

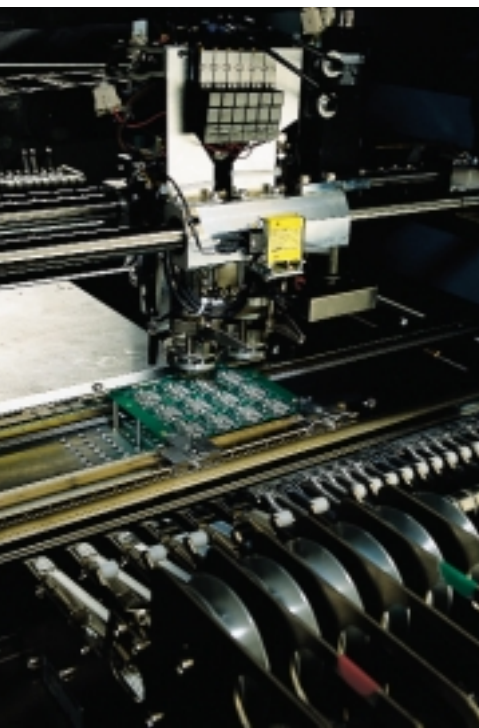
# *More Sensors. More Solutions.*

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# 15,000 Different Ways to Solve Your Applications.



With more than 15,000 different products, Banner offers you the industry's most complete and integrated line of photoelectric and ultrasonic sensors, machine safety products, and measurement /inspection products—a solution for every possible application. We ship thousands per day and one is installed every 3 1/2 seconds! Whatever part or material you need to sense or inspect, Banner has a solution.

### Advanced Manufacturing Capabilities.

Automation is the backbone of Banner's world-class manufacturing capabilities. Banner utilizes surface mount components and extremely fast pick and place technology to populate boards at speeds of nearly 30,000 components per hour. This is only one of Banner's many assurances of manufacturing capacity to meet market demands and handle any size order. We can deliver any of over 15,000 different products in just three days; most can ship within hours!



### Industry's Most Preferred Sensors.

More engineers prefer to purchase Banner sensors than any other brand, by a wide margin. Why? Because Banner is the largest, most capable sensor company with the broadest line of products and solutions in the world. Which allows Banner application engineers to solve more of your applications, each one with the support of the best field representatives and distributors to back them up.

### Products for All Industries, Worldwide.

Banner makes products for every manufacturing and process industry. Whatever industry you're in or whatever product you manufacture, Banner has the right sensors to automate your plants, and improve your overall efficiency, quality and safety.

Aircraft & Aviation  
Agriculture  
Assembly  
Automated Storage & Retrieval  
Automotive Manufacturing  
Computer Manufacturing  
Converting  
Conveyor Control

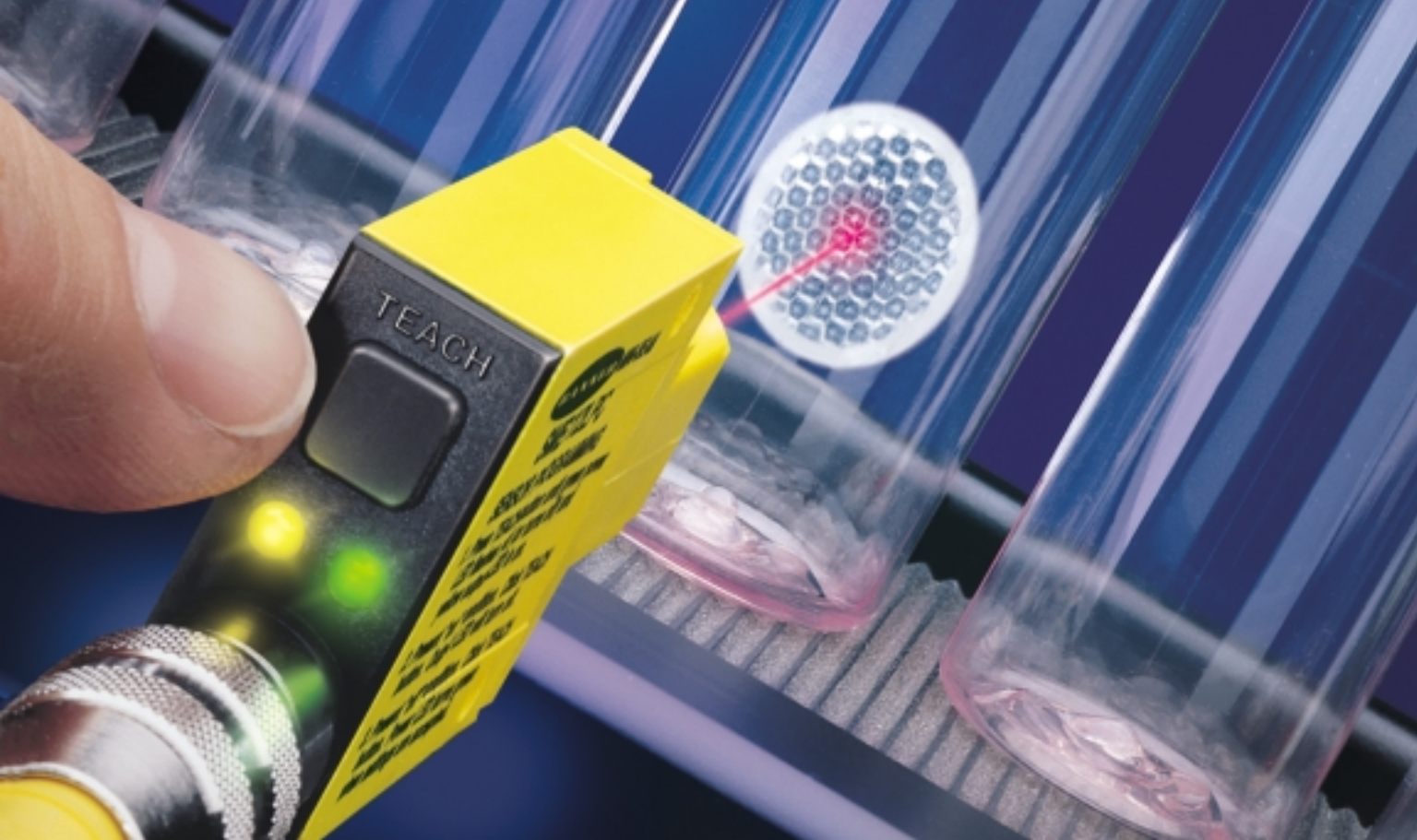
Dairy Processing  
Electronic Equipment  
Factory Automation  
Food Manufacturing  
Forest Industries  
Grain Processing  
Hazardous Areas  
Heating, Air Conditioning  
Industrial Machinery

Inspection  
Iron & Steel Manufacturing  
Material Handling  
Measurement  
Medical Manufacturing  
Metalworking  
Microelectronics  
Mining  
Motion Control

Package Shipping & Handling  
Packaging  
Paper Manufacturing  
Pharmaceuticals  
Plastics Manufacturing  
Power Transmission  
Printing Industries  
Raw Materials Processing

Robotics  
Semiconductor Manufacturing  
Systems Integration  
Textiles  
Transportation  
Wastewater Treatment  
Wood Processing





### **Photoelectric Sensors.**

The world's most complete line of more than 12,000 photoelectric sensors including models with self-contained or remote amplifiers, limit-switch style or miniature housings, precise range or high-power up to 305 m (1,000') range. Industry's broadest line of standard and custom fiber optic assemblies. Rugged NEMA 6P and IP67 construction.

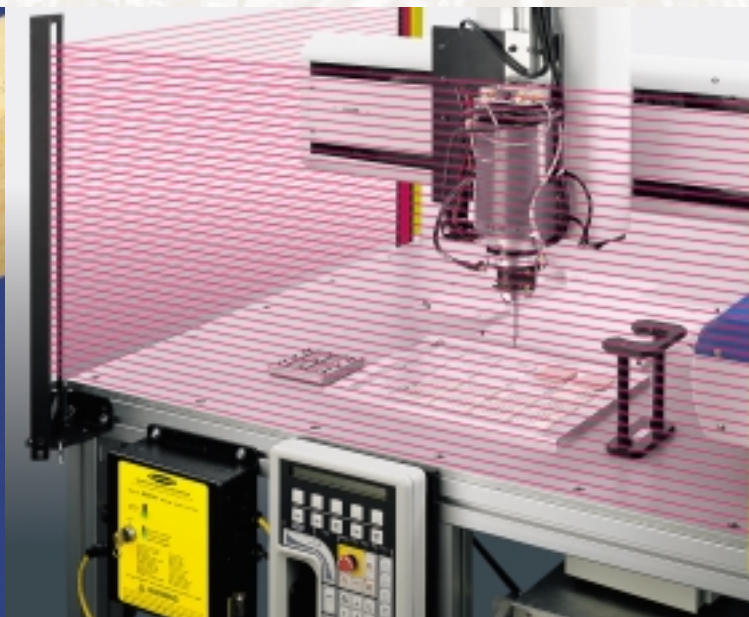
## ***Three Innovative Technologies Give You the Edge in Products & Manufacturing.***

### **Precision Measurement & Inspection Products.**

Advanced Banner precision measurement sensors solve a wide variety of difficult sensing applications. This diverse product line includes the very latest infrared, laser, ultrasonic and camera-based technologies with advanced features only available from Banner. Choose precise L-GAGE™ Class 2 laser gauging sensors, U-GAGE™ ultrasonic gauging sensors, A-GAGE™ light screens for precise on-the-fly product profiling and sizing, or *PresencePLUS*™ camera-based systems.

### **Machine Safety Products.**

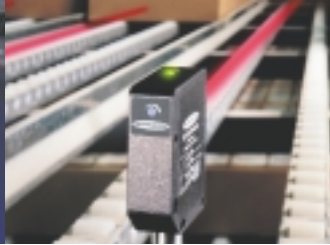
Banner has more safety solutions including safety light screens for every application. Choose from the smallest, most esthetic MICRO-SCREEN® for smaller equipment, to the popular MINI-SCREEN®, to the rugged MACHINE-GUARD™ and PERIMETER-GUARD™ systems. In addition, we offer a complete line of safety modules, two-hand controls, and safety interlock switches.



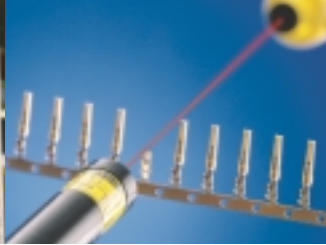




**Ultra-miniature Photoelectrics**  
Self-contained or remotely-amplified sensors fit inside the smallest equipment. Banner's advanced "chip-on-board" technology achieves a new level of miniaturization for all sensing modes.



**Long Range Sensors**  
Compact yet powerful single unit diffuse-mode sensors have ranges up to 6 m (20'). Opposed mode models available with ranges up to 305 m (1000').



**Laser-Based Sensors**  
High-precision laser sensors feature increased sensing range, visible beams for easy alignment and accuracy up to 0.25 mm (0.01") for challenging applications including precise, long-range sensing, position sensing, and sensing small objects.



**Intrinsically-safe Sensors**  
For potentially-explosive environments these special sensors meet DIN 19 234 safety requirements for use with approved switching amplifiers with intrinsically-safe input circuits, eliminating the need for extremely heavy, explosion-proof enclosures.

## Photoelectric Sensors.



### Automated & Manual Assembly

High speed solutions for error-free automated assembly operations. For control of manual assembly operations, Parts Verification Sensor shown assures accurate, sequential bin-picking for assembly operations.



### Universal Voltage Sensors

Achieve worldwide component standardization and simplify inventory with sensors that operate at 24 to 250V ac, 50/60 Hz, or 12 to 250V dc. Can be solid-state or with 5-amp electro-mechanical relay output.

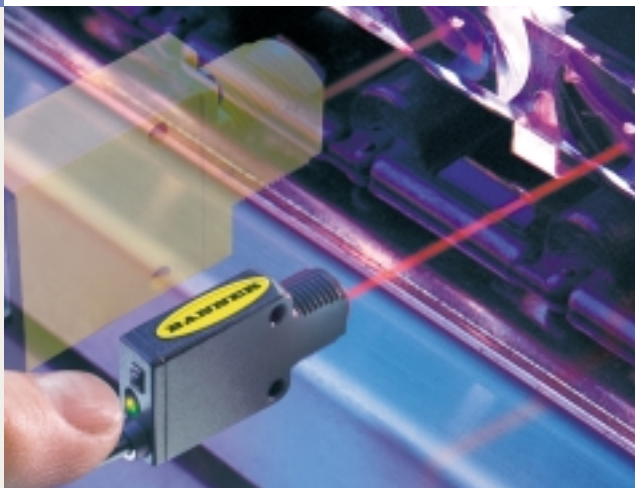


### Fiber Optic Sensors

The world's broadest line of fiber optic sensors with fibers in virtually all shapes and sizes, or custom fibers for unique applications. Glass fibers for high temperatures, corrosive environments or extreme moisture. Inexpensive plastic fibers are easily cut-to-length during installation. High-resolution microprocessor-based sensors for color mark sensing.

### Miniature Self-contained Sensors

Tiny MINI-BEAM®2 sensors fit your applications better and feature a single pushbutton for simpler digital sensitivity adjustments. Completely self-contained sensors provide outputs that will switch up to 150 mA.



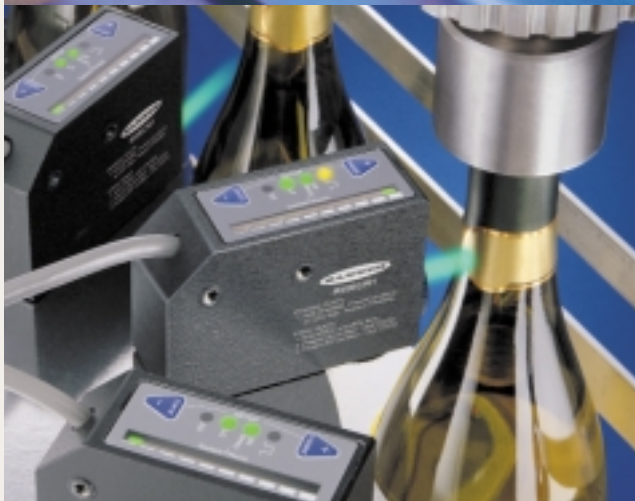
### Automotive Solutions

Rugged, NEMA 6P and IP67 stainless steel or fiber-reinforced thermoplastic sensors meet the demanding requirements of all automotive manufacturing applications. Durable, epoxy-encapsulated circuitry and leakproof designs.



### Color Mark Sensors

Extremely fast solid-state sensors with a response time of only 50 µs allow smaller, less-conspicuous color registration marks. They replace short-lived, incandescent registration sensors.



### Sensors for Packaging & Material Handling

Wide variety of sensors for packaging machinery, conveyors, and automated storage and retrieval. Models with adjustable sensing fields or fixed field models to detect objects at exact distances, ignoring background objects. Powerful diffuse models with range up to 6 m (20').





### Sensors for Automated Manufacturing

Fast responding sensors for high-speed manufacturing and automated assembly operations. Unique, patented AID™ system features LEDs that flash in direct proportion to the strength of the received sensing signal.





## Laser Displacement Sensors

L-GAGE™ Class 2 laser gauging sensors feature an ultra-precise narrow beam with a resolution of 3  $\mu\text{m}$  (0.0001"), and custom-sized sensing windows using simple "touch and go" TEACH mode programming.



**KEYENCE**

To Set ANALOG limits, use the A (red) Teach button.  
To Set DISCRETE limits, use the D (green) Teach button.  
1 Press and hold appropriate Teach button until  
Teach light turns ON.  
2 Adjust target to 1st limit point. Press Teach  
(Teach flashes).  
3 Adjust target to 2nd limit point. Press Teach  
button. (Teach turns OFF)



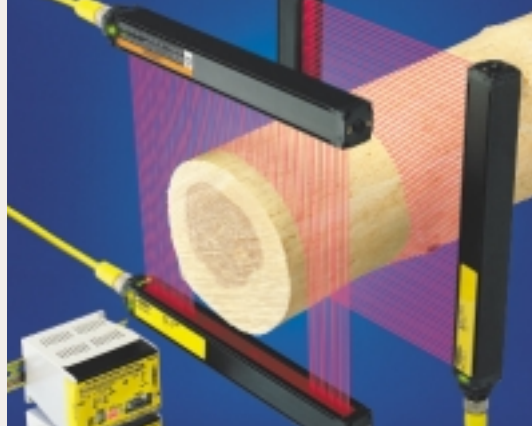


### Sensors for Microelectronic Manufacturing

Photoelectric and laser technologies solve difficult applications such as flat finding, wafer mapping, part presence, lead frame hole sensing, IC orientation, pin counting, small parts detection and leak detection. PicoDot® shown has convergent point size of only 0.25 mm (0.01").

### High Resolution Light Screens

For precise product profiling and on-the-fly sizing, A-GAGE™ light screens offer true 2.5 mm (0.1") resolution and incredible flexibility, including three scanning modes and eight measurement modes using Windows® software.



### Advanced Inspection Sensors

Camera-based sensors provide advanced vision functions without the cost of high-end vision systems. Extremely easy to set up, simple to use and affordable.



# Precision Measurement & Inspection Systems.



### Measuring Light Screens

Measuring light screens perform advanced measuring applications, including on-the-fly product sizing, object profiling, product inspection, package measurement and web guiding. Users can choose from several controllers.



### Remote Ultrasonic Sensors

Remote ultrasonic sensors for hard-to-access and limited space applications detect object presence within 0.6 mm (0.024") with an exceptional sensing repeatability of ±1%. Analog versions feature accurate 0.075 to 0.375 mm (0.003" to 0.015") resolution.



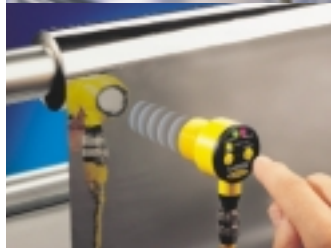
### Bus-compatible Light Screens

Measuring light screen with DeviceNet™ compatibility provides centralized monitoring of operating status and diagnostics, to minimize troubleshooting and reduce downtime.



### Ultrasonic Sensors

Advanced microprocessor-controlled sensors allow users to set their own adjustable sensing windows, including high-low limits logic. Digital or analog, short or long ranges, with resolutions as high as 0.080 mm (0.003").



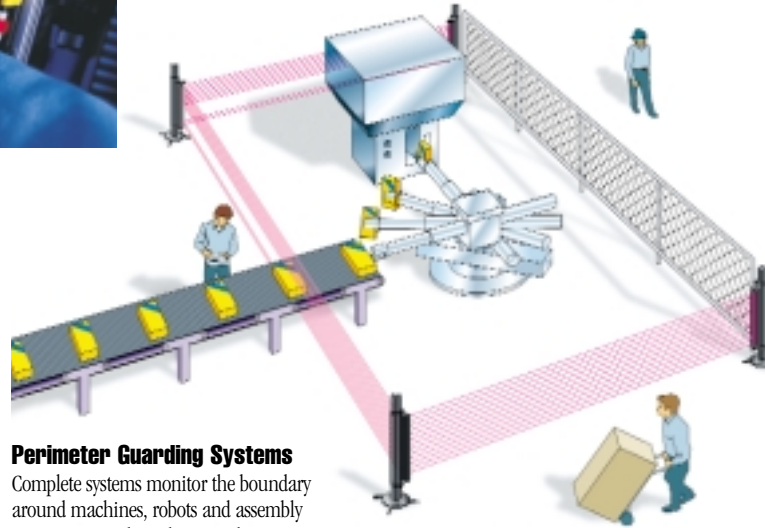
### Ultrasonic Gauging Sensors

Patented U-GAGE™ T30 ultrasonic sensors for precise measurement applications include both switched and analog outputs in the same sensor, performing both measurement and on-off switching simultaneously.



**Miniature Light Screens**

Light screen systems for smaller machinery utilize large, ultra-bright diagnostics indicators, and choice of metal or DIN-rail controllers. Banner systems are the easiest to set up with patented system of diagnostic LED indicators.



**Perimeter Guarding Systems**

Complete systems monitor the boundary around machines, robots and assembly systems. Control can be two-, three-, or four-sided with the use of corner mirrors.



**Two-hand Controls**

Safety devices require the use of both hands operating both inputs simultaneously to start and maintain a normal machine cycle. Redundant system meets EN574 standards.



**Safety Interlock Switches**

Switches and controls fit all types of guard doors and covers, and feature "positive opening" contacts as required by International safety standards.



**Safety Modules**

Safety Category 2 and 4 Safety Modules monitor normally-closed, E-stop switch contacts or safety interlock switches and comply with pertinent International standards.



**Magnetic Safety Switches**

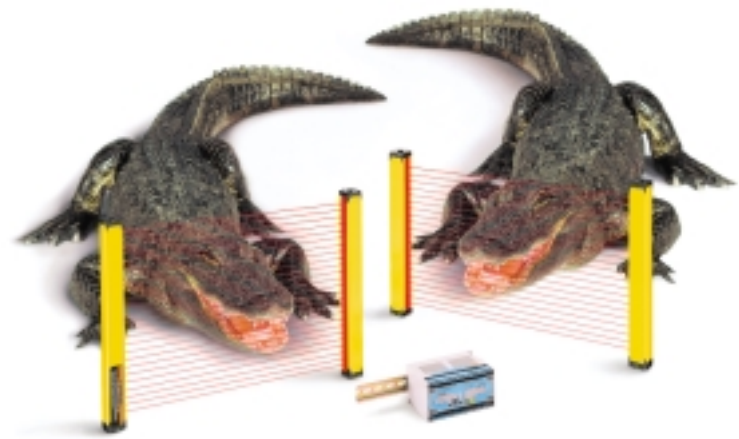
Sealed switches are extremely resistant to defeat with triple-coded magnets. Tolerant to dirt buildup, sensing distance and alignment.



**Access-Guard™**

Inexpensive eight-beam system including emitter, receiver, mirrors, brackets and stands is perfect for guarding entrances to hazardous areas.

*Machine Safety Products.*

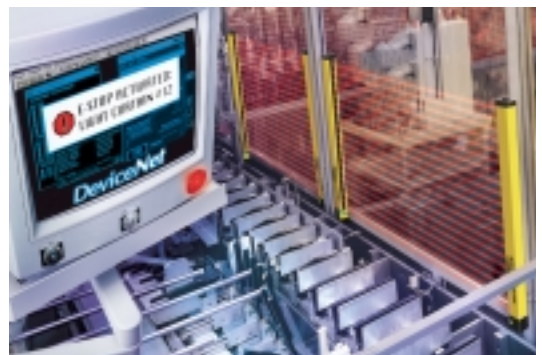


**Dual Light Screen System**

Allows users to operate two light screens with one controller, saving wiring and panel space. Pre-packaged system allows simultaneous guarding of two areas on a machine, eliminating the cost of additional controllers.

**Fieldbus-compatible Light Screens**

Light screen control modules offer complete system monitoring on DeviceNet™ fieldbus networks for non-safety monitoring of system status. They offer easier troubleshooting, greater usability and convenience, and lower operating costs.







### **Safety Light Screens**

Precisely-controlled “screens” of infrared light guard any size machine, sending a stop signal to protected machinery if any opaque object, such as a hand, interrupts the beams. Available in all sizes with ranges up to 18 m (60’). Dozens of models all designed to meet International safety standards and regulations.





Analog & Digital  
Measurement Sensors

Sensors For  
Clear Materials



Sealed Enclosures  
Withstand Washdown



Long Range Sensors With Immunity to  
Background Interference

Sensing Solutions For Explosive Atmospheres



Rugged Teflon-coated  
Fiber Optics

Sensors For Minute targets

## A Unique Ability To Solve Your Toughest Applications.

Advanced sensing, inspection and machine safety technologies are applications intensive. And Banner solves more difficult sensing, inspection and safety problems than any other company. Our application experts are just a phone call or an email away in your local country or at the Banner headquarters. We'll help you find the best way to solve your applications, quickly and efficiently.

### Banner Design Center

This state-of-the-art facility houses over 100 engineers, the largest engineering staff of its kind, to research and apply the latest optical and safety technologies, including advanced capabilities in circuit design and software development.

### Banner Application Engineers

Banner provides the very best applications engineering; technical experts who understand how to apply sensing and safety technology better than anyone.

### Over 2,000 Field Representatives

Banner has what is widely acknowledged as the best sales and distribution network in our industry. Wherever you are located, you are close to highly-trained professionals who will help you find the best sensing and safety solutions. For a current listing of Banner's Worldwide Representation, please go to the sales section of our web site at [www.baneng.com](http://www.baneng.com)



Visit Banner On-Line at  
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- Complete product information for:
  - Photoelectric sensors
  - Measurement and inspection sensors
  - Machine safety products
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- Product catalogs, specifier's guides, and product brochures available for immediate download or email request.
- Complete descriptions for each product, with links to product data sheets and dimension drawings.
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**A Worldwide Presence.**

Banner is a Global Enterprise with world-class manufacturing, sales, distribution and service in every major country worldwide. No matter where you are located, there is a Banner representative nearby to help you with your sensing, safety and inspection applications. Call your local Banner representative whenever you have a need. See the complete list of Banner representative locations enclosed with this brochure, or visit our web site at [www.baneng.com](http://www.baneng.com) to link with your local source.

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# *Worldwide Representation*

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more sensors, more solutions

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