**Sensing Mode** | **Models** | **Excess Gain** | **Beam Pattern**
---|---|---|---
**RETROREFLECTIVE Mode** | SBLV1: visible beam makes alignment very easy, and is the first choice for most retroreflective applications. Not for use in dirty environments; rather use opposed mode or see SBL1 & SBLX1, below. Do not locate retroreflector closer than 6 inches (15cm) from sensor. | \[imbalance adjective\] | ![Diagram of SBLV1](image)
SBLVAG1: uses anti-glare filter for immunity to direct reflections from shiny objects. Use only with models BRT-3 or BRT-1.5 retroreflective targets. Use only in clean environments. Do not locate retroreflector closer than 12 inches (30cm) from sensor. | ![Diagram of SBLVAG1](image)
SBL1: use where invisible beam is advantageous (e.g. security applications or film processing). First choice for retroreflective sensing in slightly or moderately dirty environments. Do not use when the object to break the beam has a shiny surface, unless the angle of light to the surface can be predicted. | ![Diagram of SBL1](image)
SBLX1: highest gain available in a retroreflective sensor. Use for all applications requiring more than 30-foot range where opposed mode sensors cannot be used. Objects must pass at a distance of at least 10 feet from the sensor to be reliably sensed. | ![Diagram of SBLX1](image)

**NOTE:** for detailed information on available retroreflective materials, see the Banner product catalog.
**DIFFUSE Mode**

SBD1: short range diffuse mode sensor with relatively wide field of view. Loses gain rapidly near the end of its range. As a result, its response to background objects is suppressed. However, use caution when applying any diffuse mode sensor if background reflectivity exceeds the reflectivity of the object to be sensed.

SBDL1: longer range than SBD1, but with less response to objects passing the sensor at close range, and greater sensitivity to background objects. Models SBD1 and SBDL1 are identical except for their upper cover (lens) assembly (SBD1 uses UC-D; SBDL1 uses UC-L; see Upper Cover Chart in the Banner product catalog).

### SBD1
- **Range:** 12 inches (30cm)
- **Response:** 1ms on/off
- **Repeatability:** 0.3ms
- **Beam:** infrared, 940nm

### SBDL1
- **Range:** 24 inches (60cm)
- **Response:** 1ms on/off
- **Repeatability:** 0.3ms
- **Beam:** infrared, 940nm

**APPLICATION NOTE:** as a general rule regarding background objects in diffuse sensing, verify that the distance to the nearest background object is at least three times the distance from the sensor to the object to be sensed. For example, if a product passes one inch from an SBD1 sensor, the nearest background object should be at least three inches further away.

SBDX1: first choice for diffuse (proximity) mode applications when there is no requirement for less than 10 ms response and where there are no background objects to falsely return light. High excess gain for reliable detection of most materials with low reflectivity which pass within 10 inches (25cm) of the sensor.

SBDX1MD: wide beam angle for forgiving alignment to reflective objects. First choice for detection of clear or translucent glass or plastics. High excess gain at close range, with fast fall-off of gain near the maximum sensing distance for optical suppression of reflective background. This model may be created from model SBDX1 by substituting upper cover (lens) model UC-DMB.

### SBDX1
- **Range:** 6 feet (2m)
- **Response:** 10ms on/off
- **Repeatability:** 1.5ms
- **Beam:** infrared, 880nm

### SBDX1MD
- **Range:** 24 inches (60cm)
- **Response:** 10ms on/off
- **Repeatability:** 1.5ms
- **Beam:** infrared, 880nm

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**MULTI-BEAM 3- & 4-wire Scanner Blocks**

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