td>Short range fiber optic Beam Break sensing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Up to 18ft (5.5m) with lens</td>
<td>Long range fiber optic Beam Break sensing. Using 2 UAC-15 lenses.</td>
</tr>
<tr>
<td><strong>Super High Intensity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSLS-12</td>
<td>SR-1</td>
<td>PSR-1</td>
<td>35ft (10.7m)</td>
<td>10X Optical power. Verification of container contents, proper fill levels, or overlap splice detection of dense materials.</td>
</tr>
</tbody>
</table>

1in = 25.4mm / 1ft = 0.3048 meters

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## Optical Block Selection

### Retroreflective Blocks

- **R1**
  - Retroreflective
  - Narrow beam optics designed to sense reflectors or reflective materials.

### Fiber Optic Blocks

- **F1**
  - Fiber Optic Adapter
  - Fiber optic quick connect

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How to Specify

Light sources and receivers are not furnished in pairs, and they must be ordered separately.

Receiver
1. Select NPN or PNP Transistor Output:
   Blank = NPN
   P = PNP
2. Select sensor model number required:
   SR-1 = Use with no optical block
   SR-2 = Use with F1 or R1 optical block
3. Select Block:
   Blank = No block
   F1 = Fiber Optic
   R1 = Long Range Lens

Example: P SR-1 R1

Light Source
1. Select sensor model:
   SLS-1 = Use with no optical block
   SLS-2 = Use with F1 or R1 optical block
   HSLS-12 = Use with no optical block
2. Select Block:
   Blank = no block
   F1 = Fiber Optic block
   R1 = Long Range block

Example: SLS-1 R1

Accessories

F1 Fiber Optic Optical Block
R1 Retroreflective Block
SEB-1 Receiver mounting bracket
DCB-1 Light Source mounting bracket
CA-1 Conduit adapter
FSR-1 Flexible strain relief
UAC-15 Threaded long range glass lens, 2in(51mm) focal point
   Fits any standard threaded tip glass fiber optic.
   Lg. 1 3/8in (35mm)
**Receiver Features**

- **OUTPUT STATUS INDICATOR**
  - Illuminates when outputs are ON.

- **OFFSET ADJUSTMENT**
  - Sets initial level in relation to switch point of 5 on contrast indicator—also functions as a sensitivity adjustment.

- **CONNECTION**
  - 4-wire 6ft cable (1.8m)

- **10 LED CONTRAST INDICATOR**
  - Provides at-a-glance analysis of the sensor's response to Light State vs Dark State sensing conditions.

- **INTERCHANGEABLE OPTICAL BLOCKS (Not shown)**
  - Choice of two Optical Blocks - R1, F1.

- **BLOCK MOUNT PEGS**
  - Note: Block mounts are only on models with blocks.

**Light Source Features**

- **INTERCHANGEABLE OPTICAL BLOCKS (Not shown)**
  - Choice of two Optical Blocks - R1, F1.

- **BLOCK MOUNT PEGS**
  - Note: Block mounts are only on models with blocks.

- **CONNECTION**
  - 4-wire 6ft cable (1.8m)
Receiver Specifications

**SUPPLY VOLTAGE**
- 12 to 24VDC
- Polarity protected

**CURRENT REQUIREMENTS**
- 50mA (exclusive of load)

**OUTPUTS**
- Complementary NPN or PNP output transistors sink/source up to 100mA

**RESPONSE TIME**
- 800 microseconds – Beam Make or Beam Break

**HYSTERESIS**
- 400 millivolts – maximum sensitivity and resolution

**LIGHT IMMUNITY**
- Extremely high immunity to ambient light – sensor responds to pulse modulated light only.

**LED INDICATOR**
- When the light level reaching the photodetector exceeds 5 on the contrast indicator, the output switch, and the output LED indicator illuminates.

**CONTRAST INDICATOR**
- Displays the receiver’s full and complete response to contrasting light levels (lightest state vs. darkest state) on the LED bargraph.

**AMBIENT TEMPERATURE/RH**
- -40°C to 70°C (-40°F to 158°F)
- 95% relative humidity

**RUGGED CONSTRUCTION**
- High-impact plastic case is dirt and moisture sealed.
- Epoxy encapsulated for mechanical stability

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**Dual Detector Receivers**

- RED
  - Positive 12 to 24 VDC
- WHITE
  - Dark “On”
- GREEN
- Light “On”
- BLACK
- Negative
- SHIELD
- Ground

- 6 ft., 4 Wire Shielded Cable (182.9 cm.)

- 6-32 x 1/4” socket hd. cap screw (7/64 hex key)

- 3.50” with R1 (88.9 mm)
- 3.00” w/02, F1 (76.2 mm)
- 2.00” (50.8 mm)
- 2.00” (63.5 mm)
- 0.20 Dia (5.0 mm)
- 2.60” (65.5 mm)
- 2.00” (50.8 mm)
- 0.75” (19.1 mm)
- 4” (101.6 mm)
- 1.75” (44.5 mm)
- 7.00” (177.8 mm)
- 0.44” (11.1 mm)
- 40.6” (1031.5 mm)

**Optional Mounting Bracket**
- PN SEB-1 with hardware

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High Intensity Light Source Specifications

**High Power Light Source Specifications**

**SUPPLY VOLTAGE**
- 12 to 24VDC
- Polarity protected

**CURRENT REQUIREMENTS**
- Dual LED light source 65mA
- HSLS-12 light source 70mA

**LED LIGHT SOURCE**
- Infrared = 880nm wavelength
- Model SLS, 2 LED's
  - Model HSLS-12, 10 LED's

**AMBIENT TEMPERATURE/RH**
- -40°C to 70°C (-40°F to 158°F)
- 95% relative humidity

**RUGGED CONSTRUCTION**
- High-impact plastic case is dirt and moisture sealed
- Epoxy encapsulated for mechanical stability

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**High Intensity Light Source/Receiver Models**

<table>
<thead>
<tr>
<th>RED</th>
<th>BLACK</th>
<th>SHIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive 12 to 24 VDC</td>
<td>Negative</td>
<td>Ground</td>
</tr>
</tbody>
</table>

6 ft. 4-wire shielded cable (182.2cm)

5-32 x 1/4" socket hd. cap screw (7/64 hex key)

<table>
<thead>
<tr>
<th>Optional Mounting Bracket</th>
<th>Model DSB-1 with Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25&quot; (31.8mm)</td>
<td>0.375&quot; (9.5mm)</td>
</tr>
<tr>
<td>2.00&quot; (50.8mm)</td>
<td>(54.0mm)</td>
</tr>
<tr>
<td>2.125&quot; w/F1</td>
<td>(55.7mm)</td>
</tr>
<tr>
<td>2.625&quot; with optical block R1</td>
<td>(19.1mm)</td>
</tr>
<tr>
<td>(54.0mm)</td>
<td>0.75&quot;</td>
</tr>
<tr>
<td>(55.7mm)</td>
<td>1.25&quot;</td>
</tr>
<tr>
<td>(54.0mm)</td>
<td></td>
</tr>
</tbody>
</table>

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