

BANNER[®]
the photoelectric specialist

MINI-BEAM[®] Expert[™] Photoelectric Sensors

The world's most popular photoelectric is now the world's smartest.

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.

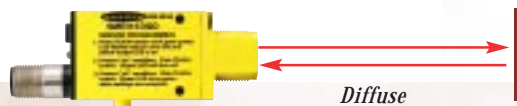
Advanced "TEACHABLE" microprocessor.

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.

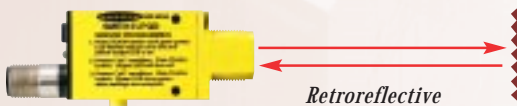
*Patent pending

Simple, one-button operation.

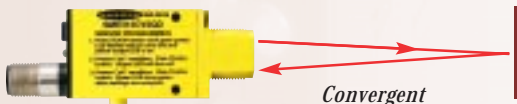
The MINI-BEAM *Expert* "learns" each job with the push of a single button. Simply push it once with the sensor pointed at the ON condition, and once with it pointed at the OFF condition. Not only does it provide extremely accurate sensitivity settings, this single pushbutton is extremely easy to use,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



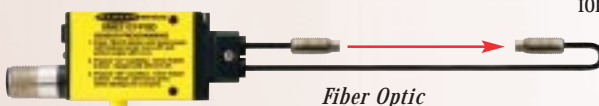
Diffuse



Retroreflective



Convergent



Fiber Optic

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.





MINI-BEAM® *Expert*™: Push one button to solve your toughest applications.

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.



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).



MINI-BEAM[®] Expert[™]: Advanced features improve performance & make your job easier.

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.





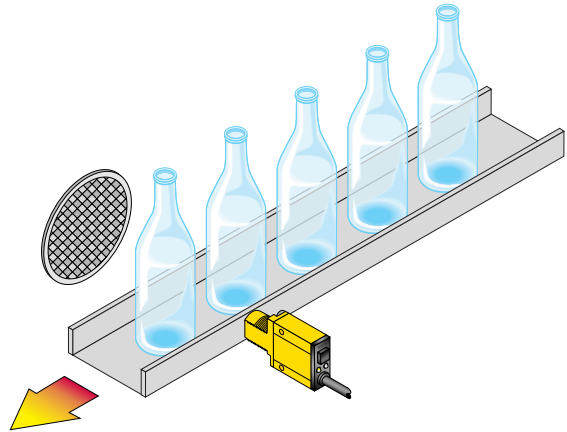
MINI-BEAM® Expert™ Sensor Applications

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.

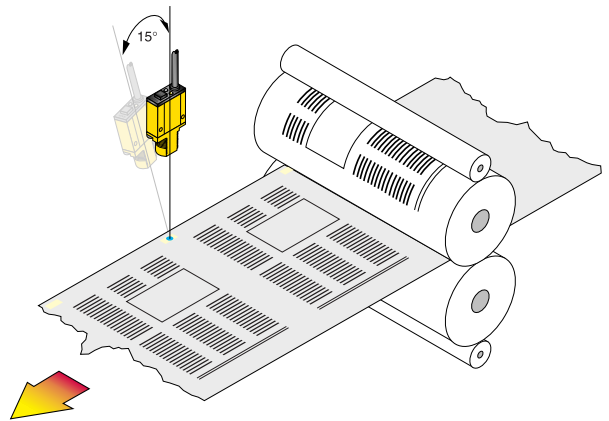


WEB CUTOFF REGISTRATION

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.

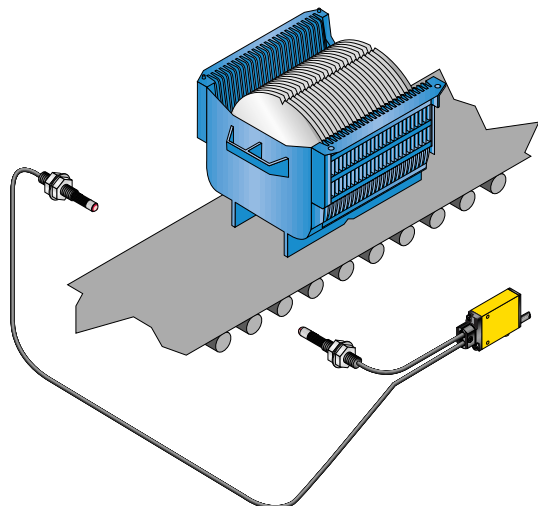


WAFER CASSETTE PRESENCE

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

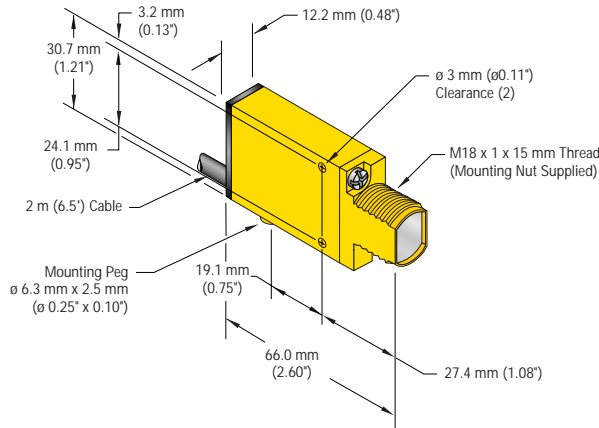
MINI-BEAM Expert Sensors

□ Infrared beam, 880 nm
 □ Red beam, 650 nm
 □ Green beam, 560 nm
 □ Blue beam, 475 nm

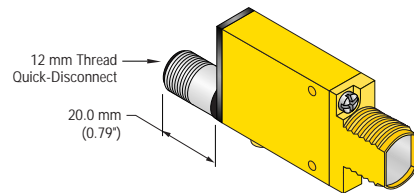
Model Number	Mode & Range	Cable*	Supply Voltage	Output Type	Output Rating	Response	Repeatability
SME312D	Standard Diffuse 380 mm (15")	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312W	Wide Angle Diffuse 130 mm (5")	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312LP	Polarized Retroreflective 10 mm to 3 m (0.4" to 10')	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312LPC	Polarized Retroreflective Clear Object Detector 1.0 m (3') with BRT 2x2	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312CV	Convergent, 16 mm (0.65")	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312CV2	Convergent, 43 mm (1.7")	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312CVG	Convergent, 16 mm (0.65")	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312CVB	Convergent, 16 mm (0.65")	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312F	Glass Fiber Optic, range varies	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312FV	Glass Fiber Optic, range varies	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312FVG	Glass Fiber Optic, range varies	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312FVB	Glass Fiber Optic, range varies	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312FP	Plastic Fiber Optic, range varies	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312FPG	Plastic Fiber Optic, range varies	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs
SME312FPB	Plastic Fiber Optic, range varies	2 m (6')	10 to 30V dc	Bipolar NPN/PNP	100 mA maximum	500µs	100µs

*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).

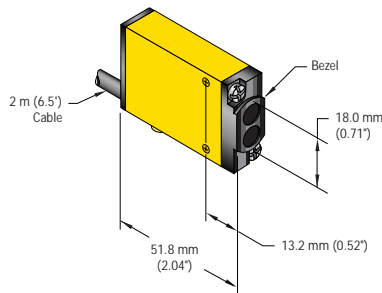
Diffuse, Retroreflective and Convergent Mode Models*



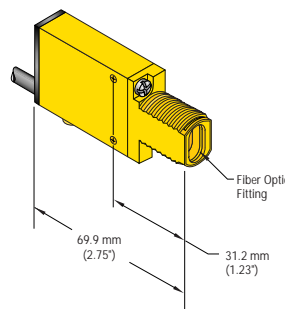
Quick-Disconnect Dimensions, All QD Models



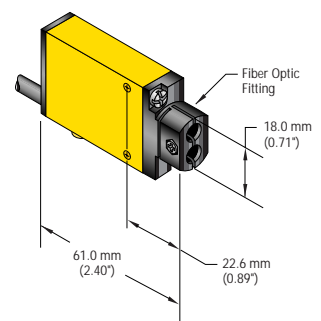
Wide Angle Diffuse Mode Model*



Glass Fiber Optic Models*



Plastic Fiber Optic Models*

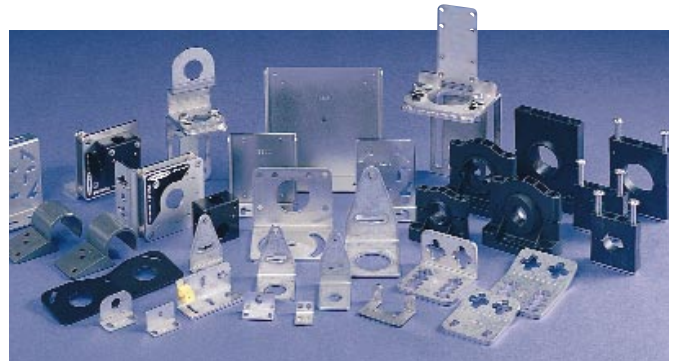


*See drawing for dimensions of Quick-Disconnect option.

The accessories you need for optimum sensor performance.

A complete selection of brackets offers flexible, esthetic 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°). 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.



Banner: Industry's number one supplier of photoelectric systems.

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!

Just as important, we have the largest photoelectric sales and support network in the industry, a collection of the industry's most knowledgeable distributors and sales engineers, available worldwide. We're close by wherever you're located, and we're ready to help you with your applications, plus give you excellent service support.

When you add it up, you'll find the best value in Banner photoelectric products.

For more information or applications assistance:

**Call 1-888-3-SENSOR
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The Banner Sensor Catalog and CD ROM.

The industry's most complete catalog; over 700 pages of detailed product and technical information on over 10,000 photoelectric and ultrasonic sensors. Simple selection charts make specifying the correct sensors easier than ever. Additional technical information includes hook-up diagrams and application notes, plus complete specifications, glossary of terms and data reference.

Call or write for your copy today,
P/N 98000;
CD ROM,
P/N 98100.



The Banner Safety Products Catalog and CD ROM.

A complete catalog of Machine Safety Products including Banner's extensive line of safety light screen controllers, emitters and receivers, including MICRO-SCREEN™, MINI-SCREEN®, MACHINE-GUARD, MULTI-SCREEN® Dual Systems and PERIMETER-GUARD Systems. Also included are Banner's two-hand anti-tiedown controls and full line of safety interlock switches, E-stop relays and safety relays.

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IMPORTANT NOTICE

The product information and applications presented in this brochure are descriptive only. These descriptions are not for use as system installation information. Banner has made every effort to provide complete application, installation, operation, and maintenance information in the instructions supplied with each product. Copies of the instructions are available; contact the factory or your local Banner sales office.