MINI-BEAM®: Millions of sensors in use.

The MINI-BEAM is the world’s most popular miniature photoelectric sensor. With millions of units in use worldwide, it has become the benchmark for small photoelectrics. Fact is, there are more MINI-BEAMs solving more sensing applications in more plants worldwide than any other sensor. Because there is a MINI-BEAM to solve every application in your plant, it is also your best single-sensor choice to standardize all of your sensing applications.

Advanced “TEACHABLE” microprocessor.
The new MINI-BEAM® Expert™ * features a highly advanced, “teachable” microprocessor. With the sensor in TEACH mode, it can “learn” the ON and OFF sensing conditions required, compute the most accurate setting for recognizing the difference in received light signals, and self-program that setting.

*Patent pending

Simple, one-button operation.
The MINI-BEAM Expert “learns” each job with the push of a single button. Simply push it once with the sensor pointed at the ON condition, and once with it pointed at the OFF condition. Not only does it provide extremely accurate sensitivity settings, this single pushbutton is extremely easy to use, and it eliminates the potential for adjustment tampering on your production line.

The sensing modes you need.
The MINI-BEAM Expert is available in many sensing modes to solve virtually every sensing application in your plant. Sensing modes include: regular and wide angle diffuse (proximity mode), polarized retroreflective, retroreflective mode clear object detection, convergent, plus infrared and visible beam fiber optics. See page 6 for available models and specifications.
Accurate indicators for excess gain and sensing contrast stability.

In TEACH mode, the patented Banner Alignment Indicating Device (AID™) superimposes a pulse rate proportional to the strength of the received light signal. After programming, when the sensor returns to the RUN mode, the display provides an ongoing indication of contrast stability at a glance.

**In TEACH mode:**
- Flashing red LED in TEACH mode indicates excess gain (AID circuit). Amber indicates when sensor is ready to learn each condition.

**In RUN mode:**
- Solid green LED indicates acceptable sensing contrast. Amber indicates output ON.
- Flashing green LED indicates sensing contrast "marginal."
- Alternating red/green LED flashes in the unlikely event of memory failure (need to re-TEACH sensor).

Precise, low-contrast sensitivity adjustments.
The MINI-BEAM Expert recognizes the most difficult low-contrast sensing conditions, and automatically expands its sensitivity range to compute the most accurate setting for differentiating even small differences in the received light signals. It is the most accurate system available and will solve tough applications such as white materials on a white background, small components, edge detection, sensing small or lightly tinted color marks, and transparent materials (see below).

Increased reliability for sensing clear and reflective materials.
The MINI-BEAM Expert offers vastly increased reliability versus standard sensors, for sensing transparent and highly reflective materials, such as plastic, shrink-wrap, clear plastic webs, bottles and numerous other applications. The specialized retroreflective clear object detection model optically improves sensing contrast with clear target materials such as glass.
Remote programming for convenience and greater security.

Wherever they are mounted, one or more MINI-BEAM Expert sensors can be easily wired to an external switch or PLC to enable remote programming from a convenient location. Remote programming also assures greater security for application settings because it can lock out the sealed programming button, and there are no easily changed external switches.

Red, green or blue LED emitters.

The choice of a red, green, or blue LED light source in both plastic and glass fiber optics, as well as convergent mode, gives users the ideal sensing solution for maximum sensitivity to any color, even low-contrast targets such as glass, or yellow ink on a white background. This wide choice of models gives you solutions to all your color mark applications.

Electrically protected.

The MINI-BEAM Expert withstands electrical problems including reverse polarity, fast-transient and over-voltage. It provides bipolar NPN and PNP (current sinking and sourcing) outputs with a maximum rating of 150 mA (25°C) to 100 mA (70°C).

Rugged and sealed.

MINI-BEAM Expert withstands difficult environments. Its yellow glass-filled polyester housing is rugged, and its electronics are completely encapsulated in epoxy. The environmentally sealed programming button eliminates leakage and tamper-prone access covers and adjustments. It is rated IEC IP67 and NEMA 6.

Prewired or QD wiring, 10 to 30V dc.

Users can choose 10 to 30V dc models with a 2 m (6.5’) or 9 m (30’) attached, 5-conductor PVC potted-in cable, or a 5-pin Euro-style quick disconnect connector for easy sensor installation and removal. Keyed connectors prevent wiring errors.
MINI-BEAM \* Expert \* Sensor Applications

**CLEAR BOTTLE COUNTING**

**Objective:** To reliably count clear bottles moving on a high-speed conveyor line.

**Sensor:** SME312LPC

**Operation:** The polarized retroreflective optics of MINI-BEAM Expert clear object detection sensors are optimized for reliable sensing of clear glass or plastic materials. This sensor generates one solid count from each bottle moving through the beam.

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**WEB CUTOFF REGISTRATION**

**Objective:** To detect a color mark printed on a continuous web for accurate control of downstream cutoff.

**Sensor:** SME312CVB

**Operation:** MINI-BEAM Expert Model SME312CVB is a convergent mode sensor with a blue light source that reliably detects many difficult color mark contrasts, such as yellow against off-white (shown here). The sensor is located near the printing drum, where web “flutter” is not a factor. The MINI-BEAM should be mounted at a “skew” angle of about 15 degrees from the perpendicular to shiny or clear webs in order to avoid strong direct reflections of the sensing beam. The MINI-BEAM Expert is available in fixed-wavelength models with blue, green, or red light sources for handling specific color contrasts.

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**WAFFER CASSETTE PRESENCE**

**Objective:** To sense the presence of wafer cassettes on a conveyor.

**Sensor:** SME312FP with PIT46U fibers and L2 lenses

**Operation:** Silicon wafers are transported in cassettes from one location to another on a conveyor. Individual plastic fiber optics are located on both sides of the conveyor in the opposed sensing mode. L2 lenses are fitted onto each fiber sensing tip to extend sensing range. The beam is broken whenever a cassette is present.
### MINI-BEAM Expert Sensors

#### Features:
- Infrared beam, 880 nm
- Red beam, 650 nm
- Green beam, 540 nm
- Blue beam, 475 nm

#### Specifications:

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Mode &amp; Range</th>
<th>Cable*</th>
<th>Supply Voltage</th>
<th>Output Type</th>
<th>Output Rating</th>
<th>Response</th>
<th>Repeatability</th>
</tr>
</thead>
<tbody>
<tr>
<td>SME312D</td>
<td>Standard Diffuse 300 mm (15&quot;)</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar</td>
<td>100 mA maximum</td>
<td>500µs</td>
<td>100µs</td>
</tr>
<tr>
<td>SME312W</td>
<td>Wide Angle Diffuse 130 mm (5&quot;)</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar</td>
<td>100 mA maximum</td>
<td>500µs</td>
<td>100µs</td>
</tr>
<tr>
<td>SME312LP</td>
<td>Polarized Retroreflective 10 mm to 3 m (0.4&quot; to 10&quot;)</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar</td>
<td>100 mA maximum</td>
<td>500µs</td>
<td>100µs</td>
</tr>
<tr>
<td>SME312LPC</td>
<td>Polarized Retroreflective Clear Object Detector 1.0 m (3&quot;) with BRT 2x2</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar</td>
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<tr>
<td>SME312CV</td>
<td>Convergent, 16 mm (0.65&quot;)</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar NPN/PNP</td>
<td>100 mA maximum</td>
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<td>100µs</td>
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<tr>
<td>SME312CV2</td>
<td>Convergent, 43 mm (1.7&quot;)</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar NPN/PNP</td>
<td>100 mA maximum</td>
<td>500µs</td>
<td>100µs</td>
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<tr>
<td>SME312CVN</td>
<td>Convergent, 16 mm (0.65&quot;)</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar NPN/PNP</td>
<td>100 mA maximum</td>
<td>500µs</td>
<td>100µs</td>
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<tr>
<td>SME312CUB</td>
<td>Convergent, 16 mm (0.65&quot;)</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar NPN/PNP</td>
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<td>500µs</td>
<td>100µs</td>
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<tr>
<td>SME312F</td>
<td>Glass Fiber Optic, range varies</td>
<td>2 m (6)</td>
<td>10 to 30V dc</td>
<td>Bipolar NPN/PNP</td>
<td>100 mA maximum</td>
<td>500µs</td>
<td>100µs</td>
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<tr>
<td>SME312FPV</td>
<td>Glass Fiber Optic, range varies</td>
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<td>10 to 30V dc</td>
<td>Bipolar NPN/PNP</td>
<td>100 mA maximum</td>
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<tr>
<td>SME312FPFG</td>
<td>Glass Fiber Optic, range varies</td>
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<td>Bipolar NPN/PNP</td>
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<tr>
<td>SME312FPB</td>
<td>Glass Fiber Optic, range varies</td>
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<td>100µs</td>
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<tr>
<td>SME312FPP</td>
<td>Plastic Fiber Optic, range varies</td>
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<td>100µs</td>
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<tr>
<td>SME312FPG</td>
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<td>2 m (6)</td>
<td>10 to 30V dc</td>
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<td>100 mA maximum</td>
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<tr>
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<td>500µs</td>
<td>100µs</td>
</tr>
</tbody>
</table>

*All models available with additional connector options: integral 5-pin Euro-style quick-disconnect (add QD to model number), or attached 9 m (30’) cable assembly (add W/30 to model number).

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**Diffuse, Retroreflective and Convergent Mode Models**

**Wide Angle Diffuse Mode Model**

**Glass Fiber Optic Models**

**Plastic Fiber Optic Models**

*See drawing for dimensions of Quick-Disconnect option.*

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**Quick-Disconnect Dimensions, All QD Models**
The accessories you need for optimum sensor performance.

A complete selection of brackets offers flexible, aesthetic mounting options.
Having the right mounting options readily available will assure optimum performance from your Banner sensors.
These attractively designed stainless steel and reinforced thermoplastic polyester units also enhance the appearance of your equipment and save you time and money through reduced installation time and lower total installed cost.
Choose angled, through-hole brackets; split-clamp models that mount to a flat surface; versatile swivel-mount models that mount flat and have an adjustable ball to position the sensor at any angle; and many more. Custom brackets can also be designed for your unique applications. Request the Banner Sensor Catalog (P/N 98000) or CD ROM (P/N 98100) for available models.

Optical-quality retroreflectors.
Choose from a complete line of high-quality acrylic targets, high-temperature targets and adhesive-backed retro tapes (not shown). Numerous sizes, shapes and mounting options meet your application requirements. Standard reflectivity model BRT-3 is used to conservatively rate the range of Banner retroreflective sensors; however new high-reflectivity models dramatically increase the sensing ranges with reflectivity factors up to 3. Maximum temperature ratings range from 50°C (120°F) up to 480°C (900°F). Various mounting options are available. Request the Banner Sensor Catalog (P/N 98000) or CD ROM (P/N 98100) for available models.

The broadest line of plastic & glass fibers.
Banner fiber optics allow you to "pipe" light into otherwise inaccessible or hostile environments. Banner has the broadest, most readily available line of fibers in the world. Choose from a huge selection of standard fibers in virtually all shapes and sizes, or custom fibers can easily be designed for your unique applications. Choose from two general styles: individual fibers are used in pairs in the opposed sensing mode; and bifurcated fibers that both emit and receive light signals in one assembly. Banner plastic fibers offer a uniquely affordable solution because they are inexpensive and are easily cut to length during installation (a cutting device is supplied with each fiber). Banner glass fibers withstand the most hostile environments such as high temperatures up to 480°C (900°F), corrosive materials, extreme moisture, high levels of electrical noise, shock, and vibration. Request the Banner Sensor Catalog (P/N 98000) or CD ROM (P/N 98100) for available models.
When you buy your sensors and machine safety equipment from Banner, you gain the confidence of dealing with the nation’s largest, most knowledgeable and experienced photoelectric company. We have the broadest line of products and the most advanced manufacturing capabilities in the industry. We can handle any size order, large or small, utilizing the most advanced manufacturing capabilities. We can deliver any of more than 10,000 different products in just three days - most can ship within hours!

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